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14.

KEY WORDS

LINK A

LINK B

LINK C

ROLE

WT

ROLE

WT

ROLE

WT

Solar Spectrum

Infrared Spectrum

Atomic Lines

ic

AFCRL-73-0349

Infrared Solar Spectrum Observed from a Balloon-Borne Spectrometer
Between 9300 and 11000 Å and Between 12000 and 19000 Å

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Bedford, Massachusetts 01730

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ABSTRACT

Records are presented of the infrared solar spectrum in the 0.9 - 1.1 μ and 1.2 - 1.9 μ regions, observed from altitudes up to 30 km, with a resolution of 0.5 \AA . The spectra show many new solar absorption lines which appear only at high altitude records, where the telluric absorptions are eliminated.

SUMMARY

This report completes the presentation of the results obtained during the balloon flight performed August 7, 1967. The flight details were described in a separate report.⁽¹⁾ During this flight, high altitude atmospheric transmittance data was obtained, using the sun as the source. The spectral region scanned was from 1 to 2 μ , with a resolution of $\sim 0.5\overset{\circ}{\text{A}}$.

Partial results from this flight were presented in previous publications, which included a few representative lines in the 1-2 μ region⁽²⁾ and the complete data obtained in the 1.1 μ region⁽³⁻⁴⁾ (10800 - 12150 $\overset{\circ}{\text{A}}$). The present report completes the data in the 1-2 μ region. The results are presented in the form of an atlas, following similar procedures to those described in Ref. 2-3. The Michigan atlas,⁽⁵⁻⁶⁾ the Arizona-NASA atlas,⁽⁷⁻⁸⁾ the Jungfraujoeh atlas⁽⁹⁻¹⁰⁾ and recently calculated line intensities and positions⁽⁴⁾ were used for line identifications.

ACKNOWLEDGMENTS

Acknowledgement is made to the National Center for Atmospheric Research which is sponsored by the National Science Foundation, for use of its Control Data 6600 Computer.

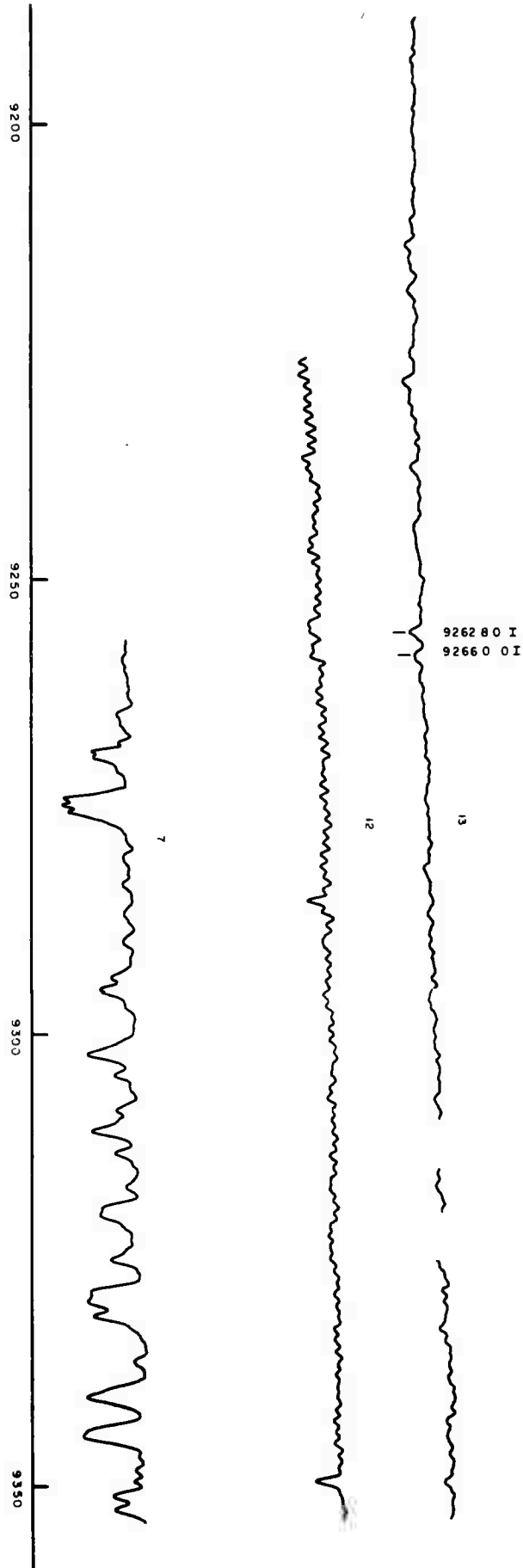
Our thanks to Charles Garwood, Steve Smith and John Van Allen for valuable assistance on the data reduction.

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DEFLECTION



4
FIG 1 SEC 1

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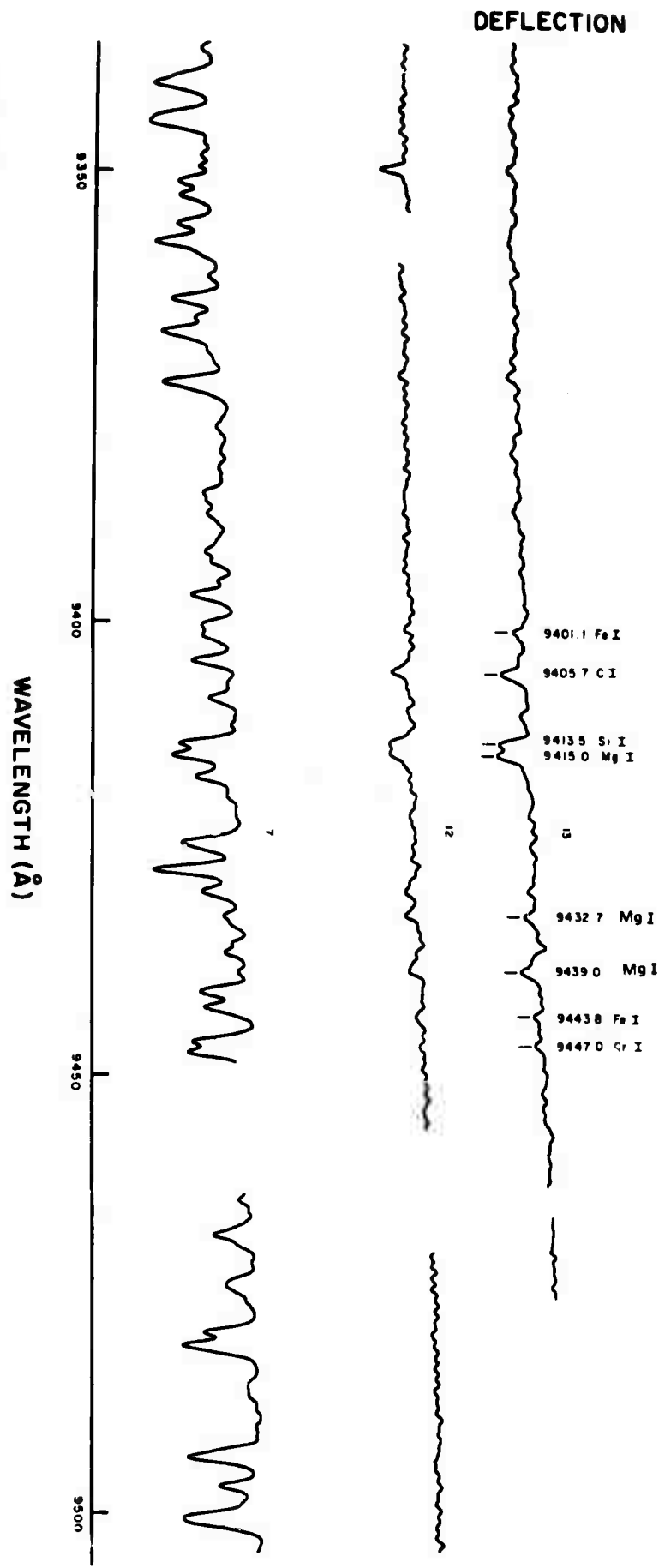
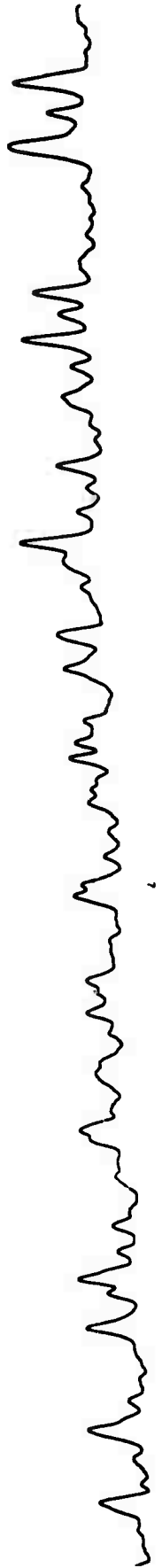


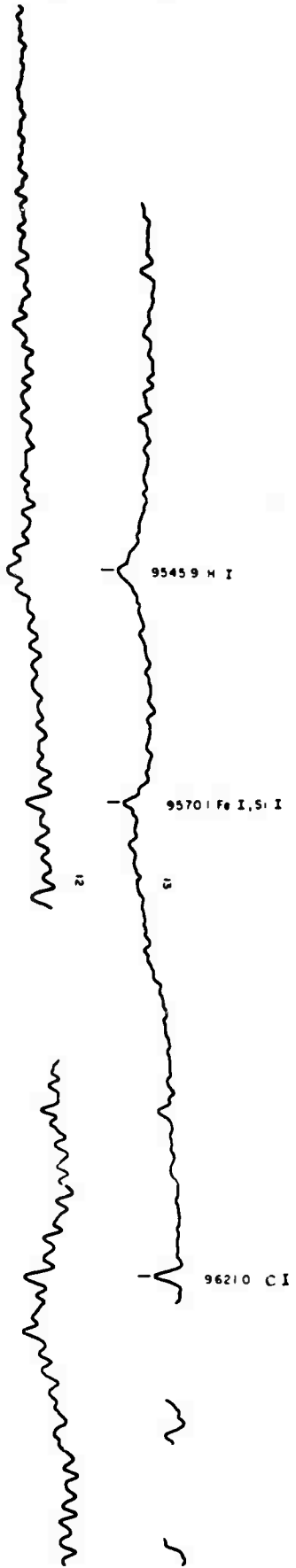
FIG 1 SEC 2

FIG 1 SEC 3

WAVELENGTH (Å)



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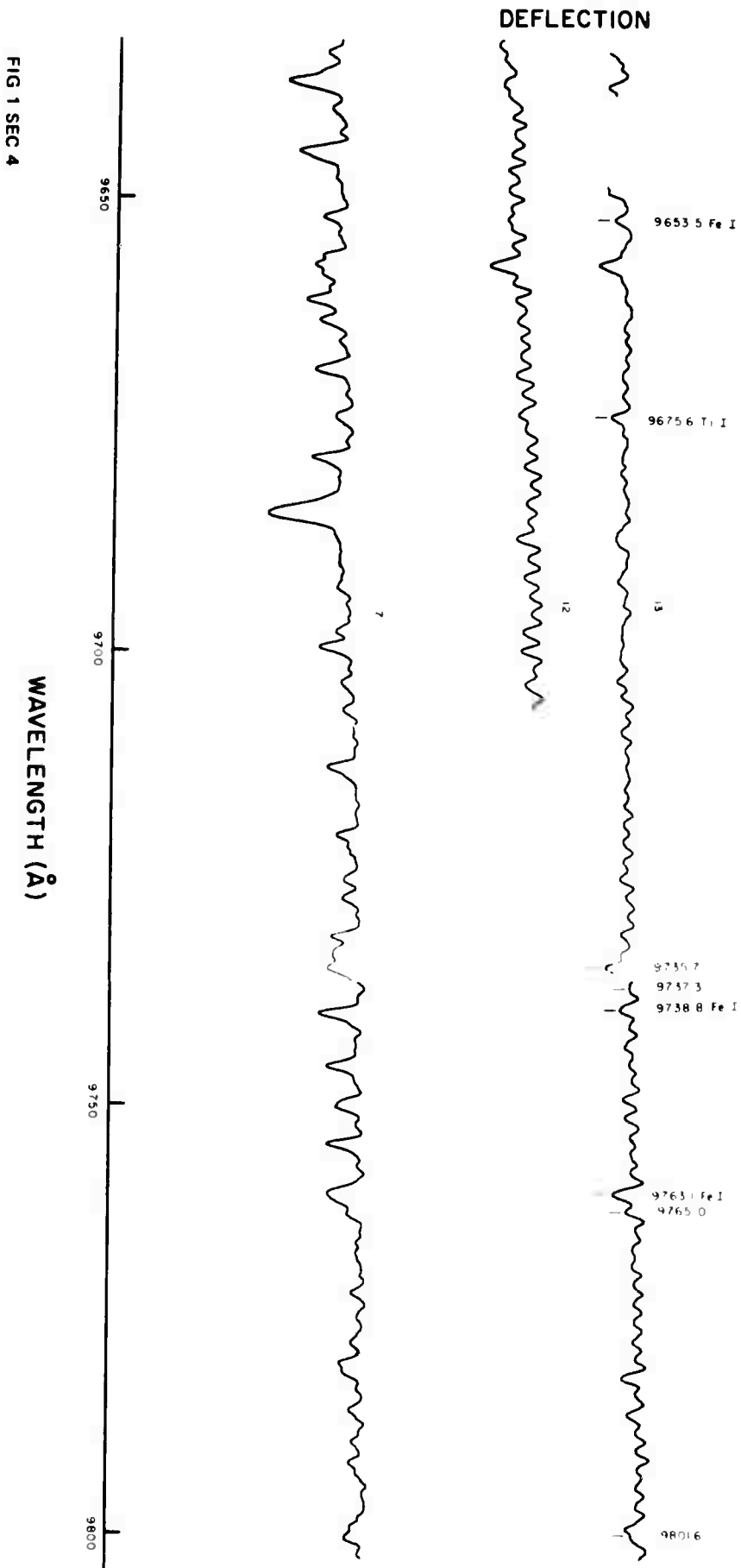


FIG 1 SEC 4

WAVELENGTH (Å)

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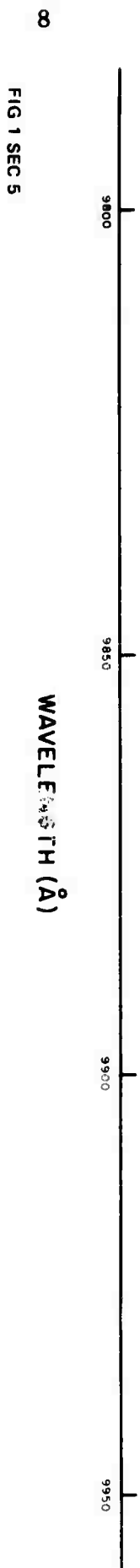


FIG 1 SEC 5

WAVELENGTH (Å)

DEFLECTION

WAVELENGTH (Å)

FIG 1 SEC 6

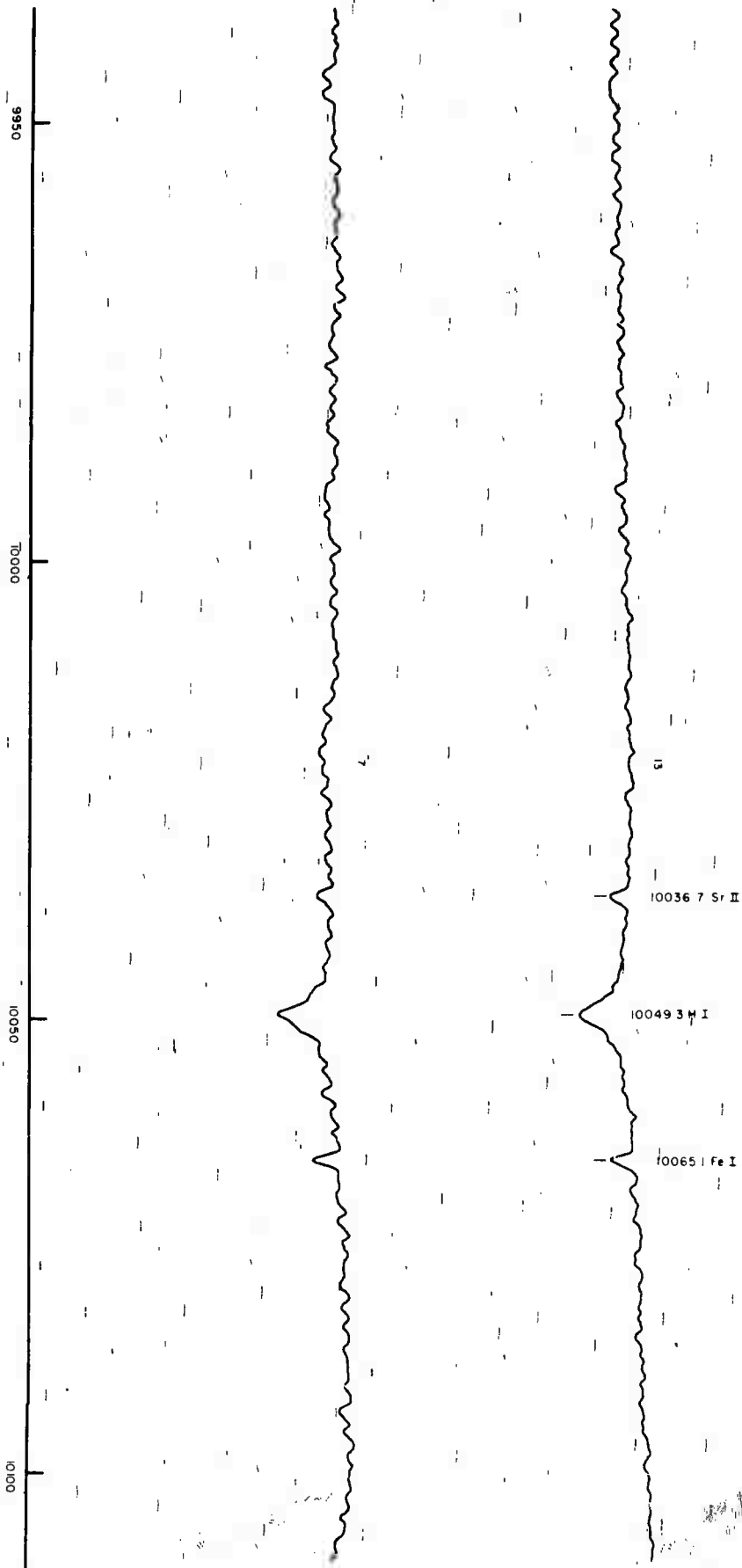
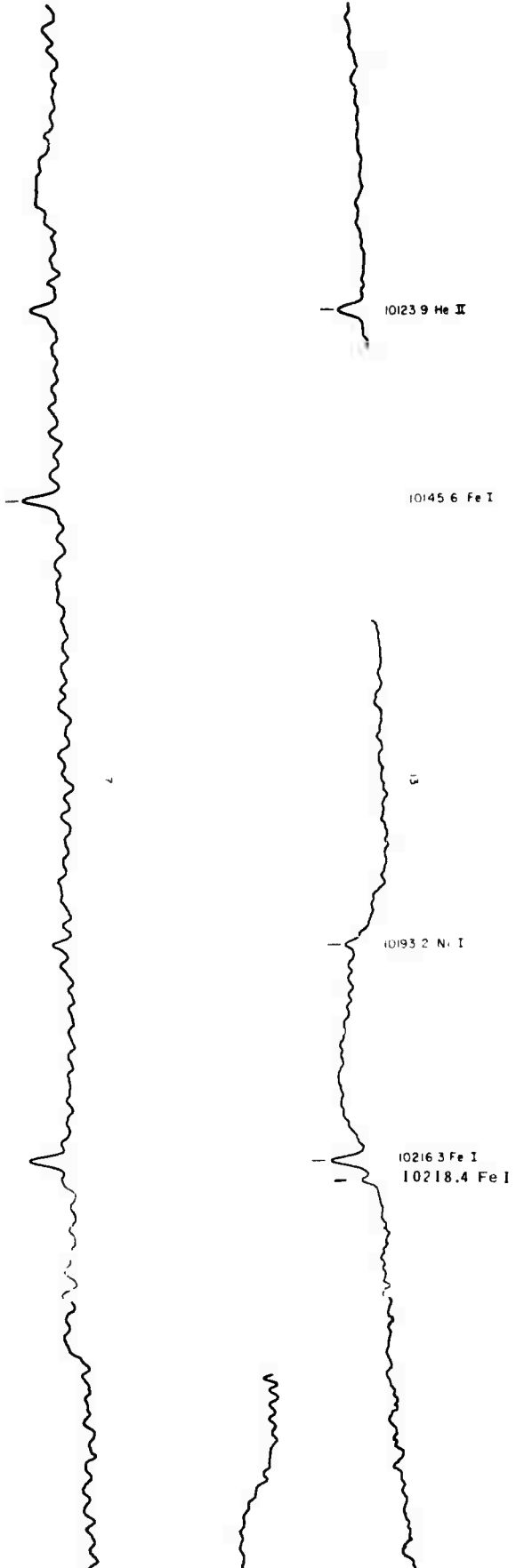


FIG 1 SEC 7

WAVELENGTH (Å)



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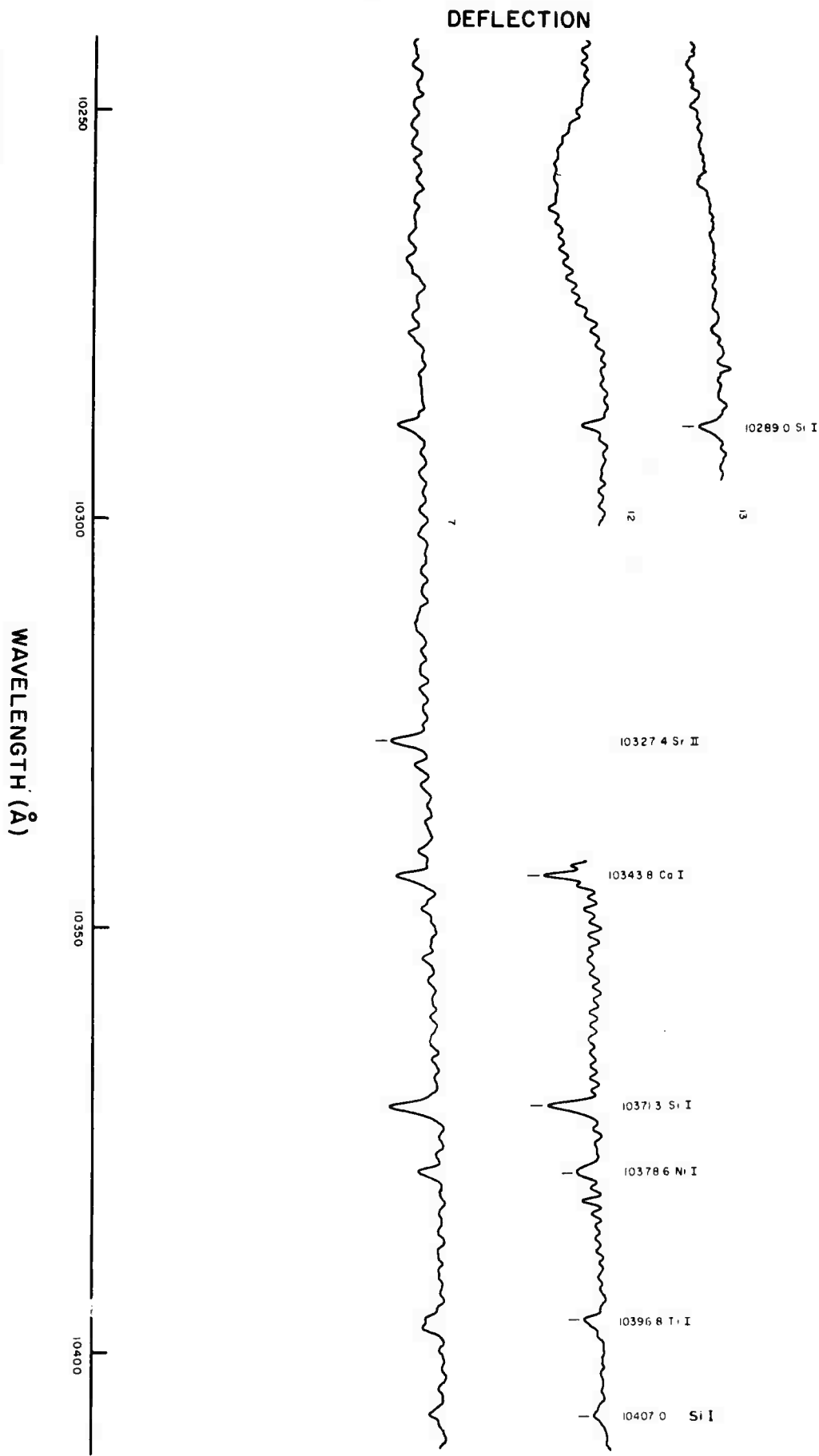


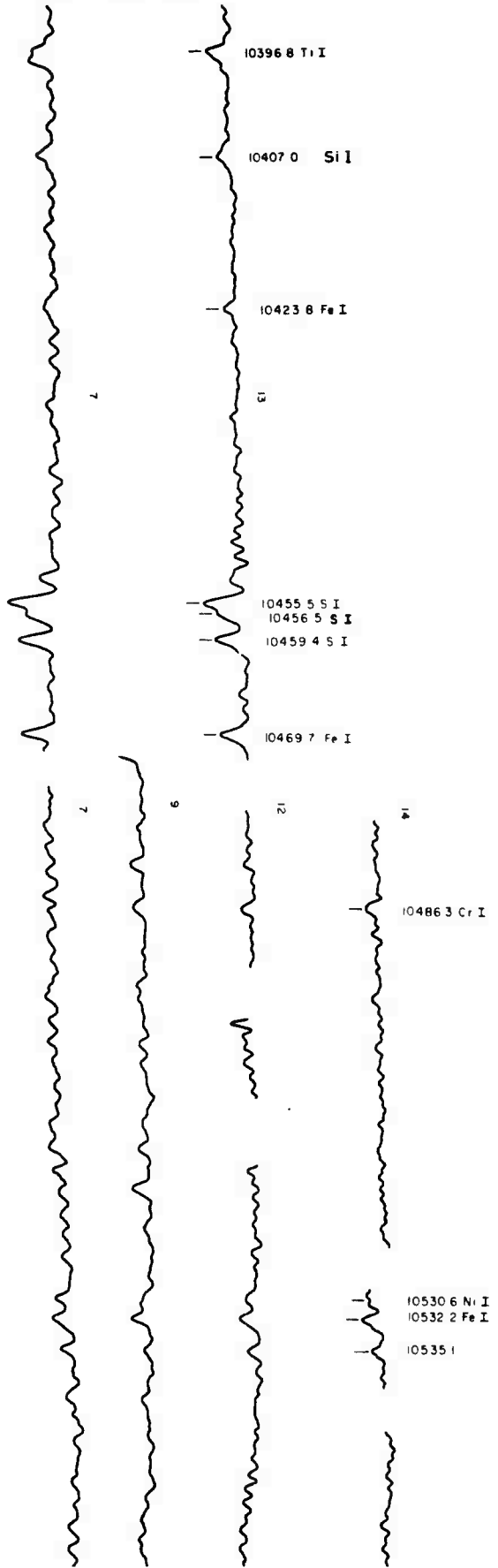
FIG 1 SEC 8

FIG 1 SEC 9

WAVELENGTH (Å)



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DEFLECTION

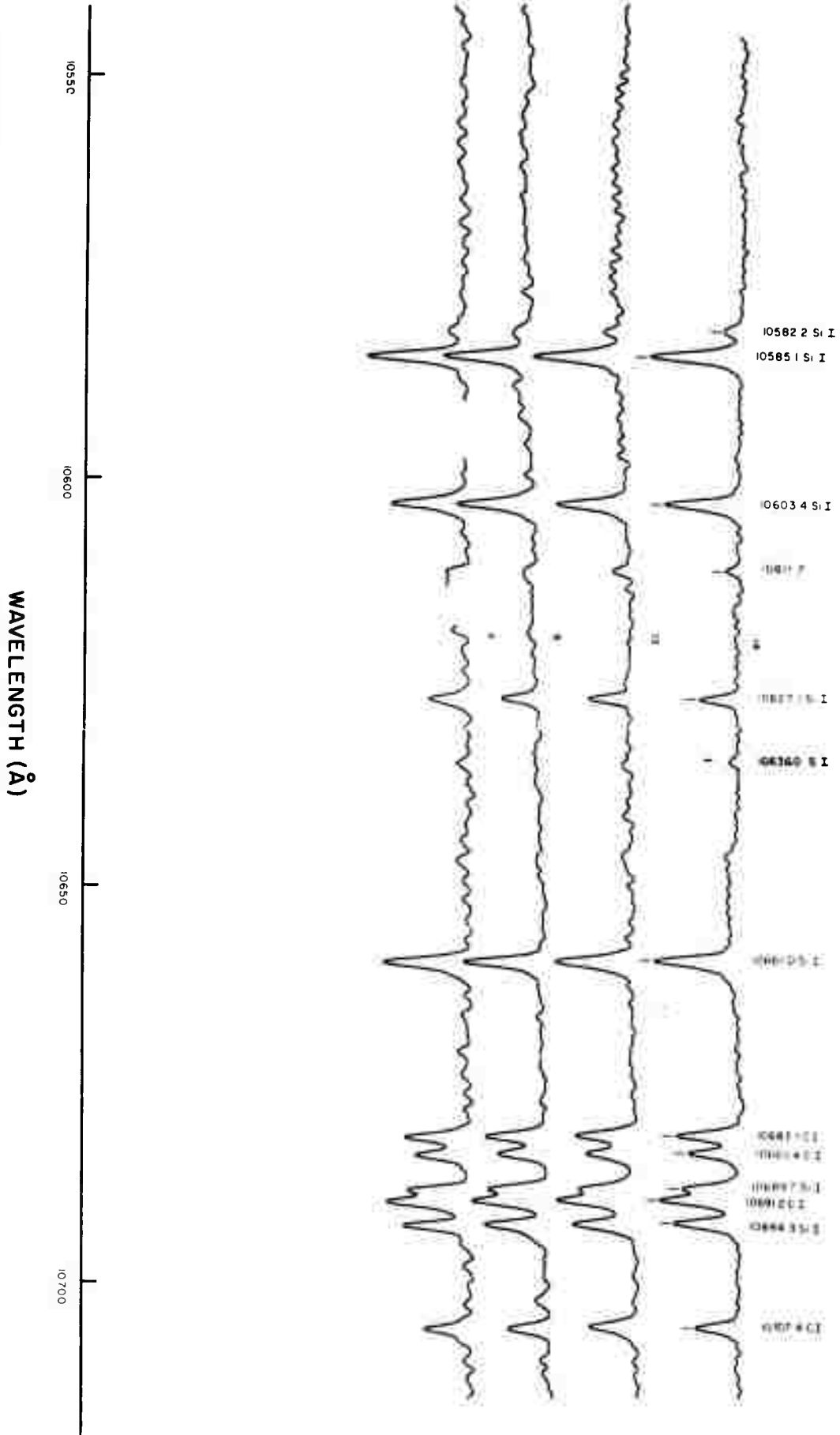


FIG 1 SEC 10

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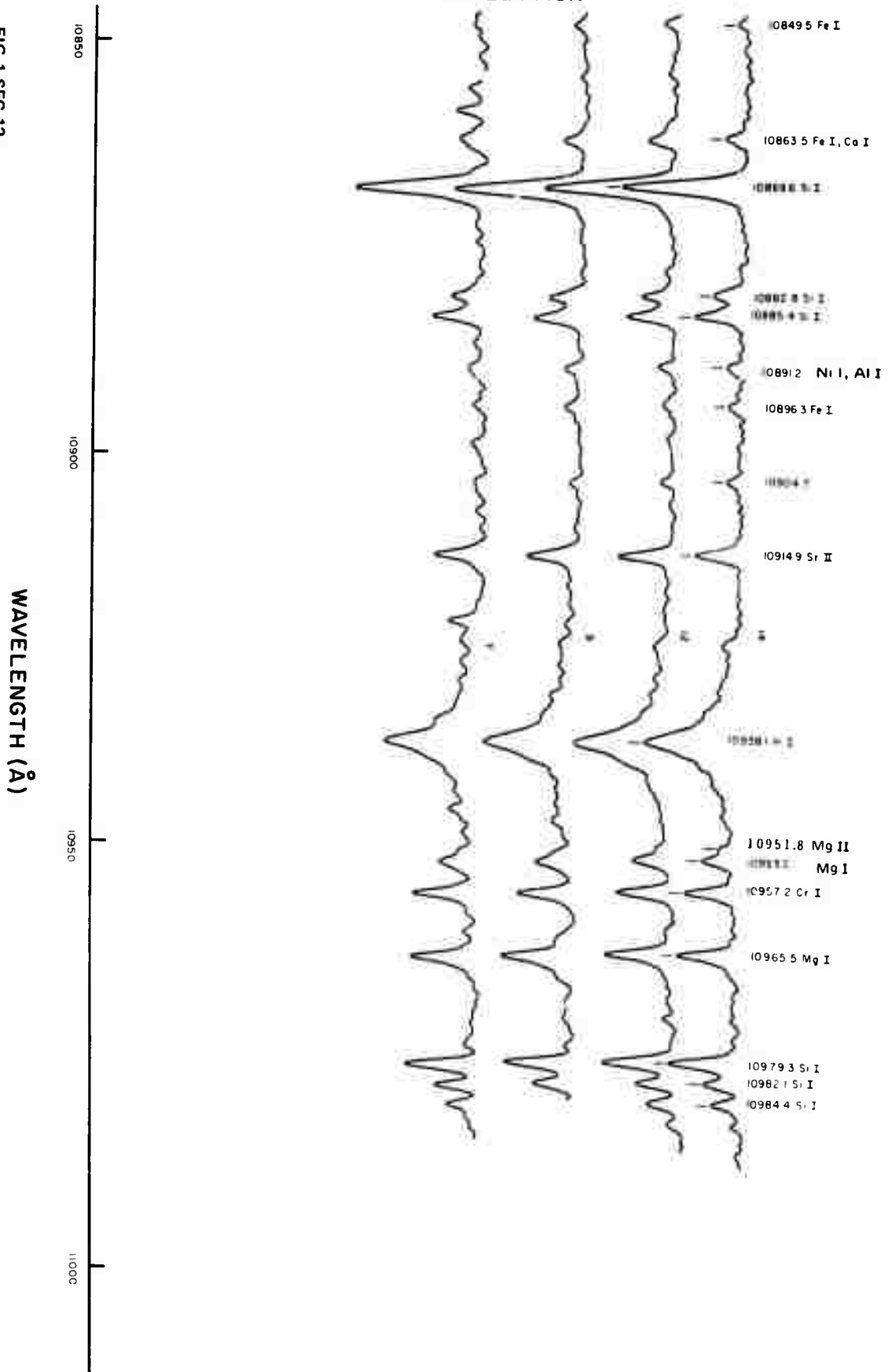


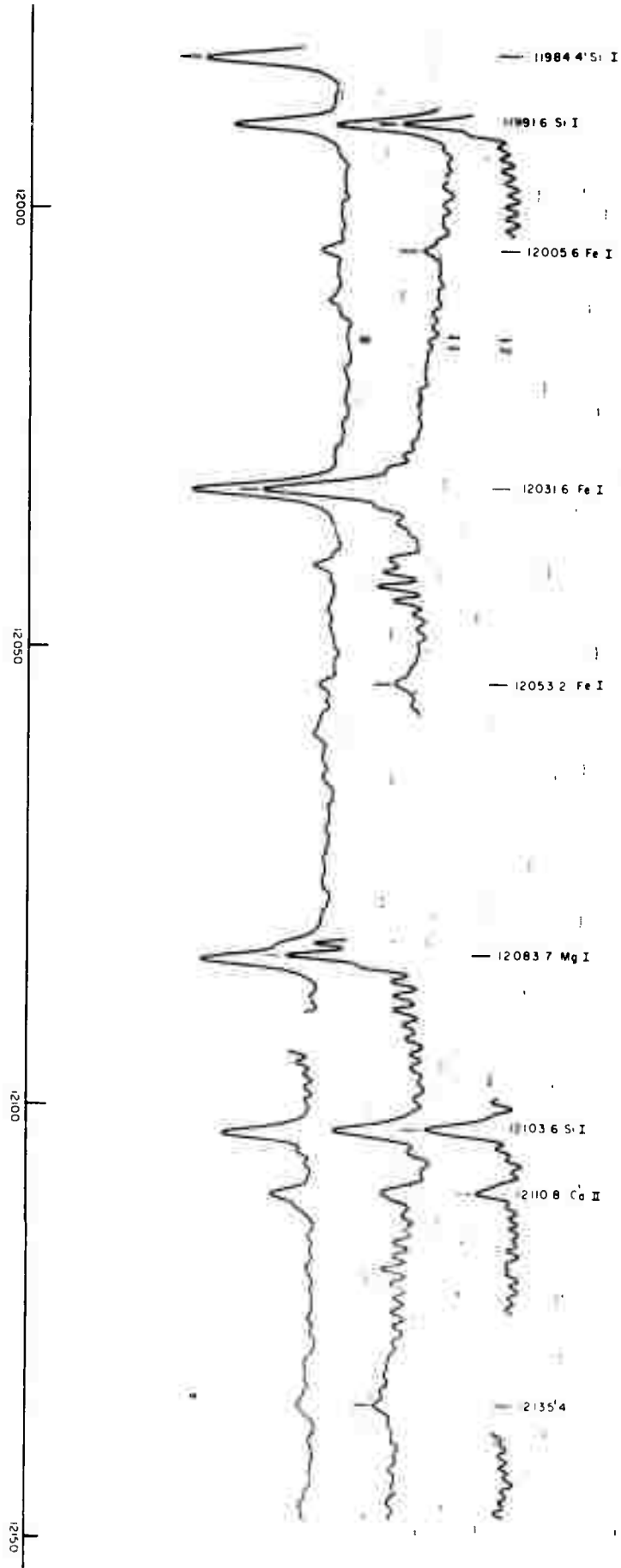
FIG 1 SEC 12

WAVELENGTH (Å)

DEFLECTION

FIG 2 SEC 1

WAVELENGTH (Å)



DEFLECTION

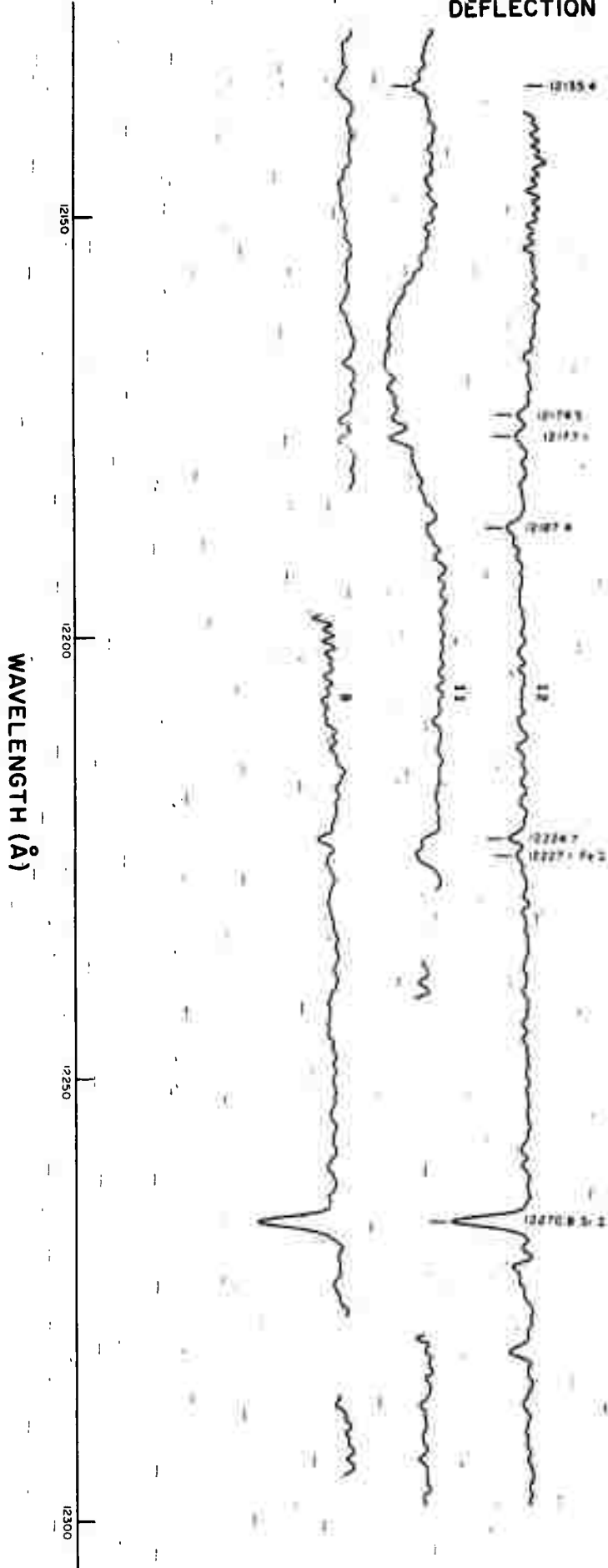


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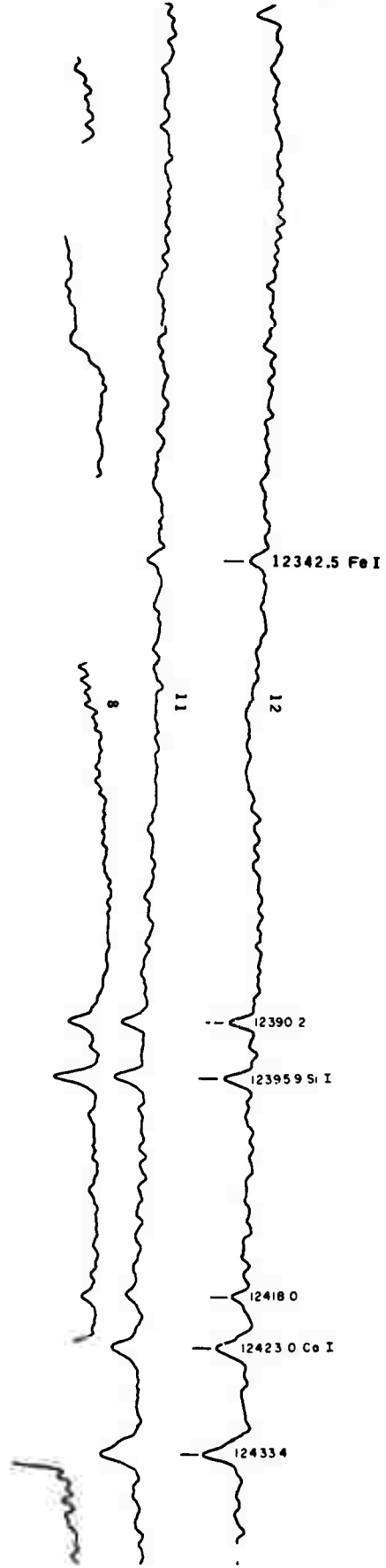
WAVELENGTH (Å)

FIG 2 SEC 3

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

WAVELENGTH (Å)

12450

12500

12550

12423.0 C I

12433.4

8

11

12

12522.1 C I

12549.5 C I

12562.2 C I

12569.1 C I

12581.6 C I

12584.1

12588.2

FIG 2 SEC 4

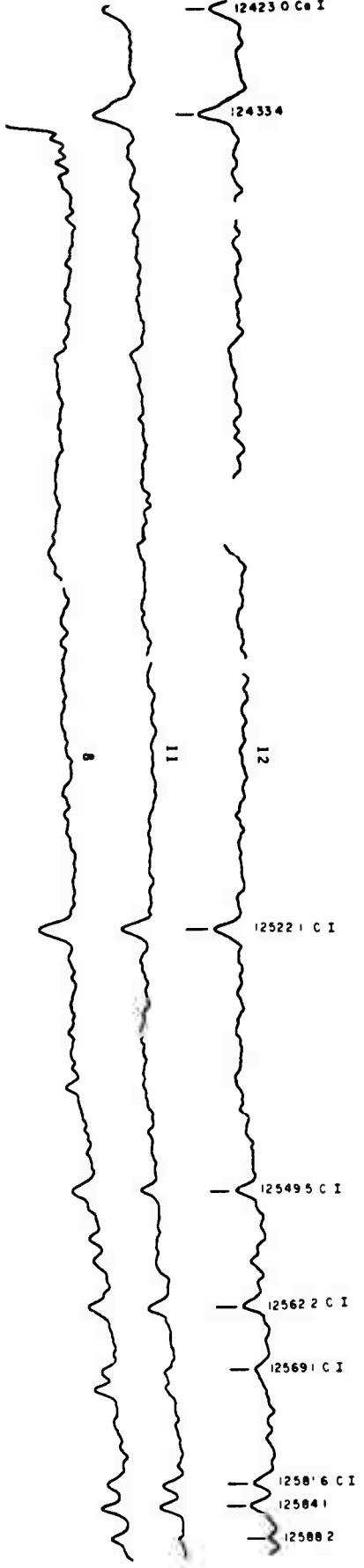
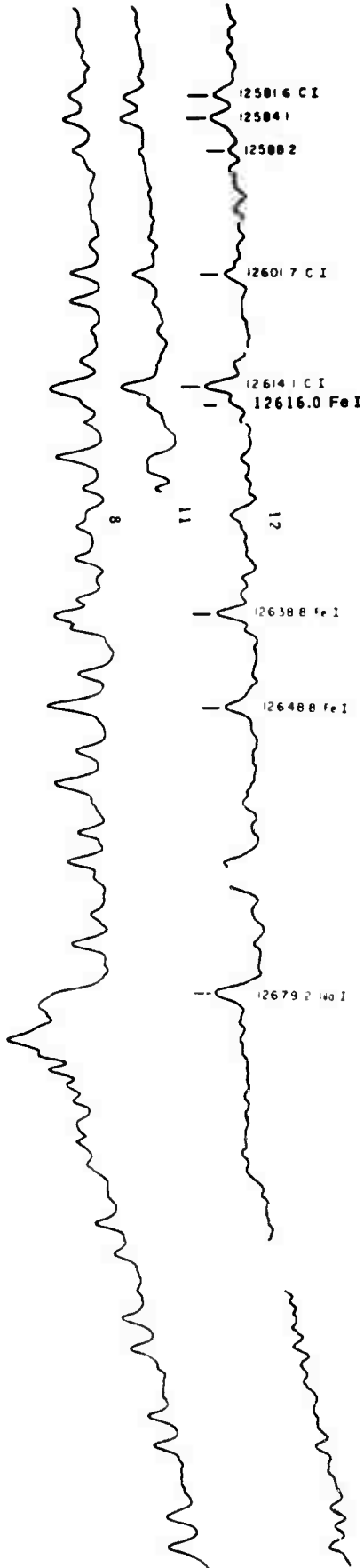


FIG 2 SEC 5

WAVELENGTH (Å)



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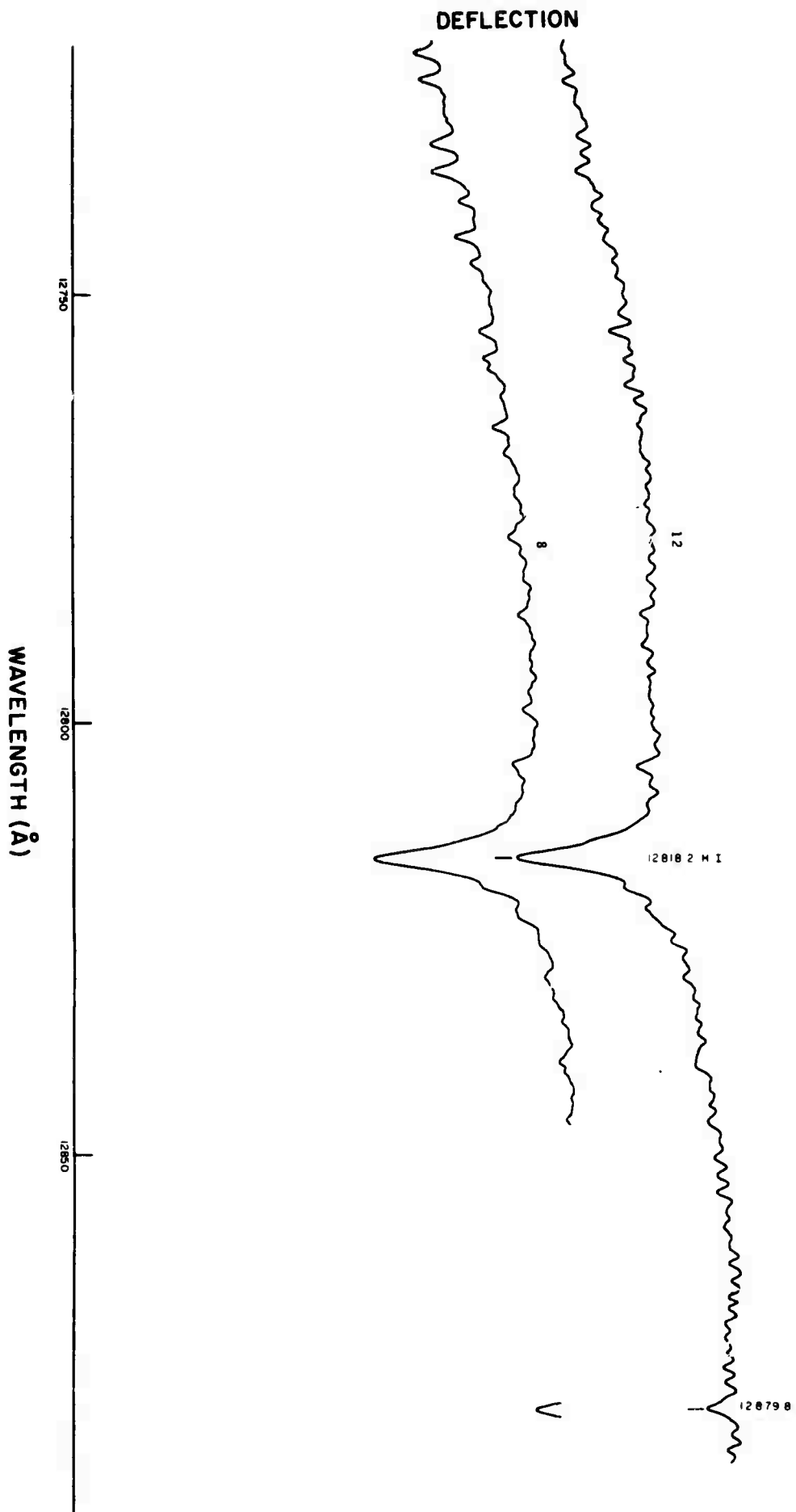
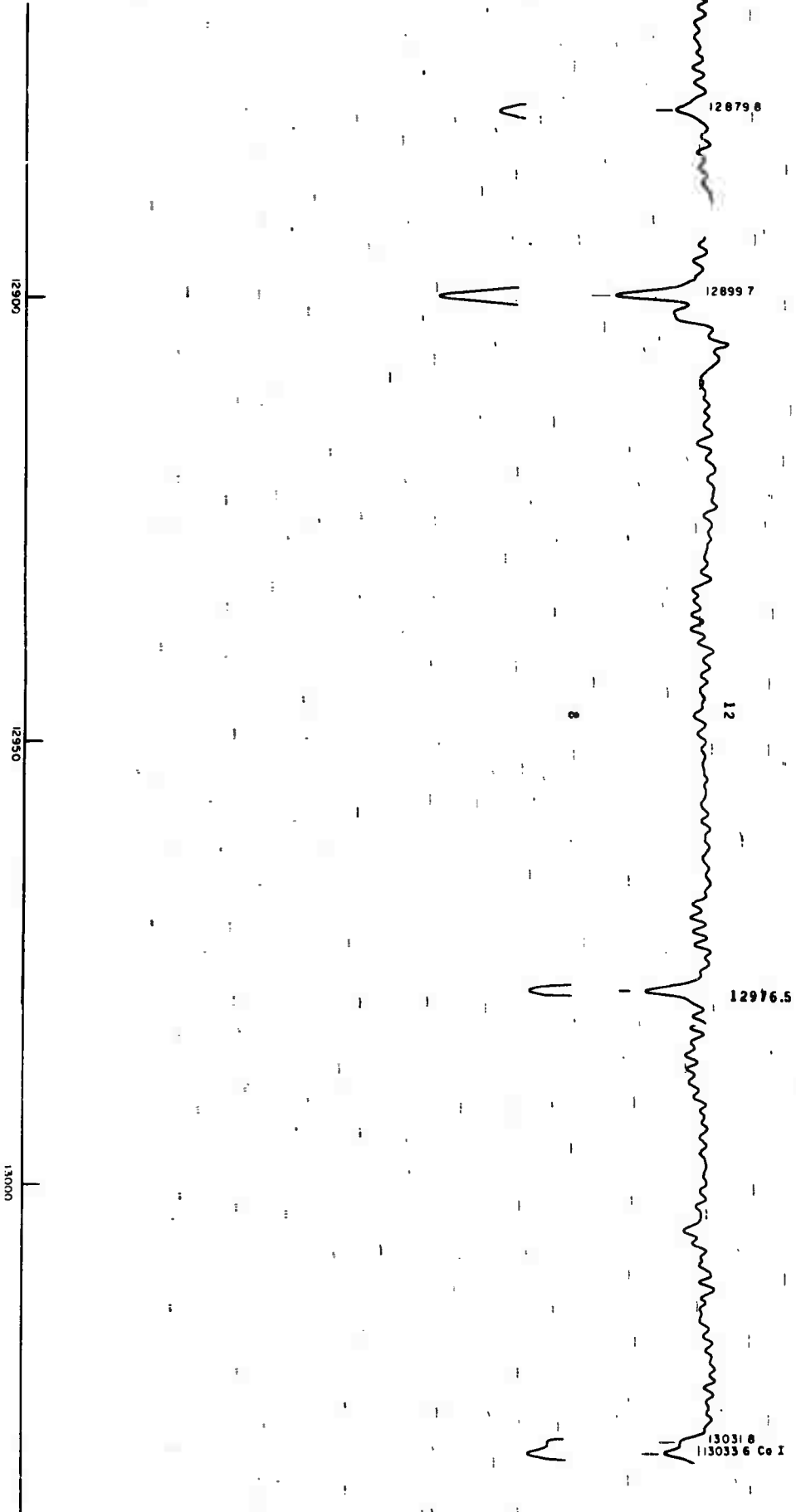


FIG 2 SEC 6

FIG 2 SEC 7

WAVELENGTH (Å)



DEFLECTION

FIG 2 SEC 8

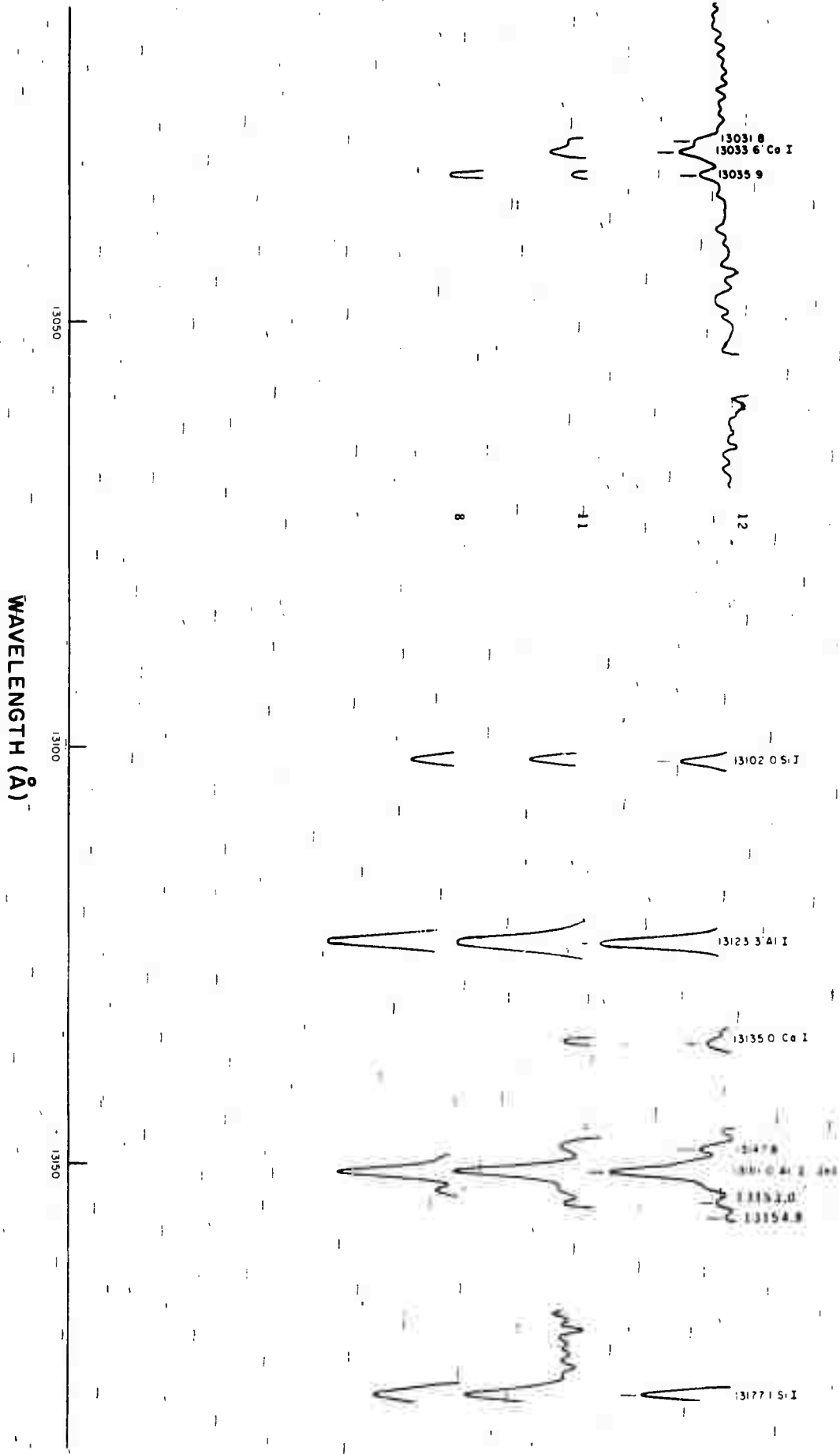
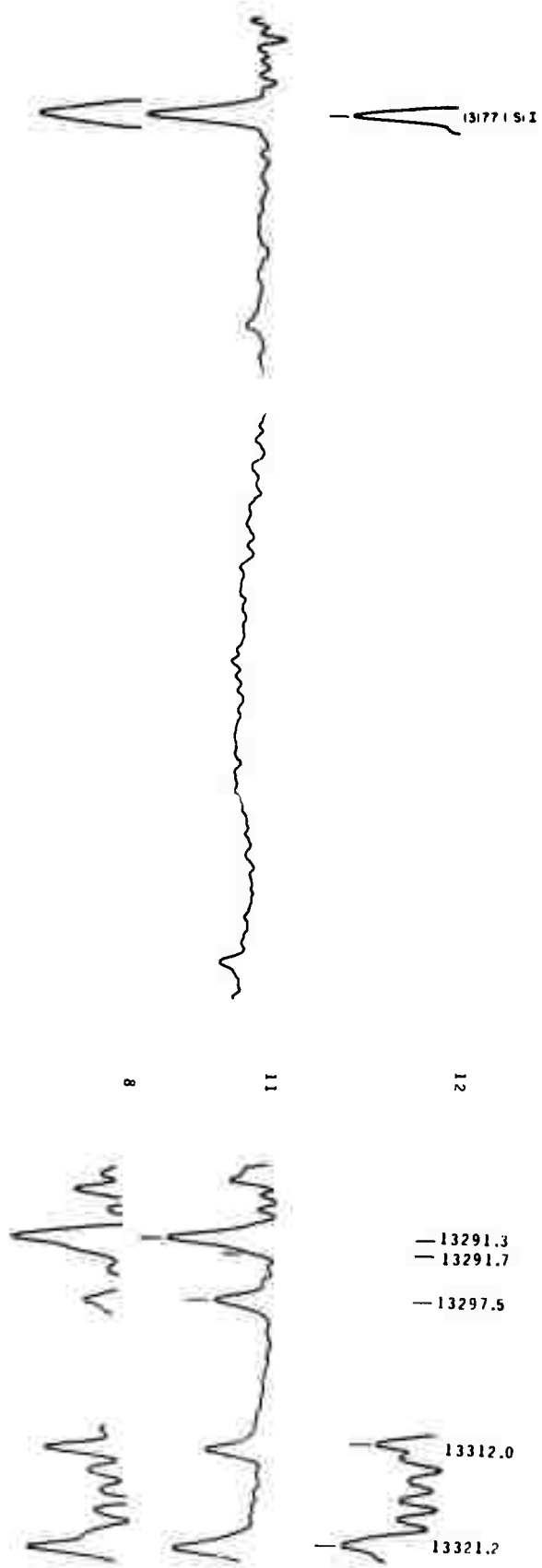


FIG 2 SEC 9

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

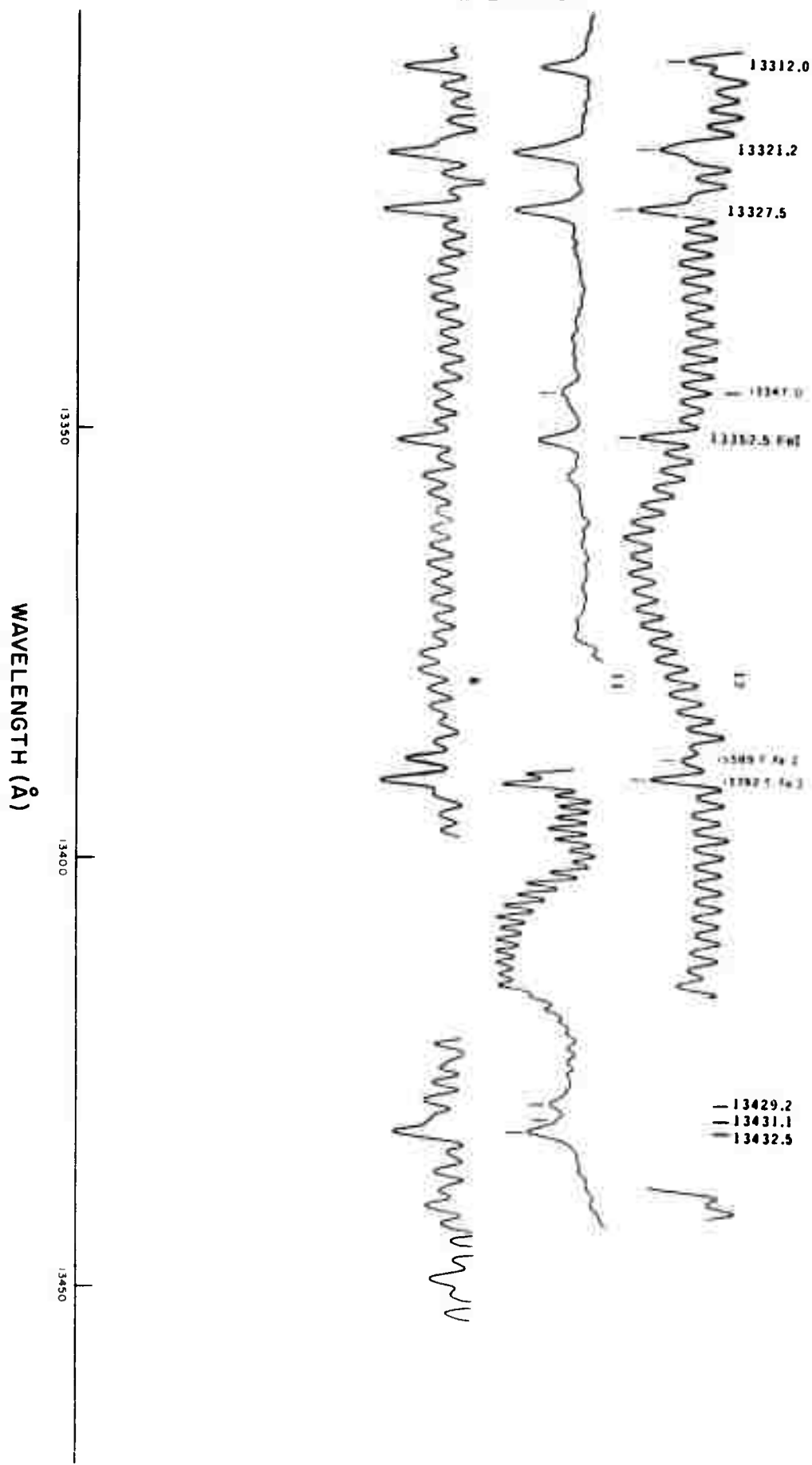


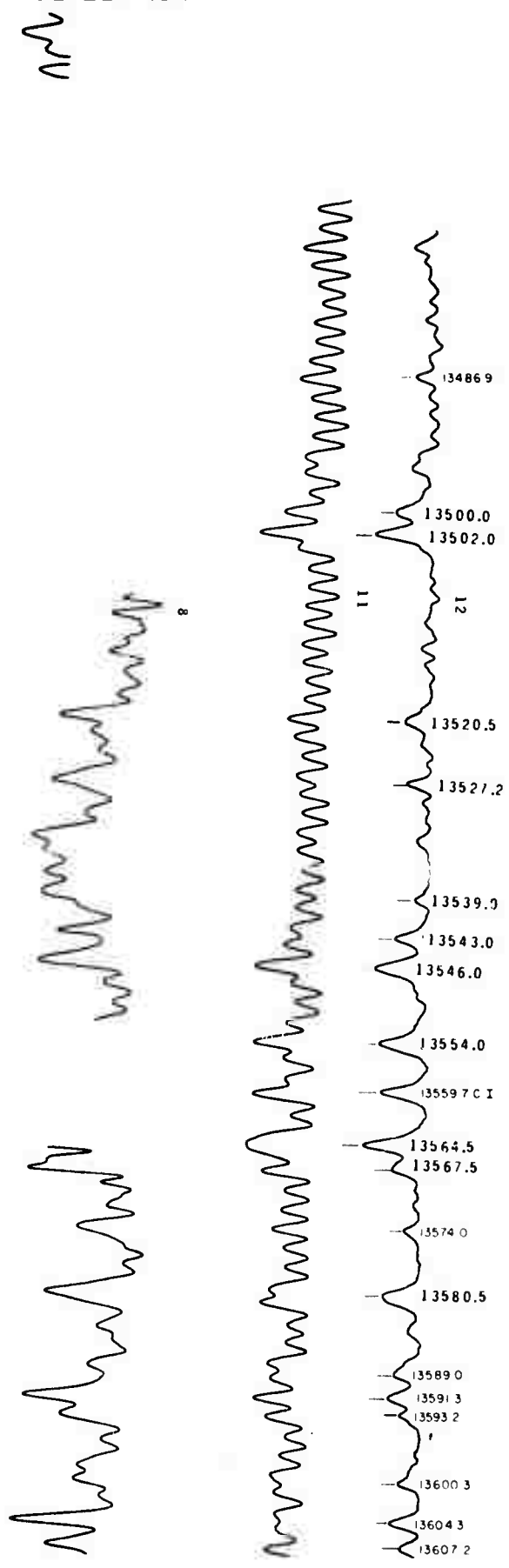
FIG 2 SEC 10

FIG 2 SEC 11

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

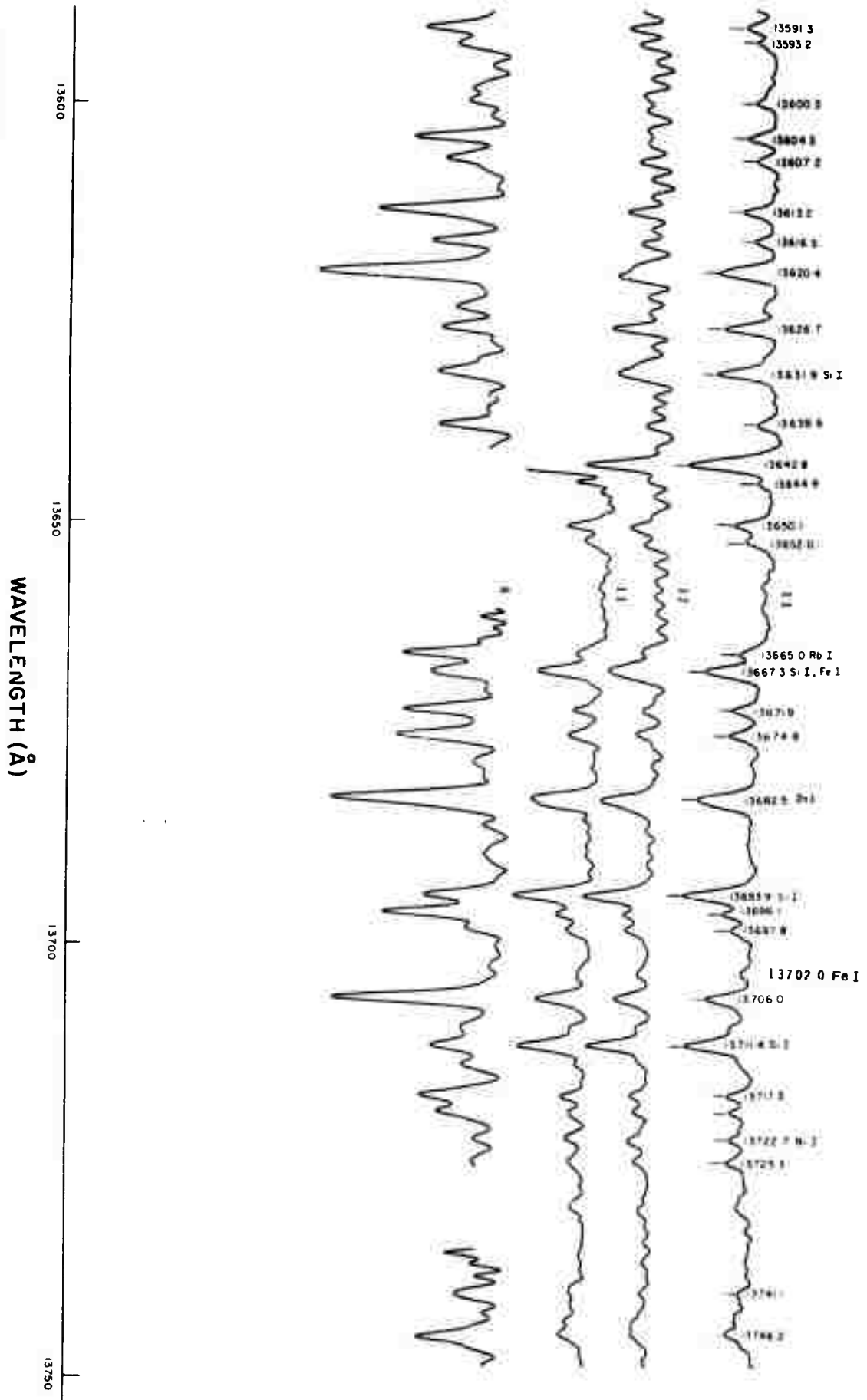
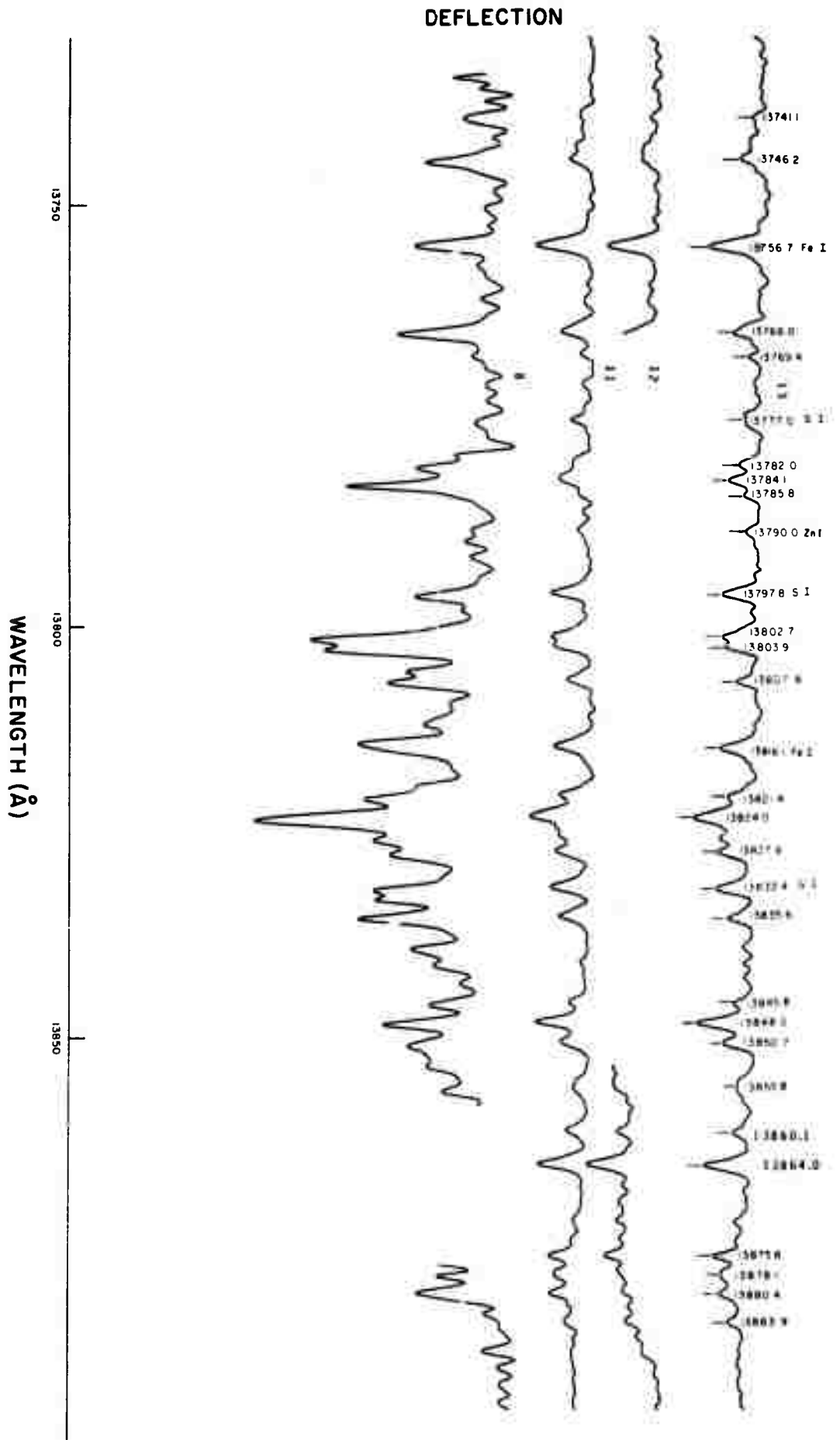


FIG 2 SEC 12

FIG 2 SEC 13



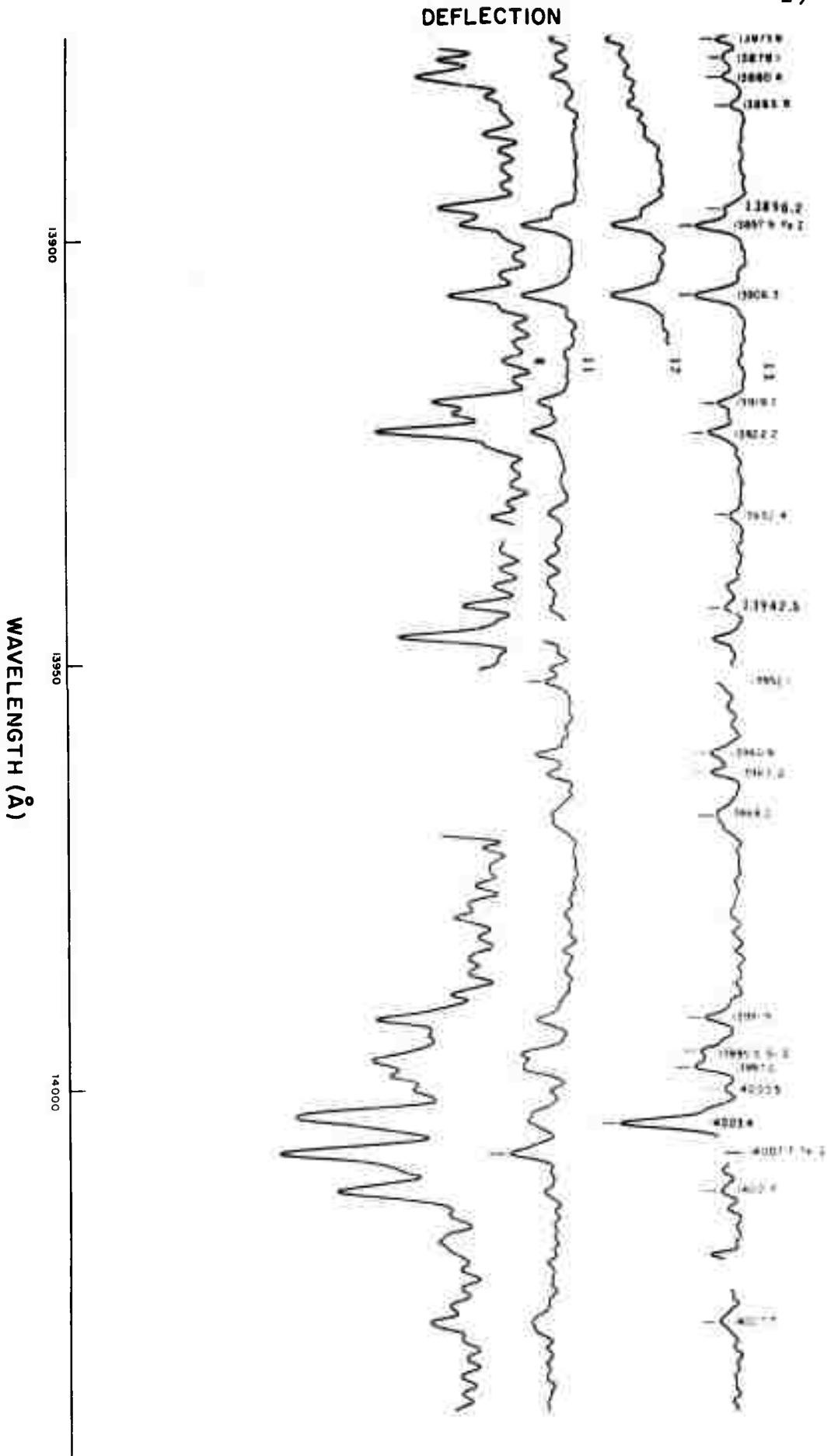
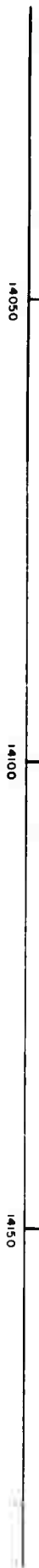


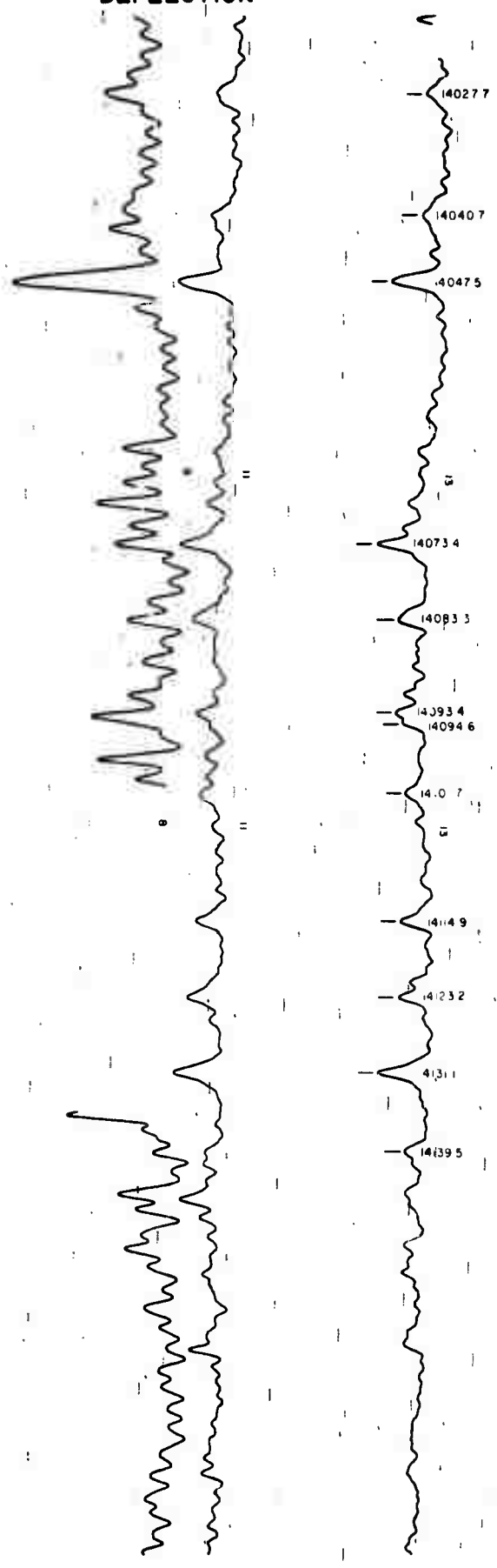
FIG 2 SEC 14

FIG 2 SEC 15

WAVELENGTH (Å)



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FIG 2 SEC 16

WAVELENGTH (Å)

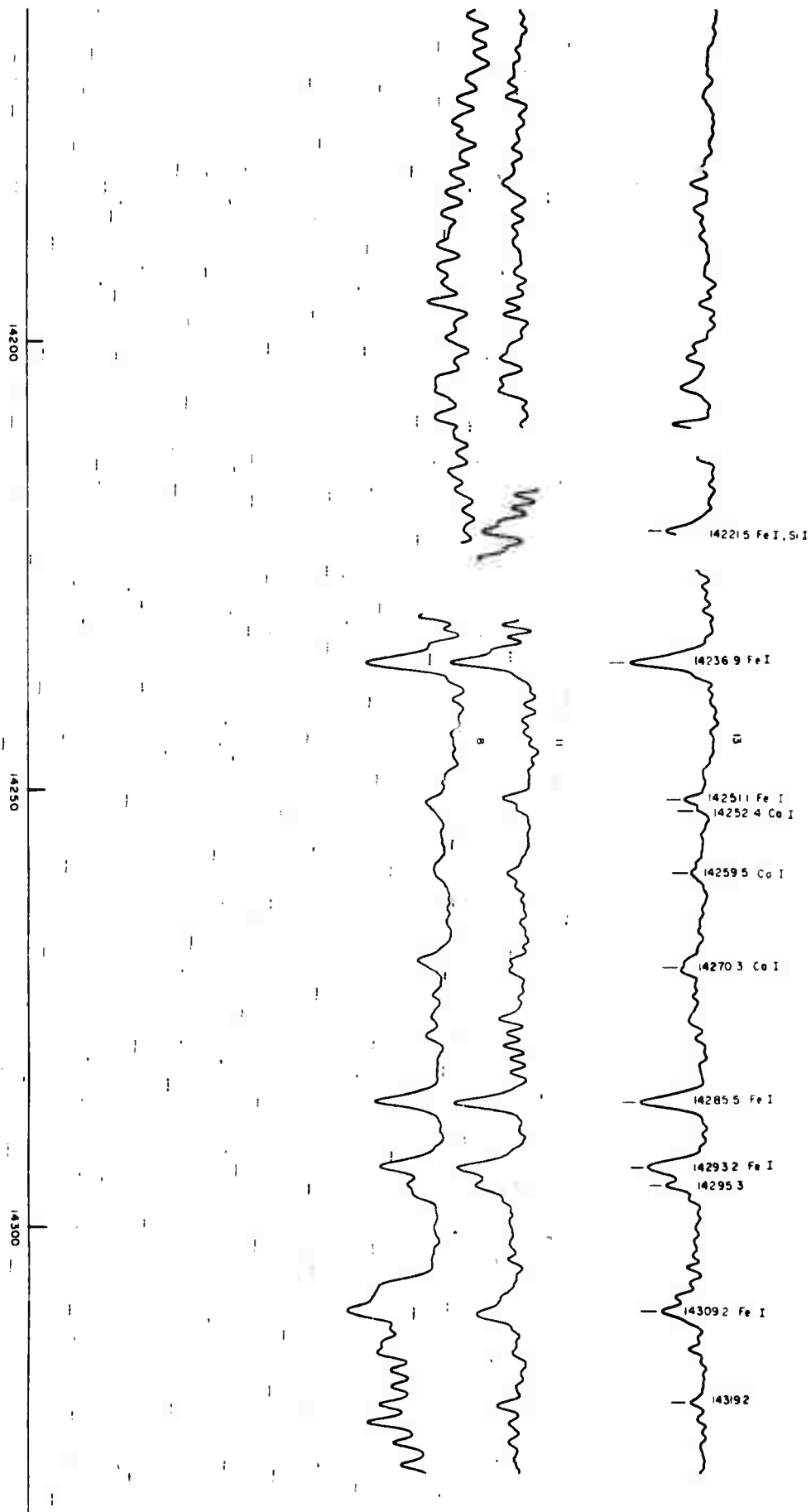
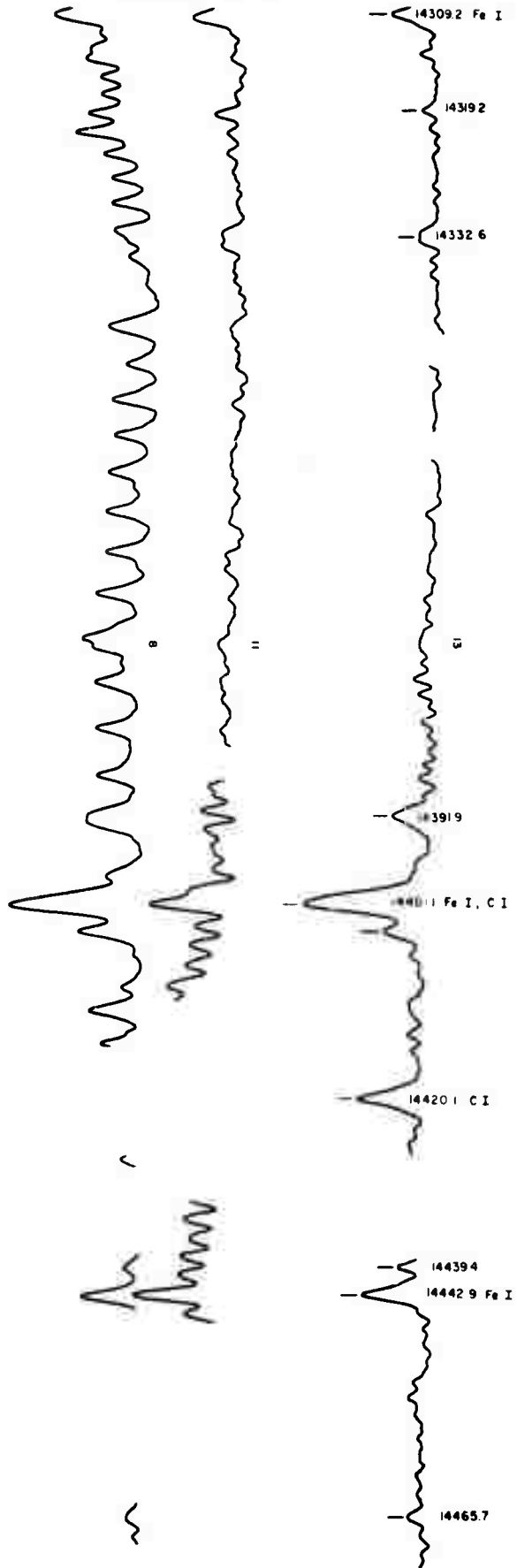


FIG 2 SEC 17

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

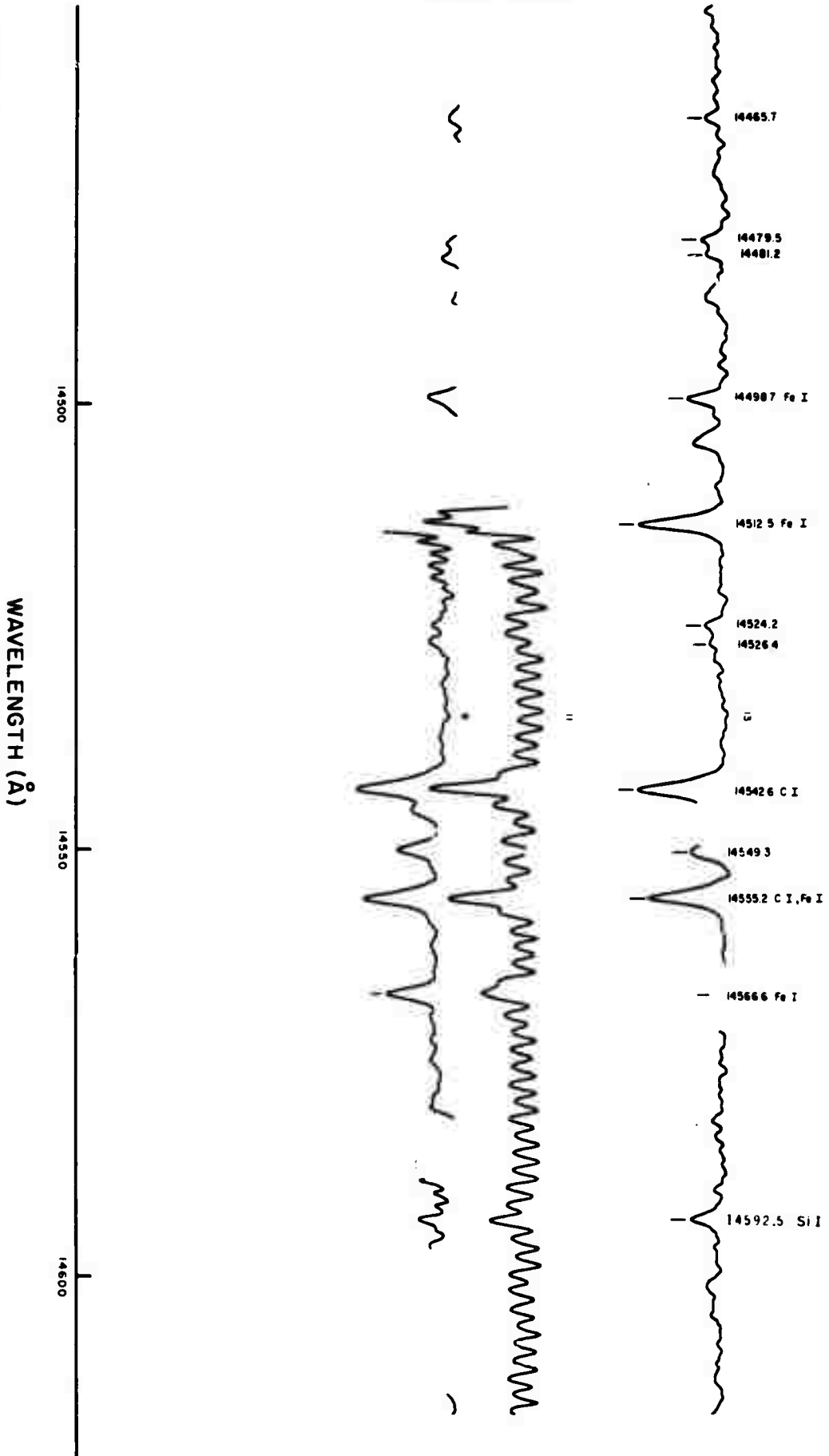


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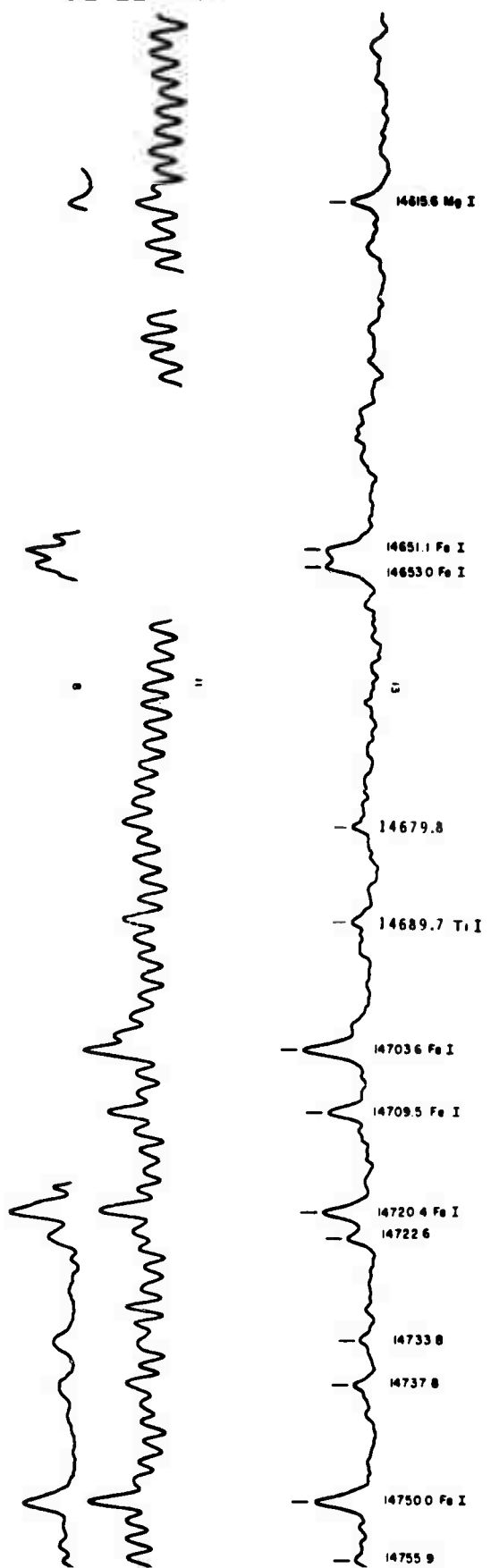
WAVELENGTH (Å)

FIG 2 SEC 19

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

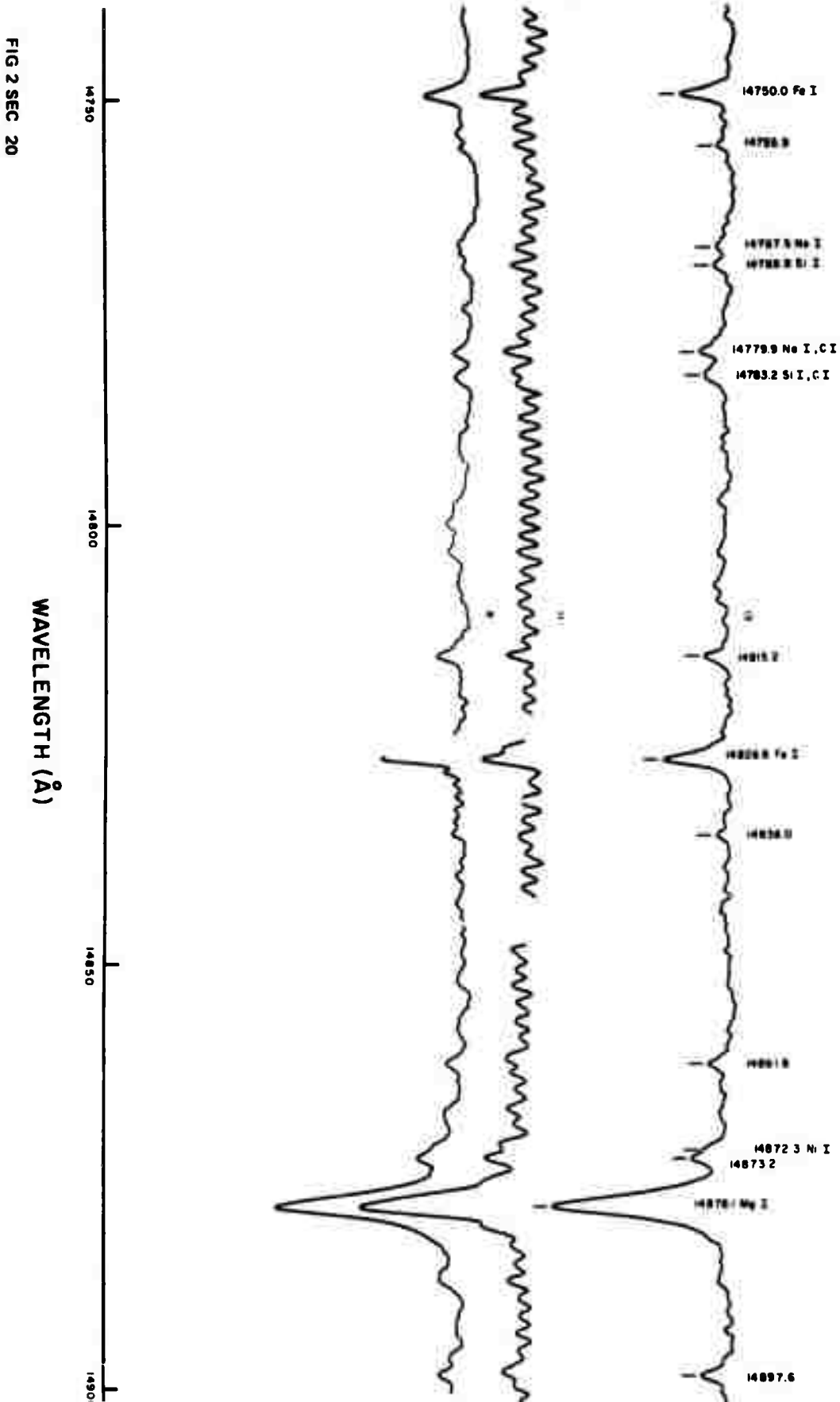
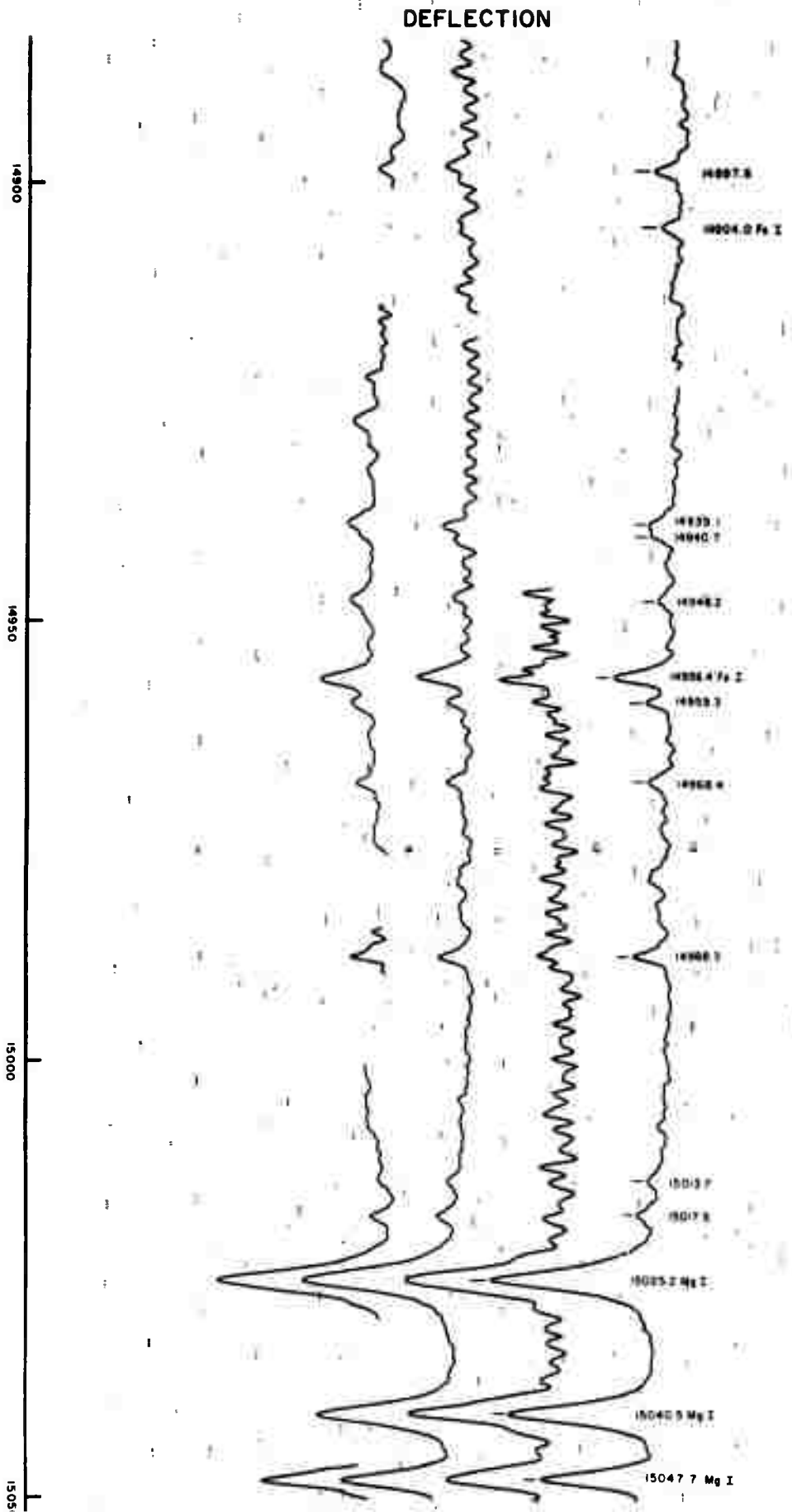


FIG 2 SEC 20

WAVELENGTH (Å)

FIG 2 SEC 21

WAVELENGTH (Å)



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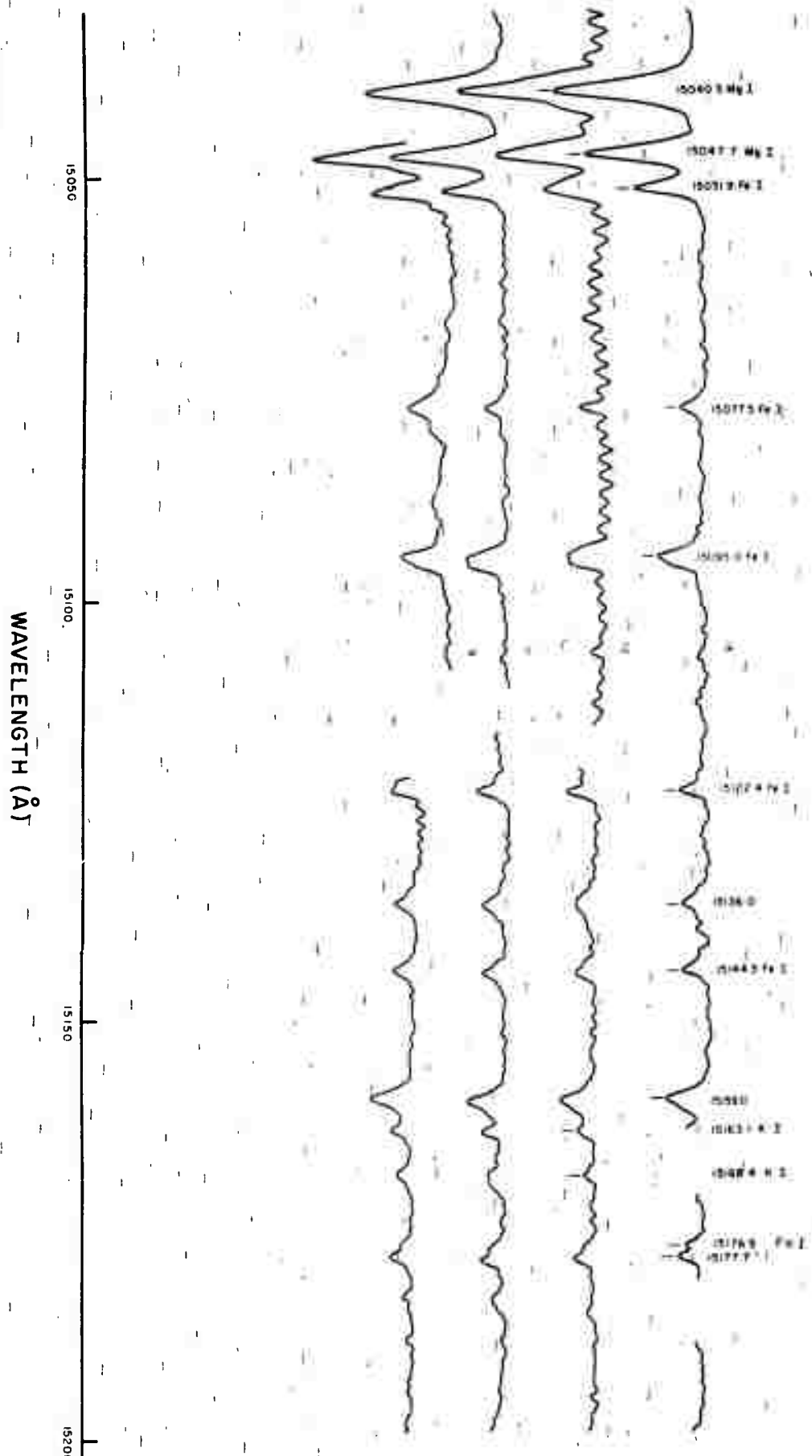


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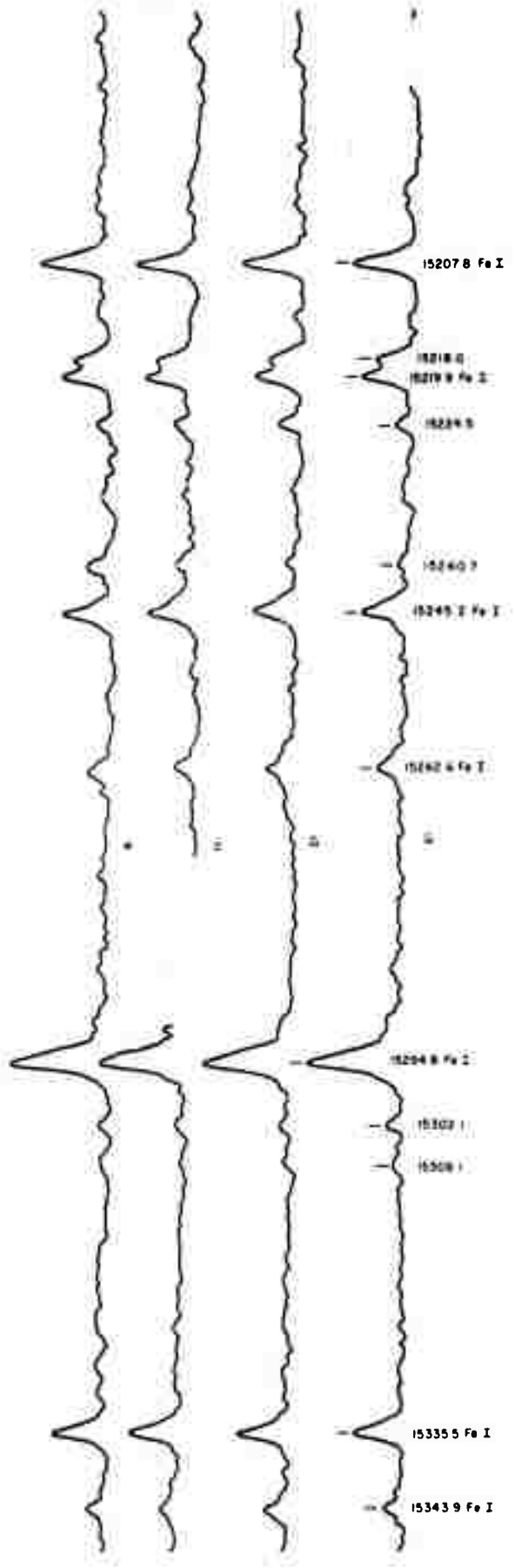
WAVELENGTH (Å)

FIG 2 SEC 23

WAVELENGTH (Å)



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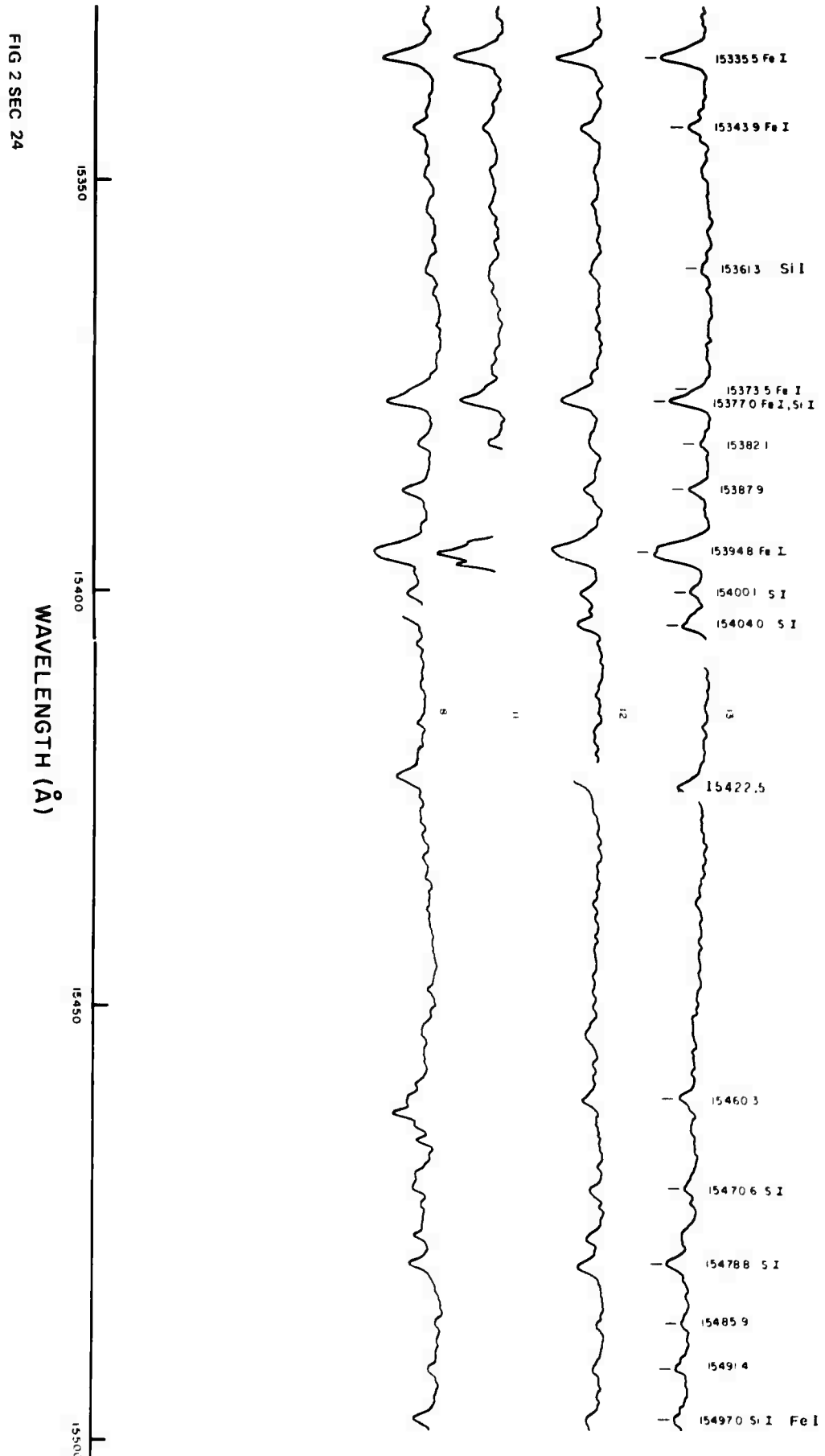
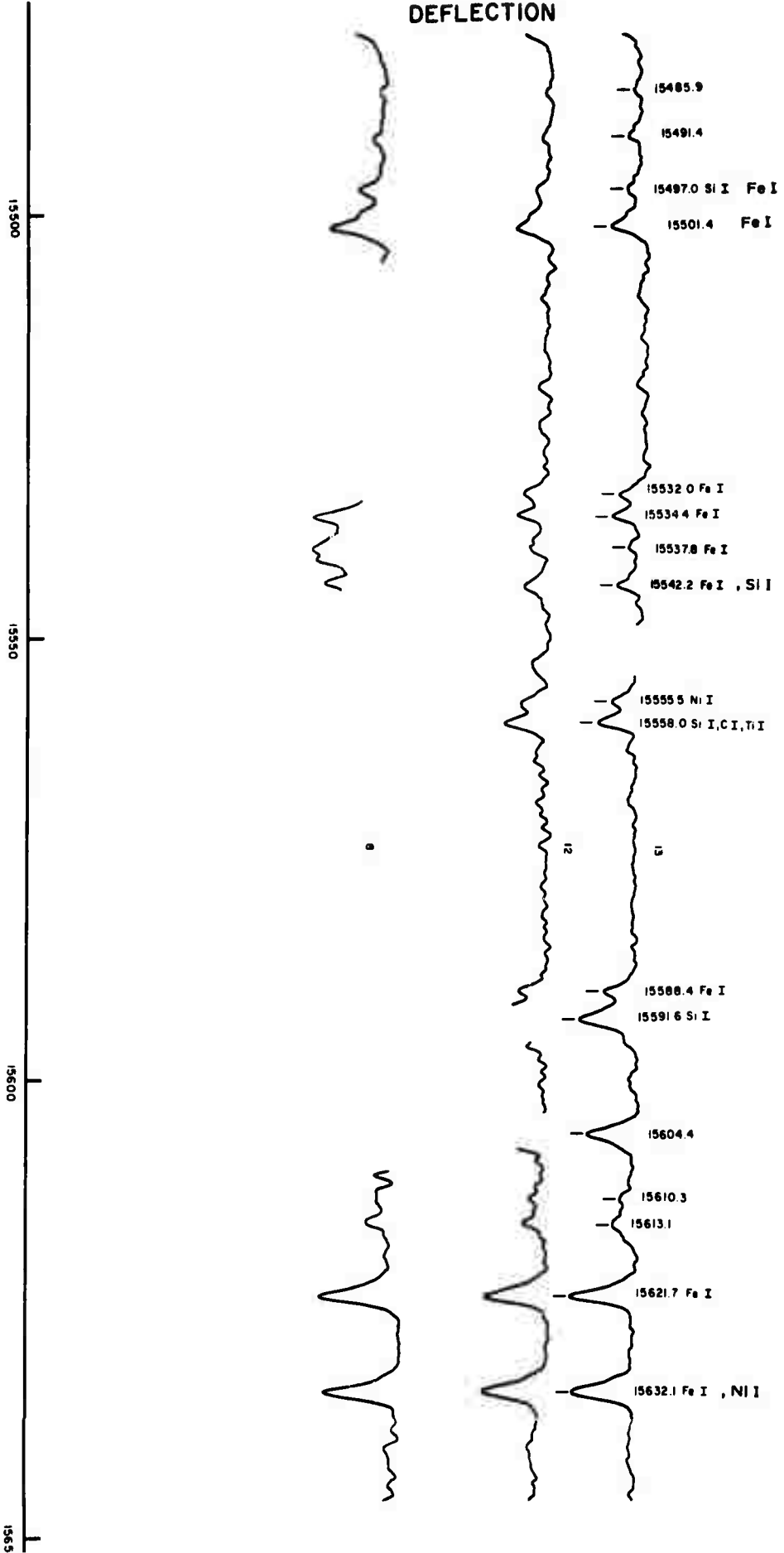


FIG 2 SEC 24

FIG 2 SEC 25

WAVELENGTH (Å)



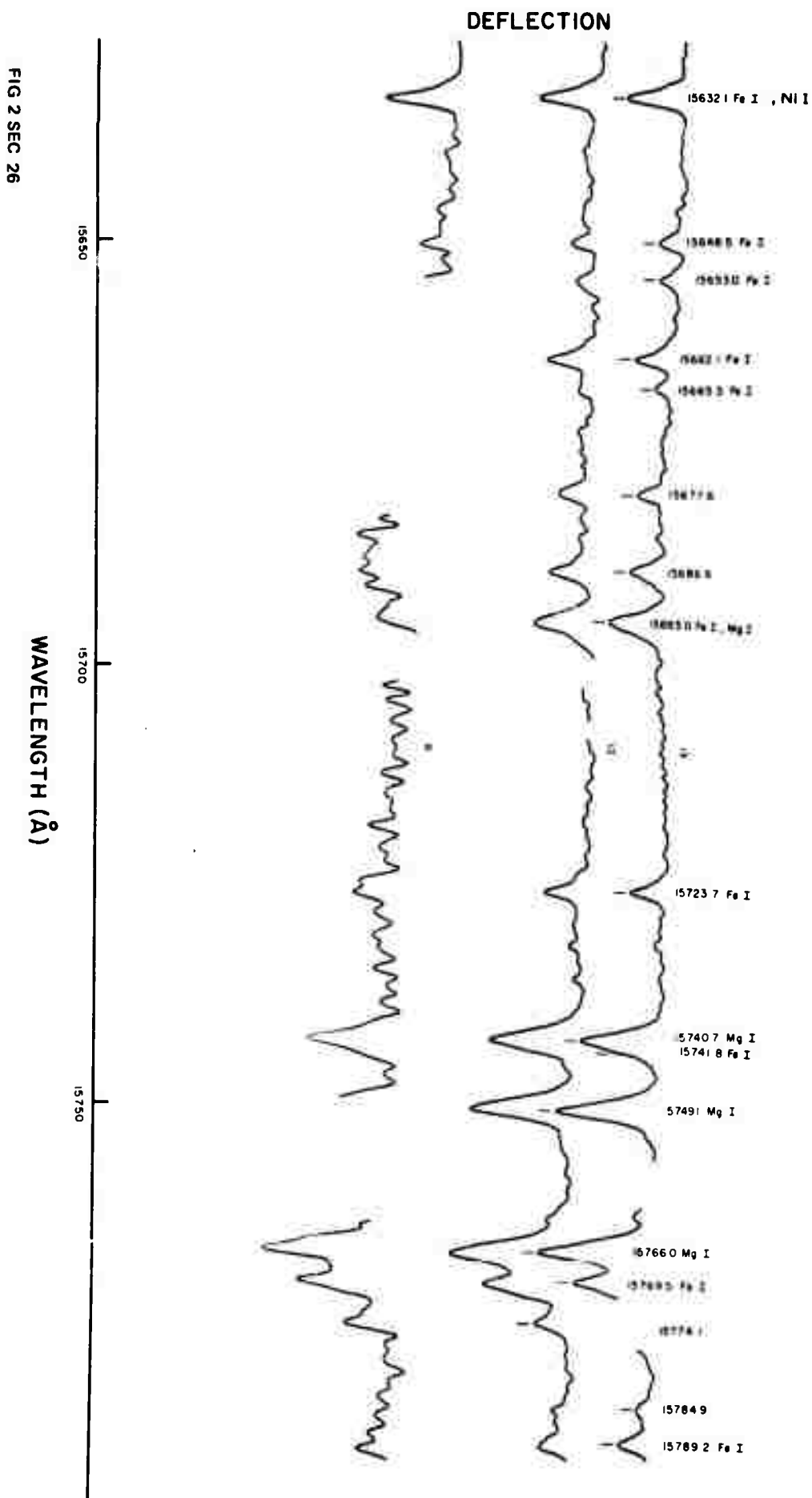
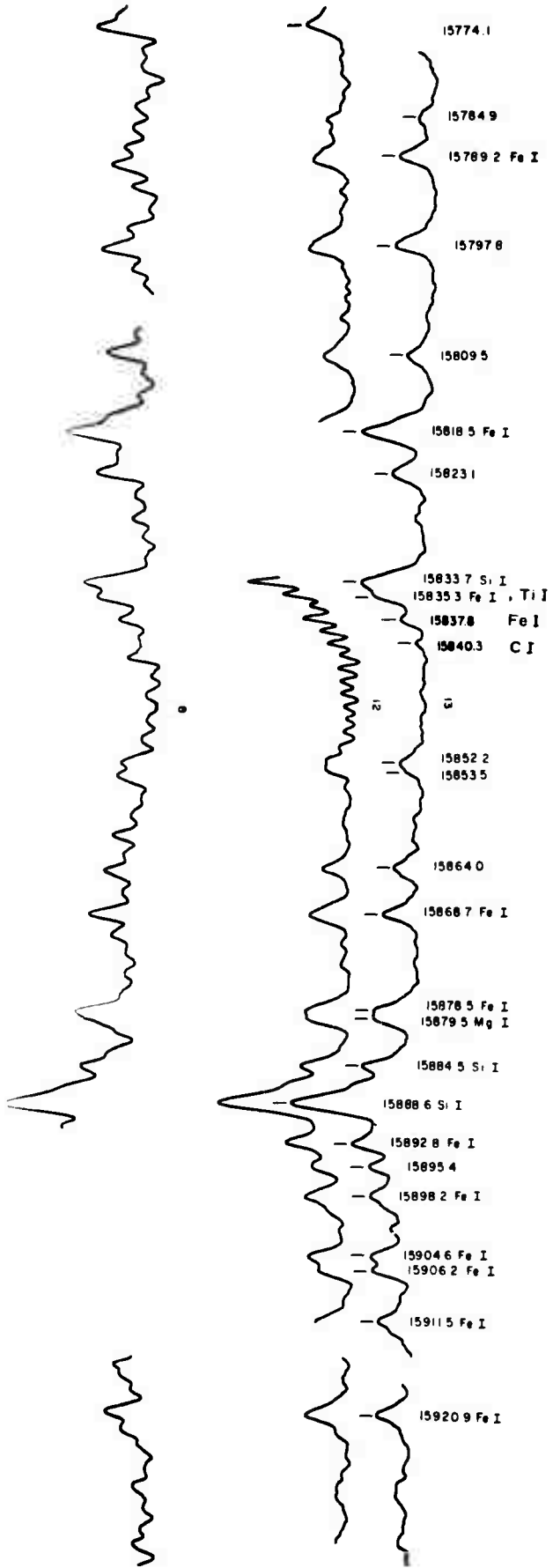


FIG 2 SEC 26

FIG 2 SEC 27

WAVELENGTH (Å)



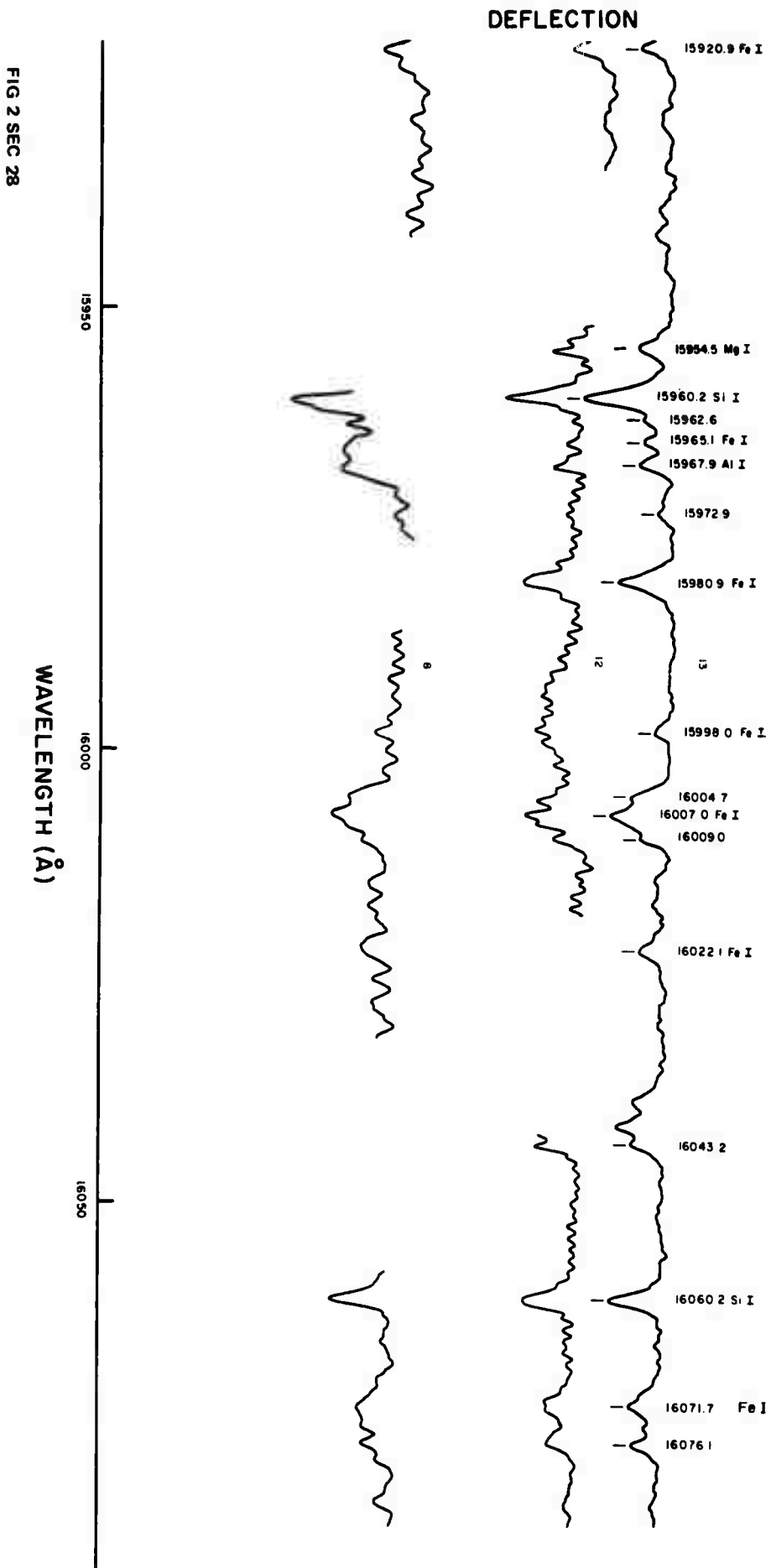
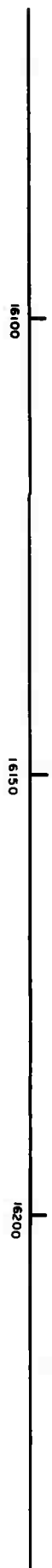


FIG 2 SEC 28

FIG 2 SEC 29

WAVELENGTH (Å)



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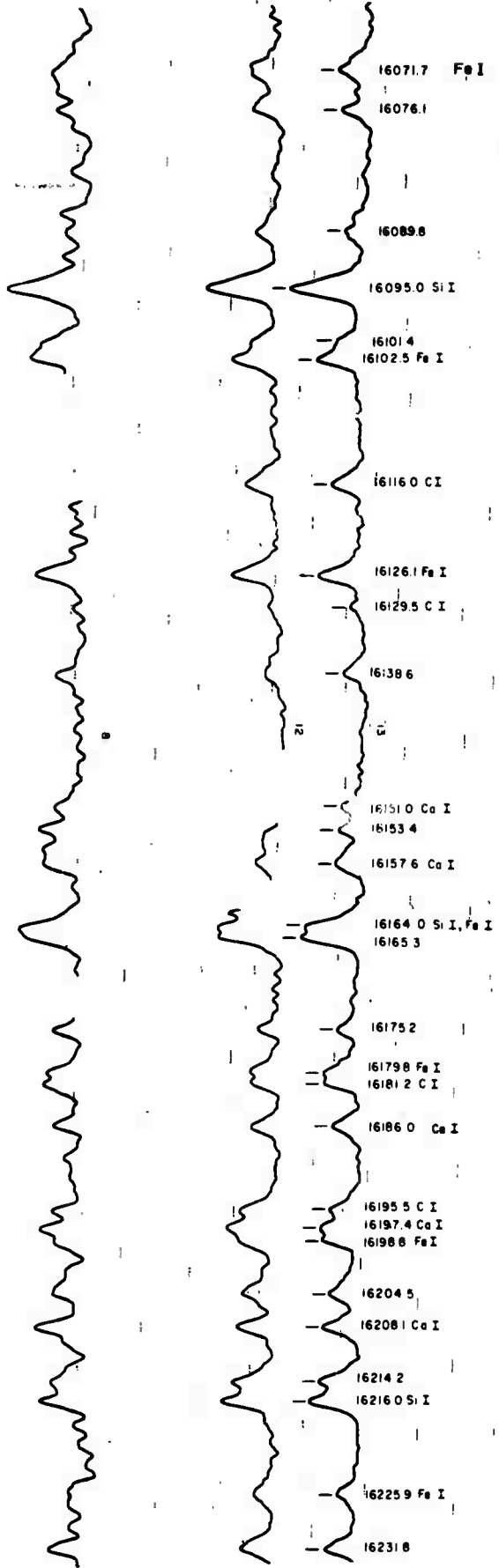


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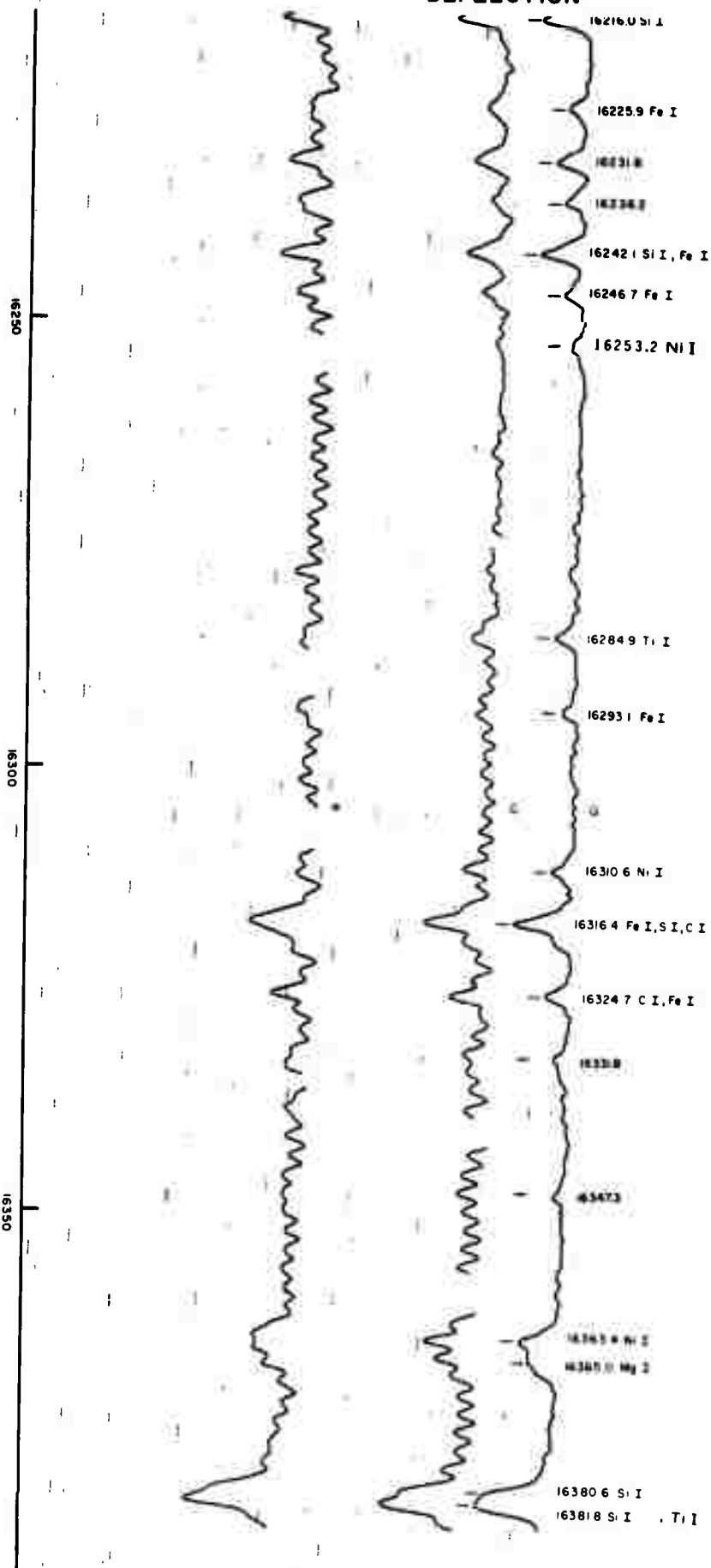
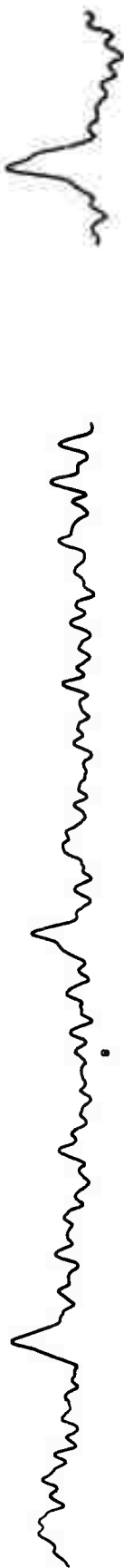
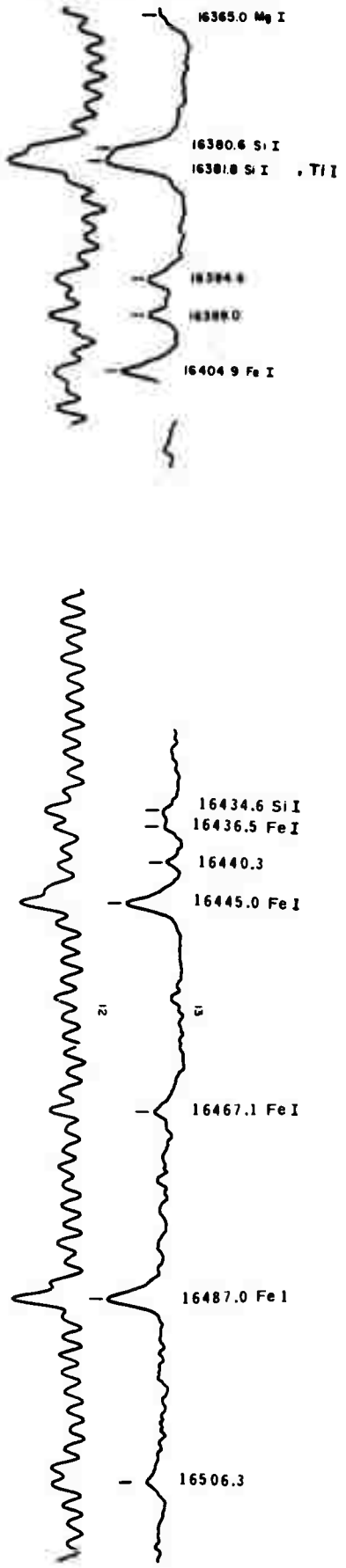


FIG 2 SEC 31

WAVELENGTH (Å)



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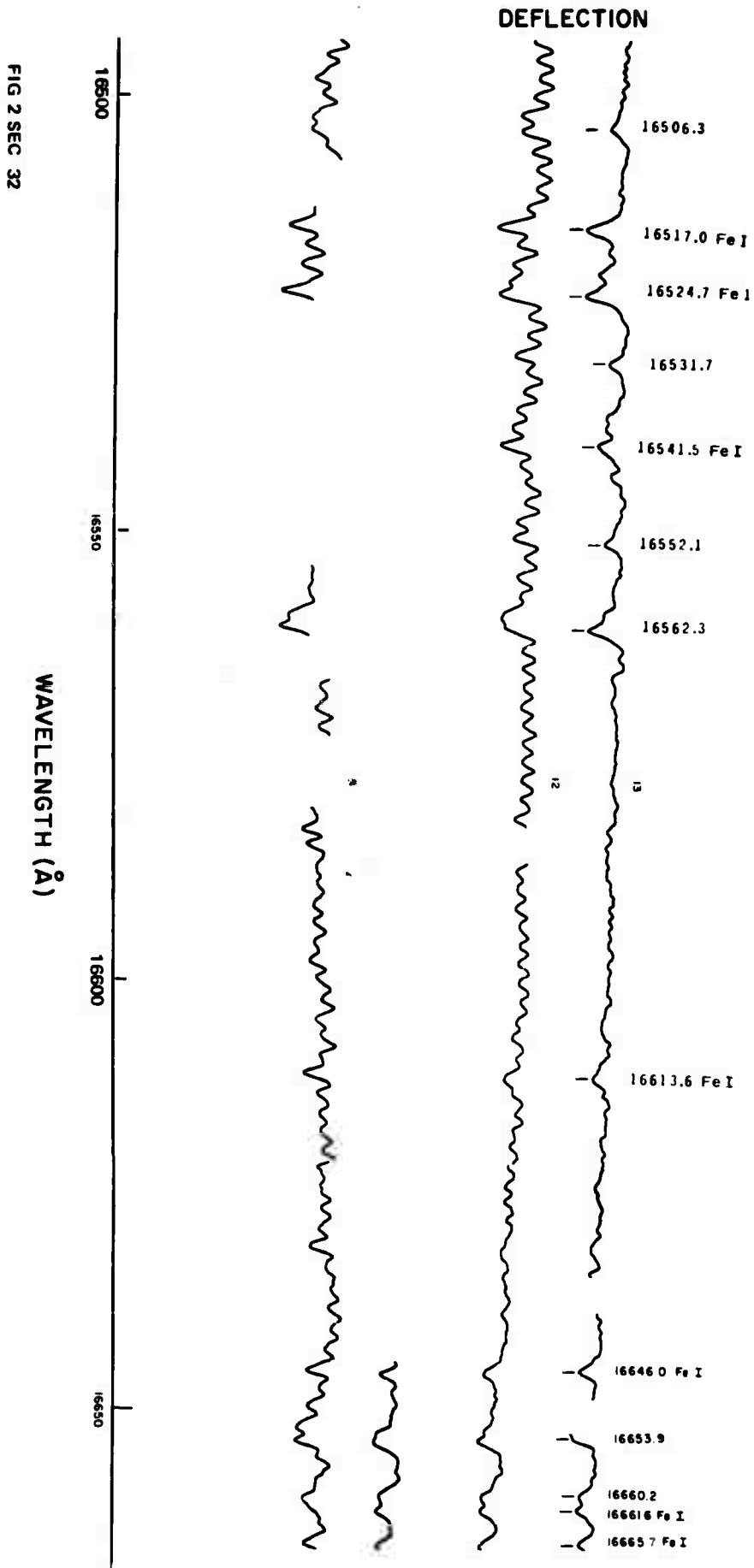
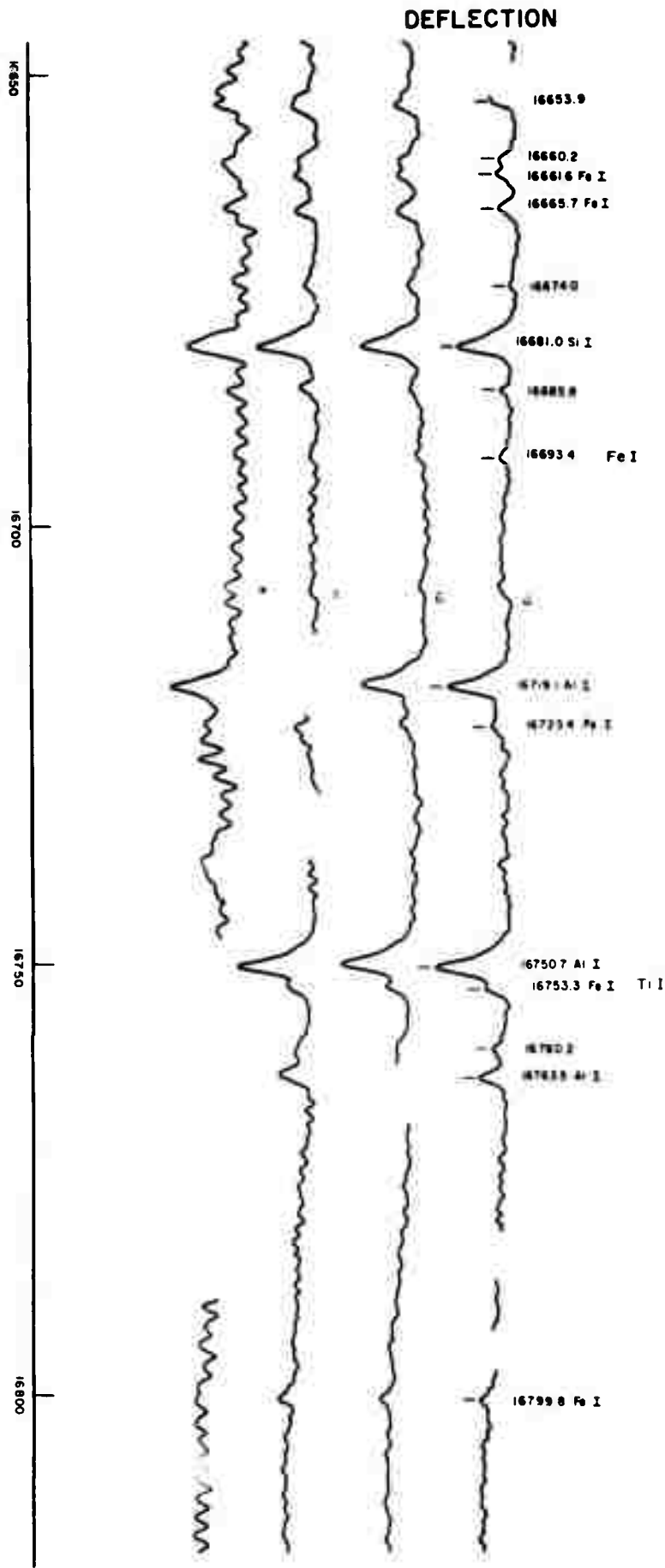


FIG 2 SEC 33

WAVELENGTH (Å)



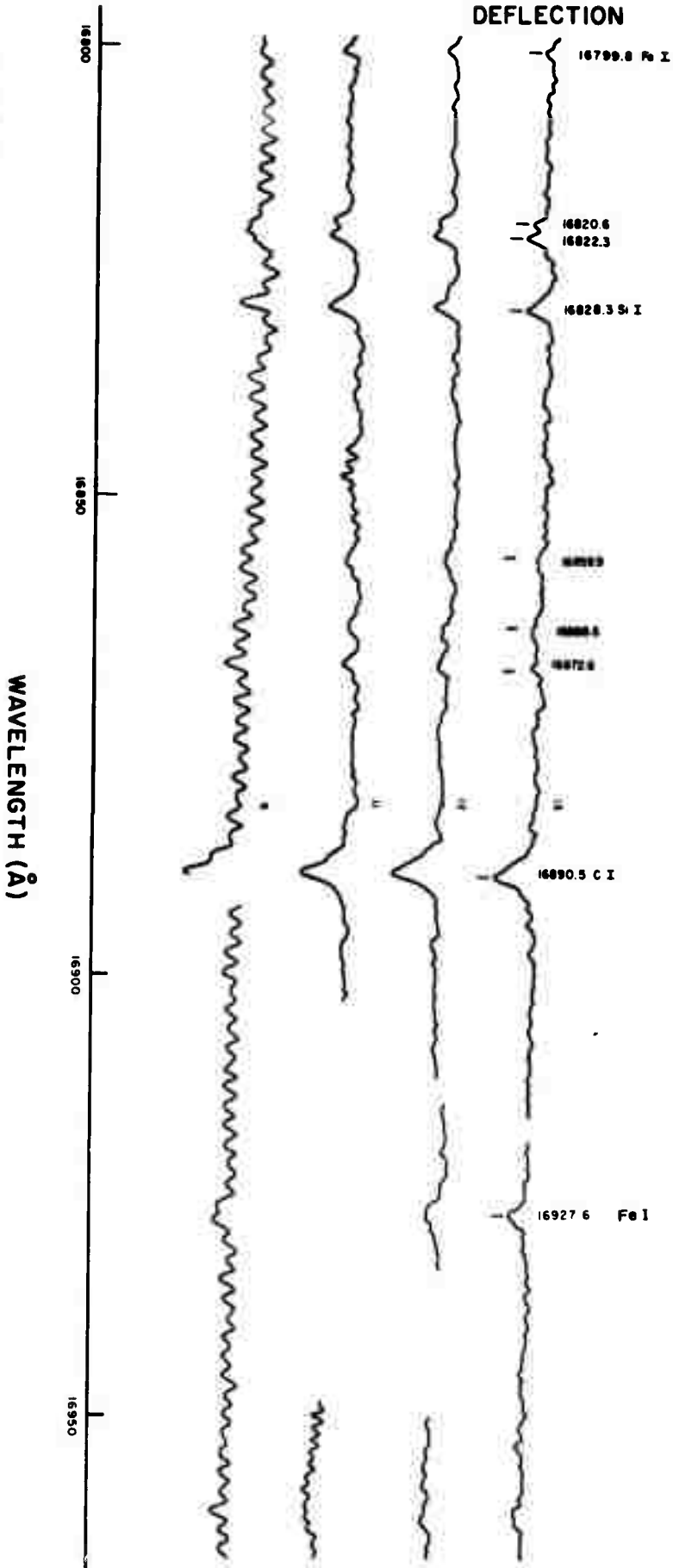


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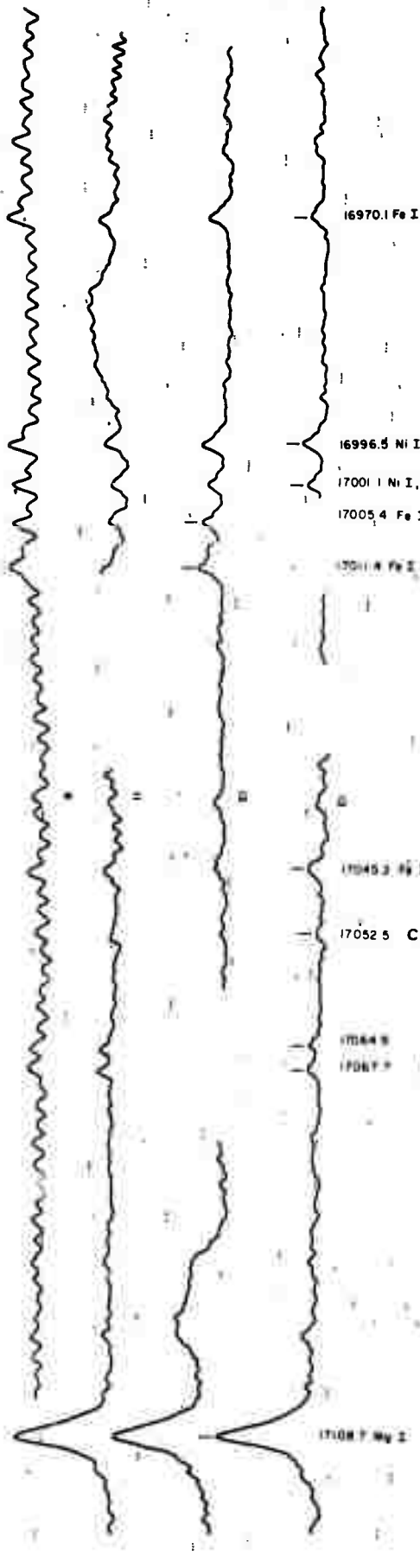
WAVELENGTH (Å)

FIG 2 SEC 35

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

WAVELENGTH (Å)

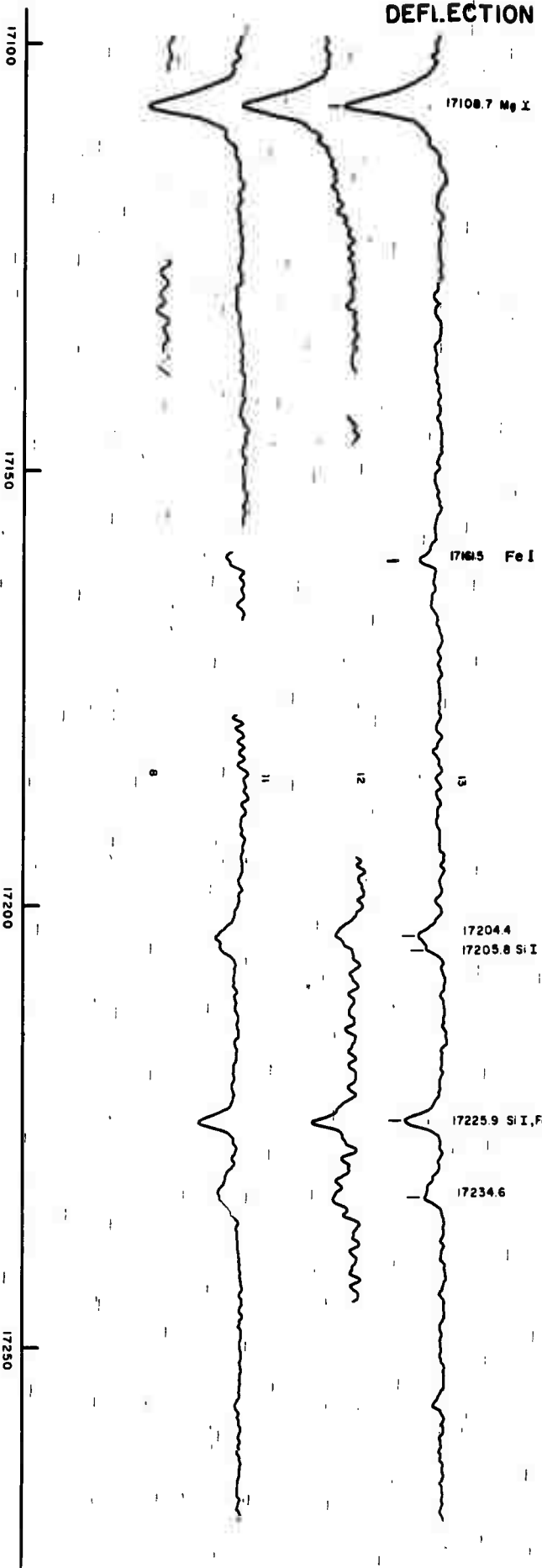
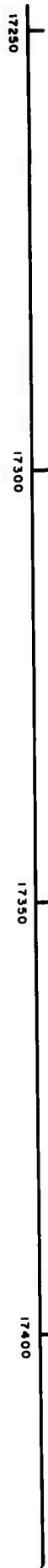


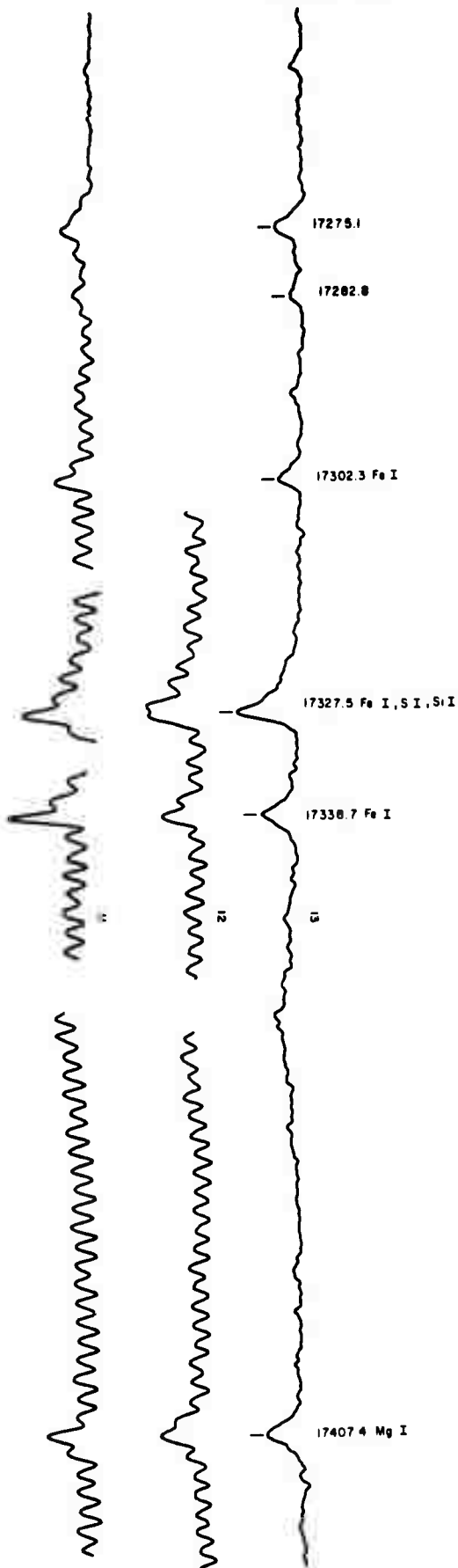
FIG 2 SEC 36

FIG 2 SEC 37

WAVELENGTH (Å)



DEFLECTION



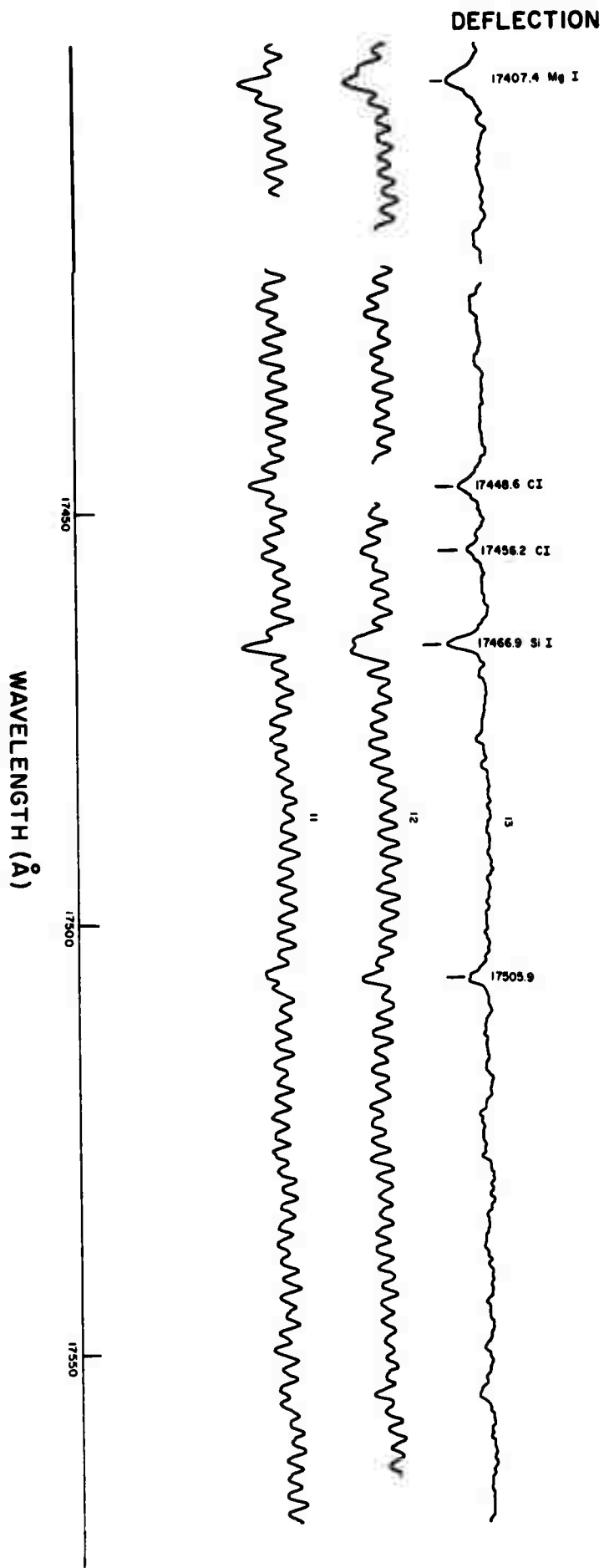


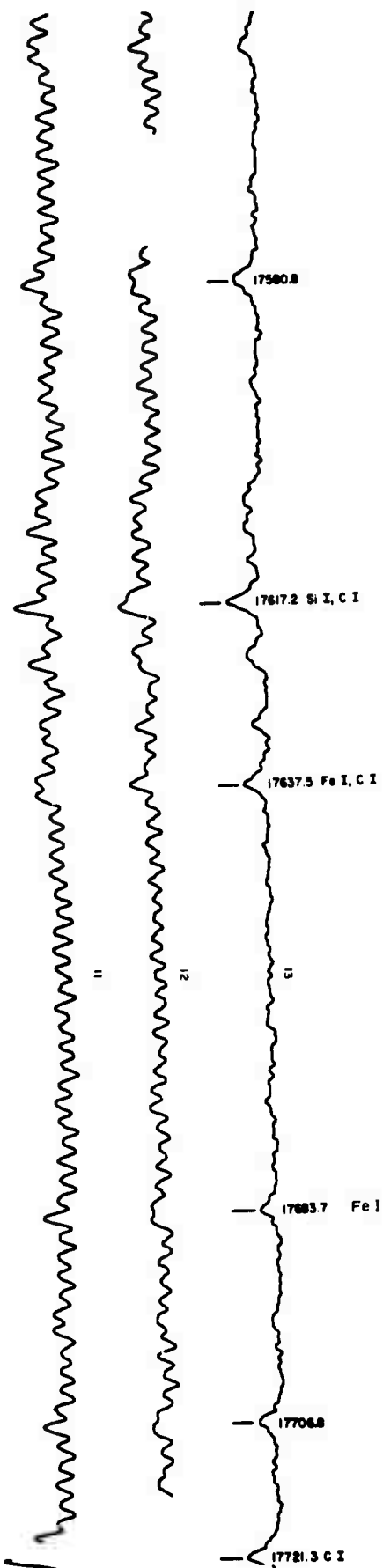
FIG 2 SEC 38

FIG 2 SEC 39

WAVELENGTH (Å)



DEFLECTION



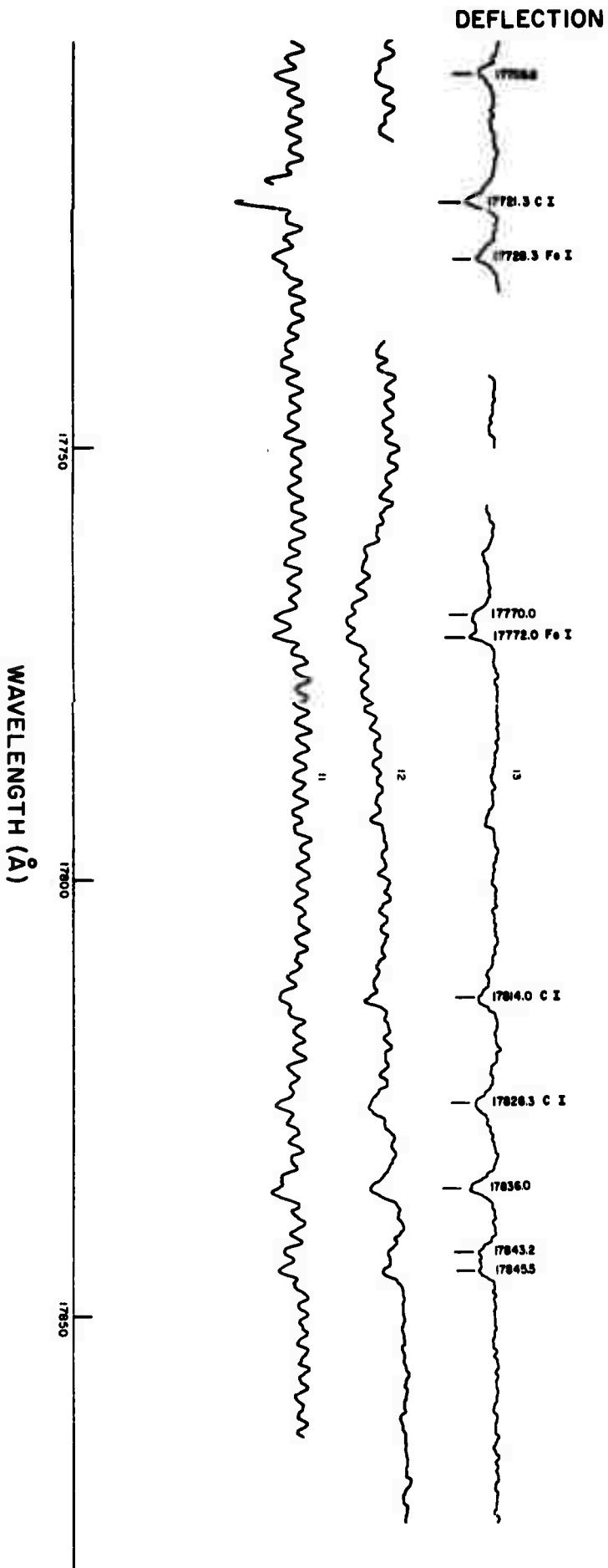


FIG 2 SEC 40

WAVELENGTH (Å)

DEFLECTION



WAVELENGTH (Å)

17900

17950

18000

FIG 2 SEC 41

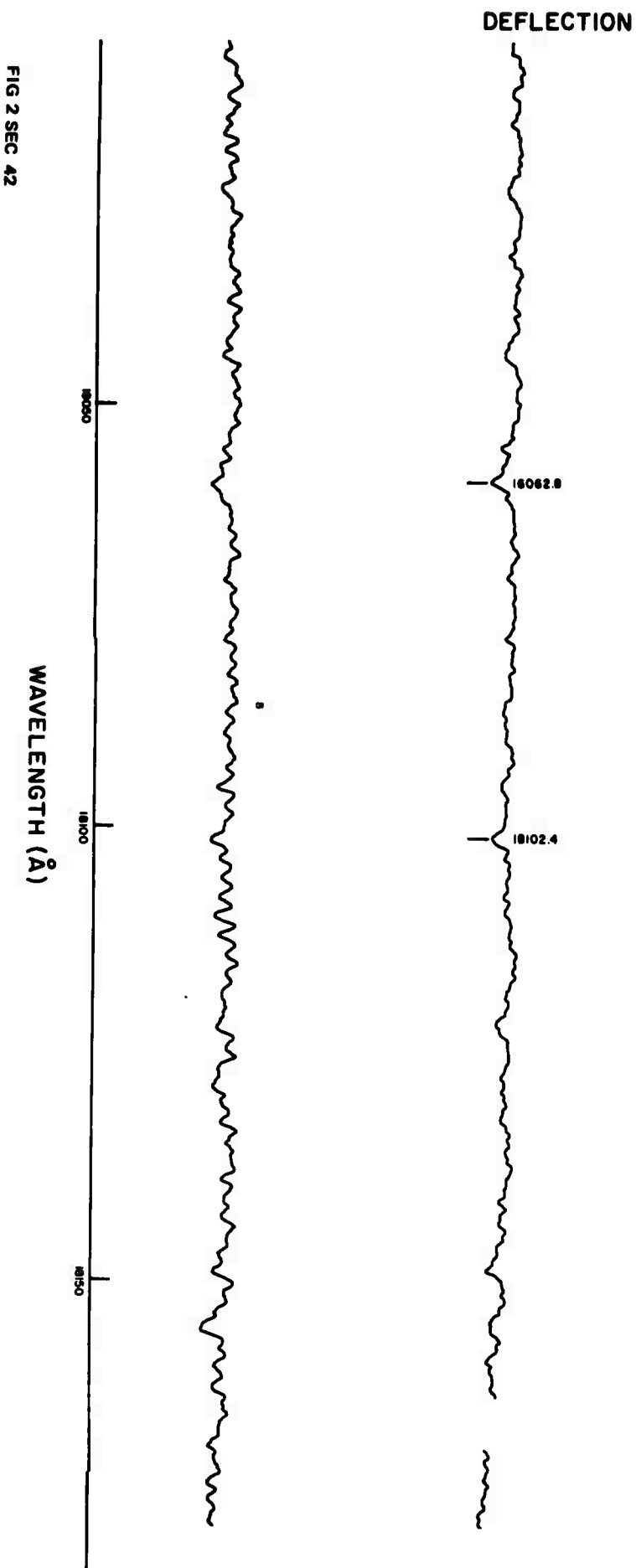
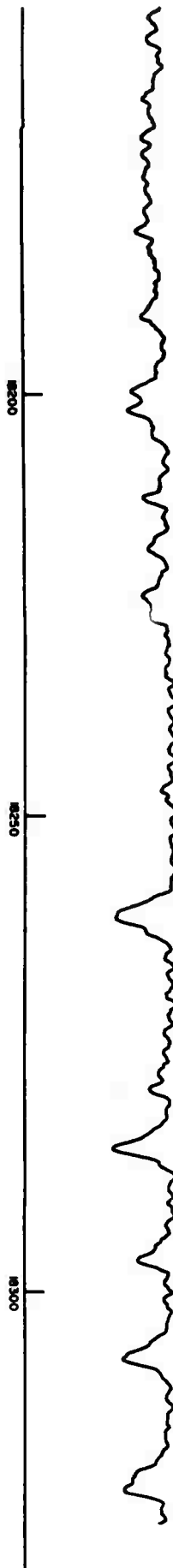


FIG 2 SEC 42

FIG 2 SEC 43

WAVELENGTH (Å)



DEFLECTION

18183.0

18225.8

18

18278.1

18284.5 Si I

18296.7

18307.6

18320.7 C I

FIG 2 SEC 44

WAVELENGTH (Å)

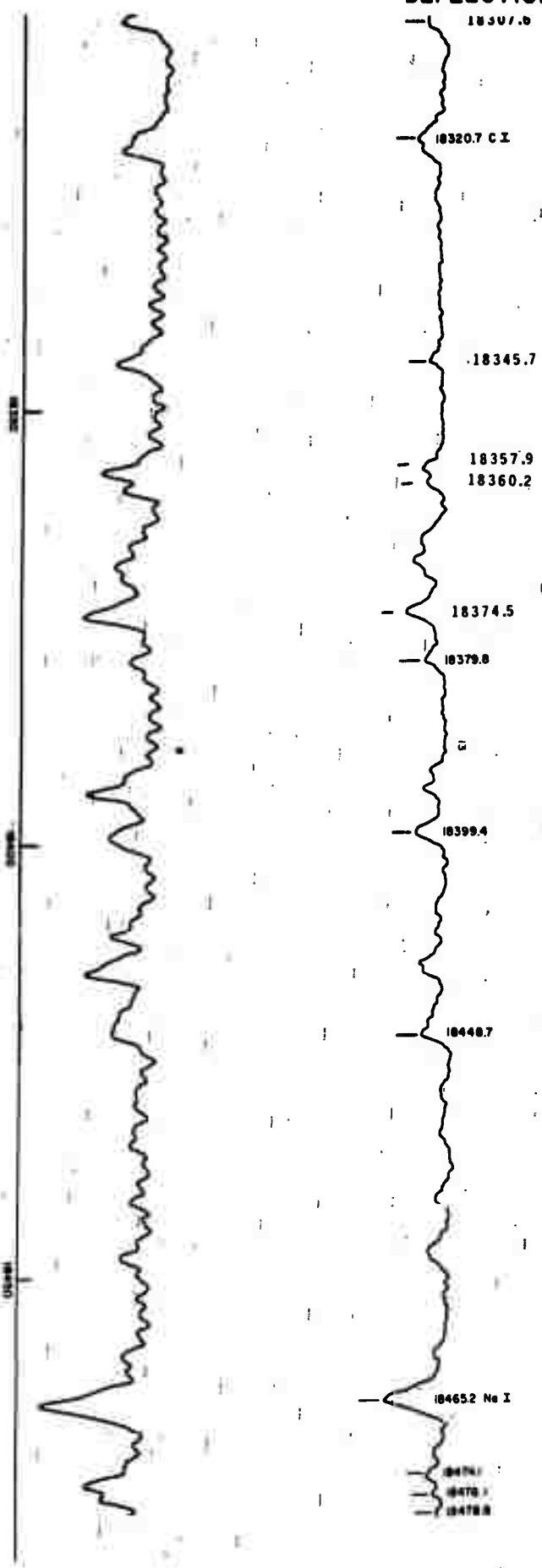
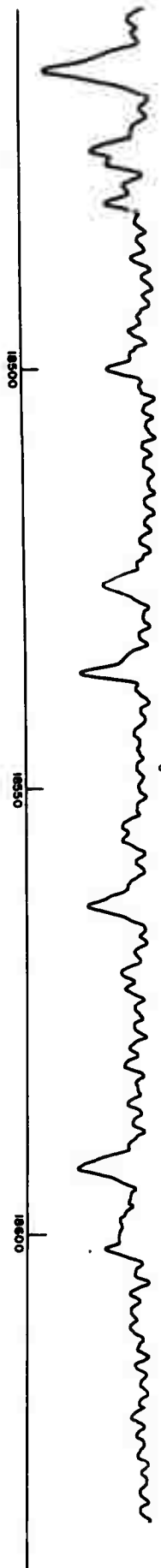
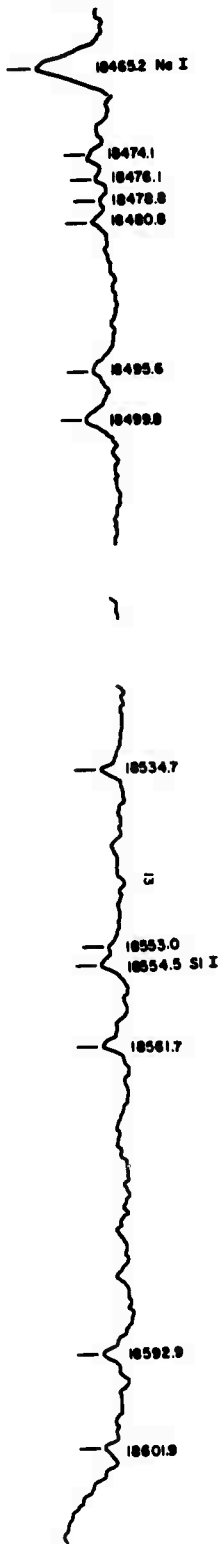


FIG 2 SEC 45

WAVELENGTH (Å)



DEFLECTION



DEFLECTION

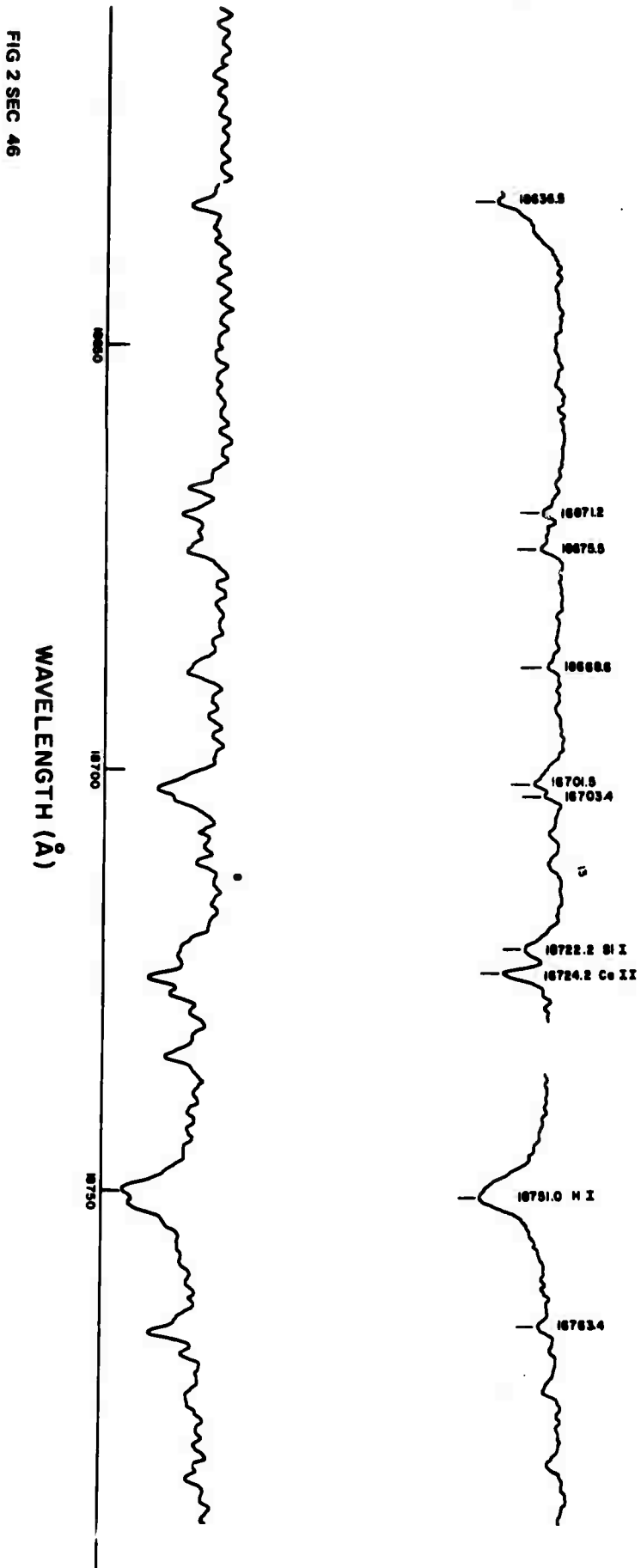


FIG 2 SEC 46

WAVELENGTH (Å)

DEFLECTION

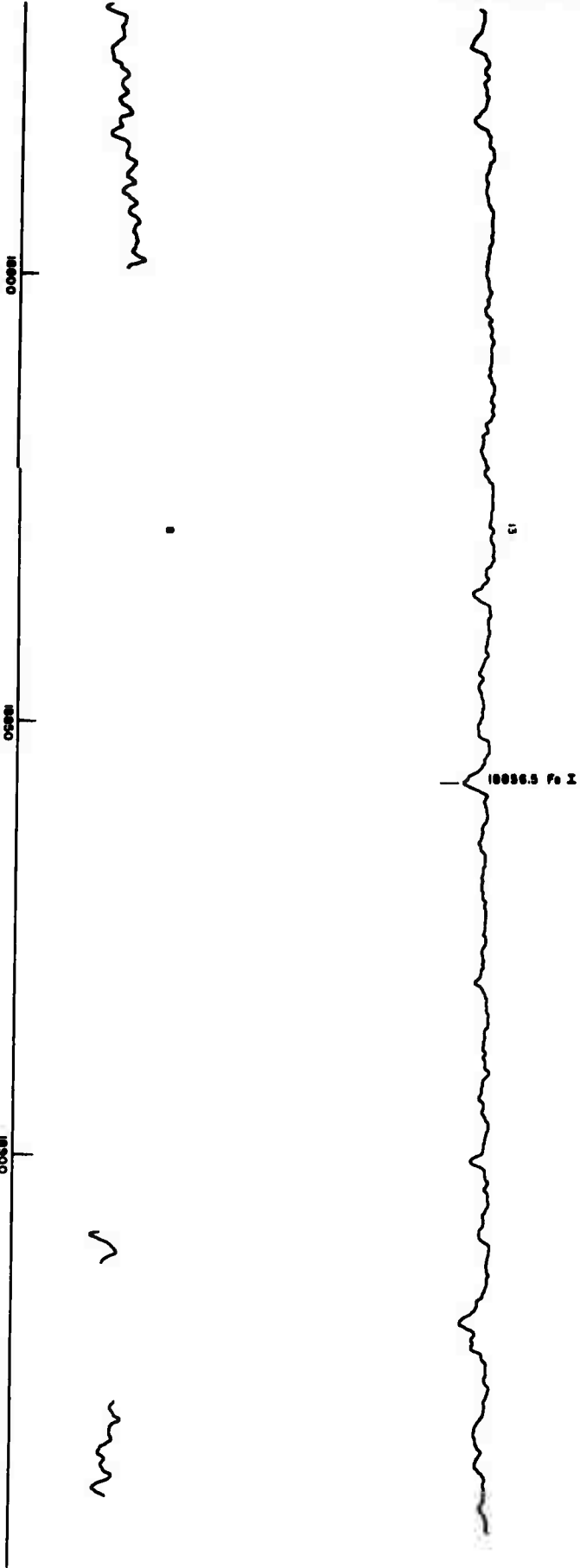


FIG 2 SEC 47

WAVELENGTH (Å)

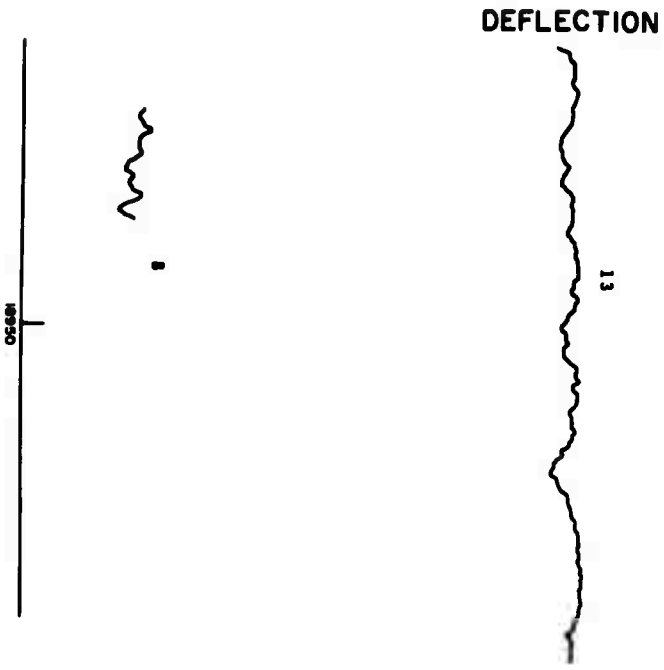


FIG 2 SEC 48

WAVELENGTH (Å)

TABLE I

Times and Altitudes for the Selected Records Shown in Figures 1-2.

Record No.	Time (MST)	Altitude(kf)
7	7:28 - 7:46	24.5 - 36.5
8	7:46 - 8:04	36.5 - 52.0
9	8:04 - 8:22	52.0 - 62.0
11	8:40 - 8:58	75.3 - 87.0
12	8:58 - 9:16	87.0 - 96.0
13	9:16 - 9:34	96.0 - 96.3
14	9:34 - 9:52	96.3 - 96.3