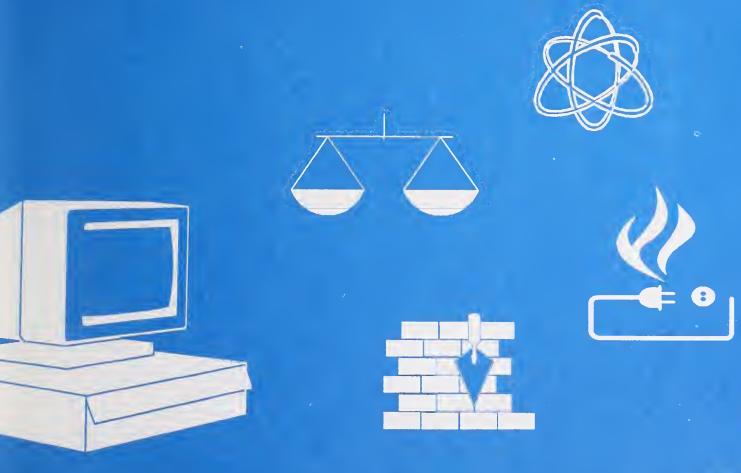




Publications of the National Institute of Standards and Technology 1993 Catalog



QC 100 U57 NO.305 Suppl.25

1996

U.S. Department of Commerce Technology Administration National Institute of Standards and Technology



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- Advanced Systems

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¹At Boulder, CO 80303.

²Some elements at Boulder, CO 80303.

Publications of the National Institute of Standards and Technology 1993 Catalog

Debby King, Editor

Office of Information Services National Institute of Standards and Technology Gaithersburg, MD 20899-0001

Issued April 1996



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CATALOG STRUCTURE AND USE

Full bibliographic citations including keywords and abstracts for National Institute of Standards and Technology (NIST) papers published and entered into the National Technical Information Service (NTIS) collection are cited in the "NIST Publications Announcements" section of this catalog. (Also included are papers published prior to 1993 but not reported in previous supplements of this annual catalog.) Entries are arranged by NTIS subject classifications which consist of 34 broad subject categories (see back cover) and over 350 subcategories. Within a subcategory, entries are listed alphanumerically by NTIS order number.

Four indexes are included to allow the user to identify papers by personal author, keywords, title, and NTIS order/report number. Each entry lists the appropriate title, the NTIS order number, and the abstract number.

Papers may also be identified by searching the NTIS database either online via commercially available systems such as DIALOG, or in the issues of NTIS's Government Reports Announcements and Index and its Government Reports Annual Index.

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The highest quality and least expensive copies of NIST publications published as Government documents are available from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402. Publications cited with stock numbers (SN) should be ordered by these numbers. GPO will accept payment by check, money order, VISA, MasterCard, or deposit account. For availability and price, write to the GPO or telephone (202) 783-3238. Should a NIST publication be out of print at the GPO, its continued availability is assured at NTIS which sells publications in microfiche or paper copy reproduced from microfiche.

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Papers noted "Not Available NTIS" may be obtained directly from the author or from the external publisher

cited. Such papers are not for sale by either the GPO or NTIS.

Two other sources for NIST publications are depository libraries (libraries designated to receive Government publications) and Department of Commerce District Offices. The depository libraries listed in Appendix A receive selected NIST publications (see inside back cover for a description of the various NIST publication series). While not every Government publication is sent to all depository libraries, certain depositories designated as Regional Depositories receive and retain one copy of all Government publications made available. Contact the depository library in your area to obtain information on what is available and where.

Department of Commerce District Offices listed in Appendix B provide ready access at the local level to publications, statistical data and summaries, and surveys. Each District Office serves as an official sales agency of the Superintendent of Documents, U.S. Government Printing Office. A wide range of Government publications can be purchased from these offices. In addition, the reference library of each District Office contains review copies of many Government publications.

NIST PUBLICATIONS ANNOUNCEMENTS

SAMPLE ENTRY

COMPUTERS, CONTROL & INFORMATION THEORY

NTIS Subject Category

Computer Software

00.261

PB93-189835

PC A03/MF A01

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Building Hadamard Matrices in Steps of 4 to Order 200.

N. Drouin. Apr 93, 22p NISTIR-5121

Keywords: Computer program verification, Systems analysis, Sensitivity, Experimental design, *SPT (Synthetic Perturbation Tuning), *Hadamard matrices, Fractional factorial design.

Based on methods of construction described in 1978, the programs described allow one to build Hadamard matrices of order up to 200, in steps of 4. These matrices are to be used to generate statistical plans of analysis for the 'Synthetic Perturbation Tuning' technique of program sensitivity analysis.

NTIS Subcategory

Abstract Number

NTIS order number Availability Price Codes

Corporate or performing organization

Report Title

Personal authors

Report date

Page count

Report Number

Contract or grant number

Keywords: * indicates keyword index entry

Abstract

ADMINISTRATION & MANAGEMENT

Research Program Administration & Technology Transfer

00,001
PB94-107430 PC E02/MF A01
Executive Office of the President, Washington, DC.
Technology for Economic Growth: President's Progress Report.
Nov 93, 74p.
See also AD-A261 553.

Keywords: *Economic growth, *Technology innovation, *Research projects, International trade, Research and development, Bilateral agreements, Multilateral agreements, Job opportunities, Global positioning system, Federal agencies, Electric hybrid vehicles, Industrial

development, Investments, Technology transfer, Dual use, Defense conversion.

Contents: Executive Summary; Technology for Economic Growth: Checklist of Clinton Administration Key Accomplishments; Putting Technology to Work for America's Future; Technology and Trade: Competing in a Global Economy; Moving Manufacturing Technologies to the Global Marketplace; Realizing the Opportunities of the Information Age; Defense Technology: The Payoffs for Economic and Military Security; Energy and Environment: New Technologies for Growth; and Transportation and the Economy.

00,002
PB94-119435 PC A06/MF A02
National Inst. of Standards and Technology,
Gaithersburg, MD. Public Affairs Div.
Guide to NIST.
Special pub.
Oct 93, 119p, NIST/SP-858.

Keywords: *Manuals, *Research management, *Laboratories, *Standardization, Measurements, Product development, Research, Test facilities, *NIST(National Institute of Standards and Technology), Technology services.

The guide is designed to make finding out about programs and contacts at the National Institute of Standards and Technology a little easier. NIST researchers

actively seek out Industrial and other collaborators to work on well-defined, cooperative research projects of mutual interest. In addition, NIST researchers collaborate informally with industrial and academic researchers to solve shorter-term technical problems. The guide describes more than 250 NIST research projects, grants and industry outreach programs, services, and facilities, followed by contact names, phone numbers, and mail and electronic mail (Internet) addresses for further information.

AERONAUTICS & AERODYNAMICS

Aerodynamics

00,003

PB93-153245 Not available NTIS

AERONAUTICS & AERODYNAMICS

Aerodynamics

National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Structures Div.
Chaotic Motions of Forced and Coupled Galloping Oscillators.

Final rept.
G. R. Cook, and E. Simlu. 1990, 12p.
Pub. In Jnl. of Wind Engineering and Industrial Aerodynamics 36, p1083-1094 1990.

Keywords: *Oscillating flow, *Oscillators, *Wind effects, *Chaos, Nonlinear systems, Numerical analysis, Flow distortion, Oscillations, Fluidelasticity, Reprints, Galloping oscillators.

Numerical simulations of the behavior of a periodically forced square galloping oscillator yielded results show-ing that the behavior of this system has similanties with the behavior of the circle map. Lock-in regions were found to be ordered as rational numbers obtained by the Farey construction. At the transition from quasipenodic to chaotic motion corresponding to a winding number equal to the golden mean, the fractal dimension of the critical line was found to be 0.864, that is, to within 0.5% of the theoretical value for the circle map. Numerical studies were also performed on an autonomous system consisting of two elastically coupled galloping oscillators. Preliminary tests_conducted in the 0.3 m diameter water tunnel of the David Taylor Research Center and in the CBT wind tunnel demonstrated the feasibility of the experimental study of both the forced oscillator and the autonomous coupled oscillators described in the paper.

Aeronautics

00,004 PB94-103660 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Fire Safety Engineering Div.
Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Conditions for the Flow Outside the Ves-

sel.
L. Y. Cooper. Sep 93, 38p, NISTIR-5219.
Sponsored by Department of the Air Force, Wright-Patterson AFB, OH.

Keywords: *Aircraft fires, *Fire extinguishers, *Boundary conditions, *Orifice flow, Two phase flow, Fire extinguishing agents, Mathematical models, Enthalpy, Pressure vessels, Dispersing, Jet flow, Thermodynamic properties, Velocity distribution, Fire pro-

The work reports on part of an effort to study the dispersion and extinguishment effectiveness of Halon and halon-alternative fire extinguishment agents dis-charged from N2-pressurized vessels. In the systems under consideration, as the agent exits from the ves-sel, thermodynamic and fluld-dynamic Instabilities lead to flashing and break-up of the agent into a two-phase droplet/gaseous jet mixture. This occurs in a transition region relatively close to the vessel exit orlfice/nozzle. Downstream of this region the two-phase agent jet then mixes with the ambient air environment and is dispersed in the protected space. A mathematical model has been developed previously to simulate the timedependent discharge of the agent from the pressure vessel. Using the output of this model and thermo-dynamic and fluid-dynamic considerations of the phenomena in the transition section, the present work develops a method for determining a set of InItlal/bound-ary conditions at an initial section of the jet, down-stream of the transition region. These initial/boundary conditions are in a form that can be used to formulate and solve the problem of the development and dispersal of the ensuing mixed air/two-phase-agent jet. Example applications of the developed methodology are presented. These are for agent discharge from a half-liter cyllndrical discharge vessel with a circular discharge nozzle/orlfice of diameter 0.019m. Simulations Involve discharge of the vessel when it is half-filled with either Freon 22 or Halon 1301 and then pressurized with N2 to 41.37x10(exp 5)Pa (600psl).

Aircraft

00 005 AD-A261 270/3 PC A07/MF A02

of Standards and Technology, National Inst. Gaithersburg, MD.

Model Study of the Aircraft Cabin Environment Re-

sulting From in-Flight Fires.

Final rept.

B. J. McCaffrey, K. M. Tu, W. J. Rinkinen, and T. I. Eklund. Nov 92, 126p, DOT/FAA/CT-90/22.

Keywords: *Simulation, *Ventilation, *Aircraft cabins, *Fire Fighting, Flight, Hatches, Heat transfer, Propane, Scale models, Temperature, Test and evaluation, Air flow, Fire safety, Temperature gradients, Aircraft seats, *Aircraft fires, Counterflow, Gas concentration profile, Ventilation flow direction.

A series of tests were conducted to examine the effect of the ventilation on the environment in an aircraft passenger cabin during an In-flight fire. These tests were run in a reduced scale mockup of an aircraft passenger cabin. A propane bumer operating at 10 or 30 kilowatts served as the fire source. The simulated seats and the cabin lining material were both noncombustible. The vertical temperature and gas concentration profiles in the cabin were measured as a function of time. Reversing the normal ventilation flow direction by introducing the forced air at the floor level and exhausting it at the ceiling significantly reduced the measured temperatures and gas concentrations. Opening two 152- by 305-millimeter hatches in the end walls at the celling level to the outside air resulted in a significant reduction in the measured gas concentrations.

00,006 PC A04/MF A01 of Standards and Technology, AD-A263 148/9 National Inst. Gaithersburg, MD. Modeling the Heat Release Rate of Aircraft Cabin Panels.

Final rept. W. J. Parker, and R. Filipczak. Feb 93, 53p, DOT/FAA/CT-92/3.

Keywords: *Aircraft cabins, *Panels, Calorimeters, Chemicals, Computers, Constants, Functions, Heat of combustion, Kinetics, Mass, Models, Ohio, Rates, Release, Temperature, Time, *Heat transmission.

A computer model was developed to calculate the heat release rate of aircraft cabin composite panels based on the panel's thermophysical, chemical, and geo-metric properties. The model calculates the temperature through the panel as a function of time and uses this along with measured kinetic constants to deduce mass loss rate which is multiplied by the heat of com-bustion of the volatiles. The calculated results are in general agreement with the measured heat release ob-tained from the Ohio State University (OSU) calorimeter.... Heat Release Rate, Calorimeter, Fire.

00.007 N94-10779/4 (Order as N94-10766/1, PC A16/ MF A03) National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Computer-Aided Molecular Design of Fire Resistant Aircraft Materials.
M. R. Nyden, and J. E. Brown. Mar 93, 12p.

In FAA, Proceedings of the International Conference for the Promotion of Advanced Fire Resistant Aircraft Interior Materials p 147-158.

Keywords: *Aircraft construction materials, *Computer aided design, *Flame retardants, Computerized sim-ulation, Flame calorimeters, Honeycomb structures, Commercial aircraft, Flammability, Heat treatment, Ir-radiation, Nonflammable materials, *Aircraft fires.

Molecular dynamic simulations and Cone Calorimeter measurements were used to assess the effects of electron beam irradiation and heat treatments on the flammability of the honeycomb composites used In the sidewalls, ceilings, and stowage bins of commercial aircraft. The irradiation of this material did not result in any measureable changes. A dramatic reduction in the peak rate of heat release, however, was observed In samples that had been heated ovemight at 250 C.

00,008 N94-10781/0 (Order as N94-10766/1, PC A16/ MF A03) National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Non-Halogenated, Flame Retarded Polycarbonate. T. Kashiwagi, T. G. Cleary, G. C. Davls, and J. H. Lupinski. Mar 93, 13p.

In FAA, Proceedings of the International Conference for the Promotion of Advanced Fire Resistant Alrcraft Interior Materials p 175-189. Sponsored by Ge.

Keywords: *Aircraft construction materials, *Flame retardants, *Flammability, *Nonflammable materials, *Polycarbonates, *Siloxanes, Charring, Combustion products, Flame calorimeters, Flame propagation, Heat transfer, *Aircraft fires.

Various flammability properties of a siloxane-containing bisphenol-A polycarbonate sample, with the siloxane as an additive or as a copolymer, were measured and compared with those of a pure polycarbonate sample. The results show that the peak heat release rate for the siloxane-containing polycarbonate sample is significantly reduced (less than half) compared to that for the pure polycarbonate sample with two different sizes of sample, 10cm x 10cm and 40cm x 40cm. However, the ignition delay time for the siloxane-containing sample is shorter than that for the pure polycarbonate sample. Also, the flame spread rate under an external radiant flux becomes faster for the siloxane-containing sample than that for the pure polycarbonate sample. The observed char behavior, such as char depth, physical nature and apparent combustibility, and its Impact on flammability properties are discussed.

00.009 N94-10787/7 (Order as N94-10766/1, PC A16/ MF A03)

National Inst. of Standards and Technology (BFRL), Galthersburg, MD.

Developments Needed to Expand the Role of Fire Modeling in Material Fire Hazard Assessment.

A. J. Fowell. Mar 93, 8p.
In FAA, Proceedings of the International Conference for the Promotion of Advanced Fire Resistant Aircraft Interior Materials p 255-262.

Keywords: *Aircraft construction materials, *Aircraft hazards, *Fire prevention, *Flammabllity, *Mathematical models, Aircraft compartments, Flame propagation, Heat transfer, *Aircraft fires.

To assess the fire hazards associated with aircraft Intenor materials, prediction of how the materials perform under different fire scenarios is needed. This requires information on a variety of fire characteristics including thermal inertia, ease of ignition, rate of heat release, flame spread, products of combustion, and the re-sponse to suppressants. Exposure conditions such as location, orientation, ventilation, and proximity to other materials can influence some of those characteristics. Pass/fail test methods of the past cannot provide the information to assure fire safety under a variety of clr-cumstances. Fire modeling in combination with new bench scale material flammability test methods can meet the need. National and international developmeet the need. National and international develop-ments in model validation, documentation, and accept-ance are presented. The transition to aircraft cabin fire hazard assessment using fire models requires a data base on material fire properties. The case is made for greater use of improved bench scale test methods which can provide data sultable for use in the fire mod-

ASTRONOMY & ASTROPHYSICS

Astronomy & Celestial Mechanics

00,010 PB93-145761 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathematics Div.

BIOMEDICAL TECHNOLOGY & HUMAN FACTORS ENGINEERING

Biomedical Instrumentation & Bioengineering

Mechanism for Capture into Resonance. T. J. Bums, and C. K. R. T. Jones. Jan 93, 34p, NISTIR-5104.

Keywords: *Celestial mechanics, *Resonance, Dynamical systems, Hamiltonian functions, Perturbation theory, Capture, Average, Theorems.

We present a mechanism for capture into resonance In perturbed two-frequency Hamiltonian systems. When an isolated attractor of the averaged system passes through a resonance on a time scale which is asymptotically slower than that on which the damping works, it transfers its domain of attraction to the resonance.

Astrophysics

PB93-149003 Not available NTIS National Inst. of Standards and Technology (PL), Gaithersburg, MD. Molecular Physics Div. Recommended Rest Frequencles for Observed

Interstellar Molecular Microwave Transitions. 1991 Revision.

F. J. Lovas. c1992, 91p.

Included In Jnl. of Physical and Chemical Reference Data, v21 n2 p181-272 Mar/Apr 92. Available from American Chemical Society, 1155 Sixteenth St., NW, WashIngton, DC. 20036-9976.

Keywords: *Molecular clouds, *Stellar envelopes, *Microwave spectra, Rotational spectra, Transition radiation, Hyperfine structure, Interstellar matter, Radio astronomy, Tables(Data).

Critically evaluated transition frequencies for the mo-lecular transitions detected in interstellar and circumstellar clouds are presented. The tabulated transitions are recommended for reference in future astronomical observations in the microwave and millimeter wavelength regions. The transition frequencies have been selected from the literature. The information tabulated includes the species identity, transition frequency, uncertainty, and quantum state labels. In addition, representative line antenna temperatures are listed for a typical astronomical source for each transition as a convenience to users, and the references are cited for the laboratory and astronomical literature which have been employed.

ATMOSPHERIC SCIENCES

Aeronomy

PB93-198422 PC A10/MF A03 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Atomic Physics Div. International Collogium on Atomic Spectra and Os-Plasmas (4th). Held at the National Institute of Standards and Technology, Gaithersburg, Maryland on September 14-17, 1992. Special pub.

J. Sugar, and D. Leckrone. Apr 93, 201p, NIST/SP-

Also available from Sunt, of Docs as SN003-003-03210-7. Prepared In cooperation with National Aeronautics and Space Administration, Greenbelt, MD. Goddard Space Flight Center.

Keywords: *Atomic spectroscopy, *Meetings, *Astrophysics, *Plasmas(Physics), Oscillators, Laboratory equipment, Aerospace environments.

This was the fourth in a series of colloquia begun at the University of Lund, Sweden in 1983 and subsequently held in Toledo, Ohio and Amsterdam, The Netherlands. The purpose of these meetings is to pro-

vide an international forum for communication between major users of atomic spectroscopic data and the providers of these data. These data include atomic wavelengths, line shapes, energy levels, lifetimes, and oscillator strengths. Speakers were selected from a wide variety of disciplines including astrophysics, laboratory plasma research, spectrochemistry, and theoretical and experimental atomic physics.

Physical Meteorology

00.013

PB93-149136 Not available NTIS American Chemical Society, Washington, DC. Journal of Physical and Chemical Reference Data, Volume 21, No. 6, November/December 1992. Bimonthly rept.

D. R. Lide. c1992, 471p.

See also PB93-149144 and PB93-149094. Prepared in cooperation with American Inst. of Physics, New York. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD.

Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Physical properties, *Chemical properties. *Physical chemistry, Atmospheric chemistry, Photo-chemical reaction, Reaction kinetics, Vapor phases, Thermochemistry, Tables(Data), Indexes(Documentation), *Reference materials.

Contents: Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry. Supplement IV. IUPAC Subcommittee on Gas Kinetic Data Evaluation for Atmospheric Chemistry.

00,014

PB93-149144 Not available NTIS California Univ., Riverside.

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Kinetic Data Evaluation for Atmospheric Chemistry.

R. Atkinson, D. L. Baulch, R. A. Cox, J. Troe, R. F. Hampson, and J. A. Kerr. c1992, 443p.

Prepared in cooperation with Leeds Univ. (England), Natural Environment Research Council, Swindon (England), National Inst. of Standards and Technology, Gaithersburg, MD., Eidgenoessische Anstalt fuer Wasserversorgung, Abwasserreinigung Gewaesserschultz, Duebendorf (Switzerland).

Included in Jnl. of Physical and Chemical Reference Data, v21 n6 p1125-1568 Nov/Dec 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Atmospheric chemistry, *Photochemistry, *Reaction kinetics, *Vapor phases, *Thermochemistry, Gases, Tables(Data), Enthalpy, Temperature.

The paper updates and extends previous critical evaluations of the kinetics and photochemistry of gas phase chemical reactions of neutral species involved in atmosphere chemistry. The work has been carried out by the authors under the auspices of the IUPAC Subcommittee on Gas Phase Kinetic Data Evaluation for Atmospheric Chemistry. Data sheets have been prepared for 489 thermal and photochemical reactions, containing summaries of the available experimental data with notes giving details of the experimental procedures. For each reaction, a preferred value of the rate coefficient at 298 K is given together with a temperature dependence where possible. The selection of the preferred value is discussed, and estimates of the accuracies of the rate coefficients and temperature coefficients have been made for each reaction. The data sheets are intended to provide the basic physical chemical data needed as input for calculations which model atmospheric chemistry. A table summanizing the preferred rate data is provided, together with an appendix listing the available data on enthalpies of formation of the reactant and product species.

BEHAVIOR & SOCIETY

Education, Law, & Humanities

PB93-213114 PC A09/MF A03

National Inst. Gaithersburg, MD. of Standards and Technology,

NIST Handbook 130, 1993. Uniform Laws and Regulations In the Areas of Legal Metrology and Motor Fuel Quality as Adopted by the 77th National Conference on Weights and Measures 1992.

J. A. Koenig. Oct 92, 196p.

Supersedes PB92-112416. Also available from Supt.

Keywords: *Metrology, *Law(Jurisprudence), *Standards, *Fuel quality, Regulations, Weight measurement, Automotive fuels, Packaging, Marking, Commodity management, Food packaging.

The handbook, which is revised annually, compiles the uniform laws and regulations developed by the Committee on Laws and Regulations of the National Conference on Weights and Measures (NCWM). The compilation itself was approved by the NCWM in 1979, and this edition includes amendments adopted by the Conference of the appeal meeting in 1997. ference at its annual meeting in 1992. The NCWM recommends adoption and promulgation by the States of these uniform laws and regulations as updated in the handbook.

BIOMEDICAL **TECHNOLOGY & HUMAN FACTORS** ENGINEERING

Biomedical Instrumentation & Bioengineering

00,016 PB93-125136 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.

Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties.

Final rept.

P. D. Costantino, C. D. Friedman, K. Jones, G. A. Sisson, L. C. Chow, and H. J. Pelzer. 1991, 6p. Sponsored by American Dental Association Health Foundation, Chicago, IL.
Pub. in Archives of Otolaryngology-Head and Neck Surgery 117, p379-384 Apr 91.

Keywords: *Hydroxyapatites, *Bone cements, *Artificial implants, *Histology, Intraoperative period, Keywords: Animals, Reprints.

Hydroxyapatite cement is a unique calclum phosphate preparation that can be shaped intraoperatively and sets in vivo to an implant composed of microporous hydroxyapatite. The histologic response to this cement was evaluated by implanting disks made of this material within the heads of nine cats. Three sets of 12 hydroxyapatite cement disks were produced containing 0%, 10%, and 20% macropores by volume, respectively. The disks were implanted subcutaneously, Intramuscularly, above the periosteum of the skull, and directly onto the surface of the calvanum. Each macropore percentage was represented in each tissue plane, and animals were killed up to 9 months postoperatively. There were no toxic reactions, implants extruded, or wound infections. Histologic examination

BIOMEDICAL TECHNOLOGY & HUMAN FACTORS ENGINEERING

Biomedical Instrumentation & Bioengineering

of the Implant-soft-tissue Interfaces revealed a translent inflammatory response without foreign body reac-tion. The disks were resorbed over time in direct proportion to their macropore content (surface areas) in all groups except for those disks placed directly onto the surface of the calvarium below the periosteum.

00.017

PB93-150761 Not available NTIS

National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Polymers Div.
Clinical Use of Beta-Quartz Glass-Ceramic Inserts.

Final rept.

F. C. Eichmiller. 1992, 5p.
Sponsored by American Dental Association Health
Foundation, Chicago, IL.
Pub. in Compendium of Continuing Education in Dentistry XIII, n7 p568-576 1992.

Keywords: *Dental materials, *Ceramics, *Restoration, *Teeth, Composite materials, Reconstruction, Performance evaluation, Durability, Fillers, Reprints.

Efforts to improve composite dental materials have largely been centered around increasing the proportion of inorganic filler. Modern composites are still limited by high thermal expansion, high polymerization shrinkage, a low elastic modulus, and excessive wear. Tooth-colored alternatives to dental composites such as porcelains and indirect resin inlays are expensive, time consuming, and require excessive tooth reduction. Glass-ceramic inserts attempt to improve the overall properties of a composite filling by Incorporating a large ceramic filler particle into the composite restoration, displacing as much of the composite resin as possible from the volume of the filling. The resulting restoration exhibits more of the superior properties of the glass-ceramic and is less influenced by the composite resin. The use of glass-ceramic inserts in com-posite fillings is a method of improving quality and du-rability at a low cost and without the need for special-Ized equipment or instrumentation.

00,018 PB9**3-150837** Not available NTIS

National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Polymers Div.
Intrinsically Colored Microcrystalline Glass-Ceramic for Use in Dental Restoration.

Final rept. L. A. George, F. C. Eichmiller, and R. L. Bowen. 1992, 4p.__

See also PB93-129450. Sponsored by American Dental Association Health Foundation, Chicago, IL. Pub. In American Ceramic Society Bulletin 71, n7 p1073-1076 Jul 92.

Keywords: *Dental materials, *Ceramics, *Crystals, *Restoration, *Teeth, Materials science, *Restoration, *Teeth, Materials science, Colors(Materials), Reconstruction, Dentistry, Bacteria, Thermal properties, Physical properties, Chemical properties, Reprints.

Development of tooth-colored restorative materials that can be directly placed in tooth defects is currently one of the most difficult challenges in dental materials science. To be functional, dental materials must resist heavy cyclic loading, thermal shock, variable pH, chemical degradation, ultraviolet radiation, and bactenal Invasion. Properties of thermal expansion, thermal conductivity, abrasion resistance, elastic modulus, and compressive and tensile strengths should be similar to natural tooth structure to begin to meet these demands. In addition, the restoration must be the natural color of the tooth to be aesthetically acceptable. The tooth-restoration interface must provide adequate mechanical and/or chemical adhesion to retain the restoration under load while providing a sealed barrier to bacteria and other unwanted substances. Metallic restorative materials have met most of the functional demands, but the development of esthetic tooth-colored materials has been limited by the properties required for these materials.

PB93-151298 Not available NTIS

National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Infrared Spectroscopic Study of Cement Formation of Polymeric Calcium Phosphate Cement.

Final rept.

K. Miyazaki, Y. Akiyama, W. Motokawa, S. Takagi, L. C. Chow, T. Horibe, and J. M. Antonucci. 1992, 7p. Sponsored by American Dental Association Health Foundation, Chicago, IL.

Pub. in Jnl. of the Japanese Society for Dental Materials and Devices 11, n2 p278-284 1992.

Keywords: *Dental materials, *Acid bonded reaction cements, *Infrared spectroscopy, *Polybasic organic acids, *Calcium phosphates, Cements, pH, Additives, Solutions, Setting time, Performance evaluation, Tartanc acid, Hydroxy acids, Reprints, Stannous fluoride.

We measured change in pH and in infrared spectra of reactants in dilute solution of polycarboxylic acid/cal-cium phosphate cement (PCA/CPC) in the presence and absence of tartaric acid and/or stannous fluoride (0.25-0.5g/10-20mlH2O) to investigate its setting reaction. Stannous fluoride inhibited the hardening of PCA/ CPC cement and markedly delayed pH increase. Addition of tartaric acid induced no effect on pH curves. However, companson of PCA/CPC cement containing tartanc acid and stannous fluoride with that containing only stannous fluoride revealed little evidence of the presence of unreacted carboxyl groups in the hard-ened cement. The increase in the pH curve observed during the first stage was related to the reaction between the tartaric acid and calcium ions in CPC. At pH values over 4, the production of the calcium salt of pol-yacrylic acid was confirmed. A correlation was ob-served between the absorbance change due to carboxylate formation and increase in pH.

PB93-151306 Not available NTIS National Inst. of Standards and Technology (PL),

Gaithersburg, MD. Molecular Physics Div.
Chemical Change of Hardened PCA/CPC Cements

in Various Storing Solutions.

Final rept. K. Miyazaki, Y. Akiyama, W. Motokawa, S. Takagi, L. C. Chow, T. Horibe, and J. M. Antonucci. 1992, 7p. Sponsored by American Dental Association Health Foundation, Chicago, IL.

Pub. in Jnl. of the Japanese Society for Dental Matenals and Devices 11, n2 p324-330 1992.

Keywords: *Dental materials, *Acid bonded reaction cements, *Storage, *Chemical properties, *Polybasic organic acids, *Calcium phosphates, Cements, X-ray diffraction, Solutions, Tartanc acid, Additives, Inorganic phosphates, Coagulation, Reprints, Stannous fluoride, Apatite/fluoro, Apatite/hydroxy.

Hardened polycarboxylic acid/calcium phosphate cement (PCA/CPC) cement with and without tartanc acid and/or stannous fluonde was subjected to x-ray analysls after storage in three kinds of solutions (artificial saliva-like solution, phosphate buffer solution, and distilled water), and amount of calcium, phosphate and fluoride lons released into the storage solution was measured. In distilled water, calclum and phosphate lons were continuously released from not only the PCA/CPC cement with tartaric acid and stannous fluoride but also from the cement without these additives. However, in artificial saliva and phosphate buffer solutions, release ceased after about one month and uptake of both ions was detected. X-ray analysis revealed the formation of fluoroapatite and hydroxyapatite in the hardened cement containing tartanc acid and stannous fluonde when it had been stored in artificial saliva or distilled water. Conversely, in the cement without these additives, only minor amount of apatite formation was observed, even when it was stored in distilled water for 6 months. In addition, it was observed that fluoride ions were continuously released from the cement containing stannous fluoride for 6 months.

PB93-151777 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.

Synthesis and Evaluation of Novei Multifunctional Oligomers for Dentistry.

Final rept. J. W. Stansbury. 1992, 4p. Pub. in Jnl. of Dental Research 71, n3 p434-437 Mar

*Dental materials, *Polymerization, *Monomers, Comparison, Condensation reactions, Performance evaluation, Molecular structure, Chemical bonds, Mechanical properties, Phenols, Reprints, Ethoxylated bis-phenol A diacrylate, Ethoxylated bisphenol A dimethacrylate.

A new type of multifunctional oligomer was synthesized, and its potential as a base monomer in dental composite formulations was evaluated. The oligomer of ethoxylated bis-phenol A diacrylate (OEBPA) was

prepared in good yield by a formaldehyde insertion/ condensation reaction. Although double bonds along the oligomer backbone are arranged in pairs such that cyclopolymerization is possible, it is not presently known whether this process plays a significant role in the polymerization. Indirect evidence supporting effiricient cyclopolymerization. Indirect evidence supporting enticient cyclopolymerization involves the reduced polymerization shrinkage observed for polymerized OEBPA relative to polymers of other monomers used as base resins. Photo-cured composites containing either OEBPA, BIS-GMA, or ethoxylated bis-phenol A dimethacrylate (EBPADM) as base resin and TEGDMA as diluent were compared. This multifunction oligomer offers mechanical strength and conversion values that are comparable with those of existing base resin monomers while providing an approximate 30% reduction in polymerization shrinkage.

00.022

PB93-151801 Not available NTIS National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Polymers Div.

Residual Stress In a Porcelain-Metal Strip Related to Thermo-Physical Properties of Materials.

Final rept.

J. A. Tesk, and K. Asaoka. 1992, 5p. Pub. in Residual Stresses - III, Science and Technology, v1 p146-150 1992.

Keywords: *Dental materials, *Thermophysical properties, *Residual stress, *Porcelain, *Metal strips, Computerized simulation, Fusion(Melting), Durability, Layers, Performance evaluation, Compressive properties, Reprints.

The durability of porcelain fused-to-metal (PFM) dental prostheses is thought to depend strongly on the levels of compressive stresses which can be generated in the porcelain outer surface layers. A computer simulation of the states of residual stress which are developed In PFM beams shows very complex interrelationships exist between properties such as the sharpness of the glass transition temperature range, coefficients of thermal expansion within that range and asymmetry of the beam. Potentially detrimental internal tensile stresses are shown capable of being developed. Due to the complex nature of the Interactions, the simulations Indicate that attempts to Improve PFM systems based on qualitative resenting may lead to disestrous results. qualitative reasoning may lead to disastrous results.

00,023

PB93-151835 Not available NTIS

National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Polymers DIv.

Effects of Magneslum and Fiuoride on the Hydroiysis of Octacalcium Phosphate.

Final rept.

M. S. Tung, B. Tomazic, and W. E. Brown. 1992, 7p. Sponsored by American Dental Association Health Foundation, Chicago, IL.

Pub. In Archives of Oral Biology 37, n7 p585-591 1992.

Keywords: *Dental materials, *Calcium phosphates, *Magnesium, *Fluorides, *Hydrolysis, *Acid bonded reaction cements, Adsorption, Reaction kinetics, Surface chemistry, Nucleation, Crystal growth, X-ray diffraction, Chemical analysis, pH, Reprints.

The adsorption of Mg ions on octacalcium phosphate (OCP) and its effect on OCP hydrolysis, with and without F, were studied. The Mg adsorption isotherm was fitted by the Langmulr model with an affinity constant of 0.74 ml/mlcromol and maximum number of sites, 31.19 micromol/g. The hydrolysis rates were measured in a pH stat by titration of base and were strongly temporative dependent. The products were exemined by perature dependent. The products were examined by X-ray diffraction and chemical analysis. OCP hydrolysis takes place In two stages: the last Initial process, which is attributed to the surface topotactical conversion, followed by the main, slower process, which involves the nucleation and crystal growth. Mg ions, as 1 mmol/l MgCl2, prevented the Initial surface reaction and decreased the nucleation rate dramatically and the growth rate slightly; F increased the rates of surface reaction and both the nucleation and crystal growth processes. The Ca/P ratio (1.53) and the line broadening in the X-ray diffraction patterns of the apatitic products were not significantly affected by the F. Mg also did not affect the Ca/P ratio and the line broadening at (002) diffraction, but decreased the line broadening at (310) diffraction.

Prosthetics & Mechanical Organs

00,024 PB93-198836 PC A06/MF A02 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.
Properties and Interactions of Oral Structures and

Properties and Interactions of Oral Structures and Restorative Materials. Annual Report for Period October 1, 1991 to September 30, 1992. Rept. for 1 Oct 91-30 Sep 92.

J. A. Tesk, J. M. Antonucci, J. W. Stansbury, J. Code, G. Schumacher, S. M. Keeny, and K. Asaoka. May 93, 118p, NISTIR-5175.

See also PB85-210409. Sponsored by National Inst. of Dental Research, Bethesda, MD.

Keywords: *Dental materials, *Permanent dental restoration, Biocompatible materials, Delivery of health care, Composite materials, Delivery of realin-care, Composite materials, Cements(Adhesives), Adhesives, Sealers, Alloys, Chemical analysis, Chroma-tography, X-ray diffraction, Nuclear magnetic reso-nance, Infrared spectroscopy.

The research program described is designed to achieve a number of objectives leading to improved dental restorative materials, techniques and applications of dental materials science for improved delivery of health care. The bulk of the research is related in one manner or another to dental composites, cements, adhesives, and sealants. Composite research focuses on improvements through the development of more durable resin matrices, stronger and more durable cou-pling between fillers and resins, and defining the best overall combination of components, including curing systems, for improved performance of composites. The work has moved swiftly toward a major emphasis on the synthesis and applications of monomers which reduce polymerization shrinkage through the use of expanding monomers (or monomers which undergo much less shrinkage than conventional resin-matrix monomers).

BUILDING INDUSTRY TECHNOLOGY

General

PB93-198869 PC A06/MF A02 National Fire Protection Association, Quincy, MA. U.S. Fires in 'Board and Care' Homes Matrix Dis-PB93-198869 play of Selected Fatal Fires. Special Analysis. J. R. Hall. Apr 93, 111p, NIST/GCR-93/627. Grant 60NANB9D0974

Sponsored by National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Keywords: *Fires, *Residential buildings, Occurrence, Fatalities, Handicaps, Death, Investigations, Tables(Data), Nursing homes, Group homes, Halfway houses, Board and care homes.

The report presents available information on 57 fatal Ine report presents available information on 57 fatal U.S. fires occurring during 1971 to 1992 and recorded in the National Fire Protection Association's (NFPA's) Fire Incident Data Organization (FIDO) as fires of technical interest in 'board and care' homes. It is an update of a report prepared in 1990 and adds nine incidents to that earlier study. It is part of a larger project on fire safety in board and care homes. The information has been organized into three tables. Included is information on: death tolls, construction details, code compliance, occupant behaviors, fire development, and building fire protection systems.

00,026 PB93-208460 PB93-208460 PC A05/MF A01
National Inst. of Standards and Technology (CAML), Gaithersburg, MD.

BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program (Version 4.0). User's Guide and Reference Manual.

S. R. Petersen. May 93, 90p, NISTIR-5185. See also PB91-159764, PB91-167288, PB93-120772 and PB93-502995. Sponsored by Department of Energy, Washington, DC. Federal Energy Management Program Staff.

Keywords: *Buildings, *Energy efficiency, *Life-cycle cost, Benefit cost analysis, Economic analysis, Computer applications, Energy conservation, Financial management, Operating costs, Computer programs.

The NIST Building Life-Cycle Cost computer program, version 4.0, provides economic analysis of proposed capital investments that are expected to reduce longterm operating costs of buildings or building systems/
components. It is especially useful for evaluating the
costs and benefits of energy conservation projects in
buildings. Two or more alternative designs can be evaluated to determine which has the lowest life-cycle cost and therefore is most economical in the long run. Economic measures, Including net savings, savings-to-investment ratio, adjusted internal rate of return, and years to payback can be calculated for any design alternative relative to the designated base case. BLCC can be used for evaluating Federal (including Department of Defense), state and local government projects as well as projects in the private sector. It complies with ASTM standards related to building economics as well as FEMP and OMB A-94 guidelines for economic analysis of Federal building projects.

PB93-219723 PC A05/MF A01 George Mason Univ., Fairfax, VA.
Affordable Fire Safety in Board and Care Homes. A Regulatory Challenge. Final Report.
B. M. Levin, N. E. Groner, and R. Paulsen. Jul 93, 81p, NIST/GCR-93/632. Grant 60NANB9D0974

Grant 60NANB9D0974
See also PB92-205483. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD., Administration on Aging, Washington, DC., Administration on Developmental Disabilities, Washington, DC., and National Inst. of Mental Health, Bethesda, MD.

Keywords: *Fire safety, *Nursing homes, Disabled persons, Elderly persons, Standards, Building codes, Regulations, Fire detection systems, Benefit cost anal-ysis, Legislation, Sprinkler systems, Human factors engineering, *Board and care homes.

The report Is on a project concerning fire safety in Board and Care Homes. Homes vary greatly in the level of disability of the residents and financial resources of the residents. A major concern is the availability of satisfactory care for clients with limited funds. Meeting fire safety codes can mean an unaffordable capital cost to financially marginal providers who cannot borrow money. One focus of the study is the use of the provisions in the Life Safety Code. Many agencies use these requirements and find they lead to a high level of safety without excessive costs. All have developed or adopted a procedure for rating Evacuation Difficulty that they find workable, and many find satisfactory. Other agencies use other requirements, sometimes more lenient and often more strict. Costs of fire safety systems, such as sprinklers, can vary greatly, impeding a dialogue on the benefit-cost relationships of these systems. It appears that in some locations there are many homes that provide the services of Board and Caré Homes but are not regulated.

00,028 PB94-108388 PC A06/MF A02 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Balanced Design Concepts Workshop. Held in Gaithersburg, Maryland on June 30-July 2, 1993. R. W. Bukowski. Sep 93, 116p, NISTIR-5264.

Keywords: *Fire detection systems, *Containment, *Meetings, Fire alarm systems, Fire protection, Sprinkler systems, Fire extinguishing agents, Smoke detectors, Warning systems, Safety engineering, Fire resist-

The purpose of the workshop was to gather information and support for a study to quantify the performance and reliability of fire detection and suppression systems, and of compartmentation, and the degree to which any one could be reduced or eliminated without undue risk of loss.

00.029 PB94-110194 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Collaborating with Our Customers: NIST Building and Fire Research Laboratory. Aug 93, 28p, NIST/SP-838/3.

Also available from Supt. of Docs. as SN003-003-

Keywords: *Buildings, *Fire tests, *Laboratories, Test facilities, US NIST, Technology transfer, Standards, Research management, Fire safety, Hazards, Safety engineering.

The 'Perspective' describes how BFRL's (Building and Fire Research Laboratory's) projects respond to needs of the principal classes of its customers in the construction and fire safety communities: owners, designers, and constructors; producers and suppliers; standards and codes interests; and the fire services. The authors' projects address major needs and opportunities for im-proving the life cycle performance of constructed facilities, including: high-performance concrete and steel; 'green' building technologies; integrated, automatic control systems for operation of constructed facilities; computer-integrated, effectively automated design and construction practices; reduction of losses from unwanted fires, earthquakes, and extreme winds.

PB94-112166 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Fire Safety Engineering Div. Zone Fire Modeling with Natural Building Flows and a Zero Order Shaft Model.

J. H. Klote, and G. P. Forney. Sep 93, 43p, NISTIR-5251.

Keywords: *Fire tests, *Buildings, *Smoke, *Computerized simulation, Space HVAC systems, Air Keywords: flow, Floors, Carbon monoxide.

The paper addresses applications of zone fire models to simulate smoke flow in multistory buildings. Natural flows in buildings are discussed. A zero order model for shaft smoke flow was developed which treated the shaft as one perfectly mixed zone. A two zone fire model was modified to simulate natural flows and the zero order shaft smoke flow. The extent to which the one zone model and the two zone model are appropriate to simulate smoke flow in shafts is discussed.

PB94-112257 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Early Detection of Room Fires through Acoustic

Emission.

W. Grosshandler, and E. Braun. Oct 93, 19p, **NISTIR-5269.**

Keywords: *Fire detection systems, *Warning systems, Acoustic detectors, Gas burners, Electric heating, Fire tests, Fire alarm systems, Heat flux, Signal processing, Safety engineering, *Acoustic emission, Room fires.

Acoustic emission (AE) previously has been shown to be a viable concept for the early indication of an open flame impinging on various structural materials. To assess its effectiveness in a more realistic environment, experiments have been performed in a 2.5 m cubical room constructed of gypsum board and wood beams. AE transducers were mounted on top of the ceiling joists and behind the center wall panel on a vertical beam. Thermocouples were mounted at several points on the wall and ceiling, and an ionization-type smoke detector was attached to the ceiling near the door opening. Two distinct fire threats were examined: (1) a flaming fire consisting of a 0.3 m diameter pan fed with natural gas to produce a thermal load of between 12 and 125 kW; and (2) a charring condition achieved by attaching a 550 W electrical heater to a vertical wooden beam located behind the gypsum board. The conclusion is that AE emission appears to be sufficiently sensitive to detect two distinct fire situations, and that an overheated condition in a wall or ceiling can be detected if it is not more than 3 m from the transducer.

00.032 PB94-121050 PC A11/MF A03 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Summarles of BFRL Fire Research In-House Projects and Grants, 1993.

N. H. Jason. Sep 93, 230p, NISTIR-5263.
See also report for 1992, PB93-116390.

Keywords: *Fire tests, *Research projects, Tests, Combustion, Fire hazards, Soot, Smoke, Sprinkler sys-

General

tems, Grants, Carbon monoxide, Turbulent flow, Technology transfer.

The report describes the fire research projects performed in the Building and Fire Research Laboratory (BFRL) and under its extramural grants program during Fiscal Year 1993. The BFRL Fire Research Program has directed its efforts under three program thrusts. The In-house priority projects, grants, and externally-funded efforts thus form an Integrated, focussed ensemble. The publication is organized along those lines:
(1) Fire Risk and Hazard Prediction; (2) Carbon Monoxide Prediction; Turbulent Combustion; Soot; Engleering Analysis; Fire Hazard Assessment; and Large Fires. (2) Fire Safety of Products and Materials; Materials Combustion; Furniture Flammability; and Wall and Celling Fires. (3) Advanced Technologies for Fire Sensing and Control; Fire Detection; and Fire Suppression. For the convenience of the reader, an alphabet-Ical listing of all grants is contained in Part 2.0.

Architectural Design & Environmental Engineering

00.033 PB93-138931 PC A04/MF A01

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.

Guidelines for Using Emulators to Evaluate the Performance of Energy Management and Control Systems.

92, 59p, NISTIR-4991.

Sponsored by Department of Energy, Washington, DC. Office of Conservation and Renewable Energy.

Keywords: *Energy management systems, *Simulation, *Algorithms, *Performance tests, Buildings, HVAC systems, Energy conservation, Test methods, Controllers, Control equipment, Ventilation, *Emulators.

A Building Energy Management System (BEMS) is that portion of a Building Automation System (BAS) that controls the heating, ventilation, and air conditioning (HVAC) systems in buildings. Its performance is di-rectly related to the amount of energy consumed in a building and the comfort of the building occupants. One approach to evaluating the performance of a BEMS is through the use of an Emulator. This is a special computer/data acquisition system that is connected to the sensor inputs and command outputs of the BEMS. It replaces the HVAC system and building and uses a computer program to simulate their response to BEMS commands. The BEMS, through its supervisory and/ commands. The BEMS, through its supervisory and/ or direct digital control algorithms, then controls the simulated building/HVAC system as if it were an actual one. At the same time, the Emulator evaluates the performance of the BEMS in terms of the energy consumed by the simulated building, the degree of comfort maintained in the simulated space, response time, accuracy, etc. The report contains guidelines for using Emulators to evaluate BEMS. An overview of the hardware and software found in a typical BEMS is presented, followed by information on: setting up a BEMS and an Emulator, evaluating system/command and DDC software, and methodologies for testing BEMS application algorithms. Considerations are also pre-sented for evaluating a BEMS' programming capabilities, DDC control loop performance, and for rating dif-ferent aspects of a BEMS' performance.

PB93-146017 PC A04/MF A01
National Inst. of Standards and Technology (CAML),
Gaithersburg, MD. Office of Applied Economics.
UNIFORMAT II: A Recommended Classification for Bullding Elements and Related Sitework.

B. Bowen, R. P. Charette, and H. E. Marshall. Aug 92, 57p, NIST/SP-841.
Also available from Supt. of Docs. as SN003-003-03173-9. See also PB89-129522. Prepared in cooperation with Hanscomb Associates, Inc., Atlanta, GA., and Le Groupe Hanscomb, Inc., Montreal (Quehec).

Keywords: *Classifications, *Buildings, *Specifications, *Cost engineering, Construction management, Economic analysis, Design criteria, Risk, Data bases, Value engineering, Cost control, Cost estimates,

Floors, Roofs. HUAC systems, Foundations, UNIFORMAT II.

The report describes UNIFORMAT II, a format for classifying building elements and related sitework. Elements, as defined here, are major components common to most buildings. Elements usually perform a given function, regardless of the design specification, construction method, or materials used. Elements are also commonly referred to as systems or assemblies. Using UNIFORMAT II ensures consistency in the economic evaluation of building projects over time and from project to project, and it enhances reporting at all stages in construction--from feasibility and planning through the preparation of working documents, construction, maintenance, rehabilitation, and disposal. UNIFORMAT II is a significant advance over the original UNIFORMAT classification because the new version is the result of an intensive industry review and has added elements and expanded descriptions of many existing elements. Performing an economic analysis based on an elemental framework instead of on a product-based classification reduces the time and costs for evaluating alternatives at the design stage, and thereby encourages more economic analyses and more economically efficient choices among buildings and building elements. Collecting capital, operating, and maintenance costs according to UNIFORMAT II is an efficient approach to project evaluation using lifecycle cost, net benefits, rate-of-return, and payback analyses.

00,035 PB9**3-1466**94 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. **Evaluation of Compact Fluorescent Lamp Perform**ance at Different Ambient Temperatures. Final rept. Nov 91-Jun 92. 92, 53p, NISTIR-4935. Prepared in cooperation with National Research Council of Canada, Ottawa (Ontario).

Keywords: *Performance evaluation, *Fluorescent lamps, *Temperature dependence, Luminous intensity, Discharge lamps, Ballasts(Electric), Ignition time, Starters, Temperature effects, Power factor.

The performance of twelve different sets of compact fluorescent lamps was evaluated at six different temperatures ranging from 45 C to -18 C and compared against the performance of a set of comparable incandescent lamps. Performance measures included the following: lamp ignition time or failure, time to luminous equilibrium and electrical stabilization, relative luminous flux density, luminous flicker index for lamps with flicker rate below 240 Hz, electrical power in watts (W) and volt amps (VA), minimum lamp wall or globe temperature as applicable, relative luminous efficacy, total harmonic distortion, and power factor. In addition time to ignition was assessed for a simulated frost condition in which lamps were misted at -4 C. Analysis of the results indicated significant decrements in performance for most compact fluorescent lamps at temperatures below 0 C, with outright failure for several lamps at -18 C. Luminous output relative to the incandescent lamps remained higher for comparable wattage lamps, however, except at the very coldest temperatures.

PB93-153302 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Building Environment Div. Performance of a Residential Desuperheater. Final rept. A. H. Fanney, and B. P. Dougherty. 1992, 11p. Sponsored by Department of Energy, Washington, DC. Pub. in ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Transactions,

00.036

v98 pt1 11p 1992.

Keywords: "Heat pumps, "Residential buildings, "Water heating, Economic analysis, Water heaters, Heat exchangers, Residential energy, Heating equipment, Domestic energy, Energy consumption, Reprints, *Desuperheaters.

The performance of a residential earth-coupled heat pump having an integral desuperheating water-heating circuit is presented. The system, which includes a 50-gallon electric water heater, is located in a home in Gaithersburg, Maryland. During a 24-month monitoring penod, the desuperheater contributed 27% of the total energy supplied for heating water. On a monthly basis, the desuperheater's contribution varied from less than

1% to 55%. Simple payback for the desuperheater is projected to occur by the end of the fourth year of operation. For a few selected days during the monitoring period, data were recorded every minute to gain insight into how the desuperheater and resistive elements Interact in recovering the water heater. In general, the desuperheater contributed most to heating the lower portion of the tank from the setpoint of the lower thermostat, 110 F, to temperatures occasionally approach-

00.037 PB93-153583 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Bullding Environment Div.

Measuring Airflow Rates with Pulse Tracer Technlaues. Final rept.

A. Persily, and J. Axley. 1990, 21p. Sponsored by Department of Energy, Washington, DC. Pub. in Air Change Rate and Airtightness in Buildings, ASTM STP 1067, p31-51 1990.

Keywords: *Ventilation, *Flow measurement, *Tracer techniques, Test methods, HVAC systems, Air flow, Fluid infiltration, Diagnostic techniques, Buildings, Reprints, Pulse tracer techniques.

New tracer gas techniques for measuring airflow rates in HVAC ducts and buildings airflow systems are described. These pulse tracer techniques are based upon the application of integral mass balance equations to the tracer gas concentration response of an airflow system to pulse injections of tracer. For building airflow systems, or portions of them, the airflow system is first Idealized by an appropriate multi-zone model, pulse injections of tracer are applied to each zone independently, and the concentration response of each of the zones is measured. The multi-zone integral mass balance equations are formed and solved to determine the airflow rates between the zones. The airflows that are determined and the accuracy of these determinations are dependent not only upon the air exchange characteristics of the building, but also on the appro-priateness of the system idealization employed. This paper presents the theoretical basis of the pulse techniques for measuring airflows in ducts, and for studying single-zone and multi-zone building airflow systems. Procedures for formulating appropriate multi-zone idealizations of building airflow systems are described and practical details of pulse testing outlined. A senes of field studies are reviewed, providing examples of procedures used to formulate system idealizations, experimental techniques employed to conduct the tests, and airflow rate measurement results.

00,038 PB93-166437 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Building Environment Div. Experimental Evaluation of Lighting/HVAC Inter-

S. J. Treado, and J. W. Bean. 1990, 7p.
See also PB91-206706. Sponsored by Department of Energy, Washington, DC.
Pub. in ASHRAE (American Society of Heating, Refrig-

erating and Air-Conditioning Engineers) Transactions, pt2 p773-779 1990.

Keywords: "Cooling load, "HVAC systems, "Lighting systems, Air flow, Lighting loads, Test facilities, Cooling systems, Ventilation, Reprints.

The interaction of building lighting and HVAC systems, and the effects on cooling load and lighting system performance, are being evaluated using a full-scale test facility at the National Institute of Standards and Tech nology. The test facility and measurement technology are described, along with sample test data, results and conclusions.

00,039 PB9**3-173458** PB93-173458 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Evaluation of Subjective Response to Lighting Distributions: A Literature Review.

B. L. Collins. Feb 93, 72p, NISTIR-5119.

Keywords: *Lighting systems, *Visual perception, Luminance, Physiological effects, Glare, Environmental engineering, Color, Illuminating, Comfort, Reviews.

The research literature on the subjective response to lighting and luminance distributions is reviewed. It in-

Building Equipment, Furnishings, & Maintenance

cludes an assessment of the lighting design parameters and system features which have been linked to occupant response, both positive and negative. Feaoccupant response, both positive and regative. Features such as uniformity, color, visual clarity, glare, gloom, daylighting, task lighting, and lighting geometry are addressed. Occupant response is discussed in terms of affect, preference and behavior. Both laboratory and field research results are reviewed. The review of the literature suggests strongly that luminance distribution and patterns play an important role in determining positive psychological response to lighting. These findings have important implications for lighting design.

00.040

PB93-206217 PC A04/MF A01

National Inst. of Standards and Technology (BFRL),

Galthersburg, MD.

Claimersburg, MD. Lighting System Design and Evaluation in Federal Office Buildings. Final rept. Feb 91-Jul 92.

S. J. Treado, and B. L. Collins. Mar 93, 71p, NISTIR-

Sponsored by Public BuildIngs Service, Washington, DC. Office of Real Property Management and Safety.

Keywords: *Federal buildings, *Lighting equipment, Design standards, Energy efficiency, Ballasts(Electric), Office buildings, Lamps, Performance evaluation.

The report describes the results from a research project on developing methods for designing and selecting efficient and effective lighting systems for federal office buildings. It includes a review of current GSA and IES lighting design guidelines and a discussion of relevant testing and rating procedures. A comprehensive procedure for measuring and evaluating lighting components and systems was developed and used to assess the performance of a range of typical office lighting equipment. The procedure accounted for interactions between different components of a lighting system. The measurement results showed a wide range of performance characteristics related to light output and energy efficiency. The T-8 triphosphor lamps and electronic ballasts exhibited the best performance, but some of the more traditional lighting system components also performed well.

PB93-208445 PC A05/MF A01

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.

Literature Review of Lighting Standards.
P. A. Sanders. Jun 93, 90p, NISTIR-5202.
Sponsored by Canadian Standards Association, Toronto (Ontario)

Keywords: *Illuminating, *Lighting equipment, *Design standards, Ballasts(Electric), Energy efficiency, Legislation, Canada, United States, Buildings.

Society's dependence on energy and increased con-cems about global warming have prompted legislative bodies to implement minimum energy efficiency requirements for architectural lighting systems. The present report reviews and summarizes current Canadian and US federal legislation, US state legislation and model energy efficiency codes with particular at-tention to describing the minimum conformance stand-

PB94-500055 **CP D02**

National Inst. of Standards and Technology,

Gaithersburg, MD.
Bullding Life Cycle Cost Computer Program (BLCC), Version 4.11 (for Microcomputers).

Software.

1993, diskette, NIST/SW/DK-93/006. System: IBM compatible; MS DOS operating system. Open READ.ME file for installation instructions. Super-PB93-502995. PB94-500097 See also

(ERATES). The software is on one 3 1/2 Inch diskette, 1.44M high density. Documentation included; may be ordered sep-arately as PB93-208460 and PB93-167288.

Keywords: *Software, *Bulldings, *Life cycle costs, *Energy conservation, Economic analysis, Long range(Time), Operating costs, Retum_on investment, Savings, Prices, Benefit cost analysis, Diskettes.

The product provides economic analysis of proposed capital investments that are expected to reduce longterm operating costs of buildings or building systems/ components. It is especially useful for evaluating the

costs and benefits of energy conservation projects in buildings. Two or more alternative designs can be eval-uated to determine which has the lowest life-cycle cost and therefore is most economical in the long run. Economic measures, including net savings, savings-to-investment ratio, adjusted internal rate of return, and years to payback can be calculated for any design alternative relative to the designated base case. It complies with ASTM standards related to building economics as well as FEMP and OMB Circular A-94 guidelines for economic analysis of federal building projects. It has new capabilities for using demand charges and block rate calculations for computing annual electricity costs. While it is primarily Intended for the economic evaluation of building systems, it can be applied to a wide range of project Investments which are intended primarily to reduce future operating-related costs.

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00.043

PB93-186005 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Fire Safety Engineering Div.
Bench-Scale Predictions of Mattress and Uphol-

stered Chair Fires: Similarities and Differences. Y. Babrauskas. Mar 93, 25p, NISTIR-5152. Sponsored by National Inst. of Justice, Washington,

Keywords: *Flammability testing, *Bedding equipment, *Upholstery, Fumiture, Burning rate, Flammability, Fire tests, Fire safety, Heat flux, Fire hazards.

The report summarizes recent and current research conducted jointly by the National Institute of Standards and Technology (NIST) and the California Bureau of Home Fumishings (BHF), now the California Bureau of Home Fumishings and Thermal Insulation, to establish bench-scale test methods for the flammability of upholstered chairs and mattresses. The NIST research was funded by the National Institute of Justice (NIJ), while the BHF research was funded by the International Sleep Products Association. The research of primary interest to NIJ Is the Investigation of mattress flammability. The BHF heat release rate (HRR) data from full-scale burn tests was correlated with benchscale burn tests conducted by NIST. An examination of the data for non-propagating and propagating fire regimes for mattresses enabled the development of an NIJ performance standard for the flammability of mattresses for detentions and corrections use based upon HRR limits as determined through bench-scale testing. The bench-scale tests conducted by NIST included both mattress specimens as received from the manufacturers and the same specimen subjected to a leaching procedure to remove flame retardant treatments. It was concluded that with the criteria recommended in the present standard, an adequate safety margin is provided against the diminution of fire retardancy seen with leaching.

00.044

PB93-198927 PC A04/MF A01

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.

Discharge of Fire Suppression Agents from a Pressurized Vessel: A Mathematical Model and Its Application to Experimental Design.

L. Y. Cooper. May 93, 61p, NISTIR-5181. Sponsored by Department of the Air Force, Wright-Pat-

terson AFB, OH.

Keywords: *Fire extinguishers, *Mathematical models, Nozzle flow, Fluorohydrocarbons, Halon, Fire protection, Nitrogen, Onfices, Jet flow, Pressure vessels, Fire extinguishing agents.

A mathematical model and associated computer program is developed to simulate the discharge of fire extinguishment agents from N2-pressurized vessels. The model is expected to have three applications. First, to establish an experimental design and procedure which closely simulates discharge of a field-deployed vessel; second, to evaluate the discharge characteristics of a wide range of alternative-agent/pressure-vessel configurations, thereby extending the slow and relatively costly experimental method of making such evaluations; and finally, to predict vessel exit flow conditions to be used to solve the problem of agent dispersal out-

side of the discharge vessel. The model Is used in example calculations which address the first of these applications.

00 045

PB93-235190 PC A03/MF A01

National Inst. of Standards and Technology,

Gaithersburg, MD.

Workshop on Elevator Use during Fires. Held in Galthersburg, Maryland on September 29, 1992. J. H. Klote, S. P. Deal, B. M. Levin, N. E. Groner,

and E. A. Donoghue. Jan 93, 21p, NISTIR-4993. See also PB87-233771 and PB88-195946. Prepared In cooperation with George Mason Univ., Fairfax, VA., and Donoghue (Edward A.) Associates, Inc., Salem,

Keywords: *Fires, *Elevators(Lifts), *Escape systems, *Meetings, Evacuating(Transportation), Handicapped persons, Field tests, Air flow, Computerized simulation, Smoke, Office buildings.

A Workshop on Elevator Use during Fires was held at the National Institute of Standards and Technology (NIST) in Gaithersburg, MD on September 29, 1992. The Workshop consisted of presentations and an open discussion. The talks were about NIST elevator research by John H. Klote, about human considerations by Bemard M. Levin and Norman E. Groner, and about industry concems by Edward A. Donoghue. An overview of these talks is presented. The following items from the open discussion are addressed: system concepts, the hoistway water problem, elevator controls, sprinklered and unsprinklered buildings, Institutional challenges, organizational challenges, and future di-rection of elevator evacuation.

PB94-103678 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Sprinkler Fire Suppression Algorithm for HAZARD. D. D. Evans. Aug 93, 23p, NISTIR-5254. See also PB92-187145.

Keywords: *Fire tests, *Algorithms, *Sprinklers, *Cribs, Fire protection, Buildings, Fire hazards, Mathematical models, Burning rate, Fires, Spraying.

Measurements of the heat release rate of fully involved square base wood crib both before and during fire suppression with water spray from commercial sprinklers were used to develop a correlation for the exponential decay time constant of the fire heat release rate from the value at sprinkler actuation. This correlation is the basis for prediction of limits for heat release rates of fumishings during fire suppression.

00,047 PB94-108644 PC A08/MF A02

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Test Methods for Quantifying the Propensity of Cigarettes to Ignite Soft Furnishings.

Special pub.
T. J. Ohlemiller, K. M. Villa, E. Braun, J. Randall Lawson, R. G. Gann, K. R. Eberhardt, and R. H. Harns. Aug 93, 169p, NIST/SP-851.

Also available from Supt. of Docs. See also PB90-169327.

Keywords: *Test methods, *Flammability testing, *Ignition, *Furniture, Upholstery, Fire tests, Tobacco, Statistical analysis, Bedding equipment, *Cigarettes.

Research funded under the Fire Safe Cigarette Act of 1990 (P.L. 101-352) has led to the development of two test methods for measuring the ignition propensity of cigarettes. The Mock-Up Ignition Test Method uses substrates physically similar to upholstered furniture and mattresses: a layer of fabric over padding. The measure of cigarette performance is Ignition or non-Ignition of the substrate. The Cigarette Extinction Test Method replaces the fabric/padding assembly with multiple layers of common filter paper. The measure of performance is full-length burning or self-extingulshment of the cigarette. Routine measurement of the relative Ignition propensity of cigarettes Is feasible using either of the two methods. Improved cigarette performance under both methods has been linked with reduced real-world Ignition behavior; and it is reasonable to assume that this, in turn, implies a significant realworld benefit. Both methods have been subjected to interlaboratory study. The resulting reproducibilities were comparable to each other and comparable to those in other fire test methods currently being used

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to regulate materials which may be involved in unwanted fires. Using the two methods, some current commercial cigarettes are shown to have reduced ignition propensities relative to the current best-selling

PC A08/MF A02 PB94-109014

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Modeling the Ignition of Soft Furnishings by a Cig-

Special pub. (Final).

H. E. Mitler, and G. N. Walton. Aug 93, 171p, NIST/ SP-852.

Also available from Supt. of Docs. See also PB87-201869, PB88-169982 and PB90-241480.

Keywords: *IgnItion, *Fumiture, User manuals(Computer programs), Upholstery, Pyrolysis, Mathematical models, Heat flux, Bedding equipment, Flammability, Convection, *Cigarettes, CIGARET computer program, SUBSTRAT computer program.

The paper describes the user-friendly computer models CIGARET and SUBSTRAT. CIGARET calculates the time-dependent behavior of a cigarette smoldering quietly in the air, away from surfaces. The model incorporates diffusion and convection of gases, as well as the kinetics of char oxidation. It calculates the internal heat fluxes, as well as the Internal distributions of temperature, gas velocity, and oxygen concentration. SUBSTRAT determines whether a two-layer solid (with an air gap in between), exposed to a moving heating flux such as Is produced by a cigarette, will Ignite. Among the processes taken into consideration are three-dimensional heat conduction in the substrate and its pyrolysis. This model has successfully simulated the thermal runaway signifying smoldering ignition of the substrate when it is exposed to a set of external heating fluxes. SUBSTRAT and CIGARET have been designed to work in tandem to simulate the most frequent cause of fatal fires: cigarette ignition of upholstered furniture and bedding. Users' guides are included.

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00,049 AD-A956 270/3 PC A03/MF A01 National Bureau of Standards, Washington, DC. Inst. for Applied Technology.
Hall Resistance of Roofing Products. S. H. Greenfeld. Aug 69, 11p. Errata sheet included.

Keywords: *Roofs, *Hail, *Impact tests, *Damage, Performance(Engineering), Test and evaluation, Resistance, Vulnerability, Construction materials, *Roofing, U/A Report, Shingles.

A test was developed for evaluating the hail resistance of roofings, in which synthetic hail-stones (ice spheres) of various sizes were shot at roof assemblies at their free-fall terminal velocities. Indentations, granule loss and roofing fracture were observed. The following conclusions have been made from these results: All roofing materials have some resistance to hail damage, but Ing materials have some resistance to hail damage, but as the size of the hail increases, a level of impact energy Is reached at which damage occurs. This level lies in the range of 1 1/2 to 2 inch (3.8-5.1 cm) hailstones for most prepared roofings. Because of the ways in which prepared roofings are applied, most products have areas of different vulnerability. The solidly supported areas of roofing tend to be the most resistant to hail damage. Heavier shingles tend to be more hail resistant than Type 235 shingles. Weathering tends to lower the hail resistance of asphalt shingles. Built-up lower the hail resistance of asphalt shingles. Built-up roofs on dense substrates tend to resist hail better than those on soft substrates. Built-up roofs made with Inorganic felts tend to be more hail resistant that those made with organic felts. Coarse aggregate surfacing tends to increase the hail resistance of roofing.

00.050 PB93-124808 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Fire Measurement and Research Div.

Heat Release Rate: The Single Most Important Variable in Fire Hazard.

Final rept.

V. Babrauskas, and R. D. Peacock. 1992, 18p. See also PB91-146977.

Pub. In Fire Safety Jnl. 18, p255-272 1992.

Keywords: *Fire hazards, *Flammabllity, *Bulldings, Safety, Fire tests, Toxicity, Fatalities, Bumlng rate, Flammability testing, Reprints, *Heat release rate.

Heat release rate measurements are sometimes seen by manufacturers and product users as just another piece of data to gather. It is the purpose of this paper to explain why heat release rate is, in fact, the single most important variable in characterizing the 'flam-mability' of products and their consequent fire hazard. Examples of typical fire histories are given which illus-trate that even though fire deaths are primarily caused by toxic gases, the heat release rate is the best predictor of fire hazard. Conversely, the relative toxicity of the combustion gases plays a smaller role. The delays in ignition time, as measured by various Bunsen burner type tests, also have only a minor effect on the development of fire hazard.

00,051

PB93-138980 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Acoustic Emission of Structural Materials Exposed to Open Flames.
W. Grosshandler, and M. Jackson. Dec 92, 27p,

NISTIR-4984.

Keywords: *Acoustic signals, *Fire tests, *Plywood, Fire detection systems, Acoustic measurement, Construction materials, Test facilities, Transducers, Signal processing, Heat flux, Fires.

The use of acoustic emission (AE) as an early indicator of a hidden structural fire has been investigated and found to be a viable, but undeveloped, concept. Piezoelectric transducers have been mounted directly on 0.5 m long, simply supported beams of different structural materials (aluminum, gypsum board, wood and plastic), and have been used to record ultrasonic events resulting from a small flame placed under the beam. The number of AE events in a minute and the cumulative energy released during the heating cycle provide a good measure of the overheated state of some of these materials even before a temperature increase is indicated. The measured signals varied in energy and number with the type of material, the thickness of the specimen and heat flux. Wood was particularly suscepevents per minute In a solid fir board and 30/min in a 13 mm thick plywood when the flame exceeded 1.0 kW. A gypsum board produced 16 events in a minute. An aluminum plate did not respond above the background level (0.3 events/minute) even though it reached the highest temperature. The differences in cumulative energy were equally striking, with the plywood being four times more energetic than the gypsum board even though the heating period for the wood was half as long, and 30 times more energetic than the aluminum.

00,052 PB93-139046 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building Environment Div.
Controlling Molsture in the Roof Cavities of Manu-

factured Housing.

Final rept. D. M. Burch. Nov 92, 51p, NISTIR-4916.

Sponsored by Department of Housing and Urban Development, Washington, DC.

Keywords: *Roofs, *Moisture resistance, *Construction materials, *Prefabricated buildings, *Attics, Humidity, Porosity, Moisture content, Ventilation, Permeability, Diffusion, Boundary conditions, Interfaces, Residential buildings, *Manufactured housing.

A detailed computer analysis is conducted to investigate whether moisture problems occur in the roof cavity of manufactured homes constructed in compliance with the current Department of Housing and Urban Development (HUD) Standards for manufactured housing. The current HUD Standards require a ceiling vapor retarder, but do not require outdoor ventilation of the roof cavity. In cold climates, the analysis revealed that moisture accumulates at lower roof surface and poses a risk of material degradation. The analysis found the following combination of passive measures to be effective In preventing detrimental winter moisture accumulation at lower surface of the roof: (1) providing a celling vapor retarder, (2) sealing penetrations and openings In the ceiling construction, and (3) providing natural ventilation of the roof cavity. In addition, the performance of a roof cavity subjected to a hot and humld cli-mate is investigated. The analysis revealed that out-door ventilation of the roof cavity causes the monthly mean relative humidity at the upper surface of the vapor retarder to exceed 80%. The condition is conducive to mold and mildew growth.

PB93-139103 PC A06/MF A02 National Inst. of Standards and Technology (BFRL),

National Inst. of Standards and Technology (BFRL), Galthersburg, MD.
Reduction of Hydrogen Cyanide Concentrations and Acute inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Part IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds.

Per Compounds.

B. C. Levin, E. Braun, M. Paabo, R. H. Harris, and M. Navarro. Dec 92, 115p, NISTIR-4989.

See also PB91-132167. Sponsored by International Copper Association, Ltd., New York, and Society of the Plastics Industry, Inc., New York.

Keywords: *Toxicity, *Combustion products, *Hydrogen cyanide, *Polyurethane resins, *Copper compounds, Fire hazards, Fires, Foam rubber, Thermal degradation, Oxidation, Fire tests.

Two full-scale protocols (A & B) were tested to determine the efficacy of cuprous oxide (Cu2O) in reducing the concentrations of hydrogen cyanide (HCN) from flexible polyurethane foams (FPU) when thermally decomposed under realistic room conditions. In each Protocol A test, a FPU cushion (untreated or treated with 0.1% Cu2O) was cut in half, and the two halves were stacked on a load cell in a closed room. The ignltion source was a hot wire placed between the two halves. Rats were exposed to the decomposition products to examine the toxicological effects of the foams with and without Cu2O. Protocol B differed from Protocol A in that chairs were simulated by four FPU cushions attached to a steel frame; the treated FPU contained 1.0% Cu2O; the cushions were covered with a cotton fabric; the chairs were ignited with cigarettes; and the burn room was open and connected to a corridor. In both protocols, the thermal decomposition progressed through nonflaming, smoldering and flaming phases and the concentrations of HCN and other gases were monitored. Foams used in the full-scale room burns were also examined under small-scale conditions (under flaming or a two-phase nonflaming/ ramped heating mode) in the cup fumace smoke toxicity method. Both atmospheric and reduced O2 conditions were studied. The small-scale tests showed an 87% reduction in the concentration of HCN and a 40 to 73% reduction in the toxicity of the thermal decomposition products when the Cu2O-treated foams were tested. In the full-scale tests, the concentration of HCN was reduced 70% when the FPU contained 1.0% Cu2O, but not when the foams contained 0.1% Cu2O.

PB93-139111 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Test Methods for Detention and Correctional Facil-

ity Locks. C. W. C. Yancey. Nov 92, 52p, NISTIR-4975. Sponsored by National Inst. of Justice, Washington,

Keywords: *Test methods, *Locks(Fasteners), *Correctional institutions, Mechanlcal properties, Performance tests, Impact tests, Mechanical tests, Fire resistance, Constraining.

Draft test methods are presented for evaluating locks Installed in detention and correctional facilities. The methods have been developed by ASTM (American Society for Testing and Materials) Committee F 33 on Detention and Correctional Facilities and are drafted In ASTM standard test method format. The NIST contribution to this effort is to assist the F 33 Committee in drafting, balloting and obtaining consensus approval for these test methods. Existing standards for residential and commercial locks have been reviewed to determine the standards for the standards for residential and commercial locks have been reviewed to determine the standards for the standards for residential and commercial locks have been reviewed to determine the standard for the st mine their applicability to the evaluation of locks subject to the abuse common to detention and correctional facilities. Synopses of relevant standards are pre-

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sented in this report. A case is made for performing laboratory tests on prototype locks to quantify current performance levels and to establish a classification system for detention-facility locks. Gaps In the knowledge base are identified and recommendations are advanced for performing a series of cyclical operations, impact and lockbolt retraction tests. The results from the recommended laboratory test program would be used to prepare a minimum performance standard for promulgation by the National Institute of Justice.

00,055 PB93-140788 PC A06/MF A02

National Inst. of Standards and Technology (BFRL), Hational first. of Stationards and Tostinology (2014), Gaithersburg, MD. User's Guide for CFAST Version 1.6. R. W. Portier, P. A. Reneke, W. W. Jones, and R. D. Peacock. Dec 92, 107p, NISTIR-4985.

Keywords: *User manuals(Computer programs), *Fires, Algorithms, Ventilation, Subroutines, Smoke, Toxicity, Computer programs, Geometry, Air flow, Buildings, *CFAST computer program, *Compartment

CFAST is a zone model capable of predicting the envi-ronment in a multi-compartment structure subjected to a fire. This guide provides a detailed description of the pre- and post-processing routines used by the model, the data input requirements and the output produced by version 1.6 of the model.

00 056

PB93-146298 PC A03/MF A01

of Standards and Technology, National Inst. Gaithersburg, MD.

Performance Standard for Wood-Based Structural-

Use Panels. Final rept.

B. Melgs. Dec 92, 38p, NIST/PS-2/92.
Also available from Supt. of Docs. as SN003-003-03181-0. Sponsored by American Plywood Association, Tacoma, WA.

Keywords: *Standards, *Test methods, *Panels, *Wood products, Durability, Plywood, Construction materials, Moisture content, Mechanical properties, Particle boards, Wallboard.

The standard covers the performance requirements, adhesive bond durability, panel construction and workmanship, dimensions and tolerances, marking, and moisture content of structural-use pariels. It covers a variety of products, including plywood, waferboard, oriented strand board, structural particleboard, and composite panels. The Standard classifies panels by exposure durability and by grade. It provides test methods, a glossary of trade terms and definitions, and a quality certification program whereby agencies inspect, sam-ple, and test products for qualification under this stand-ard. Information regarding reinspection practices is provided in an appendix.

00.057

PB93-146678 PC A04/MF A01

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.

Smoke Movement In a Corridor-Hybrid Model, Simple Model and Comparison with Experiments.
T. Matsushita, and J. H. Klote. Dec 92, 53p, NISTIR-

Keywords: *Smoke, *Mathematical models, *Fires, *Buildings, Transport properties, Heat transfer, Fluid dynamics, Fire tests, Temperature distribution, Equations of motion, Temperature dependence, *Smoke movement, *Corridors.

A hybrid model for simulating smoke movement in a corridor is described. This model uses a two zone approach which considers velocities in each zone, and uses a fine mesh in the direction of propagation. Two different approaches to deal with the pressure term are addressed. Full scale and reduced scale experiments are described and compared with the results of the hybrid model. Since heat transfer is not presently incorporated in the hybrid model, the simulated velocity of spread is constant. But in the experiment, the velocity drops with advancing time. A simple model with heat transfer is also described. This model is similar to the density flow model, and assumes that the movement of the smoke front (nose) is similar to the flow through vertical openings in a zone model. Results of the simple model are compared with the experiment with heat transfer, and the effect of the heat transfer coefficient is observed.

00.058

PC A03/MF A01 PB93-146686

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.

Observations from a Field Study of the Performance of Polymer-Modified Bitumen Roofing. W. J. Rossiter, and R. D. Denchfield. Jan 93, 45p,

Prepared in cooperation with Denchfield Corp., Silver Spring, MD.

Keywords: *Bitumens, *Roofing, *Deterioration, Roofs, Construction materials, Membranes, Polymers, Standards, Defects, Asphalts, Performance evaluation.

The report presents the results of a fleld study of polymer-modified bitumen roofing. Observations on in-service performance are beneficial for Identifying field problems that require study to attain solutions. Fiftythree roofs, ranging In age from 24 to 131 months and located in Washington/Baltimore, Jacksonville, Florida, and Dallas, Texas, were inspected. The types of membrane modifiers were almost equally distributed between atactic polypropylene and styrene-butadiene-styrene polymers. Re-roofing predominated the type of construction and was divided somewhat evenly between tear-off and re-covering. The overall performance of these relatively young roofs was considered to be satisfactory. About 70 percent of the roofs were considered visually to be in fine condition. Still, about a quarter of the roofs showed some defects that contributed to a lowered performance ranking.

PB93-151231 Not available NTIS

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD. Building Materials Div. Geochemical Considerations in the Cleaning of

Carbonate Stone.

Final rept.

Final rept.

R. Livingston, 1992, 15p.

Pub. in Proceedings of International Conference on Stone Cleaning, and the Nature, Soiling and Decay Mechanisms of Stone, Edinburgh, Scotland, UK., April 1992, p166-180.

Keywords: *Cleaning, *Marble, *Limestone, *Air pollution effects(Materials), Deterioration, Specifications, Carbonate rocks, Gypsum, Construction materials, pH, Carbon dioxide, Chelating agents, Chemical reactions, Reprints.

The specification of solutions for cleaning of limestone and marble is of major concern for several reasons. First, these materials have been very widely used for sculpture and architecture. Second, the soiling and discoloration of these surfaces is often the result of chemical processes, such as the formation of gypsum, that make cleaning more difficult. Finally, solutions in contact with carbonate stone will change in pH and ionic composition because of Interactions with the stone and atmospheric carbon dioxide. Many types of solutions have been suggested for cleaning carbonate stone. These include deionized or distilled water, acidic solutions, solutions saturated with calcite and solutions containing chelating agents such as EDTA. However, the use of a chemically incompatible cleaning could, at best, be ineffective and, at worst, could cause damage to the stone. Geochemical theory can help to clar-If the situation.

00,060

PB93-151249 Not available NTIS

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building Materials Div.

Graphical Methods for Examining the Effects of

Acid Rain and Sulfur Dioxide on Carbonate Stones.

Final rept. R. A. Livingston. 1992, 12p. Pub. in Proceedings of International Congress on De-

terioration and Conservation of Stone (7th), Lisbon, Portugal, June 14-18, 1992, p375-386.

Keywords: pollution effects(Materials), *Limestone, *Marble, *Deterioration, Urban areas, Acid rain, Sulfur dioxide, Deposition, Dry methods, Carbonate rocks, Air pollution control, Electrolytes, Calcium, Runoff, Gypsum, Construction materials, Dissolution, Reprints.

Both acid rain and dry deposition of sulfur dioxide cause dissolution of carbonate building stone. It is important to distinguish between the two processes for purposes of developing air pollution control policies, since dry deposition comes primarily from local

sources of air pollution while acid rain generally results from long range transport from distant sources. Runoff experiments are a common method used to investigate this problem, but this kind of study is complicated by the additional dissolution of carbonate stone dissolves in natural, unacidified rainwater through the karst process. This paper shows that by using data transformations based on electrolyte theory and carbonate equilibria, the total observed dissolution of calcium from the stone can be partitioned into components of acid rain, dry deposition and natural or karstic dissolution. The data can then be plotted on either a triaxial diagram or on the calcite/gypsum phase diagram for visual interpretation. The triaxial diagram provides an Index of the relative importance of the three carbonate dissolution processes, while the phase diagram puts the effect of an Individual rain event in perspective against saturation with respect to calcite or gypsum. In the examples presented here, the amount of dissolution by natural processes is comparable to, or greater than, the effect of acid deposition. In urban areas where there is significant ambient levels of SO2, the dry deposition effect often dominates over the other two processes. In such conditions the acid rain signal may be lost in the error of the dissolved calcium measurement.

PB93-151280 Not available NTIS

National Inst. of Standards and Technology (NML), Boulder, CO. Chemical Engineering Science Div. Interlaboratory Comparison of the Apparent Thermal Conductivity of a Fibrous Batt and Four Loose-

Fill Insulations.

Final rept.

D. J. McCaa, and D. R. Smith. 1991, 24p.
Pub. In Proceedings of ASTM (American Society for Testing and Materials) Symposium on Thermal Insulation, Gatlinburg, TN., October 1991, 24p.

Keywords: *Thermal conductivity, *Thermal Insulation, Test methods, Thermal resistance, Thermal diffusivity, Accuracy, Heat transmission, Glass fibers, Test facilities, Interlaboratory comparisons, Reprints.

An interlaboratory comparison of measurements of the apparent thermal conductivities of four loose-fill insulations was conducted according to ASTM Standard Practice C 687 in order to prepare a revised statement of precision and bias. The apparatus used included one guarded hot plate, one thin-heater apparatus, and eight heat-flow meters. All specimens were tested at a mean temperature of 24 C (75 F). Test results for fibrous glass blanket were used to characterize the basic imprecision (numerical measure of precision) of the test Instruments. The 2 sigma imprecisions of measurement of apparent thermal conductivity were 2.8% for fibrous glass blanket, 5.8% for cellulose, 9.4% for unbonded glass fiber, 10.5% for mineral wool, and 5.0% for perlite.

PB93-152056

PB93-152056 PC A03/MF A01 National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.
Simulating the Effect of Beamed Ceilings on Smoke Flow. Part 1. Comparison of Numerical and Experimental Results.

G. P. Forney, W. D. Davis, and J. H. Klote. Dec 92, 27p, NISTIR-4994.

See also PB92-156751 and PB92-191253.

Keywords: *Computational fluid dynamics, *Ceilings, *Smoke, *Air flow, *Fires, Beams(Supports), Mathematical models, Temperature distribution, Computerized simulation, Numerical analysis, Flow distribution, *Smoke flow.

The flow of smoke under beamed ceilings is simulated using a field model. The work was performed in order to confirm that fire detector response can be evaluated using computational data obtained from numerical sim-ulations as well as laboratory data obtained from ex-periments. The field model is verified for the application by showing that its temperature predictions match experimental results obtained earlier by Heskestad and Delichatsios. Line plots are presented which show that the numerical and experimental temperature measurements are in good agreement. Contour plots are also presented that show the temperature distribution in the channels formed by the ceiling beams. Finally some preliminary results involving the effect of beam depth on smoke flow are presented.

00.063

PB93-153161 Not available NTIS

Construction Materials, Components, & Equipment

National Inst. of Standards and Technology (BFRL), Galthersburg, MD. Bullding Materials Div. Computer Modelling of Cement-Based Materials.

Final rept.
D. P. Bentz, and E. J. Garboczl. 1992, 5p. Pub. In CRAY Channels 14, n3 p12-16 1992.

Keywords: *Concretes, *Computerized simulation, Hydration, Admixtures, Concrete durability, Interfaces, Mathematical models, Microstructure, Physical properties, Stiffness, Transport properties, Reprints.

Cement-based materials are one of the most widely used construction materials in the world and their per-formance is critical to the nation's infrastructure. One key area of research for these materials is to understand the fundamental relationships that exist between microstructure and properties, such as stiffness, strength, transport coefficients, and durability. Computer modelling has proven a valuable tool in elucidating these key relationships. Through the National Science Foundation Science and Technology Center for Advanced Cement-Based Materials, access to the CRAY-2 supercomputer at the Massachusetts Institute of Technology was provided by Cray Research, Inc. The computer was utilized to study, via large scale simulation, the microstructure of the interfaces between cement paste and aggregates, the two major components of concrete. The effects of vanous mineral admixtures on interfacial zone microstructure was investigated in a quantitative manner using the simulation model.

PB93-153179 Not available NTIS National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building Materials Div.

Experimental and Simulation Studies of the Interfacial Zone in Concrete. Final rept.

D. P. Bentz, P. E. Stutzman, and E. J. Garboczl. 1992, 12p.

Pub. in Cement and Concrete Research 22, p891-902

Keywords: *Concretes, *Interfaces, Computerized slmulation, Aggregates, Microstructure, Physical properties, Mathematical models, Silicone dioxide, Hydration, Chemical reactions, Reprints.

Since concrete is a composite material, the interfaces between components can be expected to have major effects on physical properties. In ordinary portland cement concrete, the interfacial zone between cement paste and aggregate has been shown to exhibit characteristics greatly differing from those of the bulk paste. The addition of mineral admixtures to the mix has been shown to significantly alter this interfacial zone microstructure and enhance physical properties of the composite. in this paper, a direct comparison is made between results obtained using a three-dimensional microstructural model and those obtained experi-mentally on a similar set of mixes containing various amounts of silica fume. Quantitative measurements of backscattered electron images of the interfacial zone in the real materials are compared to model results. The model reproduces the experimentally-observed characteristics of the interfacial zone, which are quite different with and without the presence of silica fume.

00,065 PB93-153229 PB93-153229 Not available NTIS
National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building Environment Div.
Water Vapor Permeability Measurements of Common Bullding Materials.

Final rept. D. M. Burch, W. C. Thomas, and A. H. Fanney. 1992, 9p.

Sponsored by Department of Energy, Washington, DC., and Department of Housing and Urban Develop-

ment, Washington, DC.
Pub. In ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Transactions, v98 pt2 9p 1992.

Keywords: *Construction materials, *Permeability, Water vapor, Moisture content, Humidity, Plywood, Wood products, Temperature effects, Measuring methods, Reprints.

A cup method was used to measure water-vapor transmission in 10 common building materials. The materials Included sugar pine, sturdy-brace fiberboard, fi-berboard sheathing, particleboard, exterior-grade ply-wood, plain gypsum board, kraft paper, waferboard

siding, vinyl-covered gypsum board, and foam core sheathing. For each material, a series of cup measurements was conducted, and the permeability (or permeance) was plotted as a function of the mean relative humidity across the specimen. Separate measurements, carried out at 24 C (75 F) and 7 C (44 F), indicated that temperature has an insignificant effect on permeability. The permeability measurements were compared with other measurements reported in the ilterature, and the agreement was good in most cases.

00.066 PB93-153252 Not available NTIS
National Inst. of Standards and Technology (BFRL),
Gaithersburg, MD. Fire Science and Engineering Div.
Feeling a Door to See if Fire is on the Other Side.
Final rept.
L. Y. Cooper, and H. E. Nelson. 1992, 6p.
Pub. In Fire Technology 28, n3 p251-256 Aug 92.

Keywords: *Doors, *Fire protection, Surface properties, Fires, Surface temperature, Smoke, Fire fighting, Thermal protection, Safety, Reprints.

The paper considers door assemblies that separate a fire environment from a protected space. It analyzes three methods of 'feeling a door' on the protected side that can assist in determining the existence of a direct fire threat on the other side. These methods are: (1) feeling the door surface to determine whether or not it is at an elevated temperature; (2) feeling, smelling and visual inspection of the door edges to determine possible smoke flows from an adjacent fire environ-ment; (3) feeling the door-knob to determine whether or not it is at an elevated temperature. It is determined that a practical and effective strategy can be developed which uses all three methods to establish the existence

of a fire threat without direct exposure to the fire environment. Of all methods discussed, the most reliable single Indicator involves touching the base of the door-knob.

00,067 PB93-153385 Not available NTIS National Inst. of Standards and Technology (BFRL), Galthersburg, MD. Fire Science and Engineering Div. Fire Information Challenges of the 21st Century. Finai rept. N. H. Jason. 1992, 2p. Pub. In Fire Technology 28, n3 p283-284 Aug 92.

Keywords: *Fires, *information retrieval, Meetings, Data bases, Information systems, Fire protection, Combustion, Fire safety, Safety engineering, Buildings, Reprints.

The article summarizes the First International Fire Information Conference and the Conference for Exploration of a National Engineering Information Service.

00,068 PB93-153674 Not available NTIS
National Inst. of Standards and Technology (BFRL),
Gaithersburg, MD. Building Environment Div.
Water Vapor Sorption Measurements of Common **Building Materials.**

Final rept.
R. F. Richards, D. M. Burch, and W. C. Thomas.
1992, 11p.
Weshington

Sponsored by Department of Energy, Washington, DC. Pub. in ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Transactions, v98 pt2 11p 1992.

Keywords: *Construction materials, *Water vapor, *Adsorption, Moisture content, Mass transfer, Steady state, Plywood, Wood products, Humidity, Surface properties, Test methods, Reprints.

Sorption isotherm measurements were carried out for common building materials. The measurements were made by placing small specimens of the materials in pint-size jars above saturated salt-in-water solutions that gave various ambient relative humidities. The jars were kept at constant temperature until the enclosed specimens reached their steady-state equilibrium moisture content. The equilibrium moisture content plotted versus ambient relative humidity at a given temperature gave the sorption Isotherm. Separate sorption isotherms were obtained for specimens initially dry (adsorption isotherm) and for specimens initially saturated (desorption isotherm). The materials included sugar pine, southern pine, extenor-grade plywood, waferboard slding, oriented strand board, particleboard, fiberboard sheathing, sturdy-brace fiberboard, kraft paper, foam-core sheathing, plain gypsum board, and vinyl-covered gypsum board.

00,069 PB**93-153724** PB93-153724 Not available NTIS
National Inst. of Standards and Technology (NEL), Galthersburg, MD. Building Materials Div.
Interim Criteria for Polymer-Modified Bituminous Roofing Membrane Materials: A Summary Report.

Final rept. W. J. Rossiter, and J. F. Seller. 1989, 6p. See also PB89-168025.

Final rept.

Pub. In international Jnl. of Roofing Technology 1, n1 p19-24 1989.

Keywords: *Bituminous materials, *Roofing, "Membranes, "Design criteria, Standards, Polymers, Construction materials, Test methods, Roofs, Blumens, Reprints, "Polymer-modified bituminous roofing membranes.

The paper presents a summary of the NIST study to suggest criteria for polymer-modified bltuminous roofing membrane materials. Criteria were suggested for 15 membrane properties including load-elongation, low-temperature flexibility, tear resistance, hall impact, strain energy, dimensional stability, and heat exposure. in addition, proposals were made for research to develop criteria on properties such as cyclic movement resistance, puncture resistance, seam strength, and weather exposure.

00.070 PB93-166403 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Building Environment Div. Experimental Validation of a Mathematical Model for Predicting Water Vapor Sorption at Interior Bullding Surfaces.

W. C. Thomas, and D. M. Burch. 1990, 10p. See also PB89-150783. Sponsored by Department of

Energy, Washington, DC.
Pub. in ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers) Transactions, v96 pt1 p487-496 1990.

Keywords: *Construction materials, *Moisture content, *Diffusion, *Mathematical models, Buildings, Walls, Finite difference method, Wallboard, Coatings, Water vapor, Ventilation, Reprints.

A mathematical model for predicting moisture sorption rates at building surfaces is presented. The governing heat and moisture transfer equations are solved by an Implicit finite-difference method. The effects of surface coatings are included in the formulation. Laboratory experiments were conducted to verify the model. Disk-shaped specimens of unpainted gypsum board, gypsum board painted with a latex paint system, and unpainted white pine were used. Sorption isotherms and diffusion coefficients for these materials were independently measured. The specimens were Initially conditioned to a uniform moisture content and then moved to an environment with a lower relative humidity. The moisture transfer rates at the surfaces of the specimens were determined as a function of time and compared to predictions by the mathematical model.

00,071 PB93-174902 PC A11/MF A03 National inst. of Standards and Technology (BFRL), Gaithersburg, MD.

CFAST, the Consolidated Model of Fire Growth and Smoke Transport.

Technical note (Final).

R. D. Peacock, G. P. Forney, P. Reneke, R. Portier, and W. W. Jones. Feb 93, 245p, NiST/TN-1299.

Also available from Supt. of Docs. as SN003-003-03194-1. See also PB91-144436, PB93-140788 and PB-297 452.

Keywords: *Smoke, *Fires, *Buildings, Transport properties, Combustion, Combustion products, Mathematical models, Plumes, Pyrolysis, Computer programs, CFAST computer program.

CFAST is a zone model capable of predicting the environment in a multi-compartment structure subjected to a fire. It calculates the time evolving distribution of smoke and fire gases and the temperature throughout a building during a user-specified fire. The report describes the equations which constitute the model, the physical basis for these equations, data which are used by the model, and details of the operation of the computer program implementing the model. A set of comparisons between the model and a range of realscale fire experiments is presented. In general, the

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CFAST model compares favorably with the experiments examined in the paper. Although differences between the model and the experiments were clear, they can be explained by limitations of the model and of the experiments. The paper documents the equations which are used in CFAST and how they are implemented. The means by which one can add new phenomena is detalled, as are the variables and structure of the model.

00.072

PB93-183754 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Galthersburg, MD.

Design of Smoke Control Systems for Areas of Ref-

J.H. Klote. Mar 93, 28p, NISTIR-5132. Sponsored by Public Buildings Service, Washington, DC. Office of Real Property Management and Safety.

Keywords: *Bulldings, *Smoke, *Survival, Air flow, Safety factor, Leakage, Windows, Mathematical models, Pressure gradients, Wind(Meteorology).

There is a rising concern for the safety of persons from fire who cannot travel building emergency exit routes in the same manner or as quickly as expected of able persons. One proposed solution for providing safety for persons with mobility limitations is the concept of areas of refuge (AOR) where they can 'safely wait' until they can be assisted in leaving the building. This paper presents information about the design of smoke control systems to prevent smoke infiltration into an AOR. Pressure differences produced when windows break both with and without wind can be significant, and the design of a smoke control system for an AOR needs to address these pressure differences. The paper identifies that wind data specifically for the design of smoke control systems is needed. The pressure fluctuations due to opening and closing building doors during fire situations can also be significant, and the design of a smoke control system for an AOR needs to address these pressure fluctuations. An example analysis incorporating the pressure effects of broken windows, wind, and open doors illustrates the feasibility of designing smoke control systems for areas of refuge.

00.073

PB93-188845 PC A05/MF A01

National Inst. of Standards and Technology (BFRL). Gaithersburg, MD.

Building and Fire Research Laboratory Publications, 1992.

N. H. Jason. Apr 93, 88p, NISTIR-5172.
See also report for 1991, PB93-116465.

Keywords: *Bulldings, *Research projects, *Fires, *Bibliographies, Combustion, Computerized simulation, Mathematical models, Bullding codes, Construction materials, Fire protection, Fire resistance, Building and Fire Research Laboratory.

Building and Fire Research Laboratory Publications. 1992 contains references to the publications prepared by the members of the Building and Fire Research Laboratory (BFRL) staff, by other National Institute of Standards and Technology (NIST) personnel for BFRL, or by external laboratories under contract or grant from the BFRL during the calendar year 1992. NIST Report series are available for purchase from either the Government Printing Office (GPO) or the National Technical Information Service (NIST).

00.074

PB93-205623 PC A04/MF A01

Kentucky Univ., Lexington. Dept. of Mechanical Englneering.

Study of Fire Induced Flow along the Vertical Corner Wall. Part 2.

Finai rept.

K. Saito. Apr 93, 63p, NIST/GCR-93/628. Grant 60NANB1D1142 Sponsored by National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Keywords: *Fires, *Walls, *Buildings, *Flow measurement, *Infrared thermography, Velocity measurement, Pyrolysis, Temperature measurement, Flame propagation, Test facilities, Fire tests, Infrared filters, *Corner

The paper describes a new experimental technique with wide application which has been proven for corner fires. To measure the flame spread rate of pyrolysis front along vertically oriented flat and comer walls, it may be necessary to measure transient temperature

profiles on the walls. Conventional thermocoupie and visual observation methods, however, have limitations due to complexity of Implementation and the Inherent ambiguity of visual observations due to Interference from flames. To overcome these limitations, automated infrared imaging was applied for simultaneously collecting temperature data in a relatively large wall surface area. Results indicate that the infrared system with a band-pass filter successfully avoids the flame interference allowing measurements of temperature distribution on the fire-heated wall, from which the spread rate in any direction can be deduced. The infrared camera without filters also can be used to measure visible flame position as photographic and video cam-

PB93-206183 PC A03/MF A01 of Standards and Technology, National Inst. Gaithersburg, MD.
Research Plan for Masonry Shear Walls.
S. G. Fattal. Jun 93, 36p, NISTIR-5117. See also PB93-206225 and PB91-167189.

Keywords: *Building codes, *Masonry, *Walls, Design standards, Loads(Forces), Compressive strength, Shear strength, Construction, Earthquake engineering, Seismic design, Research management.

A masonry research plan is presented based on studies of the behavior of masonry shear walls conducted at the National institute of Standards and Technology (NIST). The purpose of the plan is to acquire additional information to allow formulation of a design methodology. It consists of experimental and analytical investigations of masonry shear walls subjected to simulated earthquake loads. The experimental program consists of tests of lightly-reinforced and partiallygrouted specimens representing design and construc-tion practices in regions of low-to-moderate seismicity. The analytical work consists of formulations of equations to evaluate strength and deformation limit states and numerical studies of discrete models.

00,076

PB93-206894 PC A03/MF A01

National Inst. of Standards and Technology, Gaithersburg, MD. Effect of Critical Parameters on the Behavior of

Partially-Grouted Masonry Shear Walls under Lat-

S. G. Fattal. Jun 93, 49p, NISTIR-5116. See also PB92-116342 and PB91-167189.

Keywords: *Masonry, *Walls, *Ultimate strength, Shear stress, Lateral pressure, Earthquake engineering, Loads(Forces), Seismic design, Research management, Shear stress, Building codes, Design standards.

The effect of critical parameters on the lateral-load response characteristics of partially-grouted masonry shear walls is evaluated by conducting a synthesis of available experimental data and by utilizing a predictive equation to estimate ultimate shear strength. The results of the study indicate a need to supplement the existing data base with additional experimental and analytical research to develop an adequate basis for design of masonry shear walls. Recommendations are made on the specific areas of research to accomplish this design objective.

PB94-103694 PC A03/MF A01

National Inst. of Standards and Technology (BFRL),

Galthersburg, MD.
Combined Buoyancy- and Pressure-Driven Flow through a Horizontal Vent: Theoretical Consider-

L. Y. Cooper. Sep 93, 20p, NISTIR-5252.

Keywords: *Buoyancy, *Vents, *Convection, *Fires, Boundary value problems, Ventilation, Mathematical models, Buildings, Fluid flow, Pressure.

Flow through a horizontal vent is considered where the vent-connected spaces near the elevation of the vent are filled with fluids of different density in an unstable configuration, with the density of the top space larger than that of the bottom space. With zero-to-moderate cross-vent pressure difference the instability leads to a bl-directional exchange flow between the two spaces. For relatively large cross-vent pressure dif-ference the flow through the vent is unidirectional, from the high-pressure to the low-pressure space. For arbitrary specified cross-vent pressure difference, boundary value problems for the flow are formulated for

cases where the fluid media in the two spaces are the same perfect gas, with relatively high and low temperature (corresponding to low and high density) in the lower and upper spaces, respectively. Two separate classes of problem are distinguished. In the first, the higher pressure is In the space above the vent. This enhances the downward component of the flow from the top to the bottom space, and diminishes, or reduces to zero, the upward flow. In the second, the higher pressure is in the lower space leading to enhancement of the upward flow, etc. Relationships between the two boundary value problems and their solutions are identified. These are useful for extending an avallable solution for one class of problem to that of the other and for unified understanding and correlation of experimental data for the two flow configurations.

00,078

PB94-112448 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building Environment Div.

MOIST: A PC Program for Predicting Heat and

Moisture Transfer in Building Envelopes. Release 2.0.

Special pub.

D. M. Burch, and W. C. Thomas. Sep 93, 40p, NIST/ SP-853.

Also available from Supt. of Docs. as SN003-003-03236-1. See also PB92-116334, PB92-170760 and PB93-166403. Prepared in cooperation with Virginia Polytechnic Inst. and State Univ., Blacksburg. Dept. of Mechanical Engineering.

Keywords: *Moisture content, *Heat transfer, *Buildings, *Construction materials, Walls, Roofs, Ceillings (Architecture), Computer programs, Convection, User manuals (Computer programs), *Building envelopes, MOIST computer program.

The report is a users manual for a computer program called MOIST. MOIST is a user-friendly personal computer program that predicts the one-dimensional trans-ter of heat and moisture in multi-layer walls, cathedral ceilings, and low-sloped roofs. The algorithms in the program predict moisture transfer in the diffusion through the capillary flow regimes. The program has a provision to account for convective moisture transfer by including embedded cavities which may be coupled to indoor or outdoor air. The user can readily include the water-vapor resistance offered by paint layers, wallpaper, and vapor retarders in simulations. The program generates a plot on the computer screen of the average moisture content of the construction layers versus time as the program executes. The program generates output files which may be imported into plotting programs for preparing reports.

00.079

PB94-113420 PC A03/MF A01

National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.
Impacts: NIST Bullding and Fire Research Laboratory (Technical and Societal). Special pub.

N. J. Raufaste. Aug 93, 43p, NIST/SP-838-4. Also available from Supt. of Docs. as SN003-003-03232-8. See also PB94-110194.

Keywords: *Buildings, *Fires, *Research management, *Testing laboratories, Building codes, Fire safety, Structural engineering, Flammability testing, Stand-ards, Computerized simulation, Construction matenals, Oil spilis, Navy.

The Building and Fire Research Laboratory (BFRL) of the National Institute of Standards and Technology (NIST) Is dedicated to the life cycle quality of constructed facilities. The report describes major effects of BFRL's program on building and fire research. Contents: Structural Reliability; Nondestructive Testing of Concrete; Structural Failure Investigations; Selsmic Design and Construction Standards; Rehabilitation Codes and Standards; Alternative Refrigerants Research; HVAC Simulation Models; Thermal Insulation; Residential Equipment Energy Efficiency; Residential Plumbing Standards; Computer Image Evaluation of Publishing Materials Correction Residential Building Materials; Corrosion-Protection for Reinforcing Steel; Prediction of the Service Lives of Building Materials; Quality of Construction Materials Laboratory Testing; Roofing Standards; Simulating Fires with Computers; Fire Safety Evaluation System; Fire Investigations; Soot Formation and Evaluation Cone Calculation Standards tigations; Soot Formation and Evolution; Cone Calonmeter Development; Smoke Detector Standards; Standard for the Flammability of Children's Sleepwear, Smoldering Insulation Fires; Wood Heating Safety Research; In-Place Testing of Concrete; Communication

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Protocols for Building Automation and Control Systems; Computer Simulation of the Properties of Concrete and Other Porous Materials; Cigarette-Induced Furniture Fires; Carbon Monoxide Formation In Enclo-sure Fires; Halon Alternative Fire Extinguishing Agents; Turbulent Mixing Research; Materials Fire Research; Furniture Flammability Testing; Standard for the Cigarette Ignition Resistance of Mattresses; Support of Navy Firefighter Trainer Program; and Using Fire to Clean Up Oil Spills.

Structural Analyses

Not available NTIS PB93-125664 National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Structures Div. Measurement of Structural Deflections.

R. D. Marshall. 1989, 23p.

Pub. In Proceedings of Structures Congress '89, Structural Design, Analysis and Testing, San Francisco, CA., May 1-5, 1989, p904-913.

Keywords: *Structural analysis, *Sensors, Deflections, Loads(Forces), Buildings, Dynamic re-Structural vibration, Stiffness. sponse. Bridges(Structures), Transducers, Reprints.

A basic parameter to be determined when assessing the performance of structures is the stiffness. This involves the measurement of static and/or dynamic deflections at representative locations on the structure and the measurement or estimation of the associated loads. Techniques and instrumentation in current use for the measurement of structural deflections are examined and special problems encountered with tall structures or structures with long spans are described.

00,081 PB93-161354 PC A06/MF A02 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Strengthening Methodology for Lightly Reinforced Concrete Frames-I.
L. T. Phan, D. R. Todd, and H. S. Lew. Feb 93, 111p, NISTIR-5128.

*Framed ures), *Reinforced structures, Keywords: *Reinforcement(Structures), *Reinforced concrete, *Dynamic structural analysis, Concrete structures, Earthquake engineering, Dynamic response, Mathematical models, Regression analysis, Walls, Mechanical hysteresis, Stiffness, Loads(Forces), Design analysls. Deformation.

An analytical method for evaluating the inelastic dynamic structural response of lightly reinforced concrete (RC) frames strengthened by infilled shear walls was developed. The method consists of the development of hysteresis failure models for existing and strengthened RC frames and the incorporation of the models into computer program IDARC for use in analytical study. The hysteresis models were developed by, first, using the system identification techniques to character-Ize the load-deformation histories of fifty-five RC frame tests in terms of the stiffness degradation parameter alpha, the strength degradation parameter beta, and the pinching parameter gamma. Next, multi-variable regressions were performed to relate alpha, beta, gamma as functions of the specimen's material and geometric properties and reinforcement parameters. The results of the analyses showed that (1) hysteresis models developed using one-story, one-bay frames can be incorporated into IDARC for the analysis of frames with more than one-story height, and (2) reasonable predictions of structural behavior, both in terms of ultimate load capacity and in absorbed energy on the per cycle basis, can be achieved using the hysteresis models. Thus, In the present form, the hysteresis models can be used In parameter study to assist In the design of strengthening of RC frame structures.

00 082 PC A04/MF A01 of Standards and Technology, PB93-206225 National Inst. Gaithersburg, MD.
Strength of Partially-Grouted Masonry Shear Walls under Lateral Loads.
S. G. Fattal. Jun 93, 71p, NISTIR-5147.
See also PB93-206183. Keywords: *Masonry, *Walls, *Shear tests, *Lateral pressure, Earthquake engineering, Bulldings, Mathematical models, Seismic design, Cracking(Fracturing).

A proposed equation for estimating the strength of partially-grouted masonry shear walls falling in the shear mode is used to compare predicted strengths with the test results of 72 specimens obtained from three exper-lmental programs. The results of the comparison show that predictions become less consistent with decreasing specimen strength and amount of reinforcement. Overall, predictions were within 20% of test results for 50% of the specimens. For unreinforced walls and walls in which no flexural reinforcement was used, predicted strength was less than half the measured strength. It is shown that by altering the parametric functions in the predictive equation to represent more closely post-cracking resistance mechanisms in shear walls, the correlation of predictions with experi-mentally-measured ultimate strength can be improved significantly.

00,083 PB93-228666 PB93-228666 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Proceedings: ICSSC Issues Workshop. Development of Selsmic Evaluation and Rehabilitation Standards for Federally Owned and Leased Buildings. Held in Denver, Colorado on September 16-17, 1992.

Oct 92, 47p, NIST/GCR-92/617.

Prepared in cooperation with Interagency Committee on Seismic Safety in Construction. Sponsored by Federal Emergency Management Agency, Washington, DC. Office of Earthquakes and Natural Hazards.

Keywords: *Federal buildings, *Seismic design, *Earthquake engineering, *Meetings, Standards, structions, Retrolitting, Hazards, Denver(Colorado).

The Interagency Committee on Selsmic Safety in Construction (ICSSC) hosted an Issues Workshop in Denver, Colorado on September 16-17, 1992, to develop consensus resolution of issues affecting the drafting of seismic evaluation and rehabilitation standards for Federally owned and leased buildings. The develop-ment of the standards was mandated by Congress in Public Law 101-614. All potentially affected Federal agencies were invited to participate in the workshop. The report presents the proceedings of the workshop.

PC A03/MF A01 PB93-228674 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Guidelines and Procedures for Implementation of

the Executive Order on Selsmic Safety of New Con-

See also report dated Jun 92, PB92-205343. Prepared In cooperation with Interagency Committee on Selsmic Safety in Construction. Sponsored by Federal Emerican gency Management Agency, Washington, DC. Office of Earthquakes and Natural Hazards.

Keywords: *Federal buildings, *Seismic design, Earthquake engineering, Executive orders, Safety engineering, Instructions.

Executive Order 12699, 'Seismic Safety of Federal and Federally Assisted or Regulated New Bullding Construction, was signed by the President to further the goals of Public Law 95-124, the 'Earthquake Hazards Reduction Act of 1977', as amended. These guidelines and procedures for implementing the Order have been prepared and endorsed by consensus of the Interagency Committee on Selsmic Safety in Construction.

00,085 PB94-101813 PC A07/MF A02
National Inst. of Standards and Technology (BFRL),
Gaithersburg, MD. Structures Div. Performance of 1/3-Scale Model Precast Concrete Beam-Column Connections Subjected to Cyclic Inelastic Loads. Report No. 3.
G. S. Cheok, and W. C. Stone. Aug 93, 139p, NISTIR-5246.

See also PB91-222570. Sponsored by Concrete Research Council, Detroit, MI.

Keywords: *Precast concrete, *Construction joints, *Beams(Supports), *Cyclic loads, *Earthquake resistant structures, Concrete structures, Earthquake engineering, Failure, Ductility, Concrete construction, Model tests.

The test results of hybrid post-tensioned precast concrete beam-to-column connections (Phase IV A) are presented. These tests are part of an experimental program on 1/3-scale model precast concrete moment resisting connections being conducted at the National Institute of Standards and Technology. Previous test results are summarized. The objective of the test program is to develop guidelines for an economical cast beam-to-column connection for regions of high seismicity. The basic concept of the study is to use post-tensioning to connect the members and to eliminate the use of column corbels. Monolithic control specimens were designed to model Interior moment resisting connections designed in accordance with the Uniform Building Code (ICBO, 1985 and 1988) criteria for selsmic Zones 2 and 4. The precast specimens were designed to achieve moment and geometry compatibility with the monolithic design. To date, twenty specimens have been tested. Variables in the study include location of the post-tensioning steel, the use of post-tensioning bars versus strands, the use of fully and partially bonded and unbonded strands, and the combination of low strength steel and post-tensioning. Specimens were subjected to reversed cyclic loading according to a prescribed displacement history. Comparisons were made between the behavior of the precast specimens and monolithic specimens. The comparisons were based on connection strength, drift capacity of the connection, and energy dissipation characteristics. acteristics.

00.086 PB94-103686 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Structures Div. Overview of NIST Research on Seismic Performance of Moment Resisting Precast Concrete Beam-Column Joints Containing Post-Tensioning. G. S. Cheok, and W. C. Stone. Aug 93, 40p, NISTIR-5257.

Keywords: *Precast concrete, *Earthquake damage, *Beams(Supports), *Construction joints, *Buildings, Earthquake engineering, Loads(Forces), Damage assessment, Energy dissipation, Boundary conditions, Prestressed concrete, Columns(Supports), Model tests, Cyclic loads, Ductility, Structural members, Structural analysis, Moments, Concrete structures.

The experimental test program being conducted at the National Institute of Standards and Technology on 1/ 3-scale model precast concrete beam-to-column connections is summarized. The objective of the test program is to develop guidelines for an economical precast beam-to-column connection for regions of high seismlcity. The monolithic test specimens were interior moment resisting connections designed using the Uni-form Building Code (ICBO, 1985 and 1988) criteria for selsmic Zones 2 and 4 as guidelines. To date, seventeen specimens have been tested. Variables in the study include locations of the post-tensioning steel, the use of post-tensioning bars versus prestressing strands, fully bonded versus partially bonded strands, and the combination of low strength steel and post-tensioning. Specimens were subjected to reversed cyclic loading according to a prescribed displacement history. Comparisons were made between the behavior of precast specimens and monolithic specimens. The compansons were based on connection strength, connection ductility, and energy dissipation characteris-

BUSINESS & ECONOMICS

General

PB93-179968 PC A14/MF A03 National Inst. of Standards and Technology (TS), Gaithersburg, MD. Office of Standards Services. Proceedings of the Meeting of the Intergovernmental U.S.-Russian Business Development Committee's Standards Working Group (2nd). Held in Galthersburg, Maryland on March 23-24, 1993.

Internal rept. S. I. Warshaw. Apr 93, 303p, NISTIR-5166.

Keywords: *International cooperation, *Standardization, *USSR, *USA, *Meetings, Recommendations, Certification, Standards, Conformity assessment, US NIST, GOSSTANDART.

The 1992 U.S. - Russia Summit in Washington DC marked the beginning of a new commercial relation-ship between the United States and Russia. Additionally, the U.S. Secretary of Commerce and the Russian Minister of Foreign Economic Relations established an 'Intergovernmental U.S. - Russian Business Development Committee' to solve problems, promote trade development activities and serve as the forum to assist In such trade related matters as standardization and conformity assessment matters. The Standards Working Group of the Committee held its first meeting in St. Petersburg, Russia, September 8 - 9, 1992. The recommendations resulting from that first meeting are appended to the report. The second meeting of the Standards Working Group resulted in an exchange of information regarding the standards and conformity assessment practices of each country and an under-standing of new standards related legislative initiatives within Russia. Of particular significance was the sign-ing of a formal Memorandum of Understanding for cooperation on standards, certification, testing, and metrology matters between the United States (NIST) and Russia (GOSSTANDART). It was also the first public announcement of a new United States Department of Commerce initiative to provide financial support to Russians desiring to learn more about U.S. standardization practices within industrial and commercial enterprises.

00.088 PB93-188969 PC A03/MF A01 National Inst. of Standards and Technology (TS), Gaithersburg, MD. Metric Program. Metrication: An Economic Wake-up Call for U.S. Industry. G. P. Carver. Mar 93, 16p, NISTIR-5154. See also PB92-222249.

Keywords: *Metric system, *International system of units, *Standards, Government policies, Economic impact, Benefit cost analysis, Measurement, Industries, USA, *Foreign technology, *Metrication.

As the international standard of measurement, the metric system is one key to success in the global marketplace. International standards have become an important factor in international economic competition. Non-metric products are becoming increasingly unacceptable in world markets that favor metric products. Procurement is the primary federal tool for encouraging and helping U.S. industry to convert voluntarily to the metric system. Besides the perceived unwillingness of the customer, certain regulatory language, and certain legal definitions in some states, there are no major impediments to conversion of the remaining nonmetric industries to metric usage. Instead, there are good reasons for changing, including an opportunity to rethink many industry standards and to take advantage of size standardization. Also, when the remaining in-dustries adopt the metric system, they will come into conformance with federal agencies engaged in similar activities.

Domestic Commerce, Marketing, & **Economics**

00,089 PB93-139129 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Precision Engineering Div. Federal Move to Metric: Public Law, DoC and NIST. D. A. Swyt. Dec 92, 14p, NISTIR-4761.

Keywords: *International system of units, *Metric system, *Law(Jurisprudence), Government policies, Historical aspects, Metrication, Metrology, US DOC, Department of Commerce, US NIST.

Since its initial development, the metric system of measurement has evolved to become the modem

International System of Units (SI) and been formally accepted by all the nations of the world save three and all the industrialized nations save one, the United States. Recently, Congress passed the Metric Usage Act of 1988, requiring all Federal agencies, including the National Institute of Standards and Technology, to plan and implement conversion to use of metric in their business-related activities and assigned responsibility for coordination of Federal agency conversion to the Department of Commerce. This paper reviews briefly the Federal legislative history of metric use in the U.S., metric practice associated with the modernized system, and the policies and plans of the Federal government in its legislatively-mandated conversion to use of that system.

PB93-152080 PC A03/MF A01
National Inst. of Standards and Technology (TS),
Gaithersburg, MD. Standards Code and Information

Questions and Answers on Quality, the ISO 9000 Standard Series, Quality System Registration, and Related Issues.

M. Breitenberg. Jul 92, 25p, NISTIR-4721.

Also available from Supt. of Docs. See also PB92-

*Test facilities, *International trade, Keywords:

*Standards, *Quality assurance, United States, Assessments, Reliability, Requirements, Specifications, *Registration, European community, ISO 9000 Series.

The report provides information on the development, content and application of the ISO 9000 standards to readers who are unfamiliar with these aspects of the standards. It attempts to answer some of the most commonly asked questions on quality; quality systems; the content, application and revision of the ISO 9000 standards; quality system approval/registration; European Community requirements for quality system approval/registration; and sources for additional help.

00,091 PB93-160588 PC A20 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Measurements for Competitiveness in Electronics. First Edition. Apr 93, 473p, NISTIR-4583.

Keywords: *Competition, *Electronics industry, *Measurement, Marketing, Research and development, Integrated circuits, Fiber optics, Microwave equipment, Laser applications, Communication equip-

U.S. industry is experiencing a major shortfall in the measurement capability needed for competitiveness in electronic products. The document identifies the measurement needs that are most critical to U.S. competitiveness, that would have the highest economic impact if met, and that are the most difficult for the broad range of individual companies to address. The measurement needs are reviewed for nine important fields of electronics, including semiconductors, magnetics, superconductors, microwaves, lasers, optical-fiber communications, optical-fiber sensors, video, and electromagnetic compatibility. These fields of electronics underlie more than \$300 billion of electronic and electrical products manufactured in the U.S. each year. The assessment provides the framework for an action plan to correct the shortfall in U.S. measurement capability in electronics and to advance U.S. competitiveness.

00,092 PB93-206886 PC A03/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Molecular Physics Div.
Collection of Successful Interactions between the MTCs and Client Firms. Final rept.

R. D. Suenram. Mar 93, 33p, NIST/SP-848.
Also available from Supt. of Docs. as SN003-003-03206-9.

Keywords: *Manufacturing, *Productivity, *Technology transfer, Competition, United States, Assistance, Case studies, Small businesses, Computer aided design, Computer aided manufacturing, Economic analysis, Automation, Commercialization, *MTC(Manufacturing Technology Centers), NIST(National Institute of Standards and Technology), ISO(International Organization for Standardization).

The Omnibus Trade and Competitiveness Act of 1988 established the Manufacturing Technology Centers (MTC) program as a new initiative at the National Institute of Standards and Technology (NIST). The charge of the program is to contribute toward improved U.S. industrial productivity and competitiveness in the growing international marketplace with a focus on assistance to the small-to-medium sized manufacturing firms in this country. The publication contains a collection of interesting interactions that have transpired between the first five MTCs and a number of their client firms.

International Commerce, Marketing, & **Economics**

00,093 PB**93-140689** PC A04/MF A01 of Standards and Technology, National Inst. Gaithersburg, MD. More Questions and Answers on the ISO 9000 Standard Series and Related Issues.

M. Breitenberg. Feb 93, 54p, NISTIR-5122.
See also PB92-126465 and PB93-152080.

Keywords: *International trade, *Standards, *Test facilities, *Quality assurance, Quality control, Assessments, Reliability, Inspection, Specifications, *ISO 9000 Standard Series, ISO(International Organization for Standards and Technology.

The report, a sequel to NISTIR 4721 (PB92-126465), provides additional information on the ISO 9000 standards and related issues to readers unfamiliar with some of the new developments in the area. It attempts to answer additional questions on ISO 9000 standards related issues which the National Institute of Standards and Technology (NIST) has received since the publica-tion of NISTIR 4721. It also identifies sources for further help in this area.

00 094 PB93-170900 PC A03/MF A01 of Standards and Technology, National Inst. Gaithersburg, MD. Program for Conformity Assessment System Eval-

uation: Analysis of Comments on the NIST Pro-

posal. J. L. Donaldson, and P. W. Cooke. Mar 93, 45p, NISTIR-5138.

Keywords: *Program evaluation, Certification, Accreditation, Regulations, Global, Testing, International trade, Guidelines, Recognition, Tables(Data), trade, Guidelines, Recognition, Tables(Data), *National Institute of Standards and Technology, *CASF(Conformity Assessment System Evaluation).

The National Institute of Standards and Technology (NIST) proposed the establishment of a voluntary Conformity Assessment System Evaluation (CASE) program in a Federal Register Notice in March 1992.

CASE would enable the Department of Commerce, acting through NIST, to provide assurances to foreign entities that designated U.S. conformity assessment activities satisfy international guidelines. Public comments on the proposal were requested and 173 responses were received. Review and analysis of these comments indirectors a desire for NIST to provide recomments. comments indicates a desire for NIST to provide recognition of privately operated accreditation programs, although considerable support can also be seen for NIST to provide both accreditation and recognition.

CHEMISTRY

General

00 095 PB93-191427 PC A02/MF A01 Environmental Protection Agency, Research Triangle Park, NC. Atmospheric Research and Exposure Assessment Lab.

General

Two New Gas Standards Programs at the National Institute of Standards and Technology.

W. J. Mitchell, and W. E. May. Apr 93, 8p, EPA/600/

A-93/107.
See also PB82-162876. Presented at the Environmental Protection Agency/Air and Waste Management Association, 1993 Symposium on 'Measurement of Toxic and Related Air Pollutants', Durham, NC., May 3-7, 1993. Sponsored by National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Organic Analytical Research Div.

Keywords: *Standards, *Gases, *Air pollution monitors, Calibrating, Performance evaluation, US EPA, Regulations, Concentration(Composition), Agreements, Comparison, *NIST Traceable Reference Materials, *Research Gas Mixture, Certified Reference Materials Program, Standard reference materials.

The EPA/NIST certified reference materials (CRM) program is being terminated and replaced with two new ones: the NIST Traceable Reference Materials (NTRM) and the Research Gas Mixture (RGM) programs. These new programs are being implemented to provide NIST traceability to a wider number of gas mixtures. The NTRM program will differ from the CRM program in two significant ways: Candidate gas mix-tures will not have to be identical to a NIST Standard Reference Material (SRM), and the producer of the NTRM rather than EPA will pay NIST to check the concentration of the gas mixture. In the RGM program, NIST will enter into agreements with either governmental, commercial or private organizations to produce gas mixtures for which there are no SRMs or which lie outside the concentration range of existing SRMs. The details of these programs are presented in the paper.

Analytical Chemistry

00,096 PB93-100063 PC\$75.00/MF A02

Teknekron Sensor Development Corp., Menlo Park,

Opportunities for innovation: Chemical and Biological Sensors.

M. Madou, and J. P. Joseph. Oct 91, 147p, NIST/ GCR-91/593-1.

Grant 60NANB9D0980

Supersedes PB92-127315. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD.

Keywords: *Technology innovation, *Sensors, *Bioinstrumentation, *Chemical compounds, Technology transfer, Industry, Manufacturing, Design criteria, Performance evaluation, Monitors, Chemical analysis, Solid state devices, Measuring instruments, Marketing, Biological materials, Acoustic measuring instruments, Electrochemistry, Gas detectors, National Institute of Standards and Technology.

The series of NIST monographs cailed 'Opportunities for Innovation' has been conceived with the small, technology based company in mind. Each monograph provides the technical staff of a small firm with a multicompany report on the best opportunities for new business endeavors in a technology driven market. The present volume in this senes, 'Chemical and Biological Sensors', continues in the same vein. The field is full of fledgling, mostly privately held companies looking for markets in the chemical and processing industries, in the automotive and power generating industries, and in the health care industry. At the same time, users of industrial sensors have expressed disappointment in the lack of interest shown by sensor manufacturers in their specific needs. There is a need for more well-planned contacts between sensor manufacturers and those who use them. The Opportunities for Innovation program is designed to assist in the process.

00.097

PB93-125623 Not available NTiS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Gas and Particulate Science Div. Preparation and Preliminary Analysis of K-411 Glass Microspheres.

R. B. Marinenko, J. A. Small, D. H. Blackburn, D. R. Retorlck, and N. J. Shire. 1989, 3p. Pub. in Microbeam Analysis 24, p254-256 1989.

Keywords: *Microspheres, *Electron microprobe analy-*Microanalysis, Particulates, Reprints, Glass standards, Standard reference materials.

The preliminary electron microprobe analysis of a batch of glass microspheres is described. The mounted, polished, cross sections of the spheres were compared to the bulk glass, k-411, with two different instruments using energy dispersive spectrometry. Normalized results of these analysis showed that the two instruments provided consistent results which closely agrees with the bulk material within a +10 percent error. The microspheres are being evaluated for eventual Standard Reference Materials (SRM) certification.

00.098

PB93-125854 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div.

New Method for Phase Identification for Electron Diffractionists.

Final rept. A. D. Migheli, and V. L. Himes. 1990, 5p. Pub. in Jnl. of Electron Microscopy Technique 16, n2 p155-159 1990.

Keywords: *Electron mlcroscopy, Chemical analysis, Chemical composition, Crystal lattices, Electron diffraction, Reprints, Phase Identification.

An accurate analytical procedure for phase identification for electron diffractionists has been developed. The method opens new frontiers in the identification of solid-state materials as crystalline samples in the size range 10 micrometers to 10 A can be accurately characterized. Research with NIST CRYSTAL DATA (a large database with chemical, physical and crystallographic data on solid-state materials) has proved that a material can be uniquely characterized on the basis of its lattice and chemical composition. To characterize a material, it is sufficient to determine any primitive cell of the lattice and the element types present. Using a modern analytical electron microscope (AEM), the experimentalist can collect the required data on an unknown sample. The lattice information is obtained by rotation of the sample to obtain two planes of data. From these planes, a unit cell defining the lattice can be deduced. The chemical data is determined by energy dispersive spectroscopy (EDS). Once the experimental data are measured, the un-known is identified against the database of knowns using lattice/element-type matching techniques. The basic strategy consists of three steps. Experience has proved that the procedure is highly selective and reli-

00.099

PB93-151660 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div. Surface-Enhanced Raman Study Benzylpenicillin. Final rept. V. Reipa, and J. J. Horvath. 1992, 5p.

Pub. In Applied Spectroscopy 46, n6 p1009-1013 Jun

Keywords: *Raman spectra, *Penicillins, *Molecular structure, Reprints, Silver electrodes, Benzylpenicillin.

The surface-enhanced Raman spectra (SERS) of benzylpenicillin on electrochemically roughened Ag electrodes were investigated. Spectral assignments were carried out. Comparison with powder Raman spectra demonstrated that the benzene ring is In a vertical position relative to the surface. The molecule is bonded to the silver surface through the carboxylate group and the tertiary nitrogen of the beta-lactam ring, resulting in formation of a bidentate surface complex. Evidence of partial benzylpenicillin hydrolysis into 6-aminopenicillanic acid and phenylacetic acid on the surface of the electrode is presented. No indication of electrochemical reactions was observed in the poten-tial range from -1.2 to +0.3 V.

00.100

PB93-151686 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Gas and Particulate Science Div. MultI-Point Calibration of a Gas Chromatograph Using Cryogenic Preconcentration of a Single Gas Standard Containing Volatile Organic Compounds. Final rept.

G. C. Rhoderick, and W. R. Miller. 1990, 6p. Pub. in Analytical Chemistry 62, n8 p810-815 1990. Keywords: *Gas chromatography, *Volatile organic compounds, *Concentrating, *Cryogenics, Calibrating, Standards, Concentrators, Trapping, Reprints, Cryogenic preconcentration.

Methodology is described for the use of a cryogenic preconcentration technique to increase the sample amount of trace volatile toxic organic compounds in a gas matrix for analysis by a gas chromatograph (GC). A GC equipped with a flame-ionization detector (FID) was set up for the analysis of such gas mixtures in a nitrogen balance gas. A system was assembled to preconcentrate cryogenically the gas sample and then inject it onto the chromatographic column. The system was evaluated for analytical precision and to determine If it could be used to construct a calibration curve for the instrument using a single calibration gas standard. An experiment was also performed to determine the trapping efficiency of the organic compounds using the system as constructed. The operating procedure evaluated for cryogenically preconcentrating the sample involved the trapping of the sample for different time intervals at a set sample flow rate. The analytical data from this procedure was plotted for each compound in the gas standard using linear forced zero regression. Results indicate that the method is very linear over the range of operating conditions studied. This determination of linearity now allows the use of one calibration gas standard to develop a calibration range for an In-

00.101 PB93-151967 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Organic Analytical Research Div.
Specimen Banking at the National Institute of Standards and Technology. Final rept.

R. Zeisler, B. J. Koster, and S. A. Wise. 1992, 13p. See also PB89-175855.

Pub. in Analytical Approaches as Related to Specimen Banking, Chapter 3, p37-49 1992.

Keywords: *Sample preparation, *Environmental monitoring, *Analytical techniques, *Chemical analysis, Storage, Long term effects, Feasibility studies, Bioassay, Marine environments, Humans, Trends, Pollutants, Blood analysis, Reprints, *National Institute of Standards and Technology, *Specimen banking.

More than twelve years of practical experience in specimen banking at the National Institute of Standards and Technology (NIST), within the National Biomonitoring Specimen Bank (NBSB), have demonstrated that the concept of long-term storage of environmental specimens is feasible. The activities at NIST include specimen banking of: human liver samples, samples from the manne environment (sediments, oysters, mussels, fish tissue and marine mammal tissues), human serum, and total human diet samples. These research projects are associated with several different U.S. government environmental programs. The NBSB is provid-ing a wide range of know-how in the collection, processing, long-term storage, and analysis of the different samples types. Even though the types of specimens and the number of samples collected are limited, the NBSB can serve as a valuable resource for the assessment of long-term trends of pollutants and for future retrospective studies. Specimens can be made available to the scientific community and national or international organizations.

PB93-153781 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Electron and Optical Physics Div.
Resonance Ionization Spectroscopy/Resonance
Ionization Mass Spectrometry Data Service. I-Data
Sheets for As, B, Cd, C, Ge, Au, Fe, Pb, Si, and Zn.

E. B. Saloman. 1990, 47p. See also PB91-162297 and PB91-203968. Pub. in Spectrochimica Acta 45B, n1/2 p37-83 1990.

Keywords: *Resonance ionization mass spectroscopy, *Chemical analysis, Analytical chemistry, Ionization cross sections, Photoionization, Arsenic, Boron, Cadmium, Carbon, Germanium, Gold, Iron, Lead(Metal), Silicon, Zinc, Reprints, *Resonance ionization spectroscopy, Data service.

A data service is being established at the National Institute of Standards and Technology to provide the necessary information to apply the techniques of resonance ionization spectroscopy (RIS) and resonance ionization mass spectrometry (RIMS) to routine use in

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analytical chemistry. This service will collect and cal-culate the relevant atomic data, choose appropriate resonance ionization schemes, and Indicate pertinent operating details of successful RIMS studies. The first group of data sheets is Included, covering the elements As, B, Cd, C, Ge, Au, Fe, Pb, SI and Zn. Others will be published penodically. Reprints of RIS/RIMS work are solicited so that those efforts may be included in future data sheets.

00,103

PB93-153799 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Organic Analytical Research Div. Subambient Temperature Modification of Selectivity in Reversed-Phase Liquid Chromatography. Final rept.

L. C. Sander, and S. A. Wise. 1989, 6p. Pub. In Analytical Chemistry 61, n15 p1749-1754

Keywords: *Llquld column chromatography, *Extraction columns, *Aromatic polycyclic hydrocarbons, *Temperature effects, *Selectivity, Surface properties, Thermodynamics, Adsorption, Reprints, Retention theory.

The effect of column temperature on selectivity was studied for the separation of polycyclic aromatic hydrocarbon (PAH) mixtures. Two commercial columns prepared using monomeric and polymeric surface modification chemistry were employed. Selectivity was evaluated through the use of a three component PAH mixture previously developed for phase type evaluation. Column selectivity was found to vary continuously with temperature, regardless of the type of phase used. The shape recognition ability of each phase, i.e., the ability of the phase to separate closely related isomers, was observed to be highest at subambient temperatures. A model for the temperature induced selectivity changes is proposed based on the morphology of the bonded phase.

PB93-166494 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Inorganic Analytical Research Div. Laser-Enhanced ionization Spectrometry Following Matrix Modification by Automated Chelation Chromatography for the Analysis of Biological and Environmental Reference Materials.

Final rept. G. C. Turk, and H. M. Kingston. 1990, 7p.

Pub. in Jnl. of Analytical Atomic Spectrometry 5, n7 p595-601 1990.

Keywords: *Laser spectroscopy, *Chemical analysis, Trace elements, Chromatographic analysis, Chelation, Environmental materials, Bioassay, Reprints, *Laser enhanced ionization, Standard reference materials.

Trace metal analysis of biological and environmental materials by laser-enhanced ionization (LEI) spectroscopy is hampered by measurement interferences caused by the high levels of alkali and alkaline earth elements in such samples. The characteristics of these interferences are described, and the use of automated interferences are described, and the use of automated chelation chromatography to remove the interfering elements from samples prior to analysis is demonstrated. This procedure was applied to the LEI analysis of six Standard Reference Materials (SRMs), including: trace metals in water (SRM 1643b), buffalo river sediment (SRM 2704), bovine serum (SRM 1598), total diet (proposed SRM 1548), apple leaves (proposed SRM 1515), and peach leaves (proposed SRM 1547). The improved measurement performance of LEI following automated chelation chromatography is described. is described.

00,105 PB93-166502 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Inorganic Analytical Research Div. Topics in Laser Spectroscopy - Simultaneous Detection of Laser-Enhanced ionization and Laser-Induced Fluorescence In Flames - Noise Correlation Studies. Final rept.

G. C. Turk, and J. C. Travis. 1990, 11p.
Pub. in Spectrochimica Acta 45, n4-5 p409-419 1990.

Keywords: *Laser induced fluorescence, *Laser spectroscopy, *Flame spectroscopy, Pulsed lasers, Excited states, Sodium, Noise, Correlation, Reprints, *Laser enhanced lonization.

Simultaneous measurements of pulsed Laser-Enhanced Ionization (LEI) and Laser-Induced Fluorescence (LIF) of sodium in a flame were performed. Excitation line profiles were found to be identical and a strong correlation between the noise of the two signals was found. The possibility of correcting for spectrally broadband background signals encountered in LEI spectroscopy by monitoring the LIF signal from the interfering element is demonstrated. The correlation between the noise of the two measurements results in some reduction of noise when the background correction is applied.

PB93-166908 (Order as PB93-166817, PC A08) National Inst. of Standards and Technology, Gaithersburg, MD.

Prompt-Gamma Activation Analysis.

R. M. Lindstrom. 1993, 7p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p127-133 Jan/ Feb 93.

Keywords: *Activation analysis, Neutron capture gamma rays, Prompt gamma radiation, Nondestructive analysis, Chemical analysis, Cold neutrons, Gamma detection, Fullerenes, Hydrogen, Uses, CNRF facility.

A permanent, full-time instrument for prompt-gamma activation analysis is nearing completion as part of the Cold Neutron Research Facility (CNRF). The design of the analytical system has been optimized for high gamma detection efficiency and low background, particularly for hydrogen. Because of the purity of the neutron beam, shielding requirements are modest and the scatter-capture background is low. As a result of a compact sample-detector geometry, the sensitivity (counting rate per gram of analyte) is a factor of four better than the existing Maryland-NIST thermal-neutron instrument at the reactor. Hydrogen backgrounds for a few micrograms have already been achieved of a few micrograms have already been achieved. which promises to be of value in numerous applications where quantitative nondestructive analysis of small quantities of hydrogen in materials is necessary.

00.107

PB93-183796 PC A06/MF A02

National Inst. of Standards and Technology (TS), Gaithersburg, MD. Standard Reference Materials Pro-

gram. Standard Reference Materials: Handbook for SRM Users.

Special pub.

J. K. Taylor, and N. M. Trahey. Feb 93, 122p, NIST-SP-260-100-ED-1993.
Supersedes PB86-110897. Also available from Supt. of Docs. as SN003-003-03205-1.

Keywords: *Handbooks, Chemical analysis, Quality assurance. Measurement, Calibration, Uncertainty, Precision, Accuracy, Control charts, Metrology, Uses, *Standard reference materials, Statistical control.

The handbook was prepared to provide guidance for the use of Standard Reference Materials (SRMs) to provide an accuracy base for chemical measurements. The general concepts of precision and accuracy, and their realization by quality assurance of the measurement process, are discussed. General characteristics of SRMs are described and guidance given on their of SRMs are described and guidance given on their selection for specific applications. Ways to effectively use SRMs are recommended, including the utilization of control charts to evaluate and monitor measurement accuracy. Appendices provide statistical guldance on the evaluation of measurement uncertainty.

00,108 PB94-113081 PC A03/MF A01

Environmental Protection Agency, Research Triangle Park, NC. Atmospheric Research and Exposure As-

sessment Lab.
Large Scale Evaluation of a Pattern Recognition/
Expert System for Mass Spectral Molecular Weight Estimation.

Journal article (Final).

D. R. Scott, A. Levitsky, and S. E. Stein. 1993, 13p, EPA/600/J-93/465.
Pub. in Analytica Chimica Acta, v278 p137-147 1993.
Prepared in cooperation with National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Chemical Kinetics and Thermodynamics Div.

Keywords: *Mass spectroscopy, *Pattern recognition, *Organic compounds, *Expert systems, *Molecular weight, Spectrum analysis, Statistical analysis, Volatile organic compounds, Reprints.

A fast, personal-computer based method of estimating molecular weights of organic compounds from low resolution mass spectra has been thoroughly evaluated. The method is based on a rule-based pattem recognition/expert system approach which uses empirical linear corrections which are iteratively applied to two mass spectral features to yield estimates. This tech-nique has been extensively evaluated with 400 spectra of volatile and nonvolatile compounds of environmental and pharmaceutical interest and with 31378 high qual-lty NIST reference spectra of compounds of molecular weight 30-500. For both sets of evaluation spectra the median and average absolute deviations were 1.5-2.0 and 13-17 daltons, respectively. Median errors for spectra with the molecular lon present were ca. twenty times lower than those without the molecular lon. The present system can rapidly produce molecular weight estimates of a wide variety of compounds with median absolute errors of 2 (average 15) daltons. Results with the 106 toxic and related training compounds show a median and average absolute deviation of 0 and 0.6

PB94-113578

PB94-113578 PC A02/MF A01 National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Surface and Microanalysis Science

Airborne Asbestos Method: Standard Test Method for Verified Analysis of Asbestos by Transmission Electron Microscopy. Version 1.0.
S. Turner, and E. B. Steel. Sep 93, 10p, NISTIR-5276.

Sponsored by Environmental Protection Agency, Washington, DC.

Keywords: *Asbestos, *Chemical *Transmission electron microscopy, Performance eval-uation, Companson, Air pollution detection, Water pol-lution detection, Procedures, Quality assurance, Quality control, Standards, *Venfied analysis.

The analysis of asbestos by transmission electron microscopy is important for determination of the cleanliness of air or water and for research purposes. Verified analysis provides a method for determining the quality of the analyses. Venified analysis is a procedure in which a grid opening is independently analyzed for asbestos by two or more transmission electron microscope (TEM) operators and in which a comparison and evaluation of the correctness of the analyses are made by a verifying analyst. Detailed Information -- including absolute or relative location, a sketch, orientation, size (length, width), morphology, analytical information and structure identification -- is recorded for each observed asbestos structure. Comparisons of the analyses are made on a structure-by-structure basls and the per-centage of true positives, false positives and false neg-atives are determined for each TEM operator. Venfied analyses can be used as part of a quality assurance program for asbestos analyses and as a training procedure. The report describes a method for conducting a venfied analysis. The method is reported in ASTM for-

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00,110 AD-A266 615/4 PC A03/MF A01 National Inst. of Standards and Technology, Boulder,

Transient Hydrogen Heat Transfer.

Final rept. Apr 86-Apr 89. B. Louie, and W. G. Steward. 1 Aug 90, 42p, WRDC-TR-90-2070.

Keywords: *Heat transfer, *Liquid hydrogen, *Nucleate boiling, Carbon, Coefficients, Film boiling, Thin films, Platinum, Foils(Materials), Power levels, Resistance, Temperature coefficients.

The Chemical Engineering Science Division (Boulder CO) of the National Institute of Standards and Technology has Investigated transient heat transfer to liquid hydrogen. Thin carbon films and Pt folls submerged in liquid hydrogen received stepped Inputs of power of 1 to 42 W/sq cm, and the onset of nucleate or film boiling was obtained for each power level. The critical heat flux was found to be approximately 8 W/sq cm, with the transition to film boiling occurring in times less than

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10(exp-3). Premature film boiling can be related to the positive temperature coefficient of resistance and the narrowness of the heaters. Thermometric devices and power generation equipment selection are discussed... Liquid hydrogen heat transfer, Nucleate boiling onset.

00.111

PB93-153658 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Boulder, CO. Chemical Engineering Div.
Measurement of the Performance of a Spiral
Wound Polyimide Regenerator in a Pulse Tube Refrigerator.

Final rept.

W. Rawlins, K. D. Timmerhaus, R. Radebaugh, and

D. E. Daney. 1992, 7p.
Sponsored by National Aeronautics and Space Administration, Moffett Field, CA. Ames Research Center. Pub. in Advances in Cryogenic Engineering, v37 p947-

Keywords: *Polyimide resins, *Regeneration(Engineering), *Cooling systems, *Cryogenics, Numerical analysis, Performance evaluation, Reprints, *Pulse tube refrigerators.

A regenerator for use in a pulse tube refrigerator has been constructed from a polyimide (polypyromellitimide or PPMI) whose small ratio of thermal conductivity to heat capacity make it a good candidate for a regenerator material in cryocoolers. The regenerator was fabricated using 25 micrometer thick photoresist strips bonded to a 50 micrometer thick sheet of PPMI. This composite sheet was wound in jelly-roll fashion around a mandrel and inserted into the jelly-roll fashion around a mandrel and inserted into the regenerator housing. The photoresist strips, formed using a photolithographic technique, provided a 25 micrometer spacing for the axial flow of gas between each layer of PPMI. Ineffectiveness results are presented for this material under actual operating conditions in a pulse tube refrigerator and compared with a numerical model. The numerical model indicated that a polytimide responsitor would perform much better. a polyimide regenerator would perform much better than one constructed of stainless steel screen, but the experimental results showed the opposite behavior. Measured values for the ineffectiveness were 0.003 for the stainless steel screen and 0.017 for the polyimide.

Final rept.

PB93-166056 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Process Metrology Div Model Studies of SnO2-Based Gas Sensors: Va-cancy Defects and Pd Additive Effects.

S. Semancik, and T. B. Fryberger. 1990, 6p. See also PB91-203075.

Pub. in Sensors and Actuators B1, n1-6 p97-102 1990.

Keywords: *Gases, *Sensor characteristics, *Tin oxides, *Oxide coatings, Crystal defects, Palladium, Oxygen, Hydrogen, Detectors, Additives, Anodic coatings, Reprints, Surface analysis.

Surface analytical techniques including X-ray and UV photoemission spectroscopies (XPS, UPS), ion scattering spectroscopy (ISS) and in situ four-point conductance measurements have been used to carry out model studies of tin oxide (SnO2) based gas-sensing processes. Specific results presented here involve the interfacial properties of pure and Pd-dosed SnO2(110) crystals, both in vacuum and following adsorption of oxygen and hydrogen. Emphasis has been placed on experiments that isolate particular mechanistic effects and attempt to evaluate their relative Importance in producing a sensing response.

PB93-166346 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Chemical Process Metrology Div.
Mechanistic and Response Studies of Iridium Oxide pH Sensors.

Final rept. M. J. Tarlov, S. Semancik, and K. G. Kreider. 1990,

Pub. in Sensors and Actuators B 1, n1-6 p293-297

Keywords: *pH, *Sensor characteristics, *Indium oxides, *Oxide coatings, Anodic coatings, Detectors, Sputtering, Sensitivity, Reprints, Surface analysis.

Results are presented on the pH-potential response of d.c. magnetron reactively sputtered indium oxide films.

Freshly deposited films exhibit a nearly Nemstlan response to pH and little hysteresis. The redox sensitivity of films prepared by sputtering in water-saturated oxygen and annealed in an oxygen atmosphere has been examined. In addition, methods are described for preparing model indium oxide sensor surfaces for ultrahigh vacuum surface analytical studies. Stolchlometric IrO2-like surfaces are shown to be relatively inert to gas phase water. Hydroxylation of IrO2-like surfaces can be induced by if water plasma treatment.

Photochemistry and Radiation Chemistry

00,114 PB93-149128 PB93-149128 Not available NTIS
Logicon R and D Associates, Los Angeles, CA.
Franck-Condon Factors, r-Centroids, Electronic Transition Moments, and Einstein Coefficients for Many Nitrogen and Oxygen Band Systems. F. R. Gilmore, R. R. Laher, and P. J. Espy. c1992,

103p.
Prepared in cooperation with Defense Group, Inc., Santa Monica, CA., and Utah State Univ., Logan. Center for Space Engineering.
Included in Jnl. of Physical and Chemical Reference Data, v21 n5 p1005-1107 Sep/Oct 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Nitrogen, *Oxygen ions, *Fluorescence, *Spectral bans, *Photochemical reactions, *Oxygen, Auroras, Franck-Condon principle, Energy-level transitions, Centrolds, Electron transitions, Einstein equations, Nuclear explosions, Electron guns, Potential energy, Atmospheric, chemistry, Bydberg, Klein Beas ergy, Atmospheric chemistry, Rydberg Klein Reas method.

Air fluorescence models require accurate Franck-Condon factors and Einstein coefficients for analyzing the intensities of N2, N2(+), and O2(+) emissions produced by electron bombardment of air, such as in the aurora, high-altitude nuclear explosions, and rocket-bome electron gun experiments. In the previous report, improved vibrational and rotational constants based on the latest available spectroscopic measurements for several excited and ionic states important in air fluorescence modeling were derived. These constants have been used in the present work to calculate band ongins, Franck-Condon factors, and r-centroids for many band systems of nitrogen and oxygen. In the report, tables of band origin wave-lengths and wavenumbers, Franck-Condon factors, r-centroids, electronic transition moments, and Einstein coefficients are presented for 17 N2, N2(+), and O2(+) band systems.

PB93-150829 Not available NTIS
National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div.

Observation of Photon Correlations in Scattering from a Silver Electrode.

Final rept. A. K. Gaigalas, and V. Reipa. 1992, 12p. Pub. In Jnl. of Electroanaly. Chem. 328, p99-110 1992.

Keywords: *Silver, *Electrodes, *Light scattering, Surface properties, Surface roughness, Photons, Re-

Dynamic light scattering experiments were carried out on silver electrodes in aqueous solution. Two distinct time-scales were observed in the photon autocorrelation function: 1 ms and 100 ms. The 1 ms decay in the correlation was predominant during voltage cycling, while the slow decay is present at all times in varying strength. A possible source of the fast cor-relation is the generation of dynamic polarizability inhomogeneities on the silver surface, while the slow correlation is associated with microscopic surface height modulation during electrocrystallization.

Physical & Theoretical Chemistry

00.116

AD-A263 817/9 Not available NTIS National Inst. of Standards and Technology, Gaithersburg, MD.

Vibrational Spectra of Molecular Ions Isolated in Solld Neon. X. H2O(+), HDO(+), and D2O(+).
D. Fomey, M. E. Jacox, and W. E. Thompson. 1993, 10p, ARO-30094.2-CH.

Pub. in J. Chemical Physics, v98, n2, p841-849 Jan

Keywords: *Molecular lons, *Molecular properties, *Vibrational spectra, *Water, Neon, Infrared spectroscopy, Near infrared radiation, Isotopes, Isotopes, Photoionization, Reprints.

When a Ne:H2O>200 sample is codeposited at approximately 5 K with a beam of neon atoms that have been excited in a microwave discharge, new infrared absorptions appear close to the gas-phase band centers of the three vibrational fundamentals of H2O(+). Detailed isotopic substitution studies confirm this assignment and provide assignments for all of the vibrational fundamentals of HDO(+) and D2O(+). When ions are present in the neon matrix, rotation of a significant fraction of the water molecules In inhibited. Electrons produced by the photodetachment of anions, which must be present to maintain overall charge neutrality of the deposit, accelerate nuclear spin equilibrium of water in the matrix. As the concentration of H2O(+) Is decreased by capture of the photodetached electrons, the absorptions assigned to nonrotating water are also reduced in intensity. The nature of the other ionic species which may be present in the sample is considered.

AD-A263 966/4 Not available NTIS National Inst. of Standards and Technology, Gaithersburg, MD. Mid- and Near-infrared Spectra of Water and Water

Dimer Isolated in Solid Neon.
D. Fomey, M. E. Jacox, and W. E. Thompson.
c1993, 16p, ARO-30094.1-CH.
Contract MIPR-12493

Availability: Pub. in Jnl. of Molecular Spectroscopy, v157 p479-493 1993. Available only to DTIC users. No copies furnished by NTIS.

Keywords: *Nuclear spins, *Water, *Infrared spectra, Deutenium, Excitation, Molecules, Oxygen, Rare gases, Ratios, Rotation, Spectra, Reprints, Hydrogen, Solid neon.

Spectra have been obtained between 700 and 8000 /cm for H2 (16)O, and between 700 and 5000 /cm for deutenum and/or oxygen-18-enriched water, trapped in solid neon at approximately 5 K. Samples with Ne:water mole ratios between 400 and 6400 were studied. As in the heavier rare-gas solids, isolated water molecules can undergo relatively free rotation in solid neon, and nuclear spin equilibration is slow. The observed spectra can be explained by postulating exciration from the two lowest rotational levels of the water molecule. Absorptions of nonrotating water are also present in the spectrum. The matrix shifts for water isolated in a neon matrix are much smaller than those reported for water in matrices of the heavier rare gases. Absorptions contributed by the H- or D-donor moiety of (H2O)2, (HDO)2, and (D2O)2 have also been identified and assigned.

DE93019442 PC A03/MF A01
National inst. of Standards and Technology (NEL),
Gaithersburg, MD. Thermophysics Div.
Development of Measurement Capabilities for the
Thermophysical Properties of Energy-Related
Fiulds. Annual Report, December 1, 1992–November 30, 1993.

Progress rept.
R. F. Kayser. 13 Aug 93, 23p, DOE/ER/13823-T1.
Contract Al05-88ER13823

Sponsored by Department of Energy, Washington, DC.

Keywords: *Fluids, Physical Properties, Calorimeters, Densimeters, Dielectric Properties, Dilution, Equilibrium, Lubricants, Measuring Instruments, Mixtures, Phase Studies, Progress Report, Refrigerants, Solutions, Thermal Conductivity, Viscosimeters, EDB/ 360606, Thermophysical properties.

The measurement capabilities to be developed include new apparatus for transport properties, thermo-dynamic properties, phase equilibria, and dielectric properties. Specific capabilities are: Thermal conductivity apparatus, vibrating wire viscometer, dual-sinker densimeter, high-temperature vibrating tube densimeter, dynamic phase equilibria apparatus, ap-

paratus for dilute solutions, total-enthalpy flow calo-nmeter. Benchmark measurements were made (no data given) on pure and mixed alternative refrigerants and their mixtures with lubricants, and other fluids.

PB93-124824 Not available NTIS National Inst. of Standards and Technology (PL), Boulder, CO. Quantum Physics Div.

Lowest Energy Singlet State of Tetrathlophene, an Oligomer of Polythiophene. Final rept.

D. Birnbaum, D. Fichou, and B. E. Kohler. 1992, 5p. Pub. in Jnl. of Chemical Physics 96, n1 p165-169, 1

Keywords: Temperature range 0000-0013 K, Solid solutions, Mixed crystals, Vibrational spectra, Fluorescence, Excitation, Reprints, *Tetrathiophene, Tetradecane.

Fluorescence and fluorescence excitation spectra have been measured for solid solutions of tetrathiophene in tetradecane at 12 and 4.2 K. At 4.2 K, the spectra exhibit full vibrational resolution (inhomogeneous origin (full width at half-maximum) approximately 5/cm). Narrow band excitation and detection establish that there are four independent, but nearly identical excitation/emission pairs with dipole allowed origins at 22 248, 22 241, 22 214, and 22 187/cm. The data are consistent with the idea that these multiple spectra come from a single tetrathiophene conformer which can occupy four different sites in the tetradecane lattice. The vibrational frequencies of the modes in the ground (excited) state that couple strongly to the electronic excitation are given.

00,120 PB93-124840 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div.
Predictive Thermodynamic Model for Complex
High Teath Final rept.

D. W. Bonnell, and J. W. Hastie. 1990, 22p. Pub. In High Temperature Science, v26 p313-334

Keywords: *Mathematical models, *Thermodynamic properties, *Silicates, *Fused salts, *Phase transformations, High temperature, Alkali glass, Phase diagrams, Borosilicate glass, Vapor pressure, Mass spectroscopy, Reprints.

A computer-based model has been developed that predicts phase compositions of simple and complex multicomponent, nonideal, high temperature solutions. Component activities in liquid and solid solutions, and gas phase partial pressures can also be determined from the model. The applicability of the model has been demonstrated for representative test cases with solutions of compounds containing up to eight elements. Examples considered here include various silicate and all minimal librates and silicates. cate, aluminate, aluminosilicate, and lime aluminosilicates, in addition to soda lime and borosilicate glasses, calcined dolomite and illite minerals, and an alkali-rich coal slag. The model results are compared with mass spectrometrically determined vapor species identities and partial pressures and/or activities.

Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div.
Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2.

D. W. Bonnell, P. K. Schenck, J. W. Hastie, and M.

Joseph. 1989, 10p.
Sponsored by Air Force Office of Scientific Research, Bolling AFB, DC.
Pub. in Proceedings of Symposium on High Tempera-

ture Materials Chemistry, v5 p156-165 1989.

Keywords: *High temperature tests, *Silicon carbides, *Hafnium oxides, Vaporizing, Mass spectroscopy, Thermodynamics, Laser applications, Performance evaluation, Reprints, *Laser vaporization mass spec-

A Laser Vaporization Mass Spectrometric (LVMS) technique, demonstrated earlier for BN and C systems, has been applied to the systems SiC and HfO2 at temperatures of 3500-5000 C. For certain conditions of laser energy, wavelength, pulse width, and plume sam-

pling orientation, the species distributions appear to be thermally equilibrated and representative of the thermodynamic distribution at the hot surface. For SiC, the principal species were -- Si, SiC, SiC2, Si2C, C, C2, C3, Si2, Si3, and for HfO2 -- Hf, O, HfO, HfO2, O2, in approximate order of decreasing abundance. Based on an indirect (beam velocity) temperature determination, the SiC vaporization rate appears to be much less than that based on an extrapolation of lower temperature Knudsen effusion data.

PB93-125128 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div.
Exponential Density: Exact Fitting of Structure Modull by Entropy Maximization. Final rept.

D. M. Collins, and E. Prince. 1991, 9p. Pub. in Crystallographic Computing 5: From Chemistry to Biology, Chapter 22, p308-316 1991.

Keywords: *Electron density(Concentration), *Entropy, *Crystallography, Exponential functions, Contours, Optimization, Reprints.

Electron density given as an exponential function can be made to fit subsets of structure moduli exactly by a constrained nonlinear optimization. A dual method is used in which the problem is solved in a space of dimension equal to the number of structure factor constraints. Entropy is the objective function to be maximized. On the joint basis that density must be everywhere positive and exactly match the experimental constraints, the result is shown to be the most general obtainable from an initial phase assignment. If there are other acceptable maps, they cannot be as flat as the electron density map given by this algorithm.

00.123 PB93-125144 Not available NTIS National Inst. of Standards and Technology (PL),
Gaithersburg, MD. Molecular Physics Div.
Partial Structure for trans-1,2-Difluoroethylene
from High-Resolution Infrared Spectroscopy.

N. C. Craig, D. W. Brandon, S. C. Stone, and W. J. Lafferty. 1992, 8p. Pub. In Jnl. of Physical Chemistry 96, n4 p1598-1605

Keywords: *Fluorohydrocarbons, *Infrared spectra, *Vibrational spectra, Molecular vibration, Spectrum analysis, Molecular structure, Reprints, *trans-1, 2-Difluoroethylene, Rotational constants.

Three bands in the high-resolution infrared spectrum of trans-1,2-difluoroethylene have been examined. An A-type band at 1274/cm due to in-plane CH bending, and a C-type band at 874/cm due to out-of-plane CH bending have been fully analyzed. The B-type component of a hybrid A/B-band at 1657/cm has been partly analyzed. Ground-state rotational constants of A = 1.8934097 (24)/cm, B = 0.13453756 (64)/cm and C = 0.12554344 (59)/cm in a Watson-type Hamiltonian have been fit to 1670 ground-state combination differences derived from the three bands. When CH and CC geometric parameters are held at the cis isomer values, a CCF bond angle of 119.6 deg and a CF bond length of 1.345 A are fit to the principal moments of inertia of the trans isomer. The CCF bond angle is 2.5 deg smaller and the CF bond length is 0.010 A longer in the trans isomer.

00,124 PB**93-12**5**169** Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Elastic and Inelastic Neutron Scattering Study of Hydrogenated and Deuterated Hydrogenated and Trimethylammonlum Pillared Vermiculite Clays. Y. Fan, S. A. Solin, H. Kim, T. J. Pinnavaia, and D. A. Neumann. 1992, 8p. Pub. In Jnl. of Chemical Physics 96, n9 p7064-7071, 1 May 92.

Keywords: *Neutron scattering, *Hydrogenation, *Deuteration, *Vermiculite, Aluminium silicates, Molecular vibration, Clays, Inelastic scattering, Molecular structure, Minerals, Reprints, *Ammonium/trimethyl.

Neutron scattering has been used to study the basal spacing and vibrational excitations of oriented samples of (CH3)3NH(1+)-vermiculite and its deuterated form (CD3)3ND(1+)-vermiculite. Both forms exhibit a basal spacing of 12.71 A and a rich vibrational spectrum in the energy range 20-140 meV for Q perpendicular and parallel to the c-axis. These results are compared with infrared measurements and inelastic neutron scattering results of trimethylammonium halides over the same energy range. The torsional mode of the methyl group has been found to be split by approximately 8 meV due to the top-top interaction between the methyl groups in the trimethylammonium vermiculite.

PB93-125821 Not available NTIS
National Inst. of Standards and Technology (IMSE),
Gaithersburg, MD. Office of Nondestructive Evalua-

Rototranslational Absorption Spectra of H2-H2
Pairs in the Far Infrared.

Final rept.

W. Meyer, L. Frommhold, and G. Birnbaum. 1989,

Pub. in Physical Review A 39, n5 p2434-2448 1989.

Keywords: *Hydrogen complexes, Far infrared radiation, Absorption spectra, Colliding beams, Infrared spectra, Line shape, Sum rules, Reprints, Translations.

For the computation of the induced dipole moments, the collisional H2-H2 complex is treated as a molecule in the self-consistent-field and size-consistent, coupled electron pair approximations. The basis set accounts for 95% of the correlation energies and separates cor-rectly at distant range. The average of the induced dipole components is obtained for the case of both H2 molecules in the vibrational groundstate (nu=nu'=0) and recast in a simple but accurate analytical form. The analytical dipole expression is used for computations of the spectral moments (sum rules) and line shapes of the collision-induced rototranslational absorption spectra of molecular hydrogen in the far infrared, over a range of frequencies from 0 to 2200/cm, and for temperatures from 77 to 300 K, using a quantum formalism. Proven isotropic potential models are input. Results suggest that the theory is capable of predicting these spectra reliably at temperatures for which no measurements exist.

00.126 PB93-148948 Not available NTIS American Chemical Society, Washington, DC.
Journal of Physical and Chemical Reference Data, Volume 21, No. 1, January/February 1992. Bimonthly rept.

D. R. Lide. c1992, 179p.
See also PB93-148955 through PB93-148989, PB93-149136 and PB92-148162. Prepared in cooperation with American Inst. of Physics, New York. Sponsored National Inst. of Standards and Technology, Gaithersburg, MD.

Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Research, *Physical chemistry, Sodium chloride, Thermodynamic properties, Cobalt ions, Spectra, Crystal structure, Liquids, Surface extended x-ray absorption fine structure, Surface electron energy loss fine structure, Surface structure, Kerr constants.

Contents:

Thermodynamic Properties of the NaCl + H2O System. 1. Thermodynamic Properties of

NaCl(cr); Spectral Data and Grotrian Diagrams for Highly Ionized Cobalt, Co VIII through XXVII; Critical Compilation of Surface Structures Determined by Surface Extended X-Ray Absorption Fine Structure (SEXAFS) and Surface Extended Electron Energy Loss Spectroscopy (SEELFS); Laser-Induced Kerr Constants for Pure Liquids.

00.127 PB93-148955 Not available NTIS of Standards and Technology, National Inst.

National Inst. of Standards and Technology, Gaithersburg, MD.
Thermodynamic Properties of the NaCl + H2O System. 1. Thermodynamic Properties of NaCl(cr).
D. G. Archer. c1992, 21p.
Included in Jnl. of Physical and Chemical Reference Data, v21 n1 p1-21 Jan/Feb 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Sodium chloride, *Thermodynamic properties, Specific heat, Enthalpy, Entropy, Crystals, Tables(Data).

The available experimental thermodynamic data for NaCl(cr) have been fitted in order to generate thermodynamic values as a function of temperature and for a nominal pressure of 0.1 MPa. Thermal measurements (heat-capacity values and enthalpy-increment values) have been fitted with a new method. The fitted function and calculated thermodynamic values are given. Estimates of the inaccuracies of the calculated thermodynamic values are also given.

PB93-148971 Not available NTIS
Oregon State Univ., Corvallis. Dept. of Chemistry.
Critical Compilation of Surface Structures Deter-Critical Compilation of Surface Structures Determined by Surface Extended X-ray Absorption Fine Structure (SEXAFS) and Surface Extended Electron Energy Loss Spectroscopy (SEELFS).

P. R. Watson. c1992, 34p.
Included in Jnl. of Physical and Chemical Reference Data, v21 n1 p123-156 Jan/Feb 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Crystal structure, Spectroscopy, Single crystals, Adsorbates, Reviews, *Surface extended x-ray absorption fine structure, *Surface electron energy loss fine structure, *Surface structure.

The review critically compiles all surface structures derived by the technique of surface extended x-ray absorption fine-structure spectroscopy (SEXAFS) sorption fine-structure spectroscopy (SEXAFS) and surface electron energy loss fine-structure spectroscopy (SEELFS) reported in the refereed literature prior to January 1990. They are compared with the extensive low-energy electron diffraction (LEED) (P.R. Watson, J. Phys. Chem. Ref. Data 16, 953 (1987)) and ion scattering databases (P. R. Watson, J. Phys. Chem. Ref. Data 19, 85 (1990)) previously reported. The important experimental and theoretical aspects of such investigations have been extracted into easily understood tabular form supplemented by many figures and stood tabular form supplemented by many figures and ancillary tables and complete references. It is hoped that this compilation will provide a valuable resource both for the surface science specialist and for those nonspecialists in other areas who need surface crystallographic data.

PB93-148989 Not available NTIS Reading Univ. (England). J.J. Thomson Physical Lab. Laser-Induced Kerr Constants for Pure Liquids. N. J. Harrison, and B. R. Jennings. c1992, 7p. Included in Jnl. of Physical and Chemical Reference Data, v21 n1 p157-163 Jan/Feb 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Liquids, Kerr effect, Organic compounds, Birefningence, Nonlinear optics, Benzene, Birefringence, Nonlinear Tables(Data), *Kerr constants.

During the past two decades, an increasing number of publications have reported laser-induced birefringence data for pure liquids. To date there has been no comparative collection of values from these experiments. The paper lists the published values together with hitherto unpublished data of the authors of the optically induced Kerr constant B(0). The normalized parameter B(rel) for data compared with benzene under stated wavelength conditions of the light used for the measurements is also given.

PB93-149045 Not available NTIS American Chemical Society, Washington, DC. Journal of Physical and Chemical Reference Data, Volume 21, No. 4, July/August 1992. Bimonthly rept.

Bimonthly rept.
D. R. Lide. c1992, 157p.
See also PB93-149052 through PB93-149086 and PB93-149029. Prepared in cooperation with American Inst. of Physics, New York. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Research, *Physical chemistry, Propellant combustion, Reaction kinetics, Sodium chloride, Thermodynamic properties, Nitrogen oxides, Vibrational spectra, Hydrogen, Argon, Atom-molecule collisions, Ion-atom collisions.

Chemical Kinetic Data Base for Propellant Combustion. II. Reactions Involving CN, NCO, and HNCO:

Thermodynamic Properties of the NaCl + H20 System. II. Thermodynamic Properties of NaCl(aq), NaCl2H2O(cr), and Phase Equilibria; Vibrational Bands of H(x)N(y)O(z) Molecules; CollIslons of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H and H2 with Ar and Ar(+) and ArH(+) with H2 for Energies from 0.1 eV to 10

00,131 PB93-149052 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Chemical Kinetic Data Base for Propellant Combustion. 2. Reactions Involving CN, NCO, and

HNCO.
W. Tsang. c1992, 39p.
included in Jnl. of Physical and Chemical Reference
Data, v21 n4 p753-791 Jul/Aug 92. Available from
American Chemical Society, 1155 Sixteenth St., NW,
Washington, DC. 20036-9976.

Keywords: *Propellant combustion, *Reaction kinetics, Temperature range 0400-1000 K, Temperature range 1000-4000 K, Polyatomic molecules, Chemical reactions, Data bases, Nitramines, Tables(Data).

The paper contains evaluated chemical kinetic data on single step elementary reactions involving small polyatomic molecules which are of importance in propellant combustion. The work consists of the collection and evaluation of mechanistic and rate information and the use of various methods for the extrapolation and estimation of rate data where information does not exist. The conditions covered range from 500-2500 K and 10(sup 17)-10(sup 22) particles/cc. The results of the second year's effort add to the existing data base reactions involving CN, NCO and HNCO with each other and the following species: H, H2, H2O, O, OH, HCHO, CHO, CO, NO, NO2, HNO, HNO2, HCN, and

PB93-149060 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Chemical Kinetics and Thermo-dynamics Div.

dynamics DIV.

Thermodynamic Properties of the NaCI + H2O System. 2. Thermodynamic Properties of NaCI(aq), NaCI2H2O(cr), and Phase Equilibria.

D. G. Archer. c1992, 37p.
Included in Jnl. of Physical and Chemical Reference Data, v21 n4 p793-829 Jul/Aug 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Sodium choloride, *Thermodynamic properties, Temperature range 0273-0400 K, Temperature range 0400-1000 K, Aqueous solutions, Activity coefficients, Equations of state, Gibbs free energy, Specific heat, Crystals, Density, Enthalpy, Osmosis, Solubility, Vapor pressure, Tables(Data), Phase equilibrium.

Equations that described the thermodynamic properties of the NaCl + H2O system were obtained from a fit to experimental results for the system. The experimental results included in the fit spanned the range of temperature of approximately 250 to 600 K and, where available, the range of pressure from the vapor pressure of the solution to 100 MPa. New equations and/ sure of the solution to 100 MPa. New equations and/ or values for the following properties are given in the present work: (1) (Delta f)G(sub m, sup 0) and (Delta f)H(sub m, sup 0), for formation from the elements, for NaCl(cr) for 298.15 K and 0.1 MPa, (2) (Delta f)G(sub m, sup 0) and (Delta f)H(sub m, sup 0) from the ele-ments, as well as S(sub m, sup 0) and C(sub p,m, sup 0), all for 298.15 K, 0.1 MPa, for NaCl.2H2O(cr), (3) the change in chemical potential for both NaCl and H2O in NaCl(an) as a function of temperature pres-H2O in NaCl(aq) as a function of temperature, pressure, and molality, valid from 250 to 600 K and, where available, from the vapor pressure of the solution to 100 MPa. Companson of the accuracles of experimental methods, where possible, has also been per-

PB93-149078 Not available NTIS PB93-149078 Not available NTIS
Universite Libre de Bruxelles (Belgium).
Vibrational Bands of HxNyOz Molecules.
F. Melen, and M. Herman. c1992, 51p.
Included in Jnl. of Physical and Chemical Reference
Data, v21 n4 p831-881 Jul/Aug 92. Available from
American Chemical Society, 1155 Sixteenth St., NW,
Washington, DC. 20036-9976.

Keywords: *Nitrogen oxides, *Vibrational spectra, Infrared spectra, Raman spectra, Band spectra,

Polyatomic molecules, Nitrous acid, Nitric acid, Atmospheric composition, Tables(Data).

A compilation of experimental data is presented which covers all known molecular species fitting the (1)H(x)(14)N(y)(16)O(z)(y,z, not = 0) chemical formula. The vibrational bands of these compounds in gas, ilquid, solid, and matrix are listed, together with their assignments and the relevant references. Most of the literature before October 1991 is covered.

00.134 PB93-149110 Not available NTIS Emory Univ., Atlanta, GA. Dept. of Chemistry.
Solubility of Some Sparingly Soluble Salts of Zinc and Cadmium in Water and in Aqueous Electrolyte Solutions.

H. L. Clever, M. E. Dernck, and S. A. Johnson. c1992, 64p.

Included in Jnl. of Physical and Chemical Reference Data, v21 n5 p941-1004 Sep/Oct 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Cadmium inorganic compounds, *Zinc Inorganic compounds, *Solubility, Aqueous electrolytes, Water, Tables(Data).

The literature on the solubility of the sparingly soluble inorganic salts of zinc and cadmium in water and in aqueous electrolyte solutions has been reviewed. The solubility data have been compiled and evaluated. Recommended or tentative values of the solubilities and the solubility products have been given when warranted. Auxiliary thermodynamic and crystallographic data useful in the interpretation of solubility data are given. For the many zinc and cadmium substances for which only limited solubility data are available, unevaluated values are given in an annotated bibliography with emphasis on solubility data published since 1950.

00,135 PB9**3-1506**96 PB93-150696 Not available NTIS National Inst. of Standards and Technology (PL), Gaithersburg, MD. Molecular Physics Div. Determination of the Structure of CO2-H2CO.

T. A. Blake, S. E. Novick, F. J. Lovas, and R. D. Suenram. 1992, 11p. See also PB88-189311.

Pub. in Jnl. of Molecular Spectroscopy 154, p72-82

Keywords: *Carbon dioxide, *Formaldehyde, *Complexes, Van der Waals forces, Deuterium compounds, Microwave spectroscopy, Founer spectroscopy, Molecular structure, Molecular beams, Electric moments, Dipole moments, Reprints.

The structure of the weakly bound complex CO2-H2CO has been determined by pulsed-jet Fourier-transform microwave spectroscopy. The spectroscopic constants of three isotopomers, CO2-H2CO, (13)CO2-H2 CO, and CO2-D2CO, have been determined. Two distinct states of the complex are seen. These are distinct states of the complex are seen. These are caused by inversion doubling from 'rotation' of the formaldehyde about its twofold axis. The complex is planar with the C2 axis of formaldehyde almost parallel to the D(infinity h) axis of carbon dioxide. The centerof-mass to center-of-mass distance is 3.171 A.

00,136 PB9**3-150720** Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Surface and Microanalysis Science Div. Subplcosecond Problng of Vibrational Energy

Transfer at Surfaces. Final rept.

R. R. Cavanagh, J. D. Beckerie, M. P. Casassa, E. J. Heilweil, and J. C. Stephenson. 1992, 7p. Pub. in Surface Science 269/270, p113-119 1992.

Keywords: *Carbon monoxide, *Surfaces, Vibrational spectra, Ultraviolet radiation, Infrared radiation, Energy transfer, Adsorption, Platinum, Dynamics, Reprints, Femtosecond pulses.

Subpicosecond infrared pump-probe techniques are applied to the excited vibrational state dynamics of adsorbed CO on Pt(111). The CO (nu = 1) adiayer is probed as a function of IR pump fluence and CO coverage (0.1 = or < theta (CO) = or < 0.5 ML). Spectral shifts in the transient CO vibrational spectrum are observed, indicative of a shift to lower frequency of the

CO internal stretch mode as the degree of excitation of the adlayer is increased. The observed transient spectral response is discussed in terms of density matrix models which address the coherence time of the adlayer (nu = 1) excitation, and in terms of the excited state spectral characteristics of strongly coupled anharmonic oscillators. The two-to-three picosecond recovery time of the transient response is consistent with relaxation through electron-hole pair creation.

PB93-150753 Not available NTIS
National Inst. of Standards and Technology (PL),
Gaithersburg, MD. Molecular Physics Div.
High-Resolution FTIR Study of the nu4 Band of CH2F2.

Final rept. M. N. Deo, R. D'Cunha, A. Weber, and W. B. Olson. 1992, 10p.

Pub. In Jnl. of Molecular Spectroscopy 154, p83-92

Keywords: *Infrared spectra, Fourier spectroscopy, Absorption spectra, Vibrational spectra, Rotational spectra, Band spectra, High resolution, Reprints, *Methylene fluorides.

The infrared absorption spectrum of the nu(4) fundamental band of CH2F2 has been measured in the region 460-600/cm under high resolution. More than 2,700 lines have been assigned in this B-type band of the lowest fundamental centered at 528.5/cm. These data have been combined with all available pure rotational measurements on the upper state in a least-squares fit. Accurate values for the band origin and other molecular parameters for the nu(4) state have been obtained which fit the data with an overall standard deviation of 3.7 X 10(sup -4)/cm.

00,138
PB93-150803 Not available NTIS
National Inst. of Standards and Technology (PL),
Gaithersburg, MD. Molecular Physics Div.
MIcrowave and Infrared Spectra of C2H4...HCCH:
Barrier to Twofold Internal Rotation of C2H4.

Final rept.
G. T. Fraser, F. J. Lovas, R. D. Suenram, J. Z.
Gillies, and C. W. Gillies. 1992, 11p.
Pub. in Jnl. of Chemical Physics 163, p91-101 1992.

Keywords: *Acetylene, *Ethylene, *Complexes, *Microwave spectra, *Infrared spectra, Van der Waals forces, Hydrogen bonds, Deuterlum compounds, Reprints.

Microwave spectra of C2H4...HCCH, C2H4...DCCH, C2H4...DCCD, D2C=CH2...HCCH, and trans-HDC=CHD...HCCH have been recorded using a pulsed-nozzle Fourier-transform microwave spectrometer. An alpha-type, Delta K(alpha)=0 spectrum is observed, with a number of transitions being split into doublets due to tunneling arising from the hindered internal rotation of the ethylene unit about its C=C bond. For the normal isotopic species we find A=25981(33) MHz, B+C=3478.2560(13) MHz, and B-C=89.45(18) MHz. The complex is shown to have a C(sub 2(nu)) structure in which the HCCH unit hydrogen bonds to the ethylene pi cloud, with the HCCH axis normal to the plane of the ethylene. An infrared spectrum of the asymmetric acetylenic C-H stretch in the complex has also been measured using an optothermal color-center laser spectrometer. The rotational lines are predissociation broadened, preventing the resolution of K structure. The observed band origin nu(sub 0) = 3271.61/cm, is nearly identical to that found for the similar vibration in the acetylene dimer.

00,139
PB93-150852 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD. Thermophysics Div.
Measurement of the Dipole Moment of Gaseous
1,1,1-trichlorotrifluoroethane, 1,2-difluoroethane,
1,1,2-trichlorotrifluoroethane, and 2(difluoromethoxy)-1,1,1-trifluoroethane.
Final rept.

A. R. H. Goodwin, and G. Morrison. 1992, 6p. Pub. in Jnl. of Physical Chemistry 96, n13 p5521-5526, 25 Jun 92.

Keywords: *Fluorohydrocarbons, *Dipole moments, *Dielectric properties, *Polarization(Charge separation), Refractivity, Temperature dependence, Density(Mass/volume), Reprints, *1-1-1-2-((Difluoromethoxy)-1), 1-1-Trichlorotrifluoroethane, 2-

Difluoroethane, 1-2-Trichlorotrifluoroethane, 1-1-trifluoroethane.

The relative permittivity (dielectric constant) In gaseous 1,1,1-trichlorotrifluoroethane, 1,2-difluoroethane, 1,1,2-trichlorotrifluoroethane, and 2-(difluoromethoxy)-1,1,1-trifluoroethane at temperatures between 293 and 378 K has been obtained from capacitance measurements using a parallel plate capacitor. Molecular polarizabilities have been determined from the results. We report the electronic polarization for each fluid determined from liquid-phase index of refraction measurements at 297 K. Equilibrium dipole moments (mu) have been determined from the combined results. Estimates are given for the dipole moment of individual conformers where the dipole moment is temperature dependent. 1,2-Difluoroethane, for which dmu/dT < 0, exhibits the gauche effect; the temperature dependence of mu for 1,1,2-trichlorotrifluoroethane is similar. We also report liquid densities for 1,1,1-trichlorotrifluoroethane and 1,2-difluoroethane.

00,140
PB93-151207 Not available NTIS
National Inst. of Standards and Technology (PL),
Gaithersburg, MD. Molecular Physics Div.
3nu3 Band of (32)S(16)O2: Line Positions and Intensities.
Final rept.

W. J. Lafferty, G. T. Fraser, A. S. Pine, V. Dana, J. Y. Mandin, A. Barbe, J. J. Plateaux, S. Bouazza, J. M. Flaud, and C. Camy-Peyret. 1992, 10p. Pub. In Jnl. of Molecular Spectroscopy 154, p51-60

Keywords: *Sulfur dioxide, *Infrared spectra, Vibrational spectra, Band spectra, Fourier spectroscopy, Room temperature, Venus atmosphere, Hamiltonian functions, High resolution, Reprints.

The room-temperature high-resolution infrared spectrum of the alpha-type 3nu(sub 3) asymmetric S-O stretching overtone band of SO2 has been investigated at long path lengths (28-80 m) in two different laboratories using difference-frequency laser and Founier-transform infrared spectrometers. The effectively unperturbed spectrum has been fit to a Watson asymmetric-top Hamiltonian to a precision of 0.0003/cm to yield a band origin of 4054.00117(4)/cm and a complete set of rotational and centrifugal distortion constants. The intensities have been fit using Herman-Wallis type corrections to account for the K(a) dependence of the effective vibrational transition moment, giving a rotationless transition moment and an integrated band intensity for (32)SO2. The present results furnish data necessary to test the recent assignment of a feature in the infrared spectrum of Venus on the 3nu(sub 3) band of SO2.

00,141
PB93-151629 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD. Surface and Microanalysis Science

Comparison of Measured and Calculated Appearance-Potential Spectra for Six 3d Metals.

Final rept.
C. J. Powell, N. E. Erickson, and D. E. Ramaker.

1992, 5p. Pub. in Physica Scripta T41, p175-179 1992.

Keywords: *Chromium, *Cobalt, *Iron, *Nickel, *Titanium, *Vanadium, Greens function, Measurement, Computation, Comparison, Polycrystals, Reprints, *Appearance-potential spectra.

We report comparisons of measured and calculated L(3)-shell appearance-potential spectra (APS) for Ti, V, Cr, Fe, Co and Ni. The measurements were made with polycrystalline specimens and with a carefully calibrated electron energy scale.

00,142
PB93-151637 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD. Process Measurements Div.
Measurement of the Density Shift of the H2Q(0-5)
Transitions from 295 K to 1000 K.
Final rept.

L. A. Rahn, and G. J. Rosasco. 1990, 9p. Pub. in Physical Review A 41, n7 p3698-3706 1990.

Keywords: *Hydrogen, Temperature range 0273-0400 K, Temperature range 0400-1000 K, Temperature dependence, Raman spectroscopy, Electron transitions, High resolution, Quantum numbers, Measurement, Reprints, J dependence.

We report results of a high-resolution inverse Raman spectroscopy (IRS) study of the dependence on temperature and rotational quantum number (J) of the Raman Q-branch self-density-shift coefficients of pure (natural) hydrogen. The population-correlated J-dependence of these coefficients, previously established at lower temperatures as a 'coupling shift,' is observed to persist, almost independent of temperature, up to 1000 K. The temperature dependence of the overall shift is found to disagree above 500 K with extrapolations of recent theoretical calculations.

00,143
PB93-151652 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Thermophysics Div.
Kinetics of Bimolecular Recombination Processes
with Trapping.
Final rept.

J. C. Rasaiah, J. B. Hubbard, R. J. Rubin, and S. H. Lee. 1990, 11p.

Pub. ip. Int. of Physical Chemistry 94, n2 p652-66

Pub. in Jnl. of Physical Chemistry 94, n2 p652-662 1990.

Keywords: *Recombination reactions, Computerized simulation, Time dependence, Diffusion, Trapping, Kinetics, Reprints, Bimolecular recombination.

We report the results of a computer simulation and analysis of diffusion-controlled bimolecular recombination on a 2-dimensional I. (a) A + A -->*; (b) A + T --> A(T); (c) A(T) + A --> T; and II. (a) A + A -->*; (b) A --> A(T); (c) A(T) + A -->*. Reaction I refers to recombination with bimolecular trapping (b), while reaction II refers to recombination with unimolecular trapping (b). In either case the time dependence of the trapped population (A(T)) is described remarkably well by a mean field theory, while the free population (A) decays as a stretched exponential at long times (exp(-t(sup alpha)), alpha approx = 1/2). However, it is possible to distingulsh between mechanisms I and II simply by monitoring a single particle density (A or A(T)) for a range of initial conditions.

00,144
PB93-151751 Not available NTIS
National Inst. of Standards and Technology (PL),
Gaithersburg, MD. Radiometric Physics Div.
Resonance Effects in the 5SIgma(-1)
Photolonization Channel of CO.
Final rept.

Final rept.

M. R. F. Siggel, M. A. Hayes, M. A. MacDonald, A. C. Parr, J. E. Hardis, I. Iga, V. Tiit, J. B. West, and J. L. Dehmer. 1992, 7p.

L. Dehmer. 1992, 7p.
Sponsored by Department of Energy, Washington, DC.
Pub. in Jnl. of Chemical Physics 96, n10 p7433-7439,
15 May 92.

Keywords: *Carbon monoxide, *Photoionization, Angular distribution, Branching ratio, Photoelectrons, Ultraviolet radiation, Reprints.

Vibrational branching ratios and photoelectron angular distributions are reported for the 5/sigma photoionization channel of CO in the range 16eV <h(nu)<45eV. Striking non-Franck-Condon effects are observed in both the branching ratios and angular distributions as a result of various autoionizing states and a sigma shape resonance that lie in this spectral range. The goal of the present measurement was to observe definitive evidence for the sigma shape resonance via its non-Franck-Condon effects on the vibrational lonization channels. Guided by recent calculations (Smith, Lynch, and McKoy, J. Chem. Phys. 85, 6455 (1986)), we examined the broad structure in the vibrational branching ratios and angular distributions in the range 25eV<hv<40eV. There, we found clear evidence for the sigma shape resonance in the quantities beta(nu(+) = 0 and 1) and sigma(nu(+) = 2)/sigma(nu(+) = 0). Substantial differences between theory and experiment for the sigma(nu(+) = 1)/sigma(nu(+) = 0) branching ratio, however, serve to define the limitations of the current single-channel picture for this process.

00,145
PB93-153187 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD. Surface and Microanalysis Science
Div.

Vibrational Line Shape of Diatomic Adsorbates on Metal Clusters.

E. Blaisten-Barojas, and J. W. Gadzuk. 1992, 9p. Sponsored by National Science Foundation, Washington DC

Pub. In Jnl. of Chemical Physics 97, n2 p862-870, 15

Keywords: *Adsorbates, *Atomic clusters, *Vibrational spectra, *Molecular relaxation, Relaxation time, Carbon monoxide, Rhodium, Cobalt, Line shape, Reprints, *Metal clusters.

A decrease of at least an order of magnitude in the vibrational relaxation time T(1) has been measured for CO bonded to Rh and Co clusters when the size of the cluster Increases from 5 to 35 A. We propose that this effect is mainly due to the coupling of the molecular vibration omega(0) with the electron-hole excitations in the cluster. This is described via a model Hamiltonian. The finite size of the clusters give rise to a discrete electronic spectrum, and hence to a discrete pair excitation spectrum. This effect is measured in terms of D, the mean spacing between nearest-neighbor levels in the conduction band of the cluster. We find that: (1) the proposed mechanism starts to contribute to T(1) only when D<h(bar) omega(0); (2) T(1) is at least several hundred ps for clusters less than 15 A in size; (3) there Is a sharp decrease of T(1) to about 10 ps as the cluster size increases from 15 to 40 A; (4) T(1) decreases smoothly towards the bulk value for larger

00.146 PB93-153260 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Structure and Low Energy Dynamics of Solid C60. Final rept.

J. R. D. Copley, D. A. Neumann, R. L. Cappelletti, N. Coustel, J. P. McCauley, N. C. Maliszewskyj, J. E. Fischer, A. B. Smith, K. M. Creegan, D. M. Cox, W. A. Kamitakahara, and E. Prince. 1992, 3p. Pub. in Physica B 180-181, p706-708 1992.

Keywords: *Fullerenes, Neutron diffraction, Inelastic scattering, Cryogenic temperature, Room temperature, Reprints, *Buckminsterfullerene, Bragg diffraction.

A simple model explains both the Bragg peaks and the diffuse scattering observed in neutron diffraction measurements on solid C60 at 295 and 14 K. Neutron inelastic scattering measurements reveal dynamic ori-entational disorder above the order-disorder transition temperature. An analysis of the diffraction results shows that significant disorder remains at 14 K.

00.147 PB93-153336 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div.
Conversion of Temperatures and Thermodynamic Properties to the Basis of the International Temperature Scale of 1990.
Final rept.

B. N. Goldborg and B. B. Weit 1999, 1999.

R. N. Goldberg, and R. D. Weir. 1992, 18p. Pub. in Pure and Applied Chemistry 64, n10 p1545-1562 1992.

Keywords: *Temperature scales, *Thermodynamic properties, Temperature dependence, Specific heat, Enthalpy, Entropy, Reprints.

Tables of temperature differences between the International Temperature Scale of 1990 (ITS-90) and earlier temperature scales (IPTS-68, EPT-76, IPTS-48, and ITS-27) are presented. These tables also contain values of the derivatives of these differences with respect to temperature. Analytical equations to reproduce the temperature difference (T90 - T68) and its first derivative are also given. This information is needed for the adjustment of thermodynamic results to the basis of the ITS-90. Thus, for the most accurate thermodynamic results, it is preferable to change the temperatures of the original work to the ITS-90 and then recalculate the thermodynamic results on this basis. However, conversion formulae based upon a Taylor expansion of the enthalpy have been derived previously by Douglas (J. Res. Natl. Bur. Stand., Sect. A 73, 451-470 (1969)). These equations are greatly simplified when the differences between the two temperature scales are small. Approximate effects resulting from the conversion from the IPTS-68 to the ITS-90 and from the IPTS-48 to the ITS-90 for existing calorimetric determinations of heat capacity, enthalpy, and entropy have been calculated with the equations of Douglas for ND4ReO4(s), BaSnF4(s), alpha-Al2O3(s), (BeO)(Al2O3)(s), (BeO)(3Al2O3)(s), and Mo(s). It is found that only the most accurate thermodynamic results require examination and possible adjustment because of a change in the temperature 00.148 PB93-153484 Not available NTIS National Inst. of Standards and Technology (CSTL), Boulder, CO. Thermophysics Div.

Prediction of Fiuld Phase Equilibrium of Ternary Mixtures in the Critical Region and the Modified

Leung-Griffiths Theory. Final rept.

J. J. Lynch, J. C. Rainwater, L. J. Van Poolen, and D. H. Smith. 1992, 8p.
Sponsored by Department of Energy, Washington, DC. Pub. in Jnl. of Chemical Physics 96, n3 p2253-2260,

Keywords: *Liquid-vapor equilibrium, *Alkanes, Isotherms, Fluids, Reprints, Leung-Griffiths theory, Phase equilibrium, Ternary mixtures, Corresponding

The modified Leung-Griffiths theory of vapor-liquid equilibrium (VLE) is generalized to the case of three components. The principle of 'corresponding states' is reconsidered along with certain functions of 'field variables' within the model. The mathematical form of the coexistence boundary in terms of the field variables remains practically unchanged and conforms to modern scaling theory. The new model essentially predicts ternary fluid mixture phase boundaries in the critical region from previous vapor-liquid equilibrium data cor-relations of the three binary fluid mixture limits. Pre-dicted saturation isotherms of the ethane + n-butane + n-pentane and ethane + n-butane + n-heptane mixtures are compared with experimental ternary VLE data in the literature.

00,149 PB9**3-153**7**40** PB93-153740 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Boulder, CO. Process Measurements Div.
Note on the Number Dependence of
Nonequilibrium Molecular Dynamics Simulations of the Viscosity of Structured Molecules. Final rept. R. L. Rowley, and J. F. Ely. 1992, 2p. Pub. in Jnl. of Chemical Physics 96, n6 p4814-4815,

Keywords: *Butanes, *Viscosity, Lennard-Jones potential, Simulation, Reprints, Molecular dynamics, Number dependence.

The number dependence of nonequilibrium molecular dynamics simulations of the viscosity of n-butane was investigated. A site-site Lennard-Jones potential was used in the simulations. We found that a break in the linear behavior of eta* with gamma*(sup 1/2) at values of alpha*(sup 1/2) larger than 0.5 is the result of values of a real phenomenon, rather than a number-dependent artifact.

PB93-160786 PC A14/MF A03 National Inst. of Standards and Technology (CSTL), Boulder, CO. Thermophysics Div. Tables for the Thermophysical Properties of Ethane. Technical note.

D. G. Friend, J. F. Ely, and H. Ingham. Jan 93, 319p, NIST/TN-1346.

Also available from Supt. of Docs. as SN003-003-03199-2. See also NISTIR-3953.

Keywords: *Ethane, *Thermodynamic properties, *Thermophysical properties, Specific heat, Thermal conductivity, Viscosity, Temperature dependence, Pressure dependence, Tables(Data), Graphs(Charts).

The thermophysical properties of ethane are tabulated for a large range of the fluid state based on recently formulated correlations. For the thermodynamic properties, temperatures from 90 to 625 K at pressures less than 70 MPa are included; for the viscosity, the corresponding range is 90-500 K with pressures to 60 MPa; for the thermal conductivity the range is 90-600 K with pressures to 70 MPa. In addition to the tables of properties, algebraic expressions and associated tables of coefficients are given to allow additional property calculations. Graphical compansons between experimental property determinations and the correlation are also given both for primary data used in the formulation of the correlations and for additional data. A listing of a FORTRAN program for the evaluation of ethane thermophysical properties is included.

PB93-165983 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div. In situ Analysis of Laser-Induced Vapor Piumes. Final rept. P. K. Schenck, D. W. Bonnell, and J. W. Hastie.

Pub. In High Temperature Science 27, p483-501 1989.

Keywords: Refractory materials, Mass spectroscopy, Emission spectra, High temperature, Thermochemistry, Graphite, Plumes, Reprints, *Laser vaporization, Yttnum banum cuprates.

Laser-induced vapor plumes are becoming Important in the processing of advanced materials and as a me-dium for fundamental high temperature chemistry ex-penments. Techniques are required for the spatial and temporal analysis of such plumes. Time-resolved mass spectra of C(n) (n=1-9) neutral vapor species have been obtained from graphite targets using various interaction orientations and plume sampling geometries. C, C, and C have also been observed in the laserinduced plume. Mass spectra from superconducting YBa2Cu3O(x) targets also showed a diversity of species present in the laser-induced plumes, including both neutral and ionic Y, Ba, and Cu, and molecular species such as BaO, CuO(1+), YO and bimetallics (BaCu, YCu). Time and spatially resolved optical emission spectra have been obtained. With graphite targets interest of the control of the gets, intense emission was observed from C, C(1+) and C(1+)+ in the near UV. Molecular C2 emission was also observed in the vicinity of the surface/plume interface. The emission spectra obtained from the superconducting YBA2Cu3O(x) targets included intense lines from both neutral and ionic Y, Ba and Cu as well as YO.

00,152 PB93-166064 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Rate Constants for Hydrogen Abstraction Reactions of NO3 in Aqueous Solution. Final rept.

L. V. Shastri, and R. E. Huie. 1990, 8p.

See also PB91-203232.
Pub. in International Jnl. of Chemical Kinetics 22, p505-512 1990.

Keywords: *Free radicals, *Reaction kinetics, *Ethers, *Alcohols, Molecular structure, Solutions, Reprints, *Nitrate radical, Hydrogen abstraction.

Rate constants have been measured by pulse radioly-sis for the reactions of the NO3 radical with five cyclic ethers and a series of alcohols. Rate constants ranged from 3.5 x 10 to the power of 4/M/s for deuterated methanol to 1.1 x 10 to the power of 7/M/s for tetrahydrofuran. The rate constants for the reactions of NO3 with the alcohols 1-propanol to 1-heptanol were found to be linearly dependent on the number of CH2 groups with a group reactivity of 6.4 x 10 to the power of 5/M/s.

PB93-166072 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div.
Formation and Reactivity of Hypophosphite and Phosphite Radicals and Their Peroxyl Derivatives. Final rept.

L. V. Shastri, R. E. Huie, and P. Neta. 1990, 5p. Sponsored by Department of Energy, Washington, DC. Pub. in Jnl. of Physics and Chemistry 94, n5 p1895-1899 1990.

Keywords: Aqueous solutions, Electron transfer. Chemical radicals, Chemical reactivity, Radiolysis, Reprints, *Hypophosphite radicals, *Phosphite radicals.

The formation and properties of the radicals derived from hypophosphite and phosphite ions in aqueous so-lutions have been studied by pulse- and gamma-radi-olysis techniques. Hydroxyl radicals and hydrogen atoms abstract H rapidly from the P-H bond to yield P-centered radicals.

00,154 PB9**3-166189** PB93-166189 Not available NTIS National Inst. of Standards and Technology (MSEL), Raithersburg, MD. Ceramics Div.
Reflected and Refracted Fundamental Modes of Dynamic X-ray Diffraction. Final rept.
R. D. Spal. 1991, 4p.
Pub. in Crystallographica Section A 47, p223-226 May

Keywords: *X-ray diffraction, *Energy absorption, Crystallography, Reflection, Refraction, X-ray analysis, Mathematical models, Reprints.

An energy conservation relation is derived between the power absorption, energy flux, and absorption coefficient of an arbitrary fundamental mode in the n beam dynamical theory of x-ray diffraction. From this relation, it is proven that the 4n fundamental modes selected by arbitrary incidence conditions are evenly divided into two types. The types are distinguished by the sign of their absorption coefficient, and by the sign of their energy flux through a plane of constant absorption. They represent reflected and refracted beams.

PB93-166205 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Chemical Kinetics Div.
Prediction of Carbon-Hydrogen Bond Dissociation
Energies for Polycyclic Aromatic Hydrocarbons of
Arbitrary Size.
Final rept

Final rept. S. E. Stein, and R. L. Brown. 1991, 7p. Pub. In Jni. of the American Chemical Society 113, n3 p787-793 1991.

Keywords: *Dissociation energy, *Chemical bonds, *Aromatic polycyclic hydrocarbons, Enthalpy, Molecular orbitals, Quantum chemistry, Graphite, Reprints, Proton affinity

A method has been developed for estimating C-H bond dissociation energies at the edges of polycyclic aromatic hydrocarbons of arbitrary slze. A series of reference molecules having well established bond dissociation enthalpies are used to represent several types of dissociations. For each type, Huckel molecular critical theory is used to each type, Huckel molecular critical theory is used to each type. rypes of dissociations. For each type, hacker molecular orbital theory is used to calculate the pI-electron energy difference between reactant and product. This difference is then used to calculate relative bond dissociation enthalpies. Predictions are also made of G-H bond dissociation enthalpies at the perimeters of infinite graphite layers having several different edge structures. Energles depend principally on chemical structures near the bond of interest and little on overall molecular size. Along with available lonization ener-gles, these results also allow estimation of proton affin-ities at the edges of a layer of graphite. These proton affinities depend on both the chemical structures at the

00,156 PB93-166239

PB93-166239 Not available NTIS
National inst. of Standards and Technology (NEL),
Boulder, CO. Thermophysics Div.
Field-Space Conformal Solution Method: Binary

site of protonation and the overall molecular size.

Vapor-Liquid Phase Behavior.

Final rept. T. S. Storvick, and J. R. Fox. 1990, 12p. See also PB90-254566. Pub. In International Jni. of Thermophysics 11, n1 p61-72 Jan 90.

Keywords: *Alkanes, *Binary mlxtures, *Vapors, *Liquid phases, *Phase transformations, Density(Mass/volume), Equations of state, Thermodynamic properties, Butanes, Pentanes, Hexanes, Octanes, Reprints.

The field-space conformal solution method provides a new procedure for estimating the coexistence phase properties of a binary mixture using only the saturated properties of a pure reference fluid. The method is improperties of a pure reference fluid. The method is implemented and the pTxy properties of three binary mixingers, n-butane with n-pentane, n-hexane, and n-octane, are correlated. The properties of pure, saturated n-butane were used as the reference fluid. They were calculated using the Peng-Robinson and the 32-constant Benedict-Webb-Rubin equations of state. The mixture vapor densities were successfully predicted beyond the mixture stilled point for the mixtures using beyond the mixture critical point for the mixtures using the BWR generated reference fluid data. The liquid densities were overestimated. Recommendations are made to Improve the correlating power and the commercial utility of this method.

00,157 PB93-166262

PB93-166262 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Molecular Physics Div.
Microwave Spectrum of (D2O)2.
Final cont

Pub. in Jnl. of Molecular Spectroscopy 138, n2 p440-449 1989.

Final rept. R. D. Suenram, G. T. Fraser, and F. J. Lovas. 1989,

Keywords: *Microwave spectra, Van der Waais forces, Hydrogen bonds, Intermolecular forces, Deutenum compounds, Complexes, Reprints, *Water dimers.

Microwave spectra of the a-type K(a)=0 and 1 subbands of (D2O)2 for the A(1)(+-), B(1)(+-), A(2)(+-), B(2)(+-), and E(+-) rotational-tunneling states have been recorded between 9 - 110 GHz using pulsed-nozzle Fourier-transform and electric-resonance optothermal spectrometers. The tunneling splitting for the K(a)=0, A(2)(+-)/B(2)(+-) states is determined to be 1083.303(21) MHz, which is slightly lower than the 1172.115(14) MHz value observed previously for the A(1)(+-)/B(1)(+-) states. From these solittings the tun-A(1)(+-)/B(1)(+-) states. From these splittings the tunneling matrix elements associated with the geared and anti-geared proton-acceptor proton-donor interchange motions are calculated.

00.158

PB93-166445 Not available NTiS

National inst. of Standards and Technology (IMSE), Gaithersburg, MD. Reactor Radiation Div. Inelastic Neutron Scattering in Molecular Crystals.

Finai rept.

Phonons 89, Heidelberg, Federal Republic of Germany, August 21-25, 1989, v1 p7-16.

Keywords: *Molecular crystals, *Ammonlum perchlorates, *Graphite, *Neutron scattering, Inelastic scattering, Selection rules, Intercalation, Phonons, Reprints, Methyl groups.

in the present brief review the authors would like to present three topics which have in common that the materials under study are molecular crystals and that their properties have been investigated by neutron scattering. The first two are of relatively recent interest and enjoy substantial international activity (rotational motions in the solid and interactions of Intercalated species in graphite). The third, the measurement of phonons in molecular crystals, is of rather older vintage. The example chosen here is of a rather more complicated system, ammonium perchlorate, than usually encountered in the literature, but one in which interesting group theoretical rules are used as an aid in the identification of the observed phonon groups.

00,159

PB93-166452 Not available NTiS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Molecular Dynamical Studies of Energy Transport

and Energy Sharing in Molecular Dissociation.

Final rept.
D. H. Tsai. 1990, 25p.
Pub. in NATO ASI Ser., Ser. C 309, p229-253 1990.

Keywords: *Dissociation, *Detonation, Diatomic molecules, Molecular crystals, Energy transfer, Mathematical models, Shock waves, Simulation, Reprints, Molecular dynamics, Energetic materials.

The authors discuss their simulation studies of the dissociation of a diatomic molecular crystal by the method of molecular dynamics. Their objectives were method of molecular dynamics. Their objectives were to determine the dynamical properties of the model, to ascertain that they were realistic, and to Investigate the mechanisms of energy transfer and energy sharing in such a system. The results showed that when the energy release was endothermic, the kinetics of the model followed the Arrhenius relation, consistent with thermodynamic considerations. These results, moreover, remained consistent when three-body interactions were introduced. When the energy release was exothermic, the dissociation reaction proceeded rapidly to completion, and the results showed the details of thermal initiation and various energy transfer procof thermal initiation and various energy transfer proc-esses among the molecules and the products, as well as other effects such as Induction time, 'caging,' etc. The authors were also able to examine the energy re-laxation process when the vibrational degree of freedom alone was heated. These results suggest that molecular dynamics may be further developed into a tool for detonation research from an atomistic viewpoint.

00.160

PB93-166460 Not available NTiS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Chemical Kinetic Data Base for RDX Combustion. Final rept.

W. Tsang. 1989, 9p. Pub. in Proceedings of JANNAF Combustion Meeting (26th), Pasadena, CA., 1989, p93-101.

Keywords: *Reaction kinetics, *RDX, *Propellants, *Combustion, Temperature dependence, information systems, Chemical reactions, Computenzed simulation, Reprints.

The status of the work on the development of an evaluated gas phase chemical kinetic data base for use in the computer simulation of propellant combustion is re-viewed. The author's initial efforts are aimed at the gas phase reactions in RDX decomposition. All the possible reactions involving 28 of the most likely com-pounds present in such systems will be considered. The work includes the collection and evaluation of mechanistic and rate information and the use of various methods for the extrapolation and estimation of rate data where information does not exist. The conditions covered range from 500-2500 K and 10 to the 17th power to 10 to the 22nd power particles/cu cm. The results of the first year's effort leads to coverage of all pertinent reactions of the following species; H, H2, H2O, O, H, OH, HCHO, CHO, CO, NO, NO2, HNO, HNO2, HCN, N2O and a number of reactions Involving CN.

00,161

PB93-166478 Not available NTiS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Mechanisms for the Formation and Destruction of

Chlorinated Organic Products of Incomplete Combustlon.

Final rept

W. Tsang. 1990, 18p.
Pub. In Combustion Science and Technology 74, n1-6 p99-116 1990.

Keywords: *Reaction kinetics, *Inclnerators, *Chlorine organic compounds, *Combustion, *Waste disposal, Hazardous materials, Thermodynamic properties, Reprints, Bond energies.

The paper is concerned with the chemical kinetic basis for the formation and destruction of by-products during the Inclineration of hazardous wastes. Special attention is focussed on the chlorinated organics since certain classes of such compounds are frequently detected in Incinerator effluents. The approach is to concentrate on single step elementary processes and to use the existing chemical kinetic data base for hydrocarbon combustion as a starting point. The authors begin by listing available thermodynamic and kinetic data bear-Ing on the processes of importance during incineration. This information is then used to examine the possible reaction pathways. Although definitive results can only be obtained from detailed modeling, the analysis demonstrates the importance of the nature of the reaction mixture. An important variable is the ratio of hydrogen to chlorine and when this ratio is low, chlorination of unburnt hydrocarbons is an important source of unde-sirable side products. It is expected that PIC formation will be greatest under pyrolytic conditions. This illustrates the importance of proper mixing. Extensions to other systems are considered.

00,162 PB93-166577

PB93-166577 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Chemical Kinetics and Thermo-

Single Pulse Shock Tube Studies on the Thermal Decomposition of n-Butyl Phenyl Ether, n-Pentylbenzene and Phenotole and the Heat of Formation of Phenoxy and Benzyl Radicals.

J. A. Walker, and W. Tsang. 1990, 4p. Pub. in Jni. of Physical Chemistry 94, n8 p3324-3327

Keywords: *Decomposition reactions, *Ethers, *Aromatic hydrocarbons, *Free radicals, *Shock tubes, *Reaction kinetics, Heat of formation, Activation energy, Chemical bonds, Dissociation energy, Reprints.

n-Butyl phenyl ether, n-pentylbenzene and phenotole have been decomposed in single pulse shock tube experiments. The main reaction for all these processes penments. The main reaction for all these processes involves bond cleavage leading to the formation of alkyl and resonance stabilized radicals. In the case of n-butyl phenyl ether decomposition, a molecular mechanism involving the direct formation of 1-butene has also been detected. The assumption that the primary C-H bond strength for butane is 421.5 kJ/mol leads to heats of formation of the phenoxy radical of 55.3 kJ/mol and that of benzyl radical, 203 kJ/mol. The A-factors for the bond cleavage reactions are all significantly tors for the bond cleavage reactions are all significantly higher than previously reported for analogous proc-

CHEMISTRY

Physical & Theoretical Chemistry

esses. In the case of the benzyl forming process they are now in accord with combination rates and the geometric mean rule.

00,163 PB93-173409 PC A05/MF A01
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Standard Reference Data.
NIST Standard Reference Data Products Catalog,

Special pub. (Final).
M. W. Chase, and J. C. Sauerwein. Jan 93, 87p,
NIST/SP-782-ED-1993.
Supersedes PB92-149764. Also available from Supt.
of Docs. as SN003-003-03192-5. See also PB92-181163.

Keywords: *Catalogs(Publications), *Data bases, Chemical analysis, Atomic physics, Biotechnology, Re-action kinetics, Molecular structure, Molecular spec-Thermophysical Thermochemistry, Thermodynamics, Numerical data, Software tools, Fluids, *Standard reference data.

The National Institute of Standards and Technology's (NIST) Standard Reference Data Program provides reliable, well-documented data to scientists and engineers for use in technical problem-solving, research, and development. The catalog lists published data compilations and current databases in the Standard Reference Database Series. The edition of the catalog contains many new databases and updates current ones. These data compilations have been subdivided into eight categories. Prices and ordering Information are located at the back of the document.

00,164 PB**93-173417** PB93-173417 PC A14/MF A03
National Inst. of Standards and Technology (CSTL),
Boulder, CO. Thermophysics Div. Tables of Experimental Data Used for the Correla-tion of the Thermophysical Properties of Ethane.

D. G. Friend, J. F. Ely, and H. Ingham. Jan 93, 306p, NISTIR-3953

Keywords: *Ethane, *Thermophysical properties, Thermodynamic properties, Ideal gas, Tables(Data), Specific heat, Liquid phases, Transport properties, Pressure dependence, Vapor pressure, Viscosity.

The authors tabulate experimental data for the thermophysical properties of ethane from an extensive selection of the published literature. The report provides a complete tabulation of the data on ethane propertles which were used in the development of correlat-ing equations for the fluid state properties. The tables give comparisons between the correlations and the data as well as the weight which was assigned to each point in the development of the correlations. The properties include pressure and densities of the saturated liquid and vapor, the PVT relationship in the single phase, isochoric and isobaric heat capacities, sound speed, viscosity, and thermal conductivity. The general range of the data is from the triple point, near 90.4 K and 1.1 MPa, to about 625 K with pressures to about 100 MPa.

00,165 PB93-173482 PC A17/MF A04 National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. CSTL Technical Activities 1992. H. G. Semerjian. May 93, 395p, NISTIR-5111.

Keywords: *Research, *Chemistry, Biochemistry, Biochenlogy, Chemical engineering, Reaction kinetics, Thermodynamics, Inorganic compounds, Technology transfer, Measurement, Thermophysics, Analytical techniques, Organic compounds, Surface chemistry, Processing, Microanalysis, *Chemical Science and Technology Laboratory, Standard reference materials.

The expanded responsibilities the authors were given nearly five years ago in becoming the National Institute of Standards and Technology have provided the authors with a significant challenge. The authors were instructed to more directly couple the research with industrial needs in the United States, while continuing to provide: the national system of chemical and physlcal measurements, the fundamental research base for tomorrow's chemical science and technology, and a national reference laboratory to address critical problems related to public health and safety. With these goals in mind, the report contains research from the Biotechnology Division; Chemical Engineering Division; Chemical Kinetics and Thermodynamics Division;

Inorganic Analytical Research Division; Organic Analytical Research Division; Process Measurements Division; Surface and Microanalysis Science Division; and Thermophysics Division.

00,166 PB9**3-191658** PC A06/MF A02 Department of Energy, Washington, DC. Chemical Sciences Div. EXAM: A Two-State Thermodynamic Analysis Program.
Technical note (Final).
W. H. Kirchhoff. Mar 93, 114p, NIST/TN-1401.
Also available from Supt. of Docs. as SN003-003-03209-3. Sponsored by National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology

Keywords: *Thermodynamics, *Protein denaturation, Calonmetry, Spectroscopy, Lipids, Oligonucleotides, Chemical models, Enthalpy, *EXAM computer pro-

EXAM is a computer program written for the analysis of data from calonmetric or spectroscopic data on the denaturation of proteins, oligonucleotides, lipids and other macromolecules in terms of a two-state model of thermodynamic equilibrium.

00,167 PB93-196244 (Order as PB93-196228, PC A07/ MF A02) National Inst. of Standards and Technology, Gaithersburg, MD.
Optimizing Complex Kinetics Experiments Using Least-Squares Methods.

A. Fahr, W. Braun, and M. J. Kurylo. 1993, 10p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n2 p181-190 Mar/

Keywords: *Reaction kinetics, *Computerized simulation, Least squares method, Atmospheric chemistry, Free radicals, Experimental design, Optimization, Acuchem computer program, Methylperoxy radicals, Hydroperoxy radicals.

Complex kinetic problems are generally modeled employing numerical integration routines. The authors' kinetics modeling program, Acuchem, has been modified to fit rate constants and absorption coefficients generically to real or synthesized 'laboratory data' via a least-squares Iterative procedure written for personal computers. To test the model and method of analysis the self- and cross-combination reactions of HO2 and CH3O2 radicals of importance in atmospheric chem-Istry are examined. These radicals as well as other species absorb ultraviolet radiation. The resultant absorption signal is measured in the laboratory and compared with a modeled signal to obtain the best-fit to various kinetic parameters. The modified program generates synthetic data with added random noise. An analysis of the synthetic data leads to an optimization of the experimental design and best-values for certain rate constants and absorption coefficients.

Polymer Chemistry

PB93-150787 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Molecular Weight Dependence of Mobility in Polymer Blends.

Final rept. Y. Feng, C. C. Han, M. Takenaka, and T. Hashimoto.

1992, 11p. Pub. in Polymer 33, n13 p2729-2739 1992.

Keywords: *Molecular weight, *Polymers, *Mobility, Blends, Copolymers, Light scattering, Polystyrene, Transport properties, Diffusion coefficient, Polybutadiene, Vinyl ether resins, Styrene butadlene resins, Polyisoprene, Reprints.

The molecular weight dependence of mobility in polystyrene/poly(vinyl methyl ether) blends (PS/PVME), in polybutadiene/styrene-butadiene random copolymer (PB/SBR) blends and in polyisoprene/styrene-buta-diene random copolymer (PI/SBR) blends has been studied by time resolved light scattering. In the case

of PS/PVME, blend samples were quenched from an initial equilibrium temperature, close to the critical temperature, to a final temperature which is deeper in the miscible region. The decay of concentration fluctua-tions was measured, and the interdiffusion coefficient was deduced, then mobilities were calculated. In the PB/SBR and PI/SBR blends, samples were homog-enized by uniaxial compression and interdiffusion coefficients were obtained through time resolved light scattening measurement in the early stage of spinodal de-composition. It is clear from our results that mobility can be represented by the vacancy model at lower mo-lecular weights but shows deviation towards the incompressible model at higher molecular weights. The converse can also be said. The overall molecular weight dependence of the mobility can be well represented by the Akcasu-Naegele-Klein equation.

00,169 PB9**3-151116** PB93-151116 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Critical Dynamics of an Asymmetric Binary Poly-

mer Mixture.

Final rept

D. W. Hair, E. K. Hobbie, J. Douglas, and C. C. Han. 1992, 4p. Pub. in Physical Review Letters 68, n16 p2476-2479,

20 Apr 92.

Keywords: *Polymer blends, Light scattering, Binary mixtures, Diffusion, Reprints, Critical dynamics.

The critical dynamics near the consolute point of a rel-The critical dynamics near the consolute point of a relatively low molecular weight asymmetric critical binary polymer mixture is studied with dynamic light scattering. In contrast to a single exponential decay showing a critical slowing down, as has been reported for another low molecular weight polymer blend, we observe both a 'fast' and a 'slow' relaxation rate. The critical slowing down of the concentration fluctuations is seen to be contained in these two modes.

00,170 PB93-151272 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.

Chain Conformation of Block Copolymers in Dilute Solutions Measured by Small-Angle Neutron Scattering. Final rept.

Y. Matsushita, K. Shimizu, I. Noda, T. Chang, and C. C. Han. 1992, 4p. Pub. in Polymer 33, n11 p2412-2415 1992.

Keywords: *Small angle scattering, *Block polymers, *Copolymers, *Polystyrene, Polymers, Molecular structure, Neutron scattering, Solutions, Solvents, Chemical composition, Reprints, *Molecular conformation, Poly(pyridine/vinyl).

Chain dimensions of the polystyrene-d8 parts of a styrene-d8-2-vinylpyridine block copolymer (DP-33) and a styrene-d8-styrene-h8 block copolymer (DH-44), both with 50:50 compositions, were measured in dilute solutions of pyridine (a common good solvent), benzene (a selective solvent), and methyl ethyl ketone (a poor solvent) by small-angle neutron scattering. The conformation of one block chain within a diblock conformation of the block conformation of t polymer is not affected by the existence of another block chain, regardless of the solvent power, at least when the composition of the diblock copolymer is 50:50, and the molecular weight is not high.

PB93-151322 Not available NTIS
National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Rheometer with Two-Dimensional Area Detection for Light Scattering Studies of Polymer Meits and

Solutions. Final rept.

A. Nakatani, D. Waldow, and C. Han. 1992, 9p. Pub. in Review of Scientific Instruments 63, n7 p3590-

Keywords: *Rheometers, *Polymer blends, *Polymers, *Light scattering, Charge coupled devices, Two dimensional, Polybutadiene, Polystyrene, Photometers, Solutions, Melts, Reprints.

A combined rheometer and light scattering photometer has been constructed to examine the light scattering behavior of polymer melts and solutions under the in-fluence of a simple shear field. The device uses a speclal lens system and a two-dimensional charge-cou-

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pled device array detector, which has not been used previously in an apparatus of this type, to quantitatively measure the scattering intensity as a function of shear rate. The accessible q range of the instrument is from 3.75X10(sup -4) to 3.0X10(sup -3)/nm (2.2 deg-17.4 deg scattering angle, with lambda=632.8 nm). The rhedeg scattering angle, with lambda=632.8 nm). The rheometer uses a cone and plate geometry to generate the shear gradient and is capable of measuring torque (1.8 N m maximum) and normal forces (50 N maximum). An 8% solution of 50:50 polystyrene/polybutadiene blend in dioctyl phthalate was used to test the apparatus. This sample shows a shear-induced mixing behavior which is consistent with previous measurements by other investigators.

PB93-151330 Not available NTIS National inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Marriage of Exact Enumeration and 1/d Expansion Methods: Lattice Model of Dilute Polymers.

Final rept. A. M. Nemlrovsky, K. Freed, T. Ishinabe, and J.

Douglas. 1992, 26p. Pub. In Jnl. of Statistical Physics 67, n5-6 p1083-1108

Keywords: *Polymers, Partition functions, Series expansion, Enumeration, Reprints, Self-avoiding walks, Hypercubic lattices.

We consider the properties of a self-avoiding polymer chain with nearest-neighbor contact energy epsilon on a d-dimensional hypercubic lattice. General theoretical arguments enable us to prescribe the exact analytic form of the n-segment chain partition function C(n), and unknown coefficients for chains of up to 11 segments are determined using exact enumeration data in d=2-6. This exact form provides the main ingredient to produce a large-n expansion in 1/d of the chain free energy through fifth order with the full dependence on the contact energy retained. The epsllon-dependent chain connectivity constant and free energy amplitude are evaluated within the 1/d expansion to O(d(sup -5)). Our general formulation includes for the first time selfavoiding walks, neighbor-avoiding walks, theta, and collapsed chains as particular limiting cases.

PB93-151678 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Crystaliographic Defects in Polymers and What They Do. Final rept. D. H. Reneker, and J. Mazur. 1989, 4p Pub. In Polymer Preprints 30, n2 p59-62 Sep 89.

Keywords: *Polyethylene, *Crystal defects, Defects(Materials), Vacancies(Crystal defects), Screw dislocations, Polymers, Reprints.

A family of 5 crystallographic defects, characterized by a defect loop that encircles one chain, were described. The present description is restricted to defects in polyethylene. This concept, however, can be applied to other crystalline polymers. The interactions of the defects with themselves and with each other are described. Interactions with larger defects of all sorts make it easier to examine the conformational and dynamical properties of vacancies, entanglements, folds, side branches, and larger edge or screw dislocation loops in the crystal. The use of these crystallographic defects to examine the nature of an entanglement in polyethylene consisting of two chains hooked together like two halrpins is described.

PB93-151785 Not available NTIS National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Polymers Div. Radical Polymerization of Expandable Oxaspiro Monomers. Finai rept.

J. W. Stansbury. 1992, 33p. Pub. In Expanding Monomers: Synthesis, Character-Ization, and Applications, Chapter 4, p153-185 1992.

*Polymerization, Keywords: *Free *Monomers, Molecular structure, Performance evaluation, Expansion, Reviews, Oxygen organic compounds, Reprints, *Oxaspiro compounds.

All conventional monomers are prone to varying degrees of volume contraction during polymerization. For many polymer applications, the shrinkage results in deficiencies which significantly limit the utility and per-formance of the resulting materials. The development of oxaspiro compounds capable of double ning-opening polymenzation has allowed unique access to monomers which offer volume expansion on polymerization. Unsaturated spiro orthocarbonates and orthoesters have been utilized to obtain double ringopening polymerization via free radical pathways. This review was compiled to document the history and current state of research involving free radical ring-opening polymerization with expansion.

PB93-151959 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.
Polymer Self-Diffusion in Nai-Poly(ethylene oxide)

Electrolytes.

Final rept.
E. S. Wu, J. H. Shibata, and F. W. Wang. 1992, 7p. Pub. in Polymer 33, n5 p1014-1020 1992.

Keywords: *Polyoxyethylene, *Diffusion coefficient, *Electrolytes, Temperature dependence, Phase transformations, Phase diagrams, Activation energy, Reprints, *Self diffusion.

Using the technique of fluorescence recovery after photobleaching we have measured the self-diffusion coefficients (D) of poly(ethylene oxide) (PEO) in Nai-PEO electrolytes. From the temperature dependence of the D values, the activation energy of self-diffusion was obtained. It has the same salt concentration dependence as the activation energy of lonic conductivity, suggesting that polymer segmental mobility is essential for ion transport in NaI-PEO electrolytes. The PEO diffusion rate was reduced significantly at low salt concentration, but raising the Nal concentration beyond 6 mol% resulted in only slight changes in D val-ues. The concentration dependence of D was Interpreted in terms of the interactions between PEO and sodium ions. From the response of D and the immobile fraction of PEO molecules to temperature and com-position changes, several features in the Nal-PEO phase diagram were elucldated.

PB93-153526 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Phase Behavior of an Off-Critical Polymer Blend Solution during Steady Shear Studied by Small Angle Neutron Scattering. Final rept.

A. i. Nakatani, Y. B. Ban, and C. Han. 1992, 2p.
Pub. in ACS (American Chemical Society) Polymeric Materials and Science Engineering 67, p327-328

Keywords: *Small angle scattering, *Polymers, *Phase studies, Critical point, Blends, Molecular weight, Thermodynamic properties, Steady state, Shear properties, Shear rate, Temperature, Reprints.

The behavior of critical mixtures of polymer blends under the Influence of a steady shear field has been examined previously for both low and high molecular weight blends. While an understanding of behavlor at or near the critical point is important, the critical com-position represents only a very small portion of the entire phase diagram. However, studies of off-critical mixtures are infrequently performed. We will discuss the small angle neutron scattering behavior of an off-critical blend solution during steady shear as a function of shear rate and temperature. The apparent shift In the spinodal temperature as a function of shear rate and the critical q value where concentration fluctua-tions are suppressed as a function of shear rate show qualitatively different behavlor than what Is observed in critical mixtures. The differences In this behavior will be detalled and possible explanations for the dif-ferences in behavior will be discussed.

PB93-166197 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.

Synthesis and Evaluation of New Oxaspiro Monomers for Double Ring-Opening Polymerization. Final rept.

J. W. Stansbury. 1992, 5p. Pub. In Jnl. of Dental Research 71, n7 p1408-1412 Jui

*Polymerization, Keywords: *Monomers, *Polycarbonate resins, Dental materials, Chemical bonds, Curing, Comparison, Crosslinking, Reprints, Chemical reaction mechanisms.

Polymerization with expansion in volume can be achieved with spiro orthocarbonate monomers through a double ring-opening process wherein two bonds are cleaved for each new bond formed. The resulting expansion can be applied to counter the polymerization shrinkage associated with the conventional methacrylate monomers used in dental composites and thereby provide formulations with drastically reduced degrees of shrinkage. New monomers have been prepared that exhibit enhanced reactivities and ring-opening effi-ciencies compared with earlier free-radical-polymerizable oxaspiro compounds. In dental composite formulations, the monofunctional oxaspiro monomers provided DTS values equivalent to those of the controls under certain curing conditions; however, only modest reductions in polymerization shrinkage were observed. 2,3-Bis(methylene)spiro orthocarbonate monomers conjugated diene structure were also synthesized and evaluated.

PB93-166536 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. 13C NMR Studies of Polymorphy in Isotactic Polystyrene. Final rept. D. L. VanderHart, G. B. McKenna, and E. Perez. 1989, 2p. See also PB89-101737. Pub. in Polymer Preprints 30, n2 p303-304 Sep 89.

00 178

Keywords: *Nuclear magnetic *Polystyrene, *Crystal structure, *Polymorphism, Carbon 13, Isotopic labeling, Spectrum analysis, Crystallization, Crystal lattices, Gels, Reprints, Cyclooctane.

(13)C spectra taken with magic angle spinning and proton decoupling are often sensitive to the degree of organization in the solid state. It is typical that resonances associated with crystalline phases are sharper than those which anse from disordered, non-crystalline regions. Different crystalline forms produce contrasting spectra. A 3(sub1) helical chain conformation characterizes the crystals in melt crystallized isotactic polystyrene (iPS). In iPS/decalin gels ordered domains are presumed to possess the extended chaln conformation, based largely on observations on died gels. In addition, iPS will crystallize into extended chaln crystals when exposed to the vapors of certain solvents like cyclohexane. In the paper, the authors report on (13)C NMR spectra of melt crystallized iPS, gels (and dried gels) of iPS In trans-decalin, and vapor-induced crystals formed in the presence of cyclooctane. Some comparison of the relative degree of order in each of these systems is possible. Also, a technique based on proton spln diffusion, will be discussed which enables one to determine if the cyclooctane is found inside the iPS crystal lattice.

CIVIL ENGINEERING

Construction Equipment, Materials, & Supplies

00,179 PB93-125904 Not available NTIS National inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div.
Analysis of the Aggregate-Cement Paste interface Using Grazing incidence X-ray Scattering. Final rept. P. J. M. Monterio, and C. P. Ostertag. 1989, 2p.

Pub. In Cement and Concrete Research 19, n6 p987-988 Nov 89.

Keywords: *Concrete durability, *X-ray diffraction, *Substrates, Thin films, Interfaces, Nondestructive tests, Aggregates, Composite structures, Microstructure, Composition(Property), Cements, Reprints.

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The grating incidence x-ray diffraction method was used to characterize the microstructure of the thin fiber that exists at the aggregate-cement paste interface where a composite specimen was used. This technique does not allow scattering from the substrate and depth profiling and permits the characterization of very thin films (angstroms thick).

PB93-139020 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Methods for Predicting Remaining Life of Concrete

in Structures. J. R. Clifton, and J. M. Pommersheim. Nov 92, 31p,

NISTIR-4954. Prepared in Lewisburg, PA. cooperation with Bucknell Univ.,

Keywords: *Concrete structures, *Service life, *Estimating, *Concrete durability, Corrosion, Life(Durability), Diffusion, Mathematical models, Degradation, Reaction time, Reinforced concrete.

The ability to predict the remaining life of concrete structures is becoming increasingly important as the nation's infrastructure ages. Decisions on whether to repair or to demolish structures may depend on the estimated remaining life. Little attention has been given to developing methods for predicting remaining service lives, with most of the reported work dealing with corrosion of concrete reinforcement. These methods primanly involve the use of mathematical models and lifetime extrapolations based on corrosion current measurements. Predicting remaining service life usually involves making some type of time extrapolation from the present state of the concrete to the end-of-life state. The application of the time order concept in making time extrapolations is described in this report. Also, ways to determine the value of n (time order) in the time function t(expn) of degradation rate relationships are given. Use of the time order approach is demonstrated for n=1/2, 1, and 2. Ways to apply the approach to cyclic processes and multi-degradation processes are also discussed. Situations may be encountered in which the remaining service life of concrete can only be estimated by predicting its original life using a service-life model. Such a situation could arise where the concrete can not be inspected or samples taken, due to its inaccessibility or to potential serious hazards involved with its inspection. An approach for applying this method is discussed.

PB93-153815 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Structures Div. Impact-Echo Response of Plates Containing Thin Layers and Volds.

Final rept.
M. Sansalone, Y. Lin, and N. J. Carino. 1990, 8p.
Contract CES-8816688 Sponsored by National Science Foundation, Washing-

ton, DC.
Pub. In Review of Progress in Quantitative Non-destructive Evaluation, v9 p1935-1942 1990.

Keywords: *Nondestructive tests, *Concrete structures, *Plates(Structural members), Impact tests, Stress analysis, Inspection, Voids, Wave propagation, Concrete durability, Finite element method, Reprints, *Impact-echo method.

A technique called impact-echo has been developed for nondestructive testing of concrete structures. The method is based on the interaction of impact-generated stress waves with internal discontinuities and specimen boundaries. This paper summarizes the results of finite element studies performed to investigate the feasibility of using the method for the inspection of civil structures containing thin layers of acoustically dissimilar materials and voids. Axisymmetric models of layered plates subject to point impact were analyzed. The numerical solutions indicated that a void below a thin layer could be detected by the impact-echo method. The analytical conclusions were verified by expenmental results obtained from concrete specimens containing grouted and ungrouted tendon ducts. It was shown that the impact-echo method could readily distinguish between grouted and ungrouted metal or plastic tendon ducts.

00,182 PB93-157451 PC A04/MF A01 National inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Applicability of the Maturity Method to High-Per-

formance Concrete. N. J. Canno, L. I. Knab, and J. R. Clifton. May 92, 67p, NISTIR-4819.

See also PB85-189199 and PB91-143321. Sponsored by Federal Highway Administration, McLean, VA. Office of Engineering and Highway Operations Research and Development, and Corps of Engineers, Washing-

Keywords: *High strength concretes, *Cunng, *Compressive strength, Concrete durability, Mixtures, Temperature effects, Mechanical properties, Regression analysis, Specifications, Mathematical models.

The study examines whether the maturity method is applicable to represent the strength development of high-performance concrete mixtures cured at different temperatures. Two mortar mixtures were Investigated having water to cementitious solids ratios of 0.29 and 0.36. The mixtures were made with Type I cement, silica fume (10% by mass of cement), and a high-range water reducing admixture. Ten batches of mortar were prepared to make cube specimens, which were cured under water at three temperatures: 7, 23, and 40 C. Compression strengths were measured at ages range. compression strengths were measured at ages ranging from 5 hours to 139 days. The strength-age data were analyzed using three models to determine the rate constant for strength development at each curing temperature. The models included two hyperbolic equations (linear and parabolic) and an exponential equation. The rate constant versus curing temperature relationship for each model was represented by a simrelationship for each model was represented by a sim-ple exponential equation, which was used to convert test ages to equivalent ages of curing at 23 C. The strength development of the various mortar batches could be described by a single equation relating rel-ative strength to equivalent age. Thus it was concluded that the maturity method is applicable to describe strength development of the low water-cement ratio mixtures. It was also observed that the estimated longterm strength of the batches did not appear to be affected by the curing temperature. This is in direct contrast with the known behavior of conventional concrete mixtures.

00,183 PB93-159051 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Computer Model for the Diffusion and Binding of Chloride lons in Portland Cement Paste.
D. P. Bentz, and E. J. Garboczi. Feb 93, 26p, See also PB91-187690 and PB92-126598.

Keywords: *Binding, *Chlondes, *Portland cements, Ionization, Adsorption, Chemical reactions, Mathematical models, Digital simulation, Microstructure, Diffusion, Hydration, Electron microscopes, *Cement pastes.

A two-dimensional computer model has been developed to simulate the diffusion and binding of chloride ions in cement paste. The model is based on a random walk algorithm in which chloride species randomly diffuse throughout the cement paste microstructure and interact with various phases of the paste. Reaction with unhydrated C3A and C4AF and adsorption by the C-S-H gel phase are the two binding processes included in the model. Input to the model is a digital Image of cement paste microstructure which can be obtained from a real cement sample or from a digital-imagebased microstructure model. The operation of the diffusion and binding model is demonstrated on pastes made from two cements whose differing compositions are captured by combining backscattered electron and x-ray images obtained using a scanning electron microscope. These initial images are 'hydrated' using the microstructure model to produce final images to be utilized as input into the diffusion model. Chloride con-centration profiles are generated for both the binding and no-binding cases for both microstructures for times of up to several hours after exposure to the chloride.

00.184 PB93-166247 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Building Materials Div. Standard Aggregate Materials for Alkali-Silica Reaction Studies.

Final rept. L. J. Struble, and M. Brockman. 1989, 5p. See also PB89-193221.

Pub. in Proceedings of the International Conference on Alkali-Aggregate Reaction (8th), Kyoto, p433-437 1989.

Keywords: *Aggregates, *Alkali aggregate reactions, *Mortars(Material), Cements, Concrete durability, Glass, Limestone, Sands, Silicate cements, Silicon dioxide, Chemical reactions, Reprints.

Preliminary studies were carried out to identify candidate materials that may be used in place of Pyrex glass as a standard reactive aggregate in alkall-silica investigations. The various candidate materials were tested for expansion in mortars prepared using either a high-alkali or a low-alkali cement, a nonreactive limestone sand, and some reactive material. The reactive aggregates studied included several commercial glasses, an opal, and a calcined flint. The proportion of limestone replaced by each reactive material was varied so as to bracket the pessimum level of each mavaried so to brace the pession levels were measured over periods of approximately 6 months to 2 years. Based on these studies, four of the materials are identified as potential candidates as standard reactive materials. rials in mortar-bar expansion studies: Vycor, fused quartz, fused silica, and calcined flint; the calcined flint appears especially promising.

00,185
PB93-166254 Not available NTIS
National Inst. of Standards and Technology (NEL),
Gaithersburg, MD. Building Materials Div.
Standard Cement Clinkers for Phase Analysis. Final rept.

P. Stutzman, S. Lenker, H. Kanare, L. Strubble, F. Tang, and D. Campbell. 1989, 15p.
Pub. in Proceedings of the International Conference on

Cement Microscopy (11th), New Orleans, LA., April 10-13, 1989, p154-168.

Keywords: *Clinker, *Image analysis, *Microscopy, Xray diffraction, Portland cements, Standards, Porosity, Test methods, Crystal structure, Crystallography, Reprints.

Three portland cement clinkers with known phase abundance have been produced. The clinkers provide standard materials that may be used in developing and testing techniques for quantitative phase analysis. The clinkers are available as research materials; they may later be issued as Standard Reference Materials after additional analyses. The clinkers have been analyzed using reflected light microscopy, scanning electron microscopy and X-ray powder diffraction. In this paper, the authors describe the fabric (i.e., porosity, mineralogy, crystal type, size, morphology and distribution) of each clinker, and the phase abundance determined using each method.

PB93-178630 PC A07/MF A02 National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.

Performance of Electromagnetic Covermeters for Nondestructive Assessment of Steel Reinforcement. Final rept.

N. J. Canno. Dec 92, 131p, NISTIR-4988.

Keywords: *Reinforcing steels, *Reinforced concrete, *Eddy current tests, Concrete durability, Non-destructive tests, Electromagnetic tests, Electromagnetic fields, Eddy currents, Experimental data, Covermeters.

Covermeters are electromagnetic devices for locating steel reinforcing bars in concrete structures. An expenmental study was carried out to compare the basic characteristics of two types of commercial covermeters (magnetic reluctance and eddy current). Experiments were carried out using single bars and multiple bars with various configurations. One group of single-bar tests studied the relationships between meter reading and cover thickness. Empirical equations were fitted to the data, and the values of the equation parameters were found to be relatively Insensitive to the bar size. The other group of single-bar tests examined the relationship between meter reading and horizontal distance between the meter probe and the bar axis (offset). Data were fitted with a bell shaped, quadratic exponential function. The parameter characterizing the decay of the meter reading with offset was found to depend on the cover in a well-defined manner. The parameter was used to characterize the differences in the influence zones of the probes. Tests with multiple, par-allel bars were conducted to determine the critical spacings below which the location of the individual bars could not be discemed and below which the meter amplitude exceeded the single-bar value. A simple summation model was used to predict the response based on the individual-bar response.

Soil & Rock Mechanics

00,187 PB93-198885 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Highway Concrete (HWYCON) Expert System Requirements and installation Guide.
L. J. Kaetzel. May 93, 32p, NISTIR-5190.

Keywords: *Concretes, *Expert systems, *Highway maintenance, *Information systems, Concrete durability, Road materials, Pavement condition, Bridge decks, Maintenance management, Concrete pavements, Pavement damage.

A computerized system that contains knowledge about materials related activities for highway concrete structures has been developed. The system, named HWYCON (HighWaY CONcrete), was developed by the National Institute of Standards and Technology in Gaithersburg, MD. HWYCON was developed for the Strategic Highway Research Program's Project C-206, 'Optimization of Highway Concrete Technology'. The knowledge contained in HWYCON consists of facts, rules of thumb, photographs, drawings, and bibliographic references. The system is designed to assist highway departments in diagnosing distresses, selecting materials, and making repair and rehabilitation de-clsions related to highway concrete pavements, bridge decks, and bridge substructures. The document was written to identify the contents of the HWYCON Implementation package, and to provide information on the requirements and installation of the computerized sys-

00,188 PB94-111424 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Computational Materials Science of Cement-Based Materials: An Education Module.

Technical note.
D. P. Bentz, E. J. Garboczl, and R. T. Coverdale.

Aug 93, 46p, NIST/TN-1405. Also available from Supt. of Docs. as SN003-003-03229-8. See also PB92-148253. Prepared in cooperation with Northwestern Univ., Evanston, IL.

Keywords: *Cements, *Hydration, *Microstructure, *Computerized simulation, *Education, Manuals, Porosity, Porisimeters, Materials, Civil engineering, Software(Computers).

An education module demonstrating the principles of computational materials science has been developed. The module consists of: software that executes on a personal computer, and this NIST Technical Note, which provides documentation and instructions for using the computer software. The computer programs are available for both DOS-compatible PC and Mac-intosh computing environments. Four separate contents of the development of puter programs illustrate the development of microstructure during cement hydration, mercury intru-sion porosimetry, percolation of overlapping ellipses and rectangles as a function of aspect ratio, and percolation of non-overlapping hard cores each encom-passed by a soft overlapping shell.

00,189 PB9**4-112802** PC A03/MF A01 National Inst. of Standards and Technology (BFRL),

Gaithersburg, MD.
Calculating Cement Paste and Mortar Diffusivity from Conductivity Measurements: Preliminary Results of a New Method.

K. A. Snyder, and J. R. Clifton. Oct 93, 16p, NISTIR-

See also PB89-215362 and PB91-187690.

Keywords: *Reinforced concrete, *Reinforcing steels, *Diffusivity, *Conductivity, *Concrete durability, Service life, Impedance, Water cement ratio, Spectroscopy, Mathematical models, Test methods, Cements, Mortars(Materials), Chlorine ions, Corrosion.

A method to determine the chloride diffusivity of concrete is being developed which is both expeditious and accurate. The method is based upon the Nernst-Einstein equation relating conductivity and diffusivity. Results from a single measurement can be used to calculate the diffusivity for any specified ion, given the 'free' diffusivity of that ion. The experimental procedure, along with preliminary results, are reported.

Highway Engineering

PB93-134104 PC A19/MF A04 National Inst. of Standards and Technology, Gaithersburg, MD. Proceedings of the U.S.-Japan Workshop on Seismic Retroilt of Bridges (1st). Held in Tsukuba Science City, Japan on December 17-18, 1990. 1990, 443p. See also PB93-134112.

Keywords: *Earthquake damage, *Meetings, *Reinforcement(Structure), *Highway bridges, Bridge peirs, Reinforced concrete, Japan, Failure, United States, Seismic effects, Bridge inspection, Design analysis, Structural engineering, Bridges(Structures), Bridge design, Ductility, Structural steels, California, Earthquake engineering, Damage assessment, Earthquakes, *Loma Prieta Earthquake, San quakes, *Loma Francisco(California).

Contents: History of Seismic Damage and Preparation of Selsmic Design Codes; Damage to San Francisco Bridges In the Loma Prieta Earthquake; Assessment Bridges in the Loria Frieta Earthquake, Assessment and Prioritization of Vulnerable Bridges; Inspection and Strengthening Methods for Reinforced Concrete Bridge Piers; Research on Seismic Retrofitting and Strengthening of Reinforced Concrete Bridge Piers; Research on Seismic Retrofitting and Strengthening.

PB93-134112 (Order as PB93-134104, PC A19/ MF A04)

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building and Fire Research Lab. Overview of Damage to Highway Bridges during the Loma Prieta Earthquake.

H. S. Lew. 1992, 30p.

Included in Proceedings of the U.S.-Japan Workshop on Seismic Retrofit of Bridges (1st), Tsukuba Science City, Japan, December 17-18, 1990, p111-139.

Keywords: *Highway bridges, *Earthquake damage, Damage assessment, Earthquakes, Bridge inspection, Earthquake engineering, Bridges(Structures), California, Seismic effects, Vladucts, Dynamic response, Structural engineering, Design analysis, *Loma Prieta Earthquake, San Francisco(California).

At 5:04 p.m., Pacific Daylight Time, on October 17, 1989, an earthquake with a surface-wave magnitude of 7.1 occurred with its epicenter located about 10 miles (15 km) northeast of Santa Cruz and 60 miles (95 km) south-southeast of San Francisco, California. According to the U.S. Geological Survey, the earthquake ruptured a segment of the San Andreas fault below the Santa Cruz Mountains. The hypocenter was about 11 miles (18 km) beneath the Earth's surface, and the rupture propagated about 25 miles (40 km) both northwest and southeast within a 10-second pe-nod. The earthquake was felt over an area of 400,000 square miles (1,000,000 sq km), from Los Angeles to the south, Oregon to the north, and western Nevada to the east. This earthquake, named the Loma Prieta earthquake, was the largest on the San Andreas fault since the great San Francisco earthquake of 1906 (M = 8.3) when a 275-mile (440-km) stretch of the fault ruptured. The report presents an overview of damage to highway bridge structures during the earthquake.

Soil & Rock Mechanics

PB93-158343 PC A05/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Effect of Subsurface Conditions on Earthquake Ground Motions. F. Y. Yokel. Jan 93, 95p, NISTIR-4769.

Keywords: *Earth movements, *Soil properties, *Selsmic waves, Earthquakes, Dynamic response, Wave propagation, Earthquake engineering, Spectra analysis, Mathematical models, Soil profiles, Shear strain, Loma Prieta Earthquake, Oakland(California).

The revised version of the SHAKE program was prepared and used to study the effects of subsurface conditions on the earthquake ground motion in the Loma Prieta earthquake. Preliminary soil profile data from the

sites of the Oakland Outer Harbor Wharf and Apeel 2 strong motion stations are used to calculate ground motions, which are then compared with the recorded ground motions using response spectra calculated for a 5% damping ratio. Parameters affecting the amplitude of the calculated ground motion are examined. Response Spectra for recorded and calculated ground motions are compared with recommended design spectra (NEHRP, 1988). It is shown that for periods less than 1.4 s the response spectra for recorded far source earthquake motions at Oakland Wharf and Apeel 2 fall outside the envelope of the applicable design spectra, and that response spectra for deeper soil profiles calculated for near source conditions exceed the design spectra by a considerable margin. Design spectra for the San Francisco Bay region, recently proposed in a USGS study, are reasonably close to the calculated near source spectra for deeper soil profiles for periods less than 1 s, but they are conservative for the bedrock motion, and extremely conservative for longer period structures.

00,193

PB93-178606 PC A05/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Estimating Soil Parameters important for Lifeline Siting Using System Identification Techniques. S. Glaser. Mar 93, 96p, NISTIR-5143.

Keywords: *Soil dynamics, *Liquefaction, *Earthquakes, Pipelines, Power lines, Railroads, Keywords: Telecommunication, Strain measurement, Seismic waves, Mathematical models, Earthquake engineering, System identification.

Liquefaction causes a large portion of all damage done by earthquakes. The damage is especially severe to lifeline structures such as pipelines. The report examlnes the state-of-the-art of the application of System Identification (SI) methods to the liquefaction problem, with special attention to lifelines. System identification Is seen as the best way to ascertain large strain soil properties in situ. A thorough introduction to SI methods and spectral analysis is given. The traditional Founer-based methods are found to be inexact since the sample variance is equal to the sample mean if averag-Ing techniques are not used. There is an additional problem since earthquake signals are not stationary. Autoregressive-moving average models are seen as a better analysis method, especially the newer adaptive methods that are designed for non-stationary signals.

00,194

PB93-178614 PC A06/MF A02

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Estimating in situ Liquefaction Potential and Permanent Ground Displacements Due to Liquefaction for the Siting of Lifelines.

S. Glaser. Mar 93, 108p, NISTIR-5150.

Keywords: *Liquefaction, *Earth movements, *Sands, *Earthquake resistant structures, Displacement, Soil mechanics, Seismic waves, Mathematical models, Earthquakes, Soil properties.

The report examines the state-of-the-art of two aspects of the liquefaction problem with special attention to lifelines. In situ methods of estimating liquefaction potential are studied, since it is believed to be impossible to test in the laboratory an 'undisturbed' sample of loose sand, which is most susceptible to liquefaction. The state-of-practice is the SPT-based method championed by Seed, although the velocity-based predictors have a stronger physical basis. The Spectral Analysis of Surface Waves technique is especially suited for examining the large areal extents of lifeline routes. The state-of-the-art for estimating permanent ground dis-placements is purely empirical. Several methods are examined, and they all appear to have equal predictive abilities - within a factor of four. There have been a few recent attempts to construct constitutive models for post-liquefaction displacements, but at the time they are in formative stages and have not been rigorously proven.

Combustion & Ignition

COMBUSTION. **ENGINES. & PROPELLANTS**

Combustion & Ignition

00,195 DE93003631 PC A04/MF A01 National inst. of Standards and Technology (CSTL), Gaithersburg, MD. Process Measurements Div Particulate and droplet diagnostics in spray combustion. Annual report. Progress rept. H. G. Semerjian, and C. Presser. Sep 91, 58p, DOE/ CE/90213-T7. Contract Al01-86CE90213 Sponsored by Department of Energy, Washington, DC.

Keywords: *Combustion, *Droplets, Alcohois, Atomization, Flames, Interferometry, Methanol, Progress Report, Research Programs, Size, Sprays, Velocity, EDB/ 400800.

During the past year, significant progress was made In four different areas: (a) measurement of droplet velocity distributions and time of arrival, (b) time-resolved measurement of droplet size with the ESPR technique, (c) study of the structure of methanol/dodecanol spray flames, and (d) comparison of droplet sizing techniques. Droplet velocity distributions and time of amval were obtained with a single-component laser velocimetry system to obtain detailed information on the transport of individual droplets. The polarization ratio technique is being developed to obtain time re-solved droplet sizes and number density in nonburning sprays. Droplet size and velocity measurements were obtained with phase/Doppier Interferometry for different mixtures of methanol and dodecanol to ascertain evidence of the occurrence of microexplosions in this two-component fueled spray flame. Finally, a comparative analysis of droplet-size and number density was carried out in a pressure-atomized spray using three droplet sizing techniques (i.e., ESPR, PDI and LID).

00,196 DE93003632 PC A04/MF A01 National Inst. of Standards and Technology (NEL), Galthersburg, MD. Chemical Process Metrology Div. Particulate and droplet diagnostics in spray combustion, Annual report. Progress rept. H. G. Semerjian, and C. Presser. Apr 90, 58p, DOE/ CE/90213-T6. Contract Al01-86CE90213 Sponsored by Department of Energy, Washington, DC.

Keywords: *Combustion, *Droplets, *Sprays, Flames, Interferometry, Progress Report, Research Programs, Size, Velocity, *Fuels, EDB/400800.

During the past year, significant progress was made In three different areas: measurement of droplet veloc-Ity distributions, applications of the polarization ratio sizing technique, and studies of fuel property effects on spray flame structure. Droplet velocity distributions were obtained with a single-component laser velocimetry system to obtain detailed information on the transport of Individual droplets. The polarization ratio technique is being developed to obtain instantaneous droplet sizes in nonbuming and buming sprays. Droplet size and velocity measurements were obtained with phase/Doppler Interferometry for four different fuels to ascertain the influence of physical properties of fuels on the size, number density and velocity of droplets found in spray flames.

00.197 DE93007989 PC A02/MF A01 National Inst. of Standards and Technology (CSTL), Gaithersburg, MD.

Time-based ensemble scattering measurements in

J. R. Zurlo, C. Presser, A. K. Gupta, and H. G. Semerjian. 1991, 6p. CONF-911099-2.
Contract Al01-86CE90213

Eastern section of the Combustion institute fall technical meeting: chemical and physical processes in combustion, Ithaca, NY (United States), 14-16 Oct 1991. Sponsored by Department of Energy, Washington, DC.

Keywords: *Sprays, *Light Scattering, *Meetings, Combustion, Density, Droplets, Gas Turbines, Herbicides, Kerosene, Particle Size, Pesticides, Rocket Engines, *Fuel sprays, EDB/400800, EDB/400102, EDB/ 6612Ó0.

Knowledge of droplet size In sprays Is important for spray combustion, pesticide and herbicide spraying, spray cooling, fire sprinklers, and many other Industrial applications. The importance of measuring and evaluating time-varying information in sprays can be critical to the performance of these spray systems. For example, gas turbine and rocket motor stability is dependent on suppression of combustor frequencies which alter the atomization characteristics of the spray. High-speed movies of the atomization process have shown that steady sprays are not uniform in time but can contain clusters of droplets. Droplet clustering may have significant ramifications in combustion applications for soot production. Another time-dependent phenomenon observed in airblast-atomized sprays is a rapid change in spray angle known as fluttering. To study such phenomena, an ensemble light scattering technique was used to obtain time-resolved Information on droplet mean size and number density in sprays where similar temporal features have been observed.

PB93-146702 PC A12/MF A03 Virginia Polytechnic Inst. and State Univ., Blacksburg. Generation of Carbon Monoxide in Compartment Doctoral thesis. D. T. Gottuk. Dec 92, 266p, NIST/GCR-92/619. Grant 60NANB1D1176 Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD.

Keywords: *Carbon monoxide, *Fire tests, *Solid fuels, *Combustion products, Reaction kinetics, Wood, Oxidation, Hexanes, Polyurethane, Plumes, Theses, 'Compartment fires.

A test compartment was used to investigate the burning of four fuels (hexane, PMMA, spruce, and flexible polyurethane foam) in compartment fires. Empirical correlations between the upper-layer yield of major species and the plume equivalence ratio were shown to exist. The results reveal that the production of CO is primarily dependent on the compartment flow dy-namics and upper layer temperature. A chemical ki-netic analysis indicated that increased compartment temperature affects upper-layer species yields in two ways: (1) the generation of species in the plume is changed, and (2) oxidation of post-flame gases in the layer is affected. The correlations developed in the compartment fires were qualitatively similar to those developed by Beyler for simplified upper-layer environments. The species yields downstream of hexane compartment fires were investigated and compared to upper-layer yields. Results showed that downstream CO yields can be correlated to the plume equivalence ratio when taking into account the occurrence of external burning.

PB93-149029 Not available NTIS American Chemical Society, Washington, DC. Journal of Physical and Chemical Reference Data, Volume 21, No. 3, May/June 1992. Bimonthly rept. D. R. Lide. c1992, 343p.
See also PB93-149037 and PB93-148997. Prepared In cooperation with American Inst. of Physics, New York. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD.
Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

00.199

Keywords: *Physical properties, *Chemical properties, *Physical chemistry, Combustion kinetics, Reaction kin netics, Vapor phases, Chemical reactions, Gases, Thermodynamics, Tables(Data), Listings, Reference materials.

Contents: Evaluated Kinetic Data for Combustion Mod-

PB93-149037 Not available NTIS
Leeds Univ. (England).
Evaluated Kinetic Data for Combustion Modelling.
D. L. Baulch, C. J. Cobos, R. A. Cox, T. Just, J. A.
Kerr, M. J. Piiling, J. Troe, R. W. Walker, J. Warnatz,
C. Esser, and P. Frank. c1992, 323p.
Prepared in cooperation with Goettingen Univ. (Germany, F.R.). Inst. fuer Physikalische Chemie, Natural

Not available NTIS

Environment Research Council, Swindon (England), Environment Research Council, Swindon (England), Stuttgart Univ. (Germany, F.R.). Inst. fuer Technische Verbrennung, and Deutsche Forschungsanstalt fuer Luft- und Raumfahrt e.V., Stuttgart (Germany, F.R.). Included In Jnl. of Physical and Chemical Reference Data, v21 n3 p411-734 May/Jun 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Machinette P. 20026 20026 Washington, DC. 20036-9976.

Keywords: *Combustion kinetics, *Reaction kinetics, *Vapor phases, Tables(Data), Gases, Chemical reactions, Thermodynamics.

The compilation contains critically evaluated kinetic data on elementary homogeneous gas phase chemical reactions for use in modelling combustion processes. Data sheets are presented for some 196 reactions. Each data sheet sets out relevant thermodynamic data, rate coefficient measurements, an assessment of the reliability of the data, references, and recommended rate parameters. Tables summarizing the preferred rate are also given. The reactions considered are limited largely to those Involved in the combustion of methane and ethane in air but a few reactions rel-evant to the chemistry of exhaust gases and to the combustion of aromatic compounds are also included.

00,201 PB9**3-182**0**38** PC A03/MF A01 National inst. of Standards and Technology (BFRL), Gaithersburg, MD. Programmer's Reference Gulde to FDMS File For-

mats. Internal rept.

PB93-149037

R. W. Portier. Apr 93, 45p, NiSTIR-5162.

Keywords: *Fire tests, *Data bases, *Information systems, Data processing, Calorimeters, Combustion, Management systems, Fires, Information retrieval, Data retrieval, *Fire Data Management System.

Fire Data Management System, FDMS, is a computer database specifically designed to store and retrieve fire test results. The guide provides detailed descriptions of the current, beta version, file formats as well as revisions planned for the immediate future.

00.202 PB93-183952 PC A18/MF A04 Swedish Fire Research Board, Stockholm. International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Sweden on May 5-8, 1992. V. Sjolin, D. D. Evans, and N. H. Jason. Sep 92, 412p.

See also PB93-124964. Sponsored by Department of Commerce, Washington, DC. Technology Administra-

Keywords: *Fire extinguishers, *Research, *Fire fighting, *Meetings, Fire protection, Combustion, Fire extinguishing agents, Sprinklers, Fire tests, International relations, *Foreign technology.

The conference was the first one to be entirely devoted to fire suppression research and from the beginning it was decided to have a broad program. Scientists, sponsors, and users were represented. To provide an environment that would enhance information exchange, the number of participants was limited to approximately thirty people. The conference goals were to: present ongoing or recently conducted research; present views on what type of projects, types of suppression research, etc., should be undertaken in the ruture; rank future research needs; stimulate an exchange of knowledge and provide a foundation for continuing this exchange in the future. To achieve these goals, the organizers invited individuals representing a broad range of technical expertise, experience, and responsibility in their respective organizations from around the world to submit abstracts. The response was overwhelming. Representatives from Canada, Finland, Germany, Norway, Sweden, United Kingdom and the United States were able to participate.

00.203 PB93-198893 PC A03/MF A01

Common Carrier & Satellite

Michlgan State Univ., East Lansing. Dept. of Mechanical Engineering.
Extinguishment of Combustible Porous Solids by

Water Droplets.

Annual progress rept.

A. Atreya. Apr 93, 30p, NIST/GCR-93/621. Grant 60NANB8D0861

Sponsored by National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Keywords: *Fire extinguishing agents, *Diffusion flames, *Infrared photography, Polymethyl methacrylate, Infrared photography, Water, Fire safety, Research management.

Two experimental configurations are chosen for the study: (1) Stagnation-point flow apparatus: which allows studying both the gas-phase and the condensedphase suppression actions and enables transient chemical measurements in the exhaust gas. These measurements are used to study the suppression mechanisms and quantify the suppression effectiveness. (2) Counterflow diffusion flame apparatus: which allows detailed flame structure measurements but is limited to studying gas-phase suppression mechanisms (chemical and/or physical).

PB93-200889 PC A04/MF A01
National Inst. of Standards and Technology (BFRL),
Gaithersburg, MD. Fire Science Div.
RADCAL: A Narrow-Band Model for Radiation Calculations in a Combustion Environment.

Technical note.

W. L. Grosshandler. Apr 93, 57p, NIST/TN-1402. Also available from Supt. of Docs. as SN003-003-

Keywords: *Radiative heat transfer, *Computer programs, *Emissivity, *Absorption spectra, *Combustion, Spectral emittance, Radiant flux density, Spectrum analysis, Soot, Combustion products, Wavelengths, *RADCAL computer program.

Radiation within a medium containing products of combustion is dependent upon the temperature and con-centrations throughout the entire field. The energy is distributed across the infrared spectrum in a highly nonlinear fashion, which greatly complicates modeling of the heat transfer within a burning environment. The report describes a numerical program, RADCAL, which predicts the radiant intensity leaving a nonisothermal volume containing nonuniform levels of carbon dioxide, water vapor, methane, carbon monoxide, nitrogen, ox-ygen, and soot. The absorption coefficient of the com-bined gases is calculated from a narrow-band model, and a combination of tabulated spectral properties and theoretical approximations to the vibrational-rotational molecular bands. Soot is treated as a purely absorbing substance in the Rayleigh limit. Background on the development of the model, example calculations, and an explanation of input procedures are presented.

00,205 PB94-121324

PB94-121324 PC A10/MF A03
National Inst. of Standards and Technology (BFRL),
Gaithersburg, MD. Fire Safety Engineering Div.
Annual Conference on Fire Research, 1993: Book

of Abstracts.

W. J. Duffin. Oct 93, 212p, NISTIR-5280.

Presented at the NIST Annual Conference on Fire Research, Rockville, MD., October 18-20, 1993. See also PB83-155887 and PB93-188845.

Keywords: *Buildings, *Research projects, *Fires, *Bibliographies, Combustion, Computerized simulation, Mathematical models, Building codes, Construction materials, Fire protection, Fire resistance, Smoke, Fire detection systems, Meetings, Fire safety.

The NIST Annual Conference on Fire Research has long been a prime forum for presentation and discussion of the latest advances in fire science and engineering. The conference includes mostly fire research performed within Federal laboratories, or sponsored by Federal agencies. However, some private sector and foreign fire research is also included. This year's conference focuses on the development, verification of fire safety engineering tools, and their application to build-ing fires, transportation fires, underground fires, and large fires. This will enable scientists and engineers to describe recent work on fire models and measurement methods and users to describe experiences and limitations in the use of these tools.

COMMUNICATION

Common Carrier & Satellite

00.206

FIPS PUB 174 **PC E19**

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.
Federal Building Telecommunications Wiring
Standard: Category: Telecommunications Standard; Subcategory: Cables and Wiring.

Final rept.

S. M. Radack, and A. G. Hanson. 21 Aug 92, 92p.
Prepared in cooperation with National Communications System, Arington, VA.

Three ring vinyl binder also available: North American Continent price \$7.00; all others write for quote.

Keywords: *Telecommunication, *Federal information processing standards, "Commercial buildings, "Wire, Copper, Fiber optics, Data processing equipment, Design standards, Specifications.

The standard specifies minimum requirements for telecommunications wiring within a building and between buildings in a campus environment. It specifies a wiring system with a recommended topology and ommended distances. It specifies copper and opticalfiber transmission media by parameters that determine performance, and specifies connectors and their pin assignments to ensure interconnectability. The standard recognizes a background precept of fundamental importance: to have a building successfully designed and provisioned for telecommunications, it is impera-tive that the telecommunications wining design be incorporated during the preliminary architectural design phase.

00,207 FIPS PUB 175 PC E19

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.

Federal Building Standard for Telecommunications Pathways and Spaces; Category: Telecommunications Standard; Subcategory: Cables

Final rept. S. M. Radack, and A. G. Hanson. 21 Aug 92, 126p. Prepared in cooperation with National Communications System, Arlington, VA.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Telecommunication, *Federal information processing standards, *Office buildings, *Passage ways, Design standards, Wire, Communication equipment, National government.

The standard specifies minimum requirements for telecommunications pathways and spaces within a Federal office building and between office buildings in a campus environment. The standard recognizes a background precept of fundamental Importance: to have a building successfully designed, constructed, and provisioned for telecommunications, it is imperative that the telecommunications design be incorporated during the preliminary architectural design phase.

00,208 FIPS PUB 176 PC F13

National Inst. of Standards and Technology (CSL),

Residential and Light Commercial Telecommunications Wiring Standard; Category: Telecommunications Standard; Subcategory: Cables and Wir-

ing. Final rept.

S. M. Radack, and A. G. Hanson. 21 Aug 92, 58p. Prepared in cooperation with National Communications System, Arlington, VA.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Telecommunication, *Federal Information processing standards, "Residential buildings, "Wire, Design standards, Wiring, Data processing equipment, Requirements.

The standard gives an overview of premises wiring, and specifies installation requirements and component technical requirements. Appendices to the industry standard provide information on line assignments in selected network interface jacks, winng installation guidelines, component description, and references to related standards and other documents.

00,209 FIPS PUB 178 PC A02

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.

Video Teleconferencing Services at 56 to 1,920 KB/ S. Category: Telecommunications Standard and Subcategory: Video Teleconferencing.

S. M. Radack, and G. M. Rekstad. 21 Dec 92, 10p. Prepared in cooperation with National Communica-tions System, Washington, DC. Office of Technology and Standards.

Keywords: *Teleconferencing, *Video communication, *Standards, National government, Government policies, *FIPS(Federal Information Processing Standard).

The standard, by adoption of International Telegraph and Telephone Consultative Committee (CCITT) Recommendations H.320, H.221, H.242, H.261, and ommendations H.320, H.221, H.242, H.261, and H.230, defines the specifications for video teleconferencing and video telephony systems. The document provides Federal departments and agencies a comprovide systems. prehensive description of the interoperability criteria for audiovisual systems used in video teleconferencing and videophone applications.

00.210

PB93-149433 PC A03/MF A01

National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div.
Study of Traffic Control and Congestion Control in Broadband ISDN.

D. Chang, and D. H. Su. Dec 92, 42p, NISTIR-5000.

Keywords: *Traffic control, *Data transmission, *Telecommunication, Multiplexing, Modulation, Traffic management, Standards, Communications management, Switching systems, Network synthesis, *Broadband Integrated Services Digital Network, Asynchronous Transfer Mode.

In Broadband Integrated Services Digital Network (B-ISDN), the Asynchronous Transfer Mode (ATM) network architecture has been adopted as the switching and multiplexing scheme. One of the Important ATM architectural Issues Is the traffic/congestion control. Numerous schemes, algorithms and theories have been studied in the area of network flow control, congestion control, and traffic control in order to seek suitable techniques to manage network traffic effectively to meet the quality of service requirement for network users. Among B-ISDN terminals in a Customer Premises Network (CPN) domain, a new flow control concept referred to as Generic Flow Control (GFC), has been adopted and its protocol standardization is under study. The main purpose of GFC is to control and to schedule the local traffic flow at the Broadband Terminal Equipment (B-TEs) at an early stage before the traffic is transmitted into the network. This will have a significant role in the overail performance of high speed network traffic management.

00,211 PB93-173391

PB93-173391 PC A11/MF A03
National Inst. of Standards and Technology (CSL),
Galthersburg, MD. Advanced Systems Div. North American ISDN (Integrated Services Digital

Network) Users' Forum Agreements on ISDN.
Special pub. (Final).
D. P. Stokesberry, K. M. Roberts, and T. Antonishek.
Jan 93, 241p, NIST/SP-823/3.
Aiso available from Supt. of Docs. as SN003-003-03197-6. See also PB92-102219.

Keywords: *Telecommunication, Communication networks, Digltal communications, Telephone systems, Specifications, Agreements, *Foreign technology, *Integrated Services Digital Network, Basic rate Interface, Primary rate interface, Application profiles.

The document compiles the existing NIU-Forum agreements for an ISDN developed and approved in the NIU-Forum as of October 1991. These agreements cover: Layer 1 BRI at the U, and S/T reference points; Layer 1 PRI at the U/S/T reference points; Layer 2 BRI and PRI; Layer 3 BRI Basic Call Control for Class I

Common Carrier & Satellite

equipment; Layer 3 PRI Basic Call Control for Class II equipment; and Generic Control procedures for Class I BRI Supplementary Services. In addition, the document references the Conformance tests which have been completed by the NIU-Forum. These include: Layer 1 BRI S/T interface; and Layer 2 BRI LAPD. Finally, the document contains the Application Profiles for: four of the Incoming Call Management applications; the Building Controls application; the Data Conferencing - Point-to-Point application; the ISDN Chatter Event Proceeding application; application of the Station Event Recording application; and three of the Voice Messaging System applications which have been submitted to the NIU-Forum.

00,212 PB**94-100880** PB94-100880 PC A04/MF A01
National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Private Branch Exchange (PBX) Security Guide-

7 Sep 93, 72p, NIST/GCR-93/635. See also AD-A207 905 and AD-A255 422.

Keywords: *Telecommunications, *Security, Telephones, Switching systems, Instructions, *PBX(Private Branch Exchange).

Telecommunication digital switch technology has advanced rapidly in the last few years. While the topic of mainframe and table top computer security has re-ceived much attention the last 20 years, the security capability of telecommunications hardware and software, specially the Private Branch Exchange (PBX) has not kept pace. The purpose of the document is to describe the basic concepts of PBX security.

00,213 PB94-120920 PC A99/MF E11 National Inst. of Standards and Technology (CSL), Galthersburg, MD. Advanced Systems Div.
Integrated Services Digital Network Conformance
Testing. Layer 2, Data Link Layer (LAPD). Part 1,
Basic Rate Interface, User Side. Special pub. (Final).
D. P. Stokesberry, L. Collica, and K. M. Roberts. Sep 93, 1137p, NIST/SP-823-4.
Also available from Supt. of Docs. as SN003-003-03221-2. See also PB92-181114.

Keywords: *Communication networks. Communication equipment, Data links, Digital communications, Com-Tables(Data), *ISDN(Integrated Services Digital Network), *Integrated Services Digital Network), *Integrated Services Digital Network, Basic rate Interface, Conformance testing, CCITT recommenda-

This document defines the abstract test specifications to verify conformance of equipment to the Layer 2, Data Link Layer, Link Access Procedure on the D Channel (LAPD) of an Integrated Services Digital Network (ISDN) at the user-side of the user-network Interface, for the Basic Rate Interface (BRI) access arrangements, as defined in the International Telegraph and Telephone Consultative Committee (CCITT) Recommendation Q.921 and American National Standard ANS T1.602. The test scripts are written in the inter-nationally standardized Tree and Tabular Combined Notation, TTCN. These tests were developed, internationally harmonized, and approved by members of the North American ISDN Users' Forum (NIU/91-0012).

Policies, Regulations, & Studies

PB93-151926 Not available NTIS National Inst. of Standards and Technology (PL), Boulder, CO. Time and Frequency Div.

AT2, a New Time Scale Algorithm: AT1 Plus Frequency Variance. Final rept. M. A. Weiss, and T. Weissert. 1991, 10p.

Pub. In Metrologia 28, p65-74 1991.

Keywords: *Time measurement, Kalman filters, Vanance(Statistics), Reprints, Frequency step detection, AT2 algorithm.

The existing AT1 algorithm produces a time scale with a fractional frequency variation smaller than that of any

clock in the ensemble. We are developing a modifica-tion to AT1 that includes the additional desirable features: automatic frequency-step detection, the option to run in an optimal post-processing mode and to run with minimal supervision in non-technical environments. These properties are facilitated by the inclusion of a Kalman-filter estimate of the frequency variance of each clock in the scale. Results are reported from both simulated and real clock data to demonstrate automatic frequency-step detection.

Verbal

00,215 PB93-173938 PC A05/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div. DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus CD-ROM. NIST Speech Disc 1-1.1.
J. S. Garofolo, L. F. Lamel, W. M. Fisher, N. L. Dahlgren, J. G. Fiscus, and D. S. Pallett. Feb 93, 85p, NISTIR-4930. See also PB91-505065.

Keywords: *Speech recognition, *Speech corpora, *Dialects, Phonetics, Linguistics, Verbal communication, English language, Documentation, *American

The Texas Instruments/Massachusetts Institute of Technology (TIMIT) corpus of read speech has been designed to provide speech data for the acquisition of acoustic-phonetic knowledge and for the development and evaluation of automatic speech recognition systems. TIMIT contains speech from 630 speakers representing 8 major dialect divisions of American English, each speaking 10 phonetically-rich sentences. The TIMIT corpus includes time-aligned orthographic, phonetic, and word transcriptions, as well as speech waveform data for each spoken sentence. The release of TIMIT contains several improvements over the Prototype CD-ROM released in December, 1988: (1) full 630-speaker corpus, (2) checked and corrected transcriptions, (3) word-alignment transcriptions, (4) NIST SPHERE-headered waveform files and header manipulation software, (5) phonemic dictionary, (6) new test and training subsets balanced for dialectal and phonetic coverage, and (7) more extensive documenta-

COMPUTERS, CONTROL & INFORMATION THEORY

General

00,216 FIPS PUB 180 PC E03 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Secure Hash Standard. Category: Computer Secu-

rity.

11 May 93, 25p.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Computer security, *Federal information processing standards, Message processing, Data processing security, Cryptology, Data encryption, Digital signatures.

The standard specifies a Secure Hash Algorithm (SHA) which can be used to generate a condensed representation of a message called a message digest. The SHA is required for use with the Digital Signature Algorithm (DSA) as specified in the Digital Signature Standard (DSS) and whenever a secure hash algorithm is required for Federal applications. The SHA is used by both the transmitter and intended receiver of a message in computing and verifying a digital signa-

00,217 FIPS PUB 181 PC F05

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Automated Password Generator (APG). Category:

Computer Security.

5 Oct 93, 58p. See also FIPS PUB 46-1.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Access control, *Federal information processing standards, Authentication, Computer security, Identification systems, Random number generators, Data encryption, Computer programs, *Passwords.

This publication specifies a standard to be used by Federal organizations that require computer generated pronounceable passwords to authenticate the personal identity of an automated data processing (ADP) system user, and to authorize access to system re-sources. The standard describes an automated pass-word generation algorithm that randomly creates sim-ple pronounceable syllables as passwords. The password generator accepts input from a random number generator based on the Data Encryption Standard (DES) cryptographic algorithm defined in Federal Information Processing Standard 46-1 (FIPS PUB 46-1).

PB93-138956 PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Computer Security Div.

Assessing Federal and Commercial Information Security Needs. D. F. Ferraiolo, D. M. Gilbert, and N. Lynch. Nov 92, 45p, NISTIR-4976.

Keywords: *Data processing security, Standards, Computer information security, Requirements, Access control, National government, Commercial sector, *IT(Information Technology), EDI(Electronic Data Interchange).

The study assesses the current and future Information technology (IT) security needs of the commercial, civil, and military sectors. The primary objectives were to: determine a basic set of information protection policies and control objectives that pertain to the secure proc-essing needs of organizations within all sectors; and identify protection requirements and technical approaches that are used, desired or sought so they can be considered for future federal standards and guldelines. The findings of the study address the basic secu-nty needs of IT product users, including system devel-opers, end users, administrators, and evaluators. Se-curity needs have been identified based on actual existing and well-understood security organizational practices.

PB93-146025 PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Automated Tools for Testing Computer System Vulnerability. Final rept. W. T. Polk. Dec 92, 42p, NIST/SP-800/6. Also available from Supt. of Docs. as SN003-003-

Keywords: *Computer security, *Vulnerability, *Tests, Access control, Debugging(Computers), Software tools, Artificial intelligence.

The document discusses automated tools for testing computer system vulnerability. By analyzing factors affecting the security of a computer system, a system manager can identify common vulnerabilities stemming from administrative errors. Using automated tools, this process may examine the content and protections of hundreds of files on a multi-user system and identify subtle vulnerabilities. By acting on this information, system administrators can significantly reduce their systems' security exposure. Automated vulner-ability testing tools are available for a wide variety of systems. Some tools are commercially available; others are available from other system administrators. Additional tools may be developed to address specific concems for an organization's computer systems. The document examines basic requirements for vulnerability testing tools and describes the different functional classes of tools. Finally, the document offers

general recommendations about the selection and distribution of such tools.

00.220 PB93-151579 PC A10/MF A03 National Irist. of Standards and Technology (CSL), Gaithersburg, MD. Computer Security Div. Study of OSI Key Management.

R. Zamparo. Nov 92, 223p, NISTIR-4983.

Keywords: *Computer security, *Computer rietworks, Cryptography, Secure communication, Data ericryption, Models, Protocols, *Key management, OSI(Open Systems Interconnection), ASN1(Abstract Syntax Notation One).

For communications between computer systems to be useful in many environments, the systems and their communications must be secure. One prerequisite to secure communications is the management of keying material rieeded by the underlying cryptographic mechanisms that provide security. The report addresses key management as it applies to communications protocols based on the Open Systems Interconnection (OSI) architecture. It contains a criteria and model of OSI key management that allows schemes based on both secret key and public key crytography to be incorporated. The report reviews significant issues of OSI key management and presents a generic protocol that resolves a majority of them. The abstract syntax notation (ASN.1) is used to specify the protocol. An example of how registration of ASN.1 protocol modules can be used to support algorithm specific security objects Is also giveri.

00,221 PB93-152049

PC A03/MF A01

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Gulde to the Selection of Anti-Virus Tools and Techniques.

Special pub. W. T. Polk, and L. E. Bassham. Dec 92, 49p, NIST/

SP-800/5.
Also available from Supt. of Docs. as SN003-003-03188-7. See also PB90-115601.

Keywords: *Computer viruses, *Software tools, Computer security, Data integrity, Personal computers, Monitors, Error detection codes, Accuracy, Access control, Knowledge bases(Artificial intelligence), Virus removal.

Computer viruses continue to pose a threat to the integrity and availability of computer systems. This is especially true for users of personal computers. A variety of anti-virus tools are now available to help manage this threat. These tools use a wide range of techniques to detect, identify, and remove viruses. The guide pro-vides criteria for judging the functionality, practicality, and convenience of anti-virus tools. It does not weigh the merits of specific tools, however it forms a basis with which readers can then evaluate which tools are best suited to target environments.

00,222 PB93-166148 Not available NTIS National Inst. of Standards and Technology (NCSL), Gaithersburg, MD. Computer Security Div.
Token Based Access Control System for Computer

Networks. Final rept.

M. Smid, J. Dray, and R. B. J. Warnar. 1989, 1922p. Pub. in Proceedings of National Computer Security Conference (12th), 'Information Systems Security: Solutions for Today - Concepts for Tomorrow', Gaithersburg, MD., June 30, 1989, p232-253.

Keywords: *Access control, *Computer security, Computer networks, Data encryption, Random number generators, Data storage, Reprints, Smart tokens.

The paper describes a Token Based Access Control System (TBACS) developed by the Security Technology Group of the National Institute of Standards and Technology (NIST). TBACS replaces traditional password based access control systems which have often failed to prevent logins by unauthorized parties. A user's access to network computers and resources is mediated by a smart token implementing a transparent cryptographic three-way handshake with the target computer. The token's onboard processor and memory are exploited to provide sophisticated security mechanisms in a portable device. In addition to access control, the TBACS token may be used for random number generation, cryptographic key generation, data

encryption, data authentication, and secure data stor-

PB93-185999 PC A03/MF A01

National Irist. of Standards and Technology (CSL), Gaithersburg, MD.

Minimum Security Requirements for Multi-User

Operating Systems. Mar 93, 50p, NISTIR-5153.

Keywords: *Computer security, *Requirements, *Operating systems(Computers), Identifying, Authentication, Access control, Data integrity, Product development, Auditing, Reliability, MSR(Minimum Security Requirements), TCSEC(Trusted Computer System) Evaluation Criteria), ITSEC(Information Technology Security Evaluation Criteria).

The Minimum Security Requirements for Multi-User Operating Systems (MSR) document provides basic commercial computer system security requirements applicable to both government and commercial organizations. These requirements include technical measures that cari be iricorporated into multi-user, remoteaccess, resource-sharing, and information-sharing computer systems. The MSR document was written from the prospective of protecting the confidentiality and integrity of an organization's resources and promotiring the continual availability of these resources. The MSR presented in the document form the basis for the commercially oriented protection profiles in Volume II of the draft Federal Criteria for Information ume II of the draft Federal Criteria for Information Technology Security document. The MSR document has been developed by the MSR Working Group of the Federal Criteria Project under National Institute of Standards and Technology (NIST) leadership with a high level of private sector participation. Its contents are based on the Trusted Computer System Evaluation Criteria (TCSEC) C2 criteria class, with additions from current computer industry practice and commercial security requirements specifications.

PB93-188134 PC A03/MF A01

National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div. Optimization of Adaptive Resonance Theory Net-

work with Boltzmann Machine.

O. M. Omidvar, and C. L. Wilson. Apr 93, 15p, NISTIR-5176.

Prepared in cooperation with District of Columbia Univ., Washington. Dept. of Computer Science.

Keywords: *Optimization, Algorithms, Character recognition, Neural nets, Combinatorial analysis, Machine learning, Feature extraction, *Adaptive Resonance Theory, *Boltzmann machine.

Optimization of large neural networks is essential in improving the network speed and generalization power, while at the same time reducing the training error and the network complexity. Boltzmann methods have been used as a statistical method for combinatorial optimization and for the design of learning algorithms. In the networks studied, the Adaptive Resonance Theory (ART) serves as a connection creation operator and the Boltzmann method serves as a competitive con-nection annihilation operator. By combining these two methods it is possible to generate small networks that have similar testing and training accuracy and good generalization from small training sets. The findings demonstrate that for a character recognition problem demonstrate that for a character recognition problem the number of weights in a fully connected network can be reduced by over 80%. The authors have applied the Boltzmann criteria to differential pruning of the connections which is based on the weight contents rather than on the number of connections.

00.225

PB93-228682 PC A05/MF A01

lowa State Univ., Ames. Dept. of Computer Science. Report of the NSF/NIST Workshop on NSFNET/NREN Security. Held on July 6-7, 1992.
A. E. Oldehoeft, and D. K. Branstad. May 93, 88p,

NISTIR-5232

Sponsored by National Inst. of Staridards and Technology (CSL), Gaithersburg, MD. Computer Security Div., and National Science Foundation, Washington, DC.

Keywords: *Meetings, *Computer security, *Computer networks, Authentication, Access control, Management, Computer privacy, Electronic mail, Distributed computer

NREN(National Research and Education Network), NSFNET(National Science Foundation Network).

The report summarizes the results of a workshop on security sponsored by the National Science Foundation (NSF) and the National Institute of Standards and Technology (NIST). The primary goals were to develop a set of recommendations for near-term security solutions for the NSF network (NSFNET) with special emphasis on the supercomputer centers and enhancing the security of the networks developed under the National Research and Education Network (NREN) Program. Sessions were held on four primary topics in security: (1) authentication; (2) access control; (3) appli-cation security; and (4) security management. The par-ticipants included representatives of government, industry, academia and international interests in security. The principal output of the workshop is a set of recommendations for improved authentication, access control, privacy enhanced mail, and security management.

00.226

PB94-101854 PC A07/MF A02

National Irist. of Standards and Technology (CSL),

Gaithersburg, MD.

Workshop on Security Procedures for the Interchange of Electronic Documents: Selected Papers and Results.

Final rept. R. G. Saltman. Aug 93, 128p, NISTIR-5247.

Keywords: *Meetings, *Computer security, Documents, Data processing security, Risk analysis, Law(Jurisprudence), Commerce, Computer applica-tions, Health care, Costs, Environmental protection, Authentication, Requirements, Policy making, 'EDI(Electronic Data Interchange).

Contents:

Linking Security and the Law of Computer-Based Commerce;

Balanced Electronic Data Interchange Security;

The Need for Risk Analysis; Health Care Perspective on Security Procedures

On the Optimal Expenditure of Computer Security Costs: The Legal Viability of Electronically Submitted

Environmental Compliance Reports;

Autheriticity and Assurance;

What Price Data Security;
Security Requirements and Evidentiary Issues in the Interchange of Electronic Documents:

Steps Toward Developing a Security Policy.

PC A03/MF A01 PB94-102258 National Irist. of Standards and Technology (CSL),

Gaithersburg, MD.
Towards Flexible Distributed Information Retrieval. D. W. Flater, and Y. Yesha. Aug 93, 25p, NISTIR-5243.

Keywords: *Information retrieval, *Computer networks, *User needs, Information dissemination, Data transmission, Data retrieval, Data bases, Information systems, Real time systems, Natural language, Query languages, Data base management.

Many years of research into better and more effective information retrieval methods have yielded a collection of good information retrieval techniques. Careful use of these techniques can result in an information retrieval system that can answer high-level queries with surprising accuracy when the domain of discourse is small. At the same time, the growth of wide-area networks, and the corresponding growth in the amount of information available through them, has caused many archives and information bases to become lost in a great connectionless cloud. Without prior knowledge of site names and access methods, users are often unable to make contact with potentially useful information bases. To make the best use of networked resources, it is necessary to increase the amount of cooperation between network sites. By allowing sites to share the responsibility of routing requests for data and caching replicas of frequently used data, it is possible to eliminate the inefficiencies resulting from the isolation of in-dividual sites and users. However, the system must re-main flexible enough to allow the integration of existing information bases.

COMPUTERS, CONTROL & INFORMATION THEORY

Computer Hardware

Computer Hardware

N93-14778/3 (Order as N93-14771/8, PC A13/ MF A03)

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.
Status of Emerging Standards for Removable
Computer Storage Media and Related Contribu-

tions of NIST.
F. L. Podio. Sep 92, 25p.
In NASA. Goddard Space Flight Center, Nssdc Conference on Mass Storage Systems and Technologies for Space and Earth Science Applications, Volume 3

Keywords: *Computer storage devices, *Data storage, *Magnetic tapes, *Optical disks, *Standards, Digital data, Errors, Life (Durability).

Standards for removable computer storage media are needed so that users may reliably interchange data both within and among various computer installations. Furthermore, media interchange standards support competition in industry and prevent sole-source lockin. NIST participates in magnetic tape and optical disk standards development through Technical Committees X3B5, Digital Magnetic Tapes, X3B11, Optical Digital Data Disk, and the Joint Technical Commission on Data Permanence. NIST also participates in other relevant national and international standards committees for removable computer storage media. Industry standards for digital magnetic tapes require the use of Standard Reference Materials (SRM's) developed and maintained by NIST. In addition, NIST has been studying care and handling procedures required for digital magnetic tapes. NIST has developed a methodology for determining the life expectancy of optical disks. NIST is developing care and handling procedures for optical digital data disks and is involved in a program to Investigate error reporting capabilities of optical disk drives. This presentation reflects the status of emerg-ing magnetic tape and optical disk standards, as well as NIST's contributions in support of these standards.

PB93-181873 PC A05/MF A02 National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Computer Systems Laboratory Annual Report,

1992 E. B. Lennon, S. M. Radack, and R. K. Roach. Feb 93, 100p, NISTIR-5127. See also report for 1991, **P**B92-172709.

Keywords: *Computers, *Computer software, Information systems, Systems engineering, Computer secunity, Computer networks, Computer architecture, Technology transfer, Telecommunication, Federal informa-tion processing standards, Computer Systems Labora-tory, National Institute of Standards and Technology.

The Computer Systems Laboratory (CSL) Annual Report-1992 describes the annual computer and related telecommunications activities and accomplishments of the Laboratory. Following the Director's Foreword, an overview of the Laboratory is presented, including a current CSL Organization Chart. Overviews of CSL's five technical divisions are featured next, followed by a section on Technology Transfer which details the vehicles CSL uses to disseminate research and information to the public and technical communities. A list of Federal Information Processing Standards (FIPS) and FIPS order information conclude the annual report.

PB93-234730 PC A03/MF A01

National Inst. of Standards and Technology (CSL),

Galthersburg, MD.

Operating Principles of the VME MultiKron Interface Board.

A. Mink, J. W. Roberts, and J. K. Antonishek. Aug 93, 17p, NISTIR-5233.

See also PB92-181072. Sponsored by Defense Advanced Research Projects Agency, Arlington, VA.

Keywords: *Computer systems hardware, *Very large scale Integration, Multiprocessors, Printed circuits, Circuit boards, Computer architecture, Multiple-instruction multiple data(MIMD), Multi Kron interface board(MIB), National Institute of Standards and Technology

The MultiKron Experimenter's Toolkit contains the VME MultiKron interface board (MIB), installation software, data logging software, and analysis software; all

of the software supplied is written in C. The Toolkit allows users to take advantage of the National Institute of Standards and Technology (NIST) MultiKron performance measurement chip in systems that do not already have a MultiKron designed into them. The MIB is applicable to both multiprocessor systems and slngle-processor systems. The Experimenter's Toolkit allows researchers to obtain hands-on experience with the MultiKron performance measurement chip, without the engineering effort required to design and build a hardware interface between the MultiKron and their computer. Up to one million Trace Samples can be collected during an experiment to the MIB on-board memory; a practically-unlimited number of Samples can be collected if an optional external data-collection computer is used.

Computer Software

00,231 AD-A262 055/7 PC A16/MF A03 of National Inst. Standards and Technology, Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11307. Final rept. 15 Jan 93. 1993, 375p.

Keywords: *Compilers, *Ada programming language, Standards, Installation, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within It and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,232 AD-A262 056/5 PC A16/MF A03 National Inst. of Standards and Technology, National Inst. of Standards and Technology, Gaithersburg, MD.
Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11308. Final rept. 15 Jan 93. 15 Jan 93, 375p.

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This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any Implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the

Ada Standard, it must be understood that some differences do exist between Implementations. The Ada Standard permits some implementation dependenciesfor example, the maximum length of Identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategles. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,233 AD-A262 253/8 PC A17/MF A03 of Standards and Technology. National Inst. National Inst. of Standards and Technology, Gaithersburg, MD.
Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 807 UnderHP-UX BLS Version A.08.08 (Host and Target), 930115S1.11305. Final rept. 15 Jan 93, 380p.

Keywords: *Compilers, *Ada programming language, Installation, Standards, *Validation summary reports, Computer program venification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, It must be understood that some differences do exist between Implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of Identifiers or the maximum values of Integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

AD-A262 717/2 PC A16/MF A03 National Inst. of Standards and Technology (NCSL), Gaithersburg, MD. Software Standards Validation Gaithersburg, MD. Software Standards

Validation Summary Report: GTE Government Systems, Aisys Ada Software Development Environment, HP 9000 Series 800 Model 817 under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11306.

Final rept. 15 Jan 93, 375p.

Keywords: *Compilers, *Ada programming language, Standards, Test and evaluation, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any Implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be Implemented that Is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, It must be understood that some differences do exist between Implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of Integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or Implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process Includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,235 AD-A262 720/6 PC A05/MF A01

National Inst. of Standards and Technology (NCSL), Gaithersburg. MD. Software Standards Validation Gaithersburg, MD. Software Standards

Validation Summary Report: GTE Government Systems, Aisys Ada Software Development Environment for 80386 UNIX, Version 5.1.2, Zenith Data Systems, Z-Station 433 DEh (Host and Target), 930115S1.11309.

Final rept. 15 Jan 93, 91p.

Keywords: *Compilers, *Ada programming language, Standards, Test and evaluation, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and thoroughly reports the results of testing this compller using the Ada Compller Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be under-stood that some differences do exist between Imple-mentations. The Ada Standard permits some implementation dependencies-for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or Implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,236

AD-A264 885/5 National Inst. PC A05/MF A01 of Standards and Technology,

National Inst. of Standards and Technology, Galthersburg, MD.
Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS AXP Systems, Version 3.0-5, DEC 3000 Modei 400 (host target), 930319S1.11315.
Final rept.

inal rept. 19 Mar 93, 79p, NIST93DEC505-1-1.11.

Keywords: *Compilers, *Ada programming language, Computer program verification, Test and evaluation, Standards, *Validation summary reports.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FtPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada com-piler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that Is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategles. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results. The purpose of validating is to ensure conformity of the compiler to the Ada Standard by testing that the compiler properly implements legal language constructs and that it identifies and rejects illegal language constructs. The testing also identifies behavior that is implementation-dependent but is permitted by the Ada Standard. Six classes of tests are used.

AD-A264 886/3

PC A05/MF A01 of Standards and Technology, National Inst.

Gaithersburg, MD.
Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS VAX Systems, Version 3.0-7, VAXstation 4000 Model 60 (host) => VAXstation 3100 Model 48 (target), 930319\$1.11317.

Final rept.

19 Mar 93, 79p, NIST93DEC505-3-1.11.

Keywords: *Ada programming language, *Compilers, Computer program ventication, Test and evaluation, Military requirements, Standards, Computer files, Magnetic tape, *Validation summary reports, ANSI/MIL-STD-1815A.

No abstract available.

PC A05/MF A01 of Standards and AD-A265 014/1

National Inst. of Standards and Technology, Gaithersburg, MD.

Validation Summary Report: Digital Equipment Corporation, DEC Ada for OpenVMS VAX Systems, Version 3.0-7, VAXstation 4000 Model 60 (host target), 930319S1.11316. Final rept.

19 Mar 93, 78p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependenciesfor example, the maximum length of Identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implemen-tation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The Information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,239 AD-A265 260/0

PC A05/MF A01 of Standards ar National Inst. and Technology,

Gaithersburg, MD.

Ada Compiler Validation Summary Report. Certifi-cate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5 (/OPTtMtZE) VAX 8550/8600/8650 (Cluster) > Enhanced Processor (EP) AN/UYK-44 (Bare Board).

Final rept.

18 Sep 92, 89p, NIST92USN500-3-1.11.

Keywords: *Ada programming language, *Compilers, Assembly languages, Computer communications, Naval research, *Validation summary reports, AN/ UYK-44, Standards, Computer program verification.

U.S. Navy, Ada/M, Version 4.5 (/OPTIMIZE), VAX 8550/8600/8650 (Cluster), (running VAX/VMS Version 5.3)(host) to Enhanced Processor (EP) AN/UYK-44 (Bare Board)(Target), ACVC 1.11.

AD-A265 433/3 National Inst. PC A05/MF A01 of Standards and Technology, Gaithersburg, MD.

Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11265 DDC-I, Inc. DACS Sun SPARC/SunOs Native Ada Compiler System, Version 4.6.1 SPARCStation 2 => SPARCStation 2. Final rept.

6 Oct 92, 77p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FiPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,241

AD-A265 434/1 PC A05/MF A01

National Inst. of Standards and Technology,

Gaithersburg, MD.

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11273 U.S. Navy, Ada/M, Version 4.5 (OPTIMIZE), VAX 8550/8600/8650 (Ciuster) => VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board).

Final rept. 27 Oct 92, 88p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategles. All the dependencies observed during the process of testing this compiler are given in this report. The Information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,242

AD-A265 435/8 PC A05/MF A01 National Inst. of Standards and Technology, Gaithersburg, MD.

Computer Software

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11274 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => Enhanced Processor (EP) AN/UYK-44 (Bare Board).

Final rept. 27 Oct 92, 90p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The Information In this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as Inputs to an Ada compiler and evaluating the results.

00,243

AD-A265 437/4 PC A05/MF A01

National Inst. of Standards and Technology, Gaithersburg, MD.

Ada Compiler Validation Summary Report. Certiflcate Number: 920918S1.11275 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => VHSIC Processor Module (VPM) AN/ AYK-14 (Bare Board).

Final rept. 27 Oct 92, 88p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compller using the Ada Compiler Validation Capability. An Ada compller must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compller and evaluating the results.

00,244 AD-A265 600/7 PC A04/MF A01 National Inst. of Standards and Technology, Gaithersburg, MD.

Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11263 DDC-I, Inc. DACS MIPS RISC/os to MIPS R3000 Bare Ada Cross Compiler System, Release 2.1-16, MIPS M/120-5 => Lockheed Sanders STAR MVP R3010 Board. Final rept.

5 Aug 92, 56p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, it must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencles--for example, the maximum length of Identifiers or the maximum values of Integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as Inputs to an Ada compiler and evaluating the results.

00.245

AD-A265 601/5 PC A07/MF A02

National inst. of Gaithersburg, MD. of Standards and Technology,

Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11264 DDC-I, Inc. DACS DECstation/ULTRIX to MIP R3000 Bare Ada Cross Compiler System, Release 2.1-16 DECStation 3100 => Integrated Device Technology IDT7RS301 R3000/R3010 Board.

Final rept. 5 Aug 92, 145p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within it and reports the results of testing this compiler using the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada Standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, It must be understood that some dif-ferences do exist between implementations. The Ada Standard permits some implementation dependencies--for example, the maximum length of Identifiers or the maximum values of integer types. Other differences between compllers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compller are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,246 AD-A265 602/3 PC A04/MF A01 National Inst. of Standards and Technology, Gaithersburg, MD.

Ada Compller Validation Summary Report. Certificate Number: 920918S1.11270 U.S. NAVY AdaAX, Version 5.5 (/OPTIMIZE) VAXstation 4000 =Z>VAXstation 4000. Final rept.

18 Sep 92, 74p.

Keywords: *Compilers, *Ada programming language, Standards, *Validation summary reports, Computer program verification.

This Validation Summary Report describes the extent to which a specific Ada compiler conforms to the Ada Standard, ANSI/MIL-STD-1815A and FIPS PUB 119. This report explains all technical terms used within It and reports the results of testing this compiler using the Ada Compiler Validation Compiler Ada Ada Compiler Validation Compiler Validation Compiler Ada Ada Compiler Validation the Ada Compiler Validation Capability. An Ada compiler must be implemented according to the Ada Standard, and any implementation-dependent features must conform to the requirements of the Ada Standard. The Ada standard must be implemented in its entirety, and nothing can be implemented that is not in the Standard. Even though all validated Ada compilers conform to the Ada Standard, It must be understood that some differences do exist between implementations. The Ada Standard permits some implementation dependencles-for example, the maximum length of identifiers or the maximum values of integer types. Other differences between compilers result from the characteristics of particular operating systems, hardware, or implementation strategies. All the dependencies observed during the process of testing this compiler are given in this report. The information in this report is derived from the test results produced during validation testing and from the Ada compiler vendor. The validation process includes submitting a suite of standardized tests, the ACVC, as inputs to an Ada compiler and evaluating the results.

00,247 FIPS PUB 161-1 PC E01

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Electronic Data Interchange (EDI): Category: Software Standard; Subcategory: Electronic Data Interchange.

Final rept.

R. G. Saltman. 19 Apr 93, 11p. Supersedes FIPS PUB 161. Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Data transmission, Electronics, Tele-communication, Businesses, *Federal Information Processing Standards, *EDI(Electronic Data Exchange).

The publication announces the adoption, as a Federal Information Processing Standard, of recognized national and international standards for EDI. In EDI, data that would be traditionally conveyed on paper docu-ments are transmitted or communicated electronically according to established rules and formats. The data that are associated with each type of functional document, such as a purchase order or invoice, are transmitted together as an electronic message. The formatted data may be transmitted from originator to recipient via telectommunications or physically transported on electronic storage media.

00,248 FIPS-PUB-179 PC E04
National inst. of Standards and Technology (CSL), Gaithersburg, MD.

Government Network Management Profile (GNMP). Category: Hardware and Software Standards. Subcategory: Computer Network Protocols.

Federal information processing standards (Final). K. M. Hsing. 14 Dec 92, 50p. Three ring vinyl binder also available, North American Continent price \$8.00; all others write for quote.

Keywords: *Systems management, *Computer networks, Standards, Protocol(Computers), Specifications, *Government Network Management Profile, *Computer network protocols, *Hardware and software standards, Federal Information Processing Standard Publication 179, Open systems Interconnection, Federal standard 179.

The Federal Information Processing Standard adopts the Version 1.0 GNMP. The Government Network Management Profile (GNMP) specifies the common management Information exchange protocol and serv-Ices, specific management functions and services, and the syntax and semantics of the management informa-

Computer Software

tion required to support monltoring and control of the network and system components and their resources. The GNMP builds on FIPS 146-1, Government Open Systems Interconnection Profile (GOSIP), and includes the GOSIP Version 2.0 by reference. The GOSIP specifies lower layers protocols and three applications that support appears protocols and three applications that support appears to the control of the plications that support general network management operations. Future versions of the GNMP will add network management functions and services for GOSIPcompliant end systems and intermediate systems. The GNMP and GOSIP are interrelated and will cross-reference each other as required.

00.249 PB93-111656 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Statistical Engineering Div.
PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis (Documentation). S. T. Peavy, and R. N. Vamer. Oct 92, 11p, NISTIR-4957, NIST/SW/DK-93/001A. For system on diskette, see PB93-500437.

Keywords: *Statistical analysis, *Numerical analysis, *Data analysis, Arrays, Matrices(Mathematics), Bessel functions, Interactive systems, Least squares method, Personal computers, Plotting, Regression analysis, Thermodynamic properties, Documentation.

PC-OMNITAB, an interactive system for statistical and numerical data analysis, Is an extension of OMNITAB 80. The system can be implemented on a 386/486 personal computer which has a math coprocessor and at least 4 MBytes of RAM. PC-OMNITAB responds to simple instructions to obtain accurate results since reliable, varied and sophisticated algorithms for data analvsis and manipulation are referenced.

00,250 PB9**3-1**38**972** PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div.

Using Seif-Organizing Recognition as a Mechanism for Rejecting Segmentation Errors.

R. A. Wilkinson, C. L. Wilson, and M. D. Garris. Oct 92, 16p, NISTIR-4938.

Keywords: *Character recognition, *Neural nets, *Text processing, Concurrent processing, Machine learning, Algorithms, Error detection codes, Feature extraction, Classifying, *Segmentation.

The authors have developed a self-organized neural network based method that concurrently detects segmentation errors and performs character recognition. This method utilizes a two-pass classification scheme. A page of machine printed text is segmented, and a pre-trained self-organizing classifier is used to recog-nize the Images produced by the segmenter. Images that are recognized with a sufficiently high confidence are used to retrain the classifier, adapting the neural network to the current font type being segmented. All the segmented images are then reclassified by the adapted network. The assigned classes of those Images which are confidently recognized are accepted, whereas the images which are not confidently recognized the images which are not confidently recognized. nized are rejected.

00,251 PB93-151215 Not available NTIS National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. Automating Interactive Applications in a Network Environment. Final rept.

D. Libes. 1992, 6p.
Pub. In International Communications Association Annual Conference and Exhibition-Call for Innovation:
Jnl. of Proceedings, Atlanta, GA., May 17-21, 1992,

Keywords: *Computer networks, *Interactive systems. oftware tools, Applications programs(Computers), Automation, Computer program verification, Computer communications, Reprints, Expect computer program.

Expect Is a software tool designed to control interactive programs. Expect reads a script that resembles the dialogue itself, but which may include multiple paths through it. Expect can run any program locally or remotely in order to automate a task. Expect successfully deals with interactive programs and is particularly useful in a networked environment in which dissimilar machines must communicate. Expect solves the problem of 'stick the password in the script' as well as several other long-standing problems with traditional workarounds in these areas. Expect also provides the needed support for regression testing, network and computer load generation, and conformance testing in a networked environment. In practice, Expect has entirely relieved numerous computer scientists and network managers of tasks that previously had to be performed by hand. The investment in writing Expect scripts is a minimal one-time cost. Expect itself is free and in the public domain. Expect is in use in over 1000 companies as well as virtually every university in the U.S. and many overseas.

00,252 PB93-153476 Not available NTIS

National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathematics Div.

Robust Parallel Computation in Floating-Point and

SLI Arithmetic.

Final rept. D. W. Lozier, and P. R. Tumer. 1992, 19p. Pub. In Computing 48, p239-257 1992.

Keywords: *Floating point anthmetic, *Computation, *Parallel processing, Vector processing, Algorithms, Accuracy, Reprints, SLI((Symmetric Level-Index) anth-

The paper considers the parallel computation of vector norms and inner products in floating-point and a pro-posed new form of computer arithmetic, the symmetric level-index system. The vector norms provide an illuminating example of the contrast between the two arithmetic systems under discussion in terms of the ability to program for (complete) robustness and parallelizability. The conflict between robustness of the computation -- in the sense of the dual requirements of accuracy and freedom from overflow and underflow -- and easy parallelization of the algorithms within a floating-point environment is made plain. It is seen that this conflict disappears if the symmetric level-index system of arithmetic is used. The freedom from overflow and underflow offered by this system allows the programming of the straightforward definitions in a way which is simple, robust and immediately parallelizable Numerical results are given to illustrate the fact that the symmetric level-index system yields results of comparable accuracy to those of floating-point in cases where the latter system works and still yields results of high accuracy when the floating-point system fails altogether.

00.253 PB93-161339 PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div. Synthetic-Perturbation Tuning of MIMD Programs.
G. Lyon, R. Snelick, and R. Kacker. Feb 93, 30p,

NISTIR-5131. See also PB91-222588. Sponsored by Defense Advanced Research Projects Agency, Arlington, VA.

Keywords: *Parallel programming, Performance evaluation, Response time(Computers), Concurrent processing, Distributed computer systems, *SPT(Synthetic-perturbation tuning), *MIMD(Multiple-instruction Multiple-data), DEX(Designed expen-

Synthetic-perturbation tuning (SPT) is a novel technique for assaying and improving the performance of programs on Multiple-instruction Multiple-data (MIMD) systems. Conceptually, SPT brings the powerful, mathematical perspective of statistically designed experiments (DEX) to the interdependent, sometimes refractory aspects of MIMD program tuning. Practically, SPT provides a needed reconfiguration mechanism via synthetic delays for what otherwise would be ad hoc, hand-tailored program setups for DEX. Overall, the technique identifies bottlenecks in programs directly as quantitative effects upon response time. SPT works on programs for both shared and distributed-memory and its scales well with increasing system size.

PB93-163178 PC A14/MF A03 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. COBOL Compiler Validation System (CCVS 85),

User Gulde, Version 4.2. User guide.

25 May 93, 312p, NIST/SW/MT-93/003A.
For system on magnetic tape, see PB93-504918. Prepared in cooperation with National Computing Centre Ltd., Manchester (England).

Keywords: *Compilers, *Standards, *Computer program verification, Federal Information processing standards, Tests, Debugging(Computers), User manuals(Computer programs), Documentation, *Cobol programming language, ISO(International Organization for Standardization).

The report is a comprehensive user guide for the COBOL 85 Compiler Validation System. It gives a brief description of each test program and supplies Information on running the tests and interpreting the results. The validation system is used to validate COBOL compilers to ensure their conformance to the Federal standard as prescribed in Federal Information Processing Standards (FIPS) PUB 21-3 and the International Organization for Standardization (ISO) Standardization (ISO) ard 1989:1985. It consists of approximately 300 COBOL programs, each of which contains several independent tests.

00,255 PB93-178556 PC A07/MF A02

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

International Survey of Industrial Applications of Formal Methods. Volume 1. Purpose, Approach, Analysis, and Conclusions.

D. Craigen, S. Gerhart, T. Ralston, and K. Summerskill. Mar 93, 128p, NIST/GCR-93/626-VOL-

See also Volume 2, PB93-178564. Sponsored by Atomic Energy Control Board, Ottawa (Ontario), and Naval Research Lab., Washington, DC.

Keywords: *Software engineering, *Applications programs(Computers), *Industries, Systems engineering, Standards, Case studies, Research and development, Methodology, Systems analysis, Surveys, *Formal methods.

Formal methods are mathematically-based techniques, often supported by reasoning tools, that can offer a ngorous and effective way to model, design and analyze computer systems. The purpose of the study is to evaluate international industrial experience in using formal methods. The cases selected are representative of industrial-grade projects and span a variety of application domains. The study had three main objectives: to better inform deliberations within industry and government on standards and regulations; to provide an authoritative record on the practical experience of formal methods to date; and to suggest areas where future research and technology development are needed. The volume is the first of a two volume, final report on an international survey of industrial applications of formal methods. It describes the study, the formal methods, the cases that were studied, the approach to performing the study, and the analysis, findings and conclusions.

00.256 PB93-178564 PC A09/MF A03

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

International Survey of Industrial Applications of Formal Methods. Volume 2. Case Studies.
D. Craigen, S. Gerhart, T. Ralston, and K.

Summerskill. Mar 93, 200p, NIST/GCR-93/626-VOL-

See also Volume 1, PB93-178556. Sponsored by Atomic Energy Control Board, Ottawa (Ontario), and Naval Research Lab., Washington, DC.

Keywords: *Software engineering, *Applications programs(Computers), *Industnes, Case studies, Research and development, Systems analysis, Surveys, *Formal methods.

Formal methods are mathematically-based techniques, often supported by reasoning tools, that can offer a rigorous and effective way to model, design and analyze computer systems. The purpose of the study is to evaluate international industrial experience in using formal methods. The cases selected are representative of industrial-grade projects and span a variety of application domains. The study had three main objectives: to better inform deliberations within Industry and government on standards and regulations; to provide an authoritative record on the practical experience of formal methods to date; and to suggest areas where future research and technology development are needed. The volume is the second of a two volume, final report on an international survey of industrial applica-tions of formal methods. It provides the details of the twelve case studies. For each of the case studies, It presents a case description, summarizes the Informa-

Computer Software

tion obtained (from interviews and the literature), provides an evaluation of the case, highlights R & D issues pertaining to formal methods and provides some con-

00,257 PC A03/MF A01 PB93-178572

National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Using Synthetic-Perturbation Techniques for Tun-

ing Shared Memory Programs. R. Snelick, J. Ja'Ja', R. Kacker, and G. Lyon. Mar

93, 35p, NISTIR-5139.
See also PB93-161339. Prepared in cooperation with Maryland Univ., College Park. Sponsored by Defense Advanced Research Projects Agency, Arlington, VA.

Keywords: *Software engineering, Computer software, Memory(Computers), Multiprocessors, Computer program portability, Computer programming, Case studies, Image processing, Sorting routines, Parallel processing, *MIMD(Multiple-instruction multiple-data), *SPT(Synthetic Perturbation Tuning).

The Synthetic Perturbation Tuning (SPT) methodology is based on an empirical approach that introduces artificial delays into the multiple-instruction stream, multiple-data stream (MIMD) program and captures the effects of such delays by using the modern branch of statistics called design of experiments. SPT provides the basis of a powerful tool for tuning MIMD programs that are portable across machines and architectures. The purpose of the paper is to explain the general approach and to extend it to address specific features that are the main source of poor performance on the shared memory programming model. These include performance degradation due to load imbalance and insufficient parallelism, overhead introduced by synchronizations and by accessing shared data structures, and compute time bottlenecks. The authors illustrate its use on two very different case studies: a large image processing benchmark and a parallel quicksort.

PB93-182053 PC A08/MF A02

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Manual for Data Administration.

Special pub.

J. Newton, and D. C. Wahl. Mar 93, 160p, NIST/ SP-500/208.

Also available from Supt. of Docs as SN003-003-03208-5. See also PB90-147919. Prepared in co-operation with Vector Research, Inc., Arlington, VA. Sponsored by Data Administration Management Association, Washington, DC. National Capital Region.

Keywords: *Data management, Standardization, Information management, Standards, Computer software, Software tools, Data dictionaries, Data structures, Data processing security, Information systems, *Data administration

Data Administration is emerging as an independent discipline. Its fundamental objectives are to maximize the value, quality and usability of data resources. Data Administrators address Data Standardization, Automated Tools, Data Security, Repository Management and Strategic Data Planning. The manual is the result of two years' efforts by the National Capital Region Data Administration Management Association (NCR-DAMA) Standards and Procedures Working Group. It includes an extensive hibliography. includes an extensive bibliography.

PB93-183465 PC A03/MF A01
National Inst. of Standards and Technology (NCSL), Gaithersburg, MD. Systems and Network Architecture

Distributed Implementation Generator: An Overview and User Gulde.

Draft technical rept

Briantesting and B. Strausser. Jan 91, 45p, NCSL/SNA-91/3, NIST/SW/MT-93/005B.

For system on magnetic tape, see PB93-505758. Keywords: C++ programming language, Software tools, Documentation, *Distributed Implementation Generator, DINGO(Distributed Implementation Generator)

atOr), ESTELLE technique. The Distributed Implementation Generator (DINGO)

generates C++ code for distributed, prototype implementations of systems described in the International Standard Formal Description Technique, Estelle. The Input to DINGO is in the form of objects generated by

the Portable Estelle Translator (PET) developed at the National Institute of Standards and Technology. DINGO generates code that Implements all Estelle. The generated C++ must be compiled using a C++ compiler and then linked with runtime libraries to produce a set of executable programs to be run as a set of operating system processes on one or more interconnected machines. The distribution of modules over operating system processes and over sites of a distributed system is controlled by the user. Elements of an X-Window interface may also be generated by DINGO, so that individual modules can be monitored by the user. The user may also manipulate the generated code and/or provide primitives to extend the resulting prototype implementations or to Interface with other applications. The document is an overview of the system and a user guide.

00,260 PB93-183473

PB93-183473 PC A03/MF A01 National Inst. of Standards and Technology (NCSL), Gaithersburg, MD. Systems and Network Architecture

Portable Estelle Translator: An Overview and User Guide.

Technical rept.

R. Sijelmassi, and B. Strausser. Jan 91, 15p, NCSL/ SNA-91/2, NIST/SW/MT-93/005A.

For system on magnetic tape, see PB93-505758.

Keywords: *Translators, Object-oriented programming, C++ programming language, Software tools, Error analysis, Semantics, Syntax, Documentation, *Estelle

The Portable Estelle Translator (PET) was designed to provide support for a wide variety of tools for Estelle. The translator is built around an Object-Oriented model of Estelle, which allows the representation of Estelle or Estelle, which allows the representation of Estelle specifications as a collection of objects. The PET checks Estelle specifications for syntax and semantic errors and generates a collection of Estelle objects. These objects can then be exploited by a variety of applications ranging from pretty printing to generation of distributed code that implements the specification. The translator has three major components: the lexical analyzer, the parser, and the collection of classes describing the structure and behavior of objects generated by the translator; all three are implemented in C++. The document gives an overview of the structure and operation of these components and provides Information on using the PET as a front end for any tool that processes Estelle specifications.

PC A03/MF A01 PB93-189835

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Bullding Hadamard Matrices in Steps of 4 to Order

N. Drouin. Apr 93, 22p, NISTIR-5121.

Keywords: Computer program verification, Systems analysis, Sensitivity, Experimental design, *SPT(Synthetic Perturbation Tuning), *Hadamard matanalysis. rices, Fractional factorial design.

Based on methods of construction described In 1978. the programs described allow one to build Hadamard matrices of order up to 200, in steps of 4. These matrices are to be used to generate statistical plans of analysis for the 'Synthetic Perturbation Tuning' technique of program sensitivity analysis.

00,262

PB93-191641 PC A22/MF A04 National Inst. of Standards and Technology (CSL),

Gaithersburg, MD. Advanced Systems Div.
First Text REtrieval Conference (TREC-1).

D. K. Harman. Mar 93, 517p, NIST/SP-500/207. Also available from Supt. of Docs. as SN003-003-03207-7.

Keywords: *Meetings, *Information retrieval, *Text processing, Algorithms, Automatic Indexing, Documents, Routing, Data bases, Natural language processing, On-line systems, Search structuring, Machine learning, Pattern recognition, Query processing.

The first Text REtrieval Conference (TREC-1) was held in early November 1992 and was attended by about 100 people involved in the 25 participating groups. The goal of the conference was to bring research groups together to discuss their work on a new large test collection. There was a large variation of retrieval tech-

niques reported on, including methods using automatic thesaurii sophisticated term weighting, natural lan-guage techniques, relevance feedback, and advanced pattern matching. As results had been run through a common evaluation package, groups were able to compare the effectiveness of different techniques, and discuss how differences among the systems affected performance.

PB93-200871 PC A06/MF A02

National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Systems and Software Technology

Software Error Analysis.

Special pub. W. W. Peng, and D. R. Wallace. Apr 93, 113p, NIST/ SP-500/209.

Also available from Supt. of Docs as SN003-003-

Keywords: *Computer program Integrity, *Error analysis, Error detection codes, Software engineering, Computer program verification, Tests, Computer program reliability, Models, Quality assurance, Data acquisition.

The document provides guldance on software error analysis. Software error analysis includes error detection, analysis, and resolution. Error detection techniques considered in the study are those used in software development, software quality assurance, and software ventication, validation and testing activities. These techniques are those frequently cited in technical literature and software engineering standards or those representing new approaches to support error detection. The study includes statistical process control techniques and relates them to their use as a software quality assurance technique for both product and process improvement. Finally, the report describes several software reliability models.

00,264 PB93-216943 PC A06/MF A02

National Inst. of Standards and Technology (CSL), Galthersburg, MD. Systems and Software Technology

Application Portability Profile (APP): The U.S. Government's Open System Environment Profile OSE/ 1 Version 2.0.

Special pub.

G. E. Fisher. Jun 93, 106p, NIST/SP-500-210. Supersedes PB91-201004. Also available from Supt. of Docs, as SN003-003-03222-1.

Keywords: *Computer program portability, Computer program transferability, Federal Information processing standards, National Government, Computer networks, Software engineering, Computer applications, Specifications, Recommendations, *Open System Environment, *Application Portability Profile, APP(Application Portability Profile), Federal agencles.

An Open System Environment (OSE) encompasses the functionality needed to provide Interoperability, portability, and scalability of computerized applications across networks of heterogeneous hardware/software platforms. The OSE forms an extensible framework that allows Interfaces, services, protocols, and support-ing data formats to be defined in terms of nonproprietary specifications that evolve through open (public), consensus-based forums. A selected suite of specifications that define these interfaces, services, protocols, and data formats for a particular class or domain of applications is called a profile. The Application Portability Profile (APP) is the U.S. Government's OSE profile. It was developed to provide functionality across a broad range of Federal applications. The report describes the service areas and components included in the APP and provides evaluations of recommended specifications for the majority of the service area com-ponents. Organizations should use the report to assist in determining which specifications may be applicable to their particular environments.

00.265

PB93-220838

PC A02/MF A01 of Standards and Technology, National Inst.

Mational Inst. of Standards and Technology, Gaithersburg, MD.

NIST EXPRESS Toolkit: Requirements for Improvements. National PDES Testbed Report Series.

D. Libes, and J. Fowler. 26 Jun 93, 10p, NISTIR-

5212.

See also PB92-181205, PB92-187038, PB93-153450 and PB93-220846. Sponsored by CALS Evaluation and Integration Office, Washington, DC.

Computer Software

Keywords: *Software tools, Computer aided manufacturing, Computer aided design, Standards, Compilers, PDES(Product Data Exchange Using STEP), STEP(Standard for the Exchange of Product Model Data), EXPRESS programming language, Software libraries US NIST branes, US NIST.

The NIST EXPRESS toolkit is a software library for building software tools for manipulating information models written in the EXPRESS language. The paper is one in a series describing the latest version of the toolkit. The document describes shortcomings of previous versions of the toolkit, requirements for improvement, and a recommended approach for addressing those requirements. A background knowledge of EX-PRESS and the EXPRESS toolkit is presumed as well as a rudimentary grasp of basic compiler construction techniques.

00.266

PB93-220846 PC A03/MF A01
National Inst. of Standards and Technology,
Gaithersburg, MD.
NIST EXPRESS Toolkit: Updating Existing Applications. National PDES Testbed Report Series.

Published Series Applications of the Published Report Series.

D. Libes. 15 Jun 93, 16p, NISTIR-5205. See also PB93-220853. Sponsored by CALS Evaluation and Integration Office, Washington, DC.

Keywords: *Software tools, Computer aided design, Computer aided manufacturing, Standards, Compilers, PDES(Product Data Exchange Using STEP), STEP(Standard for the Exchange of Product Model Data), EXPRESS programming language, Software libraries, US NIST.

The PDES (Product Data Exchange using STEP) actrivity is the United States' effort in support of the Standard for the Exchange of Product Model Data (STEP), an emerging international standard for the interchange of product data between various vendors' CAD/CAM systems and other manufacturing-related software. A National PDES Testbed has been established at the National Institute of Standards and Technology to provide testing and validation facilities for the emerging standard. As part of the testing effort, NIST is charged with providing a software toolkit for manipulating STEP data. The NIST EXPRESS toolkit is a software library for bullding EXPRESS-related tools. The toolkit was previously released in 1991, based on ISO TC184/SC4 N14 (familiarly called 'EXPRESS N14'). The current re-lease is based on Draft International Standard (DIS) 10303-11 (N151) and while the philosophical underpinnings are similar, much of the interface has changed significantly. The paper describes changes that must be made to existing applications so that they can work with the new toolkit.

00.267

PB93-220853 PC A03/MF A01

National Inst. of Standards and Technology, Gaithersburg, MD. NIST EXPRESS ToolkIt: Using Applications. Na-

tional PDES Testbed Report Series.

D. Libes. 15 Jun 93, 21p, NISTIR-5206. See also PB93-220838. Sponsored by CALS Evalua-tion and Integration Office, Washington, DC.

Keywords: *Software tools, Computer aided design, Computer aided manufacturing, Compilers, Standards, PDES(Product Data Exchange Using STEP), STEP(Standard for the Exchange of Product Model Data), EXPRESS programming language, Software libraries US NIST braries, US NIST.

The PDES (Product Data Exchange using STEP) activity is the United States' effort in support of the Standard for the Exchange of Product Model Data (STEP), an emerging international standard for the interchange of product data between vendors' CAD/CAM systems and other manufacturing-related software. A National PDES Testbed has been established at the National Institute of Standards and Technology to provide testing and validation facilities for the emerging standard. As part of the testing effort, NIST is charged with providing a software toolkit for manipulating STEP data. The NIST EXPRESS Toolkit is a software library for building EXPRESS-related tools. The NIST Part 21 Expanse File Toolkit is a software library for building change File Toolkit is a software library for building Part 21-related tools. The paper describes how to use applications built with the toolkits. This includes typical applications such as 'fedex' and 'p21', which are stand-alone programs that read and report errors in EX-PRESS schemas and Part 21 exchange files. Readers of the document need no knowledge of the internals of the toolkits.

00,268 PB9**3-22861**7 PC A03/MF A01

of Standards and National Inst. Technology.

Gaithersburg, MD.

User's Guide for the Programmer's Hierarchical Interactive Graphics System (PHIGS) C Binding Validation Tests (Version 2).
K. Brady, and J. Cugini. Aug 93, 30p, NISTIR-5238. See also PB93-126365.

Keywords: *Computer graphics, *Standards, *Computer program verification, Tests, Interactive Keywords: graphics, Subroutine libraries, Debugging (Computers), UNIX (Operating system), *PHIGS (Programmers Hierarchical Interactive Graphics System), C programming language, NIST (National Institute of Standards and Technology), Conformance testing.

The Programmer's Hierarchical Interactive Graphics System (PHIGS) Validation Tests (PVT), developed by the National Institute of Standards and Technology (NIST), consist of a large set of 'C' programs which may be used to test how well an implementation of PHIGS conforms to the 'C' binding. The tests are organized into a biographical structure of mediulos which nized into a hierarchical structure of modules which corresponds to the conceptual overview of the standard. Directions for installation and operation of the tests are included.

00.269

PB93-500437 CP D03

National Inst. of Standards and Technology,

PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers).

Model-Simulation.
Oct 92, diskette, NIST/SW/DK-93/001.
System: 386/486 PC with Math Coprocessor; DOS 3.30 or higher operating system, 4MB. Language: Executable/Fortran. Check with README file before installing. Then use INSTALL file to load PC-OMNITAB on the PC. Requires the OTG DBOS and OTG FTN runtime library. Contact OTG Systems, Inc. (717-222-9100) for above software. See also PB91-507962, PB91-507954, PB91-505511 and PB87-172235. The software is on one 3 1/2 Inch diskette, 1.44M high

density. Documentation included; may be ordered separatelý as PB93-111656.

Keywords: *Models-Simulation, *Software, *Statistical analysis, *Numerical analysis, *Data analysis, Arrays, Matrices(Mathematics), Bessel functions, Interactive systems, Least squares method, Personal computers, Plotting, Regression analysis, Thermodynamic properties, Diskettes.

PC-OMNITAB, an interactive system for statistical and numerical data analysis, is an extension of OMNITAB 80. It permits one to perform arithmetic, complex arithmetic, trigometric calculations as well as data manipulation, special function calculations, statistical analysis, matrix and array operations. Some of the major statistical capabilities are regression, correlation analysis and oneway/twoway analysis. The system can be implemented on a 386/486 personal computer which has a math coprocessor and at least 4 MBytes of RAM. PC-OMNITAB responds to simple Instructions to obtain accurate results since reliable, varied and so-phisticated algorithms for data analysis and manipulation are referenced.

PB93-504918 **CP T99**

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.
COBOL 85 Compller Validation System (CCVS 85), Version 4.2.

Software.

Mar 93, mag tape, NIST/SW/MT-93/004.
System: IBM 4341; VM/CMS Release 3 operating system. Language: COBOL. No Sales to Japan or Europe.
Supersedes PB91-508002.
Available in 9-track, ASCII character set tape, 1600 bpi, 6250 bpi, or 3480 cartridge. Documentation in Student may be expected separative or BP03 450179. cluded; may be ordered separately as PB93-163178.

*Standards. Keywords: *Software. *Compilers, Computer program venification, Federal information processing standards, Tests, Debugging(Computers) Magnetic tapes, *Cobol programming language, ISO (International Organization for Standardization)

The COBOL 85 Compiler Validation System is used to validate COBOL compilers to ensure their conformance to the Federal Standard as prescribed in Federal Information Processing Standards (FIPS) PUB 21-3 and the International Organization for Standardization (ISO) Standard 1989:1985. The validation system consists of approximately 300 COBOL programs, each of which contains several independent tests. In addition, there is a routine which enables users of the text suite to separate programs by module, level or program name, and automatically replace implementor defined features. The test programs are organized by module as defined in the COBOL 1985 Standard and Intrinsic Function Module addendum, i.e., NUCLEUS, SE-QUENTIAL I-O, RELATIVE I-O, INDEXED I-O, Inter-Program Communication, Sort-Merge, Source Text Manipulation, Intrinsic Functions and the optional modules Report Writer, Communications, Debug and Segmentation. The tests are further organized according to one of two levels defined in the COBOL 1985 Stand-

Mag Tape \$2400.00 of Standards and PB93-505758

National Inst. of Standards and Technology, Gaithersburg, MD.
OSIKIT (Open Systems Interconnection) and NIST Prototype Compiler for Estelle.

Software.

Software. cAug 91, mag tape, NIST/SW/MT-93/005. System: Unix operating system. Language: TAR. Supersedes PB92-501428. See also PB86-146537, and PB86-118700. Typical Unix commands for loading the tape; mkdir osikit, cd osikit, tar xf/dev/rst0. Available in 9-track tape, 1600 bpi, or 6250 bpi. Documentation included; may be ordered separately as PB93-183473, PB93-183465, PB89-196190, PB89-196182, PB89-196174, PB89-196166, PB89-196158 and PB88-124193. and PB88-124193.

Keywords: *Software, C++ programming language, C programming language, Software tools, Magnetic tapes, Compilers, Open systems interconnections, Unix operating system, Estelle technique, ASN.1.

OSIKIT is a collection of tools for application of Estelle and ASN.1 that were developed by the National Institute of Standards and Technology (NIST). The Estelle Prototype Compiler is a compiler from Estelle to the C language, along with a runtime system written in C. The Free Value Tool for ASN.1 is suitable for evaluations and the control of the ing modules in ASN.1 or for building a prototype encoder-decoder. The Estelle Syntax-directed Editor, called Wizard, includes syntax-directed editing of Estelle, through checking of syntax and static semantics, and code generation for the Wise tool. The Estelle simulation environment, called Wise, provides windowbased simulation and symbolic debugging for speci-fications written in Estelle. Some of the tools require support software. They were developed in a Unix envi-ronment. The Portable Estelle Translator (PET) provides syntax and static semantics checking of Estelle and a representation of the specification in the defined model form. The Distributed Implementation Generator (DINGO) uses the model representation produced by PET as input to generate a prototype implementation of the specification in the language C++. Included libraries permit execution of the implementation with a window environment for symbolic debugging of the specification.

PB93-937300 Contact NTIS for subscription

PB93-93/300 Contact NTIS for subscription Information and price.
National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Validated Products List (Cobol, Fortran, ADA, Pascal, C, MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Security).

Quarterly rept.

1993, 1p. Supersedes PB92-937300.

Paper copy available on Standing Order, deposit account required (U.S., Canada, and Mexico \$100; all others \$200). Single copies also available in paper copy only.

Keywords: *Cobol programming language, *Fortran Keywords: "Cobol programming language, "Fortran programming language, Language programming, "Federal Information Processing Standards, "Validation summary reports, "Pascal programming language, "Ada programming language, "Computer graphics(GKS-CGM-PHIGS-Raster), "GOSIP, "POSIX, "Computer security(DES-MAC-Key Management), SQL programming language," ming language.

The Validated Products List (VPL) identifies information technology products that have been tested for con-

Computer Software

formance to Federal Information Processing Standards (FIPS) in accordance with Computer systems Laboratory (CSL) conformance testing procedures, and have a current validation certificate or registered test report. The VPL includes computer language processors for programming languages Ada, C, COBOL, Fortran, MUMPS, Pascal, and database language SQL; computer graphic implementations for GKS, CGM, PHIGS, and Raster Graphics; operating system implementations for POSIX; open systems interconnect implementations for GOSIP; and computer security implementations for DES, MAC and Key Management. The testing of products to assure conformance to the FIPS may be required by Government agencies in accordance with the FIPS, Federal Information Resources Management Regulation (FIRMR) Parts 201/13 and 201/ 39, and the associated Federal ADP and Tele-communications Standards Index. The VPL is updated and published quarterly.

00,273 PB94-104585 PC A03/MF A01

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Security Issues in the Database Language SQL. Special pub. W. T. Polk, and L. E. Bassham. Aug 93, 49p, NIST/ SP-800-8.

Also available from Supt. of Docs. as SN003-003-03225-5.

Keywords: *Data processing security, *Data base management systems, Computer security, Relational data bases, Access control, Data integrity, Standards, Authentication, Tests, Computer program reliability, Fault tolerant computing, *SQL data base language.

The document examines the specific functionality that might be required of relational database management systems (DBMS's), and compares them with the requirements and options of the SQL specifications. The companson shows that the security functionality of an SQL-compliant DBMS may vary greatly. A variety of security policies are considered which can be supported by SQL. The document ends by showing which types of functions are required by the examined secunty policies.

PB94-112497 PC A07/MF A02 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Systems and Software Technology

Reference Model for Frameworks of Software Engl-

referred Moder for Frameworks of Software Engineering Environments (Technical Report ECMA TR/55, 3rd Edition).

Special pub.

Aug 93, 128p, NIST/SP-500-211.

Supersedes PB92-158328. Also available from Supt. of Docs. as SN003-003-03227-1. Prepared in cooperation with European Computer Manufacturers Association with European Computer Manufacturers Association with European Computer Manufacturers Association. tion with European Computer Manufacturers Associa-

Keywords: *Software engineering, *Models, Software tools, Computer systems hardware, Operating systems(Computers), Computer program portability, Services, Data management, Computer communications, Man computer interface, Access control, SEEs(Software Engineering Environments). *Frameworks.

Software engineering environments (SEEs) are typically built on hardware and operating system platforms. Current SEE architectures distinguish between the set of facilities in support of the life cycle project, usually denoted 'tools', and a set of relatively fixed infrastructure capabilities which provide support for processes, objects, or user interfaces, denoted 'frame-works'. A major purpose of frameworks is to simplify the construction of tools by providing a set of com-monly needed facilities, key integration components, and support for higher level constructs than those found in typical operating systems. Another purpose may be to support the porting of environments across a variety of hardware configurations and native operat-Ing systems. Tools may also use services provided by other tools, and framework components may use services from other framework components. The report describes a reference model supporting these framework services.

PB94-118460 PC A08/MF A02 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Software Standards Validation Gaithersburg, MD. Software Standards Group.

FORTRAN Complter Vatidation System 1978. User's Gulde, Version 2.1.

1 Aug 93, 155p, NISTIR-5287. See also AD-A062 037 and magnetic tape AD-A062

Keywords: *Compilers, *Tests, Federal information processing standards, Computer program verification, Computer software management, Specifications, File structures, User manuals(Computer programs), *Fortran programming language, Conformance testing, FEXEC.

The guide gives information and procedures to install and implement the Fortran Compiler Validation System (FCVS) for testing conformance to Federal Information Processing Standards (FIPS) PUB 69 In accordance with Computer Systems Laboratory (CSL) conformance testing procedures.

PB94-120797 PC A03/MF A01

National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. Exppp: An EXPRESS Pretty Printer. National PDES Testbed Report Series.

D. Libes. 8 Nov 93, 18p, NISTIR-5292. See also PB93-178655, PB93-220838, and PB93-220853. Sponsored by CALS Evaluation and Integra-

tion Office, Washington, DC.

Keywords: *Programming languages, *Programming manuals, *Regulations, *Printers(Data processing), Tools, User manuals(Computer programs), Man machine systems, Computer codes, Writing, Computer programming, Computer programs, Improvement, Sorting routines, Standards, Procedure oriented languages, Test beds, *EXPRESS, *Pretty print, *STEP(Standard for the Exchange of Product Model Data), PDES(Product Data Exchange using STEP).

EXPRESS is a data modeling language. EXPRESS is relatively new having only been standardized in 1993. Today, few tools exist that automatically generate EX-PRESS and correspondingly most EXPRESS is handwritten. In the future, the authors predict that all but a tiny fraction of EXPRESS will be computer generated or computer read. While perhaps only during debugging, much of it will be read by humans so it is Important that it 'appear' as easy to read as possible.

Control Systems & Control Theory

PB93-151595 Not available NTIS National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. Collective Learning Systems: A Model for Automatic Control. Final rept.

S. A. Osella. 1989, 6p.

Pub. In Proceedings of IEEE (Institute of Electrical and Electronics Engineers) International Symposium (4th) on Intelligent Control, Albany, NY., September 25-26, 1989, Cat. No. 89TH0282-4, p393-398.

Keywords: *Adaptive control, *Artificial Intelligence, Automatic control, Knowledge bases(Artificial intelligence), Data acquisition, Machine learning, Data structures, Object-oriented programming, Self adaptive control systems, Reprints.

Adaptive control is usually required in situations where conditions are widely varying and/or unpredictable. Adaptive controllers have been implemented using Artificial Intelligence (AI) techniques. Knowledge acquisition, in the classical AI approach, consists of programming a knowledge-base encoded in the form of rules, frames, or object-oriented data structures. However, except for the most trivial of problems, the time and resources required to accumulate enough knowledge is intractably high. Collective Learning Systems (CLS) is a paradigm for the acquisition and application of knowledge through learning. In the CLS approach, Collective Learning Automata acquire knowledge through a learning process consisting of trial-and-error Interactions with the environment. The paper investigates how CLS theory may be used to model and implement adaptive control systems. The pole-balancing problem is posed as the experimental system paradigm.

Information Processing Standards

00.278 AD-A265 261/8

PC A04/MF A01 of Standards and Technology, National Inst.

Gaithersburg, MD.

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11271, U.S. Navy AdaVAX Version 5.5 (/NO OPTIMIZE) VAXstation 4000 > VAXstation 4000.

Final rept.

18 Sep 92, 73p, NIST92USN500-2-1.11.

Keywords: *Ada programming language, *Compilers, Standards, Operating systems(Computers), Computer program verification, Naval research, *Validation summary reports, ADAVAX Version 5.5, Macro parameters, VAX Operating systems, VAXstation 4000 com-

U.S. NAVY, AdaVAX, Version 5.5 (/NO OPTIMIZE), VAXstation 4000, (running VAX/VMS Version 5.5) (host and target), ACVC 1.11.

00.279

FIPS PUB 125-1 PC E99

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.

MUMPS, Massachusetts General Hospital Utility Muttl-Programming System. Category: Software Standard. Subcategory: Programming Language, June 1993.

Final rept.

W. H. Dashiell. 10 Jun 93, 161p. Supersedes FIPS PUB 125.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Programming languages, *Information systems, *Computer programming, Data management, Computer systems programs, Syntax, Semantics, Data systems, MUMPS programming language, Federal Information Processing Standards, Metalanguage.

The publication announces the adoption of American National Standard for MUMPS, ANSI/MDC X11.1-1990, as a Federal Information Processing Standard (FIPS). The standard supersedes FIPS PUB 125 in its entirety. The American National Standard for MUMPS specifies the form and establishes the interpretation of programs written in the MUMPS programming language. The purpose of the standard is to promote portability of MUMPS programs for use on a variety of data processing systems. The standard is for use by members as the reference authority in developing compilers. Interpreters or other forms of high level language. compilers, Interpreters, or other forms of high level lan-guage processors; and by other computer profes-sionals who need to know the precise syntactic and semantic rules adopted by ANSI.

00.280

FIPS PUB 127-2 PC E99

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Database Language SQL. Category: Software Standard. Subcategory: Database, June 1993. Final rept.

2 Jun 93, 652p.

Supersedes FIPS PUB 127-1.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Query languages, *Information retrieval, *Language programming, Data processing, Data bases, Information transfer, Information flow, Computer systems programs, Data base management systems, information management, *SQL database language, *Structured Query Language, Federal Information Processing Standards.

The publication announces adoption of American National Standard Database Language SQL, ANSI X3.135-1992, as the Federal Information Processing Standard for Database Language SQL (FIPS SQL). It is a revision of FIPS PUB 127-1 that adds extensive new functionality to the SQL language. Conformance to FIPS SQL is mandatory for all Federal procurements of relational model database management systems. FIPS SQL is specified to have four conformance levels: Entry SQL, Transitional SQL, intermediate SQL, and Full SQL. Although only Entry SQL is required for conformance to FIPS SQL, the other conformance levels may be specified as mandatory requirements in individual procurements. FIPS SQL also provides default slzing parameters and limits for SQL constructs to pro-

Information Processing Standards

vide a common baseline for database interoperability. The purpose of FIPS SQL is to promote portability and interoperability of database application programs, to facilitate maintenance of database systems among heterogeneous data processing environments, and to allow for the efficient exchange of programmers among different data management projects.

FIPS PUB 128-1A PC E99
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD.
Computer Graphics Metafile (CGM). Category:
Software Standard. Subcategory: Graphics. Part 1. Functional Specification. Final rept.

D. R. Benigni. 11 May 93, 354p. Supersedes FIPS PUB 128. See also FIPS PUB 128-

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Data processing, Computer systems programs, Software engineering, Specifications, Digital data, Data transfer, *CGM(Computer Graphics Metafile), Federal Information Processing Standards, Functional specification, CALS(Computer-aided Acquisition and Logistics Support), Graphics data interfaces, Picture transfer, Continuous Acquisition and Life Cycle Support.

The Computer Graphics Metafile provides a file format suitable for the storage and retrieval of picture informa-tion. The file format consists of a set of elements that can be used to describe pictures in a way that is compatible between systems of different architectures and devices of differing capabilities and design. The picture description includes the capability for describing static pictures. Static pictures are those where elements which may lead to dynamic effects (for example those leading to regeneration) are prohibited within the picture body.

00,282

FIPS PUB 128-1B PC E99

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Computer Graphics Metafile (CGM). Category:

Software Standard. Subcategory: Graphics. Part 2. Character Encoding.

Final rept.

D. R. Benigni. 11 May 93, 106p. Supersedes FIPS PUB 128. See also FIPS PUB 128-

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Data processing, Computer systems programs, Coding, Data compression, Software engineering, Specifications, Digital data, Syntax, Information transfer, *CGM(Computer Graphics Metafile), Federal Information Processing Standards, Character encoding, Information compaction, CALS(Computer-aided Acquisition and Logistics Support), Graphics data interfaces, Picture transfer, Continuous Acquisition and Life Cycle Support and Life Cycle Support.

The Character Encoding of the Computer Graphics Metafile (CGM) provides a representation of the Metafile syntax intended for situations in which it is important to minimize the size of the metafile or transmit the metafile through character-oriented communications services. The encoding uses compact representation of data that is optimized for storage or transfer between computer systems.

FIPS PUB 128-1C PC E99

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.
Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 3.

Binary Encoding.

Final rept.

D. R. Benigni, 11 May 93, 87p. Supersedes FIPS PUB 128. See also FIPS PUB 128-

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Data processing, Coding, Binary codes, Binary data, Data compression, Computer systems programs, Software engineering, Specifications, Digital data, Syntax, Signal encoding, Data transfer, *CGM(Computer Graphics Metafile), Federal Information Processing Standards, Binary encoding, CALS(Computer-aided Acquisition and Logistics Support), Graphics data interfaces, Picture transfer, Continuous Acquisition and Life Cycle Support.

The Binary Encoding of the Computer Graphics Metafile (CGM) provides a representation of the Metafile syntax that can be optimized for speed of generation and interpretation, while still providing a standard means of interchange among computer systems. The encoding uses binary data formats that are much more similar to the data representations used within computer systems than the data formats of the other encodings. Some of the data formats of the other encodings. Some of the data formats may exactly match those of some computer systems. In such cases processing is reduced very much relative to the other standardized encodings. On most computer systems processing requirements for the Binary Encoding will be substantially lower than for the other encodings.

00.284

FIPS PUB 128-1D PC E99

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 4. Clear Text Encoding.

Final rept.

D. R. Benigni. 11 May 93, 70p. Supersedes FIPS PUB 128. See also FIPS PUB 128-

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Text processing, Computer systems programs, Software engineering, Specifications, Mancomputer interfaces, Text editors, Digital data, Information storage, Syntax, Data transfer, *CGM(Computer Graphics Metafile), Federal Information Processing Standards, Clear text encoding, CALS(Computer-aided Acquisition and Logistics Support), Graphics data interfaces, Picture transfer, Continuous Acquisition and Life Cycle Support.

The Clear Text Encoding of the Computer Graphics Metafile (CGM) provides a representation of the Metafile syntax that is easy to type, edit and read. It allows a metafile to be edited with any standard text editor, using the internal character code of the host computer system.

00.285

FIPS PUB 128-1E PC E99

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.
Computer Graphics Metafile (CGM). Category:
Software Standard. Subcategory: Graphics. Military Specification. Digital Representation for Communication of Illustration Data: CGM Application Profile.

Final rept

D. R. Benigni. 11 May 93, 61p. Supersedes FIPS PUB 128. See also FIPS PUB 128-

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Data processing, Computer systems programs, Software engineering, Specifications, Digital data, Data transfer, *CGM(Computer Graphics Metafile), Federal Information Processing Standards, Military specifications, CALS(Computer-aided Acquisi-tion and Logistics Support), Graphics data interfaces, Picture transfer, Continuous Acquisition and Life Cycle

The revised FIPS adopts the redesignated version of the CGM standard, known as ANSI/ISO 8632.1-4:1992, and adds a requirement for the use of profiles. A profile defines the options, elements, and parameters of ANSI/ISO 8632 necessary to accomplish a particular function and to maximize the probability of interchange between systems implementing the pro-file. The revised FIPS also adopts MIL-D-28003A, Computer-Aided Acquisition and Logistics Support (CALS), as the first CGM Application Profile.

FIPS PUB 172 PC E14
National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language. IEEE Standard VHDL Language Reference Manual. Final rept.

W. H. Dashiell. 29 Jun 92, 211p.

Also pub. as Institute of Electrical and Electronics Engineers, Inc., New York rept. no. IEEE-STD-1076-1987 Prepared in cooperation with Institute of Electrical and Electronics Engineers, Inc., New York.
Three ring vinyl binder also available; North American

Continent price \$7.00; all others write for quote.

Keywords: *Computer systems design, *Standards, Computer systems hardware, Specifications, *Federal information processing standards, *Hardware description languages, Very high speed integrated circuits, VHSIC(Circuits), VHDL(VHSIC Hardware Description Language) Language).

The publication announces the adoption of the Federal Information Processing Standard (FIPS) for VHDL. The FIPS adopts American National Standard Hardware Description Language VHDL (ANSI/IEEE 1076-1987) as stipulated in the Specifications Section. The American National Standard specifies the form and establishes the interpretation of programs expressed in VHDL. The purpose of the standard is to promote portability of VHDL programs for use on a variety of data processing systems. The standard is used by implementors as the reference authority in developing compilers, interpreters, analyzers, simulators or other forms of high level language processors, and is used by digital hardware designers, and by other computer professionals who need to know the precise syntactic and semantic rules of the standard and who need to provide specifications for digital hardware descriptions.

00,287

FIPS PUB 173 PC A14

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Spatial Data Transfer Standard (SDTS); Category: Software Standard; Subcategory: Information Interchange. Final rept.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Data transfer(Computers), *Federal information processing standards, Mapping, Data structures, Geographic information systems, Topology, Computer software.

The standard provides specifications (developed through the Department of the Interior) for the organization and structure of digital spatial data transfer, definition of spatial features and attributes, and data transfer encoding. The purpose of the standard is to promote and facilitate the transfer of digital spatial data between dissimilar computer systems.

00,288 FIPS PUB 95-1 PC\$20.50

National Inst. of Standards and Technology (CSL),

Gaithersburg, MD.

Codes for the Identification of Federal and Federally Assisted Organizations. Category: Data Standard, Representations and Codes.

Supersedes FIPS PUB 95, December 23, 1982.

Keywords: *Organizations, *Federal information processing standards, *Codes, Administration, Data, Computers, Standards, Information processing, Federal agencies, Federal budgets, Tables(Data).

The standard provides a four-character identifier for each organization listed. The two leftmost characters form a component data element, called the Treasury Agency Symbol (TAS), which is identical to the two-digit numerical code used in the budgetary process to identify major Federal agencies. Organizations that are related by a common budgetary appropriation usually have the same TAS code. Organizations identified in the Standard include legislative, judicial, and executive branch agencies, as well as those Federal-State, interstate and international organizations that receive budgetary support. The standard is an organizational code set, and does not automatically include all fiscal activities represented in Budget accounts. Governmentsponsored enterprises and certain Federally aided organizations are included also. Provision is made for the inclusion of additional categories of organizations.

Information Processing Standards

00,289 (Order as N93-27704/4, PC A23/ N93-27714/3

MF A04) National Inst. of Standards and Technology, Gaithersburg, MD.

Data Management Standards In Computer-Aided

D. K. Jefferson. 1990, 29p.
In NASA, Washington, Technology for Space Station
Evolution. Volume 2: Data Management System/Environmental Control and Life Support Systems p 197-

Keywords: *Data management, *Information systems, *Weapon systems, Computer techniques, Cost reduction, Data flow analysis, Dictionaries, Logistics management, *Standards.

Viewgraphs and discussion on data management standards in computer-aided acquisition and logistic support (CALS) are presented. CALS is intended to reduce cost, increase quality, and improve timeliness of weapon system acquisition and support by greatly improving the flow of technical Information. The phase 2 standards, industrial environment, are discussed. The information resource dictionary system (IRDS) is described.

00,290 PB93-139053

PB93-139053 PC A04/MF A01 National Inst. of Standards and Technology (NCSL), Gaithersburg, MD. Systems and Network Architecture

Guidelines for the Evaluation of Virtual Terminal implementations.

Special pub. (Final)

C. A. Edgar. Nov 92, 55p, NIST/SP-500/205.
Also available from Supt. of Docs. as SN003-003-03189-5 Sponsored by Internal Revenue Service, Washington, DC.

Keywords: *Evaluation, Guidelines, Remote terminals, Remote systems, Computer networks, Computer communications, Requirements, Local area networks, *Virtual terminals, *GOSIP(Government Open Systems Interconnection Profile), IGOSS(Industry/Government Open Systems Specification), National Instltute of Standards and Technology.

The Government Open Systems Interconnection Profile (GOSIP) mandates that Federal agencies requiring remote terminal access capability procure products conforming to the International Organization for Standardization (ISO) Open Systems Interconnection (OSI) Basic Class Virtual Terminal Service and Protocol. The document advances the goals of the GOSIP by assisting a user In determining which Virtual Terminal (VT) implementation, among several candidates, best meets the functional requirements of that user. The differences in VT implementations for the same terminal type are not so great as to warrant a rating algorithm. Still, there are functional issues to be considered in a VT procurement and these issues are described within the document. The current and future availability of VT products is also discussed.

00.291

PB93-153625 Not available NTIS

National Inst. of Standards and Technology (NCSL), Gaithersburg, MD.

information Technology Standards: Processes and Strategies.

Final rept.

S. M. Radack. 1989, 7p. Pub. in Proceedings of Conference: NCGA '89, Philadelphia, PA., April 17-20, 1989, p234-240.

Keywords: *Standards, *Information processing, Federal information processing standards, Government/industry relations, Reprints, NIST(National Institute of Standards and Technology), OSI(Open Systems Inter-

Standards play an increasingly important role in the strategies of users to make effective use of their information processing systems. The process for achieving voluntary industry consensus standards is exceedingly complex, sometimes slow, and difficult for users to in-fluence. As a large user of information processing systems, the Federal government has a strong interest in getting these standards developed and implemented in commercial, off-the-shelf products. The government's National Institute of Standards and Technology helps to advance the process by assisting Industry in standards development and implementation.

00,292 PB9**3-166809** PC A99/MF E18

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Stable Implementation Agreements for Open Systems Interconnection Protocols. Version 6, Edition 1, December 1992. Based on the Proceedings of the OSE Implementors' Workshop (OIW). Special pub.

T. Boland, and B. Gray. Mar 93, 1690p, NIST/SP-

Supersedes PB92-164508. Also available from Supt. of Docs. as SN903-015-00013-6.

Keywords: *Protocols, Local area networks, Standards, Computer networks, *OSI(Open Systems Inter-connection), OSE(Open Systems Environment), Na-tional Institute of Standards and Technology, Wide area networks, ISDN(Integrated Services Digital Net-

The document records current stable implementation agreements of Open Systems Interconnection (OSI) protocols among the organizations participating in the Open Systems Environment Implementors' Workshop

port Program.

PB93-198273 PC A04/MF A01

National Inst. of Standards and Technology (CSL),

National Inst. of Standards and Technology (CSL), Gaithersburg, MD.

Computer Graphics Metafile (CGM) Test Requirements Document (Update).

Rept. for Oct 92-Sep 93.

L. S. Rosenthal. Apr 93, 58p, NISTIR-5191.

See also PB90-257759. Sponsored by Assistant Secretary of Defense (Production and Logistics), Washington DC. Computers aided Acquisition and Logistic Suppose Computers ton, DC. Computer-aided Acquisition and Logistic Sup-

Keywords: *Computer graphics, Tests, Standards, Conformity, Logistics, *CALS(Computer Aided Acquisition and Logistic Support), CGM(Computer Graphics

The report was prepared by the National Institute of Standards and Technology/Computer Systems Laboratory (NIST/CSL) in support of the Computer-aided Acquisition and Logistic Support (CALS) initiative. It represents a NIST/CSL FY93 contract deliverable task to implement CALS Conformance Testing Services for CGM (Computer Graphic Metafile). In particular, the report updates the CGM Test Requirements Document, published in 1989.

Pattern Recognition & Image **Processing**

00.294 PB93-146652 PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div.
OCR Error Rate Versus Rejection Rate for isolated Handprint Characters.

J. Geist, and R. A. Wilkinson. Dec 92, 16p, NISTIR-

Keywords: *Optical character recognition, *Character recognition, Character recognition devices, Performance evaluation, Performance(Human), Error analysis, Handwriting, Comparison, Meetings, Handprinting.

Over twenty-five organizations participating in the First Census Optical Character Recognition (OCR) Systems Conference submitted confidence data as well as character classification data for the digit test in that Conference. A three parameter function of the rejection rate r is fit to the error rate versus rejection rate data derived from this data, and found to fit it very well over the range from r=0 to r=0.15. The probability distribution underlying the model e(r) curve is derived and shown to correspond to an inherently inefficient rejection process. With only a few exceptions that seem to be insignificant, all of the organizations submitting data to the Conference for scoring seem to employ this same rejection process with a remarkable uniformity of efficiency with respect to the maximum efficiency allowed for this process. Two measures of rejection efficiency are derived, and a practical definition of ideal OCR performance in the classification of segmented characters is proposed. Perfect rejection is shown to

be achievable, but only at the cost of reduced classification accuracy in most practical situations. Human classification of a subset of the digit test suggests that there is considerable room for improvement in machine OCR before performance at the level of the proposed ideal is achieved.

00,295 PB93-147197 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
Effectiveness of Feature and Classifier Algorithms in Character Recognition Systems.
C. L. Wilson. Dec 92, 16p, NISTIR-4995.

Keywords: *Optical character recognition, Pattern recognition, Neural networks, Error analysis, Comparison, Accuracy, Algorithms, Feature extraction.

At the first Census Optical Character Recognition (OCR) Systems Conference, NIST generated accuracy data for more than 40 character recognition systems. Most systems were tested on the recognition of isolated digits and upper and lower case alphabetic characters. The recognition experiments were performed on sample sizes of 58,000 digits, and 12,000 upper and lower case alphabetic characters. The algorithms used by the 26 conference participants included rule-based methods, image-based methods, statistical methods, and neural networks. The neural network methods included Multi-Layer Perceptrons, Learned Vector Quantitization, Neocognitrons, and cascaded neural networks. In this paper, 11 different systems are compared using correlations between the answers of different systems, comparing the decrease in error rate as a function of confidence of recognition. This comparison shows that methods that used different algonithms for feature extraction and recognition performed with very high levels of correlation. This is true for neural network systems, hybrid systems, and statistically based systems, and leads to the conclusion that neural networks have not yet demonstrated a clear superiority to more conventional statistical methods.

00,296 PB93-152155 PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div.
Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. R. A. Wilkinson, M. D. Garris, and J. Geist. Dec 92, 14p, NISTIR-5105. See also PB92-238542.

Keywords: *Handwriting, *Data bases, *Tests, Errors, Classifying, Computer aided evaluation, Verifying, Interactive systems, *OCR(Optical Character Recognition), Character segmentation, NIST(National Institute of Standards and Technology).

The National Institute of Standards and Technology (NIST) needed a large set of segmented characters for use as a test set for the First Census Optical Character Recognition (OCR) Systems Conference. A machineassisted human classification system was developed assisted numarical classification system was developed to expedite the process. The testing set consists of 58,000 digits and 10,000 upper and lower case characters entered on forms by high school students and is distributed as Testdata 1. A machine system was able to recognize a majority of the characters but all system decisions required human verification. The NIST recognition system was augmented with human NIST recognition system was augmented with human verification to produce the testing database. The augmented system consists of several parts: the recognition system; a checking pass; a correcting pass; and a clean up pass. The recognition system was developed at NIST. The checking pass verifies that an image is In the correct class. The correcting pass allows classes to be changed. The clean-up pass forces the system to stabilize by accepting images with verified classifications while rejecting all others. In developing the testing set the authors discovered that segmented characters can be ambiguous even without mented characters can be ambiguous even without context bias. The ambiguity can be caused by oversegmentation or by the way a person writes. This means that a quoted accuracy rate for a set of segmented characters is meaningless without reference to human performance on the same set of characters.

PB93-159077 PC A03/MF A01 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Advanced Systems Div.

Pattern Recognition & Image Processing

Cross Validation Comparison of NIST OCR Databases.

P. J. Grother. Jan 93, 15p, NISTIR-5123. See also PB92-238542.

Keywords: *Optical character recognition, *Data bases, *Comparison, Algorithms, Handwriting, Classifying, Performance evaluation, *National Institute of Standards and Technology.

The quality of reference databases for Optical Character Recognition (OCR) is vital to the meaningful assessment of classification algorithms. The National Institute of Standards and Technology (NIST) has produced two databases of segmented handprinted characters obtained from socially distinct writer populations. Two approaches to the comparison of the databases are described. The first uses the eigenvalue spectrum of the covariance matrix as an a priori measure of the variance intrinsic to the data. The second cross validates the datasets using classification error to quantify the difficulty of OCR. The eigenvalue spectra from the training partitions of the datasets are generated during the production of the Karhunen Loeve (KL) Transforms, the leading components of which are used as prototype features for a classifier. The eigenspectra are used to quantify diversity of the character sets and the Bhattacharrya distance is used to measure class separability. The results for digits suggest that the second NIST database (used nominally for testing) is significantly harder than the first (training) set; the testing images are 11 percent more variable.

DO.298
DB93-162980 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
Methods for Evaluating the Performance of Systems Intended to Recognize Characters from Image Data Scanned from Forms.
M. D. Garris. Feb 93, 27p, NISTIR-5129.
See also PB93-120707.

Keywords: *Optical character recognition, *Performance evaluation, Systems analysis, Image processing, Forms(Paper), Data bases, Testing, Scoring.

The concepts presented in the paper were developed to establish a uniform method of evaluating the recognition of optical character readers used to process the information on forms which receive information as a bit stream directly or indirectly from scanners. Many large data entry systems are being designed to collect data from specified areas of forms, some of which may be multipart and completed with machine-printed or hand-printed characters. As the technology continues to advance, the number of commercially available products is increasing. Multiple products are emerging, all of which are designed to solve optical character recognition (OCR) applications. Improved recognition algorithms have enabled the accuracy of these products to steadily increase, but each product Is based on a different, often proprietary set of algorithms. This presents potential users of OCR technology with many different choices and options and leads to a series of significant questions: How does a person determine when the technology has matured enough to make it economically advantageous to deploy; How does a potential user determine which product is best for his or her specific needs; How can a system developer, who has the ability to choose from a large variety of diverse algorithmic approaches, intelligently choose and then track progress when developing OCR systems. The answer to these questions lies in objective system performance measurement. This is the motivation behind the paper.

PB93-178861 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
Statistical Analysis of Information Content for
Training Pattern Recognition Networks.
C. L. Wilson. Mar 93, 16p, NISTIR-5149.

Keywords: *Pattem recognition, *Neural nets, *Machine learning, Mathematical models, Statistical analysis, Optical character recognition, Dermatoglyphics.

Statistical models of neural networks predict that the difference in training and testing error will be linear In network complexity and quadratic in the feature noise of the training set. Models of this kind have been applied to the Boltzmann pruning of a large Multi-Layer

Perception (MLP) (3786 weights) trained on 10,000 and tested on 10,000 Karhunen-Loeve (K-L) features derived from images of handprinted characters and to a fingerprint classification problem which has 17,157 weights and is trained and tested on 2,000 K-L feature sets. Using the information content to optimize network size, the pruned networks have achieved high rates of recognition and at the same time been reduced in size by up to 90 percent. In the pruning process the product of the network capacity and the recognition error can be used effectively to select an optimum pruned network. If, in addition to conventional Boltzmann weight reduction, a weight reduction method which takes the variance content of the K-L by weighing the features using the K-L eigenvalues is used, networks with optimal size and information content can be constructed.

00,300
PB93-184273 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
Comparative Performance of Classification Methods for Fingerprints.

G. T. Candela, and R. Chellappa. Apr 93, 50p, NISTIR-5163.

Prepared in cooperation with Maryland Univ., College Park. Dept. of Electrical Engineering.

Keywords: *Dermatoglyphics, *Pattem recognition, *Classifying, Neural nets, Parallel processing, Computation, Feature extraction, Data bases, Preprocessing, *Fingerprint classification, National Institute of Standards and Technology.

The document reports the results of several pattern classifiers as tested on the National Institute of Standards and Technology (NIST) Special Database 4, which consists of fingerprint images produced from two rollings of each of 2,000 different fingers. The fingerprints are to be classified into five broad classes known as Arch, Tented Arch, Left Loop, Right Loop, and Whorl. The classiflers tested are drawn from traditional pattem recognition literature (minimum distance, maxlmum a posteriori, nearest neighbor) as well as neural network literature (multilayer perception, radial basis functions, probabilistic neural network). To enable a fair comparison of the classifiers, preprocessing steps such as enhancement and feature extraction are kept the same for all the classifiers. Classification accuracles for all the classifiers are tabulated for the case when they are trained on fingerprints from one rolling and tested on fingerprints from a different rolling. The effect of feature vector dimension on classifier accuracies is indicated. Computational and memory requirements of the classifiers are compared.

00,301
PB93-184422 PC A07/MF A02
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Robot Systems Div.
BInocular Spherical Disparity: A Study in Representation for a Forward Translating Camera.
D. J. Orser. Jun 92, 136p, NISTIR-4865.

Keywords: *Computer vision, *Imaging techniques, Pattern recognition, Stereoscopic vision, Scene analysis, Cameras, *Robot vision, Image segmentation, Optical flow, Binocular disparity.

The problem of interpreting optical flow and binocular disparities for a forward translating camera is addressed. A solution is offered in the form of image remappings which convert the images to the analogous well understood case for a laterally translating camera. After reviewing this latter case, a binocular camera-retina imaging model utilizing spherical projection and foveal peripheral resolution is described for analyzing both binocular disparity and optical flow. The result provides the basis for analyzing both types of disparities within a single framework for the purpose of understanding how these 'orthogonal' sources of information can be exploited in a computational model. The process of image remapping, called 'normalization,' is then defined for four 1-D parameterizations of 3-D space: range, depth, looming and clearance. It is shown that normalization transforms optical flow Into a form analogous to that for the laterally translating camera. In addition, it is shown how to obtain these same normalizations from standard planar projection images. A binocular wire frame scene simulator is used to experimentally verify the ideas. In addition a program for normalizing real iconic planar projection imagery is applied to several example images and the results demonstrated.

00,302
PB93-188126 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
NIST Scoring Pscksge Certification Procedures in
Conjunction with NIST Special Databases 2 and 6.
M. D. Garris. Apr 93, 27p, NISTIR-5173.
See also PB92-238542 and PB93-120707.

Keywords: *Certification, *Optical character recognition, *Performance evaluation, Computer software, Scoring, Data bases, Forms(Paper), Taxes, Systems analysis, *National Institute of Standards and Technology, Special Database 2(SD2), Special Database 6(SD6).

The procedures outlined in the report have been developed by the Natlonal Institute of Standards and Technology (NIST) in order to promote compliance with existing NIST Scoring Package file formats. Through certification, the proper use of the Scoring Package Is promoted and the successful scoring of recognition system data Is maximized. The certification procedures presented In the document have been developed in conjunction with NIST Special Database 2 (SD2) and NIST Special Database 6 (SD6). These two databases contain images of synthesized tax forms. The data entered on the forms appears real, but the values have been generated at random by a computer. NIST offers certification to any organization that has purchased the Scoring Package and requests the service.

00,303
PB93-206191 PC A03/MF A01
National Inst. of Standards and Technology (CAML),
Gaithersburg, MD. Applied and Computational Mathematics Div.

Computational Experience with Radial Basis Function Networks.

J. L. Blue. May 93, 16p, NISTIR-5168.

Keywords: *Character recognition, *Neural nets, Training, Computation, Graphs(Charts), *RBFs(Radial Basis Functions).

The report discusses the use of Radlal Basis Functions for use in neural networks for hand-printed character recognition. The results are expected to apply to other applications of neural networks for classifying input pattems.

PB93-207959 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
DIctionary Production for Census Form Conference.
R. A. Wilkinson. Apr 93, 16p, NISTIR-5180.

Keywords: *Optical character recognition, *Character recognition, Optical scanners, Data reduction, Pattern recognition, Dictionaries.

There are two categories of data from which dictionaries can be produced. One uses old data or data from a previous collection and the other uses new data or data from a current collection. The old data creates dictionaries that can be used for possible answer examples, assisting optical character recognition (OCR) systems, and training of recognition systems. The new data is the most useful in testing and scoring system results. For each of the categories above there are two types of dictionaries. These types may be useful for work with the Second Census OCR Conference. The first contains all words that have occurred in the data set being used. The second dictionary can be built from the essential dictionary. The second dictionary is one which has the misspellings corrected, the abbreviations expanded, and all the words stemmed into logical minimal stems. A mapping between the essential dictionary to the second or exploratory dictionary is required.

00,305
PB94-103702 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
NIST Scoring Package Cross-Reference for Use
with NIST Internal Reports 4950 and 5129.
M. D. Garris. Aug 93, 20p, NISTIR-5249.
See also PB92-238542, PB93-188126, PB93-120707
and PB93-162980.

Keywords: *Optical character recognition, *Performance evaluation, Standards, Nomenclature,

Pattern Recognition & Image Processing

Scoring, Accumulators(Computers), Data bases, Forms(Paper), Systems analysis, *National Institute of Standards and Technology, *Cross-reference, NISTIR 4950, NISTIR 5129.

The Image Recognition Group at the National Institute of Standards and Technology (NIST) has developed a uniform method of evaluating the recognition of optical character readers used to process the information on electronically scanned forms. NIST Scoring Package Release 1.0, NIST Special Software 1 (SS1), is distributed on CD-ROM as a reference implementation of this uniform method. A public version of SS1 was released in October of 1992 along with 'NIST Scoring Package User's Guide Release 1.0' (NISTIR 4950). The User's Guide describes the reference implementation in great detail, but it does not address the theory used to derive the Implementation itself. In February of 1993, the paper, 'Methods for evaluating the Performance of Systems Intended to Recognize Characters from Image Data Scanned from Forms' (NISTIR 5129), was written to replace the draft standard. NISTIR 5129 formalizes the theory used in the Scoring Package and establishes a uniform method of evaluation. In order to formalize these steps, NISTIR 5129 introduced a standard nomenclature for accumulator names. A cross-reference is presented to map this new nomenclature back to the pre-existing User's Guide (NISTIR 4950).

00,306
PB94-118213 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD. Advanced Systems Div.
Comparison of Handprinted Digit Classifiers.
P. J. Grother, and G. T. Candela. Jun 93, 20p,
NISTIR-5209.

Keywords: *Character recognition, *Pattern recognition, Data bases, Neural nets, Image processing, Preprocessing, Algorithms, Feature extraction, Companson.

We report recognition results for several pattern classifiers trained and tested on disjoint sets of 30620 digits selected from the first 500 writers of the National Institute of Standards and Technology (NIST) Special Database 3. The classifiers are ubiquitous in traditional pattern recognition literature (minimum distance, maximum a posterion, nearest neighbor) as well as neural network literature (multilayer perceptron, radial basis functions, probabilistic neural network). For the purpose of valid comparison of classifiers, fixed sets of Karhunen-Loeve Transforms produced from images preprocessed using the same methods for size and orientation normalization were used as features. The 'Kmeans' clustering algorithm is used to produce subclasses thereby supervising training and aiding recognition. Graphical displays of classification and associated confidences illustrate classifier complexity. Recognition error rates for all the classifiers are tabulated as a function of feature vector dimension. Computational and memory requirements of the different classifiers are also compared.

ELECTROTECHNOLOGY

General

O0,307
PB93-125185 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Fields Div.
Benchmark for the Verification of Microwave CAD
Software.
Final rept.
R. Furlow, R. Y. Shimoda, D. F. Williams, R. B.
Marks, and K. C. Gupta. 1992, 10p.
Sponsored by Boelng Defense and Space Group, Seattle, WA., and Colorado Univ. at Boulder.
Pub. In Proceedings of ARFTG Conference Digest (38th), San Diego, CA., December 5-6, 1991, p97-106

Keywords: *Microwave equipment, *Computer aided design, *Computer program venification, Tests, Bench

marks, Computer software, Scatter propagation, Reprints.

A set of microstrip structures which constitute a comprehensive benchmark for the verification of microwave Computer Aided Design (CAD) software has been developed in a collaborative effort. The benchmark Is designed to exhibit a wide range of physical mechanisms which may or may not be incorporated into commercial microwave CAD software. The structures are characterized experimentally with respect to a well understood calibration in which the reference Impedance is set real.

00,308
PB93-143931 (Order as PB93-143923, PC A06/MF A02)
MF A02)
National Inst. of Standards and Technology,
Gaithersburg, MD.
System for Measuring Conditional Amplitude,
Phase, or Time Distributions of Pulsating Phenomena.
R. J. Van Brunt, and E. W. Cernyar. 1992, 38p.
Included in Jnl. of Research of the National Institute
of Standards and Technology, v97 n6 p635-672 Nov/

Keywords: *Electric discharges, Multi-channel analyzers, Dielectric breakdown, Stochastic processes, Pulse height analyzers, Electrical measurement, Amplitude, Phase, Time, *Partial discharges, Trichel pulses.

A detailed description is given of an electronic stochastic analyzer for use with direct 'real-time' measurements of the conditional distributions needed for a complete stochastic characterization of pulsating phenomena that can be represented as random point processes. The measurement system described here is designed to reveal and quantify effects of pulse-to-pulse or phase-to-phase memory propagation. The unraveling of memory effects is required so that the physical basis for observed statistical properties of pulsating phenomena can be understood. The individual unique circuit components that comprise the system and the combinations of these components for various measurements, are thoroughly documented. The system has been applied to the measurement of pulsating partial discharges generated by applying alternating or constant voltage to a discharge gap. Examples are shown of data obtained for conditional and unconditional amplitude, time interval, and phase-of-occurrence distributions of partial-discharge pulses.

00,309
PB93-150795 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Technology Div.
Low Temperature Magnetic Behavior of 'Non-magnetic' Materials.
Final rept.
F. R. Fickett. 1992. 7p.

Pub. in Advances in Cryogenic Engineering Materials, v38 ptB p1191-1197 1992.

Keywords: *Magnetic properties, *Cryogenic equipment, Magnetic susceptibility, Cryogenic temperature, Magnetization, Magnetometers, Plastics, Alloys, Reprints, Magnetic impunities.

Designs for many superconductor systems, ranging from large magnets to thin film devices, require a knowledge of the magnetic properties of a wide range of materials. Commercial 'nonmagnetic' materials may show bizarre magnetic behavior as a function of temperature, changing from paramagnetic to diamagnetic, or vice versa, as the temperature is lowered, and sometimes even become ferromagnetic. In metallic alloys, whether these effects occur and at what temperature are often determined by the exact composition of the alloy, which is frequently correlated with its age. Furthermore, nonmetallic materials may have strong magnetic signatures which arise from magnetic impurities, such as inclusions of magnetite in the glass fibers of fiberglass epoxies. Here we summarize results of magnetic susceptibility measurements on a number of metallic alloys and some nonmetallic materials used in cryogenic applications. The data suggest that care should be taken in the use of many of these common materials, especially in the construction of sensitive magnetometer systems.

00,310
PB93-151793 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.

High-Accuracy Sampling Wattmeter.

Final rept.
G. N. Stenbakken, and A. Dolev. 1992, 5p.
Pub. In Proceedings of IEEE (Institute of Electrical and Electronics Engineers) Instrumentation and Measurement Technology Conference, Secaucus, NJ., May 12-14, 1992, p568-572.

Keywords: *Wattmeters, Power measurement, Callbration, Hz range, Feasibility, Alternating current, Reprints, Sampling wattmeters, High accuracy.

A high-accuracy sampling wattmeter was developed at NIST (National Institute of Standards and Technology) to investigate the feasibility of using waveform sampling techniques for making very accurate power measurements at frequencies from 50 Hz to 1000 Hz. The prototype instrument is not portable but was used to demonstrate the accuracy achievable with the sampling method. The goal of this development was to build an instrument with an uncertainty of less than + or - 50 ppm over these frequencies. The new high-accuracy sampling wattmeter was built around a previous wideband instrument developed earlier at NIST. The new wattmeter uses 16-bit converters and includes a two-stage current transformer in one of the modules. This wattmeter, as the previous wattmeter, operates with asynchronous sampling. The wattmeter has been calibrated using the NIST Audio-Frequency Power Bridge. The two instruments agreed to better than + or - 50 ppm of full scale over the 50 Hz to 1000 Hz frequency range at all power factors.

00,311
PB93-151827 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Technology Div.
Electrical Resistivity of Copper Alloys between 76
K and 300 K.
Final rept.

C. A. Thompson, and F. R. Fickett. 1992, 6p. Pub. in Advances in Cryogenic Engineering (Materials), v38 p1177-1182 1992.

Keywords: *Copper alloys, *Electrical resistivity, Copper beryllium alloys, Temperature range 0065-0273 K, Temperature range 0273-0400 K, Temperature dependence, Cryogenic temperature, Yield strength, Reprints.

We have measured the electrical resistivity of UNS C10100, C10200, C10700, C11000, C15715, and C17510 alloys at ten equally spaced temperatures between 76 K and 300 K. Our results show that the variation of resistivity with temperature is nearly linear over the entire range for each alloy and that the higher resistivity materials have slightly higher slopes. An apparatus which has accurate temperature control and can simultaneously measure the resistance of eight samples is described.

00,312
PB93-151843 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.
Partial Discharge Pulse-Height Analysis: Promises and Limitations.
Final rept.

Final rept.

R. J. Van Brunt. 1991, 5p.

Sponsored by Department of Energy, Washington, DC.
Office of Energy Storage and Distribution.

Pub. in Proceedings of International Symposium on Digital Techniques in High-Voltage Measurements, Toronto, Canada, October 28-30, 1991, p2-12-2-16.

Keywords: *Electric discharges, *Electric corona, Electrical measurement, Electrical insulation, Stochastic processes, Pulse amplitude, Reprints, *Partial discharges.

An alternative approach to measurement of the phase-resolved stochastic properties of partial-discharge pulses is described which can be used to unravel significant phase-to-phase memory propagation effects that give rise to nonstationary behavior in the observed pulse-height or phase-of-occurrence distributions. Examples are shown of data obtained using a point-to-dielectric discharge gap.

00,313
PB93-153120 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO, Electromagnetic Fields Div.

Electromagnetic Shielding of RF Gaskets Measured by Two Methods. Final rept.

J. W. Adams. 1992, 4p.
Pub. in Proceedings of International Symposium on
Electromagnetic Compatibility, Anaheim, CA., August
17-21, 1992, p154-157.

Keywords: *Electromagnetic shielding, *Gaskets, Electrical measurement, Performance evaluation, Transfer Impedance, Effectiveness, Holders, Reprints.

An evaluation of two techniques and sample holders for measuring the electromagnetic shielding effective-ness of RF gaskets is given. Measured data and suggestions for refinements are also presented.

PB93-153138 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Comparison Measurements of Currents Induced by Radiation and injection.

Final rept. J. W. Adams, J. Cruz, and D. Melquist. 1992, 3p. Pub. in IEEE (Institute of Electrical and Electronic Engineers) Transactions on Electromagnetic Compatibility 34, n3 p360-362 Aug 92.

Keywords: *Electromagnetic compatibility, Electrical measurement, Electric current, Comparison, Reprints, Bulk current.

Measurements that show significant differences between currents measured in individual wires of a bundle due to equal current excitations by external radiated fields or by bulk injection are reported. This raises concern whether bulk current injection is a reliable technique for EMC work.

PB93-153278 Not available NTiS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Reverberating Asymmetric TEM Cell for Radiated EMC/V and SE Testing, 10 kHz - 18 GHz.

Final rept.
M. L. Crawford, and B. F. Riddle. 1992, 8p. See also PB92-165273.

Pub. in Proceedings of International Symposium on Electromagnetic Compatibility, Anaheim, CA., August 17-21, 1992, p206-213.

Keywords: *Electromagnetic compatibility, *Electromagnetic shielding, Reverberation chambers, Test facilities, Vulnerability, Effectiveness, Measurement, Reprints, *TEM cells.

The paper describes work in progress at the National Institute of Standards and Technology (NIST) to develop a single, integrated facility for electromagnetic compatibility/vulnerability (EMC/V) and shielding effectiveness (SE) testing over the frequency range of 10 kHz to 18 GHz. The facility consists of an asymmetric offset center plate) TEM cell 10 m x 1 20 m x 2 29 (offset center plate) TEM cell, 1.01 m x 1.20 m x 2.98 m in size, with two cavity mode tuners, configured as a TEM transmission line-driven, mode-stirred chamber. The paper discusses the cell design, advantages and limitations for its use, the theoretical basis for its operation, and the experimental approach for its use in SE or EMC/V testing. Results are given of the eval-uation of the cell's operational parameters including VSWR, E-field amplitude versus Input power, tuners effectiveness, and test volume E-field uniformity.

PB93-153492 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div.
System Response to Puised Excitations Estimated from Measurement of cw Amplitudes. Final rept.

M. T. Ma, and J. W. Adams. 1992, 4p. Pub. in Proceedings of International Symposium on Electromagnetic Compatibility, Beijing, China, May 25-27, 1992, p29-32.

Keywords: *Systems engineering, Laplace transformation, Hilbert transformation, Continuous radiation, Transfer functions, Time response, Linear systems tems, Electromagnetic pulses, Network analysis, Excitation, Reprints.

A simple technique for determining the transfer func-tion and the complete time characteristics of an unknown linear system from the measured amplitude re-

sponse to cw excitations is described. The work is based on modern network theory. The system transfer function so determined may or may not be at minimum phase. The associated time responses can be cal-culated for all possible cases, thus revealing the worst

PB93-153567 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div. improvements in the NIST Watt Measurement:

Monitoring the Mass Stability of the Kilogram.

P. T. Olsen, W. L. Tew, and E. B. Williams, 1992.

Pub. in Conference Record for Conference on Preclsion Electromagnetic Measurements (CPEM '92), Parls, France, June 9-12, 1992, p123-124.

Keywords: Electrical measurement, Magnetic forces, Monitoring, Automation, Reprints, *Watt measurement, induced voltage, Mass stability, Watt balance, Kilo-

Considerable progress has been made toward the two orders of magnitude decrease of the experimental uncertainty of the NIST watt measurement from that previously reported. The rebuilding of the apparatus and electronics provides the automated measurement capability to obtain the statistical resolution required to study the system's behavior and the numerous possible sources of error.

00.318 PB93-153641 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Optimized Thermo-Optic Electric-Field Probes for Microwaves and Millimeter Waves. Final rept.

J. Randa, M. Kanda, and R. D. Orr. 1992, 4p. Sponsored by Naval Ocean Systems Center, San

Diego, CA.
Pub. in Proceedings of International Symposium on Electromagnetic Compatibility, Anaheim, CA., August 17-21, 1992, p200-203.

Keywords: *Electric probes, *Electric fields, Microwave equipment, Millimeter waves, Performance, Design, Reprints, Thermooptics.

We report the design and testing of electric-field probes for use at frequencies in the microwave and millimeter-wave range. The probes consist of a resistive element whose temperature rise is measured by an optically sensed thermometer. Design parameters of the resistive element were optimized theoretically, with empirical confirmation. The optimized probe has a flat response above about 13 GHz and can measure fields as small as 17 V/m.

PB93-198851 PC A03/MF A01 National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div.
Shielded Open-Circuited Sample Holders for Dielectric and Magnetic Measurements of Liquids

and Powders. J. Baker-Jarvis, M. D. Janezic, and R. B. Stafford. Mar 93, 33p, NISTIR-5001. Prepared in cooperation with Virginia Polytechnic Inst.

and State Univ., Blacksburg, Dept. of Electrical Engi-

Keywords: *Magnetic measurement, *Holders, Dielectric properties, Coaxlal cables, Powder(Particles), Permittivity, Permeability, Calibration, Uncertainty, Waveguides, Liquids, *Dielectric measurements.

The report overviews shielded open-circuit measurements and presents a comprehensive uncertainty analysis. The authors use a dominant-mode scattering formulation to develop an expression for the reflection coefficient in terms of bead and sample parameters. The formulation developed here eliminates the transformation through the various sections of the sample holder. The authors also extend the formulation to include magnetic measurements. The uncertainty analysis indicates a decrease in relative uncertainty with increasing sample length and with increasing frequency. The real part of the permittlyity at low frequencies is very sensitive to measured phase of the reflection co-efficient and sample length. The imaginary part of the permittivity of low-loss materials is not extremely sensitive to the sample length. For high-loss materials both

the real and the Imaginary parts of the permittivity are sensitive to the sample lengths.

PB93-228625 PC A11/MF A03 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electronics and Electrical Engineering Laboratory

1993 Program Plan: Supporting Technology for U.S. Competitiveness in Electronics. J. F. Mayo-Wells. Aug 93, 228p, NISTIR-5213. See also PB92-123082.

Keywords: *Electrical measurement, *Electronics industry, Semiconductor devices, Superconductors, Microwave equipment, Optical equipment, Optical flbers, Standards, Electromagnetic compatibility

The U.S. electronics and electrical egulpment industries are experiencing a major shortfall in the measure-ment capability needed for developing, marketing, and supporting more competitive products. The Electronics and Electrical Engineering Laboratory (EEEL) of the National Institute of Standards and Technology is responding with programs of measurement development supportive of a broad range of fields of electronics. These fields include semiconductors, superconductors, magnetics, microwaves, lightwaves (including lasers and optical fibers), electrical power, and video. Also addressed are several cross-cutting fields including electromagnetic compatibility, complex-system description, and complex-system testing.

PB94-110186 PC A03/MF A01 National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. NIST Measurement Service for Electromagnetic Characterization of Materials. J. H. Grosvenor. Aug 93, 14p, NISTIR-5006.

Keywords: *Electrical measurement, *Metrology, Microwave frequencies, Radio frequencies, Dielectric properties, Magnetic properties, Transmission lines, Coaxial cables, Cavity resonators, Permittivity, Permeability, Waveguides, Capacitors, Services, Automatic network analyzers, Reference materials, Round roblns, Intercomparison, US NIST, EPM project.

The paper presents an overview of the special test/ measurement services currently available at the National Institute of Standards and Technology for characterizing the dielectric and magnetic properties of materials at the rf and microwave frequencies. Many Important applications of materials used throughout the electronics, microwave, aerospace, and communica-tions Industries, have created a significant and increased need for reliable data on the electromagnetic properties of such materials. The paper emphasizes recent improvements in metrology capabilities developed at NIST. These include the broadband (0.1 MHz to 18 GHz) transmission-line techniques and low-frequency parallel-plate capacitor methods. The paper also briefly addresses other facets of the NIST pro-gram, including the provision of dielectric and magnetic reference materials to customers and the organization of national round robin intercomparisons.

PB94-112547 PC A06/MF A02 National inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Bibliography of the NIST Electromagnetic Fields Division Publications. R. M. Lyons, and K. A. Gibson. Sep 93, 119p, NISTIR-5009. Supersedes PB92-116367.

Keywords: *Electromagnetic fields, *Bibliographles, Electrical measurement, Dielectric properties, Electro-magnetic interference, Electromagnetic noise, Remote sensing, Time domain, Radiation hazards, Near fleld, Antennas, Metrology, Waveforms, Standards, Micro-waves, Attenuation, Nonionizing radiation, US NIST.

The bibliography lists the publications by the staff of the Electromagnetic Fields Division of the National In-stitute of Standards and Technology for the period January 1970 through July 1993. It supersedes NISTIR 3993 which listed the publications of the Electromagnetic Fields Division from January 1970 through July 1992. Selected earlier publications from the Division's predecessor organizations are included. Key words include: antennas; dielectric measurements; electromagnetic interference; microwave metrology; microwave power; impedance; attenuation; near-field

ELECTROTECHNOLOGY

General

antenna measurements; nolse; non-lonizing radiation; radiation hazards; standards; time domain; waveform metrology.

00,323 PB**94-12305**6 PC A03/MF A01 National inst. of Standards and Technology (EEEL), Galthersburg, MD.
Results of Screened-Room Measurements on NIST

Standard Radiators. G. Koepke, and J. Randa. Oct 93, 38p, NISTIR-5010.

See also PB92-187020.

Keywords: Electromagnetic interference, Electromagnetic compatibility, Interlaboratory comparisons, Radiation sources, Field strength, Spherical configuration, Monopoles, Dipoles, Graphs (Charts), *Standard radiators, Screened rooms, MIL-STD-462.

The National Institute of Standards and Technology (NIST) has recently developed a spherical-dipole standard radiator for use in electromagnetic interference and compatibility (EMI/EMC) applications. This report discusses results of a study of measurements of radiated emissions from the NIST spherical-dipole standard radiator in several screened rooms. The measurements were performed in accordance with MIL-STD-462 (1967). Large differences occur in the field intensity measured at different laboratories and even on different days at the same laboratory. There is also a systematic difference at low frequencies between the screened-room results and results obtained in a TEM cell, open-area test site, and anechoic chamber. Results obtained using a monopole radiator are also presented and discussed.

Antennas

00.324 PB93-153393 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div.
Ultra-Broadband and Nondispersive Sensor for the Measurement of Time-Domain Signals. Final rept.

M. Kanda, and A. R. Ondrejka. 1991, 14p.
Pub. in Proceedings of Symposium on Electromagnetic Security for Information Protection, Rome, Italy, November 21-22, 1991, p65-78.

Keywords: *Signal detection, Electrical measurement, Time domain, Broadband, Antennas, Sensors, Reprints, TEM horns.

The paper discusses an ultra-broadband and nondispersive antenna for the measurements of timedomain signals. The resistively loaded TEM hom with the active cross-over network has a nearly constant amplitude and phase response from 2 kHz to 800 MHz. The upper frequency response, up to 1 GHz, is limited by the active cross-over network. Its antenna transfer function is on the order of -22 dB relative to 1 V output for 1 V/m.

PB93-153419 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. New Spherical Dipole Source. Final rept. G. Koepke, L. D. Driver, K. Cavcey, M. Kanda, K. Masterson, and R. Johnk. 1992, 8p. Pub. in Proceedings of International Symposium on

Electromagnetic Compatibility, Anaheim, CA., August 17-21, 1992, p98-105.

Keywords: *Dipole antennas, Electromagnetic fields, Optical fibers, Remote control, Sphencal configuration, Sources, Reprints.

We have developed a spherical dipole electromagnetic source that can be characterized both by theory and experiment and integrated into modern automated test systems. The frequency and amplitude of the radiated electromagnetic field are established remotely using a signal generator. This signal and all other control features are transmitted to and from the sphere using optical fiber cable. The field measurements show good agreement with predictions over much of the frequency

00,326 PB93-235208 PC A03/MF A01

National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Dual-Port Circularty Polarized Probe Standards at

the National Institute of Standards and Technology. M. H. Francis, K. MacReynolds, and S. Canales. Aug

93, 38p, NISTIR-5007.

Keywords: *Antennas, *Measurement, *Circular polar-Ization, Electromagnetic fields, Standards, Design criteria, Probes, Frequency standards.

The National Institute of Standards and Technology has acquired dual-port circularly polarized probes to use as gain and near-field probe standards for measuring circularly polarized test antennas. These probes will serve as standards for the 18 to 26.5, 33 to 50, and 50 to 70 GHz frequency bands. The paper discusses the need for such standards, their design requirements, the measurement results for gain, polar-Ization, and pattern, and an uncertainty analysis of the measurements.

Circuits

00,327 PB93-143949 (Order as PB93-143923, PC A06/ MF A02) National Inst. of Standards and Technology, Boulder, High Power CW Wattmeter Calibration at NIST. G. Rebuldela, and J. A. Jargon. 1992, 15p. Included in Jnl. of Research of the National Institute of Standards and Technology, v97 n6 p673-687 Nov/ Dec 92.

Keywords: *Wattmeters, *Calibration, MHz range 01-100, MHz range 100-1000, Continuous radiation, Power measurement, High power, Automation, Uncertainty, Cascaded coupler technique, US NIST.

The National Institute of Standards and Technology has established a measurement capability to support high power systems and devices. The automated wattmeter calibration system operates at power levels of 1 to 1000 W for frequencies from 1 to 30 MHz and 1 to 500 W from 30 to 400 MHz. A cascaded coupler technique is used to extend power measurements to high levels which are traceable to a 10 mW standard thermistor mount. The technique uses an arrangement of nominal 10, 20, 30, 40, and 50 dB couplers with sidearm power meters. The initial step transfers the calibration of the 10 mW standard to the 10 dB coupler/ power meter. The standard is then replaced with a wattmeter to be calibrated. RF power is increased 10 dB and the calibration is transferred to the adjacent 20 dB coupler/power meter. The sequence is repeated with the remaining coupler/power meters until the wattmeter is calibrated at the desired power levels and frequencies. Power ratios calculated from simulta-neous power measurements made at each transfer are used to calculate the incident power at the wattmeter.

00.328 PB93-150688 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div.
Binary Inductive Voltage Divider Bridge. S. Avramov, N. M. Oldham, and D. G. Jarrett. 1992, See also PB93-135572.

Pub. in Proceedings of National Conference of Standards Laboratories, Washington, DC., August 2-6, 1992, p623-627.

Keywords: *Electric bridges, *Voltage dividers, KHz range 01-100, Hz range, Calibration, Automation, Linearity, Reprints, Inductive voltage dividers.

An automatic bridge to calibrate Inductive voltage dividers from 10 Hz to 100 kHz is described. The bridge is based on a programmable 30-bit binary inductive voltage divider with terminal linearity of 0.1 ppm at 100 Hz (linearity degrades to 10 ppm at frequency extremes). Measurements of programmable test dividers can be completely automated via the General Purpose interface Bus (GPIB) using software developed to align the bridge components and perform an auto balance.

00,329 PB93-150704 Not available NTIS National inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div.

Automated System for the Measurement of High-Valued Resistors.

Final rept.
P. A. Boynton. 1992, 5p.
See also PB93-129377.
Pub. in Proceedings of National Conference of Standards Laboratories, Washington, DC., August 2-6, 1992,

Keywords: *Electrical resistance, *Resistors, Electrical measurement, Calibration, Automation, Reprints, *Resistance standards, Loss of charge method, Capacitance discharge method.

An automated method for measuring high-valued resistors is described. It is based on a loss-of-charge method, involving the discharge of a standard capaci-tor through an unknown resistor. This system is in-tended to calibrate standards ranging from 10(sup 10)ohm to 10(sup 14)ohm.

00,330 PB93-151132 PB93-151132 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div. Automated AC Bridge for Resistance Measure-Final rept. D. G. Jarrett. 1992, 5p.

See also PB93-129419.

Pub. in Proceedings of National Conference of Standards Laboratories, Washington, DC., August 2-6, 1992, p563-567.

Keywords: *Electrical resistance, *Kelvin bridges, Electrical measurement, Frequency dependence, KHz range 01-100, Hz range, Voltage dividers, Phase angle, AC systems, Automation, Reprints.

An automated, guarded ac Keivin bridge has been developed for measuring the frequency dependence of precision resistors from the 1-ohm to the 1-M(ohm) level over the frequency range of 10 Hz to 10 kHz. The main ratio arms consist of two-stage 30-bit binary inductive voltage dividers. A guard Inductive voltage di-vider drives a RC network to provide a known phase compensation to balance the quadrature component of the bridge. A bridge substitution technique is used in which the unknown is compared to a standard of known impedance. The bridge resolution is better than 0.1 ppm for the in-phase and quadrature components.

PB93-151173 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.
NMR Based Current/Voltage Source.

Final rept.
C. G. Kim, E. R. Williams, H. Sasaki, W. L. Tew, S. Ye, and P. T. Olsen. 1992, 2p.
Pub. in Proceedings of Conference Record for Conference on Precision Electromagnetic Measurements, Paris, France, June 9-12, 1992, p414-415.

*Nuclear magnetic Gyromagnetic ratlo, Magnetic fields, Electrical measurement, Precision, Stability, Reprints, *Current sources, *Voltage sources.

A one-ampere current has been stabilized using nuclear magnetic resonance (NMR) techniques. A pair of tandem solenoids produce two uniform magnetic fields In opposite directions and these fields are not affected by external magnetic shielding. The current and back-ground field are controlled to 0.1 ppm in three hours.

00.332 PB93-151181 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div. Intercomparison of NIST, NPL, PTB, and VSL Thermal Voltage Converters from 100 kHz to 1 MHz. Final rept.

J. R. Kinard, R. B. D. Knight, P. Martin, J. Dessens, M. Klonz, and J. P. M. de Vreede. 1992, 5p. See also PB93-129328.

Pub. In Proceedings of National Conference of Standards Laboratories, Washington, DC., August 2-6, 1992, p557-561.

Keywords: KHz range 100-1000, interlaboratory comparisons, Repnints, *Thermal voltage converters, Thermai converters.

ELECTROTECHNOLOGY

Optoelectronic Devices & Systems

Coaxial, thermal voltage converters (TVC's) have been hand-carried among NIST, NPL, PTB, and VSL for intercomparison of ac-dc difference from 100 kHz to 1 MHz. This paper briefly describes the methods and underlying principles on which ac-dc difference determinations are based in each laboratory and gives the results of the intercomparisons.

00,333

PB93-151223 Not available NTIS

National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.

Low-Frequency Errors of Thermal Voltage Con-

verters: A Progress Report.

Final rept.
T. E. Lipe. 1992, 4p.
Pub. in Proceedings of National Conference of Standards Laboratories, Washington, DC., August 2-6, 1992, p543-546.

Keywords: Extremely low frequency, Hz range, Progress report, Errors, Reprints, *Thermal voltage converters, *Thermal current converters, Thermal converters.

Characteristics of thermal voltage converters (TVC's) and thermal current converters (TCC's) at low frequencies (below 100 Hz) are discussed. This frequency range is the region where the TVC's cease the thermal averaging of the ac input signal. The variation n ac-dc difference as the frequency of the input signal decreases is examined using various devices having differing thermal time constants. The data gathered experimentally using these devices are compared to pre-dictions made using theoretical models of the TVC's at low frequencies and these results discussed. It is expected that this research will lead to Improved accuracies for the NIST ac voltage and current calibration service at low frequencies.

00,334 PB93-151819 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div. Flux Locked Current Source Reference.

Final rept. W. L. Tew, and E. R. Williams. 1992, 2p.
Pub. in Conference Record for Conference on Precision Electromagnetic Measurements (CPEM'92), Paris, France, June 9-12, 1992, p70-71.

Keywords: SQUID devices, Quantization, Stability, Re-prints, *Current sources, Flux transformers, Voltage references.

The quantization of flux in a closed superconducting circuit is used to provide a stable reference current. A to mA current source is coupled via a toroidal transformer to a dc SQUID input and the resulting signal fed back as an error current. The result is a net current that exhibits stability of 1 x 10(sup -9) per hour and is quantized with a step of 59.4 nA. This current is sourced through a precision 100 ohm resistor and compared against Zener and standard cell voltage references.

erences. PB93-151884 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.
NIST Sampling System for the Calibration of Phase
Angle Generators from 1 Hz to 100 kHz.
Final rent

Final rept.

B. C. Waltrip, M. E. Parker, N. M. Oldham, and B. A. Bell. 1992, 4p.

Pub. in Proceedings of National Conference of Standards Laboratories, Washington, DC., August 2-6, 1992, 2513-616.

0613-616.

Keywords: *Phase meters, *Calibration, KHz range 01-100, Hz range, Wave forms, Sine waves, Linearity, Sampling, Reprints, *Phase angle generators, Phase standards.

A system for calibrating phase angle standards and phase meters from 1 Hz to 100 kHz is described. A commercial dual-channel waveform sampler is used to digitize both waveforms of the generator. The phase relationship between the two signals is resolved to less than 0.001 deg (17 microrad) using a four-parameter sine fit. The uncertainty in phase linearity is 0.001-0.010 deg over the frequency range.

PB93-151892

Not available NTIS

National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div.
Sampling Technique for Calibrating Phase Angle Generators from 1 Hz to 100 kHz.

B. C. Waltrip, M. E. Parker, N. M. Oldham, and B. A. Bell. 1992, 2p.

Final rept.

Pub. in Proceedings of Conference on Precision Electromagnetic Measurements (CPEM'92), Pans, France, June 9-12, 1992, p421-422.

Keywords: *Calibration, KHz range 01-100, Hz range, Wave forms, Sine waves, Phase meters, Reprints, *Phase angle generators, Phase standards.

A method of calibrating phase angle generators from 1 Hz to 100 kHz is described. A commercial dual-channel waveform sampler is used to digitize both waveforms of the generator. The phase relationship between the two signals is resolved to 0.001 deg (17 microrad) using a four parameter sine fit. The uncertainty in phase lineanty is + or - 0.001 deg to 0.01 deg over the above frequency range.

00,337 PB94-108487 (Order as PB94-108461, PC A09/ MF A02) National Inst. of Standards and Technology, Boulder,

Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude.
M. T. Ma, and J. W. Adams. 1993, 23p.

Included in Jnl. of Research of the National Institutes of Standards and Technology, v98 n3 p297-319 May/

Keywords: *Linear systems, *Network analysis, Continuous waves, Hilbert transformation, Laplace transformation, Rational functions, Transfer functions, Frequency response, Approximation, Impulse response.

A method is presented for predicting the total response, in both frequency and time, of an unknown linear system when only the measured continuous wave (cw) magnitude is available. The approach is based on approximating the square of the measured magnitude by a rational function, from which various system transfer functions in terms of complete from the contract of the contract o fer functions in terms of complex frequency are deduced. These transfer functions may or may not be at minimum phase. The corresponding impulse response is then obtained by taking the inverse Laplace transform of the transfer function. The impulse response of the minimum phase case does faster initially to its first the minimum-phase case rises faster initially to its first maximum than the nonminimum-phase counter-parts. This result confirms that, for the same cw magnitude response, the accumulative energy contained in the impulse response is the greatest when the transfer function is at minimum phase. Physical meaning of the energy content is also discussed.

00.338 PB94-112455 PC A04/MF A01 National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Microcalorimeter for 7 mm Coaxial Transmission Line. Technical note.

F. R. Clague. Aug 93, 51p, NIST/TN-1358. Also available from Supt. of Docs. as SN003-003-03241-7.

Keywords: *Power measurement, *Calonmeters, Electrical measurement, Transmission lines, Performance evaluation, Microcalonmetry, Calibration, Thermistors, Design, *Microwave microcalorimeters, Microwave power standards, Reference standards, US NIST.

Design, evaluation, and construction details are given for the coaxial microcalorimeter used by NIST as part of the microwave power standard in 7 mm coaxial transmission line. Two versions are described: one with Type N connector and one with an APC-7 connector. The operating frequency range is 0.01 to 18 GHz with either connector. The microcalorimeter is used to measure the effective efficiency of a reference standard, which is then used to calibrate other microwave power sensors. These reference standards are thermistor mounts designed by NIST to be compatible with the microcalorimeter. Detailed microcalorimeter drawlings and assembly instructions are included.

Optoelectronic Devices & Systems

N93-27779/6 (Order as N93-27726/7, PC A99/

N93-27779/6 (Order as N93-27726/7, PC A99/ MF A06)
National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div. Electrical and Infrared Properties of Thin Niobium Microbolometers Near T(sub c).
E. N. Grossman, J. E. Sauvageau, and D. G. Mcdonald. 1992, 11p.
In Michigan Univ., the Third International Symposium on Space Terahertz Technology: Symposium Proceedings p 643-653. Sponsored in Part by Strategic Defense Initiative Organization.

Keywords: *Bolometers, *Infrared detectors, Critical temperature, Niobium, Spiral antennas, Superconducting devices, Electrical properties, Hysteresis, Temperature dependence, Volt-ampere characteristics, *Microbolometers.

Niobium microbolometers approximately 1 micron wide x 2 micron long x 10 nm thick have been integrated at the feeds of equiangular spiral antennas made of 200 nm thick Nb. The device's current-voltage charac-200 nm thick Nb. The device's current-voltage characteristics and infrared responsivity as a function of DC bias voltage were measured over a range of temperature spanning approximately plus or minus 2 percent around T(sub c). The greatest voltage responsivity occurs well below T(sub c), in a regime where the I-V curve is significantly hysteretic due to self-heating and resembles the I-V curve of a superconducting microbridge. microbridge.

00,340 PB93-153807 Not available NTIS
National Inst. of Standards and Technology (NEL),
Boulder, CO. Electromagnetic Technology Div.
Integrated Optic Laser Fabricated by Field-Assisted ion Exchange in Neodymium Doped Soda-Lime Silicate Glass.
Final cent Final rept.

N. A. Sanford, K. J. Malone, and D. R. Larson. 1990,

Pub. in Optics Letters 15, n7 p366-368, 1 Apr 90.

Keywords: *Waveguide lasers, Continuous wave lasers, Infrared lasers, Near infrared radiation, Integrated optics, Doped materials, Neodymium, Silicates,

A continuous-wave channel waveguide laser operating at 1057 nm has been fabricated in neodymium-doped soda-lime silicate glass by field assisted ion exchange. Threshold for pumping at 528 nm is 31 mW. Slope efficiency is 0.5%.

PB94-108776 PC A05/MF A01 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD.

Metrology for Electromagnetic Technology: A Bibliography of NIST Publications.

A. J. Smith. Sep 93, 83p, NISTIR-5008.

Supersedes PB92-116375.

Keywords: *Metrology, *Bibliographies, Optical communication, Optical fibers, Fiber optics, Optoelectronic devices, Electrooptics, Solid state lasers, Superconducting devices, Superconductors, Magnetic measurement, Cryogenics, *Electromagnetic metrology, Cryoelectronics, US NIST.

The bibliography lists the publications of the personnel of the Electromagnetic Technology Division of NIST during the period from January 1970 through publication of this report. A few earlier references that are directly related to the present work of the Division are also included. Keywords include cryoelectronics, electromagnetic metrology, lasers, optical fibers, and superconducting materials.

PB94-118403 PC A03/MF A01
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
Electronics and Electrical Engineering Laboratory
Technical Publication Announcements Covering
Laboratory Programs, April to June 1993 with 1993/
1994 EEEL Events Calendar.
J. M. Rohrbaugh. Oct 93, 13p, NISTIR-5275.
See also PB93-234698.

Keywords: *Microelectronics. *Metrology *Bibliographies, Dimensional measurement, Optical fi-

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bers, High temperature superconductors, Electric contacts, Laser beams, Electrical measurement, Electric current, Magnetlc recording, Integrated optics, Waveguide lasers, Erbium glass lasers, Electric power, Photodetectors, Magnetic measurement, Abstracts, Fiber optic sensors, Yttnum banum cuprates, optic Claddings.

This is the thirty-seventh issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology, Electronics and Electrical Engineering Laboratory. This issue of the EEEL Technical Publication Announcements covers the second quarter of calendar year 1993. Abstracts are provided by technical areas for papers published. Main topic areas include: Semiconductor Microelectronics; Signal Acquisition, Processing, and Transmission; Electrical Systems; and Additional Information.

Power & Signal Transmission Devices

PB93-151124 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Space Charge Induced in Stressed Polyethylene.

Final rept. N. Hozumi, J. Tanaka, A. S. DeReggi, and N.

Nagusrinivas. 1989, 6p.
Pub. in IEEE (Institute of Electrical and Electronics Engineers) 1989 Annual Report: Conference on Electrical Insulation and Dielectric Phenomena, p253-258 1989.

Keywords: *Electrical insulation, *Polyethylene, *Electric wire, *Space charge, Degradation, Electrodes, Aging(Materials), Electric charge, Charge density, Reprints.

Measurements of space charge induced by poling have been made on XLPE samples cut from AC cables aged under different conditions. The approximately 220 micrometer thick samples were obtained by peeling. Gold electrodes were evaporated on the samples, the samples poled at approximately 0.12 MV/cm (2.75 kV per sample) for three hours at 70 C, and the space charge determined by the thermal pulse technique. The amount of space charge induced in different samples by identical poling conditions was larger in the samples with the longer exposure to AC stress. The total amount of space charge which could be induced by poling was also found to correlate with other parameters such as AC breakdown strength. In addition, the space charge dissipation rate was monitored for several weeks after poling. Samples aged at room tem-peratures with both electrodes grounded retained more than half their original space charge after one week. It is highly probable that space charge determinations will be a powerful method for estimating the degree of degradation of aged cables.

PB93-153211 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div.
Critical-Current Degradation in Nb3Sn Composite Wires Due to Locally Concentrated Transverse Stress.

Final rept.

S. Bray, and J. W. Ekin. 1992, 4p. Sponsored by Department of Energy, Washington, DC. Pub. in Advances in Cryogenic Engineering (Materials), v38 p643-646 1992.

Keywords: *Superconducting wires, *Critical current, Superconducting composites, Superconducting magnets, Stress measurement, Niobium stannides, Degradation, Reprints, Transverse stress.

The superconducting wires in an energized magnet coil are subjected to mechanical stresses caused by Lorentz force. Previous measurements have shown that either axial tensile stress or transverse compressive stress, the two dominant stresses on the wire, can cause substantial degradation in the superconductor's critical current. The previous transverse stress measurements were made with uniformly applied stress; however, many superconductor applications employ cables where the strands experience stress concentrations at the points where they cross one another. For this study, a single stress concentra-tion point was simulated by applying transverse stress to two Nb3Sn wires, which were crossed over one another at an angle, while measuring the critical current of one of the wires at magnetic fields up to 9 T. A comparison between the cross-over-transverse-stress measurements and the uniform-transverse-stress measurements shows a critical-current degradation at equivalent loads that is significantly greater for the cross-over situation due to the reduced area. However, these preliminary data indicate that the concentration effect can be simply predicted because the degradation in critical current is comparable at equivalent stress.

00,345 PB93-162865 PC A07/MF A02 National Inst. of Standards and Technology (EEEL), Boulder, CO. Optical Electronic Metrology Group. Transfer Functions for Characterizing Multimode Optical Fiber Components. S. Yang. Jan 93, 138p, NISTIR-3997. See also AD-A218 459.

Keywords: *Optical fibers, *Fiber optics, Optical coupling, Transfer matrix method, Transfer functions, Coupled modes, Multimode, Optical connectors.

A mode transfer function approach is proposed to characterize optical fiber devices. The transfer function is used to analyze the accuracy of the mode transfer matrix, which is currently being used to characterize optical fiber devices. The analysis shows that the mode transfer matrix depends on launch condition. Based on the study of the physical process of two basic mode coupling mechanisms, that is, the scattering coupling and the overlap coupling, two basic transfer functions are derived. Mode transfer functions for fibers/cables, connectors/splices, and power splitters are formed using these two basic transfer functions. Results of a round-robin test and a concatenation experiment show that the transfer function is better than the transfer matrix In that it is independent of launch conditions, and thus can improve both the repeatability of measure-ments made by different laboratories and the pre-diction of concatenated results. The transfer function can also be used to analyze the structure of a device.

00,346 PB94-118056 PC A09/MF A02 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div. Proceedings: Open Forum on Surge Protection Application. F. D. Martzloff. Aug 91, 184p, NISTIR-4657. Sponsored by Electric Power Research Inst., Palo Alto,

Keywords: *Surges, *Meetings, *Electrical faults, Electric power distribution, Overvoltage, Circuit protection, Voltage regulation, Circuits, Outages, Electric power failures.

National Power Laboratory is currently conducting the world's largest power quality study. This paper compares the first 270 site months of NPL data to the 270 site month Goldstein-Speranza (AT&T) power study.
The scope and framework of each study is discussed. The data from both studies are presented using identical event threshold levels. Results of the companison show major changes in the numbers and types of dis-turbances over the past ten years. The NPL and AT&T studies confirm the need for power conditioning and UPS equipment to protect computers and other sen-

Resistive, Capacitive, & Inductive Components

00.347 PB93-139079 PC A04/MF A01 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. NIST Measurement Service for DC Standard Resistors. Technical note (Final).
R. F. Dziuba, P. A. Boynton, R. E. Elmquist, J. D. Neal, D. G. Jarrett, and T. P. Moore. Nov 92, 67p, NIST/TN-1298. Also available from Supt. of Docs. as SN003-003-

Keywords: *Resistors, *Calibration, Electrical measurement, Resistance bridges, Direct current, Current comparators, Quantum Hall effect, Resistance standards, US NIST.

At the National Institute of Standards and Technology (NIST), the U.S. representation of the ohm is based on the quantum Hall effect, and it is maintained and disseminated at various resistance levels by working reference groups of standards. This document describes the measurement systems and procedures used to calibrate standard resistors of nominal decade values in the resistance range from 10(sup -4) ohm to 10(sup 12) ohm. Resistance scaling techniques used to assign values to the working standards are discussed. Also included is an assessment of the callbration uncertainties at each resistance level.

00,348 PB93-153716 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Process Measurements Div. New Approach to Calibration of Transducers Used In the Measurement of Dynamic Pressure and Temperature. Final rept.

G. J. Rosasco, V. E. Bean, and W. S. Hurst. 1989,

7p.
Pub. in Proceedings of Navy Metrology Research and Development Program Conference Report, Corona, CA., April 1989, p32-38.

Keywords: *Temperature measurement, *Pressure measurement, *Pressure transducers, *Calibration, Raman spectroscopy, Dynamic response, Diatomic molecules, Nonlinear optics, Response functions, Re-

Diatomic gas molecules have a fundamental vibrational motion whose frequency is affected by pressure in a simple way. In addition, these molecules have well defined rotational energy levels whose populations provide a reliable measure of the thermodynamic temperature. Since populations can be determined by laser spectroscopy, the gas molecules themselves can serve as sensors of pressure and temperature. Through measurements under static conditions, the pressure and temperature dependence of the spectra of selected molecules is now understood. Preliminary feasibility studies suggest that by using coherent anti-Stokes Raman spectroscopy we will be able to measure dynamic pressure up to 10(Sup 8) Pa and dynamic temperature up to 1500 K with an uncertainty of 5%.

Semiconductor Devices

00.349 PB93-124782 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Semiconductor Electronics Div. New Test Structure for the Electrical Measurement of the Width of Short Features with Arbitrarily Wide Voltage Taps. Final rept.

R. A. Allen, M. W. Cresswell, and L. M. Buck. 1992,

Pub. in IEEE (Institute of Electrical and Electronics Engineers) Electron Device Letters 13, n6 p322-324 Jun 92.

Keywords: *Very large scale integration, *Integrated circuits, *Dimensional measurement, *Line width, Electrical measurement, Test methods, Thin films, Width, Reprints, Test structures.

Accurate determination of the linewidth of a narrow conducting film for VLSI applications using electrical test structure metrology has required that the length of the line be many times its width to minimize geometric error due to the finite width of the voltage taps. However, long lines obscure important local effects such as nonuniformities in the film. Shorter lines highlight such effects. This paper describes a method of measuring the width of a short line having taps of arbitrary width. The effect of the taps is measured and used in the extraction of the linewidth allowing the determination of local linewidth variations with confidence.

00.350 PB93-125649 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div.

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Semiconductor Devices

Reciprocity Relations for On-Wafer Power Measurement.

Final rept.

R. B. Marks, and D. F. Williams. 1992, 8p.
Pub. in Proceedings of ARFTG Conference Digest (38th), San Diego, CA., December 5-6, 1991, p82-89 1992.

Keywords: Characteristic impedance, Power measurement, Microwaves, Metrology, Wafers, Reprints, *Waveguide junctions, Scattering parameters, Reciprocity.

The implications of expressions relating the forward and reverse transmission coefficients of a waveguide junction derived from the Lorentz reciprocity condition are explored. The two terms in the relation, the phase of the reference impedance in the guide and a new reciprocity factor, lead to an asymmetric scattering parameter matrix when one of the transmission lines connected to the junction is lossy.

00,351

PB93-125896 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
Controlled Interface Roughness In GaAs/AIAs
Superlattices.

Final rept.
W. R. Miller, W. J. Boettinger, W. F. Tseng, J. Pellegrino, and J. Comas. 1992, 6p. Pub. in Material Research Society Symposium Proceedings, Anaheim, CA., April 29-May 2, 1991, v230 p213-218 1992.

Keywords: *Superlattices, Molecular beam epitaxy, Aluminum arsenides, Gallium arsenides, X-ray diffraction, Interfaces, Reprints, Migration enhanced epitaxy, Heterostructures.

We report the results of our study of controlled interface roughness in low-order GaAs/AlAs superlattices. Samples were prepared using either the interrupted growth or the migration-enhanced epitaxy (MEE) technique. The samples were prepared with m atomic planes of GaAs and m atomic planes of AlAs (m x m) per modulation wavelength and repeated p times. For this study, m = 1 or 3. The samples were studied using x-ray diffraction. The interrupted growth samples both showed a split in one diffraction line indicating layers were not of integral order while the MEE samples showed no splitting, indicating integral order layers.

00,352

PB93-139038 PC A03/MF A01
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
MAESTRO: A Front-End to the MAIN1 Program for
Multiple-Angle Measurement of Silicon Dioxide
Layers.

R. L. Mattis. Dec 92, 27p, NISTIR-4969.

Keywords: *Silicon dioxide, Dimensional measurement, Programming manuals, Refractive index, Software tools, Ellipsometry, Thickness, Substrates, Silicon, Fortran, MAESTRO computer program.

MAESTRO is an interactive program which serves as a front-end to the MAIN1 computer program for processing ellipsometric data. It is applicable when MAIN1 is used to characterize silicon dioxide layers on silicon substrates using a single pair of Delta-psi values, using repeated pairs of Delta-psi values taken at the same nominal angle of incidence, or using pairs of Delta-psi values taken at multiple angles of incidence. MAESTRO stands for Multiple-Angle Ellipsometry for Supplying Thickness and Refractive index Output. It consists of two FORTRAN programs and a VMS DCL command procedure. An implementation for MS-DOS is also available. MAESTRO is used to prepare the X.DAT file required by MAIN1 and to give this file and the MAIN1 output files user-defined names.

PB93-147163 PC A03/MF A01
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
Electronics and Electrical Engineering Laboratory
Technical Publication Announcements Covering
Laboratory Programs, April to June 1992, with
1992/1993 EEEL Events Calendar.
E. J. Walters. Dec 92, 24p, NISTIR-4997.
See also PB93-120715.

Keywords: *Microelectronics, *Metrology, Semiconductor devices, Integrated circuits, Electronic packaging, Signal processing, Signal transmission, Electromagnetic interference, Antennas, Waveforms, Electromagnetic properties, Fiber optics, Sensors, Electro-optics, Electrical measurement, Superconductors, Abstracts.

The document is the thirty-third issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology Electronics and Electrical Engineering Laboratory (EEEL). This issue of the EEEL Technical Publication Announcements covers the second quarter of calendar year 1992. It contains citations and abstracts for Laboratory publications published in the quarter. Entires are arranged by technical topic and alphabetically by first author within each topic. Major topics include: Fundamental Electrical Measurements; Semiconductor Microelectronics; Signal Acquisition, Processing, and Transmission; Electrical Systems; Electromagnetic Interference. Following each abstract is the name and telephone number of the individual to contact for more information on the topic. The issue also includes a calendar of Laboratory conferences and workshops planned for calendar year 1992/1993 and a list of sponsors of the work.

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PB93-152098 PC A03/MF A01
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
Metrologic Support for the DARPA/NRL-XRL Mask
Program: Ellipsometric Analyses of SIC Thin Films
on SI.

Final technical rept. Aug 91-Mar 92. D. Chandler-Horowitz, N. V. Nguyen, J. F. Marchiando, and P. M. Amirtharaj. Jan 93, 21p, NISTIR-4860.

Sponsored by Defense Advanced Research Projects Agency, Arlington, VA.

Keywords: *Silicon carbides, *Ellipsometry, Amorphous materials, Surface roughness, Refractive index, Helium neon lasers, Photomasking, Substrates, Thin films, Film thickness, Coatings, X-ray lithography.

Ellipsometric analyses were performed on a number of amorphous SiC films grown on Si which are currently being considered for X-ray lithography (XRL) mask membranes. The analyses and conclusions presented here increase the accuracy with which the layer thicknesses can be determined. In addition, materials-related information such as the presence of surface roughness, Si and graphite phases, as well as densification can be discerned from the data. The sensitivity of ellipsometry to very small changes in the phase of light (= or < 0.002 deg) makes it an extremely accurate optical tool capable of detecting small changes in thickness or optical properties. Samples were measured by single-frequency and spectroscopic ellipsometry. The measurements were analyzed by using a number of models. Three models with increasing degree of complexity and sophistication for the amorphous SiC film are compared: an isotropic onelayer model, an isotropic two-layer model that accommodates a surface layer/region, and a uniaxial onelayer model to account for possible built-in strain in the film. The two-layer model was found to give the most consistent fit to the experimental data.

00,355

PB93-152106 PC A06/MF A02 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Semiconductor Electronics Div. Test Gulde for CMOS-On-SIMOX Test Chips NIST3 and NIST4.

J. C. Marshall, M. W. Cresswell, C. H. Ellenwood, M. E. Zaghlool, L. W. Linholm, and P. Roitman. Jan 93, 116p, NISTIR-4890.

Keywords: *Very large scale integration, *Integrated circuits, Chips(Electronics), MOSFET, CMOS, Tests, *Test chips, Test structures, SOI(Semiconductors), SIMOX.

A test chip set has been designed for process monitoring and device parameter extraction for a CMOS (Complementary Metal-Oxide-Semiconductor)-on-SOI (Silicon-On-Insulator) process. The chips contain structures which are common to a standard CMOS process as well as structures specifically designed for a SIMOX (Separation by the IMplantation of OXygen) process. NIST3 is 6380 micrometers x 4780 micrometers and contains several large-geometry MOSFETs, resistors, and capacitors. NIST4 is 1 cm x 1 cm and contains approximately 300 small-geometry test structures. The SIMOX specific structures found on these

chips include MOSFETs, capacitors, interconnects, and pads. The report presents the information necessary to test NIST3 and NIST4. Design guidelines, technology file modifications, and data output specifications for NIST3 and NIST4 are discussed in a separate manual.

00,356

PB93-153286 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
Directed-Graph Classifier of Semiconductor Wafer-

Test Patterns. Final rept.

M. W. Cresswell, D. Khera, L. W. Linholm, and C. E. Schuster. 1992, 9p.

Pub. in IEEE (Institute of Electrical and Electronics Engineers) Transactions on Semiconductor Manufacturing 5, n3 p255-263 Aug 92.

Keywords: *Integrated circuits, Artificial intelligence, Expert systems, Quality control, Fabrication, Diagnosis, Wafers, Reprints, Test structures, Directed graphs.

The paper describes a technique for training an expert system for semiconductor wafer fabrication process diagnosis. The technique partitions an existing set of electrically tested semiconductor wafers into groups so that all wafers within each group have similar spatial distributions of the electrical test data across selected die sites. The spatial distribution of test data from the selected die sites on each wafer is referred to as the test pattern of that wafer. The supposition is that test patterns reflect the known processing histones of the respective wafers. A directed graph that is developed by the partitioning algorithm then efficiently classifies a new incoming wafer to one of the groups established during partitioning on the basis of its test pattern. The technique is appropriate for any available test pattern, whether it is extracted from a test structure or from a functional integrated circuit device or from both.

00.357

PB93-153294 Not available NTIS
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Precision Engineering Div.
Imaging of Passivated III-V Semiconductor Surfaces by a Scanning Tunneling Microscope Operating In Air.
Final rept.

J. A. Dagata, W. Tseng, J. Bennett, J. Schneir, and H. H. Harary. 1992, 7p. Pub. in Ultramicroscopy 42-44, p1288-1294 1992.

Keywords: *Scanning tunneling microscopy, *Passivation, *Surfaces, Aluminum gallium arsenides, Imaging techniques, Superlattices, Reprints.

A procedure is described for preparing stable GaAs and other III-V semiconductor surfaces for scanning tunneling microscope (STM) imaging under ambient conditions. The procedure involves the use of a dilute P2S5/(NH4)2S passivating solution, which produces a highly uniform, ultra-thin surface oxide. STM imaging with nanometer-scale resolution of a P2S5-passivated, AI(x)Ga(1-x)As/GaAs, x=0.1-0.4, compositional superlattice and a variable-period AI(0.51)Ga(0.49)As/GaAs superlattice is used to illustrate some of the properties of this passivation method.

00,358
PB93-153443 Not available NTIS
National Inst. of Standards and Technology (CAML),
Gaithersburg, MD. Statistical Engineering Div.
Effect of Repetitive Swells on Metal-Oxide Varistors.

Final rept. E. S. Lagergren, F. D. Martzloff, M. E. Parker, and S. B. Schiller. 1992, 10p.

Pub. in Proceedings of International Conference on Power Quality: End-Use Applications and Perspectives PQA '92 (2nd), Atlanta, GA., September 28-30, 1992, p1-10

Keywords: *Varistors, *Surges, Power supply circuits, Transient response, Overvoltage, Swelling, Circuit protection, Aging(Materials), Semiconductor devices, Variable resistors, Reprints.

Neither the effects of repetitive swells on metal-oxide varistors, nor the natural occurrence of swells have been documented in the literature. The paper briefly describes a laboratory system capable of generating arbitrary swells and applying them to test varistors. A statistical experiment on five lots of varistors has been

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performed and preliminary results are reported. Effects of amplitude, duration, and number of swell occur-rences are assessed, using as a criterion the change in varistor nominal voltage from before to after the swell sequence.

00,359 PB93-153666 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div.
Millimeter Wave Metrology at the National Institute of Standards and Technology. Final rept.

G. R. Reeve. 1991, 5p. See also PB-290 019.

Pub. in Proceedings of NCSL Workshop and Symposlum, Albuquerque, NM., August 19-22, 1991, p183-

Keywords: *Millimeter waves, *Integrated circuits, *Metrology, Electrical measurement, Gallium arsenides, Near field, Scanning, Reprints, Noise standards, US NIST.

Over the past several years there has been an increased interest in the use of millimeter waves for such diverse applications as wide band satellite communications, short range radar and vehicle traffic control, and a much expanded cellular personal telephone service.
Recent developments in Gallium Arsenide fabrication and MMIC devices promise low cost, high performance circuits. Over the past five years the National Institute of Standards and Technology (NIST) has been engaged in a program to expand its measurement services in this region of the spectrum. This paper will describe the additions that have been made to these services and some of the technical challenges that were encountered during the process.

00,360 PB93-158632 PC A06/MF A02
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div. Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, July to September, 1992 with 1992/1993 EEEL Events Calendar. J. M. Rohrbaugh. Jan 93, 118p, NISTIR-5114. See also PB93-147163.

Keywords: *Microelectronics, *Metrology, Integrated circuits, Signal processing, Dimensional measurement, Electromagnetic interference, Optical fibers, Magnetic materials, Magnetic measurement, Electrical measurement, Optical communication, Electric power, Superconductors, Fiber optics, Microwayes, Progress Superconductors, Fiber optics, Microwaves, Progress report, Abstracts.

The report is the thirty-fourth issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology, Electronics and Electrical Engineering Laboratory. The issue of the EEEL Technical Publication Announce-ments covers the third quarter of calendar year 1992. Abstracts are provided by technical area for papers published this quarter. Major subject headings include the following: Fundamental electrical measurements; Semiconductor microelectronics; Signal acquisition, processing, and transmission; and, Electrical systems.

PB93-175404 PC A09/MF A03 National Inst. of Standards and Technology, Gaithersburg, MD. Automated Electronics Mfg. Programs. Initial Graphics Exchange Specification Hybrid

Microcircuit Application Protocol.

Technical note (Final). C. Parks, R. McCollough, C. Azu, T. Makoski, L. Savage, and P. Toomey. Jan 93, 199p, NIST/TN-

Also available from Supt. of Docs. as SN003-003-03202-6. See also PB91-120196. Sponsored by Naval Command, Control and Ocean Surveillance Center, San Diego, CA. Research Development Test and Evaluation Div.

Keywords: *Microcircuits, Computer aided design, Computer aided manufacturing, Specifications, Models, Tests, *Application Protocols, *IGES(Initial Graphics Exchange Specification), Concurrent engineering, HMA(Hybrid Microcircuit Assemblies).

An application protocol is an information systems view of a specific product. The view represents an agreement on the generic activities needed to design and fabricate the product, the agreement on the Information needed to support those activities, and the specific constructs of a product data standard for use in transferring some or all of the information required. This applications protocol describes the data for hybrid microcircuits products in terms of a product description standard called the Initial Graphics Exchange Specifications (IGES). More specifically, the Hybrid Micro-circuit Assembly (HMA or hybrid) IGES Application Protocol (AP) specifies the mechanisms for defining and exchanging computer-models and their associated data for hybrid microcircuits in IGES format. The AP defines the appropriateness of the data items for describing the geometry of the various parts of a hybrid microcircuit (shape and location), the connectivity, and the processing and material characteristics.

00,362 PB93-198877 PC A03/MF A01 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Semiconductor Electronics Div. Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, October to December, 1992 with 1992/1993 EEEL Events Calendar. J. M. Rohrbaugh. May 93, 16p, NISTIR-5195. See also PB93-158632.

Keywords: *Microelectronics, *Metrology, Dimensional measurement, Glow discharges, Integrated circuits, Signal processing, Electromagnetic interference, High temperature superconductors, Electrical measurement, Magnetic measurement, Waveguide lasers, Electric power, Circuit protection, Surges, Optical waveguides, Progress report, Abstracts, Reprints, Fiber optic sensors, Yttnum barium cuprates, Standard reference materials.

The publication is the thirty-fifth issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology, Electronics and Electrical Engineering Laboratory (EEEL). This issue of the EEEL Technical Publication Announcements covers the fourth quarter of calendar year 1992. Abstracts are provided by technical area for papers published this quarter. Main topic areas in-clude: Semiconductor Microelectronics; Signal Acquisition, Processing, and Transmission; Electrical Systems; and Electromagnetic Interference.

PB93-205516 PC A03/MF A01
National Inst. of Standards and Technology (NEL),
Gaithersburg, MD. Semiconductor Electronics Div.
Center for Electronics and Electrical Engineering Technical Publication Announcements Covering Center Programs, April to June 1990, with 1991 CEEE Events Calendar.
J. A. Gonzalez. Feb 91, 30p, NISTIR-4520.
See also PB91-107201 and PB91-184754.

Keywords: *Semiconductor devices, *Metrology, Electromagnetic interference, Dimensional measurement, Integrated circuits, Bipolar transistors, Optical fibers, Electrical measurement, Millimeter waves, Optical waveguides Microwaves, Photodetectors, waveguides, Microwaves, Photodetectors, Superconductors, Quantum wells, Lasers, Signal processing, Integrated optics, Progress report, Abstracts.

This is the twenty-fifth issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology (formerly the National Bureau of Standards) Center for Electronics and Electrical Engineering. This issue of the Center for Electronics and Electrical Engineering Technical Publication Announcements covers the second quarter of calendar year 1990. Abstracts are provided by technical area for papers published this quarter. Topics discussed include the following: Semiconductor Technology Program; Signals and Systems Metrology Program; Fast Signal Acquisition, Processing, and Transmission; Electrical Systems; Electromagnetic Interference; Additional Information; 1991 CEEE Calendar; Sponsor List; and Key Contacts in Center, Center Creatization. ter Organization.

00.364 PB93-205524 PC A03/MF A01 National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Semiconductor Electronics Div. Center for Electronics and Electrical Engineering Technical Progress Bulletin Covering Center Programs, April to June 1990, with 1990/1991 CEEE **Events Calendar.** J. A. Gonzalez. Nov 90, 45p, NISTIR-4446. See also PB91-159749 and PB90-265265.

Keywords: *Semiconductor devices, *Metrology, Electromagnetic interference, High temperature superconductors, Dimensional measurement, Integrated circuits, Bipolar transistors, Optical fibers, Elecrical measurement, Signal processing, Microwaves, Millimeter waves, Optical waveguldes, Electric power, Dielectric breakdown, Electric cables, Lasers, Progress report, Abstracts, Voltage standards, Fiber ontic sensors.

This is the thirty-first Issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology (formerly the National Bureau of Standards) Center for Elec-tronics and Electrical Engineering. This Issue of the CEEE Technical Progress Bulletin covers the second quarter of calendar year 1990. Abstracts are provided by technical area for both published papers and papers approved by NIST for publication. Main topics include the following: Semiconductor Technology Program; Signals and Systems Metrology Program; Fast Signal Acquisition, Processing, and Transmission Electrical Systems; Electromagnetic Interference; Additional Information; 1990/1991 CEEE Calendar; Sponsor List; and Key Contacts in Center, Center Organization.

00,365 PB93-206233 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Microelectronics Dimensional Me-

trology Group.
Report on a Workshop for Improving Relationships between Users and Suppliers of Microlithography Metrology Tools.
R. D. Larrabee. Jun 93, 25p, NISTIR-5193.

Keywords: *Semiconductors(Materials), *Lithography, *Meetings, Semiconductor devices, Microelectronics, Electronics Industry, Metrology, Standards, SupplyIng, Vendors, Integrated circuits.

The report is a summary of the opinions and comments expressed at the User-Vendor Interface Workshop held in connection with the 1993 SPIE Symposium on Microlithography held in San Jose, California in March, 1993. It was prepared to serve as a starting point for any future activity concerned with improving relations at the interface between the user and supplier of the metrology tools used in the fabrication of integrated circuits, other semiconductor devices, magnetic tape heads, micromachines, etc. The workshop was at-tended by representatives from the user, supplier, and standards communities representing strong semi-conductor interests, and many opinions and comments were expressed about problems and frustrations at the user-supplier interface.

PB93-219806 PC A07/MF A02
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Semiconductor Electronics Div.
SemIconductor Measurement Technology: A Collection of Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations, RESPAC.

Final rept. J. Albers, and H. L. Berkowitz. Jun 93, 148p, NIST/ SP-400-91.

Also available from Supt. of Docs. as SN003-003-03219-1. Prepared in cooperation with Army Lab. Command, Fort Monmouth, NJ. Electronics Technology and Devices Labs.

Keywords: *Semiconductor devices, *Semiconductor materials, *Electrical resistance, Electrical measurement, Electrical resistivity, Electric probes, Laplace equation, Poisson equation, Computer programs, Computation, Fortran, *Spreading resistance, RESPAC system, Two point resistance, Four point resistance, Multilayers.

The report presents and describes a number of FORTRAN programs which may be used to perform two-probe resistance (spreading resistance) and four-probe resistance calculations for vertically nonuniform resistivity structures. These programs fall into three general categories. They are: (1) programs for calculating the two-probe resistance (spreading resistance) from the resistivity profile, (2) programs for calculating the resistivity profile from the two-probe resistance (the inverse of 1), and (3) programs for calculating the resistivity profile from the resistivity profile. ing the four-probe resistance from the resistivity profile. Programs in the first and third category are useful for understanding the effects of resistivity variations on the two-probe resistance (spreading resistance) and the four-probe resistance. Programs in the second cat-

Electric Power Transmission

egory are useful for extracting the resistivity profile from spreading resistance data (either measured or calculated). All of the programs are based upon the Schumann and Gardner solution of the multilayer Laplace equation. As such, local charge neutrality is assumed. The limitations of this assumption are described in the text.

PB93-228641 PB93-228641 PC A03/MF A01
Materials and Metrology, Sunnyvale, CA.
Semiconductor Measurement Technology: Evolution of Silicon Materials Characterization: Lessons Learned for Improved Manufacturing.
W. M. Bullis. Jul 93, 46p, NIST/SP-400/92.
Also available from Supt. of Docs. as SN003-003-03224-7. Sponsored by National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Semiconductor Electronics Div. PC A03/MF A01

Keywords: *Silicon, *Wafers, *Semiconductor devices, *Integrated circuits, History, Standards, Tests, Electronics industry, Chips(Electronics), Reprints, ASTM(American Society for Testing and Materials).

The growth of the silicon device and integrated circuit Industry has been closely coupled with the development of materials characterization technology. The paper traces this development from the beginning, paper traces this development from the beginning, when the industry was young and each manufacturer had to grow its own materials, develop its processes, assemble its measurement systems from component instruments, and fabricate its processing equipment, to the present, when a complex infrastructure supports the industry. It also describes examples of both successful and unsuccessful developments in connection with other electronic materials. with other electronic materials.

00,368 PB93-234698 PC A03/MF A01 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD.

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, January to March, 1993 with 1993/1994 EEEL Events Calendar.

J. M. Rohrbaugh. Jul 93, 18p, NISTIR-5231. See also PB93-198877.

Keywords: *Microelectronics, *Metrology, Integrated circuits, Signal processing, Electromagnetic interference, Electrical measurement, Magnetic measurement, Transmission lines, Circuit protection, Superconductors, Wattmeters, Antennas, Surges, CMOS, Progress report, Abstracts, SOI(Semiconductors), Microfabrication, SIMOX.

The publication is the thirty-sixth Issue of a quarterly publication providing information on the technical work of the National Institute of Standards and Technology, Electronics and Electrical Engineering Laboratory. This issue of the EEEL Technical Publication Announcements covers the first quarter of calendar year 1993. Abstracts are provided by technical area for papers published this quarter. Main topic areas Include: Semi-conductor Microelectronics; Signal Acquisition, Processing, and Transmission; Electrical Systems; and Electromagnetic Interference.

00,369

PB94-108529 PC A08/MF A02 National Inst. of Standards and Technology,

Gaithersburg, MD.

Journal of Research of the National Institute of Standards and Technology, July-August 1993. Vol-

standards and rechnology, July-August 1993. Volume 98, Number 4.
1993, 153p.
See also PB94-108537 through PB94-108552 and PB94-108461. Also available from Supt. of Docs. as SN703-027-00053-9.

Keywords: *Integrated circuits, *Metrology, Dimensional measurement, Line width, Lithography, Scanning electron microscopy, Calibration standards, Crystal chemistry, BSCCO superconductors, Calcium oxides, Bismuth oxides, Copper oxides, Cuprates, X-ray lithography, Magnification standards.

Contents:

X-Ray Lithography Mask Metrology--Use of Transmitted Electrons In an SEM for Linewidth Measurement;

Interlaboratory Study on the Lithographically Produced Scanning Electron Microscope Magnification Standard Prototype;

Phase Equilibria and Crystal Chemistry in Portions of the System SrO-CaO-Bi2O3-CuO, Part IV--The System CaO-Bi2O3-CuO.

00.370 PB94-108537 (Order as PB94-108529, PC A08/

MF A02)
National Inst. of Standards and Technology,
Gaithersburg, MD.
X-ray Lithography Mask Metrology: Use of Trans-

mitted Electrons in an SEM for Linewidth Measurement.

M. T. Postek, J. R. Lowney, A. E. Vladar, R. D. Larrabee, W. J. Kerry, and E. Marx. 1993, 31p. Included In Jnl. of Research of the National Institute of Standards and Technology, v98 n4 p415-445 Jul/

Keywords: *Integrated circuits, *Dimensional measurement, *Line width, *Lithography, Scanning electron microscopy, Electron beams, Microelectronics, Metrology, *X-ray lithography, X-ray masks, Secondary electrons, Transmitted electrons.

The paper shows that excellent contrast and signal-to-noise levels can be obtained using the transmitted-electron signal for mask metrology rather than the more commonly collected secondary electron signal. The work provides one approach to improved x-ray mask linewidth metrology and a more precise edge location algorithm for measurement of feature sizes on x-ray masks in commercial instrumentation. The work also represents an Initial step toward the first SEM-based accurate linewidth measurement standard from NIST, as well as providing a viable metrology for linewidth measurement Instruments of x-ray masks for the lithography community.

00,371 PB94-108545 (Order as PB94-108529, MF A02) of Standards and Technology, National Inst. Gaithersburg, MD.

Interlaboratory Study on the Lithographically Produced Scanning Electron Microscope Magnification Standard Prototype.

M. T. Postek, A. E. Vladar, S. N. Jones, and W. J.

Kerry. 1993, 21p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n4 p447-467 Jul/ Aug 93.

Keywords: *Scanning electron microscopy, *Calibration standards, Integrated circuits, Comparative evaluations, Line width, Microelectronics, Prototypes, Metrology, Substrates, Lithography, Palladium, Titanlum, Silicon, *Magnification standards, Interlaboratory comparisons, Nanostructures.

NIST is In the process of developing a new scanning electron microscope (SEM) magnification calibration reference standard useful at both high and low accelerating voltages. This standard will be useful for all ap-plications to which the SEM is currently being used, but it has been specifically tailored to meet many of the particular needs of the semiconductor industry. A small number of test samples with the pattern were prepared on silicon substrates using electron beam lithography at the National Nanofabrication Facility at Comell University. The structures were patterned in titanium/palladium with maximum nominal pitch struc-tures of approximately 3000 micrometers scaling down to structures with minimum nominal pitch of 0.4 micrometers. Eighteen of these samples were sent out to a total of 35 university, research, semiconductor and other industrial laboratories in an interlaboratory study. The purpose of the study was to test the SEM instrumentation and to review the suitability of the sample design.

00,372 PB94-108636 PB94-108636 PC A16/MF A03 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div.

RL/NIST Workshop on Molsture Measurement and Control for Microelectronics. Proceedings of the RL/NIST Workshop held in Gaithersburg, Maryland

on April 5-7, 1993 B. A. Moore, and J. A. Carpenter. Aug 93, 362p, NISTIR-5241

See also PB87-224614. Sponsored by Rome Lab., Griffiss AFB, NY.

Keywords: *Semiconductor devices, *Integrated circuits, *Moisture content, *Microelectronics, *Meetings, Hermetic seals, Quality control, Reliability(Electronics),

Gas analysis, Measurement, Packaging, Molsture me-

The document is a compilation of papers presented at the title workshop, fifth in a series since 1978 addressing ingress mechanisms, effects, and methods of measuring moisture in electronic packages, mainly used in military and biological applications.

ENERGY

General

PB94-111853 PC A11/MF A03
National Inst. of Standards and Technology (TS),
Gaithersburg, MD. Office of Technology Evaluation
and Assessment.
Energy Released

Energy Related Inventions Program. Status Report

for Recommendations 351 through 602. Jun 93, 234p, NISTIR-5259. Supersedes PB92-226273. See also PB92-226265 and Recommendations 1 through 350, PB94-111903. Sponsored by Department of Energy, Washington, DC. Inventions and Innovation Div.

Keywords: *Inventions, Technology innovation, Product development, Research projects, Recommendations, *Department of Energy, National Institute of Standards and Technology, Patent status.

The document contains a brief description of the Energy Related Inventions Program and recommended inventions 351 through 602 by the National Institute of Standards and Technology (NIST) to the Department of Energy since the inception of the program, including a brief summary of the current status of each.

00,374 PB94-111903

PB94-111903 PC A09/MF A03
National Inst. of Standards and Technology (TS),
Gaithersburg, MD. Office of Technology Evaluation and Assessment.

Energy Related Inventions Program. Status Report for Recommendations 1 through 350.

Jun 93, 193p, NISTIR-5260.
Supersedes PB92-226265. See also Recommendations 351 through 602, PB94-111853. Sponsored by Department of Energy, Washington, DC. Inventions and Innovation Div.

Keywords: *Inventions, Technology innovation, Product development, Research projects, Recommendations, *Department of Energy, National Institute of Standards and Technology, Patent status.

The document contains a brief description of the Energy Related Inventions Program and recommended inventions 1 through 350 by the National Institute of Standards and Technology (NIST) to the Department of Energy since the Inception of the program, including a brief summary of the current status of each.

Electric Power Transmission

00,375 PB94-112182 PB94-112182 PC A03/MF A01 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div.

Research for Electric Energy Systems: An Annual

Report, October 1993.
W. E. Anderson. Oct 93, 45p, NISTIR-5268.
See also PB93-118131. Sponsored by Department of Energy, Washington, DC. Div. of Electric Energy Systems.

*Magnetic measurement, Keywords: *Magnetic probes, "Electrical Insulation, "Electric discharges, Di-electric breakdown, Breakdown(Electronic threshold), Electric corona, Magnetic fields, Sulfur hexafluoride, Sulfur fluorides, Radiation effects, Cross sections,

Electric Power Transmission

Negative lons, Computerized simulation, Monte Carlo method, Power lines, Progress report, *Gaseous dielectrics, Dissociative electron attachment, NIST flelds project, Partial discharges.

The report documents the technical progress of two Investigations. The first Investigation is concerned with the measurement of magnetic fields in support of epidemiological and in vitro studies of biological field effects. During 1992, the derivation of equations which predict differences between the average magnetic flux density using circular coll probes and the flux density at the center of the probe, assuming a dipole magnetic field, were completed. The information gained using these equations allows the determination of measurement uncertainty due to probe size when magnetic fields from many electrical appliances are characterized. Consultations with various state and federal organizations and the development of standards related to electric and magnetic field measurements continue. The second investigation is concerned with two different activities related to compressed-gas insulated high voltage systems: (1) the measurement of dissociative electron attachment cross sections and negative ion production in S2F10, S2OF10, and S2O2F10, and (2) Monte-Carlo simulations of ac-generated partial-discharge pulses that can occur in SF6-insulated power systems and can be sources of gas decomposition.

Energy Use, Supply, & Demand

00.376

PB93-183770 PC A09/MF A02
National Inst. of Standards and Technology (BFRL),
Gaithersburg, MD.
Envelope Design Guldelines for Federal Office
Buildings: Thermal Integrity and Airtightness.
A. K. Persily. Mar 93, 185p, NISTIR-4821.
See also PB91-112839. Sponsored by Public Buildings
Service, Washington, DC. Office of Real Property De-

Keywords: *Office buildings, *Air tightness, *Energy conservation, *Government buildings, *Design standards, Thermal insulation, Leakage, Air infiltration, Guidelines, Energy efficiency, Construction materials, Design criteria, Moisture content, *Office building envelopes.

Office building envelopes are generally successful in meeting a range of structural, aesthetic and thermal requirements. However, poor thermal envelope performance does occur due to the existence of defects in the envelope insulation, air barrier and vapor retarder systems. These defects result from designs that do not adequately account for heat, air and moisture transmission, with many being associated with inappropriate or inadequate detailing of the connections of enve-lope components. Other defects result from designs that appear adequate but can not be constructed in the field or will not maintain adequate performance over time. Despite the existence of these thermal envelope performance problems, information is available to design and construct envelopes that do perform well. In order to bridge the gap between available knowledge and current practice, NIST has developed thermal envelope design guidelines for federal office buildings for the General Services Administration. The goal of this project is to transfer the knowledge on thermal envelope design and performance from the building research, design and construction communities Into a form that will be used by building design professionals. These guidelines are organized by envelope construction system and contain practical Information on the avoidance of thermal performance problems such as thermal bridging, insulation system defects, moisture migration, and envelope air leakage.

Fuel Conversion Processes

00,377
PB93-145779 PC A04/MF A01
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Ceramics Div.

Assessment of Fossil Energy Materials Research Needs.

S. J. Dapkunas, and G. Sorell. Oct 92, 67p, NISTIR-4992, ORNL/SUB-89-21857/01. Contract DE-AC05-84OR21400

Prepared In cooperation with Sorell (G.) Consulting Services, North Caldwell, NJ. Sponsored by Oak Ridge National Lab., TN., Department of Energy, Washington, DC., and Martin Marietta Energy Systems, Inc., Oak Ridge, TN.

Keywords: *Energy technology, *Technology assessment, *Composite materials, *Ceramics, *Catalysts, *Coal gasification, Corrosion, Technology transfer, Process control, Electrolytes, Coatings, Thin films, Corrosion prevention, Coal liquefaction, Exhaust gases, Reviews, Heat engines, Austenitic steels, Combustion.

An assessment was conducted to identify the needs and opportunitles in materials research directed at applying new developments In materials science and engineering to fossil energy technologies. The assessment was conducted through literature review and discussions with knowledgeable industrial, academic and governmental personnel. Topics worthy of research which will provide significant benefits to fossil technologies include the following: austenitic alloys, iron aluminides, ceramic filter materials, ceramic membranes, solid electrolytes, catalyst supports, protective coatings, erosion/abrasion/wear research, corrosion mechanism research, Intelligent materials processing, diamond films, nanocomposites, superplastic forming of ceramics, surface active dual function materials and ceramic matrix components.

Fuels

00,378
DE93007992 PC A03/MF A01
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD.
Observations of soot in combustion of methanol/
toluene spray flames.
C. T. Avedisian, C. Presser, A. K. Gupta, and H. G.
Semerjian. 1992, 26p, CONF-921110-48.
Contract Al01-86Ce90213
Winter annual meeting of the American Society of Mechanical Engineers (ASME), Anaheim, CA (United States), 8-13 Nov 1992. Sponsored by Department of Energy, Washington, DC.

Keywords: *Methanol, *Soot, *Toluene, Combustion, Flames, Lasers, Light Scattering, Mixtures, Petroleum Products, Quantity Ratio, Sprays, Synthesis, *Combustion products, EDB/025000.

The influence of composition on soot formation in spray flames was investigated using, a light scattering/ dissymmetry ratio technique to provide information on soot mean size and concentration. The study was carried out using binary mixtures of a sooting (i.e., toluene) and nonsooting (i.e., methanol) liquid. The range of mixtures included methanol volume fractions, (alpha), of 0 (i.e., pure toluene), 0.25, 0.50, 0.75, 0.85, 0.90, 0.95, 0.99, and 1.0 (pure methanol). The flames were generated with an air-assist atomizer under the same operating conditions to isolate the effect of liquid composition.

00,379
PB93-159457 PC A04/MF A01
National Inst. of Standards and Technology (CSTL),
Boulder, CO. Chemical Engineering Div.
Flow Conditioner Location Effects In Orlfice
Flowmeters.
Technical note.
J. L. Scott, C. F. Sindt, and M. A. Lewis. Jan 93,
72p, NIST/TN-1356.

J. L. Scott, C. F. Sinot, and M. A. Lewis. Jan 93, 72p, NIST/TN-1356.
Also available from Supt. of Docs. as SN003-003-03198-4. See also PB92-189521 and PB92-183730.

Keywords: *Orifice meters, *Flow distortion, *Position(Location), *Flowmeters, *Gas flow, Orifices, Reynolds number, Flow measurement, Discharge coefficient, Piping systems, Experimental data, Gas distribution, Pipe flow, Orifice flow.

Tests sponsored by Gas Research Institute were conducted with orifice flowmeters of two nominal sizes: 104 mm (4 in) and 52 mm (2 in). For the 104 mm orifice meter the authors compared discharge coefficients

measured In two common plpIng configurations used by laboratories to establish baseline flow conditions. The discharge coefficients are similar for beta ratios of 0.43, 0.55, and 0.67, but not for the 0.73 beta ratio plate. For other tests with the orifice meter, a 90 degree elbow or a reducer was located upstream of the orifice plate and flow conditioner. Two beta ratios (0.54, 0.67) were tested in the 52 mm orifice meter in baseline configuration and with an elbow at 17D and a flow conditioner at 12D. For many of the tests, differential pressures were measured at more than one flange tap location. Placing the flow conditioner too close to the orifice plate in either meter yields discharge coefficients below baseline values. The location of the flow conditioner with respect to the orifice plate appears to influence meter performance more significantly than the type or location of flow disturbance upstream of it.

PB93-200822 PC A05/MF A02
National Inst. of Standards and Technology (CSTL),
Boulder, CO. Thermophysics Div.
Speed of Sound Data and Related Models for Mixtures of Natural Gas Constituents.
B. A. Younglove, N. V. Frederick, and R. D. McCarty.
Jan 93, 99p, NIST/MONO-178.
Also available from Supt. of Docs. as SN003-003-03201-8. Sponsored by Gas Research Inst., Chicago,
IL. Physical Sciences Dept.

00,380

Keywords: *Natural gas, *Binary mlxtures, *Flow measurement, *Sonic nozzles, Carbon dloxlde, Methane, Ethane, Nitrogen, Propane, Mass flow, Sound waves, Transferring, Isotherms.

Sound speed data have been obtained for thirteen binary mixtures and four multicomponent mixtures of natural gas components using a cylIndrical cavity. These data cover a temperature range from 250 to 350 K at pressures to 10 MPa. The uncertainty In the data Is approximately 0.05 percent. The binary mixtures are primarily methane-rich, with ethane nitrogen, carbon dioxide, or propane as the second component. The multicomponent mixtures are representative of commercially available compositions in the United States and Europe. The data were used to develop and test mathematical models for prediction of the sound speed of natural gas mixtures, within an average uncertainty of 0.1 percent, over the ranges of pressure, temperature, and composition that encompass the major region of custody transfer for natural gas.

00,381
PB93-207470 PC A03/MF A01
National Inst. of Standards and Technology (CSTL),
Boulder, CO. Thermophysics Div.
Thermophysical Properties of Fluids for the Gas Industry. Annual Report, January-December 1992.
T. J. Bruno, and W. M. Haynes. May 93, 19p, GRI-

T. J. Bruno, and W. M. Haynes. May 93, 19p, GRI-93/0098. Contract GRI-5088-260-1700 See also PB88-216809 and PB88-250584. Sponsored by Gas Research Inst., Chicago, IL.

Keywords: *Fluids, *Thermophysical properties, *Natural gas, Gas industry, Equations of state, Experimental design, Mathematical models, Hydrocarbons, Thermophysical properties, Detectors, Halohydrocarbons, Natural gas liquids, Pipelines, Solubility.

The U.S. gas industry standard for computing thermophysical properties is the A.G.A. Transmission Measurement Committee Report No. 8 equation of state (AGA 8). The report summarized the results from several experimental, theoretical, and modeling programs directed at the extensive evaluation of the accuracy with which various types of natural gas physical properties can be calculated using AGA 8 and related methods. The most important results were the assembly of benchmark data sets for speed of sound, viscosity, fugacity, heat capacity, critical region PVT, mixture compressibilities, and vapor pressure measurements for natural gas fluids. When tested against these benchmark properties data, the AGA 8 equation of state model was found to be generally accurate within + or - 0.1% for sound speeds (and densities) and within + or - 0.03% for compressibilities over the ranges of pressure, temperature, and composition that encompass the major region of custody transfer for natural gas. Work was also completed on the fabrication and testing of a prototype catalytic cracking detector for the selective detection of hydrocarbons; a U.S. patent was awarded for this invention with the assignment to GRI.

Heating & Cooling Systems

PB93-228203 PB93-228203 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), National Inst. of Standards and Technology (BFHL), Gaithersburg, MD. Building Environment Div. Fleld Monitoring of a Variable-Speed Integrated Heat Pump/Water Heating Appliance.

A. H. Fanney. Jun 93, 64p, NIST/BSS-171.

Also available from Supt. of Docs. Sponsored by Allegheny Power System, Greensburg, PA.

Keywords: *Space HVAC systems, *Heat pumps, Houses, Energy consumption, Heating loads, Field tests, Computerized simulation.

The report describes the residence, heat pump system, and monitoring equipment. Results are presented which include comparison of the total electrical energy consumption of the residence prior to and after installa-tion of the heat pump system, the portion of energy used by each end use within the residence, a companson of the heat pump's energy consumption using a son of the heat pump's energy consumption using a conventional watthour meter and an electronic digital power analyzer, and the hourly electrical demands imposed on the utility. The thermal performance of the heat pump system is reported on a monthly, seasonal, and annual basis using conventional performance indicators in addition to using an index, proposed by NIST, which quantifies the overall system performance of integrated appliances. tegrated appliances.

Policies, Regulations & Studies

PB93-198984 PC A11/MF A03
National Inst. of Standards and Technology (CAML),
Gaithersburg, MD. Office of Applied Economics.
Life-Cycle Costing Workshop for Energy Conservation In Buildings: Student Manual.
Final rept.
S. K. Fuller, and O. T. S. K. Fuller, and S. R. Petersen. May 93, 232p,

NISTIR-5165. See also PB90-147968, PB92-238633 and PB93-120772. Sponsored by Department of Energy, Washington, DC. Federal Energy Management Program Staff.

Keywords: *Life cycle costs, *Energy conservation, *Federal buildings, Risk, Cost analysis, Economic analysis, Instructions, Education, Students.

The manual is intended as both an in-class workbook and as a future source for references and review. The course is designed for both public and private sector energy managers. Its purpose is to provide an overview of the life-cycle cost method, specific requirements for federal building applications, sources of data, and computer tools which can greatly simplify the analytical requirements of a life-cycle cost analysis. The life-cycle cost method and related measures of economic performance are presented in a traditional engineering-economics context.

00.384

PB93-228658 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Office of Applied Economics.
ERATES: A Computer Program for Calculating
Time-of-Use, Block, and Demand Charges for Elec-

tricity Usage (Version 1.0). User's Guide and Reference Manual.

S. R. Petersen. Jul 93, 40p, NISTIR-5186. Sponsored by Federal Energy Management Program, Washington, DC.

Keywords: *Energy accounting, *Buildings, *Computer applications, Facilities, Life cycle costs, Electric power demand, Rates(Costs), Energy consumption, Cost effectiveness, Energy conservation, Interactive systems, User manuals(Computer programs), *ERATES computer program.

ERATES (Electricity Rates) is a computer program for calculating monthly and annual electricity costs for a facility, building, or system under a variety of electric utility rate schedules. Both kWh usage and maximum kW demand charges can be included in these costs. Most typically these calculations will be used to support engineering-economic studies which assess the cost-effectiveness of energy conservation measures or

measures to shift electricity use from on-peak to off-peak time periods. With ERATES a user can set up time-of-use-rate schedules, block-rate schedules, and demand-rate schedules and save these schedules to a disk file. The user can then compute monthly and annual electricity costs with ERATES, given hourly or monthly kWh and kW demand data for a facility, building, or system. ERATES is a menu-driven, interactive program, designed to be run on an IBM-PC or compatible microcomputer under DOS version 3.0 or higher, with or without a hard disk. ERATES block-rate and demand-rate schedules can be imported by the NIST BLCC 4.0 computer program for use in computing the life-cycle cost of buildings and building systems. ERATES is not intended for use by utilities in setting up or administering electric rate schedules.

PB94-500097 CP D02

National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Office of Applied Economics.

Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcomputers).

Software.

1993, diskette, NIST/SW/DK-93/007. System: IBM PC or compatible; DOS version 3.0 or greater operating system. Open READ.ME file for installation instructions. See also PB94-500055 (BLCC). The software is on one 3 1/2 inch diskette, 1.44M high density. Documentation included; may be ordered separately as PB93-228658.

Keywords: *Software, *Facilities, *Electric power generation, *Costs, Rates(Costs), Electric utilities, Buildings, Energy demand, Energy consumption, Energy conservation, Life cycle costs, Diskettes.

ERATES (Electricity Rates) is a computer program for calculating monthly and annual electricity costs for a facility, building, or system under a variety of electric utility rate schedules. Both kWh usage and maximum kW demand charges can be included in these costs. Most typically these calculations will be used to support engineering-economic studies which assess the cost-effectiveness of energy conservation measures or measures to shift electricity use from on-peak to off-peak time periods. With ERATES a user can set up time-of-use-rate schedules, block-rate schedules, and demand-rate schedules and save these schedules to diel; file. The user can then compute mostful, and a disk file. The user can then compute monthly and a disk file. The user can then compute monthly and annual electricity costs with the program, given hourly or monthly kWh usage and kW demand data for a facility, building, or system. ERATES block-rate and demand-rate schedules can be imported by the NIST BLCC (PB94-500055) computer program for use in computing the life-cycle cost of buildings and building systems. ERATES is not intended for use by utilities In setting up or administering electric rate schedules.

Solar Energy

00.386 DE93018005 PC A03/MF A01 National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Pulse Radiolytic Studies of Electron Transfer Proc-Progress Report, (February 1989-April 1990).
P. Neta. 20 Apr 90, 14p, DOE/ER/13108-T6.
Contract Al05-83ER13108 Sponsored by Department of Energy, Washington, DC.

Keywords: *Electron Transfer, Ascorbic Acid, Peroxy Radicals, Porphyrins, Chemical Reactions, Cobalt Complexes, Indium Complexes, Nickel Complexes, Organic Bromine Compounds, Organic Solvents, Oxidation, Phenols, Photosensitivity, Progress Report, Radicals, Radiolysis, Sensitizers, Solar Energy Conversion, *Photochemistry, EDB/140505.

Pulse radiolysis can provide absolute rate constants for reactions of many inorganic radicals and organic peroxyl radicals, key intermediates in many chemical processes. Emphasis of this work is electron transfer reactions of metalloporphyrins that may be applicable to solar energy conversion systems. Highlights of research during the past year are: metalloporphyrins and colloidal catalysts, peroxyl radicals, inorganic radicals, other topics.

PC A03/MF A01

DE93018016 National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Chemical Kinetics and Thermodynamics Div.

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. (Final) Progress Report, (February 1989-January

P. Neta. 17 Jan 92, 29p, DOE/ER/13108-T7. Contract AI05-83ER13108

Sponsored by Department of Energy, Washington, DC.

Keywords: *Electron Transfer, Ascorbic Acld, Porphyrins, Anions, Cations, Chromium Complexes, Cobalt Complexes, Nickel Complexes, Organic Solvents, Oxidation, Peroxy Radicals, Photosensitivity, Progress Report, Radicals, Sensitizers, Solar Energy Conversion, *Photochemistry, EDB/140505.

The studies use pulse radiolysis to provide absolute rate constants for reactions of many inorganic radicals and organic peroxyl radicals, key intermediates in many chemical processes, and to study electron transfer reactions of metalloporphyrins for solar energy conversion. Highlights of research during the past 3 years are: metalloporphyrins and colloidal catalysts, inorganic radicals, peroxyl radicals, and other topics.

DE93018715 PC A03/MF A01

National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Chemical Kinetics and Thermodynamics Div.

Pulse Radiolytic Studies of Electron Transfer Proc-Progress Report, (March 1992–March 1993).
P. Neta. 1 Apr 93, 22p, DOE/ER/13108-T8.
Contract Al05-83ER13108

Sponsored by Department of Energy, Washington, DC.

Keywords: *Porphyrins, *Pulsed Irradiation, *Solar Energy Conversion, Electron Transfer, Organic Solvents, Peroxy Radicals, Progress Report, Radicals, Radiolysis, Reaction Intermediates, EDB/140505.

Electron transfer and other reactions of various shortlived intermediates have been studied by pulse radioly-sis and laser flash photolysis. Highlights of results during the past year are summarized under two main sections: Metalloporphyrin electron transfer and associ-ated reactions, and solvent effects on reactions of inorganic radicals and organic peroxyl radicals.

ENVIRONMENTAL POLLUTION & CONTROL

Air Pollution & Control

PB93-198844 PC A07/MF A02 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building and HVAC Characterization for Commer-

cial Building Indoor Air Quality Investigations.

A. K. Persily. May 93, 142p, NISTIR-4979.

Sponsored by Environmental Protection Agency, Washington, DC. Office of Air and Radiation, and Department of Energy, Washington, DC. Building Systems and Materials Div.

Keywords: *Indoor air pollution, *Commercial buildings, *Space HVAC systems, Office buildings, Ventilation, Investigations, Questionnaires, Air quality.

A series of parameters have been developed to describe building and HVAC characteristics of commercial buildings in conjunction with indoor air quality investigations lasting one week or less. The building characterization includes both general information on the building as well as more specific information on the space being investigated. The space will in general be

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only a portion of the building, but It could be the entire building. The parameters Include those features deemed essential to an investigation intended to obtain baseline Information on a test space within a building as opposed to a detailed research study or an effort to diagnose a specific problem. The report consists of checklists or forms for recording information on the building and HVAC parameters, along with instructions for completing the checklists. The checklists are divided in four areas: (A) Whole Building Description, (B) Test Space Description, (C) HVAC System Description, and (D) HVAC System Performance.

00,390 PB**93-219764** PC A04/MF A01

National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Surface and Microanalysis Science

Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0. S. Turner, E. B. Steel, and J. M. Phelps. Jul 93, 53p, NISTIR-5134.

Sponsored by Environmental Protection Agency, Washington, DC.

Keywords: *Sample preparation, *Transmission electron microscopy, "Air pollution sampling, "Asbestos, Handbooks, Membranes, Air pollution detection, Chemical analysis, Performance evaluation, Comparison, Filters.

A necessary step for the analysis of air-collected asbestos by transmission electron microscopy (TEM) is the preparation of a thin, carbon film containing the as-bestos particles. The carbon film is obtained by preparing a replica of the filter onto which the particles are collected. An ideal carbon replica is thin, clear and coherent, so that unhindered detection and analysis of any particles are possible. Round robin studies of replicas have shown that a variety of problems and artifacts can occur on replica preparations. The main purposes of this handbook are to: (1) describe and define the problems and artifacts found in sample preparation, (2) provide examples of area estimates of the coverage of the problems, (3) provide a procedure for analysis of replica preparations by light microscopy and TEM, and (4) provide a classification or nomen-clature system so that interlaboratory comparisons may be performed.

PB93-221851 PC A02/MF A01

Environmental Protection Agency, Research Triangle Park, NC. Atmospheric Research and Exposure Assessment Lab.

Source Apportionment of Fine Particle Organics and Mutagenicity in Wintertime Roanoke.

Symposium paper.
C. W. Lewis, R. B. Zweidinger, L. D. Claxton, D. B. Klinedinst, and S. H. Warren. 17 Jun 93, 8p, EPA/

Klinedinst, and S. H. Wallell. 17 July 35, 5p, 21 70 600/A-93/167.
Presented at the Air and Waste Management Association/Environmental Protection Agency International Symposium, 'Measurement of Toxic and Related Air Pollutants', Durham, NC., May 3-7, 1993. See also PB91-219162. Prepared in cooperation with National Lost of Strandards and Technology, Gaithersburg, MD. Inst. of Standards and Technology, Gaithersburg, MD.

Keywords: *Indoor air pollution, *Air pollution sampling, *Residential buildings, Tracer studies, Mobile pollutant sources, Metals, Carbon 14, Smoke, Organic materials, Winter, Mutagenicity, Reprints, Roanoke(Virginia), Extractable organic matter, IACP(Integrated Air Cancer Project), Volatile organic compounds.

The U.S. Environmental Protection Agency has conducted a series of wintertime field studies in U.S. cities to measure ambient concentrations of fine particle EOM and associated mutagenicity. Receptor modeling has been employed with these measurements to deter-mine the quantitative contributions of various emissions sources to both Extractable Organic Matter (EOM) and mutagenicity. The present work gives receptor modeling results for the 1988-1989 field study in Roanoke VA, an airshed whose principal sources of ambient EOM were anticipated to be woodsmoke, mo-bile sources and residential distillate oil combustion (RDOC).

00,392 PB93-236511 PC A03/MF A01 National Inst. of Standards and Technology, Gaithersburg, MD.

Method for Separating Volatile Organic Carbon from 0.1 (sup 3) of Air to Identify Sources of Ozone Precursors via Isotope (14C) Measurements.

Symposium paper. G. A. Klouda, J. E. Norris, L. A. Currie, G. C. Rhodenck, and R. L. Sams. 1993, 21p, EPA/600/A-

Pub. in Proceedings of the AWMA/EPA Symposium, 'Measurement of Air Toxic and Related Air Pollutants', Durham, NC., May 3-7, 1993. See also PB86-120664. Sponsored by Environmental Protection Agency, Research Triangle Park, NC. Atmospheric Research and Exposure Assessment Lab.

Keywords: *Volatile organic compounds, *Ozone, *Precursors, *Air pollution, *Separation, Cryogenics, Air sampling, Oxidation, Mass spectroscopy, Carbon 12, Carbon 14, Hydrocarbons, Reprints.

Atmospheric non-methane volatile organic compounds (VOCs) are known to play an important role in urban ozone formation during the summer. To respond to the need for a direct measure of VOC source contributions from biogenic ((14)C/(12)C=10 to the -12 power) and fossil fuel ((14)C/(12)C=0) emissions, a system and protocol are being developed to separate the total VOC fraction from 0.1 cu m of ambient air for accelerator mass spectrometry (AMS) (14)C. The gas separation system developed at NIST allows for the simultaneous system developed at NIST allows for the simultaneous separation of low vapor pressure (LVP) VOCs and H2O, high vapor pressure (HVP) VOCs and CO2, CO and CH4 through sequential cryogenic separation and selective oxidation techniques. Preliminary results of this system and procedure for Isolating these fractions show a LVP-VOC blank of 2 + or - microgram C, which represents the effect of the separation system plus CO2 cross-contamination. Hydrocarbons having vapor pressures greater than n-decane are not retained at a level of more than a few percent in the LVP-VOC fraction. The recovery of C5-C8 hydrocarbons in the combined HVP-VOC and CO2 fraction ranges from 27% to 78%.

PB94-114519 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Fire Safety Engineering Div.
Smoke Plume Trajectory from In situ Burning of Crude Oil In Alaska.

K. B. McGrattan, A. D. Putorti, W. H. Twilley, and D. D. Evans. Oct 93, 72p, NISTIR-5273.

Sponsored by Alaska State Dept. of Environmental Conservation, Anchorage.

Keywords: *Oil spills, *Crude oil, *Combustion, *Smoke, *Dispersing, Fire tests, Burning rate, Plumes,

Experimentation, analysis, and modeling have been performed to predict the downwind dispersion of smoke resulting from in situ burning of oil spills. North Slope and Cook Inlet crude oils are burned on water in a 1.2 meter diameter pan. Burning rates and smoke aerosol size distributions are also measured, and found similar to previous work with different crude oils. Derivation of scaling factors for predicting the burning rates and smoke yields are large scale fires are guided by previous experiments with Louisiana crude oil. Scaled burning rates and smoke yields are supplied as input parameters for the LES (Large Eddy Simulation) model, version 2.0, of windblown smoke transport over flat terrain. For weather conditions appropriate for the Cook Inlet and North Slope areas, model results are presented which predict downwind dispersion and ground level concentrations of the fire generated particulate matter.

Radiation Pollution & Control

PB93-162972 PC A04/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Site Exploration for Radon Source Potential. F. Y. Yokel, and A. B. Tanner. Dec 92, 75p, NISTIR-

Sponsored by Department of Housing and Urban Development, Washington, DC.

Keywords: *Radon, *Site surveys, *Buildings, *Soil surveys, Radiation measurement, Pollution sources, Soil gases, Environmental surveys, Extraction, Diffusion, Porosity, Permeability, Construction.

Elevated radon in buildings has been recognized as a serious potential public health hazard and indoor radon mitigation has been legislated (EPA, 1992(1), Public Law 100-551, 1988). Substantial research efforts have been devoted to epidemiological studies to assess the effects of radon exposure, indoor radon surveys in various areas in the U.S., study of radon transport mechanisms, and geological mapping (for instance DOE, 1992). The purpose of the report is to propose exploration and test methods for the characterization of the radon source potential of individual building sites and fill materials.

Water Pollution & Control

00.395

PB93-166627 Not available NTIS

National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Organic Analytical Research Div. Standard Reference Materials for Trace Organic Contaminants in the Marine Environment. Final rept.

S. Wise, M. Schantz, R. Parris, T. Gills, R. Rebbert, and B. Benner. 1992, 5p.

Sponsored by National Oceanic and Atmospheric Administration, Washington, DC.

Pub. in Analusis Magazine 20, n6 p57-61 1992.

Keywords: *Organic compounds, *Chemical analysis, *Marine environments, *Water pollution detection, Marine animals, Pesticides, Aromatic polycyclic hydrocarbons, Polychlorinated biphenyls, Chlorine organic compounds, Sediments, Water pollution effects, Reprints, *Standard reference materials.

Recently NIST has issued standard reference materials (SRMs) for the determination of organic contaminants in the marine environment such as aliphatic hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and chlorinated pesticides. Both calibration solutions and natural mixture/matrix SRMs have been developed including sediment, mussel tissue and whale blubber matrices. The purpose of the article is to describe briefly the SRMs available that will be of interest to scientists involved in the analysis of marine samples.

00,396

PB94-101839 PC A03/MF A01

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

In situ Burning of Oil Spills: Mesoscaie Experiments and Analysis.

W. D. Walton, D. D. Evans, K. B. McGrattan, H. R. Baum, and W. H. Twilley. Sep 93, 40p, NISTIR-5192. Sponsored by Minerals Management Service, Herndon, VA.

Keywords: *Oil spills, *Fire tests, *Burning rate, Crude oil, Smoke, Plumes, Water.

A series of six mesoscale and one large laboratory fire experiments were performed to measure the burning characteristics of Louisiana crude oil on water in a pan. These included one - 6 m square and five 15 m square mesoscale bums and one - 1.2 m diameter laboratory bum. Results of the measurements for burning rate and smoke emissions are compared to those from previous burns of various scales. Predictions of smoke plume trajectory and particulate deposition at ground level from the Large Eddy Simulation (LES) model developed as part of the research effort are presented. LES is a steady-state three-dimensional calculation of smoke plume trajectory and smoke particulate deposition based on a mixed finite difference and Lagrangian particle tracking method.

INDUSTRIAL & MECHANICAL ENGINEERING

Laboratory & Test Facility Design & Operation

HEALTH CARE

Environmental & Occupational Factors

00.397 PB93-220820 PC A07/MF A02 George Mason Univ., Fairfax, VA.
Gulde to Board and Care Fire Safety Requirements
in the 1991 Edition of the Life Safety Code. N. E. Groner. Jul 93, 150p, NIST/GCR-93/629. Grant 60NANB9D0974

See also PB92-205483. Sponsored by National Inst. of Standards and Technology (BFRL), Gaithersburg,

Keywords: *Fire safety, *Nursing homes, Standards, Building codes, Handicaps, Cost analysis, Sprinkler systems, Evacuating(Transportation), Residential buildings, Fire safety.

The guide was written as part of a larger project with the overall goal of promoting a high degree of fire safe-ty in board and care homes without unnecessary expense or Interference with the program objectives of the homes. The guide is an accessory to the Life Safe-ty Code, not a substitute. There are certain requirements that can be reasonably interpreted in ways that differ from the descriptions offered in the guide. The reader is cautioned to read the exact wording of the Code and reach his or her own conclusions. To this end, section numbers in the 1991 edition of the Code are referenced throughout the guide.

INDUSTRIAL & MECHANICAL ENGINEERING

Industrial Safety Engineering

PB93-234722 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Air Moving Systems and Fire Protection.

J. H. Klote. Jul 93, 19p, NiSTIR-5227.

Keywords: *Space HVAC systems, *Fire hazards, Air conditioning, Fire protection, Smoke abatement, Stalrways, Alr flow, Dilution, Pressurizing, Buoyancy

The fire hazards associated with heating, ventilating, and air conditioning (HVAC) systems are significant. Protection is needed from the spread of fire and smoke due to both fires starting inside an HVAC system and fires starting outside an HVAC system. Materials for HVAC components are restricted, and fire dampers and smoke dampers are needed. To provide smoke protection, an HVAC system can be shut down or it can be put Into a special smoke control mode of operatlon. Smoke from building fires can be managed by the mechanisms of compartmentation, dilution, air flow, pressurization, and buoyancy.

Laboratory & Test Facility Design & Operation

00,399 PB93-125672 Not available NTIS
National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div.

Precision and Accuracy in XQQ Measurements: A Summary Report of the NIST-EPA international Round Robin.

Final rept.

R. I. Martinez. 1989, 3p. Pub. in Rapid Commun. Mass Spectrom. 3, n5 p127-

Keywords: *Precision, *Accuracy, Computer aided design, Data bases, Standardization, Reprints, *XQQ instruments, National Institute of Standards and Technology, Environmental Protection Agency.

The paper describes the kinetics-based measurement protocol which was used for the National Institute of Standards and Technology (NIST)-Environmental Protection Agency (EPA) International Round Robin, and provides an interim summary report of the results. At least 50% of the XQQ instruments currently in the field potentially can provide a dynamically-correct (i.e., instrument-independent) representation of ion-molecule reactions.

00.400 PB93-125680 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Instrument-Independent Database for Collisionally Activated Dissociation in Radiofrequency Only Quadrupoles. Single-Collision Versus Multiple-Collision Conditions.

Final rept. R. I. Martinez, and B. Ganguli. 1989, 5p. Pub. in Rapid Commun. Mass Spectrom. 3, n12 p427-431 1989.

Keywords: *Mass spectrometers, *Computer alded design, *Particle collisions, Cations, Acetone, Data bases, Quadrupole moment, Reprints, XQQ Instruments.

Dynamically-correct (I.e., Instrument-independent) computer aided design (CAD) spectra can be measured in XQQ (QQQ, BEQQ, etc.) tandem mass spectrometers under single-collision conditions. Hence, the characteristic branching ratios of lonic substructures can be used for the development of an Instrument-independent CAD database. By contrast, while mul-tiple-collision conditions can provide much more exten-sive fragmentation, they do distort the primary dynamical information that is specific to a particular ionic substructure.

00,401 PB93-146645 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Precision Engineering Div.
NIST Length Scale Interferometer Measurement Assurance.

J. S. Beers, and W. B. Penzes. Dec 92, 32p, NISTIR-4998.

Keywords: *Dimensional measurement, *Length, Error analysis, Interferometry, Uncertainty, Precision, Accu-

The paper is an extension of NBSIR 87-3625, Length Scale Measurement Procedures at the National Bu-reau of Standards. Results from the measurement assurance program (MAP) for graduated length scales over a twenty six year period are reviewed. Line scale interferometer modifications, measurement procedure changes, computational revisions, and a re-evaluation of measurement errors are described and their effects discussed. The question of whether the observed length changes in the MAP control standards are apparent or real is resolved. Improvements in precision and accuracy are demonstrated.

00,402 PB93-156644 PC A08/MF A02

National Inst. of Standards and Technology (TS), Gaithersburg, MD. National Voluntary Lab. Accreditation Program.

National Voluntary Laboratory Accreditation Program 1993 Directory.
Special pub.

V. R. White. Jan 93, 171p, NIST/SP-810-ED-1993. Also available from Supt. of Docs. as SN003-003-03191-7. Supersedes report for 1992, PB92-201094.

Keywords: *Laboratories, *Directories, Acoustlc measurement, Asbestos, Carpets, Computer applications, Construction materials, Electromagnetic compatibility, Thermal Insulation, Dosimetry, Telecommunication, Paints, Paper, Plastics, Seals(Stoppers), Sealers,

*National Voluntary Laboratory Accreditation Program, NVLAP program.

The 1993 Directory provides a listing of laboratories accredited by the National Institute of Standards and Technology, National Voluntary Laboratory Accreditatechnology, National Voluntary Laboratory Accreditation Program (NVLAP). The names of approximately 800 laboratories in 11 laboratory accreditation programs (LAPs) are included. A brief description of the NVLAP program and a summary of laboratory participation are provided. As an aid to the user, indexes are cross-referenced by laboratory name, LAP, geographic location (state or country), and NVLAP Lab Code. A listing of the test methods (Scope of Accreditation) is provided for each laboratory.

00,403 PB9**3-159465** PC A03/MF A01

National Inst. of Standards and Technology (PL),

Gaithersburg, MD.

Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurements Results.

Technical note. (Final). B. N. Taylor, and C. E. Kuyatt. Jan 93, 20p, NIST/ TN-1297

Also available from Supt. of Docs. as SN003-003-03193-3.

Keywords: International agreements, Confidence level, Calibration, Standards, *Measurement uncertainty, Reference materials, US NIST.

The Technical Note presents, in the context of the new NIST policy on uncertainty statements, those aspects of the Guide to the Expression of Uncertainty in Measurement being developed internationally that will be of most use to the NIST staff in implementing that policy. (The Gulde Is expected to be published by the International Organization for Standardization (ISO) during the first half of 1993 in the name of the ISO and the six other international organizations that sponsored its development.) Also included are suggestions not contained in the Guide or policy. However, none of the guidance given in the Technical Note is to be interpreted as NIST policy unless it is directly quoted from the policy itself.

00,404

PB93-166684 Not available NTIS National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Automated Production Technology

Automation of Strain-Gauge Load-Cell Force Callbration.

Final rept.

K. Yee. 1992, 5p. See also PB92-187087.

Pub. In Proceedings of NCSL Workshop and Sump. Managing Worldwide Measurements, Washington. DC., August 2-6, 1992, p387-391.

Keywords: *Load cells, Computerized control systems, Strain gages, Static loads, Calibration, Automation, Reprints, Dead weight machines, US NIST.

The National Institute of Standards and Technology (NIST) has six dead-weight machines (DWMs), used for force calibrations up to 4.4 meganewions (MN), which were all placed in service ca. 1965. More than 20 years later, five of these machines were automated. They now automatically apply programmed force values to the strain-gauge load cell and record the output using a high-precision digital voltmeter, all controlled by a PC-XT class computer. Subsequently, environmental chambers have been added to three machines to perform automatically the type evaluation testing of load cells used in scales in commerce.

00.405 PB93-196277 (Order as PB93-196228, PC A07/ MF A02)

National Inst. of Standards and Technology, Gaithersburg, MD.

Drift Eliminating Designs for Non-Simultaneous Comparison Calibrations.

T. Doiron. 1993, 8p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n2 p217-224 Mar/

Keywords: *Instrument errors, *Calibrating, *Drift, Metrology, Comparison, Elimination, Gage blocks.

The effects of drift on calibrations carried out by comparison have been studied at the National Institute of Standards and Technology for many years, and a num-

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Laboratory & Test Facility Design & Operation

ber of strategies have been introduced to combat these effects. One strategy, the use of comparison designs which are inherently immune to linear drift, was developed specifically for mass comparison measurements. These techniques, developed for simultaneous comparlsons, are extended to the case of non-simultaneous comparisons, such as gage block calibrations, where each artifact is measured separately, and the comparison is made mathematically from the individual measurements.

00,406 PB93-209781 PC A16/MF A03 of Standards and Technology, National Inst. Report of the National Conference on Weights and Measures (77th). Held in Nashville, Tennessee on July 19-23, 1992.

Special pub.
C. S. Brickenkamp, and A. H. Tumer. Oct 92, 373p, NIST-SP-845.

Also available from Supt. of Docs. Library of Congress catalog card no. 26-27766.

measurement, US NIST, Keywords: *Meetings, *Weight *Standards, Metrology, US NIST, Tolerances(Mechanics), Measuring instruments, International relations, Regulations, Nashville(Tennessee).

The 77th Annual Meeting of the National Conference on Weights and Measures (NCWM) was held July 19 through 23, 1992, at the Stouffer Nashville Hotel In Nashville, Tennessee. The theme of the meeting was 'Partnerships for Progress.' Reports by the standing and annual committees of the Conference comprises the major portion of the Nathurstian plant with major portion of the National Nathurstian plant with the Medical Nathurstian plant with the National Conference Comprises the National Comprises the Nat the major portion of the publication, along with the addresses delivered by Conference officials and other authorities from government and Industry. Special meetings included those of the Metrologists, the Associate Membership Committee, the Retired Officials Committee, the Scale Manufacturers' Association, the American Petroleum Institute, the Industry Committee on Packaging and Labeling, the regional weights and measures associations, and the National Association of State Departments of Agriculture Weights and Measures Division, and the National Council on State Metrication.

00,407 PC A10/MF A03 of Standards and Technology, PB93-213106 National Inst.

Raithersburg, MD.

NIST Handbook 44, 1993: Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices as Adopted by the 77th National Conference on Weights and Measures 1992.

H. V. Oppermann. Oct 92, 222p. Supersedes PB92-155084. Also available from Supt. of Docs.

Keywords: *Weight measurement, *Tolerances(Mechanics), *Metrology, *Measuring instruments, *Standards, Liquid level indicators, Water meters, Weight indicators, Fuel tanks, Flowmeters, Vapors, Liquified petroleum gases, Grains(Food), Mois-

Handbook 44 was first published in 1949, having been preceded by similar handbooks of various designations and In several forms beginning In 1918. The 1993 edition was developed by the Committee on Specifications and Tolerances of the National Conference on Weights and Measures with the assistance of the Office of Weights and Measures of the National Institute of Standards and Technology. It includes amendments adopted by the 77th annual meeting of the National Conference on Weights and Measures in 1992.

00,408 PB93-219715 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Galthersburg, MD. Precision Engineering Div.

Recent Results of the NIST National Ball Plate Round Robin.
G. Caskey, S. D. Phillips, and B. Borchardt. Jun 93,

14p, NISTIR-5218.

Keywords: *Metrology, *Industrial engineering, *Production engineering, *Precision, Calibrating, Balls, Metal plates, Measuring Instruments, Computer techniques, Coordinates.

The Impetus behind the national ball plate round robin, administrated by the National Institute of Standards and Technology (NIST) in cooperation with the Na-

tional Conference of Standards Laboratories (NCSL) and the University of North Carolina at Charlotte (UNCC), was to provide a simple method for the assessment of the current state of Industrial measurement capability using coordinate measuring machines (CMMs). The round robin participants included various US public and private manufacturing institutions that are engaged in coordinate metrology using coordinate measuring machines. In order to provide a fair comparison, only computer controlled coordinate measuring machines were included in the study. There were a total of 16 organizations that volunteered to participate in this round robin, representing a substantial por-tion of the manufacturing spectrum. Most participants are leaders in their fields, which include aerospace, heavy equipment, petroleum equipment and defense facilities.

PB93-219756 PC A03/MF A01
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Precision Engineering Div.
Development of a National Metrology Infrastructure for the Domestic Gear Industry.
D. C. Stieren. Jun 93, 15p, NISTIR-5215.

Keywords: *Gears, *Metrology, *Industrial engineering, Quality control, Standards, Design criteria, Aerospace industry, Automotive industry, Construction industry.

The domestic gear industry is large, shipping several billion dollars in products annually. Gears are omnipresent in our society and economy. Recently, the domestic gear industry has requested assistance from NIST to improve the quality control practices associated with the manufacture of precision gears. These requests have been formalized and documented at two industrial workshops, referenced in this text. As a result of these workshops and analysis of the industry, it can be concluded that several changes need to occur in the industry.

00,410 PB94-118288 PC A07/MF A02 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
NIST Building and Fire Research Laboratory. Projects 1993.

N. J. Raufaste. Aug 93, 132p, NIST/SP-838-1. Also available from Supt. of Docs. as SN003-003-03233-6. See also PB94-110194 and PB94-113420.

Keywords: *Research laboratories, *US NIST, *Buildings, *Fire tests, Construction materials, Research management, Standards, Earthquake engineering, Structural engineering, Concretes, Tests, Coatings, Quality control, Space HVAC systems, Indoor air pollution, Fire safety, Smoke.

The report summarizes the Building and Fire Research Laboratory's research for 1993. The report is arranged by its research programs: structural engineering, matenals engineering, mechanical and environmental systems, iire science and engineering, and fire measure-ment and research. Each summary lists the project title, point of contact, sponsor, research, and results. BFRL's mission is to increase the usefulness, safety, and economy of constructed facilities, and reduce the human and economic costs of unwanted fires in buildings.

LIBRARY & **INFORMATION** SCIENCES

Information Systems

00,411 PB94-101847 PC A08/MF A02 National Inst. of Standards and Technology (CSL), Gaithersburg, MD. Information Systems Engineering Towards SQL Database Langauge Extensions for Geographic Information Systems.

V. B. Robinson, and H. Tom. Aug 93, 154p, NISTIR-5258.

Prepared In cooperation with Erindale Coll., Mississauga (Ontarlo). Inst. for Land Information Management.

Keywords: *Geographic information systems, Query languages, Object-oriented programming, Data processing, Standards, *SQL(Structured Query Language), *Database languages.

Contents:

On Heterogeneous Geographic Information Systems, Architectures, Spatial Data Models, Transactions and Database Languages;

Database Language SQL:

Emerging Features for GIS Applications; Proposed Spatial Data Handling Extensions to

Geographic Information Systems Perspective on Spatial and Object Oriented Extensions to

Conceptual Folding and Unfolding of Spatial Data for Spatial Queries.

00,412

PB94-114568 PC A07/MF A02

National Inst. of Standards and Technology (TS), Gaithersburg, MD. Office of Information Services. Databases Available in the Research Information Center of the National institute of Standards and Technology.

Special pub. D. Cunningham. Sep 93, 148p, NIST/SP-855. Supersedes PB93-114478. Also available from Supt. of Docs. as SN003-003-03240-9.

Keywords: *Data bases, *Information services, Information systems, Indexes(Documentation), Subject in-dexing, Directories, Vendors, Tables(Data), US NIST.

Databases available online in the Research Information Center of the National Institute of Standards and Technology (NIST) are listed by acronym and by full title. In addition, descriptions of the databases, dates covered, producers, hard copy counterpart, principal sources and vendors are listed. A list of databases on CD-ROM is also included. A general subject index, a cross reference index, and a full text database list are also supplied.

Reference Materials

PB94-120847 PC A12/MF A03

National Inst. of Standards and Technology (TS), Gaithersburg, MD. Office of Information Services. NIST Serial Holdings, 1993.

Special pub. (Final).

S. A. Sanders. Feb 93, 269p, NIST/SP-777-ED-1993. Also available from Supt. of Docs. as SN003-003-03196-8. Supersedes PB92-190487.

Keywords: *Periodicals, *Catalogs(Documentation), *Collection, *Information centers, Standards, Libraries, Metrology, *National Institute of Standards and Technology, *NIST.

This publication contains bibliographic Information on approximately 5,000 titles held in the National Institute of Standards and Technology (NIST) Research Information Center, representing current and noncurrent journals, periodicals, annuals, memoirs, proceedings and transactions.

MANUFACTURING TECHNOLOGY Computer Aided Design (CAD)

MANUFACTURING TECHNOLOGY

Computer Aided Design (CAD)

00,414
AD-A261 193/7 PC A18/MF A04
National Bureau of Standards, Washington, DC. Inst. for Computer Sciences and Technology.
Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1987. Volume 4.
Technical rept. Oct 86-Sep 87.
S. J. Kemmerer. Mar 88, 425p.

Keywords: *Software engineering, *Computer applications, *Logistics support, Acquisition, Computers, Data management, Department of Defense, Environments, Industries, Management, Policles, Raster, Standards, Computer aided design, Computer aided manufacturing, Information transfer, Integrated systems, *CALS(Computer Aided Acquisition and Logistics Support).

The overall objective of the Department of Defense Computer-aided Acquisition and Logistic Support (CALS) Program Is to integrate the design, manufacturing, and logistic functions through the efficient application of computer technology. The National Bureau of Standards has been funded since Spring 1986 to recommend a sulte of Industry standards for system Integration and digital data transfer, and to accelerate their implementation. A major FY87 thrust was the completion of initial documentation of the high-priority standards required in the CALS environment. This volume Is one of four providing a collection of the final reports presented-to the CALS Policy Office. Major areas contained within this volume Include: text, data management, media, raster compression, and conformance testing strategy. The other three volumes contain the graphics and product data reports... CALS, Conformance, DoD, IRDS, Media, ODA/ODIF, Raster compression, SGML, SQL, Testing.

00,415
AD-A261 261/2 PC A20/MF A04
National Inst. of Standards and Technology,
Galthersburg, MD.
Collection of Technical Studies Completed for the
Computer-Aided Acquisition and Logistic Support
(CALS) Program Fiscal Year 1988. Volume 2.
Graphics, CGM MIL SPEC.
Intenim rept. Oct 87-Sep 88.
R. S. Morgan. Mar 91, 468p.

Keywords: *Computer aided design, *Computer aided manufacturing, Computers, Industries, Logistics, Standards, Strategy, Transitions, Weapon systems, Weapons, Data acquisition, Integrated systems, *CALS(Computer Aided Acquisition and Logistics Support), *CGM(Computer Graphics Metafile), Computer graphles.

Computer-alded Acquisition and LogIstic Support (CALS) Program is a DoD Industry strategy to transition from paper-intensive acquisition and logIstic processes to a highly automated and integrated mode of operation for the weapon systems of the 1990s. These volumes document the accomplishments of the National Institute of Standards and Technology to advance the development of technology and standards in support of CALS. These reports are divided into three volumes: 1, Text, Security, and Data Management; 2, Graphics, CGM MIL-SPEC; and 3, Graphics, CGM Registration. Volume 2. Graphics: Progress In the Computer Graphics Metafile standard is described, including work in the graphics standards committees and the expansion and updating of the CALS CGM application profile. A draft Military Specifications for CGM is Included. A plan for Extended CGM is presented, including documentation of relevant standards committee work.... CGM, Extended CGM, Graphics, Graphics metafile, Metafile.

00,416 AD-A270 049/0 PC A03/MF A01 National Inst. of Standards and Technology, Gaithersburg, MD.
Initial Graphics Exchange Specification (IGES).
30 Nov 92, 11p, NIST-FIPS-PUB-177.

Keywords: "Computer graphics, "Information exchange, "Standards, "Computer aided design, "Computer aided manufacturing, Computer program verification, Digital computers, Specifications, Syntax, Computer files, Life cycle costs, IGES(Initial Graphics Exchange Specifications), FIPS(Federal Information Processing Standard), Cost Reduction.

This publication announces the adoption of American National Standard Digital Representation for Communication of Product Definition Data, ASME/ANSI Y14.26M-1989, as a Federal Information processing Standard (FIPS). ASME/ANSI Y14.26M-1989, more commonly known as the Initial Graphics Exchange Specification (IGES), specifies file structure and syntactical definition, and defines the representation of geometric, topological, and nongeometric product definition data. ASME/ANSI Y14.26M-1989 establishes information structures for the digital representation and communication of product definition data. Use of this standard permits the compatible exchange of product definition data used by various computer-alded design and computer-alded manufacturing (CAD/CAM) systems.

00,417
FIPS PUB 177 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Galthersburg, MD.

Initial Graphics Exchange Specification (IGES). Category: Software Standard; Subcategory: Graphics and Information Interchange.

Three ring vinyl binder also available; North American Continent price \$7.00; all others write for quote.

Keywords: *Computer alded design, *Computer aided manufacturing, *Federal information processing standards, Product development, Digital data, Data transfer(Computers), Computer graphics, Computer software, *IGES(Initial Graphics Exchange Specification), API(Application Programmers Interface).

The publication announces the adoption of American National Standard Digital Representation for Communication of Product Definition Data, ASME/ANSI Y14.26M-1989, as a Federal Information Processing Standard (FIPS). ASME/ANSI Y14.26M-1989, more commonly known as the Initial Graphics Exchange Specification (IGES), specifies file structure and syntactical definition, and defines the representation of geometric, topological, and nongeometric product definition data. ASME/ANSI Y14.26M-1989 establishes information structures for the digital representation and communication of product definition data. Use of the standard permits the compatible exchange of product definition data used by various computer-alded design and computer-aided manufacturing (CAD/CAM) systems.

00,418
PB93-140820 PC A03/MF A01
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD.
Report on the Raster Capabilities of MIL-R-28002A
and MIL-D-28003A.
L. S. Rosenthal. Nov 92, 26p, NISTIR-4970.
See also PB91-962301 and PB92-962401.

Keywords: *Military requirements, Specifications, Data systems, Automation, Computer graphics, Standards, *CALS, *Raster graphics, Computer-aided Acquisition and Logistics Support, CGM(Computer Graphics Metafile), Tiling, Department of Defense.

The report examines and compares the tiled raster graphics capabilities of military specifications MIL-R-28002A and MIL-D-28003A. It presents reasons for which specification, MIL-R-28002A or MIL-D-28003A, to use to represent raster data.

PB93-146454 PC A04/MF A01
National Inst. of Standards and Technology,
Gaithersburg, MD.

Database Management Systems In Engineering.
K. C. Morris, M. Mitchell, C. Dabrowski, and E. Fong.
Dec 92, 56p, NISTIR-4987.

00.419

Supersedes PB93-138964.

Keywords: *Engineering, *Data base management systems, Object-oriented programming, Software engl-

neering, Data bases, Data structures, File organization, Memory(Computers), Concurrent processing, Standards.

Until recently the applicability of database technology to engineering systems has been limited. Early database systems addressed large-scale data processing needs of easily automatable applications. These applications were characterized by very uniform data and well understood processing methods. Engineering applications, on the other hand, are characterized by highly complex data with very variable structure. The need to represent engineering data has driven advances in database technology. Engineering domains also impose unique, new requirements on other aspects of database technology. In particular, to support the evolutionary nature of the engineering environment, recent developments in database technology have focused on the temporal dimensions of data management. In addition, the present trend in manufacturing towards concurrent engineering raises new considerations for the cooperative use of data in a distributed engineering environment. All of these factors are reflected in the new generation of database systems and are described in the article.

00,420
PB93-151165 Not available NTIS
National Inst. of Standards and Technology (CSL),
Galthersburg, MD. Information Systems Engineering
Div.
CALS TestIng: Programs, Status and Strategy.
Final rept.
S. J. Kemmerer. 1992, 7p.
See also PB93-125029.
Pub. In CALS Jnl., p55-61 1992.

Keywords: *Tests, Standards, Specifications, Reprints, *CALS, Computer-aided Acquisition and Logistics Support, Conformance testing, PDES(Product Data Exchange using STEP), STEP(Standard for the Exchange of Product Model Data).

The Computer-aided Acquisition and Logistics Support (CALS) Initiative from its inception, has viewed testing as an important aspect of qualifying the national and international standards as they are being developed, evaluating the vlability of the CALS military specifications, and galning credibility of those products which implement the military specifications. The purpose of the article is to: explain the various types of testing activities embodied in the CALS initiative as they are understood today; and provide a status update on conformance testing activities for those standards already adopted by CALS.

00,421
PB93-152171 PC A07/MF A02
National Inst. of Standards and Technology (CSL),
Gaithersburg, MD.
Raster Graphics: A Tutorial and Implementation
Gulde.
F. E. Spielman, and L. H. Sharpe. Jan 93, 137p,
NISTIR-5108.
Supersedes PB91-187708. See also PB92-119676,
PB92-196070, PB93-962001 and PB93-962301.
Sponsored by Assistant Secretary of Defense (Produc-

Keywords: *Standards, Computer graphics, Documents, File structures, Image processing, Data compression, Specifications, *CALS, *Raster graphics, Computer-aided Acquisition and Logistics Support, ODA(Open Document Architecture), ASN1(Abstract Syntax Notation One).

tion and Logistics), Washington, DC. Computer-alded Acquisition and Logistic Support Program.

The report examines the technical issues facing an Implementor of the raster data interchange format defined in the Open Document Architecture (ODA) Raster Document Application Profile (DAP). Information previously scattered throughout several standards is incorporated into the report for ease of reference. The ODA Raster DAP is analyzed with regard to both notation and intent.

00,422
PB93-153450 Not available NTIS
National Inst. of Standards and Technology (MEL),
Galthersburg, MD. Factory Automation Systems Div.
NIST EXPRESS Toolklt: Lessons Learned.
Final rept.
D. Libes, and S. Clark. 1992, 13p.
Pub. in Proceedings of EXPRESS Users' Group Conference, Dallas, TX., October 17-18, 1992, p1-13.

Computer Aided Design (CAD)

Keywords: *Software tools, Compilers, Computer alded design, Computer aided manufacturing, Standards, Reprints, *PDES(Product Data Exchange Using STEP), *EXPRESS _ programming language, STEP), *EXPRESS programming language, STEP(Standard for the Exchange of Product Model Data), NIST(National Institute of Standards and Tech-

In 1990, the National Institute of Standards and Technology (NIST) released a software toolkit for building EXPRESS-related tools. The authors have redesigned the toolkit with respect to user experience and the EX-PRESS Draft International Standard. The paper describes their work and the current state of the NIST EXPRESS toolkit. It also comments on: the 'hard' parts of implementing the EXPRESS language, things they dld wrong, several Implementation-dependent extensions to EXPRESS, and sophisticated error and wam-Ing detection. They revisit the original ideas underlying the toolkit concept. They discuss whether, in light of present experiences, the concepts still make sense, can be amended, or should be entirely scrapped.

00,423 PB9**3-158715** PC A07/MF A02

of Standards and Technology, National Inst. Galthersburg, MD.

Proceedings of the AP Validation Workshop. Held in Seattle, Washington on April 13-14, 1992. Na-tional PDES Testbed Report Series.

M. Mitchell, and J. Parker. Jan 93, 130p, NISTIR-

See also PB92-112374 and PB92-123090. Sponsored by CALS Evaluation and Integration Office, Washington, DC., and Department of Commerce, Washington,

Keywords: *Meetings, Computer aided design, Computer aided manufacturing, Product development, Standards, Models, Quality assurance, Guidelines, Requirements, Navy, Tests, *CALS, *Application Protocols, Computer-aided Acquisition and Logistics Support, STEP(Standard for the Exchange of Product Model Data), PDES(Product Data Exchange using STEP).

Contents:

Guidelines on Writing Standards within STEP; Status of AP Methods and Documentation; Model Quality Criteria and Metrics Status; Deploying the Voice of the Customer; What Information is Required in APs to Ensure Compatible Information Exchange; Common Methods for PDES, Inc;

Developing and Validating Marine Industry
Application Protocols;
The Roles of Mapping Tables and Conformance
Test Purposes In STEP Application Protocols.

00.424 PB93-178580

PC A04/MF A01 National Inst. of Standards and Technology (CSL), Galthersburg, MD. Information Systems Engineering

Detailed Design Specification for Conformance Testing of Computer Graphics Metafile (CGM) In-terpreter Products.

Rept. for Oct 91-Oct 92.

Sponsored by Assistant Secretary of Defense (Production and Logistics), Washington, DC. Computer Aided Acquisition and Logistic Support Office.

Keywords: *Computer program verification, Federal information processing standards, Tests, Specifications, Interpreters, Parsers, *CALS, *CGM(Computer Graphics Metafile).

In support of the Computer Aided Acquisition and LogIstic Support (CALS) initiative, one of the National Institutes of Standards and Technology is (NIST's) major tasks has been to ensure that conformance testing of CALS standards, including Computer Graphics Metafile (CGM), is available to meet CALS requirements. The report provides a detailed design specification and outlines the first 100 tests required for testing conformance of CGM Interpreter products. The objective of the CGM interpreter product testing program is to determine whether a given product, in this case a CGM Interpreter, can correctly and completely parse any CGM file (that satisfies both FIPS 128 and MIL-D-28003A), and produce the intended picture.

00,425 PB93-178655

PC A04/MF A01

D. R. Benigni. Mar 93, 57p, NISTIR-5146.

PB94-109220 PB94-109220 PC A03/MF A01
National Inst. of Standards and Technology,
Gaithersburg, MD.
Validation Testing System: Reusable Software Component Design. National PDES Testbed Report K. C. Morris, D. Sauder, and S. Ressler. Oct 92, 38p,

NISTIR-4937 See also PB92-143726 and PB92-143734. Sponsored

by CALS Evaluation and Integration Office, Washing-

Keywords: *Tests, *Computer systems programs, Ob-Keywords: "Tests, "Computer systems programs, Object-oriented programming, Computer program verification, Computer software, Subroutine libraries, Computer aided design, Computer aided manufacturing, Software engineering, "PDES(Product Data Exchange using STEP), "STEP(Standard for the Exchange of Product Model Data), "Information models, Software reuse, VTS(Validation Testing System).

The international Organization for Standardization (ISO) Standard for the Exchange of Product Model Data (STEP) addresses the need to share data across multiple enterprises and hardware platforms by providing information models which clearly and unambiguously describe data. The validity of these Information

National Inst. of Standards and Technology, Gaithersburg, MD. Data Probe User's Guide. National PDES Testbed

Report Series.

D. A. Sauder. Mar 93, 61p, NISTIR-5141.
Sponsored by Assistant Secretary of Defense (Production and Logistics), Washington, DC. Computer Aided Acquisition and Logistic Support Office.

Keywords: *Software tools, Man machine systems, Man computer interface, File management systems, Specifications, Models, Data processing, *Data Probe computer program, *STEP(Standard for the Exchange of Product Model Data), National Institute of Standards and Technology, PDES(Product Data Exchange using STEP), Express modeling language.

Data Probes are software tools built using the emerging International Standard for the Exchange of Product Model Data (STEP). A Data Probe is created from an information model written in the Express modeling language. A Data Probe is used to create, edit, or view data that conforms to the specification found in the information model from which it is created. It is also used to conveniently view Information from the Information model. Data Probe was built at the National Institute of Standards and Technology (NIST) to assist in the development of STEP. A Data Probe may, however, be used by anyone that wishes to create and edit data corresponding to an information model. Data Probe is available as public domain software. The document explains what Data Probes are, discusses what is involved in creating a Data Probe, explains how to run a Data Probe, and provides a detailed explanation of the commands needed to use a Data Probe.

00.426 PB93-208114 PC A03/MF A01

Standards and Technology, National Inst. of

Gaithersburg, MD.

00.427

Requirements for an Application Protocol Development Environment. National PDES Testbed Report

A. B. Feeney, S. N. Clark, and J. E. Fowler. 27 May 93, 18p, NISTIR-5197.

Sponsored by Assistant Secretary of Defense (Production and Logistics), Washington, DC. Computer-aided Acquisition and Logistic Support Program.

Keywords: *Computer aided design, *Computer aided manufacturing, *Requirements, Computer software, Standards, *APDE(Application Protocol Development Environment), *Application Protocols, PDES(Product Data Exchange using STEP), STEP(Standard for the Exchange of Product Model Data).

The National Product Data Exchange using STEP (PDES) project at the National Institute of Standards and Technology (NIST) is focused on the development and implementation of the emerging International Standard for the Exchange of Product Model Data (STEP). One sub-project within the Testbed is the effort to establish an Application Protocol Development Environment (APDE). The report documents the requirements for an APDE. The requirements provide results are APDE should be guidance as to what capabilities an APDE should provide

models is essential for success In sharing data In a highly automated business environment. The design of software, which supports the testing of these informasoftware, which supports the testing of these informa-tion models for validity and correctness, is described in the document. This design follows the requirements and architecture described in previous Validation Test-ing System (VTS) project documents. The software Il-braries described in the document may be reused in braries described in the document may be reased in a number of STEP applications. The Testbed Is used to validate information models for STEP. The scope of the document Is limited to the design of those components of VTS software scheduled for development in the initial phase of the project.

00.428 PB94-114501 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. SGML DTD for the STEP Integrated Resource Parts. National PDES Testbed Report Series.

S. Bodarky, and S. W. Paisley. 8 Jul 93, 36p, NISTIR-5224. PC A03/MF A01

Keywords: *Documents, *Standards, Product development, Automation, *STEP(Standard for the Exchange of Product Model Data), *SGML(Standard Generalized Markup Language), *DTD(Document Type Definition), Integrated resources, APDE(Application Protocol Development Types Projects (Standard Projects) velopment Environment).

The Standard for the Exchange of Product Model Data (STEP) is emerging under the International Organiza-tion for Standardization (ISO). One rnajor component of this standard is a series of documents called Inte-grated Resources. The purpose of this document is to present a Document Type Definition (DTD) for the inte-grated Resources, in the Standard Generalized Markup Language (SGML). The DTD is a template that encapsulates and formalizes the structure of the Integrated Resources, and permits their semantic content to be converted into SGML. This serves to encode the structure of the Integrated Resources in a formalized, software-based system, thereby eliminating many vaganes of human interaction that are inherent in work done by large committees across International bound-

Computer Aided Manufacturing (CAM)

00,429 PB93-152163 PC A03/MF A01

National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. Report on Scoping the Apparei Manufacturing Enterprise. Interim rept.

H. T. Moncarz, and T. Y. Lee. Jan 93, 33p, NISTIR-5106

See also PB90-247438, AD-A250 897, and AD-A249 193. Sponsored by Defense Logistics Agency, Alexandria, VA. Mfg. Engineering Branch.

Keywords: *Clothing industry, *Computer aided manufacturing, *Standardization, Automation, Integrated systems, Application Protocols, PDES(Product Data Exchange Using STEP), STEP(Standard for the Exchange of Product Model Data), Units of Functionality.

The paper identifies a set of manufacturing data interfaces that could be standardized for the effective computer Integration of the information required to operate an apparel manufacturing enterprise. The interfaces are called Application Protocols. A method is described to use pieces of information, referred to as Units of Functionality, as building blocks for designing Application Protocols.

PB93-158665 PC A03/MF A01
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Factory Automation Systems Div.
Prototype Application Protocol for Ready-to-Wear Pattern Making.

Interim rept. Y. T. Lee, and H. T. Moncarz. Jan 93, 35p, NISTIR-5115.

Contract DLA92-R/D-4 See also PB90-247438 and PB91-216663. Sponsored by Defense Logistics Agency, Alexandria, VA. Mfg. Engineering Branch.

Keywords: *Clothing Industry, *Computer aided manufacturing, *Data transfer(Computers), Patterns, Proto-

Manufacturing, Planning, Processing & Control

types, Pattern making, Tests, Models, *Application protocols, STEP(Standard for the Exchange of Product Model Data), PDES(Product Data Exchange using

A Ready-to-Wear Pattern Making Information Model is introduced for extending the emerging international Standard for the Exchange of Product Model Data (STEP) to include the exchange of apparel pattern data. The model focuses on a representation of two-dimensional (flat) patterns generated by the traditional ready-to-wear pattern making and grading method. A testing methodology of the information model is also described in the paper.

PB93-166304 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Center for Manufacturing Engineer-

Research, industry and Technology Transfer at the NIST AMRF.

Final rept.

D. A. Swyt. 1991, 2p.
Pub. in Proceedings of Triennial World Congress of the International Federation of Automatic Control (11th), Tallin, USSR, August 13-17, 1990, v1 p71-72 1991.

Reywords: *Computer aided manufacturing, *Research and development, *Technology transfer, Automation, Robotics, Machine tools, Government/industry relations, Standards, Reprints, *Automated Manufacturing Research Facility, National Institute of Standards and Technology.

The paper which

The paper, which deals with the Automated Manufacturing Research Facility (AMRF) at the U.S. National Institute of Standards and Technology (NIST), outlines briefly the nature of AMRF research, interactions with industry, and principal mechanisms of technology transfer to large-, medium- and small-size firms.

00,432 PB9**3-189801** PC A04/MF A01

National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. Strategic Plan for the Factory Automation Systems Division.

H. M. Bloom. Mar 93, 61p, NISTIR-5148. See also PB92-205392.

manufacturing, Keywords: *Computer aided Automation, Standards, Interfaces, Systems engi-Automation, Standards, Interfaces, Systems engineering, Financing, Organizational structure, Facilities, *National Institute of Standards and Technology, Concurrent engineering, Automated Manufacturing Research Facility, PDES(Product Data Exchange using STEP), STEP(Standard for the Exchange of Product Model Data).

The objective of the report is to present the strategic plan for the Factory Automation Systems Division. A plan for the Factory Automation Systems Division. A vision of 21st century manufacturing is presented in terms of the implementation of the 'Virtual Enterprise' and the use of Multi-Enterprise Concurrent Engineering. An environmental assessment is made of the Flexible Computer Integrated Manufacturing and Systems Management technologies. The goals and objectives of the Division are stated in terms of these technologies. The programs in the Division are described nologies. The programs in the Division are described and the long term program objectives are given. Plans for additional funding, resources, and facilities are given in terms of program requirements.

00.433 PB93-199164 PC A03/MF A01 PB93-199164 PC A03/MF A01
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Robot Systems Div.
ADACS. An Automated System for Part Finishing.
K. Stouffer, J. Michaloski, B. Russell, and F. Proctor.
Apr 93, 14p, NISTIR-5171.
See also PB93-116416.

Keywords: *Computer aided manufacturing, *Robotics, *Chamfering, *Deburring, Automation, Real time systems, Control systems, Controllers, Computer architecture, Interactive graphics, Feature extraction, *ADACS(Advanced Deburring and Chamfering System)

The paper describes an automated finishing system called the Advanced Deburning and Chamfering System (ADACS). ADACS uses the Real-Time Control System (RCS), a hierarchical controller architecture that was developed at the National Institute of Standards and Technology (NIST). ADACS uses a graphical

user Interface that prompts an operator to specify chamfering edges and cutting parameters for the part. Given the operator-designated chamfering edges, ADACS uses this edge information to extract features - such as inside corner - to generate a finishing process plan. ADACS interprets the finishing plan to generate motion trajectories that are tightly coupled to the tooling control. Because of the inaccuracies in robotic position control, ADACS uses active force control in the tool to compensate for any small position errors along the finishing path. A prototype ADACS has successfully processed aerospace test parts.

PB94-112430 PC A04/MF A01 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD.
Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, February 2-3, 1993).
H. T. Yolken, and G. Bimbaum. 1993, 69p, NISTIR-

See also PB92-112572.

Keywords: *Artificial Intelligence, *Process control, *Materials, *Nondestructive tests, Steels, Polymers, Expert systems, Computer aided manufacturing, Ceramics, Detectors, On-line systems, Research Detectors, projects, Standards.

In 1992, the Office of Intelligent Processing of Mate-nals continued its major focus on cooperative pro-grams with industry to establish concepts for intelligent processing of materials. The research activities are grouped into two major areas: Materials Processing; and On-Line and Nondestructive Evaluation (NDE) Sensors. The first deals with process modeling, development of sensors for on-line process modeling, development and validation of process models, and in some cases, integration of these elements with an expert computer control system to demonstrate key aspects of intelligent processing of materials. Whereas, in the first area the research on sensors is tied closely to specific processes, the work on NDE sensors in the second area, while motivated by on-line applications, Is not necessarily linked with process models or intelligent processing.

Computer Software

00,435 PB94-120623 PC A03/MF A01 of Standards and Technology, National Inst. Gaithersburg, MD. Shtolo-Converting STEP Short Listings to Annotated Listings. National PDES Testbed Report Se-

D. Libes. 8 Nov 93, 14p, NISTIR-5291. See also PB90-250077 and PB93-220838. Sponsored by CALS Evaluation and Integration Office, Washington, DC.

Keywords: *Software tools, Data processing, Automation, Computer aided design, Computer aided manufacturing, *STEP(Standard for the Exchange of Product Model Data), *Application Protocols, Shtolo computer program, PDES(Product Data Exchange using STEP), National Institute of Standards and Technology, EXPRESS.

The Standard for the Exchange of Product Model Data (STEP) Application Protocol includes an Application Interpreted Model (AIM) EXPRESS Annotated Listing. An Annotated Listing is created by combining the Short Listing and any objects from STEP Integrated Resource Parts that are referenced from the Short Listing source Parts that are referenced from the Short LIsting either directly or indirectly. A number of transformations are performed on the resulting model, which is then formatted and printed. In the past, this process has been carried out by hand. This document describes Shtolo, a tool to automate this process. Shtolo conforms to EXPRESS Part 11 and The Supplementary Directives for the Drafting and Presentation of ISO 10303 allowing direct inclusion of the result into an Application Protocol specification. Shtolo relies on the National Institute of Standards and Technology the National Institute of Standards and Technology (NIST) EXPRESS Toolklt and the NIST EXPRESS Pretty Printer.

00,436 PB94-120664 PC A03/MF A01

National Inst. of Standards and Technology, Gaithersburg, MD.

NIST EXPRESS Toolkit: Introduction and Overview. National PDES Testbed Report Series.

D. Libes. 25 Oct 93, 12p, NISTIR-5242.
See also PB90-265273 and PB91-107235. Sponsored by CALS Evaluation and Integration Office, Washington DC

Keywords: *Software tools, Subroutine libraries, Compilers, History, Computer aided design, Computer aided manufacturing, *National Institute of Standards and Technology, EXPRESS, STEP(Standard for the Exchange of Product Model Data), PDES(Product Data Exchange using STEP) Data Exchange using STEP).

The National Institute of Standards and Technology (NIST) EXPRESS Toolkit is a software library for building EXPRESS-related tools. This paper gives an intro-duction, overview, and history of the toolkit. The paper also describes how to get more information on the tool-kit. No knowledge of EXPRESS Toolkit is presumed other than a rudimentary grasp of basic computer science.

Joining

00,437 PB93-166106 PB93-166106 Not available NTIS
National Inst. of Standards and Technology (IMSE),

Boulder, CO. Fracture and Deformation Div. Standard Formats for Weiding Property Data.

Final rept.

T. A. Siewert. 1992, 5p.

Pub. in Proceedings of Conference on Computerization of Welding Information III, Ypsilanti, MI., September 12-14, 1990, p44-48 1992.

Keywords: *Welding, *Formats, *Mechanical properties, *Weld metal, Weldability, Data bases, Standards, Weldments, Specifications, Standardization, Repnints, *Welding procedure specification.

Standards societies are actively pursuing the develop-ment of standard formats for a wide range of material property data. For welding, most activity has been within AWS Committee A9 Computerization of Welding Information and ASTM Committee E49 Computerization of Material Property Data. The ASTM Committee scope covers engineering materials and properties, and has 29 documents in various stages of completion. Members of the ASTM Committee represent the entire spectrum of material properties and have the expertise to develop generic specifications so the various data formats are compatible. The AWS Committee is concerned specifically with welding data, and has the expertise to produce the most precise documents for this discipline. Together, they are producing weld standards that are fully compatible with the standards for the other materials, but are suitable for the widest possible vanety of welding applications. At present, two standards are under development, one covering the Identification of welds and the other covering the properties of welds. This report provides more details on these standards.

Manufacturing, Planning, Processing & Control

00,438 PB9**3-16616**3 Not available NTIS National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Precision Engineering Div.
Comparison between Precision Roughness Master Specimens and Their Electroformed Replicas.

Final rept. J. F. Song, T. V. Vorburger, and P. Rubert. 1992, 7p. Pub. in Precision Engineering 14, n2 p84-90 Apr 92.

Keywords: *Surface roughness, *Precision, *Profiles, *Electroforming, Quality control, Calibration, Errors, Surface properties, Profilometers, Reproducibility, Re-

Two random profile precision roughness calibration specimens with Ra=0.028 and 0.043 micrometer m are compared with their electroformed replicas. Measurements of surface texture and roughness parameter val-



Manufacturing, Planning, Processing & Control

ues show very good agreement. Fluctuations in the Ra values across the replicas track those across the mas-ters to within 1.8 nm. However, the form errors of the replicas, approximately 0.6 micrometer over a 3.2 x 2.6 sq mm area, are much bigger than those of the masters, and their hardness (HV=243) is not as good as the master specimens' (HV=852).

PB93-189793 PC A03/MF A01

National Inst. of Standards and Technology (MEL), Galthersburg, MD. Factory Automation Systems Div. National Testbed for Process Planning Research. S. R. Ray, and A. B. Feeney. Apr 93, 20p, NISTIR-

See also PB92-226307.

Keywords: *Research and development, Information services, Laboratories, Research management, *Process planning, *National Institute of Standards and Technology, Testbeds.

The National Institute of Standards and Technology (NIST) is in the process of establishing a testbed which will serve the research and information needs of the process planning community. The testbed is building up four primary services designed to facilitate the development of process planning technology: information services, workshops, a testing and integration laboratory, and a collaborative research program. Each of these services is described, along with their motivation and expected impact.

00,440

PB93-192318 PC A11/MF A03

National Inst. of Standards and Technology (MEL),

Gaithersburg, MD.

Proceedings of the Joint DoD/NIST Workshop on international Precision Fabrication Research and Development. Heid in Rockville, Maryland on October 27-29, 1992.

Special pub.

J. D. Meyer. Mar 93, 250p, NIST/SP-849.
Also available from Supt. of Docs. as SN003-003-03204-2. Sponsored by Department of Defense, Washington, DC. Mfg. Technology Program. Defense,

Keywords: *Meetings, *Fabrication, *Research and development, Global, Manufacturing, Grinding(Material removal), Technology Machining, Innovation. Precision, Microfabrication.

Contents:

Introductory Remarks;

Precision Manufacturing Practice and Research:

A North American Perspective; Western European R&D Programs and Sources of Funding;

Precision Fabrication Technology in the Former Soviet Union and Other East European Countries:

Precision Fabrication of Japan in 1993; Worldwide Microfabrication Research and Development.

PB93-209930 PC A04/MF A01

Georgia Inst. of Tech., Atlanta. School of Public Policy. Federal-State Collaboration In Industrial Modernization.

P. Shapira, J. D. Roessner, and R. Barke. Jul 92,

70p.

Grant SBNB1C6728

Sponsored by National Inst. of Standards and Technology (TS), Gaithersburg, MD. State Technology Extension Program.

Keywords: *Project management, *Industries, *Manufacturing, *United States, Government agencies, Technical assistance, Government/industry relations, Personnel development, Technology transfer, On job training, National government, State government, Technology assessment, Quality control, Improvement, Grants, "Modernization, Omnibus Trade and Competitiveness Act of 1988, State Technology Extension Programs(STEP), Small firms.

To promote industrial modernization among U.S. firms, especially small and midsized ones, the 1988 Omnibus Trade and Competitiveness Act mandated the National Institute of Standards and Technology (NIST) to take a greater role in diffusing new manufacturing technologies. The report considers federal-state collaboration in industrial modernization focusing a digital way. tion in industrial modernization, focusing particularly on NIST and its role and potential for strengthening the system, through STEP and similar programs. After examining the multidimensional nature of the Industrial modernization problem, the report assesses current federal and state practices and federal-state relations in the modernization field.

PB93-217578 PC A23/MF A04

National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Ceramics Div.

Machining of Advanced Materials: Proceedings of the International Conference on Machining of Advanced Materials. Held in Gaithersburg, Maryland on July 20-22, 1993. Special pub.

Jahanmir. Jun 93, 537p, NIST/SP-847, ISBN-0-16-

041820-8.

Also available from Supt. of Docs. as SN003-003-03218-2. Sponsored by National Science Foundation, Washington, DC., and Department of the Navy, Wash-Ington, DC.

Keywords: *Machlning, *Composite materials, *Meetings, US NIST, Grinding(Material removal), Surface roughness, Precision, Abrasive machining, Milling(Machining), Laser cutting, Ceramics, Proceed-

The present volume contains papers presented at the International Conference on Machining of Advanced Materials, held at the National Institute of Standards and Technology, Gaithersburg, Maryland, July 20-22, 1993. The goal of the conference was to strengthen communication and technology transfer among re-searchers and engineers Involved in various aspects of machining as related to ceramics and composites. The following topics are included in these proceedings: traditional and nontraditional machining and finishing techniques; mechanisms of material removal; non-destructive evaluation and characterization of machining damage; effect of machining damage on performance and properties; sensors for in-process measurement of surface quality; special cutting tools and cutting/grinding fluids for advanced materials; new machine tool designs; novel concepts for machining of advanced materials; and machining of advanced materials for specialized applications, including biological implants.

Quality Control & Reliability

00,443 PB93-124816 Not available NTIS

National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Center for Electronics and Electrical Engineering. Metrology is More Than Calibration: Letting Others

Know That Measurements Matter.

Final rept.

B. C. Belanger. 1989, 9p. Pub. in Proceedings of Measurement Science Conference, Anaheim, CA., January 26-27, 1989, p1-9.

Keywords: *Metrology, *Measurements, Government/industry relations, Calibration, Reprints, US NIST.

Anecdotal illustrations of the impact of improved measurements are given to support the thesis that metrology is much more than the routine calibration of instru-ments as is sometimes the perception. Examples taken from NIST's experiences in serving a variety of Industries and government agencies are cited in this paper to prove the point that better measurements are essential tools for solving technical problems, reducing testing costs, and improving industrial productivity.

00,444 PB93-151744 Not available NTIS

National Inst. of Standards and Technology (MSEL), Boulder, CO. Materials Reliability Div.

Quantitative Evaluation of Distributed Pores In Ref-

erence Radiographs.

Final rept. T. A. Siewert, C. N. McCowan, D. Polansky, and T. S. Jones. 1992, 3p. Pub. in Welding Jnl., p31-33 Aug 92.

Keywords: *Radiography, *Image analysis, *Weldments, Aluminum, Nondestructive tests, Porosity, X-ray analysis, Welding, Standards, Reprints.

During the development of a set of reference radiographs for aluminum (Al) welds, we invited experi-

enced radiographic Interpreters to review candidate radiographs so that the set would accurately represent Industrial usage. Quantitative evaluation of the same radiographs with a digital Image analyzer revealed that the different radiographers were quite consistent in selecting a maximum acceptable level of porosity (measured as pore area fraction in the weld). This was true for three different grade series: coarse and fine pores In welds with 12-mm-thick Al plate, and fine pores in 3-mm-thick plate. The radiographers also selected intermediate grades (levels of seventy) in a nearly geometric progression of area fraction. We have found a similar maximum pore area fraction and a geometric progression of area fraction (in a graded series) In other radiographic acceptance standards, although most standards do not present the data in these units. We suggest that a numerical evaluation procedure can be developed for impartial and quantitative ranking of flaw sevenity in radiographs. A numerical evaluation procedure would allow further automation and would be especially useful in cases where conformance to a standard is disputed.

00,445 PB93-166676

Not available NTIS

National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Statistical Engineering Div.
Renewal Look at Switching Rules In MiL-STD-105D.

Final rept. G. L. Yang. 1990, 10p.

See also PB92-126424.

Pub. In Jnl. of Applied Probability 27, n1 p183-192

Keywords: *Quality control, *Sampling, Quality assurance, Standards, inspection, Markov chains, Reprints.

A sampling system, MIL-STD-105D, used In quality control consists of three sampling plans with different acceptance probabilities alternatingly used for lot Inspection. The decision to switch plans is based on the history of the lot acceptance records and a set of stopping rules. The author derives the performance measure, Average Outgoing Quality (AOQ), of this sampling system from a renewal process in which AOQ is expressed in terms of the moments of the stopping times. The renewal approach is simpler than that of the Markov chain generally used in computing AOQ for an infinite sequence of lots. It also provides a formula for AOQ for a finite sequence of lots.

00,446 PB93-173466 PC A06/MF A02 National Inst. of Standards and Technology (MSEL), Materials Reliability. Technical Activities, 1992. (NAS-NRC Assessment Panel, May 13-14, 1993).
H. I. McHenry, and C. M. Fortunko. May 93, 103p,

Keywords: *Research projects, *Materials, *Reliability, Composite materials, Standards, Nondestructive tests, Cryogenics, Composite materials, Ultrasonic tests, Thermomechanical treatment, Welding, Mechanical properties, Process control(Industry), Performance evaluation, Physical properties, Steels, *Advanced ma-

The Materials Reliability Division conducts materials research to improve the quality, reliability, and safety of Industrial products and the nation's Infrastructure. The authors' research fosters the use of advanced materials in commercial products by Improving confidence in their service performance. The authors do this by developing measurement technology for: process control which improves the quality, consistency and producibility of materials; nondestructive evaluation (NDE) which assures the quality of finished materials and products; fitness-for-purpose standards which relate material quality to reliability and safety; and matenals evaluation for severe applications, particularly for service at cryogenic temperatures. Early in FY92, the authors reorganized the Division to build a stronger group structure. The report summanzes the Division programs, and it is organized according to the three groups: materials characterization; process sensing and modeling; and structural materials.

PB93-175990 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div.

Robotics/Robots

User's Guide for the Algorithm Testing System/

Version 1.1. C. Diaz. Feb 93, 45p, NISTIR-5137. Sponsored by Naval Research Lab., Washington, DC.

Navy Manufacturing Technology Program.

Keywords: *Verification inspection, *Computer software, *Fitting, *Computer program verification, Algorithms, Testing, Metrology, Measuring instruments, Geometry, User manuals(Computer programs), National Institute of Standards and Technology.

The National Institute of Standards and Technology (NIST) Algorithm Testing System (ATS) is a software package for evaluating the performance of geometric fitting software. The report is a user's guide to the ATS The user's guide documents the detailed description of the system operation.

00,448 PB93-184331 PC A05/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Precision Engineering Div.

issues, Concepts, and Standard Techniques in Assessing Accuracy of Coordinate Measuring Ma-

Technical note.
D. A. Swyt. Feb 93, 91p, NIST/TN-1400.
Also available from Supt. of Docs. as SN003-003-

Keywords: *Dimensional measurement, Computerized control systems, Laser applications, Tolerances(Mechanics), Distance measuring equipapplications. ment, Displacement measurement, Performance eval-uation, Comparative evaluations, Extensions, Metrol-ogy, Accuracy, Length, Tests, Japan, Germany, Great Britain, USA, *Coordinate measuring machines, Intercompanison.

The report deals with a variety of issues, concepts and standard techniques in assessing the accuracy of measurements of modern laser-based computer-controlled coordinate measuring machines. It outlines technical issues in assessing conformity of dimensions of manufactured parts to design tolerances with such or manufactured parts to design tolerances with such CMM's, uses a new system of length-dimensional types (displacement, position, distance and extension) as the basis for an error-budget analysis of CMM measurement capabilities and, based on that system, intercompares U.S., German, British and Japanese CMM performance standards, showing that the U.S. standard provides separate test of a CMM's capability to measure of each length-dimensional type and the to measure of each length-dimensional type and the part features associated with them.

PB93-189819 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Precision Engineering Div. Measurement Uncertainty Considerations for Co-ordinate Measuring Machines.

S. D. Phillips, B. Borchardt, and G. Caskey. Apr 93, 35p, NiSTIR-5170.

See also PB92-164680 and PB93-159465.

*Dimensional measurement, *Tolerances(Mechanics), Confidence limits, Uncertainty, Accuracy, Coordinate measuring machines.

The report examines some uncertainty considerations for dimensional measurements performed on a three axls coordinate measuring machine (CMM). The interaction between measurement uncertainty and part tolerance is briefly presented, and the factors affecting CMM measurements are discussed and their uncertainty described using the approach recommended by the International Committee for Weights and Measures (CIPM). Several of the current technical difficulties which make a rigorous uncertainty evaluation problem-atic are considered, and some simple examples are presented.

PB93-198455 PC A03/MF A01
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Factory Automation Systems Div.
Dimensional inspection Planning Based on Product Data Standards. National PDES Testbed Report

S. C. Feng. 18 May 93, 34p, NISTIR-5183.

Keywords: *Dimensional measurement, *Inspection, *Standards, Computer aided design, Models, Informa-tion processing, Planning, Computer aided manufac-turing, *DMIS(Dimensional Measuring Interface Stand-

Machines), ard), CMMs(Coordinate Measuring Machines), STEP(Standard for Exchange of Product Model Data).

An international standard on product data representa-tion and exchange for dimensional inspection planning is being developed. The paper provides a review of fundamental technology enabling the standard development and describes the current status of an activity model. The model defines functional requirements of the standard. A set of diagrams has been generated to represent the activity and its sub-activities, inputs, outputs, controls and mechanisms, when such planning is based on technologies of product data exchange, process planning and information modeling.

00.451

PB93-217529 PC A07/MF A02

Standards and Technology, National Inst. of Gaithersburg, MD. Office of Weights and Measures. State Weights and Measures Laboratories: State Standards Program Description and Directory. 1993 Edition.

Special pub.

G. L. Harns. Jun 93, 132p.

Supersedes PB92-183698. Also available from Supt. of Docs. as SN003-003-03220-4.

Keywords: *Laboratories, *Standards, *Directories, Units of measurement, States(United States), Puerto Rico, Virgin Islands, Tolerances (Mechanics), Calibration, Tests, *State services, *Weights and measures, National Type Evaluation Program, State Standards Program, Accreditation.

In support of its mission to promote uniform standards of measurement throughout the country, the National Institute of Standards and Technology (NIST) received funding In 1965 to provide new standards of mass, length, and volume to State weights and measures laborationes. The program, called the (New) State Standards of the Program and Program an ards Program, also provided the equipment needed to perform calibrations in these measurement areas. Part I describes the accreditation program whereby NIST accredits State weights and measures laboratories. Part II is the directory of State weights and measures laboratones and lists the services they provide to State and local weights and measures agencies as well as to industry. The directory is intended to assist potential users of the laboratory services in locating and obtain-Ing needed measurement services.

PB93-234680 PC A04/MF A01

National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Automated Production Technology

Some Guidelines for Implementing Error Compensation on Machine Tools.

M. A. Donmez, K. W. Yee, and B. Damazo. Aug 93, 62p. NISTIR-5236 See also PB89-150874 and PB91-112771.

Keywords: *Mathematical models, *Machine tools, *Errors, Accuracy, Compensation, Tuming(Machining), Deflections, Wear.

Some guidance is presented for implementing error compensation for geometric and thermally Induced errors of a machine tool. Error compensation has the potential for relatively low cost improvements in the accuracy of finished parts since machines are more repeatable than accurate and most errors are predictable and can be compensated. Measurement of individual error components and the development of a rigid-body, kinematic model of the machine tool is discussed. Some methods of implementing the predicted error com-pensation on existing machine-tools controllers is presented

Research Program Administration & **Technology Transfer**

PB93-209922 PC A03/MF A01 Georgia Inst. of Tech., Atlanta. School of Public Policy.

Japan's Kohsetsushi Program of Regional Public Examination and Technology Centers for Upgrad-Ing Small and Mid-Size Manufacturing Firms. Presented at Annual Meeting of the Association of American Geographers. Held in Miami, Florida in April 1991.

P. Shapira. 1991, 49p. Grant NANBOD1047

Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD., and West Virginia Univ., Morgantown.

Keywords: *Japan, *Manufacturing, *Research and development, Small businesses, Case studies, Technology innovation, Technology utilization, Program evaluation, Kohsetsushi program

The study investigates Japan's Kohsetsushi program of regional public examination and technology centers. These centers provide research services, testing, training, and technology guidance for small and medium-size enterprises. After a review of the role of small and mid-size manufacturing enterprises in Japan and an analysis of their use of a range of new technologies, the study is organized into three sections: (1) An examination of the operation and services of the five case study Kohsetsushi centers; (2) a discussion of developments and problems in the use of technology by ten small Japanese manufacturers; and (3) an assessment of the strengths and weaknesses of the Kohsetsushi program, based on the program and firm case studies.

Robotics/Robots

00.454 PB93-146660 PC A03/MF A01 Florida Atlantic Univ., Boca Raton.

Autonomous Obstacle Avoidance Using Visual Fixation and Looming.
K. Joarder, and D. Raviv. Dec 92, 27p, NISTIR-4996. Sponsored by National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Robot Systems Div.

Keywords: *Obstacle avoidance, Robot dynamics, Robot arms, Computer vision, *Robot navigation, Visual fixation, Visual looming.

The paper describes a vision-based method for avoid-Ing obstacles using the concepts of visual looming and fixating motion. Visual looming refers to the expansion of images of objects in the retina. Usually, this is due to the decreasing distance between the observer and the object. An increasing looming value signifies an increasing threat of collision with the object. The visual task of avoiding collision can be further simplified by purposive control of visual fixation at the objects in front of the moving camera. Using these two basic concepts real time obstacle avoidance in a tight perception-action loop is implemented. 3D space in front of the camera is divided into zones with various degrees of looming-based threat of collision. For each obstacle seen by a fixating camera, looming and its time derivative are calculated directly from the 2D Image. Depending on the threat posed by an obstacle, a course change is dictated. This looming based approach is simple, independent of the size of the 3D object and its range and involves simple quantitative measurements. Results pertinent to a camera on a robot arm navigating between obstacles are presented.

PB93-166551 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Precision Engineering Div.
Use of Contact Type Measurement Device to Detect Robots' Hand Positions.

N. Vira, and T. Estler. 1990, 20p. Pub. in ISA Transactions 29, n4 p21-40 1990.

Keywords: *Robots, *Position(Location), *Measuring instruments, Testing, Performance evaluation, Calibrating, Accuracy, Manufacturing, Standardization, Reprints, National Institute of Standards and Technology.

The article presents procedures for using a contact type measurement device to detect and calibrate robots' hand positions. The device used has recently been designed and manufactured at the National Institute of Standards and Technology (NIST) and is suitable for testing industrial robots utilized in precision

Robotics/Robots

Technologies.

manufacturing operations. The device measures accuracy and repeatability of robot hand positions in a three-dimensional work space. The need of such measurement device is well documented in the literature; however, prime reason can be summarized in a bi-fold: first, there exists a need to provide an Industrial type inexpensive measurement system applicable to test a wide variety of robots; and second, standardization on measurement methodologies and procedures are highly desired, thus common ground rules can be established between manufacturers and robot users. The device used here for a robot testing has an accuracy of 34 m and is considered as contact type apparatus because it directly connects to a fixture affixed to the robot hand. To compare the device usage, and describe its usefulness, the article highlights four other measurement systems that are in the process of development at NIST.

00,456
PB94-112422 PC A07/MF A02
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Robot Systems Div.
Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle

M. Herman. Aug 93, 142p, NISTIR-5237.
Proceedings of a conference held in Gaithersburg, MD.
on September 16-17, 1992. Sponsored by Defense
Advanced Research Projects Agency, Ariington, VA.

Keywords: *Unmanned, *Ground vehicles, *Meetings, Technology innovation, Navigation, Automatic control, Tests, Target acquisition, ARPA(Advanced Research Projects Agency).

The ARPA Unmanned Ground Vehicle (UGV) Demo II program is developing intelligent, semi-autonomous UGVs to perform cooperative tasks in militarily significant scenarios. As part of the program, NiST ran a workshop on UGV performance evaluation in September 1992. The workshop examined the various UGV technologies and aspects of performance that need to be evaluated, including sensing for navigation and driving (vision, stereo, laser, Infrared, etc.), planning (mission planning, path planning, etc.), reconnaissance, surveillance, and target acquisition (RSTA), and the Integrated perception/planning/control vehicle system. The focus of the workshop was on the breakout of the attendees into working groups. The document presents reports prepared by these working groups.

Tooling, Machinery, & Tools

00,457

DE93010922 PC A02/MF A01

National Inst. of Standards and Technology (NEL),
Galthersburg, MD. Automated Production Technology
Div.

Real-time compensation for tool form errors in

turning using computer vision.
G. Nobel, M. A. Donmez, and R. Burton. 1990, 9p, DOE/OR/21584-T1.

Contract Al05-85OR21584

Sponsored by Department of Energy, Washington, DC.

Keywords: *Cutting Tools, Adjustments, Computerized Control Systems, Real Time Systems, Tolerance, EDB/420200.

Deviations from the circular shape of the cutting edge of a single-point turning tool cause form errors in the workplece during contour cutting. One can compensate for these tool-form errors by determining the size of the effective deviation at a particular instant during cutting, and then adjusting the position of the cutting tool accordingly. An algorithm for the compensation of tooi-nose-radius errors in real time has been developed and implemented on a CNC turning center. A previously developed computer-vision-based tool-inspection system is used to determine the size of the deviations. Information from this system is fed to the error compensation computer which modifies the tool path in real time. Workpieces were cut utilizing the compensation system and were inspected on a coordinate measuring machine. Significant Improvements in workplece form were obtained.

00,458
PB93-139004 PC A03/MF A01
National Inst. of Standards and Technology (MEL),
Galthersburg, MD. Precision Engineering Div.

Comparison of National Standards for the Performance Evaluation of Coordinate Measuring Machines in Terms of Length-Based Dimensional Quantities.

D. A. Swyt. Nov 92, 15p, NISTIR-4978.

Keywords: *Dimensional measurement, *Standards, Interlaboratory comparisons, Performance evaluation, Comparison, Length, Great Britain, Germany, Japan, USA, *Coordinate measuring machines, ASME B89.1.12, JIS B7440, B5 6808, VDI/VDE 2617.

The paper compares U.S., German, British and Japanese standards for evaluation of coordinate measuring machines and shows that using a variety of special artifacts the U.S. standard alone specifies separate tests for each of the four modes of length measurements (displacement, position, distance and extension) and that, depending on the number and orientations of faces probed, a bi-directional step gage of the type suggested in the other standards can be used for tests of each of these four modes.

00,459
PB93-158731 PC A11/MF A03
National inst. of Standards and Technology (BFRL),
Gaithersburg, MD.
Development of a Fast-Response Variable-Amplitude Programmable Reaction Control System.
W. C. Stone. Jan 93, 233p, NISTIR-5118.

Keywords: *Control systems, *Microprocessors, Amplitude, Piezometers, Pulse width, Systems analysis, Sensors, Fuel Injectors, Tests, Computer programs, HSILS(High Speed Intelligent Loading System).

The report describes a high speed loading system comprised of: a piezoelectric stack and an associated mlcroprocessor-based programmable DC power source; a low-loss mechanical displacement amplifier; a high pressure spring-loaded axial valve; an integral high pressure valve seat; an expansion nozzie; and a high pressure gas supply. A half square wave voltage signal of varying duration and amplitude was used to drive the piezoelectric stack in such a manner as to produce changing displacements which were subsequently amplified by a monolithically milled hinged anvil. The anvil is connected to a valve core which seats upon, and is normally forced closed upon a spe-cially hardened throat of an expansion nozzle by means of a compression spring. The Interior side of the thruster nozzle communicates with a high pressure gas supply. The flow of gas through the nozzle is normally prohibited by the spring loaded valve core. As the piezoelectric stack expands under computer con-trol the valve core is lifted off the nozzle throat permitting gas to expand through the nozzle and create thrust that is directly proportional to the control signal from the microprocessor. The device is designed to operate as a stand-alone unit with a dedicated onboard microcontroller system and onboard energy storage system.

00,460
PB94-101821 PC A05/MF A01
National inst. of Standards and Technology (MEL),
Gaithersburg, MD. Precision Engineering Div.
Bibliography of Screw Thread Measurement.
S. Laks, J. Raja, and T. Doiron. Jul 93, 86p, NISTIR5223.

Prepared in cooperation with North Carolina Univ. at Charlotte.

Keywords: *Bibliographies, *Screw threads, *Dimensional measurement, Abstracts, Precision, Inspection, Tolerances(Mechanics), Threads, Screws, Industrial engineering.

The bibliography on screw thread measurement was compiled as background for an evaluation of the current state of the art. The bibliography covers screw thread measurement methods (lead, pitch diameter, etc.), tables for ball and wire methods, discussions of instruments for thread measurements, and papers on the basic geometry of thread forms. When possible the entire abstract is presented. The papers are presented in chronological order starting from 1890 to 1991.

00,461
PB94-118221 PC A04/MF A01
National Inst. of Standards and Technology (MEL),
Galthersburg, MD. Automated Production Technology
Div.

Portsmouth Fastener Manufacturing Workstation. Fastener Engraving System (Design, Construction, and Operation).

and Operation).
M. H. Hahn, and M. Huff. Feb 93, 68p, NISTIR-5271.
Sponsored by Office of the Assistant Secretary of the Navy, Washington, DC. Mfg. Technology Program.

Keywords: *Fasteners, *Computer-alded manufacturing, *Engraving, Production, Pneumatic equipment, Automatic control, Machine tools, Engineering drawings, Marking.

The Portsmouth Fastener workstation is an advanced fastener manufacturing workstation which produces high-quality, Level-1, safety-critical fasteners. For material traceability, each fastener manufactured must be marked with the manufacturer's Identification, iot number, and material symbol. Currently, most of the markings are done manually using either a vibrating marking pen or a stamping dle. Both methods are very labor intensive and expensive. A computer-controlled engraving machine is employed to semiautomate the marking process to improve productivity and enhance quality. The major problem encountered in engraving is the fixtuning of fasteners in the machine in a quick and easy manner. This paper describes the NiST developed pneumatic fixtuning system using an Inflatable elastomenic gasket and customized engraving software, devices, and schemes that the operator can use to run the engraving system. A complete set of englenering drawings of the engraving fixture and an operator's manual are included in the Appendices.

Tribology

son AFB, OH.

00,462
PB93-138949 PC A04/MF A01
National Inst. of Standards and Technology (MSEL),
Gaithershurg MD

Gaithersburg, MD.
Tribological Investigations of Composites and Other Selected Materials Sliding against Vacuum-Deposited MoS2 Coatings.

Final rept. 1989-92.
A. W. Ruff, and M. B. Peterson. Nov 92, 74p, NISTIB-4959

NISTIR-4959. Contract FY1457-91N-5026 Sponsored by Air Force Materials Lab., Wright-Patter-

Keywords: *Roller bearings, *Molybdenum dlsulfide, *Composite materials, *Tribology, Friction tests, Wear tests, Space environments, Solid lubricants, Metal matrix composites, Films.

A new materials approach for rolling element bearings in space satellite systems Involves the use of solid lubricating retainers and bearing elements vacuum-coated with MoS2. Improved vacuum deposition methods are now available to produce dense, suitably oriented, durable films of molybdenum disulfide. It is of interest to examine materials in sliding contact with such films in order to identify suitable combinations, and to further improve tribological performance of the system. Results of wear and friction measurements are presented on a number of materials including self-iubricating composites sliding against four different types of vacuum-deposited MoS2 films. The testing program used a controlled environment, pin-on-ring tribometer, with load and speed conditions appropriate to a possible application. Differences in wear over 4 orders of magnitude, and friction up to a factor of 7, were measured among the materials. Several promising material combinations are identified.

MATERIALS SCIENCES

General

00,463
PB93-151736 Not available NTiS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Standard Reference Data.

Ceramics, Refractories, & Glass

Making Materials Database Standards International.

Final rept

J. Rumble. 1989, 5p.
Pub. in ASTM (American Society for Testing and Materials) Standardization News, p32-36 Jun 89.

Keywords: *Data bases, *Materials, *Standards, International cooperation, Reprints, VAMAS project.

Standards for materials databases are being rapidly developed, especially within the United States. There is concern that these standards be harmonized on an international basis so that databases from different international basis so that databases from different countries are compatible and information can be freely exchanged. The Versallles Project on Advanced Materials and Standards (VAMAS) held a workshop in November 1988 to set priority actions and to develop working relationships for national and international groups building materials database standards. Five areas were highlighted where the need for cooperation is most acute: materials identification, terminology harmonization, data exchange, data recording formats, and models for data evaluation and analysis. This article contains details on each of these.

Carbon & Graphite

00,464 PB93-153708

PB93-153708 Not available NTIS National Inst. of Standards and Technology (MSEL),

Galthersburg, MD. Ceramics Div. Cathodoluminescence imaging and Spectroscopy of CVD Diamond in a Scanning Electron Micro-

scope.

L. H. Robins, L. P. Cook, E. N. Farabaugh, and A. Feldman. 1990, 12p.
Pub. In Proceedings of SPIE (Society of Photo-Optical instrumentation Engineers) Diamond Opt. 2, v1146 p166-177 1990.

Keywords: *Chemical vapor deposition, *Defects, *CathodolumInescence, *Spectrum analysis, Scanning electron microscopy, Silicon, Substrates, Comparison, Nonmetalliferous minerals, Synthetic materials, Reprints, *Diamond films.

Optically active defects in diamond films grown by the Optically active defects in diamond films grown by the hot-filament chemical vapor deposition method were investigated by cathodoluminescence (CL) imaging and spectroscopy in a scanning electron microscope. A set of films grown on silicon substrates at deposition temperatures from 600 C to 840 C was studied. The spatial resolution of the CL Images was approximately 0.2 to 0.5 micrometer; CL spectra were measured with wavelength resolution 0.4 nm in the wavelength range 350 to 900 nm. By comparing the CL spectra that the authors observed to the spectra of known types of defect in natural and synthetic diamond, the authors were able to identify the centers in their films. able to identify the centers in their films.

Ceramics, Refractories, & Glass

00,465 AD-A273 624/7 Not available NTIS National Inst. of Standards and Technology (IMSE), Gaithersburg, MD. Ceramics Div. Surface Forces and Their Action in Ceramic Materials.

R. G. Horn. 1990, 20p. Avallabllity: Pub. In Jnl. of the American Ceramic Society, v73 n5 p1117-1135, 1990.

Keywords: *Ceramic materials, *Atoms, *Molecule molecule interactions, Colloids, Fracture(Mechanics), Solids, Solvation, Microstructure, Reprints, Electrostatic charge, Van der Waals forces, Polymers, *Surface forces, *Surface interactions, Interatomic

A descriptive account is given of the surface forces acting between two solids. Different contributions to the force are outlined, with particular attention paid to the underlying mechanisms, and how they are affected by the nature of the medium between the surfaces. This is followed by a discussion of the areas of ceramic science and engineering in which surface forces play

a role. Surface forces, Mechanisms, Ceramics, Colloids, Fracture mechanics.

00,466 DE93018740 PC A02/MF A01

National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div. Equipment for Investigation of Cryogenic Compac-

tion of Nanosize Silicon Nitride Powders.
W. Chen, G. J. Piermanni, S. J. Dapkunas, S. G. Malghan, and A. Pechenik. 1992, 10p, DOE/OR/22041-1.

Contract Al05-92OR22041 Sponsored by Department of Energy, Washington, DC.

Keywords: *Silicon Nitrides, *Compacting, Cryogenics, Powders, EDB/360201.

This paper describes a system for studies of time-dependent compaction of nanosize silicon nitnde powders under vanous atmospheres at 77 to 1000 K. The system Incorporates a screw-driven press (10 ton capacity) with a piston-cylinder type die and can produce cylindrical powder compacts, 3 mm dia and about 1 mm thick, using pressures up to 3 GPa. The system Is computer-controlled and permits accurate measurements of the sample volume, and, after appropriate calibration, can determine the rate and degree of densification of the compacting powder as pressure is applied. Frictional forces between the piston and the applied. Frictional forces between the piston and the die are measured during the compaction process. For calibration of the system, powders with known volume-change accompanied by phase transition under pressure were studied, and good agreement with published results was demonstrated. Several Si(sub 3)N(sub 4) samples have been compacted and sintered at 1300 to 1600(degrees)C. Max random packing density of 64% has been obtained using liquid nitrogen lubricant at pressure less than 2.5 GPa. Both green samples and samples sintered at temperatures to 1500(degrees)C were transparent.

N9**3-20188/7** MF A03) (Order as N93-20178/8, PC A15/ National Inst. of Standards and Technology (CSTL), Gaithersburg, MD.
Principles of Gas Phase Processing of Ceramics

during Combustion.

M. R. Zachariah. Feb 93, 7p.

In NASA. Lewis Research Center, the Second international Microgravity Combustion Workshop p 81-87.

Keywords: *Ceramics, *Combustion, *High temperature environments, *Vapor phases, Corrosion, Electrical properties, Mechanical properties, Optical properties, Reliability, Sintening, *Reduced gravity.

In recent years, ceramic materials have found applica-In recent years, ceramic materials have found applications in an increasingly wider range of industrial processes, where their unique mechanical, electrical and
optical properties are exploited. Ceramics are especially useful for applications in high temperature, corrosive environments, which impose particularly stringent
requirements on mechanical reliability. One approach
to provide such materials is the manufacture of
submicron (and more recently nanometer scale) particles, which may subsequently be sintered to produce
a material with extremely high mechanical integrity. a material with extremely high mechanical integrity. a material with extremely high mechanical integrity. However, high quality ceramic materials can only be obtained if particles of known size, polydispersity, shape and chemical purity can be produced consistently, under well controlled conditions. These requirements are the fundamental driving force for the renewed interest in studying particle formation and growth of such materials. growth of such materials.

PB93-153617 Not available NTiS National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Ceramics Div.
ASTM Committee, C28, Advanced Ceramics: A Progress Report. Final rept.

G. Quinn. 1992, 3p.
Pub. in American Ceramic Society Bulletin 71, n10 p1508-1510 Oct 92.

Keywords: *Ceramics, *Standards, Flexural strength, Fracture properties, Powder testing, Reprints, Fracture properties, *Advanced materials.

The article is a brief progress report on the activities in ASTM Committee C28, Advanced Ceramics. The American Ceramic Society Bulletin has a section: 'Standards Comer' for such articles. (The author is the vice-chairman of C28.)

00,469 PB93-153732 Not available NTIS National Inst. of Standards and Technology (MSEL),

Phase Equilibria and Crystal Chemistry in Portions of the System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phase Diagrams for the Ternary Systems of SrO-Bi2O3-CuO, CaO-Bi2O3-CuO and SrO-CaO-Bi2O3-CuO a Bi2O3.

Final rept.
R. S. Roth, B. P. Burton, and C. J. Rawn. 1990, 11p. See also Part 2, PB90-256835.
Pub. in Ceram. Trans.-Supercond. Ceram. Supercond., v13 p23-33 1992.

Keywords: *Bismuth oxides, *Calclum oxldes, *Copper oxldes, *Strontlum oxldes, *Phase diagrams, High tem-perature superconductors, Ternary systems, X-ray diffraction, Single crystals, Crystal chemistry, Cuprates, Reprints, Phase equilibrium.

Temary phase equilibria diagrams are presented for the systems SrO-Bi2O3-CuO, CaO-Bi2O3-CuO and SrO-CaO-Bi2O3. Binary and temary phases have been characterized by single crystal x-ray diffraction and least squares analyses of x-ray powder diffraction patterns. No temary phases were found in the CaO-1/2Bi2O3-CuO system but the SrO-1/2Bi2O3-CuO system contains four ternary phases and the SrO-CaO-1/2Bi2O3 system contains two new ternary phases.

00,470 PB9**3-166007** Not available NTIS National Inst. of Standards and Technology (IMSE), Gaithersburg, MD.
Advanced Ceramics Standards Development. Final rept. S. Schneider. 1989, 5p. Pub. In Euro-Ceramics, v3 p3.71-3.75 1989.

Keywords: *Ceramics, *Standards, *Classifications, Forecasting, Marketing, Companson, Materials tests, Standard industrial classification, Reprints, *Advanced

Advanced ceramics, because of their unique properties, are being extensively researched, developed and brought to market as rapidly as possible. Currently there are no associated consensus standards that allow national or international compansons and this lack represents one of the more important technical unknowns in the commercial market equation. While the needs are diverse and product specific, there is a singular need for a unified classification system as it sets the basis for unanimity in information transfer and coherent standards development. Advanced ceramics development is gaining momentum with independent efforts now underway in several countries. However, early international collaboration is needed before conflicting national standards emerge. This paper presents a perspective on advanced ceramics standards needs, current activities and necessary future directions re-quired for equivalence in data between groups and na-

00,471 PB93-166015 PB93-166015 Not available NTIS
National Inst. of Standards and Technology (IMSE),
Gaithersburg, MD.
Advanced Ceramics: What's in a Name.

Final rept.
S. J. Schneider. 1989, 3p.
Pub. In ASTM (American Society for Testing and Materials) Standardization News, p28-30 Oct 89.

Keywords: *Ceramics, *Classifications, *Nomenclature, Terminology, Standards, Standard industrial classification, Repnnts, *Advanced materials.

Advanced ceramics, being a newly recognized industry, has no accepted classification system in place to serve the Interests of commercial product development and usage. It is required to set the basis for unanimity in information transfer between researchers, designers, manufacturers and product users. Further it is needed to provide the framework for product identity and promotion and to facilitate the process of international trade. To this end, beginning classification efforts now are underway internationally. The paper explores the issues and problems inherent in the development of a unified classification system for advanced ceramics.

00,472 PB93-166619 Not available NTiS

Ceramics, Refractories, & Glass

National Inst. of Standards and Technology (IMSE), Galthersburg, MD. Tensile Creep Testing of Structural Ceramics.

Final rept.
S. M. Wiederhom. 1989, 3p.
See also PB91-159277.
Pub. in Ceram. Technol. Newsl. 25, p3-5 Oct-Dec 89.

Keywords: *Ceramics, *Creep tests, Loads(Forces), Mechanical properties, Tension tests, Test methods, Deformation, Strains, Fractures(Materials), Mechanical tests, Reprints.

A technique for measuring tensile creep deformation of ceramic materials up to temperatures of 1500 C has been developed. The tensile creep apparatus was based upon a pin and clevis arrangement that was used to attach a flat dogbone-shaped specimen to the load train. Good alignment was obtained in the tensile specimen through careful machining and tapening of the specimen holes. Creep deformation is measured continuously using a non-contacting strain measurement system. The system used a laser extensometer and a set of alpha silicon carbide flags attached to the gauge section of the specimen. Further details of this equipment can be obtained from an article by Carroll et al in the Journal of the American Ceramic Society, Volume 72, pp. 1610-1614.

00,473 PB9**3-**1666**50** Not available NTIS National Inst. of Standards and Technology (IMSE), Gaithersburg, MD. Ceramics Div.
Standard X-ray Diffraction Powder Patterns of Fourteen Ceramic Phases. Final rept.

Final rept.
W. Wong-Ng, H. F. McMurdie, B. Paretzkin, M. A. Kuchinski, and A. L. Dragoo. 1989, 15p.
See also PB90-206160, PB90-206178 and PB90-206186. Sponsored by JCPDS-International Centre for Diffraction Data, Swarthmore, PA.
Pub. in Powder Diffraction 4, n1 p40-54 Mar 89.

Keywords: *X-ray diffraction, *Ceramics, *Standards, Crystal structure, Superconductors, Reprints, Powder pattems.

Fourteen reference patterns of oxide ceramics are reported. Included in the fourteen reference patterns are data for nine high critical temperature superconducting oxide related phases.

00,474 PB93-173508 PC A10/MF A03 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div.
Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993).
S. W. Freiman, and S. J. Dapkunas. May 93, 222p, NISTIR-4964.

Keywords: *Research projects, *Ceramics, Mechanical properties, Surface properties, Lubricants, Tribology, Wear, Microstructure, Composite materials, Glass, Electronics, Superconductors, Thin films, Standards, Powder(Particles), *National Institute of Standards and Technology, *Advanced materials, Structural Ceramics Database, High temperature superconductors, Ferroelectric oxide films, Diamond films.

In 1992 the Ceramics Division continued to develop a technical program which addresses the needs of U.S. industry. The program is made up of tasks involving standard materials development, construction of evaluated databases, and laboratory research focused on topics relevant to the dominant issues affecting commercialization of advanced ceramics, e.g., processing costs and reliability. Some areas of research were; data activities; powder characterization; surface properties; mechanical properties; electronic materials; optical materials; and materials microstructure characterization. ization.

PB94-108552 (Order as PB94-108529, PC A08/ MF A02) National Inst. of Standards and Technology, Gaithersburg, MD.

Phase Equilibria and Crystal Chemistry In Portlons of the System SrO-CaO-Bi2O3-CuO. Part 4. The System CaO-Bi2O3-CuO. B. P. Burton, C. J. Rawn, R. S. Roth, and N. M. Hwang. 1993, 48p.
Prepared in cooperation with Korea Standards Research Inst., Tae-jon (Republic of Korea).
Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n4 p469-516 Jul/ Aug 93.

Keywords: *Calcium oxides, *Bismuth oxides, *Copper oxides, *Crystal chemistry, X-ray diffraction, BSCCO superconductors, Crystal structure, High temperature superconductors, Cuprates, Calcium bismuth copper oxides, Phase equilibrium.

New data are presented on the phase equilibria and crystal chemistry of the binary systems CaO-Bi2O3 and CaO-CuO and the ternary CaO-Bi2O3-CuO. Symmetry data and unit cell dimensions based on single crystal and powder x-ray diffraction measurements are reported for several of the binary CaO-Bi2O3 phases, including corrected compositions for Ca4Bi6O13 and Ca2Bi2O5. The temary system contains no new ternary phases which can be formed in air at approximately 200 2004 presents. mately 700-900 degrees C.

Coatings, Colorants, & Finishes

PB93-173474 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Quality Control Tests for Adhesion of Paint on the

Panels of Tactical Rigid Wall Shelters, Phase 2. M. E. McKnight, and J. F. Seiler. Mar 93, 32p, NISTIR-4958

See also PB90-219825. Sponsored by Army Natick Research Development and Engineering Center, MA.

Keywords: *Adheslon, *Quality control, *Military facilities, *Test methods, *Paints, Aluminum, Shelters, Sandwich panels, Bond strength, Structural forms, Framed structures.

At the request of the U.S. Army Natick Research, Development and Engineering Center, a practical method was developed for measuring the adhesion of paints applied to shelters. As recommended in the Phase I report, a pull-off test based on the use of a commercially available preumatic testing device was chosen. The procedure includes ways of controlling the substrate stiffness, a parameter that affects the test results, and a process for obtaining acceptable levels of adhesion for a particular substrate. The estimated precision (standard deviation) of the method Is 9 percent. In a pilot study to determine the extent to which small differences in surface preparation would affect dif-ferences in pull-off test results, it was found that, at least for aluminum, the procedure was insensitive to small differences in surface preparation.

Composite Materials

DE93016669 PC A03/MF A01 National Inst. of Standards and Technology, Mational Inst. of Standards and Technology, Gaithersburg, MD.
Fallure Models In Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey.
Continuous Fiber Ceramic Composites Program, Task 2, Supporting Technologles.
C. P. Ostertag. 1991, 37p, DOE/OR/22014-1.
Contracts Al05-92OR22014, AC05-84OR21400 Sponsored by Department of Energy, Washington, DC.

Keywords: *Reinforced Materials, *Composite Materials, Crack Propagation, Cracks, Damage, Failure Mode Analysis, Fibers, Fracture Properties, Kinetics, Matrix Materials, Reviews, EDB/360603.

The high toughness of continuous fiber reinforced composites (CFCCs) is due to increasing the toughness by one or more of the following mechanisms: crack deflection, crack branching, crack bridging, microcracking, or fiber pullout. Most of the toughness, however, is attributed to work required to elastically elongate the bridging fibers and to pull the broken fibers out of the matrix. Understanding of matrix cracking mechanisms is important to the use of CFCCs. This survey concentrates on matrix cracking models established thus far that are based on continuous fiber-reinforced ceramic matrix composites with respect to both matrix crack Initiation and matrix crack propagation. A review of experimental results relating material prop-erties to the failure characteristics is included. 75 refs,

00,478 N93-14747/8 (Order as N93-14744/5, PC A09/ MF A02) National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Polymers Div.
Flow Behavior In Llquid Molding.
D. Hunston, F. Phelan, and R. Pamas. Oct 92, 20p.
In NASA. Langley Research Center, FIBER-TEX 1991:
The Fifth Conference on Advanced Engineering Fibers

Keywords: *Fabrication, *Flow characteristics, *Injection molding, *Manufacturing, *Polymer matrix composites, *Resin transfer molding, Process control (Industry), Resin matrix composites, Curing, On-line systems, Permeability, Thermal conductivity.

and Textile Structures for Composites p 23-42.

The liquid molding (LM) process for manufacturing polymer composites with structural properties has the potential to significantly lower fabrication costs and increase production rates. LM includes both resin transfer molding and structural reaction injection molding. To achieve this potential, however, the underlying science base must be improved to facilitate effective process optimization and Implementation of on-line process optimization and implementation of on-line process control. The National Institute of Standards and Technology (NIST) has a major program in LM that includes materials characterization, process simulation models, on-line process monitoring and control, and the fabrication of test specimens. The results of this program are applied to real parts through cooperative projects with industry. The key feature in the effort is projects with industry. The key feature in the effort is a comprehensive and Integrated approach to the proc-essing science aspects of LM. This paper briefly outlines the NIST program and uses several examples to illustrate the work.

PB93-153500 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div. Mechanical Test Methods for Metal-Matrix Composites: A Status Report from the U.S.A. Final rept. L. Mordfin. 1992, 6p.

Pub. In Proceedings of International Conference on Aluminum Alloys (3rd), Trondheim, Norway, June 22-26, 1992, p465-470.

Keywords: *Metal matrix composites, *Composite materials, *Mechanical tests, Industrial plants, United States, Standards, Mechanical properties, Performance evaluation, Reprints.

The widespread adoption of metal-matrix composite (MMC) materials for industrial applications has been impeded by the absence of a reliable database of the mechanical properties of the materials. A prerequisite to the establishment of a database are standard test methods, few of which exist for MMCs. This paper reviews some of the ongoing efforts to develop standard mechanical test methods for MMCs in ASTM, the Society of Automotive Engineers, the Department of Defense, the National Institute of Standards and Technical Control of the National Institute of Standards and Technical Control of the National Institute of Standards and Technical Control of the National Institute of Standards and Technical Control of the National Institute of Standards and Technical Control of the National Control nology, and elsewhere in the United States. It is shown that the deficiency is especially great for particulate-reinforced MMCs which, with reliable property data, could well find profitable uses in many civilian applications.

00,480 PB**93-1537**65 Not available NTIS National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Ceramics Div.
Wear and Friction Characteristics of Self-Lubricat-Ing Copper - Intercalated Graphite Composites. A. W. Ruff, M. B. Peterson, A. Gangopadhyay, and E. Whitenton, 1989, 60 E. Whitenton. 1989, 6p. Contract FY1457-89-N-5021 Sponsored by Air Force Materials Lab., Wright-Patter-

Pub. In Proceedings of International Congress on Tribology (5th), Helsinkl, Finland, June 12-15, 1989, p259-264.

Keywords: *Metal matrix composites, *Friction, *Wear tests, Stainless steels, Copper, Interfaces, Composite materials, Graphite, Tribology, Wear, Mathematical models, Reprints.

Composite materials consisting of copper metal-mat-nices with a solid lubricant phase of intercalated graphite have been prepared and studied in sliding wear against type 440C stainless steel at normal tempera-

00,475

Iron & Iron Alloys

tures in air. Results on the controlling wear and friction mechanisms in these materials are presented. Beneficial effects were found up to about 15 volume percent intercalated graphite. An analytical model has been developed that relates composite wear to mechanical and tribological properties of the different solid phases in the composite and the interface film.

Fibers & Textiles

00,481 AD-A258 836/6 PC A03/MF A01 National Bureau of Standards (NEL), Gaithersburg, MD. Center for Fire Research.

Burn Injury Potential of Navy Shipboard Work Clothing.

Final technical rept. Jan-Sep 81. J. F. Krasny, P. J. Allen, and A. Maldonado. Feb 83, 43p, NCTRF-TR-146.

Contract 80-M-0317

Keywords: *Clothing, *Burns(injuries), *Fire resistance, *Naval personnel, *Fire resistant textiles, Cotton, Polyester fibers, Heat tolerance, Fabrics, Fibers, Flames, Heat flux, Impingement, Ignition, Materials, Nylon, Combustion, Polyamide plastics, Protection, Temperature, Visual Index of Visual Index of Visual Index ture, Test and evaluation, Underwear, Visual inspec-tion, Wounds and injuries, *Occupational safety and health, Wools, Nomex, Heat protection, Shipboard work clothing, Flame exposure.

Shipboard work/utility clothing was evaluated to determine the potential of standard clothing (officer and enlisted personnel) for bum injury. Sixteen fabrics made from cotton, polyester, wool, and blends of these fibers and of nylon/cotton were used in shipboard clothing and were heat tested along with two fire-retardant (FR) materials of Nomex/Keylar and 100-percent FR-treatmaterials of Nomewkeviar and 100-percent FH-treat-ed cotton (THPOH-NH3) and four underwear materials of cotton and polyester cotton. Materials were sub-jected to radiant heat exposures of 0.2 to 0.6 g cal/ cm sec. The FR materials were also impinged by flame. Time to burn injury (TBI) values were estab-lished for all tested fabrics using the Stoll-Derksen curve with the measuring calorimeter in contact and 1/ 2 inch from the specimens. For the flame impingement tests the flame temperature was 2000 deg. F. and the tests the flame temperature was 2000 deg F and the TBI and total heat values were measured 1/8 inch from the fabrics. Experimental methods were established which could differentiate between heat protection assemblies exposed to modest and high heat exposure. Data were obtained for TBI and total heat (TH) transmitted. Visual inspection of the material was also noted. Results showed that, at radiant heat flux levels of 0.2 g cal/cm2/sec, protection was related to fabric weight and not fiber type. At higher heat exposures, the type of fiber used becomes significant, with thermo-plastic fibers providing the least protection. Data on the Nomex/Kevlar and FR cotton fabrics showed that the aramids were superior to the FR cotton at the higher flux values of 0.6 g cal/cm2/sec, but neither would provide reliable protection from jet fuel fires for more than a few seconds.

00,482 PB93-139095 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Factory Automation Systems Div. Information Technology Vision for the U.S. Fiber/Textile/Apparel Industry. Interim rept.

H. T. Moncarz. Nov 92, 35p, NISTIR-4986. Contracts DLA-91-R, DLA-D-8 Sponsored by Defense Logistics Agency, Alexandria,

VA. Mfg. Engineering Branch.

Keywords: *Textile industry, *Clothing industry, *Technology utilization, Computer aided manufacturing, Computer aided design, Product development, Competition, Industrial development, *Information technology, Concurrent engineering, National Institute of Standards and Technology.

The fiber/textile/apparel (FTA) industry is one of America's largest manufacturing industries, and its success is critical to the economic well-being of the country. In terms of technology, the Industry is very sophisticated, and in fact, each of its three sectors is the most productive In the world. However, the industry has been challenged by an onslaught of imported products. The most senous economic threat of foreign competition is to the apparel sector, which is the least capital intensive of the three industry sectors. While steps to address the challenges to the FTA industry include technological, sociological, and economic efforts, the paper focuses on efforts employing information technology. The nationwide capacity must be created that cap enable and tionwide capacity must be created that can enable and sustain the production of world class FTA products that are reasonably priced and are responsive to consumer demands. An enterprise framework, product data standards, and improved design practices are the information technologies that will enable the required system to be developed. In turn, these technologies will assist in the implementation of design-driven, multienterprise, concurrent engineering as well as demand-activated manufacturing.

Iron & Iron Alloys

00,483 PB93-153310 Not available NTIS National Inst. of Standards and Technology (MSEL), Boulder, CO. Materials Reliability Div.

Magnetic Properties of Cr-Mn Austenlitic Stainless Steels. Final rept.

M. Foldeakl, H. Ledbetter, and P. Uggowitzer. 1992,

12p. Pub. in Jnl. of Magnetism and Magnetic Materials 110, p185-196 1992.

Keywords: *Austenitic stainless steels, *Magnetic properties, *Thermomagnetic effects, Chromium steels, Manganese alloys, Mechanical properties, De-Chromium formation, Ferromagnetism, Heat treatment, Magnetic moments, Reprints.

The magnetic susceptibility of three Cr-Mn austenitic stainless steels was measured as a function of temstainless steels was measured as a function of temperature in the range 5-400 K. All specimens showed a characteristic susceptibility maximum. The temperature of the maximum and especially the curve shape depend strongly on specimen composition and metallurgical conditions (as-quenched, deformed). Because no significant field dependence appeared, the susceptibility maximum was identified as the antiferromagnetic Neel temperature. Magnetic susceptibility measurements above TN were fitted to a moditibility measurements above TN were fitted to a modified Curie-Weiss equation. Comparison between measurements and generalized-molecular-field-theory predictions allowed us to identify the magnetic structure as that of a first-type antiferromagnet with fcc crystal structure. The atomic magnetic moment and the molecular-field coefficients depend strongly not only on composition, but also on metallurgical prehistory, that is, on the degree of the applied mechanical deformation and heat treatment. Mainly, manganese affected the antiferromagnetic interactions, while chromium affected the ferromagnetic. Mn and Fe contributed the most to the effective atomic moment. Measurements on mechanically deformed specimens show a structure sensitivity of the molecular-field constants. This could be interpreted consistently in terms of lattice-parameter changes. The apparent structure sensitivity of the effective atomic moment can be attributed to changes in matrix composition caused by precipitation.

PB93-153427 Not available NTIS National Inst. of Standards and Technology (MSEL), Boulder, CO. Materials Reliability Div. WRC-1992 Constitution Diagram for Stainless Steel Weld Metals: A Modification of the WRC-1988 Diagram. Final rept. D. J. Kotecki, and T. A. Siewert. 1992, 8p. Pub. in Welding Research Supplement, p171-s-178-s May 92.

Keywords: *Stainless steels, *Weld metal, *Phase diagrams, Welded Joints, Standards, Welding, Filler metal, Ferritic stainless steels, Weldments, Reprints, Schaeffler diagram.

To increase the scope and accuracy of Ferrite Number (FN) prediction in stainless steel weld metal and related dissimilar metal joints, a modification of the Welding Research Council 1988 diagram (WRC-1988 diagram) is proposed. The proposed WRC-1992 diagram includes a coefficient for Cu in the Ni equivalent, thereby removing a tendency for the WRC-1988 diagram to overestimate the FN of weld metals when the Cu content Is high. Also, the axes of the WRC-1992 diagram can be extended (as in the Schaeffler diagram) to predict dilution effects in dissimilar metal joints.

PB93-182020 PC A03/MF A01
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Metallurgy Div.
Mechanical, Stress-Rupture, and Fracture Tough-

ness Properties of Normalized and Stress Relieved AAR TC128 Grade B Steel at Elevated Temperatures.

G. E. Hicho. 1993, 48p, NISTIR-5157, REPT-26. Sponsored by Federal Railroad Administration, Washington, DC. Safety Research DIv.

Keywords: *Steels, *Tank cars, *Fracture strength, Fracture tests, Mechanical properties, Toughness, Thermal stresses, Creep rupture strength, Fracture properties, Yield strength.

The mechanical, fracture toughness, and stress-rupture properties of a normalized and stress relieved tank car steel were found to be reduced by increased temperature and time at temperature. The effects of loading rates, 0.0127 and 0.127 cm/min, on these properties were also evaluated. Most affected was the yield strength, where at the loading rate of 0.127 cm/min, the yield strength as a function of temperature and time at temperature was greater than that obtained under similar test conditions at a loading rate of 0.0127 cm/ min. The ultimate and yield strength were observed to decrease continuously from 593 C to 677 C for time of 60, 90, and 120 minutes. The ductility, in terms of the elongation and reduction-of-area were found to In-crease over these same test temperatures and times. The fracture toughness, because of the yield strength decrease as the temperature increased, decreased as the test temperature increased. Fracture toughness tests found the steel to be highly resistant to unstable fracture, and stress-rupture tests revealed that the rupture lifetime could be extended, at elevated temperatures, by reducing the maximum internal pressure of the tank car.

00.486 PB93-219731 PC A03/MF A01 National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Metallurgy Div.
Fracture Mechanics Evaluation of Rallroad Tank
Cars Containing Postulated Circumferential

G. E. Hicho, A. Zahoor, R. J. Flelds, and R. deWit. Apr 93, 26p, NISTIR-5179, REPT-27.

Keywords: *Tank cars, *Cracking(Fracturing), *Steel AAR-TC128, Fracture properties, Hazardous materials transportation, Fracture tests.

Fracture mechanics analyses using the J-integral as fracture parameter were performed for railroad tank cars made from normalized AAR TC128 grade B steel. Circumferential through-wall cracks in the tank car shell region were postulated to determine the critical crack size for axial tension loadings anticipated In service. Five loading cases were considered. These were: (1) coupler impact, (2) test pressure, (3) start-to-discharge pressure, (4) bursting pressure, and (5) vapor tight minimum pressure. The analyses were performed for two service temperatures, -40 deg. C (-40 deg. F) and 22 Deg. C (72 deg. F).

00 487 PB93-234706 PC A04/MF A01 National Inst. of Standards and Technology (MSEL), Boulder, CO. Materials Reliability Div.
Structure-Property Relationships in Microalloyed Ferrite-Pearlite Steels Phase 1: Literature Review, Research Plan, and Initial Results.
P. T. Purtscher, and Y. W. Cheng. Jul 93, 63p, NISTIR-3992.

*Alloying, Keywords: *Steels, *Forgings, *Alloying, Microstructure, Carbon steels, Toughness, Grain refinement, Tension tests, Crankshafts.

The literature related to the relationship between nicro-structure related to the relationship between micro-structure and properties of steels after thermomechanical processing is reviewed and a plan for research is outlined. The goal is to provide a methodology which can predict the range of forging parameters that will produce acceptable properties in the asforged condition. The first phase of the work will emphasize the micro-alloyed ferrite-pearlite steels used to replace quenched and tempered steels in forged automotive applications such as crank-shafts and connectmotive applications such as crank-shafts and connecting rods.

Miscellaneous Materials

Miscellaneous Materials

00,488 DE93012534 PC A03/MF A01

National Inst. of Standards and Technology, Boulder,

CO. Center for Chemical Technology.

Apparent Thermal Conductivity of Polyurethane Foam Insulation, Containing Various HCFC Blends, from 125 to 335 K. (Final report).

Progress rept. D. R. Smith. 1993, 45p, DOE/OR/21428-T1.

Contract Ai05-84OR21428 Sponsored by Department of Energy, Washington, DC. Portions of this document are illegible in microfiche

Keywords: *Plastic Foams, *Poiyurethanes, *Thermal Insulation, *Aging, Correlations, Fillers, Gases, Progress Report, Temperature Dependence, Temperature Range 0065-0273 K, Temperature Range 0273-0400 K, Thermal Conductivity, EDB/360606, EDB/320107.

The specimens contain several different blends of HCFC 123 and HCFC 141b as fill gases. Effects of thickness on conductivity and, indirectly, on aging were studied by repeating measurements of conductivity of one specimen whose thickness was reduced in 6-mm steps from 25 to 6 mm. The effect of aging was directly studied by repeating conductivity measurements, after a lapse of time, on two different specimens. The conductivities of all specimens rise linearly with temperature over the lowest (125 to 220 K) and the highest (280 to 335 K) range of temperature, but pass through a local maximum at about 225 K and a local minimum at about 2735 K. The slopes of the two linear portions are approximately equal. For all specimens the conductivity functions below the local maximum practically coincide. The position of the local minimum is Inde-pendent of fill gas species or mixture, while the location and height of the local maximum depends on fill gas species and on effects of aging. Functional relationships between the conductivity and temperature are obtained for each specimen in the form of ratios of cubic polynomials, the simplest form that accurately models the temperature dependence of conductivity over the whole range studied.

00,489 DE93014767 PC A03/MF A01 Air-Conditioning and Refrigeration Technology Inst., inc. Ariington, VA.

Theoretical Evaluation of R22 and R502 Aiternatives. Final Report. Progress rept.

P. A. Domanski, and D. A. Didion. Jan 93, 26p,

DOE/CE/23810-7.

Contract FG02-91CE23810

Sponsored by Department of Energy, Washington, DC.

Keywords: *Refrigerants, *Thermodynamic Properties, Heat Pumps, Material Substitution, Mixtures, Progress Report, EDB/320107, EDB/360600.

The study was conducted using a semi-theoretical model, CYCLE-11, with a pure cross-flow representation of heat transfer in the evaporator and condenser. The Camahan-Starling-DeSantis equation of state was used for calculating thermodynamic properties. Transport properties were not involved in the simulations. Simulations were conducted for "drop-In" performance, for performance in a modified system to assess the fluids' potentials, and for performance in a modified system equipped with a liquid-line/suction-line heat exchanger. The results - presented on a relative basis to R22 and R502 performance - include the volumetric capacity, coefficient of performance, pressure increase across the compressor, and compressor discharge pressure and temperature.

00,490 DE93040219 PC A11/MF A03
National Inst. of Standards and Technology (NEL),
Galthersburg, MD. Thermophysics Div.
Thermophysical Properties. Progress Report, 1

January 1992--31 March 1993. R. F. Kayser. Apr 93, 237p, DOE/CE/23810-16. Contract FG02-91CE23810

Sponsored by Department of Energy, Washington, DC.

Keywords: *Refrigerants, Density, Fluorinated Allphatic Hydrocarbons, Mathematical Models, Mixtures, Progress Report, Specific Heat, Temperature Dependence, Thermal Conductivity, Thermodynamic Properties, Viscosity, *Thermophysical properties, EDB/360606, EDB/320107.

Numerous fluids have been identified as promising al-temative refrigerants, but much of the information needed to predict their behavior as pure fluids and as components in mixtures does not exist. in particular, reliable thermophysical properties data and models are needed to predict the performance of the new refigerants in heating and cooling equipment and to design and optimize equipment to be reliable and energy efficient. The objective of this fifteen-month project has been to provide highly accurate, selected thermophysical properties data for Refingerants 32, 123, 124, and 125, and to use these data to fit equations of state and transport property models. The new data have filled gaps in the existing data sets and re-solved problems and uncertainties that existed in and between the data sets.

00,491 PB**93-151157** Not available NTIS National inst. of Standards and Technology (BFRL), Gaithersburg, MD. Building Environment Div.
Comparison of Experimental Measurements of
Local Flow Boiling Heat Transfer Coefficients for R11 and R123.

Final rept. M. A. Kedzierski, and D. A. Didion. 1991, 8p. Sponsored by Electric Power Research inst., Palo Alto,

Pub. in Proceedings of ASME/JSME Thermal Engl-neering Conference, Reno, NV., March 17-22, 1991, v3 p243-250.

Keywords: *Refrigerants, *Heat transfer coefficient, *Boiling, Transport properties, Thermodynamic properties, Heat flux, Reynolds number, Heat transmission, Heat transfer, Comparison, Reprints, *R11, *R123.

The paper presents a comparison of the measured horizontal, smooth-tube, flow boiling heat transfer coefficient of R11 to that of its proposed ozone safe replacement, R123. The fluid properties of R11 and R123 are similar. The flow boiling data for the two fluids are slmilar for the convective region. However, the heat transfer coefficient for R11 in the nucleate flow boiling region was consistently observed to be, on average, 8.5% to 33% larger than that for R123. The influence of Reynolds number and heat flux on the heat transferthermodynamic quality relationship is also presented. Predictions of the heat transfer coefficient with two open literature flow boiling correlations were compared to the measured data. The heat transfer coefficients predicted with the correlations were, on average, from 13% to 57% greater than the measured heat transfer coefficients.

00,492 PB93-166593 Not available NTiS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Thermophysics Div.
Critical Parameters and Saturation Densities of 1,1-Dichioro-2,2,2-Trifiuoroethane.

L. A. Weber, and J. M. H. Levelt Sengers. 1990, 9p. Pub. in Fluid Phase Equilibria 55, n1-2 p241-249 1990.

Keywords: *Critical point, *Density(Mass/volume), *Fluorohydrocarbons, Liquid phases, Critical temperature, Critical density, Vapor phases, Phase studies, Refrigerants, Reprints, *Ethane/dichioro-trifluoro, Refrigerants, *Freon 123.

An optical cell has been used to determine the critical parameters, T(sub c) and Rho(sub c), and densities along the liquid-vapor phase boundary of 1,1-dichloro-2,2,2-trifluoroethane (Refrigerant 123). The critical temperature was found to be 456.94 K and the critical density is 550 kg/cu m. Measurement temperatures varied from 298 K to the critical point for the saturated liquid and from 433 K to the critical point for saturated vapor.

00.493 PB93-178598 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Horizontal Nucleate Flow Bolling Heat Transfer Co-

efficient Measurements and Visual Observations for R12, R134a, and R134a/Ester Lubricant Mix-

M. A. Kedzierskl, and M. P. Kaul. Mar 93, 34p, NISTIR-5144.

See also PB93-120756. Sponsored by Department of Energy, Washington, DC. Office of Conservation and Renewable Energy.

Keywords: *Refrigerants, *Air poliution abatement, Environmentai chemicai substitutes, *Nucleate boil-

Lubricants, ns, Visual Heat transfer, Mixtures, Fluorohydrocarbons, Freons, Visual inspection, Esters, Heat exchangers, Performance evaluation, R-12, R-134a, Ethane/tetrafluoro, Dichiorodifluoromethane.

The paper presents a calorimetric and visual Investigation of horizontal nucleate flow boiling of five different fluids: (1) dichlorodifluoromethane (R12), (2) 1,1,1,2-tetrafluoroethane (R134a), (3) R134a/1.7% proprietary polyol ester lubricant, (4) R134a/0.9% neopentyle polyol ester lubricant, and (5) R134a/2.3% neopentyle polyol ester lubricant. The calorimetric aspect of the study concentrates on the measurement of the iocal two-phase heat transfer coefficient (h(sub 2 phl)). The visual measurements obtained from high-speed 16 mm film of the boiling were taken simultaneously with the calorimetric measurements. The bubble diameters (D(sub b)), and the bubble density were derived from over 50 high-speed films. The purpose of the study Is to provide a source of heat transfer information for the boiling of R12 and R134a/ester lubricant mixtures. Automotive and supermarket companies have begun to manufacture original air conditioning/refrigeration equipment with R134a as the operating fluid. The evaporator predominantly utilized by these industries is the In-tube heat exchanger. Naturally, designers of such evaporators require heat transfer coefficients for the horizontal flow boiling of R134a/ester mixtures. Only the nucleate flow boiling regime was investigated in the study with the aim of furthering the understanding of the fundamental heat transfer mechanisms responsible for the phenomenon.

Nonferrous Metals & Alloys

00,494 AD-A261 751/2 PC A10/MF A03
National inst. of Standards and Technology (iMSE),
Gaithersburg, MD. Metallurgy Div.
Solidification Processing and Phase Transformations in Ordered High Temperature Alloys.
Final rept. 30 Mar 90-30 Sep 92.

W. J. Besttinger, J. A. Bendersky, and J. B. Katters W. J. Boettinger, L. A. Bendersky, and U. R. Kattner. 20 Jan 93, 205p. Contract DARPA ORDER-7469

Keywords: *Phase transformations, *Solidification, *Metal crystals, *Crystallography, *Heat resistant alloys, *Nickel alloys, *Fiber reinforced composites, Alloys, Cooling, Creep strength, Heat treatment, High temperature, Metailurgy, Phase diagrams, Temperature, Toughness, Strength (Mechanics), Annealing, Horsesting, Isostatic pressing, Microstructure, Titanlum pressing, Isostatic pressing, Microstructure, Titanlum alloys, Aiuminum, Nlobium, Molybdenum alloys, Intermetallic compounds, Powder metallurgy, Intermetallic alloys, Molybdenum disilicide, Hot isostatic pressing.

Useful high temperature alloys generally have microstructures consisting of more than one phase. Multiphase microstructures are necessary to develop acceptable toughness and creep strength In high temperature intermetallic alloy matrices. The optimum microstructures must be developed by a careful selection of processing path that includes both solidification and solid state heat treatment. Research has been conducted on the rapid solidification of selected intermetallic alloys and on the phase transformation paths that occur during cooling, primarily In the TI-Al-Nb system. This report describes research performed in the Metallurgy Division at NiST under DARPA order 7469 between 1/1/89 and 12/31/92. Various research tasks were completed and the results have been pubiished or have been submitted for publication.

00,495 N94-10178/9 (Order as N94-10171/4, PC A20/ MF A04) of Standards and Technology, National Inst. Gaithersburg, MD.
Effect of Gravitational Modulation on Convection

in Vertical Bridgman Growth.

B. T. Murray, S. R. Coriell, G. B. Mcfadden, and A. A. Wheeler. cAug 92, 4p. in Esa, Proceedings of the 8TH European Symposlum on Materials and Fluid Sciences in Microgravity, Volume 2 p 503-506. Sponsored by NASA, Washington.

Keywords: *Bridgman method, *Directional soildifica-tion (Crystals), *Free convection, Fioquet theorem,

Nonferrous Metals & Alloys

Gravitational effects, Solutes, Boundary conditions, Flow stability, Schmidt number, Vibration, Binary allovs.

During vertical directional solidification of a binary alloy at constant velocity, buoyancy driven solutal convec-tion may occur due to the solute gradient associated with the solidification process. This problem is further complicated if time periodic forcing is considered, which is relevant to materials processing in a microgravity environment or as a means of dynamic control of flow instabilities. The effect of time periodic modulation is studied by introducing a gravitational accelera-tion which is a sinusoidal function of time. The onset of solutal convection is treated by a stability analysis of the linearized governing equations and boundary conditions. Solutions are obtained numerically by em-ploying two distinct computational implementations of Floquet theory. Results for materials with large Schmidt number are presented, and an analysis for large frequency and large Schmidt number yields a more complete description of the behavior in this relevant limit.

00.496 PB93-151603 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div. Development of Ore Bloleaching Standards.

G. J. Olson. 1989, 9p.
Pub. In Proceedings of International Symposium on Biohydrometallurgy, Jackson Hole, WY., August 13-18, 1989, p71-79.

Keywords: *Ore processing, *Leaching, *Pyrite, *Biological treatment, *Hydrometallurgy, Extractive metallurgy, Microorganisms, Substrates, Oxidation, Reaction kinetics, Reprints, *Standard reference materials, Thiobacillus ferrooxidans.

Discussion at past bioleaching conferences has indicated the need for standard procedures and test matenals for improved intercompanson of data from pyrite and ore bioleaching tests. Many variables are associated with bioleaching rates and the availability of standards would provide a means for companson of strains of microorganisms and ore substrates. Pyrite from South Carolina was tested as an initial candidate reference material in an earlier study. Three strains of Thiobacillus ferrooxidans were found to leach a 100-200 mesh fraction of the material in shake flasks at rates ranging from 1.7-2.2 mg Fe/l/hr with relative standard deviations of 7-11%. Inoculum size did not standard deviations of 7-11%. Inoculum size did not affect bioleaching rates at initial cell densities of 5,000,000 or higher. Baffled flasks did not Increase pyrite oxidation rates. These and other data were incorporated into a pyrite leaching procedure. Recent efforts focused on pyrite obtained in bulk from the Waldo Mine In New Mexico. The leaching rate of this pyrite under varying conditions ranged from 3.08 to 13.2 mg Fe/l/hr with a strain of T. ferrooxidans (American Type Culture Collection no. 13661). The Waldo pyrite is being characterized for composition and will be available for distribution from the Office of Standard Reference Materials. National Institute of Standards and Technology. terials, National Institute of Standards and Technology.

PB93-151918 Not available NTIS

National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Polymers Div.

Deformation Twinning, Slip, Martensite Formation and Crack Inhibition in the B2-Type Zr50Pd35Ru15

Alloy. Final rept.

R. M. Waterstrat, L. A. Bendersky, and R. Kuentzler. 1992, 6p.

Sponsored by American Dental Association Health Foundation, Chicago, IL. Pub. in Proceedings of Shape-Memory Materials and Phenomena - Fundamental Aspects and Applications

Symposium, Boston, MA., December 3-5, 1991, p115-

Keywords: *Biological materials, *Zirconium alloys, *Fracture properties, Deformation, Twinning, Crystal structure, Martensite, Intermetallic compounds, Ruthenium alloys, Palladium alloys, Crack propagation, Dental materials, Mechanical properties, Reprints.

Enhanced room temperature toughness of the Zr50Pd35Ru15B2 phase alloy was found to be a result of the activation of an additional deformation mode be-sides the b=(001) dislocation slip mode - (114)-type mechanical twinning. The twinning is a true one, i.e., there is no change in the ordered crystal structure. Another additional mode of plastic deformation, expected for more Pd rich alloys, is the formation of stress-induced martensite. The martensite was found to have a CrB-type structure.

00,498

PB93-151934

PB93-151934 Not available NTIS National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathe-

Phase-Field Model for Isothermai Phase Transitions in Binary Alloys.

Final rept.

A. A. Wheeler, W. J. Boettinger, and G. B. McFadden. 1992, 16p. See also PB92-108992.

Pub. in Physical Review A 45, n10 p7424-7439, 15 May 92.

Keywords: *Binary alloys, *Phase transformations, *Mathematical models, Alloying, Asymptotic systems(Materials), There Interfaces, Separation, methods, Binary Thermal analysis, Isothermal treatment, Reprints.

In the paper we present a phase-field model to describe isothermal phase transitions between ideal binary-alloy liquid and solid phases. Governing equations are developed for the temporal and spatial variation of the phase field, which identifies the local state or phase, and for the composition. An asymptotic analysis as the gradient energy coefficient of the phase field becomes small shows that our model recovers classical sharp interface models of alloy solidification when the interfacial layers are thin, and we relate the parameters appearing in the phase-field model to material and growth parameters in real systems. We identify three stages of temporal evolution for the governing equations: the first corresponds to interfacial genesls, which occurs very rapidly; the second to interfacial motion controlled by diffusion and the local energy dif-ference across the interface; the last takes place on a long time scale in which curvature effects are important, and corresponds to Ostwald ripening. We also present results of numerical calculations.

00.499

PB93-166080 Not available NTIS

National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div. High Temperature X-ray Diffractometry of Ti-Al Al-

loys

Final rept

R. D. Shull, and J. Cline. 1990, 23p.

Pub. in High Temperature Science 26, p95-117 1990.

Keywords: *Aluminum alloys, *Titanium alloys, X-ray diffraction, High temperature, Debye-Waller factor, Lattice parameters, Phase transformations, Phase diagrams, Reprints, Titanium aluminides.

High temperature X-ray diffraction, an established technique for high temperature materials characterization, has been applied to the titanium-aluminum system in order to obtain structural Information on the material at elevated temperatures. In situ X-ray diffraction data for a titanium-45 atomic percent aluminum alloy clearly showed the disappearance of the ordered Ti3Al structure on heating to 1300 C, but with the fundamental alpha-Ti diffraction peaks remaining. All diffraction peaks are indexed and prove the existence of the pre-viously proposed Ti3AI + TiAI-> alpha-Ti eutectoid reaction near 1125 C in this alloy. No BCC beta-Ti phase was detected for this alloy up to 1400 C. High temperature X-ray diffraction measurements on a titanium-52 atomic percent aluminum alloy also showed no beta-Ti phase up to 1350 C. Debye Waller factor analysis of the gamma-TiAl phase diffraction peaks for Ti48Al52 also indicated the absence of any phase changes between 850-1250 C. The modified Ti-Al phase diagram presented here includes a shift in the gamma-phase transus lines to higher aluminum contents, the addition of a new alpha prime phase region, and the elimination of the beta + gamma phase field.

PB93-166601 Not available NTIS National Inst. of Standards and Technology (IMSE), Gaithersburg, MD. Metallurgy Div. Review of the Nickel-Graphite Interface.

Final rept.

N. S. Wheeler. 1990, 7p.

Pub. In Jnl. of Composites Technology and Research
12, n3 p177-183 1990.

Keywords: *Nickel, *Graphite, *Interfaces, *Surface chemistry, High temperature tests, Diffusion, chemistry, High temperature test Graphitization, Metal coatings, Reprints.

The literature on the nature of the high-temperature behavior of the nickel graphite interface is critically reviewed, and the problem is shown to be primarily due to the interdiffusion of carbon and nickel. The diffusion barriers that have been found to be the most effective in suppressing diffusion are those containing carbideforming metais.

PB93-173441 PC A07/MF A02

National Inst. of Standards and Technology (MSEL), Boulder, CO. Materials Reliability Div.

Aluminum Alioys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-Li Alloys and Alloy 2219.

R. P. Reed, P. T. Purtscher, N. J. Simon, J. R. Berger, E. S. Drexler, R. L. Santoyo, J. D. McColskey, and R. P. Walsh. Feb 93, 147p, NISTIR-

See also AD-A242 956. Sponsored by Astronautics Lab. (AFSC), Edwards AFB, CA.

Keywords: *Aluminum alloys, *Lithium alloys, *Cryogenics, Mechanical properties, Tensile properties, Toughness, Cracking(Fracturing), Ductility, Fractures(Materials), Stresses, Strains.

Tensile and fracture toughness were obtained at cryogenic temperatures to compare the Al-Li alloys 8090, 2090, and WL049, and alloy 2219 in various tempers and specimen orientations. The strongest alloy at very low temperatures is WL049-T851, which is about 10 percent stronger than 2090-T81. Both alloys are considerably stronger than 2219-T87. Alloy 2090-T81 is tougher (about 50 percent) than WL049-T851 at low temperatures; the higher toughness is attributed to the presence of fewer constituent particles and the tend-ency to delaminate at low temperatures. The delamination divides the moving crack, thus separating It into smaller regions where plane stress (rather than plane strain) conditions are conducive to increased toughness.

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PB93-228633 PC A04/MF A01

National Inst. of Standards and Technology (MSEL),

Boulder, CO. Materials Reliability Div.

Cryogenic Mechanical Testing of Al-Li Alloys at NIST. P. T. Purtscher, Jui 93, 56p, NISTIR-5004.

Keywords: *Aluminum alloys, *Llthium, *Mechanical properties, *Cryogenics, Laur Cracking(Fracturing), Fracture NLS(National Launch System). Launch vehicles. properties,

Work done In 1992 at NIST in support of the National Launch System (NLS) program consisted of two parts. The first part (Part A) was an evaluation of Al-Cu-Li-Mg-Ag-Zr alloys to determine whether recent develop-ments in the relatively new alloy produced significant improvements in the tensile and fracture toughness. The results show that there is only a slight difference between the mechanical properties of the three variations of Al-Cu-Li-Mg-Ag-Zr alloys from room temperature down to liquid-helium temperature. The second part (Part B) of the program evaluated the effect of product form on the residual strength and mechanical behavior of Alloy 2090 between room and liquid-helium temperature. Three different product forms were included in the program: sheets, extrusions, and welds. At room temperature, sheets that exhibited delaminations on the fracture surface had the highest defect tolerance of the three product forms tested.

PB93-234748 PC A03/MF A01

National Inst. of Standards and Technology (CAML),

Gaithersburg, MD.
Boundary/Interface Fitted Grid Generation Using Tensor Product B-splines: A Preliminary Study. B. V. Saunders. Aug 93, 21p, NISTIR-5239.

Keywords: *Liquid-solid interfaces, *Binary alloys, Bridgman method, Spline functions, Microstructure, Interpolation, Directional solidification, Gnd generation.

Progress in the development of an algebraic grid generation system that tracks a solid-liquid interface during directional solidification of a binary alloy is discussed. A single mapping, constructed with tensor product B splines, is proposed for calculations of both shallow

Nonferrous Metals & Alloys

and deep solidification cells. The initial spline coefficients for the coordinate mapping are modified to minlmize a discrete functional that regulates the smoothness and orthogonality of the mesh. The use of transfinite blending function interpolation to obtain an initial grid is examined.

Plastics

00,504 PB93-153542 Not available NTIS

National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Fire Measurement and Research

Molecular Modeling of Polymer Flammability: Application to the Design of Flame-Resistant Polyethylene.

Final rept.

M. R. Nyden, G. P. Fomey, and J. E. Brown. 1992,

9p. Pub. In Macromolecules 25, n6 p1658-1666, 16 Mar

*Polyethylene, Keywords: *Flammability, *Mathematical models, Thermal degradation, Polymers, Fire resistant materials, Molecular structure, Charring, Simulation, Flammability tests, Combustion products, Crosslinking, Reprints.

Molecular dynamic simulations of the thermal degrada-tion of polyethylene were used to Identify factors which might be effective in reducing polymer flammability by promoting the formation of a residual char. Computer movies of the calculated trajectories indicate that cross-linked polymers, such as those obtained from exposure of polyethylene to ionizing radiation, will undergo further cross-linking when burned, eventually forming a high molecular weight, thermally stable char. This prediction was confirmed in flammability tests of gamma-ray-irradiated polyethylene.

Wood & Paper Products

00,505 PB93-153435 Not available NTIS

National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Fire Science and Engineering Div. Heat and Mass Transport from Thermally Degrading Thin Cellulosic Materials in a Microgravity Environment.

Final rept

G. Kushida, H. R. Baum, T. Kashiwagi, and C. di

Blasi. 1992, 9p.
Pub. in Jnl. of Heat Transfer 114, p494-502 May 92.

Keywords: *Reduced gravity, *Cellulose, *Heat transfer, *Mass transfer, Thermal degradation, Oxidation, Vortices, Pyrolysis, Transport properties, Reynolds number, Slip flow, Chemical reactions, Combustion, Reprints.

A theoretical model describing the behavior of a thermally thin cellulosic sheet heated by external thermal radiation in a quiescent microgravity environment is developed. This model describes thermal and oxidative degradation of the sheet and the heat and mass transfer of evolved degradation products from the heated cellulosic surface into the gas phase. At present, gas phase oxidation reactions are not included. Without buoyancy, the dominant vorticity creation mechanism in the bulk of the gas is absent except at the material surface by the requirement of the noslip condition. The no-slip condition is relaxed, permitting the flow to be represented by a velocity potential. This approximation is permissible due to the combination of a microgravity environment and low Reynolds number associated with slow small-area heating by extemal radiation. Two calculations are carried out: heating without thermal degradation, and heating with thermal degradation of the sheet with endothermic pyrolysis, exothermic thermal oxidative degradation, and highly exothermic char oxidation. The results show that pyrolysis is the main degradation reaction. Moreover, self-sustained propagation of smoldering for cellulosic materials is very difficult due to the lack of sufficient oxygen supply in a quiescent environment.

MATHEMATICAL SCIENCES

General

matics Div.

PB93-124832 Not available NTIS National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathe-

Toward an Intelligent System for Mathematical

Software Selection.

Final rept.

R. F. Boisvert. 1992, 10p.

Pub. in Programming Environments for High-Level Scientific Problem Solving, p79-88 1992.

Keywords: *Mathematics, *Computer software, *Expert systems, Directories, Selection, Statistical analysis, Mathematical models, Heuristic methods, Reprints, National Institute of Standards and Technology.

A vast collection of mathematical and statistical software is now available for use by scientists and engineers in their modeling efforts. This software represents a significant source of mathematical expertise, created and maintained at considerable expense. Unfortunately, the heterogeneity of the collection makes it difficult simply to determine what software is available to solve a given problem. In mathematical prob-lem-solving environments of the future such questions will be fielded by expert software advisory systems. The paper describes knowledge engineering techniques and associated selection heuristics which can be used to develop such systems. A prototype under development for the Guide to Available Mathematical Software project at the National Institute of Standards and Technology (NIST) is demonstrated.

Algebra, Analysis, Geometry, & Mathematical Logic

00,507 PB93-153146 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Fast Fourier Transform Algorithms for Real and Symmetric Data.

Final rept. M. An, C. Lu, E. Prince, and R. Tolimier. 1992, 4p. Pub. in Acta Crystallographica A48, p415-418 1992.

Keywords: *Sequences(Mathematics), Fast Fourier transforms, One dimensional, Real numbers, Computation, Symmetry, Algorithms, Reprints.

Procedures are described for computing the Fourier transforms of one-dimensional periodic sequences of real numbers and sequences that contain Hermitian and translational symmetry. Transforms from real sequences to Hermitian sequences and back are particularly efficient If the number of grid points in a period is two or four times an odd number. If the relation between points that are separated by half of a period is a change of sign or complex conjugate, periods that are a power of two times an odd number are also favorable for constructing algorithms that minimize redundant computations and complex multiplications.

PB93-159069 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathematics Div. Monte Carlo Approach to the Approximation of

Invariant Measures. F. Y. Hunt. Jan 93, 27p, NISTIR-4980.

Keywords: Monte Mapping(Transformations), Numerical solution, Approximation, Convergence, Iteration, Theorems, *Invariant measures, Frobenius-Perron operator.

Approximation of absolutely continuous measures of maps of the interval and the closely related tasks of maps of the interval and the closely related tasks of computing Lyapunov exponents and metric entropy are accomplished in principle by iterating the map to produce a sufficiently long trajectory. There is an alternative approach based on approximating the fixed point of the Frobenius-Perron operator. The authors present a Monte-Carlo implementation of the original piecewise constant method proposed by Ulam. The method has the advantage of not requiring explicit availuation of the elements of the approximate. evaluation of the elements of the approximate Frobenius-Perron operator. Convergence rates of Ulam's method and some recently proposed higher order variants are discussed. Using the classical Bohman-Korovkin theorems of approximation theory the optimality of the rates are shown to be a con-sequence of the saturation phenomenon. Finally Ulam's scheme is used to estimate the leading Lyapunov exponent of a one dimensional map with an absolutely continuous measure. The authors propose an analytical criterion for comparing the results of using this method with an estimate obtained by iterating a long trajectory and illustrate its use in a numerical ex-

00.509 PB93-189298 PC A04/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Bibliographic Notes on Voronoi Diagrams.
J. Bemal. Apr 93, 58p, NISTIR-5164.

Keywords: *Computational geometry, *Bibliographies, Traveling salesman problem, Convex sets, Complexity, Stability, Algorithms, *Voronol diagrams, Delauney triangulation, Robustness(Mathematics).

The paper presents a comprehensive annotated bibliography on various theoretical and algorithmic aspects Voronoi diagrams and related diagrams. Bibliographic notes on the relationship between Voronoi diagrams and solutions to the Euclidean traveling salesman problem are also presented.

00.510 PB93-234714 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Observations About Joined Circular Arcs. C. Witzgall. Aug 93, 25p, NISTIR-5216.

Keywords: *Curve fitting, Computer aided manufacturing, Points(Mathematics), Curves(Geometry), Plane geometry, Interpolation, Automation, Theorems, geometry, Biarcs.

There is interest in interpolating and approximating strings of points in the plane by piecewise-circular smooth curves because that representation lends itself readily to some computer-automated manufacturing processes. In particular, when interpolating a string of given consecutively distinct planar points, it is commonly assumed that these points are also the 'knots' of the interpolating plecewise-circular curve, that is, the points at which successive circular arcs connect. If an initial direction is specified, such Interpolating curves are uniquely determined by the string of points. This interpolation problem becomes overdetermined, however, if directions are prescribed at all points of the string. In that case, pairs of circular arcs joined to-gether smoothly at some suitable intermediate point configurations termed 'biarcs' (K.M. Bolton) - can be used to connect successive points with prescribed directions. Several geometric observations concerning families of biarcs will be reported in the paper.

Statistical Analysis

PB93-125193 Not available NTIS National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Statistical Engineering Div. Characterization of a Distribution Function by the Second Moment of the Residual Life. Final rept.

J. Galambos, and C. Hagwood. 1992, 6p. Pub. in Commun. Statist.-Theory Meth. 21, n5 p1463-

Keywords: *Distribution functions, Moments, Reprints, Characterization theorems, Residual life.

Clinical Medicine

Let F(x) be a continuous distribution function with finite variance, and let $h(sub\ 2)(y) = E(sub\ F)((T-y)\ squared$ (vertical line)T > or = y) denote the second moment of the residual life. In this paper we show that F(x) is characterized by h(sub 2)(y).

00,512 PB93-151108 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Statistical Engineering Div. Calibration Problem as an III-Posed Inverse Problem

Final rept. C. Hagwood. 1992, 7p.

Pub. in Jnl. of Statistical Planning and Inference 31, p179-185 1992.

Keywords: Reprints, *Calibration problems, III posed problems, Inverse problems.

Let (x(1),y(1)),i = 1,2....n, be data used for developing the calibration curve, y = alpha(circumflex) + beta(circumflex)x. Classically, given a future y' the associated x' is estimated by inverting the calibration line, which gives the estimate x'(circumflex) = (y'-alpha(circumflex))/beta(circumflex). This estimate has the deficiency of having an infinite variance. In this paper we use the techniques for solving an ill-posed inverse problem to develop a family of solutions x'(circumflex)(sub lambda) = (beta(circumflex)/(lambda + beta(circumflex)squared))(y'-alpha(circumflex)), lambda > 0, with finite variance. Out of this family we find one that outperforms x'(circumflex).

PB93-151900 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Statistical Engineering Div Prediction Intervals for a Balanced One-Way Random-Effects Model.

Final rept. C. M. Wang. 1992, 17p. Pub. in Commun. Statist.-Simula. 21, n3 p671-687

Keywords: *Mathematical models, *Predictions, Forecasting, Numerical analysis, Sampling, Tables(Data), Reprints.

The article presents numerical methods for constructing, from past sample data, prediction intervals to contain future samples from a population consisting of many batches. The appropriate model for this population is the balanced one-way random-effects model. Two special cases are considered. Specifically, future observations are restricted to be either from a single batch or from multiple batches with one observation per batch. Tables of factors are given for past data from 3(1)10 batches with 2, 6, or 10 observations per batch. The tables are restricted to 2, 6, or 10 future observations.

MEDICINE & BIOLOGY

Biochemistry

PB93-125912 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Kinetics Div. Reduction Reactions of Water Soluble Cyano-Cobalt(III)-Porphyrins: Metal Versus Ligand Centered Processes.

Final rept. S. Mosseri, P. Neta, A. Harriman, and P. Hambright.

Pub. in Jrl. of Inorganic Biochemistry 39, ri2 p93-100

Keywords: *Porphyrins, *Cobalt, *Reduction(Chemistry), Radiolysis, Chemical reactions, Ligands, Complex compounds, Cyanides, Re-

Reduction reactions of dicyano-cobalt(III)-porphyrins (potential in vivo c-anide scavenger drugs) were stud-

ied by radiolytic and electrochemical methods using the water soluble tetrakis(4-sulfonatophenyl)porphyrin (TPPS) and tetrakis(N-methyl-4-pyridyl)porphyrin (TMPyP). For ((CN)2Co(III)TPPS)(1-), reduction occurs stepwise to the Co(II), Co(I), and finally to the phlorin anion. This behavior is similar to that of the colbalt prophyrins in the absence of cyanide, except that the cyanide ligand shifts the reduction potentials to much more negative values. On the other hand, under radiolytic conditions, ((CN)2Co(III)TMPyP)(1-) is reduced on the porphrin macrocycle by one electron to give the Co(III)-radical anion, which disproportionates Into the initial complex and the two-electron ring reduced Co(III) phlorin. The radical anion is also formed by intramolecular electron transfer subsequent to the reaction of Co(II)TMPyP and cyanide. The results are compared with the chemistry of Vitamin

PB93-151975 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Inorganic Analytical Research Div. Determination of Baseline Platinum Levels in Biological Materials. Final rept.

R. Zeisler, and R. R. Greenberg. 1988, 7p.
Pub. in Proceedings of the International Workshop on Trace Element Analytical Chemistry in Medicine and Biology, v5, Berlin, NY., p297-303 1988.

Keywords: *Platinum, *Chemical analysis, *Liver, *Unnalysis, Humans, Neutron activation analysis, Trace elements, Gold 198, Gold 199, Reprints, Standards Reference Materials.

Extensive data on the presence of platinum at natural levels in the biosphere is needed. However, analytical methods to obtain those measurements have not been readily available. We have introduced a radiochemical neutrón activation analysis (RNAA) procedure that is sufficiently sensitive for the determination of baseline platinum levels. This procedure is based on the ele-ment specific separation of gold for interference free counting, thus including the activation products of platinum, (199)Au, and of gold, (198)Au, for the determination of platinum and gold. The RNAA procedure has been applied to human liver tissues and biological Standard Reference Materials (SRMs). As an important addition to the investigated materials, the analysis of SRM 2670 'Toxic Metals in Freeze-Dried Urine' for normal and elevated concentration levels is discussed. In this urine pool sample, the natural platinum level is 8 pg/mL. In human liver samples from 1980 the platinum concentrations ranged from 5 to 57 pg/g (net weight).

PB93-153690 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Chemical Process Metrology Div. Kinetics of a Multistate Enzyme in a Large Oscillat-Ina Field. Final rept. B. Robertson, and R. D. Astumian. 1990, 8p. Pub. in Biophys. Jnl. 57, n4 p689-696 1990.

Keywords: *Enzymes, *Membranes, *Cells(Biology), *Electric fields, *Reaction kinetics, Mathematical models, Oscillations, Surface properties, Reprints, *Membrane transport enzymes, Electroconformational coupling.

A simple, general, and efficient method for calculating the response of a set of coupled first-order (or pseudofirst-order) chemical reactions to an arbitrarily large periodic field is described. The method is applied to a four-state membrane transport enzyme that is electroconformationally coupled to an ac field, i.e., the enzyme has electric charges that move concomitantly with a conformational transition. The calculation is done both for enzymes in a planar membrane and for enzymes in the spherical membrane of a cell or vesicle in suspension.

Botany

PB93-153153 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Inorganic Analytical Research Div. Use of High Accuracy NAA for the Certification of NIST Botanical Standard Reference Materials. Final rept.

D. A. Becker, R. R. Greenberg, and S. F. Stone. 1992, 13p. Pub. in Jnl. of Radioanalytical and Nuclear Chemistry

160, n1 p41-53 1992.

Keywords: *Neutron activation analysis, *Chemical analysis, *Botany, *Radiochemistry, Performance standards, Comparison, Measuring instruments, Leaves(Botany), Plants(Botany), Reprints, *Standard reference materials, Certified reference materials, SRM 1515, SRM 1547.

Neutron activation analysis (NAA) is one of many analytical techniques used at the National Institute of Standards and Technology (NIST) for the certification of NIST Standard Reference Materials (SRMs). NAA competes favorably with all other techniques because of its unique capabilities for high accuracy even at very low concentrations for many elements. In this paper, instrumental and radiochemical NAA results are described for 25 elements in two new NIST SRMs, SRM 1515 (Apple Leaves) and SRM 1547 (Peach Leaves), and are compared to the certified values for 19 eléments in these two new botanical reference materials.

Clinical Chemistry

00.518 PB94-108503 (Order as PB94-108461, PC A09/ MF A02) National Inst.

of Standards and Technology, Rational inst. of Standards and Technology, Gaithersburg, MD.

Evaluation of Serum Volume Losses during Long-

Term Storage.
N. E. Craft, K. S. Epler, T. A. Butler, W. E. May, and

R. G. Ziegler. 1993, 5p. Included in Jnl. of Research of the National Institute of Standards and Technology, n98 n3 p355-359 May/

Keywords: *Biological preservation, *Blood, *Clinical chemistry, Sodium, Cervix neoplasms, Vitamin A, Carotenoids, Freezing, Evaporation, Sublimation, Case-control studies, *Serum volume losses.

Aliquots of serum collected in a large case-control study of cervical cancer were stored at -70 C for up to 4 years during implementation of the study. When 500 microliters serum aliquots were thawed in preparation for carotenoid and vitamin A assays, volumes were noticeably variable and fell below 500 microliters in the majority of the samples. The authors were concerned about evaporation/sublimation during storage of the samples because loss of water would concentrate the analytes of interest. In a representative sample of serum aliquots from the case-control study, 24 of 25 vials contained less than 500 microliters of serum. The mean sodium ion concentration (138.1 + or - 3.6 mmol/ L) was within the normal range for human serum of 136-145 mmol/L, and no correlation was observed between serum volume and Na(1+) concentration. These results strongly suggest that the observed low volumes were not due to evaporative losses. Instead, the variably low volumes of serum aliquots were probably due to pipetting errors in the initial aliquotting resulting from the use of air-displacement pipettes.

Clinical Medicine

PB93-166700 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Ionizing Radiation Div. Calculations on Displacement Corrections for In-**Phantom Measurements with Ionization Chambers** for Mammography.

Final rept. J. Zoetelief, C. M. Eisenhauer, and J. J. Coyne. 1990, 13p.

Pub. in Physics in Medicine and Biology 35, n9 p1287-1299 1990

Keywords: *Mammography, *Anatomical models, *Ionization chambers, Monte Carlo method, Radiation Kevwords: dosage, Reprints.

Clinical Medicine

Displacement corrections for measurements with ion-Ization chambers in-phantom for mammography are large and represent a major correction to consider for dose determinations with ionization chambers. Experi-mental data on displacement corrections depend to a large degree on the model used to extrapolate to zero cavity radius. Calculations of displacement correction factors using a Monte Carlo code are presented for dif-ferent cavity shapes, i.e., spherical, cylindrical and disc-type, in various phantom materials simulating the average breast and breast composing tissues. In addition, the Influence of wall material and depth In-phantom are studied. Exponential extrapolation to zero cavity radius should be performed to obtain the dose in homogeneous phantoms. Displacement corrections for photons as used in mammography seem compatible with geometrical considerations made previously. A discrepancy is found between depth-dose data derived from calculations and those found in experiments.

Cytology, Genetics, & Molecular

00,520 PB93-150670 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div.

DNA Base Modifications induced in isolated
Human Chromatin by NADH Dehydrogenase-Cataiyzed Reduction of Doxorubicln.

Final rept.

S. A. Akman, J. H. Doroshow, T. G. Burke, and M. Dizdaroglu. 1992, 7p. Pub. in Biochemistry 31, n13 p3500-3506 1992.

Keywords: *DNA damage, *Chromatin, *Doxorubicin, *Free radicals, *NADH dehydrogenase, Antineoplastic agents, Catalysis, Transition metals, Reprints, Flavoenzymes.

antineoplastic benzanthroquinone doxorubicin can undergo flavoenzyme-catalyzed oneelectron reduction which, in an aerobic environment, leads to the generation of oxygen-derived species. We therefore sought to determine whether doxorubicin in the presence of NADH dehydrogenase and the transition metal ions Fe(III) or Cu(II) induces DNA base modifications in human chromatin. NADH dehydrogenase-catalyzed reduction of doxorubicin (25-100 micromolar) caused hydroxyl radical production detected as methane generated from dimethyl sulfoxide. Doxorubicin-induced DNA base modifications in chromatin required the addition of transition metal ion and was enhanced by the addition of active flavoenzyme. The scavengers of hydroxyl radical mannitol and dimethyl sulfoxide or catalase did not significantly affect doxorubicin/NADH/NADH dehydrogenase/transition metal ion-induced base modifications. Superoxide dismutase further enhanced production of all base modifications.

00,521 PB93-151314 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div.
DNA Base Damage in Chromatin of Gamma-irradiated Cuitured Human Cells. Final rept.

Z. Nackerdien, R. Olinski, and M. Dizdaroglu, 1992.

Sponsored by Department of Energy, Washington, DC. Pub. in Free Rad. Res. Comms. 16, n4 p259-273 1992.

Keywords: *DNA damage, *Chromatin, *lonizing radiation, Gas chromatography, Mass spectroscopy, Cultured cells, Reprints.

We report on the chemical characterization of DNA base damage in chromatin of gamma-irradiated cultured human cells. Chromatin was isolated from unirradiated and irradiated cells and analyzed by gas chromatography/mass spectrometry with selected-ion monitoring after acidic hydrolysis of chromatin and trimethylsilylation of hydrolysates. A number of modified bases in chromatin isolated from irradiated cells were identified and quantitated. Background levels of all modified bases were observed in chromatin isolated from unirradiated cells. The radiation yields of a num-ber of modified bases were increased significantly over their background levels at a dose as low as 42 Gy. In most cases, linear dose-yield relationships were obtained up to 200 Gy. The yields of guanine-derived bases amounted to 45% of the total net yield of modified bases measured, followed by almost equal yields of adenine-, cytosine- and thymine-derived bases.

00.522 PB93-151587 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div. DNA-Protein Cross-Linking between Thymine and Tyrosine in Chromatin of Gamma-irradiated or H2O2-Treated Cultured Human Celis. Final rept.

R. Olinski, Z. Nackerdien, and M. Dizdaroglu. 1992,

Sponsored by Department of Energy, Washington, DC. Pub. in Archives of Biochemistry and Biophysics 297, n1 p139-143, 15 Aug 92.

Keywords: *DNA damage, *Chromatin, *Cross-linking reagents, *Ionizing radiation, *Hydrogen peroxide, Free radicals, Cultured cells, Reprints.

Formation of DNA-protein cross-links between thymlne and tyrosine In chromatin of gamma-irradiated or H2O2-treated cultured human cells is reported. Chromatin was isolated from cells, and subsequently hydrolyzed and derivatized. Analysis of derivatized hydrolysates by gas chromatography/mass spectrometry with selected-ion monitoring showed that a thymidine-tyrosine (Thy-Tyr) cross-link was formed. Exposure of cells to ionizing radiation at doses between 8.7 and 82 Gy (J/kg) increased the amount of the Thy-Tyr cross-link linearly up to fourfold over the background level. At doses higher than 82 Gy, the yield approached a plateau. Treatment of cells with H2O2 (0.5 to 10 mM) also increased the amount of the Thy-Tyr cross-link in a concentration-dependent manner. Addition of dimethyl sulfoxide and o-phenanthroline in the culture medium afforded partial inhibition of cross-link formation. Addition of catalase inhibitor KCN prior to H2O2 treatment increased the yield of cross-linking over the level observed with H2O2 treatment alone. Pretreatment of cells with ascorbic acid for 24 h without H2O2 caused formation of the Thy-Tyr cross-link.

PB93-153559 Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Biotechnology Div.

DNA Base Modifications in Chromatin of Human Cancerous Tissues. Final rept.

J. Skokowski, and W. Zegarski. 1992, **6**p. Sponsored by Department of Energy, Washington, DC. Pub. in FEBS Letters 309, n2 p193-198 Sep 92.

Keywords: *DNA damage, *Malignant neoplasms, *Free radicals, *Base composition, Chromatin, Re-

Evidence exists that DNA damage by endogenous free radicals occurs in vivo, and there is a steady-state level of free radical-modified bases in cellular DNA. We have investigated endogenous levels of typical free radical-induced DNA base modifications in chromatin of various human cancerous tissues and their cancerfree surrounding tissues. Five different types of sur-gically removed tissues were used, namely colon, stomach, ovary, brain and lung tissues. In chromatin samples isolated from these tissues, five pyrimidine-derived and six purine-derived modified DNA bases were identified. These compounds are known to be formed typically by hydroxyl radical attack on DNA bases. In all cases, elevated amounts over control levels of modified DNA bases were found in cancerous tissues. The amounts of modified bases depended on the tissue type. Lung tissues removed from smokers had the highest increases of modified bases above the control levels, and the highest overall amounts. Colon cancer tissue samples had the lowest increases of modified bases over the control levels. The results clearly indicate higher steady-state levels of modified DNA bases in cancerous tissues than In their cancerfree surrounding tissues. Some of these lesions are known to be promutagenic, although others have not been investigated for their mutagenicity. Identified DNA lesions may play a causative role in carcinoaenesis.

00.524 PB93-166122 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Center for Chemical Technology.

Protein Crystai Growth of Ribonuciease A and Pancreatic Trypsin inhibitor Aboard the Maser 3 Rock-

Final rept. L. Sjolin, A. Wlodawer, G. Bergqvisat, H. Malmstrom, J. Zaar, L. A. Svensson, G. L. Gilliland, P. Holm, and K. Loth. 1991, 11p.
Pub. in Jnl. of Crystal Growth 110, n1-2 p322-332

Keywords: *Crystal growth, *Proteins, *Pancreatlc rlbo-nuclease, *Kazal pancreatic trypsin Inhibitor, X-ray dif-fraction, Solutions, Spaceborne experiments, Reduced gravity, Reprints, *Maser 3 rocket.

The crystal growth of Bovine Ribonuclease A (RNase A) and Bovine Pancreatic TrypsIn Inhibitor has simultaneously been studied onboard MASER 3, a sounding rocket, and in a ground reference unit. For crystalliza-tion to take place within the 7 minutes and 15 seconds of microgravity during the flight, both macro- and micro-seed techniques were utilized in supersaturated solutions and compared to standard seed-free crystallization procedures. Crystals were grown in both the microgravity experiment as well as in the ground reference unit. It was found that the convection-free environment produced more and larger crystals. The RNase A crystals diffracted X-rays to approximately 0.2 A higher resolution than previously observed in any terrestrially grown RNase A crystals. The refined structure based on these data contains new features not seen in the lower resolution structures.

PB93-166221 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. inorganic Analytical Research Div. Application of PolyacrylamIde-Gei Electrophroesis Neutron-Activation Analysis for Protein Quantification.

Final rept.
S. F. Stone, R. Zeisler, and G. E. Gordon. 1990, 7p.
Pub. in Biological Trace Element Research 26-7, p85-

Keywords: *Proteins, *Neutron activation analysis, *Polyacrylamide gel electrophoresis, Autoradiography, Densitometry, Reprints, Standard reference materials.

A combination of two methods, polyacrylamide gei electrophoresis (PAGE) and neutron activation analysis (NAA) has been applied to solutions containing phosphoproteins for protein determinations. The proteins were separated by molecular weight using PAGE, and then the whole gel was activated by neutron bombardment. Densitometric measurements of the visualized bands from (32)P, taken from autoradiographs of the activated gels, resulted in quantitation of the phosphorus, and then of related protein. This PAGE/NAA method was applied to several phosphoprotein-containing materials, including commercial milk products, and reference materials, i.e. IAEA A-11, milk powder and SRM 1845, Cholesterol in Egg Powder.

Dentistry

PB93-150738 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.
Effect of a Two-Solution Fluoride Mouth Rinse on Remineralization of Enamei Lesions in vitro.

Final rept.
L. C. Chow, S. Takagi, and S. Shih. 1992, 5p.
See also PB92-154137. Sponsored by American Dental Association Health Foundation, Chicago, IL.
Pub. in Jnl. of Dental Research 71, n3 p443-447 Mar

Keywords: *Dentistry, *Enamel, *Fluondes, *Teeth, *Mouthwashes, Sodium fluondes, Performance evaluation, Dental supplies, Dental caries, Dental calculi, In vitro analysis, pH, Microradiography, Reprints, *Mouth rinse.

A previous study showed that a two-solution fluoride (F) rinse deposited significantly more loosely-bound F on the tooth surface than did a sodium fluoride (NaF) rinse with the same F concentration (12 mmol/L). In the present study, this experimental rinse was evaluated for its ability to cause remineralization of enamel lesions in an in vitro pH-cycling model. Caries-like lesions were formed in the enamel of extracted human molars by means of a pH 4 demineralizing solution.

PB93-151868 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Polymers Div.

in vivo Fluoride Concentrations Measured for Two Hours After a NaF or a Novel Two-Solution Rinse. Final rept.

G. L. Vogel, Y. Mao, C. M. Carey, L. C. Chow, and Takagi. 1992, 5p.

Sponsored by American Dental Association Health Foundation, Chicago, IL. Pub. In Jnl. of Dental Research 71, n3 p448-452 Mar

Keywords: *DentIstry, *Fluorides, *In vitro analysis, *Mouthwashes, Sodium fluorides, Dental caries, Dental supplies, Concentration(Composition), Performance evaluation, Reprints, *Mouth rinse, Plaque.

The concentrations of fluoride in various samples from the oral environment were measured at timed intervals after a novel rinse or a sodium fluoride (NaF) rinse, both containing a total of 12 mmol/L (228 ppm) fluoride. The novel rinse consisted of two solutions mixed just before application: Part A contained calcium chloride and sodium acetate; part B contained a hydrolyzable source of fluoride (sodium hexafluorosilicate) and so-dium phosphate. Samples were obtained as follows: Single-site plaque-fluid samples were obtained by centrifugation of first-molar plaque; pooled whole-plaque samples were collected from second molars; centrifuged, pooled whole-saliva was collected by vacuum. All samples were analyzed by micro-analytical methods. The results of this study suggest that the new rinse may provide a greater cariostatic effect at the same fluoride dosage than does a NaF rinse.

00,528 PB94-109329 PC A04/MF A01 American Dental Association Health Foundation, Gaithersburg, MD. Paffenbarger Research Center. Clinical Trial of an Adhesive Material.

Final rept. Sep 85-Jun 93.

R. L. Bowen, and F. C. Eichmiller. 24 Aug 93, 54p.

Contract NIDR-N01-DE-52557

Sponsored by National Inst. of Dental Research, Bethesda, MD.

Keywords: *Dental materials, *Adhesive bonding, *Materials testing, Resin bonding, Biocompatible materials, Polymers, Restorative materials, Iron lons, Teeth, Dental caries, Dental pulp cavity.

The clinical contract was instrumental in the development and transfer of over twenty years worth of labora-tory investigation to clinically usable dentin adhesion systems. Phase I of the trial demonstrated the safety of materials based on novel chemistry and application techniques in human teeth. This phase of the study proved that the experimental materials did not elicit deletenous responses in the pulp tissues of vital human teeth. Phase II of the contract provided clinical experience necessary to refine the adhesive system Into a clinically usable material. Improvements in matenals and parallel improvements in application techniques and delivery methods made possible licensing of six commercial manufacturers with twelve different products based on this technology.

Electrophysiology

00,529 PB93-153682 Not available NTIS
National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Chemical Process Metrology Div. Non-Linear Effects of Periodic Electric Fields on Membrane Protein.

Final rept. B. Robertson, R. D. Astumian, and T. Y. Tsong.

1989, 19p. Pub. in Charge Field Eff. Biosyst. 2, p191-209 1989.

Keywords: *Electric fields, *Cell membrane, *Enzymes, *Electrochemistry, Membrane proteins, Reprints, Free energy transduction.

The nonlinear response of a two-state chemical reaction to an oscillating electric field is described. An interesting example is a conformational transition of a membrane protein in an applied ac electric field. Even a modest external field leads to a very large local field within the membrane and hence gives rise to nonlinear behavior. If the protein catalyzes a reaction, free energy is transduced from the electric field to the output reaction, even if that reaction is electrically silent. Many transport enzymes are ideal examples. The ac field can cause the enzyme to pump ions or molecules through the membrane against an (electro)chemical potential. The efficiency of this energy transduction can be as high as 30%.

Pathology

00.530

PB93-231835 PC A02/MF A01

Health Effects Research Lab., Research Triangle Park,

Chemical Characterization of Mutagenic Fractions of Particles from Indoor Coal Combustion: A Study of Lung Cancer in Xuan Wel, China. Journal article.

Journal article.
J. C. Chuang, S. A. Wise, S. Cao, and J. L.
Mumford. c1992, 8p, EPA/600/J-93/379.
Pub. in Environmental Sclence and Technology, v26
n5 p999-1004 May 92. Prepared in cooperation with
Battelle, Columbus, OH. Atmospheric Science and Applied Technology, National Inst. of Standards and
Technology (CSTL), Gaithersburg, MD. Organic Analytical Research Div., and Institute of Environmental
Health and Engineering, Beijing (China).

Keywords: *Indoor air pollution, *Air pollution effects(Humans), *Chemical analysis, Lung effects(Humans), *Chemical analysis, Lung neoplasms, Bioassay, Combustion products, Particulates, Polycyclic aromatic hydrocarbons, Toxicity, Reprints, Xuan Wei(China), Yunnan(China), Coal burning, Semivolatile organic compounds.

In the rural Xuan Wel County, Yunnan Province, lung cancer mortality rates for women are among the high-est in China. Most of these women are nonsmokers, and studies have shown that lung cancer in Xuan Wei is associated with domestic use of smoky coal under unvented conditions. The objective of the study is to determine the chemical constituents that may be linked to the high lung cancer rates in Xuan Wel using the bioassay-directed fractionation method. The results indicated that the presence of three to four-ring alkylated PAHs in the sample extract is a significant factor that may be linked to the high incidence of lung cancer In Xuan Wei, China. (Copyright (c) 1992 The American Chemical Society).

Pharmacology & Pharmacological Chemistry

PB93-125870 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Molecular Physics Div. Binding Cis-(1,2-Diaminocyclohexane)Platinum(II) and its Derivatives to Duplex DNA. Final rept. K. J. Miller, S. L. McCarthy, and M. Krauss. 1990,

Pub. in Jnl. of Medicinal Chemistry 33, n3 p1043-1046 1990.

Keywords: *Cisplatin, *Deoxyribonucleic acids, Leukemia L1210, Isomerization, Nucleic acid conformation, Thermodynamics, DNA repair, Experimental mela-

noma, Reprints.

A theoretical study is presented for the binding of RR, A theoretical study is presented for the binding of HH, SS, SR, and RS Isomers of DAC(1,2-diammlnocyclohexane) or cis-Pt(II)-DAC to DNA. Cis-Pt(II)-DAC Is ligated to N7(G) on two adjacent intrastrand guanine bases in a kinked pentamer duplex of DNA, (AT, CG, CG, GC, AT). The relative stability of the complexes is determined by calculating the relative conformational energy of the cis-Pt(II)-DAC-DNA complexes with molecular mechanics (MM), and the intrinsic binding or ligation energy with molecular mechanics. trinsic binding or ligation energy with quantum me-chanics (QM). The results suggest that the RR and SS

isomers of Pt(II)-DAC adducts with DNA are more sta-ble than the SR/RS Isomer by 1.7 kcal/mol relative to the cis-Pt(II)-DAC(H2O)2 aquated species. Calcula-tions on the overall stability of these Isomers show that the SS and RR Isomers are 6.5-8.2 kcal/mol more stable than the SR/RS isomers when bound to DNA, and this is attributed to differences in the strain energy In the DAC rings. The theoretical analyses of these compounds correlate a small differential activity with the trend in intrinsic binding energies. The RR Isomer Is more active in B16 melanoma cells and the SS Is most active in L1210 leukemla, and in general the RR and SS isomers are more active than the SR and RS in most cell types.

Public Health & Industrial Medicine

00,532 PB93-215184 PC A05/MF A01 of Standards and Technology, National Inst. of Gaithersburg, MD.
Report on Occupational Safety and Health for Fiscal Year 1990 (Under Public Law 91-596). Sep 92, 77p. See also report for FY 1989, PB92-222777.

Keywords: *Occupational safety and health, *Occupational diseases, Mortality, Malignant neoplasms, Asbestos, Toxicity, Spermatozoa, Health hazards, Fertility, Electrical shock, Anllines, Carcinogens, Agriculture, Injuries, Construction industry, Toluene diisocyanate, Toluene diamine, CAS 1332-21-4, CAS 584-84-9, CAS 496-72-0, CAS 95-53-4, CAS 62-

The report describes the efforts underway at NIOSH for the year 1990 in the areas of occupational safety and health. Some of the highlights during this time penod occurred in the area of agricultural programs in which work was initiated on surveillance, research, and intervention in hazardous agricultural activities. Efforts In the area of construction provided assistance for Identifying and evaluating occupational health risks to construction workers including mortality pattern analysis, identification of specific cancers linked to exposures on the job, and the role of asbestos (1332214) exposure in disease states. In the area dealing with evaluation of reproductive risks from exposure to workplace toxicants, methods were developed for studying men for sperm profiling, and methods for adapting fertility indicators for assessing health effects for workplace exposures in women. Special attention was given to toluene-diisocyanate (584849) and toluene-diamine (496720). Bladder cancer was studied in workers occupationally exposed to ortho-toluidine (95534) and aniline (62533). Electrocution, one of the leading causes of traumatic occupational fatalities, was examined. A manual of analytical methods was published which contained additional information over the previous version.

Radiobiology

PB93-158673 PC A03/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div. Proton Monte Carlo Transport Program PTRAN.
M. J. Berger. Jan 93, 47p, NISTIR-5113.
See also PB93-146033. Sponsored by National Cancer Inst., Bethesda, MD.

Keywords: *Proton transport, Proton beams, Monte Carlo method, MeV range 10-100, MeV range 100-1000, Random walk, Random numbers, Slowing-down, Transport properties, Radiotherapy, Penetration, Diffusion, Dosimetry, PTRAN system, Water phantoms.

The report describes the structure and use of Monte Carlo programs that calculate the transport of proton beams through extended media. Although more generally applicable, the programs have been designed to deal with the penetration of 50- to 250-MeV beams through water phantoms. The Monte Carlo model takes into account multiple-scattering deflections and energy-loss straggling due to Coulomb Interactions of

MEDICINE & BIOLOGY

Radiobiology

protons with atoms and orbital electrons. Nonelastic nuclear Interactions are treated as an absorptive effect. The PTRAN system at present consists of several cross-section preparation programs and two main codes, PTRAN3D and PTRAN1D. PTRAN3D applies to an incident narrow pencil beam, and calculates (a) the deposition of energy as function of depth and radial distance from the beam axis, and (b) and the energy spectra of the primary protons as function of depth. Program PTRAN1D is a simplified version which runs that the reliabilities with a radial distance from the program of the reliabilities. faster and omits the calculation of the radial distribution of energy deposition.

00,534 PB9**3-166031** Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Ionizing Radiation Div.

Dose Equivalent Response of Tissue-Equivalent Proportional Counters to Low Energy Neutrons.

H. Schuhmacher, A. Kunz, H. G. Menzel, J. J. Coyne, and R. B. Schwartz. 1990, 5p. Pub. in Radiation Protection Dosimetry 31, n1-4 p383-

Keywords: *Radiation protection, *Personnel dosimetry, Tissues(Biology), Dose equivalents, Neutrons,

Recent investigations of area monitors based on tissue-equivalent proportional counters have shown that their dose equivalent response, R(sub H)=M(sub H)/
H*(10), (M(sub H), dose equivalent reading: H*(10),
ambient dose equivalent) is considerably smaller than
one for neutron energies below a few hundred keV. Measurements in monoenergetic neutron beams with energies of 2 and 24 keV are described. Results for R(sub H) are presented and various means of Improving the dose equivalent response in the low energy region are investigated: detector size, wall thickness and pressure of gas filling.

00,535 PB9**3-166486** PB93-166486 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Chemical Process Metrology Div. Charge-Field Interactions in Cell Membranes and Electroconformational Coupling: Transduction of Electric Energy by Membrane ATPases. Final rept.

T. Y. Tsong, and R. D. Astumian. 1989, 11p. Pub. in Charge Field Eff. Biosyst.-2, p167-177 1989.

Keywords: *Electric fields, *Cell membrane, *Adenosinetriphosphatase, *Signal transduction, Bio-biogical transport, Mitochondria, Enzyme activation, Biosynthesis, Proteins, Deoxyribonucleic acids, Ribo-nucleic acids, Erythrocytes, Reprints.

Electron and ion transports, reductions and oxidations are common chemical reactions in cellular energy transductions. These reactions involve charges and are, thus, susceptible to influence by an electric field. Many laboratories have recently discovered that electric fields in certain ranges and frequencies can stimulate DNA, RNA, and protein biosyntheses. Enhancement and suppression of enzyme activities have also been reported. The paper will discuss the authors experiments in which electric fields of defined frequency and amplitude were used to activate mitochondrial ATPases of rat liver and beef heart and the (Na,K)-ATPase of human erythrocytes. Electroconformational coupling which the authors proposed earlier will be used to explain these results. The following two papers will elaborate the concept in greater details and analyze some simple reaction mechanisms which are relevant to the present discussion. The authors will also show that nonlinear effects arising from the coulombic interaction of membrane proteins and an electric field are responsible for the many observed effects.

PB93-166585 Not available NTIS National Inst. of Standards and Technology (NML), Galthersburg, MD. Chemical Process Metrology Div. Response of Living Ceils to Very Weak Electric Fields: The Thermai Noise Limit. Final rept.

J. C. Weaver, and R. D. Astumlan. 1990, 4p. Pub. In Science 247, n4941 p459-462 1990.

Keywords: *Electric fields, *Cells(Blology), Membrane potential, Signal to noise ratio, Catalysis, Detection,

A simple model is presented which considers cells as possible detectors of very weak periodic electric fields.

This yields a general relation between cell size and both thermally induced fluctuations in membrane potential, U(t), and the maximum change in membrane potential, Delta U(sub max) (t), caused by an applied field. The authors regard Delta U(sub max) as the signal of the latest the beginning to the latest th nal and make the basic assumption that if the signal-to-noise ratio (S/N) is unity or greater, then the cell may be able to respond to the applied field. The simplest version of the model provides a broad-band estimate of the smallest applied electric field to which membrane macromolecules can directly respond. This is shown to be small. It is further shown that much smaller fields can be detected if the detection mechanism responds to voltage signals in only a narrow band of frequencies and/or is capable of signal averaging. These may occur by the mechanism of field induced vanation in the catalytic activity of membrane-associated enzymes. Both extensions to the simplest theory resolve the paradox presented by the apparent viola-tion of the kT noise limit observed in some expenments. A similar analysis carried out for molecules in solution shows that the minimum field to which cytosolic macromolecules can respond is much larger than for membrane macromolecules.

00.537 PB93-219749 PC A04/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div.
Penetration of Proton Beams through Water. 1.
Depth-Dose Distribution, Spectra and LET Distribution.

M. J. Berger. Jul 93, 52p, NISTIR-5226. Sponsored by National Cancer Inst., Bethesda, MD.

Keywords: *Proton irradiation, *Proton dosimetry, *Depth dose distribution, Monte Carlo method, MeV range 10-100, MeV range 100-1000, Proton beams, Transport theory, Energy spectra, Radiotherapy, LET, PTRAN computer program, Water phantoms.

The penetration of protons through a water phantom was calculated with the Monte Carlo program PTRAN, which takes into account energy-loss straggling, multiple scattering, and nonelastic nuclear interactions. Calculations were done for incident proton beams incident with energies between 250 MeV and 50 MeV. The information obtained includes depth-dose curves as well as energy spectra of primary protons at various depth. Good agreement was found between calculated and measured relative depth-dose distributions, except at extreme depths. A systematic tabulation was made of various parameters that characterize the shape of the Bragg peak. The energy spectra were used to obtain LET distributions for primary protons. In addition, dose-averaged LET-values were obtained which in-clude contributions from primary protons as well as from secondary charged particles produced in nuclear reactions.

00,538 PB93-219772 PC A05/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div.

Assessment of the Role of Charged Secondaries from Nonelastic Nuclear interactions by Therapy Proton Beams in Water. S. M. Seltzer. Jul 93, 84p, NISTIR-5221. Sponsored by National Cancer Inst., Bethesda, MD.

Keywords: *Oxygen 16 target, *Proton reactions, *Secondary emission, *Cross sections, MeV range 10-100, MeV range 100-1000, Ionizing radiation, Biological effects, Secondary reactions, Proton irradiation, Slowing-down, Radiotherapy, Water, Let, Graphs(Charts).

The report summarizes the calculations and the syntheses of data performed to develop information on the cross sections in water for nonelastic nuclear interactions and the production of nuclear secondaries for protons with energies below 250 MeV. The data developed include the total nonelastic cross section and the number and energy distributions for secondary n, p, d, t, (3)He, alpha, and some 32 recoiling nuclides produced in interactions of p+(16)O. These data are used to evaluate slowing-down spectra (and pertinent moments) for the charged nuclear secondaries. Combin-Ing the Information with primary proton fluence spectra obtained from Monte Carlo transport calculations, illustrative results are given for the average LET, as a func-tion of depth, for unmodulated and modulated proton beams. Based on a crude biological-response model, the results are then used in exploratory calculations to estimate the relative biological effectiveness of the proton beams.

MILITARY SCIENCES

Logistics, Military Facilities, & Supplies

00,539 PB9**3-158657** PB93-158657 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Galthersburg, MD.

Comparison of Celling Jet Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures
Predicted by the DETACT-QS and LAVENT Computer Models.
W. D. Walton, and K. A. Notarianni. Jan 93, 36p,

NISTIR-4947

See also PB87-197943. Sponsored by Fire Administration, Emmitsburg, MD., and Public Buildings Service, Washington, DC. Office of Real Property Management and Safety.

Keywords: *Fire tests, *Hangars, *Military air facilitles, *Temperature distribution, Flame propagation, Computer programs, Heat flux, Sprinkler systems, Fire protection, Response time, Fire detection systems, Ceilings, Predictions, *Compartment fires, DETACT-QS computer program, LAVENT computer program.

Predictions of the DETACT-QS and LAVENT computer fire models are compared to temperature measurements made during the calibration of the fire detection system in a military aircraft hanger. Two 3.34 sq m Isopropyl alcohol pool fire tests of 60 second duration were conducted in the 37 m by 40 m by 14 m high main hanger bay. Brass disks with a known thermal response time index (RTI) were used to simulate the response time index (RTI) were used to simulate the thermal element in a sprinkler or heat detector. Measurements were made of centerline plume temperatures, and ceiling jet gas and disk temperatures at radial distances of 0, 2.7, 5.5, 8.2, and 11.0 m from the centerline of the fire, 380 mm below the ceiling. At a radial distance of 5.5 m, measurements of ceiling jet gas temperatures were also made 150 and 610 mm below the ceiling. Comparisons of predictions and measurements demonstrate some of the strengths and weakness of DFTACT-QS and I AVENT for the fire weakness of DETACT-QS and LAVENT for the fire scenario.

00,540 PB**94-109238** PB94-109238 PC A04/MF A01
National Inst. of Standards and Technology (CAML),
Galthersburg, MD. Office of Applied Economics.
Present Worth Factors for Life-Cycle Cost Studies in the Department of Defense (1994). S. R. Petersen. Oct 93, 63p, NISTIR-4942-1. See also PB88-138227, PB92-238663 and report for 1993, PB93-120772. Sponsored by Assistant Sec-retary of Defense (Production and Logistics), Washing-ton, DC.

Keywords: *Life cycle costs, *Present worth, *Energy supplies, *Military facilities, Benefit cost analysis, Economic analysis, Return on investment, Cost englneering, Fuels, Energy conservation, Construction, Regional analysis, Tables(Data), Department of Defense Military Construction Program.

The document provides 47 tables of present worth factors to be used in computing the present worth of future costs (or cost reductions) in economic analyses of design decisions for projects In the Department of Defense (DoD) Military Construction Program. These factors are especially useful for the life-cycle cost analysis of investments in buildings or building systems which are intended to reduce future operating, maintenance, repair, replacement, and energy costs over the life of the facility. The tables include present worth factors for both one-time costs and annually recurring costs, based on the FEMP discount rate of 3.1% (FY 1994) for energy-related studies and on the OMB discount rate of 4.0% and 4.5% for short-term and long-term non-energy studies, respectively. Forecasts of future energy prices used in the calculation of present worth factors for energy costs were provided by the Energy Information Administration.

Keywords: *Underwater navigation, *Submarines, *Automatic control, *Real time operations, Ship maneuvenng, Computer systems programs, Systems engineering, Controllers, Simulations, Autonomous navi-

The Robot Systems Division (RSD) at the National In-

Nuclear Instrumentation

NATURAL RESOURCES & EARTH SCIENCES

Geology & Geophysics

00,541
PB93-166411 Not available NTIS
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD.
Molecular Wedge In a Brittle Crack: A Simulation

Final rept.
R. M. Thomson. 1990, 11p.
See also PB90-193616.
Pub. In Jnl. of Materials Research 5, n3 p524-534

1990.

Keywords: *Fractures(Materials), *Cracking(Fracturing), *Mica, Crack propagation, Mo-lecular structure, Interfacial tension, Crystal lattices, Molecules, Water, Simulation, Reprints.

The paper presents an atomic calculation of the wedging effect which occurs in a brittle crack when molecules of a chemisorbing species of molecules of sufficient size enter the crack mouth. A surface tension develops at the tip of the wedge caused by the difference between the covered and vacuum surface energies. This force draws the chemisorbing molecules towards the crack tip, and distorts the crack faces, causing, in tum, a compensating elastic force on the molecules which tends to eject the molecules. The authors calculate the equilibrium penetration of the wedging molecules, and the configuration of the crack and wedge by an atomistic calculation. The authors simulate mical water chemistry by means of a simplification of the mica lattice and calculate interactions between the water and mica on the basis of Born-Mayer. Water is found to form a wedge tongue of two or three molecular thicknesses and a length of about 12 molecular distances, which penetrates into the crack tlp cohesive zone. When strong wedging action occurs at a crack tip, crack advance near threshold loadings will be limited by molecular diffusion through the wedge tongue.

PB93-185973 PC A03/MF A01 California Univ., Davis. Dept. of Civil and Environ-

mental Engineering.
Procedures for Selecting Earthquake Ground Motions at Rock Sites (Revised).

Final rept.

M. Idriss. Mar 93, 25p, NIST/GCR-93/625.
 Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD.

Keywords: *Earthquakes, *Tremors, Shock waves, Attenuation, Damping, Spectral response, Seismic effects, Time studies, Motion studies.

There are several procedures that can be used to select earthquake ground motions at a rock site. These procedures include: (1) utilization of motions previously recorded at rock sites during similar size earthquakes and at distances comparable to those under consideration; (2) estimation of a target spectrum and then se-lection of natural time histories whose spectral ordinates are comparable to those of the target spectrum for the period range of interest; (3) estimation of a target spectrum and then generation of a synthetic time history whose spectral ordinates provide a rea-sonable envelope to those of the target spectrum; or (4) use of simulation techniques starting with the source and propagating the appropriate wave forms to generate a sulte of time histories that can then be used to represent the earthquake ground motions at the rock site of interest. For the purpose for which NIST plans to use the procedures outlined in the report, only procedures number (2) and number (3) are covered here-in. Estimation of the target spectrum is based on cur-rently available empirically derived attenuation relatlonships.

PB93-196251 MF A02)

(Order as PB93-196228, PC A07/

Joint Inst. for Lab. Astrophysics, Boulder, CO.

Measuring Low Frequency Tilts.

M. L. Kohl, and J. Levine. 1993, 12p.

Prepared In cooperation with National Inst. of Standards and Technology, Boulder, CO. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n2 p191-202 Mar/

Keywords: *Tiltmeters, Performance evaluation, Power spectra, Measurement, Boreholes, Pendulums, Stability, Design.

A borehole tiltmeter with a sensitivity of a few nanoradians is described. It is composed of two orthogonal horizontal pendulums with free penods of 1 s. The pendulums are insensitive to barometric pressure fluctuations, and the measured temperature coefficient Is less than 30 nrad/C. The range of the pendulums is about + or - 5 micro rad, and their response is linear within 1% and stable over several years. The performance of the tiltmeter in the field was evaluated using tidal data obtained from a closely spaced array of boreholes in Southern California.

Mineral Industries

00,544 PB9**3-178622** PC A04/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Robot Systems Div.
Intelligent Control System for a Cutting Operation of a Continuous Mining Machine.
J. A. Horst, and A. J. Barbera. Mar 93, 54p, NISTIR-

Prepared in cooperation with Advanced Technology and Research, Inc., Laurel, MD.

Keywords: *Mining equipment, *Artificial intelligence, *Control equipment, Cutters, Cutting, Expert systems, Mining engineering, System engineering, Controllers, Computer programs, Real time operations, Continuous mining machine.

An Implementation using the Real-time Control System (RCS) reference model is described. RCS is characterized by explicit software modules that perform behavior generation, sensory processing, and world modelling functions at different hierarchical levels. A detailed and sharply defined approach to RCS design is described in the paper. It is characterized by task-based problem decomposition, cyclic execution, generic software modules, standardized communications interfaces, and state machines. The particular implementation described demonstrates the utility of the methodology for the control of a cutting operation of a continuous min-lng machine used in the underground coal mining in-dustry.

NAVIGATION, **GUIDANCE, &** CONTROL

stitute of Standards and Technology (NIST) has been developing a generic reference model architecture, known as the Real-time Control System (RCS), for the last two decades. The paper demonstrates the application of RCS to submarine automation. The automation of submarine operations involves complex system functionality and requires an enormous amount of intelligence to be built into the software to enable a submarine to operate in an unstructured and often hostile environment semi-autonomously. Software is emerg-lng as a predominant factor in determining the success and performance of modern large and complex Intelligent systems. Meanwhile, the fundamental principles and generic approaches of handling software and systems engineering processes are still being explored within the engineering community. RCS attempts to address some fundamental system development Issues including a software engineering methodology and a generic architecture. The resolution of these is-sues can facilitate a unified approach for developing intelligent systems. An open system architecture can

also be achieved to serve as a foundation for system integration and coordination. The paper provides an implementation example of the RCS methodology re-

NUCLEAR SCIENCE & TECHNOLOGY

Fusion Devices (Thermonuclear)

00,546 PB9**3-206928**

PC A13/MF A03

search projects ongoing at NIST RSD.

National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD.

Review of Irradiation Effects on Organic-Matrix Insulation.

N. J. Simon. Jun 93, 299p, NISTIR-3999. Sponsored by Department of Energy, Washington, DC. Office of Fusion Energy.

Keywords: *Nuclear fusion, *Electrical insulation, *Epoxy composites, *Magnets, Toroidal pinch devices, Tests, Cryogenics.

The objectives of the review are: (1) to provide a compilation of all the relevant mechanical property data on irradiation damage to epoxy-matrix electrical insulating materials; (2) to assess whether these data can be used to select superconducting magnet insulation for next-generation fusion devices, such as ITER and TPX; and (3) to determine what further data need to be obtained for the selection of insulation for ITER toroidal and poloidal magnets.

Navigation Systems

00,545 PB9**3-184257** 00,545
PB93-184257 PC A04/MF A01
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Robot Systems Div.
Applying the NIST Real-Time Control System Reference Model to Submarine Automation: A Maneuvering System Demonstration.
Rept. for Nov 90-Mar 92.
H. M. Huang, R. Hira, R. Quintero, and A. Barbera.
Feb 93, 75p, NISTIR-5126.
Prepared in cooperation with Advanced Technology and Research, Inc., Laurel, MD. Sponsored by Defense Advanced Research Projects Agency, Arlington, VA.

Nuclear Instrumentation

00,547 PB93-166049 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Ionizing Radiation Div.

Measurement of the Energy Response of Superheated Drop Neutron Detectors.

Final rept.

R. B. Schwartz, and J. B. Hunt. 1990, 4p.

Sponsored by Bureau of Medicine and Surgery (Navy),
Washington DC.

Pub. in Radiation Protection Dosimetry 34, n1/4 p377-

380 1990.

*Neutron dosimetry, *Dosimeters. Superheating, Spectrometers, Drops, Reprints, Bubble detectors, Energy response.

Nuclear Instrumentation

Devices using the nucleation of superheated drops for neutron detection show great promise as neutron dosemeters, and, by using such devices with different energy thresholds, spectroscopic information may be obtained. The response as a function of energy was measured for three dose equivalent measuring demeasured for three dose equivalent measuring devices: the Pen Dosimeter and the area monitor, supplied by Apfel Enterprises (New Haven, Conn., USA), and the Bubble Dosimeter, supplied by Bubble Technology Industries (BTI) (Chalk River, Ontario, Canada). In addition, the energy response was also measured for the Bubble Detector Spectrometer (also supplied by DTI). BTI). Low energy monoenergetic measurements (thermal to 144 keV) were performed with the beams at the NIST Research Reactor; higher energy monoenergetic measurements (33 keV to 18 MeV) were performed at the NPL Van de Graaff accelerator. Measurements were also made of the response to the distributed neutron energy spectra from bare and moderated (252)Cf and from Am-Be radionuclide sources.

Radiation Shielding, Protection, & Safety

00,548 PB**93-173425** PC A03/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div. Dose in Water from External Irradiation by Electrons: Radiation Protection Data.

S. M. Seltzer. Feb 93, 20p, NISTIR-5136.
Sponsored by Department of Energy, Washington, DC. Office of Health and Environmental Research.

Keywords: *Radiation doses, *Electron irradiation, Radiation protection, Dose equivalents, Monte Carlo method, Tables(Data), Graphs(Charts), Water phan-

Results from electron Monte Carlo calculations are given for the absorbed dose at depths of 7, 40, 300 and 1000 mg/sq cm in a slab water phantom irradiated by electrons incident with kinetic energles from 50 keV to 10 MeV and at angles (with respect to the normal to the surface) of 0, 15, 30, 45, 60, 75 and 89 deg. Electron number and energy reflection coefficients are given also for these cases.

Radioactive Wastes & Radioactivity

00,549 NUREG/CR-4735-V8 PC A06/MF A02 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div.
Evaluation and Compilation of DOE Waste Pack-

age Test Data. Biannual Report, August 1989-January 1990. Technical rept.

C. G. Interrante, A. C. Fraker, and E. Escalante. Jun 93, 105p.

Also available from Supt. of Docs. See also NUREG/ CR-4735-V7. Sponsored by Nuclear Regulatory Commission, Washington, DC. Div. of High-Level Waste Management.

Keywords: *Radioactive waste disposal, *High-level radioactive wastes, "Packaging, Radioactive waste storage, Borosilicate glass, Waste forms, Vitrification, Leaching, Test methods, Corrosion, Crack propagation, Environmental transport, Austenitic stainless steels, Spent fuel, Cladding, Yucca Mountain Project, Nevada disposal sites Nevada disposal sites.

The report summarizes evaluations by the National Institute of Standards and Technology (NIST) of some of the Department of Energy (DOE) activities on waste packages designed for containment of radioactive high-level nuclear waste (HLW) for the six-month period, August 1989 - January 1990. This includes reviews of related materials research and plans, information on the Yucca Mountain, Nevada disposal site activities, and other Information reparding research and plans. tivities, and other information regarding supporting re-search and special assistance. Short discussions are given relating to the publications reviewed and complete reviews and evaluations are included. Reports of other work are included in the Appendices.

Reactor Engineering & Nuclear Power **Plants**

00,550 **DE93018036** PC A02/MF A01 National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Full-Thickness Clad Beam Fracture-Toughness Tests.
R. deWit, S. Low, D. Hame, and R. Fields. 6 Apr 93, 10p, DOE/OR/22034-1. Contract Al05-92OR22034 Sponsored by Department of Energy, Washington, DC.

Keywords: *Pressure Vessels, *Structural Beams, Bending, Cracks, Displacement Gages, Fatigue, Measuring Instruments, Mechanical Tests, Strain Gages, EDB/420500, EDB/220200.

A full-thickness clad-beam bend bar from a nuclear reactor pressure vessel from ORNL was used as a demonstration test beam. A fatigue crack was introduced into the beam and the specimen then instrumented with crack opening clip gages, load line displacement gages, and strain gages. The specimen was cooled to (minus)25.5 C and loaded at a constant stroke rate of 2.49 mm/min until fracture occurred after 230 seconds. Records for all gages are given. The crack length at fracture onset was 117.2 mm; the fracture surface was fairly flat and appeared to be cleavage. It is concluded that the test was successful, and it is determined that the demonstration beam test will serve as Bendbar Test (number sign) 1. 8 figs.

Physical & Chemical Oceanography

00,552 PB93-166213 PB93-166213 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Inorganic Analytical Research Div.
instrumental Neutron Activation Analysis of Standard Reference Material 1941, Organics in Marine Sediment: Element, Content and Homogeneity.

OO, PB Na Ga Lin Bo Bul Fin

S. F. Stone, B. Koster, and R. Zelsler. 1990, 9p. Pub. in Biological Trace Element Research 26-7, p579-587 Jul 90.

Keywords: *Organic compounds, *Neutron activation analysis, *Sediments, *Marine environments, Chemical analysis, Environmental monitoring, cai analysis, Environmental monitoring, Concentration(Composition), Measuring Instruments, Reprints, *Standard reference materials, *SRM 1941.

The National Institute of Standards and Technology has Issued a new Standard Reference Material (SRM) 1941, 'Organics In Marine Sediment'. in addition to the organic constituents, over thirty elements have been determined by instrumental neutron activation analysis and prompt-gamma activation analysis. The homogeneity of the material was Investigated and variances of single elemental concentrations in 250 mg samples were found to be 1% or less with regard to major inorganic constituents and rare earth elements (REE). A slightly higher variance was found for elements that may stem from biological or anthropogenic input. The element concentrations determined in this work are discussed in comparison to concentrations in other similar reference materials. Concentrations for 30 elements will be included for information on the certificate.

OCEAN SCIENCES & TECHNOLOGY

Marine Engineering

00,551 PB9**3-13**9**08**7 PC A03/MF A01 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD. Comparison of Full Scale Fire Tests and a Computer Fire Model of Several Smoke Ejection Experiments.

Tatem, and J. Bailey. Nov 92, 44p, NISTIR-4961.
Prepared in cooperation with David Taylor Research
Center, Annapolis, MD. Sponsored by Naval Research Lab., Washington, DC.

Keywords: *Fire tests, *Diesel fuels, *Polyethylene, *Computerized simulation, *Ships, Doors, Vents, Buming rate, Toxicity, Smoke, Ventilation, Compartments, Test methods, Transport properties, Combustion, Temperature distribution, Mathematical models, Compartment fires.

Data were obtained from four large scale shipboard fire tests. The test series was designed to evaluate the efficacy of a smoke ejection system for the removal of smoke and heat from compartments around the compartment of fire origin. Using diesel oil and poly-ethylene beads as fuel, tests were conducted at 0.5 MW and 1.0 MW. The data obtained from these tests were evaluated in terms of the reduction of heat and smoke in ajacent passageways. These results were compared to numerical simulations of the shipboard environment. The test results showed that the atmospheric conditions in compartments/passageways adjacent to the compartment of fire origin could be made survivable by isolating the fire compartment and ventilating adjacent spaces. It was found that, under the ventilation conditions of these tests, effective reduction in smoke and heat from peak values to ambient values took 350 to 400 s, depending on the compartment's proximity to the door of the compartment of fire origin. Comparisons with the numerical simulation showed that the authors can predict the environment which develops with reasonable confidence.

ORDNANCE

Ammunition, Explosives, & **Pyrotechnics**

PB93-125888 Not available NTIS
National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div. Effects of Pressure on the Thermal Decomposition Kinetics, Chemical Reactivity and Phase Behavior of RDX. Final rept.

P. J. Miller, S. Block, and G. J. Piermanni. 1991,

Pub. in Combustion and Flame 83, n1-2 p174-184 1991.

Keywords: *RDX, *Decomposition reactions, *Reaction kinetics, *Pressure, Phase diagrams, Decomposition, Phase transformations, Infrared spectroscopy, X-ray diffraction, Chemical reactions, Explosives, Reprints.

The effects of pressure on the thermal decomposition kinetics, chemical reactivity and phase behavior of RDX have been studied by a combination of measurement techniques in conjunction with a high pressure diamond anvil cell. These techniques include: (1) Fourier transform infrared (FTIR) spectroscopy for kinetic measurements and phase identification, (2) energy dispersive x-ray powder diffraction for identification of the observed polymorphic forms and also compression measurements, and (3) optical polarizing microscopy for visual detection and confirmation of phase transformations and determinations of transition pressures. The ruby method of pressure measurement was used in all methods employed. Studies were generally limited to the region where decomposition rates could be measured within reasonable laboratory time, i.e., below 10 GPa and 573K. The P-T phase diagram for RDX was determined to 573K and 7.0 GPa, delineating the stability fields of three solid phases, alpha, beta and gamma, and the liquids. The alpha and beta phases of RDX were found to thermally decompose, while the gamma phase transformed to either alpha or beta before reaching decomposition temperatures. The decomposition rate of alpha phase was found to increase with increasing pressure suggesting a bimolecular-type mechanism.

Armor

00,554 PB93-138998

PC A03/MF A01

of Standards and Technology, National Inst. Galthersburg, MD.

Limited Tests to Investigate Whether the Size of Body Armor Samples influences Ballistic Test Resuits.

Final rept.

K. R. Eberhardt, and L. K. Ellason. Oct 92, 33p, NISTIR-4927.

Sponsored by Department of Justice, WashIngton, DC. Office of Justice Programs.

Keywords: *Body armor, *Terminal ballistics, *Size determination, *Impact tests, Sampling, Standards, Data analysis, Test methods, Penetration, Probability the-

A limited series of tests was conducted to investigate whether the size of body armor samples influences ballistic results. An analysis of the results was conducted, and none of the factors evaluated (the size of the sam-ple, the size of the impact pattern, or front-versus-back armor panels) were found to be statistically significant. However, the confidence Intervals were large and the possibility exists that these factors could have an effect on test results. The analysis determined that a major experiment would be necessary to quantify effects. It is concluded that the size of test samples, alone, is not critical to the results obtained from tests in accordance with NIJ Standard-0101.03. It appeared that the size of the shot pattern was more likely to have an effect on the results of ballistic testing, than the other factors that were investigated. The expense of the experi-ments required to quantify the effects of armor size and shot pattern size was not believed to be warranted, for both can be avoided by not conducting tests on small size armor samples.

Guns

PB93-124865 Not available NTIS National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathe-

Space Marching Difference Schemes in the Nonlinear inverse Heat Conduction Problem. Final rept.

A. S. Carasso. 1992, 19p.

See also PB91-144360.

Pub. in Inverse Problems 8, p25-43 1992.

Keywords: *Gun barrels, *Conduction, *Finite difference method, *Nonlinear systems, *Heat transmission, Algorithms, Thermal diffusivity, Thermal conductivity, Mathematical models, Repnints, Space Marching Difference Schemes, Inverse heat conduc-

For ill-posed Initial value problems, step by step marching computations are unconditionally unstable, and necessarily blow-up numerically as the mesh is refined. However, for the 1D nonlinear inverse heat conduction problem, we show how to construct consistent marching schemes that blow-up much more slowly than the counterpart analytical problem. Several new space marching finite difference schemes are formulated and compared with existing schemes relative to their error amplification properties. Using the Lax-Richtmyer theory, we evaluate the L2 norms of the linearized discrete solution operators mapping the sensor data into the desired temperature and gradient histories at the inaccessible active surface. Various combinations of space and time differencing are examined, leading to 18 different algorithms. It is shown that while most of the 18 schemes cannot recover the thermal pulses at the gun tube wall, two of the new methods provide reasonably accurate results. A tendency to un-derestimate peak values in fast, narrow thermal pulses, is also noted.

00,556 PC A03/MF A01 PB93-161347 National Inst. of Standards and Technology (EEEL), Gaithersburg, MD.

Test Procedure for Handgun Accuracy. N. J. Calvano, and D. E. Frank. Jan 93, 16p, NISTIR-5109

Sponsored by National Inst. of Justice, Washington,

Keywords: *Firing error Indicators, *Test methods, *Accuracy, *Pistols, Ballistlcs, Fining tests(Ordnance), Test facilities, Small arms, Optical measurement, Gun

A test procedure has been designed to determine the accuracy of handguns. The test procedure utilizes a collimated light beam as a means of establishing a fixed reference line to which the handgun sights are aligned. The alm point of the handgun once aligned is the center of the target, which is positioned on the reference line. The handgun accuracy is determined as the distance of the 10-shot bullet group from the aim point, expressed as the average value of the X and Y coordinates of the 10 shots.

PHYSICS

General

00.557

AD-P008 068/9 PC A01/MF A01

National of Standards Technology, Inst. and Gaithersburg, MD.
Status of the Soft X-ray/XUV Optical Metrology Pro-

gram at the National institute of Standards and

Technology.
R. Watts, D. Ederer, T. Lucatorto, and C. Tarrio. 5

Mar 92, 2p.
This article Is from 'Physics of X-ray Multilayer Structures' AD-A255 383, pd3-1 thru pd3-2.

Keywords: *Soft x rays, Curvature, Gratings(Spectra), Mirrors, M Diameters, Gratings(Spectra), Measurement, Monochromators, Optical properties, Metrology, Reflectometers, Standards, Surfaces, Throughput, *Extreme ultraviolet radiation, Component Reports, Beamless, US NIST.

The National Institute of Standards and Technology (NIST) has initiated a program devoted to the characterization of soft x-ray optics at the wavelength of use. Although NIST has an operational XUV characterization facility which it is using to make measurements for users across the country, that facility suffers from several deficiencies that will limit its usefulness in the company years. Therefore, we are constructing an improved ing years. Therefore, we are constructing an improved monochromator/ reflectometer beamline that will upgrade and extend our XUV measurement capabilities. We will describe the optical properties of the new monochromator and discuss the state of the design of the new reflectometer. The monochromator is based on a varied line spaced plane grating that uses simple optical elements in a fixed entrance slit/fixed exit slit geometry. Important features of the new instrument include high throughput, simple wavelength scanning, resolutions in excess of 1000, and the ability to characterize large (in excess of 30 cm dlameter) optical surfaces with small radii of curvature.

00,558 N93-25059/5 (Order as N93-24978/7, PC A22/ MF A04)

National Inst. of Standards and Technology (PL), Boulder, CO. Time and Frequency Div.

Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level.

F. L. Walls, L. M. Nelson, and G. R. Valdez. Jun 92,

In ESA. Proceedings of the 6th European Frequency and Time Forum p 477-481. Sponsored in Part by CECOM Center for Space Systems.

Keywords: *Frequency measurement, *Frequency standards, *Time measurement, Frequency stability, Metrology, Algorithms, Carrier to noise ratios, Errors, Phase detectors, Signal to noise ratios, Signal transmission. White noise.

Some of the key parameters that significantly affect the overall architecture of a system that Is being designed to measure frequency or time accuracy to 3 by 10(exp -18) are examined. Specifically, the following are investigated: the timing errors in signal transmission for distances up to 100 m; the effect of changes in tem-perature and if amplitude on timing (low frequency) errors in several available phase detectors; and the Influence of measurement algorithms on the allowable level of white phase noise in the system as a function of the carrier frequency.

00.559

PB93-124873 Not available NTIS

National Inst. of Standards and Technology (PL), Gaithersburg, MD. Quantum Metrology Div. Quantum Theory of the Dynamical Cerenkov Emis-

sion of X-rays.

Final rept.

A. Caticha. 1992, 10p. Contract AFOSR-88-0018

Sponsored by Air Force Office of Scientific Research, Bolling AFB, DC.

Pub. in Physical Review B 45, n17 p9541-9550, 1 May

Keywords: *Cerenkov radiation, *X radiation, X-ray diffraction, X-ray sources, Hard x radiation, Quantum theory, Tuning, Reprints.

X-ray photons propagating in a crystal close to the Bragg-diffraction directions have an effective index of refraction that may be larger than 1. Electrons moving rapldly in crystals may therefore emit x rays. This process, the dynamical Cerenkov radiation (DCR) of x rays, is studied with use of a theory that is closely analogous to the quantum theory of the Cerenkov effect in homo-geneous media. Features of the DCR process that are calculated include the spectral width due to x-ray absorption, the systematic deviations of the photon energy from Bragg's law, the Influence of the orientation of the crystal surface, etc. Extensions of the theory to cover many-beam diffraction cases or more detailed calculations of the small recoil effects are straightforward to carry out. The photons are emitted at the far tails of the diffraction region, they are overwhelmingly in the 'diffracted' plane-wave component, and, in the two-beam case there is no anomalous Borrmann absorption. DCR is a particularly efficient emission process for hard x rays (several tens of keV) with extremely high spectral density (within small angular regions). The use of DCR for a tunable source of hard x rays should be seriously considered.

PB93-125151 Not available NTIS National Inst. of Standards and Technology (PL), Boulder, CO. Quantum Physics Div.

End-Point Sensitivity in Quantum Dynamic Caiculations.

Final rept. L. Eno. 1991, 4p. Pub. in Molecular Physics 74, n4 p923-926 1991.

Keywords: *Quantum electrodynamics, Sensitivity analysis, Limits(Mathematics), Computation, Accuracy, Reprints.

A simple way is described for assessing the accuracy of quantum dynamic calculations as the (integration) end-points are varied. It depends upon the determination of first order elementary sensitivity coefficients (i.e., partial derivatives) of the corresponding dynamic scattering matrix with respect to each of the chosen end-points. The sensitivity coefficients draw upon knowledge of the propagated wavefunction matrix; no further significant work is required than that which is already involved in obtaining the scattering matrix.

PB93-125177 Not available NTIS

National Inst. of Standards and Technology (PL), Boulder, CO. Quantum Physics Dlv.

Regular Mechanism of Parity and Time invariance Nonconserving Effects Enhancement In Neutron Capture and Scattering Near p-Wave Compound Resonances.

Final rept.

V. V. Flambaum. 1992, 11p.

Grant NSF-PHY89-04035

Prepared in cooperation with National Science Foundation, Washington, DC.

Pub. in Physical Review C 45, n1 p437-447 Jan 92.

Keywords: *Neutron capture, Uranium 238, Thorium 232, T invariance, Wave functions, Scattering, Parity, Reprints.

PHYSICS

General

Recent measurements of parity nonconserving (PNC) effects in (238)U and (232)Th contradict the results of random matrix theory for nuclear compound states. In this work, the value of the PNC effect is expressed in terms of a wave function at the nuclear surface where the wave function of the compound state is not 'ran-dom' due to boundary conditions. A mechanism is sug-gested which can explain the permanent sign and large value of these effects. The correlations between compound-state components are considered. The Tand P-odd effects can be expressed in terms of ob-served P-odd effects. The 'dynamical enhancement' of small Interactions in other reactions and other systems is also discussed.

00,562 PB93-125219 Not available NTIS National Inst. of Standards and Technology (PL), Gaithersburg, MD. Atomic Physics Div. Comment on 'Measurement of the Lamb Shifts in Singlet Levels of Atomic Helium'. Final rept.

J. D. Gillaspy, and W. C. Martin. 1992, 2p. Pub. in Physical Review A 45, n7 p5315-5316, 1 Apr

Keywords: *Helium, *Rydberg states, *Casimer effect, Lamb shift, Energy levels, Atomic spectroscopy, Precision, Reprints.

Lichten, Shiner, and Zhou (Phys. Rev. A 43, 1663 (1991)) have stated that their precision measurements of Rydberg states of helium confirm the existence of intra-atomic Casimir forces. This interpretation misidentifies the Casimir-force shift, which in fact is too small to be detected with their present level of accu-

00,563 PB93-125656 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Temperature and Pressure Div. Nuclear Orientation of (160)Tb in Tb Single Crystal. H. Marshak, P. Roman, and W. D. Brewer. 1989.

Pub. in Physical Review C 40, n4 p1759-1781 1989.

Keywords: *Terbium 160, *Nuclear alignment, Nuclear structure, Oriented nuclei, Gamma radiation, Mixing ratio, E1-transitions, E2-transitions, M1-transitions, M2-transitions, Single crystals, Interacting boson model, Reprints.

Nuclear orientation of (160)Tb in Tb single crystal has been carried out in order to obtain accurate values of multipole mixing ratios for 22 transitions in (160)Dy. The experimental aspects are described in some detail as they form the basis for obtaining high quality data. Three different methods were used to extract the mixing ratios and they are shown to agree very well. Our results for both E1/M2 and E2/M1 transitions are compared to other measurements. The signs and magnitude of the E1/M2 mixing ratios cannot be explained in the basis of Coriolis mixing of the K=0, 1, and 2 bands. Comparison of our results for the 299, 1178, and 1272 keV transitions with those from gammagamma directional correlation measurements indicate that some E3 admixture may be present in these transitions. The mixing ratios we obtained for the E2/M1 transitions are in reasonably good agreement with the predictions of IBA-1.

00,564 PB93-125698 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Precision Engineering Div.

Elementary Particle Physics In the Dalton Manner. Final rept. E. Marx. 1992, 15p.

Pub. in Jnl. of the Franklin Institute 329, n1 p111-125

Keywords: *Elementary particles, Elementary particle interactions, Relativistic theory, Quantum mechanics, Strong interactions, Weak interactions, Annihilation reactions, Pair production, Hadrons, Leptons, Reprints.

Elementary particles are separated into basic particles and composite particles paralleling Dalton's classifica-tion of chemical substances into atoms and molecules. The 'atoms' or basic particles are the neutrino, the pion, and the archaeobaryon. Particle reactions are interpreted as rearrangements of basic particles augmented by pair creation and annihilation. The number of each basic particle is algebraically conserved. The notation of chemistry is adapted to particle reactions. A Lagrangian density containing only six parameters is proposed as a starting point for calculations of masses, lifetimes, and cross sections involving strong, weak, and electromagnetic interactions.

PC A06/MF A02 of Standards and Technology, PB93-143923 National Inst. Gaithersburg, MD.

Journal of Research of the National Institute of Standards and Technology, November-December 1992. Volume 97, Number 6. 1992, 105p. Also available from Supt. of Docs. as SN703-027-00049-1. See also PB93-143931 through PB93-

143964 and PB93-131381. *Research, Keywords: Electric discharges, Wattmeters, Calibration, Electron-atom collisions, Electron-ion collisions, Electron impact, Refractive Electron-atom collisions,

index, Partial discharges. Contents: System for Measuring Conditional Amplitude, Phase, or Time Distributions of Pulsating Phenomena; High Power CW Wattmeter Calibration at NIST; Compact Fitting Formulas for Electron-impact Cross Sections; Accuracy of the Double Variation

Technique of Refractive Index Measurement.

00,566 PB93-143956 (Order as PB93-143923, PC A06/ MF A02) National Inst. of Standards and Technology, Gaithersburg, MD.
Compact Fitting Formulas for Electron-impact Cross Sections. Y. K. Kim. 1992, 4p. Included in Jnl. of Research of the National Institute

of Standards and Technology, v97 n6 p689-692 Nov/

Keywords: *Electron-atom collisions, *Electron-ion collisions, *Electron impact, Ionization cross sections, Excitation, Hydrogen, Helium.

Compact fitting formulas, which contain four fitting constants, are presented for electron-impact excitation and ionization cross sections of atoms and ions. These formulas can fit experimental and theoretical cross sections remarkably well, when resonant structures are smoothed out, from threshold to high incident electron energies (<10 keV), beyond which relativistic formulas are more appropriate. Examples of fitted cross sections for some atoms and ions are presented. The basic form of the formula is valid for both atoms and molecules.

PB93-146033 PC A03/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div.
ESTAR, PSTAR, and ASTAR: Computer Programs for Calculating Stopping-Power and Range Tables for Electrons, Protons, and Helium Ions. M. J. Berger. Dec 92, 31p, NISTIR-4999. Sponsored by Department of Energy, Washington, DC. Office of Health and Environmental Research.

Keywords: *Stopping power, *Alpha particles, *Electrons, *Protons, *Range, Computer programs, ASTAR computer program, ESTAR computer program, PSTAR computer program.

This report describes three computer codes, ESTAR, PSTAR and ASTAR, which calculate stopping-power and range tables for electrons, protons, or helium ions, according to methods described in ICRU Reports 37 and 49. The codes provide output for electrons in any stopping material, and for protons and helium ions in 74 materials. Executable programs are provided which can be run on IBM-compatible personal computers. Fortran source code is also provided for implementing the codes on other computers.

00,568 PB93-148963 Not available NTIS Japan Atomic Energy Research Inst., Tokai.

Spectral Data and Grotrian Diagrams for Highly Ionized Cobalt, Co VIII through Co XXVII.

T. Shirai, A. Mengoni, Y. Nakai, K. Mori, H. Sakai, J. Sugar, and W. L. Wiese. c1992, 99p. Prepared in cooperation with National Inst. of Standards and Technology, Gaithersburg, MD., and Hiroshima-Denki Inst. of Tech. (Japan).

Included in Jnl. of Physical and Chemical Reference Data, v21 n1 p23-121 Jan/Feb 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Cobalt lons, *Spectra, Atomic energy levels, Transition probabilities, Oscillator strengths, Wavelengths, Plasma, Tables(Data), Grotnan diagrams.

Wavelengths, energy levels, level classifications, oscillator strengths, and atomic transition probabilities for the cobalt ions Co VIII to Co XXVII are tabulated. A short review is given for the wavelength measurements on each stage of ionization. Grotrian diagrams are also presented to provide graphical overviews. The literature has been surveyed to March 1990.

PB93-148997 Not available NTIS
American Chemical Society, Washington, DC.
Journal of Physical and Chemical Reference Data,
Volume 21, No. 2, March/April 1992. PB93-148997 Bimonthly rept.

D. R. Lide. c1992, 225p.
See also PB93-149003, PB93-149011, and PB93-148948. Prepared in cooperation with American Installation of Physics, New York. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD. Available from American Chemical Society, 1155 Slx-teenth St., NW, Washington, DC. 20036-9976.

Keywords: *Molecular clouds, *Stellar envelopes, *Vanadium ions, *Microwave spectra, Tables(Data).

Contents: Recommended Rest Frequencies for Observed Interstellar Molecular Microwave Transitions-1991 Revision; Spectral Data and Grotrian Diagrams for Highly Ionized Vanadium, V VI through V XXIII.

00,570 PB93-149011 Not available NTIS Japan Atomic Energy Research Inst., Tokai.
Spectral Data and Grotrian Dlagrams for Highly Ionized Vanadium, V VI through V XXIII.
T. Shirai, T. Nakagaki, J. Sugar, and W. L. Wiese. Prepared in cooperation with National Inst. of Stand-

ards and Technology, Gaithersburg, MD. Included in Jnl. of Physical and Chemical Reference Data, v21 n2 p273-389 Mar/Apr 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Vanadium ions, *Spectra, Atomic energy levels, Transition probabilities, Oscillator strengths, Wavelengths, Plasma, Tables(Data), Grotnan dia-

Wavelengths, energy levels, level designations, oscillator strengths, and atomic transition probabilities for the vanadium ions V VI to V XXIII are tabulated. A short review of the line identifications and wavelength measurements is given for each stage of ionization. Grotnan diagrams are also presented to provide graphical overviews. The literature has been surveyed to September 1991.

00,571 PB93-149086 Not available NTIS
Joint Inst. for Lab. Astrophysics, Boulder, CO.
Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)),
ArH(+), H(-), H, and H2 with Ar and of Ar(+) and
ArH(+) with H2 for Energles from 0.1 eV to 10 keV.
A. V. Phelps. c1992, 15p.
Included in Jnl. of Physical and Chemical Reference
Data, v21 n4 p883-897 Jul/Aug 92. Available from
American Chemical Society, 1155 Sixteenth St., NW,
Washington, DC 20036-9976

Washington, DC. 20036-9976.

Keywords: *Atom-molecule collisions, *Ion molecule collisions, *Ion-atom collisions, *Hydrogen, *Argon, Argon hydrides, Argon ions, Hydrogen ions, Momentum transfer, Charge transfer, Cross sections, KeV range 1-10, EV range, Milli eV range, Dissociation, Excitation, Ionization, Tables(data).

Graphical and tabulated data and the associated bibllography are presented for cross sections for elastic, excitation, and ionization collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2 for laboratory energies from 0.1 eV to 10 keV. Where appropriate, drift velocities and reaction or excitation coefficients are cal-culated from the cross sections and are recommended for use in analyses of swarm experiments and electrical discharges. Collisions of H with Ar are of especial interest because of the very large cross sections for excitation of the H atoms at low energies.

00,572 PB93-149094 PB93-149094 Not available NTIS
American Chemical Society, Washington, DC.
Journal of Physical and Chemical Reference Data, Volume 21, No. 5, September/October 1992.

Bimonthly rept.

D. R. Lide. c1992, 204p.

See also PB93-149102 through PB93-149128 and PB93-149045. Prepared in cooperation with American inst. of Physics, New York. Sponsored by National inst. of Standards and Technology, Gaithersburg, MD.

Available from American Chemical Society, 1155 Sixteenth St. NW Washington DC 20036-9876 teenth St., NW, Washington, DC. 20036-9976.

Keywords: *Argon ions, *Cadmium inorganic compounds, *Zinc inorganic compounds, *Solubility, *Fluorescence, Transition probabilities, Nitrogen, Oxy-

Contents: A Critical Compilation of Atomic Transition Probabilities for Singly Ionized Argon; The Solubility of Some Sparingly Soluble Salts of Zinc and Cadmium in Water and in Aqueous Electrolyte Solutions; Franck-Condon Factors, r-Centroids, Electronic Transition Moments, and Einstein Coefficients for Many Nitrogen and Oxygen Band Systems.

00,573 PB93-149102 Not available NTIS Zagreb Univ. (Yugoslavia).
Critical Compliation of Atomic Transition Probablittes for Singly Ionized Argon.
V. Vujnovic, and W. L. Wiese. c1992, 21p.
Prepared in cooperation with National Inst. of Standards and Technology, Gaithersburg, MD. Included in Jnl. of Physical and Chemical Reference Data, v21, n5 p919-939 Sep/Oct 92. Available from American Chemical Society, 1155 Sixteenth St., NW, Washington, DC. 20036-9976.

Keywords: *Argon ions, *Transition probabilities, Atom-lc energy levels, Argon plasma, Branching ratio, Wave-lengths, Tables(Data).

The authors have critically compiled the atomic transl-tion probabilities of Ar II lines by combining recent high-accuracy lifetime data with branching-ratio emission measurements. They present several companisons of the various literature data, including theoretical results, and they discuss their assessment procedure in detail. On the basis of the procedure, the authors present an extensive list of critically evaluated transition probabilities with uncertainty estimates.

00,574 PB93-150746 PB93-150746 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Technology Div.
Transport Current Effects on Fiux Creep and Magnetization in Nb-Ti Multifilament Cable Strands.
Final rent

Final rept.

R. W. Cross. 1992, 6p.
See also PB91-202903 and PB91-202911. Sponsored by Department of Energy, Washington, DC.
Pub. in Advances in Cryogenic Engineering Materials, v38 ptB p731-736 1992.

Keywords: *Superconducting cables, Electric current, Niobium alloys, Titanium alloys, Magnetization, Hysteresis, Reprints, *Flux creep, Multifilaments.

We used a Hall-probe magnetometer to measure the we used a Hall-probe magnetometer to measure the effect of transport current on magnetization and flux creep in Nb-Ti multifilamentary cable strands. Large transport currents, up to 70% of the critical current I(c) were applied to the sample. The external field was applied transverse to the current and sample length. When the applied current approached the critical current of the strand the magnetization decreased and rent of the strand, the magnetization decreased and the Lorentz-force interaction between the field and the transport current dominated the creep. Both the short-time and long-time decay of magnetization increased. The increase in the short-time decay was too large to be explained by eddy current decay. The long-time decay was enhanced by a factor of 4 with a transport current of approximately 0.7I(c).

Not available NTIS National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Inorganic Analytical Research Div. Determination of Uranium and Thorium in Materials Associated with Real Time Electronic Solar **Neutrino Detectors.**

Final rept.
J. D. Fassett, and W. R. Kelly. 1992, 7p.
Pub. in Nuclear Instruments and Methods in Physics
Research B69, p503-509 1992.

Keywords: *Neutrino detection, *Uranium, *Thonum, Mass spectroscopy, Chemical analysis, Trace amounts, Radiation detectors, Targets, Reprints, Ther-

The application of isotope dilution thermal ionization mass spectrometry to the determination of both uranium and thorium in four different target materials used or proposed for electronic neutrino detectors is described. Isotope dilution analysis is done using highly enriched (233)U and (230)Th separated Isotopes. Sensitivity of the technique is such that sub-picogram amounts of material are readily measured. The overall limit to measurement is caused by contamination of these elements during the measurement process. Uranium is more easily measured than thorum because both the instrumental sensitivity is higher and contami-nation is better controlled. The materials analyzed were light and heavy water, pseudocumene, and min-

PB93-151140 Not available NTIS National Inst. of Standards and Technology (PL), Gaithersburg, MD. Atomic Physics Div. Observation of Quantized Motion of Rb Atoms In an Optical Field. Final rept.
P. S. Jessen, C. Gerz, P. D. Lett, R. J. C. Spreeuw, C. I. Westbrook, W. D. Phillips, and S. L. Rolston.

1992, 4p.

Sponsored by Office of Naval Research, Arlington, VA. Pub. in Physical Review Letters 69, n1 p49-52, 6 Jul

Keywords: *Quantum optics, Resonance fluorescence, High resolution, Reprints, Rubidium atoms, Laser cooling, Atom traps, Lamb-Dicke effect.

We observe transitions of laser-cooled Rb between viwe observe transitions of laser-cooled Hb between vibrational levels in subwavelength-sized optical potential wells, using high-resolution spectroscopy of resonance fluorescence. We measure the spacing of the levels and the population distribution, and find the atoms to be localized to 1/15 of the optical wavelength. We find up to 60% of the population of trapped atoms in the vibrational ground state. The dependence of the spectrum on the parameters of the optical field provides detailed information about the dynamics of laservides detailed information about the dynamics of lasercooled atoms.

PB93-151264 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div. Proposed Measurement of the Fine Structure Constant Using a Coulomb-Blockade Charge Pump.

J. M. Martinis, G. Zimmerli, T. M. Eiles, H. D. Jensen, and E. Williams. 1992, 2p. Pub. in Conference Record for Conference on Precision Electromagnetic Measurements Paris, France, June 9-12, 1992, p14-15. (CPEM'92),

Keywords: *Sommerfeld constant, Experimental design, Josephson effect, Measurement, Capacitors, Electrometers, Reprints, *Fine structure constant.

We propose a new experiment to measure the fine structure constant alpha. The experiment uses an electron pump to transfer a countable number of electrons onto a cryogenic capacitor. Given a definite number of electrons on this capacitor, we can obtain a value for alpha by measuring the voltage in terms of the Josephson effect and the capacitance in terms of the calculable capacitor.

00,578 PB93-151611 Not available NTIS National Inst. of Standards and Technology (PL), Gaithersburg, MD. Electron and Optical Physics Div. Treatment of Continuum-Continuum Coupling In the Theoretical Study of Above Threshold Ionization.

Final rept.
L. Pan. 1990, 9p.
Pub. In Proceedings of NATO ASI Series, Atom in Strong Fields, Kos, Greece, October 9-21, 1988, p447-

Keywords: *Multi-photon processes, Photon-atom collisions, Perturbation theory, Laser radiation, Ionization, Reprints, Coulomb-Volkov state.

In the theoretical study of intense fields multiphoton processes, especially the above-threshold ionization process, the nonperturbative treatment of continuumcontinuum coupling has been one of the major difficul-ties. A set field-dressed continuum states has been derived which can form a basis for a less perturbative approach.

00,579 PB93-151769 PB93-151769 Not available NTIS
National inst. of Standards and Technology (PL),
Gaithersburg, MD. Quantum Metrology Div.
X-ray Beam Position Monitor Using a Quadrant PIN

Diode. Final rept.

S. H. Southworth, and P. L. Cowan. 1992, 5p. Pub. in Nuclear Instruments and Methods in Physics Research A319, p51-55 1992.

Keywords: *Synchrotron radiation, *X-ray sources, *Beam monitors, *PIN diodes, Monochromatic radiation, Performance evaluation, Silicon diodes, Beam position, Reprints.

We report on the use of a quadrant PIN silicon photodiode as a position monitor of the monochromatized X-ray beam in a synchrotron radiation beamline. Signal levels corresponding to the honzontal and vertical beam positions and to the total intensity intercepted are derived simultaneously. The detector is demonstrated to be quite sensitive to the analysis and translational motion of the X-ray beam area. gular and translational motion of the X-ray beam ansing from movement of beamline optical components. Use of the detector to obtain diagnostic information and as a position sensor in feedback loops is discussed.

00,580 PB93-153195 Not available NTIS National Inst. of Standards and Technology (PL), Boulder, CO. Time and Frequency Div. Atomic Physics Tests of Nonilnear Quantum Mechanics. Final rept.

Final rept.
J. J. Bollinger, D. J. Heinzen, W. M. Itano, S. L.
Gilbert, and D. J. Wineland. 1992, 7p.
See also PB92-170752. Sponsored by Air Force Office
of Scientific Research, Bolling AFB, DC., and Office of
Naval Research, Arlington, VA.
Pub. in Proceedings of Conference Foundations of
Quantum Mechanics, Santa Fe, NM., May 27-31,
1991, p40-46

1991, p40-46 1992.

Keywords: *Quantum mechanics, Radiofrequency spectroscopy, Schrodinger equation, Nuclear spin, Nonlinear problems, Atomic physics, Causality, Tests, Reprints, Penning traps.

Atomic physics experiments which test a nonlinear generalization of quantum mechanics recently formulated by Weinberg are described. The experiments search for a dependence of hyperfine transition frequencies or nuclear spin precession frequencies on the relative populations of the hyperfine or nuclear spin states. The experiments set limits less than 10 microHz on the size of the possible nonlinear contributions to these frequencies. In some cases this can be interpreted as a limit of less than about 10(Sup -26) on the fraction of binding energy per nucleon that could be due to a nonlinear correction to a nuclear Hamiltonian. The possibility that a nonlinear addition to quantum mechanics violates causality is discussed.

PB93-153203 Not available NTIS National Inst. of Standards and Technology (PL), Boulder, CO. Time and Frequency Div.

Low Order Modes of an Ion Cloud in a Penning Trap. Final rept.

J. J. Bollinger, D. J. Heinzen, F. L. Moore, W. M. Itano, and D. J. Wineland. 1992, 3p.
Sponsored by Office of Naval Research, Arlington, VA. Pub. in Physica Scripta 46, p282-284 1992.

Keywords: *Ion storage, Trapping(Charged particles), Beryllium ions, Spheroids, Reprints, Penning traps, Laser cooling, Ion clouds.

The electrostatic modes of a cloud of ions confined In a Penning trap are discussed in the limit that the Debye length is small compared to the cloud dimensions and

General

the cloud dimensions are small compared to the trap dimensions. Experimental measurements of some of these mode frequencies on plasmas of laser-cooled these mode frequencies on plasmas of laser-cooled Be(+) lons agree well with calculations. Observation of the modes provides a nondestructive method for obtaining information on the ion density and cloud shape. In addition, excitation of the modes by static field asymmetries may provide a practical limit to the density and number of charged particles that can be stored in a Repaired trae. In a Penning trap.

00,582 PB9**3-153534** Not available NTIS National Inst. of Standards and Technology (CSTL), Boulder, CO. Thermophysics Div. Radiative Heat Transfer in Translent Hot-Wire Measurements of Thermal Conductivity. C. A. Nieto de Castro, R. A. Perkins, and H. M.

Roder. 1991, 13p. Pub. in International Jnl. of Thermophysics 12, n6 p985-997 Nov 91.

Keywords: *Thermal conductivity, *Toluene, *Radiative heat transfer, *Hot-wire flowmeters, Heat transmission, Measuring instruments, Thermodynamic properties, Thermal radiation, Thermophysical properties, Thermodynamic properties, Reprints.

New measurements of the thermal conductivity of liquid toluene between 300 and 550 K have been used to study the importance of radiative heat transfer when using the transient hot-wire technique. The experi-mental data were used to obtain the radiation correction to the hot-wire temperature rise. Radiation-cor-rected values of thermal conductivity are reported. This study shows that the transient hot-wire method is much less affected by radiation than steady-state techniques.

PB93-153609 Not available NTIS National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div.

Physical Parameters for L X-ray Production Cross-Sections. Final rept. S. Puń, B. Chand, M. L. Garg, P. N. Trehan, N. Singh, and J. H. Hubbell. 1992, 4p. Pub. in X-ray Spectrometry 21, p171-174 1992.

Keywords: *X-ray spectra, Coster-Kronig transitions, Ionization cross sections, KeV range 10-100, Photoionization, Reprints.

Photon-induced L x-ray production cross-sections for the elements with 56 = or < z = or < 92 were calculated at different energies in the range 11-60 keV using the photoionization cross-sections based on the relativistic Dirac-Hartree-Slater (RDHS) model, fluorescence yields and Coster-Kronig transition probabilities based on the RDHS model and two sets of emission rates based on the Dirac-Fock (DF) model and the Dirac-Hartree-Slater (DHS) model. These calculated results were compared with the experimentally measured cross-sections to check the applicability of emission rates based on the DF and DHS models.

PB93-153633 Not available NTIS National Inst. of Standards and Technology (PL), Boulder, CO. Time and Frequency Div.

lonic Crystals in a Linear Paul Trap. Final rept.

M. G. Raizen, J. M. Gilligan, J. C. Bergquist, W. M. Itano, and D. J. Wineland. 1992, 9p. Sponsored by Office of Naval Research, Ariington, VA., and Air Force Office of Scientific Research, Bolling AFB, DC

Pub. in Physical Review A 45, n9 p6493-6501, 1 May

Keywords: *Ion storage, Trapping(Charged particles), Atomic spectroscopy, Atomic clocks, Ionic crystals, Mercury ions, Mercury 199, Frequency standards, Microwaves, Reprints, Paul traps, Ion traps, Laser

The authors describe a configuration for a linear Paul of ion trap. This trap can store a long string of ions with a small second-order Doppler shift, comparable to that achieved with a single ion in a quadrupole Paul trap. Crystallized strings of trapped lons, as well as more complicated structures, have been observed in the trap. They report an observation of the 40.5-GHz ground-state hyperfine Interval of (199)Hg(1+) by microwave-optical double-resonance spectroscopy and discuss prospects for a microwave frequency standard based on a trapped string of lons.

00,585 PB9**3-153773** Not available NTIS National Inst. of Standards and Technology (NML), Galthresburg, MD. Gas and Particulate Science Div. Application of the Hough Transform to Electron Diffraction Patterns.

J. C. Russ, D. S. Bright, J. Christian Russ, and T. N. Sponsored by Texas Univ. at Austin. Dept. of Biomedical Engineering.

Pub. In Jnl. of Computer-Assisted Microscopy 1, n1 p3-37 1989.

Keywords: *Microscopy, *Electron *Computer applications, Image analysis, Pattern recognition, Reprints, *Hough transform, Channeling pat-

The Hough transform maps Information from the spatial domain to a space in which the coordinates define lines or curves. This space accumulates values from multiple points in the spatial domain, to identify the principal arrangements of the points. This technique has been applied to other image interpretation problems, but is here used to extract information from electron diffraction patterns. Examples include locating lines of points in patterns from single crystals, and the additional points due to precipitates or superlattices. In addition to straight lines, it is also possible to locate rings in selected area pattems, and to accurately measure the radius and integrated intensity of the rings. Convergent beam electron diffraction pattems and selected area channeling patterns contain linear features which can be accurately located and their widths measured. The Hough transform is moderately demanding on computer memory and time, but is with-in the capability of dedicated personal computers.

00,586 PB9**3-162873** PC A07/MF A02 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. NIST REACTOR: Summary of Activities, July 1991 through September 1992.
Feb 93, 132p, NISTIR-5120.
See also PB92-149731.

Keywords: *NBSR reactor, Research reactors, Activation analysis, Cold neutrons, Crystal structure, Neutron diffraction, Neutron radiography, Nondestructive tests, Analytical chemistry, Fullerenes, Hydrogen, Magnetism, Polymers, Macromolecules, Microstructure, Magnetic superconductors, Langmuir-Blodgett films, Multilayers.

The report summarizes all the programs which use the NIST reactor. It covers the period for July 1991 through September 1992. The programs range from the use of neutron beams to study the structure and dynamics of materials through nuclear physics and neutron standard. ards to sample irradiations for activation analysis, isotope production, neutron radiography, and non-destructive evaluation.

PB93-165710 Not available NTIS National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Electron and Optical Physics Div.
Second Order Transfer Matrices for
Inhomogeneous Field Wien Filters Including Spin-Precession. Final rept.

M. R. Scheinfein. 1989, 15p. Pub. in Optik 82, n3 p99-113 1989.

Keywords: Transfer matrix method, Focusing, Aberration, Correction, Reprints, *Wien filters, Electron spin polarization, Spin precession.

The Inhomogeneous field Wien filter offers an alternative to the conventional uniform field Wien filter, magnetic sector and electrostatic deflector for electronspin rotation. The main advantage of the inhomogeneous field Wien filter used for electron-spin rotation is the point-to-point double focusing which preserves the cylindrical symmetry in a beam transport system. Both uniform and inhomogeneous field Wien filters may be used simultaneously for spin rotation and energy/mass analysis. The complete transfer matrix of a general inhomogeneous field Wien filter will be derived in a second order approximation. The matrix elements for the precession of the electron spin-polariza-tion vector are included in a separate spin-rotation ma-trix. Real entrance and exit fringing fields are included for the specialized case of a Wien filter with curved and normal (not inclined) entrance and exit pole faces. The transfer matrices will be parameterized in terms of beam parameters and the multipole expansion coefficlents of the filter's electric and magnetic fields.

PB93-165991 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Atomic and Plasma Radiation Div.
Higher-Order Vacuum Polarization Corrections in Muonic Atoms.

Final rept.
J. M. Schmidt, P. J. Mohr, and G. Soff. 1989, 4p.
See also DE88756945.
Pub. In Physical Review A 40, n4 p2176-2179 1989.

Keywords: *Muonic atoms, Vacuum polarization, Quantum electrodynamics, Energy levels, Corrections,

Energy shifts in muonic atoms caused by vacuum polarization of order alpha(Z(alpha))(sup n) with n = or > 3 are calculated. Nuclear size corrections are taken into account. The calculations are performed for all muonic levels from the 1s(1/2)-state to the 5g(9/2)-state in various atoms with nuclear charge Z between 30 and 100.

PB93-166155 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Atomic and Plasma Radiation Div. Influence of Vacuum Polarization Corrections of Order alpha(z(alpha)) and alpha(z(alpha))(sup 3) in Hydrogen-Like Uranium.

Final rept. G. Soff, and P. J. Mohr. 1989, 2p. See also DE88756940.

Pub. in Physical Review A 40, n4 p2174-2175 1989.

Keywords: *Uranium, Quantum electrodynamics, Rydberg states, Vacuum polarization, Energy levels, Reprints, *Hydrogen-like ions, Uehling potential, Wichmann-Kroll correction.

Energy shifts of a bound electron in hydrogen-like uranium due to vacuum polarization corrections of order alpha(z(alpha)) and alpha(z(alpha))(sup 3) are calculated. It is shown that for Rydberg levels, the higherorder Wichmann-Kroll correction of order alpha(z(alpha))(sup 3) is greater than the order alpha(z(alpha)) Uehling contribution.

PB93-166270 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Atomic and Plasma Radiation Div. Spectroscopy of the 3s(2)3p(n) Shell from Cu to

Final rept.
J. Sugar. 1990, 7p.
Pub. in Verh. - K. Ned. Akad. Wet., Afd. Natuurkd.,
Eerste Reeks, v33 p184-190 1990.

Keywords: *Isoelectronic sequence, *M1-transitions, Arsenic, Bromine, Copper, Gallium, Germanium, Krypton, Molybdenum, Niobium, Rubidium, Selenium, Strontium, Yttnum, Zinc, Zirconium, Spectroscopy, Tables(Data), Reviews, Reprints.

The 3s(2)3p(n) Isoelectronic sequences from Cu to Mo have been actively Investigated In the past 15 years because of the importance of these spectra for tokamak plasma diagnostics. Many magnetic dipole transitions within these configurations were identified In tokamak plasmas even before anything was known of many of these ions. The authors give a brief review of the major spectroscopic studies that have been carned out with these ions. Revised tables of M1 lines for the isoelectronic sequences 3s(2)3p(2) and 3s(2)3p(4) from Cu to Mo are given.

PB93-166320 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Surface Science Div. Material Dependence of Electron Inelastic Mean Free Paths at Low Energies. Final rept.

S. Tanuma, C. J. Powell, and D. R. Penn. 1990, 4p. Pub. in Jnl. of Vacuum Science and Technology A 8, n3 p2213-2216 1990.

Keywords: *Electron collisions, *Mean free path, *Aluminum, *Gold, Inelastic scattering, Electron scattering, Energy dependence, EV range 10-100, EV range 100-1000, KeV range 1-10, Attenuation, Re-

The authors have calculated electron inelastic mean free paths (IMFPs) for 50-2000 eV electrons in 31 materials (27 elements and 4 compounds). The authors present and discuss in the paper IMFP data for aluminum and gold in the 50-200 eV range. Substantial differences are found in the shapes of the IMFP versus energy curves and these can be understood in terms of the different Inelastic scattering mechanisms in the two metals. The minimum IMFP value occurs at 40 eV in aluminum and at 120 eV in gold, a result which is consistent with the trends expected from free-electron IMFP calculations. This result differs, however, from that expected from the Seah and Dench attenuation length formula, which shows essentially no material dependence at low energies. The authors have extended a general formula derived earlier to describe the calculated IMFPs over the 200-2000 eV energy range to give the IMFP dependences on material and energy from 50 to 2000 eV.

00,592 PB93-166353

PB93-166353 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Center for Atomic, Molecular and Optical Physics.

Constants, Fundamental.

Final rept.

B. N. Taylor. 1991, 11p.

Pub. in Encyclopedia of Physics, p180-190 1991.

Keywords: *Fundamental constants, Sommerfeld constant, Josephson effect, Least squares method, Quantum electrodynamics, Electron spin, Magnetic moments, Anomalies, Adjusting, Reprints, Quantum Hall effect, Fine structure constant.

The article touches upon four main topics: (1) the motivation for 'the romance of the next decimal place,' or why the fundamental physical constants are important and why their determination to ever greater levels of accuracy can have a profound effect on physics; (2) how a self-consistent set of 'best values' of the fundamental constants is obtained with emphasis on the 1986 least-squares adjustment of the constants (the most recent comprehensive study carried out); (3) new developments in the fundamental constants field since the 1986 adjustment was completed and their impact on the recommended set of best values resulting from that adjustment; and (4) future trends - where the fleld is heading over the next five to ten years.

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PB93-166361 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Center for Atomic, Molecular and Optical Physics.

New International Volt and Ohm Standards.

Final rept.

B. N. Taylor. 1989, 5p.
See also PB89-184097.
Pub. in Proceedings of International Symposium on Electromagnetic Metrology, Beijing, P.R.C., August 19-22, 1989, p143-147.

Keywords: *Standards, Metrology, Josephson effect, International agreements, Reprints, *Resistance standards, *Voltage standards, *Volt, *Ohm, Quantum Hall effect, Consultative Committee on Electricity.

The paper reviews the new internationally agreed upon volt and ohm reference standards based on the Jo-sephson and quantum Hall effects that are to come into effect worldwide starting on January 1, 1990; and the method to be used by the national standards laboratories to report the results of calibrations performed with the new standards.

00,594 PB93-166**3**79 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Center for Atomic, Molecular and

Preparing for the New Volt and Ohm.

Final rept.

Optical Physics.

B. N. Taylor. 1989, 4p.
Pub. In IEEE (Institute of Electrical and Electronics Engineers) Spectrum 26, n7 p20-23 1989.

Keywords: *Standards, International agreements, Josephson effect, Capacitance, Metrology, Temperature

measurement, Reprints, *Resistance standards, *Voltage standards, *Volt, *Ohm, Quantum Hall effect, Farad.

The paper discusses the newly established and Internationally adopted representations of the volt and ohm based on the Josephson and quantum Hall effects, respectively, that are to come into effect worldwide start-Ing January 1, 1990. It also provides some general guidelines and instructions on how to bring laboratory reference standards of voltage and resistance and related instrumentation into conformity with the new representations. Also covered is the effect on electrical standards of the January 1, 1990 replacement of the International Practical Temperature Scale of 1968 by the International Temperature Scale of 1990; and of the January 1, 1990 change in the U.S. representation of the Farad.

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PB93-166387 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Thermophysics Div.

Probes of Equipartition in Nonlinear Hamiltonian

Systems.

Final rept.

D. Thirumalal, and R. D. Mountain. 1989, 23p.

See also N85-29668.

Pub. in Jnl. of Statistical Physics 57, n3-4 p789-801 1989.

Keywords: Ergodic processes, Nonlinear systems, Time dependence, Dynamical systems, Reprints, *Equipartition, FPU model, Nonlinear oscillations.

The time scales for equipartition to be reached is studled using a generalization of the recently introduced measure of ergodicity in liquids. The beta-Fermi-Pasta-Ulam model is chosen as an illustration. The measures are constructed by following the evolution of the systems using two independent initial conditions. The time averaged property of an observable is calculated using the two dynamical trajectories. The measure is essentially the norm in the space of the observable obtained from the two trajectories. The authors have shown that the time dependent behavior is a good indicator of the equipartition in large nonlinear systems. The numerical results show that equipartitioning critically depends on the initial conditions, and even when mode mixing occurs, the time scales appear to be extremely long.

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PB93-166528 Not available NTIS National Inst. of Standards and Technology (EEEL),

Gaithersburg, MD. Electricity Div.

Detection of S2F10 Produced by Electrical Dis-

charge in SF6.

Final rept.

H. J. Van Brunt, J. K. Olthoff, I. Sauers, F. Y. Chu, H. D. Mornson, and J. R. Robins. 1992, 4p. See also PB89-231039 and PB92-171693. Sponsored

by Department of Energy, Washington, DC. Office of Energy Storage and Distribution, and Electric Power Research Inst., Palo Alto, CA.

Pub. in Proceedings of International Conference on Gas Discharges and Their Applications (10th), Swansea, UK., September 13-18, 1992, p418-421.

Keywords: *Electric discharges, *Gas discharges, *Arc discharges, *Corona discharges, *Sulfur hexafluoride, Concentration(Composition), Gas chromatography, Infrared spectroscopy, Absorption spectroscopy, Mass spectroscopy, Reprints, Disulfurdecafluoride.

Three methods for measuring the concentration of S2F10 In SF6 are briefly described. These are: (1) a s2F10 In SF6 are briefly described. These are: (1) a gas chromatograph-mass spectrometer equipped with a thermal conversion tube, (2) a gas chromatograph coupled with an electron-capture detector and a gas enrichment process, and (3) an Infrared absorption technique. The above techniques were used to investigate the production of S2F10 from dc-corona discharges and power arcs. The measured yields of \$2F10 from corona were found to be quite reproduct. S2F10 from corona were found to be quite reproducible thus suggesting the possibility of using this type of discharge to generate 'reference' gas samples that contain known quantities of S2F10 in SF6. The relative yield of S2F10 from power arcs is found to be very low compared with the yields of other stable by-products such as SOF2, which was expected from the low thermal stability of S2F10.

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PB93-166635 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Quantum Metrology Div.

Measurement of (3)He(n,gamma)(4)He Cross-Section at Thermai Neutron Energies.

Final rept. F. L. H. Wolfs, G. L. Greene, M. S. Dewey, S. J. Freedman, and J. E. Nelson. 1989, 4p. Pub. in Physical Review Letters 63, n25 p2721-2724

Keywords: *Helium 3 target, *Neutron capture, *Neutron cross sections, Solar neutrinos, Proton reactions, Measurement, Reprints, Radiative capture.

The authors have measured the cross-section for radiative capture of thermal neutrons on (3)He. The measured cross-section of 54 + or - 7 micro(b) is used to estimate the astrophysical S-factor for the reaction (3)He(p,e + nu)(4)He which gives rise to high energy neutrinos from the sun.

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PB93-166817

PC A08/MF A02 of Standards and Technology, National Inst. Gaithersburg, MD.

Journal of Research of the National Institute of Standards and Technology, January-February 1993. Volume 98, Number 1. Special Issue.

Also available from Supt. of Docs. as SN703-027-00050-4. See also PB93-166825 through PB93-166916 and PB93-143923.

Keywords: *Neutron scattering, *Neutron spectrometers, *Research facilities, Time-of-flight spectrometers, Condensed matter physics, Cold neutrons, Small angle scattering, Neutron diffraction, Neutron spectrometers, Neutron spectroscopy, Neutron physics, Surface analysis, Activation analysis, NBSR reactor, Uses, *Cold Neutron Research Facility, *CNRF facility, Neutron depth profiling, Depth profiles, US NIST.

Contents:

The NIST Cold Neutron Research Facility; Outline of Neutron Scattering Formalism; Small Angle Neutron Scattering at the National Institute of Standards and Technology;
Neutron Reflectivity and Grazing Angle Diffraction;
The Triple Axis and SPINS Spectrometers; Neutron Time-of-Flight Spectroscopy; Ultra-High Resolution Inelastic Neutron Scattering; Neutron Depth Profiling: Overview and Description of NIST Facilities; Prompt-Gamma Activation Analysis; Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility.

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PB93-166825 (Order as PB93-166817, PC A08)
National Inst. of Standards and Technology,
Gaithersburg, MD.
NIST Cold Neutron Research Facility.

H. J. Prask, J. M. Rowe, J. J. Rush, and I. G.

Schroder. 1993, 13p.
Included In Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p1-13 Jan/Feb

Keywords: *Research facilities, *Cold neutrons, Neutron guldes, Neutron detectors, Neutron sources, NBSR reactor, Research reactors, *CNRF facility, US

The Cold Neutron Research Facility (CNRF) at the National Institute of Standards and Technology (NIST) Research Reactor (NBSR) Is now coming on line, with the first seven experimental stations operational, and more stations scheduled to be installed during 1992. The present article provides an introduction to the facility, and to other articles in the current issue that give more details on some of the research opportunities that the facility will bring to NIST.

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(Order as PB93-166817, PC A08) of Standards and Technology, PB93-166833 National Inst. Gaithersburg, MD.

Outline of Neutron Scattering Formalism.

N. F. Berk. 1993, 16p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p15-30 Jan/Feb

Keywords: *Neutron scattering, Small angle scattering, Quasi-elastic scattering, Van Hove theory, Born approximation, Inelastic scattering, Elastic scattering, Sum rules, Neutron reflection.

PHYSICS

General

Neutron scattering formalism is briefly surveyed. Topics touched upon include coherent and incoherent scattering, bound and free cross-sections, the Van Hove formalism, magnetic scattering, elastic scattering, the static approximation, sum rules, small angle scattering, inelastic scattering, thermal diffuse scattering, quasielastic scattering, and neutron optics.

(Order as PB93-166817, PC A08) of Standards and 00,601 PB93-166841 Standards and Technology, National Inst. Gaithersburg, MD. Small Angle Neutron Scattering at the National In-

stitute of Standards and Technology.

B. Hammouda, S. Krueger, and C. J. Glinka. 1993,

16p.

Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p31-46 Jan/Feb

Keywords: *Small angle scattering, *Neutron scattering, Neutron spectrometers, Macromolecules, Microstructure, Polymers, Ceramics, Metals, Alloys, Complexes, DNA, Uses, US NIST.

The small angle neutron scattering technique is a valuable method for the characterization of morphology of various materials. It can probe inhomogeneities in the sample (whether occurring naturally or introduced through isotopic substitution) at a length scale from the atomic size (nanometers) to the macroscopic (micrometers) size. The work provides an overview of the small angle neutron scattering facilities at the National Insti-tute of Standards and Technology and a review of the technique as it has been applied to polymer systems, biologicai macromolecules, ceramic, and metallic matenals. Specific examples have been included.

PB93-166866 (Order as PB93-166817, PC A08) Army Armament Research, Development and Engineering Center, Dover, NJ.

Triple Axis and SPINS Spectrometers.

S. F. Trevino. 1993, 11p. Prepared in cooperation with National Inst. of Standards and Technology, Gaithersburg, MD.
Included in Jnl. of Research of the National Institute

of Standards and Technology, v98 n1 p59-69 Jan/Feb

Keywords: *Neutron spectrometers, Condensed matreywords. Neutron spectrometers, Condensed matter physics, Polarized beams, Magnetic materials, Neutron scattering, Inelastic scattering, Physical chemistry, Hydrogen, Phonons, Uses, SPINS spectrometer, Triple axis spectrometers, Rotational diffusion, CNRF facility.

In the paper are described the triple axis and spin polarized inelastic neutron scattering (SPINS) spectrometers which are installed at the NIST Cold Neutron Research Facility (CNRF). The general principle of operation of these two instruments is described in sufficient detail to allow the reader to make an Informed decision as to their usefulness for his needs. However, it is the intention of the staff at the CNRF to provide the expert resources for their efficient use in any given situation. Thus, the work is not intended as a user manual but rather as a guide into the range of applicability of the two instruments.

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PB93-166874 (Order as PB93-166817, PC A08) οÌ National Inst. Standards and Technology, Gaithersburg, MD.

Neutron Time-of-Flight Spectroscopy.

J. R. D. Copiey, and T. J. Udovic. 1993, 17p.
Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p71-87 Jan/Feb

Keywords: *Time-of-flight spectrometrs, *Neutron spectroscopy, Time-of-flight method, Quasi-elastic scattering, Inelastic scattering, Neutron scattering, Neutron choppers, Vibratlonal spectra, Magnetic semiconductors, Hydrogen, Diffusion, Uses, Tunneling spectroscopy, CNRF facility.

The time-of-flight technique is employed in two of the Instruments at the NIST Cold Neutron Research Facility (CNRF). A pulsed monochromatic beam strikes the sample, and the energies of scattered neutrons are determined from their times-of-flight to an array of detectors. The time-of-flight method may be used in a variety of types of experiments such as studies of vibrational and magnetic excitations, tunneling spectroscopy, and quasielastic scattering studies of diffusional behavior, several examples of experiments are discussed. The authors also present brief descriptions of the CNRF time-of-flight instruments, including their modi operandi and some of their more pertinent parameters and performance characteristics.

(Order as PB93-166718, PC A08) of Standards and Technology, PB93-166882 National Inst. Gaithersburg, MD.
Ultra-High Resolution inelastic Neutron Scattering.

D. A. Neumann, and B. Hammouda. 1993, 20p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p89-108 Jan/

Keywords: *Neutron scattering, *Neutron spectrometers, Quasi-elastic scattering, Inelastic scattering, High resolution, Coid neutrons, Spin echo, Backscattering, Dynamics, Diffusion, Polymers, Benzene, Uses, Molecular orientation, Rotational tunneling, Tunneling spectroscopy, CNRF facility.

Two types of ultra high energy resolution neutron scattering instruments, the backscattering spectrometer and the spin echo spectrometer, are described. Examples of the types of research which can be done with these instruments are given and plans for a cold neutron backscattering spectrometer which will be built in the NIST Cold Neutron Research Facility (CNRF) are discussed. It is hoped that the information will be of use to researchers considering neutron scattering experiments at NIST.

00,605 PB93-166916 (Order as PB93-166817, PC A08) of Standards and Technology, National Inst. Gaithersburg, MD.

Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility. M. Anf, M. S. Dewey, G. L. Greene, and W. M. Snow. 1993, 10p.

Included In Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p135-144 Jan/ Feb 93.

Keywords: *Research facilities, *Neutron physics, Neutron lifetime, Neutron decay, Vibration isolators, Monochromataors, Interferometers, Beta decay, Neutron interferometry, Neutron waves, CNRF facility.

The features of two fundamental neutron physics research stations at the NIST Cold Neutron Research Facility are described in some detail. A list of proposed initial experimental programs for these two stations is also given.

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PB93-173433 PC A13/MF A03 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Atomic Physics Dlv.
Bibliography on Atomic Line Shapes and Shifts
(July 1978 through March 1992) (Supplement 4). Speclal pub.

J. R. Fuhr, and A. Lesage. Jan 93, 300p, NIST/SP-366-SUPPL-4.

Also available from Supt. of Docs. as SN003-003-03203-4. See also PB-289 815. Prepared in cooperation with Observatoire de Paris, Meudon (France).

Keywords: *Atomic spectra, *Bibliographies, Van der Waals forces, Stark effect, Line broadening, Line shape, Line spectra, Pressure broadening, Multicharged lons, Resonance broadening.

This is the fourth supplement to the original NBS Special Publication 366, Bibliography on Atomic Line Shapes and Shifts (1889 through March 1972). It con-tains 1964 references and covers the literature from July 1978 to March 1992. As in the authors' previous publications, the bibliography consists of five major parts: (1) Part 1 Is a section containing papers of general interest, many without numerical data. These papers are catalogued according to the broadening mechanisms. (2) In Part 2, all papers containing numerical data are ordered according to eiement, ionization stage, and broadening mechanism. (3) While in the two preceding parts of the bibliography the references are listed for brevity by identification numbers only, in Part 3 all references are listed completely by journal, authors, and title. In addition, the papers are arranged by year of publication and alphabetically by the first author's name within the year. (4) Part 4 con-tains a listing of all authors and their papers, as identi-fied by the reference numbers from Part 3. (5) Part 5 provides corrections and/or additions to the third supplement of the original bibliography.

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PC A10/MF A03

PB93-178648 National Inst. of Standards and Technology (PL), Galthersburg, MD.

Physics Laboratory Technical Activities, 1992.
Mar 93, 219p, NISTIR-5133.
Presented to the Board on Assessment of NIST Programs, National Research Council, May 3-4, 1993. See also PB92-172824.

Keywords: *Physics, Atomic physics, Molecular physics, Fundamental constants, Frequency standards, Time standards, Quantum theory, Ionizing radiation, Metrology, Radiometry, Calibration, Optics, Electrons, Measurement, Progress report, Standard reference materials LIS NIST materials, US NIST.

The report summarizes research projects, measurement method development, calibration and testing, and data evaluation activities that were carried out during calendar year 1992 in the NIST Physics Laboratory. These activities fall in the areas of electron and optical physics, atomic physics, molecular physics, radiometric physics, quantum metrology, ionizing radiation, time and frequency, quantum physics, and fundamental constants.

00,608

PB93-181881 PC A04/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Statistical Engineering Div. PB93-181881 Surveillance Schemes with Applications to Mass Calibration.

M. Pollak, C. Croarkin, and C. Hagwood. Apr 93, 74p, NISTIR-5158.

Keywords: *Calibration, *Standards, Standard deviation, Nonparametric statistics, Computer programs, Control charts, Surveillance, Measurement, Mean, *Mass standards, Shiryayev-Roberts method, US NIST.

One of the activities at the NIST Is calibrating mass standards. In order to ensure the quality of calibration, the NIST personnel monitor the values of check standards over time. The current standard surveillance technique is a Shewhart control chart with 3 sigma limits. Here we explore the applicability of other, recently developed, control charts. While Shewhart charts are typically designed to detect large changes, the schemes regarded here are geared towards detecting medium-sized ones. Some of these procedures are parametric, others are nonparametric. They are applied plied here to a sequence of measurements of mass standards, made at the NIST over a period of time. Two types of surveillance problems are regarded: monitoring for a change in mean and monitoring for a change of standard deviation. The control charts considered are shown to be effective.

00.609

PC A06/MF A02

PB93-189421 Maryland Univ., College Park. Dept. of Mechanical En-

gineering.
Translent Cooling of a Hot Surface by Droplets
Evaporation. Final Report, November 1990.
P. Tartarini, Y. Liao, and M. di Marzo. Apr 93, 104p,
NIST/GCR-93/622.

Grant 70NANB8H0840

See also PB90-227968. Sponsored by National Inst. of Standards and Technology (BFRL), Gaithersburg,

Keywords: *Droplets, *Evaporation, *Cooling, *Surfaces, Heat transfer, Experimental data, Water, Thermal conductivity, Vaponizing, Temperature measurement, Test facilities, Mathematical models.

A new experimental set-up for the study of dropwise evaporation in a radiant heat transfer field has been designed, constructed and tested. The various Issues of concern such as: steady state solid temperature dis-tribution, radiant heater design and configuration, infrared background noise and post test data manipulation are outlined. The formulation of a model for the prediction of the cooling induced by an evaporating droplet Impinging a semi-infinite solld is the subject of the re-port. A combined Boundary Element Method (BEM) and Control Volume Method (CVM) has been used to solve this complex numerical problem. The results for both high and low thermal conductivity materials are in excellent agreement with the experimental findings. Detailed comparison of the surface temperature distributions on solid Macor detected with Infrared thermography are also performed to demonstrate the accuracy of the computational method.

00.610

PB93-189868 PC A06/MF A02
National Inst. of Standards and Technology (PL),
Gaithersburg, MD. Ionizing Radiation Div.
ENDF/B-VI Neutron Cross Section Measurement

Standards.

A. D. Carlson, W. P. Poenitz, G. M. Hale, C. Y. Fu, W. Mannhart, R. W. Peelle, and D. C. Dodder. May 93, 109p, NISTIR-5177.
See also PB86-229713 and PB92-159128. Prepared

in cooperation with Argonne National Lab., IL., Los Alamos National Lab., NM., and Oak Ridge National Lab., TN. Sponsored by Department of Energy, Washington,

Keywords: *Neutron cross sections, *Neutron reactions, *Nuclear data collections, *Standards, Boron 10 target, Lithium 6 target, Hydrogen 1 target, Hellum 3 target, Uranium 235 target, Carbon, Gold, R matrix, Neutron spectra, Californium 252, Spontaneous fission, Tables(Data), Graphs(Charts).

The document provides information on the neutron cross section standards placed in the ENDF/B-VI library. The H(n,n), (3)He(n,p), and C(n,n) cross sections were each obtained from well established R-matrix analysis techniques. The additional standards, i.e., the (6)Li(n,t), (10)B(n,alpha), (10)B(n, alpha 1), Au(n,gamma), and (235)U(n,f) cross sections were obtained with a new method. The new method involves combining the results of a simultaneous evaluation and R-matrix analyses. Contained herein is a discussion of the development of the method, a description of the evaluation process, some information on the various experiments used in the analyses, comparisons of the R-matrix, simultaneous evaluation and combination results, and comparisons to ENDF/B-V. Tables of numerical data are given for each of the cross section standards. Also, the new ENDF/B-VI evaluation for the spontaneous fission neutron spectrum for (252)Cf is given.

PB93-190338 PC A99/MF A06
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD. Process Measurements Div.
Temperature-Electromotive Force Reference Func-

tions and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90.
G. W. Bums, M. G. Scroger, G. F. Strouse, M. C. Croarkin, and W. F. Guthrie. Apr 93, 636p, NIST/

Supersedes COM-74-50351. Also available from Supt. of Docs. as SN003-003-03214-0. See also PB91-112854.

*Temperature Keywords: measurement. Thermocouples, Guidelines, Calibration, Standards, Thermometers, *ITS-90, *International Temperature Thermometers, Scale of 1990.

The International Temperature Scale of 1990 (ITS-90) and the new representation of the volt came into effect on 1 January 1990. Those changes required that the then-existing IPTS-68 based temperature-electromotive force reference functions and tables for thermocouples be revised to give values in terms of the ITS-90 and the SI volt. This monograph gives the new reference functions and tables for the eight letterdesignated thermocouple types: noble-metal types B, R, and S; and base-metal types E, J, K, N, and T. Also, for these thermocouple types, reference functions and tables of their thermoelements versus the NIST platinum thermoelectric reference standard, Pt-67, are given. The computational methods used to derive each of the new reference functions are described.

00.612 PB93-196285

(Order as PB93-196228, PC A07/

MF A02) National Inst. of Standards and Technology,

Gaithersburg, MD.
Three-Ratio Scheme for the Measurement of Iso-

topic Ratios of Silicon. H. Ku, F. Schaefer, S. Valkiers, and P. De Bievre.

Prepared In cooperation with Commission of the European Communities, Geel (Belgium). Inst. for Reference Materials and Measurements.

Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n2 p225-229 Mar/ Apr 93.

Keywords: *Silicon, *Atomic weights, *Isotope ratio, Mass spectroscopy, Measurement.

The paper proposes a scheme of measurement sequences that has been used for the redetermination of the molar mass (atomic weight) of silicon at the Central Bureau for Nuclear Measurements (now Institute for Reference Materials and Measurements). This scheme avoids correlations among the measured ratios caused by normalizing all ion current measurements to that of the largest ion current. It also provides additional information for checking on the consistency of these ratios within a cycle of scans. Measurements of isotope abundance ratios of silicon are used as an illustration.

PB93-198463 PC A06/MF A02

Maryland Univ., College Park. Dept. of Mechanical En-

gineering. Experimental Study of Multiple Droplet Evaporative Cooling.

Final rept. H. Dawson, and M. di Marzo. Apr 93, 115p, REPT-92-1, NIST/GCR-93/624. Grant 70NANB1H1173

Sponsored by National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

Keywords: *Evaporative cooling, *Drops(Liquids), Mass transfer, Heat transfer, Surface temperature, Expermental data, Mathematical models, Test facilities, Data acquisition, Computer codes, Data analysis, Infrared thermography.

The purpose of the experimental study was to quantify the transient evaporative cooling of a radiantly heated, low thermal conductivity material subject to a random impingement of water droplets. Specifically, the transient behavior and spatial distribution of the surface temperature were investigated over a range of initial surface temperatures and impinging mass fluxes. Additionally, it was desired to draw some conclusions about the important parameters in the evaporative cooling phenomenon, and about evaporative cooling generally. A concurrent goal of the research was to continue development of the infrared thermography and digital image analysis techniques and equipment employed in the data acquisition system.

00,614 PB93-207512 PC A06/MF A02 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Ionizing Radiation Div. Elastic Scattering of Electrons and Positrons by Atoms: Database ELAST. M. J. Berger, S. M. Seltzer, R. Wang, and A. Schechter. May 93, 104p, NISTIR-5188. Sponsored by Department of Energy, Washington, DC. Office of Health and Environmental Research.

Keywords: *Electron-atom collisions, *Positron-atom collisions, *Data bases, Differential cross sections, Total cross sections, Transport cross sections, KeV range 01-10, KeV range 10-1000, KeV range 100-1000, MeV range 01-10, Elastic scattering, Electron scattering, Tables(Data), ELAST database.

Database ELAST consists of cross sections for the elastic scattering of electrons and positrons by atoms. ELAST includes differential, total and transport cross sections, for scattering targets with atomic numbers Z from 1 to 100, at selected energies from 1 keV to 1024 keV. The cross sections were calculated with a computer code of Riley, based on the partial-wave expansion method. The electrons and positrons were assumed to be scattered by static, screened Coulomb potentials. Screening was calculated with the use of density distributions of atomic electrons obtained with a relativistic Dirac-Fock wave-function program of Desclaux. At. interpolation program is included with which one can obtain elastic scattering cross sections at any energy between 1 keV and 1024 keV. Cross section tables for electrons are presented for 23 elements at 27 energies between 1 MeV and 1 keV.

00.615 PB93-208494 PC A03/MF A01 National Inst. of Standards and Technology (PL), Gaithersburg, MD. Chaos, Dissipation, Arrow of Time, in Quantum Physics. Technical note. M. Danos. May 93, 14p, NIST/TN-1403. Also available from Supt. of Docs. as SN003-003-

Keywords: *Quantum theory, Hamiltonian functions, T invariance, Thermodynamics, Dissipation, Entropy, Quantum chaos.

A compact description of the evolution of a many-body system, e.g., a dilute gas, is provided by the generalization of the usual reaction S-matrix or U-matrix to a system S- or U-matrix. Using this tool It is demonstrated, that (i) the characterization of quantum chaos turns out to be very transparent: already exceedingly simple systems, including time-reversal invariant states, are capable of exhibiting quantum chaos; (ii) the time-reversal invariance of the Hamiltonian leads to relayation of arbitrary pon-equilibrium tonian leads to relaxation of arbitrary non-equilibrium states of chaotic quantum systems, i.e., to dissipation, which thus allows the definition of a quantum arrow of time; (iii) the second law of thermodynamics, and hence the complete field of thermodynamics, Is a consequence of quantum physics.

00,616 PB94-108479 (Order as PB94-108461, PC A09/ MF A02) National Inst of Standards and Technology.

Gaithersburg, MD.
Coil Probe Dimension and Uncertainties during

Measurements of Nonuniform ELF Magnetic Fields.

M. Misakian. 1993, 9p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n3 p287-295 May/ Jun 93.

Keywords: *Magnetic measurement, *Magnetic probes, Extremely low frequency, Electric appliances, Residential buildings, Transportation systems, Working conditions, Magnetic fields, Magnetic flux, Pollution sources, Measurement uncertainty.

Compansons are made between the calculated average magnetic flux density for single-axis and three-axis circular coil probes and the calculated magnetic flux density at the center of the probes. The results, which are determined assuming a dipole magnetic field, provide information on the uncertainty associated with measurements of nonuniform extremely low frequency (ELF) magnetic fields produced by some electrical appliances and other electrical equipment.

00,617 PB94-118494

PB94-118494 PC A05/MF A01 National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Thermophysics Div.

Thermodynamic Properties of Homogeneous Mix-

tures of Nitrogen and Water from 440 to 1000 K, Up to 100 MPa and 0.8 Mole Fraction N2. Technical note.

J. S. Gallagher, J. M. H. L. Sengers, I. M. Abdulagatov, J. T. R. Watson, and A. Fenghour. Aug 93, 80p, NIST/TN-1404.

Also available from Supt. of Docs. as SN003-003-03228-0. See also PB87-109948. Prepared In co-operation with Akademiya Nauk SSSR, Makhachkala. Inst. of Geothermic Problems of the Dagestan, and National Engineering Lab., East Kilbride (Scotland).

Keywords: *Thermodynamic properties, *Mixtures, *Nitrogen, *Water, Solubility, Henrys law, Specific heat, Tables(Data), Enthalpy, Pressure, Density(Mass/ volume).

A generalized corresponding-states model of the Helmholtz free energy for fluid mixtures, with pure water as the reference fluid, has been used to model the solubility and thermodynamic properties of nitrogen in water in homogeneous states In a wide range of temperatures and pressures around the water critical point. The model predictions are compared with the literature data available in this range. Tabulated values of density, enthalpy, isobanc heat capacity and fugacity coefficients are presented at selected entries of pressure from 0.05 to 100 MPa, of temperature from 440 to 1000 K, and of nitrogen mole fractions up to 0.8. Also presented are tables of infinite-dilution (standard-state) properties of the nitrogen solute in the same pressure and temperature range.

Acoustics

PB93-152064 PC A03/MF A01

National Inst. of Standards and Technology (MEL), Gaithersburg, MD. Automated Production Technology

Acoustics

ONR-Sponsored Research in Ultrasonic Measurements at NIST: 1982-92.

N. N. Hsu, G. V. Blessing, and F. R. Breckenridge.

Dec 92, 13p, NISTIR-5101.
See also PB82-229345. Sponsored by Office of Naval Research, Arlington, VA. Physics Div.

Keywords: *Acoustic measurement, *Acoustic emissions, *Ultrasonic tests, Acoustic detection, Greens function, Ultrasonic radiation, Calibration, Transducers, Sources, Inverse problems, Deconvolution.

The report summarizes the research in ultrasonic measurements at the National Institute of Standards and Technology (NIST) which was supported in part by the Physics Division of the Office of Naval Research from 1982 to 1992. This represents work accomplished since the last such summary report, NBSIR 82-2529, entitled 'Ultrasonic Research Summary Report and Literature Guide to the National Bureau of Standards/Office of Naval Research Program.' References to the published literature documenting the new work are included.

Fluid Mechanics

DE93007991 PC A02/MF A01

National Inst. of Standards and Technology (CSTL), Gaithersburg, MD.

Estimation of droplet collision frequency in a

spray.
J. R. Zurlo, C. Presser, and H. G. Semerjian. 1992, 6p, CONF-9205307-1.

Contract Al01-86CE90213

ILASS-AMERICAS '92, San Ramon, CA (United States), 18-20 May 1992. Sponsored by Department of Energy, Washington, DC.

Keywords: *Droplets, *Sprays, Atomization, Collisions, Fluid Mechanics, Fuels, Polarization, Spherical Configuration, EDB/661300.

An estimate of droplet collision frequency was obtained in a pressure-atomized fuel spray. Measurement of the vertical linear depolarization ratio was used to provide information on droplet sphencity which in turn was used to determine droplet collision frequency. The results indicate that droplet collision frequency increases near the spray boundary where the droplet number density is a maximum.

00.620 N94-10103/7 (Order as N94-10070/8, PC A19/ MF A04) National Inst. of Standards and Technology, Gaithersburg, MD.
Effect of Gravity Modulation on Thermosolutal Convection.

B. V. Saunders, B. T. Murray, G. B. Mcfadden, S. R. Coriell, and A. A. Wheeler. cAug 92, 5p. In Esa, Proceedings of the 8TH European Symposium on Materials and Fluid Sciences in Microgravity, Volume 1 p 237-241. Sponsored by NASA and Darpa.

Keywords: *Convection, *Directional solidification (Crystals), Floquet theorem, Flow stability, Gravitational effects, Reduced gravity, Solutes, Binary alloys, Prandtl number, Rayleigh number, Schmidt number, Thermomigration.

In a gravitational field, the opposing effects of components of different diffusivities, for example, temperature and solute, in the density profile in a fluid may produce convective instabilities that exhibit a broad range of dynamical behavior. The effect of time periodic vertical gravity modulation on the onset of these instabilities in an infinite honzontal layer with stress free boundaries is examined. This work is viewed as a first step in expanding previous results in solidification to the full problem of characterizing the effects of gravity modulation in thermosolutal convection during the directional solidification of binary alloys. Calculations carried out both with and without steady background acceleration are presented, the latter results being relevant to microgravity conditions.

00.621 PB93-166114 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Structures Div.

Chaotic Motions of Self-Excited Forced and Autonomous Square Prisms.

Final rept.

E. Simiu, and G. R. Cook. 1991, 1219p.

Pub. in Jnl. of Englneering Mechanics 117, n2 p241-259 Feb 91.

Keywords: *Aeroelasticity, *Wind loading, *Oscillating flow, Oscillators, Buffeting, Bluff bodies, Aerodynamics, Unsteady flow, Oscillations, Nonlinear systems, Chaos, Reprints.

The motion of oscillators governed by the standard equations for the aerodynamic galloping of square prisms is studied for two cases: a harmonically forced, single elastically mounted bar immersed in a uniform flow, and an autonomous, elastically coupled pair of such bars. It is shown that the behavior of the forced oscillator has similarities to the behavior of the standard circle map. Thus It is possible to describe how locked-in oscillatory forms are organized within the forcing amplitude/frequency parameter space and to identify transitions from quasiperiodicity to chaos and turbulent intermittencies. For the coupled pair of oscillators two stable attractors were identified on which lators, two stable attractors were identified on which the orbits are topologically similar, respectively, to the two normal modes of the associated linear system. Depending upon the system parameters, one of the attractors contains orbits that may be pendic, quasiperiodic, or chaotic. Beyond a critical flow velocity this attractor vanishes. For the other attractor, only pendic orbits were identified. This work is the first stage of a numerical and experimental investigation aimed at assessing the potential role of chaotic dynamlcs in bluff body fluid elasticity, with a view to application in ocean engineering.

Optics & Lasers

00,622 PB93-125201 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Technology Div.
High Resolution Spectroscopy Using Fiber Lasers.

S. L. Gilbert. 1991, 6p. Sponsored by Naval Sea Systems Command, Wash-

ington, DC.

Pub. in Proceedings of International Conference on Laser Spectroscopy (10th), Font-Romeu, France, June 17-21, 1991, p359-364.

Keywords: *Laser spectroscopy, Glass lasers, Tunable lasers, Frequency stability, Optical communication, High resolution, Doped materials, Erbium, Rubidium, Acetylene, Line width, Reprints, *Fiber lasers, Wavelength standards.

Fiber lasers show potential for use in high resolution laser spectroscopy. Tunable, single-longitudinal-mode operation has been achieved with free-running laser linewidths of about 1 MHz. It would be straightforward to obtain much narrower linewidths using low frequency electronic feedback. In this paper the author reviews this rapidly changing field, and discusses the use of fiber lasers in spectroscopy.

PB93-125714 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Precision Engineering Div. Direct and inverse Problems for Light Scattered by Rough Surfaces. Final rept.

E. Marx, and T. V. Vorburger. 1990, 14p. Pub. in Applied Optics 29, n25 p3613-3626 1990.

Keywords: *Light scattering, *Surface roughness, Least squares method, Angular distribution, One di-mensional, Autocorrelation, Profiles, Reprints, Inverse problems, Random surfaces, Profilometry.

Calculations are performed to relate the stylus profile of a one-dimensionally rough surface to the angular distribution of the light scattered by such a surface. In the direct problem, the angular distribution of the scat-tered light calculated from the profile is shown to agree with the measured one. In the inverse problem, the rms roughness and the autocorrelation function are found by a least-squares fit to the measured angular distribu-tion. For the smoother surfaces, the rms roughness is mostly determined by the ratio between the power of the specular beam and the total power of the scattered light; the computed values are proportional to those calculated directly from the stylus profiles. The values of the parameters obtained by the least-squares fit are affected by a variety of errors and agree only partially with those obtained from the stylus profile.

PB93-143964 (Order as PB93-143923, PC A06/ MF A02) National Inst. of Standards and Technology,

Gaithersburg, MD.

Accuracy of the Double Variation Technique of Re-

fractive index Measurement.

J. R. Verkouteren, E. B. Steel, E. S. Windsor, and J.

M. Phelps. 1992, 13p.
Included in Jnl. of Research of the National Institute

of Standards and Technology, v97 n6 p693-705 Nov/ Dec 92.

Keywords: *Refractive index, Llquid immersion tests, Experimental design, Optical measurement, Polarized light, Error analysis, Transparence, Dispersion, Callbration, Accuracy, Asbestos, Minerals, Bias, *Double variation technique.

Errors in the double variation technique of refractive index measurement are analyzed using a new approach. The ability to measure matching wavelength is characterized, along with the effect on the calculated refractive Index. Refractive Index accuracy and precirefractive Index. Refractive Index accuracy and precision are very dependent on the specifics of each callbration set, particularly the difference in dispersion between the liquid and solid. The best precision (+ or - 1 or 2 x 10(sup -4)) is attained only when the difference in dispersion between liquid and solid is small, and is dependent on an individual operator's ability to perceive changes in relief. The precision is impossible to achieve for the other glass/liquid combinations, where the authors are limited by a precision of approximately 1 nm in the selection of matching wavelength. A blas 1 nm in the selection of matching wavelength. A blas in the measurement of matching wavelength exists that affects the accuracy of the calculated refractive Indi-

PB93-150811 Not available NTIS
National Inst. of Standards and Technology (MEL),
Gaithersburg, MD. Precision Engineering Div.
Long-Range Scanning for Scanning Tunneling Mi-

Final rept.
J. Fu, R. D. Young, and T. V. Vorburger. 1992, 6p.
Pub. in Review of Scientific Instruments 63, n4 p2200-2205 Apr 92.

Keywords: *Scanning tunneling microscopy, *Microscopes, Disks(Shapes), Piezoelectricity, Linearity, Hysteresis, PZT, Reprints, Optical surfaces, Capacitance gages.

We report a scanning tunneling microscope (STM) with 500 micrometers x 500 micrometers field of view. It departs from past designs in that a long-range X-Y stage carries the specimen and scans while the STM head is held stationary. The STM head is capable of scanning with a range of 8 micrometers. Combining the capable of scanning with a range of 8 micrometers. ning with a range of 8 micrometers. Combining the ca-pability of tip scanning and X-Y stage scanning yields a wide dynamic range and has useful applications for measuring optical surfaces.

PB93-153591 Not available NTIS National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Technology Div.
Reference Detectors for Spectral Responsivity Measurements.

Final rept. R. J. Phelan, J. H. Lehman, and D. R. Larson. 1991,

Pub. in Proceedings of Measurement Science Conference Symposium and Workshop, Anaheim, CA., January 30-February 1, 1991, p1-8.

Keywords: Optical detectors, Performance evaluation, Measurement, Design, Uses, Reprints, *Reference detectors, Spectral responsivity.

The paper presents a view of the need, use, design, and evaluation of detectors to be used for spectral responsivity measurements. The emphasis Is on a design that is easy to use and for which the spectral responsivity can be understood and confirmed by the user.

00.627

PB93-153757 Not available NTIS National Inst. of Standards and Technology (NML), Galthersburg, MD. Electron and Optical Physics Div. Excitation-Energy Dependence in the L2,3 Fluorescence Spectrum of SI.

Final rept. Final rept.

J. E. Rubensson, D. Mueller, R. Shuker, J. Jia, T. A. Callcott, D. L. Ederer, and C. H. Zhang. 1990, 4p.

Sponsored by National Science Foundation, Washington, DC., and Department of Energy, Washington, DC. Pub. In Physical Review Letters 64, n9 p1047-1050, 26 Feb 90.

Keywords: *Silicon, Synchrotron radiation, Valence bands, Emission spectra, Fluorescence, Excitation, Reprints, X-ray emission.

The L(2,3) emission spectrum of c-Si, excited by monochromatized synchrotron radiation, has been recorded with a 5-m Rowland spectrometer. Dramatic spectral changes are observed as the excitation energy is varied from the 2p binding energy up to 144 eV. It is proposed that a spectator electron, close to the bottom of the conduction band, influences the emission spectrum. The observations suggest that interband shakeup is important in the excitation process, and that a population of low-lying levels, via initial-state shakeup, influences the high-energy-excited Si L emission spectrum.

PB93-166023 Not available NTIS
National Inst. of Standards and Technology (NEL),
Gaithersburg, MD. Precision Engineering Div.
Scanning Tunneling Microscopy of Optical Sur-

J. Schneir, J. A. Dagata, H. H. Harary, H. B. Elswijk, J. Sauvageau, C. J. Evans, and A. J. Melmed. 1989, 10p.

Final rept.

Pub. In Proceedings of SPIE (Society of Photo-Optical Instrumentation Engineers) Surface Characterization and Testing II, San Diego, CA., August 10-11, 1989, v1164 p112-121.

Keywords: Scanning tunneling microscopy, Surface analysis, Silicon, Gold, Reprints, *Optical surfaces, Surface finish, Diamond turning.

The authors have imaged diamond turned gold surfaces and a gold coated silicon surface with the STM. In order to determine the reproducibility of the topo-graphic information obtained with the STM, the authors imaged the same diamond turned gold surface with dif-ferent tips. Both mechanically formed and electrochemically etched tips were used. Surface images observed with the STM varied from tip to tip for both methods of preparation. The use of the STM to image optical surfaces hinges on the ability to manufacture stable and reproducible tips.

PB93-166395 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Radiometric Physics Div.
Radiometer for Precision Coherent Radiation Measurements.

Final rept.

D. B. Thomas, and E. F. Zalewski. 1989, 7p.

See also PB92-217645.

Pub. in Proceedings of SPIE (Society of Photo-Optical Instrumentation Engineers) - Opt. Radiat. Meas. 2, v1109 p70-76 1992

Keywords: *Radiometers, Visible radiation, Coherent radiation, Silicon diodes, Photodiodes, Reprints, Transfer standards.

A radiometer has been designed for precision coherent radiation measurements and tested for long term repeatability at wavelengths of 488 and 633 nm. The radiometer consists of a single high quality PN silicon photodiode maintained in a nitrogen atmosphere and a quartz window designed to eliminate interference problems. Ratio measurements between the radiometer and an absolute type detector were made over a period of 215 days. At 0.5 mW, the standard deviations (1 sigma) were 0.008 and 0.009% at 488 and 633 nm respectively. The maximum deviations from the mean were 0.016 and 0.015% at the respective wavelengths. The high precision, simplicity, and portability of the radiometer make it an excellent transfer standard for radiometric measurements.

00,630 PB93-166692 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div.

Fitting of Transmission Data for Determining the Optical Constants and Thicknesses of Optical Films

Final rept.

X. Ying, A. Feldman, and E. N. Farabaugh. 1990, 4p. Pub. in Jnl. of Applied Physics 67, n4 p2056-2059

Keywords: *Refractive index. *Absorption coefficients. Light transmission, Curve fitting, Yttrium oxides, Silicon dioxide, Thin films, Film thickness, Inhomogeneity, Silica. Reprints, Extinction coefficients.

A multiparameter nonlinear curve fitting method is used to determine the refractive indices, absorption coefficients, and thicknesses of mixed yttria-silica films from transmittance spectra. Both homogeneous and Inhomogeneous models of refractive index in the films are used for the data analysis. Results suggest that inhomogeneity in the films should be considered when investigating the optical properties of thin films. However, care must be taken when computing a refractive index gradient in an absorbing film as both phenomena can affect the optical transmittance in a similar manner.

00,631 PB93-196228

PC A07/MF A02 of Standards and Technology, National Inst.

Gaithersburg, MD.

Journal of Research of the National Institute of Standards and Technology, March-April 1993. Volume 98, Number 2.

1993, 135p. See also PB93-195236 through PB93-196293 and PB93-166817. Also available from Supt. of Docs. as SN703-027-00051-2.

Keywords: *Research, Argon plasma, Glow discharges, Reaction kinetics, Computerized simulation, Tiltmeters, Optical fibers, Fiber optics, Dimensional measurement, Instrument errors, Calibrating, Drift, Silicon, Atomic weights, Isotope ratio, Spectral shift, Wolf shifts, Claddings shifts, Claddings.

Contents:

Absolute Spatially- and Temporally-Resolved Optical Emission Measurements of rf Glow

Discharges in Argon;
Optimizing Complex Kinetics Experiments Using Least-Squares Methods;
Measuring Low Frequency Tilts;
Optical Fiber Geometry--Accurate Measurement

of Cladding Diameter;

Drift Eliminating Designs for Non-Simultaneous Companson Calibrations; A Three-Ratio Scheme for the Measurement of

Isotopic Ratios of Silicon;

"Wolf Shifts' and Their Physical Interpretation Under Laboratory Conditions.

00.632 PB93-196269 (Order as PB93-196228, PC A07/ MF A02)

National Inst. of Standards and Technology, Boulder,

Optical Fiber Geometry: Accurate Measurement of

Cladding Dlameter.
M. Young, P. D. Hale, and S. E. Mechels. 1993, 14p.
Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n2 p203-216 Mar/ Apr 93.

Keywords: *Optical fibers, *Fiber optics, *Dimensional measurement, Video equipment, Gray scale, Micrometers, Diameters, Uncertainty, *Claddings, Standard reference materials, Scanning confocal microscopes, Interference microscopes, Video microscopes.

The authors have developed three instruments for accurate measurement of optical fiber cladding diameter:
a contact micrometer, a scanning confocal microscope, and a white-light interference microscope. Each instrument has an estimated uncertainty (3 standard deviations) of 50 nm or less, but the confocal microscope may display a 20 nm systematic error as well. The micrometer is used to generate Standard Reference Materials that are commercially available.

00.633 (Order as PB93-196228, PC A07/ PB93-196293 MF A02)

Alpine Lake Resort, Terra Alta, WV.
Wolf Shifts and Their Physical Interpretation under **Laboratory Conditions.**

K. D. Mielenz. 1993, 10p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n2 p231-240 Mar/ Keywords: *Spectral shift, Light transmission, Conservation laws, Spectroscopy, Radiometry, Diffraction, Coherence, Invariance, *Wolf shifts.

The paper attempts to reconcile conflicting points of view of laboratory physicists and coherence theorists on correlation-induced spectral changes ansing from the partial coherence of primary and secondary light sources. It is shown that, under normal laboratory conditions and in the Fraunhofer approximation, the directional spectrum of light does not change on propagation in free space, and that each frequency component of the total spectrum is preserved in accordance with the principle of energy conservation. It is dem-onstrated, and illustrated by examples, that descriptions of diffraction by the theory of partial coherence and by classical wave optics are fully equivalent for in-coherent primary sources. A statistical approach is essential, and coherence theory is required, for partially coherent primary sources.

Plasma Physics

00,634 PB93-153575 Not available NTIS

National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div.

Ion Kinetic-Energy Distributions and Electrical Measurements in Ar/O2 rf Glow Discharges. Final rept.

J. K. Olthoff, R. J. Van Brunt, and M. A. Sobolewski.

1992, 4p. Pub. in Proceedings of International Conference on Gas Discharges and Their Applications (10th), Swansea, UK, September 13-18, 1992, p440-443.

Keywords: *Glow discharges, Electrical measurement, Argon plasma, Kinetic energy, Impurities, Reprints, Oxygen plasma.

lon kinetic-energy distributions and electrical characteristics were measured for a range of argon/oxygen rf plasmas. Correlations between the measurements are investigated. Dramatic changes in all of the measurements are observed when small amounts of oxygen are added to argon discharges, indicating the possible importance of impurities in ri plasma processing.

00,635

PB93-166569 Not available NTIS

National Inst. of Standards and Technology (EEEL),

Gaithersburg, MD. Electricity Div.

Energy Distribution Functions of Argon Ions In Low Current, Diffuse Discharges at High E/N.

Final rept. S. B. Vrhovac, B. M. Jelenkovic, J. K. Olthoff, and R. J. Van Brunt. 1992, 3p.

Pub. in Proceedings of International Conference on Gas Discharges and Their Applications (10th), Swansea, UK., September 13-18, 1992, p510-512 1992.

Keywords: *Gas discharges, *Argon ions, Kinetic energy, Distribution functions, Direct current, Townsend discharge, Ion temperature, Mass spectroscopy, Re-

Kinetic-energy distributions are measured for ions sampled from diffuse, low-current, dc argon discharges at high E/N (electric field/gas density). Ion tempera-tures are calculated from the distributions and variations from a Maxwellian energy dependence are discussed

00,636 PB93-196236 (Order as PB93-196228, PC A07/ MF A02)

Inst. of Standards and Technology. National Gaithersburg, MD.

Absolute Spatially- and Temporally-Resolved Optical Emission Measurements of rf Glow Discharges

In Argon. S. Djurovic, J. R. Roberts, M. A. Sobolewski, and J.

K. Olthoff. 1993, 22p.
Included in Jnl. of Research of the National Institute

of Standards and Technology, v98 n2 p159-180 Mar/ Apr 93.

Keywords: *Argon plasma, *Glow discharges, Radio frequency discharge, Emission spectra, Visible radi-

Spatially- and temporally-resolved measurements of optical émission intensitiés are presented from rf dis-

PHYSICS

Plasma Physics

charges in argon over a wide range of pressures (6.7 to 133 Pa) and applied rf voltages (75 to 200 V). Results of measurements of emission intensities are presented for both an atomic transition (Ar I, 750.4 nm) and an ionic transition (Ar II, 434.8 nm). All measurements were made in a well-defined rf reactor. They provide detalled characterization of local time-resolved plasma conditions suitable for the comparison with results from other experiments and theoretical models. These measurements represent a new level of detail in diagnostic measurements of rf plasmas, and provide insight into the electron transport properties of rf dis-

Radiofrequency Waves

00,637 PB93-125631 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Comments on 'Rapid Pulsed Microwave Propagation'. Final rept.

R. B. Marks. 1992, 1p.
Pub. in IEEE (Institute of Electrical and Electronics Engineers) Microwave and Guide Wave Letters 2, n5 p204 May 92.

Keywords: *Microwave transmission, Electromagnetic pulses, Light speed, Maxwells equations, Phase velocity. Reprints.

The letter discusses a recently published letter that reports experimental evidence of electromagnetic pulses propagating faster than the speed of light. It argues that such results contradict Maxwell's equations. Limitation of the such results contradict maxwell's equations. tations of the experiment are examined.

00.638 PB93-125706 Not available NTIS National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Precision Engineering Div. Logarithmic Terms in Fields Near the Edge of a Dieiectric Wedge. Final rept.

E. Marx. 1990, 4p.
Pub. in Proceedings of Antennas and Propagation
Symposium Digest, Dallas, TX., May 7-11, 1990, p1083-1086.

Keywords: *Electromagnetic fields, Helmholtz equations, Logarithm functions, Maxwells equations, Power series, Reprints, Dielectric wedges.

The fields in the presence of an infinite dielectric wedge can be expanded in a series that includes loganthmic terms. The form of the expansion depends on the wedge angle, and several examples are given.

00,639 PB9**3-22**000**2** PB93-220002 PC A03/MF A01
National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Fields Div. Selected EMC Standards and Regulations: A Summary. M. T. Ma. Jul 93, 18p, NISTIR-5005.

*Electromagnetic compatibility, *Regulations, Standards, Magnetic fields, Magnetic measurement, Electromagnetic fields.

The short report summarizes the objective, frequency range, allowable limits, required accuracy (if any), apparatus recommended, specific parameters involved, and measurement environment for some selected reg-ulations and standards regarding electromagnetic compatibility measurements. These regulations and standards, either enforced by the U.S. Government agencies or incorporated in voluntary industrial practice, were reviewed and critiqued in 1992.

Solid State Physics

00,640 DE93002848 PC A06/MF A02 National Inst. of Standards and Technology, Boulder, Proceedings of the sixth Japan--US workshop on high-field superconducting materials and standard procedures for high-field superconducting materials testing.

K. Tachikawa, K. Yamafuji, H. Wada, J. W. Ekin, and M. Suenaga. 1989, 118p. Contract Al01-84ER52113

Contract AI01-84EH52113
Japan-US workshop on high field superconducting materials and standard procedures for high-field superconducting materials testing (6th), Boulder, CO (United States), 22-24 Feb 1989. Sponsored by Department of Energy, Washington, DC.

Keywords: *High-Tc Superconductors, *Superconducting Devices, *Superconductors, *Meetings, Proceedings, Foreign technology, EDB/665412, EDB/700430, Niobium aluminides, Niobium ctannides *High-Tc Devices, stannides

High critical current densities and high magnetic fields are needed for most important energy applications of both conventional and high-Tc superconductors. This workshop brought together those engaged in research on high-field superconductors in Japan and the US to present recent research results on the performance of new high-field superconducting materials and to dis-cuss the most promising directions for research, spe-cifically as it relates to the fusion energy needs of both countries. Topics covered included critical currents, Irradiation effects, ac losses, magnetization properties, and new fabrication processes for conventional superconductors. An entire session was devoted to presentations on the properties of Nb(sub 3)Al superconductors. Large magnet research programs for energy applications were reviewed, including the tokamak fusion machine at JAERI, the joint US-Japan Nb(sub 3)Sn poloidal-field-coil development program, and the proposed International Thermonuclear Experimental Reactor (ITER) project. Results were also presented on the VAMAS round robin in three areas; J(sub c), stress effects, and ac losses. Finally, some current research results on experimental high-(Tc) superconductors were reviewed, with particular emphasis on new fabrication processes and the factors limiting the critical current in high-current conductors. Separate abstracts have been prepared.

00.641 N94-10188/8 (Order as N94-10171/4, PC A20/ MF A04) National Inst. of Standards and Technology, Gaithersburg, MD.
Pulsatlie Instability in Rapid Directional Solidification: Strongly-Nonlinear Analysis.
R. J. Braun, G. J. Merchant, K. Brattkus, and S. H. Davis. cAug 92, 4p.
In Esa, Proceedings of the 8TH European Symposium on Materials and Fluid Sciences in Microgravity, Vol-

ume 2 p 559-562. Sponsored by NASA, Washington. Keywords: *Directional solidification (Crystals), *Flow stability, Microstructure, Oscillations, Mathematical models, Morphology, Nonlinearity, Temperature distribution.

In models of rapid directional solidification, non-equilibrium interfacial conditions are employed. As a result, there is an oscillatory mode of instability, as well as the steady cellular mode, found in the equilibrium model of Mullins and Sekerka. When the temperature field is decoupled from the problem, the preferred wave number for the oscillatory mode is zero, and the Inter-face pulsates in time while remaining spatially uniform. Results from multiple scale analyses in the two limiting cases of the parameters are reported. In these limits, it is found that the instability is a bifurcation to relaxation oscillations; these nonlinear oscillations may be related to the observed microstructure that results from rapid solidification processes such as laser surface remelting.

PB93-124790 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div.
Fast Fourler Transforms for Space Groups Containing Rotation Axes of Order Three and Higher. M. An, C. Lu, E. Prince, and R. Tolimieri. 1992, 4p. Sponsored by Defense Advanced Research Projects Agency, Arlington, VA. Pub. in Acta Cryst. A48, p346-349 1992.

Keywords: *Fast Fourier transforms, *Space groups, Crystal symmetry, Computation, Reprints.

Methods are described for exploiting the symmetry of uniaxial space groups containing rotation axes of order

three and higher to improve the efficiency of computa-tion of Founer transforms. Mapping a symmetrical two-dimensional section into four dimensions enables the selection of non-contiguous asymmetric units over which fast Fourier transforms can be performed that reduce the computation time by a factor of approximately the order of the rotation axis. The application of the procedure to plane group p3 and its extension to p4 and p6 are described.

00,643 PB93-125839 PB93-125839 Not available NTIS
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Reactor Radiation Div.
Magnetic Transitions in the System YBa2Cu2.8Co0.2O6+y.

Final rept.
P. F. Miceli, J. M. Tarascon, P. Barboux, G. W. Hull, M. Giroud, J. J. Rhyne, D. A. Neumann, L. H. Greene, and B. G. Bagley. 1989, 4p.
Pub. In Physical Review B 39, n16 p12375-12378, 1

Keywords: *High temperature superconductors, Cobalt additions, Nickel additions, Aluminum additions, Neutron scattering, Antiferromagnetism, Reprints, *Yttrium barium cuprates, Magnetic ordering.

We have studied the oxygen dependence of the two magnetic transitions (antiferromagnetic ordering of chains and planes) in YBa2Cu(2.8)Co(0.2)O(6+y) using neutron scattering. It is found that both transition temperatures increase with decreasing oxygen concentration. At y approx 0.37 =y(0) the two transition centration. At y approx 0.37 =y(0) the two transition temperatures are equal, so that chains and planes order at a single transition temperature for y =or< y(0). For y=1 the compound is superconducting at 60K. Therefore, this system qualitatively exhibits the magnetic and superconducting properties of pure YBa2Cu3O(6+y) while providing an important insight on the oxygen dependence of chain site magnetic ordering. A discussion is presented which also includes results on Ni and Al substitutions.

00.644 PB93-125847 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Charge Transfer and Bond Lengths in YBa2Cu3-xMxO6+y. Final rept.

Prina rept.
P. F. Miceli, J. M. Tarascon, L. H. Greene, J. J. Rhyne, D. A. Neumann, P. Barboux, and J. D. Jorgensen. 1989, 7p.
See also DE90002241.

Pub. in Materials Research Society Symposium Proceedings High Temperature Supercond.: Relat. Prop., Struct., Solid-State Chem., v156 p119-125 1989.

Keywords: *High temperature superconductors, Crystal doping, Charge transfer, Chemical bonds, Neutron scattering, Reprints, *Yttrium barium cuprates

We discuss the effects of doping on the Cu chain sites in YBa2Cu(3-x)M(x)O(6+y). The relationship between bond lengths obtained from neutron scattering and charge transfer is evaluated in terms of bond valence. In particular, it is concluded that removing an oxygen from the chains transfers one electron to the planes.

00,645 PB93-125862 Not available NTIS
National Inst. of Standards and Technology (NML),
Gaithersburg, MD. Inorganic Analytical Research Div.
improvements to the Chebyshev Expansion of Attenuation Correction Factors for Cylindrical Samples. Final rept

D. F. R. Mildner, and J. M. Carpenter. 1990, 9p. Pub. in Jnl. of Applied Crystallography 23, p378-386

Keywords: Neutron diffraction, Cylindrical configuration, Sum rules, Accuracy, Reprints, *Attenuation cor-rection factors, Chebyshev expansion method.

The accuracy of the Chebyshev expansion coefficients used for the calculation of attenuation correction fac-tors for cylindrical samples has been improved. An increased order of expansion allows the method to be useful over a greater range of attenuation. We show that many of these coefficients are exactly zero, others are rational numbers, and others are rational fractions. We also examine the assumptions of Sears in his asymptotic expression of the attenuation correction fac00,646

PB93-139012 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathe-

Thermodynamically-Consistent Phase-Field Mod-

els for Solidification.
S. L. Wang, R. F. Sekerka, A. A. Wheeler, R. J. Brown, G. B. McFadden, B. T. Murray, and S. R. Coriell. Nov 92, 26p, NISTIR-4956.

Prepared in cooperation with Camegie-Mellon Univ., Pittsburgh, PA. Dept. of Physics, and Bristol Univ. (England). School of Mathematics.

Keywords: *Crystal growth, *Solidification, Liquid-solid Interfaces, Phase transformations, Mathematical models, Crystallization, Thermodynamics, Entropy, Alloys, Free boundary problems, Phase field models.

In an effort to unify the various phase-field models that have been used to study solidification, we have developed a class of phase-field models for crystallization of a pure substance from its melt. These models are based on an entropy functional, as in the treatment of Penrose and Fife, and are therefore thermodynamically consistent inasmuch as they guarantee spatially local positive entropy production. General conditions are developed to ensure that the phase field takes on definite values, independent of temperature, for the bulk phases. Specific forms of a phasefield function are chosen to produce two models that bear strong resemblances to the models proposed by Langer and Kobayashl. Our models contain additional nonlinear functions of the phase field that are necessary to guarantee thermodynamic consistency.

PB93-139061 PC A03/MF A01

National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathématics Div.

Asymptotic Behavlor of Modulated Taylor-Couette Flows with a Crystalline inner Cylinder.
R. J. Braun, G. B. McFadden, B. T. Murray, M. E. Selleck, S. R. Conell, and M. E. Glicksman. Nov 92,

47p. NISTIR-4971.

Prepared in cooperation with Rensselaer Polytechnic Inst., Troy, NY. Dept. of Materials Engineering.

Keywords: *Crystal growth, *Solidification, Coaxlal configuration, Prandtl number, Asymptotic series, Hydrodynamics, Cylinders, Instability, Crystal-melt interface, Taylor-Couette flow, Floquet theory, Succinonitrile.

The authors consider the linear stability of a modulated Taylor-Couette system when the inner cylindrical boundary consists of a crystalline solid-liquid interface. Both experimentally and in numerical calculations it is found that the two-phase system is significantly less stable than the analogous rigid-walled system for materials with moderately large Prandtl numbers. A nu-merical treatment based on Floquet theory is de-scribed, which gives results that are in good agreement with preliminary experimental findings. In addition, the Instability is further examined by carrying out a formal asymptotic expansion of the solution in the limit of large Prandtl number. In the limit the Floquet analysis is considerably simplified, and the linear stability of the modulated system can be determined to leading order through a conventional stability analysis, without re-course to Floquet theory. The resulting simplified prob-lem is then studied for both the narrow gap geometry and for the case of a finite gap. It is surprising that the determination of the linear stability of a two-phase system is considerably simpler than that of the rigid-walled system, despite the complications introduced by the presence of the crystal-melt interface.

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PB93-141737 PC A11/MF A03 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD.

Accuracy in Powder Diffraction II. Proceedings of the international Conference. Held in Gaithersburg, Maryland on May 26-29, 1992.

Special pub. (Final). E. Prince, and J. K. Stalick. Oct 92, 244p, NIST/SP-

Also available from Supt. of Docs. as SN003-003-03186-1. See also PB80-200488. Sponsored by Inter-national Union of Crystallography, and JCPDS-Inter-national Centre for Diffraction Data, Swarthmore, PA.

Keywords: *Crystal structure, *Lattice parameters, *Meetings, X-ray diffraction, Neutron diffraction, Phase

studies, Computer applications, Microstructure, International, Instruments, Automation, Standards, Accu-

The proceedings of the International conference Accuracy in Powder Diffraction II present the Invited papers and abstracts of the papers contributed to the conference, which was held at NIST, Gaithersburg, Maryland, during May 26-29, 1992. The conference was organized by the Commission on Powder Diffraction of the International Union of Crystallography, and was jointly sponsored by NIST, JCPDS-International Centre for Diffraction Data and the International Union of Crystallography. The proceedings contain 25 invited papers and 73 contributed abstracts. The program of the conference was divided into six topics: Phase Identification and Quantification; Accuracy and Standards; New Developments In Software and Data Analysis; Profile Fitting, Decomposition and Microstructural Effects; Novel Applications and Structural Science; and New Developments in Hardware, Including Detectors, and Studies under Non-ambient and Time-resolved Conditions. A ceremonial session was devoted to a tribute to the late William Parrish and his contributions to powder diffraction. In addition, there were two tutorial workshops organized by the JCPDS--International Centre for Diffraction Data, one on diffractometer sensitivity and one on automatic indexing methods.

00.649

PB93-150712 Not available NTIS

National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Electricity Div. Quantized Dissipation of the Quantum Hall Effect

at High Currents.

Final rept. M. E. Cage, 1992, 2p. See also PB90-241365.

Pub. in Conference Record for Conference on Preclsion Electromagnetic Measurements (CPEM'92), Paris, France, June 9-12, 1992, p362-363.

Keywords: *Hall effect, Electron transitions, Electron gas, Two dimensional, Dissipation, *Quantum Hall effect, Landau levels.

Quantized dissipative voltage states are observed when large currents are passed through high-quality quantized Hall resistance devices. These dissipative states are interpreted as occurring when electrons make transitions between Landau levels and then retum back to the lowest-filled levels.

00.650

PB93-150845 Not available NTIS

National Inst. of Standards and Technology (CSTL), Gaithersburg, MD. Surface and Microanalysis Science

Sims Determination of Oxygen and Carbon in YBa2Cu3O7-x Superconductors.

Final rept.
G. Gillen, P. Chi, and D. S. Simons. 1990, 4p.
Pub. in Proceedings of Ion Mass Spectroscopy (2nd),
SIMS 7, p697-700 1990.

Keywords: *Superconducting films, *YBCO superconductors, *Carbon, *Oxygen, Ion Implantation, Concentration(Composition), Thin films, Reprints, *Yttnum banum cuprates, Secondary Ion mass spectroscopy, Sputtered films.

Using minor isotope in-situ ion Implantation of (18)O and (13)C, secondary Ion mass spectrometry was used to quantify the levels of oxygen and carbon in a magnetron-sputtered thin film superconductor. Systematic errors in our analysis and implantation techniques were evaluated by checking against independent (12)C and (18)O implants in silicon. In both cases, the doses determined by the In-situ Implant technique were within 6% of the nominal values. Secondary ion imaging of the superconducting thin film Indicated that carbon was localized primarily in the grain boundaries. It was also found that the measured carbon concentration varied as a function of depth. Determination of oxygen levels in the material gave a calculated oxygen concentration of 56.4 atomic %, comparing well with the expected value of 54 atomic %. For both of these analyses, precision and accuracy were limited by the roughness of the superconducting film which made it difficult to obtain accurate crater depth measurements.

PB93-151199 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Semiconductor Electronics Div. Charge Trapping in Cubic Silicon Carbide MIS Capacitors. Final rept.

J. J. Kopanski, and R. E. Avila. 1992, 6p. Contracts NASA-C-30007-K, NASA-C-30018-M Sponsored by National Aeronautics and Space Administration, Cleveland, OH. Lewis Research Center. Pub. In Springer Proceedings In Physics - Amorphous and Crystalline Silicon Carbide III, v56 p119-124 1992.

Keywords: *Trapping(Charged particles), Temperature dependence, Silicon carbides, Cubic lattices, Interfaces, Electron traps, Hole traps, Capacitors, Instability, Reprints, MIS(Semiconductors), Fowler-Nordheim tunneling.

The charge trapping properties of the insulator and the insulator-SiC interface of cubic SiC metal-insulator-semiconductor (MIS) capacitors have been studied. The interface trap level density, D(it), was determined by the high-frequency capacitance-voltage and the conductance-voltage techniques. The number of active Interface traps increases sharply in the range from room temperature to 260 C. SiC MIS capacitors exhibit a slow-trapping instability when subjected to a stress voltage. Both the bulk oxide trap density, N(ot), and the D(it) are seen to increase during a voltage stress. The conduction mechanism in thermal oxide layers on SiC is limited by Fowler-Nordheim emission with a barner height of about 2.9 eV.

00.652 PB93-151256 Not available NTIS

National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Reactor Radiation Div. Polarization Analysis of the Magnetic Excitations

In invar Fe86B14.

Final rept.

J. W. Lynn, N. Rosov, Q. Lln, C. H. Lee, and G. Fish.

Sponsored by National Science Foundation, Washing-

Pub. In Physica B 180-181 p253-255 1992.

Keywords: *Invar, Boron containing alloys, Iron alloys, Neutron scattering, Polarized beams, Amorphous materials, Spin waves, Monochromators, Magnetization, Reprints, Magnetic excitations.

Triple-axis polarized Inelastic neutron scattering experiments have been carried out on the amorphous ferromagnet Fe(86)B(14) to separate the longitudinal fluctuations from the transverse (spin wave) excitations. The data suggest that longitudinal excitations exist not only in the vicinity of T(c), but substantially below the ordering temperature as well. The existence of these 'hidden' excitations may well explain the 'Invar anomaly'.

PB93-151645 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Gas and Particulate Science Div. MeV Be implantation in GaAs. Final rept.

M. V. Rao, P. E. Thompson, H. B. Dietrich, and D. S. Simons. 1990, 236p.
Pub. in Jnl. of Applied Physics 67, n10 p6165-6170

1990.

Keywords: *Gallium arsenides, *Ion implantation, *Beryllium Ions, MeV range 1-10, Hall effect, Activation, Annealing, Wafers, Reprints, Secondary ion mass spectroscopy, Rapid thermal annealing.

High-energy Be implantation was performed at 1, 2, and 3 MeV for a dose of 1 x 10(sup 13)/sq cm and at 2 MeV in the dose range of 4 x 10(sup 12) to 1 x 10(sup 14)/sq cm. Range statics from as-implanted secondary ion mass spectrometry profiles were calculated. The Implanted wafers were activated by either fumace or rapid thermal anneal. For the same implant dose, 1 x 10(sup 13)/sq cm, the dopant electrical activation decreased with increasing ion energy. For the 2 MeV implants, the dopant electrical activation increased with the Implant dose, in the range used in this study. An activation as high as 98% was measured for the 2 MeV/10(sup 14)/sq cm Be-Implant.

PB93-151694 Not available NTIS National Inst. of Standards and Technology (MSEL), Galthersburg, MD. Reactor Radiation Div.
NIST Cold Neutron Research Facility and Magnetic **Neutron Scattering.**

Final rept. J. J. Rhyne, and C. F. Majkrzak. 1990, 6p. See also PB93-135440.

81

PHYSICS

Solid State Physics

Pub. In Jnl. of Applied Physics 67, n9 p5693-5698 1990.

Keywords: *Research facilities, *Cold neutrons, Timeof-flight method, Small angle scattering, Inelastic scattering, Neutron scattering, Amorphous materials, Neutron detectors, Magnetization, Diffraction, Reprints, Reflectometry.

The National Institute of Standards and Technology has under development a major Cold Neutron Research Facility which on completion will make available approximately 15 new neutron scattering instruments located on neutron guides on the reactor cold source. This facility, which includes the NSF Center for High Resolution Neutron Scattering, will be operated as a user facility, which is open via a proposal system to all scientists. This paper briefly reviews the types of cold neutron instruments that have particular relevance to magnetic problems. A discussion is given of neutron scattering from magnetic systems with examples of problems appropriate for the enhanced energy and wave vector resolution of cold source instruments. Included is a review of new experimental results and techniques that will be available, including reflectometry and grazing-angle diffraction, as well as more conventional techniques such as triple axis inelastic scattering, small angle scattering, and time-of-flight spectroscopy.

00,655
PB93-151702 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Boulder, CO. Electromagnetic Technology Div.
Tunneling Stabilized Magnetic Force Microscopy
of YBa2Cu3O7-Delta Films on MgO at 76 K.
Final rept.

P. Rice, and J. Moreland. 1991, 3p. See also PB91-203653 and PB92-144948. Pub. in IEEE (Institute of Electrical and Electronics Engineers) Transactions on Magnetics 27, n6 p5181-5183 Nov 91.

Keywords: *Superconducting films, *YBCO superconductors, Temperature range 0065-0273 K, High temperature superconductors, Scanning tunneling microscopy, Type 2 superconductors, Magnetic films, Magnesium oxides, Substrates, Reprints, *Yttnum barium cuprates, Magnetic force microscopy, Sputtered films.

Tunneling Stabilized Magnetic force microscopy (TSMFM) is an elementary variation of scanning tunneling microscopy (STM). As in STM, a sharp conductive tip is scanned across a conductive sample with an electrical potential applied. As the tip is scanned, changes in tunneling current are plotted on a computer screen as a topographical image. The difference between STM and TSMFM is that the TSMFM tip is made from a flexible magnetic film which deflects in response to sample surface magnetic forces. Pinning of the Abrikosov flux lattice in high temperature superconductors determines the critical current. We have applied TSMFM to these high temperature superconductors. We present images of sputter deposited YBa2Cu3O(7-delta) films below the critical temperature.

00,656
PB93-151710 Not available NTIS
National Inst. of Standards and Technology (CSTL),
Gaithersburg, MD. Surface and Microanalysis Science
Div.

Mechanistic Studies of Photoinduced Reactions at Semiconductor Surfaces. Final rept.

L. J. Richter, and R. R. Cavanagh. 1992, 72p. Pub. in Progress in Surface Science 39, p155-226 1992.

Keywords: *Surface reactions, *Semlconductors, *Gallium arsenides, *Silicon, *Interfaces, Desorption, Oxidation, Etching, Substrates, Reviews, Reprints, Photoinduced reactions.

Photoinduced reactions at semiconductor surfaces and interfaces have recently come under intense study. This activity is motivated both by the potential technological importance of photoinduced device processing and by the fascinating complexity of the underlying science. The basic mechanisms by which photons can drive surface/interface reactions can be categorized into direct excitation of an ambient species, direct excitation of an adsorbed species, or indirect excitation via absorption within the substrate. We summarize the essential aspects of these basic mechanics active the support of the seminary of the substrate.

nisms and then review recent studies that have focused on identifying the basic photoexcitation mechanism. The review encompasses studies of molecular desorption from, metal deposition on, and the oxidation and etching of Si and GaAs substrates.

00,657
PB93-151728 Not available NTIS
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Reactor Radiation Div.
Resolution Considerations for Polarized TripleAxis Spectrometry.

Final rept. N. Rosov, J. W. Lynn, and R. W. Erwin. 1992, 2p. Pub. in Physica B 180-181, p1003-1004 1992.

Keywords: Spin orientation, Magnetization, Reflectivity, Analyzers, Resolution, Reprints, *Polarized beam spectroscopy, Neutron polarization.

It is well known that the cross-sections for triple-axis polarized beam spectroscopy depend on the relative orientation of the neutron polarization P and the momentum transfer Q. This orientational dependence of the cross-sections can give rise to large resolution effects when the direction of Q varies substantially over the resolution function, which is often the case with polarized beam measurements because relaxed resolution is frequently employed to compensate for reduced intensities. This is also true when measurements are made at small wave vectors, as is necessary for amorphous materials. We find that the positions of excitations can be shifted significantly, and the intensities can deviate by a factor of two or more from the ideal case.

00,658
PB93-151850 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.
Re-Examination of Quantum Hall Plateaus.
Final rept.
C. T. Van Degrift, K. Yoshihiro, E. C. Palm, M. E.
Cage, J. Wakabayashi, and S. Kawaji. 1992, 2p.
Pub. in Proceedings of Conference on Precision Electromagnetic Measurements (CPEM'92), Paris, France,
June 9-12, 1992, p288-289.

Keywords: *Electrical resistance, Electrical measurement, Magnetic fields, Precision, Silicon, MOSFET, Reprints, *Quantum Hall effect, Resistance standards.

Even though the practical unit of electrical resistance was tied to the quantum Hall effect in 1990, our understanding of the fundamental physics of current flow, contacting, and impurity effects in quantum Hall systems remains incomplete. This paper examines some recently discovered effects which may affect quantum Hall resistance determinations.

00,659
PB93-151876 Not available NTIS
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Ceramics Div.
Reaction Sintering High-Density, Fine-Grained
Ba2YCu3O6.5+x Superconductors Using Ba(OH)
2.H2O.
Final rept.

J. S. Wallace, B. A. Bender, S. H. Lawrence, and D. J. Schrodt. 1988, 9p. Pub. in Ceramics Supercond. 2, p243-251 1988.

Keywords: *YBCO superconductors, *Sintering, High temperature superconductors, Barium hydroxides, Reprints.

A technique for sintering high density, fine-grained BYCO superconductors employing Ba(OH)2.H2O using a single step reaction sintering cycle and partial vacuum has been developed. The materials produced are nearly single-phase and have cleaner grain boundaries than many BYC materials produced using BaCO3 and multiple step calcining/grinding procedures.

00,660
PB93-151942 Not available NTIS
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Ceramics Div.
Structural Phase Transition Studies of High Tc
Superconducting Materials.
Final rept.
W. Wong-Ng, L. P. Cook, C. K. Chiang, L. J.
Swartzendruber, and L. H. Bennett. 1988, 16p.
Pub. in Ceramic Superconductors II, p27-42 1988.

Keywords: *High temperature superconductors, *Crystal-phase transformations, Orthorhombic lattices, Tetragonal lattices, Transition temperature, Samarium oxides, Gadolinium oxides, Erbium oxides, Rare earth compounds, Reprints, Yttrium barium cuprates.

In order to gain more insight Into the effect of oxygen stolchiometry on superconductivity, and the correlation between the size of the rare-earth elements and superconductivity, the phase transitions between the orthorhombic and tetragonal structures of several high Tc superconductors Ba2RCu3O(6+x) (where R= Sm, Y, Gd and Er; X=0 to 1) have been investigated. All samples were prepared from orthorhombic starting materials by annealing at temperatures from 400 to 1000 C in air, followed by rapid quenching. Quenching was performed by using a liquid nitrogen-cooled copper cold well with a continuous flow of cooled helium gas. Various measurements including x-ray diffraction, thermogravimetric analysis, and Meissner effects were carried out in order to correlate the nature of the phase transition with crystallographic data, superconductivity and annealing temperature.

00,661
PB93-152072 PC A06/MF A02
National Inst. of Standards and Technology (MSEL),
Gaithersburg, MD. Materials Reliability Div.
Modeling of X-ray Diffraction Line Broadening with
the Voigt Function: Applications to High-T(sub c)
Superconductors.
Doctoral thesis.
D. Balzar. Jan 93, 101p, NISTIR-3998.

Keywords: *High temperature superconductors, *X-ray diffraction, *Superconductors, Line broadening, Crystal defects, Theses, Lanthanum banium cuprates, Lanthanum calclum cuprates, Lanthanum strontium cuprates, Lanthanum cuprates, Bismuth strontium calcium cuprates, Voight functions.

See also PB92-165034.

A method to analyze powder-diffraction line broadening is proposed and applied to some novel high-T(sub c) superconductors. Assuming that both size-broadened and strain-broadened profiles of the pure-specimen profile are described with a Voigt function, it is shown that the analysis of Fourier coefficients leads to the Warren-Averbach method of separation of size and strain contributions. The method was applied to two cubic structures with average volume-weighted domain sizes up to 3600 A, as well as to tetragonal and orthorhombic (La-Sr)2CuO4, which exhibit weak line broadenings and highly overlapping reflections. Comparison with the Integral-breadth methods is given. Reliability of the method is discussed in the case of a cluster of the overlapping peaks. The analysis of La2CuO4 and La(1.85)M(0.15)CuO4 (M = Ca, Ba, Sr) high-T(sub c) superconductors showed that microstrains and incoherently diffracting domain sizes are highly anisotropic. In the superconductors, stacking-fault probability Increases with Increasing T(sub c); microstrain decreases. in La2CuO4, different broadening of (h00) and (0k0) reflections is not caused by stacking faults;

00,662
PB93-153237 Not available NTIS
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.
MagnetIc FleId Dependence of Quantized Hall Effect Breakdown Voltages.
Final rept.

It might arise from lower crystallographic symmetry.

M. E. Cage. 1992, 4p.
Sponsored by Department of Defense, Washington, DC

Pub. In Semiconductors Science and Technology 7, p1119-1122 1992.

Keywords: Magnetic flelds, Electron gas, Two dimensional, Quantization, Voltage, Reprints, *Quantum Hall effect.

When large currents are passed through a high-quality quantized Hall resistance device, the voltage drop along the device is observed to assume discrete, quantized states when plotted against the magnetic field. These quantized voltage states are interpreted as occurring when electrons are excited to higher Landau levels and then return to the original Landau level. The quantization is found to be a function of magnetic field, and consequently can be more difficult to verify and determine than previously suspected.

00,663 PB93-153328 Not available NTiS

Solid State Physics

National Inst. of Standards and Technology (MSEL), Boulder, CO. Materials Reliability Div.

Orientation Dependence of Flux Pinning In a Layered BI2Sr2Ca1Cu2O8 + 10% Ag Composite. Final rept.

M. Foldeaki, and H. Ledbetter. 1992, 6p.

Pub. In Materials Research Society Symposium Proceedings, v235 p701-706 1992.

Keywords: *Superconductors, *Flux pinning, Superconducting composites, Magnetic anisotropy, Magnetic hysteresis, Magnetic susceptibility, Meissner effect, Polycrystalline, High temperature superconductors, Orientation, Silver, Reprints, *Bismuth strontium calcium cuprates.

The Bl2Sr2Ca1Cu2O8 + 10% Ag specimen was grain oriented along the a(b) axis, but random in the perpendicular plane. Magnetic susceptibility and hysteresis measured along the axis of grain orientation and in the polycrystalline direction showed remarkable anisotropy. At low temperatures (below about 30 K), hysteresis curves were compatible with the strong-pinning model. The pinning force calculated from the hysteresis loop showed a higher maximum in the random direction, but decreased fast with Increasing field and temperature. From the zero-field-cooled (zfc) and field-cooled (fc) susceptibility curves, the irreversibility line was determined. Evaluation according to the de Almeida-Thouless equation with fixed exponent n=3/ 2 revealed a two-phase vortex structure; one nearly Isotropic with low (40-K) zero-field irreversibility transition temperature, and one strongly anisotropic, the Irreversibility transition being close to the superconducting-transition temperature.

00.664 PB93-153344 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div. Demagnetizing Factors.

Final rept.

R. B. Goldfarb. 1992, 2p.
See also PB92-165174.
Pub. In Conclse Encyclopedia of Magnetic and Superconducting Materials, p103-104 1992.

*Demagnetization, Circular cylinders, Ellipsolds, [Paramagnetism, Diamagnetism, Ferromagnetism, n, Magnetostatics, Magnetic fields, Superconductivity, Reprints.

Demagnetizing factors for ellipsoids of revolution and right circular cylinders are reviewed.

00 665 PB93-153351 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div. Magnetic Units and Materials Specification. Final rept.

R. B. Goldfarb. 1992, 6p.
Pub. In Conclse Encyclopedia of Magnetic and Superconducting Materials, p253-258 1992.

Keywords: *MagnetIsm, Units of measurement, Magnetic susceptibility, Magnetic permeability, Magnetic hysteresls, Magnetic materials, Symbols, Reprints, Conversion factors.

The paper is an encyclopedia article on magnetic units and material specification.

00,666 PB93-153369 PB93-153369 Not available NTIS National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div. Comparison of Transport Critical Current Measurement Methods. Final rept.

. F. Goodrich, and A. N. Srivastava. 1992, 8p. Pub. In Advances In Cryogenic Engineering (Materials), v38 p559-566 1992

Keywords: *Superconductors, *Critical current, Electrical measurement, Comparative evaluations, Reprints.

The critical current (I(c)) of a superconductor can be measured using a variety of measurement systems and techniques. The measurement system should be chosen based upon several considerations including accuracy, the number of samples to be measured, and measurement environment. The system may vary in complexity from a simple analog recorder that monitors the voltage-current characteristic, to a sophisticated

computerized data acquisition system that monitors several different experimental parameters. Various measurement techniques are available for measuring I(c), including the dc, pulse, and ac methods. Each technique, along with its advantages and disadvantages, is discussed.

00,667 PB93-153377 Not available NTIS

National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div.

Effect of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O.

Final rept.
M. D. Hill, W. Wong-Ng, C. K. Chiang, J. E. Blendell, E. Lagergren, R. Kacker, E. R. Fuller, and B. Paretzkin. 1992, 5p.

Pub. in Jnl. of the American Ceramics Society 75, n9 p2390-2394 1992.

Keywords: *Superconductors, High temperature superconductors, Solid solutions, Reprints, *Yttrium banum cuprates, *Gadolinium banum cuprates, Phase equilibrium.

The superconducting properties of a solid-solution region in the Ba-Y-Gd-Cu-O system were Investigated as a function of composition. Phase relations, decomposition temperature, superconducting onset temperature T(c), and the transport current density J(c) were measured. The highest T(c) and J(c) are observed along the line between the stoichiometric Ba2YCu3O(6+x) and Ba2GdCu3O(6+x) compositions.

00,668 PB93-153401 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Electron and Optical Physics Div. Correlations of Magnetic Microstructure and Anisotropy with Noise Spectra for CoNI and CoCrta Thin Film Media.

Final rept.
M. R. Khan, S. Y. Lee, J. L. Pressesky, R. D. Fisher, N. Heiman, M. R. Scheinfein, J. Unguns, D. T. Pierce, R. J. Celotta, D. E. Speliotis, D. Williams, and S. L. Duan. 1990, 3p.

Pub. In IEEE (Institute of Electrical and Electronics Engineers) Transactions on Magnetics 26, n5 p2715-2717 Sep 90.

Keywords: *Cobalt alloys, Magnetic alloys, Magnetic anisotropy, Magnetic domains, Magnetic films, Magnetic hysteresls, Chromlum containing alloys, Nickel containing alloys, Thin films, Microstructure, Correlation, Noise, Reprints.

The paper reports on two thin film media alloys Co(86)Cr(12)Ta(2) and Co(75)Ni(25) which have very different noise characteristics. The magnetic different noise characteristics. The magnetic microstructure of these films was observed with SEMPA. The anisotropy and the rotational hysteresis loss measurements have been made using a torque magnetometer. The distribution of anisotropy field Hk and its width dHk have also been measured, along with Its different normalized values. We suggest that the observed magnetic microstructure can be directly correlated with measured readback noise and anisotropy differences.

00.669 PB93-153468 Not available NTIS National Inst. of Standards and Technology (EEEL), Gaithersburg, MD. Semiconductor Electronics Div. Analysis of Persistent Photoconductivity Due to Potential Barriers.

Final rept. J. R. Lowney, and S. Mayo. 1992, 6p. See also PB92-171404.

Pub. in Jnl. of Electronic Materials 21, n7 p731-736

Keywords: *Photoconductivity, Silicon oxides, Electron traps, Hole traps, Interfaces, Reprints, Carrier recombination, Silicon resistors, SIMOX.

Persistent photoconductivity has been seen in thin silicon resistors fabricated with SIMOX material at tem-peratures between 60 and 220 K. This effect has been attributed to the depletion of carriers near the interface between the top silicon layer and the buried oxide, which is due to the large number of surface traps at this Interface. The depletion of carriers is accompanied by a built-in field on the order of 10,000 V/cm, which causes a potential barrier that is nearly a quarter of the energy gap of silicon. The theory of the recombination kinetics of majority carriers with minority carriers trapped at the Interface on the other side of a potential barrier is studied. Both the possibilities of tunneling and thermal activation have been considered. The results show that thermal activation dominates at the temperatures of our measurements in SIMOX material, while at lower temperatures tunneling would dominate.

00.670 PB93-153518 Not available NTIS

National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div.

Dynamic Resistance of Superconducting

Dynamic Resistance of Superconducting YBa2Cu3Ox Sintered Powder at 81 K: Liquid versus Vapor Nitrogen Environment.

Final rept. J. Moreland, W. P. Dube, and L. F. Goodrich. 1992,

Pub. in Advances in Cryogenic Engineering (Materials), v38 p965-972 1992.

Keywords: *Superconductors, High temperature superconductors, Liquid nitrogen, Environmental tests, Flowmeters, Bolometers, Electrical resistance, Superconducting devices, Reprints, *Yttrium banum cuprates.

The dynamic resistance as a function of transport current in a superconducting YBa2Cu3Ox (YBCO) sintered powder sample depends on its thermal surroundings. Plots of V, dV/dI, and the second derivative of V with respect to I versus I are markedly different for the sample in vapor nitrogen compared to those measured in liquid nitrogen at 81 K. Plots of (I x the second derivative of V with respect to I)/dV/dI as a function of I and dV/dI quantify the curvature of the V-I character-Istics of the sample. At 81 K, we find that at the onset of detectable flux flow in the sample, the n factor determined from the dynamic derivatives of the V-I curve Is 15 in the vapor versus 5 in the liquid. This phenomena could be the basis for low power cryogenic flow meters, bolometers, level detectors, or other types of thermal environment sensors.

00,671 PB93-156743 PC A03/MF A01 National Inst. of Standards and Technology (CAML), Galthersburg, MD.

Computation of Complex Solidification Morphologies Using a Phase-Field Model.

B. T. Murray, A. A. Wheeler, W. J. Boettinger, and G.

B. McFadden. Feb 93, 23p, NISTIR-5124.

Prepared in cooperation with Bristol Univ. (England). School of Mathematics.

Keywords: *Dendritic crystals, *Crystal growth, *Solidification, Finite difference theory, Two dimensional, Mathematical models, Anisotropy, Dendrites, Computation, Phase field models.

An anisotropic phase-field model is used to calculate numerically the solidification patterns of a pure material Into an undercooled liquid In a two-dimensional rectangular region. In the phase-field approach, the solid-liquid Interface Is treated as diffuse, and a dynamic equation for the phase variable is introduced in addition to the equation for heat flow. The phase-field model equations are solved using finite-difference techniques on a uniform mesh. Calculations for dendritic growth are presented for both four-fold and six-fold anisotropy, and the effect of the level of anisotropy on the growth of a dendnte is investigated. A previous study has shown that performing computations with an interface that Is sufficiently thin for the numerical solution to accurately represent a sharp interface model is computationally demanding. However, even with a rel-atively thick interface, the computations using the phase-field model show many of the qualitative tures of dendritic growth, and the method is well suited for handling the evolution of very complex, realistic Interface shapes.

PB93-164564 PC A03/MF A01
National Inst. of Standards and Technology (CAML),
Gaithersburg, MD. Applied and Computational Mathematics Div.

Phase-Field Models for Anisotropic Interfaces.
G. B. McFadden, A. A. Wheeler, R. J. Braun, S. R. Conell, and R. F. Sekerka. Feb 93, 28p, NISTIR-

5130.
Prepared In cooperation with Camegie-Mellon Univ., Pittsburgh, PA. Dept. of Physics.

Keywords: *Solidification, Mathematical models, Asymptotic series, Two dimensional, Free energy, Anisotropy, Interfaces, Phase free models.

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The Inclusion of anisotropic surface free energy and anisotropic linear interface kinetics in phase-field models is studied for the solidification of a pure material. The formulation is described for a two-dimensional system with a smooth crystal-melt interface and for a surface free energy that varies smoothly with orientation, In which case a quite general dependence of the surface free energy and kinetic coefficient on orienta-tion can be treated; it is assumed that the anisotropy Is mild enough that missing orientations do not occur The method of matched asymptotic expansions is used to recover the appropriate anisotropic form of the Gibbs-Thomson equation in the sharp-interface limit in which the width of the diffuse interface is thin compared to its local radius of curvature. It is found that the surface free energy and the thickness of the diffuse interface have the same anisotropy, whereas the kinetic coefficient has an anisotropy characterized by the product of the interface thickness with the intrinsic mobility of the phase field.

00,673 PB93-165728

PB93-165728 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Electron and Optical Physics Div. Surface Magnetic Microstructure.

Final rept. M. R. Scheinfein, J. Unguris, R. J. Celotta, and D. T.

Pierce. 1990, 9p. See also PB90-188210.

Pub. In Magnetic Properties of Low-Dimensional Systems II, Springer Proceedings In Physics, v50 p2-10

Keywords: Scanning electron microscopy, Ferromagnetic materials, High resolution, Bloch wall, Domain walls, Magnetization, Microstructure, Reprints, *Surface magnetism, Electron spin polarization, Micromagnetics, Neel walls.

The way in which a magnetic solid minimizes its energy through the formation of domain walls is strongly influenced by the presence of the surface. At the surface, a bulk Bloch wall may change into Neel wall in order to reduce the magnetic stray field energy of the ferromagnetic system. The authors present high spatial results of the surface in olution images of surface magnetic microstructure obtained by scanning electron microscopy with polanzation analysis (SEMPA). Quantitative domain wall profiles at surfaces have been measured for a wide variety of ferromagnetic materials which display asymmetric surface Neel walls for bulk-like thicknesses. The authors have calculated the magnetic moment configuration at the surface, using bulk magnetic parameters and an iterative micromagnetic energy minimization scheme. The calculated profiles are compared directly with experimental surface magnetization profiles. The surface magnetic microstructure of a surface magnetic topological singularity is observed and an upper limit on the size of the singularity is determined.

00,674

PB93-165736 Not available NTIS

National Inst. of Standards and Technology (NML), Gaithersburg, MD. Electron and Optical Physics Div. Spatial Resolution Quantitative Micromagnetics.

Final rept. M. R. Scheinfein, J. Unguris, D. T. Pierce, and R. J. Celotta, 1990, 6p.

Pub. In Jnl. of Applied Physics 67, n9 p5932-5937 1990.

Keywords: Scanning electron microscopy, Ferromagnetic materials, High resolution, Imaging techniques, Domain walls, Bloch wall, Magnetization, Reprints, *Surface magnetism, Magnetic force microscopy, Micromagnetics, Neel walls.

Magnetization distributions near surfaces are observed with scanning electron microscopy with polarization analysis (SEMPA). This technique allows for quantitative analysis of the vector magnetization distribution near surfaces with 50 nm spatial resolution. Magnetization distributions in surface Neel walls which terminate bulk 180 degree Bloch walls near surfaces have been calculated by solving the micromagnetic equations using energy minimization. Excellent quantitative agreement between measured and calculated surface wall profiles is found for several common ferro-magnetic materials. The magnetization distributions re-sulting from the micromagnetic calculations are used to estimate the magnetic contrast that would be observed in transmission Lorentz microscopy, magnetic force microscopy (MFM) and in the Bitter technique for the observation of surface wall profiles. Comparisons between these magnetic Imaging techniques is given with an emphasis on image interpretation and the ultimate spatial resolution achievable with each techniaue.

00.675

PB93-166098 Not available NTIS

National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div.
Iron Magnetic Moments In Iron/Silica Gel

Nanocomposites.

Final rept.

R. D. Shull, J. J. Ritter, A. J. Shapiro, L. J. Swartzendruber, and L. H. Bennett. 1990, 3p. Pub. in Jnl. of Applied Physics 67, n9 p4490-4492, 1

Keywords: *Iron, *Magnetic moments, Electron microscopy, Spin glass, Mossbauer effect, X-ray diffraction, Magnetization, Silica gel, Reprints, Nanocomposites.

Homogeneous gelled composites of iron and silica containing 11-40 wt. % Fe have been prepared by lowtemperature polymerization of aqueous solutions of ferric nitrate, tetraethoxysilane, and ethanol (with an HF catalyst). X-ray diffraction, electron microscopy, Mossbauer effect, and magnetization measurements have been used to show that these bulk materials are paramagnetic composites at room temperature and remain In that state to 10 K. In this condition the Fe is present in nanometer-sized regions and exists in ionic form (both Fe(3+) and Fe(2+)). It possesses a large magnetic moment which decreases linearly from 3.9 mu(sub B)/Fe atom to 2.8 mu(sub B)/Fe atom as the Fe content increased from 11% to 40%. For this composition increase, a negative Curie-Weiss temperature was found which increased in magnitude linearly from -13 to -46 K. It is suggested that many of the iron atoms in the as-cured nanocomposites interact antiferromagnetically, and that the magnitude of the ef-fect increases with the Fe concentration. After treatment in hydrogen, the state of the Fe changes.

00.676

PB93-166130 Not available NTIS

National Inst. of Standards and Technology (IMSE), Gaithersburg, MD. Reactor Radiation Div. Magnetic Phase Transitions and Structural Distortion in Nd2CuO4.

S. Skanthakumar, H. Zhang, J. W. Lynn, W. H. Li, and T. W. Clinton. 1989, 5p.

See also PB90-254921.

Pub. in Physica C 160, n2 p124-128 1989.

Keywords: *Superconductors, Phase transformations, X-ray diffraction, Neutron diffraction, Single crystals, Magnetic properties, Tetragonal lattices, Polarized beams, Antiferromagnetism, Reprints, *Neodymium cuprates, Magnetic ordering.

Neutron and x-ray diffraction have been used to study the magnetic and structural properties of single crystal Nd2CuO4. Long range magnetic order of the Cu moments develops at T(N) = 245 K, with a noncollinear antiferromagnetic arrangement of spins. Additional abrupt transitions are observed at 75 K and 30 K, in which a spin reorientation takes place. Bragg peaks associated with the crystal structure are found at the same positions as the magnetic Bragg peaks, and indicate that a distortion of the basic tetragonal structure has occurred above 300 K.

PB93-166171 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Surface Science Div. Faceting Induced by an Ultrathin Metal Film: Pt on

Final rept.

K. J. Song, R. A. Demmin, C. Dong, E. Garfunkel, and T. E. Madey. 1990, 7p.
Pub. in Surface Science 227, n1-2 pL79-L85 1990.

Keywords: *Surfaces, Auger electron spectroscopy, Scanning tunneling microscopy, Metal films, ThIn films, Platinum, Tungsten, Flat surfaces, Reprints, Low energy electron diffraction.

The interaction of ultrathin films of Pt with a W(111) surface has been studied using low energy electron dif-fraction (LEED), Auger electron spectroscopy (AES) and scanning tunneling microscopy (STM). When W(111) is covered with 1.1 x 10(sup 15) Pt atoms/sq cm and heated in the range 800 to 1600K, the surface undergoes a massive restructuring to form microscopic

facets. At 1200K, the average facet dimensions are 100 A, and the dominant facet orientation is W(211). The faceting appears to be driven by a Pt-enhanced anisotropy in the surface free energy.

00.678

PB93-166288 Not available NTIS

National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Metallurgy Div.

Barkhausen Jump Correlations in Thin Folis of Fe and Ni.

L. J. Swartzendruber, L. H. Bennett, H. Ettedgui, and

I. Aviram. 1990, 3p. Pub. in Jnl. of Applied Physics 67, n9 p5469-5471

Keywords: *Barkhausen effect, Foils(Materials), Microstructure, Signal analysis, Nickel, Iron, Reprints.

The Barkhausen noise emanating from the surface of thin folls of nearly pure iron and nickel was obtained by digitizing the noise signal over a complete hysteresis loop. This digitizing signal is used to analyze various attributes of the noise such as the autocorrelation, power density spectrum, jump amplitude spectrum, and jump amplitude correlation. For thin foils the power density exhibits a peak in the lowfrequency range, contrary to what is predicted for a senes of statistically independent Barkhausen jumps. Return maps and plots of jump amplitude vs. time between jumps show no evident deviation from random noise behavior. Thus, jump correlations or clustering do not explain the power density spectra, and an additional mechanism for the loss of low frequency power is required.

00 679

PB93-166296 Not available NTIS

National Inst. of Standards and Technology (IMSE),

Gaithersburg, MD. Metallurgy Div.
Direct Evidence for an Effect of Twin Boundaries on Flux Pinning in Single Crystal of YBa2Cu3O6+x.

Final rept. L. J. Swartzendruber, A. Roitburd, D. L. Kaiser, F. W.

Gayle, and L. H. Bennett. 1990, 4p. Pub. in Physical Review Letters 64, n4 p483-486 1990.

Keywords: *High temperature superconductors, *Flux pinning, *Superconductors, Single crystals, Critical current, Twinning, Anisotropy, Reprints, *Yttnum barium cuprates.

The magnetic properties of a nearly cubic single crystal of YBa2Cu3O(6+x) which displays predominantly one variant of twin boundary are reported. The cubic morphology has allowed a clear determination of the aniphology has allowed a clear determination of the anisotropy of critical current density without the complication of large demagnetization factors. The observed anisotropy (Jc11/Jc1) is 62, which is higher than that reported previously for this material. Furthermore, small differences in magnetic behavior have been observed with the applied field parallel or perpendicular to the predominant twin boundary orientation, showing that twins may have a measurable effect on flux pinning. The lower critical field was measured with high ning. The lower critical field was measured with high precision, and the temperature dependence of the Ginzburg-Landau parameter was derived.

00,680 PB93-166338 Not available NTIS National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Structure and Magnetic Properties of Doped Co and Fe-Bi2Sr2Cul-xMxOy Phases.

Final rept. J. M. Tarascon, E. Tselepis, G. Plelzier, M. Glroud, M. Eibschutz, G. W. Hull, D. M. Hwang, P. Barboux, D. A. Neumann, Y. Lepage, W. R. McKinnon, P. F. Miceli, J. J. Rhyne, and L. H. Greene. 1989, 12p. Pub. in Physical Review B 39, n16 p1587-1598 1989.

Keywords: *Superconductors, Crystal structure, Solid solutions, Magnetic susceptibility, Doped materials, Neutron scattering, Antiferromagnetism, Reprints, Bismuth strontium ferrate cuprates, Bismuth strontium cobaltate cuprates.

The structure and magnetic properties of the Bi2Sr2Cu(1-x)M(x)O(y) (M=Co and Fe) materials were studied. The limits of solid solution formation are at x=0.5 for the Fe system and x=1 for the Co system. Crystals of the new Bi2Sr2CoO(y) phase were grown and the structure established by x-ray crystallography. The subcell is the same as that of the 10K superconductor, Bi2Sr2CuO(y), but the superstructure

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Is different, as it exhibits a commensurate modulation of periodicity 4 instead of 5. Extra oxygen Is accommodated In the Bi layers, as In Bi2Sr3Fe2O(y), and the structure of the Bi-O layers can be described as 50% rocksalt-type and 50% oxygen-deficient perovskite for x=1, but with disorder at the oxygen positions. The formal valence of Co in this compound is about 2.5 + or - 0.2 as deduced from structural and chemical measurements, whereas Fe adopts the oxidation state +3 as deduced by Mossbauer measurements. Bi2Sr2CoO(y) is an antiferromagnetic insulator with the spins lying within the CoO2 sheets and the antiferromagnetic ordering temperature (T(N)) is sensitive to processing conditions and composition changes. The high anisotropy of the susceptibility suggests that Bi2Sr2CoO(y) may be an Ising or xy antiferromagnet.

00,681

PB93-166510 Not available NTIS National inst. of Standards and Technology (MSEL), Gaithersburg, MD. Reactor Radiation Div. Hydrogen Vibrational Modes and Anisotropic Po-

tential in alpha-ScHx. Final rept.

T. J. Udovic, J. J. Rush, I. S. Anderson, and R. G.

Barnes. 1990, 6p. Pub. in Physical Review B: Condensed Matter 41, n6 p3460-3465 1990.

Keywords: *Scandium hydrides, *Vibrational spectra, *Hydrogen, Neutron spectroscopy, High resolution, Anisotropy, Single crystals, Reprints.

The hydrogen vibrational spectra of single-crystal alpha-ScH(x) (x=0.05, 0.16, and 0.25) have been measured using Incoherent inelastic neutron scattering methods. Results suggest that, although local ordering via hydrogen pairing across a Sc atom exists within alpha-ScH(x) at low temperature, ordering of the hydrogen pairs themselves along the c-axis is less extensive than In alpha-YH(x).

00,682

PB93-166544 Not available NTIS National Inst. of Standards and Technology (NML), Gaithersburg, MD. Gas and Particulate Science Div. SEM Analysis of Interactions between Platinum, Gold, and Silver-Palladium Capsules and Barium Yttrium Copper Oxlde Superconductors.

Final rept. J. R. Verkouteren. 1989, 5p.

Pub. in Materials Letters 8, n1-2 p59-63 1989.

Keywords: *Platinum, *Gold, *Silver alloys, *Palladium containing alloys, Scanning electron microscopy, Chemical reactivity, Chemical reactions, Capsules, Reprints, *Yttrium barium cuprates.

Quantitative compositional maps are used to determine the nature and extent of chemical reactions be-tween melted BaO-Y2O3-CuO material and capsules of Pt, Au, and Ag(70)Pd(30). All three capsule materials are reactive with BYC superconductor compositions. The effect of the reactions on the results of phase equilibria experiments is discussed.

00,683

PB93-166643 Not available NTIS National Inst. of Standards and Technology (IMSE),

Gaithersburg, MD. Ceramics Div.
Structural Phase Transformation Studies of the Superconducting Materials, Ba2RCu3O6+x, in Air.

Final rept.

Final rept.
W. Wong-Ng, L. P. Cook, C. K. Chiang, F. Beech, L.
J. Swartzendruber, L. H. Bennett, E. R. Fuller, M. D.
Vaudin, and D. L. Kaiser. 1989, 17p.
See also PB90-242264. Sponsored by Electric Power
Research Inst., Palo Alto, CA.
Pub. in High Temperature Superconducting Compounds: Processing and Related Properties, p553-569

Keywords: *High temperature superconductors, *Superconductors, Crystal-phase transformations, X-ray diffraction, Electron diffraction, Orthorhombic lateral diffraction, Electron diffraction, Paprints, Satices, Tetragonal lattices, Stoichiometry, Reprints, Sa-manum barium cuprates, Gadolinium barium cuprates, Yttnum barium cuprates, Holmium barium cuprates, Erbium barium cuprates.

To understand the crystal chemistry and to gain more Insight Into the effect of oxygen stoichiometry on superconductivity, the authors have Investigated the phase transformations between the orthorhombic and

tetragonal structures of several high T(c) superconductors, Ba2RCu3O(6+x), where R = Sm, Gd, Y, Ho and Er, and x=0 to 1. Various techniques including X-ray diffraction, thermogravimetric analysis, neutron scattering, transmission electron microscopy, and determination of Meissner effect have been used to study the nature of the phase transition.

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PB93-166668 Not available NTIS National Inst. of Standards and Technology (MSEL),

Gaithersburg, MD. Ceramics Div.

Crystal Chemistry and Phase Equilibria Studies of the BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder Characterization and Diffraction Patterns of Ba3R3Cu6O14+x, R=Lanthanides. Final rept.

W. Wong-Ng, C. K. Chiang, B. Paretzkin, and E. R.

Fuller, 1990, 7p.
Sponsored by Electric Power Research Inst., Palo Alto,

Pub. in Powder Diffraction 5, n1 p26-32 Mar 90.

Keywords: *Superconductors, Tetragonal lattices, Xray diffraction, Crystal chemistry, Solid solutions, Magnetic susceptibility, Electrical resistivity, Reprints, Barpraseodymium cuprates, Barium neodymium cuprates, Banum samanum cuprates, Banum europium cuprates, Phase equilibrium.

superconductor related phases Ba3R3Cu6O(14+x) (or Ba(2-z)R(1+z)Cu3O(7+x), with z=0.5), where R = Pr, Nd, Sm, and Eu, have been prepared and characterized by X-ray powder diffraction, ac magnetic susceptibility measurement, resistivity measurement and thermogravimetric analysis (TGA). Attempts to make corresponding compounds with R = Gd, Dy, Y, Er, and Lu were not successful; they do not appear to form for rare-earth elements, R, with an ionic size smaller than Eu. The oxygen content of the successful materials was estimated by TGA. The Ba3R3Cu6Cu(14+x) compounds which were sintered at 950 C and annealed in oxygen at 550 C were found to be nonsuperconducting above 10K. Previously reported results for the R=La compound have indicated that it was superconducting with a transition tempera-ture of 15K. The oxidation-reduction behavior of the Ba3R3Cu6O(14+x) materials is similar to that of the superconductor phases Ba2RCu3O(6+x).

(Order as PB93-166817, PC A08) of Standards and Technology PB93-166858 National Inst. Technology, Gaithersburg, MD.

Neutron Reflectivity and Grazing Angle Diffraction. J. F. Ankner, C. F. Majkrzak, and S. K. Satija. 1993, 12p.

Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n1 p47-58 Jan/Feb

Keywords: *Neutron diffraction, Grazing Incidence, Magnetic materials, Thin films, Superconductors, Interfaces, Polymers, Superlattices, Surfaces. reflection, Neutron Neutron reflectometers, Multilavers.

Over the past 10 years, neutron reflectivity has emerged as a powerful technique for the Investigation of surface and interfacial phenomena in many different fields. In the paper, a short review of some of the work on neutron reflectivity and grazing-angle diffraction as well as a description of the current and planned neutron reflectometers at NIST is presented. Specific examples of the characterization of magnetic. superconducting, and polymeric surfaces and interfaces are included.

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PB93-166890 (Order as PB93-166817, PC A08) οÌ National Inst. Standards and Technology,

Gaithersburg, MD.

Neutron Depth Profiling: Overview and Description

of NIST Facilities.

R. G. Downing, G. P. Lamaze, J. K. Langland, and S. T. Hwang. 1993, 18p. Included in Jnl. of Research of the National Institute

of Standards and Technology, v98 n1 p109-126 Jan/ Feb 93.

Keywords: *Surface analysis. Concentration(Composition), Nondestructive analysis, Cold neutrons, Boron, Lithlum, Nitrogen, Oxygen, Silicon, Light ions, Resolution, Uses, *Neutron depth profiling, *Depth profiles, CNRF facility. The Cold Neutron Depth Profiling (CNDP) instrument at the NIST Cold Neutron Research Facility (CNRF) is now operational. The neutron beam originates from a 16 L D2O ice cold source and passes through a filter of 135 mm of single crystal sapphire. The neutron energy spectrum may be described by a 65 K Maxwellian distribution. The sample chamber configuration allows for remote controlled scanning of 150 x 150 mm sample areas including the varying of both sample and detector angle. The improved sensitivity over the current thermal depth profiling instrument has permitted the first nondestructive measurements of (17)O profiles. The paper describes the CNDP instrument, illustrates the neutron depth profiling (NDP) technique with examples, and gives a separate bibliography of NDP publi-

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PB93-207157 PC A04/MF A01 National Inst. of Standards and Technology (MSEL), Gaithersburg, MD. Ceramics Div.

Workshop on Characterizing Diamond Films II. Held in Galthersburg, MD. on February 24-25, 1993. A. Feldman, C. Beetz, P. Klocek, and G. Lu. May 93, 58p, NISTIR-5198.

See also PB92-205426. Prepared in cooperation with Advanced Technology Materials, Inc., Danbury, CT., Texas Instruments, Inc., Dallas, and Norton Diamond Film, Northboro, MA.

Keywords: *Meetings, *Chemical vapor deposition, *Diamonds, Thin films, Standards, Mechanical properties, Thermal conductivity, Raman spectroscopy, Quality assurance.

The second in a series of workshops was held at NIST on February 24th and 25th 1993 to discuss in depth specific topics deemed important to the characterization of diamond films made by chemical vapor deposi-tion (CVD diamond) and to address the need for standards in diamond technology. University scientists and scientists from government laboratones were invited as experts in properties measurements. There were 44 attenders at the workshop. The authors focussed on three technical topics for discussion: characterization of optical absorption and scattering for optical applications; electronic characterization-metallization and electronic contacts for electronic applications; and, standardization of thermal conductivity measurement. In addition, a short session presented some new developments in Raman measurements and in thermal conductivity measurements.

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PB94-108461 PC A09/MF A02

of Standards and Technology, National Inst.

Gaithersburg, MD.

Journal of Research of the National Institute of Standards and Technology, May-June 1993. Volume 98, Number 3.

1993, 187p. See also PB94-108479 through PB94-108511 and PB94-108529. Also available from Supt. of Docs. as SN703-027-00052-1.

Keywords: *Research, Magnetic probes, Magnetic measurement, Network analysis, Linear systems, High temperature superconductors, X-ray diffraction, Line broadening, Biological preservation, Blood, Clinical chemistry, Quantum Hall effect, Serum volume losses.

Coll Probe Dimension and Uncertainties During Measurements of Nonuniform ELF Magnetic

Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude;

X-Ray Diffraction Line Broadening Modeling and Applications to High-T(c)

Superconductors; Evaluation of Serum Volume Losses During Long-

Term Storage;
Dependence of Quantized Hall Effect Breakdown
Voltage on Magnetic Field and Current.

00,689 PB94-108495 (Order as PB94-108461, PC A09/ MF A02) National Inst. of Standards and Technology, Boulder,

X-ray Diffraction Line Broadening: Modeling and Applications to High-(T sub c) Superconductors. D. Balzar. 1993, 33p.

Included In Jnl. of Research of the National Institute of Standards and Technology, v98 n3 p321-353 May/

PHYSICS

Solid State Physics

Keywords: *High temperature superconductors, *X-ray diffraction, *Line broadening, *Superconductors, Keywords: *High temperature superconductors, diffraction, *Line broadening, *Superconductors, BSCCO superconductors, Stacking faults, Crystal defects, Lanthanum strontlum cuprates, Averbach method, Volgt functions.

A method for analyzing the pure-specimen (structural) broadening of x-ray diffraction line profiles is proposed. By modeling the specimen size and strain broadenings with the simple Voigt function, it is possible to obtain domain sizes and strains that agree with experiment and show a logical interrelationship. Furthermore, some common consequences and problems In the Fourier-method analysis follow easily. The specimen function is convoluted with the instrumental function to match the observed x-ray diffraction-line profile. This avoids the Stokes deconvolution method, thus allowing analysis of patterns with highly overlapping peaks and weak structural broadening. Therefore, the method was applied to some novel high-Tc superconductors. Results are discussed.

00.690 PB94-108511 (Order as PB94-108461, PC A09/ National Inst. of Standards and Technology, Gaithersburg, MD. Dependence of Quantized Hall Effect Breakdown

Voltage on Magnetic Field and Current.

M. E. Cage. 1993, 13p. Included in Jnl. of Research of the National Institute of Standards and Technology, v98 n3 p361-373 May/

Keywords: Aluminum galllum arsenldes, Molecular beam epitaxy, Two dimensional, Electron gas, Electric current, Magnetic fields, *Quantum Hall effect, Breakdown voltage. Resistance standards. Landau levels. Heterostructures.

When large currents are passed through a high-quality quantized Hall resistance device the voltage drop along the device is observed to assume discrete, quantized states If the voltage is plotted versus the magnetic field. These quantized dissipative voltage states are interpreted as occurring when electrons are excited to higher Landau levels and then return to the original Landau level. The quantization is found to be, in general, both a function of magnetic field and current. Consequently, It can be more difficult to verify and determine dissipative voltage quantization than previously suspected.

00,691 PB94-111523

PC A03/MF A01

National Inst. of Standards and Technology (CAML), Gaithersburg, MD. Applied and Computational Mathe-

Morphological Instability in Phase-Field Models of Solidification.

R. J. Braun, G. B. McFadden, and S. R. Coriell. Oct 93, 48p, NISTIR-5279.

Keywords: *Crystal growth, *Solidification, Partial differential equations, Mathematical models, Perturbation theory, Asymptotic methods, Dispersion relations, Numerical solution, Instability, Crystal-melt Interface, Phase field models.

The authors analyze the linear stability of a planar front with sharp-interface and phase-field models of solidification in two physical situations: (1) an isothermal system at the melt temperature in the undisturbed state, and (2) constant-speed growth of a crystal Into Its hypercooled melt. The parameters in the phase-field models are chosen to scale with the nondimensional Interface thickness so that in the limit of vanishing interface-thickness, the sharp-interface model is recovered. Comparison of the results from the two models shows that as the interface between the melt and solid thickens: (1) the surface energy of the Interface Is apparently Increased, and (2) the Interfacial attachment kinetics are apparently faster as long as the Interface is not too thick. If the Interface thickness is on the order of the capillary length, then the attachment kinetics may appear either slower or faster than for sharp-interface models. Stability results for the planar front under 'heat trapping' conditions are obtained.

00.692 PB94-120680 PC A03/MF A01 National Inst. of Standards and Technology (EEEL), Boulder, CO. Electromagnetic Technology Div.

Analysis of the Impact on U.S. Industry of the NiST/ Boulder Superconductivity Programs: An Interim

R. L. Peterson, Nov 93, 33p, NISTIR-5012.

Keywords: *Superconductors, *Electronics Industry, *United States, Economic analysis, Benefit cost analysis, Electromagnets, Superconductivity, Electrical sis, Electromagnets, Superconductivity, Electron properties, Josephson junctions, Solid state physics, *Superconducting electronics, HTS(High-temperature superconductivity), MRI(Magnetic resonance imaging), LTS(Low-temperature superconductivity), A/D(Analogto-digital).

The report is an interim study of the impact of the National Institute of Standards and Technology (NIST)/Boulder superconductivity programs on U.S. Industry. In the report, numerical estimates are made of the retum on investment for areas which could be quantified. Anecdotal material and consideration of unquantified impacts are also included, and a survey of 40 U.S. companies or separate groups within companies in the U.S. superconductor industry is made. Small, medium, and large companies are represented equally among the 40 surveyed. All respondents indicated benefit from the NIST/Boulder programs. No negative comments were made. In superconducting electronics, the greatest Impact on U.S. industry of the NIST work has been from the Josephson junction voltage standards developed at NIST. Every U.S. superconducting-wire manual facturer uses the measurement methods established facturer uses the measurement methods established by NIST for accurate determination of the critical parameters of the wire with which superconducting magnets are made. An industry in high-temperature superconductivity is just emerging, with the NIST work providing the foundations for this innovative technology.

00.693 PB94-123064 PC A03/MF A01 National Inst. of Standards and Technology (MEL), Gaithersburg, MD.
Nanofabrication Technology In Japan. (Japan Technology Program).
J. A. Dagata. Oct 93, 50p, NISTIR-5289.

Keywords: *Electronics, *Optical equipment, Computer applications, Fiber optics, Semiconductors(Materials), Manufacturing, Research and development, Tests, Laboratories, Japan, *Nanotechnology.

The report is intended to serve several purposes: First, it provides a detailed technical summary of research activity in nanofabrication technology which is underway currently at major facilities in Japan. Major examples of this activity are described in Section II. Taken as a whole, these efforts have generated considerable recent interest within the U.S. scientific community. Many articles and reports have already appeared in specialized journals, as well as in the popular scientific press (2-5). What is striking to many researchers and program managers, even long-time supporters of nanotechnology efforts in the United States, is the apparently firm commitment of Japan's industrial sector to support a sustained, basic research effort in the

Structural Mechanics

Not available NTIS PB93-166312 National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Scientific Computing Div.

Built-in Error Estimator for Optimizing Finite Element Modeling.

Final rept.

J. Tang, J. T. Fong, and D. E. Dietrich. 1989, 16p.

Pub. in Proceedings of ASME (American Society of Mechanical Engineers) Pressure Vessels and Plping Conference, Honolulu, Hl., July 23-27, 1989, p73-88.

Keywords: *Stress analysis, *Finite element method, *Mathematical models, Mechanics, Elastic properties, Computer calculations, Computational grids, Optimization, Structural analysis, Parameter identification, Grid generation(Mathematics), Reprints.

Using two newly-introduced commands (*SET and *GET) of a FORTRAN-based general-purpose finite-element code named ANSYS, the authors develop two macros to monitor errors and automate mesh refinement for a class of stress analysis problems that pos-

sess degenerated cases of known exact solutions. By comparing the exact versus the approximate solutions of a degenerated problem at selected nodes of a speof a degenerated problem at selected hodes of a specific mesh design, they first develop a built-in error monitoring macro (EM-1) to assess the change of errors due to a small change of a key parameter of the given mesh. An 'optimal' mesh generating macro (OM-2) is then developed to automate the procedure of mesh refinement with the goal of limiting errors in selected variables to a prescribed error bound. The fea-sibility of this procedure is demonstrated through a benchmark problem where the stresses at the tip of an elliptical crack in an infinite plate subjected to a uniform unlaxial tension at infinity are computed. Signifi-cance of this approach to the evaluation of 'reliability' of finite element solutions of complex problems using a convergence monitoring macro (CM-3) is discussed.

PROBLEM-SOLVING **INFORMATION FOR** STATE & LOCAL GOVERNMENTS

Economic & Community Development

PB93-154458 PC A04/MF A01 National Governors' Association, Washington, DC. Center for Policy Research and Anaylsis.

Designing and Implementing a State Quality Award.

E. N. Dobson. Feb 93, 55p, NIST/GCR-92/620. Sponsored by National Inst. of Standards and Technology, Gaithersburg, MD.

Keywords: *State programs, *Quality assurance, *Businesses, Productivity, Incentives, Economic development, Commercial development, Awards, Government/industry relations, Organizational structure, Flnancing, Case studies.

To remain competitive in today's global economy, businesses need to ensure customer satisfaction by offering high-quality products and services. Governors and state governments can play a critical role in ensuring the economic health of the business in their state by encouraging the adoption of quality practices and recognizing successful efforts by firms to improve quality and productivity. The manual is intended to help state government officials and other individuals implement a state quality award program.

SPACE TECHNOLOGY

General

PB94-113487 PC A11/MF A03 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.

National Institute of Standards and Technology Conference on Reducing the Cost of Space Infra-structure and Operations. Part 2. Topical Papers. Held In Galthersburg, Maryland on November 20-

22, 1989. W. C. Stone. Aug 93, 238p, NISTIR-5256. See also PB94-111374.

Keywords: *Space transportation, *Cost engineering, *Meetings, Launch vehicles, Budgeting, Aerospace en-vironments, Payloads, Research and development, Technology transfer.

Table of Contents: The Industrial Space Facility; The SPACE PHOENIX Program; External Tank Habitat; A Numerical Procedure for the Evaluation of Drag and Aerodynamic Torque for Convex Shells of Revolution Aerodynamic Torque for Convex Shells of Hevolution In Low Earth Orbit; Autonomous Propulsion System Requirements for Placement of an STS External Tank in Low Earth Orbit, William C. Stone and Geraldine S. Check, NIST; EVA Life Cycle Cost Issues Summary; Flight Opportunity for Small Payloads; Commercial Launch Vehicles Using Hybrid Propulsion; Novel Integration Concepts; Payload Sensors; Cost Comparison Between the Space Flight and the Commercial Catalog Models of a Cesium Atomic Clock Module: Laser Pro-Models of a Cesium Alomic Clock Module; Laser Propulsion Work at Lawrence Livermore National Laboratory; Pulsed-Laser Propulsion for Low Cost, High Vol-ume Launch to Orbit, Jordin Kare, LLNL, Laser Propul-sion and Possible Missions to Mars, Jordin Kare, LLNL; The Ram Accelerator as a Space Cargo Launcher; and Appendix A: List of Conference Participants.

Extraterrestial Exploration

00,697 N93-27980/0 (Order as N93-27956/0, PC A16/ MF A03) National Inst. of Standards and Technology, Gaithersburg, MD. Intelligent Robots for Planetary Exploration and Construction.

J. S. Albus. Feb 92, 15p. In Arizona Univ., Proceedings of the Lunar Materials Technology Symposium 15 p.

Keywords: *Robots, *Space exploration, Automatic control, Autonomous navigation, Construction, Lunar construction equipment, Lunar excavation equipment, Obstacle avoidance, Positioning devices (Machinery), Robot control, Trajectory planning, Walking machines, Excavation, Inflatable structures, Real time operation.

Robots capable of practical applications in planetary exploration and construction will require realtime sensory-Interactive goal-directed control systems. A reference model architecture based on the NIST Realtime Control System (RCS) for real-time intelligent control systems is suggested. RCS partitions the control problem into four basic elements: behavior generation (or task decomposition), world modeling, sensory processing, and value judgment. It clusters these elements Into computational nodes that have responsibility for specific subsystems, and arranges these nodes in hierarchical layers such that each layer has characteristic functionality and timing. Planetary exploration robots should have mobility systems that can safely maneuver over rough surfaces at high speeds. Walking ma-chines and wheeled vehicles with dynamic suspen-sions are candidates. The technology of sensing and sensory processing has progressed to the point where real-time autonomous path planning and obstacle avoidance behavior is feasible. Map-based navigation systems will support long-range mobility goals and plans. Planetary construction robots must have high plans. Planetary construction robots must have high strength-to-weight ratios for lifting and positioning tools and materials in six degrees-of-freedom over large working volumes. A new generation of cable-suspended Stewart platform devices and inflatable structures are suggested for lifting and positioning materials and structures as well as for expandition and produce and structures. and structures, as well as for excavation, grading, and manipulating a variety of tools and construction ma-

Manned Spacecraft

00,698 N93-20205/9 (Order as N93-20178/8, PC A15/ MF A03) National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Ignition and Subsequent Flame Spread over a Thin
Cellulosic Material. K. Nakabe, H. R. Baum, and T. Kashiwagl. Feb 93,

in NASA. Lewis Research Center, the Second Inter-national Microgravity Combustion Workshop p 229-

Keywords: *Cellulose, *Fire prevention, *Fires, *Flame propagation, *Ignition, *Reduced gravity, Gravitation,

Mathematical models, Buoyancy, Entralnment, Navierstokes equation, Plumes, Stagnation point, Vapor phases, *Spacecraft construction materials.

Both ignition and flame spread on solid fuels are processes that not only are of considerable scientific interest but that also have important fire safety applications. Both types of processes, ignition and flame spread, are complicated by strong coupling between chemical reactions and transport processes, not only In the gas phase but also in the condensed phase. In most previous studies, ignition and flame spread were studied separately with the result that there has been little understanding of the transition from Ignition to flame spread. In fire safety applications this transition is cruclal to determine whether a fire will be limited to a localized, temporary burn or will transition Into a growth mode with a potential to become a large fire. In order to understand this transition, the transient mechanisms of ignition and subsequent flame spread must be studied. However, there have been no definitive expenmental or modeling studies, because of the complexity of the flow motion generated by buoyancy near the heated sample surface. One must solve the full Navier-Stokes equations over an extended region to represent accurately the highly unstable buoyant plume and entrainment of surrounding gas from far away. In order to avoid the complicated nature of the starting plume problem under normal gravity, previous detailed radiative Ignition models were assumed to be one-dimensional or were applied at a stagnation point. Thus, these models cannot be extended to include the transltion to flame spread. The mismatch between experimental and calculated geometries means that theories cannot be compared directly with experimental results in normal gravity. To overcome the above difficulty, theoretical results obtained without buoyancy can be directly compared with experimental data measured in a microgravity environment. Thus, the objective of this study is to develop a theoretical model for Ignition and the transition to flame spread and to make predictions using the thermal and chemical characteristics of a cellulosic material which are measured in normal gravity.

Space Launch Vehicles & Support Equipment

00.699 PB94-111374 PC A10/MF A03 National Inst. of Standards and Technology (BFRL), Galthersburg, MD. National institute of Standards and Technology Conference on Reducing the Cost of Space infra-structure and Operations. Part 1. Oral Presentations and Discussion. Held in Galthersburg, Maryland on November 20-22, 1989. W. C. Stone. Aug 93, 206p, NISTIR-5255. Supersedes PB94-109683.

Keywords: *Space transportation, *Cost engineering, *Meetings, Orbital space stations, Launch vehicles, Payloads, Aerospace environments, Research and development, Budgeting, Underwater environments, Hypobaric atmospheres, Technology transfer, Insur-

A conference was held from November 20-22, 1989 at the National Institute of Standards and Technology in Gaithersburg, Maryland for the purpose of discussing methods for reducing the cost of space Infrastructure and operations. This was a multidisciplinary group that included invited speakers from both within and outside of the traditional aerospace community. Specific comparison was made In the case of habitats and extravehicular activity with commercially successful undersea operations on earth which operate daily under more severe environmental conditions and with operating budgets on the order of 1/1000 that of orbital analogs.

TRANSPORTATION

Transportation Safety

PB93-219780 PC A08/MF A02 National Inst. of Standards and Technology (BFRL), Gaithersburg, MD.
Water Mist Fire Suppression Workshop Proceedings. Held in Galthersburg, Maryland on March 1-2, 1993.

K. A. Notarianni, and N. H. Jason. Jun 93, 158p, NISTIR-5207.

Keywords: *Fire protection, *Meetings, *Spraying, *Manne accidents, *Aircraft fires, Sprinklers, Extinguishing, Sprayers, Mist, Sprinkler systems, Transportation safety, Telecommunication, Fire fighting, Fire extinguishers, Drops.

The water mist fire suppression workshop was organized to facilitate the commercialization of water mist technology in the United States. The imminent lack of availability of halon fire suppressants has sparked worldwide efforts in developing alternative fire fighting agents and delivery systems. Water mist systems are potential replacements in many Industrial uses, as well as In new markets, such as commercial passenger aircraft. Speakers presented state-of-the-art papers on the Incentives of using misting sprays, the advances in spray drop size measurement and the engineering criteria for water mist fire suppression systems. Three papers discussed projects demonstrating the use of water mist systems in aircraft, manne, and tele-communications applications. With this background the speakers and attendees were divided into three panels: research needs, end use criteria, and marketing. The purpose of the panel sessions was to identify the areas of concern relating to the commercialization of the water mist systems. The proceedings bring together the recommendations of each panel and the in-dividual technical papers.

URBAN & REGIONAL TECHNOLOGY & DEVELOPMENT

Fire Services, Law Enforcement, & **Criminal Justice**

PB93-189827 PC A03/MF A01 PB93-189827 PC A03/MF A01
National Inst. of Standards and Technology (EEEL),
Gaithersburg, MD. Electricity Div.
Guide to Voice Privacy Equipment for Law Enforcement Radio Communications Systems.
P. M. Fulcomer. Mar 93, 39p, NISTIR-5155.
Sponsored by National Inst. of Justice, Washington,

Keywords: *Speech scrambling, *Police, *Radio communication, Privacy, Security, Voice communication, Equipment, Manufacturers, Analog data, Digital communication.

There are various methods utilized to achieve voice privacy, with level of security, voice quality, effect on transmission range, complexity of operation and cost being some of the variables. The various methods can be separated into two major categories - analog and digital. The term 'scrambler' is often used for analog devices, whereas 'encryption' is used for the digital devices. The guide is intended to provide state and local law enforcement agencies with guidance in the selec-

URBAN & REGIONAL TECHNOLOGY & DEVELOPMENT

Fire Services, Law Enforcement, & Criminal Justice

tion and use of voice scrambling and encryption devices for use with personal/mobile transceivers. The Information In it comes from both users and manufacturers, and from organizations that are working towards a new digital transmission standard.

Transportation & Traffic Planning

00,702

PB93-166429

Not available NTIS

National Inst. of Standards and Technology (NEL), Gaithersburg, MD. Law Enforcement Standards Lab. IACP's Radar Testing Program is Alive and Well.

Final rept.

B. Traynor, R. Sostkowski, and M. Treado. 1989, 2p. Sponsored by National Highway Traffic Safety Administration, Washington, DC.

Pub. in Police Chief, 2p Oct 89.

Keywords: *Radar equipment, *Traffic law enforcement, *Performance evaluation, Specifications, Test methods, Velocity measurement, Traffic surveillance, Measuring instruments, Highway safety, Speed indicators, Interagency cooperation, Reprints.

The article describes a joint program to improve the police traffic radar equipment used to enforce the na-

tional speed limit and other speed measurement laws. This joint program was initiated in 1977 with the enactment of an interagency agreement between NHTSA and NIST (NBS) and augmented by a cooperative agreement with the International Association of Chiefs of Police in 1982. With the cooperation of the manufacturers, there is presently in place a testing program to evaluate each new radar device. Effective October 1, 1989, this program will be enlarged to include the testing, at the manufacturer's expense, of devices periodically selected from production lines, to ensure compliance with established specifications. These tests will be conducted by university laboratories located in various parts of the country.

SAMPLE ENTRY

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Building Hadamard Matrices in Steps of 4 to Order 200. 00,261 PB93-189835

Author name(s)

Title

NTIS order number

Abstract number

ABDULAGATOV, I. M.

Thermodynamic Properties of Homogeneous Mixtures of Nitrogen and Water from 440 to 1000 K, Up to 100 MPa and 0.8 Mole Fraction N2.

ADAMS, J. W.

Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude. PB94-108487 00,337 Comparison Measurements of Currents Induced by Radi-

00.314 Electromagnetic Shielding of RF Gaskets Measured by Two

Methods. PB93-153120 00.313

System Response to Pulsed Excitations Estimated from Measurement of cw Amplitudes. PB93-153492 00.316

AKIYAMA, Y.

Chemical Change of Hardened PCA/CPC Cements in Var-lous Storing Solutions. PB93-151306 00,020 Infrared Spectroscopic Study of Cement Formation of Polymeric Calcium Phosphate Cement. PB93-151298

AKMAN, S. A.

DNA Base Modifications Induced in Isolated Human Chromatin by NADH Dehydrogenase-Catalyzed Reduction of Doxorubicin. PB93-150670

ALBERS, J.

Semiconductor Measurement Technology: A Collection of Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations, RESPAC.

PB93-219806 00.366 ALBUS, J. S.

Intelligent Robots for Planetary Exploration and Construction. N93-27980/0 00.697

ALLEN, P. J. Burn Injury Potential of Navy Shipboard Work Clothing. AD-A258 836/6 00,481 ALLEN, R. A.

New Test Structure for the Electrical Measurement of the Width of Short Features with Arbitrarily Wide Voltage Taps. PB93-124782 00,349

AMIRTHARAJ, P. M.

Metrologic Support for the DARPA/NRL-XRL Mask Program: Ellipsometric Analyses of SiC Thin Films on Si. PB93-152098 00.354

AN, M.

Fast Fourier Transform Algorithms for Real and Symmetric 00.507 Fast Fourier Transforms for Space Groups Containing Rotation Axes of Order Three and Higher.
PB93-124790 00,642

ANDERSON, I. S.

Hydrogen Vibrational Modes and Anisotropic Potential in alpha-ScHx. PB93-166510 00,681

ANDERSON, W. E.

Research for Electric Energy Systems: An Annual Report, October 1993 PB94-112182 00,375

ANKNER, J. F.

Neutron Reflectivity and Grazing Angle Diffraction. PB93-166858 00.685

ANTONISHEK, J. K. Operating Principles of the VME MultiKron Interface Board PB93-234730 00.23

ANTONISHEK, T.

North American ISDN (Integrated Services Digital Network) Users' Forum Agreements on ISDN. PB93-173391 00,211

ANTONUCCI, J. M.

Chemical Change of Hardened PCA/CPC Cements in Various Storing Solutions. PB93-151306 Infrared Spectroscopic Study of Cement Formation of Polymeric Calcium Phosphate Cement.
PB93-151298 00,019

Properties and Interactions of Oral Structures and Restorative Materials. Annual Report for Period October 1, 1991 to September 30, 1992. PB93-198836 00.024

ARCHER, D. G.

Thermodynamic Properties of the NaCl + H2O System. 1. Thermodynamic Properties of NaCl(cr). PB93-148955 00,127

Thermodynamic Properties of the NaCl + H2O System. 2. Thermodynamic Properties of NaCl(aq), NaCl2H2O(cr), and Phase Equilibria. PB93-149060 00.132

Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility. PB93-166916

ASAOKA, K.

Properties and Interactions of Oral Structures and Restorative Materials. Annual Report for Period October 1, 1991 to September 30, 1992. PB93-198836 00.024

Residual Stress in a Porcelain-Metal Strip Related to Thermo-Physical Properties of Materials. PB93-151801 00.022

ASTUMIAN, R. D.

Charge-Field Interactions in Cell Membranes and Electroconformational Coupling: Transduction of Electric Energy by Membrane ATPases.
PB93-166486 00,535 00.535

Kinetics of a Multistate Enzyme in a Large Oscillating Field. PB93-153690 00.516

Non-Linear Effects of Periodic Electric Fields on Membrane PB93-153682

Response of Living Cells to Very Weak Electric Fields: The Thermal Noise Limit. PB93-166585 00,536

ATKINSON, R.

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Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Kinetic Data Evaluation for Atmospheric Chemistry. PB93-149144 00,014

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Intelligent Control System for a Cutting Operation of a Con-	Standard, Subcategory: Graphics, Part 1, Functional Speci-	PB94-112430 00,434
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PB93-166510 00,681 BASSHAM, L. E. Guide to the Selection of Anti-Virus Tools and Techniques. PB93-152049 00,221 Security Issues in the Database Language SQL. PB94-104585 00,273	Computer Grephics Metefile (CGM) Interpreter Products: PB93-178580 00,424 BENNER, B. Standard Reference Materiels for Trece Organic Contaminants in the Marine Environment. PB93-166627 00,395 BENNETT, J.	PB93-150696 00,135 BLENDELL, J. E. Effect of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O. PB93-153377 00,667 BLESSING, G. V. ONR-Sponsored Research in Ultresonic Measurements et
PB93-166510 00,681 BASSHAM, L. E. Guide to the Selection of Anti-Virus Tools and Techniques. PB93-152049 00,221 Security Issues in the Database Language SQL. PB94-104585 00,273 BAULCH, D. L.	Computer Grephics Metefile (CGM) Interpreter Products. PB93-178580 00,424 BENNER, B. Standard Reference Materiels for Trece Organic Contaminants in the Marine Environment. PB93-166627 00,395 BENNETT, J. Imaging of Pessivated III-V Semiconductor Surfaces by a Scanning Tunneling Microscope Operating in Air.	PB93-150696 00,135 BLENDELL, J. E. Effect of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O. PB93-153377 00,667 BLESSING, G. V. ONR-Sponsored Research in Ultresonic Measurements et NIST: 1982-92. PB93-152064 00,618 BLOCK, S. Effects of Pressure on the Thermel Decomposition Kinetics,
PB93-166510 00,681 BASSHAM, L. E. Guide to the Selection of Anti-Virus Tools and Techniques. PB93-152049 00,221 Security Issues in the Database Language SQL. PB94-104585 00,273 BAULCH, D. L. Evelueted Kinetic end Photochemical Data for Atmospheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Ki-	Computer Grephics Metefile (CGM) Interpreter Products. PB93-178580 00,424 BENNER, B. Standard Reference Materiels for Trece Organic Contaminants in the Marine Environment. PB93-166627 00,395 BENNETT, J. Imaging of Pessivated III-V Semiconductor Surfaces by a Scanning Tunneling Microscope Operating in Air. PB93-153294 00,357 BENNETT, L H. Barkhausen Jump Correlations in Thin Folls of Fe end NI.	PB93-150696 00,135 BLENDELL, J. E. Effect of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O. PB93-153377 00,667 BLESSING, G. V. ONR-Sponsored Research in Ultresonic Measurements et NIST: 1982-92. PB93-152064 00,618 BLOCK, S.
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connection Protocols. Version 6, Edition 1, December 1992. Based on the Proceedings of the OSE Implementors' Work-	Due to Locally Concentrated Transverse Stress.	Mechanism for Cepture into Resonance. PB93-145761 00,010
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cunty. Held on July 6-7, 1992. PB93-228682 00,225	PB93-124782 00,349	ticles from Indoor Coal Combustion: A Study of Lung Can-
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-	,	

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Applicability of the Maturity Method to High-Performance Concrete.	CHEOK, G. S. Overview of NIST Research on Seismic Performance of	Evaluated Kinetic Data for Combustion Modelling.
PB93-157451 00,182	Moment Resisting Precast Concrete Beam-Column Joints	PB93-149037 00,200 CODE, J.
Impact-Echo Response of Plates Containing Thin Layers	Containing Post-Tensioning. PB94-103686 00,086	Properties and Interactions of Oral Structures and Restora-
and Voids. PB93-153815 00,181	Performance of 1/3-Scale Model Precast Concrete Beam-	tive Materials. Annual Report for Period October 1, 1991 to September 30, 1992.
Performance of Electromagnetic Covermeters for Non-	Column Connections Subjected to Cyclic Inelastic Loads. Report No. 3.	PB93-198836 00,024
destructive Assessment of Steel Reinforcement. PB93-178630 00,186	PB94-101813 00,085	COLLICA, L
CARLSON, A. D.	CHI, P.	Integrated Services Digital Network Conformance Testing. Layer 2, Data Link Layer (LAPD). Part 1, Basic Rate Inter-
ENDF/B-VI Neutron Cross Section Measurement Standards.	Sims Determination of Oxygen and Carbon in YBa2Cu3O7-x Superconductors.	face, User Side. PB94-120920 00,213
PB93-189868 00,610	PB93-150845 00,650	COLUNS, B. L
CARPENTER, J. A.	CHIANG, C. K. Crystal Chemistry and Phase Equilibria Studies of the	Evaluation of Compact Fluorescent Lamp Performance at
RL/NIST Workshop on Moisture Measurement and Control for Microelectronics. Proceedings of the RL/NIST Workshop	BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder	Different Amblent Temperatures. PB93-146694 00,035
held in Gaithersburg, Maryland on April 5-7, 1993. PB94-108636 00,372	Ba3R3Cu6O14+x, R=Lanthanides.	Evaluation of Subjective Response to Lighting Distributions:
CARPENTER, J. M.	PB93-166668 00,684	A Literature Review. PB93-173458 00,039
Improvements to the Chebyshev Expansion of Attenuation Correction Factors for Cylindrical Samples.	Effect of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O.	Lighting System Design and Evaluation in Federal Office
PB93-125862 00,645	PB93-153377 00,667	Buildings. PB93-206217 00,040
CARVER, G. P.	Structural Phase Transformation Studies of the High Tc Superconducting Materials, Ba2RCu3O6+x, in Air.	COLLINS, D. M.
Metrication: An Economic Wake-up Cail for U.S. Industry. PB93-188969 00,088	PB93-166643 00,683	Exponential Density: Exact Fitting of Structure Moduli by
CASASSA, M. P.	Structural Phase Transition Studies of High Tc Superconducting Materials.	Entropy Maximization. PB93-125128 00,122
Subpicosecond Probing of Vibrational Energy Transfer at Surfaces.	PB93-151942 00,660	COMAS, J.
PB93-150720 00,136	CHOW, L C.	Controlled Interface Roughness In GaAs/AiAs Superlattices.
CASKEY, G.	Chemical Change of Hardened PCA/CPC Cements In Various Storing Solutions.	PB93-125896 00,351
Measurement Uncertainty Considerations for Coordinate Measuring Machines.	PB93-151306 00,020	Chaotic Motions of Forced and Coupled Galioping Oscilia-
PB93-189819 00,449	Effect of a Two-Solution Fluoride Mouth Rinse on Remineralization of Enamel Lesions In vitro.	tors. PB93-153245 00,003
Recent Results of the NIST National Ball Plate Round Robin.	PB93-150738 00,526	Chaotic Motions of Self-Excited Forced and Autonomous
PB93-219715 00,408	Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties.	Square Prisms.
CATICHA, A. Quantum Theory of the Dynamical Cerenkov Emission of X-	PB93-125136 00,016	PB93-166114 00,621 COOK, L. P.
rays.	In vivo Fluoride Concentrations Measured for Two Hours	Cathodoluminescence Imaging and Spectroscopy of CVD
PB93-124873 00,559 CAVANAGH, R. R.	After a NaF or a Novel Two-Solution Rinse. PB93-151868 00,527	Diamond in a Scanning Electron Microscope. PB93-153708 00,464
Mechanistic Studies of Photoinduced Reactions at Semi-	Infrared Spectroscopic Study of Cement Formation of Poly-	Structural Phase Transformation Studies of the High Tc
conductor Surfaces. PB93-151710 00,656	meric Calcium Phosphate Cement. PB93-151298 00,019	Superconducting Materials, Ba2RCu3O6+x, in Air. PB93-166643 00,683
Subpicosecond Probing of Vibrational Energy Transfer at	CHRISTIAN RUSS, J.	Structural Phase Transition Studies of High Tc
Surfaces. PB93-150720 00,136	Application of the Hough Transform to Electron Diffraction Patterns.	Superconducting Materials.
CAVCEY, K.	PB93-153773 00,585	PB93-151942 00,660 COOKE, P. W.
New Spherical Dipole Source.	CHU, F. Y.	Program for Conformity Assessment System Evaluation:
PB93-153419 00,325 CELOTTA, R. J.	Detection of S2F10 Produced by Electrical Discharge In SF6.	Analysis of Comments on the NIST Proposal. PB93-170900 00,094
Correlations of Magnetic Microstructure and Anisotropy with	PB93-166528 00,596	COOPER, L Y.
Noise Spectra for ČoNi and CoCrTa Thin Film Media. PB93-153401 00,668	CHUANG, J. C. Chemical Characterization of Mutagenic Fractions of Par-	Combined Buoyancy- and Pressure-Driven Flow through a
High Spatial Resolution Quantitative Micromagnetics.	ticies from Indoor Coal Combustion: A Study of Lung Can-	Horizontal Vent: Theoretical Considerations. PB94-103694 00,077
PB93-165736 00,674	cer in Xuan Wei, China. PB93-231835 00,530	Discharge of Fire Suppression Agents from a Pressurized
Surface Magnetic Microstructure. PB93-165728 00,673	CLAGUE, F. R.	Vessel: A Mathematical Model and Its Application to Experimental Design.
CERNYAR, E. W.	Microcatorimeter for 7 mm Coaxial Transmission Line. PB94-112455 00,338	PB93-198927 00,044
System for Measuring Conditional Amplitude, Phase, or Time Distributions of Pulsating Phenomena.	CLARK, S.	Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Condi-
PB93-143931 00,308	NIST EXPRESS Toolkit: Lessons Learned.	tions for the Flow Outside the Vessel.
CHAND, B.	PB93-153450 00,422 CLARK, S. N.	PB94-103660 00,004
Physical Parameters for L X-ray Production Cross-Sections. PB93-153609 00,583	Requirements for an Application Protocol Development En-	Feeling a Door to See if Fire Is on the Other Side. PB93-153252 00,066
CHANDLER-HOROWITZ, D.	vironment. National PDES Testbed Report Series. PB93-208114 00,426	COPLEY, J. R. D.
Metrologic Support for the DARPA/NRL-XRL Mask Program: Ellipsometric Analyses of SiC Thin Films on Si.	CLAXTON, L D.	Neutron Time-of-Flight Spectroscopy. PB93-166874 00,603
PB93-152098 00,354	Source Apportionment of Fine Particle Organics and Mutagenicity in Wintertime Roanoke.	Structure and Low Energy Dynamics of Solid C60.
Chang, T. Chain Conformation of Block Copolymers In Dilute Solutions	PB93-221851 00,391	PB93-153260 00,146
Measured by Small-Angle Neutron Scattering.	CLEARY, T. G.	CORIELL, S. R.
PB93-151272 00,170 CHANG, Y. D.	Non-Halogenated, Flame Retarded Polycarbonate. N94-10781/0 00,008	Asymptotic Behavior of Modulated Taylor-Couette Flows with a Crystailine Inner Cylinder.
Study of Traffic Control and Congestion Control in	CLEVER, H. L.	PB93-139061 00,647
Broadband ISDN. PB93-149433 00,210	Solubility of Some Sparingly Soluble Salts of Zinc and Cadmium in Water and in Aqueous Electrolyte Solutions.	Effect of Gravitational Modulation on Convection in Vertical Bridgman Growth.
CHARETTE, R. P.	PB93-149110 00, 134	N94-10178/9 00,495
UNIFORMAT II: A Recommended Classification for Building	CLIFTON, J. R.	Effect of Gravity Modulation on Thermosolutal Convection. N94-10103/7 00,620
Elements and Related Sitework. PB93-146017 00,034	Applicability of the Maturity Method to High-Performance Concrete.	Morphological Instability in Phase-Field Models of Solidifica-
CHASE, M. W.	PB93-157451 00,182	tion. PB94-111523 00,691
NIST Standard Reference Data Products Catalog, 1993. PB93-173409 00,163	Caiculating Cement Paste and Mortar Diffusivity from Conductivity Measurements: Preiiminary Results of a New	Phase-Field Models for Anisotropic Interfaces.
CHELLAPPA, R.	Method. PB94-112802 00.189	PB93-164564 00,672
Comparative Performance of Classification Methods for Fin- gerprints.	Methods for Predicting Remaining Life of Concrete in Struc-	Thermodynamicaliy-Consistent Phase-Field Models for Solidification.
PB93-184273 00,300	tures.	PB93-139012 00,646
CHEN, W.	PB93-139020 00,180 CLINE, J.	COSTANTINO, P. D. Hudrovignostita Compan. I. Basis Chamistov and Histoirais
Equipment for Investigation of Cryogenic Compaction of Nanosize Silicon Nitride Powders.	High Temperature X-ray Diffractometry of Ti-Al Alloys.	Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties.
DE93018740 00,466	PB93-166080 00,499	PB93-125136 00,016

		,
COUSTEL, N. Structure end Low Energy Dynemics of Solid C60.	DABROWSKI, C. Detabase Manegement Systems in Engineering.	DESSENS, J. Intercomparison of NIST, NPL, PTB, and VSL Thermel Volt-
PB93-153260 00,1	6 PB93-146454 00,419	age Converters from 100 kHz to 1 MHz.
COVERDALE, R. T.	DAGATA, J. A.	PB93-151181 00,332 DEWEY, M. S.
Computational Materials Science of Cement-Based Met rials: An Education Module.	9- Imaging of Passivated III-V Semiconductor Surfaces by a Scanning Tunneling Microscope Operating in Air.	Facilities for Fundamentel Neutron Physics Research et the
PB94-111424 00,1		NIST Cold Neutron Research Fecility. PB93-166916 00.605
COWAN, P. L.	Nanofabrication Technology in Japan. (Japan Technology Program).	Measurement of (3)He(n,gamme)(4)He Cross-Section et
X-rey Beam Position Monitor Using a Quadrant PIN Diode PB93-151769 00,5	DR04-123064 00.603	Thermal Neutron Energies.
COX, D. M.	Scanning Tunneling Microscopy of Optical Surfaces.	PB93-166635 00,597
Structure end Low Energy Dynamics of Solid C60.	PB93-166023 00,628 6 DAHLGREN, N. L.	Fracture Mechanics Eveluetion of Railroad Tank Cers Con-
PB93-153260 00,1-	DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus	taining Postulated Circumferential Cracks.
Eveluated Kinetic and Photochemical Data for Atmospher	CD-ROM. NIST Speech Disc 1-1.1. ic PB93-173938 00,215	PB93-219731 00,486
Chemistry, Supplement 4, IUPAC Subcommittee on Gas I	DAMAZO, B.	Full-Thickness Clad Beam Fracture-Toughness Tests. DE93018036 00,550
netic Dete Evaluation for Atmospheric Chemistry. PB93-149144 00,0		DI BLASI, C.
Evalueted Kinetic Deta for Combustion Modelling.	Machine Tools. PB93-234680 00,452	Heat end Mass Trensport from Thermally Degreding Thin Cellulosic Materials in e Microgrevity Environment.
PB93-149037 00,20	DANA, V.	PB93-153435 00,505
COYNE, J. J. Celculetions on Displacement Corrections for In-Phanto	3nu3 Band of (32)S(16)O2: Line Positions and Intensities.	DI MARZO, M.
Measurements with Ionization Chambers for Mammo		Experimental Study of Multiple Droplet Evaporative Cooling. PB93-198463 00.613
rephy. PB93-166700 00,5		Transient Cooling of e Hot Surfece by Droplets Evaporetion.
Dose Equivelent Response of Tissue-Equivalent Propo	imide Regenerator in e Pulse Tube Refrigerator	Final Report, November 1990.
tionel Counters to Low Energy Neutrons. PB93-166031 00,5	PANOC 88	PB93-189421 00,609
CRAFT, N. E.	Chaos, Dissipation, Arrow of Time, in Quantum Physics.	User's Guide for the Algorithm Testing System/Version 1.1.
Evaluation of Serum Volume Losses during Long-Ter	PB93-208494 00,615	PB93-175990 00,447
Storege. PB94-108503 00,5	DAPRUNAS, S. J.	DIDION, D. A.
CRAIG. N. C.	PB93-145779 00,377	Comparison of Experimentel Measurements of Local Flow Boiling Heat Transfer Coefficients for R11 end R123.
Pertiel Structure for trans-1,2-Difluoroethylene from Hig	Ceramics Technical Activities, 1992 (NAS-NRC Assessment	PB93-151157 00,491
Resolution Infrered Spectroscopy. PB93-125144 00,12	Panel May 13-14, 1993). PB93-173508 00,474	Theoretical Eveluetion of R22 end R502 Alternatives, Final Report.
CRAIGEN, D.	Equipment for Investigation of Cryogenic Compaction of	DE93014767 00,489
Internetional Survey of Industrial Applications of Form		DIETRICH, D. E.
Methods. Volume 1. Purpose, Approach, Analysis, ar Conclusions.	DASHIELL, W. H.	Built-in Error Estimator for Optimizing Finite Element Modeling.
PB93-178556 00,23		PB93-166312 00,694
International Survey of Industrial Applications of Form	el gramming System. Category: Software Standard. Sub- category: Programming Language, June 1993.	DIETRICH, H. B.
Methods. Volume 2. Cese Studies. PB93-178564 00,23	6 FIPS PUB 125-1 00,279	MeV Be Implantation in GaAs. PB93-151645 00,653
CRAWFORD, M. L.	VHSIC Hardware Description Languege (VHDL); Category: Software Standard; Subcategory: Hardware Description	DIZDAROGLO, M.
Reverbereting Asymmetric TEM Cell for Rediated EMC. end SE Testing, 10 kHz - 18 GHz.	V Language IEEE Standard VHDL Language Reference	DNA Base Modifications in Chromatin of Human Cancerous Tissues.
PB93-153278 00,3	Manual. 5 FIPS PUB 172 00,286	PB93-153559 00,523
CREEGAN, K. M.	DAVIS, G. C.	DIZDAROGLU, M.
Structure end Low Energy Dynamics of Solid C60. PB93-153260 00,14	Non-Halogenated, Flame Retarded Polycarbonete. N94-10781/0 00,008	DNA Base Damage in Chrometin of Gemma-Irradieted Cultured Human Cells.
CRESSWELL, M. W.	DAVIS, S. H.	PB93-151314 00,521
Directed-Greph Classifier of Semiconductor Wefer-Test Pa		DNA Base Modifications Induced in Isolated Human Chromatin by NADH Dehydrogenase-Cetelyzed Reduction of
tems. PB93-153286 00,33	Strongly-Nonlinear Analysis. 6 N94-10188/8 00,641	Doxorubicin.
New Test Structure for the Electrical Measurement of the		PB93-150670 00,520
Width of Short Features with Arbitrarily Wide Voltage Taps PB93-124782 00,3-		DNA-Protein Cross-Linking between Thymine and Tyrosine in Chromatin of Gemma-Irredieted or H2O2-Treated Cul-
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NIST4.	DAWSON, H.	DJUROVIC, S.
PB93-152106 00,38	Experimental Study of Multiple Droplet Eveporetive Cooling. PB93-198463 00,613	Absolute Spetially- and Temporally-Resolved Optical Emis-
Surveillance Schemes with Applications to Mass Calibr		sion Measurements of rf Glow Discharges in Argon. PB93-196236 00,636
tion. PB93-181881 00,66	Three-Ratio Scheme for the Measurement of Isotopic Ra-	DOBSON, E. N.
CROARKIN, M. C.	tios of Silicon. PB93-196285 00,612	Designing and Implementing a State Quality Award.
Temperature-Electromotive Force Reference Functions ar	d DE VREEDE, J. P. M.	PB93-154458 00,695
Tables for the Letter-Designated Thermocouple Type Besed on the ITS-90.		DODDER, D. C. ENDF/B-VI Neutron Cross Section Meesurement Stand-
PB93-190338 00,6	ege Converters from 100 kHz to 1 MHz. 17 PB93-151181 00,332	erds.
CROSS, R. W.	DEAL, S. P.	PB93-189868 00,610 DOIRON, T.
Trensport Current Effects on Flux Creep end Magnetization In Nb-Ti Multifilament Ceble Strands.	n Workshop on Elevetor Use during Fires. Held In Gaithersburg, Maryland on September 29, 1992.	Bibliogrephy of Screw Threed Meesurement.
PB93-150746 00,57	4 PB93-235190 00,045	PB94-101821 00,460
CRUZ, J.	DEHMER, J. L.	Drift Elimineting Designs for Non-Simulteneous Comperison Calibretions.
Comparison Meesurements of Currents Induced by Rac etlon end Injection.	Resonance Effects in the 5Sigma(-1) Photoionization Chan- nel of CO.	PB93-196277 00,405
PB93-153138 00,3		DOLEV, A.
CUGINI, J.	DEMMIN, R. A. Feceting induced by en Ultrathin Metal Film: Pt on W(111).	High-Accuracy Sampling Wattmeter. PB93-151793 00,310
User's Guide for the Progremmer's Hiererchical Interaction Grephics System (PHIGS) C Binding Validation Tests (Ve		DOMANSKI, P. A.
sion 2).	DENCHFIELD, R. D.	Theoretical Evaluation of R22 and R502 Alternatives. Final
PB93-228617 00,26 CUNNINGHAM, D.	Observations from e Field Study of the Performance of Polymer-Modified Bitumen Roofing.	Report. DE93014767 00,489
Detebases Available in the Research Information Center	PB93-146686 00,058	DONALDSON, J. L.
the Netional Institute of Standards and Technology. PB94-114568 00,4	DEO, M. N.	Program for Conformity Assessment System Eveluation:
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Method for Sepereting Voletile Organic Cerbon from 0	1 DEREGGI, A. S.	DONG, C.
(sup 3) of Air to Identify Sources of Ozone Precursors v Isotope (14C) Measurements.	Space Charge Induced in Stressed Polyethylene. PB93-151124 00,343	Faceting Induced by en Ultrethin Metel Film: Pt on W(111). PB93-166171 00.677
PB93-236511 00,38		DONMEZ. M. A.

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Solubility of Some Sparingly Soluble Salts of Zinc and Cad-mlum in Water end in Aqueous Electrolyte Solutions. PB93-149110 00,134

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High-Resolution FTIR Study of the nu4 Bend of CH2F2. PB93-150753 00,137

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Reel-time compensation for tool form errors in tuming using computer vision.
DE93010922 00,457

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PB93-234680 00,452	Calculations on Displacement Corrections for In-Phantom Measurements with Ionization Chambers for Mammog-	Elastic and Inelastic Neutron Scattering Study of Hydro- genated and Deuterated Trimethylammonlum Pillared Ver-
DONOGHUE, E. A.	raphy. PB93-166700 00,519	miculite Clays. PB93-125169 00,124
Workshop on Elevator Use during Fires. Held in Gaithersburg, Maryland on September 29, 1992.	EKIN, J. W.	FANNEY, A. H.
PB93-235190 00,045	Critical-Current Degradation in Nb3Sn Composite Wires Due to Locally Concentrated Transverse Stress.	Field Monitoring of a Variable-Speed Integrated Heat Pump
DOROSHOW, J. H. DNA Base Modifications Induced in Isolated Human Chro-	PB93-153211 00,344	Water Heating Appliance. PB93-228203 00,382
matin by NADH Dehydrogenase-Catalyzed Reduction of Doxorubicin.	Proceedings of the sixth JapanUS workshop on high-field	Performance of a Residential Desuperheater.
PB93-150670 00,520	superconducting materials and standard procedures for high-field superconducting materials testing.	PB93-153302 00,036 Water Vapor Permeability Measurements of Common Bulld-
DOUGHERTY, B. P.	DE93002848 00,640	ing Materials.
Performance of a Residential Desuperheater. PB93-153302 00,036	EKLUND, T. I. Model Study of the Aircraft Cabin Environment Resulting	PB93-153229 00,065 FARABAUGH, E. N.
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Neutron Depth Profiling: Overview and Description of NIST	Test Guide for CMOS-On-SIMOX Test Chips NIST3 and	Determination of Uranium and Thorium In Materials Associ-
Facilities. PB93-166890 00,686	NIST4. PB93-152106 00,355	ated with Real Time Electronic Solar Neutrino Detectors. PB93-150779 00,575
DRAGOO, A. L.	ELMQUIST, R. E.	FATTAL, S. G.
Standard X-ray Diffraction Powder Patterns of Fourteen Ce-	NIST Measurement Service for DC Standard Resistors. PB93-139079 00,347	Effect of Critical Parameters on the Behavior of Partially-
ramic Phases. PB93-166650 00,473	ELSWIJK, H. B.	Grouted Masonry Shear Walls under Lateral Loads. PB93-206894 00,076
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Token Based Access Control System for Computer Networks.	PB93-166023 00,628 ELY, J. F.	PB93-206183 00,075
PB93-166148 00,222	Note on the Number Dependence of Nonequilibrium Molec-	Strength of Partially-Grouted Masonry Shear Walls under Lateral Loads.
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Aluminum Alloys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-Li	PB93-153740 00,149	FEENEY, A. B. National Testbed for Process Planning Research.
Alloys and Alloy 2219. PB93-173441 00,501	Tables for the Thermophysical Properties of Ethane. PB93-160786 00.150	PB93-189793 00,439
DRIVER, L. D.	PB93-160786 00,150 Tables of Experimental Data Used for the Correlation of the	Requirements for an Application Protocol Development En- vironment. National PDES Testbed Report Series.
New Spherical Dipole Source.	Thermophysical Properties of Ethane.	PB93-208114 00,426
PB93-153419 00,325 DROUIN, N.	PB93-173417 00,164 ENO, L.	FELDMAN, A.
Building Hadamard Matrices In Steps of 4 to Order 200.	End-Point Sensitivity In Quantum Dynamic Calculations.	Cathodoluminescence Imaging and Spectroscopy of CVD Diamond In a Scanning Electron Microscope.
PB93-189835 00,261	PB93-125151 00,560	PB93-153708 00,464
DUAN, S. L. Correlations of Magnetic Microstructure and Anisotropy with	EPLER, K. S. Evaluation of Serum Volume Losses during Long-Term	Fitting of Transmission Data for Determining the Optical Constants and Thicknesses of Optical Films.
Correlations of Magnetic Microstructure and Anisotropy with Noise Spectra for CoNi and CoCrTa Thin Film Media.	Storage.	PB93-166692 00,630
PB93-153401 00,668	PB94-108503 00,518 ERICKSON, N. E.	Workshop on Characterizing Diamond Films II. Held In Gaithersburg, MD. on February 24-25, 1993.
DUBE, W. P. Dynamic Resistance of Superconducting YBa2Cu3Ox Sin-	Comparison of Measured and Calculated Appearance-Po-	PB93-207157 00,687
tered Powder at 81 K: Liquid versus Vapor Nitrogen Envi-	tential Spectra for Six 3d Metals. PB93-151629 00,141	FENG, S. C.
ronment. PB93-153518 00,670	ERWIN, R. W.	Dimensional Inspection Planning Based on Product Data Standards. National PDES Testbed Report Series.
DUFFIN, W. J.	Resolution Considerations for Polarized Triple-Axis Spec-	PB93-198455 00,450
Annual Conference on Fire Research, 1993: Book of Abstracts.	trometry. PB93-151728 00,657	FENG, Y. Molecular Weight Dependence of Mobility in Polymer
PB94-121324 00,205	ESCALANTE, E.	Blends.
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NIST Measurement Service for DC Standard Resistors. PB93-139079 00,347	Data. Biannual Report, August 1989-January 1990. NUREG/CR-4735-V8 00,549	Thermodynamic Properties of Homogeneous Mixtures of Ni-
EBERHARDT, K. R.	ESPY, P. J.	trogen and Water from 440 to 1000 K, Up to 100 MPa and 0.8 Mole Fraction N2.
Limited Tests to Investigate Whether the Size of Body Armor Samples Influences Ballistic Test Results.	Franck-Condon Factors, r-Centroids, Electronic Transition Moments, and Einstein Coefficients for Many Nitrogen and	PB94-118494 00,617
PB93-138998 00,554	Oxygen Band Systems.	FERRAIOLO, D. F.
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PB94-108644 00,047	Evaluated Kinetic Data for Combustion Modelling.	PB93-138956 00,218
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Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology.	ESTLER, T. Use of Contact Type Measurement Device to Detect Ro-	Oligomer of Polythiophene.
AD-P008 068/9 00,557	bots' Hand Positions.	PB93-124824 00,119
EDERER, D. L. Excitation-Energy Dependence In the L2,3 Fluorescence	PB93-166551 00,455 ETTEDGUI, H.	FICKETT, F. R. Electrical Resistivity of Copper Alloys between 76 K and
Spectrum of SI.	Barkhausen Jump Correlations in Thin Foils of Fe and Ni.	300 K.
PB93-153757 00,627 EDGAR, C. A.	PB93-166288 - 00,678	PB93-151827 00,311 Low Temperature Magnetic Behavior of 'Nonmagnetic' Ma-
Guidelines for the Evaluation of Virtual Terminal Implemen-	EVANS, C. J. Scanning Tunneling Microscopy of Optical Surfaces.	terials.
tations. PB93-139053 00,290	PB93-166023 00,628	PB93-150795 00,309 FIELDS, R.
EIBSCHUTZ, M.	EVANS, D. D.	Full-Thickness Clad Beam Fracture-Toughness Tests.
Structure and Magnetic Properties of Doped Co and Fe-	In situ Burning of Oil Spills: Mesoscale Experiments and Analysis.	DE93018036 00,550
Bi2Sr2Cul-xMxOy Phases. PB93-166338 00,680	PB94-101839 00,396	FIELDS, R. J. Fracture Mechanics Evaluation of Rallroad Tank Cars Con-
EICHMILLER, F. C.	International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Sweden	taining Postulated Circumferentlal Cracks.
Clinical Trial of an Adhesive Material. PB94-109329 00.528	on May 5-8, 1992.	PB93-219731 00,486 FILIPCZAK, R.
PB94-109329 00,528 Clinical Use of Beta-Quartz Glass-Ceramic Inserts.	PB93-183952 00,202 Smoke Plume Trajectory from In situ Burning of Crude Oil	Modeling the Heat Release Rate of Alrcraft Cabin Panels.
PB93-150761 00,017	in Alaska.	AD-A263 148/9 00,006
Intrinsically Colored Microcrystalline Glass-Ceramic for Use in Dental Restoration.	PB94-114519 00,393 Sprinkler Fire Suppression Algorithm for HAZARD.	FISCHER, J. E. Structure and Low Energy Dynamics of Solid C60
PB93-150837 00,018	PB94-103678 00,046	Structure and Low Energy Dynamics of Solid C60. PB93-153260 00,146
EILES, T. M.	FAHR, A.	FISCUS, J. G.
Proposed Measurement of the Fine Structure Constant Using a Coulomb-Blockade Charge Pump.	Optimizing Complex Kinetics Experiments Using Least- Squares Methods.	DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus CD-ROM. NIST Speech Disc 1-1.1.
		PB93-173938 00,215

FISH, G.	FRASER, G. T.	GANGULI, B.
Polarization Analysis of the Magnetic Excitations in Invar Fe88B14.	3nu3 Band of (32)S(18)O2: Lina Positions and Intansitias. PB93-151207 00,140	instrumant-Indapandent Database for Collisionally Activated Dissociation in Radiofrequency Only Quadrupolas. Single-
PB93-151256 00,652	Microwava and Infrarad Spectra of C2H4HCCH: Barrier to	Collision Varsus Multiple-Collision Conditions.
FISHER, G. E.	Twofold Internal Rotation of C2H4.	PB93-125680 00,400 GANN, R. G.
Application Portability Profila (APP): The U.S. Govarnmant's Opan System Environmant Profila OSE/1 Version 2.0.	PB93-150803 00,138	Test Methods for Quantifying tha Propensity of Cigarattas to
PB93-216943 00,264	Microwava Spectrum of (D2O)2. PB93-166262 00,157	Ignite Soft Furnishings.
FISHER, R. D.	FREDERICK, N. V.	PB94-108644 00,047 GARBOCZI, E. J.
Corralations of Magnatic Microstructura and Anisotropy with	Spead of Sound Data and Ralated Modals for Mixturas of	Computational Materials Science of Cament-Based Mate-
Noisa Spectra for CoNI and CoCrTa Thin Film Madia. PB93-153401 00,668	Natural Gas Constituants. PB93-200822 00,380	rials: An Education Module.
FISHER, W. M.	FREED, K.	PB94-111424 00,188
DARPA TIMIT Acoustic-Phonatic Continous Spaech Corpus	Marriaga of Exact Enumaration and 1/d Expansion Meth-	Computer Modal for the Diffusion and Binding of Chlorida lons in Portland Camant Pasta.
CD-ROM. NIST Speech Disc 1-1.1.	ods: Lattica Modal of Dilute Polymers.	PB93-159051 00,183
PB93-173938 00,215	PB93-151330 00,172	Computer Modelling of Cament-Based Materials.
FLAMBAUM, V. V.	FREEDMAN, S. J. Maasuramant of (3)Ha(n,gamma)(4)Ha Cross-Saction at	PB93-153161 00,063
Regular Mechanism of Parity and Tima Invariance Nonconsarving Effacts Enhancament in Nautron Captura	Tharmal Nautron Enargies.	Experimental and Simulation Studies of the Interfacial Zona
and Scattaring Naar p-Wava Compound Resonances.	PB93-166635 00,597	in Concrete. PB93-153179 00,064
PB93-125177 00,561	FREIMAN, S. W.	GARFUNKEL, E.
FLATER, D. W.	Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panal May 13-14, 1993).	Faceting Induced by an Ultrathin Matal Film: Pt on W(111).
Towards Flexible Distributed Information Ratriaval. PB94-102258 00,227	PB93-173508 00.474	PB93-166171 00,677
FLAUD, J. M.	FRIEDMAN, C. D.	GARG, M. L.
3nu3 Band of (32)S(16)O2: Line Positions and Intansities.	Hydroxyapatita Cament. I. Basic Chemistry and Histologic	Physical Paramatars for L X-ray Production Cross-Sactions. PB93-153609 00,583
PB93-151207 00,140	Propartias. PB93-125136 00,016	GAROFOLO, J. S.
FOLDEAKI, M.	FRIEND, D. G.	DARPA TIMIT Acoustic-Phonatic Continous Spaech Corpus
Magnatic Propartias of Cr-Mn Austenitic Stainless Steels. PB93-153310 00,483	Tablas for tha Tharmophysical Propartias of Ethana.	CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215
,	PB93-160786 00,150	GARRIS, M. D.
Oriantation Dapandanca of Flux Pinning in a Layerad Bi2Sr2Ca1Cu2O8 + 10% Ag Composite.	Tablas of Exparimantal Data Usad for the Correlation of the Thermophysical Properties of Ethana.	Machine-Assisted Human Classification of Sagmantad
PB93-153328 00,663	PB93-173417 00,164	Characters for Optical Character Recognition Testing and
FONG, E.	FROMMHOLD, L.	Training. PB93-152155 00,296
Databasa Managamant Systams In Engineering.	Rototranslational Absorption Spactra of H2-H2 Pairs in tha	Methods for Evaluating the Performance of Systems In-
PB93-146454 00,419	Far InfraredTranslation. PB93-125821 00,125	tended to Recognize Characters from Image Data Scannad
FONG, J. T. Built la Error Estimator for Optimizing Finite Florant Model	FRYBERGER, T. B.	from Forms. PB93-162980 00,298
Built-In Error Estimator for Optimizing Finita Element Modeling.	Modal Studias of SnO2-Basad Gas Sansors: Vacancy De-	
PB93-166312 00,694	facts and Pd Additive Effects.	NIST Scoring Packaga Cartification Procaduras in Conjunction with NIST Special Databasas 2 and 6.
FORNEY, D.	PB93-166056 00,112 FU, C. Y.	PB93-188126 00,302
Mld- and Near-Infrarad Spactra of Water and Water Dimer Isolated in Solid Neon.	ENDF/B-VI Neutron Cross Section Measurement Stand-	NIST Scoring Package Cross-Rafaranca for Usa with NIST
AD-A263 966/4 00,117	ards.	Internal Reports 4950 and 5129. PB94-103702 00,305
Vibrational Spactra of Molacular Ions Isolated in Solid	PB93-189868 00,610	Using Self-Organizing Recognition as a Machanism for Ra-
Neon. X. H2O(+), HDO(+), and D2O(+).	FU, J.	jecting Segmentation Errors.
AD-A263 817/9 00,116	Long-Range Scanning for Scanning Tunneling Microscopy. PB93-150811 00,625	PB93-138972 00,250
FORNEY, G. P. CFAST, tha Consolidated Model of Fira Growth and Smoka	FUHR, J. R.	GAYLE, F. W. Diract Evidance for an Effact of Twin Boundaries on Flux
Transport.	Bibliography on Atomic Lina Shapes and Shifts (July 1978	Pinning in Singla Crystal of YBa2Cu3O6+x.
PB93-174902 00,071	through March 1992) (Supplement 4). PB93-173433 00,606	PB93-166296 00,679
Molecular Modeling of Polymer Flammability: Application to	FULCOMER, P. M.	GEIST, J.
tha Dasign of Flame-Hasistant Polyethylene. PB93-153542 00,504	Guida to Voice Privacy Equipment for Law Enforcement	Machine-Assisted Human Classification of Segmanted Characters for Optical Character Recognition Testing and
Simulating tha Effact of Beamed Cailings on Smoka Flow.	Radio Communications Systams.	Training.
Part 1. Comparison of Numarical and Experimental Results.	PB93-189827 00,701	PB93-152155 00,296
PB93-152056 00,062	FULLER, E. R.	OCR Error Rata Varsus Rajaction Rata for Isolated Hand- print Characters.
Zona Fira Modeling with Natural Building Flows and a Zaro Order Shaft Modal.	Crystal Chamistry and Phasa Equilibria Studias of tha BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder	PB93-146652 00,294
PB94-112166 00,030	Characterization and Diffraction Pattarns of	GEORGE, L. A.
FORTUNKO, C. M.	Ba3R3Cu6O14+x, R=Lanthanidas. PB93-166668 00,684	Intrinsically Colored Microcrystalline Glass-Ceramic for Use
Matarials Raliability. Tachnical Activities, 1992. (NAS-NRC	Effect of Composition on Superconducting Properties in the	in Dental Restoration. PB93-150837 00,018
Assassmant Panal, May 13-14, 1993). PB93-173466 00.446	System Ba-Y-Gd-Cu-O.	GERHART, S.
	PB93-153377 00,667	International Survey of Industrial Applications of Formal
FOWELL, A. J. Davalopmants Naadad to Expand the Role of Fire Modeling	Structural Phasa Transformation Studias of tha High To Suparconducting Materials, Ba2RCu3O6+x, in Air.	Mathods. Voluma 1. Purposa, Approach, Analysis, and
In Matarial Fira Hazard Assassment.	PB93-166643 00,683	Conclusions. PB93-178556 00,255
N94-10787/7 00,009	FULLER, S. K.	International Survey of Industrial Applications of Formal
FOWLER, J.	Lifa-Cycle Costing Workshop for Enargy Conservation in	Mathods. Voluma 2. Casa Studias.
NIST EXPRESS Toolkit: Requiraments for Improvaments. National PDES Testbed Report Sarias.	Buildings: Studant Manual. PB93-198984 00,383	PB93-178564 00,256 GERZ, C.
PB93-220838 00,265	FURLOW, R.	Obsarvation of Quantizad Motion of Rb Atoms in an Optical
FOWLER, J. E.	Benchmark for tha Varification of Microwava CAD Software.	Fiald.
Raquiramants for an Application Protocol Davalopmant En-	PB93-125185 00,307	PB93-151140 00,576
vironmant. National PDES Testbed Report Serias. PB93-208114 00,426	GADZUK, J. W.	GIBSON, K. A.
FOX, J. R.	Vibrational Line Shape of Diatomic Adsorbates on Matal Clusters.	Bibliography of the NIST Electromagnetic Fields Division Publications.
Fleld-Space Conformal Solution Method: Binary Vapor-Lig-	PB93-153187 00,145	PB94-112547 00,322
uid Phasa Bahavlor.	GAIGALAS, A. K.	GILBERT, D. M.
PB93-166239 00,156	Observation of Photon Correlations in Scattering from a Sil-	Assessing Federal and Commercial Information Sacurity
FRAKER, A. C.	ver Electrode. PB93-150829 00,115	Neads. PB93-138956 00,218
Evaluation and Compilation of DOE Wasta Package Tast Data. Biannual Report, August 1989-January 1990.	GALAMBOS, J.	GILBERT, S. L
NUREG/CR-4735-V8 00,549	Characterization of a Distribution Function by the Second	Atomic Physics Tests of Nonlinear Quantum Mechanics.
FRANCIS, M. H.	Moment of the Residual Life.	PB93-153195 00,580
Dual-Port Circularly Polarizad Probe Standards at tha Na-	PB93-125193 00,511 GALLAGHER, J. S.	High Resolution Spectroscopy Using Fiber Lasars. PB93-125201 00,622
tional Institute of Standards and Technology. PB93-235208 00,326	Tharmodynamic Propartias of Homogeneous Mixturas of Ni-	GILLASPY, J. D.
FRANK, D. E.	trogan and Water from 440 to 1000 K, Up to 100 MPa and	Commant on 'Maasurament of tha Lamb Shifts in Singlat
Tast Procedura for Handgun Accuracy.	0.8 Mola Fraction N2.	Lavals of Atomic Helium'.
PB93-161347 00,556	PB94-118494 00,617 GANGOPADHYAY, A.	PB93-125219 00,562 GILLEN, G.
FRANK, P.	Waar and Friction Characteristics of Salf-Lubricating Copper	Sims Datarmination of Oxygan and Carbon in YBa2Cu3O7-
Evaluated Kinatic Data for Combustion Modelling.	Intercalatad Graphita Compositas.	x Superconductors.
PB93-149037 00,200	PB93-153765 00,480	PB93-150845 00,650

GILLIES, C. W.	Use of High Accuracy NAA for the Certification of NIST Botanical Standard Reference Materials.	HAMBRIGHT, P.
Microwave and Infrared Spectra of C2H4HCCH: Barrier to Twofold Internal Rotation of C2H4.	PB93-153153 00,517	Reduction Reactions of Water Soluble Cyano-Cobalt(III)- Porphyrins: Metal Versus Ligand Centered Processes.
PB93-150803 00,138	GREENE, G. L.	PB93-125912 00,514
GILLIES, J. Z.	Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility.	HAMMOUDA, B.
Microwave and Infrared Spectra of C2H4HCCH: Barrier to Twofold Internal Rotation of C2H4.	PB93-166916 00,605	Small Angle Neutron Scattering at the National Institute of Standards and Technology.
PB93-150803 00,138	Measurement of (3)He(n,gamma)(4)He Cross-Section at	PB93-166841 00,601
GILLIGAN, J. M.	Thermal Neutron Energies. PB93-166635 00,597	Ultra-High Resolution Inelastic Neutron Scattering.
Ionic Crystais in a Linear Paul Trap.	GREENE, L. H.	PB93-166882 00,604
PB93-153633 00,584	Charge Transfer and Bond Lengths in YBa2Cu3-xMxO6+y.	HAMPSON, R. F.
GILLILAND, G. L. Protein Crystal Growth of Ribonuclease A and Pancreatic	PB93-125847 00,644	Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Ki-
Trypsin Inhibitor Aboard the Maser 3 Rocket.	Magnetic Transitions in the System YBa2Cu2.8Co0.2O6+y. PB93-125839 00.643	netic Data Evaluation for Atmospheric Chemistry.
PB93-166122 00,524	Structure and Magnetic Properties of Doped Co and Fe-	PB93-149144 00,014
GILLS, T.	Bi2Sr2Cui-xMxOy Phases.	HAN, C.
Standard Reference Materials for Trace Organic Contaminants in the Marine Environment.	PB93-166338 00,680	Phase Behavior of an Off-Critical Polymer Blend Solution during Steady Shear Studied by Small Angle Neutron Scat-
PB93-166627 00,395	GREENFELD, S. H. Hail Resistance of Roofing Products.	tering.
GILMORE, F. R.	AD-A956 270/3 00,049	PB93-153526 00,176 Rheometer with Two-Dimensional Area Detection for Light
Franck-Condon Factors, r-Centroids, Electronic Transition Moments, and Einstein Coefficients for Many Nitrogen and	GRONER, N. E.	Scattering Studies of Polymer Melts and Solutions.
Oxygen Band Systems.	Affordable Fire Safety in Board and Care Homes. A Regulatory Challenge. Final Report.	PB93-151322 00,171
PB93-149128 00,114	PB93-219723 00,027	HAN, C. C.
GIROUD, M. Magnetic Transitions in the System YBa2Cu2.8Co0.2O6+y.	Guide to Board and Care Fire Safety Requirements in the	Chain Conformation of Block Copolymers in Dilute Solutions Measured by Small-Angie Neutron Scattering.
PB93-125839 00,643	1991 Edition of the Life Safety Code. PB93-220820 00,397	PB93-151272 00,170
Structure and Magnetic Properties of Doped Co and Fe-	Workshop on Eievator Use during Fires. Held In	Critical Dynamics of an Asymmetric Binary Polymer Mixture.
Bi2Sr2Cul-xMxOy Phases. PB93-166338 00.680	Gaithersburg, Maryland on September 29, 1992.	PB93-151116 00,169
PB93-166338 00,680 GLASER, S.	PB93-235190 00,045	Molecular Weight Dependence of Mobility in Polymer Blends.
Estimating In situ Liquefaction Potential and Permanent	GROSSHANDLER, W.	PB93-150787 00,168
Ground Displacements Due to Liquefaction for the Siting of	Acoustic Emission of Structural Materials Exposed to Open Fiames.	HANSON, A. G.
Lifelines. PB93-178614 00,194	PB93-138980 00,051	Federal Building Standard for Telecommunications Path-
Estimating Soil Parameters Important for Lifeline Siting	Early Detection of Room Fires through Acoustic Emission.	ways and Spaces; Category: Telecommunications Standard; Subcategory: Cables and Wiring.
Using System Identification Techniques.	PB94-112257 00,031 GROSSHANDLER, W. L.	FIPS PUB 175 00,207
PB93-178606 00,193	RADCAL: A Narrow-Band Model for Radiation Calculations	Federal Building Telecommunications Wiring Standard: Cat-
GLICKSMAN, M. E.	In a Combustion Environment.	egory: Telecommunications Standard; Subcategory: Cables and Wiring.
Asymptotic Behavior of Modulated Taylor-Couette Flows with a Crystalline Inner Cylinder.	PB93-200889 00,204 GROSSMAN, E. N.	FIPS PUB 174 00,206
PB93-139061 00,647	Electrical and Infrared Properties of Thin Niobium	Residential and Light Commercial Telecommunications Wir-
GLINKA, C. J.	Microbolometers Near T(sub c).	ing Standard; Category: Telecommunications Standard; Subcategory: Cables and Wiring.
Small Angle Neutron Scattering at the National Institute of Standards and Technology.	N93-27779/6 00,339 GROSVENOR, J. H.	FIPS PUB 176 00,208
PB93-166841 00,601	NIST Measurement Service for Electromagnetic Character-	HARARY, H. H.
GOLDBERG, R. N.	ization of Materials.	Imaging of Passivated III-V Semiconductor Surfaces by a
Conversion of Temperatures and Thermodynamic Prop-	PB94-110186 00,321	Scanning Tunneling Microscope Operating in Air. PB93-153294 00,357
erties to the Basis of the International Temperature Scale of 1990.	GROTHER, P. J. Comparison of Handprinted Digit Classifiers.	Scanning Tunneling Microscopy of Optical Surfaces.
PB93-153336 00,147	PB94-118213 00,306	PB93-166023 00,628
GOLDFARB, R. B.	Cross Validation Comparison of NIST OCR Databases.	HARDIS, J. E.
Demagnetizing Factors. PB93-153344 00,664	PB93-159077 00,297	Resonance Effects In the 5Sigma(-1) Photoionization Channel of CO.
Magnetic Units and Materials Specification.	GUPTA, A. K. Observations of soot in combustion of methanol/toluene	PB93-151751 00,144
PB93-153351 00,665	spray flames.	HARE, T. N.
GONZALEZ, J. A.	DE93007992 00,378	Application of the Hough Transform to Electron Diffraction
Center for Electronics and Electrical Engineering Technical	Time-based ensemble scattering measurements in fuel sprays.	Pattems. PB93-153773 00,585
Progress Bulietin Covering Center Programs, April to June 1990, with 1990/1991 CEEE Events Calendar.	DE93007989 00,197	HARMAN, D. K.
PB93-205524 00,364	GUPTA, K. C.	First Text REtrieval Conference (TREC-1).
Center for Electronics and Electrical Engineering Technical	Benchmark for the Verification of Microwave CAD Software. PB93-125185 00.307	PB93-191641 00,262
Publication Announcements Covering Center Programs, April to June 1990, with 1991 CEEE Events Calendar.	PB93-125185 00,307 GUTHRIE, W. F.	HARNE, D.
PB93-205516 00,363	Temperature-Electromotive Force Reference Functions and	Full-Thickness Clad Beam Fracture-Toughness Tests. DE93018036 00,550
GOODRICH, L. F.	Tables for the Letter-Designated Thermocouple Types Based on the ITS-90.	HARRIMAN, A.
Comparison of Transport Critical Current Measurement Methods.	PB93-190338 00,611	Reduction Reactions of Water Soluble Cyano-Cobalt(III)-
PB93-153369 00,666	HAGWOOD, C.	Porphyrins: Metal Versus Ligand Centered Processes. PB93-125912 00,514
Dynamic Resistance of Superconducting YBa2Cu3Ox Sintered Revider at 81 Kr. Liquid yersus Mager Nitrogen Favi	Calibration Problem as an IIi-Posed Inverse Problem. PB93-151108 00.512	HARRIS, G. L.
tered Powder at 81 K: Liquid versus Vapor Nitrogen Envi- ronment.		State Weights and Measures Laboratories: State Standards
PB93-153518 00,670	Characterization of a Distribution Function by the Second Moment of the Residual Life.	Program Description and Directory. 1993 Edition.
GOODWIN, A. R. H.	PB93-125193 00,511	PB93-217529 00,451
Measurement of the Dipole Moment of Gaseous 1,1,1-trichiorotrifluoroethane, 1,2-difluoroethane, 1,1,2-	Surveillance Schemes with Applications to Mass Calibra- tion.	HARRIS, R. H. Reduction of Hydrogen Cyanide Concentrations and Acute
trichlorotrifluoroethane, and 2-(difluoromethoxy)-1,1,1-	PB93-181881 00,608	Inhalation Toxicity from Flexible Polyurethane Foam Com-
trifluoroethane. PB93-150852 00,139	HAHN, M. H.	bustion Products by the Addition of Copper Compounds. Part IV. Effects of Combustion Conditions and Scaling on
GORDON, G. E.	Portsmouth Fastener Manufacturing Workstation. Fastener Engraving System (Design, Construction, and Operation).	the Generation of Hydrogen Cyanide and Toxicity from
Application of Polyacrylamide-Gel Electrophroesis Neutron-	PB94-118221 00,461	Flexible Polyurethane Foam with and without Copper Compounds.
Activation Analysis for Protein Quantification. PB93-166221 00,525	HAIR, D. W.	PB93-139103 00,053
GOTTUK, D. T.	Critical Dynamics of an Asymmetric Binary Polymer Mixture. PB93-151116 00.169	Test Methods for Quantifying the Propensity of Cigarettes to
Generation of Carbon Monoxide in Compartment Fires.	PB93-151116 00,169 HALE, G. M.	Ignite Soft Fumishings. PB94-108644 00,047
PB93-146702 00,198	ENDF/B-VI Neutron Cross Section Measurement Stand-	HARRISON, N. J.
GRAY, B.	ards.	Laser-Induced Kerr Constants for Pure Liquids.
Stable Implementation Agreements for Open Systems Inter- connection Protocols. Version 6, Edition 1, December 1992.	PB93-189868 00,610 HALE, P. D.	PB93-148989 00,129
Based on the Proceedings of the OSE Implementors' Work-	Optical Fiber Geometry: Accurate Measurement of Cladding	HASHIMOTO, T.
shop (OIW). PB93-166809 00,292	Diameter.	Molecular Weight Dependence of Mobility in Polymer Blends.
GREENBERG, R. R.	PB93-196269 00,632 HALL, J. R.	PB93-150787 00,168
Determination of Baseline Platinum Levels in Biological Ma-	U.S. Fires in 'Board and Care' Homes Matrix Display of Se-	HASTIE, J. W.
terials. PB93-151975 00.515	lected Fatal Fires. Special Analysis.	In situ Analysis of Laser-Induced Vapor Plumes.

Predictive Thermodynamic Model for Complex H perature Solution Phases XI. PB93-124840	ligh Tem- 00,120	HUBBARD, J. B. Kinetics of Bimolecular Recombination Processes w	Vibrational Spectra of Molecular Ions Isolated In Solid Neon, X, H2O(+), HDO(+), and D2O(+). AD-A263 817/9 00,116
Ultra-High Temperature Laser Vaporization Mass S	·	Trapping. PB93-151652 00,1	43 JAHANMIR, S.
etry of SiC and HfO2. PB93-124857 HAYES, M. A.	00,121	HUBBELL, J. H. Physical Parameters for L X-ray Production Cross-Section PB93-153609 00.5	
Resonance Effects In the 5Sigma(-1) Photoionizati	ion Chan-	HUFF, M.	PB93-217578 00,442
nel of CO. PB93-151751	00,144	Portsmouth Fastener Manufacturing Workstation. Faster	JANEZIC, M. D. Shielded Open-Circuited Sample Holders for Dielectric and
AYNES, W. M.		Engraving System (Design, Construction, and Operation). PB94-118221 00,4	Magnetic Macourements of Liquids and Douglass
Thermophysical Properties of Fluids for the Gas Annual Report, January-December 1992.	Industry.	HUIE, R. E.	JARGON, J. A.
PB93-207470	00,381	Formation and Reactivity of Hypophosphite and Phosph Radicals and Their Peroxyl Derivatives.	High Power CW Wattmeter Calibration at NIST. PB93-143949 00,327
HEILWEIL, E. J. Subpicosecond Probing of Vibrational Energy Tr	ransfer at	PB93-166072 00,1	JARRETT D. G.
Surfaces. PB93-150720	00,136	Rate Constants for Hydrogen Abstraction Reactions of No in Aqueous Solution.	Automated AC Bridge for Resistance Measurements.
HEIMAN, N.	00,100	PB93-166064 00,1	52 PB93-151132 00,330 Binary Inductive Voltage Divider Bridge.
Correlations of Magnetic Microstructure and Anisot Noise Spectra for CoNi and CoCrTa Thin Film Med		HULL, G. W. Magnetic Transitions in the System YBa2Cu2.8Co0.2O6+ **Transition** Magnetic Transition**	PR03_150688 00 328
PB93-153401	00,668	PB93-125839 00,6	PR03-139070 00 247
IEINZEN, D. J. Atomic Physics Tests of Nonlinear Quantum Mecha	onics	Structure and Magnetic Properties of Doped Co and F Bi2Sr2Cul-xMxOy Phases.	JASON, N. H.
PB93-153195	00,580	PB93-166338 00,6	Building and Fire Research Laboratory Publications, 1992. PB93-188845 00,073
Low Order Modes of an Ion Cloud in a Penning Tra PB93-153203	ap. <i>00,581</i>	HUNSTON, D. Flow Behavior in Liquid Molding.	Fire Information Challenges of the 21st Century.
IERMAN, M.	00,501	N93-14747/8 00,4	78 PB93-153385 00,067
Report of the ARPA/NIST Workshop on Performan		HUNT, F. Y. Monte Carlo Approach to the Approximation of Invaria	International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Sweden
uation of Unmanned Ground Vehicle Technologies. PB94-112422	00,456	Measures.	on May 5-8, 1992.
Vibrational Bands of HxNyOz Molecules. PB93-149078	00,133	PB93-159069 00,5	Summaries of BFRL Fire Research In-House Projects and
IICHO, G. E.	00,133	Measurement of the Energy Response of Superheat	Grants, 1993. PB94-121050 00,032
Fracture Mechanics Evaluation of Railroad Tank C	Cars Con-	Drop Neutron Detectors. PB93-166049 00,5	
faining Postulated Circumferential Cracks. PB93-219731	00,486	HURST, W. S.	in Gaithersburg, Maryland on March 1-2, 1993. PB93-219780 00,700
Mechanical, Stress-Rupture, and Fracture Toughne		New Approach to Calibration of Transducers Used in fl Measurement of Dynamic Pressure and Temperature.	
erties of Normalized and Stress Relieved AAF Grade B Steel at Elevated Temperatures.		PB93-153716 00,3	Data Management Standards in Computer-Aided Acquisition and Logistic Support (CALS).
PB93-182020 IILL, M. D.	00,485	HWANG, D. M.	N93-27714/3 00,289
Effect of Composition on Superconducting Properti	ies In the	Structure and Magnetic Properties of Doped Co and F Bi2Sr2Cul-xMxOy Phases.	Energy Distribution Constitute of Armed Inno in Law Courses
System Ba-Y-Gd-Cu-O. PB93-153377	00,667	PB93-166338 00,6	Diffuse Discharges at High E/N.
IMES, V. L.	00,000	HWANG, N. M. Phase Equilibria and Crystal Chemistry in Portions of the	PB93-166569 00,635 JENNINGS, B. R.
New Method for Phase Identification for Diffractionists.	Electron	System SrO-CaO-Bi2O3-CuO. Part 4. The System Car Bi2O3-CuO.	Laser-Induced Kerr Constants for Pure Liquids.
PB93-125854	00,098	PB94-108552 00,4	
IIRA, R.) oforosoo	HWANG, S. T.	JENSEN, H. D. Proposed Measurement of the Fine Structure Constant
Applying the NIST Real-Time Control System R Model to Submarine Automation: A Maneuvering		Neutron Depth Profiling: Overview and Description of NIS Facilities.	Using a Coulomb-Blockade Charge Pump.
Demonstration. PB93-184257	00,545	PB93-166890 00,66	JESSEN, P. S.
OBBIE, E. K.		Procedures for Selecting Earthquake Ground Motions	observation of Quantized Motion of Rb Atoms in an Optical
Critical Dynamics of an Asymmetric Binary Polymer PB93-151116	r Mixture. 00,169	Rock Sites (Revised). PB93-185973 00,5	Field. PB93-151140 00,576
OLM, P.		IGA, I.	JIA, J.
Protein Crystal Growth of Ribonuclease A and P Trypsin Inhibitor Aboard the Maser 3 Rocket.	ancreatic	Resonance Effects in the 5Sigma(-1) Photoionization Chanel of CO.	n- Excitation-Energy Dependence in the L2,3 Fluorescence Specfrum of Si.
PB93-166122	00,524	PB93-151751 00,14	
ORIBE, T. Chemical Change of Hardened PCA/CPC Cement	s in Var-	INGHAM, H.	JOARDER, K. Autonomous Obstacle Avoidance Using Visual Fixation and
ious Sforing Solutions.		Tables for the Thermophysical Properties of Ethane. PB93-160786 00,1:	Looming
PB93-151306 Infrared Spectroscopic Study of Cement Formation	00,020	Tables of Experimental Data Used for the Correlation of the	
meric Calcium Phosphate Cement. PB93-151298	00,019	Thermophysical Properties of Ethane. PB93-173417 00,10	New Spherical Dipole Source.
ORN, R. G.	00,019	INTERRANTE, C. G.	PB93-153419 00,325 JOHNSON, S. A.
Surface Forces and Their Action in Ceramic Materia		Evaluation and Compilation of DOE Waste Package Te Data, Biannual Report, August 1989-January 1990.	Solubility of Some Sparingly Soluble Salts of Zinc and Cad-
AD-A273 624/7 IORST, J. A.	00,465	NUREG/CR-4735-V8 00,54	mium in Water and in Aqueous Electrolyte Solutions. PB93-149110 00,134
Intelligent Control System for a Cutting Operation of	of a Con-	ISHINABE, T. Marriage of Exact Enumeration and 1/d Expansion Met	h- JONES, C. K. R. T.
tinuous Mining Machine. PB93-178622	00,544	ods: Lattice Model of Dilute Polymers. PB93-151330 00,1	Mechanism for Capture into Resonance.
ORVATH, J. J.		TANO, W. M.	JONES, K.
Surface-Enhanced Raman Sfudy of Benzylpenicillin PB93-151660). 00,099	Atomic Physics Tests of Nonlinear Quantum Mechanics.	Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties.
OZUMI, N.	00,000	PB93-153195 00,58 Ionic Crystals in a Linear Paul Trap.	PB93-125136 00,016
Space Charge Induced in Stressed Polyethylene. PB93-151124	00,343	PB93-153633 00,58	
SING, K. M.	00,040	Low Order Modes of an Ion Cloud in a Penning Trap. PB93-153203	Interlaboratory Study on the Lifhographically Produced Scanning Electron Microscope Magnification Standard Pro-
Government Network Management Profile (GNM egory: Hardware and Software Standards, Sub-	IP). Cat-	JA'JA', J.	71 totype. PB94-108545 00,371
Computer Network Protocols.		Using Synthetic-Perturbation Techniques for Tuning Share	d JONES, T. S.
FIPS-PUB-179 ISU, N. N.	00,248	Memory Programs. PB93-178572 00,23	Quantitative Evaluation of Distributed Pores in Reference Radiographs.
ONR-Sponsored Research in Ultrasonic Measure	ments at	JACKSON, M.	PB93-151744 00,444
NIST: 1982-92. PB93-152064	00,618	Acoustic Emission of Structural Materials Exposed to Ope Flames.	CEAST, the Consolidated Model of Fire Growth and Smoke
UANG, H. M.		PB93-138980 00,08	Transport. PB93-174902 00,071
Applying the NIST Real-Time Control System R Model to Submarine Automation: A Maneuvering		JACOX, M. E. Mid- and Near-Infrared Spectra of Water and Water Dim	er Comparison of Full Scale Fire Tests and a Computer Fire
Demonstration. PB93-184257	00,545	Isolated in Solid Neon. AD-A263 966/4 00,1	Model of Several Smoke Ejection Experiments.
	-,	00,7	00,001

User's Guide for CFAST Version 1.6.	KELLY, G. E.	KNAB, L. I.
PB93-140788 00,055	Guidelines for Using Emulators to Evaluate the Perform-	Applicability of the Maturity Method to High-Performance
JORGENSEN, J. D. Charge Transfer and Bond Lengths in YBa2Cu3-xMxO6+y.	ance of Energy Management and Control Systems. PB93-138931 00,033	Concrete. PB93-157451 00,182
PB93-125847 00,644	KELLY, W. R.	KNIGHT, R. B. D.
JOSEPH, J. P.	Determination of Uranium and Thorium in Materials Associ-	intercomparison of NIST, NPL, PTB, and VSL Thermai Volt-
Opportunities for Innovation: Chemical and Biological Sen-	ated with Real Time Electronic Solar Neutrino Detectors.	age Converters from 100 kHz to 1 MHz.
sors.	PB93-150779 00,575	PB93-151181 00,332
PB93-100063 00,096	KEMMERER, S. J.	KOENIG, J. A.
JOSEPH, M.	CALS Testing: Programs, Status and Strategy.	NIST Handbook 130, 1993. Uniform Laws and Regulations
Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2.	PB93-151165 00,420	in the Areas of Legal Metrology and Motor Fuel Quality as Adopted by the 77th National Conference on Weights and
PB93-124857 00,121	Collection of Technical Studies Completed for the Com- puter-Aided Acquisition and Logistic Support (CALS) Pro-	Measures 1992.
JUST, T.	gram Fiscal Year 1987. Volume 4.	PB93-213114 00,015
Evaluated Kinetic Data for Combustion Modelling.	ÅD-A261 193/7 00,414	KOEPKE, G.
PB93-149037 00,200	KERR, J. A.	New Spherical Dipole Source.
KACKER, R.	Evaluated Kinetic and Photochemical Data for Atmospheric	PB93-153419 00,325
Effect of Composition on Superconducting Properties in the	Chemistry. Supplement 4. IUPAC Subcommittee on Gas Ki-	Results of Screened-Room Measurements on NIST Stand-
System Ba-Y-Gd-Cu-O.	netic Data Evaluation for Atmospheric Chemistry. PB93-149144 00,014	ard Radiators. PB94-123056 00.323
PB93-153377 00,667		
Synthetic-Perturbation Tuning of MIMD Programs. PB93-161339 00,253	Evaluated Kinetic Data for Combustion Modelling. PB93-149037 00,200	KOHL, M. L.
	KERRY, W. J.	Measuring Low Frequency Tilts. PB93-196251 00,543
Using Synthetic-Perturbation Techniques for Tuning Shared Memory Programs.	interiaboratory Study on the Lithographically Produced	KOHLER, B. E.
PB93-178572 00,257	Scanning Electron Microscope Magnification Standard Pro-	
KAETZEL, L. J.	totype.	Lowest Energy Singlet State of Tetrathiophene, an Oligomer of Polythiophene.
Highway Concrete (HWYCON) Expert System Require-	PB94-108545 00,371	PB93-124824 00,119
ments and installation Guide.	X-ray Lithography Mask Metrology: Use of Transmitted	KOPANSKI, J. J.
PB93-198885 <i>00,187</i>	Electrons in an SEM for Linewidth Measurement. PB94-108537 00.370	Charge Trapping in Cubic Silicon Carbide MIS Capacitors.
KAISER, D. L.		PB93-151199 00,651
Direct Evidence for an Effect of Twin Boundaries on Flux	KHAN, M. R.	KOSTER, B.
Pinning in Single Crystal of YBa2Cu3O6+x. PB93-166296 00,679	Correlations of Magnetic Microstructure and Anisotropy with Noise Spectra for CoNi and CoCrTa Thin Film Media.	Instrumental Neutron Activation Analysis of Standard Ref-
	PB93-153401 00,668	erence Material 1941, Organics in Marine Sediment: Ele-
Structural Phase Transformation Studies of the High To Superconducting Materials, Ba2RCu3O6+x, in Air.	KHERA, D.	ment, Content and Homogeneity. PB93-166213 00,552
PB93-166643 00,683	Directed-Graph Classifier of Semiconductor Wafer-Test Pat-	KOSTER, B. J.
KAMITAKAHARA, W. A.	tems.	
Structure and Low Energy Dynamics of Solid C60.	PB93-153286 00,356	Specimen Banking at the National Institute of Standards and Technology.
PB93-153260 00,146	KIM, C. G.	PB93-151967 00, 101
KANARE, H.	NMR Based Current/Voltage Source.	KOTECKI, D. J.
Standard Cement Clinkers for Phase Analysis.	PB93-151173 00,331	WRC-1992 Constitution Diagram for Stainless Steel Weld
PB93-166254 00,185	KIM, H.	Metals: A Modification of the WRC-1988 Diagram.
KANDA, M.	Elastic and Inelastic Neutron Scattering Study of Hydro-	PB93-153427 00,484
New Spherical Dipole Source.	genated and Deuterated Trimethylammonium Pillared Ver- miculite Clays.	KRASNY, J. F.
PB93-153419 00,325	PB93-125169 00,124	Bum Injury Potential of Navy Shipboard Work Clothing.
Optimized Thermo-Optic Electric-Field Probes for Micro-	KIM, Y. K.	AD-A258 836/6 00,481
waves and Millimeter Waves. PB93-153641 00,318	Compact Fitting Formulas for Electron-Impact Cross Sec-	KRAUSS, M.
	tions.	Binding of Cis-(1,2-Diaminocyclohexane)Platinum(II) and Its
Ultra-Broadband and Nondispersive Sensor for the Measurement of Time-Domain Signals.	PB93-143956 00,566	Derivatives to Duplex DNA. PB93-125870 00,531
PB93-153393 00,324	KINARD, J. R.	KREIDER, K. G.
KAO, J. Y.	intercomparison of NIST, NPL, PTB, and VSL Thermal Volt-	Mechanistic and Response Studies of Iridium Oxide pH
Guidelines for Using Emulators to Evaluate the Perform-	age Converters from 100 kHz to 1 MHz. PB93-151181 00,332	Sensors.
ance of Energy Management and Control Systems.	KINGSTON, H. M.	PB93-166346 00,113
PB93-138931 00,033	Laser-Enhanced Ionization Spectrometry Following Matrix	KRUEGER, S.
KASHIWAGI, T.	Modification by Automated Cheiation Chromatography for	Small Angle Neutron Scattering at the National Institute of
Heat and Mass Transport from Thermaily Degrading Thin	the Analysis of Biological and Environmental Reference Ma-	Standards and Technology.
Cellulosic Materials in a Microgravity Environment. PB93-153435 00,505	terials. PB93-166494 00,104	PB93-166841 00,601
Ignition and Subsequent Flame Spread over a Thin Cel-	•	KU, H.
lulosic Materiai.	KIRCHHOFF, W. H.	Three-Ratio Scheme for the Measurement of Isotopic Ratios of Silicon.
N93-20205/9 00,698	EXAM: A Two-State Thermodynamic Analysis Program. PB93-191658 00.166	PB93-196285 00,612
Non-Halogenated, Flame Retarded Polycarbonate.	KLINEDINST, D. B.	KUCHINSKI, M. A.
N94-10781/0 00,008	Source Apportionment of Fine Particle Organics and Muta-	Standard X-ray Diffraction Powder Patterns of Fourteen Ce-
KATTNER, U. R.	genicity in Wintertime Roanoke.	ramic Phases.
Solidification Processing and Phase Transformations in Or-	PB93-221851 00,391	PB93-166650 <i>00,473</i>
dered High Temperature Alloys.	KLOCEK, P.	KUENTZLER, R.
AD-A261 751/2 00,494 KAUL, M. P.	Workshop on Characterizing Diamond Films Ii. Held in	Deformation Twinning, Slip, Martensite Formation and
	Gaithersburg, MD. on February 24-25, 1993. PB93-207157 00.687	Crack Inhibition in the B2-Type Zr50Pd35Ru15 Alloy. PB93-151918 00,497
Horizontal Nucleate Flow Boiling Heat Transfer Coefficient Measurements and Visual Observations for R12, R134a,	PB93-207157 00,687 KLONZ, M.	KUNZ, A.
and R134a/Ester Lubricant Mixtures.	_	
PB93-178598 00,493	Intercomparison of NIST, NPL, PTB, and VSL Thermal Voltage Converters from 100 kHz to 1 MHz.	Dose Equivalent Response of Tissue-Equivalent Proportional Counters to Low Energy Neutrons.
KAWAJI, S.	PB93-151181 00,332	PB93-166031 00,534
Re-Examination of Quantum Hall Plateaus.	KLOTE, J. H.	KURYLO, M. J.
PB93-151850 00,658	Air Moving Systems and Fire Protection.	Optimizing Complex Kinetics Experiments Using Least-
KAYSER, R. F.	PB93-234722 00,398	Squares Methods.
Development of Measurement Capabilities for the Thermophysical Properties of Energy-Related Fluids, An-	Design of Smoke Control Systems for Areas of Refuge.	PB93-196244 00,167
nual Report, December 1, 1992November 30, 1993.	PB93-183754 00,072	KUSHIDA, G.
DE93019442 00,118	Simulating the Effect of Beamed Ceilings on Smoke Flow.	Heat and Mass Transport from Thermaily Degrading Thin
Thermophysical Properties. Progress Report, 1 January	Part 1. Comparison of Numerical and Experimental Results.	Cellulosic Materials in a Microgravity Environment. PB93-153435 00,505
199231 March 1993.	PB93-152056 00,062	KUYATT, C. E.
DE93040219 00,490	Smoke Movement in a Corridor-Hybrid Model, Simple	Guidelines for Evaluating and Expressing the Uncertainty of
KEDZIERSKI, M. A.	Model and Comparison with Experiments. PB93-146678 00,057	NIST Measurements Results.
Comparison of Experimental Measurements of Local Flow	·	PB93-159465 00,403
Boiling Heat Transfer Coefficients for R11 and R123. PB93-151157 00,491	Workshop on Elevator Use during Fires. Held in Gaithersburg, Maryland on September 29, 1992.	LAFFERTY, W. J.
· ·	PB93-235190 00,045	3nu3 Band of (32)S(16)O2: Line Positions and intensities.
Horizontal Nucleate Flow Boiling Heat Transfer Coefficient Measurements and Visual Observations for R12, R134a,		PB93-151207 00,140
and R134a/Ester Lubricant Mixtures.	Zone Fire Modeling with Natural Bullding Flows and a Zero	
	Zone Fire Modeling with Natural Building Flows and a Zero Order Shaft Model.	Partial Structure for trans-1,2-Difluoroethylene from High-
PB93-178598 00,493	Order Shaft Model. PB94-112166 00,030	Resolution Infrared Spectroscopy.
PB93-178598 00,493 KEENY, S. M.	Order Shaft Model. PB94-112166 00,030 KLOUDA, G. A.	Resolution Infrared Spectroscopy. PB93-125144 00,123
PB93-178598 00,493 KEENY, S. M. Properties and Interactions of Oral Structures and Restora-	Order Shaft Model. PB94-112166 00,030 KLOUDA, G. A. Method for Separating Volatile Organic Carbon from 0.1	Resolution Infrared Spectroscopy. PB93-125144 00,123 LAGERGREN, E.
PB93-178598 00,493 KEENY, S. M.	Order Shaft Model. PB94-112166 00,030 KLOUDA, G. A.	Resolution Infrared Spectroscopy. PB93-125144 00,123

LACEBOREN E S	LEVELT SENGERS I M N	LIN, Y.
LAGERGREN, E. S. Effect of Repetitive Swells on Metal-Oxide Varistors.	LEVELT SENGERS, J. M. H. Critical Parameters and Saturation Densities of 1,1-	Impact-Echo Response of Pletes Conteining Thin Layers
PB93-153443 00,358	Dichloro-2,2,2-Trifluoroethane. PB93-166593 00,492	end Voids. PB93-153815 00,181
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Moments, and Einstein Coefficients for Many Nitrogen and Oxygen Band Systems.	Reduction of Hydrogen Cyanide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Com-	Prompt-Gamma Activation Analysis. PB93-166908 00,106
PB93-149128 00,114	bustion Products by the Addition of Copper Compounds.	LINHOLM, L. W.
LAKS, S. Bibliography of Seroy Thread Measurement	Part IV. Effects of Combustion Conditions end Scaling on the Generation of Hydrogen Cyanide and Toxicity from	Directed-Graph Classifier of Semiconductor Wafer-Test Patterns.
Bibliography of Screw Thread Measurement. PB94-101821 00,460	Flexible Polyurethane Foam with and without Copper Compounds.	PB93-153286 00,356
LAMAZE, G. P.	PB93-139103 00,053 LEVIN, B. M.	Test Guide for CMOS-On-SIMOX Test Chips NIST3 and NIST4.
Neutron Depth Profiling: Overview and Description of NIST Facilities.	Affordable Fire Safety In Board and Care Homes. A Regu-	PB93-152106 00,355
PB93-166890 00,686 LAMEL, L. F.	latory Challenge, Final Report. PB93-219723 00,027	LIPE, T. E. Low-Frequency Errors of Thermel Voltege Converters: A
DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus	Workshop on Elevator Use during Fires. Held in	Progress Report. PB93-151223 00,333
CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215	Gaithersburg, Maryland on September 29, 1992. PB93-235190 00.045	LIVINGSTON, R.
LANGLAND, J. K.	LEVINE, J.	Geochemical Considerations In the Cleaning of Carbonate Stone.
Neutron Depth Profiling: Overview and Description of NIST Facilities.	Measuring Low Frequency Tilts. PB93-196251 00,543	PB93-151231 00,059
PB93-166890 00,686	LEVITSKY, A.	LIVINGSTON, R. A. Graphical Methods for Examining the Effects of Acid Rain
LARRABEE, R. D. Report on e Workshop for Improving Relationships between	Large Scale Evaluation of a Pattern Recognition/Expert System for Mass Spectral Molecular Weight Estimation.	Graphical Methods for Examining the Effects of Acid Rain and Sulfur Dioxide on Carbonate Stones.
Users and Suppliers of Microlithography Metrology Tools.	PB94-113081 00,108	PB93-151249 00,060 LOTH, K.
PB93-206233 00,365 X-ray Lithography Mask Metrology: Use of Transmitted	LEW, H. S. Overview of Damage to Highway Bridges during the Loma	Protein Crystal Growth of Ribonucleese A end Pancreatic
Electrons in an SEM for Linewidth Meesurement.	Prieta Earthquake.	Trypsin Inhibitor Aboard the Maser 3 Rocket. PB93-166122 00,524
PB94-108537 00,370 LARSON, D. R.	PB93-134112 00,191 Strengthening Methodology for Lightly Reinforced Concrete	LOUIE, B.
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Reference Detectors for Spectral Responsivity Measure-	Source Apportionment of Fine Particle Organics and Muta-	Determination of the Structure of CO2-H2CO. PB93-150696 00,135
ments. PB93-153591 00,626	genicity in Wintertime Roanoke. PB93-221851 00,391	Microwave end Infrared Spectra of C2H4HCCH: Berner to
LAWRENCE, S. H.	LEWIS, M. A.	Twofold Internal Rotation of C2H4. PB93-150803 00,138
Reaction Sintering High-Density, Fine-Grained Ba2YCu3O6.5+x Superconductors Using Ba(OH) 2.H2O.	Flow Conditioner Location Effects in Orifice Flowmeters. PB93-159457 00,379	Microwave Spectrum of (D2O)2.
PB93-151876 00,659	Li, W. H.	PB93-166262 00,157 Recommended Rest Frequencies for Observed Intersteller
LECKRONE, D. International Colloqium on Atomic Spectra and Oscillator	Magnetic Phase Transitions and Structural Distortion in Nd2CuO4.	Moleculer Microweve Trensitions, 1991 Revision.
Strengths for Astrophysical end Laboretory Plasmes (4th). Held et the Netionel Institute of Standards and Technology,	PB93-166130 00,676	PB93-149003 00,011 LOW, S.
Gaithersburg, Maryland on September 14-17, 1992. PB93-198422 00,012	LIAO, Y. Transient Cooling of a Hot Surfece by Droplets Evaporation.	Full-Thickness Clad Beam Fracture-Toughness Tests.
LEDBETTER, H.	Final Report, November 1990. PB93-189421 00,609	DE93018036 00,550 LOWE, D. L.
Magnetic Properties of Cr-Mn Austenitic Stainless Steels.	LIBES, D.	Comparison of Full Scale Fire Tests and e Computer Fire
PB93-153310 00,483 Orientation Dependence of Flux Pinning in e Layered	Automating Interactive Applications in e Network Environment.	Model of Several Smoke Ejection Experiments. PB93-139087 00,551
Bi2Sr2Ce1Cu2O8 + 10% Ag Composite. PB93-153328 00,663	PB93-151215 00,251	LOWNEY, J. R.
LEE, C. H.	Exppp: An EXPRESS Pretty Printer. National PDES Testbed Report Series.	Analysis of Persistent Photoconductivity Due to Potential Berriers.
Polarization Analysis of the Magnetic Excitations in Invar	PB94-120797 00,276	PB93-153468 00,669
Fe86B14. PB93-151256 00,652	NIST EXPRESS Toolkit: Introduction and Overview. National PDES Testbed Report Series.	X-rey Lithography Mask Metrology: Use of Transmitted Electrons in en SEM for Linewidth Measurement.
LEE, S. H.	PB94-120664 00,436	PB94-108537 00,370 LOZIER, D. W.
Kinetics of Bimolecular Recombination Processes with Trapping.	NIST EXPRESS Toolkit: Lessons Learned. PB93-153450 00,422	Robust Parellel Computation in Floating-Point end SLI Arith-
PB93-151652 00,143 LEE, S. Y.	NIST EXPRESS Toolkit: Requirements for Improvements.	metic. PB93-153476 00,252
Correlations of Megnetic Microstructure and Anisotropy with	National PDES Testbed Report Senes. PB93-220838 00,265	LU, C.
Noise Spectra for ČoNi and CoCrTa Thin Film Media. PB93-153401 00,668	NIST EXPRESS Toolkit: Updating Existing Applications. Na-	Fast Fourier Transform Algorithms for Real and Symmetric Date.
LEE, T. Y.	tional PDES Testbed Report Series. PB93-220846 00,266	PB93-153146 00,507
Report on Scoping the Apparel Manufacturing Enterprise. PB93-152163 00,429	NIST EXPRESS Toolkit: Using Applications. National PDES Testbed Report Series.	Fest Fourier Trensforms for Space Groups Containing Rote- tion Axes of Order Three and Higher.
LEE, Y. T.	PB93-220853 00,267	PB93-124790 00,642
Prototype Application Protocol for Reedy-to-Wear Pattern Making.	Shtolo-Converting STEP Short Listings to Annoteted Listings. National PDES Testbed Report Series.	LU, G. Workshop on Characterizing Diamond Films II. Held in
PB93-158665 00,430	PB94-120623 00,435	Gaithersburg, MD. on Februery 24-25, 1993. PB93-207157 00,687
LEHMAN, J. H.	LIDE, D. R. Journal of Physical and Chemical Reference Data, Volume	LUCATORTO, T.
Reference Detectors for Spectral Responsivity Meesurements.	21, No. 1, January/February 1992. PB93-148948 00.126	Status of the Soft X-ray/XUV Optical Metrology Progrem et the Netionel Institute of Stendards end Technology.
PB93-153591 00,626 LENKER, S.	Journal of Physical and Chemical Reference Data, Volume	AD-P008 068/9 00,557
Standard Cement Clinkers for Phese Analysis.	21, No. 2, March/April 1992. PB93-148997 00,569	LUPINSKI, J. H. Non-Halogenated, Flame Retarded Polycarbonate.
PB93-166254 00,185 LENNON, E. B.	Journal of Physical and Chemical Reference Data, Volume	N94-10781/0 00,008
Computer Systems Laboratory Annual Report, 1992.	21, No. 3, Maý/June 1992. PB93-149029 00,199	LYNCH, J. J. Prediction of Fluid Phese Equilibrium of Ternary Mixtures In
PB93-181873 00,229	Journal of Physical and Chemical Reference Data, Volume	the Critical Region and the Modified Leung-Griffiths Theory.
LEPAGE, Y. Structure and Magnetic Properties of Doped Co end Fe-	21, No. 4, July/August 1992. PB93-149045 00,130	PB93-153484 00,148 LYNCH, N.
Bi2Sr2Cul-xMxOy Pheses. PB93-166338 00,680	Journal of Physical and Chemical Reference Data, Volume	Assessing Federel end Commerciel Information Security
LESAGE, A.	21, No. 5, September/October 1992. PB93-149094 00,572	Needs. PB93-138956 00,218
Bibliography on Atomic Line Shepes end Shifts (July 1978 through March 1992) (Supplement 4).	Journal of Physical and Chemical Reference Data, Volume 21, No. 6, November/December 1992.	LYNN, J. W.
PB93-173433 00,606	PB93-149136 00,013	Magnetic Phase Transitions and Structural Distortion in Nd2CuO4.
LETT, P. D. Observation of Quantized Motion of Rb Atoms in an Optical	LIN, Q.	PB93-166130 00,676
Field. PB93-151140 O0,576	Polarization Analysis of the Magnetic Excitations in Invar Fe86B14.	Polarization Analysis of the Magnetic Excitations in Invar Fe86B14.
	PB93-151256 00,652	PB93-151256 00,652

Resolution Considerations for Polarized Triple-Axis Spec-	MARSHALL, H. E.	MCCARTHY, S. L.
trometry.	UNIFORMAT II: A Recommended Classification for Building	Binding of Cls-(1,2-Diaminocyclohexane)Platinum(II) and It
PB93-151728 00,657	Elements and Related Sitework.	Derivatives to Duplex DNA.
LYON, G. Synthetic-Perturbation Tuning of MIMD Programs.	PB93-146017 00,034 MARSHALL, J. C.	PB93-125870 00,53 MCCARTY, R. D.
PB93-161339 00,253	Test Guide for CMOS-On-SIMOX Test Chips NIST3 and	Speed of Sound Data and Related Models for Mixtures of
Using Synthetic-Perturbation Techniques for Tuning Shared	NIST4.	Natural Gas Constituents.
Memory Programs. PB93-178572 00,257	PB93-152106 00,355 MARSHALL, R. D.	PB93-200822 00,386 MCCAULEY, J. P.
LYONS, R. M.	Measurement of Structural Deflections.	Structure and Low Energy Dynamics of Solid C60.
Bibliography of the NIST Electromagnetic Flelds Division	PB93-125664 00,080	PB93-153260 00,14
Publications. PB94-112547 00.322	MARTIN, P.	MCCOLLOUGH, R.
MA, M. T.	Intercomparison of NIST, NPL, PTB, and VSL Thermal Voltage Converters from 100 kHz to 1 MHz.	Initial Graphics Exchange Specification Hybrid Microclrcui Application Protocol.
Characteristics of Unknown Linear Systems Deduced from	PB93-151181 00,332	PB93-175404 00,36
Measured CW Magnitude. PB94-108487 00,337	MARTIN, W. C.	MCCOLSKEY, J. D.
Selected EMC Standards and Regulations: A Summary.	Comment on 'Measurement of the Lamb Shifts in Singlet	Aluminum Alloys for ALS Cryogenic Tanks: Comparative
PB93-220002 00,639	Levels of Atomic Helium'. PB93-125219 00,562	Measurements of Cryogenic Mechanical Properties of Al-L Alloys and Alloy 2219.
System Response to Pulsed Excitations Estimated from	MARTINEZ, R. I.	PB93-173441 00,50
Measurement of cw Amplitudes. PB93-153492 00.316	Instrument-Independent Database for Collisionally Activated	MCCOWAN, C. N.
MACDONALD, M. A.	Dissociation in Radiofrequency Only Quadrupoles. Single- Collision Versus Multiple-Collision Conditions.	Quantitative Evaluation of Distributed Pores in Reference Radiographs.
Resonance Effects in the 5Sigma(-1) Photoionization Chan-	PB93-125680 00,400	PB93-151744 00,444
nel of CO. PB93-151751 00.144	Precision and Accuracy in XQQ Measurements: A Sum-	MCDONALD, D. G.
PB93-151751 00,144 MACREYNOLDS, K.	mary Report of the NIST-EPA International Round Robin. PB93-125672 00,399	Electrical and Infrared Properties of Thin Nioblun Microbolometers Near T(sub c).
Dual-Port Circularly Polarized Probe Standards at the Na-	MARTINIS, J. M.	N93-27779/6 00,33
tional Institute of Standards and Technology.	Proposed Measurement of the Fine Structure Constant	MCFADDEN, G. B.
PB93-235208 00,326	Using a Coulomb-Blockade Charge Pump.	Asymptotic Behavior of Modulated Taylor-Couette Flows
MADEY, T. E.	PB93-151264 00,577	with a Crystalline Inner Cylinder. PB93-139061 00,64
Faceting Induced by an Ultrathin Metal Film: Pt on W(111). PB93-166171 00,677	MARTZLOFF, F. D.	Computation of Complex Solldification Morphologies Using
MADOU, M.	Effect of Repetitive Swells on Metal-Oxide Varistors. PB93-153443 00,358	a Phase-Field Model.
Opportunities for Innovation: Chemical and Biological Sen-	Proceedings: Open Forum on Surge Protection Application.	PB93-156743 00,67
sors. PB93-100063 00,096	PB94-118056 00,346	Effect of Gravitational Modulation on Convection in Vertica Bridgman Growth.
MAJKRZAK, C. F.	MARX, E.	N94-10178/9 00,49
Neutron Reflectivity and Grazing Angle Diffraction.	Direct and Inverse Problems for Light Scattered by Rough Surfaces.	Effect of Gravity Modulation on Thermosolutal Convection.
PB93-166858 00,685	PB93-125714 00,623	N94-10103/7 00,620
NIST Cold Neutron Research Facility and Magnetic Neutron Scattering.	Elementary Particle Physics in the Dalton Manner.	Morphological Instability in Phase-Field Models of Solidification.
PB93-151694 00,654	PB93-125698 00,564	PB94-111523 00,69
MAKOSKI, T.	Logarithmic Terms in Fields Near the Edge of a Dielectric Wedge.	Phase-Field Model for Isothermal Phase Transitions in Bi
Initial Graphics Exchange Specification Hybrid Microcircuit	PB93-125706 00,638	nary Alloys. PB93-151934 <i>00,49</i> 6
Application Protocol. PB93-175404 00,361	X-ray Lithography Mask Metrology: Use of Transmitted	Phase-Field Models for Anisotropic Interfaces.
MALDONADO, A.	Electrons in an SEM for Linewidth Measurement. PB94-108537 00,370	PB93-164564 00,672
Burn Injury Potential of Navy Shipboard Work Clothing.	MASTERSON, K.	Thermodynamically-Consistent Phase-Field Models for So
AD-A258 836/6 00,481	New Spherical Dipole Source.	lidification. PB93-139012 00,64
MALGHAN, S. G.	PB93-153419 00,325	MCGRATTAN, K. B.
Equipment for Investigation of Cryogenic Compaction of Nanosize Silicon Nitride Powders.	MATSUSHITA, T.	In situ Burning of Oil Spills: Mesoscale Experiments and
DE93018740 00,466	Smoke Movement in a Corridor-Hybrid Model, Simple Model and Comparison with Experiments.	Analysis. PB94-101839 00,39
MALISZEWSKYJ, N. C.	PB93-146678 00,057	Smoke Plume Trajectory from In situ Burning of Crude O
Structure and Low Energy Dynamics of Solid C60. PB93-153260 00,146	MATSUSHITA, Y.	in Alaska.
MALMSTROM, H.	Chain Conformation of Block Copolymers in Dilute Solutions Measured by Small-Angle Neutron Scattering.	PB94-114519 00,394 MCHENRY, H. I.
Protein Crystal Growth of Ribonuclease A and Pancreatic	PB93-151272 00,170	Materials Reliability. Technical Activities, 1992. (NAS-NRC
Trypsin Inhibitor Aboard the Maser 3 Rocket. PB93-166122 00,524	MATTIS, R. L.	Assessment Panel, May 13-14, 1993).
MALONE, K. J.	MAESTRO: A Front-End to the MAIN1 Program for Mul-	PB93-173466 00,440 MCKENNA, G. B.
Integrated Optic Laser Fabricated by Field-Assisted Ion Ex-	tiple-Angle Measurement of Silicon Dioxide Layers. PB93-139038 00,352	13C NMR Studies of Polymorphy in Isotactic Polystyrene.
change in Neodymium Doped Soda-Lime Silicate Glass.	MAY, W. B.	PB93-166536 00,176
PB93-153807 00,340 MANDIN, J. Y.	Guidelines for Using Emulators to Evaluate the Perform-	MCKINNON, W. R.
3nu3 Band of (32)S(16)O2: Line Positions and Intensities.	ance of Energy Management and Control Systems. PB93-138931 00,033	Structure and Magnetic Properties of Doped Co and Fe
PB93-151207 00,140	MAY, W. E.	Bi2Sr2Cul-xMxOy Phases. PB93-166338 00,680
MANNHART, W.	Evaluation of Serum Volume Losses during Long-Term	MCKNIGHT, M. E.
ENDF/B-VI Neutron Cross Section Measurement Standards.	Storage. PB94-108503 00.518	Quality Control Tests for Adhesion of Paint on the Panels of
PB93-189868 00,610	,	Tactical Rigid Wall Shelters, Phase 2. PB93-173474 00,476
MAO, Y.	Two New Gas Standards Programs at the National Institute of Standards and Technology.	MCMURDIE, H. F.
In vivo Fluoride Concentrations Measured for Two Hours	PB93-191427 00,095	Standard X-ray Diffraction Powder Patterns of Fourteen Ce
After a NaF or a Novel Two-Solution Rinse. PB93-151868 00,527	MAYO, S.	ramic Phases. PB93-166650 00,473
MARCHIANDO, J. F.	Analysis of Persistent Photoconductivity Due to Potential Barriers.	MECHELS, S. E.
Metrologic Support for the DARPA/NRL-XRL Mask Pro-	PB93-153468 00,669	Optical Fiber Geometry: Accurate Measurement of Cladding
gram: Ellipsometric Analyses of SiC Thin Films on Si. PB93-152098 00,354	MAYO-WELLS, J. F.	Diameter.
MARINENKO, R. B.	Electronics and Electrical Engineering Laboratory 1993 Pro-	PB93-196269 00,632
Preparation and Preliminary Analysis of K-411 Glass	gram Plan: Supporting Technology for U.S. Competitive- ness in Electronics.	MEIGS, B. Performance Standard for Wood-Based Structural-Use Pan-
Microspheres.	PB93-228625 00,320	els.
PB93-125623 00,097 MARKS, R. B.	MAZUR, J.	PB93-146298 00,056
Benchmark for the Verification of Microwave CAD Software.	Crystallographic Defects in Polymers and What They Do. PB93-151678 00.173	MELEN, F.
PB93-125185 00,307	PB93-151678 00,173 MCCAA, D. J.	Vibrational Bands of HxNyOz Molecules. PB93-149078 00,133
Comments on 'Rapid Pulsed Microwave Propagation'.	Interlaboratory Comparison of the Apparent Thermal Con-	MELMED, A. J.
PB93-125631 00,637	ductivity of a Fibrous Batt and Four Loose-Fill Insulations.	Scanning Tunneling Microscopy of Optical Surfaces.
Reciprocity Relations for On-Wafer Power Measurement. PB93-125649 00,350	PB93-151280 00,061	PB93-166023 00,626
MARSHAK, H.	MCCAFFREY, B. J. Model Study of the Aircraft Cabin Environment Resulting	MELQUIST, D. Comparison Measurements of Currents Induced by Radi-
Nuclear Orientation of (160)Tb in Tb Single Crystal.	From In-Flight Fires.	ation and Injection.
PB93-125656 00.563	AD-A261 270/3 00.005	PB93-153138 00.314

MENCON	MONCART H T	Effect of Gravity Modulation on Thermosolutal Convention
MENGONI, A. Spectrel Data end Grotrien Diagrams for Highly Ionized Co-	MONCARZ, H. T. Information Technology Vision for the U.S. Fiber/Textile/Ap-	Effect of Gravity Moduletion on Thermosolutal Convection. N94-10103/7 00,620
balt, Co VIII through Co XXVII. PB93-148963 00,568	perei Industry. PB93-139095 00,482	Thermodynamically-Consistent Phase-Field Models for Solidification.
MENZEL, H. G.	Prototype Application Protocol for Ready-to-Wear Pattern	PB93-139012 00,646
Dose Equivelent Response of Tissue-Equivalent Propor-	Making, PB93-158665 00,430	NACKERDIEN, Z.
tionel Counters to Low Energy Neutrons. PB93-166031 00,534	Report on Scoping the Apparel Manufacturing Enterprise.	DNA Base Damage in Chrometin of Gamma-Irrediated Cultured Human Cells.
MERCHANT, G. J.	PB93-152163 00,429	PB93-151314 00,521 DNA-Protein Cross-Linking between Thymine end Tyrosine
Pulsatile Instability in Rapid Directional Solidification: Strongly-Nonlinear Analysis.	MONTERIO, P. J. M. Analysis of the Aggregate-Cement Paste Interface Using	in Chromatin of Gamma-irradiated or H2O2-Treated Cui-
N94-10188/8 00,641	Grazing Incidence X-ray Scattering.	tured Humen Cells. PB93-151587 00,522
MEYER, J. D. Proceedings of the Joint DoD/NIST Workshop on Inter-	PB93-125904 00,179 MOORE, B. A.	NAGUSRINIVAS, N.
national Precision Fabrication Research and Development.	RL/NIST Workshop on Moisture Measurement end Control	Space Charge Induced in Stressed Polyethylene. PB93-151124 00,343
Heid in Rockville, Maryland on October 27-29, 1992. PB93-192318 00,440	for Microelectronics. Proceedings of the RL/NIST Workshop held in Gaithersburg, Maryland on April 5-7, 1993.	NAKABE, K.
MEYER, W.	PB94-108636 00,372	Ignition and Subsequent Fleme Spread over a Thin Cel- lulosic Material.
Rototrensiational Absorption Spectra of H2-H2 Pairs in the Far InfreredTrensletion.	MOORE, F. L. Low Order Modes of an Ion Cloud in a Penning Trap.	N93-20205/9 00,698
PB93-125821 00,125	PB93-153203 00,581	NAKAGAKI, T.
MICELI, P. F. Charge Transfer end Bond Lengths in YBa2Cu3-xMxO6+y.	MOORE, T. P.	Spectrel Date end Grotnan Diagrams for Highly Ionized Venadium, V VI through V XXIII.
PB93-125847 00,644	NIST Measurement Service for DC Standard Resistors. PB93-139079 00,347	PB93-149011 00,570 NAKAI, Y.
Magnetic Transitions in the System YBa2Cu2.8Co0.2O6+y. PB93-125839 00,643	MORDFIN, L	Spectrai Data and Grotrian Diegrems for Highly Ionized Co-
Structure end Magnetic Properties of Doped Co and Fe-	Mechanical Test Methods for Metal-Matrix Composites: A Status Report from the U.S.A.	balt, Co VIII through Co XXVIII. PB93-148963 00,568
Bi2Sr2Cui-xMxOy Phases. PB93-166338 00,680	PB93-153500 00,479	NAKATANI, A.
MICHALOSKI, J.	MORELAND, J. Dynamic Resistance of Superconducting YBa2Cu3Ox Sin-	Rheometer with Two-Dimensionel Aree Detection for Light Scattering Studies of Polymer Melts end Solutions.
ADACS. An Automated System for Part Finishing. PB93-199164 00,433	tered Powder at 81 K: Liquid versus Vapor Nitrogen Envi-	PB93-151322 00,171
MIELENZ, K. D.	ronment. PB93-153518 00,670	NAKATANI, A. I.
Wolf Shifts and Their Physical Interpretation under Labora-	Tunneling Stabilized Magnetic Force Microscopy of	Phese Behavior of en Off-Critical Polymer Blend Solution during Steady Shear Studied by Small Angle Neutron Scat-
tory Conditions. PB93-196293 00,633	YBa2Cu3O7-Delta Films on MgO at 76 K. PB93-151702 00,655	tering. PB93-153526 00,176
MIGHELL, A. D.	MORGAN, R. S.	NAVARRO, M.
New Method for Phese Identification for Electron Diffrectionists.	Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Pro-	Reduction of Hydrogen Cyenide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Com-
PB93-125854 00,098	grem Flscal Year 1988. Volume 2. Graphics, CGM MIL SPEC.	bustion Products by the Addition of Copper Compounds.
MILDNER, D. F. R. Improvements to the Chebyshev Expansion of Attenuation	AD-A261 261/2 00,415	Part IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyenide end Toxicity from
Correction Fectors for Cylindrical Samples.	MORI, K.	Flexible Polyurethane Foam with and without Copper Compounds.
PB93-125862 00,645 MILLER, K. J.	Spectral Date and Grotnan Dlagrams for Highly Ionized Co- belt, Co VIII through Co XXVII.	PB93-139103 00,053
Binding of Cis-(1,2-Diaminocyclohexane)Platinum(II) end Its	PB93-148963 00,568	NEAL, J. D. NIST Measurement Service for DC Standard Resistors.
Derivatives to Duplex DNA. PB93-125870 00,531	MORRIS, K. C. Database Management Systems in Engineering.	PB93-139079 00,347
MILLER, P. J.	PB93-146454 00,419	NELSON, H. E. Feeling a Door to See if Fire Is on the Other Side.
Effects of Pressure on the Thermal Decomposition Kinetics, Chemical Reectivity and Phase Behavior of RDX.	Validation Testing System: Reusable Softwere Component Design. National PDES Testbed Report Series.	PB93-153252 00,066
PB93-125888 00,553	PB94-109220 00,427	NELSON, J. E.
MILLER, W. R. Controlled Interface Boughness in GoAs/AIAs Superlattices	MORRISON, G.	Measurement of (3)He(n,gamme)(4)He Cross-Section et Thermal Neutron Energies.
Controlled Interface Roughness in GaAs/AIAs Superlattices. PB93-125896 00,351	Measurement of the Dipole Moment of Gaseous 1,1,1- trichlorotrifluoroethane, 1,2-difluoroethene, 1,1,2-	PB93-166635 00,597 NELSON, L. M.
Multi-Point Celibration of e Ges Chrometograph Using Cryo- genic Preconcentration of a Single Gas Standard Contain-	trichlorotrifluoroethane, and 2-(difluoromethoxy)-1,1,1- trifluoroethane.	Designing for Frequency end Time Metrology at the 10 to
ing Voiatile Organic Compounds.	PB93-150852 00,139	the Minus 18 Power Level. N93-25059/5 00,558
PB93-151686 00,100 MINK, A.	MORRISON, H. D. Detection of S2F10 Produced by Electrical Discharge in	NEMIROVSKY, A. M.
Operating Principles of the VME MultiKron Interfece Board.	SF6. PB93-166528 00,596	Marriage of Exact Enumeration end 1/d Expansion Methods: Lattice Model of Dilute Polymers.
PB93-234730 00,230 MISAKIAN, M.	MOSSERI, S.	PB93-151330 00,172
Coil Probe Dimension end Uncertainties during Measure-	Reduction Reactions of Water Soluble Cyeno-Cobelt(III)-	NETA, P. Formation and Reactivity of Hypophosphite and Phosphite
ments of Nonuniform ELF Megnetic Fields. PB94-108479 00,616	Porphyrins: Metel Versus Ligand Centered Processes. PB93-125912 00,514	Radicals end Their Peroxyl Derivatives.
MITCHELL, M.	MOTOKAWA, W.	PB93-166072 00,153 Pulse Radiolytic Studies of Electron Trensfer Processes
Database Management Systems in Engineering. PB93-146454 00,419	Chemical Change of Hardened PCA/CPC Cements in Verious Storing Solutions.	end Applications to Solar Photochemistry. (Final) Progress
Proceedings of the AP Veildation Workshop. Held in Se-	PB93-151306 00,020	Report, (Februery 1989January 1992). DE93018016 00,387
ettle, Washington on April 13-14, 1992. National PDES Testbed Report Series.	Infrered Spectroscopic Study of Cement Formation of Polymeric Calcium Phosphate Cement.	Pulse Radiolytic Studies of Electron Transfer Processes
PB93-158715 00,423	PB93-151298 00,019	and Applications to Solar Photochemistry. Progress Report, (Februery 1989April 1990).
MITCHELL, W. J.	MOUNTAIN, R. D. Probes of Equipartition in Nonlinear Hamiltonian Systems.	DE93018005 00,386
Two New Gas Standards Progrems at the National Institute of Standards end Technology.	PB93-166387 00,595	Pulse Radiolytic Studies of Electron Trensfer Processes and Applications to Solar Photochemistry. Progress Report,
PB93-191427 00,095 MITLER, H. E.	MUELLER, D.	(March 1992March 1993). DE93018715 00,388
Modeling the Ignition of Soft Furnishings by a Cigarette.	Excitation-Energy Dependence in the L2,3 Fiuorescence Spectrum of Si.	Reduction Reactions of Weter Soluble Cyano-Cobalt(III)-
PB94-109014 00,048	PB93-153757 00,627	Porphyrins: Metal Versus Ligand Centered Processes. PB93-125912 00,514
MIYAZAKI, K. Chemical Chenge of Hardened PCA/CPC Cements in Ver-	MUMFORD, J. L. Chemical Cherecterizetion of Mutegenic Frections of Per-	NEUMANN, D. A.
ious Storing Solutions. PB93-151306 00,020	Ilcles from Indoor Coel Combustion: A Study of Lung Cancer in Xuan Wei, China.	Cherge Transfer end Bond Lengths in YBe2Cu3-xMxO6+y. PB93-125847 00,644
Infrered Spectroscopic Study of Cement Formetion of Poly-	PB93-231835 00,530	Elastic end Inelastic Neutron Scattering Study of Hydro-
meric Celcium Phosphete Cement. PB93-151298 00.019	MURRAY, B. T. Asymptotic Rehavior of Modulated Tevior-Couette Flows	genated end Deutereted Trimethylammonium Pillared Ver- miculite Cleys.
MOHR, P. J.	Asymptotic Behavior of Modulated Teylor-Couette Flows with a Crystelline Inner Cylinder.	PB93-125169 00,124
Higher-Order Vacuum Polarization Corrections in Muonic Atoms.	PB93-139061 00,647 Computation of Complex Solidification Morphologies Using	Magnetic Transitions In the System YBa2Cu2.8Co0.2O6+y. PB93-125839 00,643
PB93-165991 00,588	e Phase-Field Model.	Structure end Low Energy Dynamics of Solid C60.
influence of Vacuum Polarization Corrections of Order alpha(z(alpha)) and elpha(z(alpha))(sup 3) in Hydrogen-Like	PB93-156743 00,671 Effect of Grevitational Modulation on Convection in Vertical	PB93-153260 00,146 Structure and Magnetic Properties of Doped Co end Fe-
Urenium.	Bridgman Growth.	Bi2Sr2Cul-xMxOy Pheses. PB93-166338 00,680
PB93-166155 00,589	N94-10178/9 00,495	1 230-100000 00,000

Ultre-High Resolution Inelastic Neutron Scattering. PB93-166882 00,604	Ion Kinetic-Energy Distributions end Electrical Measure- ments in Ar/O2 rf Glow Discharges. PB93-153575 00,634	PARKER, W. J. Modeling the Heat Release Rete of Aircreft Cebin Penels.
NEWTON, J. J. Menuel for Dete Administration.	OMIDVAR, O. M.	AD-A263 148/9 00,000 PARKS, C.
PB93-182053 00,258	Optimization of Adaptive Resonance Theory Network with Boltzmann Machine.	Initiel Grephics Exchenge Specification Hybrid Microcircul Application Protocol.
NGUYEN, N. V. Metrologic Support for the DARPA/NRL-XRL Mask Progrem: Ellipsometric Analyses of SiC Thin Films on Si.	PB93-188134 00,224 ONDREJKA, A. R.	PB93-175404 00,36 PARNAS, R.
PB93-152098 00,354	Ultra-Broadband and Nondispersive Sensor for the Meas-	Flow Behavior In Liquid Molding.
NIETO DE CASTRO, C. A.	urement of Time-Domain Signals. PB93-153393 00,324	N93-14747/8 00,476 PARR, A. C.
Redietive Heat Transfer in Trensient Hot-Wire Measure- ments of Thermel Conductivity. PB93-153534 00.582	OPPERMANN, H. V. NIST Handbook 44, 1993: Specifications, Tolerances, end	Resonance Effects in the 5Sigme(-1) Photolonization Channel of CO.
NOBEL, G.	Other Technical Requirements for Weighing and Measuring	PB93-151751 00,144
Reel-time compensation for tool form errors in turning using	Devices es Adopted by the 77th Netional Conference on Weights end Measures 1992.	PARRIS, R. Standard Reference Materials for Trace Organic Contents
computer vision. DE93010922 00,457	PB93-213106 00,407 ORR, R. D.	Standard Reference Meterials for Trece Orgenic Contaminants in the Merine Environment. PB93-166627 00,398
NODA, I. Cheln Conformation of Block Copolymers in Dilute Solutions	Optimized Thermo-Optic Electric-Field Probes for Microwaves end Millimeter Waves.	PAULSEN, R.
Meesured by Small-Angle Neutron Scattering. PB93-151272 00,170	PB93-153641 00,318 ORSER, D. J.	Affordable Fire Safety in Board and Care Homes. A Regulatory Chellenge. Finel Report. PB93-219723 00,027
NORRIS, J. E.	Binocular Spherical Disparity: A Study in Representation for	PEACOCK, R. D.
Method for Separating Volatile Organic Carbon from 0.1 (sup 3) of Air to Identify Sources of Ozone Precursors via	a Forward Translating Caméra. PB93-184422 00,301	CFAST, the Consolidated Model of Fire Growth end Smoke
Isotope (14C) Measurements. PB93-236511 00,392	OSELLA, S. A.	Transport. PB93-174902 00,07
NOTARIANNI, K. A.	Collective Learning Systems: A Model for Automatic Control.	Heat Release Rate: The Single Most Importent Verieble in Fire Hazard.
Comparison of Ceiling Jet Temperatures Measured in en Aircreft Hanger Test Fire with Temperetures Predicted by	PB93-151595 00,277	PB93-124808 00,050
the DETACT-QS end LAVENT Computer Models. PB93-158657 00,539	OSTERTAG, C. P. Analysis of the Aggregate-Cement Paste Interfece Using	User's Guide for CFAST Version 1.6. PB93-140788 00,05:
Weter Mist Fire Suppression Workshop Proceedings. Held	Grazing Incidence X-ray Scattering. PB93-125904 00,179	PEAVY, S. T. PC-OMNITAB: An Interactive System for Statistical end Nu
in Gaithersburg, Maryland on Merch 1-2, 1993. PB93-219780 00,700	Failure Models In Continuous Fiber Ceramic Composites:	merical Data Anelysis (Documentetion).
NOVICK, S. E.	Phase 1, Tesk 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Tech-	PB93-111656 00,249 PECHENIK, A.
Determination of the Structure of CO2-H2CO. PB93-150696 00,135	nologies.	Equipment for Investigation of Cryogenic Compaction of
NYDEN, M. R.	DE93016669 00,477 OUELLETTE, M. J.	Nanosize Silicon Nitride Powders. DE93018740 00,466
Computer-Aided Molecular Design of Fire Resistant Aircraft Materials.	Evaluation of Compact Fluorescent Lamp Performance et Different Ambient Temperatures.	PEELLE, R. W.
N94-10779/4 00,007	PB93-146694 00,035	ENDF/B-VI Neutron Cross Section Meesurement Standerds.
Molecular Modeling of Polymer Flemmability: Application to the Design of Flame-Resistant Polyethylene.	PAABO, M.	PB93-189868 00,610
PB93-153542 00,504	Reduction of Hydrogen Cyanide Concentrations end Acute Inhalation Toxicity from Flexible Polyurethane Foam Com-	PELLEGRINO, J. Controlled Interfece Roughness in GaAs/AlAs Superlattices.
OHLEMILLER, T. J.	bustion Products by the Addition of Copper Compounds. Part IV. Effects of Combustion Conditions and Scaling on	PB93-125896 00,35
Test Methods for Quantifying the Propensity of Cigarettes to Ignite Soft Fumishings.	the Generation of Hydrogen Cyanide and Toxicity from	PELZER, H. J. Hydroxyapatite Cement. I. Besic Chemistry and Histologic
PB94-108644 00,047	Flexible Polyurethane Foam with end without Copper Compounds.	Properties.
OLDEHOEFT, A. E. Report of the NSF/NIST Workshop on NSFNET/NREN Se-	PB93-139103 00,053	PB93-125136 00,016 PENG, W. W.
cunty. Held on July 6-7, 1992.	PAISLEY, S. W. SGML DTD for the STEP Integrated Resource Perts. Ne-	Softwere Error Analysis.
PB93-228682 00,225	tional PDES Testbed Report Series.	PB93-200871 00,26
OLDHAM, N. M. Binary Inductive Voltage Divider Bridge.	PB94-114501 00,428 PALLETT, D. S.	PENN, D. R. Material Dependence of Electron Inelestic Meen Free Peths
PB93-150688 00,328	DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus	at Low Energies. PB93-166320 00,591
NIST Sempling System for the Calibration of Phase Angle Generators from 1 Hz to 100 kHz.	CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215	PENZES, W. B.
PB93-151884 00,335	PALM, E. C.	NIST Length Scale Interferometer Meesurement Assurence.
Sampling Technique for Calibreting Phase Angle Generators from 1 Hz to 100 kHz.	Re-Examination of Quantum Hall Plateaus.	PB93-146645 00,401 PEREZ, E.
PB93-151892 00,336	PB93-151850 00,658 PAN, L.	13C NMR Studies of Polymorphy in Isotactic Polystyrene.
OLINSKI, R.	Treatment of Continuum-Continuum Coupling in the Theo-	PB93-166536 00,178 PERKINS, R. A.
DNA Base Damage in Chromatin of Gamma-Irradiated Cultured Human Cells.	retical Study of Above Threshold Ionization. PB93-151611 00,578	Radiative Heat Transfer In Transient Hot-Wire Measure
PB93-151314 00,521	PARETZKIN, B.	ments of Thermel Conductivity. PB93-153534 00,582
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PB93-151173 00,331 OLSON, G. J.	Guidelines for Using Emulators to Evaluate the Perform-	BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program (Version 4.0), User's Guide and Reference Manual.
Development of Ore Bioleaching Standards.	ence of Energy Management and Control Systems. PB93-138931 00,033	PB93-208460 00,026
PB93-151603 00,496	PARKER, J.	ERATES: A Computer Progrem for Calculating Time-of- Use, Block, end Demend Cherges for Electricity Usage
OLSON, W. B. High-Resolution FTIR Study of the nu4 Band of CH2F2.	Proceedings of the AP Validation Workshop. Held in Seattle, Washington on April 13-14, 1992. National PDES	(Version 1.0). User's Guide and Reference Menuel.
PB93-150753 00,137	Testbed Report Series.	PB93-228658 00,384 Life-Cycle Costing Workshop for Energy Conservation in
OLTHOFF, J. K.	PB93-158715 00,423 PARKER, M. E.	Buildings: Student Menuel.
Absolute Spatielly- and Temporelly-Resolved Optical Emission Measurements of rf Glow Discharges in Argon.	Effect of Repetitive Swells on Metal-Oxide Varistors.	PB93-198984 00,383 Present Worth Fectors for Life-Cycle Cost Studies in the
PB93-196236 00,636	PB93-153443 00,358	Department of Defense (1994).
Detection of S2F10 Produced by Electrical Discharge in SF6.	NIST Sampling System for the Calibration of Phase Angle Generators from 1 Hz to 100 kHz.	PB94-109238 00,540 PETERSON, M. B.
PB93-166528 00,596	PB93-151884 00,335	Tribological Investigetions of Composites and Other Se-
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PB93-166569 00 635	PB93-151892 00.336	PR93-138949 00.462

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- Intercalated Graphite Composites. PB93-153765	00,480	Surveillance Schemes with Applications to Mass Caltion.	ilibra-	Applying the NIST Real-Time Control System Reference Model to Submarine Automation: A Maneuvering System
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Analysis of the Impact on U.S. Industry of the NIS	ST/Boulder	POMMERSHEIM, J. M.		PB93-184257 00,545
Superconductivity Programs: An Interim Study. PB94-120680	00,692	Methods for Predicting Remaining Life of Concrete in S tures.	Struc-	RADACK, S. M. Computer Systems Laboratory Annual Report, 1992.
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Strengthening Methodology for Lightly Reinforced	d Concrete	PORTIER, R.		Federal Building Standard for Telecommunications Path
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HELAN, F.			0,071	FIPS PUB 175 00,207
Flow Behavior In Liquid Molding.	00.470	PORTIER, R. W.		Federal Bullding Telecommunications Wiring Standard: Category: Telecommunications Standard; Subcategory: Cables
N93-14747/8	00,478	Programmer's Reference Gulde to FDMS File Formats. PB93-182038	0,201	and Wiring.
HELAN, R. J. Reference Detectors for Spectral Responsivity	Moasuro.	User's Guide for CFAST Version 1.6.	0,201	FIPS PUB 174 00,206
ments.			0,055	Information Technology Standards: Processes and Strate- gies.
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Handbook for Evaluation of TEM Sample Preparticles on Membrane Filters: Version 1.0.	Jaranon or		0,141	Measurement of the Performance of a Spiral Wound Poly- imide Regenerator in a Pulse Tube Refrigerator.
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PB93-153401 High Spatial Resolution Quantitative Micromagnet		Particulate and droplet diagnostics in spray combustion	n. An-	RALSTON, T.
PB93-165736	00,674	nual report. DE93003632 00	0,196	International Survey of Industrial Applications of Forma
Surface Magnetic Microstructure.		Time-based ensemble scattering measurements in	fuel	Methods. Volume 1. Purpose, Approach, Analysis, and Conclusions.
PB93-165728	00,673	sprays. DE93007989 00	0.197	PB93-178556 00,255
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Effects of Pressure on the Thermal Decomposition Chemical Reactivity and Phase Behavior of RDX.		Correlations of Magnetic Microstructure and Anisotropy	y with	Methods. Volume 2. Case Studies. PB93-178564 00,256
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ards. PB93-189868		Cryogenic Mechanical Testing of Al-Li Alloys at NIST.		RAVIV, D.
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FD90-140025	00,219	PB94-114519 00	0,393	Dhees Equilibrie and County Chamistry in Postions of the

ASTM Committee, C28, Advanced Ceramics: A Progress

Guide to the Selection of Anti-Virus Tools and Techniques. PB93-152049 00,221

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Report. PB93-153617

00,468

Phase Equilibria and Crystal Chemistry in Portions of the System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phase Diagrams for the Temary Systems of SrO-Bi2O3-CuO, CaO-Bi2O3-CuO and SrO-CaO-Bi2O3.

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Phase Equilibria and Crystal Chemistry in Portions of the	ROACH, R. K.	Resolution Considerations for Polarized Triple-Axis Spec
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National Testbed for Process Planning Research.	Absolute Spatially- and Temporally-Resolved Optical Emission Measurements of rf Glow Discharges in Argon.	Membrane Materials: A Summary Report.
PB93-189793 00,439	PB93-196236 00,636	PB93-153724 00,06
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High Power CW Wattmeter Calibration at NIST.	Layer 2, Data Link Layer (LAPD). Part 1, Basic Rate Inter-	System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phas Diagrams for the Temary Systems of SrO-Bi2O3-CuO
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NIST Serial Holdings, 1993. PB94-120847 00,413	Advanced Ceramics: What's in a Name. PB93-166015 00,471	DE93003632 00,196
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PB93-173441 00,501	PB93-151876 00,659	tion and Technology Centers for Upgrading Small and Mid- Size Manufacturing Firms. Presented at Annual Meeting of
SASAKI, H. NMR Based Current/Voltage Source.	SCHUHMACHER, H.	the Association of American Geographers. Held in Miaml, Florida in April 1991.
PB93-151173 00,331	Dose Equivalent Response of Tissue-Equivalent Proportional Counters to Low Energy Neutrons.	PB93-209922 00,453
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PB93-166858 00,685	SCHUMACHER, G. Properties and Interactions of Oral Structures and Restora-	PB93-166098 00,675
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Magnetic Properties of Cr-Mn Austenitic Stainless Steels.	Singly Ionized Argon. PB93-149102 00,573	March 23-24, 1993.
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Observation of Quantized Motion of Rb Atoms in an Optical Field.	Atomic Physics Tests of Nonlinear Quantum Mechanics.	PB94-112430 00,434 YOSHIHIRO, K.
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Fitting of Transmission Data for Determining the Optical Constants and Thicknesses of Optical Films. PB93-166692 00.630 ABSORPTION SPECTRA

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PB93-151835 00,023

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ONR-Sponsored Research in Ultrasonic Measurements at NIST: 1982-92. PB93-152064 00.618

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ONR-Sponsored Research in Ultrasonic Measurements at NIST: 1982-92. PB93-152064 00.618

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Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11308.

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Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 807 UnderHP-UX BLS Version A.08.08 (Host and Target), 930115S1.11305.

AD-A262 253/8 00.233

Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 817 under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11306.
AD-A262 717/2 00,234

Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment for 80386 UNIX, Version 5.1.2, Zenith Data Systems, Z-Station 433 DEh (Host and Target), 930115S1.11309. AD-A262 720/6 00.235

Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS AXP Systems, Version 3.0-5, DEC 3000 Model 400 (host target), 930319S1.11315. AD-A264 885/5 00,236

Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS VAX Systems, Version 3.0-7, VAXstation 4000 Model 60 (host) => VAXstation 3100 Model 48 (target), 930319S1.11317.

AD-A264 886/3 00,237

Validation Summary Report: Digital Equipment Corporation, DEC Ada for OpenVMS VAX Systems, Version 3.0-7, VAXstation 4000 Model 60 (host target), 930319S1.11316. AD-A265 014/1

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5 (/OPTIMIZE) VAX 8550/8600/8650 (Cluster) > Enhanced Processor (EP) AN/UYK-44 (Bare Board).

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Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11271, U.S. Navy AdaVAX Version 5.5 (NO OPTIMIZE) VAXstation 4000 > VAXstation 4000.

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Ada Compiler Validation Summary Report. Certificate Number: 92080551.11265 DDC-I, Inc. DACS Sun SPARC/SunOs Native Ada Compiler System, Version 4.6.1 SPARCStation 2 => SPARCStation 2. AD-A265 433/3

Ada Compiler Validation Summary Report. Cerificate Number: 920918S1.11273 U.S. Navy, Ada/M, Version 4.5 (OPTIMIZE). VAX 8550/8600/8650 (Cluster) => VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board). AD-A265 434/1 00.241

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11274 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => Enhanced Processor (EP) AN/UYK-44 (Bare Board). AD-A265 435/8 00.242

Ada Compiler Validation Summary Report. Certificate Number: 92091851.11275 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => VHSIC Processor Module (VPM) AN/AYK-14 (Bare Poord) Board). AD-A265 437/4

Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11263 DDC-I, Inc. DACS MIPS RISC/

	os to MIPS R3000 Bare Ada Cross Compiler System, Release 2.1-16, MIPS M/120-5 => Lockheed Sanders STAR	Graphical Methods for Examining the Effects of Acid Rain and Sulfur Dioxide on Carbonate Stones.	Cryogenic Mechanical Testing of Al-Li Alloys at NIST. PB93-228633 00,50
	MVP R3010 Board. AD-A265 600/7 00,244	PB93-151249 00,060	AMERICAN ENGLISH
	Ada Complier Validation Summary Report. Certificate	AIR POLLUTION MONITORS Two New Gas Standards Programs at the National Insti-	DARPA TIMIT Acoustic-Phonetic Continous Speech Co pus CD-ROM. NIST Speech Disc 1-1.1.
	Number: 920805S1.11264 DDC-I, Inc. DACS DECstation/	tute of Standards and Technology.	PB93-173938 00,21
	ULTRIX to MIP R3000 Bare Ada Cross Compiler System, Release 2.1-16 DECStation 3100 => Integrated Device	PB93-191427 00,095	AMMONIUM PERCHLORATES
	Technology IDT7RS301 R3000/R3010 Board.	AIR POLLUTION SAMPLING Handbook for Evaluation of TEM Sample Preparation of	Ineiastic Neutron Scattering in Molecular Crystals. PB93-166445 00,15
	AD-A265 601/5 00,245 Ada Compiler Validation Summary Report. Certificate	Particles on Membrane Filters: Version 1.0.	AMMONIUM/TRIMETHYL
	Number: 920918S1.11270 U.S. NÁVY AdaAX, Version	PB93-219764 00,390	Elastic and Inelastic Neutron Scattering Study of Hydro genated and Deuterated Trimethylammonium Pillare
	5.5 (/OPTIMIZE) VAXstation 4000 =Z> VAXstation 4000. AD-A265 602/3 00,246	Source Apportionment of Fine Particle Organics and Mutagenicity in Wintertime Roanoke.	Vermiculite Clays.
	Validated Products List (Cobol, Fortran, ADA, Pascal, C,	PB93-221851 00,391	PB93-125169 00,12
	MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Se-	AIR TIGHTNESS Envelope Design Guidelines for Federal Office Buildings:	ANALYTICAL CHEMISTRY Ultra-High Temperature Laser Vaporization Mass Spec
	curity). PB93-937300 <i>00,272</i>	Thermai Integrity and Airtightness.	trometry of SiC and HfO2.
	ACS (ADVANCED DEBURRING AND CHAMFERING	PB93-183770 00,376	PB93-124857 00,12 Proposition and Proliminary Applyois of K 411 Class
SYS	ADACS. An Automated System for Part Finishing.	AIRCRAFT CABINS Model Study of the Aircraft Cabin Environment Resulting	Preparation and Preliminary Analysis of K-411 Glas Microspheres.
	PB93-199164 00,433	From In-Fiight Fires.	PB93-125623 00,09
\D/	APTIVE CONTROL	AD-A261 270/3 00,005 Modeling the Heat Release Rate of Aircraft Cabin Panels.	Precision and Accuracy in XQQ Measurements: A Sun mary Report of the NiST-EPA International Round Robin
	Collective Learning Systems: A Model for Automatic Control.	AD-A263 148/9 00,006	PB93-125672 00,39
	PB93-151595 00,277	AIRCRAFT CONSTRUCTION MATERIALS	Observation of Photon Correlations in Scattering from Silver Electrode.
\D/	APTIVE RESONANCE THEORY Optimization of Adaptive Resonance Theory Network with	Computer-Aided Molecular Design of Fire Resistant Air- craft Materials.	PB93-150829 00,11
	Boitzmann Machine.	N94-10779/4 00,007	Sims Determination of Oxygen and Carbon i
	PB93-188134 00,224	Non-Halogenated, Flame Retarded Polycarbonate.	YBa2Cu3O7-x Superconductors. PB93-150845 00,65
4DE	ENOSINETRIPHOSPHATASE Charge-Field Interactions in Cell Membranes and	N94-10781/0 00,008	Measurement of the Dipole Moment of Gaseous 1,1,1
	Electroconformational Coupling: Transduction of Electric	Developments Needed to Expand the Role of Fire Model- ing in Material Fire Hazard Assessment.	trichlorotrifiuoroethane, 1,2-difiuoroethane, 1,1,2 trichlorotrifiuoroethane, and 2-(difiuoromethoxy)-1,1,1
	Energy by Membrane ATPases. PB93-166486 00,535	N§4-10787/7 00,009	trifiuoroethane.
\DI	1ESION	AIRCRAFT FIRES Model Study of the Aircraft Cabin Environment Resulting	PB93-150852 00,13
	Quality Control Tests for Adhesion of Paint on the Panels	From In-Flight Fires.	Surface-Enhanced Raman Study of Benzylpenicillin. PB93-151660 00.09
	of Tactical Rigid Wall Shelters, Phase 2. PB93-173474 00,476	AD-A261 270/3 00,005	Multi-Point Calibration of a Gas Chromatograph Usin
\DI	HESIVE BONDING	Computer-Aided Molecular Design of Fire Resistant Aircraft Materials.	Cryogenic Preconcentration of a Single Gas Standar Containing Volatile Organic Compounds.
	Clinical Trial of an Adhesive Material. PB94-109329 00,528	N94-10779/4 00,007	PB93-151686 00,10
ADS	SORBATES	Non-Halogenated, Flame Retarded Polycarbonate. N94-10781/0 00,008	Specimen Banking at the National Institute of Standard
	Vibrational Line Shape of Diatomic Adsorbates on Metal	Developments Needed to Expand the Role of Fire Model-	and Technology. PB93-151967 00,10
	Clusters. PB93-153187 00,145	ing in Materiai Fire Hazard Assessment.	Determination of Baseline Platinum Levels in Biologica
NDS	SORPTION	N94-10787/7 00,009	Materials. PB93-151975 00,51
	Water Vapor Sorption Measurements of Common Building Materials	Water Mist Fire Suppression Workshop Proceedings. Held in Gaithersburg, Maryland on March 1-2, 1993.	Application of the Hough Transform to Electron Diffraction
	ing Materials. PB93-153674 00,068	PB93-219780 00,700	Pattems.
\D\	ANCED MATERIALS	Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Con-	PB93-153773 00,58 Subamblent Temperature Modification of Selectivity is
	ASTM Committee, C28, Advanced Ceramics: A Progress Report.	ditions for the Flow Outside the Vessei.	Reversed-Phase Liquid Chromatography.
	PB93-153617 00,468	PB94-103660 00,004	PB93-153799 00,10
	Advanced Ceramics Standards Development. PB93-166007 00.470	AIRCRAFT HAZARDS Developments Needed to Expand the Role of Fire Model-	Application of Polyacrylamide-Gel Electrophroesis Neutron-Activation Analysis for Protein Quantification.
	Advanced Ceramics: What's in a Name.	ing in Material Fire Hazard Assessment. N94-10787/7 00,009	PB93-166221 00,52
	PB93-166015 00,471	ALCOHOLS	Laser-Enhanced Ionization Spectrometry Following Matri Modification by Automated Chelation Chromatography for
	Materials Reliability. Technical Activities, 1992. (NAS-	Rate Constants for Hydrogen Abstraction Reactions of	the Analysis of Biological and Environmental Reference
	NRC Assessment Panei, May 13-14, 1993). PB93-173466 00,446	NO3 in Aqueous Solution. PB93-166064 00,152	Materials. PB93-166494 00,10
	Ceramics Technical Activities, 1992 (NAS-NRC Assess-	ALGORITHMS	Topics in Laser Spectroscopy - Simultaneous Detectio
	ment Panel May 13-14, 1993). PB93-173508 00,474	Guidelines for Using Emulators to Evaluate the Perform-	of Laser-Enhanced Ionization and Laser-induced Fluores cence in Flames - Noise Correlation Studies.
۱EF	ROELASTICITY	ance of Energy Management and Control Systems. PB93-138931 00,033	PB93-166502 00,10
	Chaotic Motions of Self-Excited Forced and Autonomous	Sprinkier Fire Suppression Algorithm for HAZARD.	SEM Analysis of Interactions between Platinum, Gold
	Square Prisms. PB93-166114 00,621	PB94-103678 00,046	and Silver-Palladium Capsules and Barium Yttrium Copper Oxide Superconductors.
١G٥	GREGATES	ALKALI AGGREGATE REACTIONS Standard Aggregate Materials for Alkali-Silica Reaction	PB93-166544 00,68
	Standard Aggregate Materials for Alkali-Silica Reaction Studies.	Studies.	Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0.
	PB93-166247 00,184	PB93-166247 00,184 ALKANES	PB93-219764 00,39
١GI	NG	Prediction of Fluid Phase Equilibrium of Temary Mixtures	Evaluation of Serum Volume Losses during Long-Terr Storage.
	Apparent Thermal Conductivity of Polyurethane Foam insulation, Containing Various HCFC Blends, from 125 to	in the Critical Region and the Modified Leung-Griffiths Theory.	PB94-108503 00,51
	335 K. (Final report). DE93012534 00,488	PB93-153484 00,148	Airbome Asbestos Method: Standard Test Method for
ИR	FLOW	Field-Space Conformal Solution Method: Binary Vapor-	Verified Analysis of Asbestos by Transmission Electro Microscopy, Version 1.0.
	Simulating the Effect of Beamed Ceilings on Smoke Flow.	Liquid Phase Behavior. PB93-166239 00,156	PB94-113578 00,10
	Part 1. Comparison of Numerical and Experimental Results.	ALLOYING	ANALYTICAL TECHNIQUES Specimen Banking at the National Institute of Standard
	PB93-152056 00,062	Structure-Property Relationships in Microalioyed Ferrite-	and Technology.
NR	POLLUTION	Pearlite Steels Phase 1: Literature Review, Research Plan, and Initial Results.	PB93-151967 00,10
	Method for Separating Volatile Organic Carbon from 0.1 (sup 3) of Air to Identify Sources of Ozone Precursors via	PB93-234706 00,487	ANATOMICAL MODELS Calculations on Displacement Corrections for In-Phanton
	Isotopé (14C) Measurements. PB93-236511 00,392	ALPHA PARTICLES ESTAR, PSTAR, and ASTAR: Computer Programs for	Measurements with Ionization Chambers for Mammog
λIR	POLLUTION ABATEMENT	Calculating Stopping-Power and Range Tables for Elec-	raphy. PB93-166700 00,51
	Horizontal Nucleate Flow Boiling Heat Transfer Coeffi-	trons, Protons, and Helium Ions. PB93-146033 00,567	ANTENNAS
	cient Measurements and Visual Observations for R12, R134a, and R134a/Ester Lubricant Mixtures.	ALUMINUM	Duai-Port Circularly Polarized Probe Standards at the National Institute of Standards and Technology.
	PB93-178598 00,493	Material Dependence of Electron Inelastic Mean Free	PB93-235208 00,32
ΝIR	POLLUTION EFFECTS (HUMANS) Chemical Characterization of Mutagenic Fractions of Para		APDE (APPLICATION PROTOCOL DEVELOPMENT ENVIRONMENT)
	Chemical Characterization of Mutagenic Fractions of Particles from indoor Coal Combustion: A Study of Lung	ALUMINUM ALLOYS	Requirements for an Application Protocol Developmen
	Cancer in Xuan Wei, China. PB93-231835 00,530	High Temperature X-ray Diffractometry of Ti-Ai Alloys. PB93-166080 00,499	Environment, National PDES Testbed Report Series. PB93-208114 00,42
\IR	POLLUTION EFFECTS (MATERIALS)	·	APPEARANCE-POTENTIAL SPECTRA
	Geochemical Considerations in the Cleaning of Carbon-	Measurements of Cryogenic Mechanical Properties of Ai-	Comparison of Measured and Calculated Appearance-Po
	ate Stone. PB93-151231 00,059	Li Alioys and Alloy 2219. PB93-173441 00,501	tential Spectra for Six 3d Metals. PB93-151629 00,14

00,141

APPLICATION PORTABILITY PROFILE Application Portability Profile (APP): The U.S. Govern-	on Gas Kinetic Data Evaluation for Atmospheric Chemistry.	Molecular Dynamicel Studies of Energy Transport and Energy Sharing in Molecular Dissociation.
ment's Open System Environment Profile OSE/1 Version 2.0.	PB93-149144 00,014 ATOM-MOLECULE COLLISIONS	PB93-166452 00,159 Energy Distribution Functions of Argon Ions in Low Cur-
PB93-216943 00,264	Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2	rent, Diffuse Discharges at High E/N.
Prototype Application Protocol for Ready-to-Wear Pattern	H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2 for Energies from 0.1 eV to 10 keV. PB93-149086 00,571	PB93-166569 00,635 Outline of Neutron Scattering Formalism.
Making. PB93-158665 00,430	ATOMIC CLUSTERS	PB93-166833 00,600 Bibliography on Atomic Line Shapes and Shifts (July
Proceedings of the AP Validation Workshop. Held in Seattle, Washington on April 13-14, 1992. National PDES	Vibrational Line Shape of Diatomic Adsorbates on Metal Clusters.	1978 through March 1992) (Supplement 4).
Testbed Report Series.	PB93-153187 00,145	PB93-173433 00,606 Elastic Scattering of Electrons and Positrons by Atoms:
PB93-158715 00,423 Initial Graphics Exchange Specification Hybrid Micro-	ATOMIC & MOLECULAR STUDIES Validation Summary Report: GTE Government Systems	Database ELAST. PB93-207512 00,614
circuit Application Protocol. PB93-175404 00,361	Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000	ATOMIC SPECTRA
Requirements for an Application Protocol Development	Series 800 Model 807 UnderHP-UX BLS Version A.08.08 (Host and Target), 930115S1.11305.	Bibliography on Atomic Line Shapes and Shifts (July
Environment. National PDES Testbed Report Series. PB93-208114 00,426	AD-A262 253/8 00,233	1978 through March 1992) (Supplement 4). PB93-173433 00,606
Shtolo-Converting STEP Short Listings to Annotated List-	Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000	ATOMIC SPECTROSCOPY
ings. National PDES Testbed Report Series. PB94-120623 00,435	Series 800 Model 817 under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11306.	International Colloqium on Atomic Spectra and Oscillator Strengths for Astrophysical and Laboratory Plasmas (4th).
APPLICATIONS PROGRAMS (COMPUTERS)	AD-A262 717/2 00,234	Held at the National Institute of Standards and Tech- nology, Gaithersburg, Maryland on September 14-17,
International Survey of Industrial Applications of Formal Methods. Volume 1. Purpose, Approach, Analysis, and	Vibrational Spectra of Molecular Ions Isolated in Solid Neon. X. H2O(+), HDO(+), and D2O(+).	1992. PB93-198422 00,012
Conclusions. PB93-178556 00,255	AD-A263 817/9 00,116	ATOMIC WEIGHTS
International Survey of Industrial Applications of Formal	Mid- and Near-Infrared Spectra of Water and Water Dimer Isolated In Solid Neon.	Three-Ratio Scheme for the Measurement of Isotopic Ratios of Silicon.
Methods. Volume 2. Case Studies. PB93-178564 00,256	AD-A263 966/4 00,117	PB93-196285 00,612
ARC DISCHARGES	Lowest Energy Singlet State of Tetrathiophene, an Oligomer of Polythlophene.	ATOMS Surface Forces and Their Action In Ceramic Materials.
Detection of S2F10 Produced by Electrical Discharge In SF6.	PB93-124824 00,119	AD-A273 624/7 00,465
PB93-166528 00,596	Partial Structure for trans-1,2-Difluoroethylene from High- Resolution Infrared Spectroscopy.	ATTENUATION CORRECTION FACTORS Improvements to the Chebyshev Expansion of Attenu-
ARGON Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+),	PB93-125144 00,123 End-Point Sensitivity in Quantum Dynamic Calculations.	ation Correction Factors for Cylindrical Samples.
H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2	PB93-125151 00,560	PB93-125862 00,645
for Energies from 0.1 eV to 10 keV. PB93-149086 00,571	Regular Mechanism of Parity and Time Invariance Nonconserving Effects Enhancement In Neutron Capture	Controlling Moisture in the Roof Cavities of Manufactured
ARGON IONS	and Scettering Near p-Wave Compound Resonances.	Housing. PB93-139046 00,052
Journal of Physicel and Chemicel Reference Data, Vol- ume 21, No. 5, September/October 1992.	PB93-125177 00,561 Comment on 'Measurement of the Lamb Shifts In Singlet	AUSTENITIC STAINLESS STEELS
PB93-149094 00,572	Levels of Atomic Hellum'.	Magnetic Properties of Cr-Mn Austenitic Stainless Steels. PB93-153310 00,483
Critical Compilation of Atomic Transition Probabilities for Singly Ionized Argon.	PB93-125219 00,562 Nuclear Orientation of (160)Tb in Tb Single Crystal.	AUTOMATED MANUFACTURING RESEARCH FACILITY
PB93-149102 00,573 Energy Distribution Functions of Argon Ions In Low Cur-	PB93-125656 00,563	Research, Industry and Technology Transfer at the NIST AMRF.
rent, Diffuse Discharges at High E/N.	Elementary Particle Physics in the Dalton Manner. PB93-125698 00,564	PB93-166304 00,431
PB93-166569 00,635 ARGON PLASMA	Rototranslational Absorption Spectra of H2-H2 Pairs in	AUTOMATIC CONTROL Applying the NIST Real-Time Control System Reference
Absolute Spatially- and Temporally-Resolved Opticel	the Far InfraredTranslation. PB93-125821 00,125	Model to Submarine Automation: A Maneuvering System Demonstration.
Emission Measurements of rf Glow Discharges in Argon. PB93-196236 00,636	Compact Fitting Formulas for Electron-Impact Cross Sec-	PB93-184257 00,545
AROMATIC HYDROCARBONS	tions. PB93-143956 00,566	AUTOMATIC & ROBOTICS Real-time compensation for tool form errors in turning
Single Pulse Shock Tube Studies on the Thermal Decom- position of n-Butyl Phenyl Ether, n-Pentylbenzene and	Determination of the Structure of CO2-H2CO.	using computer vision.
Phenotole and the Heat of Formation of Phenoxy and Benzyl Radicals.	PB93-150696 00,135 High-Resolution FTIR Study of the nu4 Band of CH2F2.	DE93010922 00,457 Information Technology Vision for the U.S. Fiber/Textile/
PB93-166577 00,162	PB93-150753 00,137	Apparel Industry. PB93-139095 00,482
AROMATIC POLYCYCLIC HYDROCARBONS Subamblent Temperature Modification of Selectivity In	Microwave and Infrared Spectra of C2H4HCCH: Barrier to Twofold Internal Rotation of C2H4.	Automated Tools for Testing Computer System Vulner-
Reversed-Phase Liquid Chromatography. PB93-153799 00,103	PB93-150803 00,138	ability. PB93-146025 00,219
Prediction of Carbon-Hydrogen Bond Dissociation Ener-	Observation of Quantized Motlon of Rb Atoms In an Opti- cel Fleld.	Autonomous Obstacle Avoldance Using Visual Fixation
gles for Polycyclic Aromatic Hydrocarbons of Arbitrary Size.	PB93-151140 00,576	and Looming. PB93-146660 00.454
PB93-166205 00,155	3nu3 Band of (32)S(16)O2: Line Positions and Intensities. PB93-151207 00,140	Collective Learning Systems: A Model for Automatic Con-
ARTIFICIAL IMPLANTS Hydroxyapatite Cement. I. Basic Chemistry and Histologic	Treatment of Continuum-Continuum Coupling in the The-	trol. PB93-151595 00,277
Properties. PB93-125136 00,016	oretical Study of Above Threshold Ionization. PB93-151611 00,578	Machine-Assisted Human Classification of Segmented
ARTIFICIAL INTELLIGENCE	Measurement of the Density Shift of the H2Q(0-5) Transitions from 295 K to 1000 K.	Characters for Optical Character Recognition Testing and Training.
Collective Learning Systems: A Model for Automatic Control.	PB93-151637 00,142	PB93-152155 00,296
PB93-151595 00,277	Resonance Effects in the 5Sigma(-1) Photoionization Channel of CO.	Report on Scoping the Apparel Manufacturing Enterprise. PB93-152163 00,429
Intelligent Control System for a Cutting Operation of a Continuous Mining Machine.	PB93-151751 00,144	Prototype Application Protocol for Ready-to-Wear Pattern
PB93-178622 00,544	Atomic Physics Tests of Nonlinear Quantum Mechanics. PB93-153195 00,580	Making. PB93-158665 00,430
Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, February 2-3,	Structure and Low Energy Dynamics of Solid C60.	Research, Industry and Technology Transfer at the NIST AMRF.
1993). PB94-112430 00.434	PB93-153260 00,146	PB93-166304 00,431
ASBESTOS	Molecular Modeling of Polymer Flammability: Application to the Design of Flame-Resistant Polyethylene.	Use of Contact Type Measurement Device to Detect Ro- bots' Hand Positions.
Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0.	PB93-153542 00,504	PB93-166551 00,455
PB93-219764 00,390	Ionic Crystals in a Linear Paul Trap. PB93-153633 00,584	Intelligent Control System for a Cutting Operation of a Continuous Mining Machine.
Airbome Asbestos Method: Standard Test Method for Verified Analysis of Asbestos by Transmission Electron	In situ Analysis of Laser-Induced Vapor Plumes. PB93-165983 00,151	PB93-178622 00,544
Microscopy. Version 1.0. PB94-113578 00,109	Higher-Order Vacuum Polarization Corrections in Muonic	Applying the NIST Real-Time Control System Reference Model to Submarine Automation: A Maneuvering System
ASTROPHYSICS 60, 109	Atoms. PB93-165991 00,588	Demonstration. PB93-184257 00,545
International Colloqium on Atomic Spectra and Oscillator Strengths for Astrophysical and Laboratory Plasmas (4th).	Influence of Vacuum Polarization Corrections of Order	Issues, Concepts, and Standard Techniques in Assessing
Held at the National Institute of Standards and Tech-	alpha(z(alpha)) and alpha(z(alpha))(sup 3) in Hydrogen- Like Uranium.	Accuracy of Coordinate Measuring Machines. PB93-184331 00,448
nology, Gaithersburg, Maryland on September 14-17, 1992.	PB93-166155 00,589	Binocular Sphericel Disparity: A Study in Representation
PB93-198422 00,012 ATMOSPHERIC CHEMISTRY	Microwave Spectrum of (D2O)2. PB93-166262 00,157	for a Forward Translating Camera. PB93-184422 00,301
Evaluated Kinetic and Photochemical Data for Atmos-	Spectroscopy of the 3s(2)3p(n) Shell from Cu to Mo.	National Testbed for Process Planning Research.
pheric Chemistry. Supplement 4. IUPAC Subcommittee	PB93-166270 00,590	PB93-189793 00,439

Of the Direction Has Bridge Automatics Continue Did		2010117720
Stretegic Pien for the Fectory Autometion Systems Divi- sion.	Speed of Sound Dete end Releted Models for Mixtures of Natural Gas Constituents.	BOLOMETERS Electrical and Infrared Properties of Thin Niobium
PB93-189801 00,432	PB93-200822 00,380	Microbolometers Near T(sub c).
Proceedings of the Joint DoD/NIST Workshop on Inter- netional Precision Fabrication Research and Develop-	BINDING Computer Medal for the Diffusion and Binding of Chlorida	N93-27779/8 00,339
ment. Heid in Rockville, Merylend on October 27-29,	Computer Model for the Diffusion end Binding of Chloride lons in Portlend Cement Paste.	BOLTZMANN MACHINE Optimizetion of Adeptive Resonance Theory Network with
1992. PB93-192318 00,440	PB93-159051 00,183	Boitzmann Mechine.
Dimensional Inspection Planning Besed on Product Deta	BIOINSTRUMENTATION Opportunities for Innovetion: Chemical and Biological	PB93-188134 00,224 BONE CEMENTS
Stenderds. Netional PDES Testbed Report Series.	Sensors.	Hydroxyepetite Cement. I. Besic Chemistry end Histologic
PB93-198455 00,450	PB93-100063 00,096	Properties.
ADACS. An Automated System for Part Finishing. PB93-199164 00,433	BIOLOGICAL MATERIALS Deformetion Twinning, Slip, Martensite Formation end	PB93-125136 00,016 BOTANY
Collection of Successful Interactions between the MTCs	Crack Inhibition in the B2-Type Zr50Pd35Ru15 Alloy.	Use of High Accuracy NAA for the Certification of NIST
end Client Firms. PB93-206886 00,092	PB93-151918 00,497 BIOLOGICAL PRESERVATION	Botanical Standard Reference Materials. PB93-153153 00,517
Development of e National Metrology Infrastructure for	Evaluation of Serum Volume Losses during Long-Term	BOUNDARY CONDITIONS
the Domestic Gear Industry.	Storage.	Dispersion of Fire Suppression Agents Discherged from
PB93-219756 00,409	PB94-108503 00,518 BIOLOGICAL TREATMENT	High Pressure Vessels: Establishing Initial/Boundery Conditions for the Flow Outside the Vessel.
Some Guidelines for Implementing Error Compensation on Machine Tools.	Development of Ore Bioleaching Standards.	PB94-103660 00,004
PB93-234680 00,452	PB93-151603 00,496	BRIDGMAN METHOD
Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies.	Opportunities for Innovation: Chemical and Biological	Effect of Grevitational Moduletlon on Convection In Verti- cal Bridgmen Growth.
PB94-112422 00,456	Sensors.	N94-10178/9 00,495
Portsmouth Fastener Manufacturing Workstation, Fas-	PB93-100063 00,096	BROADBAND INTEGRATED SERVICES DIGITAL
tener Engraving System (Design, Construction, and Operation).	Binding of Cis-(1,2-Diaminocyclohexane)Platinum(II) end Its Derivatives to Duplex DNA.	NETWORK Study of Treffic Control end Congestion Control In
PB94-118221 00,461	PB93-125870 00,531	Broadband ISDN.
Nanofabrication Technology in Jepan. (Jepan Technology	DNA Base Modifications Induced in Isolated Human	PB93-149433 00,210
Program). PB94-123064 00,693	Chromatin by NADH Dehydrogenase-Catalyzed Reduc- tion of Doxorubicin.	Structure and Low Energy Dynamics of Solid C60.
AUTOMATION	PB93-150670 00,520	PB93-153260 00,146
Stretegic Pian for the Factory Automation Systems Divi-	DNA Base Damage in Chromatin of Gamma-Irrediated Cultured Human Cells.	BUILDING CODES
sion. PB93-189801 00,432	PB93-151314 00,521	Research Plan for Mesonry Sheer Wells. PB93-206183 00,075
BARKHAUSEN EFFECT	DNA-Protein Cross-Linking between Thymine end Tyro-	BUILDING ENVELOPES
Barkhausen Jump Correlations in Thin Foils of Fe end Ni.	sine in Chromatin of Gamma-Irradiated or H2O2-Treated Cultured Human Cells.	MOIST: A PC Program for Predicting Heet end Moisture
PB93-166288 00,678	PB93-151587 00,522	Transfer in Building Envelopes. Release 2.0.
BASE COMPOSITION DNA Base Modifications in Chromatin of Human Can-	DNA Base Modifications in Chromatin of Human Can-	PB94-112448 00,078 BUILDING TECHNOLOGY
cerous Tissues.	cerous Tissues. PB93-153559 00,523	Measurement of Structural Deflections.
PB93-153559 00,523	Non-Linear Effects of Periodic Electric Fields on Mem-	PB93-125664 00,080
X-ray Beam Position Monitor Using e Quadrant PIN	brane Protein.	Anelysis of the Aggregate-Cement Peste Interfece Using Grazing Incidence X-rey Scattering.
Diode.	PB93-153682 00,529	PB93-125904 00,179
PB93-151769 00,579	Protein Crystal Growth of Ribonuclease A and Pancreatic Trypsin Inhibitor Aboard the Maser 3 Rocket.	Proceedings of the U.SJepen Workshop on Selsmic
BEAMS (SUPPORTS) Performance of 1/3-Scale Model Precast Concrete Beem-	PB93-166122 00,524	Retrofit of Bridges (1st). Held In Tsukube Science City, Japan on December 17-18, 1990.
Column Connections Subjected to Cyclic Inelastic Loads.	Charge-Field Interactions in Cell Membranes and Electroconformational Coupling: Transduction of Electric	PB93-134104 00,190
Report No. 3. PB94-101813 00,085	Energy by Membrane ATPases.	Overview of Damege to Highway Bridges during the
Overview of NIST Research on Seismic Performance of	PB93-166486 00,535	Lome Priete Eerthqueke. PB93-134112 00,191
Moment Resisting Precast Concrete Beam-Column Joints Containing Post-Tensioning.	Response of Living Cells to Very Weak Electric Fields: The Thermal Noise Limit.	Controlling Moisture in the Roof Cavitles of Manufectured
PB94-103686 00,086	PB93-166585 00,536	Housing. PB93-139046 00,052
BEDDING EQUIPMENT	EXAM: A Two-State Thermodynamic Analysis Program. PB93-191658 00,166	UNIFORMAT II: A Recommended Classification for Bulld-
Bench-Scale Predictions of Mattress and Upholstered Chair Fires; Similarities and Differences.	BISMUTH OXIDES	Ing Elements end Related Sitework.
PB93-186005 00,043	Phese Equilibrie and Crystal Chemistry in Portions of the	PB93-146017 00,034
BERYLLIUM IONS	System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phase Diagrams for the Temary Systems of SrO-Bi2O3-CuO,	Observations from e Field Study of the Performence of Polymer-Modified Bitumen Roofing.
MeV Be Implantation in GaAs. PB93-151645 00,653	CaO-Bi2O3-CuO and SrO-CaO-Bi2O3.	PB93-146686 00,058
BIBLIOGRAPHIES	PB93-153732 00,469	Evaluation of Compact Fluorescent Lamp Performence et
Bibliography on Atomic Line Shapes and Shifts (July	Phase Equilibria and Crystal Chemistry in Portions of the System SrO-CaO-Bi2O3-CuO. Part 4. The System CaO-	Different Ambient Temperetures. PB93-146694 00,035
1978 through March 1992) (Supplement 4). PB93-173433 00,606	Bí2O3-CuO.	Comparison of Experimental Measurements of Local Flow
Building and Fire Research Laboratory Publications,	PB94-108552 00,475 BISMUTH STRONTIUM CALCIUM CUPRATES	Boiling Heat Trensfer Coefficients for R11 end R123. PB93-151157 00.491
1992. PB93-188845 00,073	Orientation Dependence of Flux Pinning in e Layered	Interlaboretory Comperison of the Apparent Thermal Con-
Bibliographic Notes on Voronol Diagrams.	Bi2Sr2Ca1Cu2O8 + 10% Ag Composite. PB93-153328 00,663	ductivity of a Fibrous Batt and Four Loose-Fill Insulations.
PB93-189298 00,509	BITUMENS	PB93-151280 00,061
Bibliography of Screw Thread Measurement.	Observations from a Field Study of the Performance of	Computer Modelling of Cement-Besed Meterlels. PB93-153161 00,063
PB94-101821 00,460	Polymer-Modified Bitumen Roofing. PB93-146686 00,058	Experimental and Simulation Studies of the Interfeciel
Metrology for Electromagnetic Technology: A Bibliography of NIST Publicetions.	BITUMINOUS MATERIALS	Zone in Concrete. PB93-153179 00.064
PB94-108776 00,341	Interim Criteria for Polymer-Modified Bituminous Roofing	Water Vepor Permeebility Meesurements of Common
Bibliography of the NIST Electromagnetic Fields Division Publications.	Membrane Materials: A Summary Report. PB93-153724 00,069	Building Meterials.
PB94-112547 00,322	BLOCK POLYMERS	PB93-153229 00,065
Electronics and Electrical Engineering Laboratory Tech-	Chain Conformation of Block Copolymers In Dilute Solu-	Performence of e Residentiel Desuperheeter. PB93-153302 00,036
nical Publication Announcements Covering Laboratory Programs, April to June 1993 with 1993/1994 EEEL	tions Measured by Small-Angle Neutron Scattering. PB93-151272 00,170	Measuring Airflow Retes with Pulse Trecer Techniques.
Events Calendar.	BLOOD	PB93-153583 00,037
PB94-118403 00,342 Appual Conference on Fire Research 1993: Book of Ab-	Evaluation of Serum Volume Losses during Long-Term	Weter Vepor Sorption Measurements of Common Bullding Meteriels.
Annual Conference on Fire Research, 1993: Book of Abstracts.	Storage. PB94-108503 00,518	PB93-153674 00,068
PB94-121324 00,205	BOARD AND CARE HOMES	Impact-Echo Response of Pletes Conteining Thin Layers
BINARY ALLOYS Phese-Field Model for Isothermel Phese Trensitions in Bi-	Affordable Fire Safety in Board and Care Homes. A Regulatory Challenge. Final Report.	end Voids. PB93-153815 00,181
nary Alloys.	PB93-219723 00,027	Applicability of the Meturity Method to High-Performance
PB93-151934 00,498	BODY ARMOR	Concrete. PB93-157451 00,182
Boundary/Interfece Fitted Grid Generation Using Tensor Product B-splines: A Preliminery Study.	Limited Tests to Investigate Whether the Size of Body Armor Semples Influences Bellistic Test Results.	Effect of Subsurfece Conditions on Eerthqueke Ground
PB93-234748 00,503	PB93-138998 00,554	Motlons.
BINARY MIXTURES Field-Space Conformal Solution Method: Binary Vanor-	BOILING Comparison of Experimental Measurements of Local Flow	PB93-158343 00,192 Development of e Fest-Response Verlable-Amplitude
Fleid-Space Conformal Solution Method: Binary Vapor- Liquid Phase Behavior.	Comparison of Experimental Measurements of Local Flow Boiling Heat Transfer Coefficients for R11 and R123.	Progremmeble Reection Control System.
PB93-166239 00,156	PB93-151157 00,491	PB93-158731 00,459

Computer Model for the Diffusion and Binding of Chloride Ions In Portland Cement Paste. PB93-159051 00,183	Thermodynamic Properties of Homogeneous Mixtures of Nitrogen and Water from 440 to 1000 K, Up to 100 MPe and 0.8 Mole Fraction N2.	Infrared Spectroscopic Study of Cement Formation of Polymeric Calcium Phosphete Cement.
Strengthening Methodology for Lightly Reinforced Concrete Frames-I. PB93-161354 00.081	PB94-118494 00,617 BUILDINGS Heat Release Rate: The Single Most Importent Variable	PB93-151298 00,019 Chemical Change of Hardened PCA/CPC Cements In Verious Storing Solutions.
Site Exploration for Radon Source Potential.	in Fire Hazard. PB93-124808 00.050	PB93-151306 00,020
PB93-162972 00,394 Stenderd Aggregate Materials for Alkali-Silica Reaction	UNIFORMAT II: A Recommended Classification for Build-	Effects of Magnesium and Fluoride on the Hydrolysis of Octacalcium Phosphate.
Studies. PB93-166247 00,184	Ing Elements and Related Sitework. PB93-146017 00,034	PB93-151835 00,023 CALIBRATING
Experimental Validetion of a Mathematical Model for Predicting Water Vapor Sorption et Interior Building Surfaces. PB93-166403 00,070	Smoke Movement in e Corridor-Hybrid Model, Simple Model and Comparison with Experiments. PB93-146678 00,057	Drift Eliminating Designs for Non-Simultaneous Comparison Calibrations. PB93-196277 00,405
Experimentel Evaluation of Lighting/HVAC Interaction. PB93-166437 00,038	Site Exploration for Radon Source Potential. PB93-162972 00,394	CALIBRATION NIST Measurement Service for DC Standard Resistors.
Estimating Soil Parameters Important for Lifeline Siting	CFAST, the Consolidated Model of Fire Growth and Smoke Trensport.	PB93-139079 00,347
Using System Identification Techniques. PB93-178606 00,193	PB93-174902 00,071	High Power CW Wattmeter Celibration et NIST. PB93-143949 00,327
Estimeting In situ Liquefaction Potential end Permanent Ground Displecements Due to Liquefaction for the Siting of Lifelines.	Design of Smoke Control Systems for Areas of Refuge. PB93-183754 00,072 Building and Fire Research Laboratory Publications,	NIST Sampling System for the Celibretion of Phase Angle Generetors from 1 Hz to 100 kHz. PB93-151884 00,335
PB93-178614 00,194	1992. PB93-188845 00,073	Sampling Technique for Calibrating Phese Angle Genere-
Performance of Electromagnetic Covermeters for Non- destructive Assessment of Steel Reinforcement. PB93-178630 00,186	Study of Fire Induced Flow along the Vertical Corner Wall. Part 2.	tors from 1 Hz to 100 kHz. PB93-151892 00,336
Envelope Design Guldelines for Federel Office Buildings:	PB93-205623 00,074	New Approach to Celibration of Trensducers Used in the Measurement of Dynamic Pressure end Temperature.
Thermel Integrity end Airtightness. PB93-183770 00,376	BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program (Version 4.0). User's Guide end Reference Manuel.	PB93-153716 00,348
Procedures for Selecting Earthquake Ground Motions at Rock Sites (Revised).	PB93-208460 00,026 ERATES: A Computer Program for Calculating Time-of-	Surveillence Schemes with Applications to Mass Celibra- tion. PB93-181881 00,608
PB93-185973 00,542	Use, Block, and Demand Cherges for Electricity Usage (Version 1.0). User's Guide and Reference Manuel.	CALIBRATION PROBLEMS
Optimization of Adaptive Resonance Theory Network with Boltzmann Machine.	PB93-228658 00,384	Calibration Problem as an III-Posed Inverse Problem. PB93-151108 00,512
PB93-188134 00,224 Bullding end HVAC Characterization for Commercial	Overview of NIST Research on Seismic Performance of Moment Resisting Precast Concrete Beam-Column Joints	CALIBRATION STANDARDS
Building Indoor Air Quality Investigations. PB93-198844 00,389	Conteining Post-Tensioning. PB94-103686 00,086	Interlaboratory Study on the Lithographically Produced Scanning Electron Microscope Magnification Standard
Highwey Concrete (HWYCON) Expert System Require-	Collaborating with Our Customers: NIST Bullding and Fire Research Laboratory.	Prototype. PB94-108545 00,371
ments and Installation Guide. PB93-198885 00,187	PB94-110194 00,029 Zone Fire Modeling with Naturel Building Flows end e	CALORIMETERS Microcalorimeter for 7 mm Coaxial Transmission Line.
Life-Cycle Costing Workshop for Energy Conservation in Buildings: Student Menuel.	Zero Order Sheft Model. PB94-112166 00,030	PB94-112455 00,338
PB93-198984 00,383 Research Plan for Mesonry Sheer Wells.	MOIST: A PC Program for Predicting Heet end Moisture	Report on the Raster Cepabilities of MIL-R-28002A and
PB93-206183 00,075	Transfer in Building Envelopes. Release 2.0. PB94-112448 00,078	MIL-D-28003A. PB93-140820 00,418
Lighting System Design end Eveluetion in Federel Office Buildings.	Impacts: NIST Building and Fire Research Laboretory (Technical and Societal).	CALS Testing: Programs, Stetus and Stretegy. PB93-151165 00,420
PB93-206217 00,040 Strength of Pertielly-Grouted Masonry Shear Wells under	PB94-113420 00,079 NIST Building end Fire Research Laboratory, Projects	Rester Graphics: A Tutoriel end Implementation Guide.
Laterel Loeds. PB93-206225 00,082	1993. PB94-118288 00,410	PB93-152171 00,421 Proceedings of the AP Validation Workshop. Held in Se-
Effect of Critical Perameters on the Behavior of Partially- Grouted Masonry Shear Walls under Lateral Loads.	Annuel Conference on Fire Research, 1993: Book of Ab-	ettle, Weshington on April 13-14, 1992. National PDES Testbed Report Series.
PB93-206894 00,076	stracts. PB94-121324 00,205	PB93-158715 00,423 Deteiled Design Specification for Conformence Testing of
Litereture Review of Lighting Standards. PB93-208445 00,041	Bullding Life Cycle Cost Computer Progrem (BLCC), Version 4.11 (for Microcomputers).	Computer Grephics Metefile (CGM) Interpreter Products. PB93-178580 00,424
BLCC 4.0. The NIST 'Bullding Life-Cycle Cost' Program (Version 4.0). User's Gulde and Reference Manual.	PB94-500055 00,042 BUOYANCY	CALS (COMPUTER AIDED ACQUISITION AND LOGISTIC
PB93-208460 00,026 Field Monitoring of e Veriable-Speed Integrated Heat	Combined Buoyancy- end Pressure-Driven Flow through e Horizontal Vent: Theoretical Considerations.	SUPPORT) Computer Grephics Metefile (CGM) Test Requirements
Pump/Weter Heating Applience. PB93-228203 00,382	PB94-103694 00,077	Document (Update). PB93-198273 00,293
Proceedings: ICSSC Issues Workshop. Development of	BURNING RATE In situ Buming of Oil Spills: Mesoscale Experiments end	CALS (COMPUTER AIDED ACQUISITION AND LOGISTICS SUPPORT)
Seismic Eveluation end Rehabilitation Standerds for Federelly Owned end Leesed Buildings. Held in Denver, Colerelly Owned end Leesed Buildings.	Analysis. PB94-101839 00,396	Collection of Technical Studies Completed for the Computer-Aided Acquisition end Logistic Support (CALS) Pro-
oredo on September 16-17, 1992. PB93-228666 00,083	BURNS (INJURIES) Burn Injury Potential of Navy Shipboard Work Clothing.	gram Fiscai Yeer 1987. Volume 4. AD-A261 193/7 00.414
Guldelines end Procedures for Implementation of the Ex- ecutive Order on Selsmic Sefety of New Construction	AD-A258 836/6 00,481	Collection of Technical Studies Completed for the Com-
(July 1991). PB93-228674 00,084	BUSINESSES Designing end Implementing e State Quelity Award.	puter-Alded Acquisition end Logistic Support (CALS) Program Fiscal Yeer 1988. Volume 2. Grephics, CGM MiL SPEC.
Performence of 1/3-Scale Model Precast Concrete Beem-Column Connections Subjected to Cyclic Inelastic Loeds.	PB93-154458 00,695 BUTANES	AD-A261 261/2 00,415
Report No. 3. PB94-101813 00,085	Note on the Number Dependence of Nonequilibrium Mo- leculer Dynemics Simulations of the Viscosity of Struc-	CARBON Sims Determination of Oxygen and Cerbon in
Overview of NIST Research on Seismic Performence of	tured Molecules. PB93-153740 00,149	YBa2Cu3O7-x Superconductors. PB93-150845 00,650
Moment Resisting Precast Concrete Beem-Column Joints Conteining Post-Tensioning.	C PROGRAMMING LANGUAGE Validated Products List (Cobol, Fortren, ADA, Pescal, C,	CARBON DIOXIDE
PB94-103686 00,086 Present Worth Factors for Life-Cycle Cost Studies in the	MUMPS, SQL, Grephics, GOSIP, POSIX, Computer Security).	Determinetion of the Structure of CO2-H2CO. PB93-150696 00,135
Depertment of Defense (1994). PB94-109238 00,540	PB93-937300 00,272	CARBON MONOXIDE Generation of Carbon Monoxide in Compartment Fires.
Colleboreting with Our Customers: NIST Building and Fire Research Laboretory.	Journal of Physical end Chemical Reference Dete, Vol-	PB93-146702 00,198 Subpicosecond Probing of Vibretional Energy Trensfer at
PB94-110194 00,029	ume 21, No. 5, September/October 1992. PB93-149094 00,572	Surfaces. PB93-150720 O0.136
MOIST: A PC Program for Predicting Heet end Moisture Transfer In Building Envelopes. Release 2.0.	Solubility of Some Speringly Soluble Selts of Zinc and Cedmium in Water end in Aqueous Electrolyte Solutions.	Resonence Effects in the 5Sigma(-1) Photoionization
PB94-112448 00,078 Celculeting Cement Paste end Morter Diffusivity from	PB93-149110 00,134 CALCIUM OXIDES	Chennel of CO. PB93-151751 00,144
Conductivity Meesurements: Preliminary Results of e New Method.	Phase Equilibrie end Crystei Chemistry in Portions of the System Sro-CaO-Bi2O3-CuO. Pert 3. Preliminery Phese	CASF (CONFORMITY ASSESSMENT SYSTEM EVALUATION)
PB94-112802 00,189 Impacts: NIST Building end Fire Research Laboratory	Diagrams for the Temary Systems of SrO-Bi2O3-CuO, CeO-Bi2O3-CuO end SrO-CeO-Bi2O3.	Progrem for Conformity Assessment System Evaluation: Anelysis of Comments on the NIST Proposal.
(Technical end Societel). PB94-113420 00,079	PB93-153732 00,469	PB93-170900 00,094
NIST Building and Fire Research Laboratory. Projects	Phese Equilibrie end Crystel Chemistry in Portions of the System SrO-CeO-Bi2O3-CuO. Part 4. The System CeO-	CASIMER EFFECT Comment on 'Meesurement of the Lamb Shifts in Singlet
1993. PB94-118288 <i>00,410</i>	Bi2O3-CuO. PB94-108552 00,475	Levels of Atomic Helium'. PB93-125219 00,562

CATALOGS (DOCUMENTATION)	gram Fiscal Year 1988. Volume 2. Graphics, CGM MIL	CHEMICAL VAPOR DEPOSITION
NIST Serial Holdings, 1993. PB94-120847 00,413	ŠPEC. AD-A261 261/2 00.415	Cathodoluminescence Imaging and Spectroscopy of CVD Diamond in a Scanning Electron Microscope.
CATALOGS (PUBLICATIONS)	Computer Graphics Metafile (CGM). Category: Software	PB93-153708 00,464
NIST Standard Reference Data Products Catalog, 1993. PB93-173409 00,163	Standard. Subcategory: Graphics. Part 1. Functional Specification.	Workshop on Characterizing Diamond Films II. Held In Gaithersburg, MD. on February 24-25, 1993.
CATALYSTS	FIPS PUB 128-1A 00,281	PB93-207157 00,687
Assessment of Fossil Energy Materials Research Needs.	Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 2. Character En-	CHEMISTRY
PB93-145779 00,377 CATHODOLUMINESCENCE	coding.	CSTL Technical Activities 1992. PB93-173482 00,165
Cathodoluminescence Imaging and Spectroscopy of CVD	FIPS PUB 128-1B 00,282 Computer Graphics Metafile (CGM). Category: Software	CHLORIDES
Diamond in a Scanning Electron Microscope. PB93-153708 00,464	Standard. Subcategory: Graphics. Part 3. Binary Encod-	Computer Model for the Diffusion and Binding of Chloride lons in Portland Cement Paste.
CEILINGS	ing. FIPS PUB 128-1C 00,283	PB93-159051 00,183
Simulating the Effect of Beamed Ceilings on Smoke Flow. Part 1. Comparison of Numerical and Experimental Re-	Computer Graphics Metafile (CGM). Category: Software	CHLORINE ORGANIC COMPOUNDS Mechanisms for the Formation and Destruction of
sults.	Standard. Subcategory: Graphics. Part 4. Clear Text Encoding.	Chlorinated Organic Products of Incomplete Combustion.
PB93-152056 00,062 CELESTIAL MECHANICS	FIPS PUB 128-1D 00,284	PB93-166478 00,161 CHROMATIN
Mechanism for Capture Into Resonance.	Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Military Specification.	DNA Base Modifications Induced In Isolated Human
PB93-145761 00,010	Digital Representation for Communication of Illustration Data: CGM Application Profile.	Chromatin by NADH Dehydrogenase-Catalyzed Reduction of Doxorubicin.
Non-Linear Effects of Periodic Electric Fields on Mem-	FIPS PUB 128-1E 00,285	PB93-150670 00,520
brane Protein. PB93-153682 00,529	Detailed Design Specification for Conformance Testing of Computer Graphics Metafile (CGM) Interpreter Products.	DNA Base Damage in Chromatin of Gamma-Irradiated Cultured Human Cells.
Charge-Field Interactions in Cell Membranes and	PB93-178580 00,424	PB93-151314 00,521
Electroconformational Coupling: Transduction of Electric Energy by Membrane ATPases.	CHAMFERING ADACS. An Automated System for Part Finishing.	DNA-Protein Cross-Linking between Thymlne and Tyro- sine in Chromatin of Gamma-Irradiated or H2O2-Treated
PB93-166486 00,535	PB93-199164 00,433	Cultured Human Cells.
CELLS (BIOLOGY)	CHAOS Chaotic Mexicon of Forced and Counted Colleging Open	PB93-151587 00,522 CHROMIUM
Kinetics of a Multistate Enzyme in a Large Oscillating Field.	Chaotic Motions of Forced and Coupled Galloping Oscillators.	Comparison of Measured and Calculated Appearance-Po-
PB93-153690 00,516	PB93-153245 00,003	tential Spectra for Six 3d Metals. PB93-151629 00,141
Response of Living Cells to Very Weak Electric Fields: The Thermal Noise Limit.	CHARACTER RECOGNITION Using Self-Organizing Recognition as a Mechanism for	CIGARETTES
PB93-166585 00,536	Rejecting Segmentation Errors. PB93-138972 00,250	Test Methods for Quantifying the Propensity of Cigarettes
Ignition and Subsequent Flame Spread over a Thin Cel-	OCR Error Rate Versus Rejection Rate for Isolated Hand-	to Ignite Soft Furnishings. PB94-108644 00,047
lulosic Material.	print Characters. PB93-146652 00,294	Modeling the Ignition of Soft Furnishings by a Cigarette. PB94-109014 00.048
N93-20205/9 00,698 Heat and Mass Transport from Thermally Degrading Thin	Computational Experience with Radial Basis Function	PB94-109014 00,048 CIRCULAR POLARIZATION
Cellulosic Materials in a Microgravity Environment.	Networks.	Dual-Port Circularly Polarized Probe Standards at the Na-
PB93-153435 00,505 CEMENT PASTES	PB93-206191 00,303 Dictionary Production for Census Form Conference.	tional Institute of Standards and Technology. PB93-235208 00,326
Computer Model for the Diffusion and Binding of Chloride	PB93-207959 00,304	CISPLATIN
Ions in Portland Cement Paste. PB93-159051 00,183	Comparison of Handprinted Digit Classifiers. PB94-118213 00,306	Binding of Cis-(1,2-Diaminocyclohexane)Platinum(II) and Its Derivatives to Duplex DNA.
CEMENTS	CHEMICAL ANALYSIS	PB93-125870 00,531
Computational Materials Science of Cement-Based Materials: An Education Module.	Specimen Banking at the National Institute of Standards	CLADDINGS
PB94-111424 00,188	and Technology. PB93-151967 00,101	Optical Fiber Geometry: Accurate Measurement of Cladding Diameter.
CERAMIC MATERIALS Surface Forces and Their Action in Ceramic Materials.	Determination of Baseline Platinum Levels in Biological	PB93-196269 00,632
AD-A273 624/7 00,465	Materials. PB93-151975 00,515	CLASSIFICATIONS UNIFORMAT II: A Recommended Classification for Build-
CERAMICS	Use of High Accuracy NAA for the Certification of NIST	ing Elements and Related Sitework. PB93-146017 00,034
Principles of Gas Phase Processing of Ceramics during Combustion.	Botanical Standard Reference Materials. PB93-153153 00,517	Advanced Ceramics Standards Development.
N93-20188/7 00,467	Resonance Ionization Spectroscopy/Resonance Ionization Mass Spectrometry Data Service. I-Data Sheets for As,	PB93-166007 00,470
Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377	B, Cd, C, Ge, Au, Fe, Pb, Si, and Zn.	Advanced Ceramics: What's in a Name. PB93-166015 00,471
Clinical Use of Beta-Quartz Glass-Ceramic Inserts.	PB93-153781 00,102	CLASSIFYING
PB93-150761 00,017 Intrinsically Colored Microcrystalline Glass-Ceramic for	Laser-Enhanced Ionization Spectrometry Following Matrix Modification by Automated Chelation Chromatography for	Comparative Performance of Classification Methods for Fingerprints.
Use In Dental Restoration.	the Analysis of Biological and Environmental Reference Materials.	PB93-184273 00,300
PB93-150837 00,018	PB93-166494 00,104	CLEANING Coophomical Considerations in the Cleaning of Carbon
ASTM Committee, C28, Advanced Ceramics: A Progress Report.	Standard Reference Materials for Trace Organic Contaminants in the Marine Environment.	Geochemical Considerations in the Cleaning of Carbonate Stone.
PB93-153617 00,468	PB93-166627 00,395	PB93-151231 00,059
Advanced Ceramics Standards Development. PB93-166007 00,470	Chemical Characterization of Mutagenic Fractions of Par- ticles from Indoor Coal Combustion: A Study of Lung	CLINICAL CHEMISTRY Evaluation of Serum Volume Losses during Long-Term
Advanced Ceramics: What's in a Name.	Cancer in Xuan Wel, China. PB93-231835 00.530	Storage. PB94-108503 00,518
PB93-166015 00,471 Tensile Creep Testing of Structural Ceramics.	Airborne Asbestos Method: Standard Test Method for	CLINKER
PB93-166619 00,472	Verified Analysis of Asbestos by Transmission Electron Microscopy, Version 1.0.	Standard Cement Clinkers for Phase Analysis. PB93-166254 00,185
Standard X-ray Diffraction Powder Patterns of Fourteen Ceramic Phases.	PB94-113578 00,109	CLOTHING
PB93-166650 00,473	CHEMICAL BONDS	Burn Injury Potential of Navy Shipboard Work Clothing.
Ceramics Technical Activities, 1992 (NAS-NRC Assess-	Prediction of Carbon-Hydrogen Bond Dissociation Energies for Polycyclic Aromatic Hydrocarbons of Arbitrary	AD-A258 836/6 00,481 CLOTHING INDUSTRY
ment Panel May 13-14, 1993). PB93-173508 00,474	Size. PB93-166205 00,155	Information Technology VIsion for the U.S. Fiber/Textile/
CERENKOV RADIATION	CHEMICAL COMPOUNDS	Apparel Industry. PB93-139095 00,482
Quantum Theory of the Dynamical Cerenkov Emission of X-rays.	Opportunities for Innovation: Chemical and Biological Sensors.	Report on Scoping the Apparel Manufacturing Enterprise.
PB93-124873 00,559	PB93-100063 00,096	PB93-152163 00,429
CERTIFICATION NIST Scoring Package Certification Procedures in Con-	CHEMICAL PROPERTIES Journal of Physical and Chemical Reference Data, Vol-	Prototype Application Protocol for Ready-to-Wear Pattern Making.
junction with NIST Special Databases 2 and 6. PB93-188126 00,302	ume 21, No. 3, May/June 1992.	PB93-158665 00,430
CFAST COMPUTER PROGRAM	PB93-149029 00,199 Journal of Physical and Chemical Reference Data, Vol-	CNRF FACILITY Journal of Research of the National Institute of Standards
User's Guide for CFAST Version 1.6.	ume 21, No. 6, November/December 1992.	and Technology, January-February 1993. Volume 98,
PB93-140788 00,055 CFAST, the Consolidated Model of Fire Growth and	PB93-149136 00,013 Chemical Change of Hardened PCA/CPC Cements in	Number 1. Special Issue. PB93-166817 00,598
Smoke Transport.	Various Storing Solutions.	NIST Cold Neutron Research Facility.
PB93-174902 00,071 CGM (COMPUTER GRAPHICS METAFILE)	PB93-151306 00,020 CHEMICAL SCIENCE AND TECHNOLOGY LABORATORY	PB93-166825 00,599 COAL GASIFICATION
Collection of Technical Studies Completed for the Com-	CSTL Technical Activities 1992.	Assessment of Fossil Energy Materials Research Needs.
puter-Alded Acquisition and Logistic Support (CALS) Pro-	PB93-173482 00,165	PB93-145779 00,377

COMPUTER AIDED MANUFACTURING

COBALT Reduction Reactions of Water Soluble Cyano-Cobalt(III)- Porphyrins: Metal Versus Ligand Centered Processes. PB93-125912 00,514	COMPARISON Cross Validation Comparison of NIST OCR Databases. PB93-159077 00,297	Ada Compiler Validation Summary Report. Certificate Number: 92091851.11270 U.S. NAVY AdaAX, Versior 5.5 (/OPTIMIZE) VAXstation 4000 =Z> VAXstation 4000. AD-A265 602/3 00.246
Comparison of Measured and Calculated Appearance-Potential Spectra for Six 3d Metals. PB93-151629 00,141	COMPARTMENT FIRES Comparison of Full Scale Fire Tests and a Computer Fire Model of Several Smoke Ejection Experiments.	COBOL Compiler Validation System (CCVS 85), User Guide, Version 4.2. PB93-163178 00,254
COBALT ALLOYS	PB93-139087 00,551 User's Guide for CFAST Version 1.6.	COBOL 85 Compiler Validation System (CCVS 85), Ver-
Correlations of Magnetic Microstructure and Anisotropy with Noise Spectra for CoNi and CoCrTa Thin Film	PB93-140788 00,055	sion 4.2. PB93-504918 00,270
Media. PB93-153401 00,668	Generation of Carbon Monoxide in Compartment Fires. PB93-146702 00,198	FORTRAN Compiler Validation System 1978. User's Guide, Version 2.1.
COBALT IONS Spectral Data and Grotrian Diagrams for Highly Ionized Cobalt, Co VIII through Co XXVII.	Comparison of Ceiling Jet Temperatures Measured In an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models.	PB94-118460 00,275 COMPLEXES Determination of the Structure of CO2-H2CO.
PB93-148963 00,568 COBOL PROGRAMMING LANGUAGE	PB93-158657 00,539 COMPETITION	PB93-150696 00,135
COBOL Compiler Validation System (CCVS 85), User Gulde, Version 4.2.	Measurements for Competitiveness In Electronics. First Edition. PB93-160588 00,091	Microwave and Infrared Spectra of C2H4HCCH: Barrier to Twofold Internal Rotation of C2H4. PB93-150803 00,138
PB93-163178 00,254 COBOL 85 Compller Validation System (CCVS 85), Ver-	COMPILERS	COMPOSITE MATERIALS Failure Models in Continuous Fiber Ceramic Composites
slon 4.2. PB93-504918 00,270 Validated Products List (Cobol, Fortran, ADA, Pascal, C, MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Se-	Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11307.	Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Technologies. DE93016669 00,477
curity). PB93-937300 00,272	AD-A262 055/7 00,231 Validation Summary Report: GTE Government Systems,	Tribological Investigations of Composites and Other Selected Materials Sliding against Vacuum-Deposited MoS2
CODES Codes for the Identification of Federal and Federally Assisted Organizations. Category: Data Standard, Rep-	Alsys Ada Software Development Environment, HP 9000 Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11308.	Coatings. PB93-138949 00,462
resentations and Codes. FIPS PUB 95-1 00,288	AD-A262 056/5 00,232	Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377
COLD NEUTRON RESEARCH FACILITY Journal of Research of the National Institute of Standards	Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000 Series 800 Model 807 UnderHP-UX BLS Version A.08.08 (Host and Target), 930115S1.11305.	Mechanical Test Methods for Metal-Matrix Composites: A Status Report from the U.S.A. PB93-153500 00,475
and Technology, January-February 1993. Volume 98, Number 1. Special Issue. PB93-166817 00,598	AD-A262 253/8 00,233	Machining of Advanced Materials: Proceedings of the International Conference on Machining of Advanced Ma-
COLD NEUTRONS	Validation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000	terials. Held in Gaithersburg, Maryland on July 20-22, 1993.
NIST Cold Neutron Research Facility and Magnetic Neutron Scattering.	Series 800 Model 817 under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11306.	PB93-217578 00,442
PB93-151694 00,654 NIST Cold Neutron Research Facility.	AD-A262 717/2 00,234 Validation Summary Report: GTE Government Systems,	COMPRESSIVE STRENGTH Applicability of the Maturity Method to High-Performance
PB93-166825 00,599	Alsys Ada Software Development Environment for 80386 UNIX, Version 5.1.2, Zenith Data Systems, Z-Station 433	Concrete. PB93-157451 00,182
COLLECTION NIST Serial Holdings, 1993.	DEh (Host and Target), 930115S1.11309. AD-A262 720/6 00,235	COMPUTATION Robust Parallel Computation in Floating-Point and SL
PB94-120847 00,413 COMBUSTION	Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS AXP Systems, Version 3.0-	Arithmetic. PB93-153476 00,252
Particulate and droplet diagnostics in spray combustion. Annual report. DE93003631 00,195	5, DEC 3000 Model 400 (host target), 930319S1.11315. AD-A264 885/5 00,236 Validation Summary Report: Digital Equipment Corpora-	COMPUTATIONAL FLUID DYNAMICS Simulating the Effect of Beamed Ceilings on Smoke Flow Part 1, Comparison of Numerical and Experimental Re-
Particulate and droplet diagnostics in spray combustion. Annual report.	tion, DEC Ada for Open VMS VAX Systems, Version 3.0- 7, VAXstation 4000 Model 60 (host) => VAXstation 3100	sults. PB93-152056 00,062
DE93003632 00,196 Principles of Gas Phase Processing of Ceramics during	Model 48 (target), 930319S1.11317. AD-A264 886/3 00,237	COMPUTATIONAL GEOMETRY Bibliographic Notes on Voronoi Diagrams.
Combustion. N93-20188/7 00,467	Validation Summary Report: Digital Equipment Corporation, DEC Ada for OpenVMS VAX Systems, Version 3.0-	PB93-189298 00,509
Chemical Kinetic Data Base for RDX Combustion. PB93-166460 00,160	7, VAXstation 4000 Model 60 (host target), 930319S1.11316. AD-A265.014/1 00,238	COMPUTER AIDED DESIGN Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1988. Volume 2. Graphics, CGM MIL
Mechanisms for the Formation and Destruction of Chlorinated Organic Products of Incomplete Combustion. PB93-166478 00,161	Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5	SPEC. AD-A261 261/2 00,415
RADCAL: A Narrow-Band Model for Radiation Calcula-	(/OPTIMIZE) VAX 8550/8600/8650 (Cluster) > Enhanced	Initial Graphics Exchange Specification (IGES).
tlons in a Combustion Environment. PB93-200889 00,204	Processor (EP) AN/UYK-44 (Bare Board). AD-A265 260/0 00,239	AD-A270 049/0 00,416 Initial Graphics Exchange Specification (IGES). Category
Smoke Plume Trajectory from In situ Burning of Crude Oil in Alaska. PB94-114519 00,393	Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11271, U.S. Navy AdaVAX Version 5.5 (/NO OPTIMIZE) VAXstation 4000 > VAXstation	Software Standard; Subcategory: Graphics and Information Interchange. FIPS PUB 177 00,417
COMBUSTION KINETICS Evaluated Kinetic Data for Combustion Modelling.	4000. AD-A265 261/8 00,278	Computer-Aided Molecular Design of Fire Resistant Air-
PB93-149037 00,200	Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11265 DDC-I, Inc. DACS Sun	craft Materials. N94-10779/4 00,007
Observations of soot in combustion of methanol/toluene	SPARC/SunOs Native Ada Compiler System, Version 4.6.1 SPARCStation 2 => SPARCStation 2.	Benchmark for the Verification of Microwave CAD Soft- ware.
spray flames. DE93007992 00,378	AD-A265 433/3 00,240	PB93-125185 00,307 Instrument-Independent Database for Collisionally Acti-
Reduction of Hydrogen Cyanide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper	Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11273 U.S. Navy, Ada/M, Version 4.5 (OPTIMIZE), VAX 8550/8600/8650 (Cluster) => VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board).	vated Dissociation in Radiofrequency Only Quadrupoles Single-Collision Versus Multiple-Collision Conditions. PB93-125680 00,400
Compounds. Part IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and	AD-A265 434/1 00,241	Requirements for an Application Protocol Developmen Environment, National PDES Testbed Report Series.
Toxicity from Flexible Polyurethane Foam with and with- out Copper Compounds.	Ada Compiler Validation Summary Report. Certificate Number: 92091851.11274 U.S. Navy Ada/M, Version 4.5	PB93-208114 00,426
PB93-139103 00,053 Generation of Carbon Monoxide In Compartment Fires.	(/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => Enhanced Processor (EP) AN/UYK-44 (Bare Board).	COMPUTER AIDED MANUFACTURING Collection of Technical Studies Completed for the Com-
PB93-146702 00,198	AD-A265 435/8 00,242 Ada Compiler Validation Summary Report. Certificate	puter-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1988. Volume 2. Graphics, CGM MIL
COMMERCIAL BUILDINGS Federal Building Telecommunications Wiring Standard:	Number: 920918S1.11275 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) =>	SPEC. AD-A261 261/2 00,415
Category: Telecommunications Standard; Subcategory: Cables and Wiring.	VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board).	Initial Graphics Exchange Specification (IGES). AD-A270 049/0 00,416
FIPS PUB 174 00,206 Building and HVAC Characterization for Commercial	AD-A265 437/4 00,243 Ada Compiler Validation Summary Report. Certificate	Initial Graphics Exchange Specification (IGES). Category.
Building Indoor Air Quality Investigations. PB93-198844 00,389	Number: 920805S1.11263 DDC-I, Inc. DACS MIPS RISC/ os to MIPS R3000 Bare Ada Cross Compiler System, Re-	Software Standard; Subcategory: Graphics and Information Interchange. FIPS PUB 177 00,417
COMMUNICATION NETWORKS Integrated Services Digital Network Conformance Testing.	lease 2.1-16, MIPS M/120-5 => Lockheed Sanders STAR MVP R3010 Board.	Report on Scoping the Apparel Manufacturing Enterprise.
Layer 2, Data Link Layer (LAPD). Part 1, Basic Rate Interface, User Side.	AD-A265 600/7 00,244	PB93-152163 00,429 Prototype Application Protocol for Ready-to-Wear Pattern
PB94-120920 00,213	Ada Compiler Validation Summary Report. Certificate Number: 92080551.11264 DDC-I, Inc. DACS DECstation/	Making. PB93-158665 00,430
EQUIPMENT for Investigation of Cryogenic Compaction of	ULTRIX to MIP R3000 Bare Ada Cross Compiler System, Release 2.1-16 DECStation 3100 => Integrated Device	Research, Industry and Technology Transfer at the NIST
Nanosize Silicon Nitride Powders. DE93018740 00,466	Technology IDT7RS301 R3000/R3010 Board. AD-A265 601/5 00,245	AMRF. PB93-166304 00,43

Stretegic Pien for the Fectory Autometion Systems Division.	Collection of Technical Studies Completed for the Computer-Aided Acquisition end Logistic Support (CALS) Pro-	Computer Grephics Metafile (CGM), Cetegory: Softwere Standard, Subcategory: Grephics, Part 4, Clear Text En-
PB93-189801 00,432	gram Fiscal Year 1988. Volume 2. Graphics, CGM MIL SPEC.	coding. FIPS PUB 128-1D 00.284
ADACS. An Automated System for Pert Finishing. PB93-199164 00,433	AD-A261 261/2 00,415	Computer Graphics Metefile (CGM). Cetegory: Software
Requirements for en Application Protocol Development	Velidation Summary Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000	Standerd. Subcategory: Grephics. Military Specification, Digital Representation for Communication of Illustration
Environment. National PDES Testbed Report Series. PB93-208114 00,426	Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host and Target), 930115S1.11307.	Data: CGM Application Profile. FIPS PUB 128-1E 00,285
Portsmouth Fastener Menufecturing Workstetion. Fes-	AD-A262 055/7 00,231	Electronic Data Interchange (EDI): Category: Software
tener Engreving System (Design, Construction, and Operetion).	Validation Summary Report: GTE Government Systems, Aisys Ada Software Development Environment, HP 9000	Standard; Subcategory: Electronic Data Interchange. FIPS PUB 161-1 00,247
PB94-118221 00,461 COMPUTER APPLICATIONS	Series 800 Model 867 Under HP-UX BLS Version	VHSiC Hardware Description Language (VHDL); Cet-
Collection of Technical Studies Completed for the Com-	A.08.08 (Host end Terget), 930115S1.11308. AD-A262 056/5 00,232	egory: Software Standard; Subcategory: Hardwere Description Language. IEEE Standard VHDL Language Ref-
puter-Aided Acquisition end Logistic Support (CALS) Progrem Fiscal Year 1987. Volume 4.	Velidation Summery Report: GTE Government Systems, Alsys Ada Software Development Environment for 80386	erence Manual.
AD-A261 193/7 00,414	UNIX, Version 5.1.2, Zenith Data Systems, Z-Station 433	FIPS PUB 172 00,286 Fips Spatial Date Transfer Standard (SDTS); Cetegory: Soft-
Application of the Hough Trensform to Electron Diffrection Petterns.	DEh (Host end Terget), 930115S1.11309. AD-A262 720/6 00,235	were Stenderd; Subcategory: Informetion Interchenge.
PB93-153773 00,585 ERATES: A Computer Program for Celculeting Time-of-	Validation Summery Report: Digitel Equipment Corpora-	FIPS PUB 173 00,287 Federel Building Telecommunications Wiring Stendard:
Use, Block, end Demend Charges for Electricity Usege	tion, DEC Ada for Open VMS AXP Systems, Version 3.0-5, DEC 3000 Model 400 (host target), 930319S1.11315.	Cetegory: Telecommunications Standard; Subcategory:
(Version 1.0). User's Guide and Reference Manual. PB93-228658 00,384	AD-A264 885/5 00,236 Validation Summary Report: Digital Equipment Corpora-	Cables and Wiring. FIPS PUB 174 00,206
COMPUTER GRAPHICS	tion, DEC Ada for Open VMS VAX Systems, Version 3.0-	Federal Building Standard for Telecommunications Path-
Initiel Graphics Exchenge Specification (IGES). AD-A270 049/0 00,416	7, VAXstation 4000 Model 60 (host) => VAXstation 3100 Model 48 (target), 930319S1.11317.	weys end Speces; Cetegory: Telecommunications Stenderd; Subcategory: Cebles end Wiring.
Computer Graphics Metefile (CGM) Test Requirements	AD-A264 886/3 00,237	FIPS PUB 175 00,207
Document (Update). PB93-198273 00,293	Validation Summary Report: Digital Equipment Corporetion, DEC Ade for OpenVMS VAX Systems, Version 3.0-	Residential end Light Commercial Telecommunications Wiring Stenderd; Cetegory: Telecommunications Stend-
User's Guide for the Progremmer's Hierarchical Inter- ective Graphics System (PHIGS) C Binding Velidetion	7, VAXstation 4000 Model 60 (host terget), 930319S1.11316.	ard; Subcategory: Cebles end Wiring. FIPS PUB 176 00,208
Tests (Version 2).	AD-A265 014/1 00,238	Initial Graphics Exchange Specification (IGES). Category:
PB93-228617 00,268 COMPUTER GRAPHICS (GKS-CGM-PHIGS-RASTER)	Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5	Softwere Stenderd; Subcategory: Graphics and Informetion interchange.
Validated Products List (Cobol, Fortren, ADA, Pascal, C.	(/OPTIMIZE) VAX 8550/8600/8650 (Cluster) > Enhenced Processor (EP) AN/UYK-44 (Bare Board).	FiPS PUB 177 00,417 1
MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Security).	AD-A265 260/0 00,239	Video Teleconferencing Services et 56 to 1,920 KB/S. Cetegory: Telecommunications Standard end Sub-
PB93-937300 00,272	Ade Compiler Validation Summary Report. Certificate Number: 920918S1.11271, U.S. Navy AdaVAX Version	category: Video Teleconferencing. FIPS PUB 178 00,209
Government Network Manegement Profile (GNMP). Cet-	5.5 (/NO OPTIMIZE) VAXstation 4000 > VAXstetion	Government Network Management Profile (GNMP). Cat-
egory: Hardware end Software Standards. Subcategory: Computer Network Protocols.	4000. AD-A265 261/8 00,278	egory: Herdwere and Softwere Stenderds. Subcategory: Computer Network Protocols.
FIPS-PUB-179 00,248	Ada Compiler Velidation Summary Report. Certificate Number: 920805S1.11265 DDC-i, inc. DACS Sun	FIPS-PUB-179 00,248
COMPUTER NETWORKS Government Network Menegement Profile (GNMP). Cet-	SPARC/SunOs Native Ade Compiler System, Version	Secure Hash Standard. Cetegory: Computer Security. FIPS PUB 180 00,216
egory: Hardware end Softwere Standards. Subcategory: Computer Network Protocols.	4.6.1 SPARCStation 2 => SPARCStation 2. AD-A265 433/3 00,240	Automated Pessword Generetor (APG). Category: Com-
FIPS-PUB-179 00,248	Ada Compiler Velidation Summary Report. Certificate Number: 920918S1.11273 U.S. Nevy, Ada/M, Version 4.5	puter Security. FIPS PUB 181 00,217
Autometing Interective Applications in e Network Environ- ment.	(OPTIMIZE), VAX 8550/8600/8650 (Ciuster) => VHSiC	Stetus of Emerging Standerds for Removable Computer
PB93-151215 00,251	Processor Module (VPM) AN/AYK-14 (Bere Boerd). AD-A265 434/1 00,241	Storege Media end Related Contributions of NIST. N93-14778/3 00,228
Study of OSI Key Management. PB93-151579 00,220	Ade Compiler Velidation Summery Report. Certificate	Assessing Federel end Commercial information Security
Report of the NSF/NIST Workshop on NSFNET/NREN	Number: 920918S1.11274 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => En-	Needs. PB93-138956 00,218
Security. Heid on July 6-7, 1992. PB93-228682 00,225	AD-A265 435/8 AN/UYK-44 (Bare Boerd). O0,242	Using Self-Organizing Recognition as a Mechanism for
Towerds Flexible Distributed Information Retrievel. PB94-102258 00,227	Ada Compiler Validation Summary Report. Certificate	Rejecting Segmentation Errors. PB93-138972 00,250
COMPUTER PROGRAM INTEGRITY	Number: 920918S1.11275 U.S. Nevy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Ciuster) =>	Methods for Predicting Remeining Life of Concrete in
Softwere Error Analysis. PB93-200871 00,263	VHSIC Processor Module (VPM) AN/AYK-14 (Bere Board).	Structures. PB93-139020 00,180
COMPUTER PROGRAM PORTABILITY	AD-A265 437/4 00,243	Guidelines for the Evaluation of Virtuel Terminal Implementations.
Application Portability Profile (APP): The U.S. Govern- ment's Open System Environment Profile OSE/1 Version	Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11263 DDC-I, Inc. DACS MIPS RISC/	PB93-139053 00,290
2.0. PB93-216943 <i>00,264</i>	os to MIPS R3000 Bare Ada Cross Compiler System, Re- iease 2.1-16, MIPS M/120-5 => Lockheed Senders STAR	Report on the Raster Cepabilities of MiL-R-28002A end MIL-D-28003A.
COMPUTER PROGRAM VERIFICATION	MVP R3010 Board. AD-A265 600/7 00,244	PB93-140820 00,418
Benchmerk for the Verification of Microwave CAD Software.	Ada Compiler Validation Summary Report. Certificete	Detabase Management Systems in Engineering. PB93-146454 00,419
PB93-125185 00,307	Number: 920805S1.11264 DDC-I, inc. DACS DECstation/ ULTRIX to MiP R3000 Bare Ada Cross Compiler System,	Effectiveness of Feeture and Classifier Aigorithms in
COBOL Compiler Velidetion System (CCVS 85), User Guide, Version 4.2.	Releese 2.1-16 DECStation 3100 => Integreted Device Technology IDT7RS301 R3000/R3010 Board.	Cheracter Recognition Systems. PB93-147197 00,295
PB93-163178 00,254	AD-A265 601/5 00,245	Study of Traffic Control and Congestion Control in
User's Guide for the Algorithm Testing System/Version 1.1.	Ade Compiler Validation Summary Report. Certificate Number: 920918S1.11270 U.S. NAVY AdaAX, Version	Broadband ISDN. PB93-149433 00,210
PB93-175990 00,447 Deteiled Design Specification for Conformence Testing of	5.5 (/OPTIMIZE) VAXstation 4000 =Z> VAXstation 4000. AD-A265 602/3 00,246	CALS Testing: Programs, Stetus end Stretegy.
Computer Graphics Metafile (CGM) Interpreter Products.	Codes for the identification of Federel end Federally As-	PB93-151165 00,420 Autometing Interective Applications in e Network Environ-
PB93-178580 00,424 User's Gulde for the Progremmer's Hiererchical Inter-	sisted Organizations. Category: Data Standard, Representations and Codes.	ment.
User's Gulde for the Progremmer's Hiererchical Inter- ective Graphics System (PHIGS) C Binding Velidetion Tests (Version 2).	FIPS PUB 95-1 00,288	PB93-151215 00,251 Study of OSI Key Manegement.
PB93-228617 00,268	MUMPS, Massachusetts General Hospital Utility Multi- Programming System. Cetegory: Software Standard. Sub-	PB93-151579 00,220
COBOL 85 Compiler Velidetion System (CCVS 85), Version 4.2.	category: Programming Language, June 1993. FIPS PUB 125-1 00,279	Meking Materiels Datebase Standerds Internetional. PB93-151736 00,463
PB93-504918 00,270	Datebase Lenguege SQL. Category: Softwere Standerd.	Guide to the Selection of Anti-Virus Tools and Tech-
COMPUTER PROGRAMMING MUMPS, Massachusetts Generai Hospital Utility Multi-	Subcategory: Database, June 1993. FIPS PUB 127-2 00,280	niques. PB93-152049 00,221
Programming System. Category: Software Stendard. Sub- category: Programming Language, June 1993.	Computer Grephics Metafile (CGM). Category: Software	Raster Grephics: A Tutorial end Implementation Guide.
FiPS PUB 125-1 00,279	Standard. Subcategory: Graphics. Part 1. Functional Specification.	PB93-152171 00,421
COMPUTER PROGRAMS RADCAL: A Nerrow-Bend Model for Redietion Celcule-	FIPS PUB 128-1A 00,281 Computer Graphics Metafile (CGM). Category: Software	NIST EXPRESS Toolkit: Lessons Leerned. PB93-153450 00,422
tions in e Combustion Environment. PB93-200889 00.204	Standard. Subcategory: Graphics. Part 2. Character En-	Informetion Technology Standards: Processes and Strete- gies.
COMPUTER SCIENCE & TECHNOLOGY	coding. FiPS PUB 128-1B 00,282	PB93-153625 00,291
Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Pro-	Computer Graphics Metefile (CGM). Category: Softwere Stendard. Subcategory: Graphics. Part 3. Binary Encod-	Proceedings of the AP Validation Workshop, Held in Se- ettle, Washington on April 13-14, 1992. National PDES
gram Fiscal Year 1987. Volume 4.	ing.	Testbed Report Series. PB93-158715 00,423
ÅD-A261 193/7 00,414	FiPS PUB 128-1C 00,283	F 130-1307 13 00,463

CONSTRUCTION MATERIALS

Synthetic-Perturbetion Tuning of MIMD Progrems. PB93-161339 00,253	User's Guide for the Progremmer's Hiererchical Inter- ective Grephics System (PHIGS) C Binding Velidetion	Computer Systems Leboretory Annuel Report, 1992. PB93-181873 00,229
Methods for Evelueting the Performence of Systems In-	Tests (Version 2). PB93-228617 00,268	COMPUTER STORAGE DEVICES
tended to Recognize Cherecters from Image Dete Scenned from Forms.	ERATES: A Computer Program for Celculating Time-of-	Stetus of Emerging Stenderds for Removeble Computer Storege Medie end Releted Contributions of NIST.
PB93-162980 00,298	Use, Block, end Demend Cherges for Electricity Usege (Version 1.0). User's Guide end Reference Manuel.	N93-14778/3 00,228
COBOL Compiler Velidetion System (CCVS 85), User Guide, Version 4.2.	PB93-228658 00,384	COMPUTER SYSTEMS DESIGN VHSIC Herdwere Description Lenguege (VHDL); Cet-
PB93-163178 00,254	Report of the NSF/NIST Workshop on NSFNET/NREN Security. Held on July 6-7, 1992.	egory: Softwere Stenderd; Subcategory: Hardwere De-
Token Besed Access Control System for Computer Networks.	PB93-228682 00,225	scription Lenguege. IEEE Stenderd VHDL Languege Reference Menuel.
PB93-166148 00,222	Opereting Principles of the VME MultiKron Interface Board.	FIPS PUB 172 00,286
Steble Implementation Agreements for Open Systems Interconnection Protocols. Version 6, Edition 1, December	PB93-234730 00,230	COMPUTER SYSTEMS HARDWARE Operating Principles of the VME MultiKron Interface
1992. Based on the Proceedings of the OSE	COBOL 85 Compiler Velidetion System (CCVS 85), Version 4.2.	Board. PB93-234730 00,230
Implementors' Workshop (OIW). PB93-166809 00,292	PB93-504918 00,270	COMPUTER SYSTEMS PROGRAMS
North American ISDN (Integreted Services Digitel Net-	Velidated Products List (Cobol, Fortren, ADA, Pascal, C,	Velidetion Testing System: Reusable Software Component Design. National PDES Testbed Report Series.
work) Users' Forum Agreements on ISDN. PB93-173391 00,211	MUMPS, SQL, Grephics, GOSIP, POSIX, Computer Security).	PB94-109220 00,427
DARPA TIMIT Acoustic-Phonetic Continous Speech Cor-	PB93-937300 00,272	COMPUTER VIRUSES
pus CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215	Private Branch Exchange (PBX) Security Guideline. PB94-100880 00,212	Guide to the Selection of Anti-Virus Tools and Techniques.
Initial Graphics Exchange Specification Hybrid Micro-	Towards SQL Database Langauge Extensions for Geo-	PB93-152049 00,221
circuit Application Protocol. PB93-175404 00,361	graphic Information Systems. PB94-101847 00,411	COMPUTER VISION Binocular Spherical Disparity: A Study in Representation
User's Guide for the Algorithm Testing System/Version	Workshop on Security Procedures for the Interchange of	for a Forward Translating Camera. PB93-184422 00.301
1.1. PB93-175990 00,447	Electronic Documents: Selected Pepers end Results. PB94-101854 00,226	COMPUTERIZED SIMULATION
International Survey of Industrial Applications of Formal	Towards Flexible Distributed Information Retrieval.	Comparison of Full Scale Fire Tests and a Computer Fire
Methods. Volume 1. Purpose, Approach, Analysis, end Conclusions.	PB94-102258 00,227	Model of Several Smoke Ejection Experiments. PB93-139087 00,551
PB93-178556 00,255	NIST Scoring Package Cross-Reterence for Use with NIST Internal Reports 4950 end 5129.	Computer Modelling of Cement-Based Materials.
International Survey of Industrial Applications of Formal Methods. Volume 2. Case Studies.	PB94-103702 00,305	PB93-153161 00,063 Optimizing Complex Kinetics Experiments Using Least-
PB93-178564 00,256	Security Issues in the Datebese Lenguage SQL. PB94-104585 00,273	Squares Methods.
Using Synthetic-Perturbation Techniques for Tuning Shared Memory Programs.	Velidetion Testing System: Reuseble Softwere Compo-	PB93-196244 00,167 Computational Materials Science of Cement-Based Mate-
PB93-178572 00,257	nent Design. Netional PDES Testbed Report Series. PB94-109220 00,427	riels: An Education Module.
Detailed Design Specification for Contormance Testing of Computer Graphics Metafile (CGM) Interpreter Products.	Computational Materials Science of Cement-Based Mate-	PB94-111424 00,188
PB93-178580 00,424	rials: An Education Module. PB94-111424 00,188	Zone Fire Modeling with Natural Building Flows and a Zero Order Shaft Model.
Horizontal Nucleate Flow Boiling Heat Transfer Coeffi-	Reterence Model tor Frameworks of Software Engineer-	PB94-112166 00,030
cient Meesurements and Visual Observations for R12, R134a, end R134a/Ester Lubricant Mixtures.	ing Environments (Technical Report ECMA TR/55, 3rd Edition).	COMPUTERS Computer Systems Laboratory Annual Report, 1992.
PB93-178598 00,493	PB94-112497 00,274	PB93-181873 00,229
Data Probe User's Guide. National PDES Testbed Report Series.	SGML DTD for the STEP Integreted Resource Parts. National PDES Testbed Report Series.	CONCENTRATING Multi-Point Calibration of a Gas Chromatograph Using
PB93-178655 00,425	PB94-114501 00,428	Cryogenic Preconcentration of e Single Gas Standard
Computer Systems Leboratory Annual Report, 1992. PB93-181873 00,229	Comparison of Handprinted Digit Classifiers. PB94-118213 00,306	Containing Volatile Organic Compounds. PB93-151686 00,100
Programmer's Reference Guide to FDMS File Formats.	FORTRAN Compiler Validation System 1978. User's	CONCRETE DURABILITY
PB93-182038 00,201 Manual tor Data Administration.	Guide, Version 2.1. PB94-118460 00,275	Analysis of the Aggregate-Cement Paste Interface Using Grazing Incidence X-ray Scattering.
PB93-182053 00,258	Shtolo-Converting STEP Short Listings to Annotated List-	PB93-125904 00,179
Comparative Performance of Classification Methods for Fingerprints.	ings. National PDES Testbed Report Series. PB94-120623 00,435	Methods for Predicting Remelning Life of Concrete in Structures.
PB93-184273 00,300	NIST EXPRESS Toolkit: Introduction end Overview. Na-	PB93-139020 00,180
Minimum Security Requirements for Multi-User Operating	tionel PDES Testbed Report Series. PB94-120664 00,436	Calculating Cement Paste end Mortar Diffusivity from Conductivity Measurements: Preliminery Results of a
Systems. PB93-185999 00,223	Exppp: An EXPRESS Pretty Printer. National PDES	New Method. PB94-112802 00,189
NIST Scoring Package Certification Procedures in Con-	Testbed Report Series.	CONCRETE STRUCTURES
junction with NIST Speciel Detabases 2 and 6. PB93-188126 00,302	PB94-120797 00,276 Integrated Services Digital Network Conformence Testing.	Methods for Predicting Remaining Life of Concrete in
Guide to Voice Privacy Equipment for Law Enforcement	Leyer 2, Dete Link Layer (LAPD). Part 1, Basic Rate	Structures. PB93-139020 00,180
Radio Communications Systems. PB93-189827 00,701	Interface, User Side. PB94-120920 00,213	Impact-Echo Response of Pletes Containing Thin Layers
First Text REtrievel Conterence (TREC-1).	COMPUTER SECURITY	end Voids. PB93-153815 00,181
PB93-191641 00,262 Computer Graphics Metalila (CGM) Test Requirements	Secure Hash Standard. Category: Computer Security. FIPS PUB 180 00,216	CONCRETES
Computer Graphics Metafile (CGM) Test Requirements Document (Update).	Automated Tools for Testing Computer System Vulner-	Computer Modelling of Cement-Based Materials. PB93-153161 00,063
PB93-198273 00,293	ability. PB93-146025 00,219	Experimentel and Simulation Studies of the Interfacial
Discherge of Fire Suppression Agents from a Pressurized Vessel: A Mathematical Model and Its Application to Ex-	Study of OSI Key Menegement.	Zone in Concrete. PB93-153179 00,064
perimental Design. PB93-198927 00,044	PB93-151579 00,220	Highway Concrete (HWYCON) Expert System Require-
Software Error Analysis.	Token Besed Access Control System for Computer Net- works.	ments end Installetion Guide. PB93-198885 00.187
PB93-200871 00,263	PB93-166148 00,222	CONDUCTION
Dictionery Production for Census Form Conference. PB93-207959 00,304	Minimum Security Requirements for Multi-User Operating Systems.	Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem.
Requirements for an Application Protocol Development	PB93-185999 00,223	PB93-124865 00,555
Environment. National PDES Testbed Report Series. PB93-208114 00,426	Report of the NSF/NIST Workshop on NSFNET/NREN Security. Held on July 6-7, 1992.	CONDUCTIVITY
Application Portability Protile (APP): The U.S. Govern-	PB93-228682 00,225	Calculating Cement Paste end Montar Diffusivity from Conductivity Measurements: Preliminary Results of e
ment's Open System Environment Protile OSE/1 Version 2.0.	Workshop on Security Procedures for the Interchange of Electronic Documents: Selected Pepers and Results.	New Method. PB94-112802 00,189
PB93-216943 00,264	PB94-101854 00,226	CONSTRUCTION JOINTS
Fracture Mechanics Evaluation of Railroad Tank Cars Conteining Postulated Circumferential Cracks.	COMPUTER SECURITY (DES-MAC-KEY MANAGEMENT) Validated Products List (Cobol, Fortran, ADA, Pescal, C,	Performance of 1/3-Scale Model Precast Concrete Beam-
PB93-219731 00,486	MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Se-	Column Connections Subjected to Cyclic Inelastic Loads. Report No. 3.
NIST EXPRESS Toolkit: Requirements for Improvements. National PDES Testbed Report Series.	curity). PB93-937300 00,272	PB94-101813 00,085 Overview of NIST Research on Seismic Performance of
PB93-220838 00,265	COMPUTER SOFTWARE	Overview of NIST Research on Seismic Performance of Moment Resisting Precast Concrete Beem-Column Joints
NIST EXPRESS Toolkit: Updating Existing Applications. Netionel PDES Testbed Report Series.	Towerd en Intelligent System for Methematical Software Selection.	Containing Post-Ťensioning. PB94-103686 00,086
PB93-220846 00,266	PB93-124832 00,506	CONSTRUCTION MATERIALS
NIST EXPRESS Toolkit: Using Applications. National PDES Testbed Report Series.	User's Guide for the Algorithm Testing System/Version 1.1.	Controlling Moisture in the Roof Cavities of Manufactured Housing.
PB93-220853 00,267	PB93-175990 00,447	PB93-139046 00,052

Water Vapor Permeability Measurements of Common Bullding Materials. PB93-153229 00,065	National Institute of Standards and Technology Con- ference on Reducing the Cost of Space Infrastructure and Operations. Part 1. Oral Presentations and Discussion.	Computation of Complex Solidification Morphologies Using a Phase-Field Model. PB93-156743 00,671
Water Vapor Sorption Measurements of Common Build- ing Materials.	Held in Gaithersburg, Maryland on November 20-22, 1989.	Protein Crystal Growth of Ribonuclease A and Pancreatic Trypsin Inhibitor Aboard the Maser 3 Rocket.
PB93-153674 00,068	PB94-111374 00,699 National Institute of Standards and Technology Con-	PB93-166122 00,524
Experimental Validation of a Mathematical Model for Predicting Water Vapor Sorption at Interior Building Surfaces. PB93-166403 00,070	ference on Reducing the Cost of Space Infrastructure and Operations. Part 2. Topical Papers. Held in Gaithersburg, Maryland on November 20-22, 1989.	Morphological Instability In Phase-Field Models of Solidification. PB94-111523 00,691
MOIST: A PC Program for Predicting Heat and Moisture Transfer in Building Envelopes. Release 2.0.	PB94-113487 00,696	CRYSTAL-PHASE TRANSFORMATIONS Structural Phase Transition Studies of High Tc
PB94-112448 00,078	COSTS Computer Program for Calculating Time-of-Use, Block,	Superconducting Materials. PB93-151942 00,660
Balanced Design Concepts Workshop. Held in	and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcomputers).	CRYSTAL STRUCTURE
Gaithersburg, Maryland on June 30-July 2, 1993. PB94-108388 00,028	PB94-500097 00,385 COVERMETERS	Accuracy in Powder Diffraction II. Proceedings of the International Conference. Held in Gaithersburg, Maryland
CONTINUOUS MINING MACHINE Intelligent Control System for a Cutting Operation of a	Performance of Electromagnetic Covermeters for Non- destructive Assessment of Steel Reinforcement.	on May 26-29, 1992. PB93-141737 00,648
Continuous Mining Machine. PB93-178622 00,544	PB93-178630 <i>00,186</i>	Critical Compilation of Surface Structures Determined by Surface Extended X-ray Absorption Fine Structure
CONTROL EQUIPMENT	CRACKING (FRACTURING) Molecular Wedge in a Brittle Crack: A Simulation of Mica	(SEXAFS) and Surface Extended Electron Energy Loss Spectroscopy (SEELFS).
Intelligent Control System for a Cutting Operation of a Continuous Mining Machine. PB93-178622 00,544	Water. PB93-166411 00,541	PB93-148971 00,128
PB93-178622 00,544 CONTROL SYSTEMS	Fracture Mechanics Evaluation of Railroad Tank Cars Containing Postulated Circumferential Cracks.	13C NMR Studies of Polymorphy in Isotactic Polystyrene. PB93-166536 00,178
Development of a Fast-Response Variable-Amplitude Programmable Reaction Control System.	PB93-219731 · 00,486	CRYSTALLOGRAPHY Solidification Processing and Phase Transformations in
PB93-158731 00,459 CONVECTION	CREEP TESTS Tensile Creep Testing of Structural Ceramics.	Ordered High Temperature Alloys. AD-A261 751/2 00,494
Effect of Gravity Modulation on Thermosolutal Convec-	PB93-166619 00,472 CRIBS	Exponential Density: Exact Fitting of Structure Moduli by Entropy Maximization.
tion. N94-10103/7 00,620	Sprinkler Fire Suppression Algorithm for HAZARD. PB94-103678 00,046	PB93-125128 00,122
Combined Buoyancy- and Pressure-Driven Flow through a Horizontal Vent: Theoretical Considerations.	CRITICAL CURRENT	CRYSTALS Intrinsically Colored Microcrystalline Glass-Ceramic for
PB94-103694 00,077	Critical-Current Degradation In Nb3Sn Composite Wires Due to Locally Concentrated Transverse Stress.	Use in Dental Restoration. PB93-150837 00,018
Transient Cooling of a Hot Surface by Droplets Evapo-	PB93-153211 00,344	CURING
ration. Final Report, November 1990. PB93-189421 00,609	Comparison of Transport Critical Current Measurement Methods. PB93-153369 00,666	Applicability of the Maturity Method to High-Performance Concrete.
COOLING LOAD Experimental Evaluation of Lighting/HVAC Interaction.	CRITICAL POINT	PB93-157451 00,182 CURRENT SOURCES
PB93-166437 00,038	Critical Parameters and Saturation Densities of 1,1- Dichloro-2,2,2-Trifluoroethane.	NMR Based Current/Voltage Source. PB93-151173 00,331
Measurement of the Performance of a Spiral Wound	PB93-166593 00,492 CROSS-LINKING REAGENTS	Flux Locked Current Source Reference. PB93-151819 00,334
Polyimide Regenerator in a Pulse Tube Refrigerator. PB93-153658 00,111	DNA-Protein Cross-Linking between Thymine and Tyro-	CURVE FITTING
COORDINATE MEASURING MACHINES Comparison of National Standards for the Performance	sine in Chromatin of Gamma-Irradiated or H2O2-Treated Cultured Human Cells.	Observations About Joined Circular Arcs. PB93-234714 00,510
Evaluation of Coordinate Measuring Machines in Terms of Length-Based Dimensional Quantities.	PB93-151587 00,522 CROSS-REFERENCE	CUTTING TOOLS
PB93-139004 00,458 Issues, Concepts, and Standard Techniques in Assessing	NIST Scoring Package Cross-Reference for Use with NIST Internal Reports 4950 and 5129.	Real-time compensation for tool form errors in turning using computer vision. DE93010922 00,457
Accuracy of Coordinate Measuring Machines. PB93-184331 00,448	PB94-103702 00,305 CROSS SECTIONS	CYCLIC LOADS
COPOLYMERS	Assessment of the Role of Charged Secondaries from	Performance of 1/3-Scale Model Precast Concrete Beam- Column Connections Subjected to Cyclic Inelastic Loads.
Chain Conformation of Block Copolymers In Dilute Solutions Measured by Small-Angle Neutron Scattering.	Nonelastic Nuclear Interactions by Therapy Proton Beams in Water.	Report No. 3. PB94-101813 00,085
PB93-151272 00,170 COPPER ALLOYS	PB93-219772 00,538 CRUDE OIL	DAMAGE Hall Resistance of Roofing Products.
Electrical Resistivity of Copper Alloys between 76 K and 300 K.	Smoke Plume Trajectory from In situ Bumlng of Crude Oil In Alaska.	AD-A956 270/3 00,049
PB93-151827 00,311	PB94-114519 00,393 CRYOGENIC EQUIPMENT	DATA ADMINISTRATION Manual for Data Administration.
COPPER COMPOUNDS Reduction of Hydrogen Cyanide Concentrations and	Low Temperature Magnetic Behavior of 'Nonmagnetic' Materials.	PB93-182053 00,258 DATA ANALYSIS
Acute Inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper	PB93-150795 00,309	PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis (Documentation).
Compounds. Part IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and	CRYOGENIC PRECONCENTRATION Multi-Point Calibration of a Gas Chromatograph Using	PB93-111656 00,249
Toxicity from Flexible Polyurethane Foam with and without Copper Compounds.	Cryogenic Preconcentration of a Single Gas Standard Containing Volatile Organic Compounds.	PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Micro-
PB93-139103 00,053 COPPER OXIDES	PB93-151686 00,100 CRYOGENICS	computers). PB93-500437 00,269
Phase Equilibria and Crystal Chemistry In Portions of the System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phase	Multi-Point Calibration of a Gas Chromatograph Using Cryogenic Preconcentration of a Single Gas Standard	DATA BASE MANAGEMENT SYSTEMS Database Management Systems In Engineering.
Diagrams for the Temary Systems of SrO-Bi2Ó3-CuO, CaO-Bi2O3-CuO and SrO-CaO-Bi2O3.	Containing Volatile Organic Compounds. PB93-151686 00,100	PB93-146454 00,419 Security Issues in the Database Language SQL.
PB93-153732 00,469 Phase Equilibria and Crystal Chemistry in Portions of the	Measurement of the Performance of a Spiral Wound	PB94-104585 00,273
System SrO-CaO-Bi2O3-CuO. Part 4. The System CaO-Bi2O3-CuO.	Polyimide Regenerator in a Pulse Tube Refrigerator. PB93-153658 00,111	DATA BASES Making Materials Database Standards International.
PB94-108552 00,475	Aluminum Alloys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-	PB93-151736 00,463 Machine-Assisted Human Classification of Segmented
Study of Fire Induced Flow along the Vertical Corner	Li Alloys and Alloy 2219. PB93-173441 00,501	Characters for Optical Character Recognition Testing and Training.
Wall. Part 2. PB93-205623 00,074	Cryogenic Mechanical Testing of Al-LI Alloys at NIST.	PB93-152155 00,296
CORONA DISCHARGES	PB93-228633 00,502 CRYSTAL CHEMISTRY	Cross Validation Comparison of NIST OCR Databases. PB93-159077 00,297
Detection of S2F10 Produced by Electrical Discharge in SF6.	Phase Equilibria and Crystal Chemistry in Portions of the System Sro-CaO-Bi2O3-CuO. Part 4. The System CaO-	NIST Standard Reference Data Products Catalog, 1993. PB93-173409 00,163
PB93-166528 00,596 CORRECTIONAL INSTITUTIONS	Bi2O3-CuO. PB94-108552 00,475	Programmer's Reference Guide to FDMS File Formats.
Test Methods for Detention and Correctional Facility Locks.	CRYSTAL DEFECTS	PB93-182038 00,201 Elastic Scattering of Electrons and Positrons by Atoms:
PB93-139111 00,054 CORRIDORS	Crystallographic Defects In Polymers and What They Do. PB93-151678 00,173	Database ELAST. PB93-207512 00,614
Smoke Movement in a Corndor-Hybrid Model, Simple Model and Comparison with Experiments.	CRYSTAL GROWTH	Databases Available in the Research Information Center of the National Institute of Standards and Technology.
PB93-146678 00,057	Thermodynamically-Consistent Phase-Field Models for Solidification. PB93-139012 00,646	PB94-114568 00,412
COST ENGINEERING UNIFORMAT II: A Recommended Classification for Build-	Asymptotic Behavior of Modulated Taylor-Couette Flows	DATA MANAGEMENT Data Management Standards In Computer-Aided Acquisi-
ing Elements and Related Sitework. PB93-146017 00,034	with a Crystalline Inner Cylinder. PB93-139061 00,647	tion and Logistic Support (CALS). N93-27714/3 00,289

DMIS (DIMENSIONAL MEASURING INTERFACE STANDARD)

Manual for Data Administration. PB93-182053 00,258	Rasidual Strass in a Porcelain-Metal Strip Ralatad to Thermo-Physical Properties of Materials.	DIFFUSION Experimental Validation of a Mathamatical Modal for Pra-
DATA PROBE COMPUTER PROGRAM	PB93-151801 00,022	dicting Water Vepor Sorption at Interior Building Surfaces. PB93-166403 00,070
Date Probe User's Guide. National PDES Testbed Report Series.	Effects of Magnesium and Fluoride on the Hydrolysis of Octacalcium Phosphate.	DIFFUSION COEFFICIENT
PB93-178655 00,425	PB93-151835 00,023	Polymar Salf-Diffusion in Nal-Poly(athylana oxida) Electrolytes.
DATA PROCESSING Computer Grephics Metafile (CGM). Category: Softwara	Properties and Interactions of Oral Structuras and Restor- etive Materials. Annual Report for Period October 1, 1991	PB93-151959 00,175
Standard. Subcategory: Graphics. Part 1. Functional Specification.	to Saptamber 30, 1992. PB93-198836 00,024	DIFFUSION FLAMES Extinguishment of Combustible Porous Solids by Walar
FIPS PUB 128-1A 00,281	Clinical Trial of an Adhesive Material. PB94-109329 00.528	Droplets.
Computer Graphics Metafile (CGM). Category: Softwara Standard. Subcategory: Graphics. Part 2. Character En-	PB94-109329 00,528 DENTISTRY	PB93-198893 00,203 DIFFUSIVITY
coding. FIPS PUB 128-1B 00,282	Effect of a Two-Solution Fluoride Mouth Rinse on Ramineralization of Enamel Lesions In vitro.	Calculating Cement Paste and Mortar Diffusivity from
Computer Graphics Metafile (CGM). Category: Software	PB93-150738 00,526	Conductivity Measurements: Preliminary Results of a New Method.
Standerd. Subcatagory: Graphics. Part 3. Binery Encoding.	In vivo Fluorida Concantrations Measured for Two Hours Aftar a NaF or a Noval Two-Solution Rinse.	PB94-112802 00,189 DIMENSIONAL MEASUREMENT
ing. FIPS PUB 128-1C 00,283	PB93-151868 00,527	Naw Tasl Structura for tha Elactrical Maasuramant of the
Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Military Specification.	DEOXYRIBONUCLEIC ACIDS Binding of Cis-(1,2-Diaminocyclohexane)Platinum(II) and	Width of Short Faaturas with Arbitrerily Wide Voltega Taps.
Digital Raprasantation for Communication of Illustration Date: CGM Application Profile.	Its Derivatives to Duplex DNA. PB93-125870 00.531	PB93-124782 00,349 Comparison of National Standards for the Performence
FIPS PUB 128-1E 00,285	DEPARTMENT OF ENERGY	Eveluation of Coordinate Measuring Machines in Tarms
DATA PROCESSING SECURITY Assassing Faderal and Commarcial Information Sacurity	Enargy Ralatad Invantions Program. Stetus Report for	of Length-Based Dimanslonal Quantitias. PB93-139004 00,458
Needs. PB93-138956 00,218	Racommendations 351 through 602. PB94-111853 00,373	NIST Length Scala Interfaromalar Maasurament Assur-
Sacurity Issues in the Database Language SQL.	Energy Related Inventions Program. Status Report for Recommendations 1 Ihrough 350.	ance. PB93-146645 00,401
PB94-104585 00,273 DATA STORAGE	PB94-111903 00,374	Issues, Concepts, end Stenderd Techniques in Assessing Accuracy of Coordinate Measuring Machinas.
Status of Emerging Standards for Ramovabla Computer	DEPTH DOSE DISTRIBUTION Penatration of Proton Baams through Walar. 1. Dapth-	PB93-184331 00,448
Storaga Madia and Ralated Contributions of NIST. N93-14778/3 00,228	Dose Distribution, Spactra and LET Distribution.	Measuremant Uncerteinty Considerations for Coordinate Measuring Mechines.
DATA TRANSFER (COMPUTERS)	PB93-219749 00,537 DEPTH PROFILES	PB93-189819 00,449
Spatial Data Transfar Standard (SDTS); Catagory: Softwara Standard; Subcatagory: Information Interchanga.	Neutron Depth Profiling: Ovarviaw and Dascription of	Optical Fibar Gaomatry: Accurate Measurement of Clad- ding Diameter.
FIPS PUB 173 00,287	NIST Facilitias. PB93-166890 00,686	PB93-196269 00,632
Prototype Application Protocol for Ready-to-Wear Pettarn Making.	DERMATOGLYPHICS	Dimensionel Inspection Plenning Based on Product Dale Standards. National PDES Tastbed Raport Sarias.
PB93-158665 00,430	Comparativa Performence of Classification Methods for Fingerprints.	PB93-198455 00,450
DATA TRANSMISSION Electronic Dete Interchenga (EDI): Cetegory: Softwara	PB93-184273 00,300 DESIGN CRITERIA	Bibliography of Screw Threed Meesurement. PB94-101821 00,460
Slandard; Subcatagory: Elactronic Data Interchanga. FIPS PUB 161-1 00,247	Intarim Criterie for Polymer-Modified Bituminous Roofing	X-ray Lithography Mask Matrology: Usa of Transmittad Electrons in en SEM for Linawidth Maasuramenl.
Study of Traffic Control end Congestion Control In	Membrane Materials: A Summery Raport. PB93-153724 00,069	PB94-108537 00,370
Broadband ISDN. PB93-149433 00,210	DESIGN STANDARDS	DIPOLE ANTENNAS New Spherical Dipole Source.
DATABASE LANGUAGES	Envalope Design Guidelines for Federal Offica Buildings: Thermal Integrity end Airtightnass.	PB93-153419 00,325
Towards SQL Databasa Langauge Extensions for Geo- graphic Information Systems.	PB93-183770 00,376	DIPOLE MOMENTS Maasuramant of the Dipole Moment of Gaseous 1,1,1-
PB94-101847 00,411	Litereture Reviaw of Lighting Standards. PB93-208445 00,041	trichlorotrifluoroethane, 1,2-difluoroethane, 1,1,2-trichlorotrifluoroethene, and 2-(difluoromethoxy)-1,1,1-
ADACS. An Automated System for Part Finishing.	DESUPERHEATERS	trifluoroethana.
PB93-199164 00,433 DECOMPOSITION REACTIONS	Parformanca of a Residential Desuperheater. PB93-153302 00,036	PB93-150852 00,139 DIRECTIONAL SOLIDIFICATION (CRYSTALS)
Effacts of Prassura on the Thermal Decomposition Kinet-	DETERIORATION Observations from a Field Study of the Bedemanse of	Effect of Gravity Modulation on Tharmosolutal Convec-
lcs, Chamical Reactivity end Phase Bahavior of RDX. PB93-125888 00,553	Observations from a Fiald Sludy of the Parformance of Polymer-Modified Bituman Roofing.	tion. N94-10103/7 00,620
Singla Pulsa Shock Tube Studies on the Thermal Decom-	PB93-146686 00,058 Graphical Malhods for Examining the Effects of Acid Rein	Effact of Gravitational Modulation on Convaction In Vartical Bridgman Growth.
position of n-Butyl Phenyl Ether, n-Pantylbenzana and Phanotola and tha Haat of Formation of Phanoxy and	and Sulfur Dioxide on Carbonala Slonas.	N94-10178/9 00,495
Banzyl Radicals. PB93-166577 00,162	PB93-151249 00,060 DETONATION	Pulsatila Instability In Rapid Diractional Solidification: Strongly-Nonlinaer Anelysts.
DEFECTS	Moleculer Dynamical Studias of Enargy Transport and Energy Sharing in Moleculer Dissocietion.	N94-10188/8 00,641
Cathodoluminescence Imaging and Spectroscopy of CVD Diamond in e Scanning Elactron Microscope.	PB93-166452 00,159	DIRECTORIES National Voluntary Laboratory Accreditation Program
PB93-153708 00,464 DEFLECTIONS	DEUTERATION Elastic end Inelastic Neutron Scattering Study of Hydro-	1993 Directory. PB93-156644 00,402
Maasuramant of Structural Deflactions.	geneted end Deutarated Trimathylammonium Pillared	Stata Walghts and Maasuras Laboratorias: Stata Stand-
PB93-125664 00,080 DEMAGNETIZATION	Vermiculila Clays. PB93-125169 00,124	ards Program Dascription and Directory. 1993 Edition. PB93-217529 00,451
Demagnatizing Factors.	DIALECTS DARRA TIMIT Acquestic Phonesic Continuous Second Con-	DISPERSING
PB93-153344 00,664 DENDRITIC CRYSTALS	DARPA TIMIT Acoustic-Phonatic Continuus Spaech Corpus CD-ROM. NIST Spaech Disc 1-1.1.	Smoke Plume Trajectory from In situ Bumlng of Cruda Oil in Alaska.
Computetion of Complex Solidification Morphologias	PB93-173938 00,215 DIAMOND FILMS	PB94-114519 00,393
Using a Phase-Field Model. PB93-156743 00,671	Cathodoluminascanca Imaging and Spectroscopy of CVD	DISSOCIATION Moleculer Dynemical Studies of Enargy Transport end
DENSITY (MASS/VOLUME)	Diamond in e Scanning Electron Microscope. PB93-153708 00,464	Enargy Sharing in Molacular Dissociation. PB93-166452 00,159
Critical Peramaters and Saturetion Dansities of 1,1- Dichloro-2,2,2-Trifluoroethana.	DIAMONDS	DISSOCIATION ENERGY
PB93-166593 00,492	Workshop on Charecterizing Diamond Films II. Held in Gaithersburg, MD. on Fabruary 24-25, 1993.	Pradiction of Cerbon-Hydrogan Bond Dissocietion Enar- gies for Polycyclic Arometic Hydrocarbons of Arbitrary
Clinical Use of Beta-Quertz Glass-Ceremic Inserts.	PB93-207157 00,687 DIELECTRIC MEASUREMENTS	Šiza. PB93-166205 00,155
PB93-150761 00,017 Intrinsicelly Colored Microcrystallina Glass-Caramic for	Shialded Open-Circuited Semple Holders for Dielectric	DISTRIBUTED IMPLEMENTATION GENERATOR
Usa in Dantal Rastoration.	and Megnetic Maasurements of Liquids and Powders. PB93-198851 00,319	Distributed Implementation Generator: An Ovarviaw and Usar Guida.
PB93-150837 00,018 Infrared Spactroscopic Study of Cement Formation of	DIELECTRIC PROPERTIES	PB93-183465 00,259
Polymaric Calcium Phosphate Cement. PB93-151298 00.019	Measurement of the Dipole Moment of Gasaous 1,1,1- trichlorotrifluoroethana, 1,2-difluoroethane, 1,1,2-	Cheracterization of a Distribution Function by the Second
Chemical Changa of Hardenad PCA/CPC Cemants in	trichlorotrifluoroethana, and 2-(difluoromethoxy)-1,1,1- trifluoroethana.	Moment of the Residuel Life. PB93-125193 00,511
Verious Storing Solutions. PB93-151306 00,020	PB93-150852 00,139	DMIS (DIMENSIONAL MEASURING INTERFACE
	DIECEI EUELC	
Synthesis and Eveluetion of Novel Multifunctional	DIESEL FUELS Comparison of Full Scale Fire Tasts and a Computar Fira	STANDARD) Dimensional Inspection Plenning Besed on Product Data
Synthesis and Eveluetion of Novel Multifunctional Oligomars for Dantistry. PB93-151777 00,021		STANDARD)

DNA DAMAGE	EARTHQUAKES	Automated AC Bridge for Resistance Measurements.
DNA Base Modifications Induced in Isolated Human Chromatin by NADH Dehydrogenase-Catalyzed Reduc-	Estimating Soil Parameters Important for Lifeline Siting Using System Identification Techniques.	PB93-151132 00,330
tion of Doxorubicin.	PB93-178606 00,193	Re-Examination of Quantum Hall Plateaus. PB93-151850 00,658
PB93-150670 00,520	Procedures for Selecting Earthquake Ground Motions at Rock Sites (Revised).	Semiconductor Measurement Technology: A Collection of
DNA Base Damage in Chromatin of Gamma-Irradiated Cultured Human Cells.	PB93-185973 00,542	Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations,
PB93-151314 00,521	ECONOMIC GROWTH	RESPAC.
DNA-Protein Cross-Linking between Thymlne and Tyro-	Technology for Economic Growth: President's Progress Report.	PB93-219806 00,366
sine in Chromatin of Gamma-Irradiated or H2O2-Treated Cultured Human Cells.	PB94-107430 00,001	ELECTRICAL RESISTIVITY Electrical Resistivity of Copper Alloys between 76 K and
PB93-151587 00,522	EDDY CURRENT TESTS	300 K.
DNA Base Modifications in Chromatin of Human Can-	Performance of Electromagnetic Covermeters for Non- destructive Assessment of Steel Reinforcement.	PB93-151827 00,311
cerous Tissues. PB93-153559 00,523	PB93-178630 00,186	ELECTROCHEMISTRY
DOCUMENTS	EDI (ELECTRONIC DATA EXCHANGE)	Non-Linear Effects of Periodic Electric Fields on Membrane Protein.
SGML DTD for the STEP Integrated Resource Parts. Na-	Electronic Data Interchange (EDI): Category: Software Standard; Subcategory: Electronic Data Interchange.	PB93-153682 00,529
tional PDES Testbed Report Series. PB94-114501 00,428	FIPS PUB 161-1 00,247	ELECTRODES
DOORS	EDI (ELECTRONIC DATA INTERCHANGE)	Observation of Photon Correlations in Scattering from a Silver Electrode.
Feeling a Door to See if Fire Is on the Other Side.	Workshop on Security Procedures for the Interchange of Electronic Documents: Selected Papers and Results.	PB93-150829 00,115
PB93-153252 00,066	PB94-101854 00,226	ELECTROFORMING
DOSIMETERS Measurement of the Energy Response of Superheated	EDUCATION	Comparison between Precision Roughness Master Specimens and Their Electroformed Replicas.
Drop Neutron Detectors.	Computational Materials Science of Cement-Based Materials: An Education Module.	PB93-166163 00,438
PB93-166049 00,547	PB94-111424 00,188	ELECTROLYTES
DOUBLE VARIATION TECHNIQUE	ELECTRIC BRIDGES	Polymer Self-Diffusion in Nal-Poly(ethylene oxide) Electrolytes.
Accuracy of the Double Variation Technique of Refractive index Measurement.	Binary Inductive Voltage Divider Bridge. PB93-150688 00,328	PB93-151959 00,175
PB93-143964 00,624	ELECTRIC CORONA	ELECTROMAGNETIC COMPATIBILITY
DOXORUBICIN	Partial Discharge Pulse-Height Analysis: Promises and	Comparison Measurements of Currents Induced by Radiation and Injection.
DNA Base Modifications Induced in Isolated Human Chromatin by NADH Dehydrogenase-Catalyzed Reduc-	Limitations. PB93-151843 00,312	PB93-153138 00,314
tion of Doxorubicin.	ELECTRIC DISCHARGES	Reverberating Asymmetric TEM Cell for Radiated EMC/V
PB93-150670 00,520	System for Measuring Conditional Amplitude, Phase, or	and SE Testing, 10 kHz - 18 GHz. PB93-153278 00,315
DRIFT	Time Distributions of Pulsating Phenomena. PB93-143931 00,308	Selected EMC Standards and Regulations: A Summary.
Drift Eliminating Designs for Non-Simultaneous Comparison Calibrations.	Partial Discharge Pulse-Height Analysis: Promises and	PB93-220002 00,639
PB93-196277 00,405	Limitations.	ELECTROMAGNETIC FIELDS
DROPLETS	PB93-151843 00,312	Logarithmic Terms in Fields Near the Edge of a Dielectric
Particulate and droplet diagnostics in spray combustion. Annual report.	Detection of S2F10 Produced by Electrical Discharge in SF6.	Wedge. PB93-125706 00,638
DE93003631 00,195	PB93-166528 00,596	Bibliography of the NIST Electromagnetic Fields Division
Particulate and droplet diagnostics in spray combustion.	Research for Electric Energy Systems: An Annual Report,	Publications. PB94-112547 00.322
Annual report. DE93003632 00,196	October 1993. PB94-112182 00,375	PB94-112547 00,322 ELECTROMAGNETIC METROLOGY
Estimation of droplet collision frequency in a spray.	ELECTRIC FIELDS	Benchmark for the Verification of Microwave CAD Soft-
DE93007991 00,619	Optimized Thermo-Optic Electric-Fleld Probes for Micro-	ware.
Transient Cooling of a Hot Surface by Droplets Evapo-	waves and Millimeter Waves. PB93-153641 00,318	PB93-125185 00,307
ration. Final Report, November 1990. PB93-189421 00,609	Non-Linear Effects of Periodic Electric Fields on Mem-	Comments on 'Rapid Pulsed Microwave Propagation'. PB93-125631 00,637
DROPS (LIQUIDS)	brane Protein.	Reciprocity Relations for On-Wafer Power Measurement.
Experimental Study of Multiple Droplet Evaporative Cool-	PB93-153682 00,529	PB93-125649 00,350
ing.	Kinetics of a Multistate Enzyme in a Large Oscillating Field.	NIST Measurement Service for DC Standard Resistors. PB93-139079 00,347
PB93-198463 00,613	PB93-153690 <i>00,516</i>	PB93-139079 00,347 High Power CW Wattmeter Calibration at NIST.
DTD (DOCUMENT TYPE DEFINITION) SGML DTD for the STEP Integrated Resource Parts. Na-	Charge-Field Interactions in Cell Membranes and Electroconformational Coupling: Transduction of Electric	PB93-143949 00,327
tional PDES Testbed Report Series.	Energy by Membrane ATPases.	Binary Inductive Voltage Divider Bridge.
PB94-114501 00,428	PB93-166486 00,535	PB93-150688 00,328
DYNAMIC STRUCTURAL ANALYSIS Strengthening Methodology for Lightly Reinforced Con-	Response of Living Cells to Very Weak Electric Fields: The Thermal Noise Limit.	NMR Based Current/Voltage Source. PB93-151173 00,331
crete Frames-I.	PB93-166585 00,536	Low-Frequency Errors of Thermal Voltage Converters: A
PB93-161354 00,081	ELECTRIC POWER GENERATION	Progress Report.
EARTH MOVEMENTS	Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (ERATES),	PB93-151223 00,333
Effect of Subsurface Conditions on Earthquake Ground Motions.	(Version 1.0) (for Microcomputers).	High-Accuracy Sampling Wattmeter. PB93-151793 00,310
PB93-158343 00,192	PB94-500097 00,385	Partial Discharge Pulse-Height Analysis: Promises and
Estimating In situ Liquefaction Potential and Permanent Ground Displacements Due to Liquefaction for the Siting	ELECTRIC PROBES Optimized Thermo-Optic Electric-Field Probes for Micro-	Limitations.
of Lifelines.	waves and Millimeter Waves.	PB93-151843 00,312 NIST Sampling System for the Calibration of Phase Angle
PB93-178614 00,194	PB93-153641 00,318	Generators from 1 Hz to 100 kHz.
EARTHQUAKE DAMAGE	Space Charge Induced in Stressed Polyethylene.	PB93-151884 <i>00,335</i>
Proceedings of the U.SJapan Workshop on Seismic Retrofit of Bridges (1st). Held in Tsukuba Science City,	PB93-151124 00,343	AT2, a New Time Scale Algorithm: AT1 Plus Frequency Variance.
Japan on December 17-18, 1990.	ELECTRICAL FAULTS	PB93-151926 00,214
PB93-134104 00,190	Proceedings: Open Forum on Surge Protection Applica- tion.	Electromagnetic Shielding of RF Gaskets Measured by
Overview of Damage to Highway Bridges during the Loma Prieta Earthquake.	PB94-118056 00,346	Two Methods. PB93-153120 00,313
PB93-134112 00,191	ELECTRICAL INSULATION	Comparison Measurements of Currents Induced by Radi-
Overview of NIST Research on Seismic Performance of	Space Charge Induced in Stressed Polyethylene. PB93-151124 00,343	ation and Injection.
Moment Resisting Precast Concrete Beam-Column Joints Containing Post-Tensioning.	Review of Irradiation Effects on Organic-Matrix Insulation.	PB93-153138 00,314
PB94-103686 00,086	PB93-206928 00,546	Magnetic Fleld Dependence of Quantized Hall Effect Breakdown Voltages.
EARTHQUAKE ENGINEERING	Research for Electric Energy Systems: An Annual Report,	PB93-153237 00,662
Proceedings: ICSSC Issues Workshop. Development of Seismic Evaluation and Rehabilitation Standards for Fed-	October 1993. PB94-112182 00,375	Reverberating Asymmetric TEM Cell for Radiated EMC/V
erally Owned and Leased Buildings. Held in Denver, Col-	ELECTRICAL MEASUREMENT	and SE Testing, 10 kHz - 18 GHz. PB93-153278 00,315
orado on September 16-17, 1992. PB93-228666 00,083	Electronics and Electrical Engineering Laboratory 1993	Ultra-Broadband and Nondispersive Sensor for the Meas-
EARTHQUAKE RESISTANT STRUCTURES	Program Plan: Supporting Technology for U.S. Competi- tiveness in Electronics.	urement of Time-Domain Signals.
Estimating In situ Liquefaction Potential and Permanent	PB93-228625 00,320	PB93-153393 00,324
Ground Displacement's Due to Liquefaction for the Siting of Lifelines.	NIST Measurement Service for Electromagnetic Characterization of Materials.	New Spherical Dipole Source. PB93-153419 00,325
PB93-178614 00,194	PB94-110186 00,321	Effect of Repetitive Swells on Metal-Oxide Varistors.
Performance of 1/3-Scale Model Precast Concrete Beam-	ELECTRICAL RESISTANCE	PB93-153443 00,358
Column Connections Subjected to Cyclic Inelastic Loads. Report No. 3.	Automated System for the Measurement of High-Valued Resistors.	System Response to Pulsed Excitations Estimated from Measurement of cw Amplitudes.
PB94-101813 00,085	PB93-150704 00,329	PB93-153492 00,316

Out to 1 Thomas Out Standa Field Backer to Missa	FI FOTDONIO TECHNOLOGY	Mary 19th annuals Mark Marketon I had of Transmitted
weves end Millimeter Weves.	ELECTRONIC TECHNOLOGY Controlled Interface Roughness in GaAs/AIAs	X-ray Lithography Mask Metrology: Use of Trensmitted Electrons in en SEM for Linewidth Meesurement.
PB93-153641 00,318	Superlattices. PB93-125896 00,351	PB94-108537 00,370 Interlaboretory Study on the Lithogrephically Produced
Millimeter Weve Metrology at the National Institute of Standards and Technology.	MAESTRO: A Front-End to the MAIN1 Program for Mul-	Scanning Electron Microscope Megnification Standard
PB93-153666 00,359 Interim Criteria for Polymer-Modified Bituminous Roofing	tiple-Angle Measurement of Silicon Dioxide Layers. PB93-139038 00,352	Prototype. PB94-108545 00,371
Membrane Materials: A Summary Report.	Electronics end Electrical Engineering Laboratory Tech-	RL/NIST Workshop on Moisture Measurement and Con-
PB93-153724 00,069 Shielded Open-Circuited Sample Holders for Dielectric	nical Publication Announcements Covering Laboratory Programs, April to June 1992, with 1992/1993 EEEL	trol for Microelectronics. Proceedings of the RL/NIST Workshop held in Geithersburg, Maryland on April 5-7,
end Magnetic Measurements of Liquids end Powders.	Events Calendar. PB93-147163 00,353	1993. PB94-108636 00,372
PB93-198851 00,319 Selected EMC Standards and Regulations: A Summary.	Automated System for the Measurement of High-Valued	Electronics and Electrical Engineering Laboratory Tech-
PB93-220002 00,639	Resistors. PB93-150704 00.329	nicel Publication Announcements Covering Laboratory Programs, April to June 1993 with 1993/1994 EEEL
Dual-Port Circularly Polarized Probe Standards at the Na- tional Institute of Standards end Technology.	Quantized Dissipation of the Quantum Hall Effect at High	Events Celendar. PB94-118403 00,342
PB93-235208 00,326	Currents. PB93-150712 00,649	ELECTRONICS
Coil Probe Dimension and Uncertainties during Meesurements of Nonuniform ELF Magnetic Fields.	Automated AC Bridge for Resistance Measurements.	Nanofebrication Technology In Japen. (Jepan Technology Progrem).
PB94-108479 00,616	PB93-151132 00,330	PB94-123064 00,693
Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude.	Intercomperison of NIST, NPL, PTB, and VSL Thermal Voltage Converters from 100 kHz to 1 MHz.	ELECTRONICS INDUSTRY Measurements for Competitiveness in Electronics. First
PB94-108487 00,337	PB93-151181 00,332	Edition. PB93-160588 00,091
Dependence of Quantized Hall Effect Breakdown Voitage on Magnetic Field and Current.	Charge Trapping in Cubic Silicon Carbide MIS Capacitors.	Electronics end Electrical Engineering Laboretory 1993
PB94-108511 00,690 Metrology for Electromegnetic Technology: A Bibliogrephy	PB93-151199 00,651 Flux Locked Current Source Reference.	Program Plan: Supporting Technology for U.S. Competitiveness in Electronics.
of NIST Publications.	PB93-151819 00,334	PB93-228625 00,320
PB94-108776 00,341 NIST Measurement Service for Electromagnetic Charec-	Re-Exemination of Quantum Hali Plateaus. PB93-151850 00,658	Analysis of the Impact on U.S. Industry of the NIST/Boul- der Superconductivity Programs: An Interim Study.
terization of Meterials.	Sempling Technique for Calibrating Phase Angle Genere-	PB94-120680 00,692
PB94-110186 00,321 Research for Electric Energy Systems: An Annual Report,	tors from 1 Hz to 100 kHz. PB93-151892 00.336	ESTAR, PSTAR, end ASTAR: Computer Progrems for
October 1993. PB94-112182 00,375	Metrologic Support for the DARPA/NRL-XRL Mesk Pro-	Calculating Stopping-Power and Range Tebles for Electrons, Protons, end Helium Ions.
Bibliography of the NIST Electromagnetic Fields Division	grem: Ellipsometric Analyses of SiC Thin Films on Si. PB93-152098 00,354	PB93-146033 00,567
Publications. PB94-112547 00,322	Test Guide for CMOS-On-SIMOX Test Chips NIST3 end	ELEMENTARY PARTICLES Elementary Particle Physics in the Daiton Menner.
Proceedings: Open Forum on Surge Protection Applica-	NIST4. PB93-152106 00,355	PB93-125698 00,564
tion. PB94-118056 00,346	Directed-Graph Classifier of Semiconductor Wafer-Test	ELEVATORS (LIFTS) Workshop on Elevator Use during Fires. Held in
Results of Screened-Room Meesurements on NIST	Pattems. PB93-153286 00,356	Gaithersburg, Maryland on September 29, 1992. PB93-235190 00,045
Standard Rediators. PB94-123056 00,323	Imaging of Passivated III-V Semiconductor Surfaces by e	ELLIPSOMETRY
Electromagnetic Shielding of RF Gaskets Measured by	Scanning Tunneling Microscope Operating in Air. PB93-153294 00,357	Metrologic Support for the DARPA/NRL-XRL Mesk Program: Ellipsometric Analyses of SiC Thin Films on Si.
Two Methods.	Anelysis of Persistent Photoconductivity Due to Potentiel Barriers.	PB93-152098 00,354
PB93-153120 00,313 Reverbereting Asymmetric TEM Cell for Radiated EMC/V	PB93-153468 00,669	EMISSIVITY RADCAL: A Nerrow-Band Model for Radiation Celcule-
end SE Testing, 10 kHz - 18 GHz. PB93-153278 00,315	Ion Kinetic-Energy Distributions end Electrical Meesurements in Ar/O2 rf Glow Discharges.	tions in e Combustion Environment.
ELECTRON-ATOM COLLISIONS	PB93-153575 00,634	PB93-200889 00,204 EMULATORS
Compact Fitting Formulas for Electron-Impact Cross Sections.	Integrated Optic Laser Fabricated by Field-Assisted Ion Exchenge in Neodymium Doped Soda-Lime Silicate	Guidelines for Using Emuletors to Eveluate the Perform-
PB93-143956 00,566	Gless. PB93-153807 00,340	ence of Energy Menagement end Control Systems. PB93-138931 00,033
Elestic Scattering of Electrons end Positrons by Atoms: Database ELAST.	Electronics end Electrical Engineering Laboratory Tech-	ENAMEL
PB93-207512 00,614	nical Publication Announcements Covering Laboretory Programs, July to September, 1992 with 1992/1993 EEEL	Effect of a Two-Solution Fluoride Mouth Rinse on Reminerelization of Enemel Lesions In vitro.
ELECTRON COLLISIONS Material Dependence of Electron Inelestic Meen Free	Events Calendar. PB93-158632 00,360	PB93-150738 00,526 ENERGY ABSORPTION
Paths et Low Energies. PB93-166320 00,591	Detection of S2F10 Produced by Electrical Discharge in	Reflected end Refrected Fundamental Modes of Dynamic
ELECTRON DENSITY (CONCENTRATION)	SF6. PB93-166528 00,596	X-ray Diffraction. PB93-166189 00,154
Exponential Density: Exact Fitting of Structure Moduli by Entropy Maximization.	Electronics and Electrical Engineering Laboretory Tech-	ENERGY ACCOUNTING
PB93-125128 00,122	nical Publication Announcements Covering Laboretory Programs, October to December, 1992 with 1992/1993	ERATES: A Computer Progrem for Celculeting Time-of- Use, Block, and Demand Charges for Electricity Usege
ELECTRON DIFFRACTION Application of the Hough Transform to Electron Diffrection	EEEL Events Calendar. PB93-198877 00,362	(Version 1.0). User's Gulde and Reference Manual. PB93-228658 00,384
Petterns. PB93-153773 00,585	Center for Electronics and Electrical Engineering Tech-	ENERGY CONSERVATION
ELECTRON IMPACT	nical Publication Announcements Covering Center Progrems, April to June 1990, with 1991 CEEE Events Cel-	Envelope Design Guldelines for Federel Office Buildings: Thermel Integrity and Airtightness.
Compact Fitting Formules for Electron-Impect Cross Sections.	endar. PB93-205516 00,363	PB93-183770 00,376
PB93-143956 00,566	Center for Electronics and Electrical Engineering Tech-	Life-Cycle Costing Workshop for Energy Conservation in Buildings: Student Manual.
Compact Fitting Formulas for Electron-Impact Cross Sec-	nical Progress Bulletin Covering Center Progrems, April to June 1990, with 1990/1991 CEEE Events Celendar.	PB93-198984 00,383 Ruilding Life Cycle Cost Computer Program (RLCC) Ver-
tions. PB93-143956 00,566	PB93-205524 00,364	Building Life Cycle Cost Computer Progrem (BLCC), Version 4.11 (for Microcomputers).
ELECTRON IRRADIATION	Report on a Workshop for Improving Relationships be- tween Users end Suppliers of Microlithography Metrology	PB94-500055 00,042 ENERGY CONSERVATION & PRODUCTION
Dose in Water from Externel Irradiation by Electrons: Re- dietion Protection Data.	Tools. PB93-206233 00,365	Guidelines for Using Emulators to Evaluate the Perform-
PB93-173425 00,548	Semiconductor Measurement Technology: A Collection of	ance of Energy Management and Control Systems. PB93-138931 00,033
Preparetion end Preliminery Analysis of K-411 Glass	Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations,	Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377
Microspheres. PB93-125623 00,097	RESPAC. PB93-219806 00,366	Energy Related Inventions Progrem. Status Report for
ELECTRON MICROSCOPY	Electronics and Electrical Engineering Leboratory 1993	Recommendations 351 through 602. PB94-111853 00,373
New Method for Phese Identification for Electron Diffrectionists.	Program Plan: Supporting Technology for U.S. Competitiveness in Electronics.	Energy Releted Inventions Progrem. Stetus Report for
PB93-125854 00,098	PB93-228625 00,320	Recommendations 1 through 350. PB94-111903 00,374
Pulse Redloiytic Studies of Electron Transfer Processes	Semiconductor Measurement Technology: Evolution of Sillcon Materials Characterization: Lessons Learned for	ENERGY EFFICIENCY
end Applications to Soler Photochemistry, Progress Re-	Improved Manufacturing. PB93-228641 00,367	BLCC 4.0. The NIST 'Building Life-Cycle Cost' Progrem (Version 4.0). User's Guide and Reference Menuel.
port, (February 1989April 1990). DE93018005 00,386	Electronics end Electrical Engineering Leboratory Tech-	PB93-208460 00,026
Pulse Radiolytic Studies of Electron Transfer Processes end Applications to Solar Photochemistry. (Finel)	nical Publication Announcements Covering Laboratory Programs, January to Merch, 1993 with 1993/1994 EEEL	ENERGY MANAGEMENT SYSTEMS Guldelines for Using Emuletors to Evaluete the Perform-
Progress Report, (Februery 1989January 1992). DE93018016 00,387	Events Celendar. PB93-234698 00,368	ence of Energy Menegement and Control Systems. PB93-138931 00,033
33,207		30,000

ENERGY MANAGEMENT SYSTEMS

ENERGY SUPPLIES	ESTIMATING	Lighting System Design and Evaluation in Federal Office
Present Worth Factors for Life-Cycle Cost Studies in the Department of Defense (1994).	Methods for Predicting Remaining Life of Concrete In Structures.	Buildings. PB93-206217 00.040
PB94-109238 00,540	PB93-139020 00,180	Proceedings: ICSSC Issues Workshop. Development of
ENERGY TECHNOLOGY Assessment of Fossil Energy Materials Research Needs.	Tables for the Thermonhysical Properties of Ethans	Seismic Evaluation and Rehabilitation Standards for Fed- erally Owned and Leased Buildings. Held in Denver, Col-
PB93-145779 00,377	Tables for the Thermophysical Properties of Ethane. PB93-160786 00,150	orado on September 16-17, 1992.
ENGINEERING Database Management Systems in Engineering.	Tables of Experimental Data Used for the Correlation of	PB93-228666 00,083 Guidelines and Procedures for Implementation of the Ex-
PB93-146454 O0,419	the Thermophysical Properties of Ethane. PB93-173417 00,164	ecutive Order on Seismic Safety of New Construction
ENGINEERING/PRODUCT/INFORMATION STANDARDS	ETHANE/DICHLORO-TRIFLUORO	(July 1991). PB93-228674 00,084
More Questions and Answers on the ISO 9000 Standard Series and Related Issues.	Critical Parameters and Saturation Densities of 1,1- Dichloro-2,2,2-Trifluoroethane.	FEDERAL INFORMATION PROCESSING STANDARDS
PB93-140689 00,093	PB93-166593 00,492	Codes for the Identification of Federal and Federally Assisted Organizations. Category: Data Standard, Rep-
Performance Standard for Wood-Based Structural-Use Panels.	Rate Constants for Hydrogen Abstraction Reactions of	resentations and Codes. FIPS PUB 95-1 00,288
PB93-146298 00,056	NO3 in Aqueous Solution.	Electronic Data Interchange (EDI): Category: Software
National Voluntary Laboratory Accreditation Program 1993 Directory.	PB93-166064 00,152 Single Pulse Shock Tube Studies on the Thermal Decom-	Standard; Subcategory: Electronic Data Interchange. FIPS PUB 161-1 00.247
PB93-156644 00,402	position of n-Butyl Phenyl Ether, n-Pentylbenzene and	VHSIC Hardware Description Language (VHDL); Cat-
Program for Conformity Assessment System Evaluation: Analysis of Comments on the NIST Proposal.	Phenotole and the Heat of Formation of Phenoxy and Benzyl Radicals.	egory: Software Standard; Subcategory: Hardware De- scription Language. IEEE Standard VHDL Language Ref-
PB93-170900 00,094	PB93-166577 00,162 ETHYLENE	erence Manual.
Proceedings of the Meeting of the Intergovernmental U.SRussian Business Development Committee's Stand-	Microwave and Infrared Spectra of C2H4HCCH: Barrier	FIPS PUB 172 00,286 Spatial Data Transfer Standard (SDTS); Category: Soft-
ards Working Group (2nd). Held in Gaithersburg, Maryland on March 23-24, 1993.	to Twofoid Internal Rotation of C2H4. PB93-150803 00,138	ware Standard; Subcategory: Information Interchange.
PB93-179968 00,087	EVALUATION 00,738	FIPS PUB 173 00,287 Federal Building Telecommunications Wiring Standard:
NIST Handbook 44, 1993: Specifications, Tolerances, and Other Technical Requirements for Weighing and	Guidelines for the Evaluation of Virtual Terminal Imple-	Category: Telecommunications Standard; Subcategory:
Measuring Devices as Adopted by the 77th National Con-	mentations. PB93-139053 00,290	Cables and Wiring. FIPS PUB 174 00,206
ference on Weights and Measures 1992. PB93-213106 00,407	EVAPORATION	Federal Building Standard for Telecommunications Path-
NIST Handbook 130, 1993. Uniform Laws and Regula-	Transient Cooling of a Hot Surface by Droplets Evaporation. Final Report, November 1990.	ways and Spaces; Category: Telecommunications Standard; Subcategory: Cables and Wiring.
tions in the Areas of Legal Metrology and Motor Fuel Quality as Adopted by the 77th National Conference on	PB93-189421 00,609	FIPS PUB 175 00,207
Weights and Measures 1992. PB93-213114 00,015	EVAPORATIVE COOLING Experimental Study of Multiple Droplet Evaporative Cool-	Residential and Light Commercial Telecommunications Wiring Standard; Category: Telecommunications Stand-
ENGRAVING	ing.	ard; Subcategory: Cables and Wiring. FIPS PUB 176 00,208
Portsmouth Fastener Manufacturing Workstation. Fastener Engraving System (Design, Construction, and Oper-	PB93-198463 00,613	Initial Graphics Exchange Specification (IGES). Category:
ation).	EXAM: A Two-State Thermodynamic Analysis Program.	Software Standard; Subcategory: Graphics and Information Interchange.
PB94-118221 00,461 ENTROPY	PB93-191658 00,166	FIPS PUB 177 00,417
Exponential Density: Exact Fitting of Structure Moduli by	EXPECT COMPUTER PROGRAM Automating Interactive Applications in a Network Environ-	Secure Hash Standard. Category: Computer Security. FIPS PUB 180 00.216
Entropy Maximization. PB93-125128 00,122	ment.	Automated Password Generator (APG). Category: Com-
ENVIRONMENTAL CHEMICAL SUBSTITUTES	PB93-151215 00,251 EXPERT SYSTEMS	puter Security.
Horizontal Nucleate Flow Boiling Heat Transfer Coeffi- cient Measurements and Visual Observations for R12,	Toward an Intelligent System for Mathematical Software	FIPS PUB 181 00,217 Validated Products List (Cobol, Fortran, ADA, Pascal, C,
R134a, and R134a/Ester Lubricant Mixtures.	Selection. PB93-124832 00,506	MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Se-
PB93-178598 00,493 ENVIRONMENTAL MONITORING	Highway Concrete (HWYCON) Expert System Require-	curity). PB93-937300 00,272
Specimen Banking at the National Institute of Standards	ments and Installation Guide. PB93-198885 00,187	FIBER LASERS
and Technology. PB93-151967 00,101	Large Scale Evaluation of a Pattern Recognition/Expert	High Resolution Spectroscopy Using Fiber Lasers. PB93-125201 00,622
ENVIRONMENTAL STUDIES: POLLUTION MEASUREMENT	System for Mass Spectral Molecular Weight Estimation. PB94-113081 00,108	FIBER OPTICS
Graphical Methods for Examining the Effects of Acid Rain and Sulfur Dioxide on Carbonate Stones.	EXPRESS	Transfer Functions for Characterizing Multimode Optical Fiber Components.
PB93-151249 00,060	Exppp: An EXPRESS Pretty Printer. National PDES Testbed Report Series.	PB93-162865 00,345
Field-Space Conformal Solution Method: Binary Vapor- Liquid Phase Behavior.	PB94-120797 00,276	Optical Fiber Geometry: Accurate Measurement of Cladding Diameter.
PB93-166239 00,156	EXPRESS PROGRAMMING LANGUAGE NIST EXPRESS Toolkit: Lessons Learned.	PB93-196269 00,632
Two New Gas Standards Programs at the National Insti- tute of Standards and Technology.	PB93-153450 00,422	FIBER REINFORCED COMPOSITES Solidification Processing and Phase Transformations in
PB93-191427 00,095	EXTRACTION COLUMNS	Ordered High Temperature Alioys. AD-A261 751/2 00,494
ENZYMES Non-Linear Effects of Periodic Electric Fields on Mem-	Subambient Temperature Modification of Selectivity in Reversed-Phase Liquid Chromatography.	FINE STRUCTURE CONSTANT
brane Protein. PB93-153682	PB93-153799 00,103 EXTREME ULTRAVIOLET RADIATION	Proposed Measurement of the Fine Structure Constant Using a Coulomb-Blockade Charge Pump.
Kinetics of a Multistate Enzyme in a Large Oscillating	Status of the Soft X-ray/XUV Optical Metrology Program	PB93-151264 00,577
Field. PB93-153690 00,516	at the National Institute of Standards and Technology. AD-P008 068/9 00.557	FINGERPRINT CLASSIFICATION Comparative Performance of Classification Methods for
EPOXY COMPOSITES	FABRICATION	Fingerprints.
Review of Irradiation Effects on Organic-Matrix Insulation.	Flow Behavior in Liquid Molding. N93-14747/8 00,478	PBŠ3-184273 00,300 FINITE DIFFERENCE METHOD
PB93-206928 00,546 EQUIPARTITION	Proceedings of the Joint DoD/NIST Workshop on Inter-	Space Marching Difference Schemes in the Nonlinear In-
Probes of Equipartition in Nonlinear Hamiltonian Systems.	national Precision Fabrication Research and Develop- ment. Held in Rockville, Maryland on October 27-29,	verse Heat Conduction Problem. PB93-124865 00,555
PB93-166387 00,595 ERATES COMPUTER PROGRAM	1992.	FINITE ELEMENT METHOD
ERATES: A Computer Program for Calculating Time-of-	PB93-192318 00,440 FACILITIES	Built-in Error Estimator for Optimizing Finite Element Modeling.
Use, Block, and Demand Charges for Electricity Usage (Version 1.0). User's Guide and Reference Manual.	Computer Program for Calculating Time-of-Use, Block,	PB93-166312 00,694
PB93-228658 00,384	and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcomputers).	FIPS (FEDERAL INFORMATION PROCESSING STANDARD)
ERROR ANALYSIS Software Error Analysis.	PB94-500097 00,385	Video Teleconferencing Services at 56 to 1,920 KB/S.
PB93-200871 00,263	FAST FOURIER TRANSFORMS Fast Fourier Transforms for Space Groups Containing	Category: Telecommunications Standard and Sub- category: Video Teleconferencing.
ERRORS Some Guidelines for Implementing Error Compensation	Rotation Axes of Order Three and Higher.	FIPS PUB 178 00,209
Some Guidelines for Implementing Error Compensation on Machine Tools.	PB93-124790 00,642 FASTENERS	FIRE DATA MANAGEMENT SYSTEM Programmer's Reference Guide to FDMS File Formats.
PB93-234680 00,452 ESCAPE SYSTEMS	Portsmouth Fastener Manufacturing Workstation. Fas-	PB93-182038 00,201
Workshop on Elevator Use during Fires. Held in	tener Engraving System (Design, Construction, and Operation).	FIRE DETECTION SYSTEMS Balanced Design Concepts Workshop. Held in
Gaithersburg, Maryland on September 29, 1992. PB93-235190 00,045	PB94-118221 00,461	Gaithersburg, Maryland on June 30-July 2, 1993.
ESTELLE TRANSLATOR	FEDERAL BUILDINGS Life-Cycle Costing Workshop for Energy Conservation in	PB94-108388 00,028 Early Detection of Room Fires through Acoustic Emis-
Portable Estelle Translator: An Overview and User Gulde. PB93-183473 00.260	Buildings: Student Manual. PB93-198984 00,383	sion. PB94-112257 00,031
73,200		. 507 (1220)

FLAMMABILITY TESTING

		I EXIMINADIEIT I TEOTING
FIRE EXTINGUISHERS International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Swe-	Quality Control Tests for Adhesion of Paint on the Panels of Tectical Rigid Wall Shelters, Phase 2. PB93-173474 00,476	Comparison of Ceiling Jet Temperatures Measured in a Aircraft Hanger Test Fire with Temperatures Predicted b the DETACT-QS and LAVENT Computer Models.
den on Mey 5-8, 1992. PB93-183952 00,202	CFAST, the Consolidated Model of Fire Growth end Smoke Transport.	PB93-158657 00,53 Programmer's Reference Guide to FDMS File Formats.
Discherge of Fire Suppression Agents from e Pressurized Vessel: A Mathematical Model end Its Application to Ex-	PB93-174902 00,071	PB93-182038 00,20 In situ Burning of Oil Spills: Mesoscale Experiments an
perimental Design. PB93-198927 00,044	Design of Smoke Control Systems for Areas of Refuge. PB93-183754 00,072	Analysis. PB94-101839 00,39
Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Con-	Bench-Scale Predictions of Mattress end Upholstered Chair Fires: Similarities and Differences. PB93-186005 00,043	Sprinkler Fire Suppression Algorithm for HAZARD. PB94-103678
ditions for the Flow Outside the Vessel. PB94-103660 00,004	Building and Fire Research Laboratory Publications, 1992.	Collaborating with Our Customers: NIST Building and Flr Research Laboratory.
FIRE EXTINGUISHING AGENTS Extinguishment of Combustible Porous Solids by Water	PB93-188845 00,073	PB94-110194 00,02 Zone Fire Modeling with Natural Building Flows and
Droplets. PB93-198893 00,203	Transient Cooling of a Hot Surface by Droplets Evaporation. Final Report, November 1990. PB93-189421 00,609	Zero Order Shaft Model. PB94-112166 00,03
FIRE FIGHTING Model Study of the Aircraft Cabin Environment Resulting	Experimental Study of Multiple Droplet Evaporative Cool-	NIST Building and Fire Research Laboratory. Project 1993.
From In-Flight Fires. AD-A261 270/3 00,005	PB93-198463 00,613	PB94-118288 00,418 Summaries of BFRL Fire Research In-House Project
International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Swe-	U.S. Fires In 'Board and Cere' Homes Matrix Display of Selected Fatal Fires. Special Analysis.	and Grants, 1993. PB94-121050 00,03
den on May 5-8, 1992. PB93-183952 00,202	PB93-198869 00,025 Extinguishment of Combustible Porous Solids by Water	FIRES
FIRE HAZARDS Heat Release Rate: The Single Most Importent Verlable	Droplets. PB93-198893 00,203	Ignition and Subsequent Flame Spread over e Thin Ce Iulosic Material. N93-20205/9 00,69
in Fire Hazard. PB93-124808 00,050	Study of Fire Induced Flow along the Vertical Comer Wall. Part 2.	User's Guide for CFAST Version 1.6.
Air Moving Systems end Fire Protection.	PB93-205623 00,074 Affordable Fire Safety In Board and Care Homes, A Req-	PB93-140788 00,05 Smoke Movement In a Corridor-Hybrid Model, Simple
PB93-234722 00,398 FIRE PREVENTION	ulatory Challenge. Final Report. PB93-219723 00,027	Model and Companison with Experiments. PB93-146678
Ignition and Subsequent Flame Spread over a Thin Cel- lulosic Material.	Water Mist Fire Suppression Workshop Proceedings.	Simulating the Effect of Beamed Ceilings on Smoke Flow Part 1. Comparison of Numerical and Experimental Re
N93-20205/9 00,698 Developments Needed to Expend the Role of Fire Model-	Held in Geithersburg, Maryland on March 1-2, 1993. PB93-219780 00,700	sults. PB93-152056 00,06
Ing in Material Fire Hazard Assessment. N94-10787/7 00,009	Air Moving Systems and Fire Protection. PB93-234722 00,398	Fire Information Challenges of the 21st Century. PB93-153385 00,06
FIRE PROTECTION Feeling a Door to See if Fire Is on the Other Side.	Workshop on Elevator Use during Fires. Held in Gaithersburg, Maryland on September 29, 1992.	CFAST, the Consolidated Model of Fire Growth an Smoke Transport.
PB93-153252 00,066	PB93-235190 00,045 In situ Buming of Oil Spills: Mesoscale Experiments and	PB93-174902 00,07 Building end Fire Research Laboretory Publications
Water Mist Fire Suppression Workshop Proceedings. Held in Gaithersburg, Maryland on March 1-2, 1993. PB93-219780 00,700	Analysis. PB94-101839 00,396	1992. PB93-188845 00.07
TRE RESEARCH	Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Con-	U.S. Fires in 'Board and Care' Homes Matrix Display of Selected Fetal Fires, Special Analysis.
Bum Injury Potential of Nevy Shipboard Work Clothing. AD-A258 836/6 00,481	ditions for the Flow Outside the Vessel. PB94-103660 00,004	PB93-198869 00,02
Model Study of the Aircraft Cabin Environment Resulting From In-Flight Fires.	Sprinkler Fire Suppression Algorithm for HAZARD. PB94-103678 00,046	Study of Fire Induced Flow elong the Vertical Come Wall. Pert 2. PB93-205623 00,07
AD-A261 270/3 00,005 Modeling the Heat Release Rate of Aircreft Cabin Panels.	Combined Buoyancy- end Pressure-Driven Flow through	Workshop on Elevator Use during Fires. Held in
AD-A263 148/9 00,006 Particulate and droplet diagnostics in spray combustion.	a Horizontal Vent: Theoretical Considerations. PB94-103694 00,077	Gaithersburg, Meryland on September 29, 1992. PB93-235190 00,04
Annual report. DE93003631 00,195	Balenced Design Concepts Workshop. Held in Geithersburg, Maryland on June 30-July 2, 1993. PB94-108388 00,028	Combined Buoyancy- end Pressure-Driven Flow through a Horizontal Vent: Theoretical Considerations. PB94-103694 00,07
Particulate end droplet diegnostics in sprey combustion. Annuel report.	Test Methods for QuantifyIng the Propensity of Cigarettes	Impacts: NIST Building end Fire Research Laborator (Technical end Societel).
DE93003632 00,196 Time-besed ensemble scattering measurements in fuel	to Ignite Soft Furnishings. PB94-108644 00,047	PB94-113420 00,07
sprays. DE93007989 00,197	Modeling the Ignition of Soft Furnishings by a Cigarette. PB94-109014 00,048	Annual Conference on Fire Research, 1993: Book of Atstracts. PB94-121324 00,20
Observations of soot in combustion of methanol/toluene sprey flames.	Zone Fire Modeling with Natural Building Flows end e Zero Order Shaft Model.	FIRING ERROR INDICATORS Test Procedure for Handgun Accuracy.
DE93007992 00,378 Ignition end Subsequent Fleme Spreed over e Thin Cel-	PB94-112166 00,030 Early Detection of Room Fires through Acoustic Emis-	PB93-161347 00,55
lulosic Material. N93-20205/9 00,698	sion. PB94-112257 00,031	User's Guide for the Algorithm Testing System/Version 1.1.
Heat Release Rate: The Single Most Important Variable In Fire Hazard.	Smoke Plume Trajectory from In situ Burning of Crude Oil in Alaska.	PB93-175990 00,44 FLAME PROPAGATION
PB93-124808 00,050 Acoustic Emission of Structural Materials Exposed to	PB94-114519 00,393 Summaries of BFRL Fire Research In-House Projects	Ignition and Subsequent Flame Spread over a Thin Cellulosic Material.
Open Flames. PB93-138980 00,051	and Grants, 1993. PB94-121050 00,032	N93-20205/9 00,69 FLAME RETARDANTS
Comparison of Full Scale Fire Tests end a Computer Fire Model of Several Smoke Ejection Experiments.	Annual Conference on Fire Research, 1993: Book of Abstracts.	Computer-Aided Molecular Design of Fire Resistant Air craft Materiels.
PB93-139087 00,551	PB94-121324 00,205	N94-10779/4 00,00 Non-Helogeneted, Fleme Reterded Polycarbonate.
User's Guide for CFAST Version 1.6. PB93-140788 00,055	FIRE RESISTANCE Burn Injury Potential of Navy Shipboard Work Clothing. AD-A258 836/6 00,481	N94-10781/0 00,000
Smoke Movement in e Corridor-Hybrid Model, Simple Model and Comparison with Experiments.	FIRE RESISTANT TEXTILES	FLAME SPECTROSCOPY Topics in Laser Spectroscopy - Simultaneous Detection of Laser-Induced Fluores Topics of Laser-Induced Fluores
PB93-146678 00,057 Generation of Cerbon Monoxide in Compartment Fires.	Burn Injury Potential of Navy Shipboard Work Clothing. AD-A258 836/6 00,481	cence in Flames - Noise Correletion Studies. PB93-166502 00,10
PB93-146702 00,198 Simulating the Effect of Beamed Ceilings on Smoke Flow.	FIRE SAFETY Affordable Fire Safety In Board and Care Homes. A Reg-	FLAMMABILITY
Part 1. Comparison of Numerical end Experimentel Results.	uletory Challenge. Final Report. PB93-219723 00,027	Non-Halogenated, Flame Retarded Polycarbonate. N94-10781/0 O0,00
PB93-152056 00,062 Feeling a Door to See if Fire Is on the Other Side.	Guide to Board end Care Fire Safety Requirements in the 1991 Edition of the Life Safety Code.	Developments Needed to Expand the Role of Fire Modeling in Materiel Fire Hazard Assessment. N94-1078777 00,00
PB93-153252 00,066 Fire Information Chellenges of the 21st Century.	PB93-220820 00,397 FIRE TESTS	Heat Release Rate: The Single Most Important Variable
PB93-153385 00,067	Acoustic Emission of Structurel Materials Exposed to Open Flames.	In Fire Hazerd. PB93-124808 00,05
Heat and Mess Trensport from Thermelly Degreding Thin Cellulosic Meterials in a Microgrevity Environment.	PB93-138980 00,051	Moleculer Modeling of Polymer Flemmability: Application to the Design of Flame-Resistant Polyethylene.
PB93-153435 00,505 Comparison of Celling Jet Temperetures Measured in an	Comparison of Full Scale Fire Tests and a Computer Fire Model of Severel Smoke Ejection Experiments. PB93-139087 00,551	PB93-153542 00,50 FLAMMABILITY TESTING
Alrcraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models.	Generation of Carbon Monoxide in Compartment Fires.	Bench-Scale Predictions of Mattress and Upholstere- Chair Fires: Similarities and Differences.
PB93-158657 00,539	PB93-146702 00,198	PB93-186005 00,04

Test Methods for Quantifying the Propensity of Cigarettes	FOREIGN TECHNOLOGY	FUEL QUALITY
to Ignite Soft Furnishings. PB94-108644 00,047	North American ISDN (Integrated Services Digital Network) Users' Forum Agreements on ISDN.	NIST Handbook 130, 1993. Uniform Laws and Regula- tions in the Areas of Legal Metrology and Motor Fuel
FLOATING POINT ARITHMETIC	PB93-173391 00,211	Quality as Adopted by the 77th National Conterence on
Robust Paraliel Computation in Floating-Point and SLI Arithmetic.	International Conference on Fire Suppression Research (1st): Proceedings. Heid in Stockholm and Boras, Swe-	Weights and Measures 1992. PB93-213114 00,015
PB93-153476 00,252	den on May 5-8, 1992.	FUEL SPRAYS
FLOW CHARACTERISTICS Flow Behavior In Liquid Moiding.	PB93-183952 00,202	Time-based ensemble scattering measurements in fuel sprays.
N93-14747/8 00,478	Metrication: An Economic Wake-up Cali tor U.S. Industry. PB93-188969 00,088	DE93007989 00,197
FLOW DISTORTION	FORGINGS	FUELS
Flow Conditioner Location Effects in Oritice Flowmeters. PB93-159457 00,379	Structure-Property Relationships in Microalloyed Ferrite- Pearlite Steels Phase 1: Literature Review, Research	Particulate and droplet diagnostics in spray combustion. Annual report.
FLOW MEASUREMENT	Plan, and Initial Results. PB93-234706 00,487	DE93003632 00,196
Measuring Airflow Rates with Pulse Tracer Techniques. PB93-153583 00.037	FORMAL METHODS	FULLERENES Structure and Low Energy Dynamics of Solid C60.
Speed of Sound Data and Related Modeis for Mixtures of	International Survey of Industrial Applications of Formai	PB93-153260 00,146
Natural Gas Constituents. PB93-200822 00,380	Methods. Volume 1. Purpose, Approach, Analysis, and Conclusions.	FUNDAMENTAL CONSTANTS Constants, Fundamental.
Study of Fire Induced Flow along the Vertical Corner	PB93-178556 00,255	PB93-166353 00,592
Wall. Part 2. PB93-205623 00,074	International Survey of Industrial Applications of Formal Methods. Volume 2. Case Studies.	FURNITURE Test Methods for Quantifying the Propensity of Cigarettes
FLOW STABILITY	PB93-178564 00,256	to Ignite Soft Fumishings.
Pulsatiie Instability in Rapid Directional Soliditication: Strongly-Nonlinear Analysis.	FORMALDEHYDE Determination of the Structure of CO2-H2CO.	PB94-108644 00,047
N94-10188/8 00,641	PB93-150696 00,135	Modeling the Ignition of Soft Furnishings by a Cigarette. PB94-109014 00,048
FLOWMETERS	FORMATS Standard Formats for Weiding Property Data.	FUSED SALTS
Flow Conditioner Location Effects in Orifice Flowmeters. PB93-159457 00,379	PB93-166106 00,437	Predictive Thermodynamic Model for Complex High Temperature Solution Phases XI.
FLUIDS	FORTRAN PROGRAMMING LANGUAGE	PB93-124840 00,120
Development of Measurement Capabilities tor the Thermophysical Properties of Energy-Related Fluids. An-	Validated Products List (Cobol, Fortran, ADA, Pascai, C, MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Se-	GADOLINIUM BARIUM CUPRATES Effect of Composition on Superconducting Properties In
nual Report, December 1, 1992November 30, 1993. DE93019442 00,118	cunty). PB93-937300 00,272	the System Ba-Y-Gd-Cu-O.
Thermophysical Properties of Fluids for the Gas Industry.	FORTRAN Compiler Validation System 1978. User's	PB93-153377 00,667 GALLIUM ARSENIDES
Annual Report, January-December 1992. PB93-207470 00,381	Guide, Version 2.1. PB94-118460 00,275	MeV Be Implantation in GaAs.
FLUIDS: LIQUIDS/GASES/PLASMAS	FRACTURE PROPERTIES	PB93-151645 00,653
Estimation of droplet collision trequency in a spray. DE93007991 00.619	Deformation Twinning, Slip, Martensite Formation and Crack Inhibition in the B2-Type Zr50Pd35Ru15 Alloy.	Mechanistic Studies of Photoinduced Reactions at Semi- conductor Surfaces.
Asymptotic Behavior of Modulated Taylor-Couette Flows	PB93-151918 00,497	PB93-151710 00,656 GAS CHROMATOGRAPHY
with a Crystalline Inner Cylinder.	FRACTURE STRENGTH	Multi-Point Calibration of a Gas Chromatograph Using
PB93-139061 00,647 Low Order Modes of an Ion Cloud in a Penning Trap.	Mechanical, Stress-Rupture, and Fracture Toughness Properties of Normalized and Stress Relieved AAR	Cryogenic Preconcentration of a Single Gas Standard Containing Volatile Organic Compounds.
PB93-153203 00,581	TC128 Grade B Steel at Elevated Temperatures. PB93-182020 00,485	PB93-151686 00,100
Flow Conditioner Location Effects in Orifice Flowmeters. PB93-159457 00.379	FRACTURES (MATERIALS)	GAS DISCHARGES Detection of S2F10 Produced by Electrical Discharge In
International Collogium on Atomic Spectra and Oscillator	Molecular Wedge in a Brittle Crack: A Simulation of Mica Water.	SF6.
Strengths for Astrophysical and Laboratory Plasmas (4th). Held at the National Institute of Standards and Tech-	PB93-166411 00,541	PB93-166528 00,596
nology, Gaithersburg, Maryland on September 14-17,	FRAMED STRUCTURES	Energy Distribution Functions of Argon Ions In Low Current, Diffuse Discharges at High E/N.
1992. PB93-198422 00,012	Strengthening Methodology for Lightly Reinforced Concrete Frames-I.	PB93-166569 00,635 GAS FLOW
FLUORESCENCE	PB93-161354 00,081 FRAMEWORKS	Flow Conditioner Location Effects in Orifice Flowmeters.
Journal of Physical and Chemical Reference Data, Volume 21, No. 5, September/October 1992.	Reference Model for Frameworks of Software Engineer-	PB93-159457 00,379
PB93-149094 00,572	ing Environments (Technical Report ECMA TR/55, 3rd Edition).	GASEOUS DIELECTRICS Research for Electric Energy Systems: An Annual Report,
Franck-Condon Factors, r-Centroids, Electronic Transition Moments, and Einstein Coefficients for Many Nitrogen	PB94-112497 00,274	October 1993. PB94-112182 00,375
and Oxygen Band Systems. PB93-149128 00,114	FREE CONVECTION Effect of Gravitational Modulation on Convection in Verti-	GASES
FLUORESCENT LAMPS	cal Bridgman Growth.	Model Studies of SnO2-Based Gas Sensors: Vacancy
Evaluation of Compact Fluorescent Lamp Performance at Different Ambient Temperatures.	N94-10178/9 00,495 FREE RADICALS	Detects and Pd Additive Effects. PB93-166056 00,112
PB93-146694 00,035	DNA Base Modifications Induced in Isolated Human	Two New Gas Standards Programs at the National Insti-
FLUORIDES Effect of a Two-Solution Fluoride Mouth Rinse on	Chromatin by NADH Dehydrogenase-Catalyzed Reduction of Doxorubicin.	tute of Standards and Technology. PB93-191427 00,095
Remineralization of Enamel Lesions In vitro.	PB93-150670 <i>00,520</i>	GASKETS
PB93-150738 00,526 Effects of Magnesium and Fluoride on the Hydrolysis of	Free Radical Polymerization of Expandable Oxaspiro Monomers.	Electromagnetic Shielding of RF Gaskets Measured by Two Methods.
Octacalcium Phosphate.	PB93-151785 00,174	PB93-153120 00,313
PB93-151835 00,023 In vivo Fluoride Concentrations Measured for Two Hours	DNA Base Modifications in Chromatin of Human Cancerous Tissues.	GEARS Development of a National Metrology Infrastructure for
After a NaF or a Novel Two-Solution Rinse.	PB93-153559 00,523	the Domestic Gear Industry. PB93-219756 00,409
PB93-151868 00,527 FLUOROHYDROCARBONS	Rate Constants for Hydrogen Abstraction Reactions of NO3 in Aqueous Solution.	GENERAL INTEREST
Partial Structure for trans-1,2-Difluoroethylene from High-	PB93-166064 00,152	Transient Hydrogen Heat Transfer.
Resolution Infrared Spectroscopy. PB93-125144 00,123	Single Pulse Shock Tube Studies on the Thermal Decom- position of n-Butyl Phenyl Ether, n-Pentylbenzene and	AD-A266 615/4 00,110 Initial Graphics Exchange Specification (IGES).
Measurement of the Dipole Moment of Gaseous 1,1,1-	Phenotoie and the Heat of Formation of Phenoxy and Benzyl Radicais.	AD-A270 049/0 00,416
trichlorotrifluoroethane, 1,2-difluoroethane, 1,1,2- trichlorotritluoroethane, and 2-(difluoromethoxy)-1,1,1-	PB93-166577 00,162	Hall Resistance of Roofing Products. AD-A956 270/3 00,049
trifluoroethane. PB93-150852 00,139	FREON 123 Critical Parameters and Saturation Densities of 1,1-	Apparent Thermal Conductivity of Polyurethane Foam In-
Critical Parameters and Saturation Densities of 1,1-	und Oatulation Delibities Ul 1.1°	and the control of the state of
Dichloro-2,2,2-Trifluoroethane. PB93-166593 00,492	Dichloro-2,2,2-Trifluoroethane.	sulation, Containing Various HCFC Blends, from 125 to 335 K. (Final report).
FLUX CREEP	Dichloro-2,2,2-Trifluoroethane. PB93-166593 00,492	335 K. (Final report). DE93012534 00,488
Transport Current Effects on Flux Creep and Magnetiza- tion in Nb-Ti Multitilament Cable Strands.	Dichloro-2,2,2-Trifluoroethane. PB93-166593 00,492 FREQUENCY MEASUREMENT Designing for Frequency and Time Metroiogy at the 10 to	335 K. (Final report).
	Dichloro-2,2,2-Trifluoroethane. PB93-166593 00,492 FREQUENCY MEASUREMENT	335 K. (Final report). DE93012534 Theoretical Evaluation of R22 and R502 Alternatives. Final Report. DE93014767 00,489
PB93-150746 00,574	Dichloro-2,2,2-Trifluoroethane. PB93-166593 FREQUENCY MEASUREMENT Deslgning for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 FREQUENCY STANDARDS	335 K. (Final report). DE93012534 O0,488 Theoretical Evaluation of R22 and R502 Alternatives. Final Report.
PB93-150746 00,574 FLUX PINNING	Dichloro-2,2,2-Trifluoroethane. PB93-166593 O0,492 FREQUENCY MEASUREMENT DesIgning for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 O0,558	335 K. (Final report). DE93012534 Theoretical Evaluation of R22 and R502 Alternatives. Final Report. DE93014767 Failure Models in Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting
PB93-150746 00,574 FLUX PINNING Orientation Dependence of Flux Pinning in a Layered Bi2Sr2Ca1Cu2O8 + 10% Ag Composite.	Dichloro-2,2,2-Trifluoroethane. PB93-166593 FREQUENCY MEASUREMENT DesIgning for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 FREQUENCY STANDARDS Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 00,558	335 K. (Final report). DE93012534 Theoretical Evaluation of R22 and R502 Alternatives. Final Report. DE93014767 O0,489 Failure Models in Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous
PB93-150746 00,574 FLUX PINNING Orientation Dependence of Flux Pinning in a Layered Bi2Sr2Ca1Cu2O8 + 10% Ag Composite. PB93-153328 00,663	Dichloro-2,2,2-Trifluoroethane. PB93-166593 FREQUENCY MEASUREMENT DesIgning for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 FREQUENCY STANDARDS Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 FRICTION	335 K. (Final report). DE93012534 Theoretical Evaluation of R22 and R502 Alternatives. Final Report. DE93014767 00,489 Failure Models in Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Technologies. DE93016669 00,477 Pulse Radiolytic Studies of Electron Transfer Processes
PB93-150746 00,574 FLUX PINNING Orientation Dependence of Flux Pinning in a Layered Bi2Sr2Ca1Cu2O8 + 10% Ag Composite.	Dichloro-2,2,2-Trifluoroethane. PB93-166593 FREQUENCY MEASUREMENT DesIgning for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 FREQUENCY STANDARDS Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 00,558	335 K. (Final report). DE93012534 Theoretical Evaluation of R22 and R502 Alternatives. Final Report. DE93014767 Failure Models in Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Technologies. DE93016669 00,477

Pulse Rediolytic Studies of Electron Trensfer Process and Applications to Solar Photochemistry. (Fin Progress Report, (February 1989January 1992).	nal)	Source Apportionment of Fine Perticle Organics and tagenicity in Wintertime Roanoke. PB93-221851 0	d Mu- 10,391
DE93018016 00,3 Full-Thickness Cled Beem Frecture-Toughness Tests. DE93018036 00,5		Chemical Characterization of Mutagenic Fractions of ticles from Indoor Coal Combustion: A Study of Cencer in Xuen Wei, China.	
Pulse Rediolytic Studies of Electron Transfer Process	ses		0,530
and Applications to Solar Photochemistry. Progress F port, (March 1992March 1993). DE93018715 00,3	Re-	Method for Separating Volatile Organic Carbon fror (sup 3) of Air to Identify Sources of Ozone Precurso Isotope (14C) Measurements.	
Equipment for Investigation of Cryogenic Compaction			0,392
Nenosize Silicon Nitride Powders.		PC-OMNITAB: An Interactive System for Statistica Numerical Data Analysis, Version 7.0 (for Months)	
DE93018740 00,4 Development of Measurement Capabilities for		computers).	
Thermophysical Properties of Energy-Related Fluids.			0,269
nual Report, December 1, 1992November 30, 1993. DE93019442 00, 1	118	OSIKIT (Open Systems Interconnection) and NIST F type Compiler for Estelle.	
Thermophysical Properties. Progress Report, 1 January	ary		0,271
199231 March 1993. DE93040219 00,4	190	Bibliography of Screw Thread Measurement. PB94-101821	0,460
Data Management Standards in Computer-Aided Acqu	isi-	Technology for Economic Growth: President's Pro-	gress
tion end Logistic Support (CALS). N93-27714/3 00,2	289	Report. PB94-107430 0	0,001
Electrical end Infrered Properties of Thin Niobin		Clinical Trial of an Adhesive Material.	
Microbolometers Near T(sub c). N93-27779/6 00,3	339		0,528
Intelligent Robots for Planetary Exploration and Constru		National Institute of Standards and Technology ference on Reducing the Cost of Space Infrestructure	e end
tion. N93-27980/0 00,6		Operations, Part 1. Oral Presentations and Discus Held in Gaithersburg, Maryland on November 2	
Effect of Gravity Modulation on Thermosolutal Convi		1989.	
tion.		PB94-111374 Large Scale Evaluation of a Pattern Recognition/E	0,699
N94-10103/7 00,6 Effect of Grevitetional Modulation on Convection in Ve		System for Mass Spectral Molecular Weight Estimation	
cal Bridgman Growth.			0,108
N94-10178/9 00,4		National Institute of Standards and Technology ference on Reducing the Cost of Space Infrestructure	
Pulsatile Instability in Repid Directional Solidification Strongly-Nonlinear Analysis.		Operations. Part 2. Topical Papers. Held in Gaithers Merylend on November 20-22, 1989.	sburg,
N94-10188/8 00,6			0,696
Computer-Aided Molecular Design of Fire Resistant / craft Meterials.	Air-	Datebases Available In the Research Information C of the National Institute of Standards and Technology	
N94-10779/4 00,0	007		0,412
Non-Helogeneted, Fleme Retarded Polycarbonate. N94-10781/0 00,0	008	Guide to NIST. PB94-119435 0	0,002
Developments Needed to Expand the Role of Fire Mod		Analysis of the Impact on U.S. Industry of the NIST/	
Ing in Material Fire Hazard Assessment. N94-10787/7 00,0	009	der Superconductivity Programs: An Interim Study.	0.692
Evaluation and Compilation of DOE Waste Package T	est	NIST Serial Holdings, 1993.	0,002
Data. Biannual Report, August 1989-January 1990. NUREG/CR-4735-V8 00,5	549		0,413
PC-OMNITAB: An Interactive System for StetIstical e	end	Building Life Cycle Cost Computer Progrem (BLCC), sion 4.11 (for Microcomputers).	, Ver-
Numerical Data Analysis (Documentetion). PB93-111656 00,2	249		0,042
Test Methods for Detention and Correctional Faci	ility	Computer Progrem for Celculeting Time-of-Use, E and Demand Charges for Electricity Usage (ERA)	
Locks. PB93-139111 00,0	054	(Version 1.0) (for Microcomputers). PB94-500097	0.385
Questions end Answers on Quality, the ISO 9000 Star		NERAL THEORETICAL CHEMISTRY & PHYSICS	,,,,,,,
ard Series, Quality System Registration, and Related sues.	IS-	Quantum Theory of the Dynamical Cerenkov Emissi X-rays.	ion of
PB93-152080 00,C	090		0,559
Designing and Implementing a State Quality Award. PB93-154458 00,6	595	Geochemical Considerations in the Cleaning of Ca ate Stone.	arbon-
Monte Carlo Approach to the Approximation of Invaria	ant		0,059
Measures. PB93-159069 00,5	508	CSTL Technical Activities 1992. PB93-173482 0	0,165
Test Procedure for Handgun Accuracy.		Physics Laboratory Technical Activities, 1992.	0, 103
PB93-161347 00,5 Advanced Ceramics: What's In a Neme.	556	PB93-178648 0	0,607
PB93-166015 00,4	1 71	Cheos, Dissipetion, Arrow of Time, in Quentum Phys PB93-208494	sics. 10,615
Evaluation of Subjective Response to Lighting Distril tions: A Literature Review.	bu- GE	OGRAPHIC INFORMATION SYSTEMS	
PB93-173458 00,0	239	Towards SQL Database Langauge Extensions for grephic Information Systems.	Geo-
Distributed Implementation Generator: An Overview a User Guide.	and		0,411
PB93-183465 00,2	₂₅₉ GL	OW DISCHARGES	CUTO-
Porteble Estelle Transletor: An Overview and User Gul		Ion Kinetic-Energy Distributions and Electrical Mea ments in Ar/O2 rf Glow Discherges.	
PB93-183473 00,2 International Conference on Fire Suppression Resea			0,634
(1st): Proceedings. Held In Stockholm and Boras, Sv		Emission Measurements of rf Glow Discharges in Ar	
den on May 5-8, 1992. PB93-183952 00,2	202		0,636
Metrication: An Economic Wake-up Call for U.S. Indust	ry.	Meterial Dependence of Electron Inelestic Meen	Free
PB93-188969 00,0 Thermophysical Properties of Fluids for the Gas Indus		Paths at Low Energies.	0,591
Thermophysical Properties of Fluids for the Ges Industrian Annuel Report, January-December 1992.	·	SEM Anelysis of Interections between Pletinum,	Gold,
PB93-207470 00,3		and Silver-Palladium Capsules and Barium Yttrium per Oxide Superconductors.	
Japan's Kohsetsushi Program of Regionel Public Examination and Technology Centers for Upgrading Small a	and		0,682
Mid-Size Manufacturing Firms. Presented at Ann Meeting of the Association of American Geographe	uel GC ers.	OSIP Validated Products List (Cobol, Fortran, ADA, Pesc	al C
Held In Mlaml, Florida In April 1991. PB93-209922 00,4		MUMPS, SQL, Graphics, GOSIP, POSIX, Compute	
Report on Occupational Safety and Health for Fiscal Ye		curity). PB93-937300 0	0,272
1990 (Under Public Law 91-596). PB93-215184 00,5	GC GC	OSIP (GOVERNMENT OPEN SYSTEMS	
Gulde to Board and Care Fire Safety Requirements in	1141	FERCONNECTION PROFILE) Guldelines for the Evaluation of Virtual TermInel II	mple-
4004 5 101 4 11 114 5 4 1 5 1			

mentations. PB93-139053

00,290

Gulde to Board and Care Fire Safety Requirements in the 1991 Edition of the Life Safety Code. PB93-220820 00,397

GOVERNMENT BUILDINGS Envelope Design Guidelines for Federal Office Buildings: Thermal Integrity and Artitiphiness. P893-183770 GOVERNMENT NETWORK MANAGEMENT PROFILE Government Network Management Profile (GNMP). Category: Hardware and Software Standards. Subcategory: Computer Network Protocols. FIPS-PUB-179 O0,248 GRAPHITE Inelastic Neutron Scattering in Molecular Crystals. P893-166445 Review of the Nickel-Graphite Interface. P893-16645 Review of the Nickel-Graphite Interface. P893-166601 O0,500 GROUND VEHICLES Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. P894-112422 O0,456 GRUN BARRELS Space Marching Difference Schemes in the Nonlinear Investigation of Unmanned Ground Vehicle Technologies. P894-112422 O0,456 GRUN BARRELS Space Marching Difference Schemes in the Nonlinear Investigation of Unmanned Ground Vehicle Technologies. P893-124855 MADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. P893-18935 MADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. P893-18935 MADAMARD MATRICES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HO2. P893-124857 O0,121 HAIL Hail Resistance of Roofing Products. AD-A956 270/3 AD-A956 270/3 AD-A956 270/3 AD-A956 270/3 MADBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-183796 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-150712 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. P893-150736 HANDBOOKS HANDBOOKS HANDBOOKS HANDB	HEALTH & SAFETY
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Government Network Management Profile (GNMP). Category: Hardware and Software Standards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00.248 GRAPHITE Inelastic Neutron Scattering in Molecular Crystals. PB93-166445 Review of the Nickel-Graphite Interface. PB93-166601 00.500 GROUND VEHICLES Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. PB94-112422 00.456 GROUND SCHICLES Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. 00.555 HADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB93-124865 00.251 HAFNIUM OXIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HIO2. PB93-124857 00.121 HAIL Hail Resistance of Roofing Products. AD-4956-270/3 00.049 HALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. PB93-150712 00.649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-153796 00.070 HANDWRITING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. PB93-15215 00.296 HANGARS Comparison of Ceiling Jet Temperatures Measured In an Aircraft Hanger Test Fire with Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-0S and LAVENT Computer Models. PB93-158657 00.539 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Software Standard; Subcategory: Computer Network Management Profile (GNMP). Category: Software Standard; Subcategory: Computer Network Protocols. FIPS-PUB-179 00.248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language Reference Manual. FIPS PUB-179 10.0000 Description Language (PHDL); Category: Software Standard; Subcategory: Hardware Description Language Reference Manual. FIPS PUB-179 10.0000 Description Language (PHDL); Category: Software Standard; Subcategory: Hardware Description Language Fig. 1	PB93-183770 00,376
FIPS-PUB-179 00,248 GRAPHITE Inelastic Neutron Scattering in Molecular Crystals. PB33-16645 Review of the Nickel-Graphite Interface. PB93-166601 00,500 GROUND VEHICLES Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. PB94-112422 00,456 GNBARRELS Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. PB34-124865 00,555 HADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB33-189835 HAFNIUM OXIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HIO2. PB33-124857 00,121 Hail Resistance of Roofing Products. AD-A956 270/3 00,049 HALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. PB33-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB33-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB33-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB33-150712 00,649 HANDRAFTING Machine-Assisted Human Classification of Segmented Characterise for Optical Character Recognition Testing and Training. PB33-152155 00,0296 HANGARS Comparison of Ceilling Jet Temperatures Measured In an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-OS and LAVENT Computer Models. PB33-158657 00,539 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GMMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00,248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware end Software Stendards. Subcategory: Hardware Description Language. (EEE Standard VHDL Language Reference Manual. FIPS PUB-179 00,248 HEALTH & SAFETY Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties. PB33-150736 00,007 Reduction of Hydrogen Cyenide Concentretions and Scaling on the Generation of Hydrogen Cyunide and Toxicity from Flexible Polyurethane Foam with and without Copper Co	Government Network Management Profile (GNMP). Category: Hardware and Software Standards. Subcategory:
PB93-166445 Review of the Nickel-Graphite Interface. PB93-166601 ROUND VEHICLES Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. PB94-112422 COV.456 GUN BARRELS Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. PB93-124865 Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. PB93-124865 ADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB93-189835 HAFNIUM OXIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HIO2. PB93-124857 O0.121 HAIL Hail Resistance of Roofing Products. AD-A956 270/3 ADA-956 270/3 APALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. AD-A956 270/3 APANBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-183796 ANDWARTING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Tailing. PB93-152155 O0.296 HANDWRITING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Tailing. PB93-152155 O0.296 HANDWARTING ACCOMPAIRED STANDARDS Comparison of Ceiling Jet Temperatures Measured In an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models. PB93-158657 HARDWARE AND SOFTWARE STANDARDS Govemment Network Management Profile (GNMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language. IEEE Standard VHDL Languege Reference Manual. FIPS PUB 172 O0.286 HEALTH & SAFETY Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties. PB93-125136 O0.006 Reduction of Hydrogen Cyenide Concentretions and Acute Inhalation Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Per IV. Effects of Combustion Conditions and Scaling on the Generation of Hydr	FIPS-PUB-179 00,248
PB93-166601 00,500 GROUND VEHICLES Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. PB94-112422 00,456 GUN BARRELS Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. PB93-124865 00,555 HADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB93-189835 00,261 HAFNIUM OXIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HiO2. PB93-1893-124857 00,121 HAIL Hail Resistance of Roofing Products. AD-A956 270/3 00,049 HALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. PB93-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-183796 00,107 HANDWRITING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. PB93-152155 00,296 HANGARS Comparison of Ceiling Jet Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAYENT Computer Models. PB93-158657 00,539 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00,248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language (PPS PUB-172 00,286 HEALTH & SAFETY Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties. PB93-125136 0,016 Reduction of Hydrogen Cyenide Concentretions and Acute Inhalation Toxicity from Flexible Polyurethane Foam With and Without Copper Compounds. Perf IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Perf IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam With and Without Copper Compounds. Perf IV. Effects of Combustion Condi	PB93-166445 00,158
Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. PB94-112422 00.456 GUN BARRELS Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. PB93-124865 00.555 HADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB93-189835 00.261 HAFNIUM OXIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HiO2. PB93-119857 00.121 HAIL Hail Resistance of Roofing Products. AD-A956 270/3 00.049 HALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. PB93-150712 00.649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-183796 00.107 HANDWRITING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. PB93-152155 00.296 HANGARS Comparison of Ceiling Jet Temperatures Predicted by the DETACT-OS and LAVENT Computer Models. PB93-158657 00.539 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Flerdware end Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00.248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Profile Computer Network Protocols. FIPS-PUB-179 00.248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Poscription Language (VHDL); Category: Softw	PB93-166601 00,500
Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. PB93-124865 ### ADMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB93-189835 ### ADMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200. PB93-189835 ### Overlinear Conduction of Steps of 4 to Order 200. PB93-189835 ### Overlinear Conduction of Steps of 4 to Order 200. PB93-189835 ### Overlinear Conduction of Steps of 4 to Order 200. PB93-124857 ### Overlinear Conduction of Conduction of Segmented Characters of Conduction of Segmented Characters for Optical Character Recognition Testing and Training. PB93-152155 ### Overlinear Comparison of Ceiling Jet Temperatures Measured In an Alcraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models. PB93-158657 ### ADWARD ADSOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Management Profile (GNMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Management Profile (GNMP). Category: Herdware Protocols. FIPS-PUB-179 #### ADWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language. IEEE Standard VHDL Languege Reference Manual. FIPS PUB-179 ##### HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language (VHDL); Category: Software Description Language (VHDL); Category:	Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies. PB94-112422 00,456
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HAFNIUM OXIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2. PB93-124857 HAIL Hail Resistance of Roofing Products. AD-A956 270/3 HALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. PB93-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-183796 Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. PB93-152155 00,296 HANGARS Comparison of Ceiling Jet Temperatures Measured In an Alcraft Hanger Test Fire with Temperatures Predicted by the DETACT-OS and LAVENT Computer Models. PB93-158657 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Herdware and Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00,248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language, IEEE Standard VHDL Language Reference Manual. FIPS PUB 172 00,286 HEALTH & SAFETY Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties. PB93-125136 Reduction of Hydrogen Cyenide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam With and without Copper Compounds. PB93-139103 Effect of a Two-Solution Fluoride Mouth Rinse on Reminerelization of Enemel Lesions In vitro. PB93-150738 Clinical Use of Beta-Quartz Glass-Ceramic Inserts. PB93-150739 Clinical Use of Beta-Quartz Glass-Ceramic Inserts. PB93-150739 Clinical Use of Meaneslum and Fluoride on the Hydrolysis of Octacalcium Phosphate Cement. PB93-151298 Chemical Chenge of Herdened PCA/CPC Cements In Various Storing Solutions. PB93-151085 In vivo Fluoride Concentretions Meesured for Two Hours After a NaF or a Novel Two-Solution Rinse. PB93-151835 In viv	HADAMARD MATRICES Building Hadamerd Matrices in Steps of 4 to Order 200.
trometry of SiC and HfO2. PB93-124857 00,121 HAIL Hail Resistance of Roofing Products. AD-A956 270/3 00,049 HALL EFFECT Quantized Dissipation of the Quantum Hall Effect at High Currents. PB93-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-183796 00,107 HANDWRITING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. PB93-152155 00,296 HANGARS Comparison of Ceiling Jet Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-Os and LAVENT Computer Models. PB93-158657 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00,248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language Reference Manual. FIPS PUB-172 00,286 HEALTH & SAFETY Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties. PB93-125136 00,016 Reduction of Hydrogen Cyenide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydr	HAFNIUM OXIDES
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Quantized Dissipation of the Quantum Hall Effect at High Currents. PB93-150712 00,649 HANDBOOKS Standard Reference Meterials: Hendbook for SRM Users. PB93-183796 00,107 HANDWRITING Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training. PB93-152155 00,296 HANGARS Comparison of Ceiling Jet Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models. PB93-158657 00,539 HARDWARE AND SOFTWARE STANDARDS Government Network Management Profile (GNMP). Category: Herdware end Software Stendards. Subcategory: Computer Network Protocols. FIPS-PUB-179 00,248 HARDWARE DESCRIPTION LANGUAGES VHSIC Hardware Description Language (VHDL); Category: Software Standard; Subcategory: Hardware Description Language. IEEE Standard VHDL Language Reference Manual. FIPS PUB 172 00,286 HEALTH & SAFETY Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties. PB93-125136 00,016 Reduction of Hydrogen Cyenide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Pert IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Post IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Post IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Post IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds. Post IV. Effects	AD-A956 270/3 00,049
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HIGH STRENGTH CONCRETES	PB93-139103 00,053 HYDROGEN-LIKE IONS	INDUSTRIES International Survey of Industrial Applications of Formal
Applicability of the Maturity Method to High-Performance Concrete.	Influence of Vacuum Polarization Corrections of Order	Methods. Volume 1. Purpose, Approach, Analysis, and Conclusions.
PB93-157451 00,182 HIGH-TC SUPERCONDUCTORS	alpha(z(alpha)) and alpha(z(alpha))(sup 3) in Hydrogen- Like Uranium.	PB93-178556 00,255 International Survey of Industrial Applications of Formal
Proceedings of the sixth JapanUS workshop on high- field superconducting materials and standard procedures	PB93-166155 00,589 HYDROGEN PEROXIDE	Methods. Volume 2. Case Studies.
for high-field superconducting materials testing. DE93002848 00,640	DNA-Protein Cross-Linking between Thymine and Tyro- sine in Chromatin of Gamma-Irradiated or H2O2-Treated	PB93-178564 00,256 Federal-State Collaboration in Industrial Modernization.
HIGH TEMPERATURE ENVIRONMENTS	Cultured Human Cells. PB93-151587 00,522	PB93-209930 00,441 INFORMATION CENTERS
Principles of Gas Phase Processing of Ceramics during Combustion.	HYDROGENATION	NIST Serial Holdings, 1993.
N93-20188/7 00,467 HIGH TEMPERATURE SUPERCONDUCTORS	Elastic and Inelastic Neutron Scattering Study of Hydro- genated and Deuterated Trimethylammonium Pillared	PB94-120847 00,413 INFORMATION EXCHANGE
Magnetic Transitions in the System	Vermiculite Clays. 00,124	Initial Graphics Exchange Specification (IGES). AD-A270 049/0 00.416
YBa2Cu2.8Co0.2O6+y. PB93-125839 00,643	HYDROLYSIS	INFORMATION MODELS
Charge Transfer and Bond Lengths in YBa2Cu3- xMxO6+y.	Effects of Magnesium and Fluoride on the Hydrolysis of Octacalcium Phosphate.	Validation Testing System: Reusable Software Component Design. National PDES Testbed Report Senes.
PB93-125847 00,644	PB93-151835 00,023 HYDROMETALLURGY	PB94-109220 00,427 INFORMATION PROCESSING
Structural Phase Transition Studies of High Tc Superconducting Materials.	Development of Ore Bioleaching Standards. PB93-151603 00,496	Information Technology Standards: Processes and Strategies.
PB93-151942 00,660 Modeling of X-ray Diffraction Line Broadening with the	HYDROXYAPATITES	PB93-153625 00,291
Voigt Function: Applications to High-T(sub c) Superconductors.	Hydroxyapatite Cement. I. Basic Chemistry and Histologic Properties.	INFORMATION RETRIEVAL Database Language SQL. Category: Software Standard.
PB93-152072 00,661	PB93-125136 00,016 HYPOPHOSPHITE RADICALS	Subcategory: Database, June 1993. FIPS PUB 127-2 00,280
Direct Evidence for an Effect of Twin Boundaries on Flux Pinning in Single Crystal of YBa2Cu3O6+x.	Formation and Reactivity of Hypophosphite and	Fire Information Challenges of the 21st Century. PB93-153385 00,067
PB93-166296 00,679 Structural Phase Transformation Studies of the High Tc	Phosphite Radicals and Their Peroxyl Derivatives. PB93-166072 00,153	First Text REtrieval Conference (TREC-1).
Superconducting Materials, Ba2RCu3O6+x, in Air. PB93-166643 00.683	IGES (INITIAL GRAPHICS EXCHANGE SPECIFICATION) Initial Graphics Exchange Specification (IGES). Category:	PB93-191641 00,262 Towards Flexible Distributed Information Retrieval.
X-ray Diffraction Line Broadening: Modeling and Applica-	Software Standard; Subcategory: Graphics and Information Interchange.	PB94-102258 00,227
tions to High-(T sub c) Superconductors. PB94-108495 00,689	FIPS PUB 177 00,417	INFORMATION SERVICES Databases Available in the Research Information Center
HIGH TEMPERATURE TESTS Ultra-High Temperature Laser Vaporization Mass Spec-	Initial Graphics Exchange Specification Hybrid Micro- circuit Application Protocol.	of the National Institute of Standards and Technology. PB94-114568 00,412
trometry of SiC and HfO2. PB93-124857 00,121	PB93-175404 00,361 IGNITION	INFORMATION SYSTEMS MUMPS, Massachusetts General Hospital Utility Muiti-
HIGHWAY BRIDGES	Ignition and Subsequent Flame Spread over a Thin Cellulosic Material.	Programming System. Category: Software Standard. Sub- category: Programming Language, June 1993.
Proceedings of the U.SJapan Workshop on Seismic Retrofit of Bridges (1st), Held in Tsukuba Science City,	N93-20205/9 00,698	FIPS PUB 125-1 00,279
Japan on December 17-18, 1990. PB93-134104 00,190	Test Methods for Quantifying the Propensity of Cigarettes to Ignite Soft Furnishings.	Data Management Standards in Computer-Aided Acquisition and Logistic Support (CALS).
Overview of Damage to Highway Bridges during the Loma Prieta Earthquake.	PB94-108644 00,047 Modeling the Ignition of Soft Furnishings by a Cigarette.	N93-27714/3 00,289 Programmer's Reference Gulde to FDMS File Formats.
PB93-134112 00,191	PB94-109014 00,048	PB93-182038 00,201

Highway Concrete (HWYCON) Expert System Require-	Workshop held in Gaithersburg, Maryland on April 5-7,	IRON
ments and Installation Guide. PB93-198885 00,187	1993. PB94-108636 <i>00,372</i>	Comparison of Measured and Calculated Appearance-Po- tential Spectra for Six 3d Metals.
IFORMATION TECHNOLOGY Information Technology Vision for the U.S. Fiber/Textile/	INTEGRATED SERVICES DIGITAL NETWORK North American ISDN (Integrated Services Digital Network) Heave Forum Agreements on ISDN	PB93-151629 00,141 Iron Magnetic Moments in Iron/Silica Gel Nanocomposites.
Apparel Industry. PB93-139095 00,482	work) Users' Forum Agreements on ISDN. PB93-173391 00,211	PB93-166098 00,675
IFRARED DETECTORS Electrical and Infrared Properties of Thin Niobium	Integrated Services Digital Network Conformance Testing. Layer 2, Data Link Layer (LAPD). Part 1, Basic Rate	ISDN (INTEGRATED SERVICES DIGITAL NETWORK) Integrated Services Digital Network Conformance Testing.
Microbolometers Near T(sub c). N93-27779/6 00,339	Interface, User Side. PB94-120920 00,213	Layer 2, Data Link Layer (LAPD). Part 1, Basic Rate Interface, User Side.
FRARED PHOTOGRAPHY	INTERACTIVE SYSTEMS	PB94-120920 00,213
Extinguishment of Combustible Porous Solids by Water Droplets.	Automating Interactive Applications in a Network Environ- ment.	ISO 9000 STANDARD SERIES More Questions and Answers on the ISO 9000 Standard
PB93-198893 00,203	PB93-151215 00,251	Series and Related Issues. PB93-140689 00,093
IFRARED SPECTRA Mid- and Near-Infrared Spectra of Water and Water	INTERFACES Mechanistic Studies of Photoinduced Reactions at Semi-	ISOELECTRONIC SEQUENCE
Dimer Isolated in Solid Neon. AD-A263 966/4 00,117	conductor Surfaces. PB93-151710 00,656	Spectroscopy of the 3s(2)3p(n) Shell from Cu to Mo.
Partial Structure for trans-1,2-Difluoroethylene from High-	Experimental and Simulation Studies of the Interfacial	PB93-166270 00,590
Resolution Infrared Spectroscopy. PB93-125144 00,123	Zone in Concrete. PB93-153179 00,064	Three-Ratio Scheme for the Measurement of Isotopic Ra-
High-Resolution FTIR Study of the nu4 Band of CH2F2.	Review of the Nickel-Graphite Interface.	tios of Silicon. PB93-196285 00,612
PB93-150753 00,137	PB93-166601 00,500 INTERNATIONAL COOPERATION	IT(INFORMATION TECHNOLOGY)
Microwave and Infrared Spectra of C2H4HCCH: Barrier to Twofold Internal Rotation of C2H4.	Proceedings of the Meeting of the Intergovernmental	Assessing Federal and Commercial Information Security Needs.
PB93-150803 00,138	U.SRussian Business Development Committee's Stand- ards Working Group (2nd). Held in Gaithersburg, Mary-	PB93-138956 00,218
3nu3 Band of (32)S(16)O2: Line Positions and Intensities. PB93-151207 00,140	land on March 23-24, 1993. PB93-179968 00,087	Temperature-Electromotive Force Reference Functions
FRARED SPECTROSCOPY	INTERNATIONAL SYSTEM OF UNITS	and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90.
Infrared Spectroscopic Study of Cement Formation of Polymeric Calcium Phosphate Cement.	Federal Move to Metric: Public Law, DoC and NIST. PB93-139129 00,089	PB93-190338 00,611
PB93-151298 00,019 IFRARED THERMOGRAPHY	Metrication: An Economic Wake-up Call for U.S. Industry.	JAPAN Japan's Kohsetsushi Program of Regional Public Exam-
Study of Fire Induced Flow along the Vertical Corner	PB93-188969 00,088	Ination and Technology Centers for Upgrading Small and Mid-Size Manufacturing Firms. Presented at Annual
Wall. Part 2. PB93-205623 00,074	INTERNATIONAL TEMPERATURE SCALE OF 1990 Temperature-Electromotive Force Reference Functions	Meeting of the Association of American Geographers.
JECTION MOLDING	and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90.	Held in Miami, Florida in April 1991. PB93-209922 00,453
Flow Behavior in Liquid Molding. N93-14747/8 00,478	PB93-190338 00,611	KAZAL PANCREATIC TRYPSIN INHIBITOR
SPECTION	INTERNATIONAL TRADE More Questions and Answers on the ISO 9000 Standard	Protein Crystal Growth of Ribonuclease A and Pancreatic Trypsin Inhibitor Aboard the Maser 3 Rocket.
Dimensional Inspection Planning Based on Product Data Standards. National PDES Testbed Report Series.	Series and Related Issues. PB93-140689 00.093	PB93-166122 00,524 KELVIN BRIDGES
PB93-198455 00,450	Questions and Answers on Quality, the ISO 9000 Stand-	Automated AC Bridge for Resistance Measurements.
ISTRUMENT ERRORS Drift Eliminating Designs for Non-Simultaneous Compari-	ard Series, Quality System Registration, and Related Issues.	PB93-151132 00,330 KERR CONSTANTS
son Calibrations. PB93-196277 00,405	PB93-152080 00,090	Laser-Induced Kerr Constants for Pure Liquids.
STRUMENTATION & EXPERIMENTAL METHODS	INVAR Polarization Analysis of the Magnetic Excitations In Invar	PB93-148989 00,129 KEY MANAGEMENT
Rheometer with Two-Dimensional Area Detection for Light Scattering Studies of Polymer Melts and Solutions.	Fe86B14. PB93-151256 00,652	Study of OSI Key Management.
PB93-151322 00,171	INVARIANT MEASURES	PB93-151579 00,220 LABORATORIES
NIST Cold Neutron Research Facility and Magnetic Neutron Scattering.	Monte Carlo Approach to the Approximation of Invariant Measures.	National Voluntary Laboratory Accreditation Program
PB93-151694 00,654	PB93-159069 00,508	1993 Directory. PB93-156644 00,402
Tunneling Stabilized Magnetic Force Microscopy of YBa2Cu3O7-Delta Films on MgO at 76 K.	INVENTIONS Energy Related Inventions Program. Status Report for	State Weights and Measures Laboratories: State Stand-
PB93-151702 00,655	Recommendations 351 through 602.	ards Program Description and Directory. 1993 Edition. PB93-217529 00,451
Measurement of the Performance of a Spiral Wound Polyimide Regenerator in a Pulse Tube Refrigerator.	PB94-111853 00,373 Energy Related Inventions Program. Status Report for	Collaborating with Our Customers: NIST Building and Fire
PB93-153658 00,111 Mechanistic and Response Studies of Iridium Oxide pH	Recommendations 1 through 350. PB94-111903 00,374	Research Laboratory. PB94-110194 00,029
Sensors.	ION-ATOM COLLISIONS	Guide to NIST. PB94-119435 00,002
PB93-166346 00,113 IACP's Radar Testing Program Is Alive and Well.	Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2	LANGUAGE PROGRAMMING
PB93-166429 00,702	for Energies from 0.1 eV to 10 keV.	Database Language SQL. Category: Software Standard. Subcategory: Database, June 1993.
Ultra-High Resolution Inelastic Neutron Scattering. PB93-166882 00,604	PB93-149086 00,571 ION IMPLANTATION	FIPS PUB 127-2 00,280
Measuring Low Frequency Tilts.	MeV Be Implantation in GaAs.	LASER ENHANCED IONIZATION Laser-Enhanced Ionization Spectrometry Following Matrix
PB93-196251 00,543 ITEGRATED CIRCUITS	PB93-151645 00,653 ION MOLECULE COLLISIONS	Modification by Automated Chelation Chromatography for the Analysis of Biological and Environmental Reference
New Test Structure for the Electrical Measurement of the	Collisions of $H(+)$, $H((sub 2)(+))$, $H((sub 3)(+))$, $ArH(+)$,	Materials.
Width of Short Features with Arbitrarily Wide Voltage Taps.	H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2 for Energies from 0.1 eV to 10 keV.	PB93-166494 00,104 Topics in Laser Spectroscopy - Simultaneous Detection
PB93-124782 00,349	PB93-149086 00,571	of Laser-Enhanced Ionization and Laser-Induced Fluores-
Test Guide for CMOS-On-SIMOX Test Chips NIST3 and NIST4.	ION STORAGE Low Order Modes of an Ion Cloud in a Penning Trap.	cence In Flames - Noise Correlation Studies. PB93-166502 00,105
PB93-152106 00,355 Directed-Graph Classifier of Samiconductor Water Test	PB93-153203 00,581	LASER INDUCED FLUORESCENCE
Directed-Graph Classifier of Semiconductor Wafer-Test Patterns.	Ionic Crystals in a Linear Paul Trap. PB93-153633 00,584	Topics in Laser Spectroscopy - Simultaneous Detection of Laser-Enhanced Ionization and Laser-Induced Fluores-
PB93-153286 00,356 Millimeter Wave Metrology at the National Institute of	IONIZATION CHAMBERS	cence in Flames - Noise Correlation Studies. PB93-166502 00,105
Standards and Technology. PB93-153666 00,359	Calculations on Displacement Corrections for In-Phantom Measurements with Ionization Chambers for Mammog-	LASER SPECTROSCOPY
Semiconductor Measurement Technology: Evolution of	raphy. PB93-166700 00,519	High Resolution Spectroscopy Using Fiber Lasers. PB93-125201 00,622
Sillcon Materials Characterization: Lessons Learned for Improved Manufacturing.	IONIZING RADIATION	Laser-Enhanced Ionization Spectrometry Following Matrix
PB93-228641 00,367	DNA Base Damage in Chromatin of Gamma-Irradiated Cultured Human Cells.	Modification by Automated Chelation Chromatography for the Analysis of Biological and Environmental Reference
Journal of Research of the National Institute of Standards and Technology, July-August 1993. Volume 98, Number	PB93-151314 00,521	Materials. PB93-166494 00,104
4. PB94-108529 00,369	DNA-Protein Cross-Linking between Thymine and Tyrosine in Chromatin of Gamma-Irradiated or H2O2-Treated	Topics in Laser Spectroscopy - Simultaneous Detection
X-ray Lithography Mask Metrology: Use of Transmitted	Cultured Human Cells. PB93-151587 00,522	of Laser-Enhanced Ionization and Laser-Induced Fluores- cence in Flames - Noise Correlation Studies.
Electrons in an SEM for Linewidth Measurement. PB94-108537 00,370	IRIDIUM OXIDES	PB93-166502 00,105
RL/NIST Workshop on Moisture Measurement and Con-	Mechanistic and Response Studies of Iridium Oxide pH Sensors.	In situ Analysis of Laser-Induced Vapor Plumes.
trol for Microelectronics, Proceedings of the RL/NIST	PR93-166346 00.113	PB93-165983 00 151

LASER VAPORIZATION MASS SPECTROSCOPY Ultra-High Temperature Laser Vaporization Mass Spec-	LIQUID COLUMN CHROMATOGRAPHY Subamblent Temperature Modification of Selectivity In	MAGNETIC MEASUREMENT Shielded Open-Circuited Sample Holders for Dielectric
trometry of SiC and HfO2. PB93-124857 00,121	Reversed-Phase Liquid Chromatography. PB93-153799 00,103	and Magnetic Measurements of Liquids and Powders. PB93-198851 00,319
LATERAL PRESSURE Strength of Partially-Grouted Masonry Shear Walls under	LIQUID HYDROGEN Transient Hydrogen Heat Transfer.	Coll Probe Dimension and Uncertainties during Measurements of Nonuniform ELF Magnetic Fields.
Lateral Loads. PB93-206225 00,082	AD-A266 615/4 00,110	PB94-108479 00,616
LATTICE PARAMETERS	LIQUID PHASES Field-Space Conformal Solution Method: Binary Vapor-	Research for Electric Energy Systems: An Annual Report, October 1993.
Accuracy in Powder Diffraction II. Proceedings of the International Conference. Held in Gaithersburg, Maryland	Liquid Phase Behavior. PB93-166239 00,156	PB94-112182 00,375 MAGNETIC MOMENTS
on May 26-29, 1992. PB93-141737 00,648	LIQUID-SOLID INTERFACES	Iron Magnetic Moments In Iron/Silica Gel
LAW (JURISPRUDENCE)	Boundary/Interface Fitted Grld Generation Using Tensor Product B-splines: A Preliminary Study.	Nanocomposites. PB93-166098 00,675
Federal Move to Metric: Public Law, DoC and NIST. PB93-139129 00,089	PB93-234748 00,503 LIQUID-VAPOR EQUILIBRIUM	MAGNETIC PROBES Coll Probe Dimension and Uncertainties during Measure-
NIST Handbook 130, 1993. Uniform Laws and Regula-	Prediction of Fluid Phase Equilibrium of Ternary Mixtures	ments of Nonuniform ELF Magnetic Fields.
tions In the Areas of Legal Metrology and Motor Fuel Quality as Adopted by the 77th National Conference on	In the Critical Region and the Modified Leung-Griffiths Theory.	PB94-108479 00,616 Research for Electric Energy Systems: An Annual Report,
Weights and Measures 1992. PB93-213114 00,015	PB93-153484 00,148	October 1993. PB94-112182 00,375
LEACHING	Liquids Laser-Induced Kerr Constants for Pure Liquids.	MAGNETIC PROPERTIES
Development of Ore Bioleaching Standards. PB93-151603 00,496	PB93-148989 00,129	Low Temperature Magnetic Behavior of 'Nonmagnetic' Materials.
LENGTH Code Interference Management Asset	Cryogenic Mechanical Testing of Al-Li Alloys at NIST.	PB93-150795 00,309
NIST Length Scale Interferometer Measurement Assurance.	PB93-228633 00,502 LITHIUM ALLOYS	Magnetic Properties of Cr-Mn Austenlitc Stainless Steels. PB93-153310 00,483
PB93-146645 00,401 LIFE-CYCLE COST	Aluminum Alloys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-	MAGNETIC TAPES Status of Emerging Standards for Removable Computer
BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program	Li Alloys and Alloy 2219.	Status of Emerging Standards for Removable Computer Storage Media and Related Contributions of NIST.
(Version 4.0). User's Guide and Reference Manual. PB93-208460 00,026	PB93-173441 00,501 LITHOGRAPHY	N93-14778/3 00,228 MAGNETISM
LIFE CYCLE COSTS	Report on a Workshop for Improving Relationships be- tween Users and Suppliers of Microlithography Metrology	Magnetic Units and Materials Specification.
Life-Cycle Costing Workshop for Energy Conservation in Buildings: Student Manual.	Tools.	PB93-153351 00,665 MAGNETS
PB93-198984 00,383 Present Worth Factors for Life-Cycle Cost Studies in the	PB93-206233 00,365 X-ray Lithography Mask Metrology: Use of Transmitted	Review of Irradiation Effects on Organic-Matrix Insulation. PB93-206928 00,546
Department of Defense (1994). PB94-109238 00.540	Electrons in an SEM for Linewidth Measurement. PB94-108537 00.370	MAGNIFICATION STANDARDS
Building Life Cycle Cost Computer Program (BLCC), Ver-	LIVER	Interlaboratory Study on the Lithographically Produced Scanning Electron Microscope Magnification Standard
sion 4.11 (for Microcomputers). PB94-500055 00,042	Determination of Baseline Platinum Levels in Biological Materials.	Prototype. PB94-108545 00,371
LIGHT SCATTERING	PB93-151975 00,515 LOAD CELLS	MALIGNANT NEOPLASMS
Time-based ensemble scattering measurements in fuel sprays.	Automation of Strain-Gauge Load-Cell Force Calibration.	DNA Base Modifications In Chromatin of Human Cancerous Tissues.
DE93007989 00,197 Direct and Inverse Problems for Light Scattered by	PB93-166684 00,404 LOCKS (FASTENERS)	PB93-153559 00,523
Rough Surfaces. PB93-125714 00,623	Test Methods for Detention and Correctional Facility Locks.	MAMMOGRAPHY Calculations on Displacement Corrections for In-Phantom
Observation of Photon Correlations in Scattering from a	PB93-139111 00,054	Measurements with Ionization Chambers for Mammography.
Silver Electrode. PB93-150829 00,115	LOGISTICS SUPPORT Collection of Technical Studies Completed for the Com-	PB93-166700 00,519
Rheometer with Two-Dimensional Area Detection for	puter-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1987, Volume 4.	MANUALS Guide to NIST.
Light Scattering Studies of Polymer Melts and Solutions. PB93-151322 00,171	AD-A261 193/7 00,414	PB94-119435 00,002 MANUFACTURED HOUSING
LIGHTING EQUIPMENT	LOMA PRIETA EARTHQUAKE Proceedings of the U.SJapan Workshop on Seismic	Controlling Moisture in the Roof Cavities of Manufactured
Lighting System Design and Evaluation in Federal Office Buildings.	Retrofit of Bridges (1st). Held in Tsukuba Science City, Japan on December 17-18, 1990.	Housing. PB93-139046 00,052
PB93-206217 00,040 Literature Review of Lighting Standards.	PB93-134104 00,190	MANUFACTURING Flow Behavior in Liquid Molding.
PB93-208445 00,041	Overview of Damage to Highway Bridges during the Loma Prieta Earthquake.	N93-14747/8 00,478
Experimental Evaluation of Lighting/HVAC Interaction.	PB93-134112 00,191 LOW TEMPERATURE SCIENCE & ENGINEERING	Collection of Successful Interactions between the MTCs and Client Firms.
PB93-166437 00,038 Evaluation of Subjective Response to Lighting Distribu-	Transport Current Effects on Flux Creep and Magnetiza-	PB93-206886 00,092
tions: A Literature Review.	tion in Nb-Ti Multifilament Cable Strands. PB93-150746 00,574	Japan's Kohsetsushi Program of Regional Public Exam- ination and Technology Centers for Upgrading Small and Mid-Size Manufacturing Firms. Presented at Annual
PB93-173458 00,039 LIMESTONE	Modeling of X-ray Diffraction Line Broadening with the Voigt Function: Applications to High-T(sub c)	Meeting of the Association of American Geographers.
Geochemical Considerations in the Cleaning of Carbonate Stone.	Superconductors. PB93-152072 00,661	Held in Miami, Florida in April 1991. PB93-209922 00,453
PB93-151231 00,059	Orientation Dependence of Flux Pinning in a Layered	Federal-State Collaboration in Industrial Modemization. PB93-209930 00,441
Graphical Methods for Examining the Effects of Acid Rain and Sulfur Dioxide on Carbonate Stones.	Bi2Sr2Ca1Cu2O8 + 10% Ag Composite. PB93-153328 00,663	MARBLE
PB93-151249 00,060	Aluminum Alloys for ALS Cryogenic Tanks: Comparative	Geochemical Considerations in the Cleaning of Carbonate Stone.
X-ray Diffraction Line Broadening: Modeling and Applica-	Measurements of Cryogenic Mechanical Properties of Al- Li Alloys and Alloy 2219.	PB93-151231 00,059
tions to High-(T sub c) Superconductors. PB94-108495 00,689	PB93-173441 00,501 M1-TRANSITIONS	Graphical Methods for Examining the Effects of Acid Rain and Sulfur Dioxide on Carbonate Stones.
LINE WIDTH	Spectroscopy of the 3s(2)3p(n) Shell from Cu to Mo. PB93-166270 00.590	PB93-151249 00,060 MARINE ACCIDENTS
New Test Structure for the Electrical Measurement of the Width of Short Features with Arbitrarily Wide Voltage	MACHINE LEARNING	Water Mist Fire Suppression Workshop Proceedings.
Taps. PB93-124782 00,349	Statistical Analysis of Information Content for Training Pattern Recognition Networks.	Held in Gaithersburg, Maryland on March 1-2, 1993. PB93-219780 00,700
X-ray Lithography Mask Metrology: Use of Transmitted Electrons in an SEM for Linewidth Measurement.	PB93-178861 00,299	MARINE ENVIRONMENTS
PB94-108537 00,370	MACHINE TOOLS Some Guidelines for Implementing Error Compensation	Instrumental Neutron Activation Analysis of Standard Ref- erence Material 1941, Organics in Marine Sediment: Ele-
LINEAR SYSTEMS Characteristics of Unknown Linear Systems Deduced	on Machine Tools. PB93-234680 00,452	ment, Content and Homogeneity. PB93-166213 00,552
from Measured CW Magnitude. PB94-108487 00,337	MACHINING	Standard Reference Materials for Trace Organic Contamlnants in the Marine Environment.
LIQUEFACTION	Machining of Advanced Materials: Proceedings of the International Conference on Machining of Advanced Ma-	PB93-166627 <i>00,395</i>
Estimating Soil Parameters Important for Lifeline Siting Using System Identification Techniques.	terials. Held in Gaithersburg, Maryland on July 20-22, 1993.	MASER 3 ROCKET Protein Crystal Growth of Ribonuclease A and Pancreatic
PB93-178606 00,193 Estimating In situ Liquefaction Potential and Permanent	PB93-217578 00,442 MAGNESIUM	Trypsin Inhibitor Aboard the Maser 3 Rocket. PB93-166122 00,524
Ground Displacements Due to Liquefaction for the Siting		
of Lifelines.	Effects of Magnesium and Fluoride on the Hydrolysis of Octacalcium Phosphate.	MASONRY Research Plan for Masonry Shear Walls.

Our calls of Bartistic Countried Manager Change Wells under	Colibertian Broklem on an III Broad Investo Broklem	BEACUDERENT COUNCE & TECHNOLOGY, PHYCICAL
Strength of Partially-Grouted Masonry Shear Walls under Lateral Loads. PB93-206225 00,082	Calibration Problem as an III-Posed Inverse Problem. PB93-151108 00,512	MEASUREMENT SCIENCE & TECHNOLOGY: PHYSICAL STANDARDS & FUNDAMENTAL CONSTANTS Designing for Frequency and Time Metrology at the 10 to
Effect of Critical Parameters on the Behavior of Partially-	Marriage of Exact Enumeration and 1/d Expansion Methods: Lattice Model of Dilute Polymers.	the Minus 18 Power Level. N93-25059/5 00,558
Grouted Masonry Shear Walls under Lateral Loads. PB93-206894 00,076	PB93-151330 00,172 Prediction Intervals for a Balanced One-Way Random-Ef-	New Test Structure for the Electrical Measurement of the
ASS SPECTROMETERS	fects Model. PB93-151900 00.513	Width of Short Features with Arbitrarily Wide Voltage Taps.
Instrument-Independent Database for Collisionally Activated Dissociation in Radiofrequency Only Quadrupoles.	Phase-Field Model for Isothermal Phase Transitions in Bi-	PB93-124782 00,349
Single-Collision Versus Multiple-Collision Conditions. PB93-125680 00,400	nary Alloys. PB93-151934 00,498	Federal Move to Metric: Public Law, DoC and NIST. PB93-139129 00,089
ASS SPECTROSCOPY Large Scale Evaluation of a Pattern Recognition/Expert	Fast Fourier Transform Algorithms for Real and Symmet-	System for Measuring Conditional Amplitude, Phase, or Time Distributions of Pulsating Phenomena.
System for Mass Spectral Molecular Weight Estimation. PB94-113081	ric Data. PB93-153146 00,507	PB93-143931 00,308
ASS STANDARDS	Chaotic Motions of Forced and Coupled Galloping Oscillators.	NIST Length Scale Interferometer Measurement Assurance.
Surveillance Schemes with Applications to Mass Calibration.	PB93-153245 00,003	PB93-146645 00,401 Proposed Measurement of the Fine Structure Constant
PB93-181881 00,608	Robust Parallel Computation in Floating-Point and SLI Arithmetic.	Using a Coulomb-Blockade Charge Pump. PB93-151264 00,577
ASS TRANSFER Heat and Mass Transport from Thermally Degrading Thin	PB93-153476 00,252	Conversion of Temperatures and Thermodynamic Prop-
Cellulosic Materials In a Microgravity Environment. PB93-153435 00,505	Computation of Complex Solidification Morphologies Using a Phase-Field Model.	erties to the Basis of the International Temperature Scale of 1990.
ATERIALS	PB93-156743 00,671 Cross Validation Comparison of NIST OCR Databases.	PB93-153336 00,147 Improvements in the NIST Watt Measurement: Monitoring
Making Materials Database Standards International. PB93-151736 00,463	PB93-159077 00,297	the Mass Stability of the Kilogram.
Materials Reliability. Technical Activities, 1992. (NAS-NRC Assessment Panel, May 13-14, 1993).	Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurements Results.	PB93-153567 00,317 Measurements for Competitiveness In Electronics. First
PB93-173466 00,446	PB93-159465 00,403	Edition. PB93-160588 00,091
Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, February 2-3,	Phase-Field Models for Anisotropic Interfaces. PB93-164564 00,672	Constants, Fundamental.
1993). PB94-112430 00,434	Chaotic Motions of Self-Excited Forced and Autonomous Square Prisms.	PB93-166353 00,592 New International Volt and Ohm Standards.
ATERIALS TESTING	PB93-166114 00,621	PB93-166361 00,593
Clinical Trial of an Adhesive Material. PB94-109329 00,528	Built-in Error Estimator for Optimizing Finite Element Modeling.	Preparing for the New Volt and Ohm. PB93-166379 00,594
ATHEMATICAL MODELS	PB93-166312 00,694	State Weights and Measures Laboratories: State Standards Program Description and Directory. 1993 Edition.
Developments Needed to Expand the Role of Fire Modeling in Material Fire Hazard Assessment.	Renewal Look at Switching Rules in MIL-STD-105D. PB93-166676 00,445	PB93-217529 00,451
N94-10787/7 00,009 Predictive Thermodynamic Model for Complex High Tem-	Statistical Analysis of Information Content for Training Pattern Recognition Networks.	MEASUREMENT SCIENCE & TECHNOLOGY: POLICY & STATE-OF-THE-ART SURVEYS
perature Solution Phases XI. PB93-124840 00,120	PB93-178861 00,299	Metrology Is More Than Calibration: Letting Others Know That Measurements Matter.
Smoke Movement in a Corridor-Hybrid Model, Simple	Surveillance Schemes with Applications to Mass Calibration.	PB93-124816 00,443
Model and Companison with Experiments. PB93-146678 00,057	PB93-181881 00,608	Development of Ore Bioleaching Standards. PB93-151603 00,496
Prediction Intervals for a Balanced One-Way Random-Ef-	Bibliographic Notes on Voronoi Diagrams. PB93-189298 00,509	Magnetic Units and Materials Specification. PB93-153351 00,665
fects Model. PB93-151900 00,513	Building Hadamard Matrices in Steps of 4 to Order 200. PB93-189835 00,261	Measurement Uncertainty Considerations for Coordinate
Phase-Field Model for Isothermal Phase Transitions in Binary Alloys.	Optimizing Complex Kinetics Experiments Using Least-	Measuring Machines. PB93-189819 00,449
PB93-151934 00,498	Squares Methods. PB93-196244 00,167	Temperature-Electromotive Force Reference Functions
Molecular Modeling of Polymer Flammability: Application to the Design of Flame-Resistant Polyethylene.	Drift Eliminating Designs for Non-Simultaneous Comparison Calibrations.	and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90.
PB93-153542 00,504	PB93-196277 00,405	PB93-190338 00,611 Report of the National Conference on Weights and Meas-
Built-in Error Estimator for Optimizing Finite Element Modeling.	Three-Ratio Scheme for the Measurement of Isotopic Ratios of Silicon.	ures (77th). Held in Nashville, Tennessee on July 19-23, 1992.
PB93-166312 00,694 Experimental Validation of a Mathematical Model for Pre-	PB93-196285 00,612	PB93-209781 00,406
dicting Water Vapor Sorption at Interior Building Surfaces. PB93-166403 00,070	RADCAL: A Narrow-Band Model for Radiation Calculations in a Combustion Environment.	MEASUREMENT UNCERTAINTY Guidelines for Evaluating and Expressing the Uncertainty
Discharge of Fire Suppression Agents from a Pressurized	PB93-200889 00,204 Computational Experience with Radial Basis Function	of NIST Measurements Řesults. PB93-159465 00,403
Vessel: A Mathematical Model and Its Application to Experimental Design.	Networks.	MEASUREMENTS
PB93-198927 00,044 Some Guidelines for Implementing Error Compensation	PB93-206191 00,303 Observations About Joined Circular Arcs.	Metrology is More Than Calibration: Letting Others Know That Measurements Matter.
on Machine Tools.	PB93-234714 00,510	PB93-124816 00,443 MEASURING INSTRUMENTS
PB93-234680 00,452 ATHEMATICAL & STATISTICAL METHODS	Boundary/Interface Fitted Grid Generation Using Tensor Product B-splines: A Preliminary Study.	Use of Contact Type Measurement Device to Detect Ro-
Fast Fourier Transforms for Space Groups Containing Rotation Axes of Order Three and Higher.	PB93-234748 00,503 X-ray Diffraction Line Broadening: Modeling and Applica-	bots' Hand Positions. PB93-166551 00,455
PB93-124790 00,642	tions to High-(T sub c) Superconductors.	NIST Handbook 44, 1993: Specifications, Tolerances, and Other Technical Requirements for Weighing and
Toward an Intelligent System for Mathematical Software Selection.	PB94-108495 00,683 Morphological Instability in Phase-Field Models of Solidi-	Measuring Devices as Adopted by the 77th National Conference on Weights and Measures 1992.
PB93-124832 00,506	fication. PB94-111523 00,691	PB93-213106 00,407
Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem.	MATHEMATICS	MECHANICAL PROPERTIES Standard Formats for Welding Property Data.
PB93-124865 00,555 Characterization of a Distribution Function by the Second	Toward an Intelligent System for Mathematical Software Selection.	PB93-166106 00,437
Moment of the Residual Life. PB93-125193 00,511	PB93-124832 00,506	Cryogenic Mechanical Testing of Al-LI Alloys at NIST. PB93-228633 00,502
Logarithmic Terms in Fields Near the Edge of a Dielectric	MEAN FREE PATH Material Dependence of Electron Inelastic Mean Free	MECHANICAL TESTS Mechanical Test Methods for Metal-Matrix Composites: A
Wedge. PB93-125706 00,638	Paths at Low Energies. PB93-166320 00,591	Status Report from the U.S.A.
Limited Tests to Investigate Whether the Size of Body	MEASUREMENT	PB93-153500 00,479 MECHANICS: DESIGN/TESTING/MEASUREMENT
Armor Samples Influences Ballistic Test Results. PB93-138998 00,554	Measurements for Competitiveness in Electronics. First Edition.	Quantitative Evaluation of Distributed Pores in Reference Radiographs.
Thermodynamically-Consistent Phase-Field Models for Solidification,	PB93-160588 00,091	PB93-151744 00,444
PB93-139012 00,646	Dual-Port Circularly Polarized Probe Standards at the National Institute of Standards and Technology.	Cryogenic Mechanical Testing of Al-Li Alloys at NIST. PB93-228633 00,502
Accuracy of the Double Variation Technique of Refractive Index Measurement.	PB93-235208 00,326 MEASUREMENT SCIENCE & TECHNOLOGY	MEETINGS Proceedings of the sixth JapanUS workshop on high-
PB93-143964 00,624 Mechanism for Capture Into Resonance.	CALIBRATION New Approach to Calibration of Transducers Used in the	field superconducting materials and standard procedures
PB93-145761 00,010	Measurement of Dynamic Pressure and Temperature.	for high-field superconducting materials testing. DE93002848 00,640
OCR Error Rate Versus Rejection Rate for Isolated Hand- print Characters.	PB93-153716 00,348 Automation of Strain-Gauge Load-Cell Force Calibration.	Time-based ensemble scattering measurements in fuel sprays.
PB93-146652 00,294	PB93-166684 00,404	DE93007989 00,197

Proceedings of the U.SJapan Workshop on Seismic Retrofit of Bridges (1st). Held in Tsukuba Science City, Japan on December 17-18, 1990.	Interim Criteria for Polymer-Modified Bituminous Roofing Membrane Materials: A Summary Report. PB93-153724 00,069	Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, April to June 1993 with 1993/1994 EEEL
PB93-134104 00,190 Accuracy in Powder Diffraction II. Proceedings of the	METAL CLUSTERS Vibrational Line Shape of Diatomic Adsorbates on Metal	Events Calendar. PB94-118403 00,342
International Conference. Held in Gaithersburg, Maryland	Clusters.	METROLOGY: PHYSICAL MEASUREMENTS
on May 26-29, 1992. PB93-141737 00,648	PB93-153187 00,145	High Resolution Spectroscopy Using Fiber Lasers. PB93-125201 00,622
Proceedings of the AP Validation Workshop. Heid in Se-	METAL CRYSTALS Solidification Processing and Phase Transformations in	Direct and Inverse Problems for Light Scattered by
attle, Washington on April 13-14, 1992. National PDES Testbed Report Series.	Ordered High Temperature Alloys.	Rough Surfaces.
PB93-158715 00,423	AD-A261 751/2 00,494 METAL MATRIX COMPOSITES	PB93-125714 00,623 Comparison of National Standards for the Performance
Proceedings of the Meeting of the Intergovernmental	Mechanical Test Methods for Metal-Matrix Composites: A	Evaluation of Coordinate Measuring Machines in Terms
U.SRussian Business Development Committee's Stand- ards Working Group (2nd). Held in Gaithersburg, Mary-	Status Report from the U.S.A. PB93-153500 00,479	of Length-Based Dimensional Quantities. PB93-139004 00,458
land on March 23-24, 1993. PB93-179968 00,087	Wear and Friction Characteristics of Self-Lubricating Cop-	Journal of Research of the National institute of Standards
International Conference on Fire Suppression Research	per - intercalated Graphite Composites.	and Technology, November-December 1992. Volume 97, Number 6.
(1st): Proceedings. Held in Stockholm and Boras, Swe-	PB93-153765 00,480 METAL STRIPS	PB93-143923 00,565
den on May 5-8, 1992. PB93-183952 00,202	Residual Stress in a Porcelain-Metal Strip Related to	Long-Range Scanning for Scanning Tunneling Micros-
First Text REtrieval Conference (TREC-1).	Thermo-Physical Properties of Materials. PB93-151801 00,022	copy. PB93-150811 00,625
PB93-191641 00,262	METHANOL	Comparison of Transport Critical Current Measurement
Proceedings of the Joint DoD/NIST Workshop on Inter- national Precision Fabrication Research and Develop-	Observations of soot in combustion of methanol/toluene	Methods. PB93-153369 00,666
ment. Heid in Rockville, Maryland on October 27-29, 1992.	spray flames. DE93007992 00,378	Radiative Heat Transfer in Transient Hot-Wire Measure-
PB93-192318 00,440	METHYLENE FLUORIDES	ments of Thermal Conductivity. PB93-153534 00.582
International Colloqium on Atomic Spectra and Oscillator	High-Resolution FTIR Study of the nu4 Band of CH2F2. PB93-150753 00,137	Reference Detectors for Spectral Responsivity Measure-
Strengths for Astrophysical and Laboratory Plasmas (4th). Held at the National Institute of Standards and Tech-	METRIC SYSTEM	ments.
nology, Gaithersburg, Maryland on September 14-17, 1992.	Federal Move to Metric: Public Law, DoC and NIST.	PB93-153591 00,626 Scanning Tunneling Microscopy of Optical Surfaces.
PB93-198422 00,012	PB93-139129 00,089	PB93-166023 00,628
Report on a Workshop for Improving Relationships be-	Metrication: An Economic Wake-up Call for U.S. Industry. PB93-188969 00,088	Comparison between Precision Roughness Master Speci-
tween Users and Suppliers of Microlithography Metrology Tools.	METRICATION	mens and Their Electroformed Replicas. PB93-166163 00,438
PB93-206233 00,365	Metrication: An Economic Wake-up Call for U.S. Industry. PB93-188969 00,088	Radiometer for Precision Coherent Radiation Measure-
Workshop on Characterizing Diamond Films II. Held in Gaithersburg, MD. on February 24-25, 1993.	METROLOGY	ments. PB93-166395 00,629
PB93-207157 00,687	Metrology is More Than Calibration: Letting Others Know That Measurements Matter.	Journal of Research of the National Institute of Standards
Report of the National Conference on Weights and Meas- ures (77th). Held in Nashville, Tennessee on July 19-23,	PB93-124816 00,443	and Technology, January-February 1993. Volume 98, Number 1. Special Issue.
1992.	Electronics and Electrical Engineering Laboratory Tech-	PB93-166817 00,598
PB93-209781 00,406 Machining of Advanced Materials: Proceedings of the	nical Publication Announcements Covering Laboratory Programs, April to June 1992, with 1992/1993 EEEL	Journal of Research of the National Institute of Standards
International Conference on Machining of Advanced Ma-	Events Calendar. PB93-147163 00.353	and Technology, March-April 1993. Volume 98, Number 2.
terials. Heid in Gaithersburg, Maryland on July 20-22, 1993.	Millimeter Wave Metrology at the National Institute of	PB93-196228 00,631
PB93-217578 00,442	Standards and Technology. PB93-153666 00,359	Recent Results of the NIST National Bali Plate Round Robin.
Water Mist Fire Suppression Workshop Proceedings. Held in Gaithersburg, Maryland on March 1-2, 1993.	Electronics and Electrical Engineering Laboratory Tech-	PB93-219715 00,408
PB93-219780 00,700	nical Publication Announcements Covering Laboratory	Journal of Research of the National Institute of Standards and Technology, May-June 1993. Volume 98, Number 3.
Proceedings: ICSSC Issues Workshop. Development of Seismic Evaluation and Rehabilitation Standards for Fed-	Programs, July to September, 1992 with 1992/1993 EEEL Events Calendar.	PB94-108461 00,688
eraily Owned and Leased Buildings. Held in Denver, Col-	PB93-158632 00,360	Journal of Research of the National institute of Standards and Technology, July-August 1993. Volume 98, Number
orado on September 16-17, 1992. PB93-228666 00,083	Electronics and Electrical Engineering Laboratory Tech- nical Publication Announcements Covering Laboratory	4. PB94-108529 <i>00,369</i>
Report of the NSF/NIST Workshop on NSFNET/NREN	Programs, October to December, 1992 with 1992/1993 EEEL Events Calendar.	MICA
Security. Held on July 6-7, 1992. PB93-228682 00,225	PB93-198877 00,362	Molecular Wedge in a Brittle Crack: A Simulation of Mica
Workshop on Elevator Use during Fires. Held in	Center for Electronics and Electrical Engineering Tech- nical Publication Announcements Covering Center Pro-	Water. PB93-166411 00,541
Gaithersburg, Maryland on September 29, 1992. PB93-235190 00,045	grams, April to June 1990, with 1991 CEEE Events Calendar.	MICROANALYSIS
Workshop on Security Procedures for the Interchange of	PB93-205516 00,363	Preparation and Preliminary Analysis of K-411 Glass Microspheres.
Electronic Documents: Selected Papers and Results. PB94-101854 00,226	Center for Electronics and Electrical Engineering Technical Progress Bulletin Covering Center Programs, April	PB93-125623 00,097
Balanced Design Concepts Workshop. Held in	to June 1990, with 1990/1991 CEEE Events Calendar.	MICROBOLOMETERS Electrical and Infrared Properties of Thin Niobium
Gaithersburg, Maryland on June 30-July 2, 1993. PB94-108388 00.028	PB93-205524 00,364	Microbolometers Near T(sub c).
RL/NIST Workshop on Moisture Measurement and Con-	NIST Handbook 44, 1993: Specifications, Tolerances, and Other Technical Requirements for Weighing and	N93-27779/6 00,339
trol for Microelectronics. Proceedings of the RL/NIST Workshop held in Gaithersburg, Maryland on April 5-7,	Measuring Devices as Adopted by the 77th National Con- ference on Weights and Measures 1992.	MICROCIRCUITS Initial Graphics Exchange Specification Hybrid Micro-
1993.	PB93-213106 00,407	circuit Application Protocol. PB93-175404 00,361
PB94-108636 00,372	NIST Handbook 130, 1993. Uniform Laws and Regula- tions in the Areas of Legal Metrology and Motor Fuel	MICROELECTRONICS
National Institute of Standards and Technology Con- ference on Reducing the Cost of Space infrastructure and	Quality as Adopted by the 77th National Conference on	Electronics and Electrical Engineering Laboratory Tech-
Operations. Part 1. Oral Presentations and Discussion. Held in Gaithersburg, Maryland on November 20-22,	Weights and Measures 1992. PB93-213114 00,015	nical Publication Announcements Covering Laboratory Programs, April to June 1992, with 1992/1993 EEEL
1989. PB94-111374 00,699	Recent Results of the NIST National Ball Plate Round	Events Calendar. PB93-147163 00,353
Report of the ARPA/NIST Workshop on Performance	Robin. PB93-219715 00,408	Electronics and Electrical Engineering Laboratory Tech-
Evaluation of Unmanned Ground Vehicle Technologies.	Development of a National Metrology Infrastructure for	nical Publication Announcements Covering Laboratory Programs, July to September, 1992 with 1992/1993 EEEL
PB94-112422 00,456 National Institute of Standards and Technology Con-	the Domestic Gear Industry. PB93-219756 00,409	Events Calendar.
ference on Reducing the Cost of Space infrastructure and	Electronics and Electrical Engineering Laboratory Tech-	PB93-158632 00,360 Electronics and Electrical Engineering Laboratory Tech-
Operations. Part 2. Topical Papers. Held in Gaithersburg, Maryland on November 20-22, 1989.	nical Publication Announcements Covering Laboratory Programs, January to March, 1993 with 1993/1994 EEEL	nical Publication Announcements Covering Laboratory
PB94-113487 00,696	Events Calendar.	Programs, October to December, 1992 with 1992/1993 EEEL Events Calendar.
Proceedings: Open Forum on Surge Protection Applica- tion.	PB93-234698 00,368 Journal of Research of the National Institute of Standards	PB93-198877 00,362
PB94-118056 00,346	and Technology, July-August 1993. Volume 98, Number	Electronics and Electrical Engineering Laboratory Tech- nical Publication Announcements Covering Laboratory
MEMBRANE TRANSPORT ENZYMES Kinetics of a Multistate Enzyme In a Large Oscillating	4. PB94-108529 <i>00,369</i>	Programs, January to March, 1993 with 1993/1994 EEEL Events Calendar.
Field. PB93-153690 00,516	Metrology for Electromagnetic Technology: A Bibliography of NIST Publications.	PB93-234698 00,368
MEMBRANES	PB94-108776 00,341	RL/NIST Workshop on Moisture Measurement and Con- trol for Microelectronics. Proceedings of the RL/NIST
Kinetics of a Multistate Enzyme in a Large Oscillating Field.	NIST Measurement Service for Electromagnetic Characterization of Materials.	Workshop held in Gaithersburg, Maryland on April 5-7, 1993.
PB93-153690 00,516	PB94-110186 00,321	PB94-108636 00,372

		NEUTHON CAPTORE
Electronics and Electrical Engineering Laboratory Tech-	MODERNIZATION	MUONIC ATOMS
nical Publication Announcements Covering Laboratory Programs, April to June 1993 with 1993/1994 EEEL	Federal-State Collaboration in Industrial Modernization. PB93-209930 00,441	Higher-Order Vacuum Polarization Corrections in Muonic Atoms.
Events Calendar. PB94-118403 00,342	MOISTURE CONTENT	PB93-165991 00,588
MICROPROCESSORS	Experimental Validation of a Mathematical Model for Pre- dicting Water Vapor Sorption at Interior Building Surfaces.	NADH DEHYDROGENASE DNA Base Modifications Induced In Isolated Human
Development of a Fast-Response Variable-Amplitude Programmable Reaction Control System.	PB93-166403 00,070	Chromatin by NADH Dehydrogenase-Catalyzed Reduc- tion of Doxorubicin.
PB93-158731 00,459	RL/NIST Workshop on Moisture Measurement and Con- trol for Microelectronics. Proceedings of the RL/NIST	PB93-150670 00,520
MICROSCOPES Long-Range Scanning for Scanning Tunneling Micros-	Workshop held in Gaithersburg, Maryland on April 5-7, 1993.	NANOTECHNOLOGY Nanofabrication Technology in Japan. (Japan Technology
сору.	PB94-108636 00,372	Program). PB94-123064 00,693
PB93-150811 00,625 MICROSCOPY	MOIST: A PC Program for Predicting Heat and Moisture Transfer in Building Envelopes. Release 2.0.	NATIONAL INSTITUTE OF STANDARDS AND
Application of the Hough Transform to Electron Diffraction	PB94-112448 00,078	TECHNOLOGY Specimen Banking at the National Institute of Standards
Pattems. PB93-153773 00,585	MOISTURE RESISTANCE Controlling Moisture In the Roof Cavities of Manufactured	and Technology.
Standard Cement Clinkers for Phase Analysis.	Housing. PB93-139046 00,052	PB93-151967 00,101 Cross Validation Comparison of NIST OCR Databases.
PB93-166254 00,185 MICROSPHERES	MOLECULAR CLOUDS	PB93-159077 00,297
Preparation and Preliminary Analysis of K-411 Glass	Journal of Physical and Chemical Reference Data, Volume 21, No. 2, March/April 1992.	Program for Conformity Assessment System Evaluation: Analysis of Comments on the NIST Proposal.
Microspheres. PB93-125623 00,097	PB93-148997 00,569	PB93-170900 00,094
MICROSTRUCTURE	Recommended Rest Frequencies for Observed Inter- stellar Molecular Microwave Transitions, 1991 Revision,	Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993).
Computational Materials Science of Cement-Based Materials; An Education Module.	PB93-149003 00,011	PB93-173508 00,474
PB94-111424 00,188	MOLECULAR CONFORMATION Chain Conformation of Block Copolymers in Dilute Solu-	NIST Scoring Package Certification Procedures In Conjunction with NIST Special Databases 2 and 6.
MICROWAVE EQUIPMENT Benchmark for the Verification of Microwave CAD Soft-	tions Measured by Small-Angle Neutron Scattering.	PB93-188126 00,302
ware. PB93-125185 00,307	PB93-151272 00,170 MOLECULAR CRYSTALS	National Testbed for Process Planning Research. PB93-189793 00,439
MICROWAVE MICROCALORIMETERS	Inelastic Neutron Scattering In Molecular Crystals.	Strategic Plan for the Factory Automation Systems Divi-
Microcalorimeter for 7 mm Coaxial Transmission Line.	PB93-166445 00,158 MOLECULAR IONS	sion. PB93-189801 00,432
PB94-112455 00,338 MICROWAVE SPECTRA	Vibrational Spectra of Molecular Ions Isolated in Solid	NIST Scoring Package Cross-Reference for Use with
Journal of Physical and Chemical Reference Data, Vol-	Neon. X. H2O(+), HDO(+), and D2O(+). AD-A263 817/9 00,116	NIST Internal Reports 4950 and 5129. PB94-103702 00,305
ume 21, No. 2, March/April 1992. PB93-148997 00,569	MOLECULAR PROPERTIES	NIST EXPRESS Toolkit: Introduction and Overview. Na-
Recommended Rest Frequencies for Observed Inter-	Vibrational Spectra of Molecular lons Isolated in Solid Neon. X. H2O(+), HDO(+), and D2O(+).	tional PDES Testbed Report Series. PB94-120664 00,436
stellar Molecular Microwave Transitions. 1991 Revision. PB93-149003 00,011	AD-A263 817/9 00,116	NIST Serial Holdings, 1993. PB94-120847 00.413
Microwave and Infrared Spectra of C2H4HCCH: Barrier	MOLECULAR RELAXATION Vibrational Line Shape of Diatomic Adsorbates on Metal	NATIONAL VOLUNTARY LABORATORY ACCREDITATION
to Twofold Internal Rotation of C2H4. PB93-150803 00,138	Clusters. PB93-153187 00,145	PROGRAM
Microwave Spectrum of (D2O)2.	MOLECULAR STRUCTURE	National Voluntary Laboratory Accreditation Program 1993 Directory.
PB93-166262 00,157 MICROWAVE TRANSMISSION	Surface-Enhanced Raman Study of Benzylpenicillin. PB93-151660 00.099	PB93-156644 00,402 NATURAL GAS
Comments on 'Rapid Pulsed Microwave Propagation'.	MOLECULAR WEIGHT	Speed of Sound Data and Related Models for Mixtures of
PB93-125631 00,637 MILITARY AIR FACILITIES	Molecular Weight Dependence of Mobility in Polymer Blends.	Natural Gas Constituents. PB93-200822 00,380
Comparison of Ceiling Jet Temperatures Measured in an	PB93-150787 00,168	Thermophysical Properties of Fluids for the Gas Industry.
Alrcraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models.	Large Scale Evaluation of a Pattern Recognition/Expert System for Mass Spectral Molecular Weight Estimation.	Annual Report, January-December 1992. PB93-207470 00,381
PB93-158657 00,539	PB94-113081 00,108	NAVAL PERSONNEL
MILITARY FACILITIES Quality Control Tests for Adhesion of Paint on the Panels	MOLECULE MOLECULE INTERACTIONS Surface Forces and Their Action in Ceramic Materials.	Burn Injury Potential of Navy Shipboard Work Clothing. AD-A258 836/6 00,481
of Tactical Rigid Wall Shelters, Phase 2. PB93-173474 00,476	AD-A273 624/7 00,465	NBSR REACTOR
Present Worth Factors for Life-Cycle Cost Studies In the	MOLYBDENUM DISULFIDE Tribological Investigations of Compositor and Other So-	NIST REACTOR: Summary of Activities, July 1991 through September 1992.
Department of Defense (1994). PB94-109238 00,540	Tribological Investigations of Composites and Other Selected Materials Sliding against Vacuum-Deposited MoS2	PB93-162873 00,586
MILITARY REQUIREMENTS	Coatings. PB93-138949 00,462	NEODYMIUM CUPRATES Magnetic Phase Transitions and Structural Distortion in
Report on the Raster Capabilities of MIL-R-28002A and MIL-D-28003A.	MONOMERS	Nd2CuO4. PB93-166130 00,676
PB93-140820 00,418	Synthesis and Evaluation of Novel Multifunctional Oligomers for Dentistry.	NETWORK ANALYSIS
MILLIMETER WAVES	PB93-151777 00,021	Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude.
Millimeter Wave Metrology at the National Institute of Standards and Technology.	Free Radical Polymerization of Expandable Oxaspiro Monomers.	PB94-108487 00,337
PB93-153666 00,359 MIMD (MULTIPLE-INSTRUCTION MULTIPLE-DATA)	PB93-151785 00,174	NEURAL NETS Using Self-Organizing Recognition as a Mechanism for
Synthetic-Perturbation Tuning of MIMD Programs.	Synthesis and Evaluation of New Oxaspiro Monomers for Double Ring-Opening Polymenzation.	Rejecting Segmentation Errors. PB93-138972 00,250
PB93-161339 00,253	PB93-166197 00,177	Statistical Analysis of Information Content for Training
Using Synthetic-Perturbation Techniques for Tuning Shared Memory Programs.	MORTARS (MATERIAL) Standard Aggregate Materials for Alkali-Silica Reaction	Pattern Recognition Networks. PB93-178861 00,299
PB93-178572 00,257	Studies. PB93-166247 00,184	Computational Experience with Radial Basis Function
Intelligent Control System for a Cutting Operation of a	MOUTH RINSE	Networks. PB93-206191 00.303
Continuous Mining Machine. PB93-178622 00,544	Effect of a Two-Solution Fluonde Mouth Rinse on Remineralization of Enamel Lesions In vitro.	NEUTRINO DETECTION
MIXTURES	PB93-150738 00,526	Determination of Uranium and Thorium in Materials Associated with Real Time Electronic Solar Neutrino Detec-
Thermodynamic Properties of Homogeneous Mixtures of Nitrogen and Water from 440 to 1000 K, Up to 100 MPa	In vivo Fluoride Concentrations Measured for Two Hours After a NaF or a Novel Two-Solution Rinse.	tors. PB93-150779 00,575
and 0.8 Mole Fraction N2.	PB93-151868 00,527	NEUTRON ACTIVATION ANALYSIS
PB94-118494 00,617 MOBILITY	MOUTHWASHES Effect of a Two-Solution Fluoride Mouth Rinse on	Use of High Accuracy NAA for the Certification of NIST Botanical Standard Reference Materials.
Molecular Weight Dependence of Mobility In Polymer	Remineralization of Enamel Lesions In vitro. PB93-150738 00,526	PB93-153153 00,517
Blends. PB93-150787 00,168	In vivo Fluoride Concentrations Measured for Two Hours	Instrumental Neutron Activation Analysis of Standard Ref- erence Material 1941, Organics in Marine Sediment: Ele-
MODELS	After a NaF or a Novel Two-Solution Rinse. PB93-151868 00,527	ment, Content and Homogeneity.
Reference Model for Frameworks of Software Engineering Environments (Technical Report ECMA TR/55, 3rd	MTC (MANUFACTURING TECHNOLOGY CENTERS)	PB93-166213 00,552 Application of Polyacrylamide-Gel Electrophroesis Neu-
Editlon). PB94-112497 00,274	Collection of Successful Interactions between the MTCs and Client Firms.	tron-Activation Analysis for Protein Quantification. PB93-166221 00,525
MODELS-SIMULATION	PB93-206886 00,092	NEUTRON CAPTURE

MULTI-PHOTON PROCESSES

Treatment of Continuum-Continuum Coupling in the Theoretical Study of Above Threshold Ionization.
PB93-151611 00.578

PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers).
PB93-500437 00,269

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Regular Mechanism of Parity and Time Invariance
Nonconserving Effects Enhancement In Neutron Capture
and Scattering Near p-Wave Compound Resonances.
PB93-125177 00,561

Measurement of (3)He(n,gamme)(4)He Cross-Section et	NITROGEN OXIDES	Celculations on Displacement Corrections for In-Phanton
Thermel Neutron Energies. PB93-166635 00,597	Vibrational Bands of HxNyOz Molecules. PB93-149078 00,133	Measurements with Ionization Chambers for Mammog raphy. PB93-166700 00.51:
NEUTRON CROSS SECTIONS Measurement of (3)He(n,gamma)(4)He Cross-Section at	NOMENCLATURE Advanced Ceramics: What's in a Name.	NIST Cold Neutron Research Facility. PB93-166825 00,59
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Neutron Depth Profiling: Overview and Description of	Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, Februery 2-3.	PB93-166858 00,688 Triple Axis and SPINS Spectrometers.
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PB93-189868 00,610	PB93-125656 00,563	PB93-189868 00,616 Penetretion of Proton Beems through Water. 1. Depth
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Journel of Research of the National Institute of Standards and Technology, January-February 1993. Volume 98,	13C NMR Studies of Polymorphy in Isotactic Polystyrene. PB93-166536 00,178	NUCLEATE BOILING Transient Hydrogen Heat Transfer.
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Journal of Research of the National Institute of Standards and Technology, January-February 1993. Volume 98,	PB93-146033 00,567	Numerical Data Analysis, Version 7.0 (for Micro computers).
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PB93-166601 00,500	PB93-153757 00,627 Proton Monte Cerlo Trensport Program PTRAN.	PB93-215184 00,53
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NIST Serial Holdings, 1993. PB94-120847 00,413	through September 1992.	PB93-215184 00,533 OCR (OPTICAL CHARACTER RECOGNITION)
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OPEN SYSTEM ENVIRONMENT	1992. Based on the Proceedings of the OSE Implementors' Workshop (OIW).	PB93-178861 00,299
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port, (February 1989April 1990). DE93018005 00,386	Chemical Change of Hardened PCA/CPC Cements in Various Storing Solutions.	port, (March 1992March 1993). DE93018715 00,388
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ume 21, No. 4, July/August 1992. PB93-149045 00.130	Critical Dynamics of an Asymmetric Binary Polymer Mixture.	PB94-112455 00,338
Journal of Physical and Chemical Reference Data, Vol-	PB93-151116 00,169	PRECAST CONCRETE Performance of 1/3-Scale Model Precast Concrete Beam-
ume 21, No. 6, November/December 1992. PB93-149136 00,013	Rheometer with Two-Dimensional Area Detection for Light Scattering Studies of Polymer Melts and Solutions.	Column Connections Subjected to Cyclic Inelastic Loads. Report No. 3.
HYSICAL PROPERTIES	PB93-151322 00,171	PB94-101813 00,085
Journal of Physical and Chemical Reference Data, Vol- ume 21, No. 3, May/June 1992.	POLYMER MATRIX COMPOSITES Flow Behavlor in Liquid Molding.	Overview of NIST Research on Seismic Performance of Moment Resisting Precast Concrete Beam-Column Joints
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Physics Laboratory Technical Activities, 1992. PB93-178648 00,607	PB93-153724 00,069 POLYMERIZATION	PB93-125672 00,399
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International Collogium on Atomic Spectra and Oscillator	PB93-166197 00,177	Isotope (14C) Measurements. PB93-236511 00,392
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nology, Gaithersburg, Maryland on September 14-17, 1992.	Blends. PB93-150787 00,168	Prediction Intervals for a Balanced One-Way Random-Effects Model.
PB93-198422 00,012	Rheometer with Two-Dimensional Area Detection for	PB93-151900 <i>00,513</i>
Apparent Thermal Conductivity of Polyurethane Foam In-	Light Scattering Studies of Polymer Melts and Solutions. PB93-151322 00,171	PREFABRICATED BUILDINGS Controlling Moisture in the Roof Cavities of Manufactured
sulation, Containing Various HCFC Blends, from 125 to 335 K. (Final report).	Marriage of Exact Enumeration and 1/d Expansion Meth-	Housing. PB93-139046 00,052
DE93012534 00,488 PLATES (STRUCTURAL MEMBERS)	ods: Lattice Model of Dilute Polymers. PB93-151330 00,172	PRESENT WORTH
Impact-Echo Response of Plates Containing Thin Layers	Phase Behavior of an Off-Critical Polymer Blend Solution during Steady Shear Studled by Small Angle Neutron	Present Worth Factors for Life-Cycle Cost Studies in the Department of Defense (1994).
and Voids. PB93-153815 00,181	Scattering. PB93-153526 00,176	PB94-109238 00,540
PLATINUM Determination of Baseline Platinum Levels in Biological	POLYMORPHISM	PRESSURE Effects of Pressure on the Thermal Decomposition Kinet-
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SEM Analysis of Interactions between Platinum, Gold.	POLYOXYETHYLENE	PRESSURE MEASUREMENT
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PB93-166544 00,682	PB93-151959 <i>00,175</i>	PB93-153716 00,348

PRESSURE TRANSDUCERS New Approach to Calibration of Trensducers Used in the	Resolution Considerations for Polarized Triple-Axis Spectrometry.	Deformation Twinning, Slip, Martensite Formetion end Crack Inhibition in the B2-Type Zr50Pd35Ru15 Alloy.
Measurement of Dynamic Pressure and Temperature. PB93-153716 00,348	PB93-151728 00,657 Electrical Resistivity of Copper Alloys between 76 K end	PB93-151918 00,497 Structural Phase Transition Studies of High Tc
PRESSURE VESSELS	300 K. PB93-151827 00,311	Superconducting Materials. PB93-151942 00,660
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PRETTY PRINT Exppp: An EXPRESS Pretty Printer. National PDES	Due to Locally Concentrated Transverse Stress. PB93-153211 00,344	trolytes. PB93-151959 00,175
Testbed Report Series. PB94-120797 00,276	Magnetic Properties of Cr-Mn Austenitic Stainless Steels. PB93-153310 00,483	Effect of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O.
PRINTERS (DATA PROCESSING)	Demagnetizing Factors.	PB93-153377 00,667
Exppp: An EXPRESS Pretty Printer, National PDES Testbed Report Series.	PB93-153344 00,664 Correlations of Magnetic Microstructure and Anisotropy	WRC-1992 Constitution Diagram for Stainless Steel Weld Metals: A Modification of the WRC-1988 Diagram.
PB94-120797 00,276	with Noise Spectra for CoNi and CoCrTa Thin Film Media.	PB93-153427 00,484 Mechanical Test Methods for Metal-Matrix Composites: A
PROCESS CONTROL Intelligent Processing of Materials, Technical Activities	PB93-153401 00,668	Status Report from the U.S.A. PB93-153500 00,479
1992. (NAS-NRC Assessment Panel, February 2-3, 1993).	Dynamic Resistance of Superconducting YBa2Cu3Ox Sintered Powder at 81 K: Liquid versus Vapor Nitrogen	Phase Behavior of an Off-Critical Polymer Blend Solution
PB94-112430 00,434	Environment. PB93-153518 00,670	during Steady Shear Studied by Small Angle Neutron Scattering.
PROCESS PLANNING Nationel Testbed for Process Planning Research.	Resonance Ionization Spectroscopy/Resonance Ionization Mass Spectrometry Data Service. I-Data Sheets for As,	PB93-153526 00,176
PB93-189793 00,439	B, Cd, C, Ge, Au, Fe, Pb, Si, and Zn.	ASTM Committee, C28, Advanced Ceramics: A Progress Report.
PROCESSING & PERFORMANCE OF MATERIALS Flow Behavior in Liquid Molding.	PB93-153781 00,102 Surface Magnetic Microstructure.	PB93-153617 00,468 Wear and Friction Characteristics of Self-Lubricating Cop-
N93-14747/8 00,478	PB93-165728 00,673	per - Intercalated Graphite Composites.
Principles of Gas Phase Processing of Ceramics during Combustion.	High Spatial Resolution Quantitative Micromagnetics. PB93-165736 00,674	PB93-153765 00,480 Advanced Ceramics Standards Development.
N93-20188/7 00,467 New Method for Phase Identification for Electron	High Temperature X-ray Diffractometry of Ti-Al Alloys.	PB93-166007 00,470
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Crystal Chemistry end Phese Equilibria Studies of the	Nanocomposites. PB93-166098 00,675	Molecular Wedge in e Brittle Creck: A Simulation of Mica Water.
BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder Charecterization end Diffraction Patterns of	Magnetic Phase Transitions and Structural Distortion in	PB93-166411 00,541
Ba3R3Cu6O14+x, R=Lanthanides. PB93-166668 00.684	NdŽCuO4. PB93-166130 00,676	Tensile Creep Testing of Structurel Ceramics. PB93-166619 00,472
PRODUCTION ENGINEERING	Barkhausen Jump Correlations in Thin Foils of Fe and Ni. PB93-166288 00,678	Structural Phase Transformation Studies of the High Tc
Recent Results of the NIST National Ball Plate Round Robin.	Direct Evidence for an Effect of Twin Boundaries on Flux	Superconducting Materials, Ba2RCu3O6+x, in Air. PB93-166643 00,683
PB93-219715 00,408	Pinning in Single Crystal of YBa2Cu3O6+x. PB93-166296 00,679	Materials Reliability. Technical Activities, 1992. (NAS- NRC Assessment Panel, May 13-14, 1993).
PRODUCTIVITY Collection of Successful Interactions between the MTCs	Structure and Magnetic Properties of Doped Co and Fe-	PB93-173466 00,446
end Client Firms. PB93-206886 00,092	Bi2Sr2Cul-xMxOy Phases. PB93-166338 00,680	Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993).
PROFILES	13C NMR Studies of Polymorphy in Isotactic Polystyrene. PB93-166536 00,178	PB93-173508 00,474
Comparison between Precision Roughness Master Specimens and Their Electroformed Replicas.	Standard X-ray Diffraction Powder Patterns of Fourteen	Mechenical, Stress-Rupture, and Fracture Toughness Properties of Normalized and Stress Relieved AAR
PB93-166163 00,438	Ceramic Phases. PB93-166650 00,473	TC128 Grade B Steel et Elevated Temperetures. PB93-182020 00,485
PROGRAM EVALUATION Program for Conformity Assessment System Evaluation:	Absolute Spatially- and Temporally-Resolved Optical Emission Measurements of rf Glow Discharges in Argon.	Review of Irradiation Effects on Organic-Matrix Insulation.
Analysis of Comments on the NIST Proposal. PB93-170900 00,094	PB93-196236 00,636	PB93-206928 00,546 Workshop on Characterizing Diamond Films II. Held In
PROGRAMMING LANGUAGES	Optical Fiber Geometry: Accurate Measurement of Clad- ding Diameter.	Gaithersburg, MD. on February 24-25, 1993. PB93-207157 00,687
MUMPS, Messachusetts Generel Hospital Utility Multi- Programming System. Category: Software Standard. Sub-	PB93-196269 00,632	Machining of Advanced Materials: Proceedings of the
category: Programming Lenguage, June 1993. FIPS PUB 125-1 00,279	Wolf Shifts and Their Physical Interpretation under Laboratory Conditions.	International Conference on Machining of Advanced Meterials. Held in Gaithersburg, Maryland on July 20-22,
Exppp: An EXPRESS Pretty Printer. National PDES	PB93-196293 00,633 PROPERTIES OF MATERIALS: STRUCTURAL/	1993. PB93-217578 <i>00,442</i>
Testbed Report Series. PB94-120797 00,276	MECHANICAL Solidification Processing and Phase Transformations in	Structure-Property Relationships in Microalloyed Ferrite-
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Exppp: An EXPRESS Pretty Printer. National PDES Testbed Report Series.	AD-A261 751/2 00,494 Proceedings of the sixth JapenUS workshop on high-	PB93-234706 00,487 Phase Equilibria and Crystal Chemistry in Portions of the
PB94-120797 00,276 PROJECT MANAGEMENT	field superconducting materials and standard procedures for high-field superconducting materials testing.	System SrO-CaO-Bi2O3-CuO. Part 4. The System CeO-Bi2O3-CuO.
Federal-State Collaboration in Industrial Modernization.	DE93002848 00,640	PB94-108552 00,475
PB93-209930 00,441 PROPELLANT COMBUSTION	Charge Transfer and Bond Lengths in YBa2Cu3- xMxO6+y.	Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, February 2-3,
Chemical Kinetic Data Base for Propellant Combustion. 2. Reactions Involving CN, NCO, and HNCO.	PB93-125847 00,644 Tribological Investigations of Composites and Other Se-	1993). PB94-112430 <i>00,434</i>
PB93-149052 00,131	lected Materials Sliding against Vacuum-Deposited MoS2	PROPERTIES OF MATERIALS: THERMODYNAMIC/
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PB93-166460 00,160	Accuracy in Powder Diffraction II. Proceedings of the International Conference. Held in Gaithersburg, Maryland	In the Critical Region and the Modified Leung-Griffiths Theory.
PROPERTIES OF MATERIALS: ELECTRONIC/MAGNETIC/ OPTICAL	on May 26-29, 1992. PB93-141737 00,648	PB93-153484 00,148
Exponential Density: Exact Fitting of Structure Moduli by Entropy Maximization.	Molecular Weight Dependence of Mobility in Polymer	Phase Equilibria and Crystel Chemistry in Portions of the System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phase
PB93-125128 00,122	Blends. PB93-150787 00,168	Diagrams for the Temary Systems of SrO-Bi2O3-CuO, CaO-Bi2O3-CuO and SrO-CeO-Bi2O3.
Elastic end Inelastic Neutron Scattering Study of Hydro- geneted and Deuterated Trimethylammonium Pillared	Criticel Dynamics of an Asymmetric Binary Polymer Mix-	PB93-153732 00,469
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Fe86B14. PB93-151256 00,652	PB93-151801 00,022	PÉ93-166122 00,524 Application of Polyacrylamide-Gel Electrophroesis Neu-
MeV Be Implantation in GaAs.	Ba2YCu3O6.5+x Superconductors Using Ba(OH) 2.H2O.	tron-Activation Analysis for Protein Quantification.
PB93-151645 00,653	PB93-151876 00,659	PB93-166221 00,525

PROTOCOLS Steble Implementation Agreements for Open Systems Interconnection Protocols. Version 6, Edition 1, December 1992. Besed on the Proceedings of the OSE	RADIATION DOSES Dose In Water from Externel Irrediction by Electrons: Radiation Protection Dete. PB93-173425 00,548	RECOMBINATION REACTIONS Kinetics of Bimoleculer Recombination Processes with Trepping. PB93-151652 00,143
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Penetration of Proton Beams through Water. 1. Depth- Dose Distribution, Spectre and LET Distribution. PB93-219749 00,537	RADCAL: A Narrow-Band Model for Radiation Calculations in a Combustlon Environment.	Heat and Mass Transport from Thermally Degreding Thin Cellulosic Materials in e Microgrevity Environment. PB93-153435 00,505
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Beams in Weter. PB93-219772 00,538	Redio Communications Systems. PB93-189827 00,701	Porphyrins: Metal Versus Ligand Centered Processes. PB93-125912 00,514 REFERENCE DETECTORS
PROTON TRANSPORT Proton Monte Cerlo Trensport Progrem PTRAN. PB93-158673 00,533	RADIOACTIVE WASTE DISPOSAL Evaluation and Compilation of DOE Waste Package Test Date. Biannual Report, August 1989-January 1990.	Reference Detectors for Spectral Responsivity Measurements.
PROTONS ESTAR, PSTAR, and ASTAR: Computer Programs for	NUREG/CR-4735-V8 00,549 RADIOCHEMISTRY	REFERENCE MATERIALS
Calculating Stopping-Power and Range Tebles for Elec- trons, Protons, end Helium Ions. PB93-146033 00,567	Use of High Accuracy NAA for the Certificetion of NIST Botanical Standard Reference Meteriels. PB93-153153 00,517	Journal of Physical end Chemical Reference Deta, Vol- ume 21, No. 3, May/June 1992. PB93-149029 00,199
PULSE TUBE REFRIGERATORS	RADIOGRAPHY	Journal of Physical end Chemical Reference Dete, Volume 21, No. 6, November/December 1992.
Measurement of the Performance of e Spiral Wound Polyimide Regenerator in a Pulse Tube Refrigerator. PB93-153658 00,111	Quantitative Evaluation of Distributed Pores in Reference Radiogrephs. PB93-151744 00,444	PB93-149136 00,013 REFRACTIVE INDEX
PULSED IRRADIATION Pulse Radiolytic Studies of Electron Transfer Processes	RADIOMETERS Rediometer for Precision Coherent Radiation Measure-	Accuracy of the Double Variation Technique of Refractive Index Measurement.
and Applications to Solar Photochemistry. Progress Report, (March 1992Merch 1993).	ments. PB93-166395 00,629	PB93-143964 00,624 Fitting of Transmission Dete for Determining the Opticel
DE93018715 00,388 PYRITE	RADON Site Exploration for Radon Source Potential.	Constants end Thicknesses of Optical Films. PB93-166692 00,630
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QUALITY ASSURANCE More Questions and Answers on the ISO 9000 Standard Series and Related Issues.	Surface-Enhanced Raman Study of Benzylpenicillin. PB93-151660 00,099	DE93014767 00,489 Thermophysical Properties. Progress Report, 1 January
PB93-140689 00,093 Questions and Answers on Quelity, the ISO 9000 Stand-	RANGE ESTAR, PSTAR, and ASTAR: Computer Programs for Calculeting Stopping-Power and Range Tables for Elec-	199231 March 1993. DE93040219 00,490
ard Series, Quality System Registretion, end Related Issues.	trons, Protons, and Helium Ions. PB93-146033 00,567	Comparison of Experimental Measurements of Local Flow Boiling Heat Transfer Coefficients for R11 and R123.
PB93-152080 00,090 Designing and Implementing a State Quality Award.	RASTER GRAPHICS Report on the Raster Capabilities of MIL-R-28002A and	PB93-151157 00,491 Horizontel Nucleate Flow Boiling Heat Transfer Coeffi-
PB93-154458 00,695 QUALITY CONTROL	MIL-D-28003A. PB93-140820 00,418 Pactor Craptics: A Tutorial and Implementation Cuids	cient Measurements end Visuel Observations for R12, R134a, end R134a/Ester Lubricant Mixtures. PB93-178598 00,493
Renewal Look at Switching Rules in MIL-STD-105D. PB93-166676 00,445	Raster Graphics: A Tutorial and Implementation Guide. PB93-152171 00,421	REGENERATION (ENGINEERING) Measurement of the Performance of a Spiral Wound
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PB93-150712 00,649 Re-Examination of Quantum Hall Plateaus.	REACTION KINETICS Effects of Pressure on the Thermal Decomposition Kinet-	PB93-220002 00,639 Exppp: An EXPRESS Pretty Printer, National PDES
PB93-151850 00,658 Magnetic Field Dependence of Quantized Hall Effect Breakdown Voltages.	ics, Chemical Reactivity and Phase Behavior of RDX. PB93-125888 00,553	Testbed Report Series. PB94-120797 00,276
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on Magnetic Field and Current. PB94-108511 00,690	Chemical Kinetic Data Base for Propellant Combustion. 2. Reactions Involving CN, NCO, and HNCO.	crete Frames-I. PB93-161354 00,081
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PB93-153195 00,580 QUANTUM OPTICS	pheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Kinetic Data Evaluation for Atmospheric Chem- istry.	Calculating Cement Paste and Mortar Diffusivity from Conductivity Measurements: Preliminary Results of a
Observation of Quantized Motion of Rb Atoms in an Opti- cal Field. PB93-151140 00,576	PB93-149144 00,014 Kinetics of e Multistate Enzyme in a Large Oscilleting	New Method. PB94-112802 00, 189
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PB93-208494 00,615 QUERY LANGUAGES	Rate Constants for Hydrogen Abstrection Reactions of NO3 in Aqueous Solution. PB93-166064 00,152	Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceremic Composites Program, Task 2, Supporting Technologies.
Database Language SQL. Cetegory: Software Standard. Subcategory: Database, June 1993.	Chemical Kinetic Data Base for RDX Combustion. PB93-166460 00.160	DE93016669 00,477 REINFORCEMENT (STRUCTURE)
FIPS PUB 127-2 00,280 R11	Mechanisms for the Formation and Destruction of Chlorinated Organic Products of Incomplete Combustion.	Proceedings of the U.SJapan Workshop on Seismic Retrofit of Bridges (1st). Held in Tsukuba Science City,
Comparison of Experimental Measurements of Locel Flow Boiling Heat Transfer Coefficients for R11 and R123.	PB93-166478 Single Pulse Shock Tube Studies on the Thermal Decom-	Japen on December 17-18, 1990. PB93-134104 00,190
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PB93-200889 00 204	PB93-184257	PB94-112802 00.189

SEMICONDUCTOR DEVICES

RELIABILITY	RESIDENTIAL BUILDINGS	SAMPLE PREPARATION
Materials Reliability. Technical Activities, 1992. (NAS-NRC Assessment Panel, May 13-14, 1993). PB93-173466 00,446	Residential and Light Commercial Telecommunications Wiring Standard; Category: Telecommunications Stand- ard; Subcategory: Cables and Wiring.	Specimen Banking at the National Institute of Standards and Technology. PB93-151967 00,101
REQUIREMENTS Minimum Security Requirements for Multi-User Operating	FIPS PUB 176 00,208 Performanca of a Residential Desuperheater.	Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0.
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Requirements for an Application Protocol Development Environment, National PDES Testbed Report Series. PB93-208114 00.426	Selected Fatal Fires. Special Analysis. PB93-198869 00,025 Source Apportionment of Fine Particle Organics and Mu-	Renewal Look at Switching Rules in MIL-STD-105D. PB93-166676 00,445
RESEARCH	tagenicity in Wintertime Roanoke. PB93-221851 00,391	SANDS Estimating In situ Liquefaction Potential and Permanent
Journal of Research of the National Institute of Standards and Technology, November-December 1992. Volume 97, Number 6.	RESIDUAL STRESS Residual Stress in a Porcelain-Metal Strip Related to	Ground Displacaments Due to Liquefaction for the Siting of Lifelines. PB93-178614 00,194
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Journal of Physical and Chemical Reference Data, Vol- ume 21, No. 1, January/February 1992.	RESIN TRANSFER MOLDING	Hydrogen Vibrational Modes and Anisotropic Potential in alpha-ScHx.
PB93-148948 00,126 Journal of Physical and Chemical Reference Data, Vol-	Flow Behavior in Liquid Molding. N93-14747/8 00,478	PB93-166510 00,681 SCANNING ELECTRON MICROSCOPY
ume 21, No. 4, July/August 1992. PB93-149045 00, 130	RESISTANCE STANDARDS Automated System for the Measurement of High-Valued	Interlaboratory Study on the Lithographically Produced Scanning Electron Microscope Magnification Standard
CSTL Technical Activities 1992. PB93-173482 00,165	Resistors. PB93-150704 00,329	Prototype. PB94-108545 00,371
International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Swe-	New International Volt and Ohm Standards. PB93-166361 00,593	SCANNING TUNNELING MICROSCOPY Long-Range Scanning for Scanning Tunneling Micros-
den on May 5-8, 1992. PB93-183952 00,202	Preparing for the New Volt and Ohm. PB93-166379 00,594	copy. PB93-150811 00,625
Journal of Research of the National Institute of Standards and Technology, March-April 1993, Volume 98, Number	RESISTORS NIST Measurement Service for DC Standard Resistors.	Imaging of Passivated III-V Semiconductor Surfaces by a Scanning Tunneling Microscope Operating In Air.
2. PB93-196228 00,631	PB93-139079 00,347	PB93-153294 00,357
Journal of Research of the National Institute of Standards	Automated System for the Measurement of High-Valued Resistors. PB93-150704 00.329	SCREW THREADS Bibliography of Screw Thread Measurement.
and Technology, May-June 1993. Volume 98, Number 3. PB94-108461 00,688	RESONANCE	PB94-101821 00,460 SECONDARY EMISSION
RESEARCH AND DEVELOPMENT Research, Industry and Technology Transfer at the NIST	Mechanism for Capture into Resonance. PB93-145761 00,010	Assessment of the Role of Charged Secondaries from Nonelastic Nuclear Interactions by Therapy Proton
AMRF. PB93-166304 00,431	RESONANCE IONIZATION MASS SPECTROSCOPY Resonanca Ionization Spectroscopy/Resonanca Ionization	Beams in Water. PB93-219772 00,538
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ment. Held in Rockville, Maryland on October 27-29,	Resonance Ionization Spectroscopy/Resonanca Ionization Mass Spectrometry Data Service. I-Data Sheets for As,	Instrumental Neutron Activation Analysis of Standard Reference Material 1941, Organics in Marine Sediment: Ele-
PB93-192318 00,440	B, Cd, C, Ge, Au, Fe, Pb, Si, and Zn. PB93-153781 00,102	ment, Content and Homogeneity. PB93-166213 00,552
Japan's Kohsetsushi Program of Regional Public Exam- lation and Technology Centers for Upgrading Small and Mid-Size Manufacturing Firms. Presented at Annual	RESTORATION Clinical Use of Beta-Quartz Glass-Ceramic Inserts.	SEES (SOFTWARE ENGINEERING ENVIRONMENTS)
Meeting of the Association of American Geographers. Held in Miami, Florida in April 1991.	PB93-150761 00,017 Intrinsically Colored Microcrystalline Glass-Ceramic for	Reference Model for Frameworks of Software Engineering Environments (Technical Report ECMA TR/55, 3rd
PB93-209922 00,453 RESEARCH FACILITIES	Use in Dental Restoration. PB93-150837 00,018	Edition). PB94-112497 00,274
NIST Cold Neutron Research Facility and Magnetic Neutron Scattering.	RHEOMETERS Rheometer with Two-Dimensional Area Detection for	SEGMENTATION Using Self-Organizing Recognition as a Mechanism for
PB93-151694 00,654	Light Scattering Studies of Polymer Melts and Solutions. PB93-151322	Rejecting Segmentation Errors. PB93-138972 00,250
Journal of Research of the National Institute of Standards and Technology, January-February 1993. Volume 98,	ROBOT NAVIGATION	SEISMIC DESIGN Proceedings: ICSSC Issues Workshop. Development of
Number 1. Special Issue. PB93-166817 00,598	Autonomous Obstacle Avoidance Using Visual Fixation and Looming. PB93-146660 00,454	Seismic Evaluation and Rehabilitation Standards for Federally Owned and Leased Buildings. Held in Denver, Col-
NIST Cold Neutron Research Facility. PB93-166825 00,599	ROBOT VISION	orado on September 16-17, 1992. PB93-228666 00,083
Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility.	Binocular Spherical Disparity: A Study in Representation for a Forward Translating Camera.	Guidelines and Procedures for Implementation of the Ex- ecutive Order on Selsmic Safety of New Construction
PB93-166916 00,605 RESEARCH GAS MIXTURE	PB93-184422 00,301 ROBOTICS	(July 1991). PB93-228674 00,084
Two New Gas Standards Programs at the National Insti- tute of Standards and Technology.	ADACS. An Automated System for Part Finishing. PB93-199164 00,433	SEISMIC WAVES Effect of Subsurfaca Conditions on Earthquake Ground
PB93-191427 00,095 RESEARCH LABORATORIES	ROBOTS Intelligent Robots for Planetary Exploration and Construc-	Motions. PB93-158343 00,192
NIST Building and Fire Research Laboratory. Projects	tion. N93-27980/0 00,697	SELECTIVITY
1993. PB94-118288 00,410	Use of Contact Type Measurement Device to Detect Robots' Hand Positions.	Subambient Temperature Modification of Selectivity in Reversed-Phase Liquid Chromatography. PB93-153799 00,103
RESEARCH MANAGEMENT Impacts: NIST Building and Fire Research Laboratory	PB93-166551 00,455 ROLLER BEARINGS	SELF DIFFUSION
(Technical and Societal). PB94-113420 00,079	Tribological Investigations of Composites and Other Selected Materials Sliding against Vacuum-Deposited MoS2	Polymer Self-Diffusion in Nal-Poly(ethylene oxide) Electrolytes. PB93-151959 00,175
Guide to NIST. PB94-119435 00,002	Coatings. PB93-138949 00,462	SEMICONDUCTOR DEVICES
RESEARCH PROJECTS Materials Reliability. Technical Activities, 1992. (NAS-	ROOFING Hail Resistance of Roofing Products.	Center for Electronics and Electrical Engineering Technical Publication Announcements Covering Center Pro-
NRC Assessment Panel, May 13-14, 1993). PB93-173466 00.446	AD-A956 270/3 00,049	grams, April to June 1990, with 1991 CEEE Events Calendar.
Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993).	Observations from a Field Study of the Performance of Polymer-Modified Bitumen Roofing. PB93-146686 00,058	PB93-205516 00,363 Center for Electronics and Electrical Engineering Tech-
PB93-173508 00,474	Interim Criteria for Polymer-Modified Bituminous Roofing	nical Progress Bulletin Covering Center Programs, April to June 1990, with 1990/1991 CEEE Events Calendar.
Building and Fire Research Laboratory Publications, 1992.	Membrane Materials: A Summary Report. PB93-153724 00,069	PB93-205524 00,364 Semiconductor Measurement Technology: A Collection of
PB93-188845 00,073 Technology for Economic Growth: President's Progress	ROOFS Hail Resistance of Roofing Products.	Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations,
Report. PB94-107430 00,001	AD-A956 270/3 00,049 Controlling Moisture in the Roof Cavities of Manufactured	RESPAC. PB93-219806 00,366
Summaries of BFRL Fire Research In-House Projects and Grants, 1993.	Housing. PB93-139046 00,052	Semiconductor Measurement Technology: Evolution of Silicon Materials Characterization: Lessons Leamed for
PB94-121050 00,032 Annual Conference on Fire Research, 1993: Book of Ab-	RYDBERG STATES Comment on 'Measurement of the Lamb Shifts in Singlet	Improved Manufacturing. PB93-228641 00,367
stracts. PB94-121324 00,205	Levels of Atomic Helium'. PB93-125219 00,562	RL/NIST Workshop on Moisture Measurement and Con- trol for Microelectronics. Proceedings of the RL/NIST

Workshop held in Gaithersburg, Maryland on April 5-7, 1993.	SILICON DIOXIDE MAESTRO: A Front-End to the MAIN1 Program for Mul-	OSIKIT (Open Systems Interconnection) and NIST Proto- type Compiler for Estelle.
PB94-108636 00,372	tiple-Angle Measurement of Silicon Dioxide Layers. PB93-139038 00,352	PB93-505758 00,271
SEMICONDUCTOR MATERIALS Semiconductor Measurement Technology: A Collection of	SILICON NITRIDES	Building Life Cycle Cost Computer Program (BLCC), Version 4.11 (for Microcompulers).
Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations,	Equipment for Investigation of Cryogenic Compaction of Nanosize Silicon Nitride Powders.	PB94-500055 00,042 Computer Program for Calculating Time-of-Use, Block,
RESPAC. PB93-219806 00,366	DE93018740 00,466 SILOXANES	and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcompulers).
SEMICONDUCTORS Mechanistic Studies of Photoinduced Reactions at Semi-	Non-Halogenated, Flame Retarded Polycarbonate.	PB94-500097 00,385
conductor Surfaces.	N94-10781/0 00,008 SILVER	SOFTWARE ENGINEERING Collection of Technical Studies Completed for the Com-
PB93-151710 00,656 SEMICONDUCTORS (MATERIALS)	Observation of Photon Correlations in Scattering from a	puter-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1987. Volume 4.
Report on a Workshop for Improving Relationships be- tween Users and Suppliers of Microlithography Metrology	Silver Electrode. PB93-150829 00,115	ÄD-A261 193/7 00,414
Tools.	SILVER ALLOYS SEM Analysis of Interactions between Platinum, Gold,	International Survey of Industrial Applications of Formal Methods. Volume 1. Purpose, Approach, Analysis, and
PB93-206233 00,365 SENSOR CHARACTERISTICS	and Silver-Palladium Capsules and Barium Yttrium Cop-	Conclusions. PB93-178556 00,255
Model Studies of SnO2-Based Gas Sensors: Vacancy Defects and Pd Additive Effects.	per Oxide Superconductors. PB93-166544 00,682	International Survey of Industrial Applications of Formal
PB93-166056 00,112	SIMULATION Model Study of the Aircraft Cabin Environment Resulting	Methods. Volume 2. Case Studies. PB93-178564 00,256
Mechanistic and Response Studies of Iridium Oxide pH Sensors.	From In-Filght Fires. AD-A261 270/3 00.005	Using Synthetic-Perturbation Techniques for Tuning Shared Memory Programs.
PB93-166346 00,113 SENSORS	Guldelines for Using Emulators to Evaluate the Perform-	PB93-178572 00,257
Opportunities for Innovation: Chemical and Biological	ance of Energy Management and Control Systems. PB93-138931 00,033	Reference Model for Frameworks of Software Engineer- ing Environments (Technical Report ECMA TR/55, 3rd
Sensors. PB93-100063 00,096	SINTERING	Edition). PB94-112497 00,274
Measurement of Structural Deflections. PB93-125664 00,080	Reaction Sintering High-Density, Fine-Grained Ba2YCu3O6.5+x Superconductors Using Ba(OH) 2.H2O.	SOFTWARE TOOLS
SEPARATION 00,000	PB93-151876 00,659 SITE SURVEYS	Automating Interactive Applications in a Network Environ- ment.
Method for Separating Volatile Organic Carbon from 0.1 (sup 3) of Air to Identify Sources of Ozone Precursors via	Site Exploration for Radon Source Potential.	PB93-151215 00,251
Isotope (14C) Measurements. PB93-236511 00,392	PB93-162972 00,394 SIZE DETERMINATION	Guide to the Selection of Anti-Virus Tools and Techniques.
SEQUENCES (MATHEMATICS)	Limited Tests to Investigate Whether the Size of Body	PB93-152049 00,221 NIST EXPRESS Toolkit: Lessons Learned.
Fast Fourier Transform Algorithms for Real and Symmetric Data.	Armor Samples Influences Ballistic Test Results. PB93-138998 00,554	PB93-153450 00,422
PB93-153146 00,507	SMALL ANGLE SCATTERING	Data Probe User's Guide. National PDES Testbed Report Series.
SERUM VOLUME LOSSES Evaluation of Serum Volume Losses during Long-Term	Chain Conformation of Block Copolymers In Dilute Solu- tions Measured by Small-Angle Neutron Scattening.	PB93-178655 00,425
Storage. PB94-108503 00,518	PB93-151272 00,170 Phase Behavior of an Off-Critical Polymer Blend Solution	NIST EXPRESS Toolkit: Requirements for Improvements. National PDES Testbed Report Series.
SERVICE LIFE	during Steady Shear Studied by Small Angle Neutron	PB93-220838 00,265
Methods for Predicting Remaining Life of Concrete in Structures.	Scattering. PB93-153526 00,176	NIST EXPRESS Toolkit: Updating Existing Applications. National PDES Testbed Report Series.
PB93-139020 00,180 SGML (STANDARD GENERALIZED MARKUP LANGUAGE)	Small Angle Neutron Scattering at the National Institute of Standards and Technology.	PB93-220846 00,266 NIST EXPRESS Toolkit: Using Applications. National
SGML DTD for the STEP Integrated Resource Parts. Na-	PB93-166841 00,601	PDES Testbed Report Series.
tional PDES Testbed Report Series. PB94-114501 00,428	SMOKE Smoke Movement in a Corridor-Hybrid Model, Simple	PB93-220853 00,267 Shtolo-Converting STEP Short Listings to Annotated List-
SHEAR TESTS Strength of Partially-Grouted Masonry Shear Walls under	Model and Comparison with Experiments. PB93-146678 00.057	ings. National PDES Testbed Report Series. PB94-120623 00,435
Lateral Loads. PB93-206225 00,082	Simulating the Effect of Beamed Ceilings on Smoke Flow.	NIST EXPRESS Toolkit: Introduction and Overview, Na-
SHIPS 00,002	Part 1. Comparison of Numerical and Experimental Results.	tional PDES Testbed Report Series. PB94-120664 00,436
Comparison of Full Scale Fire Tests and a Computer Fire Model of Several Smoke Ejection Experiments.	PB93-152056 00,062	SOIL DYNAMICS
PB93-139087 00,551	CFAST, the Consolidated Model of Fire Growth and Smoke Transport.	Estimating Soil Parameters Important for Lifeline Siting Using System Identification Techniques.
SHOCK TUBES Single Pulse Shock Tube Studies on the Thermal Decom-	PB93-174902 00,071 Design of Smoke Control Systems for Areas of Refuge.	PB93-178606 00,193 SOIL PROPERTIES
position of n-Butyl Phenyl Ether, n-Pentylbenzene and Phenotole and the Heat of Formation of Phenoxy and	PB93-183754 00,072	Effect of Subsurface Conditions on Earthquake Ground
Benzyl Radicals. PB93-166577 00,162	Zone Fire Modeling with Natural Building Flows and a Zero Order Shaft Model.	Motions. PB93-158343 00,192
SIGNAL DETECTION	PB94-112166 00,030 Smoke Plume Trajectory from In situ Burning of Crude Oll	SOIL SURVEYS
Ultra-Broadband and Nondispersive Sensor for the Measurement of Time-Domain Signals.	in Alaska.	Site Exploration for Radon Source Potential. PB93-162972 00,394
PB93-153393 00,324 SIGNAL TRANSDUCTION	PB94-114519 00,393 SMOKE FLOW	SOLAR ENERGY CONVERSION Pulse Radiolytic Studies of Electron Transfer Processes
Charge-Field Interactions in Cell Membranes and	Simulating the Effect of Beamed Ceilings on Smoke Flow. Part 1. Comparison of Numerical and Experimental Re-	and Applications to Solar Photochemistry. Progress Report, (March 1992March 1993).
Electroconformational Coupling: Transduction of Electric Energy by Membrane ATPases.	sults. PB93-152056 00,062	DE93018715 00,388
PB93-166486 00,535 SILICATES	SMOKE MOVEMENT	SOLID FUELS Generation of Carbon Monoxide in Compartment Fires.
Predictive Thermodynamic Model for Complex High Temperature Solution Phases XI.	Smoke Movement in a Corridor-Hybrid Model, Simple Model and Comparison with Experiments.	PB93-146702 00,198
PB93-124840 00,120	PB93-146678 00,057	SOLIDIFICATION Solidification Processing and Phase Transformations in
SILICON Mechanistic Studies of Photoinduced Reactions at Semi-	SODIUM CHLORIDE Thermodynamic Properties of the NaCI + H2O System. 1.	Ordered High Temperature Alloys. AD-A261 751/2 00,494
conductor Surfaces. PB93-151710 00,656	Thermodynamic Properties of NaCl(cr). PB93-148955 00,127	Thermodynamically-Consistent Phase-Field Models for
Excitation-Energy Dependence in the L2,3 Fluorescence	SODIUM CHOLORIDE	Solidification. PB93-139012 00,646
Spectrum of Si. PB93-153757 00,627	Thermodynamic Properties of the NaCI + H2O System. 2. Thermodynamic Properties of NaCI(aq), NaCI2H2O(cr),	Asymptotic Behavior of Modulated Taylor-Couette Flows
Three-Ratio Scheme for the Measurement of Isotopic Ra-	and Phase Equilibria. PB93-149060 00,132	with a Crystalline Inner Cylinder. PB93-139061 00,647
tios of Silicon. PB93-196285 00,612		Computation of Complex Solidification Morphologles
Semiconductor Measurement Technology: Evolution of Silicon Materials Characterization: Lessons Learned for	SOFT X RAYS	
	Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology.	Using a Phase-Field Model. PB93-156743 00,671
Improved Manufacturing. PB93-228641 00.367	Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology. AD-P008 068/9 00,557	Using a Phase-Field Model.
PB93-228641 00,367 SILICON CARBIDES	Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology. AD-P008 068/9 00,557 SOFTWARE PC-OMNITAB: An Interactive System for Statistical and	Using a Phase-Field Model. PB93-156743 00,671 Phase-Field Models for Anisotropic Interfaces. PB93-164564 00,672 Morphological Instability in Phase-Field Models of Soildi-
PB93-228641 00,367 SILICON CARBIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2.	Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology. AD-P008 068/9 00,557 SOFTWARE PC-OMITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers).	Using a Phase-Field Model. PB93-156743 00,671 Phase-Field Models for Anisotropic Interfaces. PB93-164564 00,672
PB93-228641 00,367 SILICON CARBIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2. PB93-124857 00,121	Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology. AD-P008 068/9 00,557 SOFTWARE PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers). PB93-500437 00,269	Using a Phase-Field Model. PB93-156743 00,671 Phase-Field Models for Anisotropic Interfaces. PB93-164564 00,672 Morphological Instability in Phase-Field Models of Soildification. PB94-111523 00,691 SOLUBILITY
PB93-228641 00,367 SILICON CARBIDES Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2.	Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology. AD-P008 068/9 00,557 SOFTWARE PC-OMITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers).	Using a Phase-Field Model. PB93-156743 00,671 Phase-Field Models for Anisotropic Interfaces. PB93-164564 00,672 Morphological Instability in Phase-Field Models of Solidification. PB94-111523 00,691

Solubility of Some Sparingly Soluble Salts of Zinc and Cedmium in Water and in Aqueous Electrolyte Solutions.	Time-based ensemble scattering measurements in fuel sprays.	Journal of Physicel end Chemicel Reference Dete, Volume 21, No. 5, September/October 1992.
PB93-149110 00,134 OMMERFELD CONSTANT	DE93007989 00,197 Estimation of droplet collision frequency in a spray.	PB93-149094 00,572 Critical Compilation of Atomic Trensition Probabilities for
Proposed Measurement of the Fine Structure Constant	DE93007991 00,619	Singly Ionized Argon. PB93-149102 00,573
Using a Coulomb-Blockade Charge Pump. PB93-151264 00,577	SPREADING RESISTANCE Semiconductor Measurement Technology: A Collection of	Solubility of Some Sparingly Soluble Seits of Zinc and
ONIC NOZZLES Speed of Sound Data and Related Models for Mixtures of	Computer Programs for Two-Probe Resistance (Spread- lng Resistance) and Four-Probe Resistance Calculations,	Cadmium In Water and In Aqueous Electrolyte Solutions. PB93-149110 00,134
Natural Gas Constituents. PB93-200822 00,380	RESPAC. PB93-219806 00,366	Franck-Condon Factors, r-Centroids, Electronic Trensition Moments, end Einstein Coefficients for Meny Nitrogen
оот	SPRINKLERS	and Oxygen Band Systems. PB93-149128 00.114
Observations of soot in combustion of methanol/toluene sprey flames.	Sprinkler Fire Suppression Algorithm for HAZARD. PB94-103678 00,046	Journal of Physical end Chemical Reference Date, Vol-
DE93007992 00,378	SPT (SYNTHETIC-PERTURBATION TUNING)	ume 21, No. 6, November/December 1992. PB93-149136 00.013
PACE CHARGE Space Charge Induced in Stressed Polyethylene.	Synthetic-Perturbation Tuning of MIMD Programs. PB93-161339 00,253	Eveluated Kinetic and Photochemical Dete for Atmos-
PB93-151124 00,343 PACE EXPLORATION	Using Synthetic-Perturbation Techniques for Tuning	pheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Kinetic Deta Eveluetion for Atmospheric Chem-
Intelligent Robots for Planetary Exploration and Construc-	Shared Memory Programs. PB93-178572 00,257	Istry. PB93-149144 00,014
tion. N93-27980/0 00,697	Building Hadamard Matrices in Steps of 4 to Order 200. PB93-189835 00,261	NIST Standard Reference Data Products Cetalog, 1993. PB93-173409 00,163
PACE GROUPS Fest Fourier Transforms for Space Groups Containing	SQL DATA BASE LANGUAGE	Microcalorimeter for 7 mm Coaxial Transmission Line.
Rotation Axes of Order Three and Higher.	Security Issues in the Database Language SQL. PB94-104585 00,273	PB94-112455 00,338 STANDARD REFERENCE MATERIALS
PB93-124790 00,642 PACE HVAC SYSTEMS	SQL DATABASE LANGUAGE	Development of Ore Bioleaching Stendards.
Building and HVAC Characterization for Commercial Building Indoor Air Quality Investigations.	Database Language SQL. Category: Software Standard. Subcategory: Database, June 1993.	PB93-151603 00,496 Use of High Accuracy NAA for the Certification of NIST
PB93-198844 00,389	FIPS PUB 127-2 00,280	Botanical Standard Reference Materials. PB93-153153 00,517
Field Monitoring of a Variable-Speed Integrated Heat Pump/Water Heating Appliance.	SQL (STRUCTURED QUERY LANGUAGE) Towards SQL Database Language Extensions for Geo-	Instrumentel Neutron Activetion Analysis of Standard Ref-
PB93-228203 00,382	graphic Information Systems. PB94-101847 00,411	erence Materiel 1941, Organics in Merine Sediment: Element, Content and Homogeneity.
Air Moving Systems and Fire Protection. PB93-234722 00,398	SRM 1941	PB93-166213 00,552
PACE TRANSPORTATION	Instrumental Neutron Activation Analysis of Standard Reference Material 1941, Organics in Marine Sediment: Ele-	Standard Cement Clinkers for Phase Analysis. PB93-166254 00,185
National Institute of Standards and Technology Con- ference on Reducing the Cost of Space Infrastructure and	ment, Content and Homogeneity. PB93-166213 00,552	Stendard Reference Materials for Trace Organic Contami-
Operations. Part 1. Orel Presentations end Discussion. Held in Geithersburg, Marylend on November 20-22,	STAINLESS STEELS	nants in the Marine Environment. PB93-166627 00,395
1989. PB94-111374 00,699	WRC-1992 Constitution Diagrem for Steinless Steel Weld Metals: A Modification of the WRC-1988 Diagram.	NIST Standerd Reference Data Products Catalog, 1993. PB93-173409 00.163
Netional Institute of Standerds and Technology Con-	PB93-153427 00,484	Standard Reference Meterials: Handbook for SRM Users.
ference on Reducing the Cost of Space Infrestructure and Operations. Part 2. Topical Papers. Held in Gaithersburg,	STANDARD RADIATORS Results of Screened-Room Measurements on NIST	PB93-183796 00,107 STANDARDIZATION
Merylend on November 20-22, 1989. PB94-113487 00,696	Standard Radiators. PB94-123056 00.323	Report on Scoping the Apparel Manufecturing Enterprise.
PACECRAFT CONSTRUCTION MATERIALS	STANDARD REFERENCE DATA	PB93-152163 00,429 Proceedings of the Meeting of the Intergovernmental
Ignition and Subsequent Flame Spread over a Thin Cel- lulosic Material.	Instrument-Independent Database for Collisionally Activated Dissociation in Radiofrequency Only Quadrupoles.	U.SRussian Business Development Committee's Stand-
N93-20205/9 00,698	Single-Collision Versus Multiple-Collision Conditions.	ards Working Group (2nd). Held in Gaithersburg, Maryland on March 23-24, 1993.
PECIFICATIONS UNIFORMAT II: A Recommended Classification for Build-	PB93-125680 00,400 Journal of Physical and Chemical Reference Date, Vol-	PB93-179968 00,087 Guide to NIST.
Ing Elements end Related Sitework. PB93-146017 00,034	ume 21, No. 1, January/February 1992. PB93-148948 00,126	PB94-119435 00,002
PECIMEN BANKING	Thermodynamic Properties of the NaCl + H2O System. 1.	STANDARDS Initial Graphics Exchange Specification (IGES).
Specimen Banking at the National Institute of Standards and Technology.	Thermodynamic Properties of NaCl(cr). PB93-148955 00,127	AD-A270 049/0 00,416
PB93-151967 00,101 PECTRA	Spectral Data end Grotrian Diagrams for Highly Ionized	VHSIC Hardware Description Language (VHDL); Category: Softwere Stenderd; Subcategory: Hardware De-
Spectral Data and Grotnan Diagrams for Highly Ionized	Cobalt, Co VIII through Co XXVII. PB93-148963 00,568	scription Language. IEEE Standard VHDL Language Reference Manual.
Cobalt, Co VIII through Co XXVII. PB93-148963 00,568	Critical Compilation of Surface Structures Determined by	FIPS PUB 172 00,286 Video Teleconferencing Services at 56 to 1,920 KB/S.
Spectral Data end Grotrian Diagrams for Highly Ionized	Surface Extended X-ray Absorption Fine Structure (SEXAFS) and Surface Extended Electron Energy Loss	Cetegory: Telecommunications Stenderd end Sub-
Vanadium, V VI through V XXIII. PB93-149011 00,570	Spectroscopy (SEELFS). PB93-148971 00,128	category: Video Teleconferencing. FIPS PUB 178 00,209
PECTRAL BANS Franck-Condon Fectors, r-Centroids, Electronic Transition	Leser-Induced Kerr Constants for Pure Liquids.	Stetus of Emerging Standards for Removeble Computer Storage Media end Related Contributions of NIST.
Moments, end Einstein Coefficients for Many Nitrogen	PB93-148989 00,129 Journal of Physical and Chemical Reference Date, Vol-	N93-14778/3 00,228
and Oxygen Band Systems. PB93-149128 00,114	ume 21, No. 2, March/April 1992. PB93-148997 00,569	Data Management Standards in Computer-Aided Acquisition and Logistic Support (CALS).
PECTRAL SHIFT Wolf Shifts and Their Physicel Interpretation under Lab-	Recommended Rest Frequencies for Observed Inter-	N93-27714/3 00,289
oretory Conditions.	stellar Molecular Microwave Transitions. 1991 Revision. PB93-149003 00,011	Comparison of Netionel Stenderds for the Performance Evaluation of Coordinate Measuring Machines In Terms
PB93-196293 00,633 PECTRUM ANALYSIS	Spectrel Data and Grotrian Diagrams for Highly Ionized	of Length-Besed Dimensionel Quantities. PB93-139004 00,458
Cathodoluminescence Imaging and Spectroscopy of CVD	Vanadium, V VI through V XXIII. PB93-149011 00,570	Test Methods for Detention end Correctionel Fecility
Diamond in e Scanning Electron Microscope. PB93-153708 00,464	Journal of Physical and Chemical Reference Data, Vol-	Locks. PB93-139111 00,054
PEECH CORPORA DARRA TIMIT Acquetic Phonetic Continuos Secondo Cor	ume 21, No. 3, May/June 1992. PB93-149029 00,199	More Questions and Answers on the ISO 9000 Stenderd Series end Releted Issues.
DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00.215	Evaluated Kinetic Data for Combustion Modelling. PB93-149037 00,200	PB93-140689 00,093
PB93-173938 00,215 PEECH RECOGNITION	Journal of Physical and Chemical Reference Data, Vol-	Performance Stenderd for Wood-Besed Structural-Use Penels.
DARPA TIMIT Acoustic-Phonetic Continous Speech Cor-	ume 21, No. 4, July/August 1992. PB93-149045 00,130	PB93-146298 00,056
pus CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215	Chemicel Kinetic Data Base for Propellant Combustion. 2.	Making Meteriels Datebase Stenderds Internetional. PB93-151738 00,463
PEECH SCRAMBLING Guide to Voice Privacy Equipment for Lew Enforcement	Reactions Involving CN, NCO, and HNCO. PB93-149052 00,131	Questions and Answers on Quality, the ISO 9000 Stenderd Series, Quelity System Registration, and Releted Is-
Redio Communications Systems.	Thermodynamic Properties of the NaCl + H2O System. 2.	sues.
PB93-189827 00,701 PRAYING	Thermodynemic Properties of NeCl(eq), NaCl2H2O(cr), and Phase Equilibria.	PB93-152080 00,090 Raster Grephics: A Tutoriel and Implementation Gulde.
Weler Mist Fire Suppression Workshop Proceedings. Held in Gaithersburg, Meryland on March 1-2, 1993.	PB93-149060 00,132	PB93-152171 00,421
PB93-219780 00,700	Vibrational Bands of HxNyOz Molecules. PB93-149078 00,133	ASTM Committee, C28, Advenced Ceremics: A Progress Report.
PRAYS Particulate and droplet diagnostics in spray combustion.	Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2	PB93-153617 00,468 Information Technology Stendards: Processes end Strete-
Annual report. DE93003632 00,196	for Energies from 0.1 eV to 10 keV. PB93-149086 00,571	gies. PB93-153625 00,291
00,190	. 200 140000	1 000-100020 00,291

COBOL Compiler Validation System (CCVS 85), Use	Shtolo-Converting STEP Short Listings to Annotated List-	Direct Evidence for an Effect of Twin Boundaries on Flux
Guide, Version 4.2.	ings. National PDES Testbed Report Series.	Pinning in Single Crystal of YBa2Cu3O6+x.
PB93-163178 00,254 Advanced Ceramics Standards Development.		PB93-166296 00,679
PB93-166007 00,470		Structure and Magnetic Properties of Doped Co and Fe- Bi2Sr2Cui-xMxOy Phases.
New International Voit and Ohm Standards.	PB94-120797 00,276	PB93-166338 00,680
PB93-166361 00,593	STOPPING POWER ESTAR, PSTAR, and ASTAR: Computer Programs for	Structural Phase Transformation Studies of the High Tc Superconducting Materials, Ba2RCu3O6+x, in Air.
Preparing for the New Voit and Ohm. PB93-166379 00,594	Calculating Stopping-Power and Range Tables for Elec-	PB93-166643 00,683
Standard X-ray Diffraction Powder Patterns of Fourteen	trons, Protons, and Helium lons. PB93-146033 00,567	Crystal Chemistry and Phase Equilibria Studies of the
Ceramic Phases. PB93-166650 00,47	CTODACE	BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder Characterization and Diffraction Patterns of
Surveillance Schemes with Applications to Mass Calibra	Chemical Change of Hardened PCA/CPC Cements in	Ba3R3Cu6O14+x, R=Lanthanides. PB93-166668 00.684
tion.	PB93-151306 00.020	PB93-166668 00,684 X-ray Diffraction Line Broadening: Modeling and Applica-
PB93-181881 00,600	STRESS ANALYSIS	tions to High-(T sub c) Superconductors.
Metrication: An Economic Wake-up Call for U.S. Industry. PB93-188969 00,086	Built-in Error Estimator for Optimizing Finite Element Modeling.	PB94-108495 00,689
ENDF/B-Vi Neutron Cross Section Measurement Stand	Widdeling.	Analysis of the Impact on U.S. Industry of the NIST/Boul- der Superconductivity Programs: An Interim Study.
ards. PB93-189868 00.610	STRONTIUM OXIDES	PB94-120680 00,692
Two New Gas Standards Programs at the National insti	Fliase Equilibria and Crystal Chemistry in Foldons of the	SUPERLATTICES Controlled Interface Roughness in GaAs/AlAs
tute of Standards and Technology.	Diagrams for the Temary Systems of SrO-Bi2O3-CuO,	Controlled Interface Roughness in GaAs/AlAs Superiattices.
PB93-191427 00,095	PR93-153732 00 460	PB93-125896 00,351
Dimensional Inspection Planning Based on Product Data Standards. National PDES Testbed Report Series.	STRUCTURAL ANALYSIS	SURFACE ANALYSIS Neutron Depth Profiling: Overview and Description of
PB93-198455 00,450		NIST Facilities.
Report of the National Conference on Weights and Meas		PB93-166890 00,686
ures (77th). Held in Nashville, Tennessee on July 19-23 1992.	Full-Thickness Clad Beam Fracture-Toughness Tests.	SURFACE CHEMISTRY Review of the Nickel-Graphite Interface.
PB93-209781 00,406	DE93018036 00,550	PB93-166601 00,500
NIST Handbook 44, 1993: Specifications, Tolerances and Other Technical Requirements for Weighing and		SURFACE ELECTRON ENERGY LOSS FINE STRUCTURE
Measuring Devices as Adopted by the 77th National Con-	Subcategory: Database, June 1993.	Critical Compilation of Surface Structures Determined by Surface Extended X-ray Absorption Fine Structure
ference on Weights and Measures 1992. PB93-213106 00,407	FIPS PUB 127-2 00,280	(SEXAFS) and Surface Extended Electron Energy Loss Spectroscopy (SEELFS).
NIST Handbook 130, 1993. Uniform Laws and Regula	SUBMARINES	PB93-148971 00,128
tions in the Areas of Legal Metrology and Motor Fue Quality as Adopted by the 77th National Conference or	Model to Submarine Automation: A Maneuvering System	SURFACE EXTENDED X-RAY ABSORPTION FINE
Weights and Measures 1992.	Demonstration. PB93-184257 00,545	STRUCTURE Criticel Compilation of Surface Structures Determined by
PB93-213114 00,015	SUBSTRATES	Surface Extended X-ray Absorption Fine Structure
State Weights and Measures Laboratories: State Standards Program Description and Directory. 1993 Edition.	rately 313 of the rigglegate Centent I aste interlace Cally	(SEXAFS) and Surface Extended Electron Energy Loss Spectroscopy (SEELFS).
PB93-217529 00,45	Grazing incidence X-ray Scattering. PB93-125904 00,179	PB93-148971 00,128
User's Guide for the Programmer's Hierarchicei Inter-	00-10112101122	SURFACE FORCES Surface Forces and Their Action in Coronia Materials
active Graphics System (PHIGS) C Binding Validatior Tests (Version 2).	3nu3 Band of (32)S(16)O2: Line Positions and Intensities. PB93-151207 00,140	Surface Forces and Their Action in Ceramic Materials. AD-A273 624/7 00,465
PB93-228617 00,268	SULFUR HEXAELUORIDE	SURFACE INTERACTIONS
COBOL 85 Compiler Validation System (CCVS 85), Version 4.2.	Detection of S2F10 Produced by Electrical Discharge in	Surface Forces and Their Action in Ceramic Materials. AD-A273 624/7 00,465
PB93-504918 00,270	SF6. PB93-166528 00.596	SURFACE MAGNETISM
SGML DTD for the STEP Integrated Resource Parts. Na-		Surface Magnetic Microstructure.
tional PDES Testbed Report Series. PB94-114501 00.428	Transport Current Effects on Flux Creep and Magnetiza-	PB93-165728 00,673
STATE PROGRAMS	tion in Nb-Ti Multifilament Cable Strands. PB93-150746 00,574	High Spatial Resolution Quantitative Micromagnetics. PB93-165736 00,674
Designing and Implementing a State Quality Award. PB93-154458 00,695	SUPERCONDUCTING DEVICES	SURFACE REACTIONS
STATE SERVICES	Proceedings of the sixth JapanUS workshop on high- field superconducting materials and standard procedures	Mechanistic Studies of Photoinduced Reactions at Semi- conductor Surfaces.
State Weights and Measures Laboratories: State Stand-	for high-field superconducting materials testing.	PB93-151710 00,656
ards Program Description and Directory. 1993 Edition. PB93-217529 00,451	DE93002848 00,640	SURFACE ROUGHNESS
STATISTICAL ANALYSIS	SUPERCONDUCTING ELECTRONICS Analysis of the impact on U.S. Industry of the NIST/Boul-	Direct and Inverse Problems for Light Scattered by Rough Surfaces.
PC-OMNITAB: An interactive System for Statistical and	der Superconductivity Programs: An Interim Study.	PB93-125714 00,623
Numerical Data Analysis (Documentation). PB93-111656 00,249	PB94-120680 00,692 SUPERCONDUCTING FILMS	Comparison between Precision Roughness Master Specimens and Their Electroformed Replices.
PC-OMNITAB: An Interactive System for Statistical and	Sims Determination of Oxygen and Carbon in	PB93-166163 00,438
Numerical Data Analysis, Version 7.0 (for Micro- computers).	YBa2Cu3O7-x Superconductors. PB93-150845 00,650	SURFACE STRUCTURE
PB93-500437 00,269		Criticel Compilation of Surface Structures Determined by Surface Extended X-ray Absorption Fine Structure
STEEL AAR-TC128	YBa2Cu3O7-Delta Films on MgO at 76 K.	(SEXAFS) and Surface Extended Electron Energy Loss
Fracture Mechanics Evaluation of Railroad Tank Cars Containing Postulated Circumferential Cracks.		Spectroscopy (SEELFS). PB93-148971 00,128
PB93-219731 00,486	SUPERCONDUCTING WIRES Critical-Current Degradation in Nb3Sn Composite Wires	SURFACES
TEELS	Due to Locally Concentrated Transverse Stress.	Subpicosecond Probing of Vibrational Energy Transfer at Surfaces.
Mechanical, Stress-Rupture, and Fracture Toughness Properties of Normalized and Stress Relieved AAR	PB93-153211 00,344 SUPERCONDUCTORS	PB93-150720 00,136
TC128 Grade B Steel at Elevated Temperatures.	Proceedings of the sixth Janan-US workshop on high-	Imaging of Passivated III-V Semiconductor Surfaces by a
PB93-182020 00,485	field superconducting materials and standard procedures	Scenning Tunneling Microscope Operating in Air. PB93-153294 00,357
Structure-Property Relationships in Microalioyed Ferrite- Pearlite Steels Phase 1: Literature Review, Research	for high-field superconducting materials testing. DE93002848 00,640	Faceting Induced by an Ultrathin Metai Film: Pt on
Plan, and Initial Results. PB93-234706 00,487	Modeling of X-ray Diffraction Line Broadening with the	W(111). PB93-166171 00,677
STELLAR ENVELOPES	Voigt Function: Applications to High-T(sub c) Superconductors.	Transient Cooling of a Hot Surface by Dropiets Evapo-
Journal of Physical and Chemical Reference Data, Vol-	PB93-152072 00,661	ration. Final Report, November 1990.
ume 21, No. 2, March/April 1992. PB93-148997 00,569	Orientation Dependence of Flux Pinning in a Layered Bi2Sr2Ca1Cu2O8 + 10% Ag Composite.	PB93-189421 00,609 SURFACES & INTERFACES
Recommended Rest Frequencies for Observed inter-	PB93-153328	Surface Forces and Their Action in Ceramic Materials.
stellar Molecular Microwave Transitions. 1991 Revision.	Comparison of Transport Critical Current Measurement	AD-A273 624/7 00,465
PB93-149003 00,011 TEP (STANDARD FOR THE EXCHANGE OF PRODUCT	Methods. PB93-153369 00,666	Subpicosecond Probing of Vibrational Energy Transfer at Surfaces.
MODEL DATA)	Effect of Composition on Superconducting Properties in	PB93-150720 00,136
Data Probe User's Guide. National PDES Testbed Report Series.	the System Ba-Y-Gd-Cu-O. PB93-153377 00.667	Mechanistic Studies of Photoinduced Reactions at Semi- conductor Surfaces.
PB93-178655 00,425	Dynamic Resistance of Superconducting YBa2Cu3Ox	PB93-151710 00,656
Validation Testing System: Reusable Software Compo-	Sintered Powder at 81 K: Liquid versus Vapor Nitrogen	Vibrational Line Shape of Diatomic Adsorbates on Metal
nent Design. National PDES Testbed Report Series. PB94-109220 00,427	Environment. PB93-153518 00,670	Clusters. PB93-153187 00,145
SGML DTD for the STEP Integrated Resource Parts. Na-	· ·	
tional DDEC Toothard Days a Contra	Magnetic Phase Transitions and Structural Distortion In	Cathodoluminescence Imaging and Spectroscopy of CVD
tional PDES Testbed Report Series. PB94-114501 00,428	NdŽCuO4.	Cathodoluminescence Imaging and Spectroscopy of CVD Diamond in a Scenning Electron Microscope. PB93-153708 00,464

THERMODYNAMICS & CHEMICAL KINETICS

Model Studies of SnO2-Besed Ges Sensors: Vecency Defects end Pd Additive Effects.	TELECONFERENCING Video Teleconferencing Services et 56 to 1,920 KB/S.	Using Self-Organizing Recognition es e Mechenism for Rejecting Segmentetion Errors. PB93-138972 00.250
PB93-166056 00,112 Feceting Induced by en Uitrethin Metel Film: Pt on	Cetegory: Telecommunications Stendard end Sub- category: Video Teleconferencing.	First Text REtrievel Conference (TREC-1).
W(111). PB93-166171 00,677	FIPS PÜB 178 00,209 TEM CELLS	PB93-191641 00,262 TEXTILE INDUSTRY
Meteriel Dependence of Electron Inelastic Meen Free Peths et Low Energles. PB93-166320 00,591	Reverberating Asymmetric TEM Cell for Radiated EMC/V end SE Testing, 10 kHz - 18 GHz. PB93-153278 00,315	Informetion Technology Vision for the U.S. Fiber/Textile/ Apparei Industry. PB93-139095 00,482
Review of the Nickel-Grephite Interface. PB93-166601 00,500	TEMPERATURE DEPENDENCE Eveluetion of Compact Fluorescent Lamp Performance et	THERMAL CONDUCTIVITY Interlaboratory Comparison of the Apparent Thermel Con-
Fitting of Transmission Dete for Determining the Optical Constants end Thicknesses of Opticel Films.	Different Ambient Temperatures. PB93-146694 00,035	ductivity of e Fibrous Batt end Four Loose-Fill Insuletions. PB93-151280 00,061 Radiative Heet Trensfer In Transient Hot-Wire Measure-
PB93-166692 00,630 SURGES	TEMPERATURE DISTRIBUTION Comparison of Ceiling Jet Temperatures Measured in en	ments of Thermal Conductivity.
Effect of Repetitive Swells on Metel-Oxide Veristors. PB93-153443 00,358	Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-OS and LAVENT Computer Models.	THERMAL CURRENT CONVERTERS
Proceedings: Open Forum on Surge Protection Applica-	PB93-158657 00,539 TEMPERATURE EFFECTS	Low-Frequency Errors of Thermal Voltage Converters: A Progress Report.
tion. PB94-118056 00,346	Subambient Temperature Modification of Selectivity in Reversed-Phase Liquid Chromatography.	PB93-151223 00,333 THERMAL INSULATION
SURVIVAL Design of Smoke Control Systems for Arees of Refuge.	PB93-153799 00,103	Apparent Thermal Conductivity of Polyurethane Foam In- sulation, Containing Various HCFC Blends, from 125 to
PB93-183754 00,072 SYNCHROTRON RADIATION	TEMPERATURE MEASUREMENT New Approach to Calibration of Transducers Used in the	335 K. (Finel report). DE93012534 00,488
X-rey Beem Position Monitor Using e Ouadrant PIN Diode.	Meesurement of Dynamic Pressure and Tempereture. PB93-153716 00,348	Interlaboratory Comperison of the Apparent Thermel Con-
PB93-151769 00,579	Temperature-Electromotive Force Reference Functions end Tables for the Letter-Designated Thermocouple	ductivity of e Fibrous Batt and Four Loose-Fill Insulations. PB93-151280 00,061
System Response to Pulsed Excitetions Estimeted from	Types Based on the ITS-90. PB93-190338 00.611	THERMAL VOLTAGE CONVERTERS Intercomparison of NIST, NPL, PTB, end VSL Thermel
Measurement of cw Amplitudes. PB93-153492 00,316	TEMPERATURE SCALES	Voltege Converters from 100 kHz to 1 MHz. PB93-151181 00.332
SYSTEMS MANAGEMENT	Conversion of Temperatures and Thermodynamic Prop- erties to the Basis of the International Temperature Scale	Low-Frequency Errors of Thermal Voltage Converters: A Progress Report.
Government Network Menegement Profile (GNMP). Cet- egory. Herdwere end Softwere Stenderds. Subcetegory:	of 1990. PB93-153336 00,147	PB93-151223 00,333
Computer Network Protocols. FIPS-PUB-179 00,248	TERBIUM 160	THERMOCHEMISTRY Evaluated Kinetic and Photochemical Deta for Atmos-
TANK CARS Mechenical, Stress-Rupture, end Frecture Toughness	Nuclear Orientation of (160)Tb in Tb Single Crystal. PB93-125656 00,563	pheric Chemistry. Supplement 4. IUPAC Subcommittee on Ges Kinetic Dete Evaluation for Atmospheric Chem-
Properties of Normelized end Stress Relieved AAR TC128 Grede B Steel et Eleveted Temperatures.	TERMINAL BALLISTICS Limited Tests to Investigate Whether the Size of Body	istry. PB93-149144 00,014
PB93-182020 00,485	Armor Samples Influences Ballistic Test Results. PB93-138998 00.554	THERMOCOUPLES Temperature-Electromotive Force Reference Functions
Frecture Mechanics Evaluation of Reilroad Tank Cers Conteining Postuleted Circumferential Crecks.	TEST CHIPS	and Tables for the Letter-Designated Thermocouple
PB93-219731 00,486 TECHNOLOGY ASSESSMENT	Test Guide for CMOS-On-SIMOX Test Chips NIST3 end NIST4.	Types Based on the ITS-90. PB93-190338 00,611
Assessment of Fossil Energy Materiels Research Needs. PB93-145779 00,377	PB93-152106 00,355	THERMODYNAMIC PROPERTIES Theoretical Evaluation of R22 and R502 Alternatives.
TECHNOLOGY INCENTIVES	TEST FACILITIES More Questions and Answers on the ISO 9000 Standard	Final Report. DE93014767 00,489
Federel-State Collaboration in Industrial Modemization. PB93-209930 00,441	Series and Related Issues. PB93-140689 00,093	Predictive Thermodynamic Model for Complex High Temperature Solution Phases XI.
TECHNOLOGY INNOVATION Opportunities for Innovation: Chemical end Biological	Questions and Answers on Quality, the ISO 9000 Standard Series, Quality System Registration, and Related Is-	PB93-124840 00,120
Sensors. PB93-100063 00,096	sues. PB93-152080 00,090	Thermodynamic Properties of the NaCl + H2O System. 1. Thermodynamic Properties of NaCl(cr).
Technology for Economic Growth: President's Progress Report.	TEST METHODS	PB93-148955 00,127 Thermodynamic Properties of the NaCl + H2O System. 2.
PB94-107430 00,001	Test Methods for Detention and Correctional Facility Locks.	Thermodynamic Properties of NaCl(aq), NeCl2H2O(cr), and Phase Equilibria.
TECHNOLOGY TRANSFER Research, Industry end Technology Transfer at the NIST	PB93-139111 00,054 Performance Standard for Wood-Based Structural-Use	PB93-149060 00,132 Conversion of Temperatures and Thermodynamic Prop-
AMRF. PB93-166304 00,431	Panels. PB93-146298 00,056	erties to the Basis of the International Temperature Scale of 1990.
Collection of Successful Interections between the MTCs end Client Firms.	Test Procedure for Handgun Accuracy.	PB93-153336 00,147
PB93-206886 00,092	PB93-161347 00,556 Ouality Control Tests for Adhesion of Paint on the Panels	Tables for the Thermophysical Properties of Ethane. PB93-160786 00,150
TECHNOLOGY UTILIZATION Information Technology Vision for the U.S. Fiber/Textile/	of Tećtical Rigid Wall Shelters, Phase 2. PB93-173474 00,476	Thermodynamic Properties of Homogeneous Mixtures of Nitrogen and Water from 440 to 1000 K, Up to 100 MPa
Apperel Industry. PB93-139095 00,482	Test Methods for Quantifying the Propensity of Cigarettes	end 0.8 Mole Fraction N2. PB94-118494 00,617
TEETH Effect of e Two-Solution Fluoride Mouth Rinse on	to Ignite Soft Furnishings. PB94-108644 00,047	THERMODYNAMICS EXAM: A Two-State Thermodynamic Analysis Program.
Reminerelization of Enemel Lesions In vitro. PB93-150738 00,526	TESTING LABORATORIES Impacts: NIST Building and Fire Research Laboratory	PB93-191658 00,166
Clinical Use of Beta-Ouartz Glass-Ceramic Inserts.	(Technicel end Societel). PB94-113420 00,079	THERMODYNAMICS & CHEMICAL KINETICS Predictive Thermodynamic Model for Complex High Tem-
PB93-150761 00,017 Intrinsically Colored Microcrystalline Glass-Ceremic for	TESTS	perature Solution Phases XI. PB93-124840 00,120
Use in Dental Restoretion. PB93-150837 00,018	Automated Tools for Testing Computer System Vulner- ebility.	Effects of Pressure on the Thermal Decomposition Kinetics, Chemical Reactivity end Phase Behavior of RDX.
TELECOMMUNICATION	PB93-146025 00,219 CALS Testing: Programs, Status and Strategy.	PB93-125888 00,553
Federal Building Telecommunications Wiring Standard: Cetegory: Telecommunications Standard; Subcategory:	PB93-151165 00,420	Reduction Reactions of Weter Soluble Cyano-Cobelt(III)- Porphyrins: Metal Versus Ligand Centered Processes. PB93-125912 00,514
Cebles and Wiring. FIPS PUB 174 00,206	Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and	Kinetics of Bimolecular Recombination Processes with
Federal Building Standard for Telecommunications Peth- weys end Spaces; Cetegory: Telecommunications Stand-	Training. PB93-152155 00,296	Trapping. PB93-151652 <i>00,143</i>
erd; Subcategory: Cables and Wiring. FIPS PUB 175 00,207	Validation Testing System: Reusable Software Component Design. National PDES Testbed Report Series.	Kinetics of a Multistate Enzyme in a Large Oscillating Field.
Residential and Light Commercial Telecommunications Wiring Standard; Category: Telecommunications Stand-	PB94-109220 00,427	PB93-153690 00,516
erd; Subcategory: Category: Telecommunications Stand- erd; Subcategory: Cables end Wiring. FIPS PUB 176 00,208	FORTRAN Compiler Validation System 1978. User's Guide, Version 2.1.	Tables for the Thermophysical Properties of Ethane. PB93-160786 00,150
Study of Treffic Control end Congestion Control in	PB94-118460 00,275 TETRATHIOPHENE	Rate Constants for Hydrogen Abstraction Reactions of NO3 in Aqueous Solution.
Broadbend ISDN. PB93-149433 00,210	Lowest Energy Singlet State of Tetrathiophene, an Oligomer of Polythiophene.	PB93-166064 00,152 Formation end Reectivity of Hypophosphite and
North American ISDN (Integrated Services Digital Network) Users' Forum Agreements on ISDN.	PB93-124824 00,119	Phosphite Radicals and Their Peroxyl Derivatives. PB93-166072 00,153
PB93-173391 00,211	Computer Graphics Metafile (CGM). Cetegory: Software	Prediction of Cerbon-Hydrogen Bond Dissociation Ener-
Private Branch Exchenge (PBX) Security Guideline.	Stenderd. Subcategory: Graphics. Pert 4. Clear Text Encoding. FIPS PUB 128-1D 00,284	gies for Polycyclic Aromatic Hydrocarbons of Arbitrary Size.
PB94-100880 00,212	FIPS PUB 128-1D 00,284	PB93-166205 00,155

00,155

Probes of Equipartition in Nonlinear Hamiltonian Systems. PB93-166387 00,595	TRANS-1 Pertiel Structure for trens-1,2-Diffuoroethylene from High-Resolution Infrered Spectroscopy.	VALIDATION SUMMARY REPORTS Velidation Summery Report: GTE Government Systems, Alsys Ada Software Development Environment, HP 9000
Chemical Kinetic Dete Bese for RDX Combustion. PB93-166460 00,160	PB93-125144 00,123 TRANSITION PROBABILITIES	Series 800 Model 867 Under HP-UX BLS Version A.08.08 (Host end Target), 930115S1.11307.
Mechanisms for the Formetion end Destruction of Chlorinated Organic Products of Incomplete Combustion. PB93-166478 00.161	Critical Compilation of Atomic Transition Probabilities for Singly Ionized Argon.	AD-A262 055/7 00,231 Validation Summary Report: GTE Government Systems,
Single Pulse Shock Tube Studies on the Thermel Decomposition of n-Butyl Phenyl Ether, n-Pentylbenzene and	PB93-149102 00,573 TRANSLATORS	Aisys Ada Software Development Environment, HP 9000 Series 800 Model 867 Under HP-UX BLS Version
Phenotole end the Heat of Formation of Phenoxy end Benzyl Radicals.	Porteble Estelle Translator: An Overview and User Guide. PB93-183473 00,260	A.08.08 (Host and Target), 930115S1.11308. AD-A262 056/5 Volidation Suppose Boost, CTE Construct Systems
PB93-166577 00,162 Critical Parameters end Saturation Densities of 1,1-	TRANSMISSION ELECTRON MICROSCOPY Hendbook for Eveluetion of TEM Semple Preparetion of	Velidation Summary Report: GTE Government Systems, Alsys Ada Softwere Development Environment, HP 9000 Series 800 Model 807 UnderHP-UX BLS Version A.08.08
Dichloro-2,2,2-Trifluoroethene. PB93-166593 00,492	Particles on Membrene Filters: Version 1.0. PB93-219764 00,390	(Host end Target), 930115S1.11305. AD-A262 253/8 00,233
FHERMOMAGNETIC EFFECTS Magnetic Properties of Cr-Mn Austenitic Steinless Steels.	Airbome Asbestos Method: Stenderd Test Method for Verified Analysis of Asbestos by Transmission Electron	Validation Summary Report: GTE Government Systems, Alsys Ade Softwere Development Environment, HP 9000
PBŠ3-153310 00,483 FHERMOPHYSICAL PROPERTIES	Microscopy. Version 1.0. PB94-113578 00,109	Series 800 Model 817 under HP-UX BLS Version A.08.08 (Host end Terget), 930115S1.11306.
Thermophysical Properties. Progress Report, 1 Januery 199231 March 1993.	TRAPPING (CHARGED PARTICLES) Charge Trepping in Cubic Silicon Carbide MIS Cepaci-	AD-A262 717/2 00,234 Validation Summary Report: GTE Government Systems,
DE93040219 00,490 Residual Stress in e Porcelain-Metai Strip Related to	tors. PB93-151199 00,651	Alsys Ada Software Development Environment for 80386 UNIX, Version 5.1.2, Zenith Date Systems, Z-Station 433
Thermo-Physical Properties of Meterials. PB93-151801 00,022	TREMORS Procedures for Selecting Earthquake Ground Motions et	DEh (Host and Target), 930115S1.11309. AD-A262 720/6 00,235
Tables for the Thermophysical Properties of Ethane. PB93-160786 00,150	Rock Sites (Revised). PB93-185973 00,542	Velidation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS AXP Systems, Version 3.0-
Tables of Experimental Data Used for the Correlation of the Thermophysical Properties of Ethane.	TRIBOLOGY Tribological Investigations of Composites end Other Se-	5, DEC 3000 Model 400 (host target), 930319S1.11315. AD-A264 885/5 00,236
PB93-173417 00,164	lected Materials Sliding against Vacuum-Deposited MoS2 Coatings.	Validation Summary Report: Digital Equipment Corpora- tion, DEC Ade for Open VMS VAX Systems, Version 3.0- 7, VAXstation 4000 Model 60 (host) => VAXstation 3100
Thermophysical Properties of Fluids for the Ges Industry. Annual Report, January-December 1992. PB93-207470 00,381	PB93-138949 00,462 ULTIMATE STRENGTH	Model 48 (target), 930319S1.11317. AD-A264 886/3 00.237
THORIUM	Effect of Critical Parameters on the Behavior of Partially- Grouted Masonry Shear Walls under Laterel Loads.	Velidetion Summery Report: Digitel Equipment Corporation, DEC Ada for OpenVMS VAX Systems, Version 3.0-
Determination of Uranium and Thorium in Materiels Asso- clated with Reel Time Electronic Solar Neutrino Detec-	PB93-206894 00,076 ULTRASONIC TESTS	7, VAXstetion 4000 Model 60 (host terget), 930319S1.11316.
tors. PB93-150779 00,575	ONR-Sponsored Research in Ultrasonic Measurements et NIST: 1982-92.	AD-A265 014/1 00,238 Ada Compiler Validation Summary Report. Certificate
FILTMETERS Measuring Low Frequency Tilts. PB93-196251 00.543	PB93-152064 00,618 UNDERWATER NAVIGATION	Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5 (/OPTIMIZE) VAX 8550/8600/8650 (Cluster) > Enhanced
PB93-196251 00,543 FIME MEASUREMENT	Applying the NIST Real-Time Control System Reference Model to Submerine Autometion: A Maneuvering System	Processor (ÉP) AN/UYK-44 (Bare Boerd). AD-A265 260/0 00,239
Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level.	Demonstretion. PB93-184257 00,545	Ada Compiler Validation Summary Report. Certificete Number: 920918S1.11271, U.S. Nevy AdaVAX Version
N93-25059/5 00,558 AT2, a New Time Scele Algorithm: AT1 Plus Frequency	UNIFORMAT II UNIFORMAT II: A Recommended Classification for Build-	5.5 (/NO OPTIMIZE) VAXstation 4000 > VAXstation 4000.
Variance. PB93-151926 00,214	ing Eiements and Related Sitework. PB93-146017 00.034	AD-A265 261/8 00,278 Ade Compiler Validation Summary Report. Certificate
FIME-OF-FLIGHT SPECTROMETERS Neutron Time-of-Fiight Spectroscopy.	UNITED STATES Federel-State Collaboration in Industrial Modernization.	Number: 920805S1.11265 DDC-I, Inc. DACS Sun SPARC/SunOs Native Ada Compiler System, Version
PB93-166874 00,603	PB93-209930 00,441	4.6.1 SPARCStetion 2 => SPARCStetion 2. AD-A265 433/3 00,240
Model Studies of SnO2-Based Gas Sensors: Vacancy Defects and Pd Additive Effects.	Analysis of the Impact on U.S. Industry of the NIST/Boul- der Superconductivity Programs: An Interim Study. PB94-120680 00,692	Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11273 U.S. Navy, Ada/M, Version 4.5 (OPTIMIZE), VAX 8550/8600/8650 (Cluster) => VHSIC
PB93-166056 00,112	UNMANNED Report of the ARPA/NIST Workshop on Performance	Processor Module (VPM) AN/AYK-14 (Bare Board). AD-A265 434/1 00,241
Comparison of Meesured end Calculeted Appearance-Potential Spectra for Six 3d Metels.	Eveluation of Unmenned Ground Vehicle Technologies. PB94-112422	Ade Compiler Validation Summary Report. Certificate Number: 920918S1.11274 U.S. Navy AdaM, Version 4.5
PB93-151629 00,141 FITANIUM ALLOYS	UPHOLSTERY Bench-Scale Predictions of Mattress end Upholstered	(/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => Enhanced Processor (EP) AN/UYK-44 (Bare Boerd).
High Tempereture X-ray Diffrectometry of Ti-Al Alloys. PB93-166080 00,499	Cheir Fires: Similarities end Differences. PB93-186005 00.043	AD-A265 435/8 00,242 Ada Compiler Validation Summary Report. Certificate
FOLERANCES (MECHANICS) Measurement Uncertainty Considerations for Coordinate	URANIUM Determination of Uranium and Thorlum in Materials Asso-	Number: 920918S1.11275 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) =>
Measuring Machines. PB93-189819 00,449	ciated with Real Time Electronic Solar Neutrino Detectors.	VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board).
NIST Handbook 44, 1993: Specifications, Tolerances, end Other Technical Requirements for Weighing end	PB93-150779 00,575 Influence of Vacuum Polarization Corrections of Order	AD-A265 437/4 00,243 Ada Compiler Velidation Summary Report. Certificate
Measuring Devices es Adopted by the 77th National Con- ference on Weights and Measures 1992.	aipha(z(aipha)) end aipha(z(aipha))(sup 3) in Hydrogen- Like Uranium.	Number: 920805S1.11263 DDC-I, Inc. DACS MIPS RISC/ os to MIPS R3000 Bare Ada Cross Compiler System, Re- lease 2.1-16, MIPS M/120-5 => Lockheed Sanders STAR
PB93-213106 00,407 FOLUENE	PB93-166155 00,589 URINALYSIS	MVP R3010 Board. AD-A265 600/7 00,244
Observations of soot In combustion of methanol/toluene spray flemes.	Determination of Baseline Piatinum Levels in Biological Materials.	Ada Compiler Validation Summary Report. Certificate Number: 920805S1.11264 DDC-I, Inc. DACS DECstation/
DE93007992 00,378 Rediative Heat Trensfer in Transient Hot-Wire Measure-	PB93-151975 00,515 US NIST	ULTRIX to MIP R3000 Bere Ade Cross Compiler System, Release 2.1-16 DECStation 3100 => Integreted Device
ments of Thermel Conductivity. PB93-153534 00,582	NIST Building end Fire Research Laboretory. Projects 1993.	Technology IDT7RS301 R3000/R3010 Board. AD-A265 601/5 00,245
FOXICITY Reduction of Hydrogen Cyenide Concentrations end	PB94-118288 00,410 USA	Ade Compiler Validation Summary Report. Certificete Number: 920918S1.11270 U.S. NAVY AdaAX, Version
Acute Inhalation Toxicity from Fiexible Polyurethene Foam Combustion Products by the Addition of Copper	Proceedings of the Meeting of the Intergovernmentel U.SRussian Business Development Committee's Stend-	5.5 (/OPTIMIZE) VAXstetion 4000 =Z> VAXstetion 4000. AD-A265 602/3 00,246
Compounds. Pert IV. Effects of Combustion Conditions and Sceling on the Generation of Hydrogen Cyanide and	ards Working Group (2nd). Held in Gelthersburg, Maryland on March 23-24, 1993.	Validated Products List (Cobol, Fortren, ADA, Pescal, C, MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Se-
Toxicity from Flexible Polyurethane Foem with end with- out Copper Compounds. PB93-139103 00,053	PB93-179968 00,087 USER MANUALS (COMPUTER PROGRAMS)	curity). PB93-937300 00.272
FRACER TECHNIQUES	User's Guide for CFAST Version 1.6. PB93-140788 00,055	VANADIUM Comparison of Measured end Calculated Appearence-Po-
Measuring Airflow Retes with Pulse Trecer Techniques. PB93-153583 00,037	USER NEEDS Towerds Fiexible Distributed Informetion Retrieval.	tentiel Spectra for Six 3d Metels. PB93-151629 00,141
FRAFFIC CONTROL Study of Traffic Control end Congestion Control In	PB94-102258 00,227 USSR	VANADIUM IONS Journel of Physical end Chemical Reference Deta, Vol-
Broadband ISDN. PB93-149433 00,210	Proceedings of the Meeting of the Intergovernmental U.SRussian Business Development Committee's Stand-	ume 21, No. 2, March/April 1992. PB93-148997 00,569
IRAFFIC LAW ENFORCEMENT IACP's Radar Testing Progrem Is Alive and Well.	ards Working Group (2nd). Held in Gaithersburg, Meryland on March 23-24, 1993.	Spectral Data and Grotrian Diagrams for Highly Ionized Vanedium, V VI through V XXIII.
PB93-166429 00,702	PB93-179968 00,087	PB93-149011 00,570

YBCO SUPERCONDUCTORS

VAPOR PHASES Principles of Gas Phase Processing of Ceremics dur	Preparing for the New Volt and Ohm. PB93-166379		onel Conference on Welghts end Meas-
Combustion. N93-20188/7 00,4	VOLTAGE DIVIDERS		in Neshville, Tennessee on July 19-23,
Evaluated Kinetic Data for Combustion Modelling.	PB93-150688	00,328 PB93-209781	00,406
PB93-149037 00,2	VOLIAGE SOURCES	NIST Handbook and Other Techn	44, 1993: Specifications, Tolerances, rical Requirements for Weighing end
Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry. Supplement 4. IUPAC Subcommitted	ee PB93-151173	Measuring Devices	s es Adopted by the 77th National Consand Measures 1992.
on Gas Kinetic Data Evaluation for Atmospheric Che istry.	TOETAGE OTATIONATION	PB93-213106	00,407
PB93-149144 00,0	New International Volt and Ohm Standards. PB93-166361	0,593 WEIGHTS AND MEAS	SURES d Measures Laboratories: State Stand-
VAPORS Field-Space Conformal Solution Method: Binary Vap	Preparing for the New Volt and Ohm.	erds Program Des	cription end Directory. 1993 Edition.
Liquid Phase Behavior.	1 000 100075	0,594 PB93-217529 WELD METAL	00,451
PB93-166239 00,1 VARISTORS	Bibliographic Notes on Voronoi Diagrams.	WRC-1992 Constit	tution Diagram for Stainless Steel Weld
Effect of Repetitive Swells on Metal-Oxide Varistors.	PB93-189298 VULNERABILITY	0,509 Metals: A Modifica PB93-153427	tion of the WRC-1988 Diagram.
PB93-153443 00,3	Automated Tools for Testing Computer System		for Welding Property Data.
VENTILATION Model Study of the Aircraft Cabin Environment Resulti	ebility. ing PB93-146025	PB93-166106 0,219 WELDING	00,437
From In-Flight Fires. AD-A261 270/3 00,0	WATERC	Standard Formats	for Welding Property Deta.
Measuring Airflow Rates with Pulse Tracer Techniques.	Semiconductor Meesurement Technology: Evo Silicon Materials Characterization: Lessons Lea		00,437
PB93-153583 00,0	Improved Menufacturing. PB93-228641	Stendard Formets	for Welding Property Data.
VENTS Combined Buoyancy- and Pressure-Driven Flow throu		0,367 PB93-166106 WELDMENTS	00,437
a Horizontal Vent: Theoretical Considerations. PB94-103694 00.0	Study of Fire Induced Flow along the Vertica	Corner Quantitetive Evelu	ation of Distributed Pores in Reference
VERIFICATION INSPECTION	77 Wall. Part 2. PB93-205623	Radlographs. 90,074 PB93-151744	00.444
User's Guide for the Algorithm Testing System/Versi	on Research Plan for Mesonry Shear Wells.	WIEN FILTERS	
1.1. PB93-175990 00,4	PB93-206183 Strength of Pertially-Grouted Mesonry Sheer We		nsfer Metrices for Inhomogeneous Field ling Spin-Precession.
VERIFIED ANALYSIS	Lateral Loads.	PB93-165710	00,587
Airbome Asbestos Method: Stendard Test Method Verified Analysis of Asbestos by Trensmission Electr		tielly- Cheotic Motions of	f Forced end Coupled Galloping Oscil-
Microscopy. Version 1.0. PB94-113578 00,1	Grouted Masonry Shear Wells under Lateral Load	letors. 0.076 PB93-153245	00,003
VERMICULITE	WARNING SYSTEMS	WIND LOADING	00,003
Elastic and Inelastic Neutron Scattering Study of Hyd	ro- Eerly Detection of Room Fires through Acoust	Emis- Chaotic Motions of	f Self-Excited Forced and Autonomous
genated and Deuterated Trimethylemmonlum Pillar Vermiculite Clays.	PB94-112257	Squere Prisms. 90,031 PB93-166114	00,621
PB93-125169 00,1 VERY LARGE SCALE INTEGRATION	WAS IE DISPOSAL	WIRE Fodoral Building	Tologommunications Wiring Standards
New Test Structure for the Electrical Measurement of t		stion. Category: Telecor	Telecommunications Wiring Stendard: mmunications Standard; Subcategory:
Width of Short Features with Arbitrarily Wide Volta Taps.		0,161 Cebles end Wirlng. FIPS PUB 174	00,206
PB93-124782 00,3	Vibretional Spectra of Moleculer Ions Isoleted		Ight Commercial Telecommunications
Test Guide for CMOS-On-SIMOX Test Chips NIST3 e NIST4.	nd Neon. X. H2O(+), HDO(+), and D2O(+). AD-A263 817/9	0.116 erd; Subcategory:	Cetegory: Telecommunications Stand- Cebles end Wiring.
PB93-152106 00,3	Mid- and Near-Infrared Spectre of Weter en	Weter FIPS PUB 176	00,208
Opereting Principles of the VME MultiKron Interfe Board.	ce Dimer Isolated in Solid Neon. AD-A263 966/4	WOLF SHIFTS 0.117 Wolf Shifts and Ti	heir Physical Interpretation under Lab-
PB93-234730 00,2		oratory Conditions	
VIBRATIONAL SPECTRA Vibrational Spectra of Molecular Ions Isolated In Sc	Nitrogen end Water from 440 to 1000 K, Up to 1 and 0.8 Mole Fraction N2.	WOOD PRODUCTS	50,000
Neon. X. H2O(+), HDO(+), end D2O(+).	PB94-118494	0,617 Performence Stan Panels.	nderd for Wood-Based Structural-Use
AD-A263 817/9 00,1 Partial Structure for trans-1,2-Difluoroethylene from High	(1000)	PB93-146298	00,056
Resolution Infrared Spectroscopy.	PB93-166262	0,157 X RADIATION	of the Dynamical Cerenkov Emission of
PB93-125144 00,1 Vibrational Bands of HxNyOz Molecules.	23 WATER HEATING Performance of a Residential Desuperheater.	X-rays.	·
PB93-149078 00.1		0,036 PB93-124873 X-RAY DIFFRACTION	00,559
Vibretional Line Shape of Diatomic Adsorbates on Me Clusters.	tel WATER POLLUTION DETECTION Stendard Reference Meteriels for Trece Organic (Anelysis of the Ag	gregete-Cement Paste Interface Using
PB93-153187 00, 1	45 nents in the Marine Environment.	PB93-125904	X-rey Scattering. 00,179
Hydrogen Vibrational Modes and Anisotropic Potential elpha-ScHx.	in PB93-166627 WATER VAPOR	0,395 Modeling of X-ray	Diffrection Line Broadening with the
PB93-166510 00,6	81 Water Vepor Permeability Meesurements of (nmon Superconductors.	Applications to High-T(sub c)
/IDEO COMMUNICATION Video Teleconferencing Services et 56 to 1,920 KB	Building Meterials. PB93-153229	0,065 PB93-152072	00,661 rected Fundamental Modes of Dynamic
Cetegory: Telecommunications Stendard and Su	b- Weter Vapor Sorption Meesurements of Commo	Build- X-rey Diffrection.	•
category: Video Teleconferencing. FIPS PUB 178 00,2		0,068 PB93-166189	00,154 iffraction Powder Patterns of Fourteen
/IRTUAL TERMINALS	WATT MEASUREMENT	Ceremic Phases.	
Guidelines for the Eveluation of Virtuel Terminal Imp mentations.	the Mass Stability of the Kilogram.	V roy Diffraction II	00,473 Ine Broadening: Modeling and Applica-
PB93-139053 00,2		tions to High-(T sul	b c) Superconductors.
/ISCOSITY Note on the Number Dependence of Nonequilibrium M	WATTMETERS High Power CW Wattmeter Calibration at NIST.	PB94-108495 X-RAY LITHOGRAPHY	00,689
lecular Dynamics Simulations of the Viscosity of Strutured Molecules.	IC- PB93-143949	X-rey Lithography	Mask Metrology: Use of Trensmitted
PB93-153740 00,1	High-Accuracy Sampling Wattmeter. PB93-151793	0,310 PB94-108537	M for Linewidth Measurement. 00,370
/ISUAL PERCEPTION	WAVEGUIDE JUNCTIONS	X-RAY SOURCES	
Evaluation of Subjective Response to Lighting Distributions: A Literature Review.	PB93-125649	nent. X-ray Beam Posi 0,350 Diode.	ition Monitor Using a Quedrant PIN
PB93-173458 00,0	WAVEGUIDE LASENS	PB93-151769	00,579
OLATILE ORGANIC COMPOUNDS Multi-Point Calibration of a Gas Chromatograph Usi	Integrated Optic Laser Fabricated by Field-Assi ng Exchange in Neodymium Doped Soda-Lime		ers for L X-rey Production Cross-Sec-
Cryogenic Preconcentration of a Single Gas Standa Containing Volatile Organic Compounds.	urd Glass. 7 7 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	tions. 0,340 PB93-153609	00,583
PB93-151686 00,1	00 WEAPON SYSTEMS	XQQ INSTRUMENTS	00,000
Method for Separating Volatile Organic Carbon from (sup 3) of Air to Identify Sources of Ozone Precursors	Data Management Standards in Computer-Aided tion end Logistic Support (CALS).		uracy In XQQ Measurements: A Sum- NIST-EPA International Round Robin.
Isotope (14C) Measurements. PB93-236511 00,3	N93-27714/3	0,289 PB93-125672	00,399
/OLT	WEAR TESTS Wear and Friction Characteristics of Self-Lubricati	YBCO SUPERCONDUC Cop- Sims Determination	CTORS Ion of Oxygen and Carbon in
New International Volt and Ohm Standards. PB93-166361 00,5	per - Intercalated Graphite Composites.	YBa2Cu3O7-x Sup	perconductors.
. 255 155551	00 100-100/00	0,480 PB93-150845	00,650

Tunneling Stabilized Magnetic Force Mic YBa2Cu3O7-Delta Films on MgO at 76 K. PB93-151702	croscopy of 00,655
Reaction Sintering High-Density, I Ba2YCu3O6.5+x Superconductors Using Ba(PB93-151876	Fine-Grained OH) 2.H2O. <i>00,659</i>
VTTRIUM BARIUM CUPRATES Magnetic Transitions in the YBa2Cu2.8Co0.2O6+y. PB93-125839	System 00,643
Charge Transfer and Bond Lengths in xMxO6+y. PB93-125847	YBa2Cu3- 00,644
Slms Determination of Oxygen and YBa2Cu3O7-x Superconductors.	Carbon in
PB93-150845	00,650

	Stabilized 7-Delta Filn			Microscopy	of
PB93-1517		is on wgo	at 76 K.	00,0	655

Effect of Composition on Superconducting Properties In the System Ba-Y-Gd-Cu-O. PB93-153377 00,667

Dynamic Resistance of Superconducting YBa2Cu3Ox Sintered Powder at 81 K: Liquid versus Vapor Nitrogen Environment.
PB93-153518 00.670

Direct Evidence for an Effect of Twin Boundaries on Flux Pinning in Single Crystal of YBa2Cu3O6+x. PB93-166296 00,679

SEM Analysis of Interactions between Platinum, Gold, and Silver-Palladium Capsules and Barium Yttrium Copper Oxide Superconductors.
PB93-166544 00,682

ZINC INORGANIC COMPOUNDS

Journal of Physical and Chemical Reference Data, Volume 21, No. 5, September/October 1992.
PB93-149094

00,572

Solubility of Some Sparingly Soluble Salts of Zinc and Cadmium in Water and in Aqueous Electrolyte Solutions. PB93-149110 00,134

ZIRCONIUM ALLOYS

Deformation Twinning, Slip, Martensite Formation and Crack Inhibition in the B2-Type Zr50Pd35Ru15 Alloy. PB93-151918 00,497

SAMPLE ENTRY

Building Hadamard Matrices in Steps of 4 to Order 200.

PB93-189835

00.261

PC A03/MF A01

Title NTIS order number

Abstract number

Availability Price Code

3nu3 Band of (32)S(16)O2: Line Positions and Intensities. PB93-151207 00,140 Not available NTIS

13C NMR Studles of Polymorphy In Isotactic Polystyrene. PB93-166536 00,178 Not available NTIS

Absolute Spatially- and Temporally-Resolved Optical Emission Measurements of if Glow Discharges in Argon. PB93-196236 00,636

(Order as PB93-196228, PC A07/MF A02)

Accuracy in Powder Diffraction II. Proceedings of the International Conference. Held in Gaithersburg, Maryland on May 26-29, 1992.

PB93-141737 00.648 PC A11/MF A03

Accuracy of the Double Variation Technique of Refractive Index Measurement.

Index Measurement.
PB93-143964 00,624

(Order as PB93-143923, PC A06/MF A02)

Acoustic Emission of Structural Materials Exposed to Open Flames.

PB93-138980 00,051 PC A03/MF A01

Ada Compller Validation Summary Report. Certificate Number: 920805S1.11263 DDC-I, Inc. DACS MIPS RISC/os to MIPS R3000 Bare Ada Cross Compller System, Release 2.1-16, MIPS W/120-5 => Lockheed Sanders STAR MVP R3010 Board.

AD-A265 600/7 00,244 PC A04/MF A01

Ada Compller Validation Summary Report. Certificate Number: 920805S1.11264 DDC-I, Inc. DACS DECstation/ULTRIX to MIP R3000 Bare Ada Cross Compiler System, Release 2.1-16 DECStation 3100 => Integrated Device Technology IDT7RS301 R3000/R3010 Board.

AD-A265 601/5 00.245 PC A07/MF A02

Ada Compller Validation Summary Report. Certificate Number: 920805S1.11265 DDC-I, Inc. DACS Sun SPARC/SunOS Native Ada Compiler System, Version 4.6.1 SPARCStation 2 => SPARCStation 2.

AD-A265 433/3 00,240 PC A05/MF A01

Ada Compller Validation Summary Report. Certificate Number: 920918S1.11270 U.S. NAVY AdaAX, Version 5.5 (/OP-TIMIZE) VAXstation 4000 = Z> VAXstation 4000.

AD-A265 602/3 00,246 PC A04/MF A01

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11271, U.S. Navy AdaVAX Version 5.5 (NO OPTIMIZE) VAXstation 4000 > VAXstation 4000. AD-A265 261/8 00,278 PC A04/MF A01

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5 (/OP-TIMIZE) VAX 8550/8600/8650 (Cluster) > Enhanced Processor (EP) AN/UYK-44 (Bare Board).

AD-A265 260/0 00,239 PC A05/MF A01

Ada Compiler Validation Summary Report. Certiflcate Number: 920918S1.11273 U.S. Navy, Ada/M, Version 4.5 (OP-TIMIZE), VAX 8550/8600/8650 (Cluster) => VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board).

AD-A265 434/1 00,241 PC A05/MF A01

Ada Compller Validation Summary Report. Certificate Number: 92091851.11274 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => Enhanced Processor (EP) AN/UYK-44 (Bare Board).

AD-A265 435/8 00,242 PC A05/MF A01

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11275 U.S. Navy Ada/M, Version 4.5 (/NO OPTIMIZE) VAX 8550/8600/8650 (Cluster) => VHSIC Processor Module (VPM) AN/AYK-14 (Bare Board). AD-A265 437/4 00,243 PC A05/MF A01

ADACS. An Automated System for Part Finishing. PB93-199164 00,433 PC A03/MF A01

Advanced Ceramics Standards Development.
PB93-166007 00.470 Not available NTIS

Advanced Ceramics: What's In a Name. PB93-166015 00,471 Not available NTIS

Affordable Fire Safety In Board and Care Homes. A Regulatory Challenge. Final Report.
PB93-219723 00,027 PC A05/MF A01

Air Moving Systems and Fire Protection. PB93-234722 00,398 PC A03/MF A01

Airbome Asbestos Method: Standard Test Method for Verified Analysis of Asbestos by Transmission Electron Microscopy, Version 1.0. PB94-113578 00,109 PC A02/MF A01

Aluminum Alloys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-Li Alloys and Alloy 2219.
PB93-173441 00,501 PC A07/MF A02

Analysis of Persistent Photoconductivity Due to Potential Barriers.
PB93-153468 00,669 Not available NTIS

Analysis of the Aggregate-Cement Paste Interface Using Grazing Incidence X-ray Scattering.
PB93-125904 00,179 Not available NTIS

Analysis of the Impact on U.S. Industry of the NIST/Boulder Superconductivity Programs: An Interim Study. PB94-120680 00,692 PC A03/MF A01

Annual Conference on Fire Research, 1993: Book of Abstracts.
PB94-121324 00,205 PC A10/MF A03

Apparent Thermal Conductivity of Polyurethane Foam Insulation, Containing Various HCFC Blends, from 125 to 335 K. (Final report).

DE93012534 00,488 PC A03/MF A01

Applicability of the Maturity Method to High-Performance Concrete.
PB93-157451 00,182 PC A04/MF A01

Application of Polyacrylamide-Gel Electrophroesis Neutron-Activation Analysis for Protein Quantification. PB93-166221 00,525 Not available NTIS

Application of the Hough Transform to Electron Diffraction Patterns.
PB93-153773 00.585 Not available NTIS

Application Portability Profile (APP): The U.S. Government's Open System Environment Profile OSE/1 Version 2.0. PB93-216943 00,264 PC A06/MF A02

Applying the NIST Real-Time Control System Reference Model to Submarine Automation: A Maneuvering System Demonstration.
PB93-184257 00,545 PC A04/MF A01

Assessing Federal and Commercial Information Security Needs.
PB93-138956 00,218 PC A03/MF A01

Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377 PC A04/MF A01

Assessment of the Role of Charged Secondaries from Nonelastic Nuclear Interactions by Therapy Proton Beams in Water.

90.538 PC A05/MF A01

ASTM Committee, C28, Advanced Ceramics: A Progress Report. PB93-153617 00,468 Not available NTIS

Asymptotic Behavior of Modulated Taylor-Couette Flows with a Crystalline Inner Cylinder.
PB93-139061 00,647 PC A03/MF A01

AT2, a New Time Scale Algorithm: AT1 Plus Frequency Variance. PB93-151926 00,214 Not available NTIS

Atomic Physics Tests of Nonlinear Quantum Mechanics. PB93-153195 00,580 Not available NTIS

Automated AC Bridge for Resistance Measurements. PB93-151132 00,330 Not available NTIS

Automated Password Generator (APG). Category: Computer Security.
FIPS PUB 181 00.217 PC E05

Automated System for the Measurement of High-Valued Resistors.
PB93-150704 00,329 Not available NTIS

Automated Tools for Testing Computer System Vulnerability. PB93-146025 00,219 PC A03/MF A01

Automating Interactive Applications in a Network Environment. PB93-151215 00.251 Not available NTIS

Automation of Strain-Gauge Load-Cell Force Calibration. PB93-166684 00,404 Not available NTIS

Autonomous Obstacle Avoidance Using Visual Fixation and Looming.

PB93-146660 00,454 PC A03/MF A01

Balanced Design Concepts Workshop. Held in Gaithersburg, Maryland on June 30-July 2, 1993. PB94-108388 00,028 PC A06/MF A02

Barkhausen Jump Correlations in Thin Foils of Fe and Ni. PB93-166288 00,678 Not available NTIS

Benchmark for the Verification of Microwave CAD Software. PB93-125185 00,307 Not available NTIS

Bibliographic Notes on Voronol Diagrams. PB93-189298 00,509 PC A04/MF A01

Bibliography of Screw Thread Measurement. PB94-101821 00,460 PC A05/MF A01

Bibliography of the NIST Electromagnetic Fields Division Publications. PB94-112547 00,322 PC A06/MF A02

Bibliography on Atomic Line Shapes and Shifts (July 1978 through March 1992) (Supplement 4).
PB93-173433 00,606 PC A13/MF A03

Binary Inductive Voltage Divider Bridge. PB93-150688 00,328 Not available NTIS

Binding of Cis-(1,2-Diaminocyclohexane)Platinum(II) and Its Derivatives to Duplex DNA. PB93-125870 00,531 Not available NTIS

Binocular Spherical Disparity: A Study in Representation for a Forward Translating Camera.
PB93-184422 00.301 PC A07/MF A02

BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program (Version 4.0). User's Guide and Reference Manual. PB93-208460 00,026 PC A05/MF A01

Boundary/Interface Fitted Grid Generation Using Tensor Product B-splines: A Preliminary Study.
PB93-234748 00,503 PC A03/MF A01

Building and Fire Research Laboratory Publications, 1992. PB93-188845 00,073 PC A05/MF A01

Building and HVAC Characterization for Commercial Building Indoor Air Quality Investigations.
PB93-198844 00,389 PC A07/MF A02

Building Hadamard Matrices in Steps of 4 to Order 200. PB93-189835 00,261 PC A03/MF A01

Building Life Cycle Cost Computer Program (BLCC), Version 4.11 (for Microcomputers).
PB94-500055 00,042 CP D02

Built-In Error Estimator for Optimizing Finite Element Modeling.
PB93-166312 00,694 Not available NTIS

Burn Injury Potential of Navy Shipboard Work Clothing. AD-A258 836/6 00,481 PC A03/MF A01

Calculating Cement Paste and Mortar Diffusivity from Conductivity Measurements: Preliminary Results of a New Method.
PB94-112802

00.189
PC A03/MF A01

Calculations on Displacement Corrections for In-Phantom Measurements with Ionization Chambers for Mammography. PB93-166700 00,519 Not available NTIS

Calibration Problem as an Ill-Posed Inverse Problem. PB93-151108 00,512 Not available NTIS

CALS Testing: Programs, Status and Strategy. PB93-151165 00,420 Not available NTIS

Cathodoluminescence Imaging and Spectroscopy of CVD Diamond in a Scanning Electron Microscope. PB93-153708 00,464 Not available NTIS

Center for Electronics and Electrical Engineering Technical Progress Bulletin Covering Center Programs, April to June 1990, with 1990/1991 CEEE Events Calendar. PB93-205524 00,364 PC A03/MF A01

Center for Electronics and Electrical Engineering Technical Publication Announcements Covering Center Programs, April to June 1990, with 1991 CEEE Events Calendar. PB93-205516 00,363 PC A03/MF A01

Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993).
PB93-173508 00,474 PC A10/MF A03

CFAST, the Consolidated Model of Fire Growth and Smoke Transport.
PB93-174902 00,071 PC A11/MF A03

Chain Conformation of Block Copolymers in Dilute Solutions Measured by Small-Angle Neutron Scattering. PB93-151272 00,170 Not available NTIS

Chaos, Dissipation, Arrow of Time, in Quantum Physics. PB93-208494 00,615 PC A03/MF A01

Chaotic Motions of Forced and Coupled Galloping Oscillators.
PB93-153245 00,003 Not available NTIS

Chaotic Motions of Self-Excited Forced and Autonomous Square Prisms.
PB93-166114 00,621 Not available NTIS

Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude. PB94-108487 00,337

(Order as PB94-108461, PC A09/MF A02)

Characterization of a Distribution Function by the Second Moment of the Residual Life.
PB93-125193 00,511 Not available NTIS

Charge-Field Interactions in Cell Membranes and Electroconformational Coupling: Transduction of Electric Energy by Membrane ATPases.
PB93-166486 00,535 Not available NTIS

Charge Transfer and Bond Lengths in YBa2Cu3-xMxO6+y, PB93-125847 00,644 Not available NTIS

Charge Trapping in Cubic Silicon Carbide MIS Capacitors. PB93-151199 00,651 Not available NTIS

Chemical Change of Hardened PCA/CPC Cements in Various Storing Solutions.
PB93-151306 00,020 Not available NTIS

Chemical Characterization of Mutagenic Fractions of Particles from Indoor Coal Combustion: A Study of Lung Cancer in Xuan Wei, China.
PB93-231835

00.530
PC A02/MF A01

Chemical Kinetic Data Base for Propellant Combustion. 2. Reactions Involving CN, NCO, and HNCO. PB93-149052 00,131 Not available NTIS

Chemical Kinetic Data Base for RDX Combustion. PB93-166460 00,160 Not available NTIS

Clinical Trial of an Adhesive Material. PB94-109329 00,528 PC A04/MF A01

Clinical Use of Beta-Quartz Glass-Ceramic Inserts. PB93-150761 00,017 Not available NTIS COBOL Compiler Validation System (CCVS 85), User Guide, Version 4.2.

00.254 PC A14/MF A03

COBOL 85 Compiler Validation System (CCVS 85), Version 4.2. PB93-504918 00,270 CP T99

PB93-163178

Codes for the Identification of Federal and Federally Assisted Organizations. Category: Data Standard, Representations and Codes.
FIPS PUB 95-1

00,288

PC\$20.50

Coll Probe Dimension and Uncertainties during Measurements of Nonuniform ELF Magnetic Fields.
PB94-108479 00.616

(Order as PB94-108461, PC A09/MF A02)

00.277 Not available NTIS

Collaborating with Our Customers: NIST Building and Fire Research Laboratory. PB94-110194 00,029 PC A03/MF A01

Collection of Successful Interactions between the MTCs and Client Firms.
PB93-206886 00,092 PC A03/MF A01

Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1987. Volume 4.

AD-A261 193/7 00,414 PC A18/MF A04

Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1988. Volume 2. Graphics, CGM MIL SPEC.

AD-A261 261/2 00,415 PC A20/MF A04
Collective Learning Systems: A Model for Automatic Con-

PR93-151595

Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H, and H2 with Ar and of Ar(+) and ArH(+) with H2 for Energies from 0.1 eV to 10 keV.

PB93-149086 00,571 Not available NTIS

Combined Buoyancy- and Pressure-Driven Flow through a

Combined Buoyancy- and Pressure Entertaints.
Horizontal Vent: Theoretical Considerations.
PB94-103694 00,077 PC A03/MF A01
Comment on 'Measurement of the Lamb Shifts in Singlet Levels of Atomic Helium'.
PB93-125219 00,562 Not available NTIS

Comments on 'Rapid Pulsed Microwave Propagation'.
PB93-125631 00,637 Not available NTIS

Compact Fitting Formulas for Electron-Impact Cross Sections.
PB93-143956 00,566

(Order as PB93-143923, PC A06/MF A02)

Comparative Performance of Classification Methods for Fingerprints.
PB93-184273 00,300 PC A03/MF A01

Comparison between Precision Roughness Master Specimens and Their Electroformed Replicas.
PB93-166163 00,438 Not available NTIS

Comparison Measurements of Currents Induced by Radiation and Injection.
PB93-153138 00,314 Not available NTIS

Comparison of Ceiling Jet Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models. PB93-158657 00,539 PC A03/MF A01

Comparison of Experimental Measurements of Local Flow Boiling Heat Transfer Coefficients for R11 and R123. PB93-151157 00,491 Not available NTIS

Comparison of Full Scale Fire Tests and a Computer Fire Model of Several Smoke Ejection Experiments. PB93-139087 00,551 PC A03/MF A01

Comparison of Handprinted Digit Classifiers. PB94-118213 00,306 PC A03/MF A01

Comparison of Measured and Calculated Appearance-Potential Spectra for Six 3d Metals.
PB93-151629 00,141 Not available NTIS

Comparison of Transport Critical Current Measurement Methods.
PB93-153369 00,666 Not available NTIS

Computation of Complex Solidification Morphologles Using a Phase-Field Model.
PB93-156743 00,671 PC A03/MF A01

Computational Experience with Radial Basis Function Networks. PB93-206191 00,303 PC A03/MF A01

Computational Materials Science of Cement-Based Materials: An Education Module.
PB94-111424 00,188 PC A03/MF A01

Computer-Aided Molecular Design of Fire Resistant Aircraft Materials. N94-10779/4 00,007

(Order as N94-10766/1, PC A16/MF A03)

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Military Specification. Digital Representation for Communication of Illustration Data: CGM Application Profile.

FIPS PUB 128-1E 00,285 PC E99

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 1. Functional Specification. FIPS PUB 128-1A 00,281 PC E99

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 2. Character Encoding.

FIPS PUB 128-1B 00,282 PC E99

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 3. Binary Encoding. FIPS PUB 128-1C 00,283 PC E99

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 4. Clear Text Encoding.
FIPS PUB 128-1D 00,284 PC E99

Computer Graphics Metafile (CGM) Test Requirements Document (Update). PB93-198273 00,293 PC A04/MF A01

Computer Model for the Diffusion and Binding of Chloride lons in Portland Cement Paste. PB93-159051 00,183 PC A03/MF A01

Computer Modeiling of Cement-Based Materials.
PB93-153161 00,063 Not available NTIS

Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcomputers).

PB94-500097 00,385 CP D02

Computer Systems Laboratory Annual Report, 1992. PB93-181873 00,229 PC A05/MF A02

Constants, Fundamental. PB93-166353 00,592 Not available NTIS

Controlled Interface Roughness in GaAs/AIAs Superlattices. PB93-125896 00,351 Not available NTIS

Controlling Moisture in the Roof Cavities of Manufactured Housing.
PB93-139046 00,052 PC A04/MF A01

Conversion of Temperatures and Thermodynamic Properties to the Basis of the International Temperature Scale of 1990.

PB93-153336 00,147 Not available NTIS

Correlations of Magnetic Microstructure and Anisotropy with Noise Spectra for CoNi and CoCrTa Thin Film Media. PB93-153401 00,668 Not available NTIS

Critical Compilation of Atomic Transition Probabilities for Singly Ionized Argon. PB93-149102 00,573 Not available NTIS

Critical Compilation of Surface Structures Determined by Surface Extended X-ray Absorption Fine Structure (SEXAFS) and Surface Extended Electron Energy Loss Spectroscopy (SEELFS).

PB93-148971 00,128 Not available NTIS

CritIcal-Current Degradation in Nb3Sn Composite Wires Due to Locally Concentrated Transverse Stress. PB93-153211 00,344 Not available NTIS

Critical Dynamics of an Asymmetric Binary Polymer Mixture. PB93-151116 00,169 Not available NTIS

Critical Parameters and Saturation Densities of 1,1-Dichloro-2,2,2-Trifluoroethane. PB93-166593 00,492 Not available NTIS

Cross Validation Comparison of NIST OCR Databases. PB93-159077 00,297 PC A03/MF A01

Cryogenic Mechanical Testing of Al-Li Alloys at NIST. PB93-228633 00,502 PC A04/MF A01

Crystal Chemistry and Phase Equilibria Studies of the BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder Characterization and Diffraction Patterns of Ba3R3Cu6O14+x, R=Lanthanides. PB93-166668 00,684 Not available NTIS

Crystallographic Defects In Polymers and What They Do. PB93-151678 00,173 Not available NTIS

CSTL Technical Activities 1992. PB93-173482

00,165 PC A17/MF A04

DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215 PC A05/MF A01

Data Management Standards In Computer-Aided Acquisition and Logistic Support (CALS). N93-27714/3 00,289

(Order as N93-27704/4, PC A23/MF A04)

Data Probe User's Guide. National PDES Testbed Report Series.
PB93-178655 00,425 PC A04/MF A01

Database Language SQL. Category: Software Standard. Subcategory: Database, June 1993. FIPS PUB 127-2 00,280 PC E99

Database Management Systems in Engineering. PB93-146454 00,419 PC A04/MF A01

Databases Available in the Research Information Center of the National Institute of Standards and Technology. PB94-114568 00,412 PC A07/MF A02

Deformation Twinning, Slip, Martensite Formation and Crack Inhibition in the B2-Type Zr50Pd35Ru15 Alloy. PB93-151918 00,497 Not available NTIS

Demagnetizing Factors. PB93-153344

53344 00,664 Not available NTIS

Dependence of Quantized Hall Effect Breakdown Voltage on Magnetic Field and Current.
PB94-108511 00,690

(Order as PB94-108461, PC A09/MF A02)

Design of Smoke Control Systems for Areas of Refuge. PB93-183754 00,072 PC A03/MF A01

Designing and Implementing a State Quality Award. PB93-154458 00,695 PC A04/MF A01

Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. N93-25059/5 00,558

(Order as N93-24978/7, PC A22/MF A04)

Detailed Design Specification for Conformance Testing of Computer Graphics Metafile (CGM) Interpreter Products. PB93-178580 00,424 PC A04/MF A01

Detection of S2F10 Produced by Electrical Discharge in SF6.
PB93-166528 00.596 Not available NTIS

Determination of Baseline Platinum Levels In Biological Materials.

terials. PB93-151975 00,515 Not available NTIS

Determination of the Structure of CO2-H2CO. PB93-150696 00,135 Not available NTIS

Determination of Uranium and Thorium In Materials Associated with Real Time Electronic Solar Neutrino Detectors. PB93-150779 00,575 Not available NTIS

Development of a Fast-Response Variable-Amplitude Programmable Reaction Control System.
PB93-158731 00,459 PC A11/MF A03

Development of a National Metrology Infrastructure for the Domestic Gear Industry.
PB93-219756 00,409 PC A03/MF A01

Development of Measurement Capabilities for the Thermophysical Properties of Energy-Related Fluids. Annual Report, December 1, 1992--November 30, 1993. DE93019442 00,118 PC A03/MF A01

Development of Ore Bioleaching Standards. PB93-151603 00,496 Not available NTIS

Developments Needed to Expand the Role of Fire Modeling in Material Fire Hazard Assessment.

N94-10787/7

00.009

(Order as N94-10766/1, PC A16/MF A03)

Dictionary Production for Census Form Conference. PB93-207959 00,304 PC A03/MF A01

Dimensional Inspection Planning Based on Product Data Standards. National PDES Testbed Report Series. PB93-198455 00,450 PC A03/MF A01

Direct and Inverse Problems for Light Scattered by Rough Surfaces.
PB93-125714 00,623 Not available NTIS

Direct Evidence for an Effect of Twin Boundaries on Flux Pinning in Single Crystal of YBa2Cu3O6+x. PB93-166296 00,679 Not available NTIS

Directed-Graph Classifier of Semiconductor Wafer-Test Patterns.
PB93-153286 00,356 Not available NTIS

Discharge of Fire Suppression Agents from a Pressurized Vessel: A Mathematical Model and Its Application to Experimental Design.
PB93-198927 00,044 PC A04/MF A01

Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Conditions for the Flow Outside the Vessel. PB94-103660 00,004 PC A03/MF A01

Distributed Implementation Generator: An Overview and User Gulde.
PB93-183465 00,259 PC A03/MF A01

DNA Base Damage in Chromatin of Gamma-Irradiated Cultured Human Cells.
PB93-151314 00,521 Not available NTIS

DNA Base Modifications in Chromatin of Human Cancerous Tissues.
PB93-153559 00,523 Not available NTIS

DNA Base Modifications Induced In Isolated Human Chromatin by NADH Dehydrogenase-Catalyzed Reduction of Doxorubicin.
PB93-150670 00,520 Not available NTIS

DNA-Protein Cross-Linking between Thymine and Tyrosine in Chromatin of Gamma-Irradiated or H2O2-Treated Cultured Human Cells.
PB93-151587 00.522 Not available NTIS

Dose Equivalent Response of Tissue-Equivalent Proportional Counters to Low Energy Neutrons.
PB93-166031 00,534 Not available NTIS

Dose in Water from External Irradiation by Electrons: Radiation Protection Data.

PB93-173425

00.548

PC A03/MF A01

Drift ElimInating Designs for Non-Simultaneous Comparison Calibrations.
PB93-196277 00,405

(Order as PB93-196228, PC A07/MF A02)

Dual-Port Circularly Polarized Probe Standards at the National Institute of Standards and Technology.

PB93-235208 00,326 PC A03/MF A01

Dynamic Resistance of Superconducting YBa2Cu3Ox Sintered Powder at 81 K: Liquid versus Vapor Nitrogen Environment.

00.670 Not available NTIS

Early Detection of Room Fires through Acoustic Emission. PB94-112257 00,031 PC A03/MF A01

Effect of a Two-Solution Fluoride Mouth Rinse on Remineralization of Enamel Lesions In vitro.

PB93-150738 00,526 Not available NTIS

Effect of Composition on Superconducting Properties In the System Ba-Y-Gd-Cu-O.
PB93-153377 00,667 Not available NTIS

Effect of Critical Parameters on the Behavior of Partially-Grouted Masonry Shear Walls under Lateral Loads. PB93-206894 00,076 PC A03/MF A01

Effect of Gravitational Modulation on Convection in Vertical Bridgman Growth.
N94-10178/9 00,495

(Order as N94-10171/4, PC A20/MF A04)

Effect of Gravity Modulation on Thermosolutal Convection. N94-10103/7 00,620

(Order as N94-10070/8, PC A19/MF A04)

Effect of Repetitive Swells on Metal-Oxide Varistors. PB93-153443 00,358 Not available NTIS

Effect of Subsurface Conditions on Earthquake Ground Motions.
PB93-158343 00,192 PC A05/MF A01

Effectiveness of Feature and Classifier Algorithms in Character Recognition Systems.
PB93-147197 00,295 PC A03/MF A01

Effects of Magnesium and Fluoride on the Hydrolysis of Octacalcium Phosphate.
PB93-151835 00,023 Not available NTIS

Effects of Pressure on the Thermal Decomposition Kinetics, Chemical Reactivity and Phase Behavior of RDX. PB93-125888 00,553 Not available NTIS

Elastic and Inelastic Neutron Scattering Study of Hydrogenated and Deuterated Trimethylammonium Pillared Vermiculite Clays. PB93-125169 00,124 Not available NTIS

Elastic Scattering of Electrons and Positrons by Atoms: Database ELAST.
PB93-207512 00,614 PC A06/MF A02

Electrical and Infrared Properties of Thin Niobium Microbolometers Near T(sub c).

N93-27779/6 00,339

(Order as N93-27726/7, PC A99/MF A06)

Electrical Resistivity of Copper Alloys between 76 K and 300 K.
PB93-151827 00,311 Not available NTIS

Electromagnetic Shielding of RF Gaskets Measured by Two Methods.
PB93-153120 00,313 Not available NTIS

Electronic Data Interchange (EDI): Category: Software Standard; Subcategory: Electronic Data Interchange. FIPS PUB 161-1 00,247 PC E01

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, April to June 1992, with 1992/1993 EEEL Events Calendar. PB93-147163 00,353 PC A03/MF A01

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, April to June 1993 with 1993/1994 EEEL Events Calendar. PB94-118403 00,342 PC A03/MF A01

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, January to March, 1993 with 1993/1994 EEEL Events Cal-

PB93-234698

00.368 PC A03/MF A01

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, July to September, 1992 with 1992/1993 EEEL Events Cal-PB93-158632 00.360 PC A06/MF A02

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, October to December, 1992 with 1992/1993 EEEL Events PB93-198877 00.362 PC A03/MF A01

Electronics and Electrical Engineering Laboratory 1993 Program Plan: Supporting Technology for U.S. Competitiveness in Electronics. 00.320 PC A11/MF A03 PB93-228625

Elementary Particle Physics in the Dalton Manner PB93-125698 00,564 Not available NTIS

End-Point Sensitivity In Quantum Dynamic Calculations. PB93-125151 00,560 Not available NTIS

ENDF/B-VI Neutron Cross Section Measurement Stand-PR93-189868 00.610 PC A06/MF A02

Energy Distribution Functions of Argon Ions in Low Current, Diffuse Discharges at High E/N. PB93-166569 00,635 Not available NTIS 00,635 Not available NTIS

Energy Related Inventions Program. Status Report for Recommendations 1 through 350. PB94-111903 00.374 PC A09/MF A03

Energy Related Inventions Program. Status Report for Recommendations 351 through 602. PB94-111853 00,373 PC A11/MF A03

Envelope Design Guidelines for Federal Office Buildings: Thermal Integrity and Airtightness. PB93-183770 00,376 PC A09/MF A02

Equipment for Investigation of Cryogenic Compaction of Nanosize Silicon Nitride Powders. 00.466 PC A02/MF A01 DF93018740

ERATES: A Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (Version 1.0). User's Gulde and Reference Manual. PB93-228658 00,384 PC A03/MF A01

ESTAR, PSTAR, and ASTAR: Computer Programs for Calculating Stopping-Power and Range Tables for Electrons, Protons, and Helium Ions. PB93-146033 00.567 PC A03/MF A01

Estimating in situ Liquefaction Potential and Permanent Ground Displacements Due to Liquefaction for the Siting of PB93-178614 00,194 PC A06/MF A02

Estimating Soil Parameters Important for Lifeline Siting Using System Identification Techniques. PB93-178606 00,193 PC A05/MF A01

Estimation of droplet collision frequency in a spray. DE93007991 00,619 PC A02/MF A01

Evaluated Kinetic and Photochemical Data for Atmospheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Kinetic Data Evaluation for Atmospheric Chemistry. PB93-149144 00,014 Not available NTIS

Evaluated Kinetic Data for Combustion Modelling. PB93-149037 00,200 Not available NTIS

Evaluation and Compilation of DOE Waste Package Test Data. Blannual Report, August 1989-January 1990. NUREG/CR-4735-V8 00,549 PC A06/MF A02

Evaluation of Compact Fluorescent Lamp Performance at Different Ambient Temperatures. PB93-146694 00.035 PC A04/MF A01

Evaluation of Serum Volume Losses during Long-Term Storage. PB94-108503 00.518

(Order as PB94-108461, PC A09/MF A02)

Evaluation of Subjective Response to Lighting Distributions: A Literature Review. PB93-173458 00.039 PC A04/MF A01

EXAM: A Two-State Thermodynamic Analysis Program. PB93-191658 00,166 PC A06/MF A02

Excitation-Energy Dependence in the L2,3 Fluorescence Spectrum of Si. PB93-153757 00,627 Not available NTIS Experimental and Simulation Studies of the Interfacial Zone PB93-153179 00.064 Not available NTIS

Experimental Evaluation of Lighting/HVAC Interaction. PB93-166437 00,038 Not available NTIS

Experimental Study of Multiple Droplet Evaporative Cooling. PB93-198463 00,613 PC A06/MF A02

Experimental Validation of a Mathematical Model for Predicting Water Vapor Sorption at Interior Bullding Surfaces. PB93-166403 00,070 Not available NTIS

Exponential Density: Exact Fitting of Structure Modull by Entropy Maximization.
PB93-125128 00,122 Not available NTIS

Exppp: An EXPRESS Pretty Printer. National PDES Testbed Report Series. PB94-120797

Extinguishment of Combustible Porous Solids by Water PB93-198893 00,203 PC A03/MF A01

Faceting Induced by an Ultrathin Metal Film: Pt on W(111). PB93-166171 00,677 Not available NTIS

Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility. PB93-166916 00.605

(Order as PB93-166817, PC A08)

Fallure Models in Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Tech-DF93016669 00.477 PC A03/MF A01

Fast Fourier Transform Aigorithms for Real and Symmetric PB93-153146 00,507 Not available NTIS

Fast Fourier Transforms for Space Groups Containing Rotation Axes of Order Three and Higher.
PB93-124790 00,642 Not available NTIS

Federal Building Standard for Telecommunications Pathways and Spaces; Category: Telecommunications Standard; Subcategory: Cables and Wiring.
FIPS PUB 175 00,207 PC E19

Federal Bullding Telecommunications Wiring Standard: Category: Telecommunications Standard; Subcategory: Cables and Wiring.

FIPS PUB 174

00,206 PC E19

Federal Move to Metric: Public Law, DoC and NIST. PB93-139129 00,089 PC A03/MF A01

Federal-State Coliaboration in Industrial Modernization. PB93-209930 00,441 PC A04/MF A01

Feeling a Door to See If Fire Is on the Other Side. PB93-153252 00,066 Not available NTIS

Field Monitoring of a Variable-Speed Integrated Heat Pump/ Water Heating Appliance. PB93-228203 00,382 PC A04/MF A01

Field-Space Conformal Solution Method: Binary Vapor-Liguid Phase Behavior. PB93-166239 00,156 Not available NTIS

Fire Information Challenges of the 21st Century. PB93-153385 00,067 Not available NTIS PB93-153385

Fitting of Transmission Data for Determining the Optical Constants and Thicknesses of Optical Films. PB93-166692 00,630 Not available NTIS

Flow Behavior in Liquid Molding. N93-14747/8

(Order as N93-14744/5, PC A09/MF A02)

Flow Conditioner Location Effects in Orifice Flowmeters. PB93-159457 00,379 PC A04/MF A01

Flux Locked Current Source Reference. PB93-151819 00,334 Not available NTIS

Formation and Reactivity of Hypophosphite and Phosphite Radicals and Their Peroxyl Derivatives. PB93-166072 00,153 Not available NTIS

FORTRAN Compiler Validation System 1978. User's Guide, PB94-118460 00,275 PC A08/MF A02

Fracture Mechanics Evaluation of Railroad Tank Cars Containing Postulated Circumferential Cracks. PB93-219731 00,486 PC A03/MF A01

Franck-Condon Factors, r-Centroids, Electronic Transition Moments, and Einstein Coefficients for Many Nitrogen and Oxygen Band Systems.
PB93-149128 00,114 Not available NTIS

Free Radical Polymerization of Expandable Oxaspiro PB93-151785 00.174 Not available NTIS

Fuli-Thickness Clad Beam Fracture-Toughness Tests. DE93018036 00,550 PC A02/MF A01

Generation of Carbon Monoxide In Compartment Fires. PB93-146702 00,198 PC A12/MF A03

Geochemical Considerations in the Cleaning of Carbonate PB93-151231 00,059 Not available NTIS

Government Network Management Profile (GNMP). Category: Hardware and Software Standards. Subcategory: Computer Network Protocols.
FIPS-PUB-179

00.248 PC F04

Graphical Methods for Examining the Effects of Acid Rain and Sulfur Dioxide on Carbonate Stones.
PB93-151249 00,060 Not available NTIS

Gulde to Board and Care Fire Safety Requirements in the 1991 Edition of the Life Safety Code.
PB93-220820 00,397 PC A07/MF A02

Guide to NIST. PB94-119435

00.002 PC A06/MF A02

00.290 PC A04/MF A01

00.327

Gulde to the Selection of Anti-Virus Tools and Techniques. PB93-152049 00,221 PC A03/MF A01

Gulde to Voice Privacy Equipment for Law Enforcement Radio Communications Systems. PB93-189827 00,701 PC A03/MF A01

Guidelines and Procedures for Implementation of the Exec utive Order on Seismic Safety of New Construction (July PB93-228674 00,084 PC A03/MF A01

Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurements Results.

PB93-159465 00,403 PC A03/MF A01 Guidelines for the Evaluation of Virtual Terminal Implementations. PB93-139053

Guidelines for Using Emulators to Evaluate the Performance of Energy Management and Control Systems.
PB93-138931 00,033 PC A04/MF A01

Hail Resistance of Roofing Products. AD-A956 270/3 00,049 PC A03/MF A01

Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0. PB93-219764 00,390 PC A04/MF A01

Heat and Mass Transport from Thermally Degrading Thin Cellulosic Materials in a Microgravity Environment.
PB93-153435 00,505 Not available NTIS

Heat Release Rate: The Single Most Important Variable In PB93-124808 00,050 Not available NTIS

High-Accuracy Sampling Wattmeter. PB93-151793 00,310 Not available NTIS

High Power CW Wattmeter Calibration at NIST.

PB93-143949

(Order as PB93-143923, PC A06/MF A02)

High-Resolution FTIR Study of the nu4 Band of CH2F2. PB93-150753 00,137 Not available NTIS PB93-150753

High Resolution Spectroscopy Using Fiber Lasers PB93-125201 00,622 Not available NTIS

High Spatial Resolution Quantitative Micromagnetics. PB93-165736 00,674 Not available NTIS

High Temperature X-ray Diffractometry of TI-Al Alloys. PB93-166080 00,499 Not available NTIS

Higher-Order Vacuum Polarization Corrections In Muonic PB93-165991 00.588 Not available NTIS

Highway Concrete (HWYCON) Expert System Requirements and Installation Guide.
PB93-198885 00,187 PC A03/MF A01

Horizontal Nucleate Flow Bolling Heat Transfer Coefficient Measurements and Visual Observations for R12, R134a, and R134a/Ester Lubricant Mixtures. 00,493 PC A03/MF A01

Hydrogen Vibrational Modes and Anisotropic Potential in alpha-ScHx. alpha-ScHx. PB93-166510 00.681 Not available NTIS

Hydroxyapatite Cement. I. Basic Chemistry and Histologic PB93-125136 00,016 Not available NTIS

IACP's Radar Testing Program Is Alive and Well.
PB93-166429 00,702 Not available NTIS

Ignition and Subsequant Flama Spraad ovar a Thin Cal-Juhale Matarial

(Ordar as N93-20178/8, PC A15/MF A03)

Imaging of Passivatad III-V Samiconductor Surfacas by a Scanning Tunnaling Microscopa Oparating in Air.
PB93-153294 00,357 Not available NTIS

Impact-Echo Rasponsa of Platas Containing Thin Layars and Voids. 00.181 Not available NTIS PB93-153815

Impacts: NIST_Building and Fira Rasaarch Laboratory (Tachnical and Sociatal). PB94-113420 00,079 PC A03/MF A01

Improvements in the NIST Watt Measurement: Monitoring the Mass Stability of the Kilogram.

PB93-153567 00,317 Not available NTIS

Improvaments to the Chabyshav Expansion of Attenuation Correction Factors for Cylindrical Samples.

PB93-125862 00,645 Not available NTIS

In situ Analysis of Lasar-Induced Vapor Plumas. PB93-165983 00,751 Not available NTIS

In situ Burning of Oil Spills: Masoscala Expariments and Analysis. PB94-101839 00,396 PC A03/MF A01

In vivo Fluorida Concentrations Maasurad for Two Hours Aftar a NaF or a Noval Two-Solution Rinsa. PB93-151868 00,527 Not available NTIS

Inalastic Nautron Scattaring in Molacular Crystals. PB93-166445 00,158 Not available NTIS

Influance of Vacuum Polarization Corractions of Ordar alpha(z(alpha)) and alpha(z(alpha))(sup 3) in Hydrogan-Lika Uranium.
PB93-166155 00,589 Not availabla NTIS

Information Tachnology Standards: Procassas and Strata-

PB93-153625 00,291 Not available NTIS Information Tachnology Vision for tha U.S. Fibar/Taxtila/Ap-

parai Industry. PB93-139095 00,482 PC A03/MF A01

Infrared Spectroscopic Study of Camant Formation of Polymaric Calcium Phosphata Camant PB93-151298 00 00,019 Not available NTIS

Initial Graphics Exchanga Specification Hybrid Microcircuit Application Protocol. PB93-175404 00,361 PC A09/MF A03

Initial Graphics Exchanga Spacification (IGES). AD-A270 049/0 00,416 PC A03/MF A01

Initial Graphics Exchanga Spacification (IGES). Category: Softwara Standard; Subcatagory: Graphics and Information Intarchanga. FIPS PUB 177 00,417 PC A03/MF A01

Instrumant-Indapandent Databasa for Collisionally Activatad Dissociation in Radiofraquancy Only Quadrupolas. Singla-Collision Varsus Multipla-Collision Conditions. PB93-125680 00,400 Not available NTIS

Instrumantal Nautron Activation Analysis of Standard Rafaranca Material 1941, Organics in Marina Sadimant: Element, Contant and Homogenaity.
PB93-166213 00,552 Not available NTIS

Integrated Optic Lasar Fabricated by Fiald-Assisted Ion Exchange in Naodymium Doped Soda-Lima Silicete Glass. PB93-153807 00,340 Not available NTIS

Integrated Sarvicas Digital Natwork Conformanca Tasting. Layar 2, Data Link Layar (LAPD). Part 1, Basic Rata Intarface, User Side. PB94-120920 00,213 PC A99/MF E11

Intalligent Control Systam for a Cutting Operation of a Continuous Mining Machina.
PB93-178622 00,544 PC A04/MF A01

Intalligant Procassing of Matarials, Tachnical Activitias 1992. (NAS-NRC Assassmant Panal, Fabruary 2-3, 1993). PB94-112430 00,434 PC A04/MF A01

Intalligant Robots for Planatary Exploration and Construc-N93-27980/0

(Ordar as N93-27956/0, PC A16/MF A03)

Intarcomparison of NIST, NPL, PTB, and VSL Tharmal Voltage Convartars from 100 kHz to 1 MHz.
PB93-151181 00,332 Not available NTIS

Intarim Criteria for Polymar-Modified Bituminous Roofing Membrana Materials: A Summary Report. PB93-153724 00,069 Not available NTIS

Intarlaboratory Comparison of the Apparant Thermal Conductivity of a Fibrous Batt and Four Loosa-Fill Insulations. PB93-151280 00,061 Not available NTIS

Interiaboratory Study on tha Lithographicelly Producad Scenning Elactron Microscope Magnification Standard Prototype. PB94-108545

(Ordar as PB94-108529, MF A02)

Intarnational Colloqium on Atomic Spactra and Oscillator Strangths for Astrophysical and Laboratory Plasmas (4th). Hald at the National Institute of Standards and Technology, Gaitharsburg, Maryland on Septamber 14-17, 1992. PB93-198422 00,012 PC A10/MF A03

International Conference on Fire Suppression Research (1st): Proceedings. Hald in Stockholm and Boras, Sweden on May 5-8, 1992.
PB93-183952

00.202
PC A18/MF A04

Intarnational Survay of Industrial Applications of Formal Mathods. Voluma 1. Purposa, Approach, Analysis, and Conclusions. 00,255 PC A07/MF A02

International Survay of Industrial Applications of Formal Mathods. Voluma 2. Casa Studias. PB93-178564 00,256 PC A09/MF A03

Intrinsically Colorad Microcrystallina Glass-Caramic for Usa in Dantal Rastoration.
PB93-150837 00,018 Not available NTIS

lon Kinatic-Enargy Distributions and Elactrical Maasuramants in Ar/O2 rf Glow Dischargas.
PB93-153575 00,634 Not available NTIS

lonic Crystals in a Linear Paul Trap. PB93-153633 00,584 Not available NTIS

Iron Magnatic Momants in Iron/Silica Gal Nanocompositas. PB93-166098 00,675 Not availabla NTIS

Issuas, Concapts, and Standard Tachniquas in Assassing Accuracy of Coordinata Maasuring Machinas. PB93-184331 00,448 PC A05/MF A01

Japan's Kohsatsushi Program of Ragional Public Examination and Tachnology Cantars for Upgrading Small and Mid-Siza Manufacturing Firms. Prasantad at Annual Maating of tha Association of Amarican Gaographars. Hald in Miaml, Florida in April 1991.

PB93-209922 00,453 PC A03/MF A01

Journal of Physical and Chamlcal Rafarance Data, Voluma 21, No. 1, January/Fabruary 1992. PB93-148948 00,126 Not availabla NTIS

Journal of Physical and Chamical Rafarance Data, Voluma 21, No. 2, March/April 1992. PB93-148997 00,569 Not available NTIS

Journal of Physical and Chamical Rafaranca Data, Voluma 21, No. 3, May/Juna 1992. PB93-149029 00,199 Not available NTIS

Journal of Physical and Chamicel Rafarance Data, Voluma 21, No. 4, July/August 1992. PB93-149045 00,130 Not available NTIS

Journal of Physicel and Chamical Rafaranca Data, Voluma 21, No. 5, Saptambar/Octobar 1992. PB93-149094 00,572 Not available NTIS

Journal of Physical and Chamical Rafarance Data, Voluma 21, No. 6, Novambar/Dacamber 1992. PB93-149136 00,013 Not available NTIS

Journal of Rasaarch of tha National Instituta of Standards and Tachnology, January-Fabruary 1993. Voluma 98, Numbar 1. Spacial Issua.

PB93-166817 00,598 PC A08/MF A02

Journal of Research of the National Institute of Standards and Technology, July-August 1993. Volume 98, Number 4. PB94-108529 00,369 PC A08/MF A02

Journal of Rasaarch of tha National Institute of Standards and Technology, March-April 1993. Voluma 98, Number 2. PB93-196228 00,631 PC A07/MF A02

Journal of Rasearch of tha National Instituta of Standards and Technology, May-Juna 1993. Voluma 98, Number 3. PB94-108461 00,688 PC A09/MF A02

Journal of Rasaarch of tha National Instituta of Standards and Technology, November-Dacambar 1992. Voluma 97, Number 6. PB93-143923 00.565 PC A06/MF A02

Kinatics of a Multistata Enzyma in a Larga Oscillating Fiald. PB93-153690 00,516 Not available NTIS

Kinatics of Bimolecular Racombination Processas with Trapping. PB93-151652 00,143 Not available NTIS

Larga Scale Evaluation of a Pattam Recognition/Expert Systam for Mass Spectral Molacular Waight Estimation. PB94-113081 00,108 PC A03/MF A01

Laser-Enhanced Ionization Spectromatry Following Matrix Modification by Automated Chalation Chromatography for the Analysis of Biological and Environmental Rafarance Materials.

PB93-166494 00,104 Not available NTIS

Lasar-Induced Karr Constants for Pura Liquids. PB93-148989 00,129 Not available NTIS

Lifa-Cycla Costing Workshop for Enargy Consarvation in Bulldings: Studant Manual.

PB93-198984 00,383 PC A11/MF A03

Lighting Systam Dasign and Evaluation in Fadaral Offica Buildings. PB93-206217 00,040 PC A04/MF A01

Limited Tasts to Invastigata Whathar tha Siza of Body Armor Samplas Influances Ballistic Tast Rasults. PB93-138998 00,554 PC A03/MF A01

Litaratura Raviaw of Lighting Standards. PR93-208445 00,041 PC A05/MF A01

Logarithmic Tarms in Fialds Naar tha Edge of a Dialectric Wadga. PB93-125706 00,638 Not available NTIS

Long-Range Scanning for Scanning Tunnaling Microscopy. PB93-150811 00,625 Not available NTIS

Low-Frequency Errors of Tharmal Voltaga Convartars: A Prograss Raport.
PB93-151223 00,333 Not available NTIS

Low Ordar Modas of an Ion Cloud in a Panning Trap. PB93-153203 00,581 Not available NTIS

Low Tamparatura Magnatic Bahavior of 'Nonmagnatic' Ma-PB93-150795 00.309 Not available NTIS

Lowast Enargy Singlat Stata of Tatrathiophana, an Oligomar of Polythiophana. PB93-124824 00,119 Not availabla NTIS

Machina-Assistad Human Classification of Sagmantad Characters for Optical Character Recognition Tasting and Training. PB93-152155 00,296 PC A03/MF A01

Machining of Advanced Matarials: Proceadings of tha Intarnational Conference on Machining of Advanced Materials. Hald in Gaithersburg, Maryland on July 20-22, 1993. PB93-217578 00,442 PC A23/MF A04

MAESTRO: A Front-End to the MAIN1 Program for Mul-tiple-Angia Measurement of Silicon Dioxide Layers. PB93-139038 00,352 PC A03/MF A01

Magnatic Fiald Dependanca of Quantized Hail Effect Braak-down Voltagas. PB93-153237 00,662 Not availabla NTIS

Magnatic Phasa Transitions and Structural Distortion in PB93-166130 00,676 Not availabla NTIS

Magnatic Propertias of Cr-Mn Austanitic Stainlass Staals. PB93-153310 00,483 Not available NTIS

Magnatic Transitions in tha Systam YBa2Cu2.8Co0.2O6+y PB93-125839 00,643 Not availabla NTi 00,643 Not available NTIS

Magnatic Units and Matarials Specification. PB93-153351 00,665 Not available NTIS

Making Materials Databasa Standards Intamational. PB93-151736 00.463 Not available NTIS

Manual for Data Administration. PB93-182053 00,258 PC A08/MF A02

Marriaga of Exact Enumaration and 1/d Expansion Mathods: Lattice Model of Diluta Polymers.
PB93-151330 00,172 Not available NTIS

Material Dapendence of Electron Inalastic Mean Fraa Paths at Low Enargias. PB93-166320 00,591 Not available NTIS

Matarials Reliability. Tachnical Activitias, 1992. (NAS-NRC Assessmant Panal, May 13-14, 1993).
PB93-173466 00,446 PC A06/MF A02

Maasuremant of Structural Daflactions.
00,080 Not availabla NTIS PB93-125664

Maasuramant of tha Dansity Shift of tha H2Q(0-5) Transitions from 295 K to 1000 K. PB93-151637 00,142 Not available NTIS

Measuremant of tha Dipola Momant of Gaseous 1,1,1-trichlorotrifluoroethana, 1,2-difluoroethana, 1,1,2-trichlorotrifluoroethana, and 2-(difluoromathoxy)-1,1,1trifluoroethane. PB93-150852 00,139 Not available NTIS

Measuramant of tha Energy Rasponse of Superhaalad Drop Nautron Datactors.
PB93-166049 00,547 Not availabla NTIS

Maasuramant of tha Parformanca of a Spiral Wound Poly-imida Raganarator in a Pulsa Tube Rafrigarator. PB93-153658 00,111 Not available NTIS

Measurement of (3)Ha(n,gamma)(4)Ha Cross-Saction at Thermal Nautron Enargias.
PB93-166635 00,597 Not available NTIS

Measurement Uncertainty Considerations for Coordinate Measuring Machines. PB93-189819 00,449 PC A03/MF A01 Measurements for Competitiveness in Electronics, First Edition. PB93-160588 00 091 PC A20 Measuring Airflow Rates with Pulse Tracer Techniques. PB93-153583 00,037 Not available NTIS Measuring Low Frequency Tilts. PB93-196251 00.543 (Order as PB93-196228, PC A07/MF A02) Mechanical, Stress-Rupture, and Fracture Toughness Properties of Normalized and Stress Relieved AAR TC128 Grade B Steel at Elevated Temperatures.
PB93-182020 00,485 PC A03/MF A01 Mechanical Test Methods for Status Report from the U.S.A. PB93-153500 Metal-Matrix Composites: A 00,479 Not available NTIS Mechanism for Capture into Resonance PB93-145761 00.03 00,010 PC A03/MF A01 Mechanisms for the Formation and Destruction of Chlorinated Organic Products of Incomplete Combustion. PB93-166478 00,161 Not available NTIS Mechanistic and Response Studies of Iridium Oxide pH Sensors. PB93-166346 00.113 Not available NTIS Mechanistic Studies of Photoinduced Reactions at Semi-conductor Surfaces. PB93-151710 00,656 Not available NTIS Method for Separating Volatile Organic Carbon from 0.1 (sup 3) of Air to Identify Sources of Ozone Precursors via Isotope (14C) Measurements.

PB93-236511 00,392 PC A03/MF A01 tures. PB93-139020

Methods for Evaluating the Performance of Systems Intended to Recognize Characters from Image Data Scanned 00,298 PC A03/MF A01 Methods for Predicting Remaining Life of Concrete in Struc-00.180 PC A03/MF A01 Metrication: An Economic Wake-up Call for U.S. Industry. PB93-188969 00,088 PC A03/MF A01 Metrologic Support for the DARPA/NRL-XRL Mask Program: Ellipsometric Analyses of SiC Thin Films on Si. PB93-152098 00,354 PC A03/MF A01 Metrology for Electromagnetic Technology: A Bibliography of NIST Publications. PB94-108776 00,341 PC A05/MF A01 Metrology is More Than Calibration: Letting Others Know That Measurements Matter. PB93-124816 00,443 Not available NTIS MeV Be Implantation in GaAs. PB93-151645 00.653 Not available NTIS Microcalorimeter for 7 mm Coaxial Transmission Line. PB94-112455 00,338 PC A04/MF A01

00.138 Not available NTIS

00,359 Not available NTIS

00,223 PC A03/MF A01

00.112 Not available NTIS

Modeling the Ignition of Soft Furnishings by a Cigarette. PB94-109014 00,048 PC A08/MF A02

MOIST: A PC Program for Predicting Heat and Moisture Transfer In Building Envelopes. Release 2.0. PB94-112448 00,078 PC A03/MF A01

Microwave and Infrared Spectra of C2H4...HCCH: Barrier to Twofold Internal Rotation of C2H4 PB93-150803 Microwave Spectrum of (D2O)2. PB93-166262 00,157 Not available NTIS Mid- and Near-Infrared Spectra of Water and Water Dimer Isolated in Solid Neon. AD-A263 966/4 00,117 Not available NTIS Millimeter Wave Metrology at the National Institute of Standards and Technology. PB93-153666 Minimum Security Requirements for Multi-User Operating Systems. PB93-185999 Model Studies of SnO2-Based Gas Sensors: Vacancy Defects and Pd Additive Effects. PB93-166056 Model Study of the Aircraft Cabin Environment Resulting From In-Flight Fires. AD-A261 270/3 00,005 PC A07/MF A02 Modeling of X-ray Diffraction Line Broadening with the Voigt Function: Applications to High-T(sub c) Superconductors. PB93-152072 00,661 PC A06/MF A02 Modeling the Heat Release Rate of Aircraft Cabin Panels. AD-A263 148/9 00,006 PC A04/MF A01

Molecular Dynamical Studies of Energy Transport and Energy Sharing in Molecular Dissociation.
PB93-166452

00,159

Not available NTIS

Molecular Modeling of Polymer Flammability: Application to the Design of Flame-Resistant Polyethylene. PB93-153542 00,504 Not available NTIS

Molecular Wedge in a Brittle Crack: A Simulation of Mica Water. PB93-166411 00.541 Not available NTIS

Molecular Weight Dependence of Mobility in Polymer PB93-150787 00,168 Not available NTIS

Monte Carlo Approach to the Approximation of Invariant Measures PB93-159069 00,508 PC A03/MF A01

More Questions and Answers on the ISO 9000 Standard Series and Related Issues. PB93-140689 00.093 PC A04/MF A01

Morphological Instability in Phase-Field Models of Solidifica-PB94-111523 00.691 PC A03/MF A01

Multi-Point Calibration of a Gas Chromatograph Using Cryogenic Preconcentration of a Single Gas Standard Containing Volatile Organic Compounds.

PB93-151686 00,100 Not available NTIS

MUMPS, Massachusetts General Hospital Utility Multi-Programming System. Category: Software Standard. Sub-category: Programming Language, June 1993. FIPS PUB 125-1 00,279 PC E99

Nanofabrication Technology in Japan. (Japan Technology Program). PB94-123064 00,693 PC A03/MF A01

National Institute of Standards and Technology Conference on Reducing the Cost of Space Infrastructure and Operations. Part 1. Oral Presentations and Discussion. Held in Gaithersburg, Maryland on November 20-22, 1989.
PB94-111374 00,699 PC A10/MF A03

National Institute of Standards and Technology Conference on Reducing the Cost of Space Infrastructure and Operations. Part 2. Topical Papers. Held in Gaithersburg, Maryland on November 20-22, 1989. 00,696 PC A11/MF A03 PB94-113487

National Testbed for Process Planning Research. PB93-189793 00,439 PC A03/MF A01

National Voluntary Laboratory Accreditation Program 1993 PB93-156644 00,402 PC A08/MF A02

Neutron Depth Profiling: Overview and Description of NIST PB93-166890 00.686

(Order as PB93-166817, PC A08)

Neutron Reflectivity and Grazing Angle Diffraction. 00.685 PB93-166858

(Order as PB93-166817, PC A08) Neutron Time-of-Flight Spectroscopy.

PB93-166874 00.603 (Order as PB93-166817, PC A08)

New Approach to Calibration of Transducers Used in the Measurement of Dynamic Pressure and Temperature. PB93-153716 00,348 Not available NTIS

New International Volt and Ohm Standards. PB93-166361 00,593 Not available NTIS New Method for Phase Identification for Electron

00.098 Not available NTIS PB93-125854

New Spherical Dipole Source. PB93-153419 00,325 Not available NTIS

New Test Structure for the Electrical Measurement of the Width of Short Features with Arbitrarily Wide Voltage Taps. PB93-124782 00,349 Not available NTIS

NIST Building and Fire Research Laboratory. Projects 1993. PB94-118288 00,410 PC A07/MF A02

NIST Cold Neutron Research Facility. PB93-166825 00.599

(Order as PB93-166817, PC A08)

NIST Cold Neutron Research Facility and Magnetic Neutron Scattering. PB93-151694 00.654 Not available NTIS

NIST EXPRESS Toolkit: Introduction and Overview. Na-Historial PDES Testbed Report Series.
PB94-120664 00,436 PC A03/MF A01

NIST EXPRESS Toolkit: Lessons Learned. PB93-153450 00.422 Not available NTIS NIST EXPRESS Toolkit: Requirements for Improvements. National PDES Testbed Report Series. PB93-220838 00,265 PC A02/MF A01

NIST EXPRESS Toolkit: Updating Existing Applications. National PDES Testbed Report Series.
PB93-220846 00,266 PC A03/MF A01

NIST EXPRESS Toolkit: Using Applications. National PDES Testbed Report Series. PB93-220853 00.267 PC A03/MF A01

NIST Handbook 44, 1993: Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices as Adopted by the 77th National Conference on Weights and Measures 1992. PB93-213106 00,407 PC A10/MF A03

NIST Handbook 130, 1993. Uniform Laws and Regulations in the Areas of Legal Metrology and Motor Fuel Quality as Adopted by the 77th National Conference on Weights and Measures 1992. Measures 199 PB93-213114 00.015 PC A09/MF A03

NIST Length Scale Interferometer Measurement Assurance, PB93-146645 00,401 PC A03/MF A01

NIST Measurement Service for DC Standard Resistors. PB93-139079 00,347 PC A04/MF A01

NIST Measurement Service for Electromagnetic Characterization of Materials. PB94-110186 00.321 PC A03/MF A01

NIST REACTOR: Summary of Activities, July 1991 through September 1992. PB93-162873 00,586 PC A07/MF A02

NIST Sampling System for the Calibration of Phase Angle Generators from 1 Hz to 100 kHz. PB93-151884 00,335 Not available NTIS

NIST Scoring Package Certification Procedures in Conjunc-tion with NIST Special Databases 2 and 6. PB93-188126 00,302 PC A03/MF A01

NIST Scoring Package Cross-Reference for Use with NIST Internal Reports 4950 and 5129. PB94-103702 00,305 PC A03/MF A01

NIST Serial Holdings, 1993. 00,413 PC A12/MF A03 PB94-120847

NIST Standard Reference Data Products Catalog, 1993. PB93-173409 00,163 PC A05/MF A01

NMR Based Current/Voltage Source.

PB93-151173 00,331 Not available NTIS Non-Halogenated, Flame Retarded Polycarbonate. N94-10781/0

00,008 (Order as N94-10766/1, PC A16/MF A03)

Non-Linear Effects of Periodic Electric Fields on Membrane PB93-153682 00,529 Not available NTIS

North American ISDN (Integrated Services Digital Network)
Users' Forum Agreements on ISDN.

00.211 PC A11/MF A03 PB93-173391

Note on the Number Dependence of Nonequilibrium Molecular Dynamics Simulations of the Viscosity of Structured Molecules. 00,149 Not available NTIS PB93-153740

Nuclear Orientation of (160)Tb in Tb Single Crystal. PB93-125656 00,563 Not available NTIS

Observation of Photon Correlations in Scattering from a Sil-PB93-150829 00,115 Not available NTIS

Observation of Quantized Motion of Rb Atoms in an Optical PB93-151140 00,576 Not available NTIS

Observations About Joined Circular Arcs PB93-234714 00,510 00,510 PC A03/MF A01

Observations from a Field Study of the Performance of Polymer-Modified Bitumen Roofing.
PB93-146686 00,058 PC A03/MF A01

Observations of soot in combustion of methanol/toluene spray flames DE93007992 00,378 PC A03/MF A01

OCR Error Rate Versus Rejection Rate for Isolated Handprint Characters. PB93-146652

00.294 PC A03/MF A01 ONR-Sponsored Research in Ultrasonic Measurements at

NIST: 1982-92. PB93-152064 00,618 PC A03/MF A01

Operating Principles of the VME MultiKron Interface Board PB93-234730 PC A03/MF A0 00,230 PC A03/MF A01

Opportunities for Innovation: Chemical and Biological Sen-PB93-100063 00.096 PC\$75.00/MF A02

Optical Fiber Geometry: Accurata Measurement of Cladding iamatar. PB93-196269 00.632

(Ordar as PB93-196228, PC A07/MF A02)

Optimization of Adaptiva Rasonanca Theory Network with Boltzmann Machina. PB93-188134 00.224 PC A03/MF A01

Optimized Tharmo-Optic Elactric-Fiald Probes for Microwavas and Millimetar Wavas. PB93-153641 00,318 Not available NTIS

Optimizing Complex Kinetics Experiments Using Least-Squares Methods. PB93-196244 00,167

(Order as PB93-196228, PC A07/MF A02)

Orientation Dapandenca of Flux Pinning in a Layarad Bi2Sr2Ca1Cu2O8 + 10% Ag Composita. PB93-153328 00,663 Not available NTIS

OSIKIT (Open Systams Intarconnaction) and NIST Proto-type Compiler for Estelle. PB93-505758 00,271 Mag Tapa \$2400.00 00,271 Mag Tapa \$2400.00

Outline of Neutron Scattering Formalism.

PB93-166833 00 600

(Ordar as PB93-166817, PC A08)

Overview of Damage to Highway Bridgas during the Loma Priata Earthquaka. PB93-134112 00,191

(Ordar as PB93-134104, PC A19/MF A04)

Overview of NIST Resaarch on Saismic Performance of Momant Rasisting Pracast Concrete Beam-Column Joints Containing Post-Tansioning.
PB94-103686 00,086 PC A03/MF A01

Partial Discharga Pulsa-Haight Analysis: Promisas and Limitations. PB93-151843 00.312 Not available NTIS

Partial Structure for trans-1,2-Difluoroathylana from High-

Particulate and droplat diagnostics In spray combustion. Annual raport. DE93003631 00.195 PC A04/MF A01

Particulate and dropiat diagnostics in spray combustion. Annual raport. DE93003632 00,196 PC A04/MF A01

PC-OMNITAB: An Intaractiva Systam for Statistical and Numarical Data Analysis (Documentation).
PB93-111656 00,249 PC A03/MF A01

PC-OMNITAB: An Intaractive Systam for Statistical and Numarical Data Analysis, Varsion 7.0 (for Microcomputars). PB93-500437 00,269 CP D03

Panatration of Proton Baams through Water. 1. Depth-Dose Distribution, Spectra and LET Distribution. PB93-219749 00,537 PC A04/MF A01

Parformance of a Residantial Desuparheater PB93-153302 00,036 No.

00.036 Not available NTIS

Parformanca of Elactromagnetic Covermetars for Non-dastructiva Assessment of Steel Reinforcamant. 00,186 PC A07/MF A02 PB93-178630

Parformance of 1/3-Scale Model Precest Concrete Beam-Column Connections Subjected to Cyclic Inelastic Loads.
Report No. 3.
PB94-101813

00,085
PC A07/MF A02

Parformance Standard for Wood-Basad Structural-Use Pan-PB93-146298 00,056 PC A03/MF A01

Phasa Bahavior of an Off-Critical Polymar Bland Solution during Staady Shear Studied by Small Angla Neutron Scattering. PB93-153526 00,176 Not available NTIS

Phasa Equilibria and Crystal Chemistry in Portions of the System SrO-CaO-Bi2O3-CuO. Part 3. Preliminary Phasa Diagrams for tha Temary Systams of SrO-Bi2O3-CuO, CaO-Bi2O3-CuO and SrO-CaO-Bi2O3. PB93-153732 00,469 Not available NTIS

Phase Equilibria and Crystal Chamistry in Portions of tha System SrO-CaO-Bi2O3-CuO. Part 4. The Systam CaO-Bi2O3-CuO. PB94-108552

(Order as PB94-108529, PC A08/MF A02)

Phase-Field Modal for Isothermal Phasa Transitions in Bi-00,498 Not available NTIS PB93-151934

Phase-Field Modals for Anisotropic Interfaces. PB93-164564 00,672 PC A03/MF A01

Physical Paramatars for L X-ray Production Cross-Sections. P893-153609 00,583 Not available NTIS PB93-153609

Physics Laboratory Technical Activitias, 1992. PB93-178648 00,607 PC A10/MF A03

Polarization Analysis of the Magnetic Excitations in Invar Fe86B14 PB93-151256 00.652 Not available NTIS

Polymar Salf-Diffusion in Nal-Poly(athylana oxida) Elactro-PB93-151959 00,175 Not available NTIS

Portabla Estella Translator: An Ovarviaw and Usar Guide. 00,260 PC A03/MF A01

Portsmouth Fastener Manufacturing Workstation. Fastenar Engraving Systam (Design, Construction, and Operation). PB94-118221 00,461 PC A04/MF A01

Pracision and Accuracy in XQQ Maasuramants: A Summary Raport of tha NIST-EPA International Round Robin. PB93-125672 00,399 Not available NTIS

Pradiction Intervals for a Balanced One-Way Random-Effacts Model 00.513 Not available NTIS

Prediction of Carbon-Hydrogan Bond Dissociation Energies for Polycyclic Aromatic Hydrocarbons of Arbitrary Size. PB93-166205 00,155 Not available NTIS

Pradiction of Fluid Phase Equilibrium of Tamary Mixtures in tha Critical Ragion and tha Modified Laung-Griffiths Thaory.
PB93-153484 00,148 Not available NTIS

Pradictiva Tharmodynamic Model for Complax High Tamparatura Solution Phasas XI. PB93-124840 00.120 Not available NTIS

Praparation and Praliminary Analysis of K-411 Glass Microspheres PB93-125623 00,097 Not available NTIS

Preparing for the New Volt and Ohm. PB93-166379 00,58 00,594 Not available NTIS

Prasant Worth Factors for Lifa-Cycla Cost Studias in tha Dapartment of Defense (1994).

PB94-109238 00,540 PC A04/MF A01 Principlas of Gas Phasa Procassing of Caramics during Combustion.

N93-20188/7 00.467 (Ordar as N93-20178/8, PC A15/MF A03)

Privata Branch Exchanga (PBX) Sacurity Guidalina PB94-100880 00,212 PC A04/MF A01

Probas of Equipartition in Nonlinaar Hamiltonian Systams. 00,595 Not available NTIS

Procaduras for Salacting Earthquaka Ground Motions at Rock Sites (Ravlsad).
PB93-185973 00,542 PC A03/MF A01

Procaedings: ICSSC Issues Workshop. Davalopment of Saismic Evaluation and Rahabilitation Standards for Fedarally Owned and Leased Buildings. Held in Danvar, Colorado on Saptamber 16-17, 1992. PB93-228666 00.083 PC A03/MF A01

Procaedings of the AP Validation Workshop. Hald In Sa-attle, Washington on April 13-14, 1992. National PDES Testbed Report Saries. PB93-158715 00,423 PC A07/MF A02

Procaedings of the Joint DoD/NIST Workshop on Intar-national Precision Fabrication Research and Devalopment. Held in Rockville, Maryland on October 27-29, 1992. 00.440 PC A11/MF A03

Proceedings of tha Meating of tha Intargovarnmantal U.S.-Russian Business Development Committee's Standards Working Group (2nd). Hald in Gaitharsburg, Maryland on March 23-24, 1993. 00,087 PC A14/MF A03

Proceedings of the sixth Japan--US workshop on high-field superconducting materials and standard procedures for high-fiald superconducting materials tasting. DE93002848 00,640 PC A06/MF A02

Proceedings of the U.S.-Japan Workshop on Saismic Ratro-fit of Bridges (1st). Hald In Tsukuba Scianca City, Japan on Dacambar 17-18, 1990. PB93-134104 00,190 PC A19/MF A04

oceedings: Open Forum on Surge Protection Application. 94-118056 00,346 PC A09/MF A02 PB94-118056

Program for Conformity Assessment System Evaluation: Analysis of Comments on the NIST Proposal. PB93-170900 00,094 PC A03/MF A01

Programmar's Refarenca Gulde to FDMS Fila Formats. PB93-182038 00,201 PC A03/MF A01

Prompt-Gamma Activation Analysis. PB93-166908

00.106

(Ordar as PB93-166817, PC A08)

Properties and Intaractions of Oral Structures and Restorativa Matarials. Annual Raport for Period Octobar 1, 1991 to Saptamber 30, 1992. 00.024 PC A06/MF A02

Proposed Maasuremant of tha Fina Structura Constant Using a Coulomb-Blockade Charge Pump.
PB93-151264 00.577 Not available NTIS

Protain Crystal Growth of Ribonucleasa A and Pancraatic Trypsin Inhibitor Aboard tha Maser 3 Rocket.
PB93-166122 00,524 Not availabla NTIS

Proton Monte Carlo Transport Program PTRAN. PB93-158673 PC A03/MF A01

Prototype Application Protocol for Raady-to-Wear Pattern Making. PB93-158665 00.430 PC A03/MF A01

Pulsatile Instability in Rapid Diractional Solidification: Strongly-Nonlinear Analysis. N94-10188/8 00,641

(Ordar as N94-10171/4, PC A20/MF A04)

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. (Final) Prograss Report, (February 1989--January 1992). DE93018016 00,387 PC A03/MF A01

Pulsa Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. Prograss Raport, (February 1989--April 1990).
DE93018005

00,386

PC A03/MF A01

Pulsa Radiolytic Studies of Electron Transfar Processas and Applications to Solar Photochemistry. Progress Report, (March 1992--March 1993).
DE93018715 00,388 PC A03/MF A01

Quality Control Tasts for Adhasion of Paint on the Panels of Tactical Rigid Wall Shaltars, Phasa 2. PB93-173474 00,476 PC A03/MF A01

Quantitativa Evaluation of Distributad Poras in Rafarance 00.444 Not available NTIS

Quantizad Dissipation of the Quantum Hall Effect at High PB93-150712 00.649 Not available NTIS

Quantum Theory of the Dynamical Cerankov Emission of X-PB93-124873 00,559 Not available NTIS

Quastions and Answars on Quality, tha ISO 9000 Standard Serias, Quality System Registration, and Ralated Issuas. PB93-152080 00,090 PC A03/MF A01

RADCAL: A Narrow-Band Modal for Radiation Calculations in a Combustion Environment. PB93-200889 00,204 PC A04/MF A01

Radiativa Haat Transfer in Transient Hot-Wire Measuremants of Tharmal Conductivity.
PB93-153534

00,582

Not availabla NTIS

Radiomatar for Pracision Coharant Radiation Maasure-PB93-166395 00.629 Not available NTIS

Raster Graphics: A Tutorial and Implementation Guide. PB93-152171 00,421 PC A07/MF A02 PB93-152171

Rate Constants for Hydrogan Abstraction Reactions of NO3 in Aqueous Solution. PB93-166064 00.152 Not available NTIS

Re-Examination of Quantum Hall Plateaus. PB93-151850 00,658 Not available NTIS

aaction Sintering High-Density, Fine-Grained a2YCu3O6.5+x Superconductors Using Ba(OH) 2.H2O. B93-151876 00,659 Not availabla NTIS Reaction PB93-151876

Raal-time compansation for tool form arrors in turning using computar vision. DE93010922 00.457 PC A02/MF A01

Racent Rasults of the NIST National Ball Plate Round PB93-219715 00.408 PC A03/MF A01

Reciprocity Relations for On-Wafer Powar Maasuramant. PB93-125649 00,350 Not available NTIS

Racommanded Rast Fraquancias for Obsarved Interstellar Molecular Microwave Transitions. 1991 Revision. PB93-149003 00.011 Not available NTIS

Raduction of Hydrogan Cyanide Concentrations and Acute Inhalation Toxicity from Flexibla Polyurethane Foam Combustion Products by tha Addition of Copper Compounds. Part IV. Effacts of Combustion Conditions and Scaling on tha Ganaration of Hydrogan Cyanida and Toxicity from Flexibla Polyurethane Foam with and without Copper Compounds PB93-139103 00,053 PC A06/MF A02

Reduction Raactions of Watar Solubla Cyano-Cobalt(III)-Porphyrins: Matal Varsus Ligand Centared Processes. PB93-125912 00,514 Not available NTIS

Reference Detectors for Spectral Responsivity Measurements. PB93-153591 00.626 Not available NTIS Reference Model for Frameworks of Software Engineering Environments (Technical Report ECMA TR/55, 3rd Edition). PB94-112497 00,274 PC A07/MF A02 Reflected and Refracted Fundamental Modes of Dynamic X-ray Diffraction. PB93-166189 00.154 Not available NTiS Regular Mechanism of Parity and Time Invariance Nonconserving Effects Enhancement in Neutron Capture and Scattering Near p-Wave Compound Resonances. PB93-125177 00,561 Not available NTIS Renewal Look at Switching Rules in MIL-STD-105D. PB93-166676 00,445 Not available NTIS Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies.
PB94-112422 00,456 PC A07/MF A02 Report of the National Conference on Weights and Measures (77th). Held in Nashville, Tennessee on July 19-23, PB93-209781 00.406 PC A16/MF A03 Report of the NSF/NIST Workshop on NSFNET/NREN Security. Held on July 6-7, 1992. PB93-228682 00.225 PC A05/MF A01 Report on a Workshop for Improving Relationships between Users and Suppliers of Microlithography Metrology Tools. PB93-206233 00,365 PC A03/MF A01 Report on Occupational Safety and Health for Fiscal Year 1990 (Under Public Law 91-596).
PB93-215184 00,532 PC A05/MF A01 Report on Scoping the Apparel Manufacturing Enterprise. PB93-152163 00,429 PC A03/MF A01 Report on the Raster Capabilities of MIL-R-28002A and /IL-D-28003A. 00.418 PC A03/MF A01 PR93-140820 Requirements for an Application Protocol Development Environment. National PDES Testbed Report Series.
PB93-208114 00,426 PC A03/MF A01 search for Electric Energy Systems: An Annual Report, PB94-112182 00.375 PC A03/MF A01 Research, Industry and Technology Transfer at the NIST PB93-166304 00.431 Not available NTIS Research Plan for Masonry Shear Walls. 00.075 PC A03/MF A01 PB93-206183 Residential and Light Commercial Telecommunications Wirling Standard; Category: Telecommunications Standard; Subcategory: Cables and Wiring.

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00,315 Not available NTIS

view of Irradiation Effects on Organic-Matrix Insulation. 93-206928 00,546 PC A13/MF A03

Review of the Nickel-Graphite Interface. PRG3-166601 00,500 Not available NTIS

Rheometer with Two-Dimensional Area Detection for Light Scattering Studies of Polymer Melts and Solutions. PB93-151322 00,171 Not available NTIS

RL/NIST Workshop on Moisture Measurement and Control for Microelectronics. Proceedings of the RL/NIST Workshop held in Gaithersburg, Maryland on April 5-7, 1993. PB94-108636 00,372 PC A16/MF A03

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PB93-166544 00,682 Not available NTIS Semiconductor Measurement Technology: A Collection of Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations, 00,366 PC A07/MF A02 Semiconductor Measurement Technology: Evolution of Silicon Materials Characterization: Lessons Learned for Im-00.367 PC A03/MF A01 SGML DTD for the STEP integrated Resource Parts. National PDES Testbed Report Series. 00.428 PC A03/MF A01 Shielded Open-Circuited Sample Holders for Dielectric and Magnetic Measurements of Liquids and Powders. PB93-198851 00,319 PC A03/MF A01 Shtolo-Converting STEP Short Listings to Annotated Listings. National PDES Testbed Report Series.
PB94-120623 00,435 PC A03/MF A01 Sims Determination of Oxygen and Carbon in YBa2Cu3O7-00.650 Not available NTIS Simulating the Effect of Beamed Cellings on Smoke Flow. Part 1. Comparison of Numerical and Experimental Results. PB93-152056 00,062 PC A03/MF A01 Single Pulse Shock Tube Studies on the Thermal Decomposition of n-Butyl Phenyl Ether, n-Pentylbenzene and Phenotole and the Heat of Formation of Phenoxy and 00.162 Not available NTIS Site Exploration for Radon Source Potential. 00,394 PC A04/MF A01 Small Angle Neutron Scattering at the National Institute of 00.601 (Order as PB93-166817, PC A08) Smoke Movement in a Corridor-Hybrid Model, Simple Model and Comparison with Experiments. PB93-146678 PC A04/MF A01 Smoke Plume Trajectory from In situ Burning of Crude Oil 00,393 PC A04/MF A01 00.263 PC A06/MF A02 Solidification Processing and Phase Transformations in Ordered High Temperature Alloys.

AD-A261 751/2 00,494 PC A10/MF A03 Solubility of Some Sparingly Soluble Salts of Zinc and Cadmium in Water and in Aqueous Electrolyte Solutions.
PB93-149110 00,134 Not available NTIS Some Guidelines for Implementing Error Compensation on 00,452 PC A04/MF A01 Source Apportionment of Fine Particle Organics and Mutagenicity in Wintertime Roanoke.
PB93-221851 00,391 PC A02/MF A01 Space Charge Induced in Stressed Polyethylene. PB93-151124 00,343 Not available NTIS Space Marching Difference Schemes In the Nonlinear Inverse Heat Conduction Problem.
PB93-124865 00,555 Not available NTIS

Spatlal Data Transfer Standard (SDTS); Category: Software Standard; Subcategory: Information Interchange. FIPS PUB 173 00,287 PC A14 Specimen Banking at the National Institute of Standards and Technology. PB93-151967 00.101 Not available NTIS Spectral Data and Grotrian Diagrams for Highly Ionized Cobalt, Co VIII through Co XXVII. PB93-148963 00,568 Not available NTIS Spectral Data and Grotrian Diagrams for Highly IonIzed Vanadium, V VI through V XXIII.
PB93-149011 00,570 Not available NTIS Spectroscopy of the 3s(2)3p(n) Shell from Cu to Mo. PB93-166270 00,590 Not available NTIS Speed of Sound Data and Related Models for Mixtures of atural Gas Constituents. 00.380 PC A05/MF A02 PB93-200822 Sprinkler Fire Suppression Algorithm for HAZARD. PR94-103678 00.046 PC A03/MF A01 Stable Implementation Agreements for Open Systems Inter-connection Protocols. Version 6, Edition 1, December 1992. Based on the Proceedings of the OSE implementors' Work-shop (OIW). PB93-166809 00,292 PC A99/MF E18 Standard Aggregate Materials for Alkall-Silica Reaction PB93-166247 00,184 Not available NTIS Standard Cement Clinkers for Phase Analysis. PB93-166254 00,185 Not available NTIS Standard Formats for Welding Property Data. PB93-166106 00,437 Not available NTIS Standard Reference Materials for Trace Organic Contaminants in the Marine Environment.
PB93-166627 00,395 Not available NTIS Standard Reference Materials: Handbook for SRM Users. PB93-183796 00,107 PC A06/MF A02 Standard X-ray Diffraction Powder Patterns of Fourteen Ce-PB93-166650 00.473 Not available NTIS State Weights and Measures Laboratories: State Standards Program Description and Directory. 1993 Edition. PB93-217529 00,451 PC A07/MF A02 Statistical Analysis of Information Content for Training Pattern Recognition Networks.
PB93-178861 00,299 PC A03/MF A01 Status of Emerging Standards for Removable Computer Storage Media and Related Contributions of NIST. N93-14778/3 (Order as N93-14771/8, PC A13/MF A03) Status of the Soft X-ray/XUV Optical Metrology Program at the National Institute of Standards and Technology.

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O0,557

PC A01/MF A01 Strategic Plan for the Factory Automation Systems Division. PB93-189801 00,432 PC A04/MF A01 Strength of Partially-Grouted Masonry Shear Walls under Lateral Loads. 00.082 PC A04/MF A01 PB93-206225 Strengthening Methodology for Lightly Reinforced Concrete PB93-161354 00,081 PC A06/MF A02 Structural Phase Transformation Studies of the High Tc Superconducting Materials, Ba2RCu3O6+x, in Air. PB93-166643 00,683 Not available NTIS Structural Phase Transition Studies of High Tc Superconducting Materials. PB93-151942 00.660 Not available NTIS Structure and Low Energy Dynamics of Solid C60. PB93-153260 O0,146 Not available NTIS PB93-153260 Structure and Magnetic Properties of Doped Co and Fe-Bi2Sr2Cul-xMxOy Phases. PB93-166338 00.680 Not available NTIS Structure-Property Relationships in Microalloyed Ferrite-Pearlite Steels Phase 1: Literature Review, Research Plan, and Initial Results. PB93-234706 00,487 PC A04/MF A01 Study of Fire Induced Flow along the Vertical Comer Wall. PB93-205623 00.074 PC A04/MF A01 Study of OSI Key Management. PB93-151579 00,220 PC A10/MF A03 Study of Traffic Control and Congestion Control In Broadband ISDN. PB93-149433 00,210 PC A03/MF A01

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PB93-206928

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Summaries of BFRL Fire Research In-House Projects and PB94-121050 00.032 PC A11/MF A03

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Technology for Economic Growth: President's Progress Re-PB94-107430 00,001 PC E02/MF A01

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Thermodynamic Properties of the NaCl + H2O System. 1. Thermodynamic Properties of NaCl(cr). PB93-148955 00,127 Not available NTIS

Thermodynamic Properties of tha NaCl + H2O Systam. 2. Thermodynamic Properties of NaCl(aq), NaCl2H2O(cr), and Phase Equillbria. PB93-149060 00,132 Not available NTIS

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Thermophysical Properties of Fluids for the Gas Industry. Annual Report, January-December 1992. PB93-207470 00,381 PC A03/MF A01

Thermophysical Properties. Prograss Report, 1 January 1992--31 March 1993.
DE93040219 00.490 PC A11/MF A03

Three-Ratio Schema for the Measurement of Isotopic Ratios of Silicon PB93-196285

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Tima-based ensamble scattaring maasuraments in fual sprays. DE93007989 00,197 PC A02/MF A01

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Topics In Lasar Spectroscopy - Simultanaous Datection of Laser-Enhanced Ionization and Lasar-Induced Fluorescence in Flames - Noisa Corralation Studies. 00,105 Not available NTIS PB93-166502

Toward an Intelligent Systam for Mathematical Software Se-PB93-124832 00.506 Not available NTIS

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Towards SQL Database Langauge Extensions for Gaoraphic Information Systems. PB94-101847 00,411 PC A08/MF A02

Transfer Functions for Characterizing Multimoda Optical Fiber Components. PB93-162865 00.345 PC A07/MF A02

Transient Cooling of a Hot Surface by Droplats Evaporation. Final Report, November 1990. PB93-189421 00,609 PC A06/MF A02

Transient Hydrogen Heat Transfar. AD-A266 615/4 00,110 PC A03/MF A01

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Traatmant of Continuum-Continuum Coupling in the Theoratical Study of Abova Threshold Ionization.
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Tunnaling Stabilizad Magnetic Force Microscopy of YBa2Cu3O7-Delta Films on MgO at 76 K. PB93-151702 00,655 Not available NTIS

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Usar's Guide for the Algorithm Testing System/Version 1.1. PB93-175990 00,447 PC A03/MF A01

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Water Mist Fira Suppression Workshop Proceedings. Held in Gaitharsburg, Maryland on March 1-2, 1993. PB93-219780 00,700 PC A08/MF A02

Watar Vapor Parmaability Maasuramants of Common Build-Ing Matarials. PB93-153229 00.065 Not available NTIS

Water Vapor Sorption Measurements of Common Building Materials PB93-153674 00,068 Not available NTIS

Waar and Friction Characteristics of Self-Lubricating Copper - Intercalated Graphite Composites.
PB93-153765 00,480 Not available NTIS

Wolf Shifts and Their Physical Interpretation under Laboratory Conditions. PB93-196293 00,633

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Workshop on Characterizing Diamond Films II. Hald in Gaitharsburg, MD. on February 24-25, 1993. PB93-207157 00,687 PC A04/MF A01

Workshop on Elevator Use during Fires. Held in Gaithersburg, Maryland on September 29, 1992. PB93-235190 00,045 PC A03/MF A01

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Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1987. Volume 4.

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Collection of Technical Studies Completed for the Computer-Aided Acquisition and Logistic Support (CALS) Program Fiscal Year 1988. Volume 2. Graphics, CGM MIL SPEC.

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AD-A261 751/2

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AD-A262 055/7

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AD-A262 717/2 00,234 PC A16/MF A03

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AD-A263 966/4

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AD-A264 886/3

Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS VAX Systems, Version 3.0-7, VAXstation 4000 Model 60 (host) => VAXstation 3100 Model 48 (target), 930319S1.11317.

AD-A264 886/3 00,237 PC A05/MF A01

AD-A265 014/1

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AD-A265 260/0

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5 (/OP-

TIMIZE) VAX 8550/8600/8650 (Cluster) > Enhanced Processor (ÉP) AN/UYK-44 (Bare Board). AD-A265 260/0 00,239 PC A05/MF A01

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CONF-921110-48

Observations of soot in combustion of methanol/toluene spray flames. DE93007992 00,378 PC A03/MF A01

CONF-9205307-1

Estimation of droplet collision frequency in a spray. DE93007991 00,619 PC A02/MF A01

DE93002848

Proceedings of the sixth Japan--US workshop on high-field superconducting materials and standard procedures for high-field superconducting materials testing.

DE93002848 00,640 PC A06/MF A02

DE93003631

Particulate and droplet diagnostics in spray combustion. Annual report. DE93003631 00,195 PC A04/MF A01

DE93003632

Particulate and droplet diagnostics In spray combustion. Annual report. DE93003632 00,196 PC A04/MF A01 DE93007989

Time-based ensemble scattering measurements in fuel sprays. DE9300**7**989 00.197 PC A02/MF A01 DE93007991

Estimation of droplet collision frequency in a spray.
DE93007991 00,619 PC A02/MF A01 DE93007992

Observations of soot in combustion of methanol/toluene spray flames. DE93007992 00,378 PC A03/MF A01

DE93010922

Real-time compensation for tool form errors in turning using computer vision. DE93010922 00.457 PC A02/MF A01

DE93012534

Apparent Thermal Conductivity of Polyurethane Foam Insulation, Containing Various HCFC Blends, from 125 to 335 K. (Final report).

DE93012534 00,488 PC A03/MF A01

DE93014767

Theoretical Evaluation of R22 and R502 Alternatives. Final Report. DE93014767 00.489 PC A03/MF A01

DE93016669 Failure Models In Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Technologies. DE93016669 00.477 PC A03/MF A01

DE93018005

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. Progress Report, (February 1989--April 1990).
DE93018005 00,386 PC A03/MF A01 DE93018016

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. (Final) Progress Report, (February 1989--January 1992).
DE93018016 00,387 PC A03/MF A01

DE93018036

Full-Thickness Clad Beam Fracture-Toughness Tests. DE93018036 00,550 PC A02/MF A01 DE93018715

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. Progress Report, (March 1992--March 1993). DE93018715 00,388 PC A03/MF A01

DE93018740

Equipment for Investigation of Cryogenic Compaction of Nanosize Silicon Nitride Powders.

DE93018740

O0,466 PC A02/MF A01 DE93019442

Development of Measurement Capabilities for the Thermophysical Properties of Energy-Related Fluids. Annual Report, December 1, 1992--November 30, 1993. DE93019442 00,118 PC A03/MF A01

DE93040219 Thermophysical Properties. Progress Report, 1 January 1992--31 March 1993.
DE93040219 00,490 PC A11/MF A03

DOE/CE/23810-7 Theoretical Evaluation of R22 and R502 Alternatives. Final

Report. DE93014767 00,489 PC A03/MF A01 DOE/CE/23810-16

Thermophysical Properties. Progress Report, 1 January 1992--31 March 1993.
DE93040219 00.490 PC A11/MF A03

DOE/CE/90213-T6 Particulate and droplet diagnostics in spray combustion. Annual report. DE93003632 00,196 PC A04/MF A01

DOE/CE/90213-T7 Particulate and droplet diagnostics in spray combustion. Annual report. DE93003631

00.195 PC A04/MF A01

DOE/ER/13108-T6

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. Progress Report, (February 1989--April 1990).

DE93018005 00,386 PC A03/MF A01

DOE/ER/13108-T7

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. (Final) Progress Report, (February 1989--January 1992).

DE93018016

O0,387

PC A03/MF A01

DOE/ER/13108-T8

Pulse Radiolytic Studies of Electron Transfer Processes and Applications to Solar Photochemistry. Progress Report, (March 1992--March 1993).

DE93018715 00,388 PC A03/MF A01

DOE/ER/13823-T1

Development of Measurement Capabilities for the Thermophysical Properties of Energy-Related Fluids. Annual Report, December 1, 1992--November 30, 1993. DE93019442 00,118 PC A03/MF A01

DOE/OR/21428-T1 Apparent Thermal Conductivity of Polyurethane Foam Insulation, Containing Various HCFC Blends, from 125 to 335 K. (Final report).

DE93012534 00,488 PC A03/MF A01 DOE/OR/21584-T1

Real-time compensation for tool form errors In turning using computer vision. DE93010922 00.457 PC A02/MF A01

DOE/OR/22014-1

Fallure Models in Continuous Fiber Ceramic Composites: Phase 1, Task 1, State of the Art Survey. Continuous Fiber Ceramic Composites Program, Task 2, Supporting Technologies DE93016669 00.477 PC A03/MF A01

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EPA/600/A-93/167

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EPA/600/A-93/222

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EPA/600/J-93/379

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EPA/600/J-93/465

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Codes for the Identification of Federal and Federally Assisted Organizations. Category: Data Standard, Representations and Codes.
FIPS PUB 95-1

00,288

PC\$20.50

FIPS PUB 125-1

MUMPS, Massachusetts General Hospital Utility Multi-Programming System. Category: Software Standard. Subcategory: Programming Language, June 1993.
FIPS PUB 125-1 00,279 PC E99 FIPS PUB 127-2

Database Language SQL. Category: Software Standard. Subcategory: Database, June 1993. FIPS PUB 127-2 00,280 PC E99

FIPS PUB 128-1A

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 1. Functional Specification. fication. FIPS PUB 128-1A 00.281 PC E99

FIPS PUB 128-1B

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 2. Character Encoding. FIPS PUB 128-1B

00.282 PC E99

00,284 PC E99

FIPS PUB 128-1C

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 3. Binary Encoding. FIPS PUB 128-1C 00,283 PC E99 FIPS PUB 128-1D

Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Part 4. Clear Text Encod-

Ing. FIPS PUB 128-1D

FIPS PUB 128-1E Computer Graphics Metafile (CGM). Category: Software Standard. Subcategory: Graphics. Military Specification. Digital Representation for Communication of Illustration Data: CGM Application Profile.

FIPS PUB 128-1E 00,285 PC E99

FIPS PUB 161-1

Electronic Data Interchange (EDI): Category: Software Standard; Subcategory: Electronic Data Interchange. FIPS PUB 161-1 00,247 PC E01

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FIPS PUB 174

00,206 PC E19 Speed of Sound Data and Related Models for Mixtures of Natural Gas Constituents.
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FIPS PUB 175 00,207 PC E19 N94-10781/0 PB93-146298 00,056 PC A03/MF A01 Non-Halogenated, Flame Retarded Polycarbonate. N94-10781/0 NIST-SP-260-100-ED-1993 Standard Reference Materials: Handbook for SRM Users. PB93-183796 00,107 PC A06/MF A02 (Order as N94-10766/1, PC A16/MF A03) FIPS PUB 176 Residential and Light Commercial Telecommunications Wiring Standard; Category: Telecommunications Standard; Subcategory: Cables and Wiring.

FIPS PUB 176 00,208 PC E13 N94-10787/7 NIST/SP-366-SUPPL-4 Developments Needed to Expand the Role of Fire Modeling in Material Fire Hazard Assessment. Bibliography on Atomic Line Shapes and Shifts (July 1978 through March 1992) (Supplement 4).
PB93-173433 00,606 PC A13/MF A03 N94-10787/7 (Order as N94-10766/1, PC A16/MF A03) FIPS PUB 177 NIST/SP-400-91 Initial Graphics Exchange Specification (IGES). Category: Software Standard; Subcategory: Graphics and Information NCSL/SNA-91/2 Semiconductor Measurement Technology: A Collection of Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations, RESPAC. Portable Estelle Translator: An Overview and User Guide. PB93-183473 00,260 PC A03/MF A01 00,417 PC A03/MF A01 NCSL/SNA-91/3 FIPS PUB 178 PB93-219806 00.366 PC A07/MF A02 Distributed Implementation Generator: An Overview and Video Teleconferencing Services at 56 to 1,920 KB/S. Category: Telecommunications Standard and Subcategory: Video Teleconferencing.
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Annual Report, January-December 1992 NIST/GCR-92/617 Proceedings: ICSSC Issues Workshop. Development of Annual Report, January-December 1992. PB93-207470 00,381 PC A03/MF A01 Proceedings: ICSSC Issues Workshop. Development of Seismic Evaluation and Rehabilitation Standards for Federally Owned and Leased Buildings. Held in Denver, Colorado on September 16-17, 1992.

PB93-228666 00,083 PC A03/MF A01 NIST/SP-500/208 Manual for Data Administration. ISBN-0-16-041820-8 PB93-182053 00,258 PC A08/MF A02 Machining of Advanced Materials: Proceedings of the International Conference on Machining of Advanced Materials. Held in Gaithersburg, Maryland on July 20-22, 1993. PB93-217578 00,442 PC A23/MF A04 NIST/SP-500/209 NIST/GCR-92/619 Software Error Analysis. PB93-200871 00,263 PC A06/MF A02 Generation of Carbon Monoxide in Compartment Fires. PR93-146702 00.198 PC A12/MF A03 NIST/SP-500-210 N93-14747/8 Application Portability Profile (APP): The U.S. Government's Open System Environment Profile OSE/1 Version 2.0. PB93-216943 00,264 PC A06/MF A02 NIST/GCR-92/620 Flow Behavior in Liquid Molding. Designing and Implementing a State Quality Award. PB93-154458 00,695 PC A04/MF A01 N93-14747/8 00,478 (Order as N93-14744/5, PC A09/MF A02) NIST/SP-500-211 NIST/GCR-93/621 N93-14778/3 Reference Model for Frameworks of Software Engineering Environments (Technical Report ECMA TR/55, 3rd Edition). PB94-112497 00,274 PC A07/MF A02 Status of Emerging Standards for Removable Computer Storage Media and Related Contributions of NIST. N93-14778/3 00,228 Extinguishment of Combustible Porous Solids by Water Droplets. PB93-198893 00,203 PC A03/MF A01 NIST/SP-777-ED-1993 (Order as N93-14771/8, PC A13/MF A03) NIST/GCR-93/622 NIST Serial Holdings, 1993. N93-20188/7 Transient Cooling of a Hot Surface by Droplets Evaporation. Final Report, November 1990. PB93-189421 00,609 PC A06/MF A02 PB94-120847 00,413 PC A12/MF A03 Principles of Gas Phase Processing of Ceramics during NIST/SP-782-ED-1993 00,609 PC A06/MF A02 Combustion. N93-20188/7 NIST Standard Reference Data Products Catalog, 1993. PB93-173409 00,163 PC A05/MF A01 NIST/GCR-93/624 (Order as N93-20178/8, PC A15/MF A03) Experimental Study of Multiple Droplet Evaporative Cooling. PB93-198463 00,613 PC A06/MF A02 NIST/SP-800/5 N93-20205/9 NIST/GCR-93/625 Guide to the Selection of Anti-Virus Tools and Techniques. PB93-152049 00,221 PC A03/MF A01 Ignition and Subsequent Flame Spread over a Thin Cel-PB93-152049 lulosic Material. Procedures for Selecting Earthquake Ground Motions at N93-20205/9 NIST/SP-800/6 Rock Sites (Revised). (Order as N93-20178/8, PC A15/MF A03) PB93-185973 00,542 PC A03/MF A01 Automated Tools for Testing Computer System Vulner-N93-25059/5 NIST/GCR-93/626-VOL-1 ability. PB93-146025 00.219 PC A03/MF A01 Designing for Frequency and Time Metrology at the 10 to the Minus 18 Power Level. International Survey of Industrial Applications of Formal Methods. Volume 1. Purpose, Approach, Analysis, and NIST/SP-800-8 Security Issues in the Database Language SQL.
PR94-104585 00,273 PC A03/MF A01 N93-25059/5 (Order as N93-24978/7, PC A22/MF A04) 00,255 PC A07/MF A02 NIST/GCR-93/626-VOL-2 N93-27714/3 NIST/SP-810-ED-1993 International Survey of Industrial Applications of Formal Methods. Volume 2. Case Studies.
PB93-178564 00,256 PC A09/MF A03 Data Management Standards in Computer-Aided Acquisi-National Voluntary Laboratory Accreditation Program 1993 tion and Logistic Support (CALS). N93-27714/3 Directory. PB93-156644 00.289 00.402 PC A08/MF A02 (Order as N93-27704/4, PC A23/MF A04) NIST/GCR-93/627 NIST/SP-823/3 U.S. Fires in 'Board and Care' Homes Matrix Display of Selected Fatal Fires. Special Analysis.
PB93-198869 00,025 PC A06/MF A02 N93-27779/6 North American ISDN (Integrated Services Digital Network) Users' Forum Agreements on ISDN. PB93-173391 00,211 PC A11/MF A03 Electrical and Infrared Properties of Thin Niobium Microbolometers Near T(sub c). N93-27779/6 NIST/GCR-93/628 NIST/SP-823-4 (Order as N93-27726/7, PC A99/MF A06) Study of Fire Induced Flow along the Vertical Corner Wall. Integrated Services Digital Network Conformance Testing. Layer 2, Data Link Layer (LAPD). Part 1, Basic Rate Interface, User Side. N93-27980/0 PB93-205623 00,074 PC A04/MF A01 Intelligent Robots for Planetary Exploration and Construc-PB94-120920 00,213 PC A99/MF E11 NIST/GCR-93/629 N93-27980/0 Guide to Board and Care Fire Safety Requirements in the 1991 Editlon of the Life Safety Code.
PB93-220820 00,397 PC A07/MF A02 NIST/SP-838-1 (Order as N93-27956/0, PC A16/MF A03) NIST Building and Fire Research Laboratory. Projects 1993. PB94-118288 00,410 PC A07/MF A02 N94-10103/7 NIST/GCR-93/632 Effect of Gravity Modulation on Thermosolutal Convection. Affordable Fire Safety in Board and Care Homes. A Regulatory Challenge. Final Report.
PB93-219723

00.027

PC A05/MF A04 NIST/SP-838/3 N94-10103/7 Collaborating with Our Customers: NIST Building and Fire Research Laboratory. PB94-110194 00,029 PC A03/MF A01 (Order as N94-10070/8, PC A19/MF A04)

N94-10178/9

N94-10188/8

Effect of Gravitational Modulation on Convection In Vertical Bridgman Growth.
N94-10178/9 00,495

Pulsatile Instability In Rapid Directional Solidification: Strongly-Nonlinear Analysis. N94-10188/8 00,641

(Order as N94-10171/4, PC A20/MF A04)

NIST/GCR-93/635

NIST/MONO-175

PB93-190338

Private Branch Exchange (PBX) Security Guldeline. PB94-100880 00,212 PC A04

Temperature-Electromotive Force Reference Functions and Tables for the Letter-Designated Thermocouple Types Based on the ITS-90.

00.079 PC A03/MF A01

00,034 PC A04/MF A01

NIST/SP-838-4

NIST/SP-841

PC A04/MF A01

00.611 PC A99/MF A06

(Technical and Societal). PB94-113420

Elements and Related Sitework. PB93-146017

Impacts: NIST Building and Fire Research Laboratory

UNIFORMAT II: A Recommended Classification for Bullding

NIST-SP-845

Report of the National Conference on Weights and Measures (77th). Held in Nashville, Tennessee on July 19-23, 00.406 PC A16/MF A03

PB93-209781 NIST/SP-846

Accuracy in Powder Diffraction II. Proceedings of the International Conference. Held in Gaithersburg, Maryland on May 26-29, 1992. 00 648 PC A11/MF A03 PR03-141737

NIST/SP-847

Machining of Advanced Materials: Proceedings of the International Conference on Machining of Advanced Materials. Held in Gaithersburg, Maryland on July 20-22, 1993. PB93-217578 00,442 PC A23/MF A04

NIST/SP-848 Collection of Successful Interactions between the MTCs and Client Firms. PR93-206886 00.092 PC A03/MF A01

NIST/SP-849

Proceedings of the Joint DoD/NIST Workshop on International Precision Fabrication Research and Development. Held in Rockville, Maryland on October 27-29, 1992. PB93-192318 00,440 PC A11/MF A03

NIST/SP-850

International Colloqium on Atomic Spectra and Oscillator Strengths for Astrophysical and Laboratory Plasmas (4th). Held at the National Institute of Standards and Technology, Gaithersburg, Maryland on September 14-17, 1992. PB93-198422 00,012 PC A10/MF A03

NIST/SP-851 Test Methods for Quantifying the Propensity of Cigarettes to Ignite Soft Furnishings. PB94-108644 00.047 PC A08/MF A02

NIST/SP-852

Modeling the Ignition of Soft Furnishings by a Cigarette. PB94-109014 00,048 PC A08/MF A02

NIST/SP-853 MOIST: A PC Program for Predicting Heat and Moisture Transfer in Building Envelopes. Release 2.0. PB94-112448 00,078 PC A03/MF A01

MIST/SD-855

Databases Available in the Research Information Center of the National Institute of Standards and Technology. PB94-114568 00,412 PC A07/MF A02 NIST/SP-858

Guide to NIST. PB94-119435 00,002 PC A06/MF A02 NIST/SW/DK-93/001

PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers). PB93-500437 00,269 CP D03

NIST/SW/DK-93/001A

PC-OMNITAB: An Interactive System for Statistical and Numericel Data Analysis (Documentation).
PB93-111656 00,249 PC A03/MF A01

NIST/SW/DK-93/006

Building Life Cycle Cost Computer Program (BLCC), Version 4.11 (for Microcomputers).
PB94-500055 00,042 CP D02

NIST/SW/DK-93/007

Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcomputers). PB94-500097 00,385 CP D02 NIST/SW/MT-93/003A

COBOL Compiler Validation System (CCVS 85), User Guide, Version 4.2. PB93-163178 00.254 PC A14/MF A03

NIST/SW/MT-93/004

COBOL 85 Compiler Validation System (CCVS 85), Version PB93-504918 00.270 CP T99

NIST/SW/MT-93/005

OSIKIT (Open Systems Interconnection) and NIST Prototype Compiler for Estelle. PB93-505758 00,271 Mag Tape \$2400.00

NIST/SW/MT-93/005A

Portable Estelle Translator: An Overview and User Guide. PB93-183473 00,260 PC A03/MF A01

NIST/SW/MT-93/005B

Distributed Implementation Generator: An Overview and 00,259 PC A03/MF A01 NIST/TN-1295

Initial Graphics Exchange Specification Hybrid Microcircuit Application Protocol. PB93-175404 00,361 PC A09/MF A03 NIST/TN-1297

Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurements Results. PB93-159465 00,403 PC A03/MF A01

NIST/TN-1298

NIST Measurement Service for DC Standard Resistors. PB93-139079 00,347 PC A04/MF A01

CFAST, the Consolidated Model of Fire Growth and Smoke Transport. PB93-174902 00.071 PC A11/MF A03 NIST/TN-1346

Tables for the Thermophysical Properties of Ethane. 00.150 PC A14/MF A03 PR93-160786 NIST/TN-1356

Flow Conditioner Location Effects in Orifice Flowmeters. PB93-159457 00,379 PC A04/MF A01 PB93-159457 NIST/TN-1358

Microcelorimeter for 7 mm Coaxial Transmission Line. PB94-112455 00,338 PC A04/MF A01 NIST/TN-1400

Issues, Concepts, and Standard Techniques in Assessing Accuracy of Coordinate Measuring Machines. PB93-184331 00,448 PC A05/MF A01 PB93-184331

NIST/TN-1401

EXAM: A Two-State Thermodynamic Analysis Program. PB93-191658 00,166 PC A06/MF A02 NIST/TN-1402

RADCAL: A Narrow-Band Model for Radiation Calculations in a Combustion Environment. PB93-200889 00.204 PC A04/MF A01 NIST/TN-1403

Chaos, Dissipation, Arrow of Time, in Quantum Physics. PB93-208494 00,615 PC A03/MF A01

NIST/TN-1404

Thermodynamic Properties of Homogeneous Mixtures of Nitrogen and Water from 440 to 1000 K, Up to 100 MPa and 0.8 Mole Fraction N2.
PB94-118494
00,617 PC A05/MF A01

NIST/TN-1405

Computational Materials Science of Cement-Based Materials: An Education Module. PR94-111424 00.188 PC A03/MF A01

NIST92USN500-2-1.11

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11271, U.S. Navy AdaVAX Version 5.5 (/NO OPTIMIZE) VAXstation 4000 > VAXstation 4000.

AD-A265 261/8 00,278 PC A04/MF A01

NIST92USN500-3-1.11

Ada Compiler Validation Summary Report. Certificate Number: 920918S1.11272, U.S. Navy Ada/M, Version 4.5 (/OP-TIMIZE) VAX 8550/8600/8650 (Cluster) > Enhanced Processor (EP) AN/UYK-44 (Bare Board).

AD-A265 260/0 00,239 PC A05/MF A01

NIST93DEC505-1-1.11

Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS AXP Systems, Version 3.0-5, DEC 3000 Model 400 (host target), 930319S1.11315. 00.236 PC A05/MF A01 AD-A264 885/5

NIST93DEC505-3-1.11

Validation Summary Report: Digital Equipment Corporation, DEC Ada for Open VMS VAX Systems, Version 3.0-7, VAXstation 4000 Model 60 (host) => VAXstation 3100 Model 48 (target), 930319S1.11317.

AD-A264 886/3 00,237 PC A05/MF A01

NISTIR-3953

Tables of Experimental Data Used for the Correlation of the Thermophysical Properties of Ethane.
PB93-173417 00,164 PC A14/MF A03

NISTIR-3979

Aluminum Alloys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-LI Alloys and Alloy 2219. PB93-173441 00,501 PC A07/MF A02

NISTIR-3992

Structure-Property Relationships In Microalloyed Ferrite-Pearlite Steels Phase 1: Literature Review, Research Plan, and Initial Results. PB93-234706 00.487 PC A04/MF A01

NISTIR-3997

Transfer Functions for Characterizing Multimode Optical Fiber Components. PB93-162865 00.345 PC A07/MF A02

NISTIR-3998

Modeling of X-ray Diffraction Line Broadening with the Voigt Function: Applications to High-T(sub c) Superconductors. PB93-152072 00,661 PC A06/MF A02

NISTIR-3999

Review of Irradiation Effects on Organic-Matrix Insulation. PB93-206928 00,546 PC A13/MF A03

NISTIR-4446

Center for Electronics and Electrical Engineering Technical Progress Bulletin Covering Center Programs, April to June 1990, with 1990/1991 CEEE Events Calendar. PB93-205524 00,364 PC A03/MF A01

NISTIR-4520

Center for Electronics and Electrical Engineering Technical Publication Announcements Covering Center Programs, April to June 1990, with 1991 CEEE Events Calendar. PR93-205516 00.363 PC A03/MF A01

NISTIR-4583

Measurements for Competitiveness in Electronics. First Edi-PR93-160588 00.091 PC A20

NISTIR-4635

Guidelines and Procedures for Implementation of the Executive Order on Seismic Safety of New Construction (July 1991) PB93-228674 00.084 PC A03/MF A01 NISTIR-4657

Proceedings: Open Forum on Surge Protection Application, PB94-118056 00,346 PC A09/MF A02 NISTIR-4721

Questions and Answers on Quality, the ISO 9000 Standard Series, Quality System Registration, and Related Issues. PB93-152080 00,090 PC A03/MF A01

NISTIR-4761 Federal Move to Metric: Public Law, DoC and NIST. PB93-139129 00,089 PC A03/MF A01 NISTIR-4769

Effect of Subsurface Conditions on Earthquake Ground Motions. PB93-158343 00.192 PC A05/MF A01

NISTIR-4819

Applicability of the Maturity Method to High-Performance PB93-157451 00.182 PC A04/MF A01

NISTIR-4821

Envelope Design Guidelines for Federal Office Buildings: Thermal Integrity and Airtightness. PB93-183770 00,376 PC A09/MF A02

NISTIR-4860 Metrologic Support for the DARPA/NRL-XRL Mask Program: Ellipsometric Analyses of SiC Thin Films on Si. PB93-152098 00,354 PC A03/MF A01

NISTIR-4865

Binocular Spherical Disparity: A Study in Representation for a Forward Translating Camera.
PB93-184422 00,301 PC A07/MF A02

NISTIR-4890 Test Guide for CMOS-On-SIMOX Test Chips NIST3 and

NIST4 PB93-152106 00,355 PC A06/MF A02 MISTIR-4916

Controlling Moisture in the Roof Cavities of Manufactured Housing. PB93-139046 00.052 PC A04/MF A01 NISTIR-4927

Limited Tests to Investigate Whether the Size of Body Armor Samples Influences Ballistic Test Results. PB93-138998 00,554 PC A03/MF A01 NISTIR-4930

DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus CD-ROM. NIST Speech Disc 1-1.1 PB93-173938 00.215 PC A05/MF A01

NISTIR-4935 Evaluation of Compact Fluorescent Lamp Performance at Different Ambient Temperatures.

PB93-146694 00,035 PC A04/MF A01 NISTIR-4937 Validation Testing System: Reusable Software Component Design. National PDES Testbed Report Series. PB94-109220 00,427 PC A03/MF A01

NISTIR-4938

Using Self-Organizing Recognition as a Mechanism for Rejecting Segmentation Errors.
PB93-138972 00,250 PC A03/MF A01 NISTIR-4942-1

Present Worth Factors for Life-Cycle Cost Studies In the Department of Defense (1994). PB94-109238 00,540 PC A04/MF A01 NISTIR-4947

Comparison of Ceiling Jet Temperatures Measured In an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models.

PB93-158657 00,539 PC A03/MF A01 NISTIR-4954

Methods for Predicting Remaining Life of Concrete in Struc-PB93-139020 00,180 PC A03/MF A01

Thermodynamically-Consistent Phase-Field Models for Solidificetion. PR93-139012

NISTIR-4956

00.646 PC A03/MF A01 NISTIR-4957

PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis (Documentation).
PB93-111656 00,249 PC A03/MF A01 NISTIR-4958

Quality Control Tests for Adhesion of Paint on the Panels of Tactical Rigid Wall Shelters, Phase 2. PB93-173474 00,476 PC A03/MF A01 NISTIR-4959

Tribological Investigations of Composites and Other Selected Materials Sliding against Vacuum-Deposited MoS2

Coatings. PB93-138949 00,462 PC A04/MF A01 NISTIR-4960 Lighting System Design and Evaluation in Federal Office

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Comparison of Full Scale Fire Tests and a Computer Fire Model of Several Smoke Ejection Experiments. PB93-139087 00,551 PC A03/MF A01

Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, February 2-3, 1993). PB94-112430 00,434 PC A04/MF A01

NTIS ORDER/REPORT NUMBER INDEX

NISTIR-4964 Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993).

PB93-173508 00.474 PC A10/MF A03 NISTIR-4965

Materials Reliability. Technical Activities, 1992. (NAS-NRC Assessment Panel, May 13-14, 1993). PB93-173466 PC A06/MF A02 NISTIR-4969

MAESTRO: A Front-End to the MAIN1 Program for Multiple-Angle Measurement of Silicon Dioxide Layers.
PB93-139038 00,352 PC A03/MF A01 NISTIR-4970

Report on the Raster Capabilities of MIL-R-28002A and MIL-D-28003A. 00.418 PC A03/MF A01

PB93-140820 NISTIR-4971

Asymptotic Behavior of Modulated Taylor-Couette Flows with a Crystalline Inner Cylinder.
PB93-139061 00,647 PC A03/MF A01 NISTIR-4972

Observations from a Field Study of the Performance of PB93-146386 PC A03/MF A01 NISTIR-4975

Test Methods for Detention and Correctional Facility Locks. PB93-139111 00,054 PC A04/MF A01 NISTIR-4976

Assessing Federal and Commercial Information Security PB93-138956 00,218 PC A03/MF A01

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PB93-139004 00,458 PC A03/MF A01

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Acoustic Emission of Structural Materials Exposed to Open Flames. PB93-138980 00,051 PC A03/MF A01 **NISTIR-4985**

User's Guide for CFAST Version 1.6. 00.055 PC A06/MF A02 PB93-140788 NISTIR-4986

Information Technology Vision for the U.S. Fiber/Textile/Apparel Industry.
PB93-139095 00,482 PC A03/MF A01 NISTIR-4987

Database Management Systems in Engineering. PB93-146454 00,419 PC A04/MF A01 NISTIR-4988

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NISTIR-4989 Reduction of Hydrogen Cyanide Concentrations and Acute Inhalation Toxicity from Flexible Polyurethane Foam Combustion Products by the Addition of Copper Compounds. Part IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foam with and without Copper Compounds.

pounds. PB93-139103 00.053 PC A06/MF A02 NISTIR-4990

OCR Error Rate Versus Rejection Rate for Isolated Handorint Characters. PB93-146652 00,294 PC A03/MF A01 NISTIR-4991

Guidelines for Using Emulators to Evaluate the Performance of Energy Management and Control Systems.
PB93-138931 00,033 PC A04/MF A01 **NISTIR-4992**

Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377 PC A04/MF A01 NISTIR-4993

Workshop on Elevator Use during Fires. Held in Gaithersburg, Maryland on September 29, 1992. PB93-235190 00,045 PC A03/MF A01 NISTIR-4994

Simulating the Effect of Beamed Ceilings on Smoke Flow. Part 1. Comparison of Numerical and Experimental Results. PB93-152056 00,062 PC A03/MF A01

NISTIR-4995

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Autonomous Obstacle Avoidance Using Visual Fixation and Looming. PB93-146660 00.454 PC A03/MF A01

NISTIR-4997

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, April to June 1992, with 1992/1993 EEEL Events Calendar. PB93-147163 00.353 PC A03/MF A01 NISTIR-4998

NIST Length Scale Interferometer Measurement Assurance. PB93-146645 00,401 PC A03/MF A01 **NISTIR-49**99

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PB93-146033 00,567 PC A03/MF A01

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NISTIR-5001 Shielded Open-Circuited Sample Holders for Dielectric and Magnetic Measurements of Liquids and Powders.
PB93-198851 00,319 PC A03/MF A01

NISTIR-5004 Cryogenic Mechanical Testing of Al-Li Alloys at NIST. PB93-228633 00,502 PC A04/MF A01

NISTIR-5005 Selected EMC Standards and Regulations: A Summary. PB93-220002 00,639 PC A03/MF A01

NISTIR-5006 NIST Measurement Service for Electromagnetic Character-

ization of Materials. PB94-110186 00.321 PC A03/MF A01 NISTIR-5007

Dual-Port Circularly Polarized Probe Standards at the National Institute of Standards and Technology.
PB93-235208 00,326 PC A03/MF A01

NISTIR-5008 Metrology for Electromagnetic Technology: A Bibliography of NIST Publications. PB94-108776 00,341 PC A05/MF A01

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NISTIR-5010 Results of Screened-Room Measurements on NIST Stand-

ard Radiators. PB94-123056 00.323 PC A03/MF A01 NISTIR-5012

Analysis of the Impact on U.S. Industry of the NIST/Boulder Superconductivity Programs: An Interim Study. PB94-120680 00,692 PC A03/MF A01 NISTIR-5101

ONR-Sponsored Research in Ultrasonic Measurements at NIST: 1982-92. PB93-152064 00,618 PC A03/MF A01

NISTIR-5104 Mechanism for Capture into Resonance. PB93-145761 00,010 PC A03/MF A01 NISTIR-5105

Machine-Assisted Human Classification of Segmented Characters for Optical Character Recognition Testing and Training PB93-152155 00,296 PC A03/MF A01

NISTIR-5106 Report on Scoping the Apparel Manufacturing Enterprise. PB93-152163 00,429 PC A03/MF A01 NISTIR-5107

Proceedings of the AP Validation Workshop. Held in Seattle, Washington on April 13-14, 1992. National PDES Testbed Report Series. PR93-158715 00.423 PC A07/MF A02

NISTIR-5108 Raster Graphics: A Tutorial and Implementation Guide. PB93-152171 00,421 PC A07/MF A02 NISTIR-5109

Test Procedure for Handgun Accuracy.

00,556 PC A03/MF A01 NISTIR-5111

CSTL Technical Activities 1992. PB93-173482 00,165 PC A17/MF A04 NISTIR-5113

Proton Monte Carlo Transport Program PTRAN. PB93-158673 PC A03/MF A01 NISTIR-5114 Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs,

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Effect of Critical Parameters on the Behavior of Partially-Grouted Masonry Shear Walls under Lateral Loads. PB93-206894 00,076 PC A03/MF A01 NISTIR-5117

Research Plan for Masonry Shear Walls. PB93-206183 00,075 PC A03/MF A01 NISTIR-5118

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More Questions and Answers on the ISO 9000 Standard Series and Related Issues. PB93-140689 00,093 PC A04/MF A01

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NISTIR-5125 Computer Model for the Diffusion and Binding of Chloride lons in Portland Cement Paste. PB93-159051 00.183 PC A03/MF A01

NISTIR-5126 Applying the NIST Real-Time Control System Reference Model to Submarine Automation: A Maneuvering System Demonstration.

PB93-184257 00,545 PC A04/MF A01 **NISTIR-5127** Computer Systems Laboratory Annual Report, 1992. PB93-181873 00,229 PC A05/MF A02

NISTIR-5128 Strengthening Methodology for Lightly Reinforced Concrete

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NISTIR-5132

Design of Smoke Control Systems for Areas of Refuge. PB93-183754 00,072 PC A03/MF A01 NISTIR-5133

Physics Laboratory Technical Activities, 1992. PB93-178648 00,607 PC A10/MF A03 NISTIR-5134

Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0. PB93-219764 00,390 PC A04/MF A01

NISTIR-5135

Site Exploration for Radon Source Potential. PB93-162972 00,394 PC A04/MF A01 NISTIR-5136

Dose in Water from External Irradiation by Electrons: Radiation Protection Data. PB93-173425 00,548 PC A03/MF A01

NISTIR-5137 User's Guide for the Algorithm Testing System/Version 1. PB93-175990 00,447 PC A03/MF A PC A03/MF A01

NISTIR-5138

Program for Conformity Assessment System Evaluation: Analysis of Comments on the NIST Proposal. PB93-170900 00.094 PC A03/MF A01

NISTIR-5139 Using Synthetic-Perturbation Techniques for Tuning Shared Memory Programs. PB93-178572 00,257 PC A03/MF A01

NISTIR-5141 Data Probe User's Guide. National PDES Testbed Report Series. PB93-178655 00.425 PC A04/MF A01

NISTIR-5142 Intelligent Control System for a Cutting Operation of a Continuous Mining Machine. PR93-178622 00 544 PC A04/MF A01 NISTIR-5143 Estimating Soil Parameters Important for Lifeline Siting Using System Identification Techniques. PB93-178606 00,193 PC A05/MF A01 NISTIR-5144 Horizontal Nucleate Flow Boiling Heat Transfer Coefficient Measurements and Visual Observations for R12, R134a, and R134a/Ester Lubricant Mixtures. PB93-178598 00,493 PC A03/MF A01 NISTIR-5146 Detailed Design Specification for Conformance Testing of Computer Graphics Metafile (CGM) Interpreter Products. PB93-178580 00,424 PC A04/MF A01 NISTIR-5147 Strength of Partially-Grouted Masonry Shear Walls under Lateral Loads. PR93-206225 00.082 PC A04/MF A01 NISTIR-5148 Strategic Plan for the Factory Automation Systems Division. PB93-189801 PC A04/MF A01 NISTIR-5149 Statistical Analysis of Information Content for Training Pattern Recognition Networks. PB93-178861 00,299 PC A03/MF A01 NISTIR-5150 Estimating In situ Liquefaction Potential and Permanent Ground Displacements Due to Liquefaction for the Siting of Lifelines. PB93-178614 00,194 PC A06/MF A02 NISTIR-5152 Bench-Scale Predictions of Mattress and Upholstered Chair NISTIR-5153 Minimum Security Requirements for Multi-User Operating PB93-185999 00.223 PC A03/MF A01 NISTIR-5154 Metrication: An Economic Wake-up Call for U.S. Industry. PB93-188969 00,088 PC A03/MF A01 NISTIR-5155 Guide to Voice Privacy Equipment for Law Enforcement Radio Communications Systems. PB93-189827 00,701 PC A03/MF A01 NISTIR-5157 Mechanical, Stress-Rupture, and Fracture Toughness Properties of Normalized and Stress Relieved AAR TC128 Grade B Steel at Elevated Temperatures. PB93-182020 00,485 PC A03/MF A01 NISTIR-5158 Surveillance Schemes with Applications to Mass Calibra-PB93-181881 00,608 PC A04/MF A01 NISTIR-5162 Programmer's Reference Guide to FDMS File Formats. PB93-182038 00,201 PC A03/MF A01 NISTIR-5163 Comparative Performance of Classification Methods for Fingerprints. PB93-184273 00.300 PC A03/MF A01 NISTIR-5164 Bibliographic Notes on Voronoi Diagrams. PB93-189298 00,509 PC A04/MF A01 NISTIR-5165 Life-Cycle Costing Workshop for Energy Conservation in Buildings: Student Manual. PB93-198984 00,383 PC A11/MF A03 NISTIR-5166 Proceedings of the Meeting of the Intergovernmental U.S.-Russian Business Development Committee's Standards Working Group (2nd). Held in Gaithersburg, Maryland on March 23-24, 1993. PB93-179968 00,087 PC A14/MF A03 NISTIR-5168 Computational Experience with Radial Basis Function Networks. PB93-206191 00.303 PC A03/MF A01 NISTIR-5169 National Testbed for Process Planning Research. PB93-189793 00,439 PC A03/MF A01 NISTIR-5170 Measurement Uncertainty Considerations for Coordinate

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ness in Electronics. PB93-228625

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PB94-103660 00,004 PC A03/MF A01 Fracture Mechanics Evaluation of Railroad Tank Cars Containing Postulated Circumferential Cracks.
PB93-219731 00,486 PC A03/MF A01 NISTIR-5221 Assessment of the Role of Charged Secondaries from Nonelastic Nuclear Interactions by Therapy Proton Beams Dictionary Production for Census Form Conference PB93-207959 00,304 PC A03 00,304 PC A03/MF A01 in Water. PB93-219772 NISTIR-5223 Discharge of Fire Suppression Agents from a Pressurized Vessel: A Mathematical Model and Its Application to Experi-Bibliography of Screw Thread Measurement, PB94-101821 00,460 PC A05/MF A01 00,044 PC A04/MF A01 NISTIR-5224 SGML DTD for the STEP Integrated Resource Parts. National PDES Testbed Report Series.
PB94-114501 00,428 PC A03/MF A01 Dimensional Inspection Planning Based on Product Data Standards. National PDES Testbed Report Series. PB93-198455 00,450 PC A03/MF A01 NISTIR-5226 Penetration of Proton Beams through Water. 1. Depth-Dose Distribution, Spectra and LET Distribution. PB93-219749 00,537 PC A04/MF A01 BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program (Version 4.0). User's Guide and Reference Manual. PB93-208460 00,026 PC A05/MF A01 NISTIR-5227 Air Moving Systems and Fire Protection. PB93-234722 00,398 PC A03/MF A01 ERATES: A Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (Version 1.0). User's Guide and Reference Manual. PB93-228658 00,384 PC A03/MF A01 NISTIR-5231 Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, January to March, 1993 with 1993/1994 EEEL Events Cal-Elastic Scattering of Electrons and Positrons by Atoms: Database ELAST.
PB93-207512 00,614 PC A06/MF A02 PB93-234698 NISTIR-5232 Report of the NSF/NIST Workshop on NSFNET/NREN Security. Held on July 6-7, 1992. PB93-228682 00,225 PC A05/MF A01 Highway Concrete (HWYCON) Expert System Requirements and Installation Guide. 00.187 PC A03/MF A01 NISTIR-5233 Operating Principles of the VME MultiKron Interface Board. PB93-234730 PC A03/MF A01 Computer Graphics Metafile (CGM) Test Requirements NISTIR-5235 00,293 PC A04/MF A01 Calculating Cement Paste and Mortar Diffusivity from Conductivity Measurements: Preliminary Results of a New Method. In situ Burning of Oil Spills: Mesoscale Experiments and PR94-112802 00,396 PC A03/MF A01 NISTIR-5236 Some Guidelines for Implementing Error Compensation on Machine Tools.
PB93-234680 00,452 PC A04/MF A01 Report on a Workshop for Improving Relationships between Users and Suppliers of Microlithography Metrology Tools. PB93-206233 00,365 PC A03/MF A01 NISTIR-5237 Report of the ARPA/NIST Workshop on Performance Evaluation of Unmanned Ground Vehicle Technologies.
PB94-112422 00,456 PC A07/MF A02 Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, October to December, 1992 with 1992/1993 EEEL Events NISTIR-5238 User's Guide for the Programmer's Hierarchical Interactive Graphics System (PHIGS) C Binding Validation Tests (Ver-00.362 PC A03/MF A01 Requirements for an Application Protocol Development Environment. National PDES Testbed Report Series.
PB93-208114 00,426 PC A03/MF A01 Workshop on Characterizing Diamond Films II. Held in Gaithersburg, MD. on February 24-25, 1993. PB93-207157 00,687 PC A04/MF A01 00.041 PC A05/MF A01

sion 2). PB93-228617 NISTIR-5239 Boundary/Interface Fitted Grid Generation Using Tensor Product B-splines: A Preliminary Study.
PB93-234748 00,503 PC A03/MF A01 NISTIR-5241 RL/NIST Workshop on Moisture Measurement and Control for Microelectronics. Proceedings of the RL/NIST Workshop held in Gaithersburg, Maryland on April 5-7, 1993. PB94-108636 00,372 PC A16/MF A03 NISTIR-5242 NIST EXPRESS Toolkit: Introduction and Overview. National PDES Testbed Report Series. PB94-120664 NISTIR-5243

PC A03/MF A01

00,320 PC A11/MF A03

Towards Flexible Distributed Information Retrieval. PB94-102258 00,227 PC A03/MF A01 NISTIR-5246 Performance of 1/3-Scale Model Precast Concrete Beam-Column Connections Subjected to Cyclic Inelastic Loads.
Report No. 3.
PB94-101813

00,085 PC A07/MF A02 NISTIR-5247

Development of a National Metrology Infrastructure for the

00,409 PC A03/MF A01

00 408 PC A03/MF A01

00.538 PC A05/MF A01

00,368 PC A03/MF A01

00.189 PC A03/MF A01

00.268 PC A03/MF A01

00.436 PC A03/MF A01

Domestic Gear Industry.

PB93-2197**15**

Workshop on Security Procedures for the Interchange of Electronic Documents: Selected Papers and Results. PB94-101854 00,226 PC A07/MF A02 NISTIR-5249

NIST Scoring Package Cross-Reference for Use with NIST Internal Reports 4950 and 5129.
PB94-103702 00,305 PC A03/MF A01 NISTIR-5251

Zone Fire Modeling with Natural Building Flows and a Zero Order Shaft Model. PB94-112166 00,030 PC A03/MF A01

Measuring Machines. PB93-189819

NIST Scoring Package Certification Procedures in Conjunction with NIST Special Databases 2 and 6.
PB93-188126 00,302 PC A03/MF A01

NISTIR-5171

NISTIR-5172

NISTIR-5173

NISTIR-5252

Combined Buoyancy- and Pressure-Driven Flow through a Horizontal Vent: Theoretical Considerations. PB94-103694 00,077 PC A03/MF A01

NISTIR-5254

Sprinkler Fire Suppression Algorithm for HAZARD. PB94-103678 00,046 PC A03/MF A01

NISTIR-5255

National Institute of Standards and Technology Conference on Reducing the Cost of Space Infrastructure and Operations. Part 1. Oral Presentations and Discussion. Held in Gaithersburg, Maryland on November 20-22, 1989. PB94-111374 00,699 PC A10/MF A03

National Institute of Standards and Technology Conferenca on Reducing the Cost of Space Infrastructure and Operations. Part 2. Topical Papers. Held in Galthersburg, Maryland on November 20-22, 1989.

PB94-113487

O0,696

PC A11/MF A03

NISTIR-5257

Overview of NIST Research on Seismic Performance of Moment Resisting Precast Concrete Beam-Column Joints Containing Post-Tensioning.
PB94-103686 00.086 PC A02/AET A02

NISTIR-5258

Towards SQL Database Langauge Extensions for Geographic Information Systems. PB94-101847 00,411 PC A08/MF A02

NISTIR-5259

NISTIR-5260

Energy Related Inventions Program. Status Report for Recommendations 1 through 350. PB94-111903 00.374 PC A09/MF A03

NISTIR-5263 Summaries of BFRL Fire Research In-House Projects and Grants, 1993. PB94-121050

00,032 PC A11/MF A03

00,691 PC A03/MF A01

NISTIR-5264

Balanced Design Concepts Workshop. Held in Gaithersburg, Maryland on June 30-July 2, 1993. PB94-108388 00,028 PC A06/MF A02 NISTIR-5268

Research for Electric Energy Systems: An Annual Report, October 1993. PB94-112182 00.375 PC A03/MF A01

NISTIR-5269

Early Detection of Room Fires through Acoustic Emission. PB94-112257 00,031 PC A03/MF A01 NISTIR-5271

Portsmouth Fastener Manufacturing Workstation. Fastener Engraving System (Design, Construction, and Operation). PB94-118221 00,461 PC A04/MF A01

NISTIR-5273

Smoke Plume Trajectory from In situ Burning of Crude Oil PB94-114519 00,393 PC A04/MF A01

NISTIR-5275

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, April to June 1993 with 1993/1994 EEEL Events Calendar. PB94-118403 00,342 PC A03/MF A01 NISTIR-5276

Airborne Asbestos Method: Standard Test Method for Verified Analysis of Asbestos by Transmission Electron Microscopy. Version 1.0.
PB94-113578 00,109 PC A02/MF A01

NISTIR-5279

Morphological Instability in Phase-Field Models of Solidifica-

tion. PB94-111523

NISTIR-5280 Annual Conference on Fire Research, 1993: Book of Ab-PB94-121324 00,205 PC A10/MF A03

NISTIR-5287

FORTRAN Compiler Validation System 1978. User's Guide, /ersion 2. PB94-118460 00,275 PC A08/MF A02

NISTIR-5289 Nanofabrication Technology In Japan. (Japan Technology

Program). PB94-123064 00.693 PC A03/MF A01 NISTIR-5291

Shtolo-Converting STEP Short Listings to Annotated Listings. National PDES Testbed Report Series.
PB94-120623 00,435 PC A03/MF A01 NISTIR-5292

Exppp: An EXPRESS Pretty Printer. National PDES Testbed Report Series. PB94-120797 00.276 PC A03/MF A01 NUREG/CR-4735-V8

Evaluation and Compilation of DOE Waste Package Test Data. Biannual Report, August 1989-January 1990. NUREG/CR-4735-V8 00,549 PC A06/MF A02

ORNL/SUB-89-21857/01

Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377 PC A04/MF A01

PB93-100063

Opportunities for Innovation: Chemical and Biological Sen-PR93-100063 00.096 PC\$75.00/MF A02

PR93-111656

PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis (Documentation).
PB93-111656 00,249 PC A03/MF A01

PB93-124782

New Test Structure for the Electrical Measurement of the Width of Short Features with Arbitrarily Wide Voltage Taps. PB93-124782 00,349 Not available NTIS

PB93-124790

Fast Fourier Transforms for Space Groups Containing Rotation Axes of Order Three and Higher.
PB93-124790 00,642 Not available NTIS

PB93-124808

Heat Release Rate: The Single Most Important Variable in Fire Hazard PB93-124808 00,050 Not available NTIS

PB93-124816

Metrology is More Than Calibration: Letting Others Know That Measurements Matter. PB93-124816 00,443 Not available NTIS

PB93-124824

Lowest Energy Singlet State of Tetrathiophene, an Oligomer of Polythiophene. PB93-124824 00,119 Not available NTIS

PB93-124832

Toward an Intelligent System for Mathematical Software Selection. PB93-124832 00.506 Not available NTIS

PB93-124840

Predictive Thermodynamic Model for Complex High Temperature Solution Phases XI.
PB93-124840 00,120 Not available NTIS

PB93-124857

Ultra-High Temperature Laser Vaporization Mass Spectrometry of SiC and HfO2.
PB93-124857 00,121 Not available NTIS

PB93-124865

Space Marching Difference Schemes in the Nonlinear Inverse Heat Conduction Problem. 00.555 Not available NTIS PB93-124865

PB93-124873

Quantum Theory of the Dynamical Cerenkov Emission of Xrays. PB93-124873 00.559 Not available NTIS

PB93-125128

Exponential Density: Exact Fitting of Structure Moduli by Entropy Maximization.
PB93-125128 00,122 Not available NTIS

PB93-125136

Hydroxyapatite Cement. I. Basic Chemistry and Histologic PB93-125136 00,016 Not available NTIS

PB93-125144

Partial Structure for trans-1,2-Difluoroethylene from High-PB93-125144 O0,123 Not available NTIS

PB93-125151

End-Point Sensitivity In Quantum Dynamic Calculations. PB93-125151 00,560 Not available NTIS

PB93-125169

Elastic and Inelastic Neutron Scattering Study of Hydro-genated and Deuterated Trimethylammonium Pillared Ver-miculite Clays. PB93-125169 00,124 Not available NTIS

PB93-125177

Regular Mechanism of Parity and Time Invariance Nonconserving Effects Enhancement In Neutron Capture and Scattering Near p-Wave Compound Resonancas. PB93-125177 00,561 Not available NTIS

PB93-125185

Benchmark for the Verification of Microwave CAD Software. PB93-125185 00,307 Not available NTIS

PB93-125193

Characterization of a Distribution Function by the Second Moment of the Residual Life. PB93-125193 00,511 Not available NTIS

PB93-125201

High Resolution Spectroscopy Using Fiber Lasers. PB93-125201 00,622 Not available NTIS

PB93-125219

Comment on 'Measurement of the Lamb Shifts In Singlet Levels of Atomic Helium'. PB93-125219 00.562 Not available NTIS

PB93-125623

Preparation and Preliminary Analysis of K-411 Glass Microspheres. PB93-125623 00.097 Not available NTIS PB93-125631

Comments on 'Rapid Pulsed Microwave Propagation'. PB93-125631 00,637 Not available NTIS

PB93-125649

Reciprocity Relations for On-Wafer Power Measurement. PB93-125649 00,350 Not available N 00,350 Not available NTIS PB93-125658

Nuclear Orientation of (160)Tb in Tb Single Crystal. PB93-125656 00,563 Not available NTIS

PB93-125664

Measurement of Structural Deflections 00.080 Not available NTIS PR93-125664

PB93-125672

Precision and Accuracy in XQQ Measurements: A Summary Report of the NIST-EPA International Round Robin. PB93-125672 00,399 Not available NTIS

PB93-125680

Instrument-Independent Database for Collisionally Activated Dissociation in Radiofrequency Only Quadrupoles. Single-Collision Versus Multiple-Collision Conditions.

PB93-125680 00,400 Not available NTIS

PB93-125698

Elementary Particle Physics in the Dalton Manner. PB93-125698 00,564 Not avail 00,564 Not available NTIS

PB93-125706

Logarithmic Terms In Fields Near the Edge of a Dielectric Wedge. PB93-125706 00.638 Not available NTIS

PB93-125714

Direct and Inverse Problems for Light Scattered by Rough Surfaces. PB93-125714 00.623 Not available NTIS

PB93-125821

Rototranslational Absorption Spectra of H2-H2 Pairs in the Far Infrared--Translation. PB93-125821 00,125 Not available NTIS

PB93-125839

Magnetic Transitions in the System YBa2Cu2.8Co0.2O6+y. PB93-125839 00,643 Not available NTIS

PB93-125847

Charge Transfer and Bond Lengths in YBa2Cu3-xMxO6+y. PB93-125847 00,644 Not available NTIS PB93-125854

New Method for Phase Identification for Electron Diffractionists PB93-125854 00,098 Not available NTIS

PB93-125862

Improvements to the Chebyshev Expansion of Attenuation Correction Factors for Cylindrical Samples.
PB93-125862 00,645 Not available NTIS

PB93-125870

Binding of Cis-(1,2-Diamlnocyclohexane)Platinum(II) and Its Derivatives to Duplex DNA. PB93-125870 00.531 Not available NTIS PB93-125888

Effects of Pressure on the Thermal Decomposition Kinetics, Chemical Reactivity and Phase Behavior of RDX. PB93-125888 00,553 Not available NTIS

PB93-125896

Controlled Interfaca Roughness in GaAs/AIAs Superlattices. PB93-125896 00,351 Not available NTIS PB93-125904

Analysis of the Aggregate-Cement Paste Interface Using Grazing Incidence X-ray Scattering.
PB93-125904 00,179 Not available NTIS

PB93-125912

Reduction Reactions of Water Soluble Cyano-Cobalt(III)-Porphyrins: Metal Versus Ligand Centered Processes. PB93-125912 00,514 Not available NTIS PB93-134104

Proceedings of the U.S.-Japan Workshop on Seismic Retro-fit of Bridges (1st). Held in Tsukuba Science City, Japan on December 17-18, 1990. PR93-134104 00.190 PC A19/MF A04

PB93-134112

Overview of Damage to Highway Bridges during the Loma Prieta Earthquake. PB93-134112 (Order as PB93-134104, PC A19/MF A04)

PB93-138931

Guidelines for Using Emulators to Evaluate the Performance of Energy Management and Control Systems.
PB93-138931 00,033 PC A04/MF A01 PB93-138949

Tribological Investigations of Composites and Other Selected Materials Sliding against Vacuum-Deposited MoS2 Coatings. PB93-138949 00.462 PC A04/MF A01 PB93-138956

Assessing Federal and Commercial Information Security Needs. PB93-138956 00.218 PC A03/MF A01

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Using Self-Organizing Recognition as a Mechanism for Rejecting Segmentation Errors.
PB93-138972 00,250 PC A03/MF A01

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Acoustic Emission of Structural Materials Exposed to Open Flames. PB93-138980 00,051 PC A03/MF A01

PB93-138998

Limited Tests to Investigate Whether the Size of Body Armor Samples Influences Ballistic Test Results. PB93-138998 00,554 PC A03/MF A01 00,554 PC A03/MF A01

Comparison of National Standards for the Performence Eveluetion of Coordinate Meesuring Mechines in Terms of Length-Based Dimensionel Quentities. PB93-139004

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PB93-139012 Thermodynemically-Consistent Phese-Field Models for So-

lidification. PB93-139012 00.646 PC A03/MF A01 PB93-139020

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MAESTRO: A Front-End to the MAIN1 Program for Multiple-Angle Measurement of Silicon Dioxide Layers.
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PB93-139046 Controlling Moisture in the Roof Cavities of Manufactured Housing. PB93-139046

00.052 PC A04/MF A01 PB93-139053

Guldelines for the Evaluation of Virtual Terminal Implementations. PB93-139053 00.290 PC A04/MF A01

PB93-139061 Asymptotic Behevior of Modulated Teylor-Couette Flows with a Crystalline Inner Cylinder.
PB93-139061 00,647 PC A03/MF A01

PR93-139079

NIST Meesurement Service for DC Stendard Resistors. PB93-139079 00,347 PC A04/MF A01 PB93-139079 PB93-139087

Comparison of Full Scale Fire Tests and e Computer Fire Model of Severel Smoke Ejection Experiments. PB93-139087 00,551 PC A03/MF A01

PB93-139095 Information Technology Vision for the U.S. Fiber/Textile/Ap-

perel Industry. PB93-139095 00.482 PC A03/MF A01 PB93-139103

Reduction of Hydrogen Cyanide Concentrations and Acute Inheletion Toxicity from Flexible Polyurethene Foam Combustion Products by the Addition of Copper Compounds. Part IV. Effects of Combustion Conditions and Scaling on the Generation of Hydrogen Cyanide and Toxicity from Flexible Polyurethane Foem with end without Copper Compounds.

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PB93-139111 Test Methods for Detention end Correctional Fecility Locks. PB93-139111 00,054 PC A04/MF A01

PB93-139129 Federel Move to Metric: Public Lew, DoC end NIST. PB93-139129 00,089 PC A03/MF A01

PB93-140689

More Questions and Answers on the ISO 9000 Standard Series end Releted Issues. PB93-140689

00,093 PC A04/MF A01 PB93-140788

User's Guide for CFAST Version 1.6. PB93-140788 00.055 PC A06/MF A02 PB93-140820

Report on the Raster Cepebilities of MIL-R-28002A end MII -D-28003A. PB93-140820 00.418 PC A03/MF A01

PB93-141737 Accurecy in Powder Diffraction II. Proceedings of the International Conference. Held in Gaithersburg, Maryland on 26-29, 1992.

PB93-141737 00.648 PC A11/MF A03 PB93-143923

Journal of Research of the National Institute of Standards and Technology, November-December 1992. Volume 97,

PB93-143923 00.565 PC A06/MF A02 PB93-143931

System for Measuring Conditional Amplitude, Phase, or Time Distributions of Pulseting Phenomene. PB93-143931 00.308 (Order es PB93-143923, PC A06/MF A02)

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High Power CW Wattmeter Calibration at NIST. PB93-143949

00.327 (Order as PB93-143923, PC A06/MF A02)

PB93-143956 Compact Fitting Formulas for Electron-Impact Cross Sec-

PR93-143956 (Order es PB93-143923, PC A06/MF A02)

PB93-143964 Accurecy of the Double Verietion Technique of Refractive Index Measurement.
PB93-143964 00.624

(Order es PB93-143923, PC A06/MF A02)

PB93-145761

Mechanism for Capture Into Resonance. 00.010 PC A03/MF A01 PB93-145761

PB93-145779

Assessment of Fossil Energy Materials Research Needs. PB93-145779 00,377 PC A04/MF A01 PB93-146017

UNIFORMAT II: A Recommended Classification for Building Elements and Related Sitework.

00,034 PC A04/MF A01 PB93-146025

Autometed Tools for Testing Computer System Vuinerability. PB93-146025 00.219 PC A03/MF A01

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ESTAR, PSTAR, and ASTAR: Computer Programs for Celculeting Stopping-Power end Range Tebles for Electrons, Protons, end Helium Ions.

PB93-146033 00,567 PC A03/MF A01

PB93-146298 Performance Standard for Wood-Besed Structurel-Use Pen-

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B93-146454
Datebase Management Systems In Engineering.
00,419 PC A04/MF A01

PR93-146645 NIST Length Scale Interferometer Measurement Assurance. PB93-146645 00,401 PC A03/MF A01

PB93-146652 OCR Error Rate Versus Rejection Rate for Isolated Hand-

print Characters. PB93-146652 00.294 PC A03/MF A01 PB93-146660

Autonomous Obstacle Avoidance Using Visual Fixation end Looming. PB93-146660 00.454 PC A03/MF A01 PB93-146678

Smoke Movement in a Corridor-Hybrid Model, Simple Model and Companison with Experiments. PB93-146678 00,057 PC A04/MF A01

PB93-146686 Observetions from e Field Study of the Performance of Polymer-Modified Bitumen Roofing.

PB93-146686 00,058 PC A03/MF A01

PB93-146694 Eveluation of Compact Fluorescent Lamp Performance et Different Ambient Temperatures.

PB93-146694 00.035 PC A04/MF A01 PB93-146702

Generation of Carbon Monoxide in Compartment Fires. PB93-146702 00,198 PC A12/MF A03 PB93-147163

Electronics end Electrical Engineering Leboretory Technical Publication Announcements Covering Laboretory Progrems, April to June 1992, with 1992/1993 EEEL Events Calendar. PB93-147163 00,353 PC A03/MF A01

PB93-147197 Effectiveness of Feature and Classifier Algorithms in Character Recognition Systems. PB93-147197 00.295 PC A03/MF A01

PR93-148948 Journal of Physical and Chemical Reference Data, Volume 21, No. 1, January/February 1992. PB93-148948 00,126 Not aveilable NTIS

PB93-148955

Thermodynamic Properties of the NaCl + H2O System. 1. Thermodynamic Properties of NaCl(cr). PB93-148955 00,127 Not aveilable NTIS

PR93-148963 Spectral Data and Grotrian Diagrams for Highly Ionized Co-balt, Co VIII through Co XXVII. balt, Co VIII th PB93-148963 00,568 Not available NTIS

PB93-148971 Critical Compilation of Surface Structures Determined by Surface Extended X-rey Absorption Fine Structure (SEXAFS) and Surface Extended Electron Energy Loss

Spectroscopy (SEELFS). PB93-148971 00,128 Not available NTIS PB93-148989

Laser-Induced Kerr Constants for Pure Liquids. PB93-148989 00,129 Not available NTIS PB93-148997

Journal of Physical and Chemical Reference Data, Volume 21, No. 2, March/April 1992. PB93-148997 00,569 Not aveilable NTIS

PB93-149003 Recommended Rest Frequencies for Observed Interstellar Molecular Microwave Transitions, 1991 Revision. PB93-149003 00,011 Not evailable NTIS

PB93-149011 Spectral Data end Grotrian Diegrems for Highly IonIzed Venadium, V VI through V XXIII. PB93-149011

00,570 Not available NTIS PB93-149029 Journal of Physical and Chemical Reference Data, Volume

21, No. 3, May/June 1992. PB93-149029 00,199 Not evaileble NTIS PB93-149037

Evaluated Kinetic Data for Combustion Modelling. 00,200 Not aveilable NTIS PR93-149037

PB93-149045

Journal of Physical end Chemical Reference Date, Volume 21, No. 4, July/August 1992. PB93-149045 00,130 Not eveileble NTIS

PB93-149052

Chemical Kinetic Data Bese for Propellant Combustion. 2. Reections Involving CN, NCO, end HNCO. PB93-149052 00,131 Not evelleble NTIS

PB93-149060

Thermodynemic Properties of the NeCl + H2O System. 2. Thermodynamic Properties of NeCl(eq), NeCl2H2O(cr), end Phase Equilibria. PB93-149060 00.132 Not evalleble NTIS

PB93-149078

Vibrational Bands of HxNyOz Molecules.

DRG2-149078 00,133 Not evailable NTIS PB93-149086

Collisions of H(+), H((sub 2)(+)), H((sub 3)(+)), ArH(+), H(-), H, end H2 with Ar end of Ar(+) and ArH(+) with H2 for Energies from 0.1 eV to 10 keV. PR93-149086 00,571 Not aveileble NTIS PR93-149094

Journal of Physical and Chemical Reference Dete, Volume 21, No. 5, September/October 1992. PB93-149094 00,572 Not aveileble NTIS

PB93-149102 Critical Compiletion of Atomic Transition Probabilities for Singly Ionized Argon. PB93-149102 00,573 Not available NTIS

PB93-149110 Solubility of Some Speringly Soluble Salts of Zinc and Ced-mlum in Water end in Aqueous Electrolyte Solutions. PB93-149110 00,134 Not evallable NTIS

PR93-149128 Franck-Condon Factors, r-Centrolds, Electronic Transition Moments, end Einstein Coefficients for Many Nitrogen end Oxygen Band Systems.

PB93-149128 00,114 Not aveilable NTIS

PB93-149136

Journal of Physical end Chemical Reference Dete, Volume 21, No. 6, November/December 1992. 00,013 Not available NTIS PR93-149136 PR93-149144

Evaluated Kinetic end Photochemical Date for Atmospheric Chemistry. Supplement 4. IUPAC Subcommittee on Gas Kinetic Data Eveluation for Atmospheric Chemistry. PB93-149144 00,014 Not available NTIS

PR93-149433 Study of Traffic Control end Congestion Control in Broadband ISDN. 00.210 PC A03/MF A01 PR93-149433

PB93-150670

DNA Bese Modifications Induced in Isoleted Humen Chromatin by NADH Dehydrogenese-Cetelyzed Reduction of Doxorubicin. PB93-150670 00,520 Not eveilable NTIS

PB93-150688 Binery Inductive Voltege Divider Bridge. PB93-150688 00,328 Not eveilable NTIS

PB93-150696 Determination of the Structure of CO2-H2CO. 00.135 Not available NTIS PB93-150696 PB93-150704

Automated System for the Meesurement of High-Velued Resistors. PB93-150704 00,329 Not eveileble NTIS PB93-150712

Quentized Dissipation of the Quantum Hall Effect et High Currents. PB93-150712 00,649 Not available NTIS PR93-150720

Subpicosecond Probing of Vibrational Energy Trensfer at PB93-150720 00,136 Not evaileble NTIS PB93-150738

Effect of a Two-Solution Fluoride Mouth Rinse on Remineralization of Enamel Lesions In vitro.

PB93-150738 00,526 Not availeble NTIS PB93-150746

Transport Current Effects on Flux Creep end Megnetization In Nb-Ti Multitilament Cable Strands. 00,574 Not available NTIS PB93-150746

PB93-150753 High-Resolution FTIR Study of the nu4 Bend of CH2F2. PB93-150753 00,137 Not evaileble NTIS

PB93-150761 Clinical Use of Beta-Quertz Glass-Ceramic Inserts.

00,017 Not available NTIS PB93-150761 PB93-150779

Determination of Uranlum end Thorium in Meterieis Associeted with Reel Time Electronic Solar Neutrino Detectors. PB93-150779 00,575 Not eveilable NTIS PB93-150787

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PB93-150795 Low Temperature Magnetic Behevior of 'Nonmagnetic' Me-PB93-150795 00.309 Not evailable NTIS

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NTIS ORDER/REPORT NUMBER INDEX

PR93-150803 Microwava and Infrared Spectra of C2H4...HCCH: Barriar to Twofoid Intarnal Rotation of C2H4. PB93-150803 00,138 Not available NTIS

PB93-150811

Long-Range Scanning for Scanning Tunnaling Microscopy. PB93-150811 00,625 Not available NTIS

PB93-150829 Obsarvation of Photon Corralations in Scattaring from a Silvar Electrode.

PB93-150829 00.115 Not available NTIS PB93-150837

Intrinsically Colored Microcrystallina Glass-Ceramic for Usa in Dental Rastoration. PB93-150837 00.018 Not available NTIS

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00.650 Not available NTIS PB93-150852 Maasuramant of tha Dipola Momant of Gasaous 1,1,1-

trichiorotriflueroethana, trichiorotrifluoroethana, 1,2-difluoroethana, 1,1,2-and 2-(difluoromathoxy)-1,1,1trifluoroethana. PB93-150852 00,139 Not available NTIS

PB93-151108 Calibration Problam as an III-Posed Invarsa Problam. 00.512 Not available NTIS PB93-151108

PB93-151118 Critical Dynamics of an Asymmetric Binary Polymar Mixtura. PB93-151116 00,169 Not availabla NTIS

PB93-151124

Space Charge Induced in Strassed Polyathylana. PB93-151124 00,343 Not availabla NTIS PB93-151132

Automatad AC Bridga for Rasistance Maasuramants. PB93-151132 00,330 Not available NTIS PB93-151140

Obsarvation of Quantized Motion of Rb Atoms in an Optical PB93-151140 00.576 Not available NTIS

PB93-151157

Comparison of Experimental Maasuraments of Local Flow Boiling Haat Transfar Coefficients for R11 and R123. PB93-151157 00,491 Not available NTIS Not availabla NTiS PB93-151165

CALS Testing: Programs, Status and Strategy. PB93-151165 00,420 Not available NTIS

PB93-151173

NMR Based Current/Voitaga Sourca. PB93-151173 00.331 Not available NTIS PR93-151181

Intarcomparison of NIST, NPL, PTB, and VSL Tharmai Voltaga Convartars from 100 kHz to 1 MHz.
PB93-151181 00,332 Not available NTIS

PB93-151199

Charga Trapping in Cubic Silicon Carbida MIS Capacitors. PB93-151199 00,651 Not available NTIS PB93-151207

3nu3 Band of (32)S(16)O2: Lina Positions and intansitias. PB93-151207 00,140 Not available NTIS PB93-151215

Automating intaractiva Applications in a Natwork Environment. PB93-151215 00,251 Not available NTIS

PB93-151223 Low-Frequancy Errors of Tharmal Voitaga Convartars: A Prograss Raport.
PB93-151223 00,333 Not available NTiS

PB93-151231

Gaochamical Considerations in tha Claaning of Carbonata Stona. PB93-151231 00.059 Not available NTIS PB93-151249

Graphical Mathods for Examining tha Effacts of Acid Rain and Sulfur Dioxida on Carbonata Stonas. PB93-151249 00,060 Not availabla NTIS

PB93-151256 Polarization Analysis of tha Magnatic Excitations in Invar Fe86R14 PB93-151256 00,652 Not availabla NTIS

PB93-151264 Proposed Maasuramant of the Fine Structure Constant Using a Coulomb-Blockada Charga Pump.
PB93-151264 00,577 Not available NTIS

PB93-151272

Chain Conformation of Biock Copolymars in Dilute Solutions Maasured by Smali-Angla Nautron Scattaring. PB93-151272 00,170 Not available NTIS PB93-151280

interiaboratory Comparison of the Apparant Tharmai Conductivity of a Fibrous Batt and Four Loosa-Fill Insulations. PB93-151280 00,061 Not available NTIS PB93-151298

Infrared Spectroscopic Study of Camant Formation of Polymaric Calcium Phosphata Camant.
PB93-151298 00,019 Not availabla NTIS

PB93-151306

Chamical Changa of Hardened PCA/CPC Cemants in Various Storing Solutions.
PB93-151306 00,020 Not available NTIS PB93-151314

DNA Basa Damaga in Chromatin of Gamma-Irradiated Cultured Human Cells.
PB93-151314 00,521 Not availabla NTIS

00,521 Not available NTIS PB93-151322

Rheomatar with Two-Dimansional Araa Detection for Light Scattaring Studias of Polymar Malts and Solutions. PB93-151322 00,171 Not available NTIS 00,171 Not avaiiabia NTIS PB93-151330

Marriage of Exact Enumaration and 1/d Expansion Mathods: Lattice Modal of Diluta Polymars.

PB93-151330

Oo,172

Not available NTIS

PB93-151579

Study of OSI Kay Managamant. PB93-151579 00.220 PC A10/MF A03

PB93-151587

DNA-Protain Cross-Linking between Thymina and Tyrosina in Chromatin of Gamma-Irradiated or H2O2-Traated Cultured Human Cells.

PB93-151587 00.522 Not available NTIS PB93-151595

Collective Laarning Systams: A Modai for Automatic Control. PB93-151595 00.277 Not available NTIS

PB93-151603 Davaiopment of Ora Biolaaching Standards.

PB93-151603 00.496 Not available NTIS PB93-151611

Traatmant of Continuum-Continuum Coupling in tha Theoretical Study of Abova Thrashold Ionization.
PB93-151611 00,578 Not available NTIS PB93-151829

Comparison of Maasurad and Calculated Appearance-Po-Comparison of Maasura and Landal Spectra for Six 3d Matals. 00,141 Not available NTIS

PB93-151637 Maasuremant of tha Dansity Shift of tha H2Q(0-5) Transitions from 295 K to 1000 K.

PR93-151637 00.142 Not available NTIS PB93-151645

MaV Ba impiantation in GaAs. PB93-151645

00,653 Not available NTIS PB93-151652

Kinatics of Bimolecular Recombination Processas with Trapping. PB93-151652 00.143 Not available NTIS

PB93-151660 Surface-Enhanced Raman Study of Banzylpenicillin. PB93-151660 00,099 Not available NTIS

PB93-151678 Crystaliographic Dafacts in Polymars and What Thay Do. PB93-151678 00,173 Not available NTIS

PB93-151688 Multi-Point Calibration of a Gas Chromatograph Using Cryoganic Preconcentration of a Singla Gas Standard Containing Volatila Organic Compounds.

PB93-151686 00,100 Not availabla NTIS

PB93-151694

NIST Coid Nautron Rasaarch Facility and Magnatic Nautron Scattaring. PB93-151694 00.654 Not available NTIS PB93-151702

Tunnaling Stabilized Magnatic Force Microscopy of YBa2Cu3O7-Delta Films on MgO at 76 K. PB93-151702 00,655 Not available NTIS

PB93-151710 Mechanistic Studias of Photoinduced Raactions at Semi-conductor Surfacas. PB93-151710 00,656 Not available NTIS

PB93-151728 Rasolution Considerations for Polarized Triple-Axis Spec-

trometry. PB93-151728 00,657 Not available NTIS PB93-151738

Making Matariais Databasa Standards Intamational. PB93-151736 00,463 Not availal 00.463 Not available NTIS PB93-151744

Quantitativa Evaluation of Distributad Poras in Rafarance Radiographs. PB93-151744 00,444 Not availabla NTIS PB93-151751

Rasonance Effects in tha 5Sigma(-1) Photoionization Channai of CO. P**B**93-151**7**51 00,144 Not availabla NTIS

PB93-151769 X-ray Beam Position Monitor Using a Quadrant PIN Diode. PB93-151769 00,579 Not available NTIS PB93-151777

Synthasis and Evaluation of Noval Multifunctional Oligomars for Dantistry. PB93-151777 00,021 Not available NTIS PR93-151785

Fraa Radical Polymarization of Expandabla Oxaspiro Monomars. PB93-151785 00.174 Not available NTIS PB93-151793

High-Accuracy Sampling Wattmatar. PB93-151793 00,3 00,310 Not available NTIS

PB93-151801

Rasidual Strass in a Porcelain-Matal Strip Ralated to Tharmo-Physical Properties of Materials.
PB93-151801

00,022

Not available NTIS

PB93-151819

Flux Locked Currant Source Rafarance.

PB93-151819 00,334 Not available NTIS

PB93-151827

Electrical Rasistivity of Copper Alloys between 76 K and 300 K PB93-151827 00,311 Not available NTIS

PB93-151835

Effects of Magnasium and Fluoride on the Hydrolysis of Octacalcium Phosphata. PB93-151835 00,023 Not available NTIS

PB93-151843

Partial Discharge Puise-Haight Analysis: Promisas and Limitations PB93-151843 00.312 Not available NTIS

PB93-151850

Re-Examination of Quantum Haii Piateaus. PB93-151850 00,658 Not available NTIS

PB93-151868

In vivo Fluorida Concentrations Maasured for Two Hours Aftar a NaF or a Novel Two-Solution Rinsa. PB93-151868 00,527 Not available NTIS

PB93-151878

Sintaring Raaction Sintaring High-Density, Fine-Grained Ba2YCu3O6.5+x Superconductors Using Ba(OH) 2.H2O. PB93-151876 00,659 Not available NTIS

PR93-151884

NIST Sampling System for tha Calibration of Phase Angle Ganerators from 1 Hz to 100 kHz.
PB93-151884 00,335 Not available NTIS

PB93-151892 Sampling Techniqua for Calibrating Phasa Angla Ganerators from 1 Hz to 100 kHz.

PB93-151892 00.336 Not available NTIS PR93-151900

Prediction Intervals for a Balanced One-Way Random-Effects Model. PB93-151900

PB93-151918 Deformation Twinning, Slip, Martensita Formation and Crack Inhibition in tha B2-Type Zr50Pd35Ru15 Alloy. PB93-151918 00,497 Not available NTIS

00.513 Not available NTIS

PB93-151928

AT2, a Naw Tima Scala Algorithm: AT1 Plus Frequency Varianca. PB93-151926 00.214 Not available NTIS

PB93-151934

Phase-Fiald Modal for Isotharmal Phasa Transitions in Binary Alloys.
PB93-151934 00,498 Not available NTIS

PB93-151942

Structurai Phasa Transi Superconducting Matariais. PB93-151942 Transition Studias of High 00,660 Not available NTIS PB93-151959

Polymar Salf-Diffusion in Nal-Poly(athylena oxide) Electrolytas. PB93-151959 00,175 Not available NTIS

PB93-151967

Specimen Banking at tha National Instituta of Standards and Technology. PB93-151967 00,101 Not available NTIS PB93-151975

Datarmination of Basalina Piatinum Lavais in Biological Matarials. PB93-151975 00,515 Not available NTIS

PB93-152049

Guida to tha Selection of Anti-Virus Toois and Techniquas PR93-152049 00.221 PC A03/MF A01 PB93-152056

Simulating tha Effect of Baamed Callings on Smoka Flow. Part 1. Comparison of Numarical and Experimental Rasuits. PB93-152056 00,062 PC A03/MF A01

PB93-152064 ONR-Sponsored Rasaarch in Ultrasonic Maasuramants at NIST: 1982-92. PB93-152064 00,618 PC A03/MF A01

PB93-152072

Modaling of X-ray Diffraction Line Broadaning with tha Voigt Function: Applications to High-T(sub c) Superconductors. PB93-152072 00,661 PC A06/MF A02

PB93-152080

Quastions and Answars on Quality, tha ISO 9000 Standard Sarias, Quality System Registration, and Related Issuas. PB93-152080 00,090 PC A03/MF A01 PR93-152098

Matrologic Support for the DARPA/NRL-XRL Mask Program: Ellipsomatric Analyses of SIC Thin Films on SI. PB93-152098 00,354 PC A03/MF A01

PB93-153609 Demagnatizing Factors. PB93-153344 Physical Paramaters for L X-ray Production Cross-Sections PB93-153609 00,583 Not available NTIS Tast Gulde for CMOS-On-SIMOX Tast Chips NIST3 and NIST4. 00.664 Not available NTIS 00,583 Not available NTIS PB93-152106 00.355 PC A06/MF A02 PB93-153351 PB93-153617 P893-152155 Magnetic Units and Materials Specification. ASTM Committee, C28, Advanced Caramics: A Prograss Machine-Assisted Human Classification of Sagmantad Characters for Optical Character Racognition Testing and PR93-153351 00.665 Not available NTIS Raport. PB93-153617 00,468 Not available NTIS PB93-153369 PB93-153625 Comparison of Transport Critical Current Measurement 00,296 PC A03/MF A01 Methods. PB93-153369 Information Technology Standards: Processes and Strate-PB93-152163 00.666 Not available NTIS glas. PB93-153625 Report on Scoping the Apparel Manufacturing Enterprise. PB93-152163 00,429 PC A03/MF A01 PB93-153377 00,291 Not available NTIS Effact of Composition on Superconducting Properties in the System Ba-Y-Gd-Cu-O. PB93-153377 00,667 Not available NTIS PR93-153633 lonic Crystals in a Linaar Paul Trap. PB93-153633 00,584 Not available NTIS PB93-152171 Rastar Graphics: A Tutorial and Implamantation Guida. PB93-152171 00,421 PC A07/MF A02 PB93-153385 PB93-153641 Fira Information Challengas of the 21st Century.
PR93-153385 00,067 Not available NTIS Optimized Tharmo-Optic Electric-Fiald Probes for Microwavas and Millimatar Waves.
PB93-153641 00,318 Not available NTIS PB93-153120 Electromagnetic Shlalding of RF Gaskats Maasurad by Two PB93-153393 PB93-153120 Ultra-Broadband and Nondispersiva Sansor for tha Maasurement of Time-Domain Signals.
PB93-153393 00,324 Not availabla NTIS PR93-153658 00.313 Not available NTIS Measurement of the Parformance of a Spiral Wound Poly-imide Reganarator in a Pulsa Tube Rafrigarator. PB93-153658 00,111 Not available NTIS PB93-153138 Comparison Maasuramants of Currants Induced by Radi-PB93-153401 ation and Injection. PB93-153138 PB93-153666 Correlations of Magnetic Microstructura and Anisotropy with Noisa Spectra for CoNi and CoCrTa Thin Film Madia. PB93-153401 00,668 Not available NTIS 00.314 Not available NTIS Millimeter Wave Matrology at the National Institute of PB93-153146 Standards and Technology. PB93-153666 Fast Fouriar Transform Algorithms for Real and Symmatric 00,359 Not available NTIS PB93-153419 Data New Spharical Dipole Sourca. PB93-153419 PB93-153674 PB93-153146 00,507 Not available NTIS 00.325 Not available NTIS Water Vapor Sorption Maasuramants of Common Building PB93-153153 Materials. PB93-153674 PB93-153427 Use of High Accuracy NAA for the Certification of NIST Botanical Standard Reference Materials.
PB93-153153 00,517 Not available NTIS 00.068 Not available NTIS WRC-1992 Constitution Diagram for Stainlass Staal Wald Matals: A Modification of the WRC-1988 Diagram. PB93-153427 00,484 Not available NTIS PB93-153682 Non-Linaar Effects of Periodic Electric Fialds on Mambrana PB93-153161 PB93-153435 Protain. PB93-153682 Computar Modalling of Camant-Based Materials. PB93-153161 00,063 Not availabla NTIS 00.529 Not available NTIS Heat and Mass Transport from Thermally Dagrading Thin Cellulosic Matanals in a Microgravity Environment. PB93-153435 00,505 Not available NTIS PB93-153690 PB93-153179 Kinetics of a Multistate Enzyma in a Larga Oscillating Fiald. PB93-153690 00,516 Not available NTIS Experimental and Simulation Studies of the Interfacial Zona PR93-153443 In Concrata. PB93-153179 PB93-153708 Effact of Rapetitiva Swalls on Matal-Oxide Varistors. PB93-153443 00,358 Not available NTIS 00.064 Not available NTIS Cathodoluminascence Imaging and Spectroscopy of CVD Diamond in a Scanning Electron Microscope. PB93-153708 00,464 Not available NTIS PB93-153187 PB93-153450 Vibrational Lina Shapa of Diatomic Adsorbatas on Matal NIST EXPRESS Toolkit: Lassons Laarned. Clusters. PB93-153187 PB93-153716 PB93-153450 00,422 Not available NTIS 00.145 Not available NTIS Naw Approach to Calibration of Transducers Used in tha Maasuremant of Dynamic Prassura and Temperatura. PB93-153716 00,348 Not available NTIS PB93-153468 PB93-153195 Analysis of Parsistant Photoconductivity Due to Potential Atomic Physics Tests of Nonlinear Quantum Mechanics Barriers. PB93-153468 00,580 Not available NTIS PB93-153724 00.669 Not available NTIS Intarim Critaria for Polymar-Modified Bituminous Roofing Mambrana Matarials: A Summary Raport.
PB93-153724 00,069 Not availabla NTIS PB93-153203 PB93-153476 Low Order Modas of an Ion Cloud in a Penning Trap. PB93-153203 00,581 Not available Robust Parallal Computation in Floating-Point and SLI Arith-00,581 Not available NTIS PB93-153732 PB93-153476 PB93-153211 00,252 Not available NTIS Phase Equilibria and Crystal Chamistry in Portions of the Systam SrO-CaO-Bi2O3-CuO. Part 3. Praliminary Phase Diagrams for the Tamary Systems of SrO-Bi2O3-CuO, CaO-Bi2O3-CuO and SrO-CaO-Bi2O3. Critical-Current Dagradation in Nb3Sn Composita Wiras Dua to Locally Concentrated Transverse Strass.
PB93-153211 00,344 Not available NTIS PB93-153484 Pradiction of Fluid Phasa Equilibrium of Tamary Mixturas in the Critical Region and the Modified Laung-Griffiths Theory. PB93-153484 00,148 Not available NTIS PB93-153229 00,469 Not available NTIS PB93-153732 PB93-153492 Watar Vapor Parmaability Maasuramants of Common Build-PB93-153740 ing Materials. PB93-153229 System Responsa to Pulsed Excitations Estimated from Nota on the Number Dependence of Nonequilibrium Molecular Dynamics Simulations of the Viscosity of Structured 00.065 Not available NTIS Maasuramant of cw Amplitudas. 00,316 Not available NTIS PR03-153237 PB93-153492 Moleculas. Magnetic Field Dependenca of Quantized Hall Effect Break-down Voltagas. PB93-153237 00,662 Not available NTIS PB93-153740 PR93-153500 00,149 Not available NTIS Mechanical Tast Mathods for Matal-Matrix Compositas: A Status Report from the U.S.A. PB93-153500 00,479 Not available NTIS PB93-153757 Excitation-Energy Dependence in tha L2,3 Fluorascence Spectrum of Si. PB93-153757 00,627 Not available NTIS PB93-153245 PB93-153518 Chaotic Motions of Forced and Coupled Galloping Oscilla-Dynamic Rasistanca of Superconducting YBa2Cu3Ox Sintarad Powdar at 81 K: Liquid varsus Vapor Nitrogan Envl-PB93-153765 PB93-153245 00,003 Not available NTIS Waar and Friction Charactaristics of Self-Lubricating Copper PB93-153252 - Intarcalated Graphita Composites. PB93-153765 00,480 Not available NTIS ronment. PB93-153518 00.670 Not available NTIS Feeling a Door to Saa if Fira Is on tha Other Side. PB93-153252 00,066 Not available NTIS PB93-153526 Phasa Bahavior of an Off-Critical Polymer Blend Solution during Staady Shaar Studiad by Small Angla Nautron Scat-PB93-153260 Application of the Hough Transform to Electron Diffraction Structura and Low Enargy Dynamics of Solid C60.
PR93-153260 00,146 Not available NTIS Pattams. PB93-153773 00,585 Not available NTIS tering. PB93-153526 00,176 Not available NTIS PB93-153781 PB93-153278 Rasonanca Ionization Spectroscopy/Rasonance Ionization Mass Spectrometry Data Service. I-Data Shaats for As, B, Cd, C, Ga, Au, Fa, Pb, Si, and Zn. PB93-153781 00,102 Not available NTIS PB93-153534 Raverbarating Asymmatric TEM Cell for Radiated EMC/V and SE Testing, 10 kHz - 18 GHz.
PB93-153278 00,315 Not available NTIS Radiative Heat Transfar in Transiant Hot-Wira Maasure-mants of Tharmal Conductivity. PB93-153534 00,582 Not available NTIS PB93-153288 PB93-153542 PB93-153799 Diracted-Graph Classiflar of Semiconductor Wafer-Test Pat-Molecular Modaling of Polymar Flammability: Application to tha Dasign of Flame-Rasistant Polyethylena. PB93-153542 00,504 Not available NTIS Subambiant Tamperatura Modification of Selectivity In Reversed-Phasa Liquid Chromatography. PB93-153799 00,103 Not available NTIS PB93-153286 00,356 Not available NTIS PB93-153294 PB93-153559 PB93-153807 Imaging of Passivated III-V Semiconductor Surfaces by a Scanning Tunneling Microscope Operating in Air. PB93-153294 00,357 Not available NTIS DNA Basa Modifications in Chromatin of Human Cancerous Integrated Optic Lasar Fabricated by Flaid-Assisted Ion Exchanga in Neodymium Doped Soda-Lime Silicata Glass. PB93-153807 00,340 Not available NTIS Tissuas. PB93-153559 00,523 Not available NTIS PB93-153302 PB93-153567 PB93-153815 Parformance of a Rasidantial Desuperheater. PB93-153302 00,036 Not available NTIS Improvaments in the NIST Watt Measurement: Monitoring Impact-Echo Rasponse of Plates Containing Thin Layars tha Mass Stability of the Kilogram. PB93-153567 00,317 Not availabla NTIS and Voids. PB93-153815 PB93-153310 00.181 Not available NTIS Magnetic Propertias of Cr-Mn Austanitic Stainlass Staels. PB93-153310 00,483 Not available NTIS PB93-153575 PB93-154458 Ion Kinatic-Enargy Distributions and Electrical Maasura-mants in Ar/O2 rf Glow Discharges. PB93-153575 00,634 Not available NTIS Dasigning and Implamenting a Stata Quality Award. PB93-154458 00,695 PC A04/MF A01 PR93-153328 Orientation Dapendanca of Flux Pinning in a Layerad Bi2Sr2Ca1Cu2O8 + 10% Ag Composita. PB93-153328 00,663 Not available NTIS PB93-156644 PB93-153583 National Voluntary Laboratory Accreditation Program 1993 Measuring Airflow Ratas with Pulsa Tracer Tachniquas. PB93-153583 00,037 Not available NTIS Directory. PB93-156644 00,402 PC A08/MF A02

PB93-153336

PB93-153336

Convarsion of Temperaturas and Tharmodynamic Proparties to the Basis of the Intamational Temperatura Scala of

00,147 Not available NTIS

PB93-153591

PB93-153591

Rafaranca Datactors for Spectral Rasponsivity Maasura-

00.626 Not available NTIS

PB93-156743

Computation of Complax Solidification Morphologias Using a Phase-Field Modal.

00,671 PC A03/MF A01

PR93-152106

Applicability of the Maturity Method to High-Performance

Concrete. PB93-157451 00,182 PC A04/MF A01

PB93-158343

Effect of Subsurface Conditions on Earthquake Ground Mo-

00.192 PC A05/MF A01

PB93-158632

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, July to September, 1992 with 1992/1993 EEEL Events Cal-

PR93-158632 00.360 PC A06/MF A02

PB93-158657

Comparison of Ceiling Jet Temperatures Measured in an Aircraft Hanger Test Fire with Temperatures Predicted by the DETACT-QS and LAVENT Computer Models. PB93-158657 00,539 PC A03/MF A01

PB93-158665

Prototype Application Protocol for Ready-to-Wear Pattern Making. PB93-158665 00.430 PC A03/MF A01

PB93-158673

Proton Monte Carlo Transport Program PTRAN. PB93-158673 00,533 PC A03/MF A01

PB93-158715

Proceedings of the AP Validation Workshop. Held in Seattle, Washington on April 13-14, 1992. National PDES Testbed Report Series.

00.423 PC A07/MF A02 PB93-158715

PB93-158731

Development of a Fast-Response Variable-Amplitude Programmable Reaction Control System.
PB93-158731 00,459 PC A11/MF A03

PB93-159051

Computer Model for the Diffusion and Binding of Chloride Ions in Portland Cement Paste. PB93-159051

00,183 PC A03/MF A01

PB93-159069

Monte Carlo Approach to the Approximation of Invariant PB93-159069 00.508 PC A03/MF A01

PB93-159077

Cross Validation Comparison of NIST OCR Databases. PB93-159077 00,297 PC A03/MF A01

PB93-159457

Flow Conditioner Location Effects in Orifice Flowmeters. PB93-159457 00,379 PC A04/MF A01

PB93-159465

Guidelines for Evaluating and Expressing the Uncertainty of NIST Measurements Results. PB93-159465 00,403 PC A03/MF A01

PB93-160588

Measurements for Competitiveness in Electronics. First Edi-

PB93-160588

00,091 PC A20

00,345 PC A07/MF A02

PB93-160786

Tables for the Thermophysical Properties of Ethane. PR93-160786 00,150 PC A14/MF A03

PB93-161339

Synthetic-Perturbation Tuning of MIMD Programs. PB93-161339 00,253 PC A03/MF A01

PB93-161347 B93-161347
Test Procedure for Handgun Accuracy.
00,556 PC A03/MF A01

PB93-161354

Strengthening Methodology for Lightly Reinforced Concrete PB93-161354 00,081 PC A06/MF A02

PB93-162865

Transfer Functions for Characterizing Multimode Optical Fiber Components.

PB93-162865

PB93-162873 NIST REACTOR: Summary of Activities, July 1991 through September 1992.

PB93-162873 00,586 PC A07/MF A02 PB93-162972

Site Exploration for Radon Source Potential. PB93-162972 00,394 PC A04/MF A01

PB93-162980

Methods for Evaluating the Performance of Systems Intended to Recognize Characters from Image Data Scanned from Forms PB93-162980 00.298 PC A03/MF A01

PR93-163178

COBOL Compiler Validation System (CCVS 85), User Gulde, Version 4.2. PB93-163178 00,254 PC A14/MF A03

PB93-164564

Phase-Field Models for Anisotropic Interfaces

PB93-165710

00,672 PC A03/MF A01

Second Order Transfer Matrices for Inhomogeneous Field Wien Filters Including Spin-Precession. PB93-165710 00,587 Not available NTIS

PB93-165728

Surface Magnetic Microstructure.

PB93-165728 00,673 Not available NTIS

PB93-165736

High Spatial Resolution Quantitative Micromagnetics. PB93-165736 00,674 Not available NTIS PB93-165983

In situ Analysis of Laser-Induced Vapor Plumes. PB93-165983 00,151 Not available NTIS PB93-165991

Higher-Order Vacuum Polarization Corrections in Muonic

PB93-165991 00.588 Not available NTIS

PB93-166007

Advanced Ceramics Standards Development. PB93-166007 00,470 Not 00,470 Not available NTIS

PB93-166015

Advanced Ceramics: What's In a Name. 00,471 Not available NTIS PB93-166015

PB93-166023

Scanning Tunneling Microscopy of Optical Surfaces. PB93-166023 00,628 Not available NTIS

PB93-166031

Dose Equivalent Response of Tissue-Equivalent Proportional Counters to Low Energy Neutrons.

PB93-166031 00,534 Not available NTIS

PB93-166049

Measurement of the Energy Response of Superheated Drop Neutron Detectors.
PB93-166049 00,547 Not available NTIS

PB93-166056

Model Studies of SnO2-Based Gas Sensors: Vacancy Defects and Pd Additive Effects. PB93-166056 00,112 Not available NTIS

PB93-166064

Rate Constants for Hydrogen Abstraction Reactions of NO3 In Aqueous Solution. PB93-166064

00,152 Not available NTIS

PB93-166072

Formation and Reactivity of Hypophosphite and Phosphite Radicals and Their Peroxyl Derivatives.
PB93-166072 00,153 Not available NTIS

PB93-166080

High Temperature X-ray Diffractometry of Ti-Al Alloys. PB93-166080 00,499 Not available NTIS PB93-166098

Iron Magnetic Moments in Iron/Silica Gel Nanocomposites. PB93-166098 00,675 Not available NTIS PB93-166106

Standard Formats for Welding Property Data.
PB93-166106 00,437 Not available NTIS PB93-166114 Chaotic Motions of Self-Excited Forced and Autonomous

Guare Prisms. PB93-166114 00,621 Not available NTIS

PB93-166122 Protein Crystal Growth of Ribonuclease A and Pancreatic Trypsin Inhibitor Aboard the Maser 3 Rocket.

PB93-166122 00,524 Not available NTIS PB93-166130

 $\begin{tabular}{lll} Magnetic & Phase & Transitions & and & Structural & Distortion & in Nd2CuO4. \end{tabular}$ PB93-166130 00,676 Not available NTIS PB93-166148

Token Based Access Control System for Computer Net-PB93-166148 00,222 Not available NTIS

PB93-166155

Influence of Vacuum Polarization Corrections of Order alpha(z(alpha)) and alpha(z(alpha))(sup 3) in Hydrogen-Like Uranium. PB93-166155 00,589 Not available NTIS

PB93-166163

Comparison between Precision Roughness Master Specimens and Their Electroformed Replicas.
PB93-166163 00,438 Not available NTIS PB93-166171

Faceting Induced by an Ultrathin Metal Film: Pt on W(111) PB93-166171 Not available NT 00,677 Not available NTIS

PB93-166189

Reflected and Refracted Fundamental Modes of Dynamic X-ray Diffraction. PB93-166189 00,154 Not available NTIS

PB93-166197

Synthesis and Evaluation of New Oxaspiro Monomers for Double Ring-Opening Polymerization PB93-166197 00.1 00,177 Not available NTIS

PB93-166205

Prediction of Carbon-Hydrogen Bond Dissociation Energies for Polycyclic Aromatic Hydrocarbons of Arbitrary Size. PB93-166205 00,155 Not available NTIS PB93-166213

Instrumental Neutron Activation Analysis of Standard Reference Material 1941, Organics in Marine Sediment: Element, Content and Homogeneity.
PB93-166213 00,552 Not available NTIS PB93-166221

Application of Polyacrylamide-Gel Electrophroesis Neutron-Activation Analysis for Protein Quantification. PB93-166221 00,525 Not available NTIS

PB93-166239

Field-Space Conformal Solution Method: Binary Vapor-Llq-uid Phase Behavior. PB93-166239 00,156 Not available NTIS

PB93-166247

Standard Aggregate Materials for Alkali-Silica Reaction Studies. PB93-166247 00,184 Not available NTIS

PB93-166254

Standard Cement Clinkers for Phase Analysis. PB93-1**66**254 00,185 Not available NTIS PB93-166262

Microwave Spectrum of (D2O)2. PB93-166262 00,157 Not available NTIS

PB93-166270

Spectroscopy of the 3s(2)3p(n) Shell from Cu to Mo. PB93-166270 00,590 Not availab 00,590 Not available NTIS PB93-166288

Barkhausen Jump Correlations in Thin Foils of Fe and Ni. PB93-166288 00,678 Not available NTIS PB93-166296

Direct Evidence for an Effect of Twin Boundaries on Flux Pinning in Single Crystal of YBa2Cu3O6+x. PB93-166296 00,679 Not available NTIS

PB93-166304

Research, Industry and Technology Transfer at the NIST AMRF. PB93-166304 00,431 Not available NTIS

PB93-166312 Built-in Error Estimator for Optimizing Finite Element Model-

00,694 Not available NTIS

ing. PB93-1**6**6312 PB93-166320

Material Dependence of Electron Inelastic Mean Free Paths at Low Energies. PB93-166320 00.591 Not available NTIS

PB93-166338 Structure and Magnetic Properties of Doped Co and Fe-Bi2Sr2Cul-xMxOy Phases. PB93-166338 00,680 Not available NTIS

PB93-166346

Mechanistic and Response Studies of Iridium Oxide pH Sensors. 00,113 Not available NTIS

PB93-166346 PB93-166353

Constants, Fundamental. PB93-166353 00.592 Not available NTIS

PB93-166361

New International Volt and Ohm Standards. PB93-166361 00,593 Not available NTIS

PB93-166379

Preparing for the New Volt and Ohm. PB93-166379 00,5 00,594 Not available NTIS

PB93-166387

Probes of Equipartition in Nonlinear Hamiltonian Systems PR93-166387 00,595 Not available NTIS

PB93-166395

Radiometer for Precision Coherent Radiation Measure-PB93-166395 00,629 Not available NTIS PB93-166403

Experimental Validation of a Mathematical Model for Predicting Water Vapor Sorption at Interior Building Surfaces. 00,070 Not available NTIS PB93-166403

Molecular Wedge in a Brittle Crack: A Simulation of Mica Water.
PB93-166411 00,541 Not available NTIS

PB93-166429

PB93-166411

IACP's Radar Testing Program Is Alive and Well. PB93-166429 00,702 Not available NTIS

PB93-166437

Experimental Evaluation of Lighting/HVAC Interaction. PB93-166437 00,038 Not available NTIS

PB93-166445 Inelastic Neutron Scattering in Molecular Crystals. PB93-166445 00,158 Not available NTIS

PB93-166452 Molecular Dynamical Studies of Energy Transport and Energy Sharing in Molecular Dissociation.
PB93-166452 00,159 Not available NTIS

PB93-166460

Chemical Kinetic Data Base for RDX Combustion. PB93-166460 00,160 Not available NTIS PB93-166478

Mechanisms for the Formation and Destruction of Chlorinated Organic Products of Incomplete Combustion. PB93-166478 00,161 Not available NTIS PB93-166486

Charge-Field Interactions in Cell Membranes and Electroconformational Coupling: Transduction of Electric Energy by Membrane ATPases. 00,535 Not available NTIS

Laser-Enhanced Ionization Spectrometry Following Matrix Modification by Automated Chelation Chromatography for the Analysis of Biological and Environmental Reference Ma-

00,104 Not available NTIS

PB93-166502

Topics In Laser Spectroscopy - Simultaneous Detection of Laser-Enhanced Ionization and Laser-Induced Fluorescence In Flames - Noise Correlation Studies.

PB93-166502 00,105 Not available NTIS

PB93-166510

Hydrogen Vibrational Modes and Anisotropic Potential in alpha-ScHx. PB93-166510 00.681 Not available NTIS

PB93-166528

Detection of S2F10 Produced by Electrical Discharge in PR93-166528 00.596 Not available NTIS

PB93-166536

13C NMR Studies of Polymorphy in Isotactic Polystyrene. PB93-166536 00,178 Not available NTIS

PB93-166544

SEM Analysis of Interactions between Platinum, Gold, and Silver-Palladium Capsules and Barium Yttrium Copper Oxide Superconductors.
PB93-166544 00,682 Not available NTIS

PB93-166551

Use of Contact Type Measurement Device to Detect Robots' Hand Positions. PB93-166551 00,455 Not available NTIS

PB93-166569

Energy Distribution Functions of Argon Ions in Low Current, Diffuse Discharges at High E/N. PB93-166569 00,635 Not available NTIS

PB93-166577

Single Pulse Shock Tube Studies on the Thermal Decomposition of n-Butyl Phenyl Ether, n-Pentylbenzene and Phenotole and the Heat of Formation of Phenoxy and Benzyl Radicais. PR93-166577 00.162 Not available NTIS

PB93-166585

Response of Living Cells to Very Weak Electric Fields: The Thermal Noise Limit.

00.536 Not available NTIS

PB93-166585 PB93-166593

Critical Parameters and Saturation Densities of 1,1-Dichloro-2,2,2-Trifluoroethane.

PB93-166593

00,492 Not available NTIS PB93-166601

Review of the Nickel-Graphite Interface. PB93-166601

00,500 Not available NTIS PB93-166619

Tensile Creep Testing of Structural Ceramics. PB93-166619 00,472 Not available NTIS

PB93-166627

Standard Reference Materials for Trace Organic Contami-PB93-166627 00,395 Not available NTIS

PB93-166635

Measurement of (3)He(n,gamma)(4)He Cross-Section at Thermal Neutron Energies. 00,597 Not available NTIS PB93-166635

PB93-166643

Structural Phase Transformation Studies of the High Tc Superconducting Materials, Ba2RCu3O6+x, in Air. PB93-166643 00.683 Not available NTIS PB93-166650

Standard X-ray Diffraction Powder Patterns of Fourteen Ceramic Phases. PB93-166650 00.473 Not available NTIS

PB93-166668

Crystal Chemistry and Phase Equilibria Studies of the BaO(BaCO3)-1/2R2O3-CuO Systems III: X-Ray Powder Characterization and Diffraction Patterns of Ba3R3Cu6O14+x, R=Lanthanides.
PB93-166668

00,684

Not available NTIS

PB93-166676 Renewal Look at Switching Rules In MIL-STD-105D. PB93-166676 00,445 Not available NTIS

PB93-166684

Automation of Strain-Gauge Load-Cell Force Calibration PB93-166684 00,404 Not available N 00,404 Not available NTIS

PB93-166692

Fitting of Transmission Data for Determining the Optical Constants and Thicknesses of Optical Films. PB93-166692 00,630 Not available NTIS

PB93-166700

Calculations on Displacement Corrections for In-Phantom Measurements with Ionization Chambers for Mammography. PB**9**3-166700 00.519 Not available NTIS

PB93-166809

Stable Implementation Agreements for Open Systems Inter-connection Protocols. Version 6, Edition 1, December 1992. Based on the Proceedings of the OSE Implementors' Work-shop (OIW). PB93-166809 00,292 PC A99/MF E18 PB93-166817

Journal of Research of the National Institute of Standards and Technology, January-February 1993. Volume 98, Number 1. Special Issue.
PB93-166817 00,598 PC A08/MF A02

00,598 PC A08/MF A02 PB93-166825

NIST Cold Neutron Research Facility. PB93-166825

00,599 (Order as PB93-166817, PC A08)

PB93-166833

Outline of Neutron Scattering Formalism. PB93-166833

(Order as PB93-166817, PC A08)

PB93-166841

Small Angle Neutron Scattering at the National Institute of Standards and Technology. PB93-166841

(Order as PB93-166817, PC A08)

Neutron Reflectivity and Grazing Angle Diffraction. PB93-166858 00.685

(Order as PB93-166817, PC A08)

PB93-166866

Triple Axis and SPINS Spectrometers.

PB93-166866 (Order as PB93-166817, PC A08)

PB93-166874

Neutron Time-of-Flight Spectroscopy. PB93-166874

(Order as PB93-166817, PC A08)

PB93-166882

Ultra-High Resolution Inelastic Neutron Scattering. PB93-166882

(Order as PB93-166718, PC A08)

PB93-166890

Neutron Depth Profiling: Overview and Description of NIST PB93-166890 00.686 (Order as PB93-166817, PC A08)

PB93-166908

Prompt-Gamma Activation Analysis.

PR93-166908 (Order as PB93-166817, PC A08)

Facilities for Fundamental Neutron Physics Research at the NIST Cold Neutron Research Facility. PB93-166916

(Order as PB93-166817, PC A08)

PB93-170900

Program for Conformity Assessment System Evaluation: Analysis of Comments on the NIST Proposal. PB93-170900 00,094 PC A03/MF A01

PB93-173391

North American ISDN (Integrated Services Digital Network) Users' Forum Agreements on ISDN. 00,211 PC A11/MF A03 PB93-173391 PB93-173409

NIST Standard Reference Data Products Catalog, 1993. PB93-173409 00,163 PC A05/MF A01

PB93-173417

Tables of Experimental Data Used for the Correlation of the Thermophysical Properties of Ethane.
PB93-173417 00,164 PC A14/MF A03

PB93-173425

Dose in Water from External Irradiation by Electrons: Radiation Protection Data. PB93-173425 00.548 PC A03/MF A01

PB93-173433

Bibliography on Atomic Line Shapes and Shifts (July 1978 through March 1992) (Supplement 4). PB93-173433 00,606 PC A13/MF A03

PB93-173441

Aluminum Alloys for ALS Cryogenic Tanks: Comparative Measurements of Cryogenic Mechanical Properties of Al-Li Alloys and Alloy 2219.

PB93-173441

00,501 PC A07/MF A02

PB93-173458

Evaluation of Subjective Response to Lighting Distributions:

A Literature Review. PB93-173458 00,039 PC A04/MF A01 PB93-173466

Materials Reliability. Technical Activities, 1992. (NAS-NRC Assessment Panel, May 13-14, 1993). PB93-173466 PC A06/MF A02

PB93-173474

Quality Control Tests for Adhesion of Paint on the Panels of Tactical Rigid Wall Shelters, Phase PB93-173474 00,476 PC A03/MF A01

PB93-173482

CSTL Technical Activities 1992. PB93-173482

PB93-173508

Ceramics Technical Activities, 1992 (NAS-NRC Assessment Panel May 13-14, 1993). PB93-173508 00,474 PC A10/MF A03

00.165 PC A17/MF A04

PB93-173938

DARPA TIMIT Acoustic-Phonetic Continous Speech Corpus CD-ROM. NIST Speech Disc 1-1.1. PB93-173938 00,215 PC A05/MF A01

PR93-174902

CFAST, the Consolidated Model of Fire Growth and Smoke Transport. PB93-174902 00.071 PC A11/MF A03

PB93-175404

Initial Graphics Exchange Specification Hybrid Microclrcuit Application Protocol. PB93-175404 00,361 PC A09/MF A03

PB93-175990

User's Guide for the Algorithm Testing System/Version 1.1. PB93-175990 00,447 PC A03/MF A01 PB93-178556

International Survey of Industrial Applications of Formal Methods. Volume 1. Purpose, Approach, Analysis, and Conclusions 00.255 PC A07/MF A02

PB93-178556

PB93-178564 International Survey of Industrial Applications of Formal Methods. Volume 2. Case Studies.

PB93-178564 00,256 PC A09/MF A03 PR93-178572

Using Synthetic-Perturbation Techniques for Tuning Shared Memory Programs. PB93-178572 00,257 PC A03/MF A01

PB93-178580

Detailed Design Specification for Conformance Testing of Computer Graphics Metafile (CGM) Interpreter Products. PB93-178580 00,424 PC A04/MF A01

PB93-178598

Horizontal Nucleate Flow Boiling Heat Transfer Coefficient Measurements and Visual Observations for R12, R134a, and R134a/Ester Lubricant Mixtures.

PB93-178598 00,493 PC A03/MF A01

PB93-178606

Estimating Soil Parameters Important for Lifeline Siting Using System Identification Techniques. PB93-178606 00,193 PC A05/MF A01 PB93-178614

Estimating In situ Liquefaction Potential and Permanent Ground Displacements Due to Liquefaction for the Siting of Lifelines.

PB93-178614

00,194

PC A06/MF A02

PB93-178622

Intelligent Control System for a Cutting Operation of a Continuous Mining Machine.
PB93-178622 00,544 PC A04/MF A01

PB93-178630

Performance of Electromagnetic Covermeters for Non-destructive Assessment of Steel Reinforcement. PB93-178630 00,186 PC A07/MF A02

PB93-178648

Physics Laboratory Technical Activities, 1992. PB93-178648 00,607 PC A10/MF A03

PB93-178655

Data Probe User's Guide. National PDES Testbed Report Series. PB93-178655 00.425 PC A04/MF A01 PB93-178861

Statistical Analysis of Information Content for Training Pattern Recognition Networks.
PB93-178861 00,299 PC A03/MF A01 PB93-179968

Proceedings of the Meeting of the Intergovernmental U.S.-Russian Business Development Committee's Standards Working Group (2nd). Held in Gaithersburg, Maryland on March 23-24, 1993. PB93-179968 00.087 PC A14/MF A03 PB93-181873

Computer Systems Laboratory Annual Report, 1992. PB93-181873 00,229 PC A05/MF A02 PB93-181881 Surveillance Schemes with Applications to Mass Calibra-

tion. PB93-181881

PB93-182020 Mechanical, Stress-Rupture, and Fracture Toughness Properties of Normalized and Stress Relieved AAR TC128 Grade B Steel at Elevated Temperatures.
PB93-182020 00,485 PC A03/MF A01

00.608 PC A04/MF A01

PB93-182038 Programmer's Reference Guide to FDMS File Formats. PB93-182038 00,201 PC A03/MF A01

PB93-182053 Manual for Data Administration. PB93-182053 00.258 PC A08/MF A02

PB93-183465

Distributed Implementation Generator: An Overview and User Guide. PB93-183465 00,259 PC A03/MF A01

PB93-183473

Portable Estelle Translator: An Overview and User Guide. PB93-183473 00,260 PC A03/MF A01 PB93-183754

Design of Smoke Control Systems for Areas of Refuge. PB93-183754 00,072 PC A03/MF A01 PB93-183770 Envelope Design Guidelines for Federal Office Buildings:

Thermal Integrity and Airtightness.
PB93-183770 00,376 PC A09/MF A02

Standard Reference Materials: Handbook for SRM Users. PB93-183796 00,107 PC A06/MF A02

PB93-183952

International Conference on Fire Suppression Research (1st): Proceedings. Held in Stockholm and Boras, Sweden on Mey 5-8, 1992.
PB93-183952

O0,202

PC A18/MF A04

PB93-184257

Applying the NIST Real-Time Control System Reference Model to Submarine Automation: A Maneuvening System Demonstretion. 00.545 PC A04/MF A01

PB93-184257

PB93-184273 Comparative Performance of Classification Methods for Fin-

00,300 PC A03/MF A01

PB93-184273

PB93-184331 Issues, Concepts, and Standard Techniques in Assessing Accuracy of Coordinate Measuring Machines. PB93-184331 00,448 PC A05/MF A01

PB93-184422

Binoculer Spherical Disparity: A Study in Representation for a For verd Transleting Camera.
PB93-184422 00,301 PC A07/MF A02

PB93-185973

Procedures for Selecting Eerthquake Ground Motions at Rock Sites (Revised).
PB93-185973 00,542 PC A03/MF A01

PB93-185999

Minimum Security Requirements for Multi-User Operating Systems. PB93-185999 00.223 PC A03/MF A01

PB93-186005

Bench-Scale Predictions of Mattress and Upholstered Chair Fires: Similerities end Differences. PB93-186005 00,043 PC A03/MF A01

PB93-188126

NIST Scoring Packege Certification Procedures in Conjunction with NIST Speciet Detabeses 2 end 6. PB93-188126 00,302 PC A03/MF A01

PB93-188134

Optimizetion of Adaptive Resonance Theory Network with Boltzmann Machine.
PB93-188134 00,224 PC A03/MF A01

PB93-188845

Building and Fire Research Laboratory Publications, 1992. PB93-188845 00,073 PC A05/MF A01 PB93-188969

Metricetion: An Economic Weke-up Cell for U.S. Industry. PB93-188969 00,088 PC A03/MF A01

PB93-189298

Bibliogrephic Notes on Voronot Diagrems. PB93-189298 00,509 PC A04/MF A01

PB93-189421

Trensient Cooling of e Hot Surface by Droplets Evaporetion. Final Report, November 1990. PB93-189421 00,609 PC A06/MF A02

PB93-189793

National Testbed for Process Planning Research. PB93-189793 00,439 PC A03/MF A01

PB93-189801

PB93-189819 Meesurement Uncertainty Considerations for Coordinate Measuring Machines. PB93-189819

00,449 PC A03/MF A01

PB93-189827

Guide to Voice Privacy Equipment for Law Enforcement Radio Communications Systems.

00.701 PC A03/MF A01 PB93-189827 PB93-189835

Building Hadamard Matrices in Steps of 4 to Order 200. PB93-189835 00,261 PC A03/MF 00,261 PC A03/MF A01 PB93-189868

ENDF/B-Vt Neutron Cross Section Measurement Stend-PB93-189868 00.610 PC A06/MF A02

PB93-190338

Temperature-Electromotive Force Reference Functions end Tebles for the Letter-Designeted Thermocouple Types Based on the ITS-90. PB93-190338 00.611 PC A99/MF A06

PB93-191427

Two New Gas Standards Progrems at the Netional Institute of Stenderds end Technology. PB93-191427 00.095 PC A02/MF A01

PB93-191641

First Text Retrieval Conference (TREC-1). PB93-191641 00,262 PC A22/MF A04

PB93-191658

EXAM: A Two-Stete Thermodynamic Analysis Program. PB93-191658 00,166 PC A06/MF A02

PB93-192318

Proceedings of the Joint DoD/NtST Workshop on Internetional Precision Fabrication Research and Development. Held in Rockville, Maryland on October 27-29, 1992. PB93-192318 00,440 PC A11/MF A03

PB93-196228

Journal of Research of the National Institute of Standards and Technology, March-April 1993. Volume 98, Number 2. PB93-196228 00,631 PC A07/MF A02

PB93-196236

Absolute Spatially- end Temporally-Resolved Opticat Emission Measurements of rf Glow Discharges In Argon. 00.636 PB93-196236

(Order as PB93-196228, PC A07/MF A02)

PB93-196244

Optimizing Complex Kinetics Experiments Using Least-Squares Methods. PB93-196244

(Order as PB93-196228, PC A07/MF A02)

PB93-196251

Measuring Low Frequency Tilts. PB93-196251

(Order as PB93-196228, PC A07/MF A02)

PB93-196269

Optical Fiber Geometry: Accurate Measurement of Cladding Diameter PB93-196269 (Order as PB93-196228, PC A07/MF A02)

PB93-196277

Drift Eliminating Designs for Non-Simultaneous Comparison Calibretions PB93-196277

(Order as PB93-196228, PC A07/MF A02)

PB93-196285 Three-Ratio Scheme for the Measurement of Isotopic Ratios of Silicon. PB93-196285

(Order es PB93-196228, PC A07/MF A02)

PB93-196293

Wolf Shifts and Their Physical Interpretetion under Leborafory Conditions. PB93-196293 (Order es PB93-196228, PC A07/MF A02)

PB93-198273

Computer Grephics Metafile (CGM) Test Requirements Document (Updete). PB93-198273 00,293 PC A04/MF A01

PB93-198422

Internetional Colloqium on Atomic Spectre end Oscilletor Strengths for Astrophysical end Laboretory Plesmas (4th). Held at the National Institute of Standards and Technology, Geithersburg, Merylend on September 14-17, 1992. PB93-198422 00,012 PC A10/MF A03

PB93-198455

Dimensional Inspection Planning Besed on Product Data Standards. National PDES Testbed Report Series. PB93-198455 00,450 PC A03/MF A01

PB93-198463

Experimental Study of Multiple Droplet Evaporative Cooling. PB93-198463 00,613 PC A06/MF A02 PB93-198836

Properties end Interactions of Orel Structures end Restoretive Meteriels. Annual Report for Period October 1, 1991 to September 30, 1992. PB93-198836 00.024 PC A06/MF A02

PB93-198844

Building end HVAC Cherecterizetion for Commercial Building Indoor Air Quality Investigations. PB93-198844 00,389 PC A07/MF A02 PB93-198851

Shielded Open-Circuited Sample Holders for Dielectric end Magnetic Meesurements of Liquids end Powders PB93-198851 00,319 PC A03/MF A01

PB93-198869

U.S. Fires In 'Board and Cere' Homes Matrix Display of Selected Fatal Fires. Special Analysis 00,025 PC A06/MF A02

PB93-198877

Electronics and Electricel Engineering Laboretory Technical Publication Announcements Covering Laboratory Programs, October to December, 1992 with 1992/1993 EEEL Events Celender. PR93-198877 00.362 PC A03/MF A01

PB93-198885

Highway Concrete (HWYCON) Expert System Requirements end Instellation Guide.
PB93-198885 00,187 PC A03/MF A01

PB93-198893

Extinguishment of Combustible Porous Solids by Water Droplets. P**B**93-198893 00,203 PC A03/MF A01

PB93-198927

Discharge of Fire Suppression Agents from e Pressurized Vessel: A Mathematical Model and Its Application to Experimental Design.
PB93-198927 00,044 PC A04/MF A01

PB93-198984

Life-Cycle Costing Workshop for Energy Conservation in Buildings: Student Manual. Buildings: Stu PB93-198984 00.383 PC A11/MF A03 PB93-199164

ADACS. An Automated System for Part Finishing. PB93-199164 00,433 PC A03/MF A01

PB93-200822

Speed of Sound Data and Related Models for Mixtures of Natural Gas Constituents. PB93-200822 00.380 PC A05/MF A02

PB93-200871

Software Error Analysis. PB93-200871 00.263 PC A06/MF A02

PB93-200889

RADCAL: A Narrow-Band Model for Radiation Calculations in a Combustion Environment. PB93-200889 00,204 PC A04/MF A01

PB93-205516

Center for Electronics and Electrical Engineering Technicat Publication Announcements Covering Center Programs, April to June 1990, with 1991 CEEE Events Calendar. PB93-205516 00,363 PC A03/MF A01

PB93-205524

Center for Electronics and Electrical Engineering Technicat Progress Bulletin Covering Center Programs, April to June 1990, with 1990/1991 CEEE Events Calendar. PB93-205524 00,364 PC A03/MF A01

PB93-205623

Study of Fire Induced Flow along the Vertical Corner Wall. Part 2. PB93-205623 00,074 PC A04/MF A01

PB93-206183

Research Plan for Masonry Shear Walls.

PB93-206183 00,075 PC A03/MF A01 PB93-206191

Computational Experience with Radiat Basis Function Net-PB93-206191 00,303 PC A03/MF A01

PB93-206217

Lighting System Design end Eveluetlon In Federet Office Buildings. PB93-206217 00.040 PC A04/MF A01 PB93-206225

Strength of Pertielly-Grouted Masonry Shear Wells under eteral Loads. 00,082 PC A04/MF A01

PB93-206233

Report on e Workshop for Improving Reletionships between Users end Suppliers of Microlithogrephy Metrology Tools. PB93-206233 00,365 PC A03/MF A01

Collection of Successful Interections between the MTCs end Client Firms. 00.092 PC A03/MF A01

PB93-206886 PB93-206894

PB93-206886

Effect of Critical Paremeters on the Behevior of Partielly-Grouted Masonry Shear Walls under Laterel Loads.
PB93-206894 00,076 PC A03/MF A01

PB93-206928 Review of Irrediation Effects on Organic-Metrix Insulation. PB93-206928 00,546 PC A13/MF A03

PB93-207157

Workshop on Cheracterizing Diamond Films II. Held in Gaithersburg, MD. on February 24-25, 1993. PB93-207157 00,687 PC A04/MF A01 PB93-207470

Thermophysical Properties of Fluids for the Gas Industry. Annual Report, Januery-December 1992.
PB93-207470 00,381 PC A03/MF A01

Elastic Scattering of Electrons and Positrons by Atoms: Datebase ELAST. PB93-207512 00,614 PC A06/MF A02 PB93-207959 Dictionary Production for Census Form Conference. PB93-207959 00,304 PC A03/MF A01

PB93-208114

PB93-207512

Requirements for an Application Protocol Development Environment, National PDES Testbed Report Series.
PB93-208114 00,426 PC A03/MF A01

PB93-208445

Literature Review of Lighting Standards.
PB93-208445 00.041 PC A05/MF A01 PB93-208445 PB93-208460

BLCC 4.0. The NIST 'Building Life-Cycle Cost' Program (Version 4.0), User's Guide end Reference Menuel. PB93-208460 00,026 PC A05/MF A01 PB93-208494

Chaos, Dissipation, Arrow of Time, in Quantum Physics. PB93-208494 00,615 PC A03/MF A01 PB93-209781

Report of the Netional Conference on Weights end Measures (77th). Held in Nashville, Tennessee on July 19-23, 1992. 00.406 PC A16/MF A03

PR93-209781 PB93-209922

Japan's Kohsetsushi Program of Regional Public Examine-tion end Technology Centers for Upgrading Smell and Mid-Size Manufacturing Firms. Presented at Annual Meeting of the Association of American Geographers. Held in Miami, FlorIda in April 1991. PB93-209922 00,453 PC A03/MF A01

PB93-209930

Federal-State Collaboration in Industrial Modemization. 00,441 PC A04/MF A01

NIST Handbook 44, 1993: Specifications, Tolerances, and Other Technical Requirements for Weighing and Measuring Devices as Adopted by the 77th National Conference on Weights and Measures 1992.

00 407 PC A10/MF A03 PB93-213106

PB93-213114

NIST Handbook 130, 1993. Uniform Laws and Regulations in the Areas of Legal Metrology and Motor Fuel Quality as Adopted by the 77th National Conference on Weights and Measures 1992.

00.015 PC A09/MF A03

PB93-215184

Report on Occupational Safety and Health for Fiscal Year 1990 (Under Public Law 91-596). PB93-215184 00,532 PC A05/MF A01

PR93-216943

Application Portability Profile (APP): The U.S. Government's Open System Environment Profile OSE/1 Version 2.0. PB93-216943 00,264 PC A06/MF A02

PB93-217529

State Weights and Measures Laboratories: State Standards Program Description and Directory. 1993 Edition. PB93-217529 00,451 PC A07/MF A02

PB93-217578

Machining of Advanced Materials: Proceedings of the International Conference on Machining of Advanced Materials. Held in Gaithersburg, Maryland on July 20-22, 1993. PB93-217578 00,442 PC A23/MF A04

PB93-219715

Recent Results of the NIST National Ball Plate Round 00,408 PC A03/MF A01

PB93-219715 PB93-219723

Affordable Fire Safety in Board and Care Homes. A Regulatory Challenge. Final Report. PB93-219723 00,027 PC A05/MF A01

PB93-219731

Fracture Mechanics Evaluation of Railroad Tank Cars Containing Postulated Circumferential Cracks.
PB93-219731 00,486 PC A03/MF A01

PB93-219749

Penetration of Proton Beams through Water. 1. Depth-Dose Distribution, Spectra and LET Distribution. PB93-219749 00,537 PC A04/MF A01

PB93-219756

Development of a National Metrology Infrastructure for the Domestic Gear Industry. PB93-219756 00,409 PC A03/MF A01

PB93-219764

Handbook for Evaluation of TEM Sample Preparation of Particles on Membrane Filters: Version 1.0. PB93-219764 00,390 PC A04/MF A01 PB93-219772

Assessment of the Role of Charged Secondaries from Nonelastic Nuclear Interactions by Therapy Proton Beams PB93-219772 00.538 PC A05/MF A01

PB93-219780

Water Mist Fire Suppression Workshop Proceedings. Held in Gaithersburg, Maryland on March 1-2, 1993. PB93-219780 00,700 PC A08/MF A02

PB93-219806

Semiconductor Measurement Technology: A Collection of Computer Programs for Two-Probe Resistance (Spreading Resistance) and Four-Probe Resistance Calculations, RESPAC. PB93-219806 00,366 PC A07/MF A02

PB93-220002

Selected EMC Standards and Regulations: A Summary. PB93-220002 00,639 PC A03/MF A01 PB93-220820

Guide to Board and Care Fire Safety Requirements in the 1991 Edition of the Life Safety Code.
PB93-220820 00,397 PC A07/MF A02

PB93-220838

NIST EXPRESS Toolkit: Requirements for Improvements. National PDES Testbed Report Series. PB93-220838 00,265 PC A02/MF A01

PB93-220846 NIST EXPRESS Toolkit: Updating Existing Applications. National PDES Testbed Report Series.

PB93-220846 00,266 PC A03/MF A01 PB93-220853

NIST EXPRESS Toolkit: Using Applications. National PDES Testbed Report Series.
PB93-220853 00,267 PC A03/MF A01

PB93-221851 Source Apportionment of Fine Particle Organics and Mutagenicity in Wintertime Roanoke.
PB93-221851 00,391 PC A02/MF A01

PB93-228203

Field Monitoring of a Variable-Speed Integrated Heat Pump/ Water Heating Appliance. PB93-228203 00.382 PC A04/MF A01 PB93-228617

User's Guide for the Programmer's Hierarchical Interactive Graphics System (PHIGS) C Binding Validation Tests (Versian)

PB93-228617 00,268 PC A03/MF A01 PB93-228625

Electronics and Electrical Engineering Laboratory 1993 Program Plan: Supporting Technology for U.S. Competitiveness in Electronics. PB93-228625 00,320 PC A11/MF A03

PB93-228633

Cryogenic Mechanical Testing of Al-Li Alloys at NIST. PB93-228633 00,502 PC A04/MF A01 PB93-228641

Semiconductor Measurement Technology: Evolution of Sill-con Materials Characterization: Lessons Learned for Im-proved Manufacturing. PB93-228641 00,367 PC A03/MF A01

ERATES: A Computer Program for Calculating Time-of-Use, Block, and Demand Charges for Electricity Usage (Version 1.0). User's Gulde and Reference Manual. PB93-228658 00,384 PC A03/MF A01

PB93-228666

PB93-228658

Proceedings: ICSSC Issues Workshop. Development of Seismic Evaluation and Rehabilitation Standards for Federally Owned and Leased Buildings. Held in Denver, Colorado on September 16-17, 1992. PB93-228666 00,083 PC A03/MF A01

PB93-228674

Guidelines and Procedures for Implementation of the Executive Order on Seismic Safety of New Construction (July 1991) PB93-228674 00.084 PC A03/MF A01

PB93-228682

Report of the NSF/NIST Workshop on NSFNET/NREN Security. Held on July 6-7, 1992. PB**9**3-228682 00,225 PC A05/MF A01

PB93-231835

Chemical Characterization of Mutagenic Fractions of Particles from Indoor Coal Combustion: A Study of Lung Cancer in Xuan Wei, China. PB93-231835 00,530 PC A02/MF A01

PB93-234680

Some Guidelines for Implementing Error Compensation on 00,452 PC A04/MF A01

PB93-234698

Electronics and Electrical Engineering Laboratory Technical Publication Announcements Covering Laboratory Programs, January to March, 1993 with 1993/1994 EEEL Events Cal-00,368 PC A03/MF A01

PB93-234698

PB93-234706

Structure-Property Relationships in Microalloyed Ferrite-Pearlite Steels Phase 1: Literature Review, Research Plan, and Initial Results. 00.487 PC A04/MF A01

PB93-234714

Observations About Joined Circular Arcs. 00,510 PC A03/MF A01

PB93-234722

Air Moving Systems and Fire Protection.
PB93-234722 00,398 PC A03/MF A01

PB93-234730

Operating Principles of the VME MultiKron Interface Board, PB93-234730 00,230 PC A03/MF A01 PB93-234748

Boundary/Interface Fitted Grid Generation Using Tensor Product B-splines: A Preliminary Study.
PB93-234748 00,503 PC A03/MF A01 PR03-235100

Workshop on Elevator Use during Fires. Held In Gaithersburg, Maryland on September 29, 1992. PB93-235190 00,045 PC A03/MF A01 PB93-235208

Dual-Port Circularly Polarized Probe Standards at the National Institute of Standards and Technology. PB93-235208 00,326 PC A03/MF A01 PB93-236511

Method for Separating Volatile Organic Carbon from 0.1 (sup 3) of Air to Identify Sources of Ozone Precursors via Isotope (14C) Measurements. 00,392 PC A03/MF A01 PB93-236511

PB93-500437

PC-OMNITAB: An Interactive System for Statistical and Numerical Data Analysis, Version 7.0 (for Microcomputers). PB93-500437 00,269 CP D03

PB93-504918

COBOL 85 Compiler Validation System (CCVS 85), Version PB93-504918 00,270 CP T99

PB93-505758

OSIKIT (Open Systems Interconnection) and NIST Proto-type Compiler for Estelle. PB93-505758 00,271 Mag Tape \$2400.00

PR93-937300

Validated Products List (Cobol, Fortran, ADA, Pascal, C, MUMPS, SQL, Graphics, GOSIP, POSIX, Computer Security). PB93-937300 00,272 Standing Order

PB94-100880

Private Branch Exchange (PBX) Security Guideline. PB94-100880 00,212 PC A04/MF A01

PB94-101813

Performance of 1/3-Scale Model Precast Concrete Beam-Column Connections Subjected to Cyclic Inelastic Loads. Report No. 3. PB94-101813 00.085 PC A07/MF A02

PB94-101821

Bibliography of Screw Thread Measurement. PB94-101821 00,460 F 00,460 PC A05/MF A01

PB94-101839

In situ Burning of Oil Spills: Mesoscale Experiments and Analysis. PB94-101839 00.396 PC A03/MF A01

PB94-101847

Towards SQL Database Langauge Extensions for Geographic Information Systems.
PB94-101847 00,411 PC A08/MF A02 PB94-101854

Workshop on Security Procedures for the Interchange of Electronic Documents: Selected Papers and Results. PB94-101854 00,226 PC A07/MF A02

PB94-102258

Towards Flexible Distributed Information Retrieval. PB94-102258 00,227 PC A03/MF A01 PB94-103660

Dispersion of Fire Suppression Agents Discharged from High Pressure Vessels: Establishing Initial/Boundary Conditions for the Flow Outside the Vessel. 00,004 PC A03/MF A01 PB94-103660

PB94-103678

Sprinkler Fire Suppression Algorithm for HAZARD. PB94-103678 00,046 PC A03/MF A01 PR94-103678

PB94-103686

Overview of NIST Research on Seismic Performance of Moment Resisting Precast Concrete Beam-Column Joints Containing Post-Tensioning. PB94-103686 00.086 PC A03/MF A01

PB94-103694 Combined Buoyancy- and Pressure-Driven Flow through a Horizontal Vent: Theoretical Considerations.
PB94-103694 00,077 PC A03/MF A01

PB94-103694 PB94-103702

NIST Scoring Package Cross-Reference for Use with NIST Internal Reports 4950 and 5129. PB94-103702 00,305 PC A03/MF A01

PB94-104585

Security Issues in the Database Language SQL. PB94-104585 00,273 PC A03/MF A01 PB94-107430

Technology for Economic Growth: President's Progress Re-00,001 PC E02/MF A01

PB94-107430

PB94-108388 Balanced Design Concepts Workshop. Held in Gaithersburg, Maryland on June 30-July 2, 1993.
PB94-108388 PC A06/MF A02

PB94-108461

Journal of Research of the National Institute of Standards and Technology, May-June 1993. Volume 98, Number 3. PB94-108461 00,688 PC A09/MF A02

PB94-108479

Coil Probe Dimension and Uncertainties during Measurements of Nonuniform ELF Magnetic Fields. PB94-108479 (Order as PB94-108461, PC A09/MF A02)

PB94-108487

Characteristics of Unknown Linear Systems Deduced from Measured CW Magnitude. PB94-108487 (Order as PB94-108461, PC A09/MF A02)

PB94-108495

X-ray Diffraction Line Broadening: Modeling and Applica-tions to High-(T sub c) Superconductors. PB94-108495 00,689

(Order as PB94-108461, PC A09/MF A02) PB94-108503 Evaluation of Serum Volume Losses during Long-Term

Storage. PB94-108503 (Order as PB94-108461, PC A09/MF A02) PB94-108511

Dependence of Quantized Hall Effect Breakdown Voltage on Magnetic Field and Current.
PB94-108511 00,690 (Order as PB94-108461, PC A09/MF A02)

PB94-108529

Journal of Research of the National Institute of Standards and Technology, July-August 1993. Volume 98, Number 4. PB94-108529 00,369 PC A08/MF A02

PB94-108537

X-ray Lithography Mask Metrology: Use of Transmitted Electrons in an SEM for Linewidth Measurement. PB94-108537 00.370 (Order as PB94-108529, PC A08/MF A02)

PB94-108545

Interlaboratory Study on the Lithographically Produced Scanning Electron Microscope Magnification Standard Pro-PB94-108545 00.371

(Order as PB94-108529, MF A02)

PB94-108552

Phese Equilibria end Crystal Chemistry in Portions of the System SrO-CeO-Bi2O3-CuO. Pert 4. The System CeO-Bi2O3-CuO.

PB94-108552 (Order es PB94-108529, PC A08/MF A02)

PB94-108636

RL/NIST Workshop on Moisture Measurement and Control for Microelectronics. Proceedings of the RL/NIST Workshop held in Geithersburg, Maryland on April 5-7, 1993. PB94-108636 00,372 PC A16/MF A03

PB94-108644

Test Methods for Quentifying the Propensity of Cigarettes to Ignite Soft Fumishings. PB94-108644 00,047 PC A08/MF A02

PB94-108778 Metrology for Electromagnetic Technology: A Bibliography of NIST Publications.

00.341 PC A05/MF A01 PB94-108776 PB94-109014

Modeling the Ignition of Soft Furnishings by e Cigarette. PB94-109014 00,048 PC A08/MF A02 PB94-109220

Validation Testing System: Reusable Software Component Design. Netional PDES Testbed Report Series. PB94-109220 00,427 PC A03/MF A01

PB94-109238

Present Worth Factors for Life-Cycle Cost Studies in the Department of Defense (1994).

PB94-109238 00.540 PC A04/MF A01 PB94-109329

Clinical Trial of an Adhesive Material.

00,528 PC A04/MF A01 PB94-109329 PB94-110186

NIST Measurement Service for Electromagnetic Character-lization of Materials. PB94-110186 00,321 PC A03/MF A01

PB94-110194

Colleboreting with Our Customers: NIST Building end Fire

Research Laboratory. PB94-110194 00,029 PC A03/MF A01 PB94-111374

Netlonel Institute of Standards end Technology Conference on Reducing the Cost of Space Infrestructure end Operetions. Part 1. Oral Presentations and Discussion. Held in Gaithersburg, Maryland on November 20-22, 1989. PB

PB94-111424

Computetional Materials Science of Cement-Besed Materials: An Education Module. PR94-111424 00.188 PC A03/MF A01

PB94-111523

Morphological Instability In Phase-Field Models of Solidifica-

tion. PB94-111523 00.691 PC A03/MF A01 PB94-111853

Energy Releted Inventions Progrem. Stetus Report for Recommendations 351 through 602. PB94-111853 00,373 PC A11/MF A03 PB94-111903

Energy Related Inventions Progrem. Status Report for Recommendations 1 through 350.

PR94-111903 00.374 PC A09/MF A03 PB94-112166

Zone Fire Modeling with Netural Building Flows and e Zero Order Shaft Model.
PB94-112166 00,030 PC A03/MF A01 PB94-112182

Research for Electric Energy Systems: An Annual Report,

PB94-112182 00,375 PC A03/MF A01 PB94-112257

Eerly Detection of Room Fires through Acoustic Emission. PB94-112257 00,031 PC A03/MF A01 PB94-112422

Report of the ARPA/NIST Workshop on Performence Eveluation of Unmanned Ground Vehicle Technologies.
PB94-112422 00,456 PC A07/MF A02 PB94-112422

PB94-112430

Intelligent Processing of Materials, Technical Activities 1992. (NAS-NRC Assessment Panel, Februery 2-3, 1993). PB94-112430 00,434 PC A04/MF A01

PB94-112448

PB94-112455

MicrocalorImeter for 7 mm Coaxial Transmission Line. PB94-112455 00.338 PC A04/N 00.338 PC A04/MF A01

PR94-112497

Reference Model for Frameworks of Software Engineering Environments (Technical Report ECMA TR/55, 3rd Edition). PB94-112497 00,274 PC A07/MF A02

PB94-112547

Bibliography of the NIST Electromagnetic Flelds Division Publications. PB94-112547 00,322 PC A06/MF A02

PB94-112802

Calculeting Cement Paste end Morter Diffusivity from Conductivity Meesurements: Preliminary Results of e New ductivity Method.

PB94-112802 00.189 PC A03/MF A01

PB94-113081

Large Scale Evaluation of e Pattern Recognition/Expert System for Mass Spectrel Molecular Weight Estimation. PB94-113081 00,108 PC A03/MF A01

PB94-113420

Impacts: NIST Building and Fire Research Laboratory (Technical and Societal). PB94-113420 00,079 PC A03/MF A01

PB94-113487

Netional Institule of Stendards and Technology Conference on Reducing the Cost of Space Infrestructure end Operetions. Part 2. Topical Papers. Held in Galthersburg, Meryland on November 20-22, 1989.

PB94-113487 00,696 PC A11/MF A03 PB94-113578

Airbome Asbestos Method: Standerd Test Method for Verified Analysis of Asbestos by Trensmission Electron Microscopy. Version 1.0. PB94-113578 00.109 PC A02/MF A01

PB94-114501

SGML DTD for the STEP Integrated Resource Perts. Netional PDES Testbed Report Series. PB94-114501 00,428 PC A03/MF A01

PB94-114519

Smoke Plume Trajectory from In situ Burning of Crude Oll in Alaska PB94-114519 00,393 PC A04/MF A01 PB94-114568

Detabases Availeble in the Research Information Center of the National Institute of Standards and Technology. PB94-114568 00,412 PC A07/MF A02

PB94-118056

Proceedings: Open Forum on Surge Protection Application. PB94-118056 00,346 PC A09/MF A02

PB94-118213

Comparison of Hendprinted Digit Classifiers. PB94-118213 00,306 PC A03/MF A01

PB94-118221

Portsmouth Festener Manufecturing Workstation. Fastener Engraving System (Design, Construction, end Operation). PB94-118221 00,461 PC A04/MF A01

PB94-118288

NIST Building end Fire Reseerch Laboratory, Projects 1993. PB94-118288 00,410 PC A07/MF A02

PB94-118403

Electronics end Electrical Engineering Laboretory Technical Publicetion Announcements Covering Laboretory Programs, April to June 1993 with 1993/1994 EEEL Events Celender. PB94-118403 00,342 PC A03/MF A01

PB94-118460

FORTRAN Compiler Validation System 1978. User's Guide, Version 2.1. PB94-118460 00.275 PC A08/MF A02 PB94-118494

Thermodynemic Properties of Homogeneous Mixtures of Nitrogen end Water from 440 to 1000 K, Up to 100 MPa and 0.8 Mole Fraction N2.

PR94-118494 00.617 PC A05/MF A01

PB94-119435

Guide to NIST. PB94-119435

00,002 PC A06/MF A02

PB94-120623

Shtolo-Converting STEP Short Listings to Annoteted List-Ings. Netlonel PDES Testbed Report Series. PB94-120623 00,435 PC A03/MF A01

PB94-120664

NIST EXPRESS Toolkit: Introduction end Overview. Netional PDES Testbed Report Series.
PB94-120664 00,436 PC A03/MF A01

PB94-120680

Analysis of the Impact on U.S. Industry of the NIST/Boulder Superconductivity Progrems: An Interim Study. PB94-120680 00,692 PC A03/MF A01

PB94-120797

Exppp: An EXPRESS Pretty Printer. Netionel PDES Testbed Report Series. PB94-120797 00,276 PC A03/MF A01

PB94-120847

NIST Serial Holdings, 1993. PB94-120847

00.413 PC A12/MF A03

PB94-120920

Integreted Services Digitel Network Conformence Testing, Layer 2, Dete Link Layer (LAPD). Part 1, Basic Rate Interface User Side. PB94-120920 00.213 PC A99/MF E11

PB94-121050

Summeries of BFRL Fire Research In-House Projects end Grants, 1993. PB94-121050 00,032 PC A11/MF A03

PB94-121324

Annual Conference on Fire Research, 1993; Book of Abstrects. PB94-121324 00,205 PC A10/MF A03

PB94-123056

Results of Screened-Room Measurements on NIST Standerd Rediators PB94-123056 00,323 PC A03/MF A01

PB94-123064

Nanofabrication Technology In Jepen. (Japan Technology Program). PB94-123064 00.693 PC A03/MF A01

PB94-500055

Building Life Cycle Cost Computer Program (BLCC), Version 4.11 (for Microcomputers).

PB94-500055 00,042 CP D02

PB94-500097

Computer Program for Celculeting Time-of-Use, Block, and Demand Charges for Electricity Usage (ERATES), (Version 1.0) (for Microcomputers).

PB94-500097 00,385 CP D02

Mechenical, Stress-Rupture, and Frecture Toughness Properties of Normelized end Stress Relieved AAR TC128 Grede B Steel et Eleveted Temperatures.
PB93-182020 00,485 PC A03/MF A01

REPT-27

Frecture Mechanics Evaluation of Reliroad Tank Cars Conteining Postuleted Circumferential Crecks. PB93-219731 00,486 PC A03/MF A01

Experimentel Study of Multiple Droplet Evaporative Cooling. PB93-198463 00,613 PC A06/MF A02

WRDC-TR-90-2070

Transient Hydrogen Heet Transfer. AD-A266 615/4 00.110 PC A03/MF A01



ALABAMA

Auburn

Auburn University Ralph Brown Draughon Library (1907)

Birmingham

Birmingham Public Library (1895)
Birmingham-Southern College Library (1932)
Jefferson State Community College James B. Allen Library (1970)
Samford University Library Harwell G. Davis Library (1884)

Enterprise

Enterprise State Junior College Learning Resources Center (1967)

Fayette

Bevill State Community College at Brewer Learning Resources Center (1979)

Florence

University of North Alabama Collier Library (1932)

Gadsden

Gadsden Public Library (1963)

Huntsville

University of Alabama in Huntsville Library (1964)

Jacksonville

Jacksonville State University Houston Cole Library (1929)

Maxwell Air Base

Air University Library (1963)

Mobile

Mobile Public Library (1963) Spring Hill College Thomas Byrne Memorial Library (1937) University of South Alabama Library (1968)

Montgomery

Alabama Public Library Service (1984) Alabama Supreme Court and State Law Library (1884) Auburn University at Montgomery Library (1971) REGIONAL

Normal

Alabama Agricultural and Mechanical University J. F. Drake Memorial Library Learning Resources Center (1963)

Troy

Troy State University Library (1963)

Tuscaloosa

University of Alabama Amelia Gayle Gorgas Library (1860) REGIONAL University of Alabama School of Law Library (1967)

Tuskegee

Tuskegee University Hollis Burke Frissell Library (1907)

ALASKA

Anchorage

Anchorage Law Library (1973)
Anchorage Municipal Libraries Z. J. Loussac Public Library (1978)
Department of the Interior Alaska Resources Library (1981)
University of Alaska at Anchorage Consortium Library (1961)
U.S. Court Law Library (1983)

Fairbanks

University of Alaska Elmer E. Rasmuson Library (1922)

Juneau

Alaska State Library (1900) University of Alaska Southeast William A. Egan Library (1981)

Ketchikan

Ketchikan Community College Library (1970)

AMERICAN SAMOA

Pago Pago

American Samoa Community College Learning Resources Center (1985)

ARIZONA

Apache Junction

Apache Junction Public Library (1992)

Coolidge

Central Arizona College Learning Resources Center (1973)

Flagstaff

Northern Arizona University Cline Library (1937)

Glendale

Glendale Public Llbrary (1986)

Mesa

Mesa Public Library (1983)

Phoenix

Arizona Department of Library Archives and Public Records (unknown)
REGIONAL
Grand Canyon University Fleming Library (1978)
Maricopa County Library District (1993)
Phoenix Public Library (1917)
U.S. Court of Appeals Ninth Circuit Library (1984)

Prescott

Yavapai College Library (1976)

Tempe

Arizona State University Hayden Library/Government Documents (1970)
Arizona State University Ross-Blakley Law Library (1977)

Tucson

Tucson-Pima Public Library (1970) University of Arizona College of Law Library (1991) University of Arizona Main Library (1907)

Winslow

Northland Pioneer College Winslow Center LRC (1985)

Yuma

Yuma County District Library (1963)

ARKANSAS

Arkadelphia

Ouachita Baptist University Riley Hickingbotham Library (1963)

Batesville

Lyons College Mabee Library (1963)

Clarksville

University of the Ozarks Dobson Memorial Library (1925)

Conway

Hendrix College Olin C. Bailey Library (1903)

Fayetteville

University of Arkansas Mullins Library (1907)
University of Arkansas School of Law Library Robert A. Leflar (1978)

Jonesboro

Arkansas State University—Jonesboro Dean B. Ellis Library (1913)

Little Rock

Arkansas State Library (1978) REGIONAL
Arkansas Supreme Court Library (1962)
Central Arkansas Library System Main Library (1953)
University of Arkansas at Little Rock Library Ottenheimer Library (1973)
University of Arkansas at Little Rock Pulaski County Law Library (1979)

Magnolia

Southern Arkansas University Magale Library (1956)

Monticello

University of Arkansas at Monticello Library (1956)

Pine Bluff

University of Arkansas at Pine Bluff Watson Memorial Library (1976)

Russellville

Arkansas Technical University Tomlinson Library (1925)

Searcy

Harding University Brackett Library (1963)

Walnut Ridge

Williams Baptist College Felix Goodson Library (1967)

CALIFORNIA

Anaheim

Anaheim Public Library (1963)

Arcadia

Arcadia Public Library (1975)

Arcata

Humboldt State University Library (1963)

Bakersfield

California State University Walter Stiern Library (1974) Kern County, Beale Memorial Library (1943)

Berkeley

University of California General Library (1907) University of California Boalt Hall Law Library (1963)

Carson

California State University Dominguez Hills Library (1973) Carson Regional Library (1973)

Chico

California State University at Chico Merriam Library (1962)

Claremont

Claremont College Government Publications and Microforms Department Honnold/Mouth Library (1913)

Culver City

Culver City Library Los Angeles Public Library (1966)

Davis

University of California at Davis Shields Library (1953) University of California at Davis Law Library (1972)

Downey

Downey City Library (1963)

Fresno

California State University at Fresno Henry Madden Library (1962) Fresno County Free Library (1920)

Fullerton

California State University at Fullerton University Library (1963)

Garden Grove

Orange County Public Library (1963)

Hayward

California State University at Hayward Library (1963)

Inglewood

Inglewood Public Library (1963)

Irvine

University of California at Irvine Main Library (1963)

La Jolla

University of California at San Diego Central University Library (1963)

Lakewood

Angelo M. Iacoboni Public Library (1970)

Lancaster

Lancaster Public Library (1967)

La Verne

University of La Verne College of Law Library (1979)

Long Beach

California State University at Long Beach Library (1962) Long Beach Public Library (1933)

Los Angeles

California State University at Los Angeles John F. Kennedy Memorial Library (1956)

Los Angeles County Law Library (1963)

Los Angeles Public Library (1891)

Loyola Law School William M. Rains Law Library (1979) Occidental College Mary Norton Clapp Library (1941) Southwestern University School of Law Library (1975)

University of California at Los Angeles University Research Library (1932)

University of California at Los Angeles Hugh & Hazel Darling Law Library (1958)

University of Southern California Doheny Memorial Library (1933)

University of Southern California Law Library (1978) U.S. Court of Appeals Ninth Circuit Library (1981) Whittier College School of Law Library (1978)

Malibu

Pepperdine University Payson Library (1963)

Menio Park

U.S. Geological Survey Library (1962)

Montebello

Montebello Regional Library (1966)

Monterey

U.S. Naval Postgraduate School Dudley Knox Library (1963)

Monterey Park

Bruggemeyer Memorial Library (1964)

Northridge

California State University at Northridge Delmar T. Oviatt Library (1958)

Norwalk

Norwalk Regional Library (1973)

Oakland

Mills College Library (1966) Oakland Public Library (1923)

Ontario

Ontario City Library (1974)

Palm Springs

Palm Springs Public Library (1980)

Pasadena

California Institute of Technology Millikan Memorial Library (1933) Pasadena Public Library (1963)

Pleasant Hill

Contra Costa County Library (1964)

Redding

Shasta County Library (1956)

Redlands

University of Redlands Armacost Library (1933)

Redwood City

Redwood City Public Library (1966)

Reseda

West Valley Regional Branch Library Los Angeles Public Library (1966)

Richmond

Richmond Public Library (1943)

Riverside

Riverside City and County Public Library (1947) University of California at Riverside Library (1963)

Sacramento

California State Library (1895) REGIONAL
California State University at Sacramento Library (1963)
Sacramento County Law Library (1963)
Sacramento Public Library (1880)
University of the Pacific McGeorge School of Law Gordon D. Schaber
Law Library (1978)

San Bernardino

San Bernardino County Law Library (1984) San Bernardino County Library (1964)

San Diego

San Diego County Law Library (1973)
San Diego County Library (1973)
San Diego Public Library (1895)
San Diego State University Library (1962)
University of San Diego Alcala Park School of Law Library (1967)

San Francisco

Golden Gate University Law Library (1979) San Francisco Public Library (1889) San Francisco State University J. Paul Leonard Library (1955) Supreme Court of California Library (1979) University of California Hastings College of Law Legal Information Center (1972) University of San Francisco Richard A. Gleeson Library (1963) U.S. Court of Appeals Ninth Circuit Library (1971)

San Jose

San Jose State University Clark Library (1962)

San Leandro

San Leandro Public Library Community Library Center (1961)

San Luis Obispo

California Polytechnic State University Robert F. Kennedy Library (1969)

San Mateo

College of San Mateo Library (1987)

San Rafael

Marin County Free Library (1975)

Santa Ana

Orange County Law Library (1975) Santa Ana Public Library (1959)

Santa Barbara

University of California at Santa Barbara Library (1960)

Santa Clara

Santa Clara University Orradre Library (1963)

Santa Cruz

University of California at Santa Cruz McHenry Library (1963)

Santa Rosa

Sonoma County Library (1896)

Stanford

Stanford University Jonsson Library (1895) Stanford University Robert Crown Law Library (1978)

Stockton

Public Library of Stockton and San Joaquin County (1884)

Thousand Oaks

California Lutheran University Pearson Library (1964)

Torrance

Torrance Public Library (1969)

Turlock

California State University, Stanislaus Library (1964)

Vallejo

Solano County Library System John F. Kennedy Library (1982)

Valencia

Valencia Library (1972)

Ventura

Ventura County Library E. P. Foster Library (1975)

Visalia

Tulare County Free Library (1967)

Walnut

Mount San Antonio College Learning Resources Library (1966)

West Covina

West Covina Regional Library (1966)

Whittler

Whittier College Wardman Library (1963)

COLORADO

Alamosa

Adams State College Library (1963)

Aurora

Aurora Public Library (1984)

Boulder

University of Colorado at Boulder Norlin Library (1879) REGIONAL University of Colorado at Boulder School of Law Library (1988)

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Mamie Doud Eisenhower Public Library

Colorado Springs

Colorado College Tutt Library (1880) University of Colorado at Colorado Springs Library (1974) U.S. Air Force Academy Library (1956)

Denver

Auraria Library (1978) Colorado Supreme Court Library (1978) Denver Public Library (1884) REGIONAL Department of the Interior Bureau of Reclamation Library (1962)
Regis University Dayton Memorial Library (1915)
University of Denver College of Law Library Westminister Law Library (1978)
University of Denver Penrose Library (1909)
U.S. Courts Library (1973)

Fort Collins

Colorado State University Libraries (1907)

Golden

Colorado School of Mines Arthur Lakes Library (1939)

Grand Junction

Mesa County Public Library District (1975) Mesa State College John Tomlinson Library (1985)

Greeley

University of Northern Colorado James A. Michener Library (1966)

Gunnison

Western State College of Colorado Leslie J. Savage Library (1932)

La Junta

Otero Junior College Wheeler Library (1963)

Lakewood

Jefferson County Public Library Lakewood Library (1968)

Pueblo

Pueblo Library District McClelland Library (1893) University of Southern Colorado Library (1965)

CONNECTICUT

Bridgeport

Bridgeport Public Library (1884)

Quinnipiac College School of Law Library Wahlstrom Library (1979)

Danbury

Western Connecticut State University Ruth A. Haas Library (1967)

Hartford

Connecticut State Library (unknown) REGIONAL Hartford Public Library (1945)

Middletown

Wesleyan University Olin Library (1906)

Mystic

Mystic Seaport Museum, Inc., G. W. Blunt White Library (1964)

New Britain

Central Connecticut State University Elihu Burritt Library (1973)

New Haven

Southern Connecticut State University Hilton C. Buley Library (1968) Yale University Law Library (1981) Yale University Seeley G. Mudd Library (1859)

New London

Connecticut College C. E. Shain Library (1926) U.S. Coast Guard Academy Library (1939)

Stamford

Ferguson Library (1973)

Storrs

University of Connecticut Homer Babbidge Library (1907)

Waterbury

Silas Bronson Public Library (1869) Teikyo Post University Traurig Library (1977)

West Haven

University of New Haven Marvin K. Peterson Library (1971)

DELAWARE

Dover

Delaware Division of Libraries (1992) Delaware State University William C. Janson Library (1962)

Georgetown

Delaware Technical and Community College Southern Campus Library (1968)

Newark

University of Delaware Library (1907)

Wilmington

Widener University School of Law Library (1976)

DISTRICT OF COLUMBIA

Washington

Administrative Conference of the United States Library (1972)
Board of Governors of the Federal Reserve System Law Library (1976)

Board of Governors of the Federal Reserve System Research Library (1978)

American University Washington College of Law Library (1983)

Catholic University of America Robert J. White Law Library (1979)

Comptroller of the Currency Library (1986) Department of Commerce Library (1955)

Department of Education Research Library (1988)

Department of Housing and Urban Development Library (1969)

Department of the Army Pentagon Library (1969)

Department of the Interior Natural Resources Library (1895)

Department of Justice Main Library (1895)

Department of Labor Library (1976)

Department of the Navy Library (1895)
Department of State Law Library (1966)

Department of State Library (1895)

Department of Transportation Main Library (1982)

Department of Transportation U.S. Coast Guard Law Library (1982)

Department of the Treasury Library (1895)

Department of Veterans' Affairs Central Office Library (1967)

District of Columbia Court of Appeals Library (1981)

District of Columbia Public Library (1943)

Equal Employment Opportunity Commission Library (1984)

Executive Office of the President Libraries (1965)
Federal Deposit Insurance Corporation Library (1972)
Federal Election Commission Law Library (1975)

Federal Energy Regulatory Commission Library (1983)

Federal Mine Safety & Health Review Commission Library (1976)

General Accounting Office Information Services Center (1974)

General Services Administration Library (1975)

Georgetown University Law Center Edward Bennett Williams Law Library (1978)

Georgetown University Library (1969)

George Washington University Melvin Gelman Library (1983)

George Washington University National Law Center Jacob Burns Law Library (1978)

Library of Congress Congressional Research Service (1978)

Library of Congress Serial and Government Publications Division (1977)

Merit Systems Protection Board Library (1979)

National Defense University Library (1895)

Office of Personnel Management Library (1963)

Pension Benefit Guaranty Corporation Office of General Counsel Library (1984)

U.S. Court of Appeals for the Federal Circuit Library (1986)

U.S. Court of Appeals Judges' Library (1975)

U.S. Information Agency Library (1984)

U.S. Postal Service Library (1895)

U.S. Senate Library (1979)

U.S. Supreme Court Library (1978)

FLORIDA

Boca Raton

Florida Atlantic University S. E. Wimberly Library (1963)

Bradenton

Manatee County Public Library (1991)

Casselberry

Seminole County Public Library System (1989)

Clearwater

Clearwater Public Library System (1991)

Coral Gables

University of Miami Otto G. Richter Library (1939)

Daytona Beach

Volusia County Public Library Volusia County Library Center (1963)

Deland

Stetson University duPont-Ball Library (1887)

Fort Lauderdale

Broward County Main Library (1967) Nova Southeastern University Law Library (1967)

Fort Pierce

Indian River Community College Library (1975)

Gainesville

University of Florida College of Law Library (1978) University of Florida Libraries (1907) REGIONAL

Jacksonville

Jacksonville Public Libraries (1914) Jacksonville University Carl S. Swisher Library (1962) University of North Florida Thomas G. Carpenter Library (1972)

Key West

Florida Keys Community College Key West Campus Library (1989)

Lakeland

Lakeland Public Library (1928)

Leesburg

Lake-Sumter Community College Library (1963)

Melbourne

Florida Institute of Technology Evans Library (1963)

Miami

Florida International University University Park Campus Library (1970) Miami-Dade Public Library (1952) St. Thomas University Library (1966)

North Miami

Florida International University North Miami Campus Library (1977)

Orlando

University of Central Florida Library (1966)

Palatka

Saint Johns River Community College Library (1963)

Panama City

Bay County Public Library (1983)

Pensacola

University of West Florida John C. Pace Library (1983)

Port Charlotte

Charlotte-Glades Library System (1973)

Saint Petersburg

Saint Petersburg Public Library (1965) Stetson University College of Law Charles A. Dana Law Library (1975)

Sarasota

Selby Public Library (1970)

Tallahassee

Florida Agricultural and Mechanical University Coleman Memorial Library (1936) Florida State University College of Law Library (1978) Florida State University Strozier Library (1941) Florida Supreme Court Library (1974) State Library of Florida (1929)

Tampa

Tampa-Hillsborough County Public Library (1965) University of South Florida Library (1962) University of Tampa Merl Kelce Library (1953)

Winter Park

Rollins College Olin Library (1909)

GEORGIA

Albany

Dougherty County Public Library (1964)

Americus

Georgia Southwestern College James Earl Carter Library (1966)

Athens

University of Georgia Libraries (1907) REGIONAL University of Georgia School of Law Library (1979)

Atlanta

Atlanta-Fulton Public Library (1880)
Atlanta University Center Robert W. Woodruff Library (1962)
Emory University Robert W. Woodruff Library (1928)
Emory University School of Law Library (1968)
Georgia Institute of Technology Price Gilbert Memorial Library (1963)
Georgia State Law Library (unknown)
Georgia State University College of Law Library (1983)
Georgia State University William Russell Pullen Library (1970)
U.S. Court of Appeals Eleventh Circuit Library (1980)

Augusta

Augusta College Reese Library (1962) Medical College of Georgia Greenblatt Library (1986)

Brunswick

Brunswick-Glynn County Regional Library (1965)

Carrollton

West Georgia College Irvine Sullivan Ingram Library (1962)

Columbus

Columbus College Simon Schwob Memorial Library (1975)

Dahlonega

North Georgia College Stewart Library (1939)

Dalton

Dalton College Library Resources Center (1978)

Macon

Mercer University Main Library (1964) Mercer University School of Law Library (1978)

Marietta

Kennesaw State College Horace W. Sturgis Library (1968)

Milledgeville

Georgia College Ina Dillard Russell Library (1950)

Mount Berry

Berry College Memorial Library (1970)

Rome

Berry College Memorial Library (1970)

Savannah

Chatham-Effingham-Liberty Regional Library (1857)

Statesboro

Georgia Southern College Zoch S. Henderson Library (1939)

Valdosta

Valdosta State College Odum Library (1956)

GUAM

Agana

Nieves M. Flores Memorial Library (1962)

Mangilao

University of Guam Robert F. Kennedy Memorial Library (1978)

HAWAII

Hilo

University of Hawaii at Hilo Edwin H. Mookini Library (1962)

Honolulu

Hawaii Medical Library Incorporated (1968)
Hawaii State Library (1929)
Municipal Reference & Records Center (1965)
Supreme Court Law Library (1973)
University of Hawaii Hamilton Library (1907) REGIONAL
University of Hawaii School of Law Library (1978)

Laie

Brigham Young University Hawaii Campus Joseph F. Smith Library (1964)

Lihue

Lihue Public Library (1967)

Pearl City

Leeward Community College Library (1967)

Wailuku

Wailuku Public Library (1962)

IDAHO

Boise

Boise Public Library (1929)
Boise State University Library (1966)
Idaho State Library (1971)
Idaho Supreme Court State Law Library (unknown)

Caldwell

Albertson College N. L. Terteling Library (1930)

Lewiston

Lewis-Clark State College The Library (1991)

Moscow

University of Idaho College of Law Library (1978) University of Idaho Library (1907) REGIONAL

Nampa

Northwest Nazarene College John E. Riley Library (1984)

Pocatello

Idaho State University Eli Oboler Library (1908)

Rexburg

Ricks College David O. McKay Learning Resources Center (1946)

Twin Falls

College of Southern Idaho Library (1970)

ILLINOIS

Bloomington

Illinois Wesleyan University, Sheean Library (1964)

Bourbonnais

Olivet Nazarene University Benner Library and Resource Center (1946)

Carbondale

Southern Illinois University at Carbondale Morris Library (1932) Southern Illinois University at Carbondale School of Law Library (1978)

Carlinville

Blackburn College Lumpkin Library (1954)

Carterville

John A. Logan College Learning Resources Center (1992)

Champaign

University of Illinois Law Library (1965)

Charleston

Eastern Illinois University Booth Library (1962)

Chicago

Chicago Public Library Harold Washington Library (1876) Chicago State University Paul and Emily Douglas Library (1954) DePaul University Law Library (1979) Field Museum of Natural History Library (1963) Illinois Institute of Technology Chicago-Kent College of Law Library

Illinois Institute of Technology Paul V. Galvin Library (1982)

John Marshall Law School Library (1981)

Loyola University of Chicago E. M. Cudahy Memorial Library (1966) Loyola University School of Law Library (1979) Northeastern Illinois University Ronald Williams Library (1961) Northwestern University School of Law Library (1978) University of Chicago D'Angelo Law Library (1964) University of Chicago Library (1897) University of Illinois at Chicago Library (1957) William J. Campbell Library of the U.S. Courts (1979)

Decatur

Decatur Public Library (1954)

De Kalb

Northern Illinois University College of Law Library (1978) Northern Illinois University Founders' Memorial Library (1960)

Des Plaines

Oakton Community College Library (1976)

Edwardsville

Southern Illinois University at Edwardsville Lovejoy Memorial Library (1959)

Elsah

Principia College Marshall Brooks Library (1957)

Evanston

Northwestern University Library (1876)

Freeport

Freeport Public Library (1905)

Galesburg

Galesburg Public Library (1896)

Jacksonville

MacMurray College Henry Pfeiffer Library (1990)

Lake Forest

Lake Forest College Donnelley Library (1962)

Lebanon

McKendree College Holman Library (1968)

Lisle

Illinois Benedictine College Theodore F. Lownik Library (1911)

Macomb

Western Illinois University Government Publications & Legal Reference Library (1962)

Moline

Black Hawk College Library (1970)

Monmouth

Monmouth College Hewes Library (1860)

Mount Carmel

Wabash Valley College Bauer Media Center (1975)

Mount Prospect

Mount Prospect Public Library (1990)

Normal

Illinois State University Milner Library (1877)

Oak Park

Oak Park Public Library (1963)

Oglesby

Illinois Valley Community College Jacobs Memorial Library (1976)

Palos Hills

Moraine Valley Community College Robert E. Turner Learning Resources Center (1972)

Peoria

Bradley University Cullom-Davis Library (1963) Peoria Public Library (1883)

River Forest

Rosary College Rebecca Crown Library (1966)

Rockford

Rockford Public Library (1895)

Romeoville

Lewis University Library (1952)

South Holland

South Suburban College Learning Resources Center

Springfield

Illinois State Library (unknown) REGIONAL

Streamwood

Poplar Creek Public Library (1980)

University Park

Governors' State University Library (1974)

Urbana

University of Illinois at Urbana-Champaign Documents Library (1907)

Wheaton

Wheaton College Buswell Memorial Library (1964)

Woodstock

Woodstock Public Library (1963)

INDIANA

Anderson

Anderson Public Library (1983) Anderson University Robert A. Nicholson Library (1959)

Bloomington

Indiana University Library (1881) Indiana University School of Law Library (1978)

Crawfordsville

Wabash College Lilly Library (1906)

Evansville

Evansville-Vanderburgh County Public Library (1928) University of Southern Indiana Library Services (1969)

Fort Wayne

Allen County Public Library (1896)
Indiana University-Purdue University at Fort Wayne (1965)

Franklin

Franklin College Library (1976)

Gary

Gary Public Library Main Library (1943) Indiana University Northwest Library (1966)

Greencastle

DePauw University Roy O. West Library (1879)

Hammond

Hammond Public Library (1964)

Hanover

Hanover College Duggan Library (1892)

Huntington

Huntington College Richlyn Library (1964)

Indianapolis

Butler University Irwin Library (1965)
Indiana State Library (unknown) REGIONAL
Indiana Supreme Court Law Library (1975)
Indiana University School of Law Library (1967)
Indiana University-Purdue University at Indianapolis University Library (1979)
Indianapolis-Marion County Public Library (1906)

Kokomo

Indiana University Kokomo Library (1969)

Muncie

Ball State University Alexander M. Bracken Library (1959) Muncie Public Library (1906)

New Albany

Indiana University Southeast Library (1965)

Notre Dame

University of Notre Dame Kresge Law Library (1985) University of Notre Dame Theodore M. Hesburgh Library (1883)

Rensselaer

Saint Joseph's College Robinson Memorial Library (1964)

Richmond

Earlham College Lilly Library (1964) Morrison-Reeves Library (1906)

South Bend

Indiana University at South Bend Franklin D. Schurz Library (1965)

Terre Haute

Indiana State University Cunningham Memorial Library (1906)

Valparaiso

Valparaiso University Law Library (1978) Valparaiso University Moellering Memorial Library (1930)

West Lafayette

Purdue University Libraries (1907)

IOWA

Ames

Iowa State University Parks Library (1907)

Cedar Falls

University of Northern Iowa Donald O. Rod Library (1946)

Cedar Rapids

Cedar Rapids Public Library (1986)

Council Bluffs

Council Bluffs Public Library (1885)

Davenport

Davenport Public Library (1973)

Des Molnes

Drake University Cowles Library (1966) Drake University Law Library (1972) Public Library of Des Moines (1888) State Library of Iowa (unknown)

Dubuque

Carnegie-Stout Public Library (unknown) Loras College Wahlert Memorial Library (1967)

Fayette

Upper Iowa University Henderson-Wilder Library (1972)

Grinnell

Grinnell College Burling Library (1874)

Iowa City

University of Iowa College of Law Library (1968) University of Iowa Libraries (1884) REGIONAL

Lamoni

Graceland College F. M. Smith Library (1927)

Mason City

North Iowa Area Community College Library (1976)

Mount Vernon

Cornell College Russell D. Cole Library (1896)

Orange City

Northwestern College Ramaker Library (1970)

Sioux City

Sioux City Public Library (1894)

KANSAS

Atchison

Benedictine College Library (1965)

Baldwin City

Baker University Collins Library (1908)

Colby

Colby Community College H. F. Davis Memorial Library (1968)

Dodge City

Dodge City Community College Learning Resources Center (1991)

Emporia

Emporia State University William Allen White Library (1909)

Hays

Fort Hays State University Forsyth Library (1926)

Hutchinson

Hutchinson Public Library (1963)

Kansas City

Kansas City Kansas Community College Library (1992)

Lawrence

University of Kansas Government Documents and Maps Library (1869) REGIONAL University of Kansas Law School Library (1971)

Manhattan

Kansas State University Farrell Library (1907)

Pittsburg

Pittsburg State University Leonard H. Axe Library (1952)

Salina

Kansas Wesleyan University Memorial Library (1930)

Shawnee Mission

Johnson County Library (1979)

Topeka

Kansas State Historical Society Library (1877) Kansas State Library (1975) Kansas Supreme Court Law Library (1975) Washburn University of Topeka Law Library (1971)

Wichita

Wichita State University Ablah Library (1901)

KENTUCKY

Ashland

Ashland Community College Library (1990)

Barbourville

Union College Abigail E. Weeks Memorial Library (1958)

Bowling Green

Western Kentucky University Helm-Cravens Library (1934)

Columbia

Lindsey Wilson College Katie Murrell Library (1987)

Crestview Hills

Thomas More College Library (1970)

Danville

Centre College Grace Doherty Library (1884)

Frankfort

Kentucky Department of Libraries and Archives (1967) Kentucky State Law Library (unknown) Kentucky State University Paul G. Blazer Library (1972)

Hazard

Hazard Community College Library (1988)

Highland Heights

Northern Kentucky University W. Frank Steely Library (1973)

Lexington

University of Kentucky Law Library (1968) University of Kentucky King Library South (1907) REGIONAL

Louisville

Louisville Free Public Library (1904) University of Louisville Ekstrom Library (1925) University of Louisville Law Library (1975)

Morehead

Morehead State University Camden-Carroll Library (1955)

Murray

Murray State University Waterfield Library (1924)

Owensboro

Kentucky-Wesleyan College Library Learning Center (1966)

Richmond

Eastern Kentucky University John Grant Crabbe Library (1966)

Williamsburg

Cumberland College Norma Perkins Hagan Memorial Library (1988)

LOUISIANA

Baton Rouge

Louisiana State University Middleton Library (1907) REGIONAL Louisiana State University Paul M. Herbert Law Center Law Library (1929) Southern University John B. Cade Library (1952) Southern University Law Center Library (1979) State Library of Louisiana (1976)

Eunice

Louisiana State University at Eunice Arnold LeDoux Library (1969)

Hammond

Southeastern Louisiana University Sims Memorial Library (1966)

Lafayette

University of Southwestern Louisiana Dupre Library (1938)

Lake Charles

McNeese State University Lether E. Frazar Memorial Library (1941)

Leesville

Vernon Parish Library (1991)

Monroe

Northeast Louisiana University Sandel Library (1963)

Natchitoches

Northwestern State University Watson Memorial Library (1887)

New Orleans

Law Library of Louisiana (unknown) Loyola University Library (1942)

Loyola University Law Library (1978)

New Orleans Public Library (1883)

Our Lady of Holy Cross College Blaine S. Kern Library (1968)

Southern University at New Orleans Leonard S. Washington Library (1962)

Tulane University School of Law Library (1976)

Tulane University Howard-Tilton Memorial Library (1942)

U.S. Court of Appeals Fifth Circuit Library (1973)

University of New Orleans Earl K. Long Library (1963)

Xavier University Library (1991)

Pineville

Louisiana College Norton Memorial Library (1969)

Ruston

Louisiana Technical University Prescott Memorial Library (1896) REGIONAL

Shreveport

Louisiana State University in Shreveport Noel Memorial Library (1967) Shreve Memorial Library (1923)

Thibodaux

Nicholls State University Ellender Memorial Library (1962)

MAINE

Augusta

Maine Law and Legislative Reference Library (1973) Maine State Library (unknown)

Bangor

Bangor Public Library (1884)

Brunswick

Bowdoin College Hawthorne-Longfellow Library (1884)

Castine

Maine Maritime Academy Nutting Memorial Library (1969)

Lewiston

Bates College George and Helen Ladd Library (1883)

Orono

University of Maine Raymond H. Fogler Library (1907) REGIONAL

Portland

Portland Public Library (1884)
University of Maine School of Law Library Garbrecht Law Library (1964)

Presque Isle

University of Maine at Presque Isle Library (1979)

Sanford

Louis B. Goodall Memorial Library (1984)

Waterville

Colby College Miller Library (1884)

MARYLAND

Annapolis

Maryland State Law Library (unknown) U.S. Naval Academy Nimitz Library (1895)

Baltimore

Enoch Pratt Free Library (1887)

Johns Hopkins University New Engineering Building Government/

Publication/Maps Law Library (1882)

Morgan State University Soper Library (1940)

University of Baltimore Langsdale Library (1973)

University of Baltimore Law Library (1980)

University of Maryland School of Law Library Marshall Law Library (1969)

U.S. Court of Appeals Fourth Circuit Library (1982)

Bel Air

Harford Community College Library (1967)

Beltsville

Department of Agriculture National Agricultural Library (1895)

Bethesda

Department of Health and Human Services National Library of Medicine (1978)

Uniformed Services University of Health Sciences Learning Resources Center (1983)

Catonsville

University of Maryland Baltimore County Albin O. Kuhn Library & Gallery (1971)

Chestertown

Washington College Clifton M. Miller Library (1891)

College Park

University of Maryland at College Park McKeldin Library (1925) REGIONAL

Cumberland

Allegany Community College Library (1974)

Frostburg

Frostburg State University Library (1967)

Patuxent River

Patuxent River Central Library (1968)

Rockville

Montgomery County Department of Public Libraries Rockville Regional Library (1951)

Salisbury

Salisbury State University Blackwell Library (1965)

Silver Spring

Department of Commerce NOAA Central Library (1993)

Towson

Goucher College Julia Rogers Library (1966) Towson State University Albert S. Cook Library (1979)

Westminster

Western Maryland College Hoover Library (1886)

MASSACHUSETTS

Amherst

Amherst College Library (1884) University of Massachusetts University Library (1907)

Boston

Boston Athenaeum Library (unknown)
Boston Public Library (1859) REGIONAL
Boston University School of Law Pappas Law Library (1979)
Northeastern University Snell Library (1962)
State Library of Massachusetts (unknown)
Suffolk University Law Library (1979)
Supreme Judicial Court Social Law Library (1979)
U.S. Court of Appeals First Circuit Library (1978)

Brookline

Public Library of Brookline (1925)

Cambridge

Harvard College Library (1860) Harvard Law School Library (1981) Massachusetts Institute of Technology Libraries (1946)

Chestnut Hill

Boston College Thomas P. O'Neill Jr. Library (1963)

Chicopee

College of Our Lady of the Elms Alumnae Library (1969)

Lowell

University of Massachusetts-Lowell O'Leary Library (1952)

Medford

Tufts University Wessell Library (1899)

Milton

Curry College Levin Library (1972)

New Bedford

New Bedford Free Public Library (1858)

Newton Center

Boston College Law School Library (1979)

North Dartmouth

University of Massachusetts-Dartmouth Library (1965)

North Easton

Stonehill College Cushing-Martin Library (1962)

Springfield

Massachusetts Trial Court Hampden Law Library (1992) Springfield City Library (1966) Western New England College School of Law Library (1978)

Waltham

Brandeis University Library (1965)

Wellesley

Wellesley College Margaret Clapp Library (1943)

Wenham

Gordon College Jenks Learning Resource Center (1963)

Williamstown

Williams College Sawyer Library (unknown)

Worcester

American Antiquarian Society Library (1814)
University of Massachusetts Medical Center Lamar Soutter Library (1972)
Worcester Public Library (1859)

MICHIGAN

Albion

Albion College Stockwell-Mudd Library (1966)

Allendale

Grand Valley State University Zumberge Library (1963)

Alma

Alma College Library (1963)

Ann Arbor

University of Michigan Harlan Hatcher Graduate Library (1884) University of Michigan Law Library (1978)

Benton Harbor

Benton Harbor Public Library (1907)

Clinton Township

Macomb County Library (1968)

Dearborn

Henry Ford Community College Eshleman Library (1957)

Detroit

Detroit College of Law Library (1979)
Detroit Public Library (1868) REGIONAL
Marygrove College Library (1965)
University of Detroit Kresge Law Library (1978)
University of Detroit-Mercy McNichols Campus Library (1884)
Wayne State University Purdy/Kresge Library (1937)
Wayne State University Arthur Neef Law Library (1971)

Dowaglac

Southwestern Michigan College Fred L. Mathews Library (1971)

East Lansing

Michigan State University Government Documents Library (1907)

Farmington Hills

Oakland Community College King Learning Resources Center (1968)

Flint

Flint Public Library (1967) University of Michigan-Flint Library (1977)

Grand Rapids

Calvin College & Seminary Library (1967) Grand Rapids Public Library (1876)

Houghton

Michigan Technological University J. Robert Van Pelt Library (1876)

Jackson

Jackson District Library (1965)

Kalamazoo

Kalamazoo Public Library (1907) Western Michigan University Dwight B. Waldo Library (1963)

Lansing

Library of Michigan (1860) REGIONAL Thomas M. Cooley Law School Library (1978)

Livonia

Livonia Public Library (1987) Schoolcraft College Eric J. Bradner Library (1962)

Madison Heights

Madison Heights Public Library (1982)

Marquette

Northern Michigan University Lydia M. Olson Library (1963)

Monroe

Monroe County Library System (1974)

Mount Pleasant

Central Michigan University Charles V. Park Library (1958)

Muskegon

Hackley Public Library (1894)

Petoskey

North Central Michigan College Library (1962)

Pontiac

Oakland County Research Library 1992)

Port Huron

Saint Clair County Library (1876)

Rochester

Oakland University Kresge Library (1964)

Royal Oak

Royal Oak Public Library (1984)

Saginaw

Hoyt Public Library (1890)

Sault Ste. Marie

Lake Superior State University Kenneth Shouldice Library (1982)

Traverse City

Northwestern Michigan College Mark and Helen Osterlin Library (1964)

University Center

Delta College Library (1963)

Warren

Warren Public Library Arthur J. Miller Branch (1973)

Ypsilanti

Eastern Michigan University Library (1965)

MICRONESIA

Pohnpei State

College of Micronesia-FSM U.S. Government Documents Library (1982)

MINNESOTA

Bemidji

Bemidji State University A. C. Clark Library (1963)

Blaine

Anoka County Library (1971)

Collegeville

Saint John's University Alcuin Library (1954)

Duluth

Duluth Public Library (1909) University of Minnesota-Duluth Library (1984)

Eagan

Dakota County Library—Westcott Branch (1983)

Edina

Hennepin County Library Southdale-Hennepin Area Library (1971)

Mankato

Mankato State University Memorial Library (1962)

Marshall

Southwest State University Library (1986)

Minneapolis

Minneapolis Public Library (1893) University of Minnesota Law School Library (1978) University of Minnesota Wilson Library (1907) REGIONAL

Moorhead

Moorhead State University Library (1956)

Morris

University of Minnesota, Morris, Rodney A. Briggs Library (1963)

Northfield

Carleton College The Library (1930) Saint Olaf College Rolvaag Memorial Library (1930)

Saint Cloud

Saint Cloud State University, Learning Resources Center (1962)

Saint Paul

Hamline University School of Law Library (1978) Minnesota State Law Library (unknown) Saint Paul Public Library (1914) University of Minnesota Saint Paul Campus Library (1974) William Mitchell College of Law Library (1979)

Saint Peter

Gustavus Adolphus College Folke Bernadotte Memorial Library (1941)

Winona

Winona State University Maxwell Library (1969)

MISSISSIPPI

Cleveland

Delta State University W. B. Roberts Library (1975)

Columbus

Mississippi University for Women John Clayton Fant Memorial Library (1929)

Hattiesburg

University of Southern Mississippi Joseph A. Cook Memorial Library (1935)

Jackson

Jackson State University Henry Thomas Sampson Library (1968) Millsaps College Millsaps-Wilson Library (1963) Mississippi College School of Law Library (1977) Mississippi Library Commission (1947) Supreme Court of Mississippi State Law Library (unknown)

Lorman

Alcorn State University J. D. Boyd Library (1970)

Mississippi State

Mississippi State University Mitchell Memorial Library (1907)

University

University of Mississippi J. D. Williams Library (1883) REGIONAL University of Mississippi James O. Eastland Law Library (1967)

MISSOURI

Cape Girardeau

Southeast Missouri State University Kent Library (1916)

Columbia

University of Missouri at Columbia Ellis Library (1862) REGIONAL University of Missouri-Columbia Law Library (1978)

Fulton

Westminster College Reeves Library (1875)

Hillsboro

Jefferson College Library (1984)

Jefferson City

Lincoln University Inman E. Page Library (1944) Missouri State Library (1963) Missouri Supreme Court Library (unknown)

Joplin

Missouri Southern State College George A. Spiva Library (1966)

Kansas City

Kansas City Missouri Public Library (1881) Rockhurst College Greenlease Library (1917) University of Missouri at Kansas City Leon E. Bloch Law Library (1978) University of Missouri at Kansas City Miller Nichols Library (1938)

Kirksville

Northeast Missouri State University Pickler Memorial Library (1966)

Liberty

William Jewell College Charles F. Curry Library (1900)

Maryville

Northwest Missouri State University B. D. Owens Library (1982)

Rolla

University of Missouri at Rolla Curtis Laws Wilson Library (1907)

Saint Charles

Lindenwood College Margaret Leggat Butler Library (1973)
Saint Charles City/County Library District Kisker Road Branch Library (1990)

Saint Joseph

River Bluffs Regional Library Central Library (1891)

Saint Louis

Maryville University Library (1976)
Saint Louis County Library (1970)
Saint Louis Public Library (1866)
Saint Louis University Law Library (1967)
Saint Louis University Pius XII Memorial Library (1866)
U.S. Court of Appeals Eighth Circuit Library (1972)
University of Missouri at Saint Louis Thomas Jefferson Library (1966)
Washington University John M. Olin Library (1906)
Washington University Freund Law Library (1978)

Springfield

Drury College F. W. Olin Library (1874) Southwest Missouri State University Duane G. Meyer Library (1963)

Warrensburg

Central Missouri State University Ward Edwards Library (1914)

MONTANA

Billings

Montana State University Billings Library (1958)

Bozeman

Montana State University Renne Library (1907)

Butte

Montana Tech of the University of Montana Materials Processing Department/Documents (1901)

Havre

Montana State University-Northern Vande Bogart Library (1980)

Helena

Carroll College Corette Library (1974) Montana State Library (1966) State Law Library of Montana (1977)

Missoula

University of Montana Mansfield Library (1909) REGIONAL

NEBRASKA

Blair

Dana College C. A. Dana Life Library (1924)

Crete

Doane College Perkins Library (1944)

Fremont

Midland Lutheran College Luther Library (1924)

Kearney

University of Nebraska at Kearney Calvin T. Ryan Library (1962)

Lincoln

Nebraska Library Commission (1972) Nebraska State Library (unknown)

University of Nebraska at Lincoln D. L. Love Memorial Library (1907) REGIONAL

University of Nebraska at Lincoln Marvin & Virginia Schmid Law Library (1981)

Omaha

Creighton University Reinert/Alumni Library (1964) Creighton University Klutznick Law Library (1979) Omaha Public Library W. Dale Clark Library (1880) University of Nebraska at Omaha University Library (1939)

Scottsbluff

Scottsbluff Public Library (1925)

Wayne

Wayne State College U.S. Conn Library (1970)

NEVADA

Carson City

Nevada State Library and Archives (unknown) Nevada Supreme Court Library (1973)

Elko

Elko County Library (1991)
Northern Nevada Community College Learning Resources Center (1992)

Las Vegas

Clark County Law Library (1988)
Las Vegas-Clark County Library District (1974)
University of Nevada at Las Vegas James Dickinson Library (1959)

Reno

National Judicial College Law Library (1979) Nevada Historical Society Library (1974) University of Nevada Libraries (1907) REGIONAL Washoe County Library (1980)

NEW HAMPSHIRE

Concord

Franklin Pierce Law Center Library (1973) New Hampshire Law Library (1994) New Hampshire State Library (unknown)

Durham

University of New Hampshire Dimond Library (1907)

Hanover

Dartmouth College Baker Library (1884)

Henniker

New England College Danforth Library (1966)

Manchester

Manchester City Library (1884) New Hampshire College H. A. B. Shapiro Memorial Library (1976) Saint Anselm College Geisel Library (1963)

Nashua

Nashua Public Library (1971)

NEW JERSEY

Bayonne

Bayonne Free Public Library (1909)

Bloomfield

Bloomfield Public Library (1965)

Bridgeton

Cumberland County Library (1966)

Camden

Rutgers University Law School Library (1979) Rutgers University Paul Robeson Library (1966)

East Brunswick

East Brunswick Public Library (1977)

East Orange

East Orange Public Library (1966)

Elizabeth

Free Public Library of Elizabeth (1895)

Glassboro

Rowan College of New Jersey Savitz Library (1963)

Hackensack

Johnson Free Public Library (1966)

Irvington

Irvington Public Library (1966)

Jersey City

Jersey City Public Library (1879) Jersey City State College Forrest A. Irwin Library (1963)

Lawrenceville

Rider University Franklin F. Moore Library (1975)

Madison

Drew University Library (1939)

Mahwah

Ramapo College George T. Potter Library (1971)

Morristown

College of Saint Elizabeth Mahoney Library (1938)

Mount Holly

Burlington County Library (1966)

New Brunswick

Rutgers University Alexander Library (1907)

Newark

Newark Public Library (1906) REGIONAL Rutgers University John Cotton Dana Library (1966) Rutgers University Law School Ackerson Law Library (1979) Seton Hall University Law Library (1979)

Newton

Sussex County Library (1986)

Phillipsburg

Phillipsburg Free Public Library (1976)

Plainfield

Plainfield Public Library (1971)

Pomona

Stockton State College Library (1972)

Princeton

Princeton University Firestone Library (1884)

Randolph

County College of Morris Sherman H. Masten Learning Resource Center (1975)

Shrewsbury

Monmouth County Library (1968)

South Orange

Seton Hall University Walsh Library (1947)

Teaneck

Fairleigh Dickinson University Weiner Library (1963)

Toms River

Ocean County College Library (1966)

Trenton

New Jersey State Library (unknown) Trenton Public Library (1902)

Upper Montclair

Montclair State College Harry A. Sprague Library (1967)

Wayne

Wayne Public Library (1972)

West Long Branch

Monmouth College Guggenheim Memorial Library (1963)

Woodbridge

Free Public Library of Woodbridge (1965)

NEW MEXICO

Albuquerque

University of New Mexico Health Sciences Center Library (1973) University of New Mexico School of Law Library (1973) University of New Mexico General Library (1896) REGIONAL

Hobbs

New Mexico Junior College Pannell Library (1969)

Las Cruces

New Mexico State University Branson Library (1907)

Las Vegas

New Mexico Highlands University Donnelly Library (1913)

Portales

Eastern New Mexico University Golden Library (1962)

Santa Fe

New Mexico State Library (1960) REGIONAL New Mexico Supreme Court Law Library (unknown)

Silver City

Western New Mexico University Miller Library (1972)

Socorro

New Mexico Institute of Mining & Technology New Mexico Tech Library (1984)

NEW YORK

Albany

Albany Law School Schaffer Law Library (1979)
New York State Library (unknown) REGIONAL
State University of New York at Albany University Library (1964)

Binghamton

State University of New York at Binghamton Glenn G. Bartle Library (1962)

Brockport

State University of New York at Brockport Drake Memorial Library (1967)

Bronx

Fordham University Library (1937)
Herbert H. Lehman College Library (1967)
New York Public Library (1987)
State University of New York Maritime College Stephen B. Luce Library (1947)

Bronxville

Sarah Lawrence College Esther Raushenbush Library (1969)

Brooklyn

Brooklyn College Library (1936)
Brooklyn Law School Library (1974)
Brooklyn Public Library Business Library (1984)
Brooklyn Public Library (1908)
Pratt Institute Library (1891)
State University of New York Medical Research Library (1958)

Buffalo

Buffalo and Erie County Public Library (1895)
State University of New York at Buffalo Charles B. Sears Law Library (1978)
State University of New York at Buffalo Lockwood Memorial Library (1963)

Canton

Saint Lawrence University Owen D. Young Library (1920)

Corning

Corning Community College Arthur A. Houghton Jr. Library (1963)

Cortland

State University College Cortland Memorial Library (1964)

Delhi

State University of New York College of Technology Resnick Library (1973)

East Islip

East Islip Public Library (1973)

Elmira

Elmira College Gannett Tripp Library (1956)

Farmingdale

State University of New York at Farmingdale Greenley Library (1917)

Flushing

Queens College Benjamin S. Rosenthal Library (1939)
Queens College of City University of New York Law School Library (1983)

Garden City

Adelphi University Swirbul Library (1966)

Geneseo

State University of New York at Geneseo Milne Library (1967)

Greenvale

Long Island University B. Davis Schwartz Memorial Library (1964)

Hamilton

Colgate University, Everett Needham Case Library (1902)

Hempstead

Hofstra University Axinn Library (1964) Hofstra University School of Law Library (1979)

Huntington

Touro College School of Law Library (1985)

Ithaca

Cornell University Albert R. Mann Library (1943) Cornell University Law School Library (1978) Cornell University Olin Library (1907)

Jamaica

Queens Borough Public Library (1926) Saint John's University Library (1956) Saint John's University School of Law Library (1978)

Kings Point

U.S. Merchant Marine Academy Schuyler Otis Bland Library (1962)

Long Island City

Fiorello H. LaGuardia Community College Library (1981)

Middletown

Thrall Library (1986)

Mount Vernon

Mount Vernon Public Library (1962)

New Paltz

State University College at New Paltz Sojourner Truth Library (1965)

New York City

City College of City University of New York Cohen Library (1884)

College of Insurance Library (1965)

Columbia University Libraries (1882)

Columbia University School of Law Library (1981)

Cooper Union for the Advancement of Science and Arts Library (1930)

Fordham University Leo T. Kissam Memorial Law Library (1987)

Medical Library Center of New York (1976)

New York Law Institute Library (1909)

New York Law School Library (1979) New York Public Library Astor Branch (1907)

New York Public Library Lenox Branch (1884)

New York University Elmer Holmes Bobst Library (1967)

New York University Law Library (1974)

U.S. Court of Appeals Second Circuit Library (1976)

Yeshiva University Chutick Law Library (1979)

Yeshiva University Pollack Library (1979)

Newburgh

Newburgh Free Library (1909)

Niagara Falls

Niagara Falls Public Library (1976)

Oakdale

Dowling College Library (1965)

Oneonta

State University College at Onenonta James M. Milne Library (1966)

Oswego

State University of New York at Oswego Penfield Library (1966)

Plattsburgh

State University College at Plattsburgh Benjamin F. Feinberg Library (1967)

Potsdam

Clarkson University Harriet Call Burnap Memorial Library (1938) State University of New York-College at Potsdam Frederick W. Crumb Memorial Library (1964)

Poughkeepsie

Vassar College Library (1943)

Purchase

State University of New York at Purchase Library (1969)

Rochester

Rochester Public Library (1978) University of Rochester Rush Rhees Library (1880)

Saint Bonaventure

Saint Bonaventure University Friedsam Memorial Library (1938)

Saratoga Springs

Skidmore College Library (1964)

Schenectady

Union College Schaffer Library (1901)

Southampton

Long Island University Southhampton Campus Library (1973)

Sparkill

St. Thomas Aguinas College Lougheed Library (1984)

Staten Island

Wagner College Horrmann Library (1953)

Stony Brook

State University of New York at Stony Brook Frank Melville Jr. Memorial Library (1963)

Syracuse

Onondaga County Public Library (1978)
Syracuse University E. S. Byrd Library (1878)
Syracuse University College of Law Library H. Douglas Barclay Law Library (1978)

Troy

Troy Public Library (1869)

Uniondale

Nassau Library System (1965)

Utica

State University of New York Institute of Technology Library (1977) Utica Public Library (1885)

West Point

U.S. Military Academy Library (unknown)

White Plains

Pace University School of Law Library (1978)

Yonkers

Yonkers Public Library Getty Square Branch (1910)

Yorktown Heights

Mercy College Library (1976)

NORTH CAROLINA

Asheville

University of North Carolina at Asheville D. Hiden Ramsey Library (1965)

Boiling Springs

Gardner-Webb University Dover Memorial Library (1974)

Boone

Appalachian State University Carol Grotnes Belk Library (1963)

Buies Creek

Campbell University Carrie Rich Memorial Library (1965)

Burlington

Elon College Iris Holt McEwen Library (1971)

Chapel Hill

University of North Carolina at Chapel Hill Law Library (1978)
University of North Carolina at Chapel Hill Walter Royal Davis Library (1884) REGIONAL

Charlotte

Public Library of Charlotte and Mecklenburg County (1964)
Queens College Everett Library (1927)
University of North Carolina at Charlotte J. Murrey Atkins Library (1964)

Cullowhee

Western Carolina University Hunter Library (1953)

Davidson

Davidson College E. H. Little Library (1893)

Durham

Duke University School of Law Library (1978)
Duke University William R. Perkins Library (1890)
North Carolina Central University Law School Library (1979)
North Carolina Central University James E. Shepard Library (1973)

Fayetteville

Fayetteville State University Charles W. Chesnutt Library (1971)

Greensboro

North Carolina Agricultural and Technical State University F. D. Bluford Library (1937)

University of North Carolina at Greensboro Walter Clinton Jackson Library (1963)

Greenville

East Carolina University J. Y. Joyner Library (1951)

Laurinburg

Saint Andrews Presbyterian College DeTamble Library (1969)

Lexington

Davidson County Public Library (1971)

Mount Olive

Mount Olive College Moye Library (1971)

Pembroke

Pembroke State University Mary Livermore Library (1956)

Raleigh

Department of Cultural Resources Division of State Library (unknown) North Carolina State University D. H. Hill Library (1923) North Carolina Supreme Court Library (1972)

Rocky Mount

North Carolina Wesleyan College Pearsall Library (1969)

Salisbury

Catawba College Corriher-Linn-Black Library (1925)

Wilmington

University of North Carolina at Wilmington William M. Randall Library (1965)

Wilson

Barton College Hackney Library (1930)

Winston-Salem

Forsyth County Public Library Main Library (1954) Wake Forest University Worrell Professional Center Library (1990) Wake Forest University Z. Smith Reynolds Library (1902)

NORTH DAKOTA

Bismarck

Bismarck Veterans' Memorial Public Library (1967)
North Dakota State Library (1971)
North Dakota Supreme Court Law Library (unknown)
State Historical Society of North Dakota State Archives & Historical
Research Library (1907)

Dickinson

Dickinson State University Stoxen Library (1968)

Fargo

North Dakota State University Library (1907) REGIONAL

Grand Forks

University of North Dakota Chester Fritz Library (1890) REGIONAL

Minot

Minot State University Gordon B. Olson Library (1925)

Valley City

Valley City State University Allen Memorial Library (1913)

NORTHERN MARIANA ISLANDS

Saipan

Northern Marianas College Olympio T. Borja Memorial Library (1988)

OHIO

Ada

Ohio Northern University Jay P. Taggart Law Library (1965)

Akron

Akron-Summit County Public Library (1952) University of Akron Bierce Library (1963) University of Akron School of Law Library (1978)

Alliance

Mount Union College Library (1888)

Ashland

Ashland University Library (1938)

Athens

Ohio University Alden Library (1886)

Bluffton

Bluffton College Musselman Library (1951)

Bowling Green

Bowling Green State University Jerome Library (1933)

Canton

Malone College Everett L. Cattel Library (1970)

Chardon

Chardon Public Library (1971)

Cincinnati

Public Library of Cincinnati and Hamilton County Main Library (1884) University of Cincinnati College of Law Library (1978) University of Cincinnati Langsam Library (1929) U.S. Court of Appeals Sixth Circuit Library (1986)

Cleveland

Case Western Reserve University Freiberger Library (1913)
Case Western Reserve University School of Law Library (1979)
Cleveland Public Library (1886)
Cleveland State University Cleveland-Marshall College of Law Library
Joseph W. Bartunek III Law Library (1978)
Cleveland State University Library (1966)
Municipal Reference Library (1970)

Cleveland Heights

Cleveland Heights-University Heights Public Library (1970)

Columbus

Capital University Law and Graduate Center Documents Department (1980)

Capital University Library (1968)

Columbus Metropolitan Main Library (1885)

Ohio State University College of Law Library (1984)

Ohio State University Libraries (1907)

Ohio Supreme Court Law Library (1973)

State Library of Ohio (unknown) REGIONAL

Dayton

Dayton and Montgomery County Public Library (1909) University of Dayton Roesch Library (1969) Wright State University Paul Laurence Dunbar Library (1965)

Delaware

Ohio Wesleyan University L. A. Beeghly Library (1845)

Elyria

Elyria Public Library (1966)

Findlay

University of Findlay Shafer Library (1969)

Gambier

Kenyon College Olin/Chalmers Libraries (1873)

Granville

Denison University Libraries (1884)

Hiram

Hiram College Teachout-Price Memorial Library (1874)

Kent

Kent State University Libraries (1962)

Marietta

Marietta College Dawes Memorial Library (1884)

Marion

Marion Public Library (1979)

Middletown

Miami University Middletown Gardner-Harvey Library (1970)

New Concord

Muskingum College Library (1966)

Oberlin

Oberlin College Library (1858)

Oxford

Miami University King Library (1909)

Portsmouth

Shawnee State University Library (1987)

Rio Grande

University of Rio Grande Jeanette Albiez Davis Library (1966)

Springfield

Clark County Public Library (1884)

Steubenville

Franciscan University of Steubenville John Paul II Library (1971) Public Library of Steubenville and Jefferson County (1950)

Tiffin

Heidelberg College Beeghly Library (1964)

Toledo

Toledo-Lucus County Public Library (1884) University of Toledo College of Law Library (1981) University of Toledo William S. Carlson Library (1963)

University Heights

John Carroll University Grasselli Library (1963)

Westerville

Otterbein College Courtright Memorial Library (1967)

Westlake

Porter Public Library (1991)

Wilmington

Wilmington College S. Arthur Watson Library (1986)

Wooster

College of Wooster Andrews Library (1966)

Worthington

Worthington Public Library (1984)

Youngstown

Public Library of Youngstown and Mahoning County (1923) Youngstown State University William F. Maag Library (1971)

OKLAHOMA

Ada

East Central University Linscheid Library (1914)

Alva

Northwestern Oklahoma State University J. W. Martin Library (1907)

Bethany

Southern Nazarene University R. T. Williams Learning Resources Center (1971)

Durant

Southeastern Oklahoma State University Henry G. Bennett Memorial Library (1929)

Edmond

University of Central Oklahoma Library (1934)

Enid

Public Library of Enid and Garfield County (1908)

Langston

Langston University G. Lamar Harrison Library (1941)

Lawton

Lawton Public Library (1987)

Norman

University of Oklahoma Bizzell Memorial Library (1893) University of Oklahoma Law Library (1978)

Oklahoma City

Metropolitan Library System Downtown Library (1974) Oklahoma City University Dulaney Browne Library (1963) Oklahoma Department of Libraries (1893) REGIONAL

Shawnee

Oklahoma Baptist University Mabee Learning Center (1933)

Stillwater

Oklahoma State University Edmon Low Library (1907) REGIONAL

Tahlequah

Northeastern State University John Vaughan Library (1923)

Tulsa

Tulsa City-County Library System (1963) University of Tulsa College of Law Library (1979) University of Tulsa McFarlin Library (1929)

Weatherford

Southwestern Oklahoma State University Al Harris Library (1958)

OREGON

Ashland

Southern Oregon State College Library (1953)

Bend

Central Oregon Community College Library/Media Center (1985)

Corvallis

Oregon State University William Jasper Kerr Library (1907)

Eugene

University of Oregon Law Library (1979) University of Oregon Library (1883)

Forest Grove

Pacific University Harvey W. Scott Memorial Library (1897)

Klamath Falls

Oregon Institute of Technology Library (1982)

La Grande

Eastern Oregon State College Walter M. Pierce Library (1954)

McMinnville

Linfield College Northup Library (1965)

Monmouth

Western Oregon State College Library (1967)

Pendleton

Blue Mountain Community College Library (1983)

Portland

Lewis and Clark College Aubrey R. Watzek Library (1967)
Multnomah County Library (1884)
Northwestern School of Law Paul L. Boley Law Library (1979)
Portland State University Branford P. Millar Library (1963) REGIONAL
Reed College Library Eric V. Houser Library (1912)
U.S Department of Energy Bonneville Power Administration Library (1962)

Salem

Oregon State Library (unknown)
Oregon Supreme Court Law Library (1974)
Willamette University College of Law Library (1979)
Willamette University Mark O. Hatfield Library (1969)

PANAMA

Balboa Heights

Panama Canal Commission Technical Resources Center (1963)

PENNSYLVANIA

Allentown

Muhlenberg College Trexler Library (1939)

Altoona

Altoona Area Public Library (1969)

Bethel Park

Bethel Park Public Library (1980)

Bethlehem

Lehigh University Library (1876)

Blue Bell

Montgomery County Community College Learning Resources Center (1975)

Bradford

University of Pittsburgh at Bradford Hanley Library (1979)

Broomall

Marple Public Library (1988)

California

California University of Pennsylvania Louis L. Manderino Library (1986)

Carlisle

Dickinson College Boyd Lee Spahr Library (1947) Dickinson School of Law Sheeley-Lee Law Library (1978)

Cheyney

Cheyney University Leslie Pinckney Hill Library (1967)

Collegeville

Ursinus College Myrin Library (1963)

Coraopolis

Robert Morris College Library (1978)

Doylestown

Bucks County Free Library (1970)

East Stroudsburg

East Stroudsburg University Kemp Library (1966)

Erie

Erie County Library System (1897)

Greenville

Thiel College Langenheim Memorial Library (1963)

Harrisburg

State Library of Pennsylvania (unknown) REGIONAL Widener University Harrisburg Campus School of Law Library (1989)

Haverford

Haverford College Magill Library (1897)

Indiana

Indiana University of Pennsylvania Stapleton Library (1962)

Johnstown

Cambria County Library System Glosser Memorial Library (1965)

Lancaster

Franklin and Marshall College Shadek-Fackenthal Library (1895)

Lewisburg

Bucknell University Ellen Clarke Bertrand Library (1963)

Mansfield

Mansfield University Library (1968)

Meadville

Allegheny College Lawrence Lee Pelletier Library (1907)

Millersville

Millersville University Helen A. Ganser Library (1966)

Monessen

Monessen Public Library (1969)

New Castle

New Castle Public Library (1963)

Newton

Bucks County Community College Library (1968)

Norristown

Montgomery County-Norristown Public Library (1969)

Philadelphia

Free Library of Philadelphia (1897)
Saint Joseph's University Francis A. Drexel Library (1974)
Temple University Paley Library (1947)
Temple University School of Law Library (1979)
U.S. Court of Appeals Third Circuit Library (1973)
University of Pennsylvania Biddle Law Library (1974)
University of Pennsylvania Library (1886)

Pittsburgh

Allegheny County Law Library (1977)
Carnegie Library of Pittsburgh Allegheny Regional Branch (1924)
Carnegie Library of Pittsburgh (1895)
Duquesne University School of Law Library (1978)
La Roche College John J. Wright Library (1974)
University of Pittsburgh Hillman Library (1910)
University of Pittsburgh School of Law Barco Law Library (1979)
U.S. Bureau of Mines Library (1962)

Pottsville

Pottsville Free Public Library (1967)

Reading

Reading Public Library (1901)

Scranton

Scranton Public Library (1895)

Shippensburg

Shippensburg University Ezra Lehman Memorial Library (1973)

Slippery Rock

Slippery Rock University Bailey Library (1965)

Swarthmore

Swarthmore College McCabe Library (1923)

University Park

Pennsylvania State University Pattee Library (1907)

Villanova

Villanova University Law School Library (1964)

Warren

Warren Library Association Warren Public Library (1885)

West Chester

West Chester University Francis Harvey Green Library (1967)

Wilkes-Barre

King's College D. Leonard Corgan Library (1949)

Williamsport

Lycoming College Snowden Memorial Library (1970)

Youngwood

Westmoreland County Community College Learning Resources Center (1972)

PUERTO RICO

Mayaguez

University of Puerto Rico Mayaguez Campus Library (1928)

Ponce

Pontifical Catholic University of Puerto Rico Encarnacion Valdes Library (1966)

Pontifical Catholic University of Puerto Rico School of Law Library (1978)

San Juan

University of Puerto Rico Jose M. Lazaro Library (1928) University of Puerto Rico Law Library (1991)

RHODE ISLAND

Barrington

Barrington Public Library (1986)

Kingston

University of Rhode Island Library (1907)

Newport

U.S. Naval War College Library (1963)

Providence

Brown University John D. Rockefeller Jr. Library (unknown) Providence College Phillips Memorial Library (1969) Providence Public Library (1884) Rhode Island College James P. Adams Library (1965) Rhode Island State Law Library (1979) Rhode Island State Library (1895)

Warwick

Warwick Public Library (1966)

Westerly

Westerly Public Library (1977)

Woonsocket

Woonsocket Harris Public Library (1977)

SOUTH CAROLINA

Aiken

University of South Carolina-Aiken Gregg-Graniteville Library (1989)

Charleston

Charleston Southern University L. Mendel Rivers Library (1967) The Citadel Military College Daniel Library (1962) College of Charleston Robert Scott Small Library (1869)

Clemson

Clemson University Robert Muldrow Cooper Library (1893) REGIONAL

Columbia

Benedict College Payton Learning Resources Center (1969) South Carolina State Library (1895) University of South Carolina Coleman Karesh Law Library (1983) University of South Carolina Thomas Cooper Library (1884) REGIONAL

Conway

Coastal Carolina University Kimbel Library (1974)

Due West

Erskine College McCain Library (1968)

Florence

Florence County Library (1967)
Francis Marion University James A. Rogers Library (1970)

Greenville

Furman University James B. Duke Library (1962) Greenville County Library (1966)

Greenwood

Lander University Jackson Library (1967)

Lancaster

University of South Carolina at Lancaster Medford Library (1990)

Orangeburg

South Carolina State University Miller F. Whittaker Library (1953)

Rock Hill

Winthrop University Dacus Library (1896)

Spartanburg

Spartanburg County Public Library (1967)

SOUTH DAKOTA

Aberdeen

Northern State University Williams Library (1963)

Brookings

South Dakota State University Hilton M. Briggs Library (1889)

Pierre

South Dakota State Library (1973) South Dakota Supreme Court Library (1978)

Rapid City

Rapid City Public Library (1963)
South Dakota School of Mines and Technology Devereaux Library (1963)

Sioux Falls

Augustana College Mikkelsen Library (1969) Sioux Falls Public Library (1903)

Spearfish

Black Hills State University E. Y. Berry Library (1942)

Vermillion

University of South Dakota I. D. Weeks Library (1889)

TENNESSEE

Bristol

King College E. W. King Library (1970)

Chattanooga

Chattanooga-Hamilton County Bicentennial Library (1908) U.S. Tennessee Valley Authority Corporate Library (1976)

Clarksville

Austin Peay State University Felix G. Woodward Library (1945)

Cleveland

Cleveland State Community College Library (1973)

Columbia

Columbia State Community College John W. Finney Memorial Library (1973)

Cookeville

Tennessee Technological University Library (1969)

Jackson

Lambuth University Luther L. Gobbel Library (1967)

Jefferson City

Carson-Newman College Library (1964)

Johnson City

East Tennessee State University Sherrod Library (1942)

Knoxville

Knoxville County Public Library System Lawson-McGhee Library (1973)

University of Tennessee at Knoxville John C. Hodges Library (1907) University of Tennessee Law Library (1971)

Martin

University of Tennessee at Martin Paul Meek Library (1957)

Memphis

Memphis-Shelby County Public Library (1896)
University of Memphis Cecil C. Humphreys School of Law Library (1979)
University of Memphis Libraries (1966)

Murfreesboro

Middle Tennessee State University Todd Library (1912)

Nashville

Fisk University Library (1965)

Public Library of Nashville and Davidson County Ben West Library (1884)

Tennessee State Library and Archives (unknown)

Tennessee State University Brown-Daniel Library (1972)

Vanderbilt University Alyne Queener Massey Law Library (1976)

Vanderbilt University Library (1884)

Sewanee

University of the South Jessie Ball duPont Library (1873)

TEXAS

Abilene

Abilene Christian University Margaret and Herman Brown Library (1911)
Hardin-Simmons University Rupert and Pauline Richardson Library

(1940)

Arlington

Arlington Public Library (1970) University of Texas at Arlington Library (1963)

Austin

Texas State Law Library (1972)
Texas State Library (unknown) REGIONAL
University of Texas at Austin Edie and Lew Wasserman Library (1966)
University of Texas at Austin General Libraries (1884)
University of Texas at Austin Tarlton Law Library (1965)

Baytown

Lee College Erma Wood Carlson Learning Resources Center (1970)

Beaumont

Lamar University Gray Library (1957)

Brownwood

Howard Payne University Walker Memorial Library (1964)

Canyon

West Texas A&M University Cornette Library (1928)

College Station

Texas A&M University-Sterling G. Evans Library (1907)

Commerce

East Texas State University James Gilliam Gee Library (1937)

Corpus Christi

Texas A&M University-Corpus Christi Library (1976)

Corsicana

Navarro College Learning Resources Center (1965)

Dallas

Dallas Baptist University Vance Memorial Library (1967) Dallas Public Library (1900) Southern Methodist University Fondren Library (1925)

Denton

University of North Texas Libraries (1948)

Edinburg

University of Texas-Pan American Library (1959)

El Paso

El Paso Public Library (1906) University of Texas at El Paso Library (1966)

Fort Worth

Fort Worth Public Library (1905)
Texas Christian University Mary Couts Burnett Library (1916)

Galveston

Rosenberg Library (1909)

Garland

Nicholson Memorial Library System (1990)

Houston

Houston Public Library (1884)
North Harris College Learning Resources Center (1974)
Rice University Fondren Library (1967)
South Texas College of Law Library (1981)
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Sam Houston State University Newton Gresham Library (1949)

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