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THE KINETICS OF POLYMER CURE BY DIFFERENTIAL SCANNING CALORIMETRY

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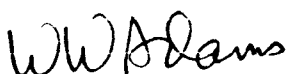Final Report for Period 1 July 1976 - 30 June 1981
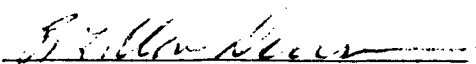
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FOR THE COMMANDER

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The need for providing processing information for new resins requires obtaining the reaction kinetics for polymerization of these resins. The kinetic parameters can be used to generate reaction window plots. Because of the exothermic nature of these reactions, differential scanning calorimetry (DSC) was utilized to obtain the kinetic parameters. Multiple-scan DSC curves at several heating rates were utilized applying the Friedman method of kinetic analysis. This method, which obtains activation energies at each extent of conversion, allows

kinetic parameters to be evaluated without having to assume any apriori
functionality for the rate dependency. The kinetic parameters so obtained are
then utilized to predict the behavior of reacting systems under a variety of
isothermal conditions. This behavior is displayed in reaction window plots.
The method is described, and includes descriptions of computer programs with
illustrated data from the cure of new resins.

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INTRODUCTION

The need for providing processing information on new resins in this laboratory requires obtaining the reaction kinetics for polymerization of these resins. The kinetic parameters can then be used to generate reaction window plots. Because of the exothermic nature of these polymerization reactions, differential scanning calorimetry (DSC) is an effective method to obtain the kinetic parameters.

A number of methods have been reported in the literature for determining reaction kinetics by DSC. Many of these attempt to obtain the kinetic parameters from a single DSC scan. A review of some of these has appeared recently (Reference 1). Single scan DSC kinetic analysis has inherent difficulties especially when the reaction order is not known or if the reaction rate data do not justify the use of a reaction order function. The consequences of the use of single scan kinetics were well described by Flynn and Wall (Reference 2) for the analogous case of thermogravimetric analysis. In this report, the use of the Friedman method of kinetic analysis of thermogravimetry (Reference 3) is applied to DSC measurements of resin cure.

SECTION II

THEORY

1. KINETIC ANALYSIS

Let us define a variable α, the conversion factor ($0 \leq \alpha \leq 1$), which is the amount or fractional conversion of reactants to products. In general, r, the rate of the process can be considered to be a product of factors involving both α and temperature:

$$r = \frac{d\alpha}{dt} = k(T)f(\alpha) \tag{1}$$

The rate is also a function of pressure, but for our purposes pressure is a constant and will be neglected. k is called the "rate constant" and is independent of the concentrations of the reactants but is a function of temperature.

The dependence of k upon T is usually given by:

$$\frac{d(\ln k)}{dT} = \frac{E_A}{RT^2} \tag{2}$$

where T is the temperature, R is the usual Gas Constant, and the activation energy E_A is constant. Hence, the familiar Arrhenius equation arises upon integration:

$$k = A\, e^{-\frac{E_A}{RT}} \tag{3}$$

and the activation energy is interpreted as the energy needed for a molecular species to become reactive. In a reacting system an equilibrium exists between ordinary and active molecules. E_A is the difference between the average energy of the active molecules and the average energy of all the molecules. The two averages must have the same temperature dependence for the Arrhenius equation to be valid (Reference 4). Substituting Equation 3 into Equation 1 yields

$$\frac{d\alpha}{dt} = Ae^{-E/RT}f(\alpha) \tag{4}$$

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The other factor in the rate equation, $f(\alpha)$, is generally derived experimentally by plotting different functions of α against time. As an analogy to many chemical reactions in solution one might consider $f(\alpha)$ to be of the form:

$$f(\alpha) = 1-\alpha)^n \qquad (5)$$

where n is called the order of the reaction. In this case since conversion is used rather than the usual kinetic form which utilizes some form of concentration of reactant(s), this should be more appropriately called the "apparent" order. If the volume change during reaction were known, conversion units could be converted to concentration units.

The simplest case of Equation 5 is when $n = 1$ or a first order reaction. Then, if temperature is constant, Equation 1 reduces to

$$d\alpha/dt = k\ (1-\alpha) \qquad (6)$$

or the rate of change of conversion decreases proportionally with the concentration of reactant(s).

While an expression of the form of Equation 5 is not always valid, particularly in bulk reactions, it still represents a useful starting point for describing experimental reactions. In the case of solid state or viscous state reactions, however, any kinetic analysis of experimental data should not initially require a reaction "order" form of rate dependency.

Consider experiments conducted under different conditions, e.g., different heating rates, such that a certain constant degree of conversion (α) is attained for each experiment at different temperatures. Then assuming that $f(\alpha)$ is not a function of temperature, i.e., the mechanism does not change over the temperature range considered, Equation 1 can be rewritten:

$$\ln \frac{d\alpha}{dt} = -\frac{E}{R}\frac{1}{T} + \ln Af\ (\alpha) \qquad (7)$$

Since α is a constant, $f(\alpha)$ is also constant and the second term on the right side of Equation 7 is a constant. Thus, a plot of $\ln d\alpha/dt$ vs. $1/T$ for the several experiments should yield a straight line with a slope equal to $-E/R$ and an intercept equal to $\ln Af(\alpha)$. An activation energy can be obtained without making any assumption as to the reaction "order" or rate dependency. Repeating this process at different values of α can verify that the activation energy is indeed constant during the course of the reaction. If not, it indicates that Equation 4 is not a valid representation of the reaction and alternate expressions should be tried.

Having determined an average E_a over the whole reaction as described previously, values of $d\alpha/dt$ and T at various values of α can be substituted into Equation 6 giving $Af(\alpha)$ as a function of α. The rate dependency can be determined in this manner without having to assume any a priori functionality. If a plot of $\ln Af(\alpha)$ vs. $\ln(1-\alpha)$ results in a straight line then the slope of that line gives the reaction order n of Equation 5 as well as the pre-exponential factor A. If the plot is not a straight line either some other functional form can be tested or a numerical table of $Af(\alpha)$ vs. α may have to suffice, as described below.

Having obtained the kinetic parameters, one can utilize them to predict the behavior of the reacting system under a variety of isothermal reaction conditions. This is displayed in a so-called "reaction window plot," the source of which can be described as follows:

If temperature is held constant, Equation 4 can be rearranged and integrated to yield

$$\int_0^\alpha \frac{d\alpha}{Af(\alpha)} = e^{-E/RT} \int_0^\tau dt \qquad (8)$$

The left-hand side of Equation 8 is a function of α which we can call $g(\alpha)$ and, if the functional form of $f(\alpha)$ is known, can be

expressed analytically. If not, g(α) as a function of α can be obtained by numerical integration of 1/Af(α) as a function of α. Thus, Equation 8 becomes

$$g(\alpha) = te^{-E/RT} \tag{9}$$

or rearranging and taking logarithms of both sides,

$$\ln t = \frac{E}{R} \cdot \frac{1}{T} + \ln g(\alpha) \tag{10}$$

which relates reaction time to extent of conversion for each temperature. Plots of ln t vs. 1/T will give parallel straight lines for each extent of conversion. These are called reaction window plots since they indicate how long one can process reactants before any appreciable reaction has occurred and how long one must heat them at any given temperature before the reaction is essentially complete. It is for this reason that our reaction window plots show lines for α = 0.05 (5% conversion) and α = 0.95 (95% conversion) as well as α = 0.5 (50% conversion), to show the extremes of the reaction. It should be emphasized that while 1/T is plotted on the abcissa of the reaction window plots, the plots display times for isothermal reactions.

2. DIFFERENTIAL SCANNING CALORIMETRY

Differential Scanning Calorimetry, first described in 1964 (Reference 5), is a scanning thermal analysis technique utilizing insulated sample and reference holders maintained at the same temperature by a closed loop electrical system (Figure 1). The energy per unit time absorbed or released by the sample is exactly compensated by a corresponding increase or decrease in the electrical power to the heaters, such that equivalent temperature of the two holders is maintained. The measure of the electrical power applied is equivalent to the heat flow of the system to the sample. Thus, the DSC is an _energy_ measuring device, while other familiar thermal analysis instruments (such as differential thermal analysis, (DTA)) are _temperature_ measuring devices.
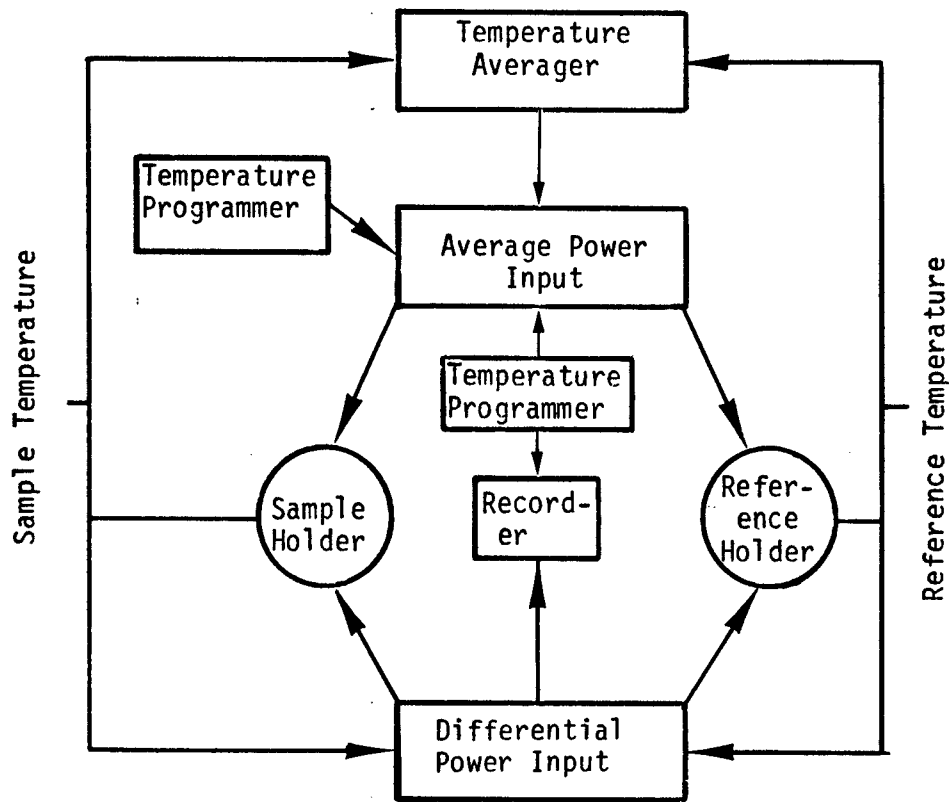
Figure 1.   Differential Scanning Calorimeter, Simplified
            Diagram (Modification of Drawing in Reference 8)

A simplified view of a thermal analysis cell is shown in Figure 2. The sample and its holder are at temperature T_s, the thermal energy source is at temperature T_p, and the total resistance to the heat flow dq/dt is R, a sum of resistance between the pan and the sample, and the resistance of the sample itself. If care is taken to insure good thermal contact between the sample, the pan, and the heater, the thermal resistance can be minimized, but it is an effect which must be compensated for in DSC measurements.

If we assume that the temperature of the sample and pan are uniform and equal, and that the heat capacity of the sample and pan and the thermal resistance R are constant over the range of interest, then:

$$\frac{dh}{dt} = C_s \frac{dT_s}{dt} - \frac{dq}{dt} \qquad (11)$$

where the sample produces heat $\frac{dh}{dt}$ in an exothermic reaction (dh/dt is considered positive for an exothermic reaction). Heat flow dq/dt to the sample is taken as positive, and Equation 11 indicates that heat either produced by the sample or absorbed from the energy source must increase the sample temperature or be lost to the surroundings. The heat loss is controlled by the value of R, and in an analogy with electrical circuits, the heat current is equal to the potential difference (temperature) divided by the resistance:

$$\frac{dq}{dt} = \frac{T_p - T_s}{R} \qquad (12)$$

This is Newton's Law, the thermal analogy of Ohm's Law. If we take the time derivative of Equation 12

$$\frac{d\left(\frac{dq}{dt}\right)}{dt} = \frac{\frac{dT_p}{dt}}{R} - \frac{\frac{dT_s}{dt}}{R} \qquad (13)$$

and if we consider a sharply melting standard material such as indium, $\frac{dT_s}{dt} = 0$ during melting. Hence, during melting, the slope of the curve
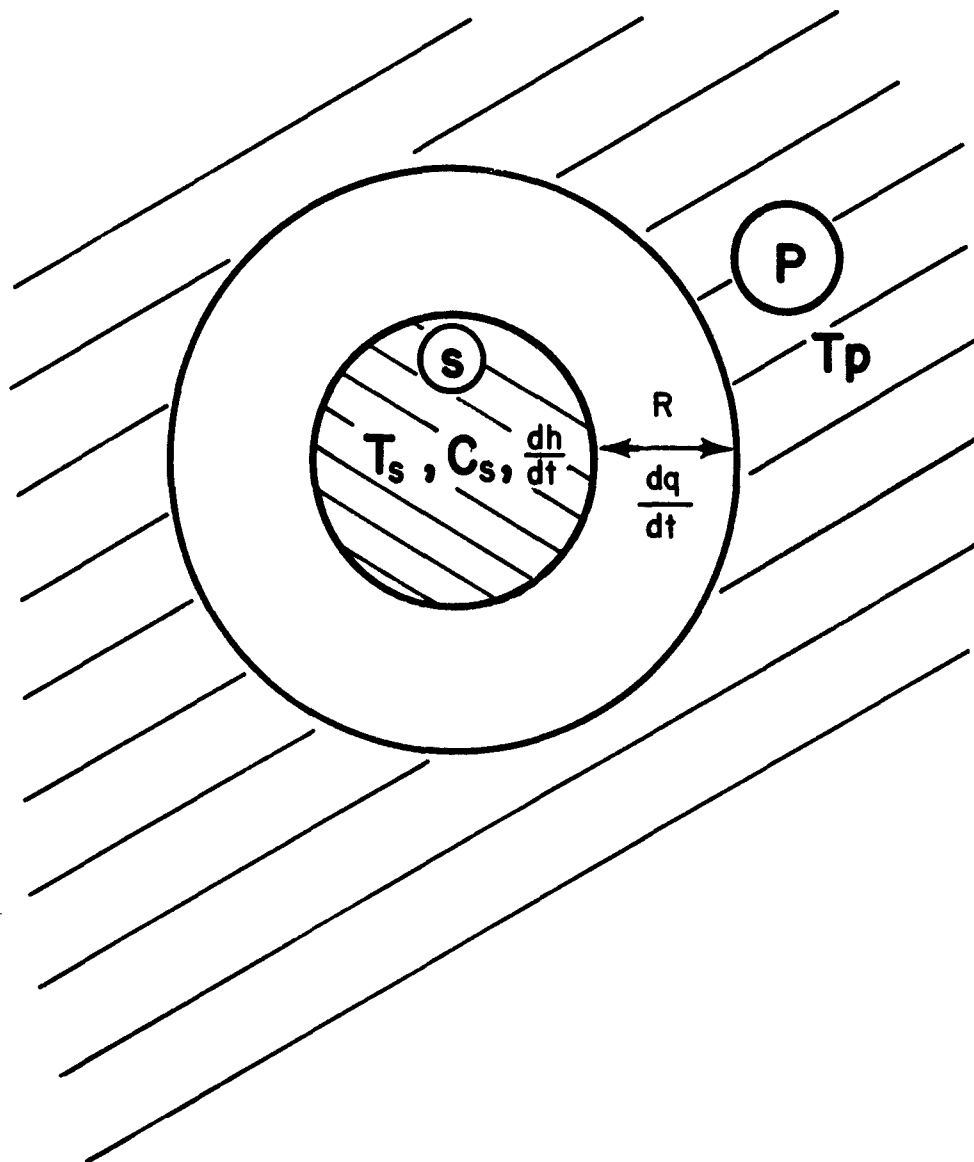
Figure 2. Simplified Differential Scanning Calorimeter Sample
Cell. Sample and Holder Ⓢ, Thermal Energy Source
or Sink Ⓟ

generated, $\dfrac{d\left(\dfrac{dq}{dt}\right)}{dt}$, is equal to the programmed temperature rate $\dfrac{dT_p}{dt}$ divided by the thermal resistance R. This provides the correction method commonly used in DSC analysis: a value of R is calculated for each heating rate used in scanning a sharply melting standard (indium), as shown in Figure 3.

This value of R is then used to calculate the actual temperature at any point on an actual data curve of interest. For example, in Figure 4, the true temperature at the peak height is not T_A, but is actually found to be T_B by constructing a line of slope $\dfrac{dT}{dt}\dfrac{1}{R}$ from the peak height at A to the intercept on the temperature axis. This correction typically ranges from 0.2° for an ultra pure, sharply melting material to several tens of degrees for other less pure materials with broad melting curves or curves showing other thermal phenomena (Reference 6).

Obviously, the greatest accuracy in temperature measurements is achieved with small sample size, proper encapsulation in the sample pan (i.e., no bending of the flat pan bottom), and slow heating rates. A balance between sensitivity, which increases with scan rate, and accuracy is possible by reducing thermal resistance by experimental techniques and performing a correction for thermal lag and scan rate error.

Another error considered is that of absolute calibration error and scan rate/temperature nonlinearity. The usual method of correcting for the latter effect involves measuring melting points of a number of standard materials and calculating a polynomial fit between the T_m's and the indicated temperatures (Reference 7). The correction was not accomplished in this study since over the limited range of temperatures involved, the error is not large, and a linear correction was applied instead. The error due to inaccuracy in the calibration points and the scan rate error can be described by

$$T_{true} = T_{obs} - C\ dT/dt + D \tag{14}$$

where the coefficients can be evaluated from two melting points.

$\frac{dT}{dt} = \infty$ (infinite heat rate)

$\frac{dT}{dt} = C_1$ (finite heat rate)

$\frac{dT}{dt} = 1/2C_1$

Temperature

T_m

Melting
Point

$\frac{dq}{dt}$

Heat Flow
Measured
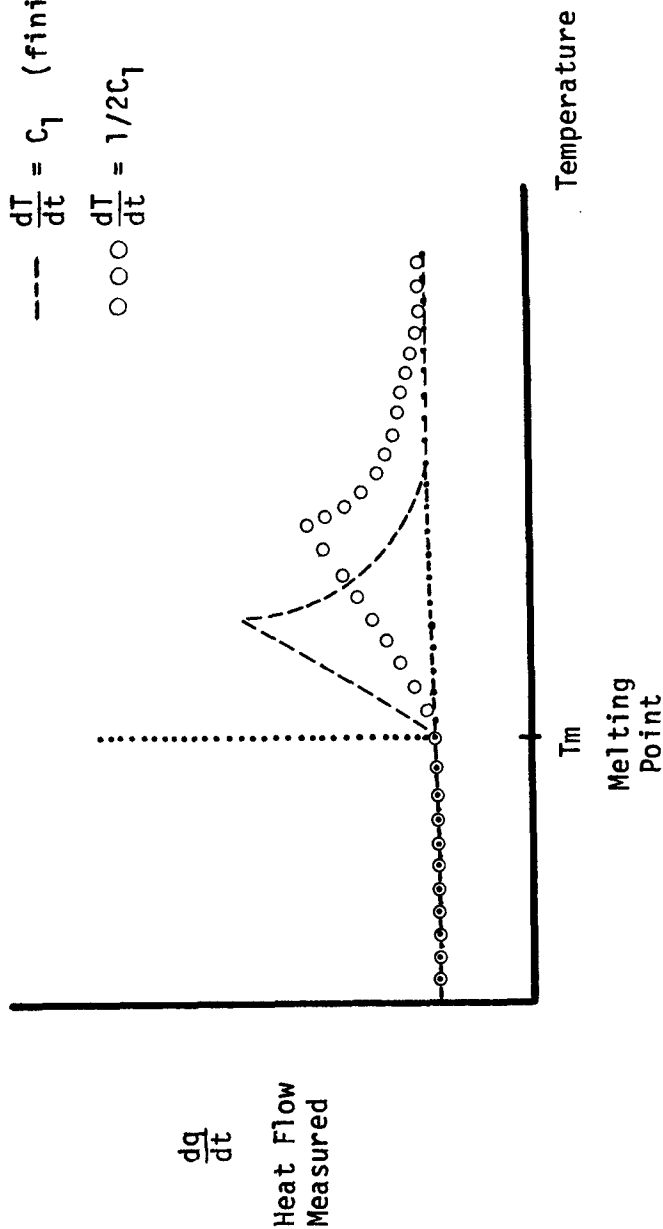
Figure 3. Differential Scanning Calorimeter Simulated Curves for a Sharply Melting Standard. Slopes of two finite heat rate curves $(C_1, \frac{1}{2}C_1)$ are equal to C_1/R (or $\frac{dT}{dt} \cdot \frac{1}{R}$) and $\frac{1}{2}C_1/R$ (or $\frac{dT}{dt} \cdot \frac{1}{2R}$) respectively, where R is the thermal resistance
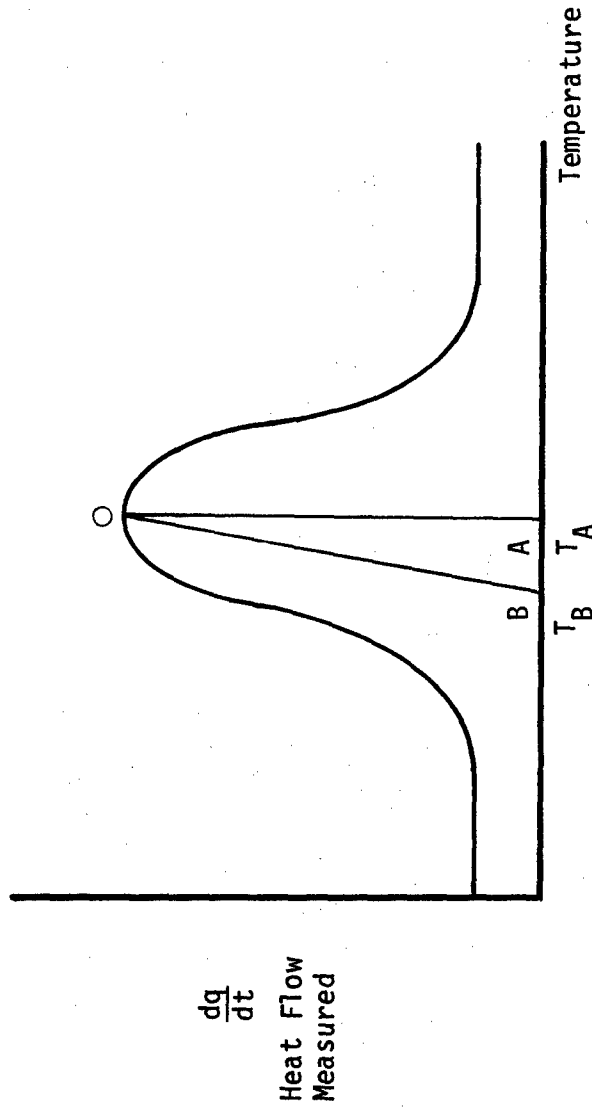
Figure 4. Differential Scanning Calorimeter Simulated Curve for Non-Sharply Melting Sample (or Any Other Broad Thermal Phenomenon). Slope of OB is $\frac{dT}{dt} \cdot \frac{1}{R}$, T_A is measured temperature at peak height, T_B is actual temperature

3. KINETIC ANALYSIS BY DIFFERENTIAL SCANNING CALORIMETRY

The Differential Scanning Calorimeter (DSC) produces a plot of dH/dt versus time t (or temperature T), where dH/dt is either the rate of heat input (endotherm) or heat output (exotherm) in millicalories/second. The total area under the thermogram curve (Figure 5) defines the heat of reaction ΔH. The area of a small section of this peak, a, corresponds to the fractional heat evolved up to time t (or temp T) and is proportional to the extent of conversion (α),

$$\alpha = \frac{a}{\Delta H} \tag{15}$$

or more generally

$$\alpha(t) = \frac{1}{\Delta H} \int_{t_0}^{t} \frac{dH}{dt} \, dt \tag{16}$$

where t_0 is the time for the onset of the exotherm or endotherm.

$$\frac{dH}{dt}$$
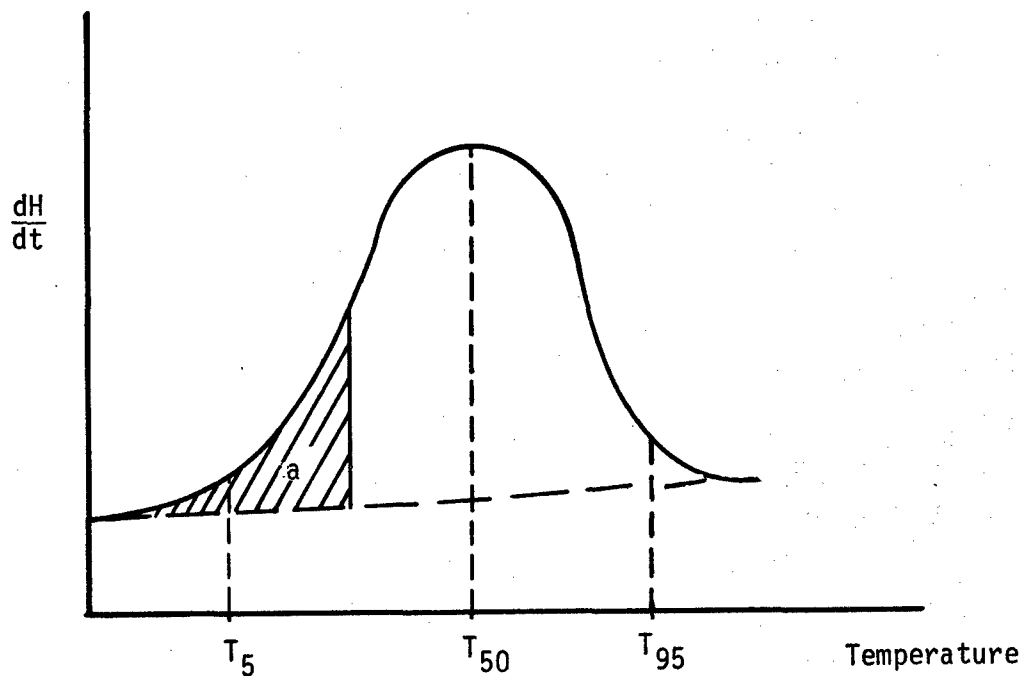
Figure 5. Typical Differential Scanning Calorimeter Curve.
Indicated is the Partial Peak Area, a; the Total Area
Is Equal to the Heat of Reaction, ΔH. T_5, T_{50}, and T_{95}
are respectively the temperatures for 5%, 50%, and 95%
completion of the reaction.

SECTION III

EXPERIMENTAL

1. INSTRUMENTATION

Thermal data were obtained using a Perkin Elmer DSC-2 differential
scanning calorimeter with analog output display on a Perkin Elmer
Model 56 strip chart recorder. BCD temperature output and heat signal
from the DSC were recorded on punched paper tape by means of a Hewlett-
Packard Model 2570A Coupler/Controller, a Hewlett Packard Model 3480B
Digital Voltmeter, and a Teletype Corporation Model 33 teletype.
Computer calculations were performed on the WPAFB-ASD Computer Center
Cyber 175, and all programs were written in Fortran Extended.

2. CALIBRATION

The DSC was calibrated in the manner described in the operations
manual (Reference 8). Cooling rates were carefully controlled to avoid
super cooling of the standards. Absolute temperature calibration was
checked by examining the melting points of high purity indium and lead at
different heating rates, and constructing a temperature correction curve
for each heating rate, the intercept and slope of which were calculated
in program kinetic (Appendix B). Program CALIB (Appendix A) was used
to determine the value of the thermal resistance factor (TR) for each
scanning rate. This program performs a peak analysis of the melting
endotherm for the standard, and prints out the values of TR and the
observed melting point (Appendix A.2). CALIB is a modified version of
a standard program provided to DSC users by The Perkin Elmer Corporation
(Reference 7).

3. DATA COLLECTION

Data for each material was collected for a set of at least four heating
rates. The coupler/controller was used to initiate the temperature
program of the DSC, and measurements of the signal voltage were made by

the DVM at intervals of 0.8 seconds or longer (limited by the maximum
punching rate of the teletype). For each specimen, three runs were made.
First a scan of the empty sample pan was performed to provide a back-
ground level, then the sample was introduced into the pan and data was
collected through the temperature program. The background scan was
subtracted from the peak data scan to produce a corrected data set
(Reference 9). After completion of the curing scan, the sample was
rescanned to determine if cure was complete and to determine a glass
transition temperature (Tg). Samples were weighed before and after
scanning, and all samples were scanned under a nitrogen atmosphere.
Sample DSC scans are shown in Figure 6.

4. DATA REDUCTION

Punched paper tapes were either converted into punched cards using a
utility program or were read directly onto a disk file by remote terminal.
After checking the data to eliminate any obvious errors, the program
KINETIC in Appendix B was executed. Sample data, required data cards,
and typical output of KINETIC are listed in Appendixes B.1, B.2, and B.3,
respectively.

5. COMPUTER PROGRAMS

Several computer programs have been utilized to perform the kinetic
analysis. Each will be summarized briefly and the main subroutines will
be listed and their functions described. Those subroutines which are
identified with an asterisk are unmodified or slightly modified versions
of standard Perkin Elmer routines, and are printed with the permission
of the Perkin Elmer Corporation, Norwalk, Connecticut (Attn:
Dr. Bruce Castle).

a. Program KINETIC (see Volume II for program listing)

This program is a general data reduction program for transforming
raw data from the DSC into conversion rate versus time or temperature
data for kinetic analysis. Kinetic parameters are ultimately
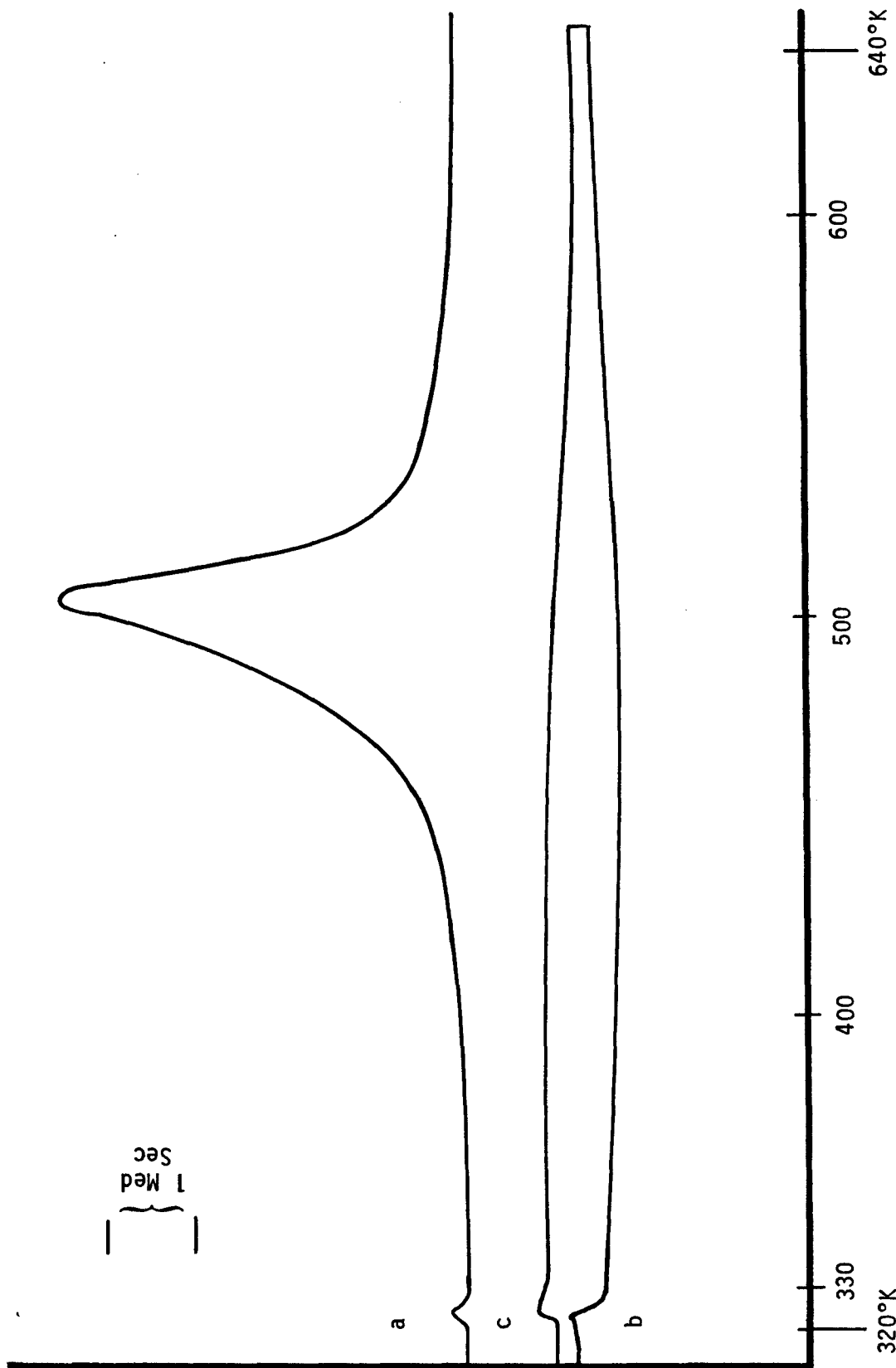
Figure 6. DSC Curves for Acetylene Terminated Sulfone Specimen and Background (Strip-Chart Recording). Scan rate 20° minute, range 10 mcal/sec, curves are arbitrarily shifted vertically. a. Curing Curve, b. Baseline for a (taken of an empty sample pan before a was run), c. Cured sample, rerun after a

produced, including activation energy and reaction order. Each subroutine will be summarized briefly to indicate its function.

KINETIC - Calls individual subroutines depending upon mode of operation, repeats for multiple data sets. Comments list all data formats.

PRELIM - Initializes control constants, reads input cards to select options and to set values of thermal resistance and scan rate temperature correction factors.

INREAD - Reads data file for scan rate, range, initial temperature, and data rate information followed by raw data for each curve. Calls INPUTT for actual reading of the raw data. If background subtraction option used, calls SUBBAK which in turn uses INPUTT to read background data. Calls COUPLR to analyze each peak.

COUPLR - Peak processing subroutine, applies thermal resistance and scan rate corrections, senses the peak, truncates if desired, applies baseline correction, fills the two main data arrays (DHDT and TEMP), and copies the data to the output data file if desired.

CVPLOT - Calcomp plotting routine for the set of up to six curves for a graph.

PREKIN - Calculates area under a curve and cumulative areas for 0.01 intervals of conversion. Data is interpolated to calculate $\frac{dc}{dt}$, c, time, and temperature for each value of c from 0.01 to 0.99. Calls subroutine TGA3 for kinetics analysis.

TGA3 - Modified subroutine TGA3 from Reference 10.

POSTLM - Reinitializes to the main program or terminates execution if job is complete.

FITY - Utility for FT.

FT - Performs a three-point fit and interpolate operation.

NUC005 - Controls page skips and numbering and title printing for printer control.

NUC008 - Writes benchmarks, elapsed running or execution time and time since last call.

PRPLOT - Calls subroutine GP to produce a one page printer plot of data when requested by various calls in the main subroutines. Provides the proper heading for the plot depending upon the value of N in the call.

SUBBAK - calls INPUTT to read the background data, and subtracts point by point since the data are required to be at the same starting temperature and data rate.

TEMPTR - Corrects a given temperature for thermal resistance and applies the scan rate correction.

TK - Utility for FT.

KINETIC - also uses some utility routines listed under program CALIB.

b. Program CURE

This program uses the output kinetic parameters from program KINETIC to produce a processing window plot. This plot indicates time-temperature factors for various degrees of cure desired. The program consists of only one main routine (CURE), which reads kinetic factors from the teletype or $g(\alpha)$ data from a file (from KINETIC). The temperature - cure time - cure amount (degree of conversion) relationships are then calculated and plotted in a convenient graphic form on the plotter. (See Appendix C for input and output).

c. Program CALIB

This program is a modified version of a Perkin-Elmer Co. supplied routine to calculate the calibration constants for the DSC. It locates the melting peak of the standard employed after subtracting baseline curvature, calculates a least-squares background on either side of

the peak, integrates the peak (to find heat of fusion), and locates the true melting temperature for that peak. Subroutines included in this program are:

CALIB - Main routine, reads sample identification, and other data about the standard, calls INPUTT to read peak and background data, locates the maximum (calls IMAX), beginning and end of the endotherm (calls PEAK twice), and integrates (INTGRA). The leading edge of the peak is considered to be indicative of the thermal resistance (TR) of the system at that scan rate, and subroutine DER is used to obtain the maximum slope of that edge. The area heat constant which converts encoder readings (ordinate values from the coupler-controller) to cal/sec in absolute units is obtained from the area of the peak and the heat of fusion of the sample. TR is applied to the peak maximum to obtain the true melting temperature for the standard. A printer plot of the data and all values of constants are then printed. The program cycles through as many data sets as desired.

INPUTT - Reads the input file for raw data and fills array Y or YB with M or MM points.

The following utility routines are used by either KINETIC or CALIB or both:

*BASE   Calculates the value of the baseline at a point given the intercept and slope of the baseline function.

*DER   Calculates the derivative at a point in an array.

*GP   Produces one page line printer plot of the data requested.

*IMAX   Finds the maximum value of an array.

*INTGRA Performs a Simpson's Rule integration.

*INVT   Finds the data point index for a given temperature (not valid after thermal resistance correction is applied).

*PEAK   Locates the beginning of a peak in an array of ordinate data.

*SLOPE Applies a least squares fit to ordinate data to obtain a straight line approximation.

*TEMPT   Calculates the temperature of a data point knowing the initial
         temperature and the scan rate.

*TEMPTR Calculates the thermal resistance corrected temperature of a
         data point.

*YAV   Finds average values of an array.

SECTION IV

RESULTS AND DISCUSSION

DSC curves for the reaction of an acetylene terminated sulfone resin (Reference 11) are shown in Figure 7. The values have been corrected for baseline and only show deviations from the baseline.

It should be noted that the integration of the DSC curves is as a function of time, not temperature, so that the abscissa actually used for the integration is the elapsed time from the beginning of the exotherm. Integrations are accomplished utilizing computer programs that interpolate the integrated values to integral percent conversions, i.e., for $\Delta\alpha = 0.01$. The data for $d\alpha/dt$ are plotted on a log scale vs. $1/T$ in Figure 8. The numbers beside each curve refer to the heating rate in degrees per minute. Points on each curve at a constant value of α should describe a straight line in accordance with Equation 7. Two such lines are drawn on Figure 8, one for $\alpha = 0.5$ and the other for $\alpha = 0.8$. The computer program evaluates the slope of the straight lines for each value of α thereby determining the activation energy as a function of extent of reaction. If all the lines are essentially parallel as in the case for this example, a single reaction is assumed whose activation energy is given by the average obtained from the slopes of the straight lines. Lack of constancy of activation energy as a function of conversion (and also temperature) is evidence for a more complex reaction scheme, and a warning not to proceed further with this method. In this case the slopes are quite constant giving an average activation energy of 25.06 kcal/mole. It should be noted that data on Figure 8 for early stages of reaction (i.e., the right side of each curve) are essentially superimposable and parallel to the constant conversion straight lines. That is because, at early extents of reaction, there is little loss of reactant and the reaction curve follows the Arrhenius function. Only after significant reaction has occurred do the curves start decreasing in slope due to loss of reactant.
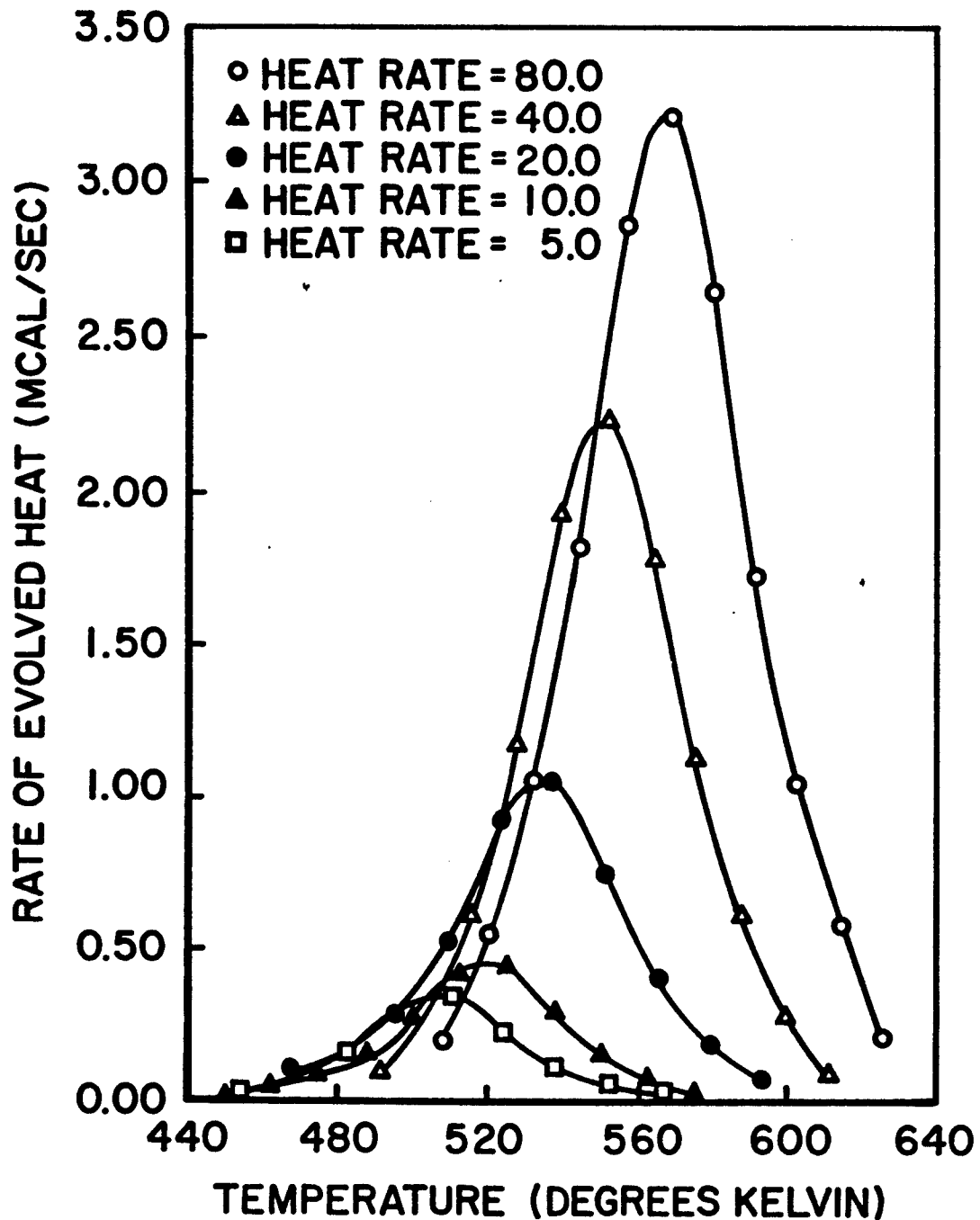
Figure 7.   DSC Curves for Acetylene Terminated Sulfone Resin Cure
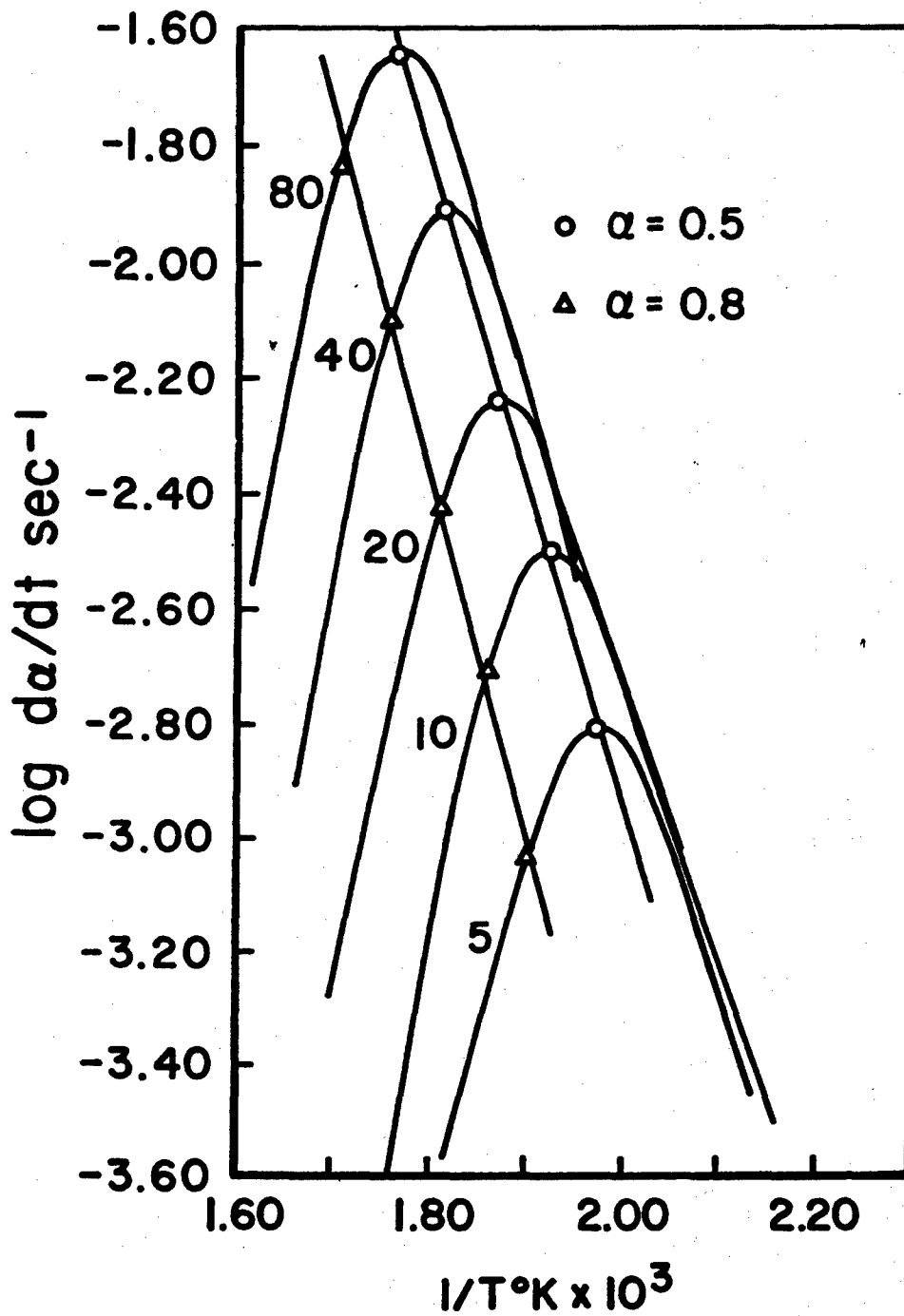
Figure 8.   Arrhenius DSC Curve Plot for ATS Resin

Having obtained an activation energy, it can be substituted into
Equation 7 along with the appropriate experimental values to obtain the
log $Af(\alpha)$ as described previously. If log $Af(\alpha)$ vs. log $(1-\alpha)$ is a
straight line the slope gives n, the apparent order of the reaction. In
this case the values are log A = 8.3530 and n = 1.21. These values are
substituted into Equation 10 yielding the reaction window plot given in
Figure 9. This plot can be utilized to guide processing of resins as
described previously.
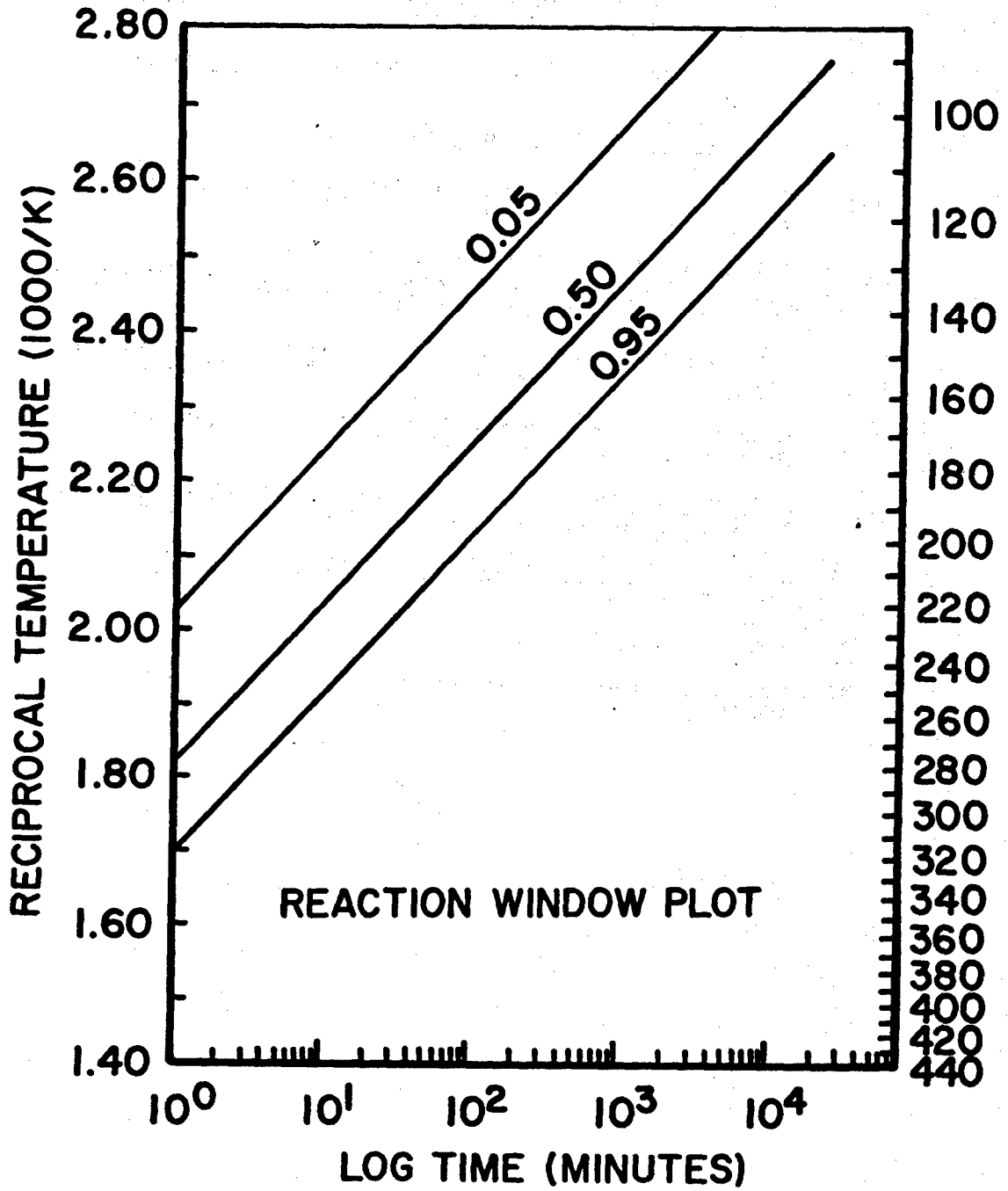
Figure 9. Reaction Window Plot for ATS Resin

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APPENDIX A.1

PROGRAM CALIB

SAMPLE DATA FILE

0 81.10.7.2 INDIUM
6.8
9.1
20.0
80.0
370.0
0.8
 0339 0337 0337 0337 0337 0336 0336 0335
 0335 0334 0334 0335 0334 0333 0333 0333
 0333 0333 0333 0331 0332 0331 0331 0331
 0330 0331 0331 0331 0329 0330 0330 0331
 0329 0329 0329 0329 0329 0329 0329 0328
 0329 0329 0329 0329 0329 0329 0329 0329
 0328 0329 0328 0328 0328 0328 0328 0328
 0327 0327 0327 0327 0308 0194-0021-0290
-0542-0554-0339-0087 0105 0222 0284 0312
 0323 0326 0324 0324 0323 0322 0322 0321
 0321 0320 0320 0320 0320 0320 0320 0320
 0320 0320 0320 0320 0319 0319 0319 0318

0 81.10.7.3 INDIUM
6.8
9.1
20.0
80.0
370.0
0.8
 0341 0340 0340 0339 0339 0338 0338 0338
 0337 0337 0337 0336 0336 0335 0335 0335
 0336 0336 0335 0335 0335 0334 0333 0333
 0333 0333 0333 0333 0332 0333 0333 0333
 0333 0332 0332 0332 0332 0332 0332 0332
 0331 0332 0331 0332 0331 0331 0331 0331
 0331 0331 0331 0331 0330 0329 0329 0329
 0329 0329 0329 0329 0317 0217 0013-0251
-0515-0567-0370-0115 0088 0213 0280 0311
 0324 0327 0328 0327 0327 0326 0325 0325
 0324 0324 0324 0324 0324 0323 0323 0323
 0323 0323 0323 0323 0322 0322 0322 0320
 0321 0321 0320 0321

0 81.10.7.4 INDIUM
6.8
9.1
20.0
40.0
380.0
0.8
 0290 0290 0290 0290 0290 0289 0289 0290
 0289 0289 0289 0289 0289 0289 0289 0288
 0288 0288 0288 0288 0287 0288 0287 0287
 0287 0287 0287 0287 0287 0287 0287 0287
 0287 0287 0287 0287 0286 0286 0287 0287
 0287 0287 0286 0286 0285 0286 0286 0286
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 0283 0277 0229 0129-0002-0149-0294-0428
-0457-0303-0094 0076 0183 0241 0268 0279
 0282 0282 0282 0281 0279 0280 0280 0279
 0279 0279 0279 0279 0279 0279 0279 0279
 0279 0279 0279 0279 0278 0278 0278 0278

0278 0278 0278 0278 0279 0278 0278 0277
0277

0 81.10.7.5 INDIUM
6.8
9.1
20.0
40.0
380.0
0.8
 0288 0288 0288 0289 0288 0288 0288 0288
 0288 0288 0287 0287 0288 0287 0286 0287
 0287 0287 0287 0287 0287 0287 0287 0287
 0286 0286 0287 0286 0287 0287 0286 0287
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 0284 0283 0283 0284 0284 0283 0283 0283
 0283 0283 0283 0283 0283 0283 0283 0283
 0283 0276 0226 0125-0013-0153-0297-0431
-0453-0295-0087 0081 0187 0243 0271 0281
 0283 0283 0283 0282 0282 0282 0282 0282
 0281 0281 0281 0281 0281 0280 0281 0281
 0280 0280 0280 0280 0280 0280 0279 0280
 0280 0280 0279 0281 0279 0279

0 81.10.7.6 INDIUM
6.8
9.1
10.0
20.0
390.0
0.8
 0323 0323 0323 0323 0323 0323 0323 0323
 0323 0323 0323 0323 0323 0322 0321 0322
 0322 0321 0321 0320 0320 0320 0321 0321
 0321 0321 0321 0322 0321 0321 0321 0321
 0322 0321 0321 0320 0321 0321 0321 0321
 0321 0320 0320 0320 0319 0320 0321 0320
 0320 0319 0320 0320 0319 0319 0320 0319
 0320 0320 0319 0320 0320 0321 0318 0318
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 0319 0321 0319 0318 0317 0317 0317 0317
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 0316 0316 0317 0317 0316 0317 0317 0317
 0317 0317 0317 0316 0315 0316 0315 0316
 0315 0316 0317 0316 0316 0316 0317

0 81.10.7.7 INDIUM
6.8
9.1

10.0
20.0
390.0
0.8
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0323 0323 0323 0323 0323 0323 0323 0323
0323 0323 0323 0324 0324 0323 0323 0323
0323 0323 0323 0323 0324 0324 0324 0323
0323 0324 0323 0323 0323 0323 0323 0323
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0323 0323 0323 0323 0323 0323 0323 0323
0323 0323 0323 0323 0323 0323 0323 0323
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0322 0321 0322 0323 0323 0323 0322 0322
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0319 0320 0320 0321 0320 0320 0320 0319
0320 0320 0320 0320 0319 0319 0319 0319
0320 0320 0320 0319 0319 0319 0319 0319

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9.1
10.0
10.0
400.0
0.8
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0289 0289 0290 0289 0289 0289 0290 0290
0289 0290 0290 0290 0289 0289 0291 0290
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5.0
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5.0
20.0
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 0287 0288 0287

0 81.10.7.11 INDIUM
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5.0
20.0
40.0
380.0
0.8
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 0233 0233 0233 0233 0233 0233 0233 0233
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 0233 0233 0233 0233 0233 0233 0232 0232
 0232 0232 0232 0232 0232 0232 0231 0231
 0232 0232 0232 0232 0232 0231 0232

0 81.10.7.12 INDIUM
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5.0
10.0
20.0
390.0
0.8
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 0392 0393 0393 0393 0393 0392 0393 0393
 0392 0392 0393 0393 0393 0393 0393 0393
 0393 0393 0393 0393 0393 0393 0393 0393
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 0395 0395 0395 0395 0395 0395 0395 0395

```
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0205 0328 0383 0403 0406 0402 0400 0399
0397 0397 0396 0396 0396 0395 0396 0395
0396 0396 0396 0396 0396 0396 0396 0396
0397 0396 0397 0396 0396 0397 0396 0396
0396 0397 0396 0397 0396
```

0 81.10.7.13 INDIUM
6.8
5.0
10.0
10.0
410.0
0.8
```
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0351 0350 0350 0350 0350 0350 0350 0349
0349 0350 0350 0350 0350 0350 0349 0350
0350 0350 0350 0350 0350 0350 0350 0350
0350 0350 0350 0349 0350 0350 0350 0350
0350 0350 0350 0350 0350 0350 0350 0350
0350 0350 0350 0350 0350 0351 0351 0350
0351 0350 0350 0351 0350 0351 0351 0350
0350 0351 0350 0351 0351 0351 0350 0350
0351 0350 0351 0351 0351 0350 0351 0351
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0352 0351 0351 0351 0351 0351 0350 0351
0351 0351 0350 0351 0351 0351 0350 0351
0351 0351 0351 0351 0351 0350 0351 0351
0351 0352 0351 0352 0351 0351 0351 0352
0352 0351 0351 0352 0351 0352 0351 0351
0351 0351 0351 0349 0334 0287 0208 0112
0009-0091-0188-0276-0346-0296-0089 0119
0254 0324 0353 0360 0360 0358 0356 0353
0353 0353 0352 0352 0352 0352 0353 0352
0352 0351 0352 0351 0352 0352 0352 0352
0352 0352 0352 0352 0352
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0 81.10.7.14 INDIUM
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5.0
5.0
5.0
420.0
0.8
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0307 0308 0307 0308 0307 0308 0308 0308
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0309 0309 0309 0309 0308 0306 0300 0277
```

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0311 0310 0309 0310 0309 0310 0309 0310
0309 0309 0310 0310 0310 0310 0310 0309
0310 0310 0309 0310 0310 0310 0310 0310
0310 0310 0311 0311 0310 0311 0311 0311
0311 0311 0310 0310 0311 0310 0311 0311
0311 0311 0311 0309 0310 0310 0311 0310
0310 0310 0310 0311 0311 0309 0311 0310
0310 0311 0310 0310
```

```
0 81.10.7.15 LEAD
5.5
4.9
20.0
80.0
540.0
0.8
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 0308 0307 0308 0308 0307 0307 0307 0307
 0306 0307 0307 0306 0307 0307 0306 0306
 0306 0306 0306 0305 0305 0304 0303 0303
 0303 0303 0303 0303 0303 0304 0303 0303
 0303 0303 0303 0303 0303 0303 0302 0302
 0302 0302 0302 0302 0302 0302 0302 0302
 0302 0302 0302 0302 0299 0252 0119-0038
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 0298 0299 0300 0300 0300 0300 0300 0300
 0299 0300 0300 0300 0300 0300 0299
```

```
0 81.10.7.16 LEAD
5.5
4.9
20.0
80.0
540.0
0.8
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 0317 0316 0316 0316 0316 0315 0316 0316
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-0061 0025 0125 0203 0254 0283 0298 0305
 0307 0309 0309 0309 0309 0309 0310 0309
 0310 0309 0309 0309 0309 0309 0309 0309
 0309 0309 0309
```

```
0 81.10.7.17 LEAD
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20.0
40.0
560.0
0.8
 0265 0264 0265 0265 0265 0265 0264 0265
 0264 0265 0264 0264 0264 0264 0265 0265
 0264 0264 0265 0264 0264 0264 0264 0264
 0264 0264 0264 0264 0264 0264 0264 0264
 0263 0264 0264 0264 0264 0263 0264 0264
 0264 0263 0263 0263 0263 0264 0263 0263
 0263 0263 0263 0263 0263 0263 0263 0263
 0263 0263 0263 0263 0263 0263 0263 0263
```

```
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0263 0263 0263 0263 0262 0263 0262 0257
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0208 0236 0250 0257 0261 0261 0262 0262
0262 0263 0262 0262 0262 0262 0262 0262
0262 0262 0262 0262 0262 0263 0262 0262
0262 0262 0261 0262 0262 0262 0262 0262
0262 0262 0262
```

```
0 81.10.7.18 LEAD
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4.9
20.0
40.0
560.0
0.8
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 0264 0264 0264 0264 0264 0264 0264 0263
 0264 0264 0264 0263 0264 0264 0263 0264
 0263 0263 0263 0263 0263 0263 0263 0263
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 0261 0261
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```
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10.0
20.0
580.0
0.8
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 0336 0335 0336 0336 0336 0336 0335 0336
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 0331 0332 0331 0331 0331 0331 0331 0332
 0331 0331 0331 0331 0331 0332 0332 0332
 0331 0332 0332 0332 0331 0331 0331 0331
 0330 0331 0331 0331 0332 0331 0332 0332
 0332 0332 0332 0331 0331 0331 0331 0331
 0331 0331 0330 0331 0331 0331
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0 81.10.7.20 LEAD
5.5
4.9
10.0
10.0
590.0
0.8
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0298 0298 0298 0298 0298 0298 0299 0297
0298 0298 0298 0299 0298 0298 0297 0298
0298 0298 0298 0299 0299 0299 0299 0299
0298 0298 0297 0298 0298 0298 0298 0298
0298 0297 0299 0298 0299 0299 0299 0299
0298 0298 0298 0298 0298 0298 0298 0298
0298 0299 0299 0299 0299 0298 0298 0299
0299 0298 0298 0297 0298 0298 0297 0298
0297 0298 0298 0298 0298 0298 0298 0299
0299 0299 0298 0297 0297 0297 0297 0296
0292 0274 0237 0183 0121 0054-0014-0081
-0140-0170-0132-0030 0084 0174 0232 0265
0283 0292 0295 0297 0297 0298 0298 0297
0297 0297 0297 0298 0298 0298 0298 0298
0298 0298 0297 0297 0297 0297 0297 0297
0297 0298 0298 0298 0298 0298 0298 0299
0297 0298 0299 0299 0299 0299 0298 0298
0299 0299 0298 0298 0297
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0 81.10.7.21 LEAD
5.5
4.9
5.0
5.0
595.0
0.8
0311 0309 0309 0309 0310 0310 0310 0310
0310 0310 0311 0311 0310 0310 0310 0310
0309 0310 0311 0311 0312 0311 0311 0311
0310 0309 0310 0311 0310 0310 0309 0309
0309 0309 0309 0308 0309 0310 0310 0311
0309 0308 0309 0310 0310 0309 0309 0307
0308 0308 0308 0309 0309 0309 0309 0308
0309 0308 0309 0309 0308 0309 0308 0308
0308 0308 0307 0307 0308 0308 0308 0308
0309 0308 0307 0308 0307 0307 0307 0307
0305 0298 0279 0244 0193 0137 0069 0003
-0065-0133-0199-0265-0326-0377-0402-0356
-0221-0052 0093 0193 0252 0283 0297 0303
0306 0308 0308 0309 0307 0307 0307 0307
0308 0307 0307 0307 0307 0307 0308 0308
0307 0307 0307 0307 0307 0307 0308 0309
0308 0307 0307 0306 0307 0307 0306 0306
0306 0306 0307 0307 0308 0308 0308 0307
0306 0306 0306 0305 0306 0307 0307 0307
0307 0307 0307 0307 0307 0305 0306 0306
0307 0307 0307 0307 0307 0307 0307 0307
0307 0306 0305 0305 0306 0307 0307 0307
0307 0308 0307 0307 0307 0306 0306 0306
0307 0306 0306 0307 0307 0307 0307 0307
0307 0307 0306 0306 0306 0306 0306 0307
0307 0307 0307 0307 0307 0307 0306 0307
0307 0307 0307 0307 0306 0305 0306 0306
0307 0307 0307 0307 0307 0306 0305 0306
0306 0306 0306 0306 0306 0307 0307 0307
0307 0307 0305 0305 0306 0307 0307 0307
0307 0307 0307 0306 0307 0307 0307 0306
0307 0307 0306 0307 0306 0306 0306 0307
0307 0307 0307 0307 0307 0307 0307 0307
0307 0307 0307 0307 0307 0307
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0 81.10.7.22 LEAD
5.5
6.5
20.0
80.0
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540.0
0.8
 0243 0243 0242 0242 0242 0242 0242 0241
 0241 0241 0240 0240 0240 0239 0240 0239
 0239 0239 0239 0239 0239 0239 0239 0238
 0239 0238 0238 0238 0238 0238 0237 0237
 0237 0237 0237 0236 0236 0236 0236 0236
 0235 0235 0235 0234 0234 0234 0234 0234
 0233 0233 0233 0233 0233 0233 0232 0233
 0232 0232 0232 0232 0228 0190 0084-0081
-0267-0391-0342-0189-0032 0085 0157 0196
 0216 0224 0227 0228 0228 0228 0228 0227
 0227 0227 0227 0227 0227 0227 0227 0227
 0227 0227 0227 0227 0227 0226 0226 0226

0 81.10.7.23 LEAD
5.5
8.5
20.0
80.0
540.0
0.8
 0252 0251 0251 0251 0250 0250 0249 0249
 0249 0249 0249 0249 0249 0248 0248 0248
 0248 0247 0247 0247 0247 0247 0247 0246
 0246 0246 0246 0245 0245 0245 0244 0244
 0244 0243 0243 0243 0243 0243 0243 0242
 0241 0242 0242 0241 0241 0241 0240 0240
 0240 0239 0239 0239 0239 0239 0239 0239
 0238 0239 0238 0237 0236 0205 0110-0044
-0229-0373-0356-0213-0053 0071 0151 0195
 0217 0227 0230 0232 0232 0232 0231 0231
 0231 0230 0231 0230 0230 0231 0230 0230
 0230 0229 0230 0229 0229 0228 0229

0 81.10.7.24 LEAD
5.5
8.5
20.0
40.0
560.0
0.8
 0196 0195 0195 0195 0195 0195 0194 0195
 0195 0195 0195 0195 0195 0194 0195 0194
 0194 0193 0193 0194 0194 0194 0193 0194
 0193 0193 0193 0193 0193 0193 0193 0193
 0193 0193 0193 0193 0193 0192 0192 0192
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 0191 0191 0191 0191 0190 0190 0190 0190
 0190 0190 0191 0190 0190 0190 0190 0189
 0191 0190 0190 0190 0190 0189 0189 0189
 0189 0189 0189 0189 0189 0189 0189 0186
 0163 0107 0025-0072-0174-0269-0327-0280
-0155-0027 0069 0128 0161 0177 0183 0186
 0187 0187 0188 0187 0187 0187 0187 0187
 0187 0187 0187 0187 0187 0187 0186 0187

0 81.10.7.25 LEAD
5.5
8.5
20.0
40.0
560.0
0.8
 0213 0213 0213 0213 0213 0213 0213 0212
 0213 0213 0213 0213 0213 0213 0212 0212
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0212 0212 0211 0211 0212 0211 0212 0211
0212 0212 0212 0212 0211 0212 0211 0211
0211 0212 0211 0211 0211 0211 0211 0211
0211 0211 0211 0209 0211 0211 0210 0211
0209 0211 0210 0211 0210 0211 0211 0211
0210 0210 0210 0210 0210 0210 0210 0210
0210 0210 0210 0210 0209 0210 0210 0210
0210 0209 0210 0210 0210 0210 0207 0189
0135 0053-0047-0153-0253-0317-0273-0144
-0008 0093 0154 0187 0201 0208 0209 0209
0207 0207 0208 0207 0207 0207 0207 0207
0207 0207 0207 0207 0207 0207 0207 0207
0207 0207 0207 0207 0207 0207 0207 0207
0207 0207 0207 0206 0207 0207 0207 0207
0207 0207 0207 0207 0207 0207 0207 0207
0207 0207 0207 0207 0207 0207 0207 0207
0207 0207 0206 0207 0207 0207 0207 0207
0207 0207 0207 0207 0207 0207 0207 0207
0207 0207 0207 0207 0207 0207 0207 0206

0 81.10.7.26 LEAD
5.5
8.5
10.0
20.0
580.0
0.8
0368 0369 0369 0368 0368 0369 0368 0369
0368 0368 0368 0368 0368 0368 0368 0368
0368 0368 0368 0368 0368 0368 0367 0367
0368 0367 0367 0367 0367 0368 0367 0367
0367 0367 0367 0367 0367 0367 0367 0367
0367 0367 0367 0367 0366 0367 0367 0367
0367 0367 0367 0367 0367 0367 0367 0367
0367 0367 0367 0367 0367 0367 0367 0366
0367 0367 0367 0366 0366 0365 0366 0366
0366 0366 0366 0366 0365 0364 0352 0310
0238 0147 0044-0063-0171-0277-0371-0439
-0431-0278-0065 0119 0242 0312 0346 0362
0367 0368 0368 0368 0367 0367 0367 0367
0367 0367 0367 0367 0367 0367 0367 0367
0367 0366 0367 0367 0367

0 81.10.7.27 LEAD
5.5
8.5
10.0
10.0
590.0
0.8
0337 0337 0337 0337 0337 0337 0337 0337
0337 0337 0337 0337 0337 0337 0337 0337
0337 0337 0337 0337 0337 0337 0337 0337
0337 0337 0337 0337 0337 0337 0337 0337
0337 0337 0337 0337 0337 0337 0337 0337
0337 0337 0337 0337 0336 0337 0336 0337
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0337 0337 0336 0336 0336 0337 0336 0336
0336 0337 0337 0336 0336 0337 0336 0336
0336 0336 0335 0334 0329 0311 0279 0237
0189 0137 0085 0031-0022-0075-0127-0178
-0222-0257-0276-0237-0109 0047 0173 0255
0301 0323 0333 0336 0337 0336 0336 0336
0335 0335 0336 0336 0336 0336 0335 0336
0335 0336 0335 0335 0335 0335 0334 0335
0337 0337 0337
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0 81.10.7.28 LEAD
5.5
8.5
5.0
5.0
595.0
0.8
 0264 0264 0264 0264 0264 0264 0263 0264
 0264 0263 0263 0263 0264 0263 0263 0263
 0264 0264 0264 0263 0263 0263 0264 0264
 0264 0264 0264 0264 0264 0264 0265 0264
 0265 0264 0264 0264 0264 0264 0264 0264
 0264 0264 0264 0264 0264 0264 0263 0264
 0264 0263 0264 0264 0264 0263 0264 0264
 0264 0264 0264 0264 0264 0264 0264 0264
 0264 0264 0263 0263 0263 0263 0263 0263
 0259 0248 0227 0194 0152 0105 0055 0004
-0047-0099-0150-0203-0254-0306-0357-0409
-0460-0508-0552-0585-0609-0622-0590-0456
-0242-0041 0133 0190 0234 0253 0262 0263
 0264 0264 0264 0264 0264 0263 0263 0263
 0264 0263 0264 0264 0263 0263 0263 0263
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 0263 0264 0264
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APPENDIX A.2

PROGRAM CALIB

SAMPLE OUTPUT

81.10.7.2 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   371.067 (DEG KELVIN)

PEAK BEGINS AT 434.00 DEG. K.   (PEAK HEIGHT =   12.94)
   PEAK ENDS AT 446.80 DEG. K.   (PEAK HEIGHT =   16.92)

AREA-HEAT CONSTANT = .00090099 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .27145 DEG. K.-SEC./MILLICAL

TM= 436.10 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .37106667E+03   XMAX = .47240000E+03   YMIN = 0.   YMAX = .89300000E+03

81.10.7.3 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   371.067 (DEG KELVIN)

PEAK BEGINS AT 434.30 DEG. K.   (PEAK HEIGHT =   12.67)
   PEAK ENDS AT 446.80 DEG. K.   (PEAK HEIGHT =   16.13)

AREA-HEAT CONSTANT = .00090140 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .27790 DEG. K.-SEC./MILLICAL

TM=   435.92 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .37106667E+03   XMAX = .47666667E+03   YMIN = 0.   YMAX = .90800000E+03

81.10.7.4 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   380.533 (DEG KELVIN)

PEAK BEGINS AT 431.73 DEG. K.   (PEAK HEIGHT =   7.35)
   PEAK ENDS AT 439.20 DEG. K.   (PEAK HEIGHT =   10.65)

AREA-HEAT CONSTANT = .00091008 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20875 DEG. K.-SEC./MILLICAL

TM= 433.20 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .38053333E+03   XMAX = .45733333E+03   YMIN = 0.   YMAX = .74700000E+03

61.10.7.5 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   380.533 (DEG KELVIN)

PEAK BEGINS AT 431.73 DEG. K. (PEAK HEIGHT =   6.80)
   PEAK ENDS AT 439.20 DEG. K. (PEAK HEIGHT =   7.82)

AREA-HEAT CONSTANT = .00090879 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .21030 DEG. K.-SEC./MILLICAL

TM=   433.19 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .3805J333E+J3   XMAX = .45573333E+03   YMIN = 0.   YMAX = .7420000E+03

81.10.7.6 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA =   390.267 (DEG KELVIN)

PEAK BEGINS AT 430.27 DEG. K. (PEAK HEIGHT =   6.97)
  PEAK ENDS AT 435.07 DEG. K. (PEAK HEIGHT =   5.07)

AREA-HEAT CONSTANT = .00091680 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20122 DEG. K.-SEC./MILLICAL

TM= 431.06 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .3902666E+03   XMAX = .4452000E+03   YMIN = 0.   YMAX = .1168000E+04

61.10.7.7 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   390.267 (DEG KELVIN)

PEAK BEGINS AT 430.27 DEG. K.   (PEAK HEIGHT =   4.17)
  PEAK ENDS AT 435.07 DEG. K.   (PEAK HEIGHT =   4.01)

AREA-HEAT CONSTANT = .00091671 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20074 DEG. K.-SEC./MILLICAL

TM=   431.07 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .39026667E+03   XMAX = .44333333E+03   YMIN = 0.   YMAX = .11630000E+04

81.10.7.8 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   400.133 (DEG KELVIN)

PEAK BEGINS AT 430.13 DEG. K. (PEAK HEIGHT =   1.04)
  PEAK ENDS AT 432.80 DEG. K. (PEAK HEIGHT =   2.57)

AREA-HEAT CONSTANT = .00092041 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20141 DEG. K.-SEC./MILLICAL

TM= 430.24 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .40013333E+03   XMAX = .49378667E+03   YMIN = 0.   YMAX = .88100000E+03

81.10.7.9 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   9.100

RANGE =.   5.000 (MILLICA./SEC FULL SCALE)   SCAN RATE =   5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 410.067 (DEG KELVIN)

PEAK BEGINS AT 429.47 DEG. K. (PEAK HEIGHT =   5.81)
  PEAK ENDS AT 431.33 DEG. K. (PEAK HEIGHT =   4.85)

AREA-HEAT CONSTANT = .00092688 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .19850 DEG. K.-SEC./MILLICAL

TM= 429.69 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .41006667E+03   XMAX = .43453333E+03   YMIN = 0.   YMAX = .12880000E+04

81.10.7.10 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   5.000

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   60.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   371.067 (DEG KELVIN)

PEAK BEGINS AT 432.93 DEG. K.   (PEAK HEIGHT =   5.30)
   PEAK ENDS AT 443.60 DEG. K.   (PEAK HEIGHT =   4.82)

AREA-HEAT CONSTANT = .00090978 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .34373 DEG. K.-SEC./MILLICAL

TM=   434.46 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .37106667E+03   XMAX = .46706667E+03   YMIN = 0.   YMAX = .61400000E+03

81.10.7.11 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   5.000

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   380.533 (DEG KELVIN)

PEAK BEGINS AT 431.20 DEG. K.   (PEAK HEIGHT =   6.23)
  PEAK ENDS AT 436.53 DEG. K.   (PEAK HEIGHT =   6.49)

AREA-HEAT CONSTANT = .00032576 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .21357 DEG. K.-SEC./MILLICAL

TM=   431.78 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
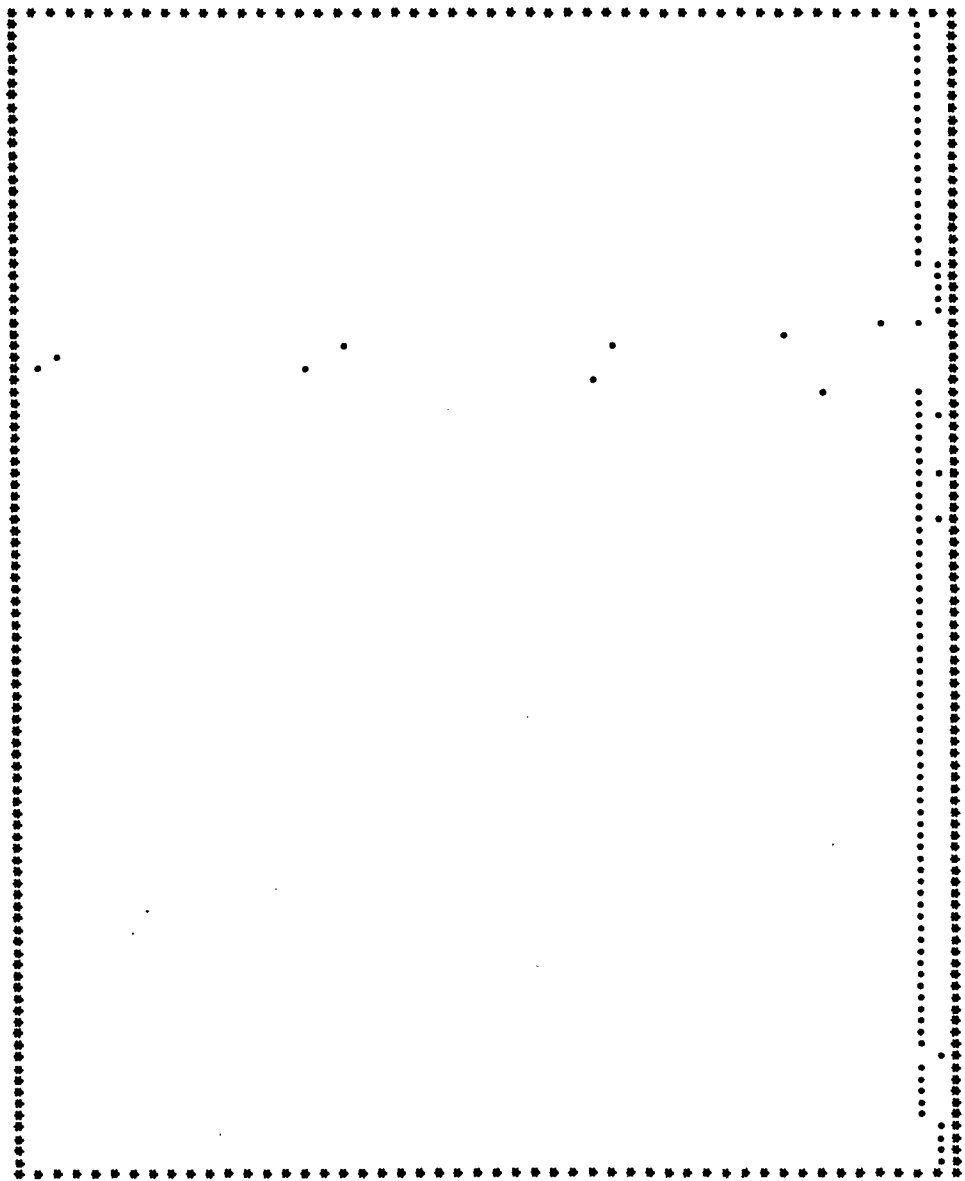
XMIN = .38053333E+03   KMAX = .45626667E+03   YMIN = 0.   YMAX = .53300000E+03

81.10.7.12 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   5.000

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   390.267 (DEG KELVIN)

PEAK BEGINS AT 430.27 DEG. K. (PEAK HEIGHT =   10.97)
  PEAK ENDS AT 433.47 DEG. K. (PEAK HEIGHT =   8.55)

AREA-HEAT CONSTANT = .00092508 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .16122 DEG. K.-SEC./MILLICAL

TM=   430.81 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
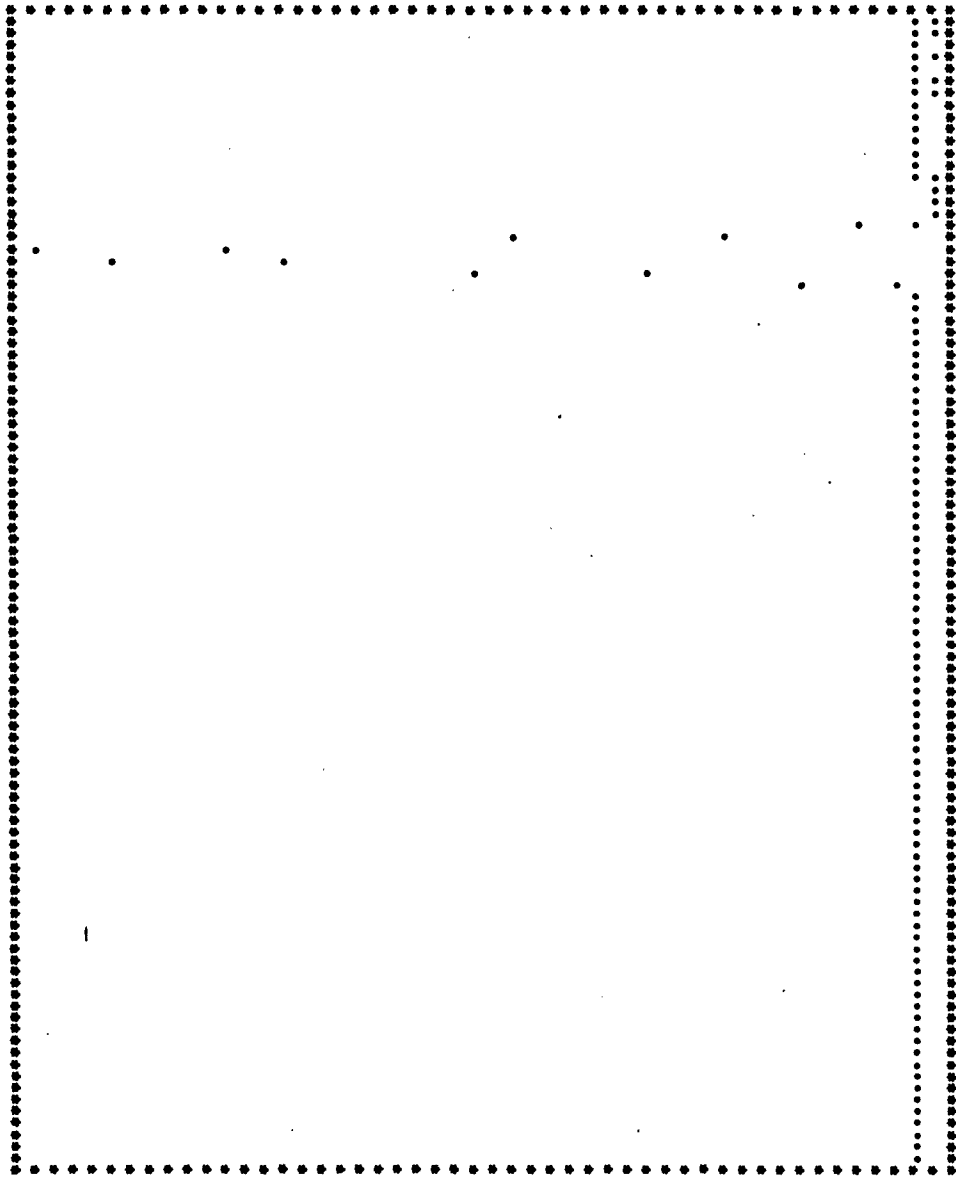
XMIN = .39026667E+03   XMAX = .44253333E+03   YMIN = 0.   YMAX = .89900000E+03

81.10.7.13 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   5.000

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   410.133 (DEG KELVIN)

PEAK BEGINS AT 429.87 DEG. K.   (PEAK HEIGHT =   9.15)
   PEAK ENDS AT 431.73 DEG. K.   (PEAK HEIGHT =   4.38)

AREA-HEAT CONSTANT = .00092816 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .14388 DEG. K.-SEC./MILLICAL

TM= 430.00 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .41013333E+03   XMAX = .43520000E+03   YMIN = 0.   YMAX = .70600000E+03
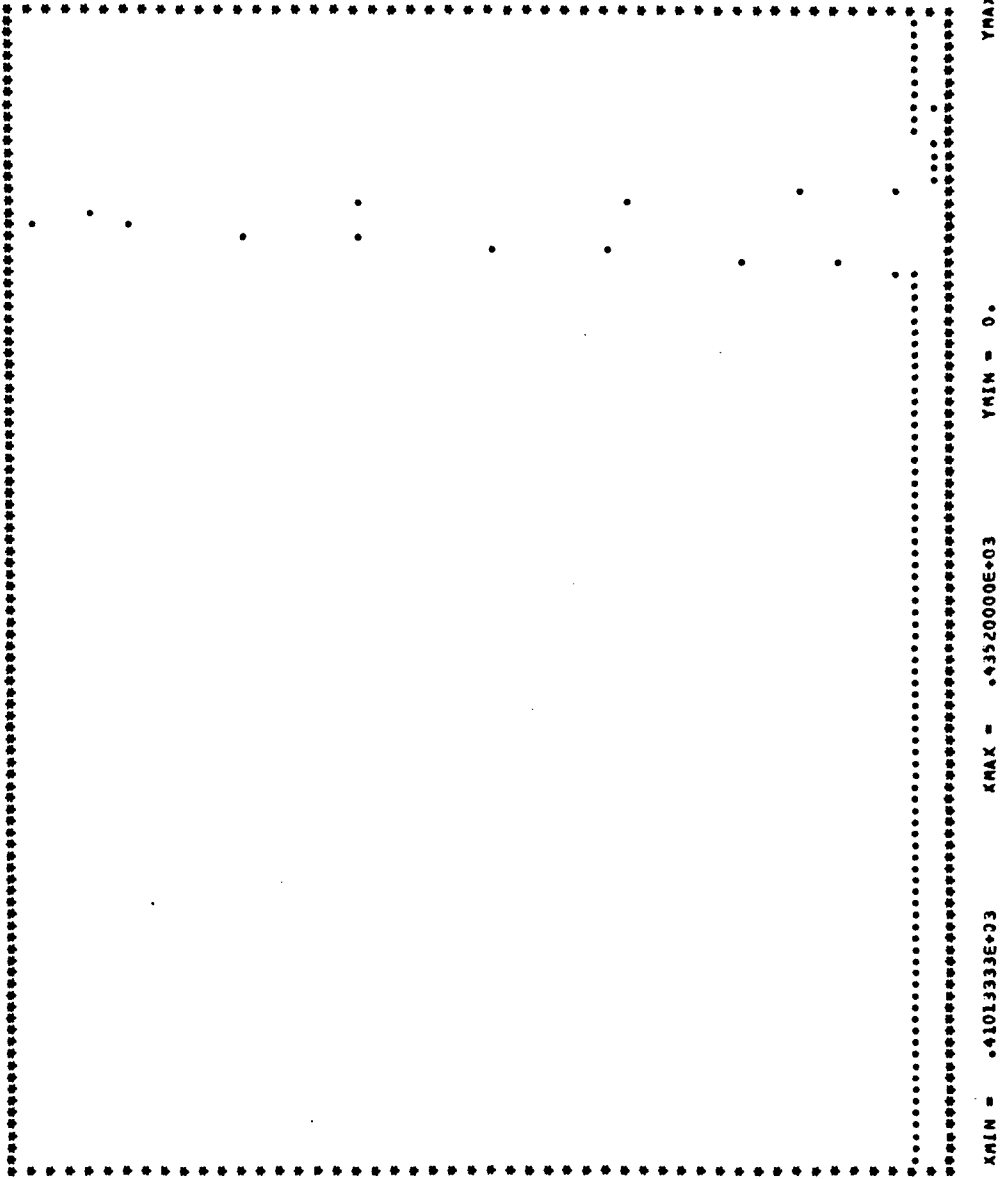
81.10.7.14 INDIUM

HEAT OF FUSION (CAL/GRAM) =   6.800

WEIGHT (MG) OF CALIBRATION STANDARD =   5.000

RANGE =   5.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 420.067 (DEG KELVIN)

PEAK BEGINS AT 429.60 DEG. K. (PEAK HEIGHT = 16.77)
  PEAK ENDS AT 430.80 DEG. K. (PEAK HEIGHT = 12.28)

AREA-HEAT CONSTANT = .00093993 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .14136 DEG. K.-SEC./MILLICAL

TM= 429.71 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
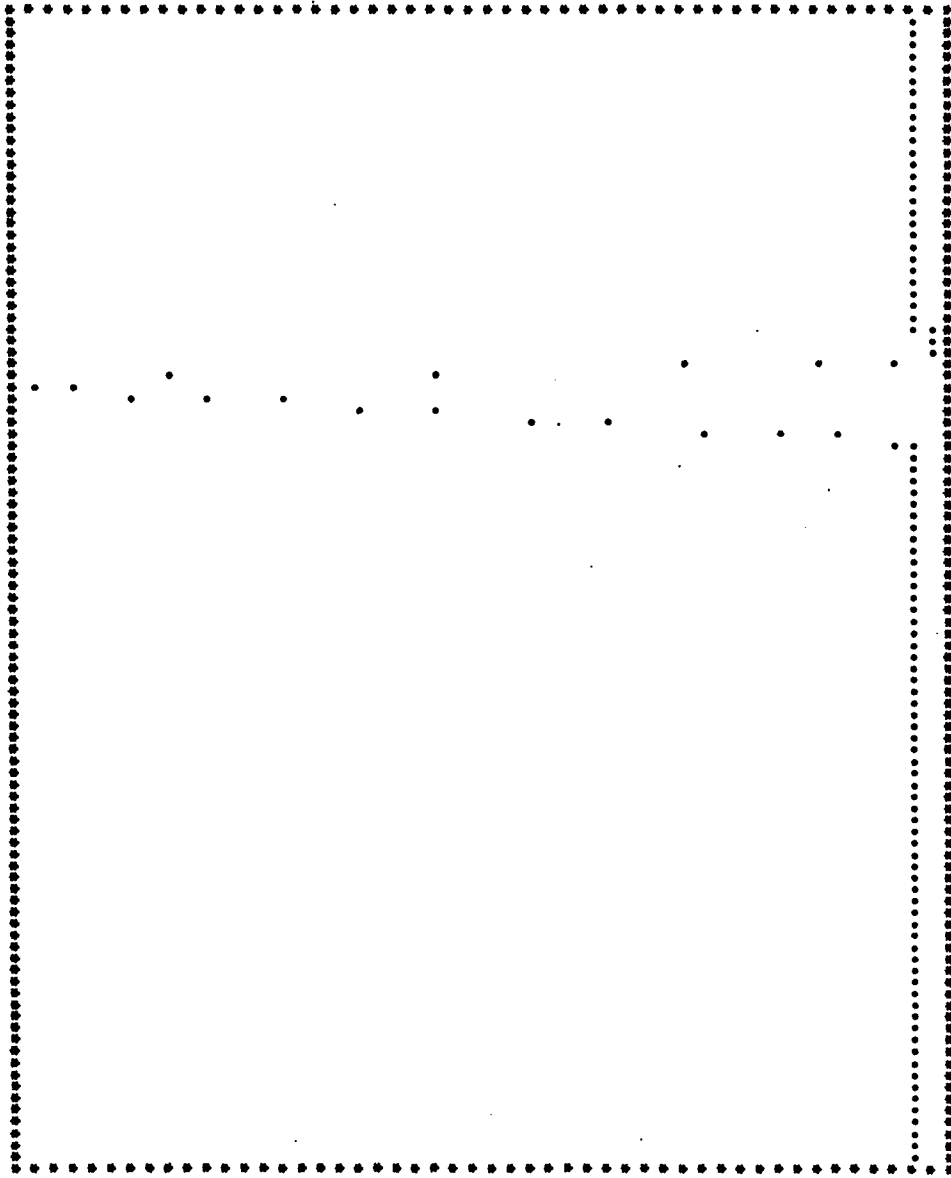
XMIN = .42006667E+03   XMAX = .43520000E+03   YMIN = 0.   YMAX = .10570000E+04

81.10.7.15 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   20.000 (MILLICA./SEC FULL SCALE)   SCAN RATE =   80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA = 541.067 (DEG KELVIN)

PEAK BEGINS AT 604.00 DEG. K. (PEAK HEIGHT =   8.19)
  PEAK ENDS AT 614.67 DEG. K. (PEAK HEIGHT =   20.33)

AREA-HEAT CONSTANT = .00103078 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .49757 DEG. K.-SEC./MILLICAL

TM= 605.47 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .39106667E+03   XMAX = .63280000E+03   YMIN = 0.   YMAX = .39100000E+03

81.10.7.16 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   541.067 (DEG KELVIN)

PEAK BEGINS AT 604.00 DEG. K.   (PEAK HEIGHT =   7.30)
  PEAK ENDS AT 614.67 DEG. K.   (PEAK HEIGHT =   16.91)

AREA-HEAT CONSTANT = .00100984 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .52374 DEG. K.-SEC./MILLICAL

TM= 605.44 DEG. K.

GRAPH UF BACKGROUND CORRECTED DATA IF OPTIUM USED OTHERWISE RAW DATA
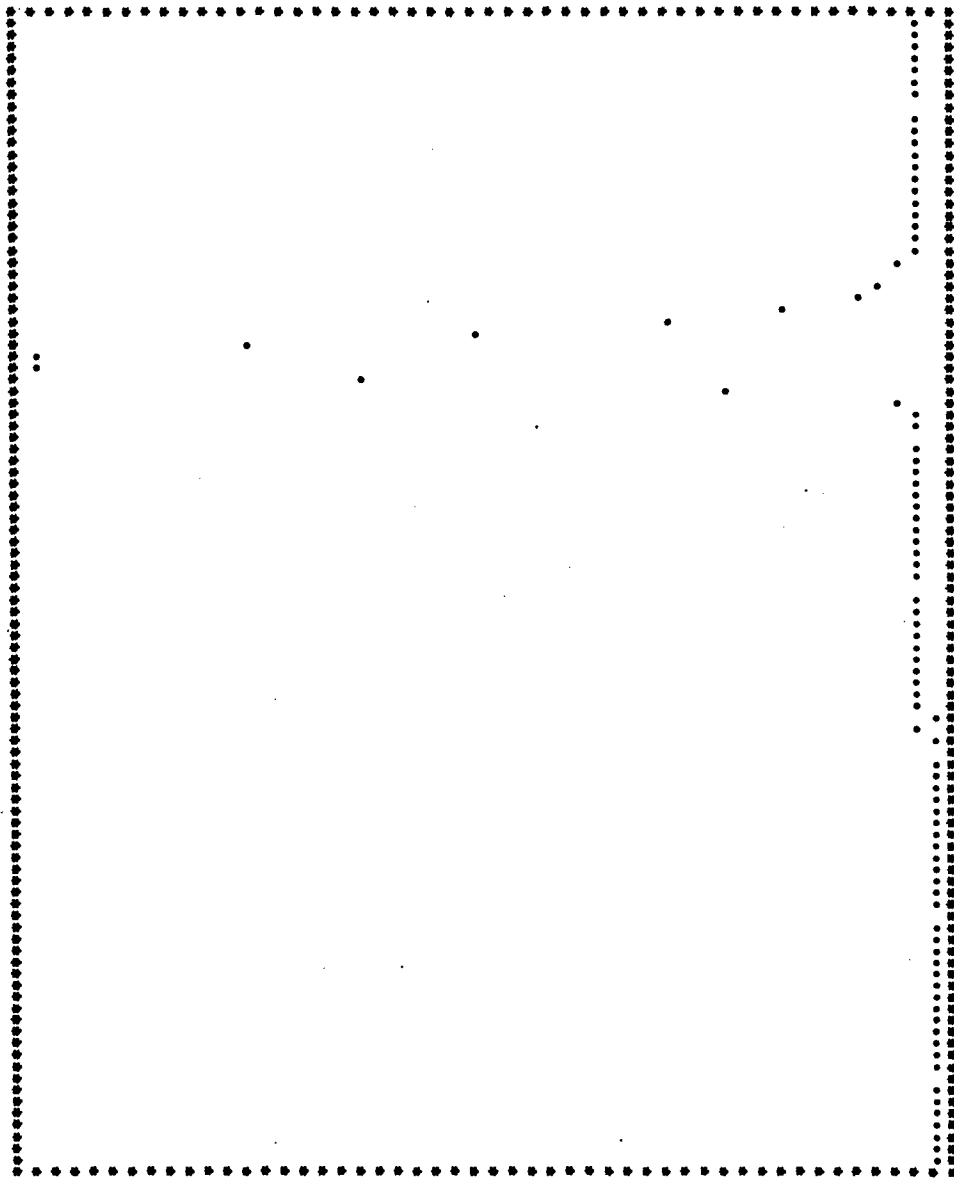
XMIN = .54106667E+03   XMAX = .63706667E+03   YMIN = 0.   YMAX = .38000000E+03

81.10.7.17 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA =   560.533 (DEG KELVIN)

PEAK BEGINS AT 602.67 DEG. K.   (PEAK HEIGHT =   2.78)
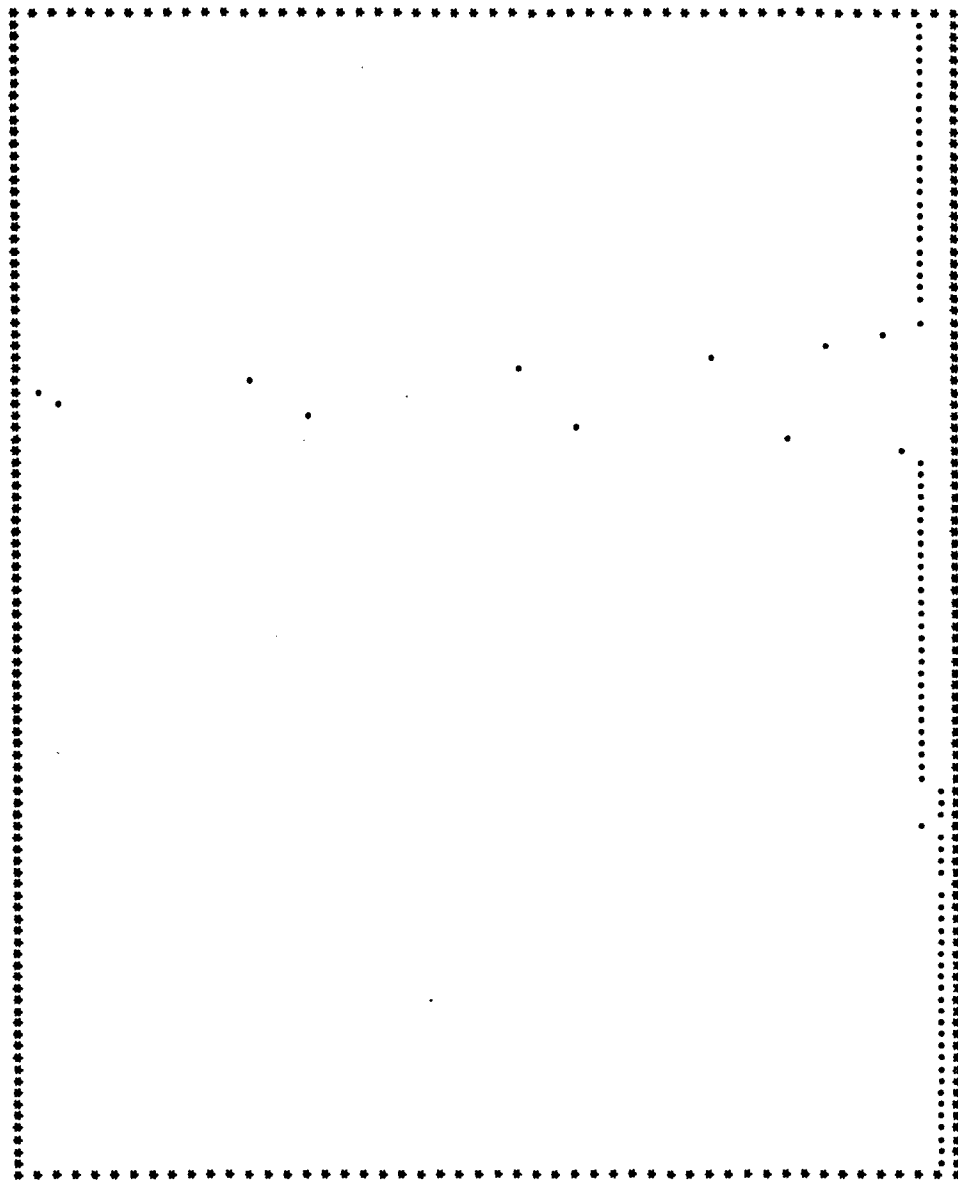 PEAK ENDS AT 608.00 DEG. K.   (PEAK HEIGHT =   7.82)

AREA-HEAT CONSTANT = .00130783 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .31389 DEG. K.-SEC./MILLICAL

TM= 603.21 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .56053333E+03   XMAX = .62560000E+03   YMIN = 0.   YMAX = .34100000E+03
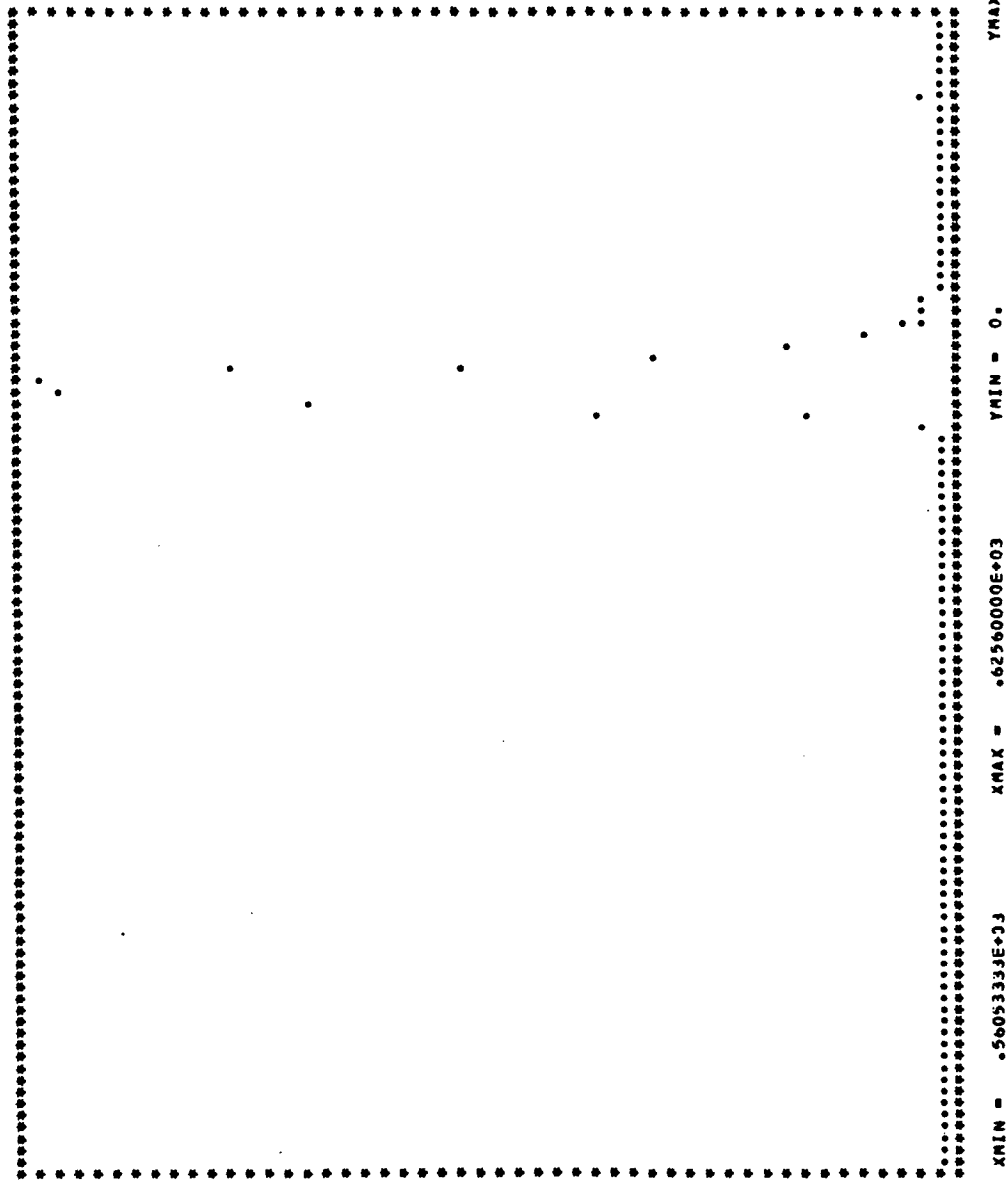
81.10.7.18 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   560.533 (DEG KELVIN)

PEAK BEGINS AT 602.67 DEG. K. (PEAK HEIGHT =   3.41)
   PEAK ENDS AT 608.00 DEG. K. (PEAK HEIGHT =   9.27)

AREA-HEAT CONSTANT = .00101127 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .31919 DEG. K.-SEC./MILLICAL

TM= 603.13 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
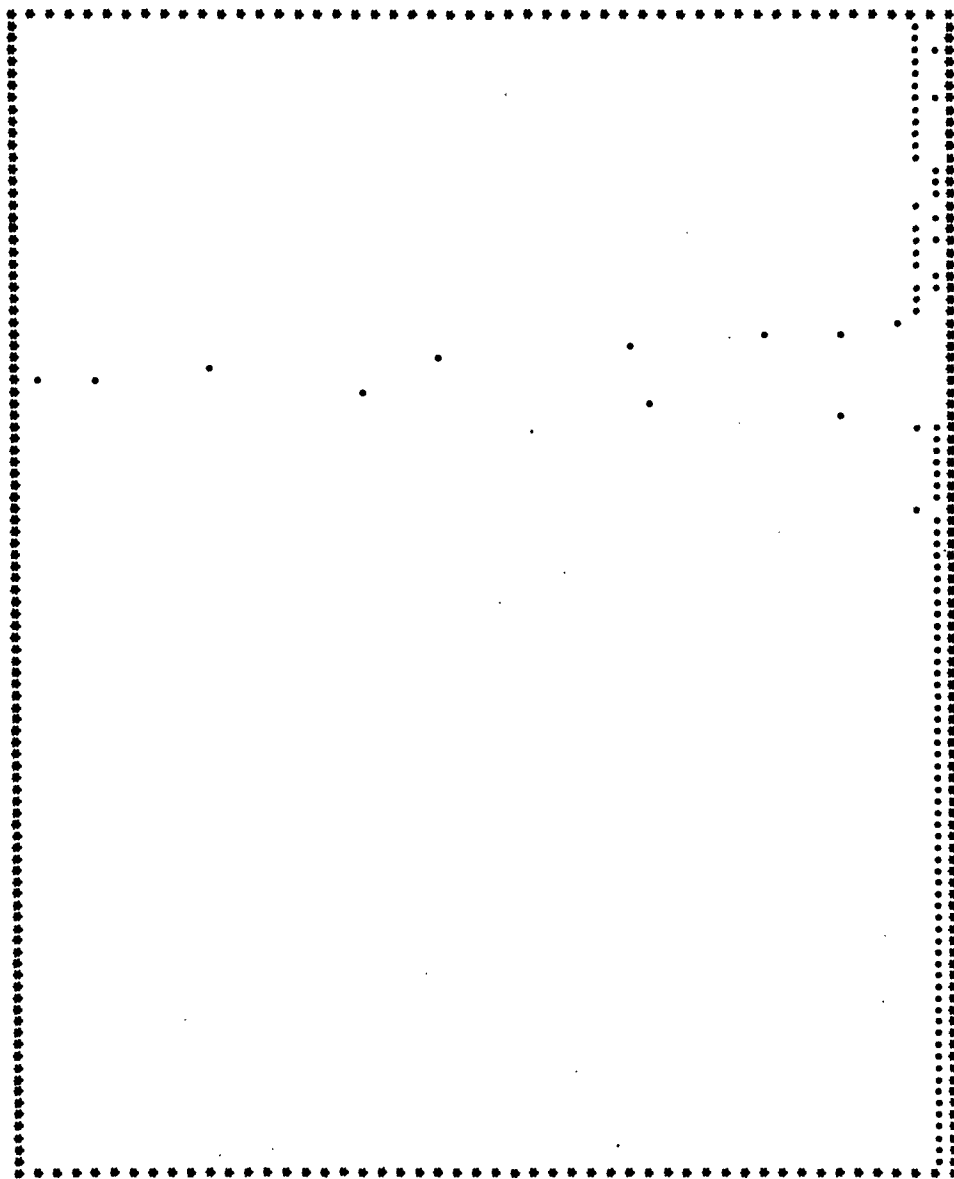
XMIN = .56053333E+03   KMAX = .62506667E+03   YMIN = 0.   YMAX = .34800000E+03

81.10.7.19 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   580.267 (DEG KELVIN)

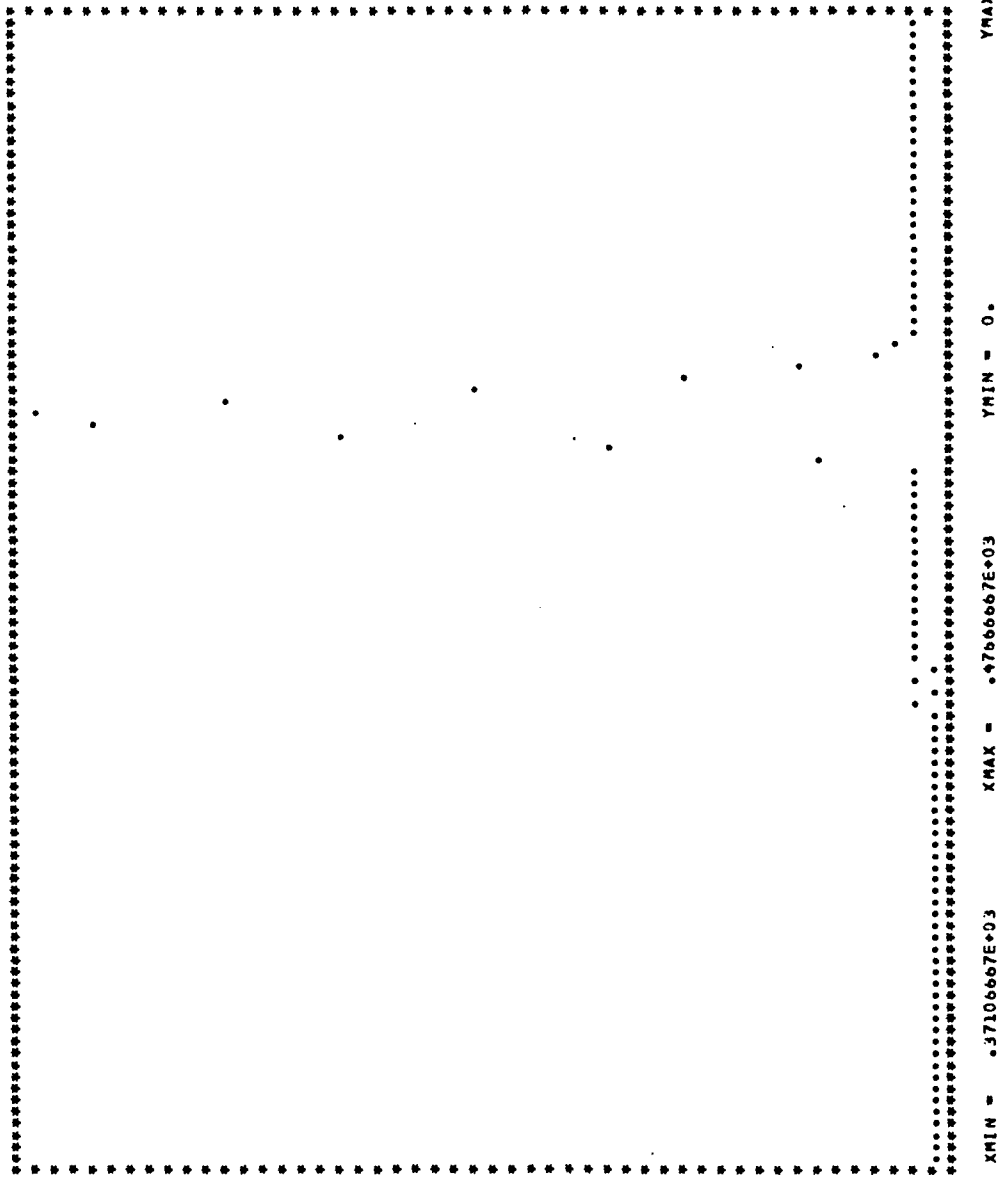PEAK BEGINS AT 601.60 DEG. K.   (PEAK HEIGHT =   5.93)
  PEAK ENDS AT 604.80 DEG. K.   (PEAK HEIGHT =   9.30)

AREA-HEAT CONSTANT = .00099521 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .22666 DEG. K.-SEC./MILLICAL

TM=   601.88 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
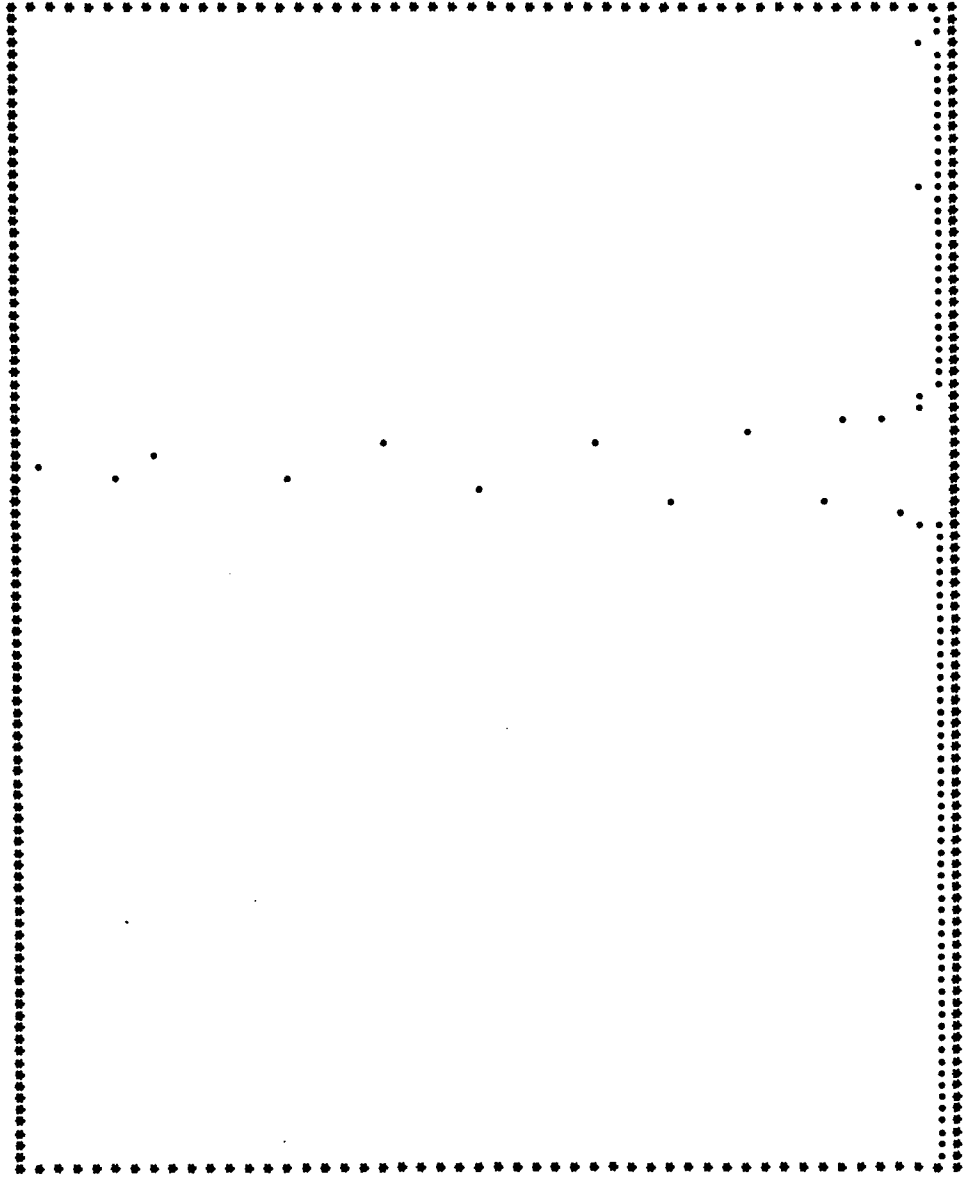
XMIN = .58026667E+03   XMAX = .61766667E+03   YMIN = 0.   YMAX = .59400000E+03

81.10.7.20 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

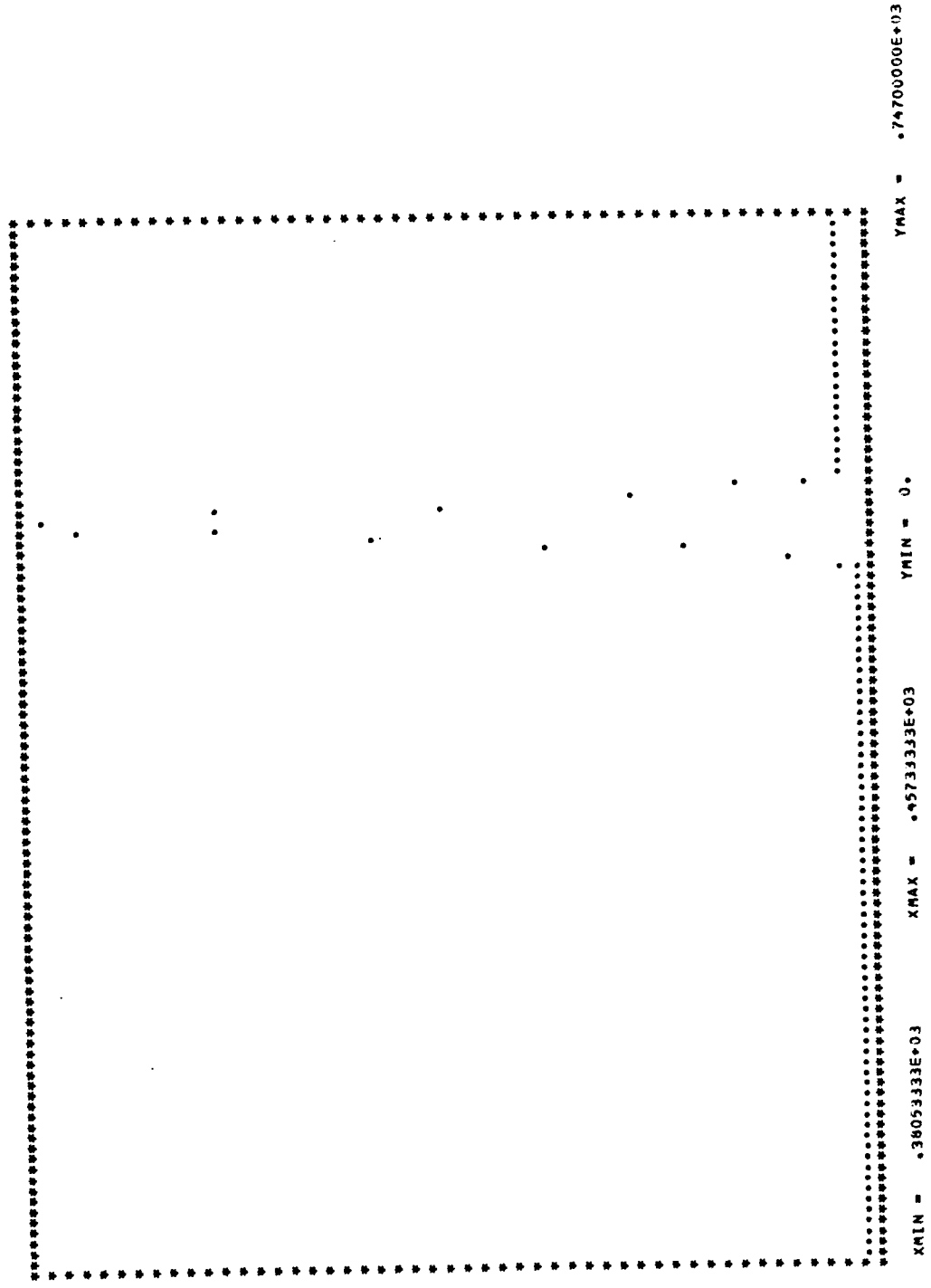TEMPERATURE OF FIRST POINT OF DATA = 590.133 (DEG KELVIN)

PEAK BEGINS AT 600.93 DEG. K. (PEAK HEIGHT =   2.53)
  PEAK ENDS AT 602.80 DEG. K. (PEAK HEIGHT =   6.32)

AREA-HEAT CONSTANT = .00100849 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .20023 DEG. K.-SEC./MILLICAL

TM= 601.06 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
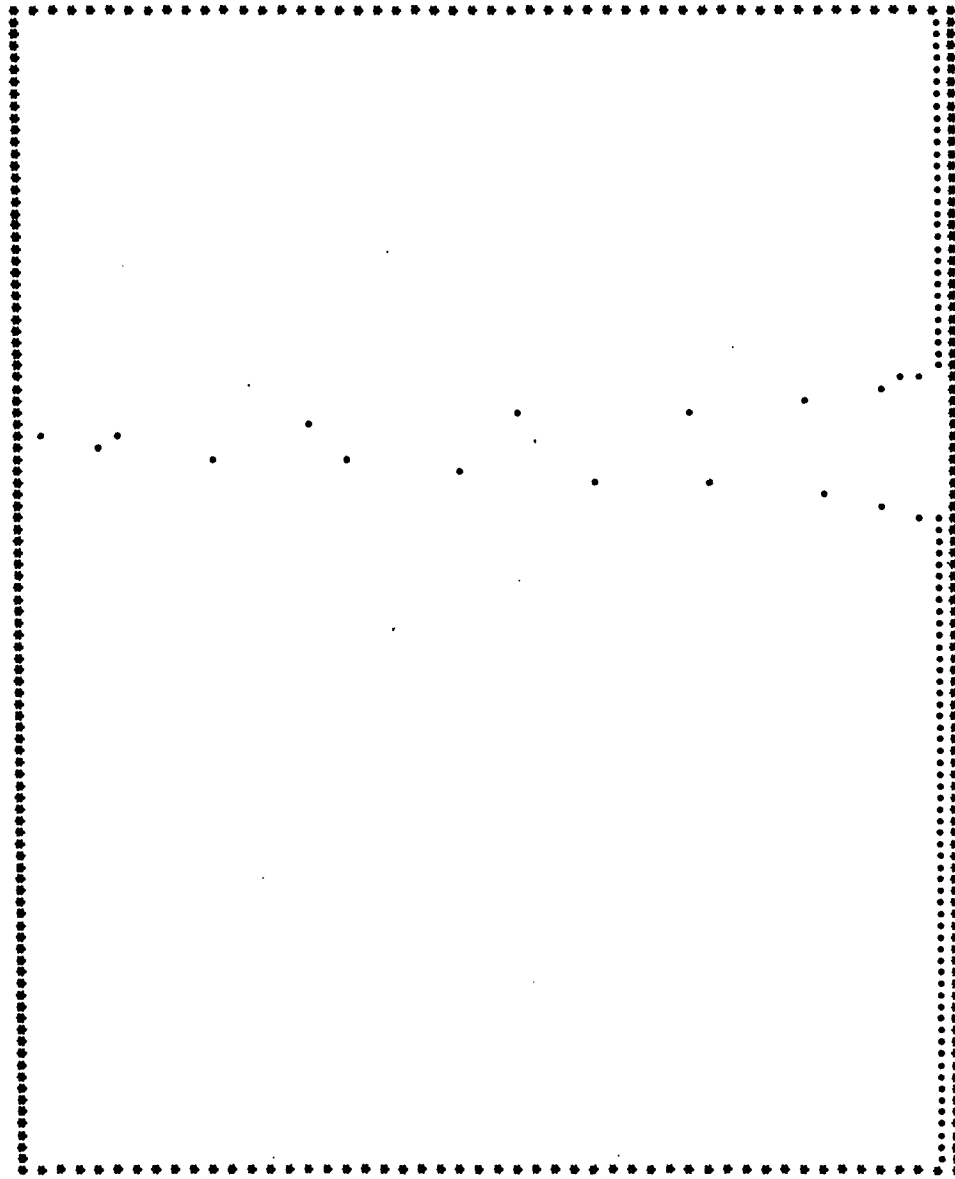
XMIN = .59013333E+03   XMAX = .60880000E+03   YMIN = 0.   YMAX = .46900000E+03

81.10.7.21 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   4.900

RANGE =   5.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA = 595.067 (DEG KELVIN)

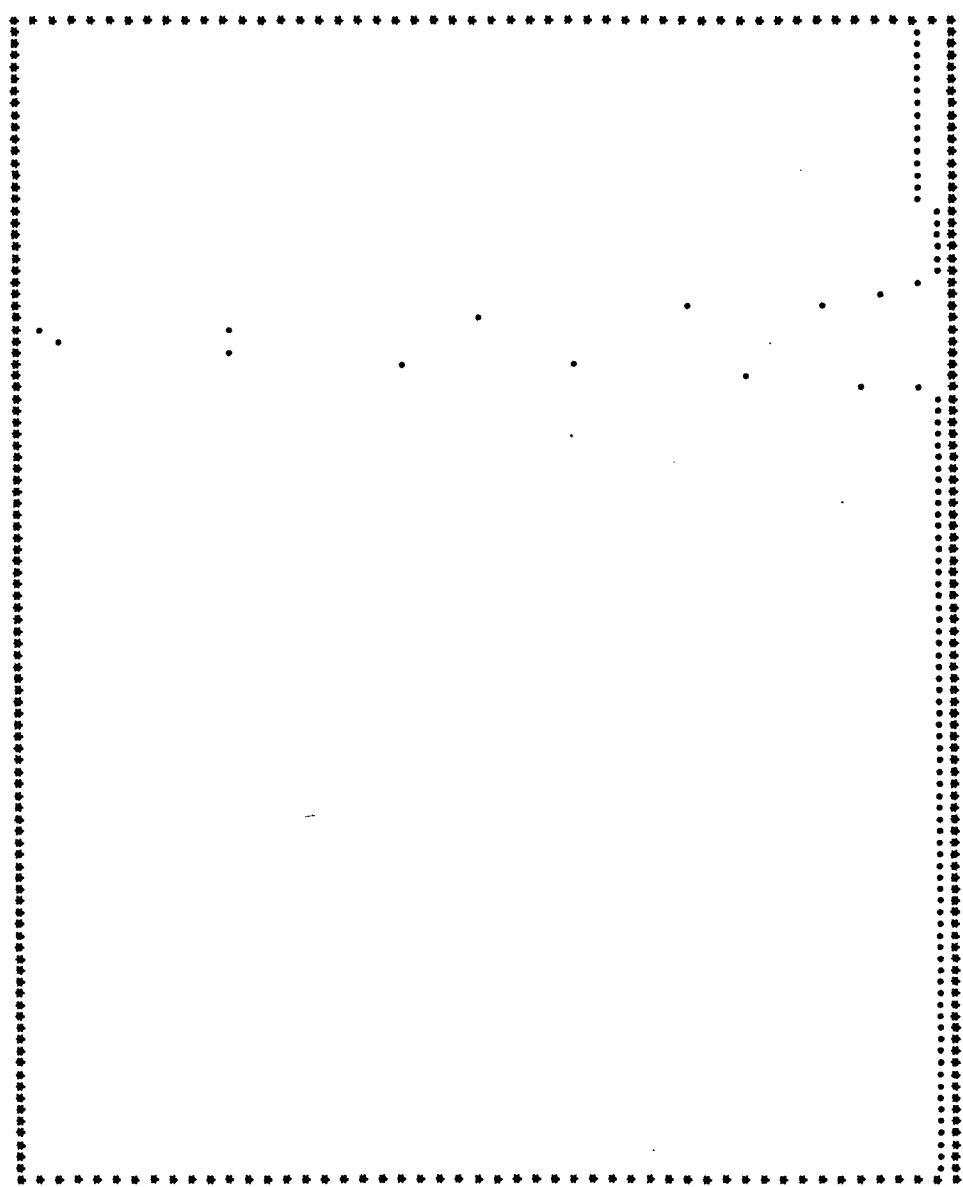PEAK BEGINS AT 600.47 DEG. K.   (PEAK HEIGHT =   6.42)
   PEAK ENDS AT 601.80 DEG. K.   (PEAK HEIGHT =   5.86)

AREA-HEAT CONSTANT = .00099615 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .19851 DEG. K.-SEC./MILLICAL

TM= 600.63 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .59506667E+03   XMAX = .61300000E+03   YMIN = 0.   YMAX = .71400000E+03
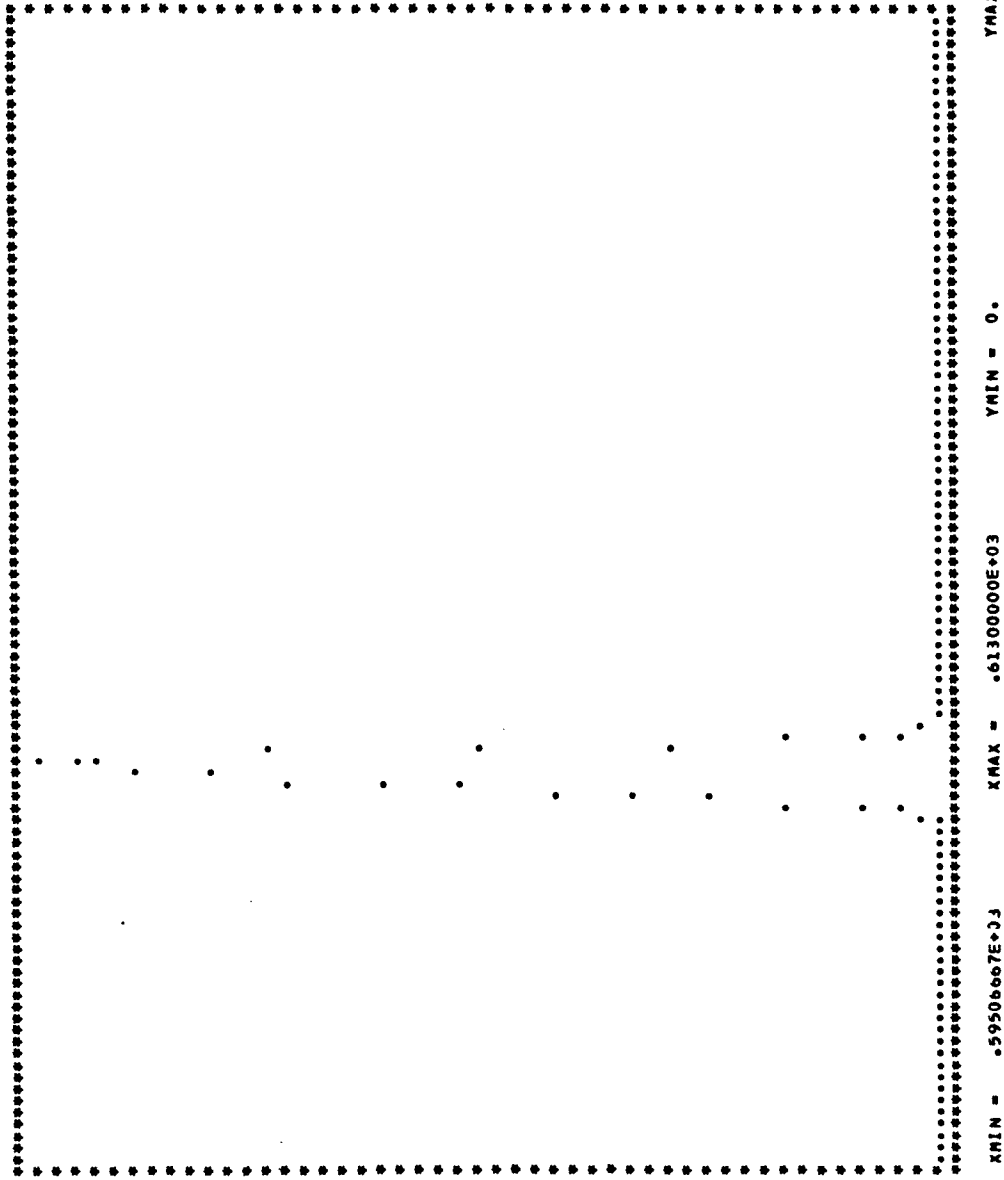
81.10.7.22 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA =   541.067 (DEG KELVIN)

PEAK BEGINS AT 604.00 DEG. K.   (PEAK HEIGHT =   11.53)
  PEAK ENDS AT 616.80 DEG. K.   (PEAK HEIGHT =   22.04)

AREA-HEAT CONSTANT = .00095532 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .37114 DEG. K.-SEC./MILLICAL

TM= 606.02 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .5410b667E+03   XMAX = .64240000E+03   YMIN = 0.   YMAX = .63400000E+03
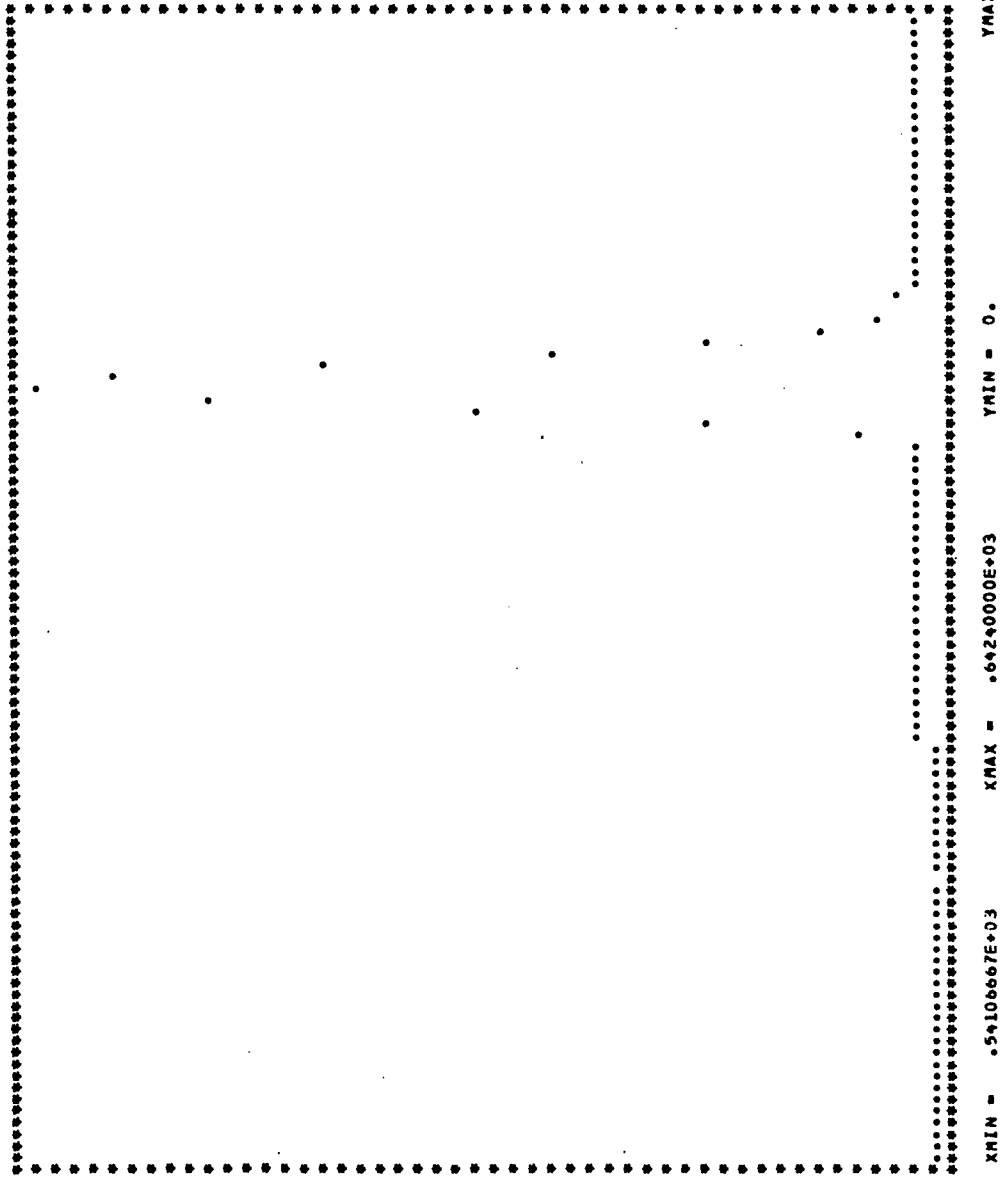
81.10.7.23 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.503

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   80.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA = 541.067 (DEG KELVIN)
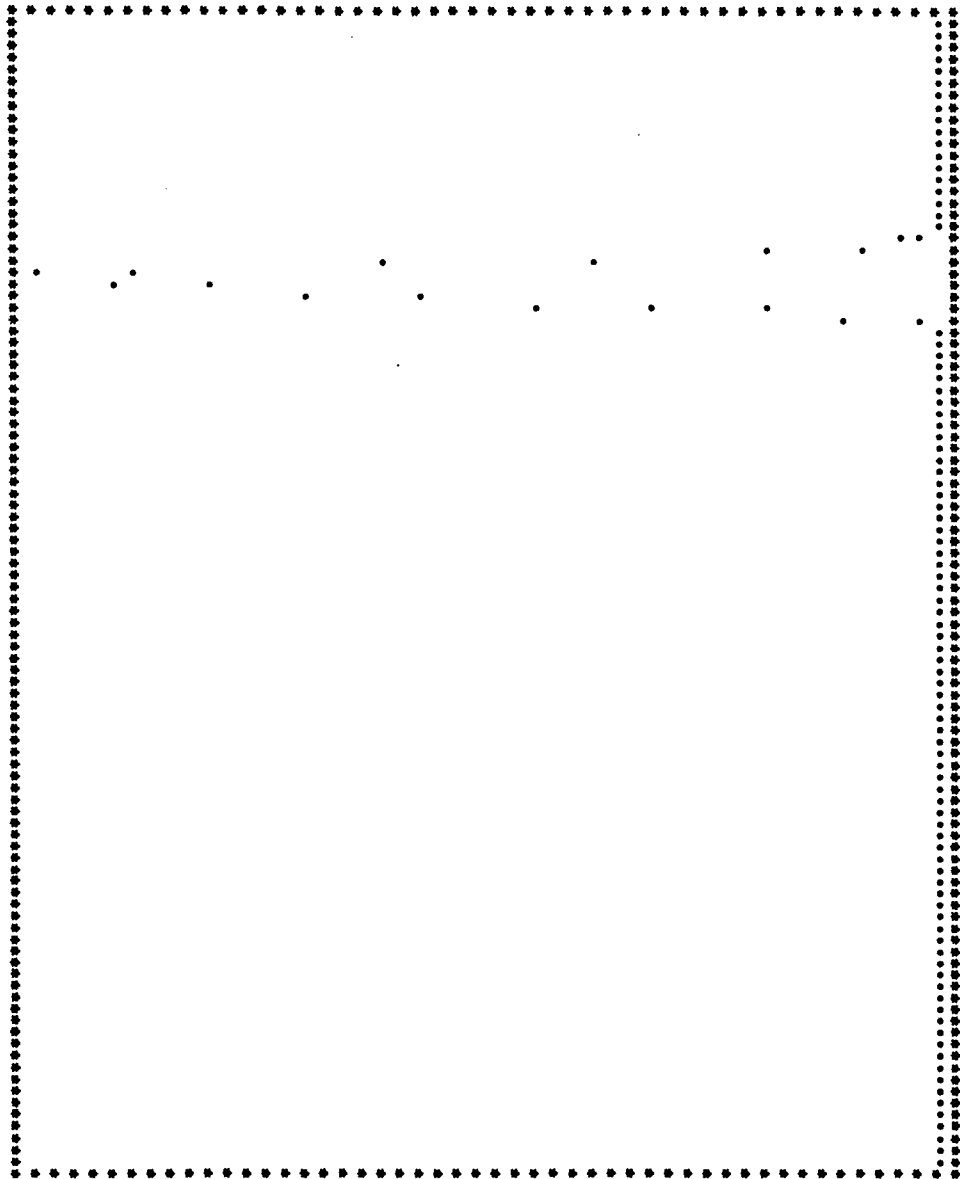
PEAK BEGINS AT 604.30 DEG. K. (PEAK HEIGHT =   14.58)
  PEAK ENDS AT 616.80 DEG. K. (PEAK HEIGHT =   28.55)

AREA-HEAT CONSTANT = .00095949 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .37472 DEG. K.-SEC./MILLICAL

TM= 606.06 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
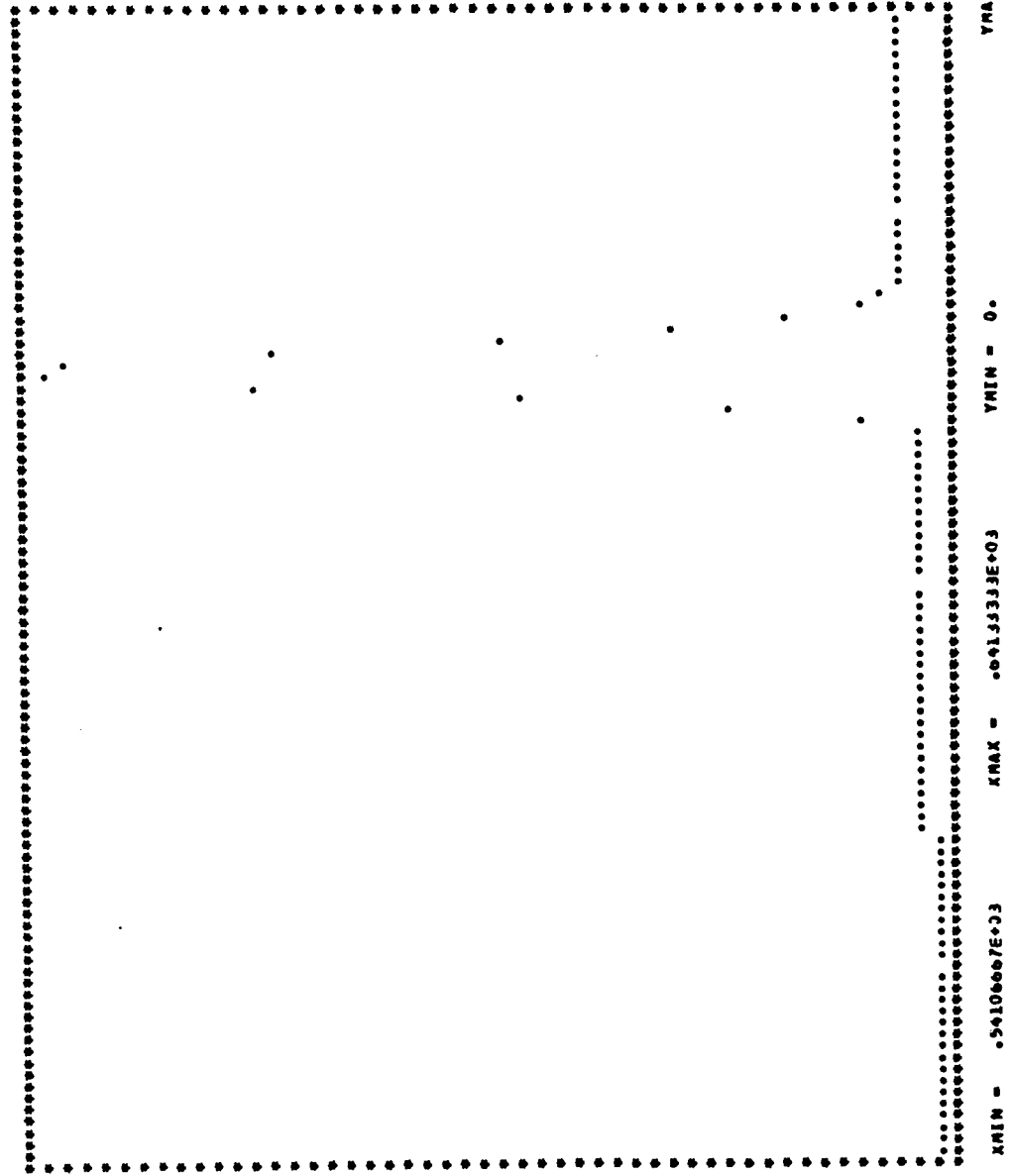
81.10.7.24 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   560.533 (DEG KELVIN)

PEAK BEGINS AT 603.20 DEG. K.   (PEAK HEIGHT =   8.93)
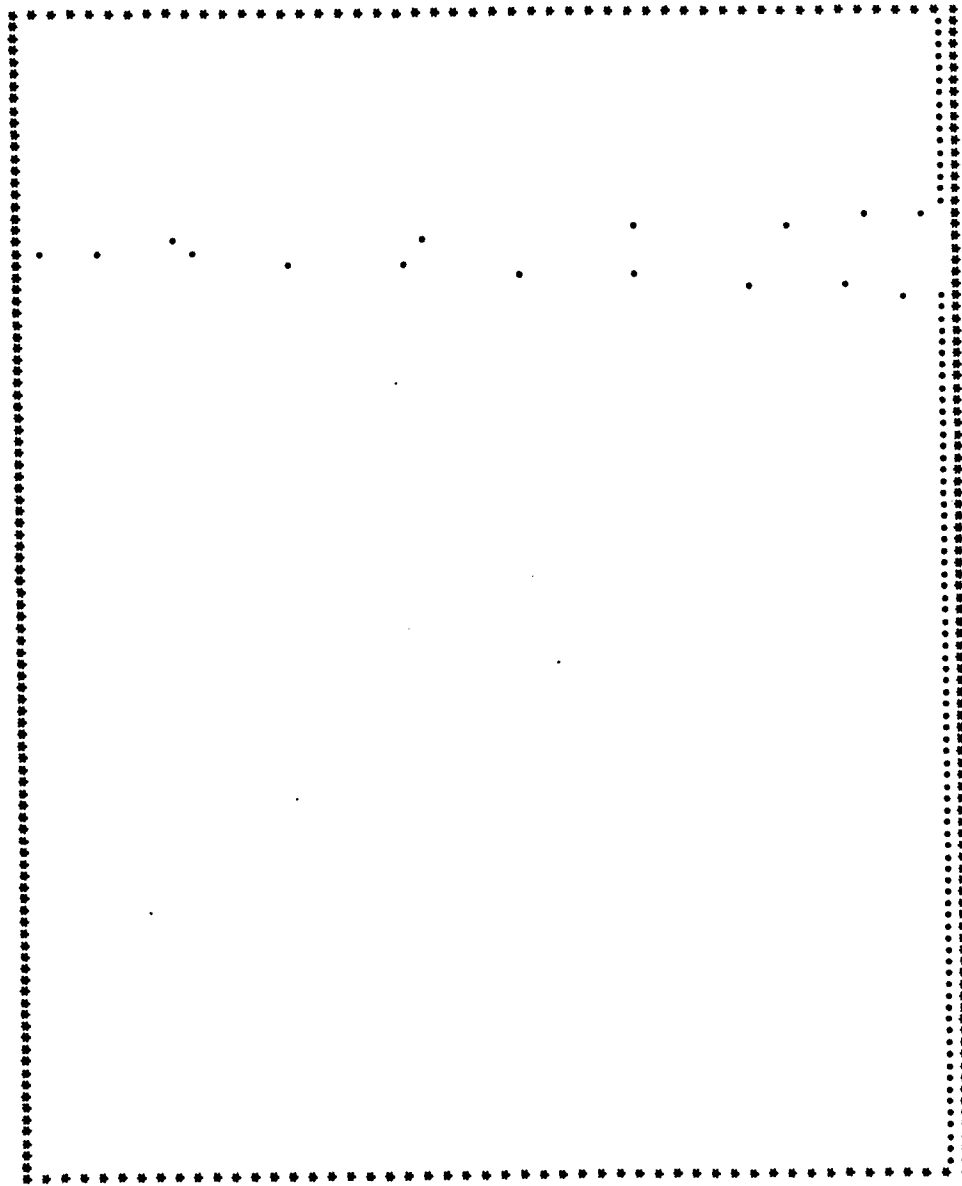 PEAK ENDS AT 609.60 DEG. K.   (PEAK HEIGHT =   16.14)

AREA-HEAT CONSTANT = .00096786 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .29156 DEG. K.-SEC./MILLICAL

TM= 603.52 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .56053333E+03   XMAX = .61473333E+03   YMIN = 0.   YMAX = .52300000E+03
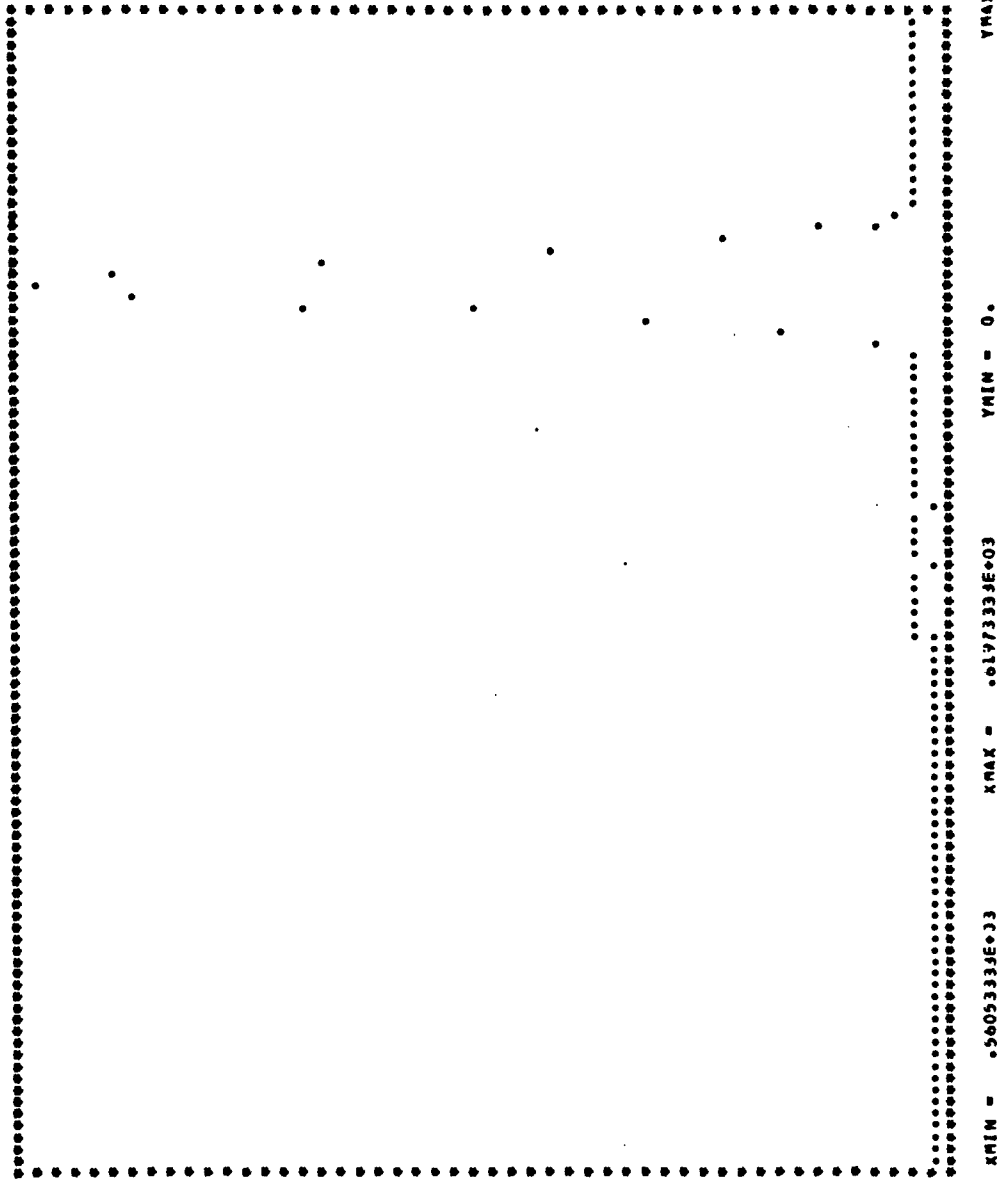
81.10.7.25 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   20.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   40.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   560.533 (DEG KELVIN)
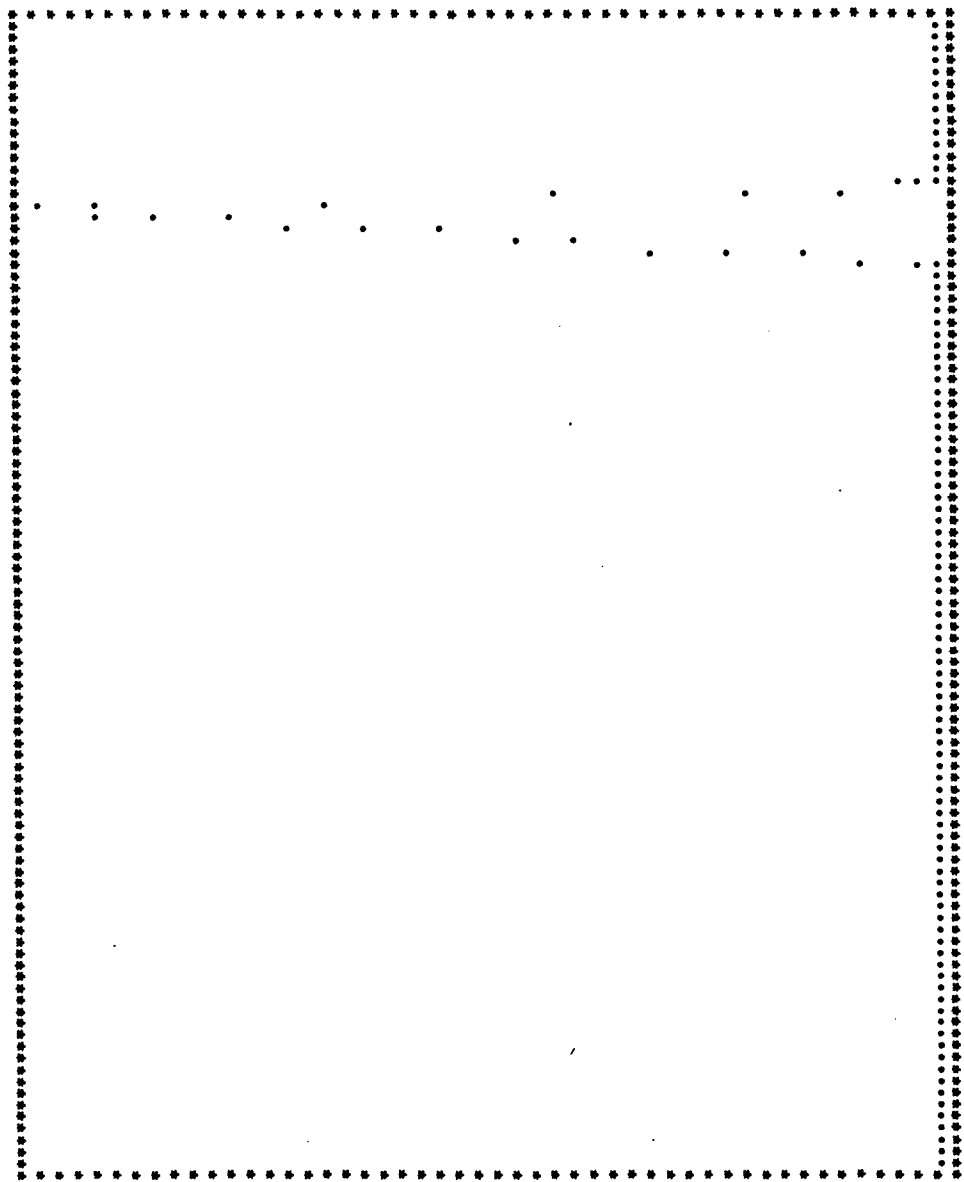
PEAK BEGINS AT 602.67 DEG. K. (PEAK HEIGHT =   4.85)
  PEAK ENDS AT 609.07 DEG. K. (PEAK HEIGHT =   7.03)

AREA-HEAT CONSTANT = .00095462 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .28499 DEG. K.-SEC./MILLICAL

TM= 603.02 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
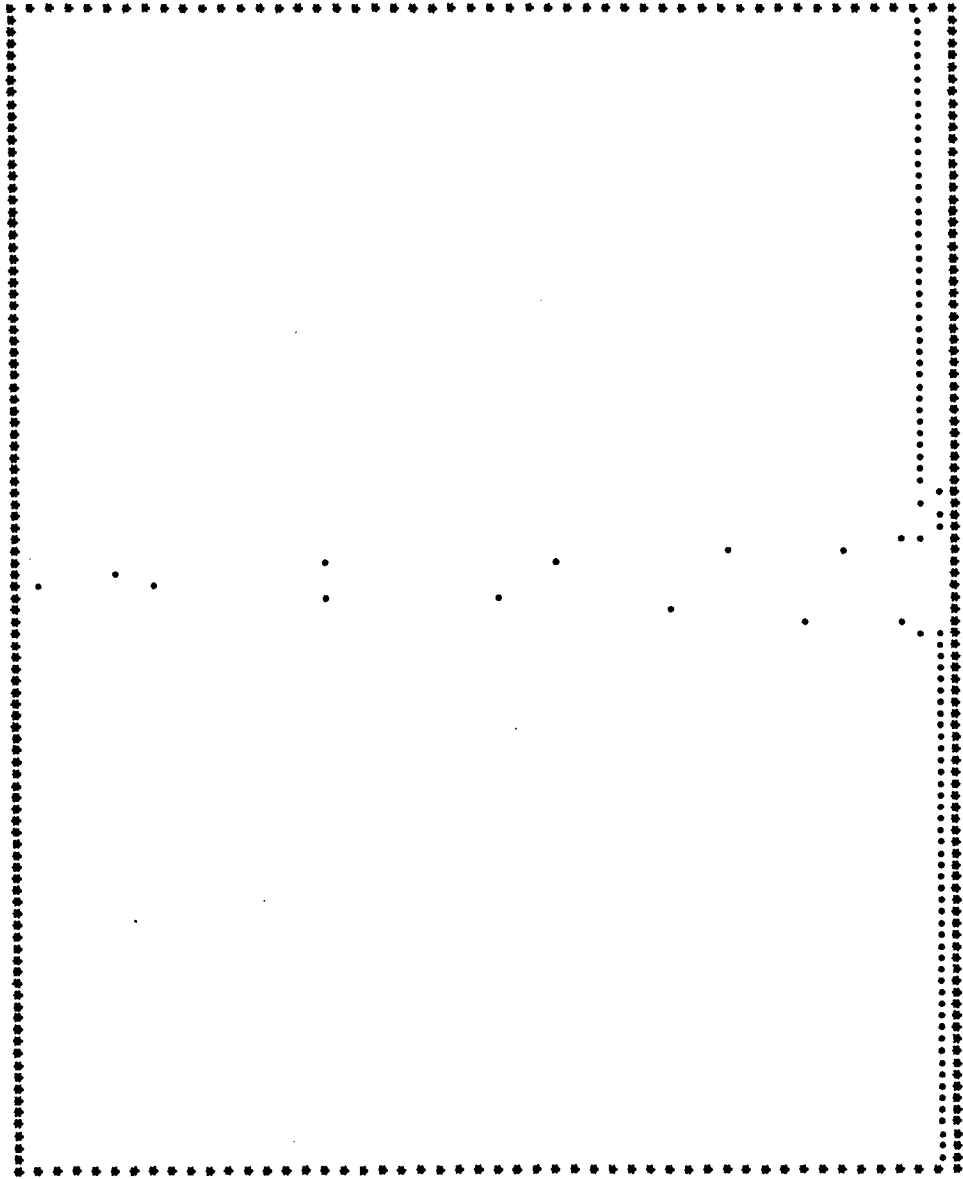
XMIN = .56053333E+03   XMAX = .64960000E+03   YMIN = 0.   YMAX = .53000000E+03

81.10.7.26 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   20.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

TEMPERATURE OF FIRST POINT OF DATA =   580.267 (DEG KELVIN)

PEAK BEGINS AT 601.07 DEG. K. (PEAK HEIGHT =   3.87)
  PEAK ENDS AT 605.33 DEG. K. (PEAK HEIGHT =   5.78)

AREA-HEAT CONSTANT = .00094833 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .26483 DEG. K.-SEC./MILLICAL

TM= 601.45 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .58026667E+03   KMAX = .61200000E+03   YMIN = 0.   YMAX = .80800000E+03
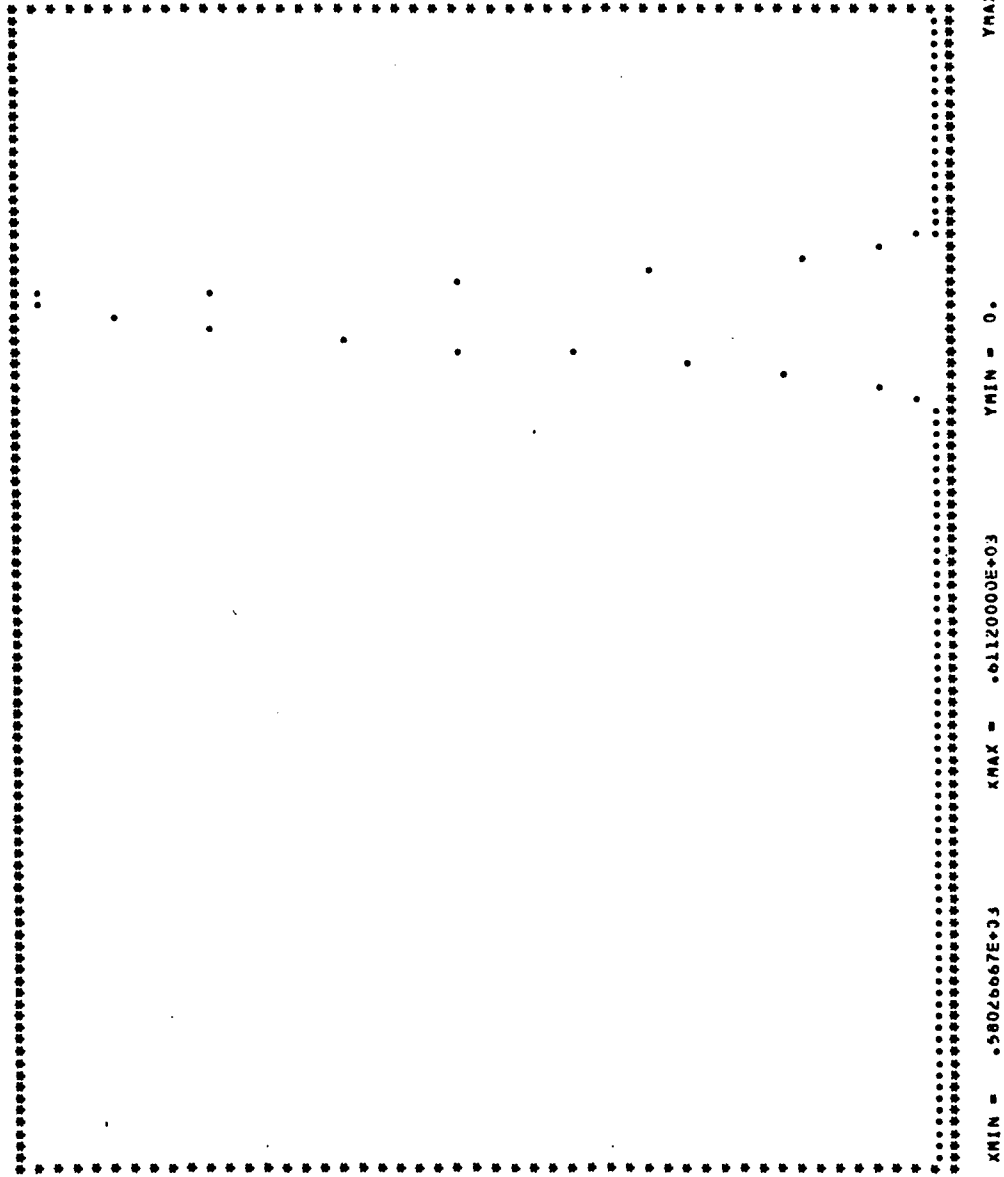
81.10.7.27 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   10.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   10.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) =   .80000000

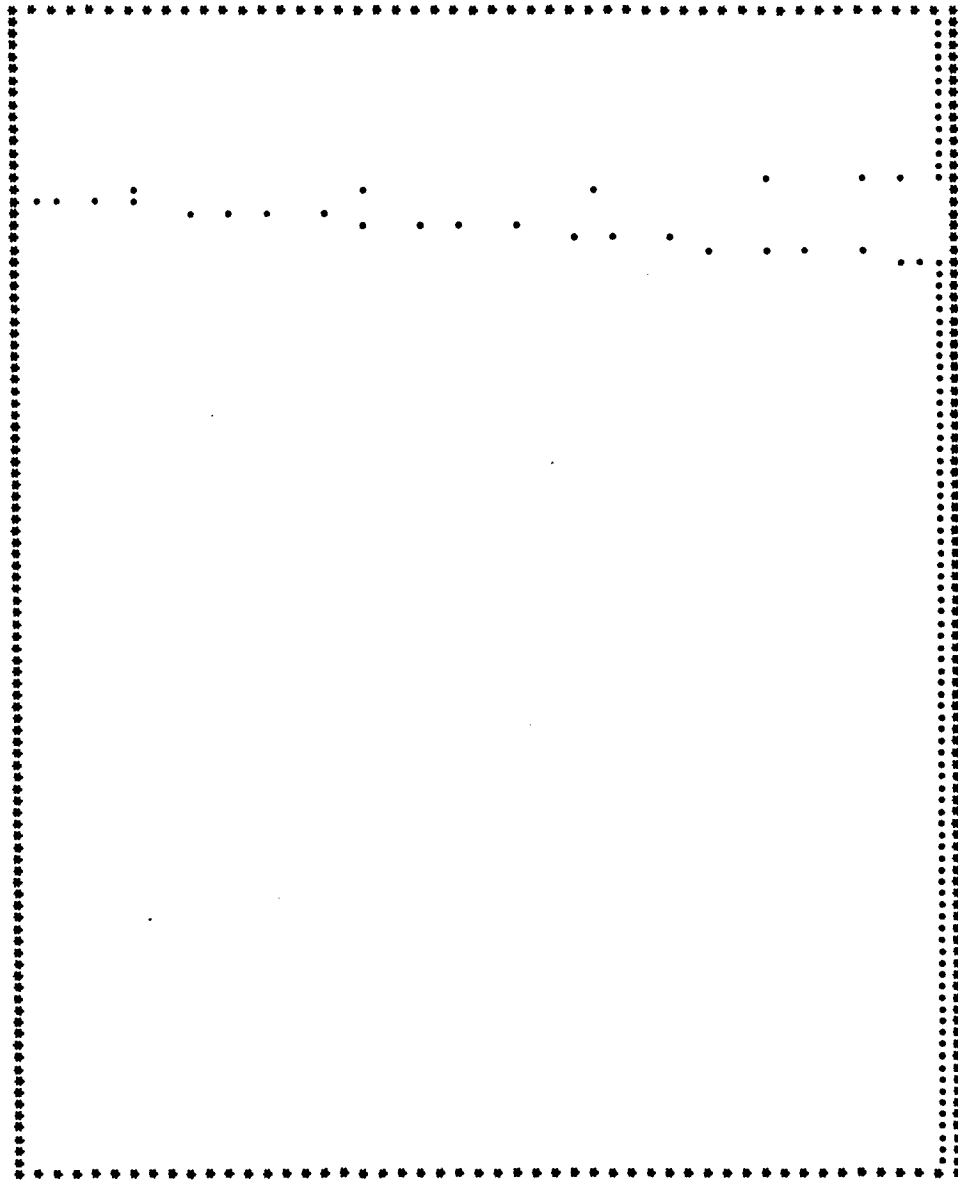TEMPERATURE OF FIRST POINT OF DATA =   590.133 (DEG KELVIN)

PEAK BEGINS AT 600.53 DEG. K. (PEAK HEIGHT =   5.30)
  PEAK ENDS AT 602.93 DEG. K. (PEAK HEIGHT =   8.08)

AREA-HEAT CONSTANT = .00097209 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .25906 DEG. K.-SEC./MILLICAL

TM= 600.61 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA
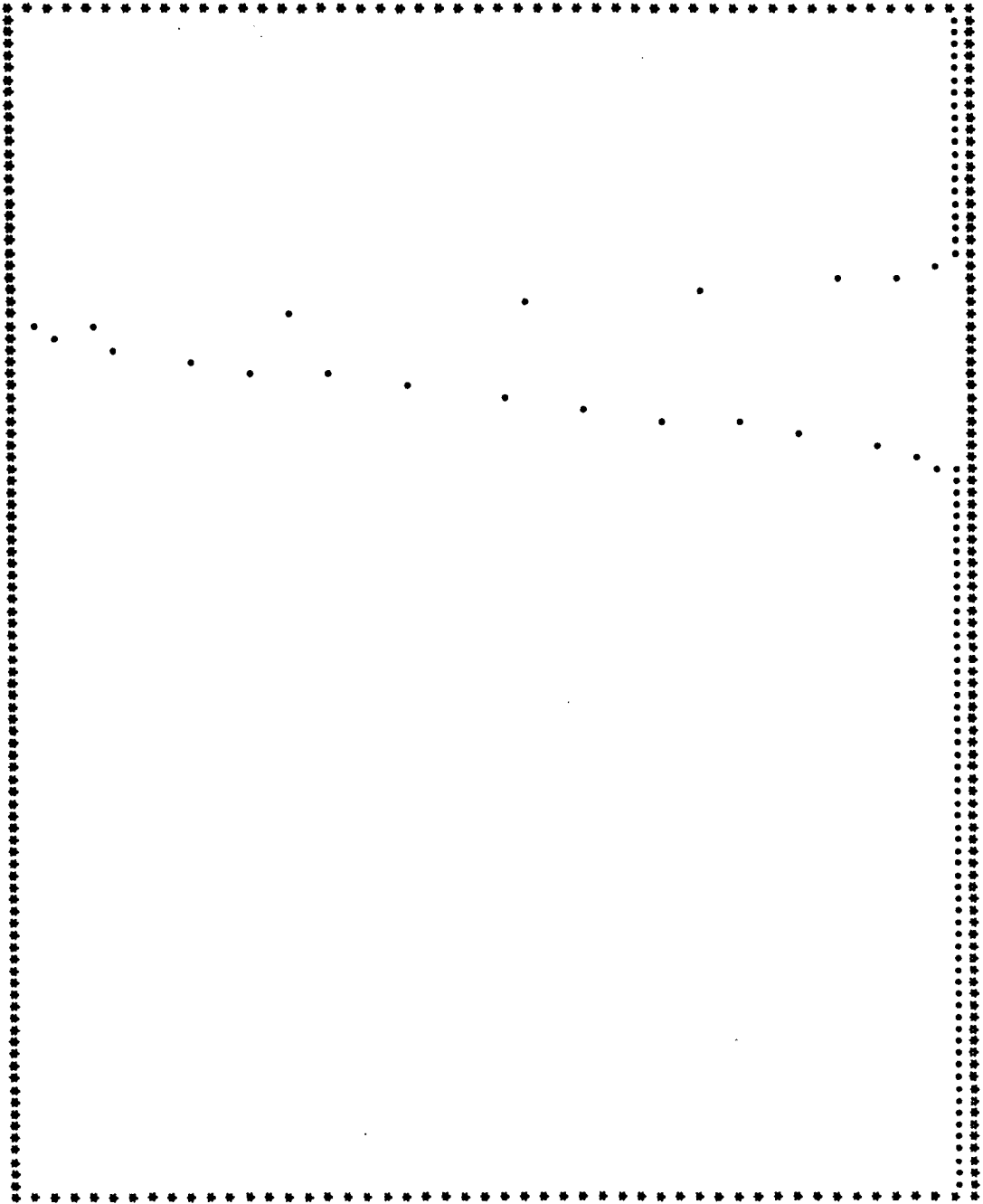
XMIN = .54013333E+03   XMAX = .60540000E+03   YMIN = 0.   YMAX = .61300000E+03

81.10.7.28 LEAD

HEAT OF FUSION (CAL/GRAM) =   5.500

WEIGHT (MG) OF CALIBRATION STANDARD =   8.500

RANGE =   5.000 (MILLICAL/SEC FULL SCALE)   SCAN RATE =   5.000 (DEGREES/MIN)

PEAK DATA INPUT:

DATA RATE (SECONDS/DATA POINT) = .80000000

TEMPERATURE OF FIRST POINT OF DATA =   595.067 (DEG KELVIN)
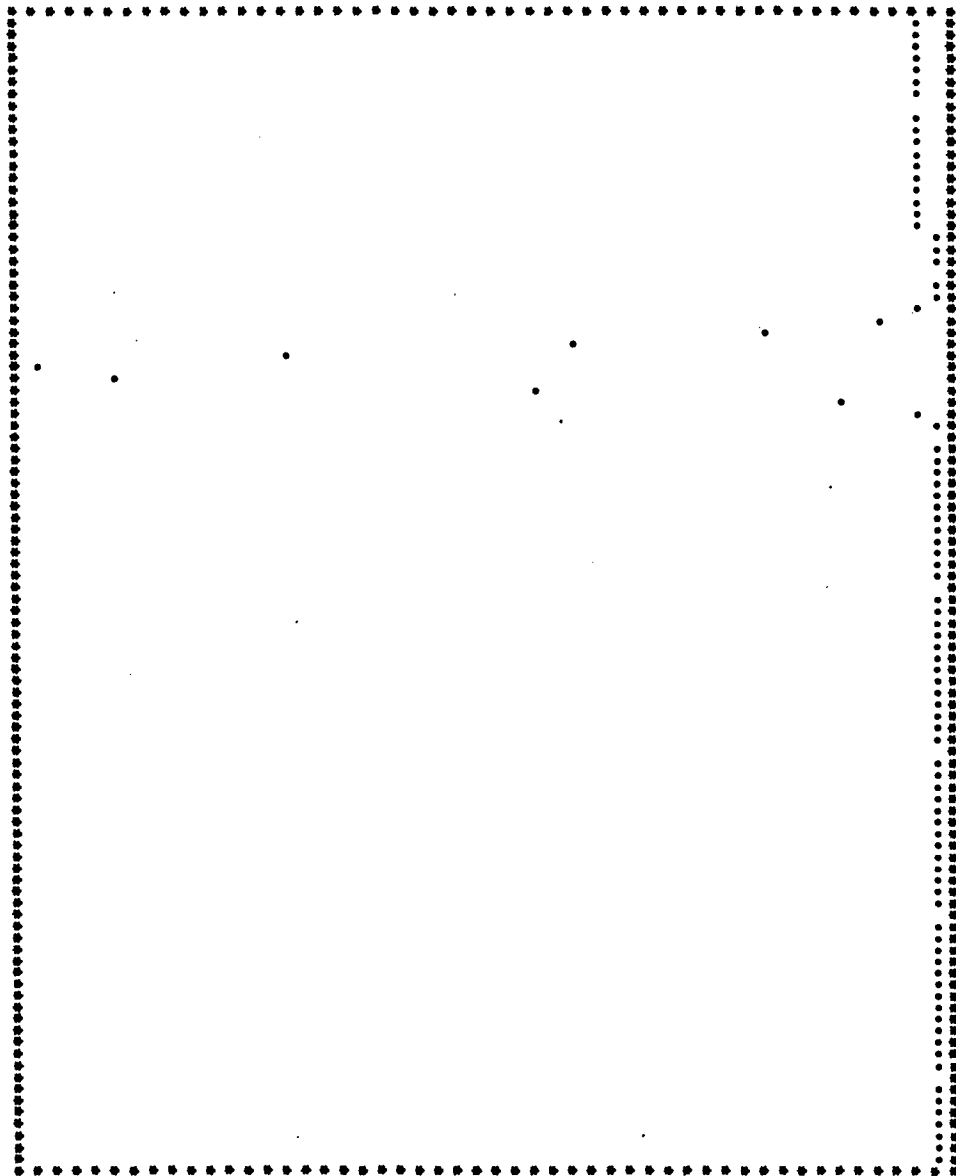
PEAK BEGINS AT 600.00 DEG. K. (PEAK HEIGHT =   4.24)
  PEAK ENDS AT 601.73 DEG. K. (PEAK HEIGHT =   4.49)

AREA-HEAT CONSTANT = .00095500 RANGE PER ENCODER UNIT (CON*RAN=MCAL/SEC PER ENCODER UNIT)

THERMAL RESISTANCE = .26958 DEG. K.-SEC./MILLICAL

TM= 600.13 DEG. K.

GRAPH OF BACKGROUND CORRECTED DATA IF OPTION USED OTHERWISE RAW DATA

XMIN = .59506667E+03   XMAX = .60533333E+03   YMIN = 0.   YMAX = .88700000E+03
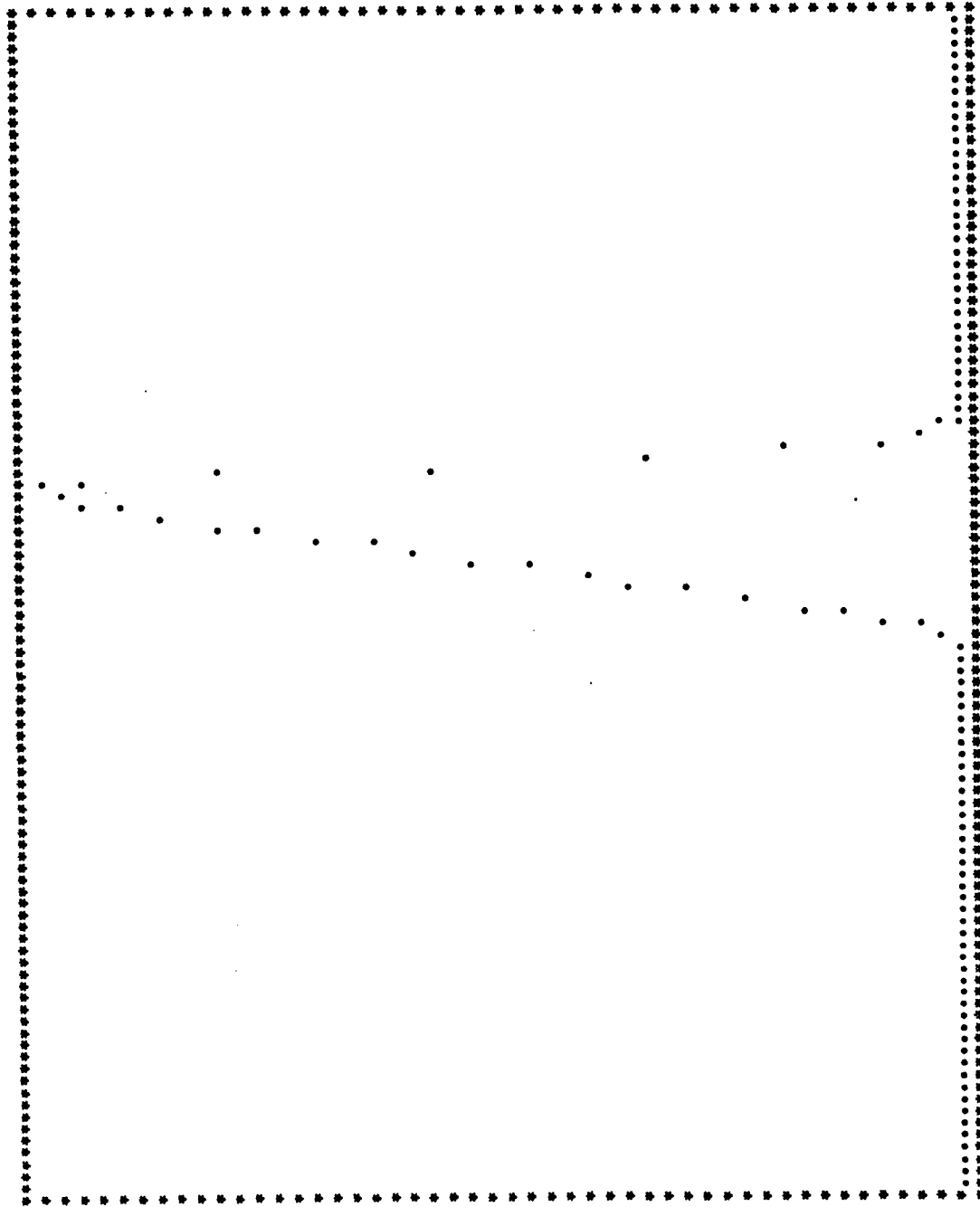
APPENDIX B.1

PROGRAM KINETIC

SAMPLE DATA FILE

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81.15.10.14.1 GULF ATS
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20.0
60.0
323.0
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81.15.10.14.2 GULF ATS
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81.15.10.14.3 GULF ATS
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81.11.8.21.7 GULF ATS
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81.11.8.21.6 GULF ATS
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```

APPENDIX B.2

PROGRAM KINETIC

SAMPLE INPUT CARDS

```
100= KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)
110= 0.30920 0.21155 0.18110 0.17265 0.16998
120= 0.44179 0.29991 0.24575 0.22965 0.23405
130=   435.24   432.49   430.94   430.12   429.70
140=   605.75   603.22   601.67   600.84   600.38
150=0.000905490.000917600.000920920.000924290.00093341
160=        0.000986860.000985400.000971770.000990290.00097558
170=
180=11110001100        380  670  340  650  396  620  374  585  353
600
..
```

APPENDIX B.3

PROGRAM KINETIC

SAMPLE OUTPUT

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

PROGRAM CONTROL CARD

```
++++++++++++++++++++++++**#**+++++***#*++++**#**+++++****#*++++*****#*+++++**#**+++++
1111000110000000000000  380  670  340  650  396  620  374  585  353  600    0    0
++++++++++++++++++++++++**#**+++++***#*++++**#**+++++****#*++++*****#*+++++**#**+++++
```
CALIBRATION DATA

MELTING POINTS:
(UNITS OF KELVINS)

HEAT RATE	TM(INDIUM)	DELTA	TM(LEAD)	DELTA
80.0000	435.24	5.44	605.75	5.10
40.0000	432.49	2.69	603.22	2.57
20.0000	430.94	1.14	601.67	1.02
10.0000	430.12	.32	600.84	.19
5.0000	429.70	-.10	600.38	-.27
2.5000	429.80	0.00	600.65	0.00
1.2500	429.80	0.00	600.65	0.00
.6250	429.80	0.00	600.65	0.00
.3125	429.80	0.00	600.65	0.00

CALCULATED THERMAL CORRECTION FACTORS
STRAIGHT LINE SHOWING TRUE TEMPERATURE
VERSUS OBSERVED TEMPERATURE

HEAT RATE	INTERCEPT	SLOPE
80.0000	-6.30766	1.00199
40.0000	-2.99398	1.00070
20.0000	-1.44289	1.00070
10.0000	-.64753	1.00076
5.0000	-.32799	1.00100
2.5000	.00000	1.00000
1.2500	.00000	1.00000
.6250	.00000	1.00000
.3125	.00000	1.00000

THERMAL RESISTANCE (LAG CORRECTION)
(IN UNITS OF KELVINS/(MCAL/SEC))

HEAT RATE	TR(INDIUM)	TR(LEAD)	TR(AVERAGE)
80.0000	.30920	.44179	.37550
40.0000	.21155	.29991	.25573
20.0000	.18110	.24575	.21343
10.0000	.17265	.22965	.20115
5.0000	.16998	.23405	.20202
2.5000	0.00000	0.00000	0.00000
1.2500	0.00000	0.00000	0.00000
.6250	0.00000	0.00000	0.00000
.3125	0.00000	0.00000	0.00000

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

AREA HEAT CONSTANT
(UNITS OF INVERSE ENCODER UNITS
I.E.,RANGE*CON=MCAL/SEC)

HEAT RATE	CON(INDIUM)	CON(LEAD)	CON(AVERAGE)
80.0000	.00090549	.00098886	.00094718
40.0000	.00091760	.00098540	.00095150
20.0000	.00092092	.00097177	.00094635
10.0000	.00092429	.00099029	.00095729
5.0000	.00093341	.00097558	.00095450
2.5000	0.00000000	0.00000000	0.00000000
1.2500	0.00000000	0.00000000	0.00000000
.6250	0.00000000	0.00000000	0.00000000
.3125	0.00000000	0.00000000	0.00000000

****

**********   81.15.10.14.1 GULF ATS   *****

****

WEIGHT(MG) OF SAMPLE=   1.55
RANGE(MILLICAL/SEC FULL SCALE)=, 20.0
SCAN RATE(DEG PER MINUTE(=   80.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE=   324.07

DATA RATE (SECONDS PER DATA POINT)=   .8000

X (SECONDS)	TEMPERATURE (KELVINS)	ORIGINAL Y (E.U.)
.80	324.07	-116.
1.60	325.13	-116.
2.40	326.20	-113.
3.20	327.27	-111.
4.00	328.33	-111.
4.80	329.40	-111.
5.60	330.47	-109.
6.40	331.53	-101.
7.20	332.60	-90.
8.00	333.67	-79.
8.80	334.73	-65.
9.60	335.80	-59.
10.40	336.87	-52.
11.20	337.93	-46.
12.00	339.00	-46.
12.80	340.07	-46.
13.60	341.13	-47.
14.40	342.20	-49.
15.20	343.27	-52.
16.00	344.33	-53.

KINETIC ***81.15.10.14.1 GOLF ATS

16.80	345.40	-56.
17.60	346.47	-58.
18.40	347.53	-60.
19.20	348.60	-61.
20.00	349.67	-62.
20.80	350.73	-63.
21.60	351.80	-65.
22.40	352.87	-64.
23.20	353.93	-64.
24.00	355.00	-65.
24.80	356.07	-65.
25.60	357.13	-65.
26.40	358.20	-65.
27.20	359.27	-65.
28.00	360.33	-65.
28.80	361.40	-66.
29.60	362.47	-67.
30.40	363.53	-67.
31.20	364.60	-68.
32.00	365.67	-68.
32.80	366.73	-69.
33.60	367.80	-69.
34.40	368.87	-70.
35.20	369.93	-70.
36.00	371.00	-70.
36.80	372.07	-71.
37.60	373.13	-72.
38.40	374.20	-72.
39.20	375.27	-72.
40.00	376.33	-73.
40.80	377.40	-75.
41.60	378.47	-77.
42.40	379.53	-76.
43.20	380.60	-78.
44.00	381.67	-78.
44.80	382.73	-78.
45.60	383.80	-77.
46.40	384.87	-77.
47.20	385.93	-77.
48.00	387.00	-76.
48.80	388.07	-77.
49.60	389.13	-77.
50.40	390.20	-77.
51.20	391.27	-77.
52.00	392.33	-77.
52.80	393.40	-77.
53.60	394.47	-77.
54.40	395.53	-76.
55.20	396.60	-76.
56.00	397.67	-77.
56.80	398.73	-77.
57.60	399.80	-76.
58.40	400.87	-77.
59.20	401.93	-77.
60.00	403.00	-77.
60.80	404.07	-77.
61.60	405.13	-76.

KINETIC ***61.15.13.14.1 GULF ATS

62.40	406.20	-77.
63.20	407.27	-77.
64.00	408.33	-77.
64.80	409.40	-77.
65.60	410.47	-77.
66.40	411.53	-76.
67.20	412.60	-76.
68.00	413.67	-76.
68.80	414.73	-77.
69.60	415.80	-76.
70.40	416.87	-76.
71.20	417.93	-77.
72.00	419.00	-78.
72.80	420.07	-77.
73.60	421.13	-77.
74.40	422.20	-77.
75.20	423.27	-76.
76.00	424.33	-75.
76.80	425.40	-75.
77.60	426.47	-75.
78.40	427.53	-75.
79.20	428.60	-75.
80.00	429.67	-75.
80.80	430.73	-75.
81.60	431.80	-74.
82.40	432.87	-73.
83.20	433.93	-73.
84.00	435.00	-73.
84.80	436.07	-73.
85.60	437.13	-74.
86.40	438.20	-74.
87.20	439.27	-74.
88.00	440.33	-74.
88.80	441.40	-74.
89.60	442.47	-74.
90.40	443.53	-74.
91.20	444.60	-73.
92.00	445.67	-74.
92.80	446.73	-73.
93.60	447.80	-74.
94.40	448.87	-74.
95.20	449.93	-74.
96.00	451.00	-74.
96.80	452.07	-74.
97.60	453.13	-73.
98.40	454.20	-73.
99.20	455.27	-73.
100.00	456.33	-73.
100.80	457.40	-73.
101.60	458.47	-73.
102.40	459.53	-73.
103.20	460.60	-73.
104.00	461.67	-72.
104.80	462.73	-72.
105.60	463.80	-72.
106.40	464.87	-72.
107.20	465.93	-72.

KINETIC ***81.15.10.14.1 GULF ATS

108.00	467.00	-71.
108.80	468.07	-71.
109.60	469.13	-71.
110.40	470.20	-71.
111.20	471.27	-70.
112.00	472.33	-69.
112.80	473.40	-69.
113.60	474.47	-69.
114.40	475.53	-68.
115.20	476.60	-68.
116.00	477.67	-68.
116.80	478.73	-67.
117.60	479.80	-66.
118.40	480.87	-65.
119.20	481.93	-64.
120.00	483.00	-64.
120.80	484.07	-63.
121.60	485.13	-62.
122.40	486.20	-61.
123.20	487.27	-60.
124.00	488.33	-59.
124.80	489.40	-58.
125.60	490.47	-56.
126.40	491.53	-54.
127.20	492.60	-53.
128.00	493.67	-52.
128.80	494.73	-50.
129.60	495.80	-49.
130.40	496.87	-47.
131.20	497.93	-45.
132.00	499.00	-43.
132.80	500.07	-41.
133.60	501.13	-39.
134.40	502.20	-36.
135.20	503.27	-34.
136.00	504.33	-32.
136.80	505.40	-29.
137.60	506.47	-26.
138.40	507.53	-23.
139.20	508.60	-20.
140.00	509.67	-17.
140.80	510.73	-14.
141.60	511.80	-10.
142.40	512.87	-8.
143.20	513.93	-3.
144.00	515.00	1.
144.80	516.07	5.
145.60	517.13	9.
146.40	518.20	13.
147.20	519.27	18.
148.00	520.33	24.
148.80	521.40	29.
149.60	522.47	35.
150.40	523.53	40.
151.20	524.60	46.
152.00	525.67	53.
152.80	526.73	59.

KINETIC   ***81.15.10.14.1 GULF ATS

153.60	527.80	65.
154.40	528.87	72.
155.20	529.93	79.
156.00	531.00	86.
156.80	532.07	93.
157.60	533.13	100.
158.40	534.20	108.
159.20	535.27	116.
160.00	536.33	124.
160.80	537.40	132.
161.60	538.47	141.
162.40	539.53	149.
163.20	540.60	158.
164.00	541.67	166.
164.80	542.73	175.
165.60	543.80	183.
166.40	544.87	190.
167.20	545.93	197.
168.00	547.00	204.
168.80	548.07	209.
169.60	549.13	213.
170.40	550.20	216.
171.20	551.27	217.
172.00	552.33	215.
172.80	553.40	212.
173.60	554.47	206.
174.40	555.53	197.
175.20	556.60	186.
176.00	557.67	174.
176.80	558.73	159.
177.60	559.80	144.
178.40	560.87	129.
179.20	561.93	113.
180.00	563.00	96.
180.80	564.07	83.
181.60	565.13	69.
182.40	566.20	56.
183.20	567.27	44.
184.00	568.33	32.
184.80	569.40	23.
185.60	570.47	13.
186.40	571.53	5.
187.20	572.60	-2.
188.00	573.67	-9.
188.80	574.73	-15.
189.60	575.80	-20.
190.40	576.87	-25.
191.20	577.93	-30.
192.00	579.00	-33.
192.80	580.07	-37.
193.60	581.13	-40.
194.40	582.20	-44.
195.20	583.27	-46.
196.00	584.33	-49.
196.80	585.40	-51.
197.60	586.47	-54.
198.40	587.53	-55.

KINETIC ***81.15.10.14.1 GULF ATS

199.20	588.60	-58.
200.00	589.67	-59.
200.80	590.73	-61.
201.60	591.80	-62.
202.40	592.87	-04.
203.20	593.93	-66.
204.00	595.00	-67.
204.80	596.07	-69.
205.60	597.13	-69.
206.40	598.20	-71.
207.20	599.27	-71.
208.00	600.33	-72.
208.80	601.40	-73.
209.60	602.47	-74.
210.40	603.53	-75.
211.20	604.60	-75.
212.00	605.67	-77.
212.80	606.73	-77.
213.60	607.80	-79.
214.40	608.87	-79.
215.20	609.93	-80.
216.00	611.00	-80.
216.80	612.07	-81.
217.60	613.13	-82.
218.40	614.20	-83.
219.20	615.27	-83.
220.00	616.33	-84.
220.80	617.40	-85.
221.60	618.47	-86.
222.40	619.53	-87.
223.20	620.60	-88.
224.00	621.67	-89.
224.80	622.73	-89.
225.60	623.80	-89.
226.40	624.87	-90.
227.20	625.93	-91.
228.00	627.00	-91.
228.80	628.07	-92.
229.60	629.13	-93.
230.40	630.20	-93.
231.20	631.27	-93.
232.00	632.33	-94.
232.80	633.40	-94.
233.60	634.47	-95.
234.40	635.53	-96.
235.20	636.60	-96.
236.00	637.67	-95.
236.80	638.73	-96.
237.60	639.80	-126.
238.40	640.87	-93.
239.20	641.93	-96.
240.00	643.00	-97.
240.80	644.07	-97.
241.60	645.13	-97.
242.40	646.20	-96.
243.20	647.27	-96.
244.00	648.33	-96.

KINETIC   ***81.15.10.14.1 GULF ATS

244.80	649.40	-96.
245.60	650.47	-96.
246.40	651.53	-96.
247.20	652.60	-96.
248.00	653.67	-96.
248.80	654.73	-95.
249.60	655.80	-95.
250.40	656.87	-95.
251.20	657.93	-95.
252.00	659.00	-95.
252.80	660.07	-95.
253.60	661.13	-94.
254.40	662.20	-94.
255.20	663.27	-94.
256.00	664.33	-94.
256.80	665.40	-93.
257.60	666.47	-93.
258.40	667.53	-93.
259.20	668.60	-93.
260.00	669.67	-92.
260.80	670.73	-92.
261.60	671.80	-92.
262.40	672.87	-91.
263.20	673.93	-92.
264.00	675.00	-92.
264.80	676.07	-92.
265.60	677.13	.-91.
266.40	678.20	-92.
267.20	679.27	-92.
268.00	680.33	-92.
268.80	681.40	-92.
269.60	682.47	-92.
270.40	683.53	-93.
271.20	684.60	-93.
272.00	685.67	-93.
272.80	686.73	-93.
273.60	687.80	-93.
274.40	688.87	-93.
275.20	689.93	-93.

KINETIC ***81.15.10.14.1 GULF ATS

GRAPH OF RAW DATA

XMIN = .3240667E+03   XMAX = .6886667E+03   YMIN = -.12600000E+03   YMAX = .21700000E+03
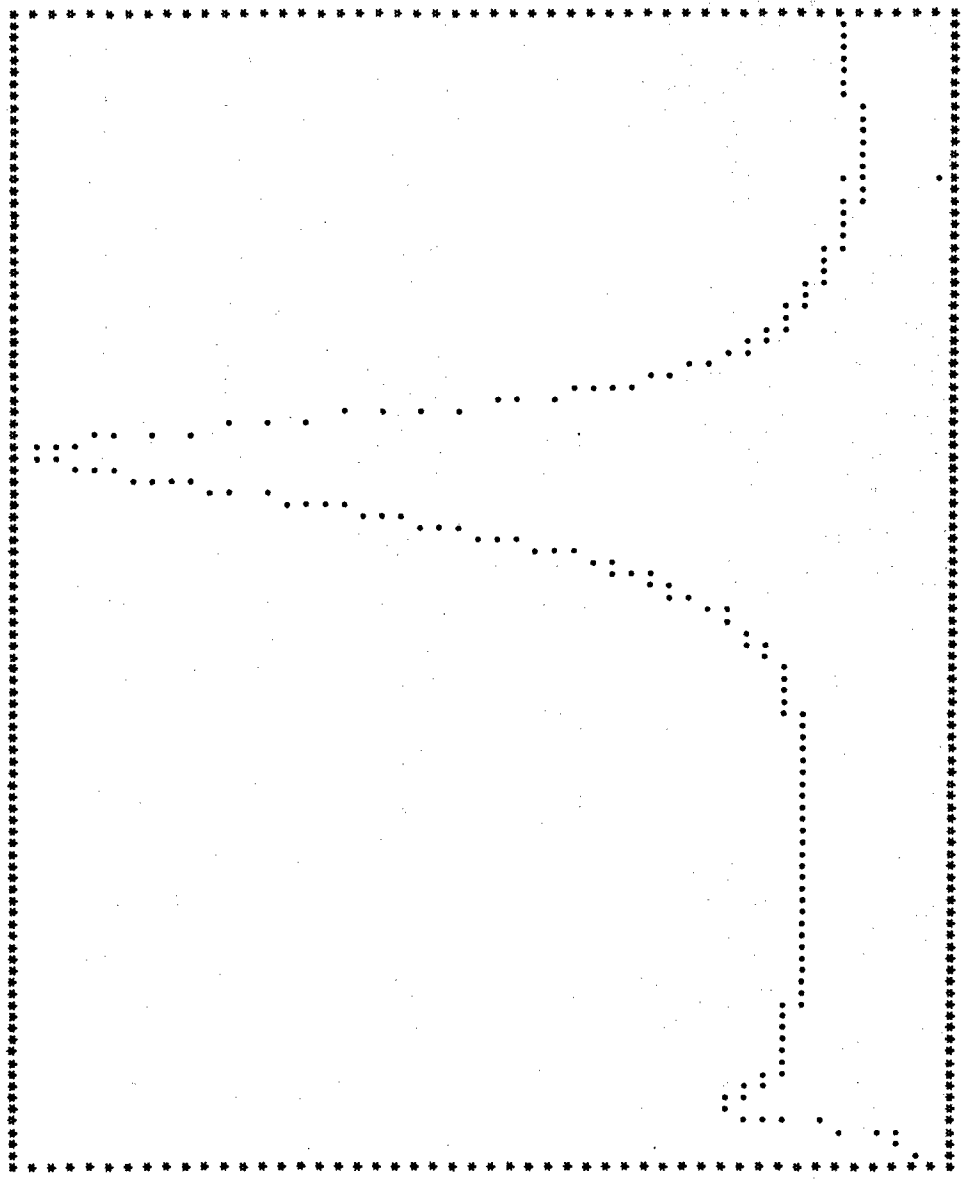
KINETIC ***81.15.10.14.1 GULF ATS

MAXIMUM ORDINATE= 217.0 OCCURS AT   551.27 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 379.5 STOP PT.= 669.7 DEG. KELVIN

    THE PEAK ENDS AT 255 POINTS FROM START. THE Y AT THIS POINT IS -75.77
    THE BASELINE EQUATION IS Y= -.37304E+00*X+ .19350E+02

    THE PEAK STARTS AT 155 POINTS FROM THE START. THE Y AT THIS POINT IS -67.17
    THE BASELINE EQUATION IS Y= .12345E+00*X+ -.86304E+02

PEAK BEGINS AT 488.33 DEG KELVIN   (PEAK HEIGHT = -67.17) (DATA PT. 155)
PEAK ENDS AT   595.00 DEG KELVIN   (PEAK HEIGHT = -75.77) (DATA PT. 255)

NUMBER OF POINTS IN PEAK= 100

BASELINE SHIFT COMPENSATED IS   -3.88

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: -3.15

****

***********   81.15.10.14.2 GULF ATS   *****

****

WEIGHT(MG) OF SAMPLE= 4.07
RANGE(MILLICAL/SEC FULL SCALE)=, 20.0
SCAN RATE(DEG PER MINUTE(= 40.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE=   324.00

DATA RATE (SECONDS PER DATA POINT)=   1.5000

| X | TEMPERATURE | ORIGINAL Y |
(SECONDS)	(KELVINS)	(E.U.)
1.50	324.00	-160.
3.00	325.00	-160.
4.50	326.00	-159.
6.00	327.00	-164.
7.50	328.00	-167.
9.00	329.00	-166.
10.50	330.00	-164.
12.00	331.00	-163.
13.50	332.00	-162.
15.00	333.00	-162.
16.50	334.00	-162.
18.00	335.00	-163.

KINETIC ***81.15.10.14.2 GULF ATS

19.50	336.00	-163.
21.00	337.00	-164.
22.50	338.00	-164.
24.00	339.00	-164.
25.50	340.00	-165.
27.00	341.00	-165.
28.50	342.00	-166.
30.00	343.00	-166.
31.50	344.00	-166.
33.00	345.00	-166.
34.50	346.00	-167.
36.00	347.00	-167.
37.50	348.00	-168.
39.00	349.00	-169.
40.50	350.00	-169.
42.00	351.00	-170.
43.50	352.00	-170.
45.00	353.00	-169.
46.50	354.00	-168.
48.00	355.00	-168.
49.50	356.00	-168.
51.00	357.00	-168.
52.50	358.00	-168.
54.00	359.00	-168.
55.50	360.00	-167.
57.00	361.00	-167.
58.50	362.00	-168.
60.00	363.00	-168.
61.50	364.00	-168.
63.00	365.00	-168.
64.50	366.00	-168.
66.00	367.00	-169.
67.50	368.00	-169.
69.00	369.00	-169.
70.50	370.00	-169.
72.00	371.00	-170.
73.50	372.00	-170.
75.00	373.00	-170.
76.50	374.00	-170.
78.00	375.00	-170.
79.50	376.00	-171.
81.00	377.00	-171.
82.50	378.00	-171.
84.00	379.00	-171.
85.50	380.00	-172.
87.00	381.00	-172.
88.50	382.00	-172.
90.00	383.00	-172.
91.50	384.00	-172.
93.00	385.00	-171.
94.50	386.00	-172.
96.00	387.00	-173.
97.50	388.00	-172.
99.00	389.00	-171.
100.50	390.00	-172.
102.00	391.00	-172.
103.50	392.00	-173.

KINETIC   ***81.15.10.14.2 GULF ATS

105.00	393.00	-172.
106.50	394.00	-172.
108.00	395.00	-172.
109.50	396.00	-172.
111.00	397.00	-172.
112.50	398.00	-172.
114.00	399.00	-171.
115.50	400.00	-172.
117.00	401.00	-171.
118.50	402.00	-171.
120.00	403.00	-171.
121.50	404.00	-172.
123.00	405.00	-171.
124.50	406.00	-172.
126.00	407.00	-171.
127.50	408.00	-171.
129.00	409.00	-172.
130.50	410.00	-172.
132.00	411.00	-171.
133.50	412.00	-171.
135.00	413.00	-170.
136.50	414.00	-170.
138.00	415.00	-171.
139.50	416.00	-170.
141.00	417.00	-171.
142.50	418.00	-170.
144.00	419.00	-170.
145.50	420.00	-170.
147.00	421.00	-170.
148.50	422.00	-170.
150.00	423.00	-169.
151.50	424.00	-170.
153.00	425.00	-169.
154.50	426.00	-169.
156.00	427.00	-169.
157.50	428.00	-169.
159.00	429.00	-169.
160.50	430.00	-169.
162.00	431.00	-169.
163.50	432.00	-168.
165.00	433.00	-168.
166.50	434.00	-166.
168.00	435.00	-166.
169.50	436.00	-166.
171.00	437.00	-165.
172.50	438.00	-165.
174.00	439.00	-165.
175.50	440.00	-165.
177.00	441.00	-165.
178.50	442.00	-164.
180.00	443.00	-164.
181.50	444.00	-163.
183.00	445.00	-164.
184.50	446.00	-163.
186.00	447.00	-163.
187.50	448.00	-162.
189.00	449.00	-162.

KINETIC   ***81.15.10.14.2 GULF ATS

190.50	450.00	-161.
192.00	451.00	-161.
193.50	452.00	-161.
195.00	453.00	-160.
196.50	454.00	-159.
198.00	455.00	-158.
199.50	456.00	-159.
201.00	457.00	-158.
202.50	458.00	-157.
204.00	459.00	-157.
205.50	460.00	-156.
207.00	461.00	-155.
208.50	462.00	-154.
210.00	463.00	-153.
211.50	464.00	-152.
213.00	465.00	-151.
214.50	466.00	-150.
216.00	467.00	-149.
217.50	468.00	-148.
219.00	469.00	-146.
220.50	470.00	-144.
222.00	471.00	-143.
223.50	472.00	-142.
225.00	473.00	-140.
226.50	474.00	-138.
228.00	475.00	-136.
229.50	476.00	-134.
231.00	477.00	-133.
232.50	478.00	-130.
234.00	479.00	-128.
235.50	480.00	-126.
237.00	481.00	-123.
238.50	482.00	-121.
240.00	483.00	-118.
241.50	484.00	-115.
243.00	485.00	-112.
244.50	486.00	-108.
246.00	487.00	-105.
247.50	488.00	-101.
249.00	489.00	-98.
250.50	490.00	-94.
252.00	491.00	-90.
253.50	492.00	-86.
255.00	493.00	-81.
256.50	494.00	-77.
258.00	495.00	-72.
259.50	496.00	-66.
261.00	497.00	-61.
262.50	498.00	-55.
264.00	499.00	-49.
265.50	500.00	-44.
267.00	501.00	-37.
268.50	502.00	-30.
270.00	503.00	-23.
271.50	504.00	-16.
273.00	505.00	-8.
274.50	506.00	0.

KINETIC ***81.15.10.14.2 GULF ATS

276.00	507.00	8.
277.50	508.00	16.
279.00	509.00	25.
280.50	510.00	34.
282.00	511.00	44.
283.50	512.00	53.
285.00	513.00	63.
286.50	514.00	74.
288.00	515.00	84.
289.50	516.00	95.
291.00	517.00	106.
292.50	518.00	118.
294.00	519.00	129.
295.50	520.00	142.
297.00	521.00	153.
298.50	522.00	163.
300.00	523.00	177.
301.50	524.00	188.
303.00	525.00	199.
304.50	526.00	209.
306.00	527.00	217.
307.50	528.00	224.
309.00	529.00	229.
310.50	530.00	231.
312.00	531.00	230.
313.50	532.00	225.
315.00	533.00	217.
316.50	534.00	203.
318.00	535.00	187.
319.50	536.00	167.
321.00	537.00	145.
322.50	538.00	121.
324.00	539.00	97.
325.50	540.00	74.
327.00	541.00	52.
328.50	542.00	30.
330.00	543.00	12.
331.50	544.00	-5.
333.00	545.00	-21.
334.50	546.00	-34.
336.00	547.00	-47.
337.50	548.00	-58.
339.00	549.00	-68.
340.50	550.00	-76.
342.00	551.00	-84.
343.50	552.00	-91.
345.00	553.00	-97.
346.50	554.00	-102.
348.00	555.00	-107.
349.50	556.00	-112.
351.00	557.00	-115.
352.50	558.00	-119.
354.00	559.00	-123.
355.50	560.00	-125.
357.00	561.00	-129.
358.50	562.00	-131.
360.00	563.00	-134.

KINETIC ***81.15.10.14.2 GULF ATS

361.50	564.00	-137.
363.00	565.00	-138.
364.50	566.00	-140.
366.00	567.00	-142.
367.50	568.00	-144.
369.00	569.00	-146.
370.50	570.00	-147.
372.00	571.00	-149.
373.50	572.00	-150.
375.00	573.00	-151.
376.50	574.00	-153.
378.00	575.00	-153.
379.50	576.00	-154.
381.00	577.00	-155.
382.50	578.00	-157.
384.00	579.00	-157.
385.50	580.00	-159.
387.00	581.00	-160.
388.50	582.00	-160.
390.00	583.00	-161.
391.50	584.00	-162.
393.00	585.00	-162.
394.50	586.00	-163.
396.00	587.00	-164.
397.50	588.00	-165.
399.00	589.00	-166.
400.50	590.00	-167.
402.00	591.00	-167.
403.50	592.00	-168.
405.00	593.00	-169.
406.50	594.00	-169.
408.00	595.00	-169.
409.50	596.00	-170.
411.00	597.00	-171.
412.50	598.00	-171.
414.00	599.00	-172.
415.50	600.00	-173.
417.00	601.00	-200.
418.50	602.00	-176.
420.00	603.00	-175.
421.50	604.00	-176.
423.00	605.00	-177.
424.50	606.00	-177.
426.00	607.00	-184.
427.50	608.00	-188.
429.00	609.00	-180.
430.50	610.00	-190.
432.00	611.00	-187.
433.50	612.00	-191.
435.00	613.00	-181.
436.50	614.00	-181.
438.00	615.00	-182.
439.50	616.00	-182.
441.00	617.00	-183.
442.50	618.00	-183.
444.00	619.00	-183.
445.50	620.00	-184.

KINETIC   ***61.15.10.14.2 GULF ATS

447.00	521.00	-184.
448.50	522.00	-184.
450.00	523.00	-184.
451.50	524.00	-184.
453.00	625.00	-185.
454.50	626.00	-185.
456.00	627.00	-186.
457.50	528.00	-185.
459.00	529.00	-185.
460.50	630.00	-185.
462.00	531.00	-185.
463.50	632.00	-185.
465.00	633.00	-185.
466.50	634.00	-184.
468.00	635.00	-184.
469.50	636.00	-185.
471.00	537.00	-184.
472.50	638.00	-184.
474.00	639.00	-183.
475.50	540.00	-183.
477.00	541.00	-183.
478.50	642.00	-183.
480.00	543.00	-183.
481.50	544.00	-182.
483.00	645.00	-182.
484.50	646.00	-182.
486.00	647.00	-182.
487.50	648.00	-181.
489.00	649.00	-182.
490.50	550.00	-181.
492.00	551.00	-181.
493.50	652.00	-181.
495.00	653.00	-181.
496.50	654.00	-180.
498.00	655.00	-180.
499.50	656.00	-180.
501.00	657.00	-180.
502.50	658.00	-180.
504.00	559.00	-180.
505.50	560.00	-180.
507.00	661.00	-180.
508.50	662.00	-180.
510.00	563.00	-180.
511.50	664.00	-180.
513.00	665.00	-180.
514.50	666.00	-180.
516.00	667.00	-180.
517.50	668.00	-180.
519.00	569.00	-180.
520.50	670.00	-180.
522.00	671.00	-181.
523.50	572.00	-181.
525.00	573.00	-181.
526.50	674.00	-181.
528.00	675.00	-182.
529.50	676.00	-187.
531.00	677.00	-227.

KINETIC   ***81.15.10.14.2 GULF ATS

532.50	578.00	-244.
534.00	579.00	-243.
535.50	580.00	-238.
537.00	681.00	-237.
538.50	682.00	-235.
540.00	683.00	-233.
541.50	684.00	-233.
543.00	685.00	-231.
544.50	686.00	-229.
546.00	687.00	-228.
547.50	688.00	-227.
549.00	689.00	-225.
550.50	690.00	-225.
552.00	591.00	-225.

KINETIC ***81.15.10.14.2 GULF ATS

GRAPH OF RAW DATA
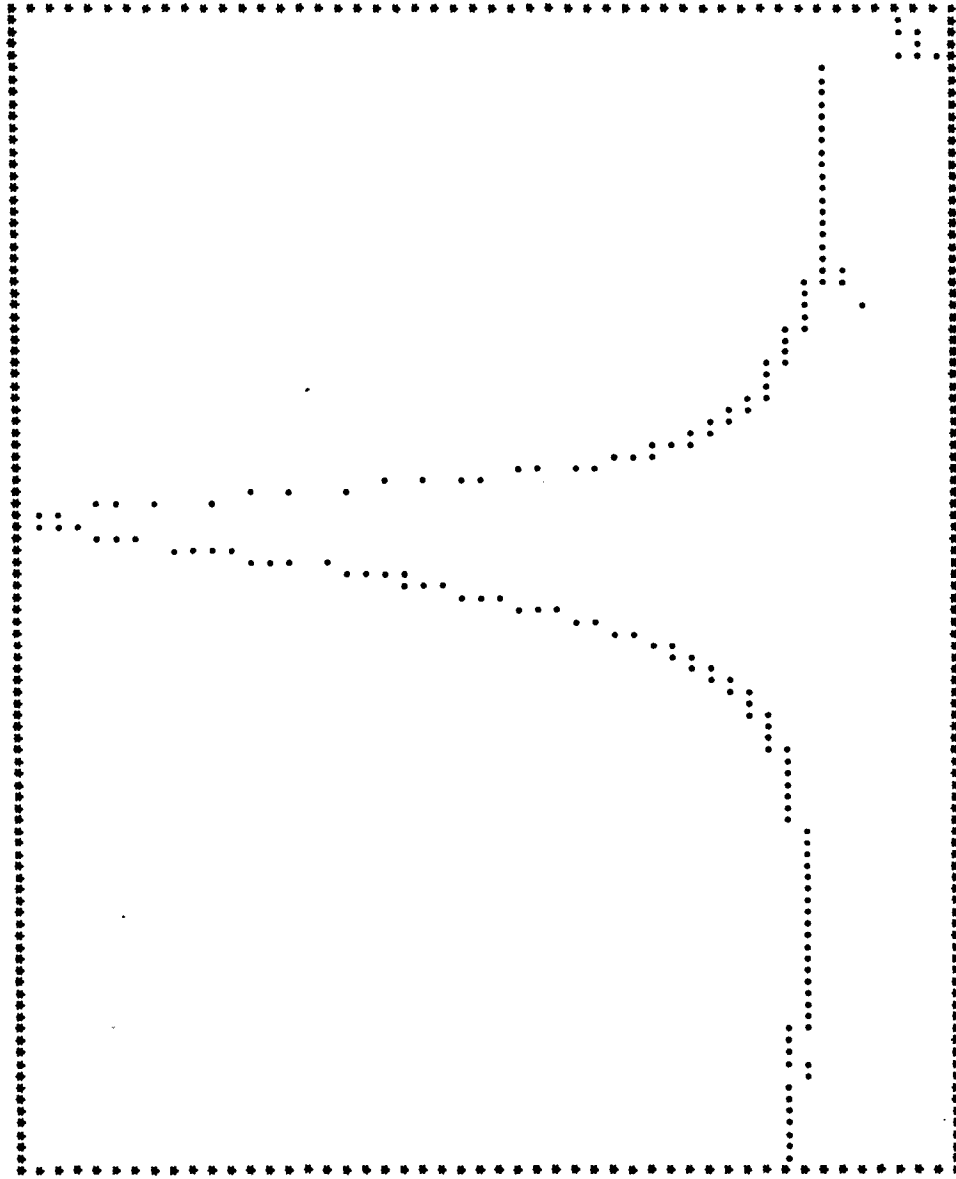
XMIN =   .32400000E+03   XMAX =   .69000000E+03   YMIN = -.24400000E+03   YMAX =   .23100000E+03

KINETIC ***81.15.10.14.2 GULF ATS

MAXIMUM ORDINATE= 231.0 OCCURS AT 530.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 340.0 STOP PT.= 650.0 DEG. KELVIN

    THE PEAK ENDS AT 255 POINTS FROM START. THE Y AT THIS POINT IS -165.48
    THE BASELINE EQUATION IS Y= -.34136E+00*X+ -.78433E+02

    THE PEAK STARTS AT 136 POINTS FROM THE START. THE Y AT THIS POINT IS -165.12
    THE BASELINE EQUATION IS Y= .51382E-01*X+ -.17211E+03

PEAK BEGINS AT 458.00 DEG KELVIN (PEAK HEIGHT =-165.17) (DATA PT. 135)
PEAK ENDS AT 578.00 DEG KELVIN (PEAK HEIGHT =-165.48) (DATA PT. 255)

NUMBER OF POINTS IN PEAK= 120

BASELINE SHIFT COMPENSATED IS -17.09

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: -.69

****

********** 81.15.10.14.3 GULF ATS   *****

****

WEIGHT(MG) OF SAMPLE= 4.23
RANGE(MILLICAL/SEC FULL SCALE)=, 10.0
SCAN RATE(DEG PER MINUTE(= 20.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE= 324.00

DATA RATE (SECONDS PER DATA POINT)= 3.0000

X (SECONDS)	TEMPERATURE (KELVINS)	ORIGINAL Y (E.U.)
3.00	324.00	-367.
6.00	325.00	-368.
9.00	326.00	-373.
12.00	327.00	-375.
15.00	328.00	-374.
18.00	329.00	-373.
21.00	330.00	-370.
24.00	331.00	-369.
27.00	332.00	-368.
30.00	333.00	-367.
33.00	334.00	-368.
36.00	335.00	-367.

KINETIC ***81.15.10.14.3 GULF ATS

39.00	336.00	-367.
42.00	337.00	-366.
45.00	338.00	-368.
48.00	339.00	-367.
51.00	340.00	-367.
54.00	341.00	-365.
57.00	342.00	-367.
60.00	343.00	-368.
63.00	344.00	-369.
66.00	345.00	-370.
69.00	346.00	-369.
72.00	347.00	-368.
75.00	348.00	-367.
78.00	349.00	-367.
81.00	350.00	-367.
84.00	351.00	-365.
87.00	352.00	-366.
90.00	353.00	-367.
93.00	354.00	-365.
96.00	355.00	-365.
99.00	356.00	-367.
102.00	357.00	-367.
105.00	358.00	-366.
108.00	359.00	-366.
111.00	360.00	-367.
114.00	361.00	-368.
117.00	362.00	-366.
120.00	363.00	-365.
123.00	364.00	-365.
126.00	365.00	-364.
129.00	366.00	-366.
132.00	367.00	-367.
135.00	368.00	-365.
138.00	369.00	-366.
141.00	370.00	-362.
144.00	371.00	-361.
147.00	372.00	-362.
150.00	373.00	-362.
153.00	374.00	-363.
156.00	375.00	-361.
159.00	376.00	-361.
162.00	377.00	-360.
165.00	378.00	-358.
168.00	379.00	-357.
171.00	380.00	-357.
174.00	381.00	-358.
177.00	382.00	-356.
180.00	383.00	-358.
183.00	384.00	-357.
186.00	385.00	-356.
189.00	386.00	-357.
192.00	387.00	-358.
195.00	388.00	-356.
198.00	389.00	-355.
201.00	390.00	-355.
204.00	391.00	-353.
207.00	392.00	-352.

KINETIC ***81.15.10.14.3 GULF ATS

210.00	393.00	-350.
213.00	394.00	-351.
216.00	395.00	-354.
219.00	396.00	-353.
222.00	397.00	-352.
225.00	398.00	-352.
228.00	399.00	-352.
231.00	400.00	-353.
234.00	401.00	-352.
237.00	402.00	-351.
240.00	403.00	-351.
243.00	404.00	-351.
246.00	405.00	-351.
249.00	406.00	-350.
252.00	407.00	-349.
255.00	408.00	-350.
258.00	409.00	-348.
261.00	410.00	-349.
264.00	411.00	-348.
267.00	412.00	-347.
270.00	413.00	-347.
273.00	414.00	-347.
276.00	415.00	-346.
279.00	416.00	-344.
282.00	417.00	-345.
285.00	418.00	-344.
288.00	419.00	-343.
291.00	420.00	-341.
294.00	421.00	-340.
297.00	422.00	-340.
300.00	423.00	-341.
303.00	424.00	-340.
306.00	425.00	-340.
309.00	426.00	-342.
312.00	427.00	-336.
315.00	428.00	-340.
318.00	429.00	-340.
321.00	430.00	-340.
324.00	431.00	-340.
327.00	432.00	-337.
330.00	433.00	-334.
333.00	434.00	-333.
336.00	435.00	-334.
339.00	436.00	-334.
342.00	437.00	-332.
345.00	438.00	-332.
348.00	439.00	-332.
351.00	440.00	-332.
354.00	441.00	-331.
357.00	442.00	-331.
360.00	443.00	-330.
363.00	444.00	-330.
366.00	445.00	-328.
369.00	446.00	-326.
372.00	447.00	-325.
375.00	448.00	-324.
378.00	449.00	-323.

KINETIC ***81.15.10.14.3 GULF ATS

381.00	450.00	-323.
384.00	451.00	-323.
387.00	452.00	-319.
390.00	453.00	-317.
393.00	454.00	-314.
396.00	455.00	-313.
399.00	456.00	-312.
402.00	457.00	-310.
405.00	458.00	-309.
408.00	459.00	-308.
411.00	460.00	-306.
414.00	461.00	-305.
417.00	462.00	-302.
420.00	463.00	-301.
423.00	464.00	-300.
426.00	465.00	-297.
429.00	466.00	-293.
432.00	467.00	-290.
435.00	468.00	-287.
438.00	469.00	-284.
441.00	470.00	-279.
444.00	471.00	-277.
447.00	472.00	-274.
450.00	473.00	-270.
453.00	474.00	-265.
456.00	475.00	-263.
459.00	476.00	-258.
462.00	477.00	-253.
465.00	478.00	-248.
468.00	479.00	-245.
471.00	480.00	-238.
474.00	481.00	-235.
477.00	482.00	-227.
480.00	483.00	-219.
483.00	484.00	-213.
486.00	485.00	-206.
489.00	486.00	-199.
492.00	487.00	-192.
495.00	488.00	-183.
498.00	489.00	-176.
501.00	490.00	-167.
504.00	491.00	-161.
507.00	492.00	-153.
510.00	493.00	-143.
513.00	494.00	-130.
516.00	495.00	-120.
519.00	496.00	-111.
522.00	497.00	-100.
525.00	498.00	-88.
528.00	499.00	-75.
531.00	500.00	-63.
534.00	501.00	-51.
537.00	502.00	-38.
540.00	503.00	-23.
543.00	504.00	-11.
546.00	505.00	3.
549.00	506.00	15.

KINETIC   ***81.15.10.14.3 GULF ATS

552.00	507.00	30.
555.00	508.00	44.
558.00	509.00	57.
561.00	510.00	70.
564.00	511.00	82.
567.00	512.00	94.
570.00	513.00	101.
573.00	514.00	104.
576.00	515.00	107.
579.00	516.00	99.
582.00	517.00	91.
585.00	518.00	79.
588.00	519.00	62.
591.00	520.00	37.
594.00	521.00	13.
597.00	522.00	-16.
600.00	523.00	-43.
603.00	524.00	-71.
606.00	525.00	-94.
609.00	526.00	-117.
612.00	527.00	-138.
615.00	528.00	-157.
618.00	529.00	-174.
621.00	530.00	-190.
624.00	531.00	-203.
627.00	532.00	-215.
630.00	533.00	-223.
633.00	534.00	-233.
636.00	535.00	-236.
639.00	536.00	-247.
642.00	537.00	-250.
645.00	538.00	-254.
648.00	539.00	-258.
651.00	540.00	-263.
654.00	541.00	-268.
657.00	542.00	-270.
660.00	543.00	-274.
663.00	544.00	-280.
666.00	545.00	-281.
669.00	546.00	-284.
672.00	547.00	-289.
675.00	548.00	-289.
678.00	549.00	-290.
681.00	550.00	-293.
684.00	551.00	-292.
687.00	552.00	-298.
690.00	553.00	-300.
693.00	554.00	-300.
696.00	555.00	-301.
699.00	556.00	-302.
702.00	557.00	-303.
705.00	558.00	-304.
708.00	559.00	-306.
711.00	560.00	-304.
714.00	561.00	-304.
717.00	562.00	-306.
720.00	563.00	-305.

KINETIC ***81.15.10.14.3 GULF ATS

723.00	564.00	-306.
726.00	565.00	-308.
729.00	566.00	-310.
732.00	567.00	-310.
735.00	568.00	-311.
738.00	569.00	-310.
741.00	570.00	-312.
744.00	571.00	-313.
747.00	572.00	-313.
750.00	573.00	-313.
753.00	574.00	-314.
756.00	575.00	-315.
759.00	576.00	-317.
762.00	577.00	-317.
765.00	578.00	-317.
768.00	579.00	-316.
771.00	580.00	-316.
774.00	581.00	-317.
777.00	582.00	-318.
780.00	583.00	-318.
783.00	584.00	-318.
786.00	585.00	-319.
789.00	586.00	-319.
792.00	587.00	-317.
795.00	588.00	-320.
798.00	589.00	-320.
801.00	590.00	-320.
804.00	591.00	-320.
807.00	592.00	-323.
810.00	593.00	-323.
813.00	594.00	-325.
816.00	595.00	-325.
819.00	596.00	-326.
822.00	597.00	-325.
825.00	598.00	-326.
828.00	599.00	-327.
831.00	600.00	-325.
834.00	601.00	-328.
837.00	602.00	-326.
840.00	603.00	-327.
843.00	604.00	-327.
846.00	605.00	-326.
849.00	606.00	-326.
852.00	607.00	-326.
855.00	608.00	-326.
858.00	609.00	-324.
861.00	610.00	-328.
864.00	611.00	-326.
867.00	612.00	-328.
870.00	613.00	-328.
873.00	614.00	-326.
876.00	615.00	-327.
879.00	616.00	-327.
882.00	617.00	-325.
885.00	618.00	-327.
888.00	619.00	-326.
891.00	620.00	-325.

KINETIC ***81.15.10.14.3 GULF ATS

894.00	621.00	-325.
897.00	622.00	-325.
900.00	623.00	-323.
903.00	624.00	-322.
906.00	625.00	-322.
909.00	626.00	-321.
912.00	527.00	-320.
915.00	628.00	-323.
918.00	629.00	-320.
921.00	630.00	-320.
924.00	631.00	-320.
927.00	632.00	-317.
930.00	633.00	-320.
933.00	634.00	-319.
936.00	635.00	-318.
939.00	636.00	-316.
942.00	637.00	-318.
945.00	638.00	-315.
948.00	639.00	-313.
951.00	640.00	-316.
954.00	641.00	-313.
957.00	642.00	-312.
960.00	643.00	-310.
963.00	644.00	-313.
966.00	645.00	-309.
969.00	646.00	-309.
972.00	647.00	-307.
975.00	648.00	-307.
978.00	649.00	-306.
981.00	550.00	-305.
984.00	651.00	-309.
987.00	652.00	-307.
990.00	653.00	-308.
993.00	654.00	-286.
996.00	655.00	-319.
999.00	656.00	-347.
1002.00	657.00	-348.
1005.00	658.00	-346.
1008.00	659.00	-343.
1011.00	560.00	-342.
1014.00	661.00	-342.
1017.00	662.00	-341.
1020.00	663.00	-336.
1023.00	664.00	-336.
1026.00	665.00	-334.
1029.00	666.00	-333.
1032.00	667.00	-332.
1035.00	668.00	-331.
1038.00	669.00	-333.
1041.00	670.00	-331.
1044.00	671.00	-329.
1047.00	672.00	-328.
1050.00	673.00	-330.
1053.00	674.00	-329.
1056.00	675.00	-329.
1059.00	676.00	-329.
1062.00	677.00	-328.

KINETIC ***81.15.10.14.3 GULF ATS

1065.00	678.00	-330.
1068.00	679.00	-333.
1071.00	680.00	-335.
1074.00	681.00	-334.
1077.00	682.00	-337.
1080.00	683.00	-335.
1083.00	684.00	-335.
1086.00	685.00	-336.
1089.00	686.00	-336.
1092.00	687.00	-336.
1095.00	688.00	-335.
1098.00	689.00	-333.
1101.00	690.00	-335.
1104.00	691.00	-337.

KINETIC ***81.15.10.14.3 GULF ATS

GRAPH OF RAW DATA
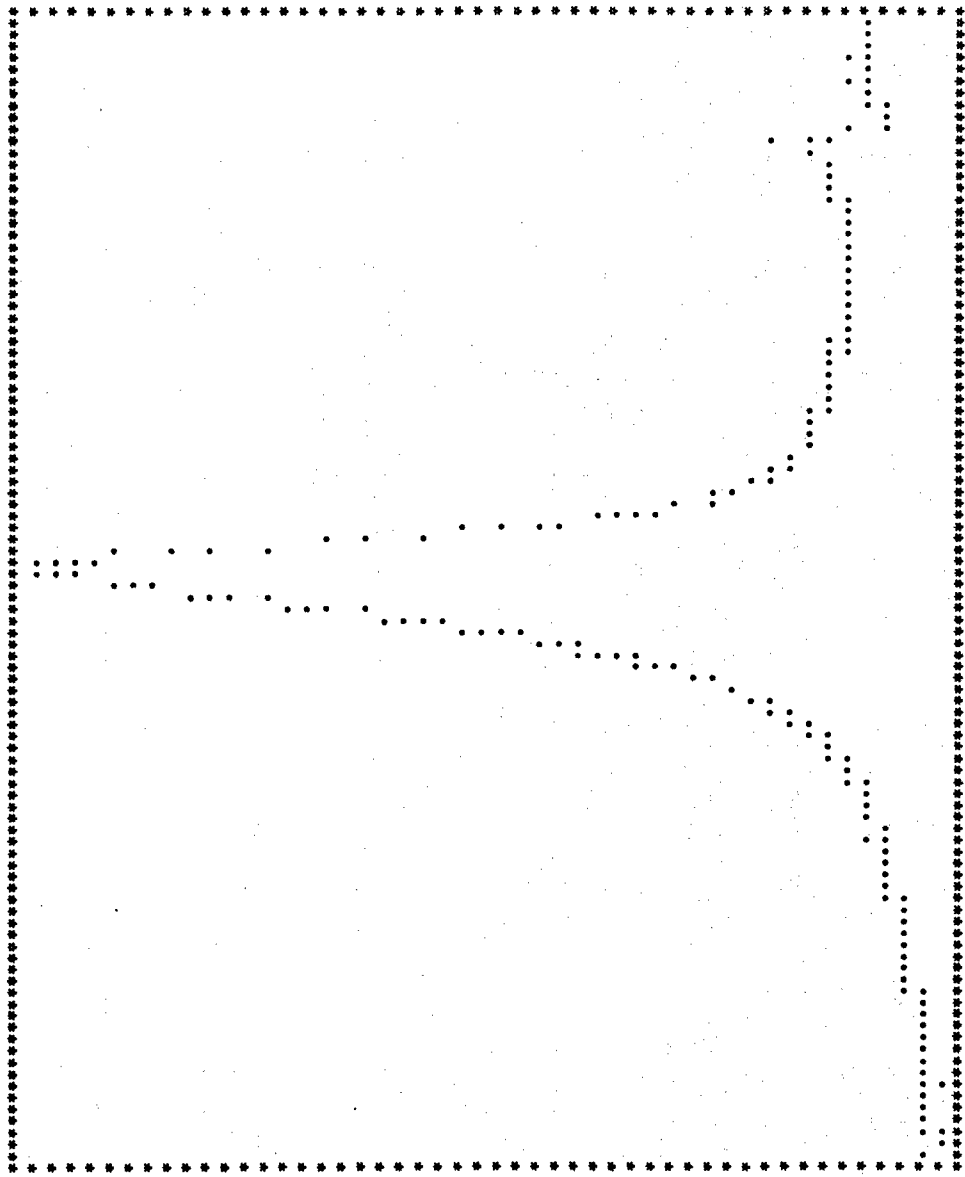
XMIN = .32400000E+03   XMAX = .69300000E+03   YMIN = -.37500000E+03   YMAX = .10700000E+03

KINETIC ***81.15.10.14.3 GULF ATS

MAXIMUM ORDINATE= 107.0 OCCURS AT 515.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 396.0 STOP PT.= 620.0 DEG. KELVIN

    THE PEAK ENDS AT 233 POINTS FROM START. THE Y AT THIS POINT IS -305.87
    THE BASELINE EQUATION IS Y= -.39939E+00*X+ -.21281E+03

    THE PEAK STARTS AT 130 POINTS FROM THE START. THE Y AT THIS POINT IS -323.01
    THE BASELINE EQUATION IS Y= .57489E+00*X+ -.39775E+03

PEAK BEGINS AT 452.00 DEG KELVIN (PEAK HEIGHT =-323.59) (DATA PT. 129)
PEAK ENDS AT 556.00 DEG KELVIN (PEAK HEIGHT =-305.87) (DATA PT. 233)

NUMBER OF POINTS IN PEAK= 104

BASELINE SHIFT COMPENSATED IS -8.60

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: -.23

****

**********   81.11.8.21.7 GULF ATS   *****

****

WEIGHT(MG) OF SAMPLE= 7.35
RANGE(MILLICAL/SEC FULL SCALE)=, 10.0
SCAN RATE(DEG PER MINUTE(= 10.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE= 324.00

DATA RATE (SECONDS PER DATA POINT)= 6.0000

X (SECONDS)	TEMPERATURE (KELVINS)	ORIGINAL Y (E.U.)
6.00	324.00	-106.
12.00	325.00	-103.
18.00	326.00	-118.
24.00	327.00	-119.
30.00	328.00	-128.
36.00	329.00	-127.
42.00	330.00	-127.
48.00	331.00	-129.
54.00	332.00	-129.
60.00	333.00	-128.
66.00	334.00	-129.
72.00	335.00	-131.

KINETIC   ***81.11.8.21.7 GULF ATS

78.00	336.00	-129.
84.00	337.00	-130.
90.00	338.00	-129.
96.00	339.00	-129.
102.00	340.00	-127.
108.00	341.00	-130.
114.00	342.00	-129.
120.00	343.00	-131.
126.00	344.00	-130.
132.00	345.00	-129.
138.00	346.00	-129.
144.00	347.00	-129.
150.00	348.00	-133.
156.00	349.00	-128.
162.00	350.00	-127.
168.00	351.00	-132.
174.00	352.00	-129.
180.00	353.00	-131.
186.00	354.00	-129.
192.00	355.00	-128.
198.00	356.00	-130.
204.00	357.00	-130.
210.00	358.00	-127.
216.00	359.00	-131.
222.00	360.00	-131.
228.00	361.00	-130.
234.00	362.00	-132.
240.00	363.00	-138.
246.00	364.00	-128.
252.00	365.00	-127.
258.00	366.00	-129.
264.00	367.00	-131.
270.00	368.00	-129.
276.00	369.00	-121.
282.00	370.00	-129.
288.00	371.00	-132.
294.00	372.00	-128.
300.00	373.00	-129.
306.00	374.00	-129.
312.00	375.00	-129.
318.00	376.00	-119.
324.00	377.00	-131.
330.00	378.00	-129.
336.00	379.00	-131.
342.00	380.00	-131.
348.00	381.00	-130.
354.00	382.00	-131.
360.00	383.00	-138.
366.00	384.00	-132.
372.00	385.00	-133.
378.00	386.00	-131.
384.00	387.00	-131.
390.00	388.00	-132.
396.00	389.00	-133.
402.00	390.00	-132.
408.00	391.00	-138.
414.00	392.00	-131.

KINETIC ***81.11.8.21.7 GULF ATS

420.00	393.00	-130.
426.00	394.00	-131.
432.00	395.00	-132.
438.00	396.00	-131.
444.00	397.00	-133.
450.00	398.00	-131.
456.00	399.00	-133.
462.00	400.00	-130.
468.00	401.00	-133.
474.00	402.00	-123.
480.00	403.00	-127.
486.00	404.00	-128.
492.00	405.00	-129.
498.00	406.00	-127.
504.00	407.00	-127.
510.00	408.00	-127.
516.00	409.00	-119.
522.00	410.00	-128.
528.00	411.00	-129.
534.00	412.00	-129.
540.00	413.00	-128.
546.00	414.00	-126.
552.00	415.00	-122.
558.00	416.00	-125.
564.00	417.00	-125.
570.00	418.00	-125.
576.00	419.00	-124.
582.00	420.00	-123.
588.00	421.00	-130.
594.00	422.00	-122.
600.00	423.00	-122.
606.00	424.00	-119.
612.00	425.00	-121.
618.00	426.00	-119.
624.00	427.00	-124.
630.00	428.00	-114.
636.00	429.00	-117.
642.00	430.00	-117.
648.00	431.00	-117.
654.00	432.00	-119.
660.00	433.00	-115.
666.00	434.00	-113.
672.00	435.00	-119.
678.00	436.00	-110.
684.00	437.00	-109.
690.00	438.00	-110.
696.00	439.00	-107.
702.00	440.00	-108.
708.00	441.00	-105.
714.00	442.00	-103.
720.00	443.00	-106.
726.00	444.00	-104.
732.00	445.00	-99.
738.00	446.00	-97.
744.00	447.00	-96.
750.00	448.00	-93.
756.00	449.00	-90.

KINETIC ***81.11.8.21.7 GULF ATS

762.00	450.00	-69.
768.00	451.00	-87.
774.00	452.00	-79.
780.00	453.00	-80.
786.00	454.00	-75.
792.00	455.00	-67.
798.00	456.00	-70.
804.00	457.00	-63.
810.00	458.00	-63.
816.00	459.00	-59.
822.00	460.00	-53.
828.00	461.00	-47.
834.00	462.00	-43.
840.00	463.00	-41.
846.00	464.00	-33.
852.00	465.00	-30.
858.00	466.00	-20.
864.00	467.00	-20.
870.00	468.00	-12.
876.00	469.00	-7.
882.00	470.00	-1.
888.00	471.00	6.
894.00	472.00	11.
900.00	473.00	20.
906.00	474.00	30.
912.00	475.00	38.
918.00	476.00	39.
924.00	477.00	58.
930.00	478.00	63.
936.00	479.00	72.
942.00	480.00	83.
948.00	481.00	94.
954.00	482.00	100.
960.00	483.00	119.
966.00	484.00	132.
972.00	485.00	142.
978.00	486.00	159.
984.00	487.00	167.
990.00	488.00	179.
996.00	489.00	199.
1002.00	490.00	214.
1008.00	491.00	230.
1014.00	492.00	246.
1020.00	493.00	256.
1026.00	494.00	269.
1032.00	495.00	278.
1038.00	496.00	279.
1044.00	497.00	279.
1050.00	498.00	278.
1056.00	499.00	265.
1062.00	500.00	247.
1068.00	501.00	222.
1074.00	502.00	200.
1080.00	503.00	172.
1086.00	504.00	139.
1092.00	505.00	115.
1098.00	506.00	87.

KINETIC ***81.11.8.21.7 GULF ATS

1104.00	507.00	60.
1110.00	508.00	39.
1116.00	509.00	18.
1122.00	510.00	8.
1128.00	511.00	-9.
1134.00	512.00	-22.
1140.00	513.00	-27.
1146.00	514.00	-43.
1152.00	515.00	-49.
1158.00	516.00	-60.
1164.00	517.00	-67.
1170.00	518.00	-71.
1176.00	519.00	-77.
1182.00	520.00	-83.
1188.00	521.00	-85.
1194.00	522.00	-90.
1200.00	523.00	-93.
1206.00	524.00	-89.
1212.00	525.00	-101.
1218.00	526.00	-99.
1224.00	527.00	-107.
1230.00	528.00	-108.
1236.00	529.00	-120.
1242.00	530.00	-107.
1248.00	531.00	-118.
1254.00	532.00	-115.
1260.00	533.00	-120.
1266.00	534.00	-121.
1272.00	535.00	-123.
1278.00	536.00	-125.
1284.00	537.00	-125.
1290.00	538.00	-126.
1296.00	539.00	-129.
1302.00	540.00	-129.
1308.00	541.00	-130.
1314.00	542.00	-133.
1320.00	543.00	-138.
1326.00	544.00	-135.
1332.00	545.00	-137.
1338.00	546.00	-138.
1344.00	547.00	-138.
1350.00	548.00	-137.
1356.00	549.00	-139.
1362.00	550.00	-144.
1368.00	551.00	-141.
1374.00	552.00	-143.
1380.00	553.00	-140.
1386.00	554.00	-139.
1392.00	555.00	-147.
1398.00	556.00	-143.
1404.00	557.00	-147.
1410.00	558.00	-139.
1416.00	559.00	-147.
1422.00	560.00	-152.
1428.00	561.00	-152.
1434.00	562.00	-153.
1440.00	563.00	-153.

KINETIC ***81.11.8.21.7 GULF ATS

1446.00	564.00	-153.
1452.00	565.00	-153.
1458.00	566.00	-155.
1464.00	567.00	-155.
1470.00	568.00	-158.
1476.00	569.00	-157.
1482.00	570.00	-157.
1488.00	571.00	-160.
1494.00	572.00	-158.
1500.00	573.00	-158.
1506.00	574.00	-161.
1512.00	575.00	-162.
1518.00	576.00	-161.
1524.00	577.00	-163.
1530.00	578.00	-163.
1536.00	579.00	-165.
1542.00	580.00	-166.
1548.00	581.00	-168.
1554.00	582.00	-167.
1560.00	583.00	-166.
1566.00	584.00	-168.
1572.00	585.00	-170.
1578.00	586.00	-169.
1584.00	587.00	-163.
1590.00	588.00	-173.
1596.00	589.00	-173.
1602.00	590.00	-174.
1608.00	591.00	-175.
1614.00	592.00	-174.
1620.00	593.00	-175.
1626.00	594.00	-170.
1632.00	595.00	-177.
1638.00	596.00	-180.
1644.00	597.00	-179.
1650.00	598.00	-180.
1656.00	599.00	-179.
1662.00	600.00	-179.
1668.00	601.00	-179.
1674.00	602.00	-182.
1680.00	603.00	-179.
1686.00	604.00	-179.
1692.00	605.00	-183.
1698.00	606.00	-180.
1704.00	607.00	-182.
1710.00	608.00	-185.
1716.00	609.00	-185.
1722.00	610.00	-181.
1728.00	611.00	-186.
1734.00	612.00	-183.
1740.00	613.00	-179.
1746.00	614.00	-185.
1752.00	615.00	-187.
1758.00	616.00	-187.
1764.00	617.00	-187.
1770.00	618.00	-187.
1776.00	619.00	-183.
1782.00	620.00	-187.

KINETIC ***81.11.8.21.7 GULF ATS

1788.00	521.00	-187.
1794.00	622.00	-187.
1800.00	523.00	-187.
1806.00	624.00	-183.
1812.00	525.00	-181.
1818.00	626.00	-183.
1824.00	627.00	-188.
1830.00	528.00	-190.
1836.00	629.00	-189.
1842.00	630.00	-191.
1848.00	631.00	-183.
1854.00	632.00	-191.
1860.00	633.00	-192.
1866.00	634.00	-187.
1872.00	635.00	-193.
1878.00	536.00	-193.
1884.00	537.00	-194.
1890.00	538.00	-194.
1896.00	639.00	-194.
1902.00	640.00	-193.
1908.00	641.00	-198.
1914.00	642.00	-197.
1920.00	543.00	-198.
1926.00	644.00	-198.
1932.00	645.00	-203.
1938.00	546.00	-206.
1944.00	647.00	-209.
1950.00	548.00	-214.
1956.00	649.00	-214.
1962.00	650.00	-220.

KINETIC ***81.11.8.21.7 GULF ATS

GRAPH OF RAW DATA
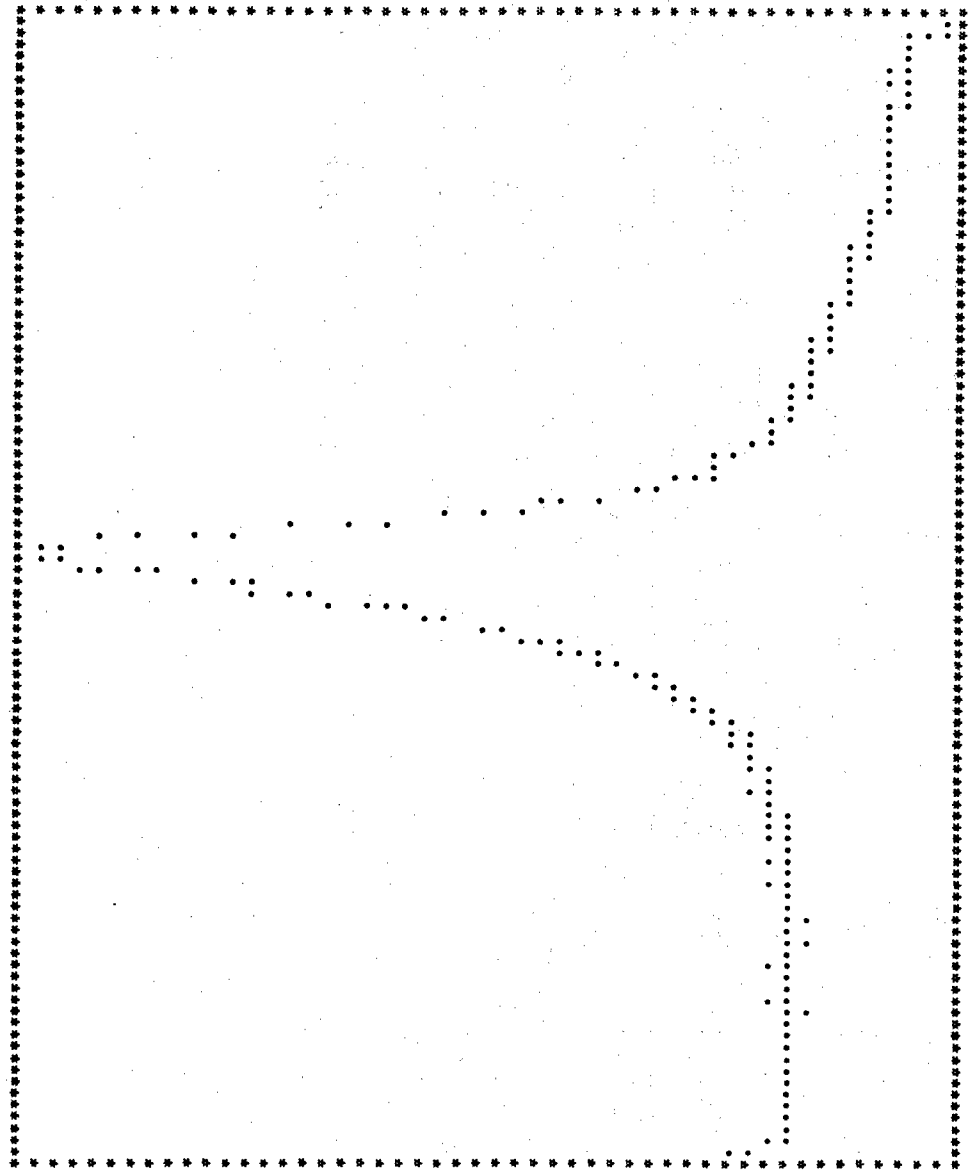
XMIN =   .32400000E+03   XMAX =   .64900000E+03   YMIN = -.21400000E+03   YMAX =   .27900000E+03

KINETIC ***81.11.8.21.7 GULF ATS

MAXIMUM ORDINATE= 279.0 OCCURS AT   497.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 374.0 STOP PT.= 585.0 DEG. KELVIN

    THE PEAK ENDS AT 213 POINTS FROM START. THE Y AT THIS POINT IS -127.29
    THE BASELINE EQUATION IS Y= -.88034E+00*X+ .60220E+02

    THE PEAK STARTS AT 110 POINTS FROM THE START. THE Y AT THIS POINT IS -119.98
    THE BASELINE EQUATION IS Y= .23579E+00*X+ -.14591E+03

PEAK BEGINS AT 432.00 DEG KELVIN   (PEAK HEIGHT =-120.21) (DATA PT. 109)
PEAK ENDS AT   536.00 DEG KELVIN   (PEAK HEIGHT =-127.29) (DATA PT. 213)

NUMBER OF POINTS IN PEAK= 104

BASELINE SHIFT COMPENSATED IS -26.44

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT,AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: .51

****

**********   81.11.8.21.6 GULF ATS   *****

****

WEIGHT(MG) OF SAMPLE=   7.22
RANGE(MILLICAL/SEC FULL SCALE)=, 10.0
SCAN RATE(DEG PER MINUTE(=   5.0
TEMPERATURE(DEG KELVIN) OF FIRST POINT ON DATA TAPE=   323.75

DATA RATE (SECONDS PER DATA POINT)=   9.0000

X (SECONDS)	TEMPERATURE (KELVINS)	ORIGINAL Y (E.U.)
9.00	323.75	-83.
18.00	324.50	-83.
27.00	325.25	-87.
36.00	326.00	-93.
45.00	326.75	-94.
54.00	327.50	-94.
63.00	328.25	-95.
72.00	329.00	-97.
81.00	329.75	-97.
90.00	330.50	-97.
99.00	331.25	-97.
108.00	332.00	-96.

KINETIC   ***81.11.8.21.6 GULF ATS

117.00	332.75	-95.
126.00	333.50	-95.
135.00	334.25	-93.
144.00	335.00	-93.
153.00	335.75	-93.
162.00	336.50	-93.
171.00	337.25	-93.
180.00	338.00	-93.
189.00	338.75	-95.
198.00	339.50	-95.
207.00	340.25	-95.
216.00	341.00	-95.
225.00	341.75	-95.
234.00	342.50	-95.
243.00	343.25	-95.
252.00	344.00	-94.
261.00	344.75	-93.
270.00	345.50	-93.
279.00	346.25	-93.
288.00	347.00	-95.
297.00	347.75	-94.
306.00	348.50	-95.
315.00	349.25	-93.
324.00	350.00	-93.
333.00	350.75	-93.
342.00	351.50	-93.
351.00	352.25	-93.
360.00	353.00	-93.
369.00	353.75	-93.
378.00	354.50	-93.
387.00	355.25	-93.
396.00	356.00	-93.
405.00	356.75	-93.
414.00	357.50	-93.
423.00	358.25	-93.
432.00	359.00	-93.
441.00	359.75	-93.
450.00	360.50	-93.
459.00	361.25	-93.
468.00	362.00	-93.
477.00	362.75	-92.
486.00	363.50	-93.
495.00	364.25	-92.
504.00	365.00	-92.
513.00	365.75	-92.
522.00	366.50	-93.
531.00	367.25	-92.
540.00	368.00	-91.
549.00	368.75	-92.
558.00	369.50	-91.
567.00	370.25	-89.
576.00	371.00	-89.
585.00	371.75	-89.
594.00	372.50	-91.
603.00	373.25	-91.
612.00	374.00	-89.
621.00	374.75	-89.

KINETIC   ***81.11.8.21.6 GULF ATS

630.00	375.50	-89.
639.00	376.25	-89.
648.00	377.00	-89.
657.00	377.75	-89.
666.00	378.50	-89.
675.00	379.25	-89.
684.00	380.00	-89.
693.00	380.75	-89.
702.00	381.50	-89.
711.00	382.25	-89.
720.00	383.00	-89.
729.00	383.75	-89.
738.00	384.50	-89.
747.00	385.25	-87.
756.00	386.00	-87.
765.00	386.75	-87.
774.00	387.50	-87.
783.00	388.25	-87.
792.00	389.00	-87.
801.00	389.75	-87.
810.00	390.50	-87.
819.00	391.25	-87.
828.00	392.00	-87.
837.00	392.75	-87.
846.00	393.50	-87.
855.00	394.25	-87.
864.00	395.00	-87.
873.00	395.75	-87.
882.00	396.50	-87.
891.00	397.25	-87.
900.00	398.00	-86.
909.00	398.75	-87.
918.00	399.50	-86.
927.00	400.25	-86.
936.00	401.00	-85.
945.00	401.75	-85.
954.00	402.50	-85.
963.00	403.25	-85.
972.00	404.00	-84.
981.00	404.75	-85.
990.00	405.50	-84.
999.00	406.25	-83.
1008.00	407.00	-84.
1017.00	407.75	-83.
1026.00	408.50	-83.
1035.00	409.25	-83.
1044.00	410.00	-83.
1053.00	410.75	-83.
1062.00	411.50	-83.
1071.00	412.25	-82.
1080.00	413.00	-79.
1089.00	413.75	-79.
1098.00	414.50	-82.
1107.00	415.25	-79.
1116.00	416.00	-79.
1125.00	416.75	-79.
1134.00	417.50	-79.

140

KINETIC ***81.11.8.21.6 GULF ATS

1143.00	418.25	-79.
1152.00	419.00	-79.
1161.00	419.75	-79.
1170.00	420.50	-79.
1179.00	421.25	-77.
1188.00	422.00	-77.
1197.00	422.75	-77.
1206.00	423.50	-77.
1215.00	424.25	-77.
1224.00	425.00	-77.
1233.00	425.75	-75.
1242.00	426.50	-73.
1251.00	427.25	-73.
1260.00	428.00	-73.
1269.00	428.75	-73.
1278.00	429.50	-73.
1287.00	430.25	-71.
1296.00	431.00	-71.
1305.00	431.75	-69.
1314.00	432.50	-69.
1323.00	433.25	-69.
1332.00	434.00	-67.
1341.00	434.75	-67.
1350.00	435.50	-65.
1359.00	436.25	-65.
1368.00	437.00	-63.
1377.00	437.75	-63.
1386.00	438.50	-63.
1395.00	439.25	-61.
1404.00	440.00	-59.
1413.00	440.75	-59.
1422.00	441.50	-57.
1431.00	442.25	-57.
1440.00	443.00	-55.
1449.00	443.75	-55.
1458.00	444.50	-53.
1467.00	445.25	-52.
1476.00	446.00	-49.
1485.00	446.75	-47.
1494.00	447.50	-47.
1503.00	448.25	-45.
1512.00	449.00	-42.
1521.00	449.75	-39.
1530.00	450.50	-39.
1539.00	451.25	-35.
1548.00	452.00	-33.
1557.00	452.75	-33.
1566.00	453.50	-29.
1575.00	454.25	-27.
1584.00	455.00	-25.
1593.00	455.75	-22.
1602.00	456.50	-19.
1611.00	457.25	-16.
1620.00	458.00	-13.
1629.00	458.75	-9.
1638.00	459.50	-7.
1647.00	460.25	-3.

KINETIC ***81.11.8.21.6 GULF ATS

1656.00	461.00	0.
1665.00	461.75	4.
1674.00	462.50	8.
1683.00	463.25	12.
1692.00	464.00	16.
1701.00	464.75	20.
1710.00	465.50	24.
1719.00	466.25	30.
1728.00	467.00	34.
1737.00	467.75	40.
1746.00	468.50	43.
1755.00	469.25	50.
1764.00	470.00	34.
1773.00	470.75	60.
1782.00	471.50	66.
1791.00	472.25	73.
1800.00	473.00	80.
1809.00	473.75	85.
1818.00	474.50	92.
1827.00	475.25	100.
1836.00	476.00	106.
1845.00	476.75	114.
1854.00	477.50	121.
1863.00	478.25	128.
1872.00	479.00	136.
1881.00	479.75	142.
1890.00	480.50	147.
1899.00	481.25	151.
1908.00	482.00	152.
1917.00	482.75	150.
1926.00	483.50	144.
1935.00	484.25	136.
1944.00	485.00	124.
1953.00	485.75	110.
1962.00	486.50	96.
1971.00	487.25	82.
1980.00	488.00	68.
1989.00	488.75	54.
1998.00	489.50	40.
2007.00	490.25	30.
2016.00	491.00	20.
2025.00	491.75	10.
2034.00	492.50	2.
2043.00	493.25	-6.
2052.00	494.00	-12.
2061.00	494.75	-17.
2070.00	495.50	-22.
2079.00	496.25	-27.
2088.00	497.00	-29.
2097.00	497.75	-33.
2106.00	498.50	-37.
2115.00	499.25	-39.
2124.00	500.00	-39.
2133.00	500.75	-43.
2142.00	501.50	-45.
2151.00	502.25	-47.
2160.00	503.00	-49.

KINETIC   ***81.11.8.21.6 GULF ATS

2169.00	503.75	-49.
2178.00	504.50	-53.
2187.00	505.25	-53.
2196.00	506.00	-55.
2205.00	506.75	-57.
2214.00	507.50	-57.
2223.00	508.25	-57.
2232.00	509.00	-59.
2241.00	509.75	-59.
2250.00	510.50	-63.
2259.00	511.25	-62.
2268.00	512.00	-63.
2277.00	512.75	-63.
2286.00	513.50	-63.
2295.00	514.25	-65.
2304.00	515.00	-65.
2313.00	515.75	-66.
2322.00	516.50	-67.
2331.00	517.25	-67.
2340.00	518.00	-67.
2349.00	518.75	-67.
2358.00	519.50	-67.
2367.00	520.25	-69.
2376.00	521.00	-69.
2385.00	521.75	-69.
2394.00	522.50	-69.
2403.00	523.25	-69.
2412.00	524.00	-71.
2421.00	524.75	-71.
2430.00	525.50	-71.
2439.00	526.25	-73.
2448.00	527.00	-73.
2457.00	527.75	-73.
2466.00	528.50	-74.
2475.00	529.25	-76.
2484.00	530.00	-76.
2493.00	530.75	-77.
2502.00	531.50	-77.
2511.00	532.25	-77.
2520.00	533.00	-77.
2529.00	533.75	-77.
2538.00	534.50	-77.
2547.00	535.25	-79.
2556.00	536.00	-77.
2565.00	536.75	-79.
2574.00	537.50	-79.
2583.00	538.25	-79.
2592.00	539.00	-79.
2601.00	539.75	-79.
2610.00	540.50	-79.
2619.00	541.25	-79.
2628.00	542.00	-79.
2637.00	542.75	-82.
2646.00	543.50	-79.
2655.00	544.25	-82.
2664.00	545.00	-83.
2673.00	545.75	-83.

KINETIC ***81.11.8.21.6 GULF ATS

2682.00	546.50	-83.
2691.00	547.25	-83.
2700.00	548.00	-83.
2709.00	548.75	-83.
2718.00	549.50	-83.
2727.00	550.25	-83.
2736.00	551.00	-85.
2745.00	551.75	-85.
2754.00	552.50	-87.
2763.00	553.25	-86.
2772.00	554.00	-86.
2781.00	554.75	-87.
2790.00	555.50	-87.
2799.00	556.25	-87.
2808.00	557.00	-87.
2817.00	557.75	-87.
2826.00	558.50	-89.
2835.00	559.25	-87.
2844.00	560.00	-87.
2853.00	560.75	-89.
2862.00	561.50	-89.
2871.00	562.25	-89.
2880.00	563.00	-89.
2889.00	563.75	-89.
2898.00	564.50	-89.
2907.00	565.25	-89.
2916.00	566.00	-89.
2925.00	566.75	-89.
2934.00	567.50	-89.
2943.00	568.25	-89.
2952.00	569.00	-89.
2961.00	569.75	-91.
2970.00	570.50	-92.
2979.00	571.25	-92.
2988.00	572.00	-92.
2997.00	572.75	-92.
3006.00	573.50	-93.
3015.00	574.25	-93.
3024.00	575.00	-93.
3033.00	575.75	-93.
3042.00	576.50	-93.
3051.00	577.25	-93.
3060.00	578.00	-93.
3069.00	578.75	-93.
3078.00	579.50	-95.
3087.00	580.25	-93.
3096.00	581.00	-94.
3105.00	581.75	-93.
3114.00	582.50	-95.
3123.00	583.25	-95.
3132.00	584.00	-96.
3141.00	584.75	-95.
3150.00	585.50	-97.
3159.00	586.25	-97.
3168.00	587.00	-97.
3177.00	587.75	-97.
3186.00	588.50	-97.

KINETIC   ***81.11.8.21.6 GULF ATS

3195.00	589.25	-97.
3204.00	590.00	-97.
3213.00	590.75	-97.
3222.00	591.50	-97.
3231.00	592.25	-97.
3240.00	593.00	-97.
3249.00	593.75	-97.
3258.00	594.50	-97.
3267.00	595.25	-97.
3276.00	596.00	-97.
3285.00	596.75	-97.
3294.00	597.50	-97.
3303.00	598.25	-99.
3312.00	599.00	-97.
3321.00	599.75	-97.
3330.00	600.50	-99.
3339.00	601.25	-99.
3348.00	602.00	-97.
3357.00	602.75	-99.
3366.00	603.50	-97.
3375.00	604.25	-97.
3384.00	605.00	-97.
3393.00	605.75	-97.
3402.00	606.50	-99.
3411.00	607.25	-97.
3420.00	608.00	-97.
3429.00	608.75	-97.
3438.00	609.50	-97.
3447.00	610.25	-99.
3456.00	611.00	-99.
3465.00	611.75	-99.
3474.00	612.50	-99.
3483.00	613.25	-99.
3492.00	614.00	-99.
3501.00	614.75	-99.
3510.00	615.50	-99.
3519.00	616.25	-99.
3528.00	617.00	-99.

GRAPH OF RAW DATA

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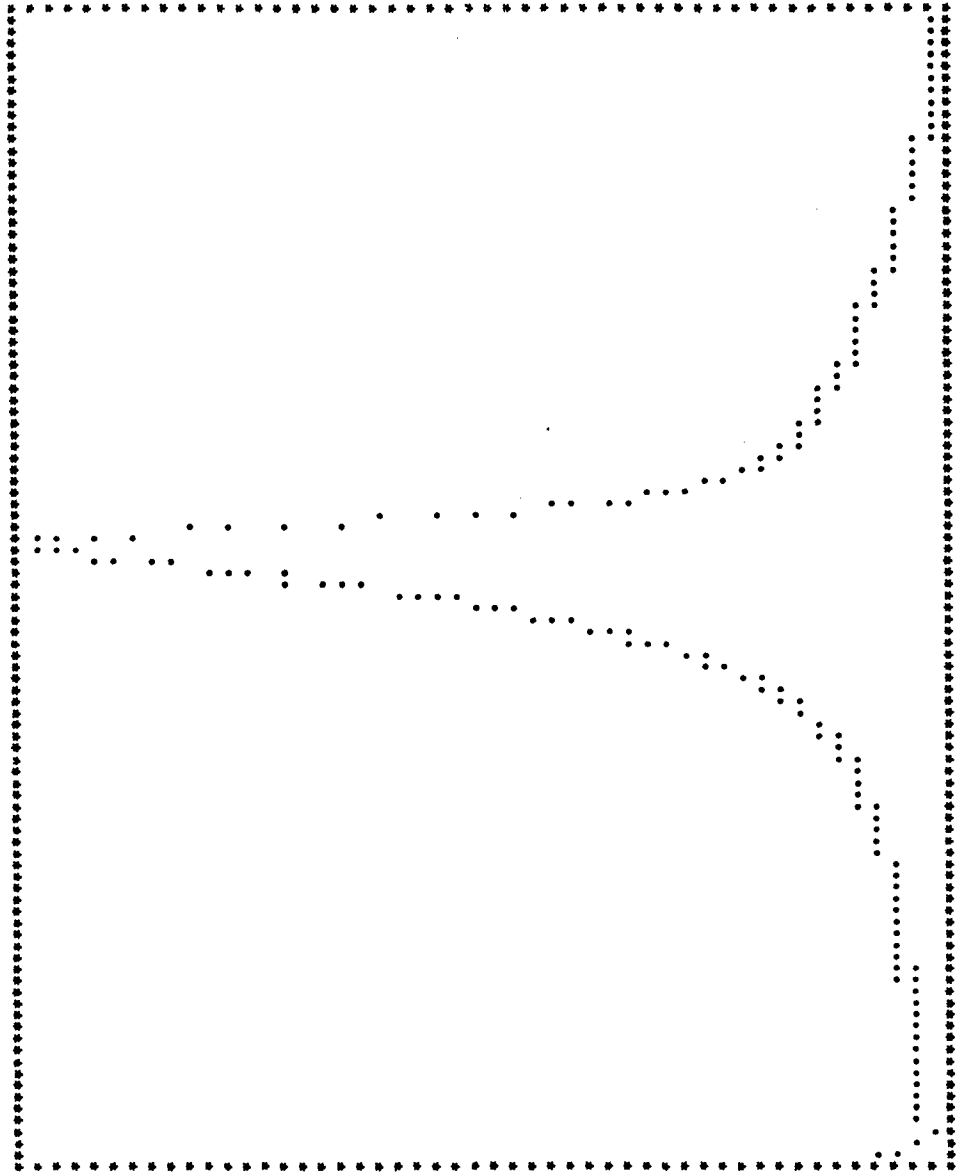
XMIN = .32375000E+03   XMAX = .61625000E+03   YMIN = -.49000000E+02   YMAX = .15200000E+03

KINETIC ***81.11.5.21.6 GULF ATS

MAXIMUM ORDINATE= 152.0 OCCURS AT   482.00 DEG KELVIN.

PEAK SEARCH LIMITS: START PT.= 353.0 STOP PT.= 599.8 DEG. KELVIN

    THE PEAK ENDS AT 256 POINTS FROM START. THE Y AT THIS POINT IS -69.15
    THE BASELINE EQUATION IS Y= -.28556E+00*X+ .39566E+01

    THE PEAK STARTS AT 141 POINTS FROM THE START. THE Y AT THIS POINT IS -76.94
    THE BASELINE EQUATION IS Y= .18050E+00*X+ -.10239E+03

PEAK BEGINS AT 428.00 DEG KELVIN   (PEAK HEIGHT = -77.12) (DATA PT. 140)
PEAK ENDS AT   515.00 DEG KELVIN   (PEAK HEIGHT = -69.15) (DATA PT. 256)

NUMBER OF POINTS IN PEAK= 116

BASELINE SHIFT COMPENSATED IS -14.07

TEMPERATURES HAVE NOW BEEN CORRECTED FOR THERMAL LAG, SCAN RATE EFFECT, AND CALIBRATION ERROR.
MAGNITUDE OF THE CORRECTION AT MAXIMUM ORDINATE IS: .58

****

CALCOMP PLOT OF FAMILY OF 5 CURVES WILL BE PRODUCED.

****

CURVE NUMBER	NUMBER OF POINTS	AREA UNDER CURVE	WEIGHT OF SAMPLE	RANGE MCAL/SEC	HEAT OF REACTION(CAL/GM)
1	101	170.64	1.56	20.00	109.38
2	121	445.72	4.07	20.00	109.51
3	105	413.14	4.23	10.00	97.67
4	105	780.10	7.35	10.00	106.14
5	117	713.29	7.22	10.00	98.38

AVERAGE HEAT OF REACTION FOR THIS SERIES: 104.22   STANDARD DEVIATION OF: 5.20

****

********** CURVE NUMBER   1.

TIME (SECONDS)	TEMPERATURE (KELVINS)	DC/DT (SEC-1)	C
.80	483.06	.00391	0.000
1.60	484.13	.00103	.001

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

2.40	485.22	.00127	.002
3.20	486.30	.00150	.003
4.00	487.36	.00163	.004
4.80	488.46	.00175	.005
5.60	489.54	.00199	.007
6.40	490.62	.00211	.009
7.20	491.70	.00235	.010
8.00	492.78	.00259	.012
8.80	493.87	.00282	.014
9.60	494.95	.00305	.017
10.40	496.04	.00329	.019
11.20	497.13	.00363	.022
12.00	498.21	.00387	.025
12.80	499.29	.00410	.028
13.60	500.38	.00445	.032
14.40	501.46	.00479	.035
15.20	502.57	.00514	.039
16.00	503.66	.00548	.044
16.80	504.75	.00583	.048
17.60	505.84	.00617	.053
18.40	506.94	.00563	.058
19.20	508.02	.00686	.063
20.00	509.13	.00743	.069
20.80	510.22	.00788	.075
21.60	511.32	.00834	.082
22.40	512.42	.00879	.089
23.20	513.52	.00925	.096
24.00	514.62	.00981	.103
24.80	515.74	.01049	.112
25.60	516.84	.01105	.120
26.40	517.95	.01173	.129
27.20	519.06	.01230	.139
28.00	520.17	.01297	.149
28.80	521.29	.01376	.160
29.60	522.40	.01443	.171
30.40	523.51	.01511	.183
31.20	524.63	.01589	.195
32.00	525.75	.01668	.208
32.80	526.87	.01746	.222
33.60	527.99	.01825	.236
34.40	529.11	.01903	.251
35.20	530.23	.01993	.267
36.00	531.36	.02082	.283
36.80	532.49	.02172	.300
37.60	533.61	.02261	.318
38.40	534.75	.02362	.336
39.20	535.87	.02451	.355
40.00	537.00	.02552	.375
40.80	538.13	.02641	.396
41.60	539.26	.02741	.418
42.40	540.39	.02830	.440
43.20	541.51	.02909	.463
44.00	542.63	.02987	.467
44.80	543.75	.03065	.511
45.60	544.85	.03121	.536
46.40	545.95	.03165	.561
47.20	547.04	.03199	.586

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

48.00	548.11	.03210	.612
48.80	549.17	.03188	.637
49.60	550.22	.03155	.663
50.40	551.24	.03089	.688
51.20	552.25	.02989	.712
52.00	553.24	.02868	.735
52.80	554.22	.02735	.758
53.60	555.19	.02569	.779
54.40	556.15	.02403	.799
55.20	557.11	.02237	.818
56.00	558.07	.02060	.835
56.80	559.03	.01894	.851
57.60	559.99	.01728	.865
58.40	560.96	.01574	.878
59.20	561.94	.01430	.890
60.00	562.92	.01298	.901
60.80	563.91	.01166	.911
61.60	564.91	.01067	.920
62.40	565.91	.00957	.928
63.20	566.92	.00869	.935
64.00	567.94	.00792	.942
64.80	568.96	.00716	.948
65.60	569.99	.00650	.954
66.40	571.02	.00596	.958
67.20	572.06	.00542	.963
68.00	573.09	.00487	.967
68.80	574.14	.00455	.971
69.60	575.18	.00412	.974
70.40	576.23	.00380	.978
71.20	577.27	.00337	.980
72.00	578.32	.00316	.983
72.80	579.37	.00284	.985
73.60	580.43	.00263	.988
74.40	581.48	.00231	.990
75.20	582.54	.00221	.991
76.00	583.59	.00189	.993
76.80	584.65	.00180	.995
77.60	585.71	.00159	.996
78.40	586.77	.00149	.997
79.20	587.82	.00128	.998
80.00	588.88	.00107	.999
80.80	589.94	.00097	1.000

********** CURVE NUMBER 2.

TIME (SECONDS)	TEMPERATURE (KELVINS)	DC/DT (SEC-1)	C
1.50	455.37	.00035	0.000
3.00	456.37	.00035	.001
4.50	457.38	.00040	.001
6.00	458.38	.00045	.002
7.50	459.39	.00050	.002
9.00	460.39	.00055	.003
10.50	461.40	.00060	.004
12.00	462.41	.00064	.005
13.50	463.41	.00069	.006

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

15.00	464.42	.00074	.007
16.50	465.42	.00079	.008
18.00	466.44	.00088	.010
19.50	467.45	.00097	.011
21.00	468.45	.00102	.012
22.50	469.46	.00107	.014
24.00	470.47	.00116	.016
25.50	471.48	.00125	.017
27.00	472.49	.00134	.019
28.50	473.50	.00143	.021
30.00	474.51	.00147	.024
31.50	475.53	.00161	.026
33.00	476.54	.00170	.028
34.50	477.55	.00179	.031
36.00	478.56	.00192	.034
37.50	479.57	.00201	.037
39.00	480.59	.00214	.040
40.50	481.61	.00227	.043
42.00	482.62	.00240	.047
43.50	483.64	.00258	.050
45.00	484.66	.00271	.054
46.50	485.68	.00288	.059
48.00	486.69	.00302	.063
49.50	487.71	.00319	.068
51.00	488.73	.00336	.073
52.50	489.75	.00354	.078
54.00	490.78	.00375	.083
55.50	491.80	.00393	.089
57.00	492.83	.00414	.095
58.50	493.86	.00440	.101
60.00	494.88	.00461	.108
61.50	495.91	.00487	.115
63.00	496.94	.00513	.123
64.50	497.97	.00534	.131
66.00	499.00	.00564	.139
67.50	500.04	.00594	.148
69.00	501.07	.00624	.157
70.50	502.11	.00654	.166
72.00	503.14	.00688	.176
73.50	504.18	.00722	.187
75.00	505.22	.00756	.198
76.50	506.26	.00790	.210
78.00	507.31	.00828	.222
79.50	508.35	.00866	.234
81.00	509.40	.00908	.248
82.50	510.44	.00946	.262
84.00	511.49	.00989	.276
85.50	512.55	.01035	.291
87.00	513.60	.01077	.307
88.50	514.65	.01124	.324
90.00	515.70	.01170	.341
91.50	516.76	.01221	.359
93.00	517.81	.01267	.377
94.50	518.88	.01321	.397
96.00	519.93	.01368	.417
97.50	520.98	.01409	.438
99.00	522.05	.01465	.459

KINETIC   *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

100.50	523.10	.01514	.482
102.00	524.15	.01560	.505
103.50	525.20	.01602	.529
105.00	526.24	.01635	.553
106.50	527.27	.01563	.578
108.00	528.30	.01683	.603
109.50	529.31	.01691	.628
111.00	530.30	.01685	.653
112.50	531.28	.01663	.678
114.00	532.24	.01627	.703
115.50	533.17	.01566	.727
117.00	534.09	.01497	.750
118.50	534.99	.01411	.772
120.00	535.88	.01316	.792
121.50	536.77	.01213	.811
123.00	537.65	.01109	.829
124.50	538.54	.01011	.845
126.00	539.43	.00916	.859
127.50	540.32	.00822	.872
129.00	541.24	.00745	.884
130.50	542.15	.00672	.894
132.00	543.08	.00604	.904
133.50	544.01	.00548	.913
135.00	544.95	.00493	.920
136.50	545.90	.00446	.928
138.00	546.85	.00403	.934
139.50	547.81	.00369	.940
141.00	548.78	.00335	.945
142.50	549.74	.00306	.950
144.00	550.71	.00280	.954
145.50	551.69	.00259	.958
147.00	552.67	.00238	.962
148.50	553.64	.00217	.965
150.00	554.63	.00205	.969
151.50	555.61	.00188	.971
153.00	556.59	.00172	.974
154.50	557.59	.00163	.977
156.00	558.57	.00147	.979
157.50	559.56	.00139	.981
159.00	560.55	.00126	.983
160.50	561.53	.00114	.985
162.00	562.53	.00110	.987
163.50	563.52	.00102	.988
165.00	564.51	.00094	.990
166.50	565.50	.00086	.991
168.00	566.50	.00078	.992
169.50	567.49	.00074	.993
171.00	568.48	.00066	.994
172.50	569.48	.00063	.995
174.00	570.48	.00059	.996
175.50	571.47	.00051	.997
177.00	572.47	.00052	.998
178.50	573.47	.00048	.999
180.00	574.46	.00044	.999
181.50	575.45	.00036	1.000

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

********** CURVE NUMBER 3.

TIME (SECONDS)	TEMPERATURE (KELVINS)	DC/DT (SEC-1)	C
3.00	450.88	.00011	0.000
6.00	451.89	.00015	.000
9.00	452.90	.00022	.001
12.00	453.90	.00024	.002
15.00	454.90	.00026	.002
18.00	455.90	.00030	.003
21.00	456.91	.00032	.004
24.00	457.91	.00034	.005
27.00	458.91	.00039	.006
30.00	459.92	.00041	.007
33.00	460.92	.00047	.009
36.00	461.93	.00049	.010
39.00	462.93	.00051	.012
42.00	463.94	.00058	.013
45.00	464.94	.00067	.015
48.00	465.95	.00074	.017
51.00	466.96	.00080	.020
54.00	467.96	.00087	.022
57.00	468.97	.00098	.025
60.00	469.98	.00102	.028
63.00	470.98	.00109	.031
66.00	471.99	.00118	.034
69.00	473.00	.00129	.038
72.00	474.01	.00133	.042
75.00	475.02	.00145	.046
78.00	476.03	.00155	.051
81.00	477.04	.00167	.056
84.00	478.05	.00173	.061
87.00	479.06	.00189	.066
90.00	480.07	.00196	.072
93.00	481.08	.00214	.078
96.00	482.10	.00232	.085
99.00	483.11	.00245	.092
102.00	484.13	.00261	.099
105.00	485.14	.00276	.108
108.00	486.16	.00292	.116
111.00	487.18	.00312	.125
114.00	488.19	.00328	.135
117.00	489.21	.00348	.145
120.00	490.22	.00362	.156
123.00	491.24	.00379	.167
126.00	492.26	.00402	.178
129.00	493.28	.00431	.191
132.00	494.31	.00454	.204
135.00	495.32	.00474	.218
138.00	496.35	.00499	.233
141.00	497.37	.00526	.248
144.00	498.40	.00555	.264
147.00	499.42	.00582	.281
150.00	500.45	.00609	.299
153.00	501.47	.00638	.318

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

156.00	502.50	.00672	.337
159.00	503.53	.00699	.358
162.00	504.56	.00730	.379
165.00	505.58	.00757	.402
168.00	506.61	.00791	.425
171.00	507.64	.00822	.449
174.00	508.67	.00851	.474
177.00	509.69	.00880	.500
180.00	510.72	.00907	.527
183.00	511.74	.00934	.555
186.00	512.75	.00949	.583
189.00	513.76	.00955	.611
192.00	514.77	.00961	.640
195.00	515.75	.00942	.669
198.00	516.73	.00923	.697
201.00	517.71	.00895	.724
204.00	518.68	.00855	.750
207.00	519.63	.00797	.775
210.00	520.58	.00741	.798
213.00	521.52	.00674	.819
216.00	522.46	.00612	.839
219.00	523.41	.00547	.856
222.00	524.36	.00494	.872
225.00	525.32	.00441	.886
228.00	526.27	.00392	.898
231.00	527.24	.00348	.909
234.00	528.20	.00309	.919
237.00	529.17	.00272	.928
240.00	530.14	.00242	.936
243.00	531.12	.00214	.942
246.00	532.10	.00195	.949
249.00	533.08	.00172	.954
252.00	534.08	.00165	.959
255.00	535.06	.00140	.964
258.00	536.05	.00132	.968
261.00	537.04	.00123	.972
264.00	538.04	.00114	.975
267.00	539.03	.00102	.978
270.00	540.02	.00090	.981
273.00	541.01	.00085	.984
276.00	542.01	.00076	.986
279.00	542.99	.00062	.988
282.00	543.99	.00059	.990
285.00	544.99	.00052	.992
288.00	545.98	.00041	.993
291.00	546.98	.00040	.994
294.00	547.98	.00038	.996
297.00	548.97	.00031	.997
300.00	549.97	.00033	.998
303.00	550.96	.00019	.998
306.00	551.96	.00014	.999
309.00	552.96	.00014	.999
312.00	553.96	.00011	1.000
315.00	554.96	.00009	1.000

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

********** CURVE NUMBER   4.

TIME (SECONDS)	TEMPERATURE (KELVINS)	DC/DT (SEC-1)	C
6.00	431.68	.00001	0.000
12.00	432.69	.00007	.000
18.00	433.70	.00010	.001
24.00	434.69	.00003	.001
30.00	435.71	.00014	.002
36.00	436.71	.00016	.003
42.00	437.71	.00015	.003
48.00	438.72	.00019	.004
54.00	439.72	.00018	.006
60.00	440.72	.00022	.007
66.00	441.73	.00025	.008
72.00	442.72	.00022	.010
78.00	443.73	.00024	.011
84.00	444.74	.00031	.013
90.00	445.74	.00034	.014
96.00	446.75	.00035	.017
102.00	447.76	.00039	.019
108.00	448.76	.00043	.021
114.00	449.77	.00045	.024
120.00	450.77	.00047	.027
126.00	451.79	.00058	.030
132.00	452.79	.00057	.033
138.00	453.80	.00063	.037
144.00	454.81	.00073	.041
150.00	455.81	.00070	.045
156.00	456.82	.00079	.050
162.00	457.83	.00079	.054
168.00	458.83	.00084	.059
174.00	459.85	.00092	.065
180.00	460.86	.00099	.070
186.00	461.87	.00104	.076
192.00	462.87	.00107	.083
198.00	463.89	.00117	.089
204.00	464.90	.00121	.097
210.00	465.92	.00133	.104
216.00	466.92	.00133	.112
222.00	467.93	.00143	.121
228.00	468.94	.00150	.129
234.00	469.95	.00157	.139
240.00	470.97	.00166	.148
246.00	471.98	.00172	.158
252.00	473.00	.00183	.169
258.00	474.02	.00195	.180
264.00	475.04	.00205	.192
270.00	476.04	.00207	.205
276.00	477.06	.00230	.218
282.00	478.09	.00236	.232
288.00	479.10	.00247	.246
294.00	480.13	.00260	.261
300.00	481.15	.00274	.277
306.00	482.16	.00281	.294

KINETIC *** KINETIC SERIES FOR SULF ATS (50 GRAM EVALUATION)

312.00	483.20	.00304	.312
318.00	484.22	.00320	.330
324.00	485.24	.00332	.350
330.00	486.28	.00352	.370
336.00	487.29	.00362	.392
342.00	488.31	.00376	.414
348.00	489.35	.00400	.437
354.00	490.38	.00419	.462
360.00	491.41	.00438	.488
366.00	492.44	.00457	.514
372.00	493.46	.00469	.542
378.00	494.49	.00484	.571
384.00	495.51	.00494	.600
390.00	496.51	.00495	.630
396.00	497.51	.00495	.660
402.00	498.50	.00493	.689
408.00	499.48	.00476	.718
414.00	500.45	.00454	.746
420.00	501.40	.00423	.772
426.00	502.35	.00395	.797
432.00	503.30	.00360	.820
438.00	504.24	.00320	.840
444.00	505.19	.00290	.858
450.00	506.14	.00255	.875
456.00	507.09	.00222	.889
462.00	508.05	.00196	.902
468.00	509.01	.00171	.913
474.00	509.99	.00158	.922
480.00	510.96	.00138	.931
486.00	511.93	.00122	.939
492.00	512.92	.00116	.946
498.00	513.90	.00096	.953
504.00	514.88	.00089	.958
510.00	515.86	.00076	.963
516.00	516.85	.00068	.967
522.00	517.85	.00063	.971
528.00	518.84	.00056	.975
534.00	519.83	.00049	.978
540.00	520.82	.00047	.981
546.00	521.81	.00041	.983
552.00	522.81	.00037	.986
558.00	523.82	.00043	.988
564.00	524.80	.00028	.990
570.00	525.80	.00031	.992
576.00	526.79	.00022	.994
582.00	527.79	.00021	.995
588.00	528.77	.00006	.996
594.00	529.79	.00023	.997
600.00	530.77	.00010	.998
606.00	531.76	.00014	.998
612.00	532.77	.00008	.999
618.00	533.77	.00007	.999
624.00	534.77	.00005	1.000
630.00	535.77	.00003	1.000

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

********** CURVE NUMBER   5.

TIME (SECONDS)	TEMPERATURE (KELVINS)	DC/DT (SEC-1)	C
9.00	428.11	.00006	0.000
18.00	428.86	.00006	.001
27.00	429.61	.00006	.001
36.00	430.36	.00008	.002
45.00	431.11	.00008	.002
54.00	431.87	.00011	.003
63.00	432.62	.00011	.004
72.00	433.37	.00011	.005
81.00	434.12	.00014	.006
90.00	434.88	.00014	.008
99.00	435.63	.00015	.009
108.00	436.38	.00016	.010
117.00	437.14	.00020	.012
126.00	437.89	.00020	.014
135.00	438.64	.00020	.016
144.00	439.39	.00022	.017
153.00	440.15	.00025	.020
162.00	440.90	.00025	.022
171.00	441.65	.00028	.024
180.00	442.40	.00028	.027
189.00	443.16	.00031	.029
198.00	443.91	.00031	.032
207.00	444.66	.00033	.035
216.00	445.42	.00035	.038
225.00	446.17	.00039	.041
234.00	446.93	.00041	.045
243.00	447.68	.00041	.049
252.00	448.43	.00044	.053
261.00	449.19	.00048	.057
270.00	449.94	.00052	.061
279.00	450.70	.00052	.066
288.00	451.45	.00058	.071
297.00	452.21	.00060	.076
306.00	452.96	.00060	.082
315.00	453.72	.00066	.087
324.00	454.47	.00068	.093
333.00	455.23	.00071	.100
342.00	455.98	.00075	.106
351.00	456.74	.00079	.113
360.00	457.50	.00083	.120
369.00	458.25	.00087	.128
378.00	459.01	.00092	.136
387.00	459.77	.00095	.144
396.00	460.52	.00100	.153
405.00	461.28	.00104	.162
414.00	462.04	.00109	.172
423.00	462.80	.00114	.182
432.00	463.56	.00120	.192
441.00	464.31	.00125	.203
450.00	465.07	.00130	.215
459.00	465.83	.00135	.227

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

466.00	466.59	.00143	.239
477.00	467.35	.00148	.253
486.00	468.11	.00156	.266
495.00	468.87	.00160	.281
504.00	469.63	.00169	.295
513.00	470.35	.00148	.310
522.00	471.15	.00182	.324
531.00	471.91	.00190	.341
540.00	472.68	.00199	.359
549.00	473.44	.00208	.377
558.00	474.20	.00215	.396
567.00	474.97	.00224	.416
576.00	475.73	.00234	.437
585.00	476.49	.00242	.458
594.00	477.26	.00253	.480
603.00	478.02	.00262	.503
612.00	478.79	.00271	.527
621.00	479.55	.00281	.552
630.00	480.31	.00289	.578
639.00	481.07	.00295	.604
648.00	481.83	.00300	.631
657.00	482.56	.00301	.658
666.00	483.33	.00298	.685
675.00	484.07	.00289	.711
684.00	484.80	.00278	.737
693.00	485.53	.00261	.761
702.00	486.25	.00242	.784
711.00	486.98	.00223	.805
720.00	487.70	.00204	.824
729.00	488.42	.00185	.841
738.00	489.15	.00166	.857
747.00	489.87	.00147	.871
756.00	490.60	.00133	.884
765.00	491.33	.00120	.895
774.00	492.06	.00106	.905
783.00	492.80	.00095	.914
792.00	493.53	.00084	.922
801.00	494.27	.00076	.930
810.00	495.01	.00069	.936
819.00	495.76	.00063	.942
828.00	496.50	.00056	.948
837.00	497.24	.00053	.952
846.00	497.99	.00048	.957
855.00	498.73	.00042	.961
864.00	499.48	.00040	.965
873.00	500.23	.00040	.968
882.00	500.97	.00034	.972
891.00	501.72	.00032	.975
900.00	502.46	.00029	.977
909.00	503.21	.00026	.980
918.00	503.96	.00026	.982
927.00	504.70	.00021	.984
936.00	505.46	.00021	.986
945.00	506.20	.00018	.988
954.00	506.95	.00016	.990
963.00	507.70	.00016	.991
972.00	508.45	.00016	.992

KINETIC *** KINETIC SERIES FOR GJLF ATS (50 GRAM EVALUATION)

981.00	509.20	.00013	.994
990.00	509.95	.00013	.995
999.00	510.69	.00008	.996
1008.00	511.44	.00009	.997
1017.00	512.19	.00008	.997
1026.00	512.94	.00008	.998
1035.00	513.70	.00006	.999
1044.00	514.44	.00006	1.000
1053.00	515.19	.00006	1.000

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TABULATED PREKINETIC DATA (INTERPOLATED) FOR EACH CURVE ON THIS GRAPH (NO. 1)

CURVE NO. 1   HEAT RATE= 80.000

C (FRACTION)	TIME (SEC)	TEMP (KELVINS)	DC/DT (SEC-1)
.01	7.06	491.51	.00230
.02	10.60	496.31	.00336
.03	13.21	499.85	.00427
.04	15.32	502.73	.00519
.05	17.12	505.18	.00596
.06	18.69	507.33	.00672
.07	20.11	509.28	.00749
.08	21.39	511.03	.00822
.09	22.55	512.63	.00888
.10	23.64	514.13	.00954
.11	24.65	515.52	.01037
.12	25.58	516.81	.01104
.13	26.46	518.03	.01177
.14	27.29	519.18	.01236
.15	28.07	520.27	.01304
.16	28.82	521.32	.01377
.17	29.53	522.30	.01437
.18	30.21	523.25	.01494
.19	30.87	524.17	.01556
.20	31.50	525.05	.01619
.21	32.10	525.90	.01678
.22	32.69	526.72	.01736
.23	33.26	527.51	.01791
.24	33.81	528.28	.01845
.25	34.34	529.03	.01897
.26	34.85	529.76	.01954
.27	35.37	530.47	.02011
.28	35.86	531.16	.02066
.29	36.33	531.83	.02120
.30	36.80	532.49	.02172
.31	37.25	533.13	.02223
.32	37.70	533.75	.02273
.33	38.13	534.37	.02328
.34	38.55	534.97	.02380

KINETIC   *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

.35	38.98	535.55	.02426
.36	39.38	536.13	.02474
.37	39.78	536.70	.02525
.38	40.18	537.25	.02572
.39	40.56	537.80	.02614
.40	40.94	538.33	.02658
.41	41.31	538.86	.02706
.42	41.68	539.38	.02751
.43	42.04	539.89	.02793
.44	42.40	540.39	.02830
.45	42.75	540.88	.02864
.46	43.10	541.36	.02898
.47	43.44	541.84	.02932
.48	43.78	542.32	.02965
.49	44.11	542.79	.02998
.50	44.44	543.25	.03030
.51	44.77	543.71	.03062
.52	45.10	544.15	.03089
.53	45.42	544.61	.03110
.54	45.74	545.05	.03129
.55	46.06	545.48	.03147
.56	46.38	545.92	.03164
.57	46.69	546.35	.03179
.58	47.01	546.78	.03192
.59	47.32	547.20	.03203
.60	47.63	547.52	.03210
.61	47.94	548.04	.03211
.62	48.26	548.45	.03205
.63	48.57	548.87	.03196
.64	48.88	549.23	.03185
.65	49.20	549.67	.03174
.66	49.51	550.13	.03160
.67	49.83	550.52	.03141
.68	50.15	550.93	.03114
.69	50.47	551.34	.03081
.70	50.80	551.75	.03043
.71	51.13	552.16	.02999
.72	51.47	552.53	.02950
.73	51.81	553.00	.02897
.74	52.16	553.43	.02843
.75	52.51	553.87	.02788
.76	52.88	554.32	.02719
.77	53.25	554.77	.02641
.78	53.63	555.23	.02562
.79	54.03	555.70	.02479
.80	54.44	556.20	.02394
.81	54.87	556.71	.02306
.82	55.31	557.24	.02214
.83	55.77	557.79	.02109
.84	56.25	558.38	.02006
.85	56.77	558.99	.01900
.86	57.31	559.65	.01788
.87	57.89	560.34	.01670
.88	58.51	561.10	.01553
.89	59.18	561.91	.01433
.90	59.91	562.81	.01313
.91	60.71	563.80	.01180

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

.92	61.60	564.91	.01066
.93	62.60	566.17	.00932
.94	63.75	567.62	.00816
.95	65.08	569.32	.00691
.96	66.65	571.35	.00579
.97	68.60	573.87	.00464
.98	71.07	577.10	.00343
.99	74.56	581.69	.00228

CURVE NO. 2   HEAT RATE= 40.000

C (FRACTION)	TIME (SEC)	TEMP (KELVINS)	DC/DT (SEC-1)
.01	18.55	466.81	.00092
.02	27.47	472.81	.00137
.03	33.93	477.16	.00175
.04	39.07	480.64	.00215
.05	43.34	483.53	.00256
.06	46.99	486.01	.00293
.07	50.23	488.21	.00327
.08	53.13	490.19	.00362
.09	55.76	491.98	.00396
.10	58.17	493.63	.00434
.11	60.39	495.15	.00468
.12	62.45	496.56	.00503
.13	64.38	497.88	.00532
.14	66.20	499.14	.00568
.15	67.91	500.32	.00602
.16	69.52	501.43	.00634
.17	71.06	502.50	.00666
.18	72.53	503.51	.00700
.19	73.92	504.48	.00731
.20	75.26	505.41	.00762
.21	76.55	506.30	.00791
.22	77.79	507.15	.00822
.23	78.99	507.99	.00853
.24	80.14	508.80	.00884
.25	81.25	509.57	.00915
.26	82.33	510.32	.00942
.27	83.37	511.05	.00970
.28	84.39	511.75	.01000
.29	85.37	512.46	.01031
.30	86.33	513.13	.01058
.31	87.26	513.78	.01085
.32	88.17	514.42	.01113
.33	89.06	515.04	.01141
.34	89.92	515.65	.01168
.35	90.77	516.25	.01196
.36	91.60	516.83	.01224
.37	92.41	517.40	.01248
.38	93.20	517.95	.01274
.39	93.98	518.51	.01303
.40	94.74	519.04	.01329
.41	95.48	519.57	.01352
.42	96.22	520.08	.01374
.43	96.94	520.59	.01393

KINETIC   *** KINETIC SERIES FOR GJLF ATS (50 GRAM EVALUATION)

.44	97.05	521.09	.01414
.45	98.35	521.58	.01443
.46	99.04	522.07	.01469
.47	99.71	522.55	.01490
.48	100.38	523.02	.01510
.49	101.04	523.48	.01531
.50	101.69	523.93	.01550
.51	102.33	524.38	.01570
.52	102.96	524.83	.01588
.53	103.59	525.25	.01604
.54	104.21	525.59	.01618
.55	104.82	526.12	.01631
.56	105.44	526.54	.01643
.57	106.04	526.96	.01655
.58	106.64	527.37	.01666
.59	107.24	527.78	.01675
.60	107.84	528.19	.01682
.61	108.43	528.59	.01687
.62	109.03	528.99	.01690
.63	109.62	529.38	.01691
.64	110.21	529.78	.01690
.65	110.80	530.17	.01687
.66	111.40	530.55	.01681
.67	111.99	530.95	.01672
.68	112.59	531.34	.01661
.69	113.20	531.73	.01649
.70	113.81	532.12	.01633
.71	114.43	532.50	.01612
.72	115.05	532.89	.01586
.73	115.69	533.28	.01558
.74	116.34	533.68	.01529
.75	117.00	534.09	.01497
.76	117.67	534.50	.01460
.77	118.37	534.91	.01419
.78	119.09	535.34	.01375
.79	119.83	535.78	.01328
.80	120.59	536.23	.01275
.81	121.40	536.71	.01220
.82	122.24	537.20	.01162
.83	123.12	537.72	.01101
.84	124.05	538.27	.01039
.85	125.05	538.86	.00976
.86	126.11	539.49	.00910
.87	127.25	540.18	.00838
.88	128.50	540.93	.00769
.89	129.85	541.76	.00703
.90	131.35	542.58	.00631
.91	133.02	543.72	.00566
.92	134.91	544.89	.00496
.93	137.07	546.26	.00429
.94	139.59	547.87	.00367
.95	142.58	549.79	.00304
.96	146.21	552.15	.00250
.97	150.74	555.11	.00197
.98	156.68	559.02	.00143
.99	165.32	564.73	.00093

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

CURVE NO. 3   HEAT RATE= 20.000

C (FRACTION)	TIME (SEC)	TEMP (KELVINS)	DC/DT (SEC-1)
.01	35.69	461.82	.00049
.02	51.50	467.12	.00081
.03	62.02	470.56	.00107
.04	70.42	473.48	.00131
.05	77.51	475.86	.00154
.06	83.59	477.91	.00172
.07	89.02	479.74	.00192
.08	93.90	481.39	.00219
.09	98.22	482.85	.00242
.10	102.20	484.19	.00262
.11	105.88	485.44	.00281
.12	109.32	486.61	.00301
.13	112.54	487.70	.00320
.14	115.57	488.72	.00339
.15	118.45	489.70	.00355
.16	121.22	490.63	.00368
.17	123.88	491.53	.00385
.18	126.40	492.39	.00406
.19	128.80	493.22	.00430
.20	131.08	493.99	.00447
.21	133.28	494.74	.00462
.22	135.41	495.45	.00477
.23	137.47	496.16	.00494
.24	139.45	496.84	.00511
.25	141.38	497.50	.00529
.26	143.23	498.14	.00547
.27	145.03	498.75	.00564
.28	146.78	499.35	.00580
.29	148.48	499.93	.00595
.30	150.14	500.49	.00610
.31	151.76	501.05	.00626
.32	153.34	501.59	.00641
.33	154.88	502.12	.00659
.34	156.38	502.63	.00675
.35	157.84	503.13	.00688
.36	159.28	503.62	.00701
.37	160.69	504.11	.00716
.38	162.07	504.58	.00731
.39	163.43	505.04	.00742
.40	164.77	505.50	.00754
.41	166.08	505.95	.00769
.42	167.37	506.39	.00783
.43	168.63	506.83	.00798
.44	169.88	507.25	.00810
.45	171.10	507.67	.00823
.46	172.31	508.09	.00835
.47	173.50	508.49	.00846
.48	174.67	508.89	.00858
.49	175.83	509.29	.00869
.50	176.97	509.68	.00880
.51	178.10	510.07	.00890

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

.52	179.22	510.45	.00900
.53	180.33	510.83	.00910
.54	181.42	511.20	.00920
.55	182.50	511.57	.00929
.56	183.57	511.94	.00938
.57	184.64	512.30	.00945
.58	185.70	512.65	.00948
.59	186.75	513.01	.00950
.60	187.80	513.36	.00953
.61	188.85	513.71	.00955
.62	189.89	514.05	.00958
.63	190.94	514.41	.00961
.64	191.98	514.75	.00961
.65	193.03	515.11	.00956
.66	194.08	515.45	.00949
.67	195.13	515.79	.00941
.68	196.20	516.14	.00934
.69	197.28	516.50	.00928
.70	198.36	516.85	.00920
.71	199.45	517.21	.00911
.72	200.56	517.57	.00899
.73	201.68	517.93	.00888
.74	202.82	518.30	.00874
.75	203.97	518.67	.00856
.76	205.16	519.04	.00833
.77	206.38	519.43	.00809
.78	207.63	519.83	.00785
.79	208.92	520.24	.00761
.80	210.26	520.66	.00736
.81	211.65	521.10	.00705
.82	213.10	521.55	.00672
.83	214.62	522.03	.00641
.84	216.23	522.54	.00607
.85	217.93	523.07	.00570
.86	219.74	523.64	.00533
.87	221.67	524.26	.00500
.88	223.75	524.92	.00463
.89	226.00	525.64	.00424
.90	228.47	526.43	.00385
.91	231.21	527.30	.00346
.92	234.28	528.29	.00305
.93	237.80	529.43	.00264
.94	241.91	530.77	.00224
.95	246.77	532.35	.00190
.96	252.55	534.25	.00161
.97	259.73	536.62	.00127
.98	268.65	539.57	.00095
.99	281.67	543.88	.00060

CURVE NO. 4   HEAT RATE= 10.000

C (FRACTION)	TIME (SEC)	TEMP (KELVINS)	DC/DT (SEC-1)
.01	74.05	443.07	.00022
.02	105.02	448.25	.00041
.03	120.33	451.84	.00058

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

.04	142.09	454.59	.00071
.05	150.43	456.90	.00079
.06	168.85	458.95	.00085
.07	179.72	460.81	.00099
.08	189.45	462.45	.00106
.09	198.48	463.97	.00118
.10	206.73	465.35	.00126
.11	214.30	466.54	.00132
.12	221.64	467.87	.00143
.13	228.46	469.02	.00150
.14	234.94	470.12	.00158
.15	241.09	471.15	.00167
.16	246.96	472.14	.00173
.17	252.55	473.09	.00184
.18	257.82	473.99	.00195
.19	262.83	474.84	.00203
.20	267.73	475.65	.00206
.21	272.48	476.47	.00216
.22	276.96	477.24	.00231
.23	281.25	477.95	.00235
.24	285.43	478.67	.00242
.25	289.51	479.35	.00250
.26	293.43	480.03	.00259
.27	297.22	480.65	.00267
.28	300.92	481.30	.00275
.29	304.53	481.91	.00278
.30	308.05	482.51	.00288
.31	311.45	483.10	.00302
.32	314.71	483.55	.00311
.33	317.88	484.20	.00319
.34	320.98	484.73	.00326
.35	324.02	485.25	.00332
.36	326.98	485.76	.00342
.37	329.87	486.25	.00352
.38	332.70	486.73	.00357
.39	335.48	487.20	.00361
.40	338.22	487.67	.00367
.41	340.92	488.13	.00374
.42	343.57	488.59	.00382
.43	346.15	489.03	.00393
.44	348.65	489.47	.00402
.45	351.13	489.89	.00410
.46	353.54	490.33	.00417
.47	355.92	490.71	.00424
.48	358.26	491.11	.00432
.49	360.55	491.51	.00439
.50	362.80	491.89	.00447
.51	365.03	492.23	.00454
.52	367.22	492.65	.00460
.53	369.39	493.02	.00464
.54	371.53	493.35	.00468
.55	373.66	493.75	.00472
.56	375.76	494.11	.00478
.57	377.84	494.46	.00484
.58	379.90	494.81	.00488
.59	381.94	495.15	.00492
.60	383.97	495.50	.00494

KINETIC   *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

.61	385.99	495.84	.00495
.62	388.02	496.18	.00495
.63	390.04	496.51	.00495
.64	392.06	496.85	.00495
.65	394.08	497.19	.00495
.66	396.10	497.52	.00495
.67	398.12	497.86	.00494
.68	400.15	498.20	.00493
.69	402.18	498.53	.00493
.70	404.22	498.87	.00489
.71	406.29	499.20	.00482
.72	408.38	499.54	.00475
.73	410.50	499.88	.00468
.74	412.66	500.23	.00460
.75	414.86	500.58	.00449
.76	417.12	500.94	.00437
.77	419.44	501.31	.00425
.78	421.82	501.69	.00414
.79	424.27	502.08	.00403
.80	426.76	502.43	.00391
.81	429.40	502.89	.00377
.82	432.12	503.32	.00360
.83	434.98	503.77	.00339
.84	438.01	504.24	.00320
.85	441.21	504.75	.00304
.86	444.60	505.29	.00287
.87	448.24	505.85	.00266
.88	452.15	506.48	.00243
.89	456.47	507.16	.00220
.90	461.24	507.93	.00200
.91	466.57	508.78	.00177
.92	472.50	509.74	.00162
.93	479.09	510.81	.00141
.94	486.76	512.05	.00120
.95	495.50	513.49	.00104
.96	506.17	515.24	.00084
.97	519.95	517.51	.00064
.98	538.12	520.51	.00047
.99	562.87	524.61	.00030

CURVE NO. 5   HEAT RATE= 5.000

C (FRACTION)	TIME (SEC)	TEMP (KELVINS)	DC/DT (SEC-1)
.01	105.17	436.14	.00016
.02	154.59	440.28	.00025
.03	190.97	443.32	.00031
.04	221.27	445.85	.00037
.05	245.94	447.92	.00042
.06	267.49	449.73	.00051
.07	286.35	451.32	.00056
.08	303.30	452.73	.00060
.09	319.10	454.06	.00067
.10	333.60	455.23	.00071
.11	347.13	456.41	.00077
.12	359.63	457.45	.00083

KINETIC   *** KINETIC SERIES FOR GULF ATJ (50 GRAM EVALUATION)

.13	371.35	458.45	.00088
.14	382.35	459.33	.00094
.15	392.82	460.26	.00098
.16	402.77	461.09	.00103
.17	412.26	461.69	.00108
.18	421.29	462.65	.00113
.19	429.92	463.38	.00118
.20	438.19	464.38	.00123
.21	446.15	464.75	.00128
.22	453.85	465.43	.00132
.23	461.27	466.02	.00137
.24	468.39	466.53	.00144
.25	475.27	467.20	.00148
.26	481.92	467.77	.00152
.27	488.38	468.31	.00158
.28	494.68	468.84	.00160
.29	500.74	469.36	.00166
.30	506.91	469.87	.00165
.31	513.24	470.37	.00148
.32	519.39	470.92	.00175
.33	525.08	471.41	.00185
.34	530.30	471.86	.00190
.35	535.54	472.30	.00195
.36	540.62	472.73	.00200
.37	545.56	473.15	.00205
.38	550.38	473.55	.00210
.39	555.12	473.95	.00213
.40	559.77	474.35	.00216
.41	564.34	474.74	.00221
.42	568.81	475.12	.00226
.43	573.19	475.49	.00231
.44	577.47	475.85	.00236
.45	581.68	476.21	.00240
.46	585.82	476.55	.00243
.47	589.90	476.91	.00248
.48	593.90	477.25	.00252
.49	597.83	477.58	.00257
.50	601.70	477.91	.00260
.51	605.51	478.24	.00264
.52	609.27	478.55	.00268
.53	612.98	478.87	.00272
.54	616.63	479.18	.00276
.55	620.23	479.49	.00280
.56	623.77	479.79	.00284
.57	627.29	480.08	.00286
.58	630.76	480.38	.00289
.59	634.20	480.67	.00292
.60	637.62	480.95	.00294
.61	641.01	481.24	.00296
.62	644.37	481.53	.00298
.63	647.72	481.81	.00300
.64	651.06	482.09	.00301
.65	654.38	482.37	.00301
.66	657.72	482.64	.00301
.67	661.05	482.92	.00300
.68	664.40	483.20	.00298
.69	667.75	483.47	.00297

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

.70	671.15	483.75	.00293
.71	674.59	484.04	.00290
.72	678.06	484.32	.00286
.73	681.60	484.61	.00281
.74	685.19	484.90	.00276
.75	688.86	485.20	.00270
.76	692.63	485.50	.00262
.77	696.50	485.81	.00254
.78	700.51	486.13	.00246
.79	704.65	486.47	.00237
.80	708.97	486.81	.00227
.81	713.45	487.17	.00218
.82	718.16	487.55	.00208
.83	723.08	487.95	.00197
.84	728.30	488.37	.00186
.85	733.83	488.81	.00175
.86	739.77	489.29	.00162
.87	746.21	489.81	.00149
.88	753.21	490.37	.00137
.89	760.81	490.99	.00126
.90	769.15	491.67	.00113
.91	778.53	492.43	.00100
.92	789.15	493.30	.00088
.93	801.42	494.31	.00076
.94	815.58	495.47	.00065
.95	832.46	496.87	.00054
.96	852.55	498.53	.00044
.97	877.39	500.59	.00038
.98	909.50	503.25	.00026
.99	956.65	507.17	.00015

BENCH MARK AT   .153 MIN. (.153 MIN. SINCE LAST MARK)   KINETIC IN CORE AT THIS MARK.

KINETIC ANALYSIS BY FRIEDMANS METHOD (OLD TGA3 SUBROUTINE).

% CONV	EA(KCAL)	ST.DEVN.	LOG PREX	ST.DEVN.	AV.LOG AFC	ST.DEVN.	LOG(1-C)*100
4	20.055	.567	6.429	.564	6.357	.0461	1.9823
5	20.367	.485	6.587	.480	6.371	.0406	1.9777
6	20.143	.379	6.498	.374	6.386	.0311	1.9731
7	20.063	.414	6.476	.406	6.401	.0336	1.9685
8	20.349	.306	6.614	.299	6.409	.0266	1.9638
9	20.159	.276	6.539	.269	6.421	.0230	1.9590
10	20.318	.273	6.617	.265	6.427	.0238	1.9542
11	20.446	.217	6.680	.210	6.433	.0211	1.9494
12	20.408	.215	6.670	.208	6.441	.0205	1.9445
13	20.462	.177	6.698	.170	6.445	.0187	1.9395
14	20.422	.169	6.685	.162	6.450	.0177	1.9345
15	20.498	.178	6.722	.170	6.454	.0193	1.9294
16	20.588	.193	6.764	.185	6.456	.0215	1.9243
17	20.520	.198	6.737	.189	6.460	.0208	1.9191
18	20.439	.187	6.706	.179	6.465	.0190	1.9138

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

19	20.442	.145	6.711	.138	6.470	.0165	1.9085
20	20.547	.139	6.757	.132	6.470	.0179	1.9031
21	20.514	.138	6.745	.131	6.472	.0173	1.8976
22	20.413	.153	6.704	.145	6.476	.0155	1.8921
23	20.459	.139	6.724	.132	6.477	.0164	1.8855
24	20.379	.148	6.691	.140	6.479	.0157	1.8808
25	20.368	.136	6.696	.129	6.481	.0152	1.8751
26	20.348	.126	6.680	.118	6.483	.0140	1.8692
27	20.299	.126	6.661	.119	6.485	.0133	1.8633
28	20.337	.111	6.699	.104	6.485	.0138	1.8573
29	20.395	.138	6.703	.129	6.486	.0154	1.8513
30	20.551	.091	6.770	.085	6.484	.0158	1.8451
31	21.298	.235	7.067	.220	6.475	.0356	1.8388
32	20.405	.088	6.709	.082	6.488	.0130	1.8325
33	20.191	.104	6.620	.097	6.493	.0104	1.8261
34	20.177	.103	6.614	.096	6.493	.0102	1.8195
35	20.147	.116	6.601	.110	6.493	.0109	1.8129
36	20.068	.122	6.568	.113	6.495	.0104	1.8062
37	20.007	.120	6.543	.112	6.496	.0099	1.7993
38	19.995	.130	6.537	.121	6.496	.0106	1.7924
39	20.024	.138	6.549	.126	6.495	.0114	1.7853
40	20.041	.143	6.555	.132	6.494	.0118	1.7782
41	20.003	.146	6.539	.135	6.494	.0119	1.7709
42	19.953	.146	6.516	.135	6.494	.0117	1.7634
43	19.845	.136	6.472	.126	6.495	.0110	1.7559
44	19.763	.135	6.436	.125	6.496	.0112	1.7482
45	19.740	.131	6.426	.121	6.495	.0113	1.7404
46	19.717	.127	6.416	.118	6.495	.0139	1.7324
47	19.652	.131	6.387	.120	6.494	.0118	1.7243
48	19.577	.135	6.354	.124	6.494	.0129	1.7160
49	19.521	.135	6.330	.124	6.493	.0136	1.7076
50	19.473	.132	6.309	.122	6.492	.0141	1.6990
51	19.427	.132	6.288	.122	6.491	.0148	1.6902
52	19.381	.135	6.267	.124	6.489	.0157	1.6812
53	19.329	.138	6.242	.127	6.487	.0167	1.6721
54	19.264	.144	6.213	.132	6.485	.0180	1.6628
55	19.188	.149	6.178	.137	6.483	.0196	1.6532
56	19.116	.148	6.146	.136	6.481	.0209	1.6435
57	19.059	.146	6.119	.134	6.478	.0219	1.6335
58	19.001	.150	6.091	.137	6.475	.0230	1.6232
59	18.950	.157	6.066	.144	6.472	.0243	1.6128
60	18.901	.164	6.041	.150	6.467	.0255	1.6021
61	18.848	.172	6.014	.157	6.463	.0269	1.5911
62	18.795	.178	5.987	.162	6.458	.0281	1.5798
63	18.734	.183	5.956	.167	6.453	.0295	1.5682
64	18.679	.187	5.927	.170	6.447	.0307	1.5563
65	18.640	.192	5.904	.175	6.440	.0317	1.5441
66	18.590	.201	5.876	.183	6.433	.0330	1.5315
67	18.545	.204	5.850	.185	6.425	.0340	1.5185
68	18.496	.201	5.822	.182	6.417	.0348	1.5051
69	18.437	.196	5.788	.178	6.408	.0355	1.4914
70	18.412	.187	5.768	.170	6.398	.0360	1.4771
71	18.396	.184	5.750	.167	6.387	.0363	1.4624
72	18.363	.184	5.724	.166	6.375	.0369	1.4472
73	18.336	.177	5.700	.160	6.362	.0373	1.4314
74	18.312	.174	5.677	.158	6.348	.0377	1.4150
75	18.336	.175	5.673	.159	6.333	.0372	1.3979

KINETIC   *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

76	18.354	.175	5.663	.159	6.315	.0369	1.3802
77	18.349	.175	5.643	.158	6.297	.0370	1.3617
78	18.362	.164	5.629	.148	6.277	.0364	1.3424
79	18.355	.148	5.605	.133	6.256	.0361	1.3222
80	18.342	.129	5.578	.117	6.234	.0359	1.3010
81	18.348	.132	5.557	.119	6.209	.0359	1.2786
82	18.370	.140	5.539	.126	6.182	.0356	1.2553
83	18.399	.147	5.522	.132	6.151	.0352	1.2304
84	18.445	.155	5.509	.139	6.119	.0345	1.2041
85	18.467	.154	5.485	.139	6.085	.0341	1.1761
86	18.502	.152	5.462	.136	6.047	.0333	1.1461
87	18.602	.145	5.462	.132	6.005	.0311	1.1139
88	18.657	.172	5.440	.153	5.959	.0309	1.0792
89	18.709	.201	5.413	.180	5.909	.0311	1.0414
90	18.780	.230	5.387	.205	5.853	.0311	1.0000
91	18.913	.235	5.380	.209	5.790	.0291	.9542
92	18.966	.281	5.337	.249	5.724	.0309	.9031
93	19.014	.314	5.277	.279	5.644	.0324	.8451
94	19.125	.370	5.237	.327	5.557	.0349	.7782
95	19.110	.433	5.133	.382	5.458	.0396	.6990
96	19.327	.482	5.110	.423	5.345	.0416	.6021
97	18.964	.564	4.829	.510	5.211	.0522	.4771
98	19.337	.635	4.798	.553	5.026	.0537	.3010

AVERAGE ACTIVATION ENERGY =   19.900
AVERAGE LOG PREX   =   6.489
BOTH FOR 20-60 PERCENT CONVERSION

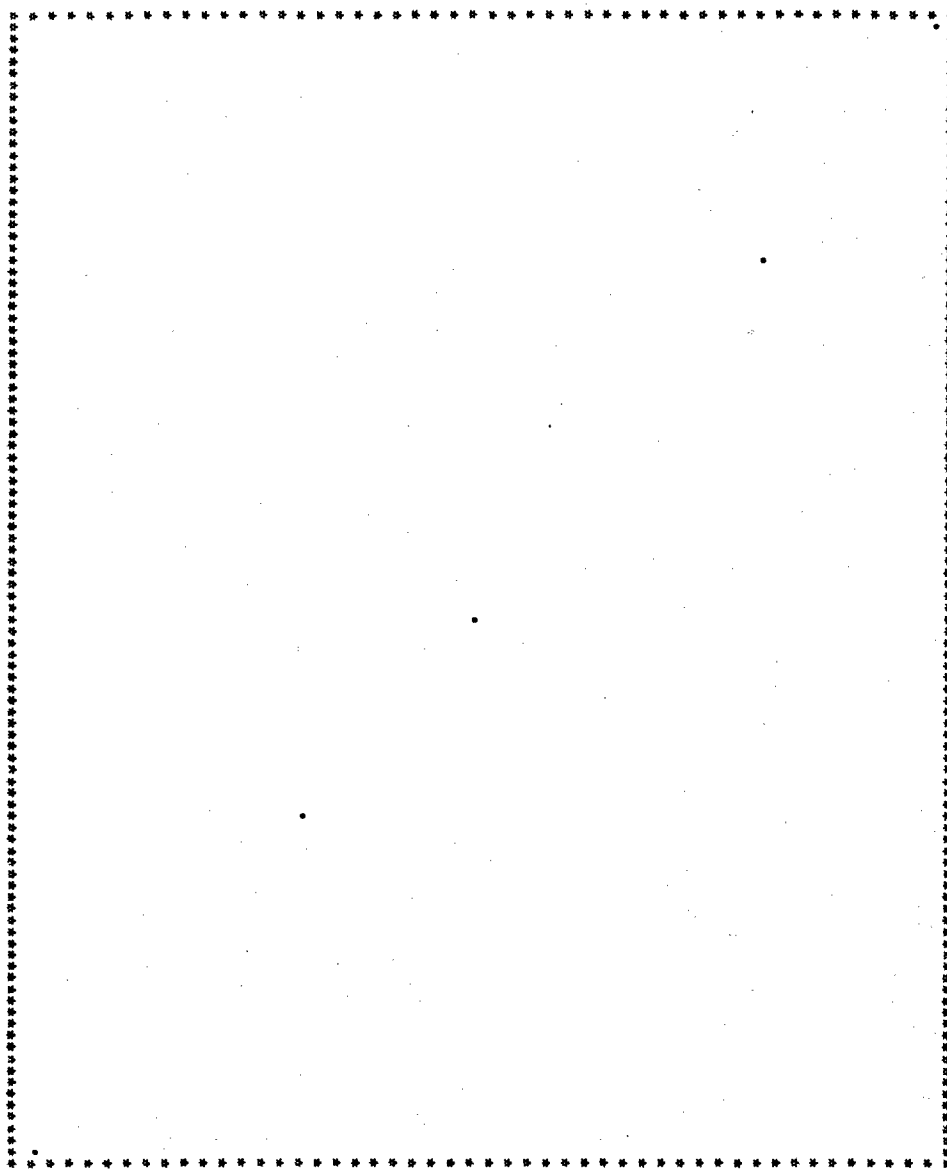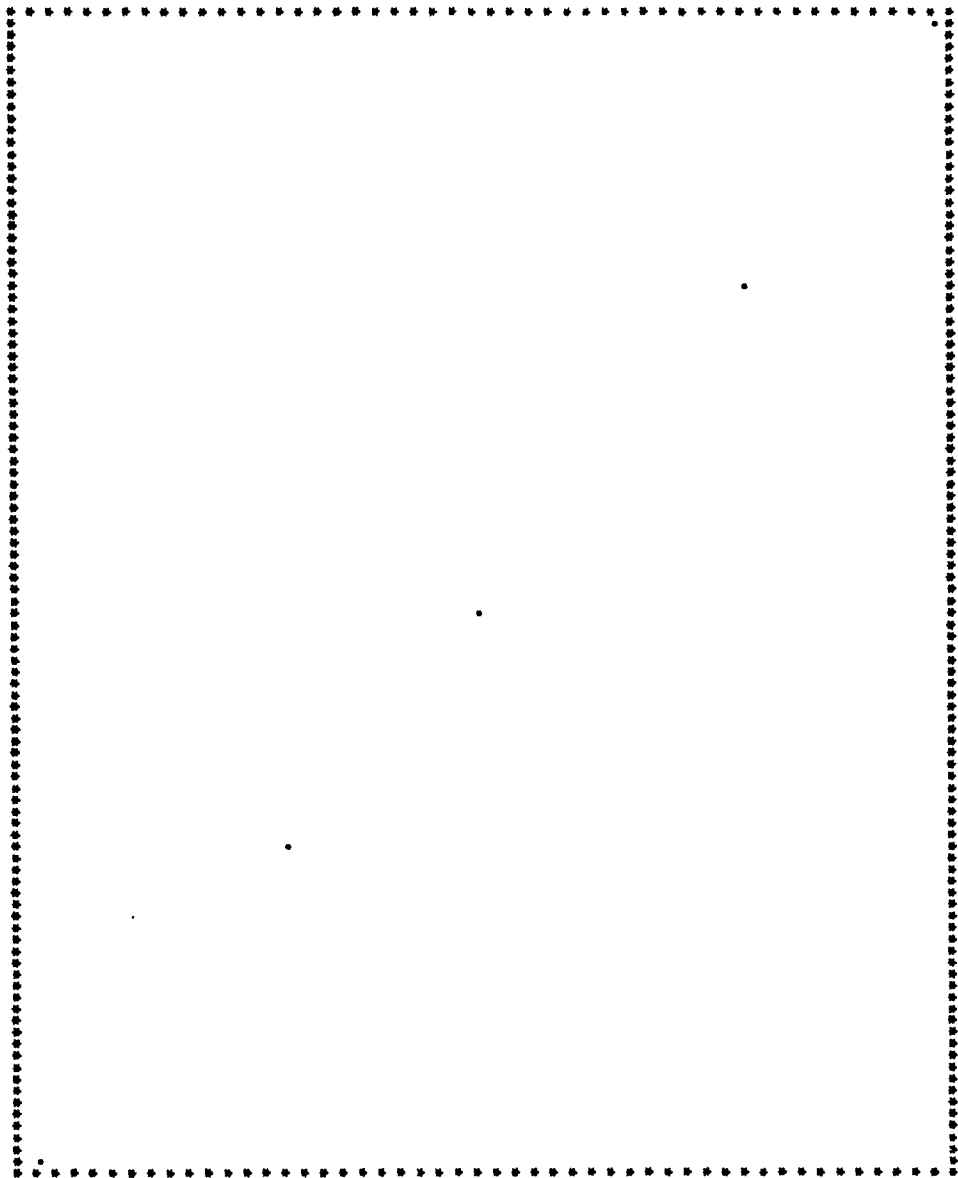KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)
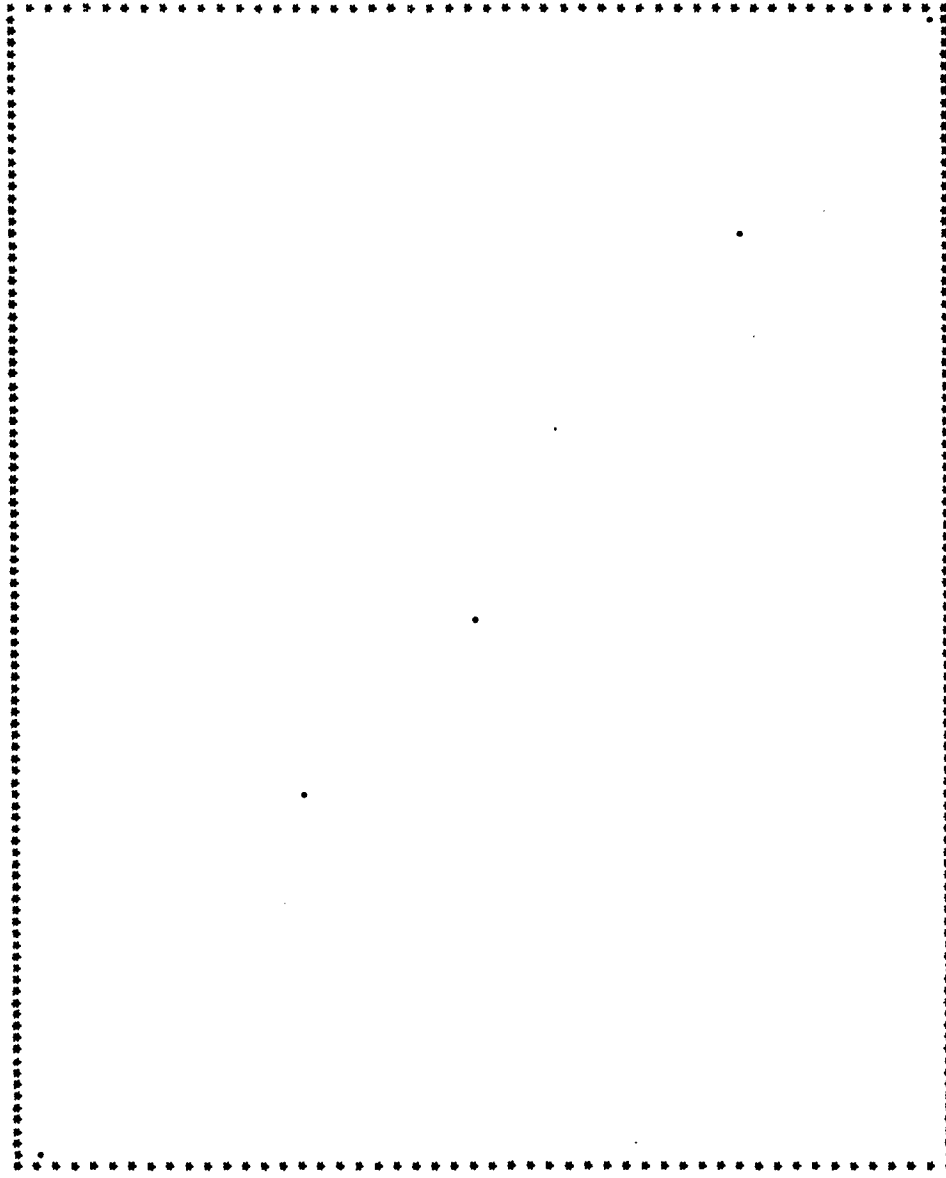
LOG RATE VS 1/TEMP
CONVERSION = 20

XMIN = .19045802E-02   XMAX = .21548153E-02   YMIN = -.29092216E+01   YMAX = -.1790d683E+01

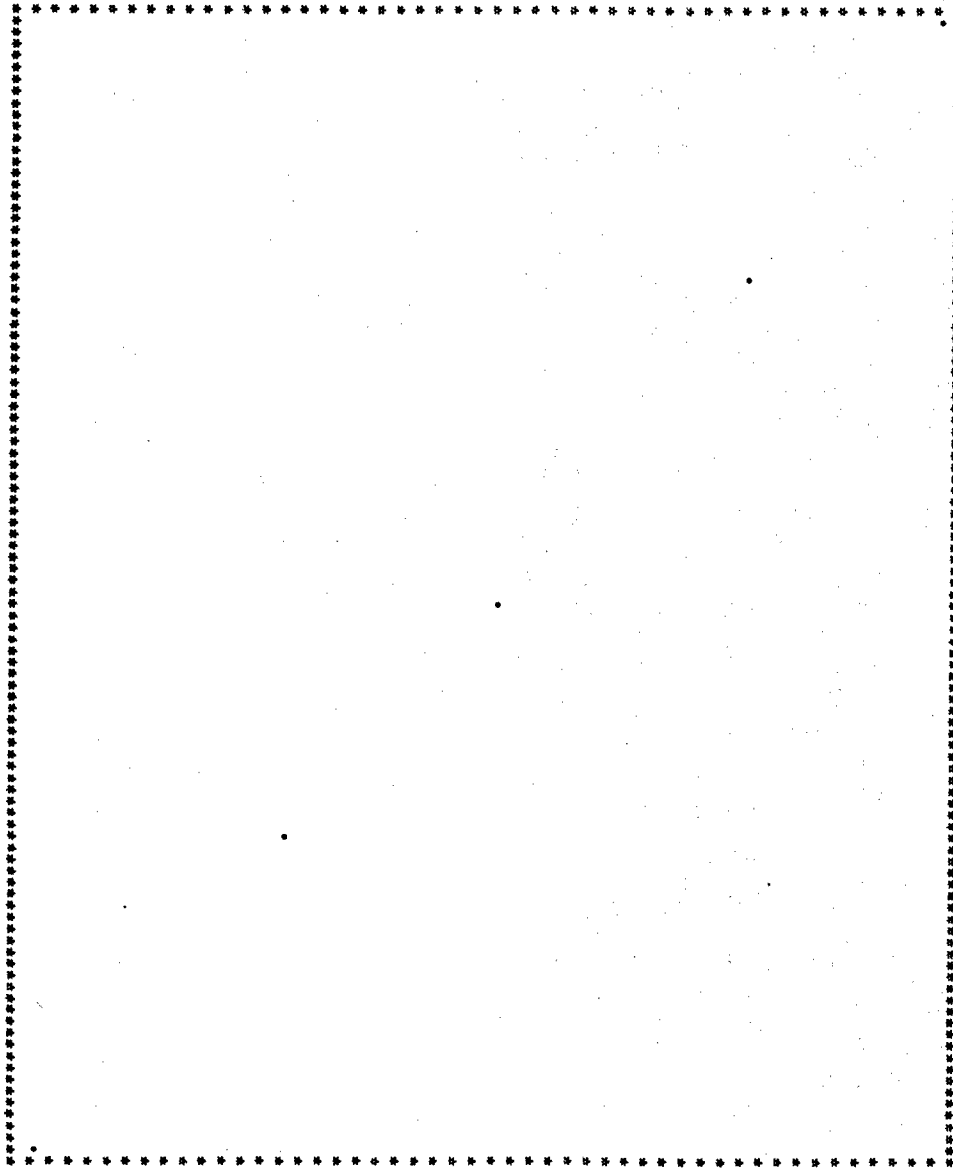KINETIC *** KINETIC SERIES FOR GOLF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 30

XMIN = .18779835E-02   XMAX = .21282555E-02   YMIN = -.27831274E+01   YMAX = -.16631890E+01
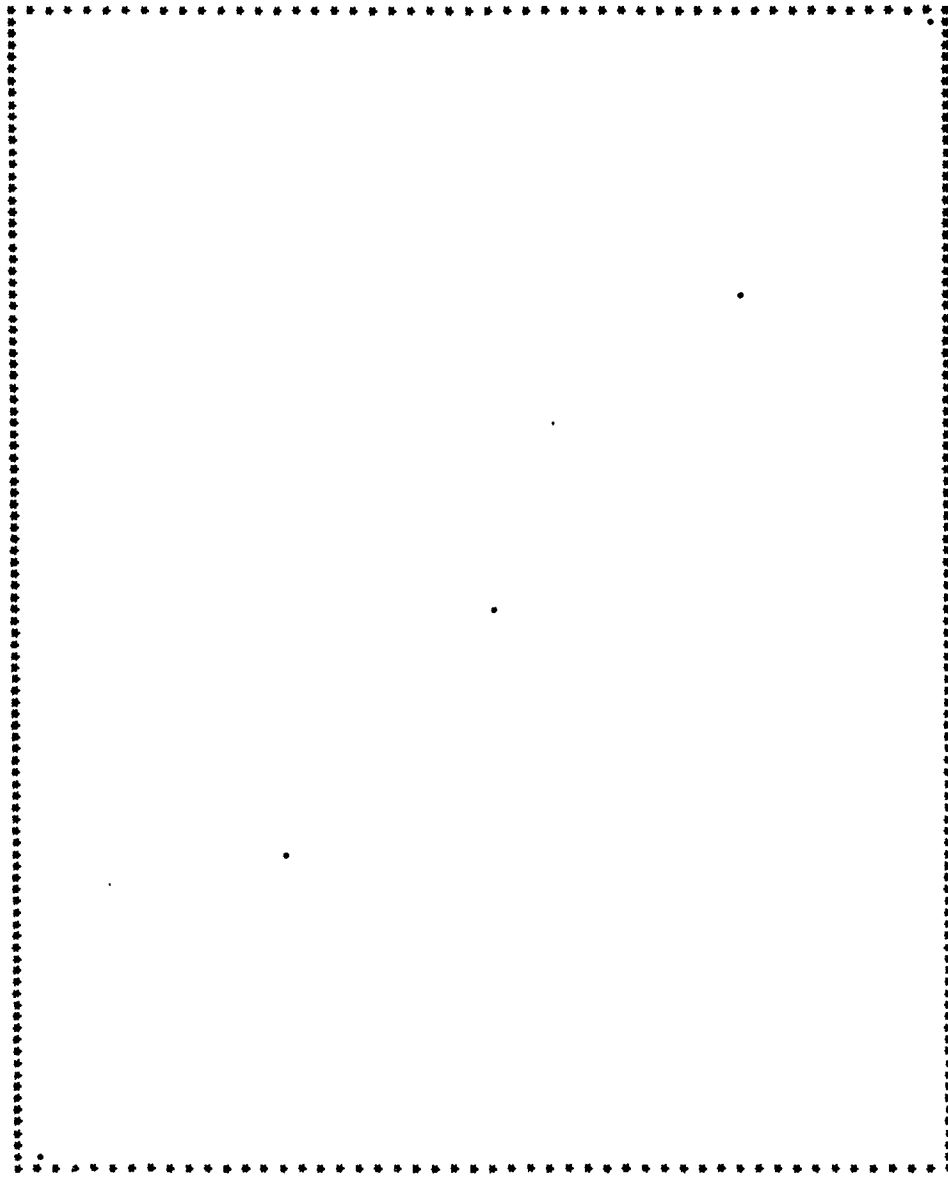
KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 40

XMIN = .18575954E-02   XMAX = .18575954E-02   YMIN = -.26648222E+01   YMAX = -.16754452E+01

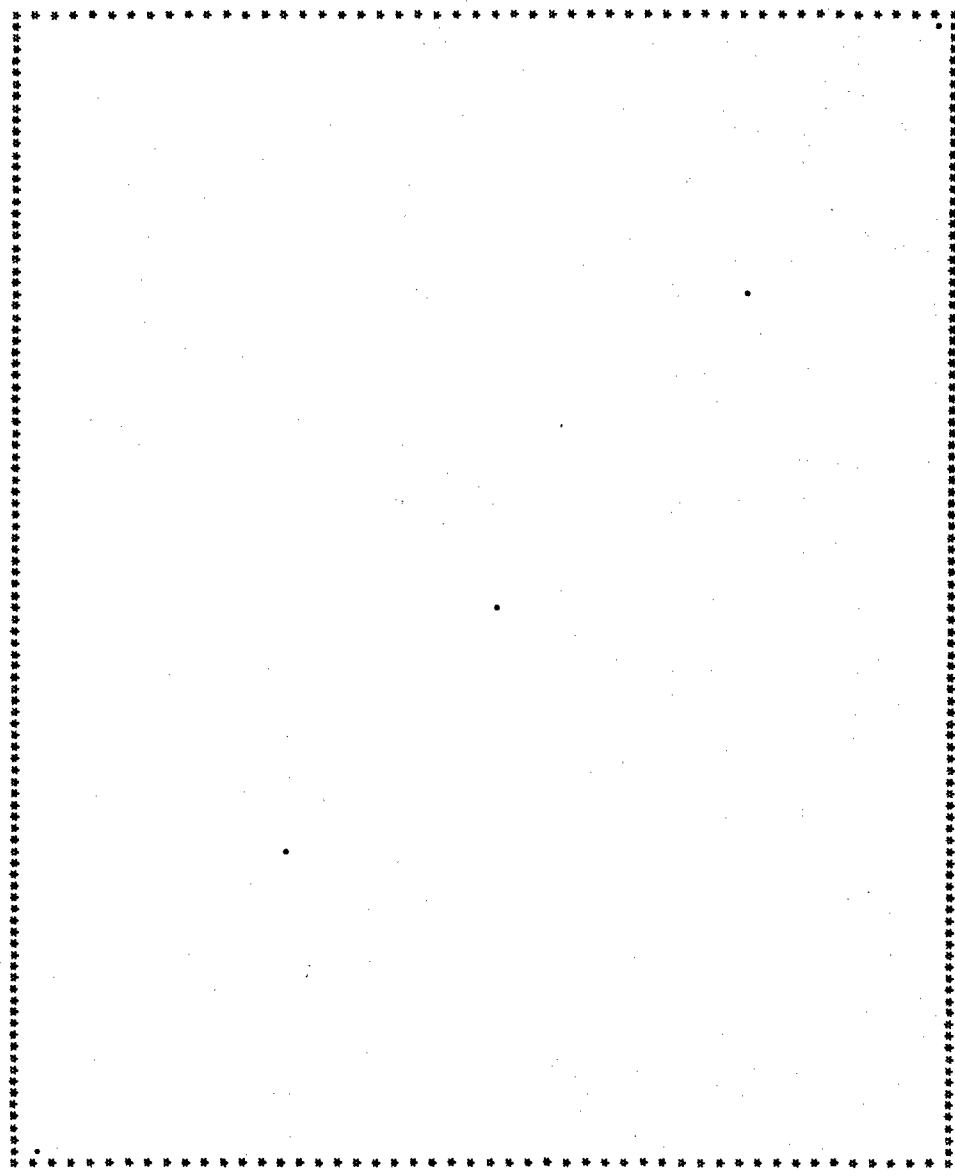KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 50

XMIN = .18407733E-22   XMAX = .20924328E-02   YMIN = -.25844744E+01   YMAX = -.15185473E+01

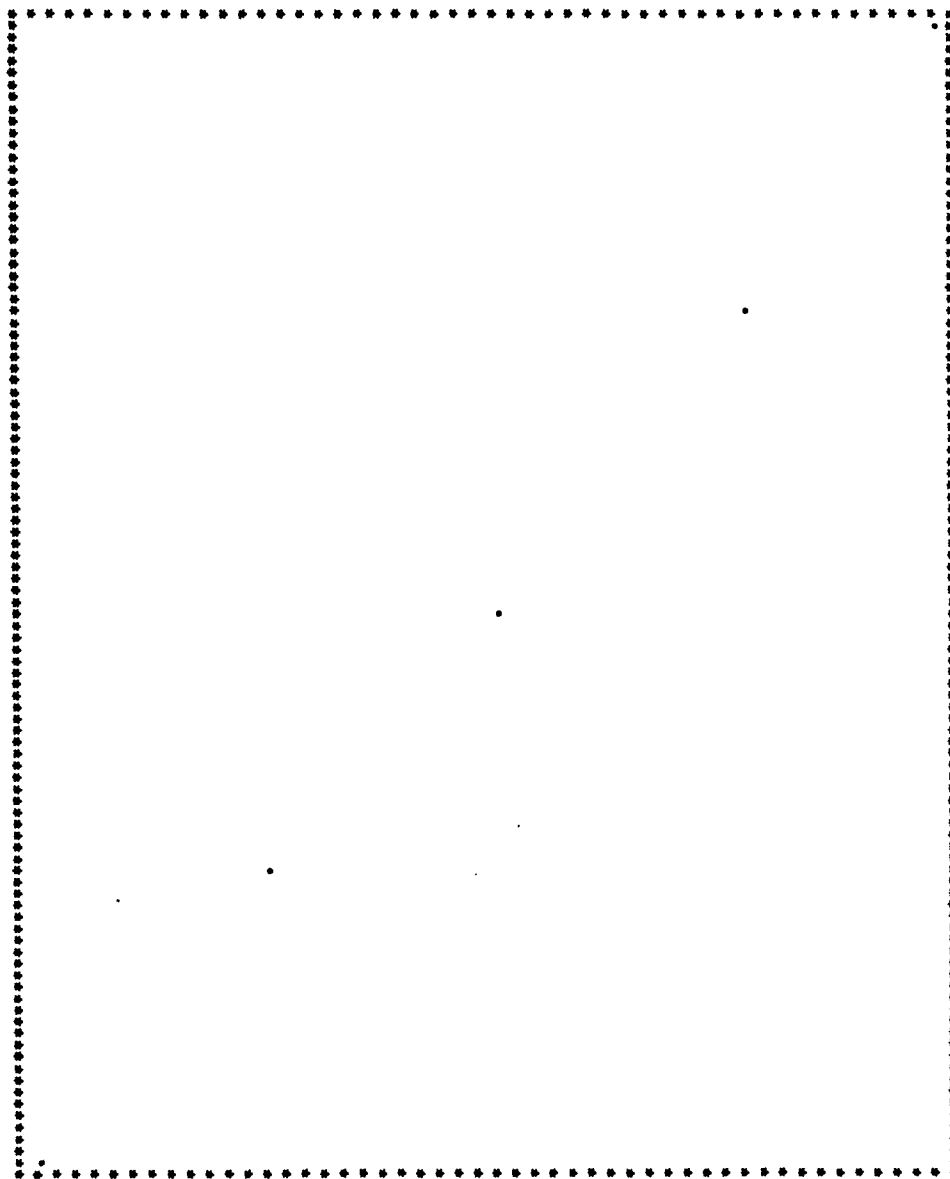KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 50

XMIN = .18263741E-02   KMAX = .20791856E-02   YMIN = -.25316745E+01   YMAX = -.14635116E+01

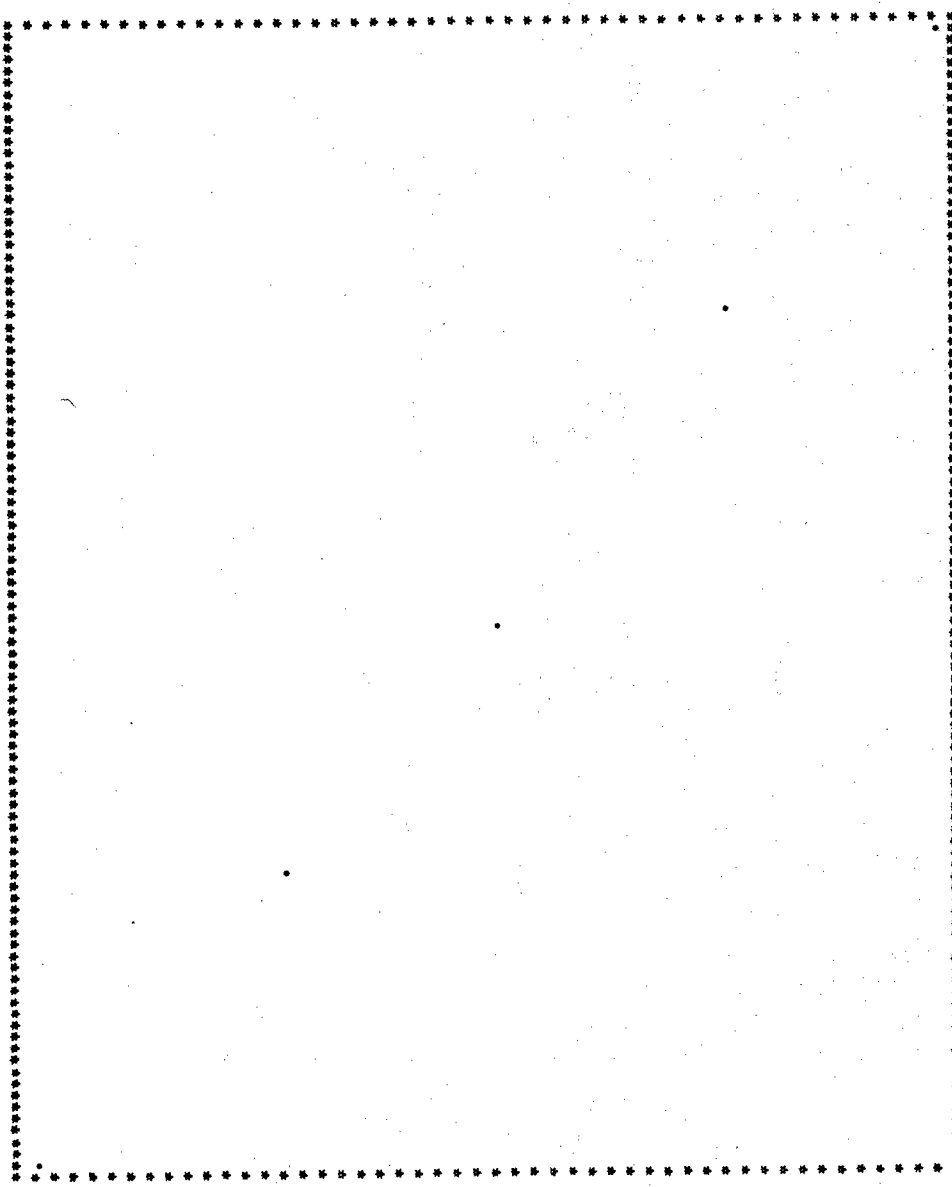KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 70

XMIN = .18124195E-02   XMAX = .20679672E-02   YMIN = -.25326664E+01   YMAX = -.15167050E+01

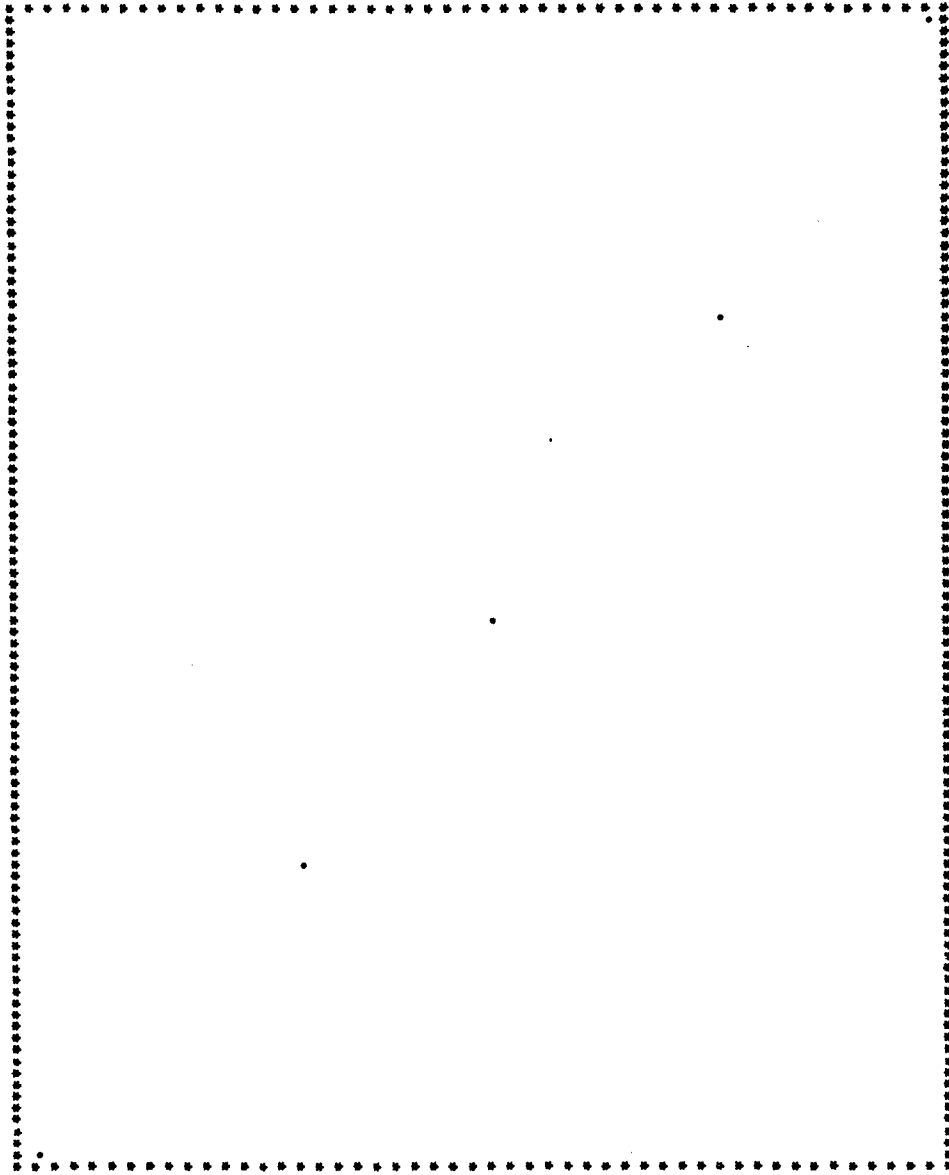KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 80

XMIN = .17979204E-02   XMAX = .23541750E-02   YMIN = -.26431449E+01   YMAX = -.16208398E+01
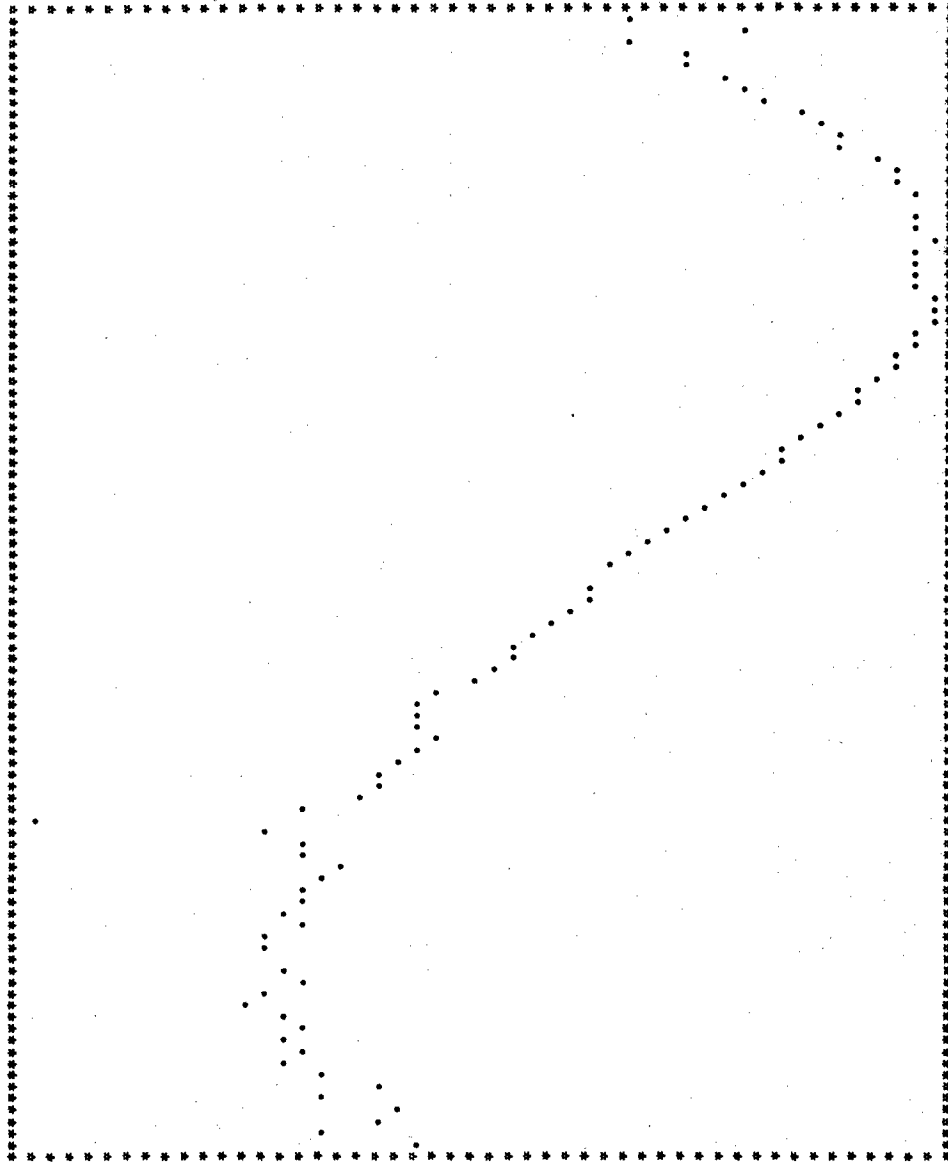
KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

LOG RATE VS 1/TEMP
CONVERSION = 90

XMIN = .17767982E-02   KMAX = .20338812E-02   YMIN = -.29455058E+01   YMAX = -.18817536E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

ACTIVATION ENERGY VS CONVERSION

XMIN = .40000000E+01   XMAX = .98000000E+02   YMIN = .18311577E+05   YMAX = .21297938E+05

KINETIC *** (INETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

PRE-EXP VS CONVERSION
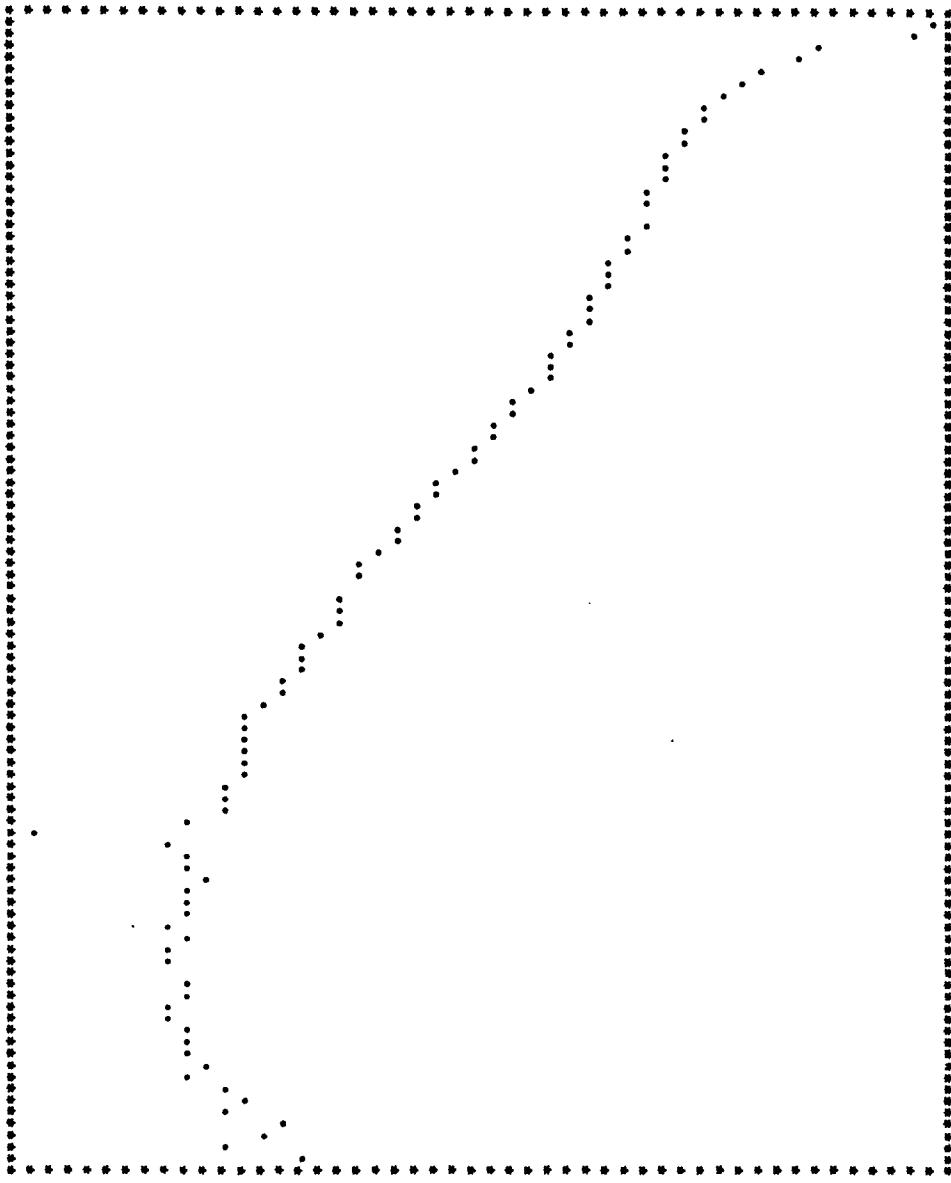
XMIN = .40000000E+01   XMAX = .96000000E+02   YMIN = .47981509E+01   YMAX = .70872916E+01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

AVER LOG AF(C) VS LOG CONVERSION REMAINING
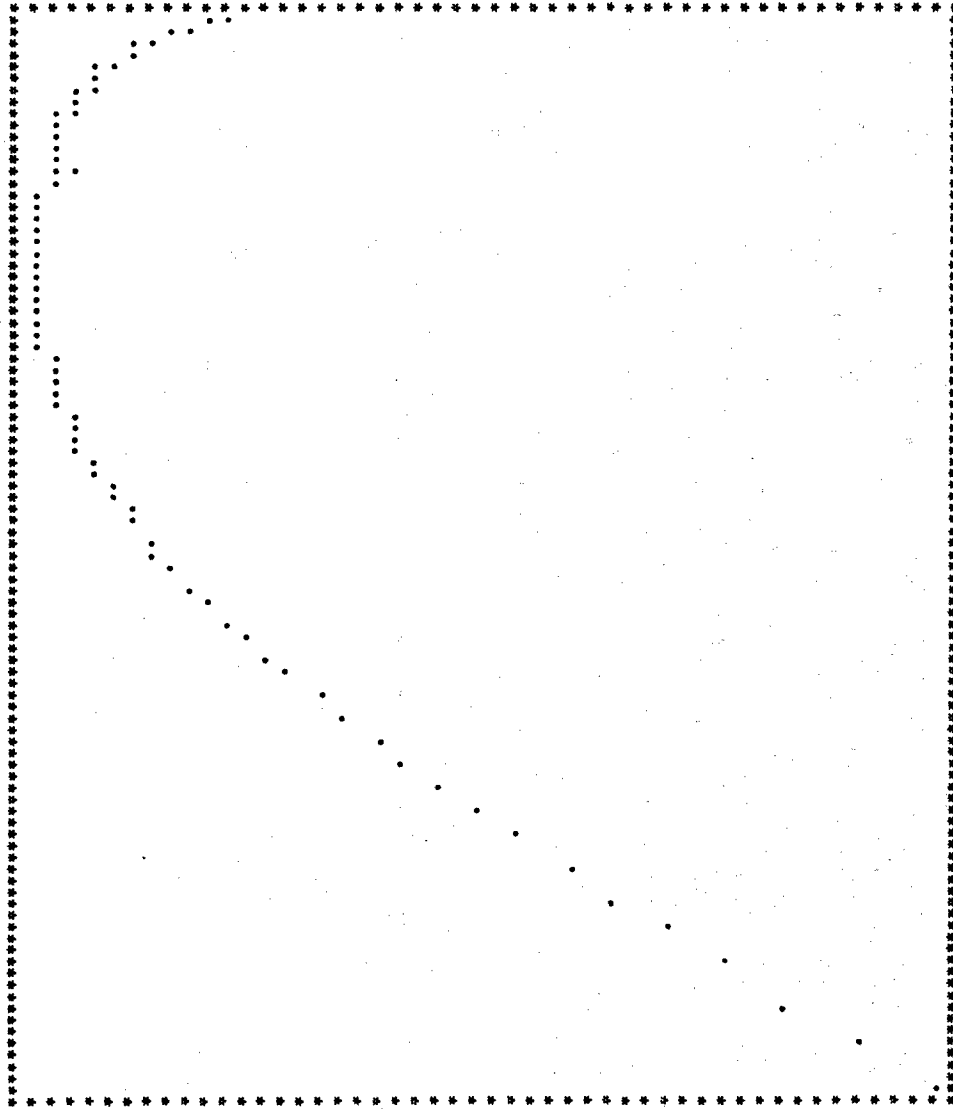
XMIN = .10000000E+01   XMAX = .19322712E+01   YMIN = .58532690E+01   YMAX = .64961707E+01

KINETIC *** KINETIC SERIES FOR GULF ATS 150 GRAM EVALUATION)

COMPOUNDED RATE OF CONVERSION VS. CONVERSION
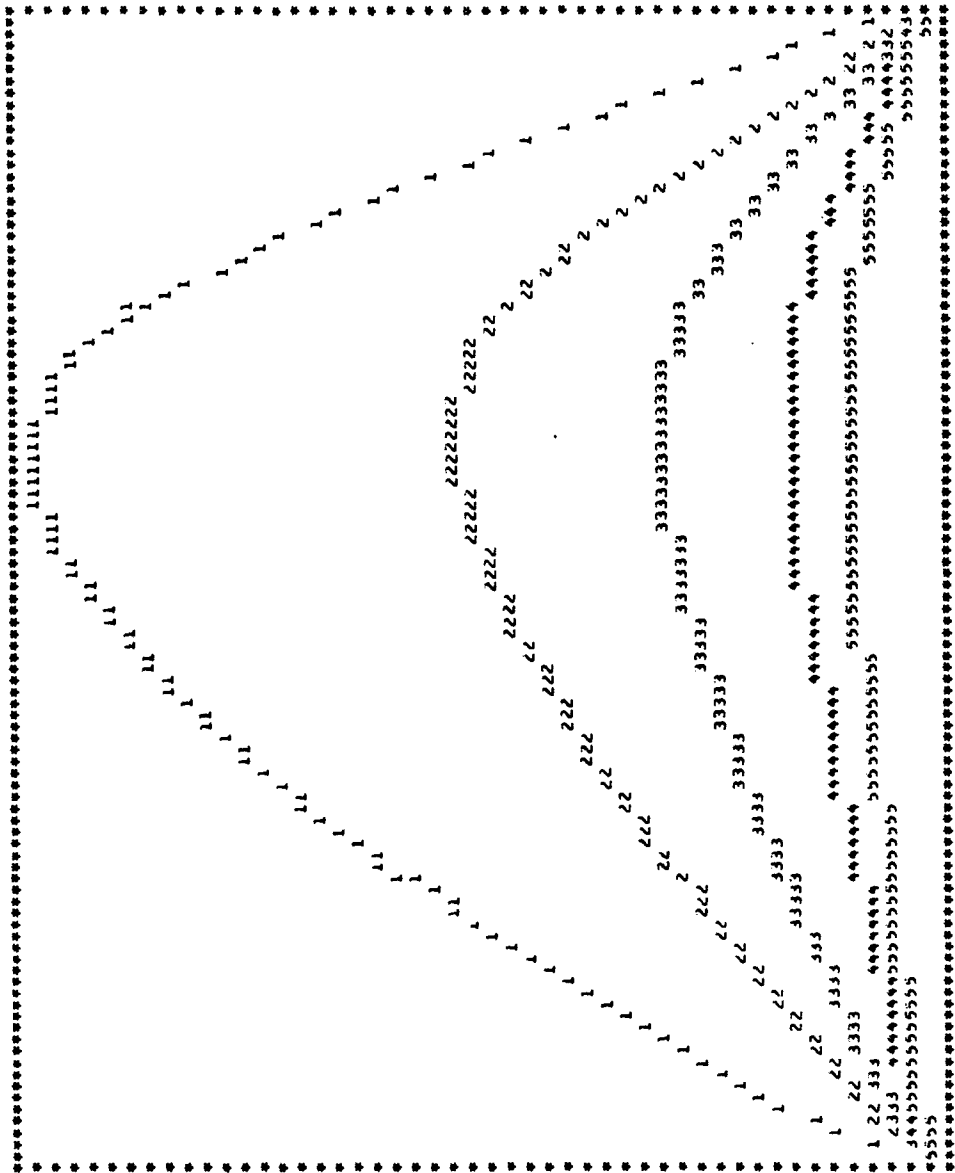
XMIN = 0.   XMAX = .99300000E+02   YMIN = 0.   YMAX = .32108535E-01

KINETIC *** KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)

THE ORDER OF THE REACTION IS: .34 THIS VALUE IS CALCULATED FROM

THE AVERAGE LOG F(C) VERSUS (1-C)

LOG OF PRE-EXPONENTIAL FACTOR= 6.5440

AVERAGE ACTIVATION ENERGY IS: 19.900

AVERAGE HEAT OF REACTION IS: 104.22 STANDARD DEVIATION: 5.20

% CONV	EA(KCAL)	ST.DEVN.	LOG PREX	ST.DEVN.	AV.LOG AFC	ST.DEVN.
5	20.367	.485	6.587	.480	6.371	.0406
10	20.318	.273	6.517	.265	6.427	.0238
15	20.498	.178	6.722	.170	6.454	.0193
20	20.547	.139	6.757	.132	6.470	.0179
25	20.388	.136	6.696	.129	6.481	.0152
30	20.551	.091	6.770	.085	6.484	.0158
35	20.147	.118	6.601	.110	6.493	.0109
40	20.041	.143	6.555	.132	6.494	.0118
45	19.740	.131	6.426	.121	6.495	.0110
50	19.473	.132	6.309	.122	6.492	.0141
55	19.188	.149	6.178	.137	6.483	.0196
60	18.901	.164	6.041	.150	6.467	.0255
65	18.640	.192	5.904	.175	6.440	.0317
70	18.412	.187	5.768	.173	6.398	.0360
75	18.338	.175	5.673	.159	6.333	.0372
80	18.342	.129	5.578	.117	6.234	.0359
85	18.467	.154	5.485	.139	6.085	.0341
90	18.780	.230	5.387	.205	5.853	.0311
95	19.110	.433	5.133	.382	5.458	.0396

APPENDIX B.4

PROGRAM KINETIC

SAMPLE OUTPUT PLOT

KINETIC SERIES FOR GULF ATS (50 GRAM EVALUATION)
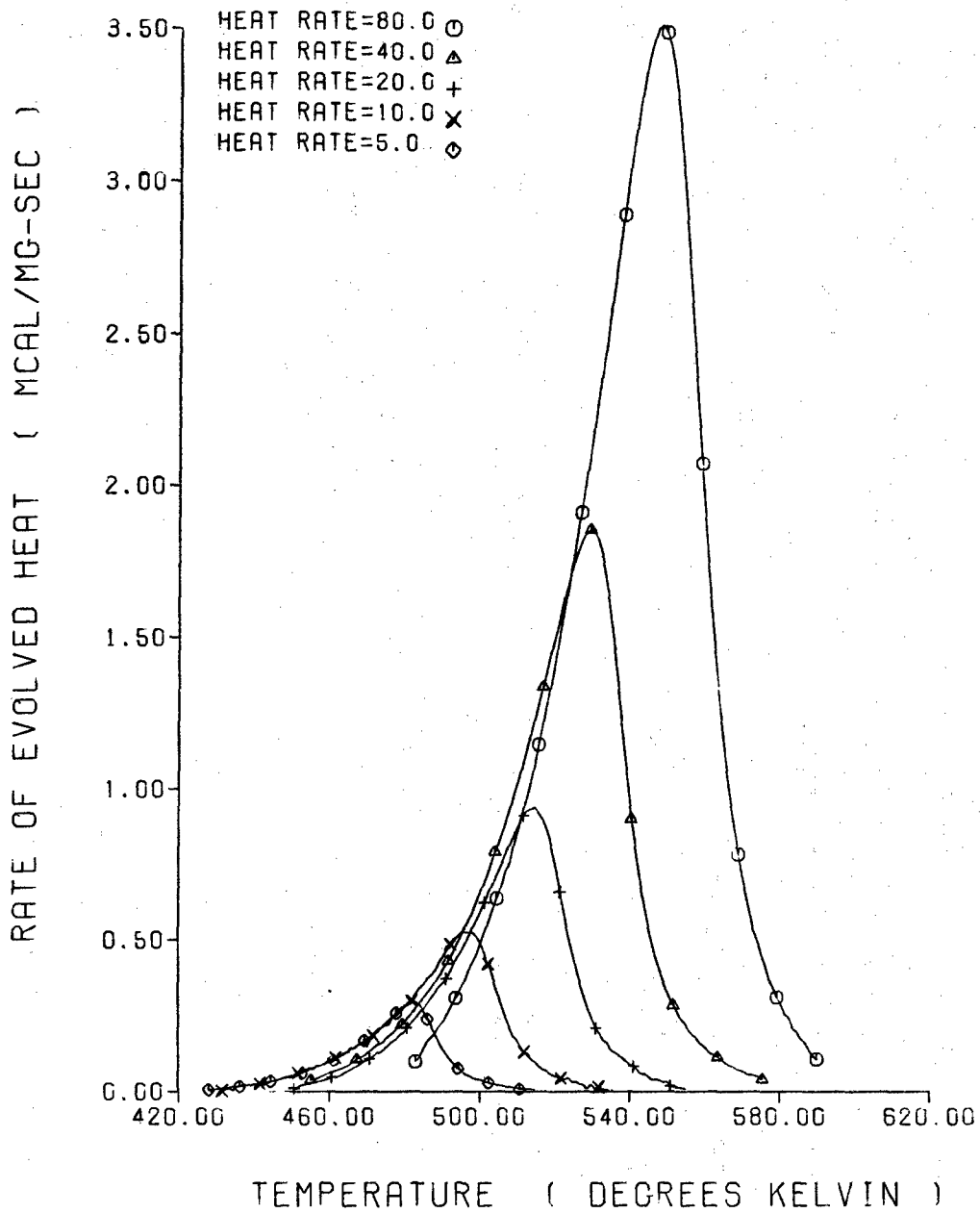
APPENDIX C.1

PROGRAM CURE

SAMPLE INPUT LISTING

PERCENT	AFC
4	.22738074E+07
5	.23515481E+07
6	.24327397E+07
7	.25166769E+07
8	.25652591E+07
9	.26368209E+07
10	.26727999E+07
11	.27127953E+07
12	.27599353E+07
13	.27884618E+07
14	.28199494E+07
15	.28420162E+07
16	.28558923E+07
17	.28849835E+07
18	.29187519E+07
19	.29486649E+07
20	.29491786E+07
21	.29666067E+07
22	.29956269E+07
23	.29992366E+07
24	.30164546E+07
25	.30267524E+07
26	.30423478E+07
27	.30581706E+07
28	.30577325E+07
29	.30601862E+07
30	.30500511E+07
31	.29878389E+07
32	.30792629E+07
33	.31093431E+07
34	.31142447E+07
35	.31142713E+07
36	.31252837E+07
37	.31345174E+07
38	.31324466E+07
39	.31244527E+07
40	.31180040E+07
41	.31200509E+07
42	.31221499E+07
43	.31292697E+07
44	.31306019E+07
45	.31279903E+07
46	.31231982E+07
47	.31189853E+07
48	.31158618E+07
49	.31105374E+07
50	.31042840E+07
51	.30969672E+07
52	.30857187E+07
53	.30709962E+07
54	.30561041E+07
55	.30420570E+07
56	.30273463E+07
57	.30086715E+07
58	.29870385E+07
59	.29619491E+07
60	.29341015E+07
61	.29033402E+07
62	.28694670E+07
63	.28349742E+07
64	.27974740E+07
65	.27544551E+07
66	.27092683E+07
67	.26513993E+07

68	.26113075E+07
69	.25604960E+07
70	.25026545E+07
71	.24377786E+07
72	.23702077E+07
73	.23013382E+07
74	.22308047E+07
75	.21521272E+07
76	.20669165E+07
77	.19796255E+07
78	.18910669E+07
79	.18032011E+07
80	.17135667E+07
81	.16178828E+07
82	.15194932E+07
83	.14172920E+07
84	.13157593E+07
85	.12159430E+07
86	.11148862E+07
87	.10104268E+07
88	.90951992E+06
89	.81072689E+06
90	.71329474E+06
91	.61633592E+06
92	.52941006E+06
93	.44017549E+06
94	.36034136E+06
95	.28706038E+06
96	.22142478E+06
97	.16267415E+06
98	.10626377E+06

APPENDIX C.2

PROGRAM CURE

SAMPLE OUTPUT

..

WHAT IS SAMPLE?

GULF ATS 50 G FUAL.

BY WHAT KINETIC METHOD WAS DATA FOUND?
MULTIPLE SCANS/DSC

ENERGY OF ACTIVATION?19.900

ORDER OR REACTION(S)? (IF THERE IS NO ORDER MAKE N=0)0

DO YOU WANT AF(C) AND G(C) PRINTED?YES

PERCENT	AFC	
14	.57156417E+07	.20852549E+07

% OF C	AF(C)	G(C)
0	.20852549E+07	0.
1	.21424113E+07	.47316073E-08
2	.21995677E+07	.93386001E-08
3	.22567241E+07	.13827375E-07
4	.22738074E+07	.18241931E-07
5	.23515481E+07	.22567145E-07
6	.24327397E+07	.26748699E-07
7	.25166769E+07	.30790742E-07
8	.25652591E+07	.34726610E-07
9	.26368209E+07	.38571954E-07
10	.26727999E+07	.42338874E-07
11	.27127953E+07	.46052689E-07
12	.27599353E+07	.49707443E-07
13	.27884618E+07	.53312183E-07
14	.28199494E+07	.56878367E-07
15	.28420162E+07	.60410763E-07
16	.28558923E+07	.63920844E-07
17	.28849835E+07	.67404722E-07
18	.29187519E+07	.70850895E-07
19	.29486649E+07	.74259639E-07
20	.29491786E+07	.77650709E-07
21	.29666067E+07	.81031524E-07
22	.29956269E+07	.84396051E-07
23	.29892366E+07	.87722241E-07
24	.30164546E+07	.91046907E-07
25	.30267524E+07	.94356418E-07
26	.30423478E+07	.97651821E-07
27	.30581706E+07	.10093025E-06
28	.30577325E+07	.10420042E-06
29	.30601862E+07	.10746950E-06
30	.30500511E+07	.11074371E-06
31	.29878389E+07	.11405547E-06
32	.30792629E+07	.11735269E-06
33	.31093431E+07	.12058451E-06
34	.31142447E+07	.12379809E-06
35	.31142713E+07	.12700913E-06
36	.31252837E+07	.13021450E-06
37	.31345174E+07	.13341949E-06
38	.31324466E+07	.13660053E-06
39	.31244527E+07	.13979731E-06
40	.31180040E+07	.14300119E-06
41	.31200509E+07	.14620731E-06

42	.31221499E+07	.14941131E-06
43	.31292697E+07	.15261058E-06
44	.31306019E+07	.15580554E-06
45	.31279903E+07	.15900115E-06
46	.31231982E+07	.16220054E-06
47	.31189853E+07	.16540455E-06
48	.31158618E+07	.16861233E-06
49	.31105374E+07	.17182446E-06
50	.31042840E+07	.17504257E-06
51	.30969672E+07	.17826773E-06
52	.30857187E+07	.18150258E-06
53	.30709962E+07	.18475109E-06
54	.30561041E+07	.18801529E-06
55	.30420570E+07	.19129499E-06
56	.30273463E+07	.19459023E-06
57	.30086715E+07	.19790370E-06
58	.29870385E+07	.20123946E-06
59	.29619491E+07	.20460144E-06
60	.29341015E+07	.20799362E-06
61	.29033402E+07	.21141987E-06
62	.28694670E+07	.21488451E-06
63	.28349742E+07	.21839068E-06
64	.27974740E+07	.22194169E-06
65	.27544551E+07	.22554425E-06
66	.27092683E+07	.22920501E-06
67	.26613993E+07	.23292924E-06
68	.26113075E+07	.23672270E-06
69	.25604960E+07	.24059020E-06
70	.25026545E+07	.24454082E-06
71	.24377786E+07	.24858975E-06
72	.23702077E+07	.25275032E-06
73	.23013382E+07	.25703248E-06
74	.22308047E+07	.26144648E-06
75	.21521272E+07	.26601110E-06
76	.20669165E+07	.27075345E-06
77	.19796255E+07	.27569824E-06
78	.18910669E+07	.28086798E-06
79	.18032011E+07	.28628484E-06
80	.17135667E+07	.29197558E-06
81	.16178828E+07	.29798392E-06
82	.15194932E+07	.30436495E-06
83	.14172920E+07	.31118338E-06
84	.13157593E+07	.31851132E-06
85	.12159430E+07	.32642344E-06
86	.11148862E+07	.33502024E-06
87	.10104268E+07	.34445341E-06
88	.90951992E+06	.35489922E-06
89	.81072689E+06	.36656393E-06
90	.71329474E+06	.37974096E-06
91	.61633592E+06	.39486314E-06
92	.52941006E+06	.41242009E-06
93	.44017549E+06	.43322366E-06
94	.36034136E+06	.45845849E-06
95	.28706038E+06	.48975216E-06
96	.22142478E+06	.52975113E-06
97	.16267415E+06	.58306846E-06
98	.10626377E+06	.66085747E-06

```
DO YOU WANT ANOTHER PLOT?NO
      STOP
      031200 MAXIMUM EXECUTION FL.
       .467 CP SECONDS EXECUTION TIME.
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APPENDIX C.3

PROGRAM CURE

SAMPLE OUTPUT PLOT

REACTION WINDOW PLOT
SAMPLE: GULF ATS 50 G EVAL.
MULTIPLE SCANS/DSC
E= 19.900