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COMPILATION OF X-RAY CROSS SECTIONS

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SECTION II REVISION 1

COMPILATION OF X-RAY CROSS SECTIONS

Abstract

This report contains graphs and tables of x-ray cross sections in the range of 1 keV to 1 MeV. The total cross sections presented are the sum of

computed scattering cross sections and a combination of the fit to derived experimental and theoretical photoelectric cross sections.

Introduction

Form factors of Cromer and Mann¹ were used to compute the incoherent scattering cross sections for 35 elements. The incoherent, cross section values for the remaining elements were obtained from a sliding polynomial fit across Z for each energy. Form factors of Cromer and Waber² were used to obtain the coherent scattering cross sections.

To derive the experimental photoelectric cross sections, the computed scattering cross sections were subtracted from the total attenuation data obtained by numerous experimenters. These experimental data were weighted according to the indicated accuracy of the experiment.

The high energy photoelectric cross sections were derived principally from the work of Schmickley and Pratt.³ The photoelectric cross section data were then fit by an appropriate polynomial on a log-log scale.

The graphs for each element which show the data points used to obtain the fits presented are in barns/atom as a function of photon energy in keV.

Section I of this report contains a more detailed discussion of the methods used, an evaluation of the data, and a comparison of the theoretical and experimental cross sections.

Compilation Format

The data for each element consist of four pages: one graph and three data pages. The cross sections are given in both barns/atom and cm²/g on the first two data pages in a standard energy grid. In addition the cross sections for the upper and lower value of the edges are given.

At the bottom of these pages, the cross sections for the K_{α₁}, K_{β₁}, L_{α₁}, and L_{β₁} fluorescent x rays are given at the indicated energies.

The third page of the data contains additional information useful for calculations. Various values used in processing

the data are presented on this page and are mostly self-explanatory with the following clarifications:

(1) The unit bunches/cc refers to the atomic density n in units of atoms/barn-cm or 10^{24} atoms/cc. It is a convenient unit to use when forming the product $n\sigma$ since the powers of ten cancel. Hence, if the attenuation coefficient for a given (elemental) substance is given in terms of the cross section σ in barns/atom, then the transmission T of primary photons through a layer d cm in thickness is readily calculated as

$$T = (I/I_0) = \exp(-n\sigma d) \quad (1)$$

For a given elemental substance, n is calculated from

$$n = \frac{N\rho}{A} \times 10^{-24}, \quad (2)$$

where $N(6.02252 \times 10^{23}$ a/mole) is Avogadro's number, ρ is the density of the substance in g/cc, and A is the atomic weight in g/mole. For a noble gas at STP, n is obtained directly from Loschmidt's number ($L = 2.68702 \times 10^{19}$ a/cc) as

$$n = 2.68702 \times 10^{-5} \text{ bunches/cc.}$$

(2) The conversion constant, C , is used to convert between barns/atom and cm^2/g in the following formula:

$$\sigma(b/a) = C\sigma(\text{cm}^2/\text{g}), \quad (3)$$

and is calculated as

$$C = \frac{A(\text{g}/\text{mole})}{N(a/\text{mole})} \times 10^{24}$$

in which A and N have the same meaning as in Eq. (2)

(3) Barns/atom fit coefficients are to be used in the equation,

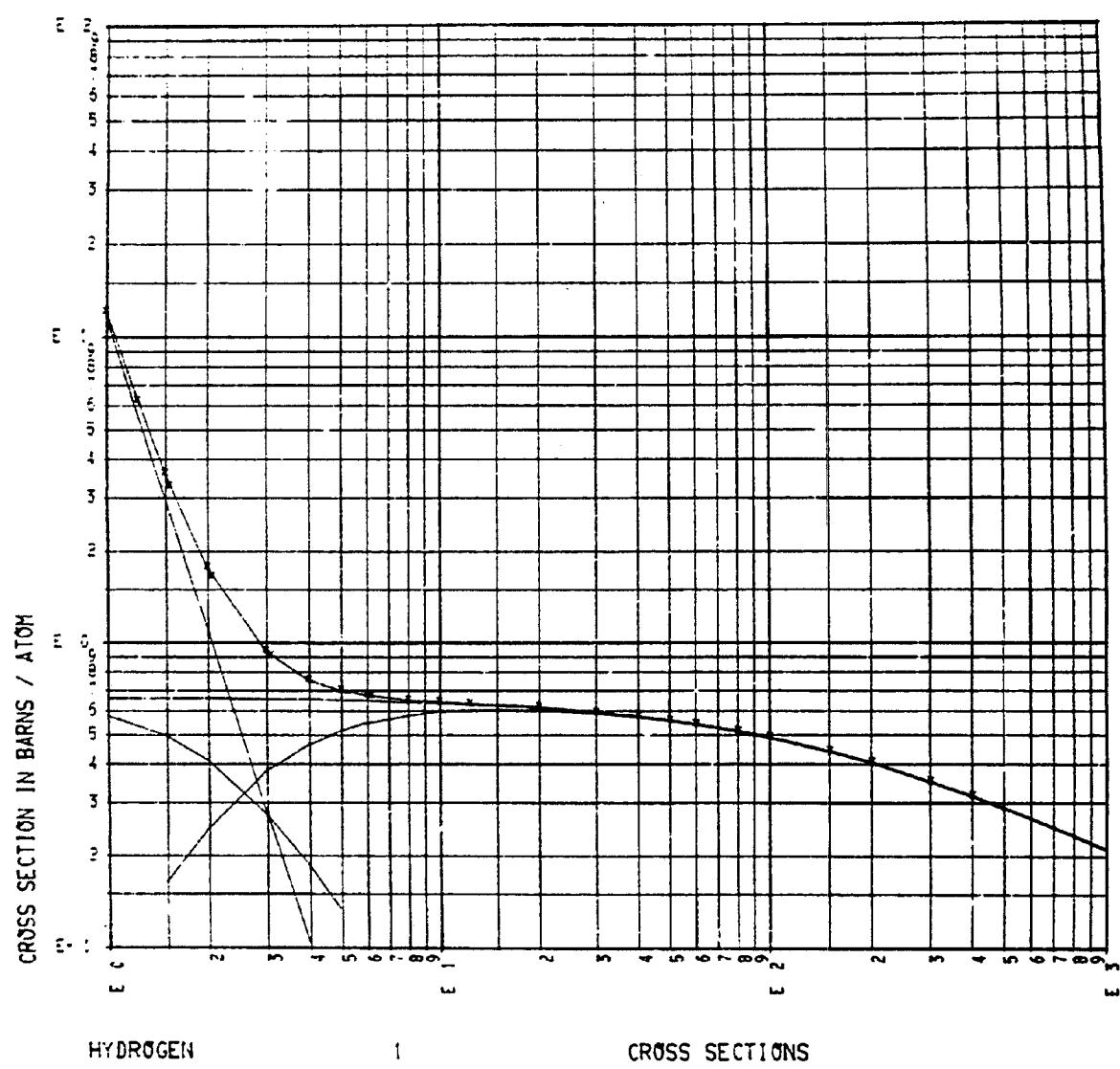
$$\ln \sigma = \sum_{i=0}^3 A_i (\ln E)^i. \quad (4)$$

The fit coefficients for the total photoelectric cross section are those used in generating the values given in the compilation tables.

The fit coefficients for the scattering cross sections were made to facilitate usage of the data by computer users. These fits are generally good to a few percent except at 1 keV where in some cases the deviation is as much as 20 percent.

References

1. D. T. Cromer and J. B. Mann, Compton Scattering Factors for Spherically Free Atoms, Los Alamos Scientific Laboratory, New Mexico, Rpt. LA-DC-8819 (1967).
2. D. T. Cromer and J. T. Waber, "Scattering Factors Computed from Relativistic Dirac-Slater Wave Functions," Acta Crystall 18, 104 (1965).
3. R. D. Schmickley and R. H. Pratt, "K-, L-, and M-Shell Atomic Photoeffect for Screened-Potential Models," Phys. Rev. 164, 104 (1967).



1 - 1 REVISED 6/03/69

CROSS SECTIONS FOR HYDROGEN		Z = 1	BARNs / ATOM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.158E+01	5.803E-01	8.442E-02	1.225E+01
1.500	2.957E+00	4.983E-01	1.655E-01	3.621E+00
2.000	1.114E+00	4.141E-01	2.486E-01	1.776E+00
3.000	2.787E-01	2.753E-01	3.833E-01	9.382E-01
4.000	1.038E-01	1.881E-01	4.683E-01	1.601E-01
5.000	4.814E-02	1.340E-01	5.194E-01	1.515E-01
6.000	2.657E-02	9.985E-02	5.608E-01	6.763E-01
8.000	9.509E-03	6.125E-02	5.843E-01	6.550E-01
10.000	4.400E-03	4.120E-02	5.934E-01	6.450E-01
15.000	1.085E-03	1.942E-02	5.095E-01	5.301E-01
20.000	4.629E-04	1.116E-02	6.068E-01	6.184E-01
30.000	1.002E-04	5.060E-03	5.924E-01	5.976E-01
40.000	3.749E-05	2.860E-03	5.758E-01	5.787E-01
50.000	1.756E-05	1.840E-03	5.596E-01	5.515E-01
60.000	9.470E-06	1.280E-03	5.443E-01	5.456E-01
80.000	3.595E-05	7.200E-04	5.165E-01	5.173E-01
100.000	1.705E-05	4.660E-04	4.923E-01	4.927E-01
150.000	4.455E-07	2.000E-04	4.434E-01	4.436E-01
200.000	1.739E-07	1.100E-04	4.063E-01	4.065E-01
300.000	4.708E-08	5.000E-05	3.534E-01	3.534E-01
400.000	1.890E-08	3.000E-05	3.166E-01	3.167E-01
500.000	6.397E-09	1.000E-05	2.891E-01	2.891E-01
600.000	2.343E-09	1.000E-05	2.615E-01	2.615E-01
800.000	2.219E-09	0.	2.349E-01	2.349E-01
1000.000	1.134E-09	0.	2.112E-01	2.112E-01

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CROSS SECTIONS FOR HYDROGEN		Z = 1	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1,000	6.931E-00	3.467E-01	5.044E-02	7.318E+00
1,500	1.167E+00	2.978E-01	9.890E-02	2.164E+00
2,000	6.654E-01	2.474E-01	1.483E-01	1.061E+00
3,000	1.665E-01	1.651E-01	2.290E-01	5.605E-01
4,000	6.201E-02	1.242E-01	2.1798E-01	4.542E-01
5,000	2.676E-02	8.009E-02	3.103E-01	4.192E-01
6,000	1.834E-02	5.966E-02	3.231E-01	4.041E-01
8,000	5.681E-03	3.650E-02	3.491E-01	3.913E-01
10,000	2.629E-03	2.462E-02	3.581E-01	3.854E-01
15,000	6.485E-04	1.160E-02	3.642E-01	3.764E-01
20,000	2.407E-04	6.680E-03	3.629E-01	3.695E-01
30,000	5.984E-05	3.023E-03	3.539E-01	3.570E-01
40,000	2.240E-05	1.709E-03	3.440E-01	3.458E-01
50,000	1.049E-05	1.099E-03	3.344E-01	3.355E-01
60,000	5.658E-06	7.648E-04	3.252E-01	3.260E-01
80,000	2.148E-06	4.302E-04	3.086E-01	3.090E-01
100,000	1.019E-06	2.748E-04	2.941E-01	2.944E-01
150,000	2.652E-07	1.195E-04	2.649E-01	2.650E-01
200,000	1.039E-07	6.572E-05	2.428E-01	2.428E-01
300,000	2.813E-08	2.987E-05	2.111E-01	2.112E-01
400,000	1.129E-08	1.792E-05	1.892E-01	1.892E-01
500,000	5.615E-09	5.975E-06	1.727E-01	1.728E-01
600,000	3.193E-09	5.975E-06	1.598E-01	1.598E-01
800,000	1.326E-09	0.	1.404E-01	1.404E-01
1000,000	6.778E-10	0.	1.262E-01	1.262E-01

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REVISED 5/03/69

MISCELLANEOUS DATA FOR HYDROGEN

ATOMIC WEIGHT 1.008 GRAMS / MOLE
DENSITY 8.987E-05 GRAMS / CC
ATOMIC DENSITY 5.369E-05 BUNCHES / CC

CONVERSION CONSTANT IS 1.674E+00

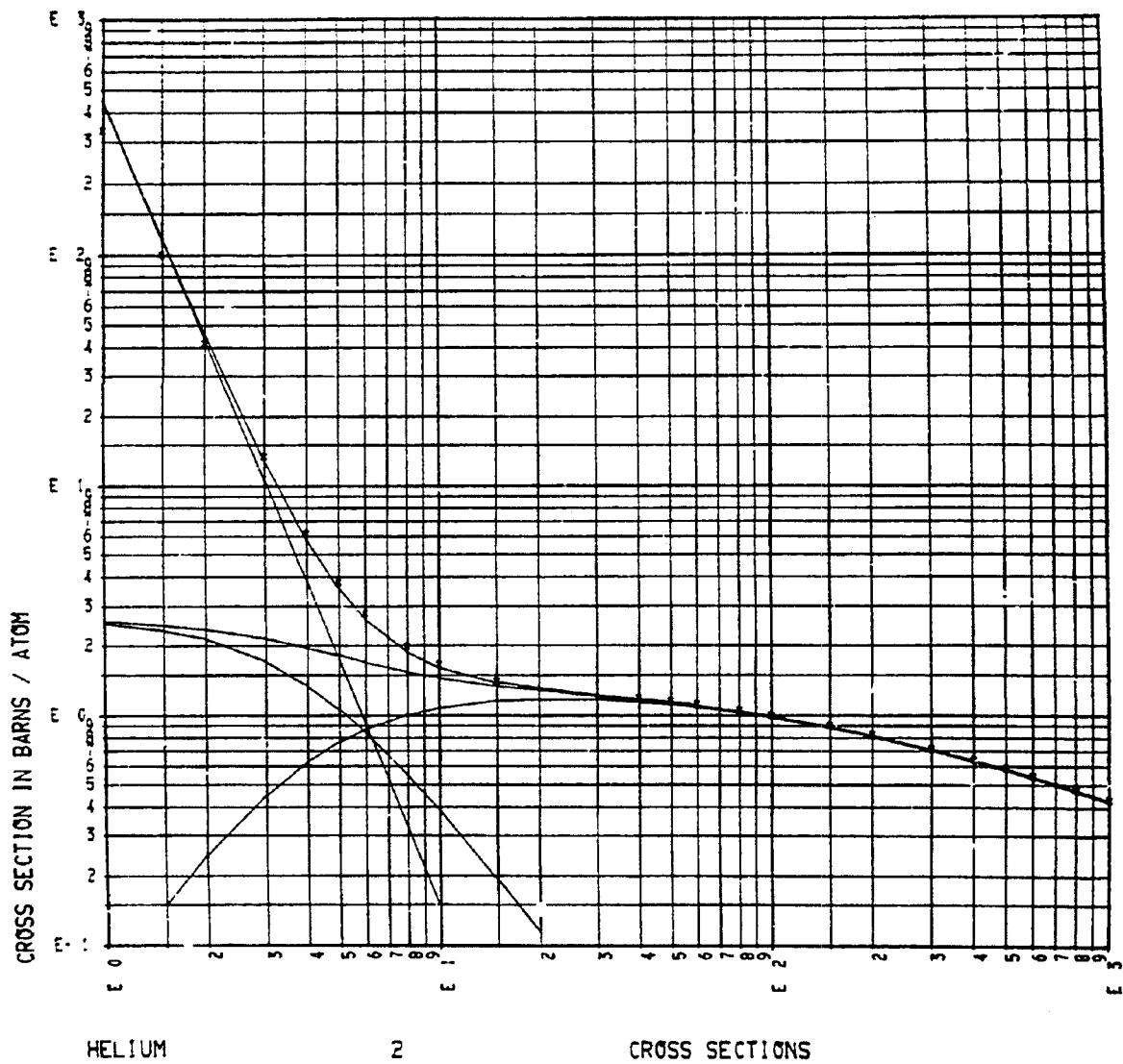
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	X	Y	C.	L	C.	K	C.014
0	0.	0.	0.	0.	0.	2.44954E+00	
1	0.	0.	0.	0.	0.	-3.34953E+00	
2	0.	0.	0.	0.	0.	-4.71370E-02	
3	0.	0.	0.	0.	0.	-1.09962E-03	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	-1.19073E-01	-2.15712E+00
1	-9.37086E-01	1.52685E+00
2	-2.06538E-01	-3.05620E-01
3	1.06597E-02	1.85025E-02



HELIUM

2

CROSS SECTIONS

2 - 1

REVISED 6/03/69

CROSS SECTIONS FOR HELIUM		Z = 2	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	4.305E+02	2.612E+00	7.039E-02	4.331E+02
1.500	1.115E+02	2.347E+00	1.492E-01	1.140E+02
2.000	4.199E+01	2.148E+00	2.447E-01	4.438E+01
3.000	1.038E+01	1.726E+00	4.447E-01	1.255E+01
4.000	3.802E+00	1.353E+00	6.251E-01	5.780E+00
5.000	1.736E+00	1.060E+00	7.669E-01	3.562E+00
6.000	9.119E-01	8.398E-01	8.732E-01	2.625E+00
8.000	3.291E-01	5.542E-01	1.009E+00	1.892E+00
10.000	1.489E-01	3.891E-01	1.083E+00	1.621E+00
15.000	3.523E-02	1.948E-01	1.158E+00	1.388E+00
20.000	1.269E-02	1.159E-01	1.177E+00	1.305E+00
30.000	3.630E-03	5.410E-02	1.167E+00	1.224E+00
40.000	1.105E-03	3.100E-02	1.141E+00	1.174E+00
50.000	5.083E-04	2.000E-02	1.113E+00	1.133E+00
60.000	2.708E-04	1.400E-02	1.084E+00	1.098E+00
80.000	1.012E-04	7.900E-03	1.030E+00	1.038E+00
100.000	4.761E-05	5.050E-03	9.828E-01	9.879E-01
150.000	1.239E-05	2.250E-03	8.860E-01	8.883E-01
200.000	4.874E-06	1.260E-03	8.123E-01	8.135E-01
300.000	1.354E-06	5.600E-04	4.066E-01	4.071E-01
400.000	5.611E-07	3.200E-04	6.332E-01	6.335E-01
500.000	2.882E-07	1.900E-04	5.782E-01	5.784E-01
600.000	1.693E-07	1.300E-04	5.349E-01	5.350E-01
800.000	7.478E-08	7.000E-05	4.698E-01	4.699E-01
1000.000	4.052E-08	4.000E-05	4.224E-01	4.224E-01

2 - 2

REVISED 6/03/69

CROSS SECTIONS FOR HELIUM		Z = 2	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	6.476E+01	3.779E-01	1.059E-02	6.515E+01
1.500	1.877E+01	3.531E-01	2.245E-02	1.715E+01
2.000	6.311E+00	3.232E-01	3.562E-02	6.677E+00
3.000	1.561E+00	2.597E-01	6.690E-02	1.888E+00
4.000	5.720E-01	2.036E-01	9.404E-02	8.696E-01
5.000	2.611E-01	1.595E-01	1.154E-01	5.359E-01
6.000	1.372E-01	1.263E-01	1.314E-01	3.949E-01
8.000	4.951E-02	8.338E-02	1.518E-01	2.847E-01
10.000	2.241E-02	5.854E-02	1.630E-01	2.439E-01
15.000	5.501E-03	2.931E-02	1.743E-01	2.089E-01
20.000	1.909E-03	1.744E-02	1.770E-01	1.964E-01
30.000	4.558E-04	8.139E-03	1.756E-01	1.842E-01
40.000	1.663E-04	4.664E-03	1.717E-01	1.766E-01
50.000	7.648E-05	3.009E-03	1.674E-01	1.705E-01
60.000	4.074E-05	2.106E-03	1.631E-01	1.652E-01
80.000	1.523E-05	1.189E-03	1.550E-01	1.562E-01
100.000	7.164E-06	7.513E-04	1.479E-01	1.486E-01
150.000	1.865E-05	3.385E-04	1.333E-01	1.336E-01
200.000	7.332E-07	1.896E-04	1.222E-01	1.224E-01
300.000	2.037E-07	8.425E-05	1.063E-01	1.064E-01
400.000	8.442E-08	4.814E-05	9.526E-02	9.531E-02
500.000	4.556E-08	2.859E-05	8.699E-02	8.702E-02
600.000	2.546E-08	1.956E-05	8.047E-02	8.049E-02
800.000	1.125E-08	1.053E-05	7.069E-02	7.070E-02
1000.000	6.096E-09	6.018E-06	5.354E-02	5.355E-02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR HELIUM

ATOMIC WEIGHT 4.003 GRAMS / MOLE
DENSITY 1.785E-04 GRAMS / CC
ATOMIC DENSITY 2.686E-05 BUNCHES / CC

CONVERSION CONSTANT IS 6.647E+00

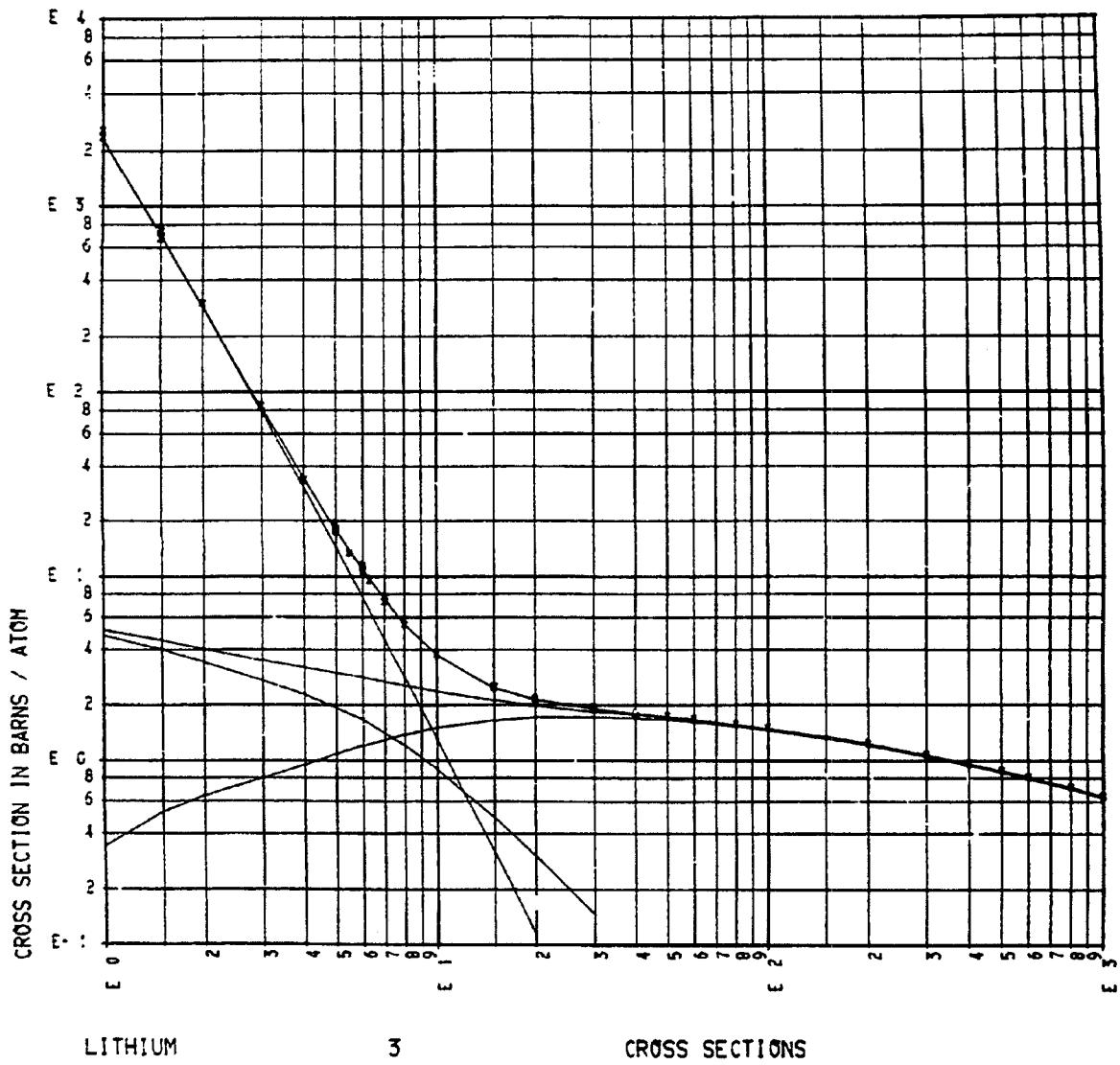
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	0.025
0	0.	0.	0.	0.	0.	5.06488E+00	
1	0.	0.	0.	0.	0.	-3.29055E+00	
2	0.	0.	0.	0.	0.	-1.07256E-01	
3	0.	0.	0.	0.	0.	1.44466E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	1.04768E+00	-2.55357E+00
1	-8.51805E-02	2.02535E+00
2	-4.03527E-01	-4.48710E-01
3	2.69398E-02	2.79691E-02



3 - 1 REVISED 6/03/69

CROSS SECTIONS FOR LITHIUM		Z = 3	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.530E+03	4.784E+00	3.396E-01	2.335E+03
1.500	7.156E+02	4.005E+00	5.195E-01	1.201E+02
2.000	2.968E+02	3.428E+00	6.365E-01	3.008E+02
3.000	8.152E+01	2.721E+00	8.071E-01	8.505E+01
4.000	3.158E+01	2.279E+00	9.528E-01	3.481E+01
5.000	1.490E+01	1.938E+00	1.085E+00	1.793E+01
6.000	8.000E+00	1.652E+00	1.201E+00	1.085E+01
8.000	2.958E+00	1.209E+00	1.386E+00	5.553E+00
10.000	1.355E+00	9.020E-01	1.511E+00	3.768E+00
15.000	3.233E-01	4.872E-01	1.663E+00	2.474E+00
20.000	1.163E-01	3.010E-01	1.718E+00	2.152E+00
30.000	2.748E-02	1.466E-01	1.724E+00	1.898E+00
40.000	9.920E-03	8.590E-02	1.696E+00	1.792E+00
50.000	4.525E-03	5.610E-02	1.658E+00	1.719E+00
60.000	2.394E-03	3.940E-02	1.618E+00	1.660E+00
80.000	8.870E-04	2.250E-02	1.541E+00	1.565E+00
100.000	4.154E-04	1.440E-02	1.471E+00	1.486E+00
150.000	1.081E-04	6.400E-03	1.328E+00	1.334E+00
200.000	4.283E-05	3.700E-03	1.218E+00	1.221E+00
300.000	1.222E-05	1.600E-03	1.060E+00	1.061E+00
400.000	5.228E-06	8.900E-04	9.495E-01	9.504E-01
500.000	2.777E-06	5.700E-04	8.572E-01	8.577E-01
600.000	1.687E-06	3.800E-04	8.022E-01	8.026E-01
800.000	7.962E-07	2.200E-04	1.047E-01	1.049E-01
1000.000	4.593E-07	1.300E-04	6.335E-01	6.336E-01

3 - 2

REVISED 6/03/69

CROSS SECTIONS FOR LITHIUM Z = 3 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.022E+02	4.152E-01	2.947E-02	2.027E+02
1.500	6.210E+01	3.475E-01	4.508E-02	6.249E+01
2.000	2.575E+01	2.975E-01	5.523E-02	2.611E+01
3.000	7.074E+00	2.361E-01	7.004E-02	7.380E+00
4.000	2.740E+00	1.978E-01	8.268E-02	3.021E+00
5.000	1.293E+00	1.681E-01	9.413E-02	1.556E+00
6.000	6.942E-01	1.434E-01	1.043E-01	9.419E-01
8.000	2.557E-01	1.049E-01	1.203E-01	4.819E-01
10.000	1.176E-01	7.828E-02	1.311E-01	3.270E-01
15.000	2.806E-02	4.228E-02	1.443E-01	2.147E-01
20.000	1.009E-02	2.612E-02	1.488E-01	1.850E-01
30.000	2.384E-03	1.272E-02	1.496E-01	1.647E-01
40.000	8.608E-04	7.454E-03	1.472E-01	1.555E-01
50.000	3.927E-04	4.868E-03	1.439E-01	1.492E-01
60.000	2.078E-04	3.419E-03	1.404E-01	1.441E-01
80.000	7.697E-05	1.953E-03	1.337E-01	1.358E-01
100.000	3.605E-05	1.250E-03	1.277E-01	1.290E-01
150.000	9.378E-06	5.554E-04	1.152E-01	1.158E-01
200.000	3.717E-06	3.211E-04	1.057E-01	1.060E-01
300.000	1.061E-06	1.388E-04	9.194E-02	9.208E-02
400.000	4.537E-07	1.723E-05	8.240E-02	8.248E-02
500.000	2.410E-07	4.946E-05	7.525E-02	7.530E-02
600.000	1.464E-07	3.298E-05	6.952E-02	6.965E-02
800.000	6.909E-08	1.909E-05	9.116E-02	9.117E-02
1000.000	3.985E-08	1.128E-05	5.498E-02	5.499E-02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR LITHIUM

ATOMIC WEIGHT 6.940 GRAMS / MOLE
DENSITY 0.534 GRAMS / CC
ATOMIC DENSITY 4.634E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.152E+01

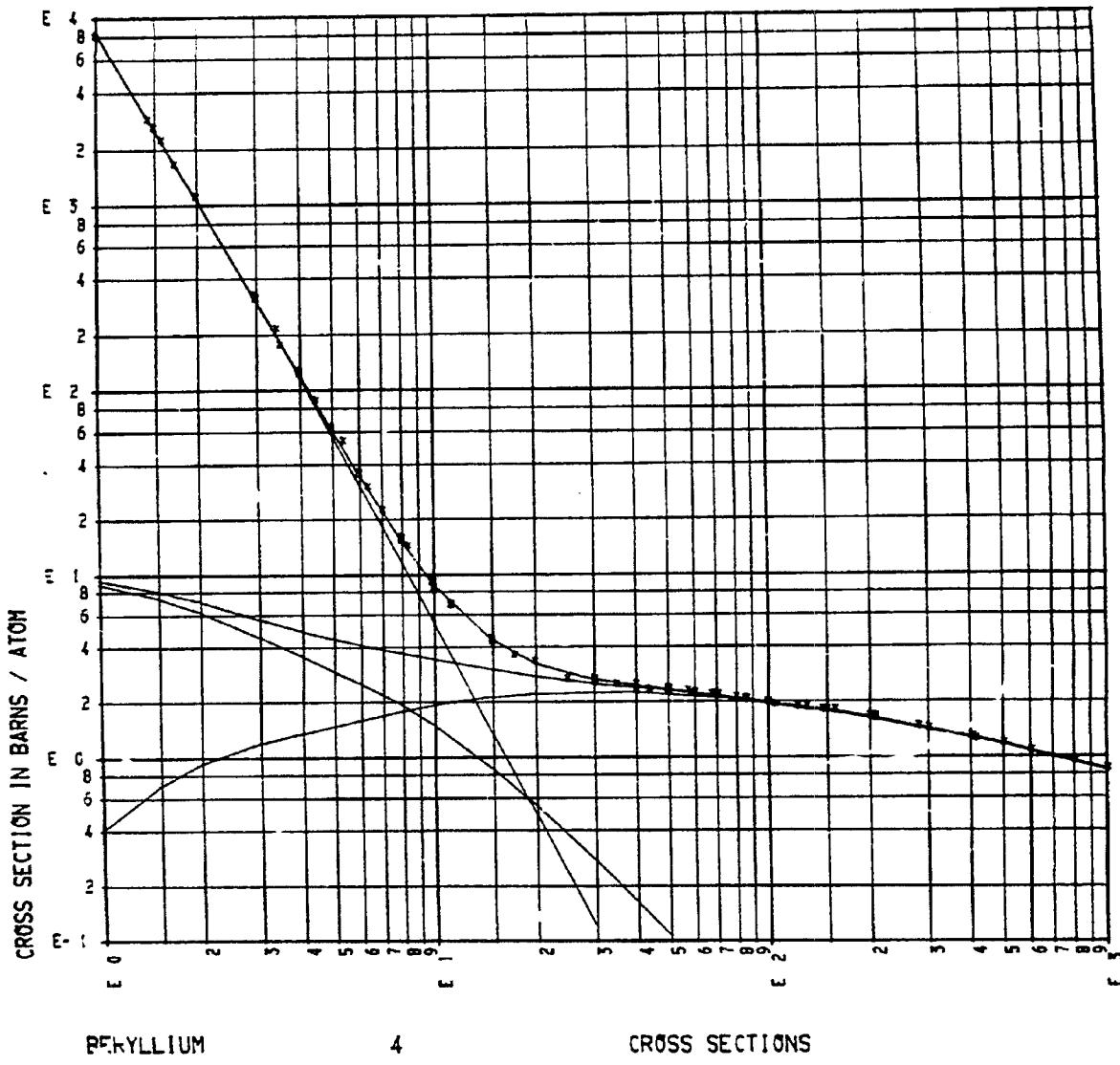
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	G.055
0	0.	0.	0.	0.	0.	7.75370E+00	
1	0.	0.	0.	0.	0.	-2.81801E+00	
2	0.	0.	0.	0.	0.	-2.41738E-01	
3	0.	0.	0.	0.	0.	2.62542E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	1.34366E+00	-1.08740E+00
1	1.81557E-01	1.03368E+00
2	-4.23981E-01	-1.90377E-01
3	2.66190E-02	7.79955E-03



PERYLLIUM

4

CROSS SECTIONS

4 - 1 REVISED 6/03/69

CROSS SECTIONS FOR BERYLLIUM		Z = 4	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	8.477E+03	8.886E+00	4.011E-01	8.486E+03
1.500	2.598E+03	7.461E+00	6.979E-01	2.607E+03
2.000	1.082E+03	6.215E+00	9.247E-01	1.089E+03
3.000	3.012E+02	4.517E+00	1.197E+00	3.069E+02
4.000	1.182E+02	3.548E+00	1.360E+00	1.231E+02
5.000	5.650E+01	2.945E+00	1.487E+00	6.093E+01
6.000	3.068E+01	2.521E+00	1.597E+00	3.479E+01
8.000	1.157E+01	1.923E+00	1.781E+00	1.527E+01
10.000	5.389E+00	1.501E+00	1.926E+00	8.815E+00
15.000	1.328E+00	8.650E-01	2.137E+00	4.331E+00
20.000	4.891E-01	5.503E-01	2.227E+00	3.267E+00
30.000	1.196E-01	2.759E-01	2.255E+00	2.661E+00
40.000	4.424E-02	1.643E-01	2.240E+00	2.448E+00
50.000	2.055E-02	1.085E-01	2.196E+00	2.325E+00
60.000	1.103E-02	7.680E-02	2.147E+00	2.235E+00
80.000	4.174E-03	4.410E-02	2.049E+00	2.097E+00
100.000	1.985E-03	2.840E-02	1.958E+00	1.988E+00
150.000	5.288E-04	1.280E-02	1.768E+00	1.782E+00
200.000	2.125E-04	1.200E-03	1.622E+00	1.630E+00
300.000	6.142E-05	3.200E-03	1.412E+00	1.415E+00
400.000	2.639E-05	1.800E-03	1.266E+00	1.268E+00
500.000	1.402E-05	1.200E-03	1.156E+00	1.157E+00
600.000	8.501E-06	8.000E-04	1.070E+00	1.071E+00
800.000	3.982E-06	4.200E-04	9.396E-01	9.400E-01
1000.000	2.275E-06	2.600E-04	8.446E-01	8.449E-01

CROSS SECTIONS FOR BERYLLIUM Z = 4 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	5.665E+02	5.939E-01	2.681E-02	5.671E+02
1.500	1.736E+02	4.986E-01	4.664E-02	1.742E+02
2.000	1.233E+01	4.154E-01	6.180E-02	7.281E+01
3.000	2.013E+01	3.019E-01	8.001E-02	2.051E+01
4.000	7.901E+00	2.371E-01	9.090E-02	8.229E+00
5.000	3.776E+00	1.968E-01	9.939E-02	4.072E+00
6.000	2.050E+00	1.685E-01	1.067E-01	2.325E+00
8.000	7.732E-01	1.285E-01	1.190E-01	1.021E+00
10.000	3.601E-01	1.003E-01	1.287E-01	5.891E-01
15.000	8.876E-02	5.781E-02	1.428E-01	2.894E-01
20.000	3.269E-02	3.678E-02	1.488E-01	2.183E-01
30.000	7.995E-03	1.844E-02	1.514E-01	1.778E-01
40.000	2.956E-03	1.098E-02	1.497E-01	.636E-01
50.000	1.373E-03	1.251E-03	1.467E-01	.554E-01
60.000	1.371E-04	5.132E-03	1.435E-01	.493E-01
80.000	2.789E-04	2.947E-03	1.369E-01	.401E-01
100.000	1.326E-04	1.898E-03	1.308E-01	1.329E-01
150.000	3.534E-05	8.554E-04	1.182E-01	1.191E-01
200.000	1.420E-05	4.812E-04	1.084E-01	1.089E-01
300.000	4.104E-06	2.138E-04	9.437E-02	9.459E-02
400.000	1.264E-06	1.203E-04	8.459E-02	8.471E-02
500.000	9.372E-07	8.019E-05	7.725E-02	7.733E-02
600.000	5.681E-07	5.346E-05	7.147E-02	7.153E-02
800.000	2.661E-07	2.807E-05	6.279E-02	6.282E-02
1000.000	1.520E-07	1.738E-05	5.645E-02	5.646E-02

4 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR BERYLLIUM

ATOMIC WEIGHT 9.012 GRAMS / MOLE
DENSITY 1.848 GRAMS / CC
ATOMIC DENSITY 1.235E-01 BUNCHES / CC

CONVERSION CONSTANT IS 1.496E+01

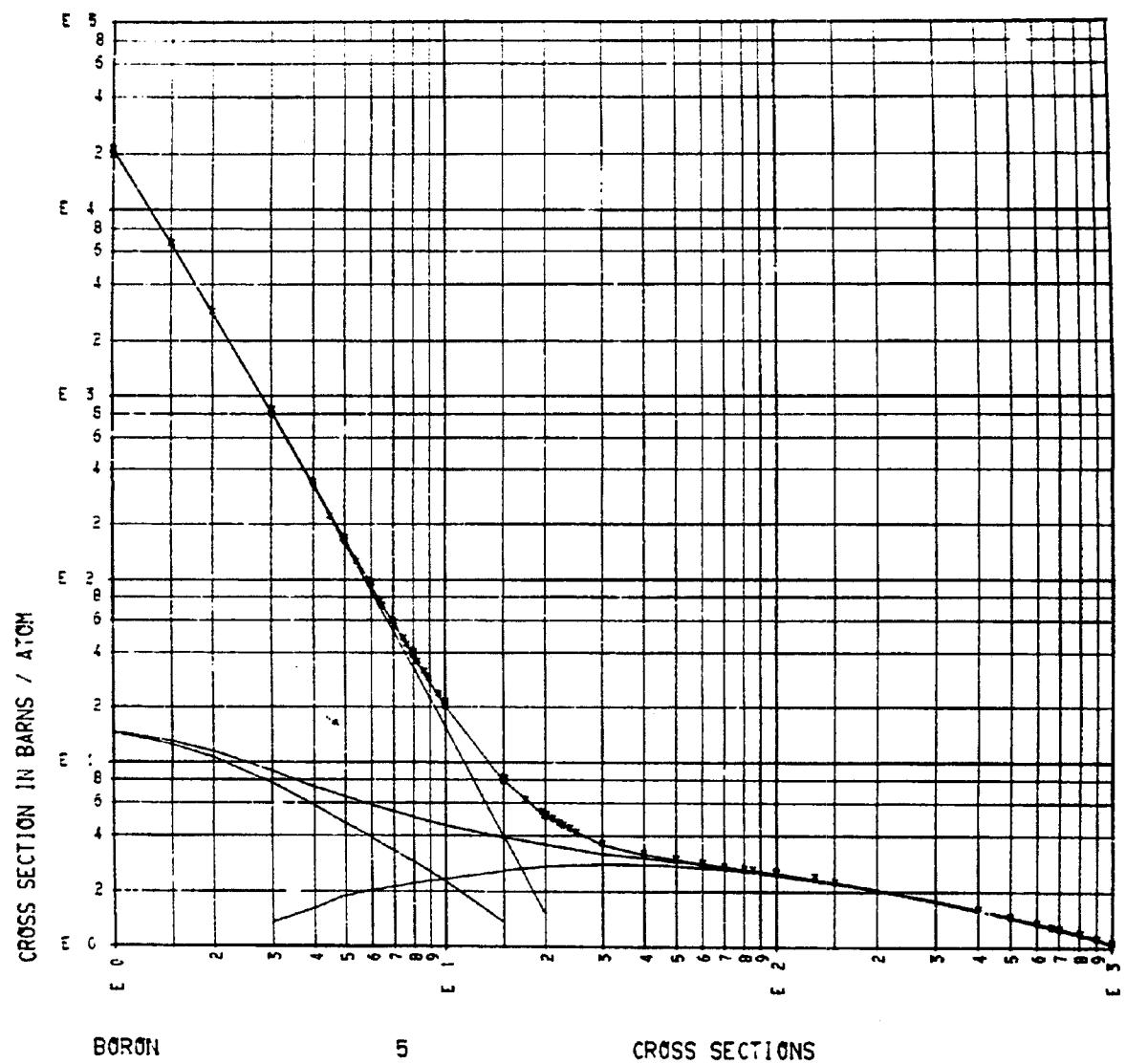
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	O.112
0	0.	0.	0.	0.	0.	9.04511E+00	
1	0.	0.	0.	0.	0.	-2.83487E+00	
2	0.	0.	0.	0.	0.	-2.10021E-01	
3	0.	0.	0.	0.	0.	2.29526E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	2.00860E+00	-6.90079E-01
1	-4.61920E-02	9.46448E-01
2	-3.37018E-01	-1.71142E-01
3	1.86939E-02	6.51413E-03



5 - 1 REVISED 6/03/69

CROSS SECTIONS FOR BORON		Z = 5	BARNs / ATOM	
KEV	PHOTs	COHERENT	INCOHERENT	TOTAL
1.000	2.096E+04	1.449E+01	3.551E-01	2.098E+04
1.500	6.668E+03	1.256E+01	6.698E-01	6.681E+03
2.000	2.848E+03	1.067E+01	9.552E-01	2.860E+03
3.000	8.198E+02	1.740E+00	1.365E+00	8.289E+02
4.000	3.293E+02	5.868E+00	1.629E+00	3.368E+02
5.000	1.601E+02	4.673E+00	1.920E+00	1.667E+02
6.000	8.810E+01	3.879E+00	2.048E+00	9.402E+01
8.000	3.592E+01	2.890E+00	2.226E+00	3.903E+01
10.000	1.604E+01	2.271E+00	2.336E+00	2.055E+01
15.000	4.058E+00	1.363E+00	2.597E+00	8.018E+00
20.000	1.520E+00	8.880E-01	2.718E+00	5.125E+00
30.000	3.803E-01	4.543E-01	2.877E+00	3.622E+00
40.000	1.427E-01	2.737E-01	2.727E+00	3.188E+00
50.000	6.697E-02	1.823E-01	2.725E+00	2.975E+00
60.000	3.624E-02	1.298E-01	2.669E+00	2.835E+00
80.000	1.387E-02	7.510E-02	2.553E+00	2.642E+00
100.000	6.652E-03	4.870E-02	2.442E+00	2.495E+00
150.000	1.795E-03	2.190E-02	2.208E+00	2.232E+00
200.000	7.271E-04	1.240E-02	2.037E+00	2.040E+00
300.000	2.120E-04	5.500E-03	1.755E+00	1.771E+00
400.000	9.153E-05	3.100E-03	1.582E+00	1.585E+00
500.000	4.877E-05	2.000E-03	1.445E+00	1.447E+00
600.000	2.961E-05	1.300E-03	1.337E+00	1.338E+00
800.000	1.389E-05	1.000E-04	1.174E+00	1.175E+00
1000.000	7.935E-06	5.000E-04	1.055E+00	1.057E+00

5 - 2

REVISED 6/05/69

CROSS SECTIONS FOR BORON		Z = 5	CM**2 / GRAM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.168E+03	8.072E-01	1.984E-02	1.169E+03
1.500	3.714E+02	6.995E-01	3.731E-02	3.722E+02
2.000	1.587E+02	5.944E-01	5.327E-02	1.593E+02
3.000	4.567E+01	4.312E-01	7.604E-02	4.617E+01
4.000	1.834E+01	3.269E-01	9.075E-02	1.876E+01
5.000	8.917E+00	2.603E-01	1.070E-01	9.285E+00
6.000	4.908E+00	2.161E-01	1.141E-01	5.236E+00
8.000	1.889E+00	1.610E-01	1.240E-01	2.174E+00
10.000	8.935E-01	1.265E-01	1.301E-01	1.150E+00
15.000	2.260E-01	7.595E-02	1.447E-01	4.467E-01
20.000	8.469E-02	4.947E-02	1.814E-01	2.856E-01
30.000	2.118E-02	2.531E-02	1.553E-01	2.017E-01
40.000	7.948E-03	1.525E-02	1.844E-01	1.776E-01
50.000	3.731E-03	1.016E-02	1.519E-01	1.657E-01
60.000	2.019E-03	7.231E-03	1.487E-01	1.579E-01
80.000	7.729E-04	4.184E-03	1.422E-01	1.472E-01
100.000	3.706E-04	2.713E-03	1.360E-01	1.391E-01
150.000	1.000E-04	1.220E-03	1.230E-01	1.243E-01
200.000	4.050E-05	6.908E-04	1.129E-01	1.137E-01
300.000	1.181E-05	3.064E-04	9.832E-02	9.864E-02
400.000	5.099E-06	1.727E-04	8.813E-02	8.851E-02
500.000	2.717E-06	1.114E-04	8.050E-02	8.061E-02
600.000	1.649E-06	7.242E-05	7.448E-02	7.455E-02
800.000	1.737E-07	3.906E-05	6.540E-02	6.544E-02
1000.000	4.421E-07	2.185E-05	5.885E-02	5.886E-02

5 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR BORON

ATOMIC WEIGHT 10.811 GRAMS / MOLE
DENSITY 2.340 GRAMS / CC
ATOMIC DENSITY 1.304E-01 BUNCHES / CC

CONVERSION CONSTANT IS 1.795E+01

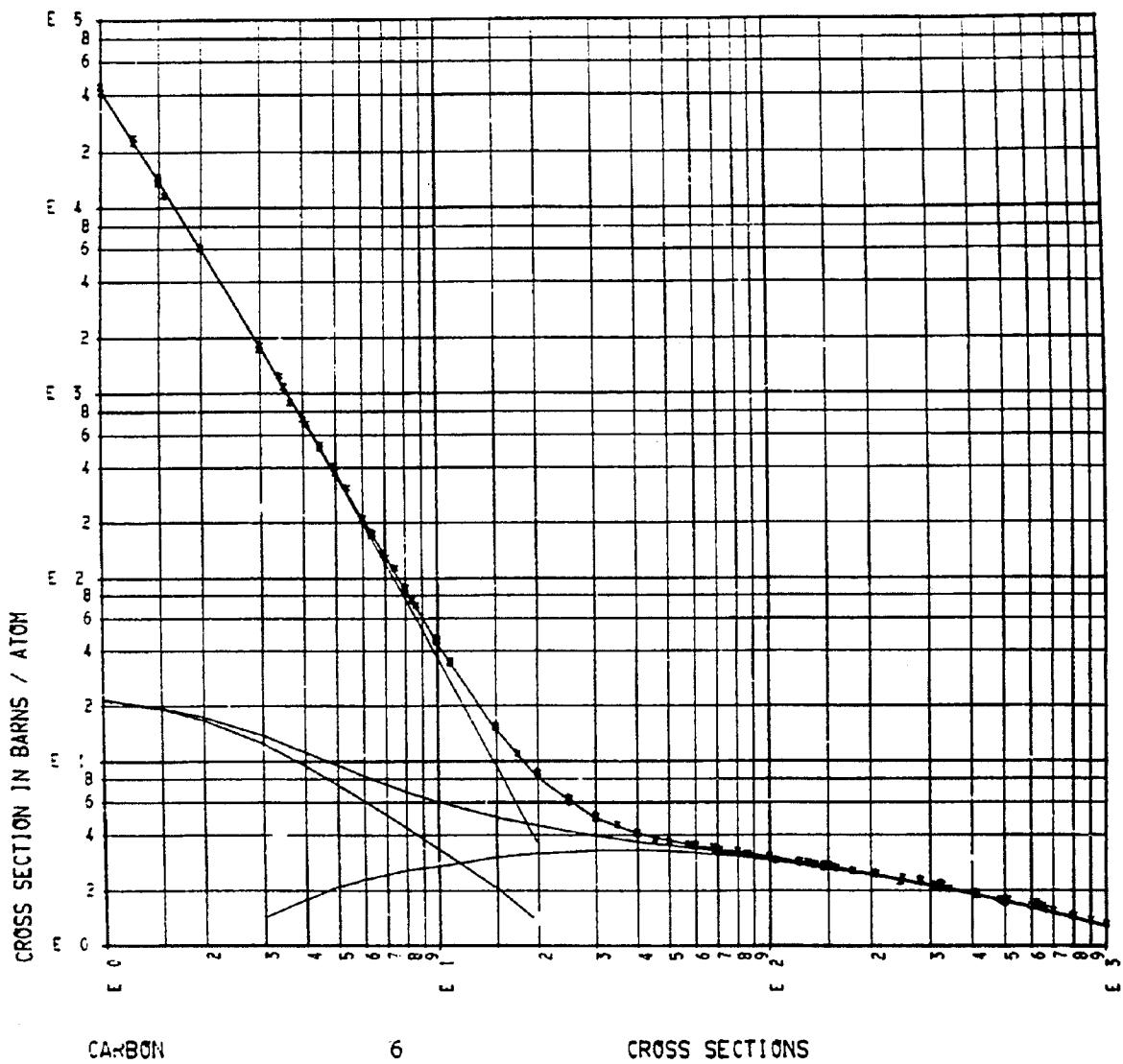
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	X	Y	C.	L	G.	K	O.188
0	0.	0.	0.	0.	0.	9.95057E+00	
1	0.	0.	0.	0.	0.	-2.74173E+00	
2	0.	0.	0.	0.	0.	-2.15138E-01	
3	0.	0.	0.	0.	0.	2.27845E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	2.61862E+00	-1.91177E-01
1	-2.07916E-01	1.21611E+00
2	-2.86283E-01	-2.39087E-01
3	1.44966E-02	1.17686E-02



CARBON

6

CROSS SECTIONS

5 - 1

REVISED 6/03/69

CROSS SECTIONS FOR CARBON		Z = 6	BARNS / ATOM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	4.382E+04	2.160E+01	3.029E+01	4.385E+04
1.500	1.413E+04	1.929E+01	5.989E+01	1.415E+04
2.000	6.108E+03	1.585E+01	9.039E+01	9.125E+03
3.000	1.193E+03	1.259E+01	1.413E+00	1.807E+03
4.000	1.317E+02	9.548E+00	1.785E+00	1.450E+02
5.000	3.603E+02	1.490E+00	2.086E+00	3.699E+02
6.000	2.004E+02	6.084E+00	2.291E+00	2.088E+02
8.000	1.854E+01	4.351E+00	2.901E+00	8.546E+01
10.000	3.766E+01	3.354E+00	2.696E+00	4.372E+01
15.000	9.770E+00	2.030E+00	3.029E+00	1.483E+01
20.000	3.725E+00	1.343E+00	3.188E+00	8.256E+00
30.000	9.539E-01	1.003E+00	3.295E+00	4.949E+00
40.000	3.634E-01	4.252E-01	3.293E+00	4.083E+00
50.000	1.725E-01	2.856E-01	3.248E+00	3.706E+00
60.000	9.411E-02	2.043E-01	3.186E+00	3.484E+00
80.000	3.646E-02	1.190E-01	3.053E+00	3.208E+00
100.000	1.761E-02	1.750E-02	2.923E+00	3.018E+00
150.000	4.804E-03	3.510E-02	2.946E+00	2.686E+00
200.000	1.953E-03	1.990E-02	2.430E+00	2.452E+00
300.000	5.698E-04	8.800E-03	2.111E+00	2.126E+00
400.000	2.451E-04	5.000E-03	1.898E+00	1.903E+00
500.000	1.299E-04	3.100E-03	1.733E+00	1.736E+00
600.000	7.837E-05	2.200E-03	1.604E+00	1.606E+00
800.000	3.628E-05	1.200E-03	1.409E+00	1.410E+00
1000.000	2.046E-05	1.000E-04	1.267E+00	1.268E+00

6 - 2 REVISED 6/03/69

CROSS SECTIONS FOR CARBON		Z = 6	CM**2 / GRAM	
KEY	PHSTJ	COHERENT	INCOHERENT	TOTAL
1.000	2.198E+03	1.083E+00	1.519E-02	2.199E+03
1.500	1.083E+02	9.574E-01	3.003E-02	1.095E+02
2.000	3.063E+02	8.449E-01	4.533E-02	3.072E+02
3.000	8.992E+01	6.313E-01	1.086E-02	9.062E+01
4.000	3.669E+01	4.788E-01	8.951E-02	3.726E+01
5.000	1.807E+01	3.756E-01	1.046E-01	1.855E+01
6.000	1.005E+01	3.051E-01	1.149E-01	1.047E+01
8.000	3.938E+00	2.187E-01	1.284E-01	4.285E+00
10.000	1.888E+00	1.587E-01	1.352E-01	2.192E+00
15.000	4.899E-01	1.018E-01	1.519E-01	1.436E-01
20.000	1.868E-01	6.737E-02	1.699E-01	4.140E-01
30.000	4.783E-02	3.512E-02	1.652E-01	2.482E-01
40.000	1.823E-02	2.157E-02	1.661E-01	2.047E-01
50.000	6.650E-03	1.432E-02	1.629E-01	1.858E-01
60.000	4.719E-03	1.024E-02	1.598E-01	1.747E-01
80.000	1.828E-03	5.967E-03	1.531E-01	1.609E-01
100.000	8.832E-04	3.886E-03	1.453E-01	1.513E-01
150.000	2.409E-04	1.760E-03	1.327E-01	1.347E-01
200.000	9.792E-05	9.979E-04	1.219E-01	1.230E-01
300.000	2.857E-05	4.413E-04	1.062E-01	1.060E-01
400.000	1.229E-05	2.507E-04	9.518E-02	9.544E-02
500.000	6.513E-06	1.555E-04	8.590E-02	8.606E-02
600.000	3.930E-06	1.103E-04	8.043E-02	8.059E-02
800.000	1.819E-06	6.018E-05	6.056E-02	6.072E-02
1000.000	1.026E-06	3.510E-05	6.353E-02	6.357E-02

6 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR CARBON

ATOMIC WEIGHT 12.010 GRAMS / MOLE
DENSITY 1.580 GRAMS / CC
ATOMIC DENSITY 7.923E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.994E+01

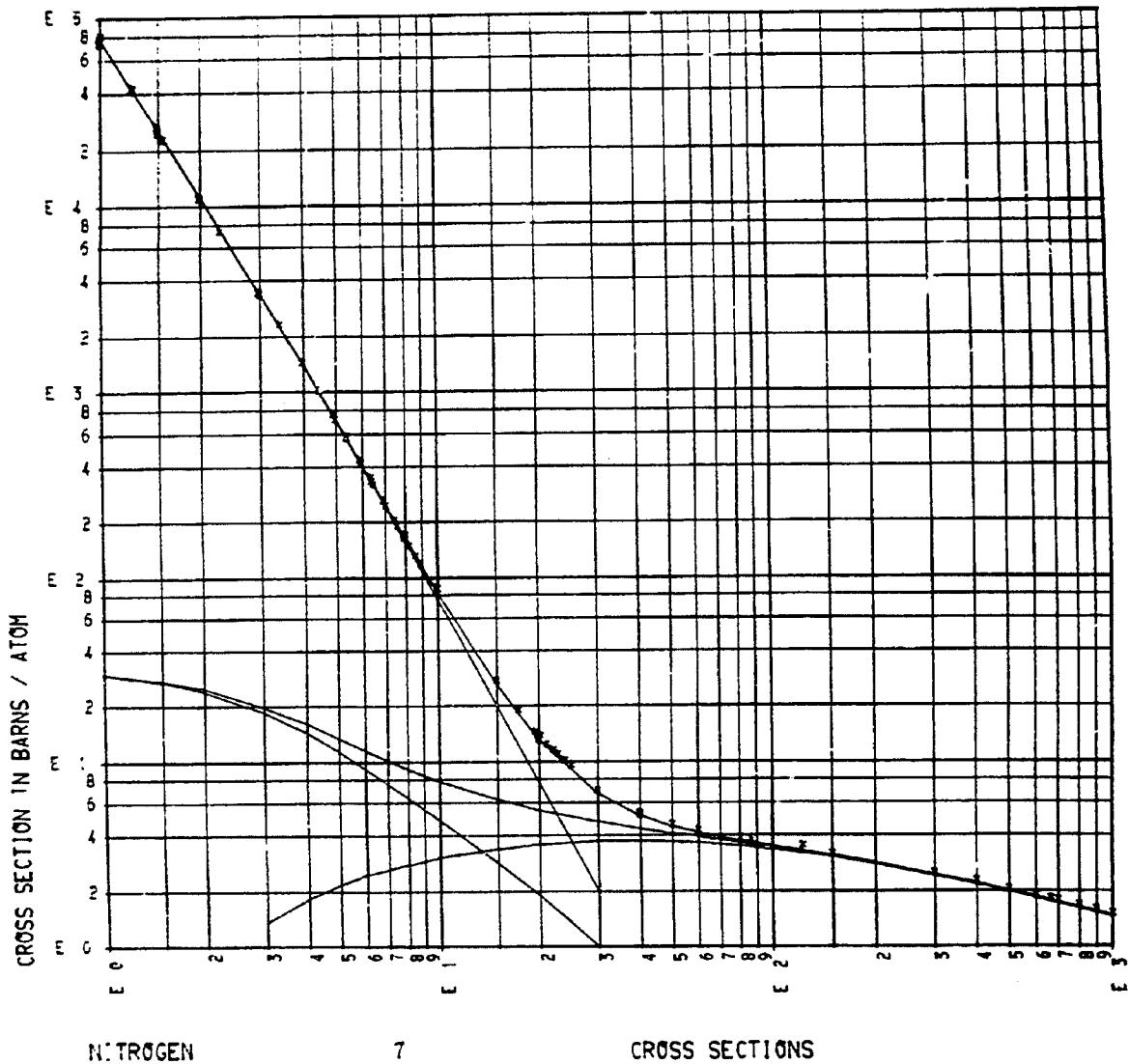
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	0.284
0	0.	0.	-	0.	-	1.06879E+01	
1	0.	0.	-	0.	-	-2.71400E+00	
2	0.	0.	-	0.	-	-2.00530E-01	
3	0.	0.	-	0.	-	2.07249E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	3.10861E+00	-9.82876E-01
1	-2.60580E-01	1.46693E+00
2	-2.71974E-01	-2.93743E-01
3	1.35181E-02	1.56005E-02



NITROGEN

7

CROSS SECTIONS

7 - 1

REVISED 6/03/69

CROSS SECTIONS FOR NITROGEN		Z = 7	BARNs / ATOM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	7.895E+04	3.011E+01	2.524E-01	7.898E+04
1.500	2.608E+04	2.755E+01	5.157E-01	2.610E+04
2.000	1.147E+04	2.465E+01	8.128E-01	1.149E+04
3.000	3.448E+03	1.909E+01	1.381E+00	3.468E+03
4.000	1.430E+03	1.473E+01	1.854E+00	1.447E+03
5.000	7.131E+02	1.159E+01	2.215E+00	7.269E+02
6.000	4.007E+02	9.352E+00	2.487E+00	4.125E+02
8.000	1.594E+02	6.544E+00	2.856E+00	1.688E+02
10.000	7.731E+01	4.942E+00	3.095E+00	8.535E+01
15.000	2.045E+01	2.925E+00	3.454E+00	2.683E+01
20.000	7.899E+00	1.949E+00	3.651E+00	1.350E+01
30.000	2.056E+00	1.021E+00	3.802E+00	6.880E+00
40.000	7.917E-01	6.206E-01	3.811E+00	5.223E+00
50.000	3.785E-01	4.162E-01	3.765E+00	4.560E+00
60.000	2.076E-01	2.982E-01	3.695E+00	4.205E+00
80.000	8.102E-02	1.740E-01	3.549E+00	3.804E+00
100.000	3.933E-02	1.136E-01	3.402E+00	3.555E+00
150.000	1.080E-02	5.150E-02	3.083E+00	3.145E+00
200.000	4.400E-03	2.920E-02	2.833E+00	2.866E+00
300.000	1.285E-03	1.300E-02	2.468E+00	2.483E+00
400.000	5.518E-04	7.300E-03	2.213E+00	2.221E+00
500.000	2.917E-04	4.600E-03	2.022E+00	2.021E+00
600.000	1.755E-04	3.200E-03	1.871E+00	1.874E+00
800.000	8.073E-05	1.800E-03	1.644E+00	1.646E+00
1000.000	4.523E-05	1.100E-03	1.478E+00	1.479E+00

7 - 2

REVISED 6/03/69

CROSS SECTIONS FOR NITROGEN		Z = 7	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.394E+03	1.294E+00	1.085E-02	3.395E+03
1.500	1.121E+03	1.185E+00	2.217E-02	1.122E+03
2.000	4.930E+02	1.060E+00	3.495E-02	4.941E+02
3.000	1.482E+02	8.207E-01	5.938E-02	1.491E+02
4.000	6.149E+01	6.334E-01	7.973E-02	6.220E+01
5.000	3.066E+01	4.984E-01	9.525E-02	3.125E+01
6.000	1.723E+01	4.021E-01	1.069E-01	1.774E+01
8.000	6.853E+00	2.813E-01	1.228E-01	1.258E+00
10.000	3.324E+00	2.125E-01	1.331E-01	3.669E+00
15.000	8.793E-01	1.257E-01	1.485E-01	1.154E+00
20.000	3.396E-01	8.379E-02	1.570E-01	5.804E-01
30.000	8.840E-02	4.390E-02	1.635E-01	2.958E-01
40.000	3.404E-02	2.668E-02	1.638E-01	2.246E-01
50.000	1.627E-02	1.789E-02	1.619E-01	1.961E-01
60.000	8.926E-03	1.282E-02	1.590E-01	1.808E-01
80.000	3.483E-03	7.481E-03	1.526E-01	1.636E-01
100.000	1.691E-03	4.884E-03	1.463E-01	1.528E-01
150.000	4.642E-04	2.214E-03	1.326E-01	1.352E-01
200.000	1.892E-04	1.255E-03	1.218E-01	1.232E-01
300.000	5.525E-05	9.589E-04	1.061E-01	1.067E-01
400.000	2.372E-05	3.139E-04	9.516E-02	9.550E-02
500.000	1.254E-05	1.978E-04	8.693E-02	8.714E-02
600.000	7.545E-06	1.376E-04	8.044E-02	8.056E-02
800.000	3.471E-06	7.739E-05	7.061E-02	7.075E-02
1000.000	1.945E-06	4.729E-05	6.354E-02	6.358E-02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR NITROGEN

ATOMIC WEIGHT 14.008 GRAMS / MOLE
DENSITY 1.250E-03 GRAMS / CC
ATOMIC DENSITY 5.574E-05 BUNCHES / CC

CONVERSION CONSTANT IS 2.326E+01

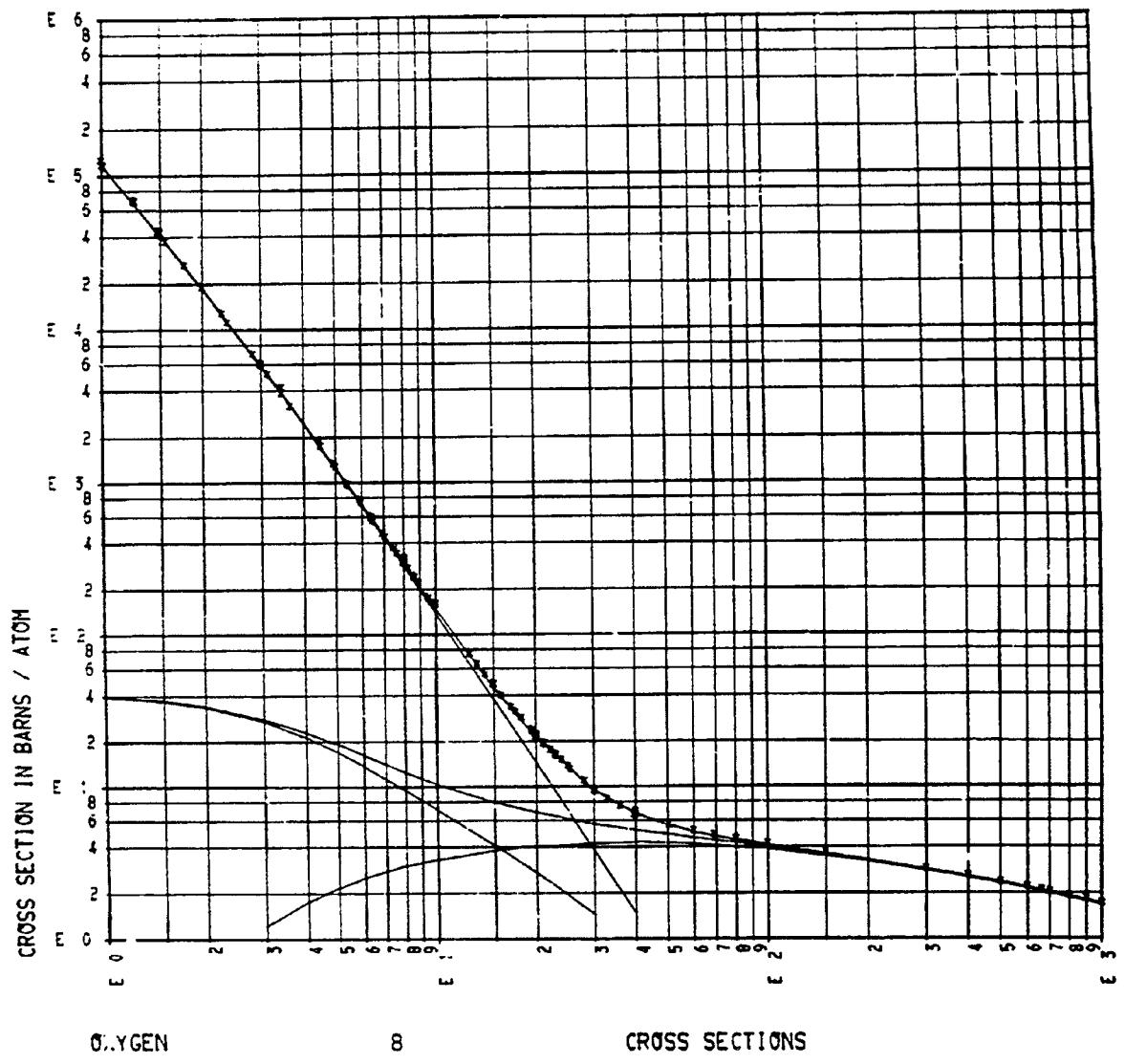
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	0.402
0	O.	O.	O.	O.	O.	1.12765E+01	
1	O.	O.	O.	O.	O.	-2.65400E+00	
2	O.	O.	O.	O.	O.	-2.00445E-01	
3	O.	O.	O.	O.	O.	2.00755E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	3.47760E+00	-1.23693E+00
1	-2.15762E-01	1.74510E+00
2	-2.88874E-01	-3.54660E-01
3	1.51312E-02	1.98705E-02



8 - 1

REVISED 6/03/69

CROSS SECTIONS FOR OXYGEN

Z = 8

BARNs / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.221E+05	3.999E+01	1.573E-01	1.222E+05
1.500	4.167E+04	3.720E+01	3.617E-01	4.171E+04
2.000	1.873E+04	3.392E+01	6.304E-01	1.876E+04
3.000	5.796E+03	2.722E+01	1.220E+00	5.825E+03
4.000	2.451E+03	2.150E+01	1.770E+00	2.475E+03
5.000	1.240E+03	1.710E+01	2.171E+00	1.259E+03
6.000	7.046E+02	1.384E+01	2.540E+00	7.210E+02
8.000	2.851E+02	9.617E+00	3.063E+00	2.978E+02
10.000	1.400E+02	7.156E+00	3.354E+00	1.505E+02
15.000	3.782E+01	4.135E+00	3.844E+00	4.580E+01
20.000	1.481E+01	2.746E+00	4.086E+00	2.164E+01
30.000	3.921E+00	1.457E+00	4.278E+00	9.655E+00
40.000	1.526E+00	8.942E-01	4.309E+00	5.725E+00
50.000	1.350E-01	6.026E-01	4.271E+00	5.609E+00
60.000	4.054E-01	4.329E-01	4.203E+00	5.041E+00
80.000	1.595E-01	2.535E-01	4.042E+00	4.455E+00
100.000	7.782E-02	1.561E-01	3.878E+00	4.122E+00
150.000	2.153E-02	7.680E-02	3.519E+00	3.616E+00
200.000	8.807E-03	4.300E-02	3.235E+00	3.087E+00
300.000	2.558E-03	1.920E-02	2.820E+00	2.842E+00
400.000	1.109E-03	1.080E-02	2.529E+00	2.541E+00
500.000	5.859E-04	6.900E-03	2.310E+00	2.311E+00
600.000	3.522E-04	4.700E-03	2.138E+00	2.143E+00
800.000	1.615E-04	2.600E-03	1.878E+00	1.881E+00
1000.000	9.026E-05	1.600E-03	1.689E+00	1.691E+00

KEY	PHOTO	CROSS SECTIONS FOR OXYGEN			CM**2 / GRAM
		Z = 8 COHERENT	Z = 8 INCOHERENT	TOTAL	
1.000	4.598E+03	1.505E+00	5.921E-03	4.599E+03	
1.500	1.568E+03	1.400E+00	1.361E-02	1.570E+03	
2.000	1.049E+02	1.277E+00	2.373E-02	7.062E+02	
3.000	2.182E+02	1.024E+00	4.592E-02	2.192E+02	
4.000	9.228E+01	8.093E-01	6.652E-02	9.315E+01	
5.000	4.667E+01	6.438E-01	8.172E-02	4.740E+01	
6.000	2.652E+01	5.210E-01	9.561E-02	2.714E+01	
8.000	1.073E+01	3.620E-01	1.153E-01	1.121E+01	
10.000	5.270E+00	2.694E-01	1.262E-01	5.666E+00	
15.000	1.424E+00	1.556E-01	1.447E-01	1.724E+00	
20.000	5.573E-01	1.034E-01	1.538E-01	8.145E-01	
30.000	1.476E-01	3.483E-02	1.610E-01	3.634E-01	
40.000	5.743E-02	3.365E-02	1.622E-01	2.533E-01	
50.000	2.766E-02	2.263E-02	1.608E-01	2.111E-01	
60.000	1.526E-02	1.629E-02	1.582E-01	1.898E-01	
80.000	6.003E-03	9.542E-03	1.521E-01	1.677E-01	
100.000	2.929E-03	6.257E-03	1.466E-01	1.552E-01	
150.000	8.102E-04	2.853E-03	1.325E-01	1.361E-01	
200.000	3.315E-04	1.619E-03	1.218E-01	1.237E-01	
300.000	9.712E-05	2.227E-04	1.061E-01	1.070E-01	
400.000	4.174E-05	4.065E-04	9.519E-02	9.564E-02	
500.000	2.205E-05	2.597E-04	8.695E-02	8.723E-02	
600.000	1.326E-05	1.769E-04	8.048E-02	8.067E-02	
800.000	6.082E-06	9.787E-05	7.059E-02	7.079E-02	
1000.000	3.397E-06	6.023E-05	6.358E-02	6.364E-02	

8 - 3

REVISED 6/05/69

MISCELLANEOUS DATA FOR OXYGEN

ATOMIC WEIGHT 16.000 GRAMS / MOLE
DENSITY 1.429E-03 GRAMS / CC
ATOMIC DENSITY 5.379E-05 BUNCHES / CC

CONVERSION CONSTANT IS 2.657E+01

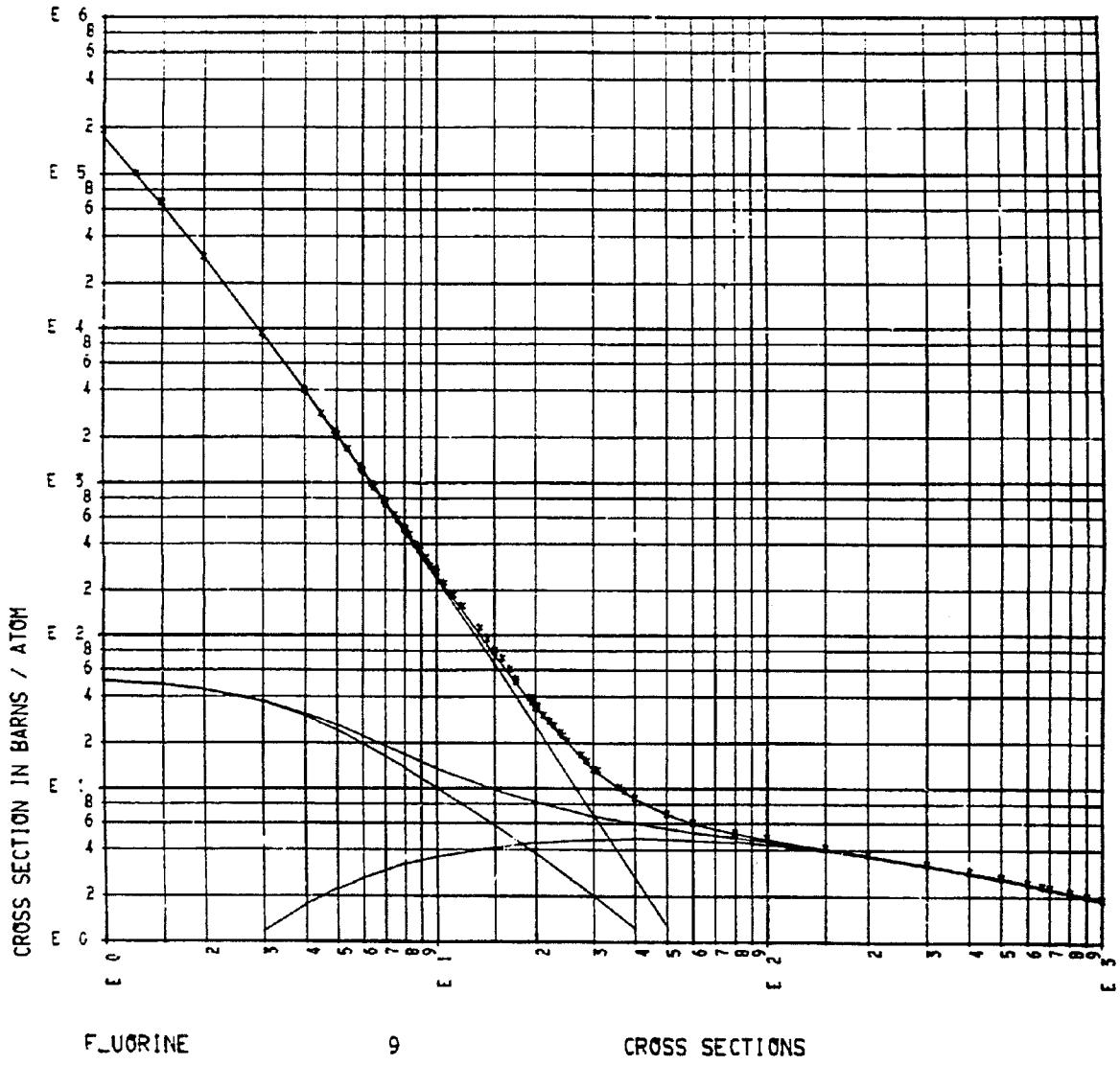
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	0.532
0	0.	0.	0.	0.	0.	0.	0.17130E+01
1	0.	0.	0.	0.	0.	0.	-2.57229E+00
2	0.	0.	0.	0.	0.	0.	-2.05893E-01
3	0.	0.	0.	0.	0.	0.	1.99244E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	3.77239E+00	-1.73679E+00
1	-1.48539E-01	2.17686E+00
2	-3.07124E-01	-4.49050E-01
3	1.67303E-02	2.54733E-02



9 - 1 REVISED 6/03/69

CROSS SECTIONS FOR FLUORINE		Z = 9	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.792E+05	5.122E+01	1.469E-01	1.793E+05
1.500	6.417E+04	4.826E+01	3.388E-01	6.422E+04
2.000	2.959E+04	4.467E+01	5.950E-01	2.974E+04
3.000	9.511E+03	3.694E+01	1.180E+00	9.549E+03
4.000	4.103E+03	2.988E+01	1.757E+00	4.135E+03
5.000	2.103E+03	2.414E+01	2.247E+00	2.129E+03
6.000	1.206E+03	1.970E+01	2.660E+00	1.229E+03
8.000	4.942E+02	1.372E+01	3.276E+00	5.112E+02
10.000	2.446E+02	1.015E+01	3.652E+00	2.584E+02
15.000	6.677E+01	5.745E+00	4.230E+00	7.674E+01
20.000	2.627E+01	3.785E+00	4.516E+00	3.457E+01
30.000	9.985E+00	2.013E+00	4.754E+00	1.375E+01
40.000	3.722E+00	1.243E+00	4.804E+00	8.769E+00
50.000	1.312E+00	8.405E-01	4.772E+00	6.924E+00
60.000	4.236E-01	6.052E-01	4.704E+00	6.033E+00
80.000	2.844E-01	3.545E-01	4.531E+00	5.170E+00
100.000	1.387E-01	2.329E-01	4.351E+00	4.723E+00
150.000	3.832E-02	1.066E-01	3.953E+00	4.098E+00
200.000	1.567E-02	6.050E-02	3.636E+00	3.712E+00
300.000	4.592E-03	2.710E-02	3.171E+00	3.203E+00
400.000	1.975E-03	1.520E-02	2.844E+00	2.861E+00
500.000	1.046E-03	9.700E-03	2.599E+00	2.610E+00
600.000	6.304E-04	6.700E-03	2.405E+00	2.412E+00
800.000	2.907E-04	3.700E-03	2.113E+00	2.117E+00
1000.000	1.632E-04	2.300E-03	1.900E+00	1.902E+00

9 - 2

REVISED 6/03/69

CROSS SECTIONS FOR FLUORINE Z = 9 CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.680E+03	1.623E+00	4.656E-03	5.682E+03
1.500	2.034E+03	1.530E+00	1.074E-02	2.035E+03
2.000	9.412E+02	1.416E+00	1.866E-02	9.426E+02
3.000	3.015E+02	1.171E+00	3.740E-02	3.027E+02
4.000	1.301E+02	9.472E-01	5.569E-02	1.311E+02
5.000	6.666E+01	7.653E-01	1.122E-02	6.749E+01
6.000	3.824E+01	6.244E-01	8.432E-02	3.895E+01
8.000	1.566E+01	4.349E-01	1.038E-01	1.620E+01
10.000	7.752E+00	3.216E-01	1.158E-01	8.190E+00
15.000	2.116E+00	1.821E-01	1.341E-01	2.433E+00
20.000	8.326E-01	1.200E-01	1.431E-01	1.096E+00
30.000	2.214E-01	6.381E-02	1.507E-01	4.359E-01
40.000	8.629E-02	3.940E-02	1.523E-01	2.780E-01
50.000	4.158E-02	2.664E-02	1.513E-01	2.195E-01
60.000	2.294E-02	1.918E-02	1.491E-01	1.912E-01
80.000	9.016E-03	1.124E-02	1.436E-01	1.639E-01
100.000	4.397E-03	7.382E-03	1.379E-01	1.497E-01
150.000	1.215E-03	3.379E-03	1.253E-01	1.299E-01
200.000	4.967E-04	1.921E-03	1.153E-01	1.177E-01
300.000	1.456E-04	8.590E-04	1.005E-01	1.015E-01
400.000	6.264E-05	4.818E-04	9.015E-02	9.069E-02
500.000	3.317E-05	3.075E-04	8.238E-02	8.272E-02
600.000	1.998E-05	2.124E-04	7.623E-02	7.646E-02
800.000	9.214E-06	1.173E-04	6.698E-02	6.710E-02
1000.000	5.174E-06	7.290E-05	6.023E-02	6.030E-02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR FLUORINE

ATOMIC WEIGHT 19.000 GRAMS / MOLE
DENSITY 1.108 GRAMS / CC
ATOMIC DENSITY 3.512E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.155E+01

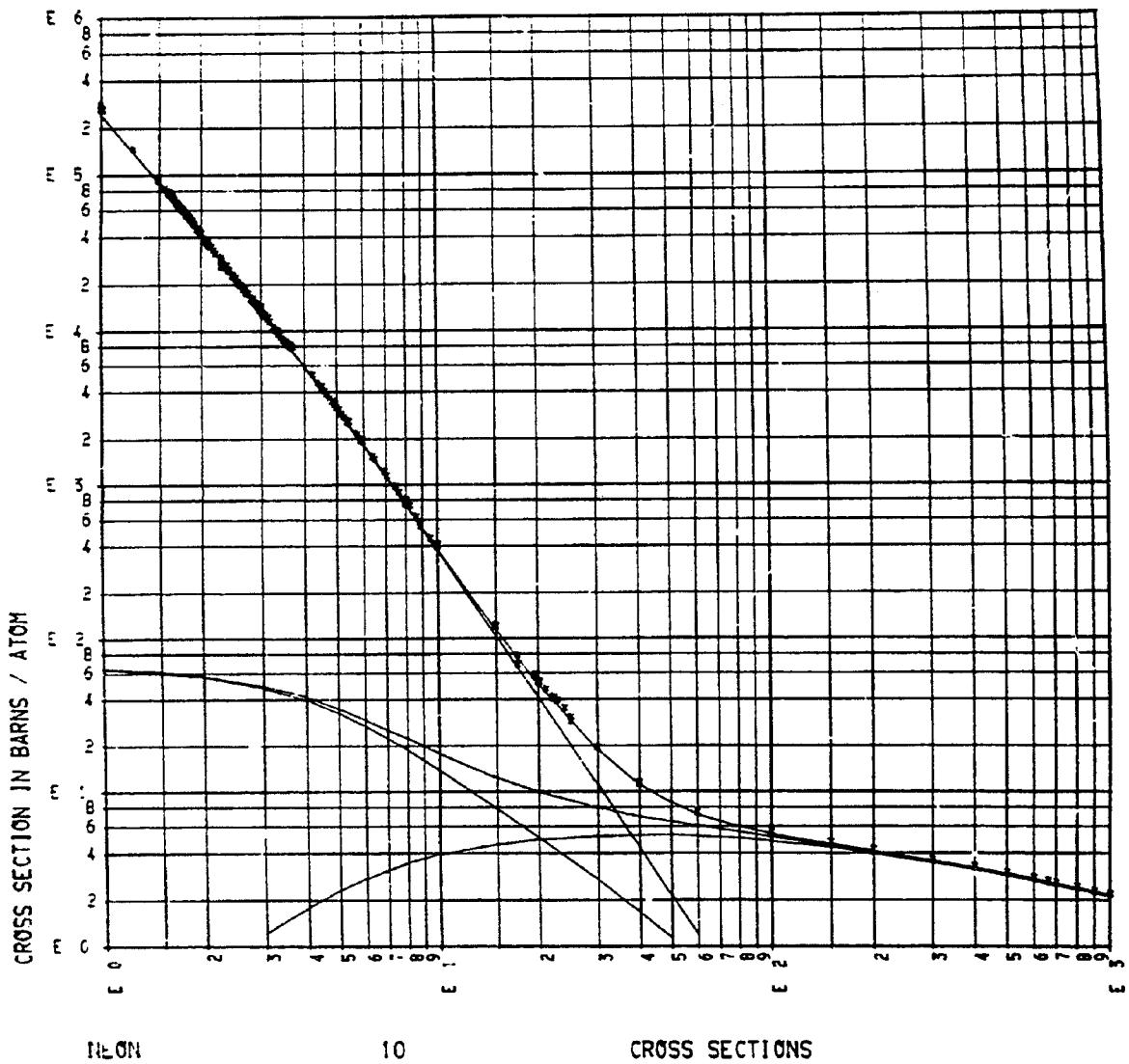
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	R	M	O.	L	S.	K	0.686
0	C.	C.		C.			1.20963E+01
1	C.	C.		C.			-2.44148E+00
2	C.	C.		C.			-2.34461E-01
3	C.	C.		C.			2.19537E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.00716E+00	-1.87570E+00
1	-5.60908E-02	2.32016E+00
2	-3.32017E-01	-4.75412E-01
3	1.87934E-02	2.80680E-02



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REVISED 6/03/69

CROSS SECTIONS FOR NEON		Z = 10	BARNES / ATOM	
KEY	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	2.549E+05	6.379E+01	1.824E-01	2.549E+05
1.500	9.095E+04	6.070E+01	3.890E-01	9.101E+04
2.000	4.215E+04	5.685E+01	6.448E-01	4.221E+04
3.000	1.359E+04	4.821E+01	1.216E+00	1.364E+04
4.000	5.910E+03	3.988E+01	1.793E+00	5.952E+03
5.000	3.051E+03	3.276E+01	2.318E+00	3.087E+03
6.000	1.762E+03	2.702E+01	2.774E+00	1.792E+03
8.000	1.308E+02	1.899E+01	3.478E+00	1.533E+02
10.000	3.654E+02	1.404E+01	3.956E+00	3.834E+02
15.000	1.018E+02	1.848E+00	4.612E+00	1.142E+02
20.000	4.064E+01	5.123E+00	4.939E+00	5.070E+01
30.000	1.104E+01	2.721E+00	5.224E+00	1.896E+01
40.000	4.366E+00	1.687E+00	5.294E+00	1.135E+01
50.000	2.127E+00	1.146E+00	5.269E+00	8.542E+00
60.000	1.184E+00	8.272E-01	5.200E+00	7.211E+00
80.000	4.713E-01	4.839E-01	6.017E+00	5.972E+00
100.000	2.319E-01	3.184E-01	4.822E+00	5.373E+00
150.000	6.494E-02	1.463E-01	4.586E+00	4.598E+00
200.000	2.675E-02	8.340E-02	4.036E+00	4.146E+00
300.000	1.886E-03	3.730E-02	3.521E+00	3.566E+00
400.000	3.396E-03	2.100E-02	3.159E+00	3.184E+00
500.000	1.795E-03	1.340E-02	2.887E+00	2.902E+00
600.000	1.078E-03	9.300E-03	2.671E+00	2.682E+00
800.000	4.935E-04	5.100E-03	2.348E+00	2.353E+00
1000.000	2.747E-04	3.300E-03	2.111E+00	2.114E+00

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REVISED 6/03/69

CROSS SECTIONS FOR NEON		Z = 10	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	7.605E+03	1.903E+00	5.442E-03	7.607E+03
1.500	2.714E+03	1.811E+00	1.161E-02	2.716E+03
2.000	1.258E+03	1.697E+00	1.924E-02	1.259E+03
3.000	4.056E+02	1.439E+00	3.629E-02	4.071E+02
4.000	1.754E+02	1.190E+00	5.351E-02	1.776E+02
5.000	9.106E+01	9.774E-01	6.918E-02	9.210E+01
6.000	5.259E+01	8.062E-01	8.277E-02	5.348E+01
8.000	2.181E+01	5.666E-01	1.038E-01	2.248E+01
10.000	1.092E+01	4.188E-01	1.180E-01	1.144E+01
15.000	3.037E+00	2.342E-01	1.376E-01	3.409E+00
20.000	1.213E+00	1.529E-01	1.474E-01	1.513E+00
30.000	3.294E-01	8.118E-02	1.559E-01	5.665E-01
40.000	1.303E-01	5.035E-02	1.580E-01	3.386E-01
50.000	6.348E-02	3.419E-02	1.572E-01	2.549E-01
60.000	3.532E-02	2.468E-02	1.552E-01	2.152E-01
80.000	1.406E-02	1.444E-02	1.497E-01	1.282E-01
100.000	6.920E-03	9.501E-03	1.439E-01	1.603E-01
150.000	1.938E-03	4.366E-03	1.309E-01	1.312E-01
200.000	7.982E-04	2.489E-03	1.204E-01	1.237E-01
300.000	2.353E-04	1.113E-03	1.051E-01	1.064E-01
400.000	1.013E-04	6.266E-04	9.427E-02	9.500E-02
500.000	5.356E-05	3.999E-04	8.614E-02	8.659E-02
600.000	3.218E-05	2.775E-04	7.972E-02	8.003E-02
800.000	1.473E-05	1.522E-04	7.005E-02	7.022E-02
1000.000	8.198E-06	9.847E-05	6.298E-02	6.309E-02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR NEON

ATOMIC WEIGHT 20.183 GRAMS / MOLE
DENSITY 9.000E-04 GRAMS / CC
ATOMIC DENSITY 2.686E-05 BUNCHES / CC

CONVERSION CONSTANT IS 3.351E+01

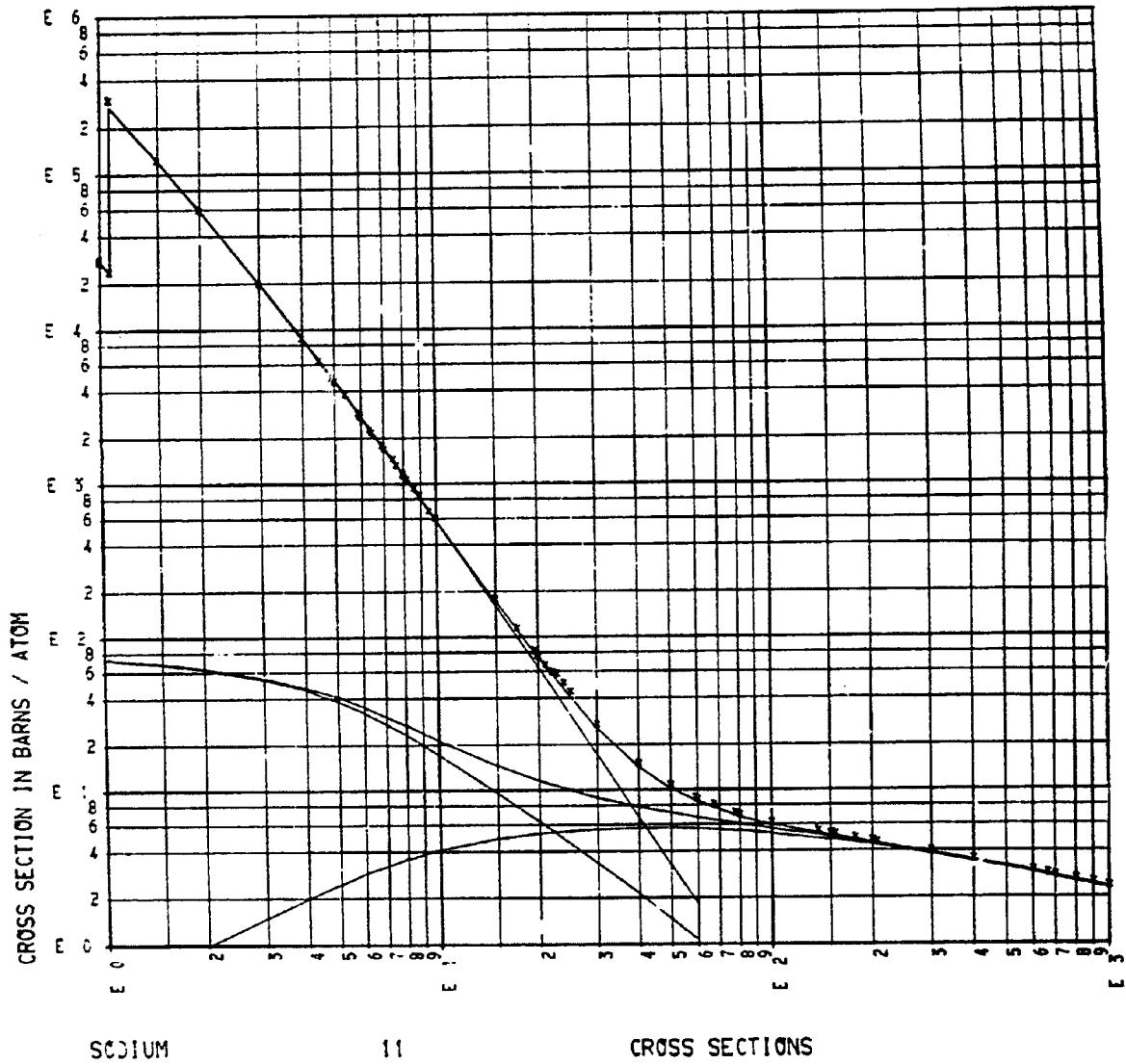
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	O.	K	0.867
0	0.	0.	0.	0.	0.	1.	2.4485E+01
1	0.	0.	0.	0.	0.	-2.	45819E+00
2	0.	0.	0.	0.	0.	-2.	12591E-01
3	0.	0.	0.	0.	0.	1.	96489E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.20151E+00	-1.75510E+00
1	4.16247E-02	2.24225E+00
2	-3.56754E-01	-4.47640E-01
3	2.07585E-02	2.55801E-02



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REVISED 6/03/69

CROSS SECTIONS FOR SODIUM Z = 11 BARNS / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.787E+04	7.376E+01	4.636E-01	2.795E+04
1.011	2.337E+04	7.283E+01	5.029E-01	2.345E+04
1.022	2.738E+05	7.282E+01	5.035E-01	2.739E+05
1.500	2.235E+05	6.840E+01	7.505E-01	1.235E+05
2.000	5.974E+04	6.341E+01	1.003E+00	5.980E+04
3.000	2.018E+04	5.457E+01	1.509E+00	2.024E+04
4.000	8.988E+03	4.646E+01	2.022E+00	9.036E+03
5.000	4.706E+03	3.918E+01	2.510E+00	4.747E+03
6.000	2.142E+03	3.298E+01	2.955E+00	2.178E+03
8.000	1.148E+03	2.373E+01	3.687E+00	1.175E+03
10.000	5.760E+02	1.170E+01	4.218E+00	5.979E+02
15.000	1.606E+02	9.928E+00	4.973E+00	1.755E+02
20.000	6.392E+01	6.472E+00	5.348E+00	7.574E+01
30.000	1.722E+01	3.457E+00	5.579E+00	2.536E+01
40.000	6.762E+00	2.170E+00	5.172E+00	1.470E+01
50.000	3.274E+00	1.490E+00	5.736E+00	1.052E+01
60.000	1.813E+00	1.086E+00	5.689E+00	8.588E+00
80.000	1.167E-01	6.345E-01	5.498E+00	6.849E+00
100.000	3.510E-01	4.193E-01	5.290E+00	6.050E+00
150.000	9.279E-02	1.941E-01	4.818E+00	8.116E+00
200.000	4.028E-02	1.110E-01	4.435E+00	4.587E+00
300.000	1.1195E-02	4.980E-02	3.871E+00	3.933E+00
400.000	5.201E-03	2.800E-02	3.474E+00	3.507E+00
500.000	2.782E-03	1.790E-02	3.175E+00	3.195E+00
600.000	1.693E-03	1.240E-02	2.938E+00	2.952E+00
800.000	7.946E-04	6.900E-03	2.552E+00	2.590E+00
1000.000	4.535E-04	4.400E-03	2.322E+00	2.326E+00

FLUORESCENT ENERGIES

1.04.	2.514E+04	7.321E+01	4.862E-01	2.522E+04
1.067	2.360E+04	7.288E+01	5.007E-01	2.357E+04

CROSS SECTIONS FOR SODIUM Z = 11 CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	7.300E+02	1.932E+00	1.214E-02	7.319E+02
1.071	6.121E+02	1.907E+00	1.317E-02	6.140E+02
1.072	7.171E+03	1.907E+00	1.319E-02	7.173E+03
1.500	3.234E+03	1.791E+00	1.956E-02	3.236E+03
2.000	1.564E+03	1.661E+00	2.627E-02	1.566E+03
3.000	5.265E+02	1.429E+00	3.952E-02	5.300E+02
4.000	2.354E+02	1.217E+00	5.296E-02	2.356E+02
5.000	1.232E+02	1.026E+00	6.974E-02	1.243E+02
6.000	7.180E+01	8.636E-01	7.737E-02	7.274E+01
8.000	3.005E+01	6.213E-01	9.655E-02	3.077E+01
10.000	1.508E+01	4.635E-01	1.055E-01	1.565E+01
15.000	4.205E+00	2.600E-01	3.02E-01	4.595E+00
20.000	1.574E+00	1.655E-01	4.01E-01	1.984E+00
30.000	4.510E-01	9.052E-02	4.87E-01	6.903E-01
40.000	1.771E-01	5.683E-02	5.12E-01	5.651E-01
50.000	8.575E-02	3.903E-02	5.07E-01	5.755E-01
60.000	4.748E-02	2.844E-02	4.90E-01	5.249E-01
80.000	1.877E-02	1.662E-02	4.40E-01	5.194E-01
100.000	9.192E-03	1.098E-02	3.88E-01	5.587E-01
150.000	2.561E-03	5.083E-03	2.62E-01	3.395E-01
200.000	1.055E-03	2.907E-03	1.62E-01	2.019E-01
300.000	3.130E-04	1.304E-03	0.144E-01	0.305E-01
400.000	1.362E-04	5.333E-04	0.998E-02	9.185E-02
500.000	7.287E-05	4.688E-04	0.514E-02	8.368E-02
600.000	4.433E-05	3.247E-04	0.394E-02	5.337E-02
800.000	2.081E-05	1.807E-04	0.632E-02	5.782E-02
1000.000	1.188E-05	1.1522E-04	0.680E-02	6.093E-02

FLUORESCENT ENERGIES

1.041	6.584E+02	1.917E+00	1.273E-02	6.564E+02
1.067	6.180E+02	1.909E+00	1.311E-02	6.200E+02

II - 3

REVISED 5/03/69

MISCELLANEOUS DATA FOR SODIUM

ATOMIC WEIGHT 22.997 GRAMS / MOLE
DENSITY 0.970 GRAMS / CC
ATOMIC DENSITY 2.540E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.819E+01

K-EDGE AT 1.072 KEV
K-EDGE JUMP 11.744

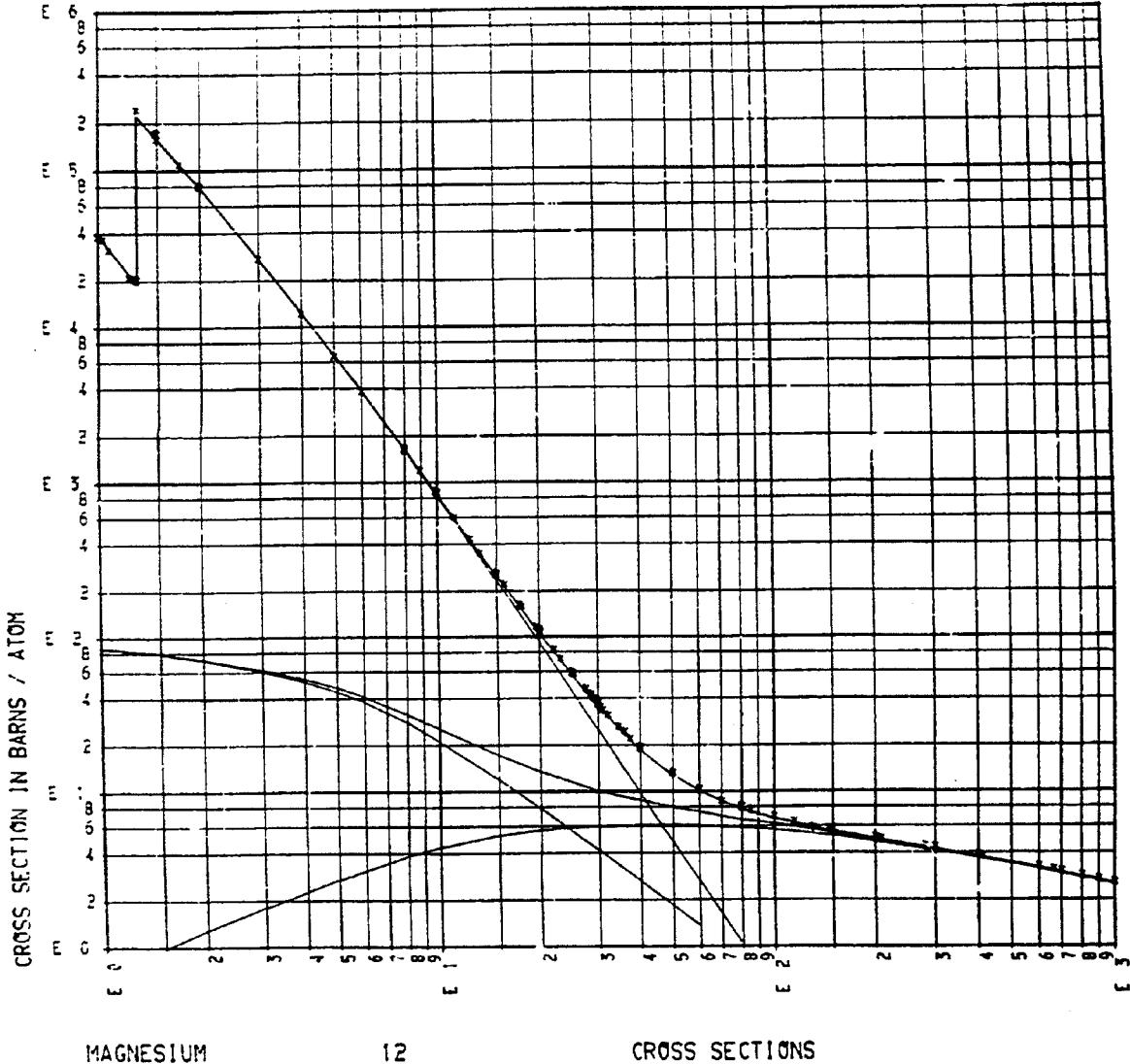
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	R	X	C.	L	C.	K	1.072
0	0.	0.	0.	1.02355E+01	1.26777E+01		
1	0.	0.	0.	-2.55905E+00	1.24521E+00		
2	0.	0.	0.	-1.19524E-01	1.14813E-01		
3	0.	0.	0.	0.	2.60270E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.26374E+00	-9.67717E-01
1	1.34662E-01	1.61794E+00
2	-3.70080E-01	-2.87191E-01
3	2.14467E-02	1.31526E-02



MAGNESIUM

12

CROSS SECTIONS

12 - 1

REVISED 6/03/69

CROSS SECTIONS FOR MAGNESIUM Z = 12 BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	4.002E+04	8.719E+01	5.939E-01	4.011E+04
1.304	1.885E+04	6.234E+01	8.357E-01	1.894E+04
1.305	2.181E+05	8.233E+01	8.366E-01	2.182E+05
1.500	1.579E+05	1.985E+01	1.001E+00	1.580E+05
2.000	7.850E+04	1.267E+01	1.321E+00	7.858E+04
3.000	2.739E+04	6.166E+01	1.842E+00	2.746E+04
4.000	1.244E+04	5.292E+01	2.319E+00	1.249E+04
5.000	6.595E+03	4.525E+01	2.772E+00	6.643E+03
6.000	3.879E+03	3.873E+01	3.195E+00	3.921E+03
8.000	1.644E+03	2.857E+01	3.924E+00	1.677E+03
10.000	8.321E+02	2.157E+01	4.487E+00	8.582E+02
15.000	2.348E+02	1.218E+01	5.330E+00	2.523E+02
20.000	9.405E+01	7.940E+00	6.753E+00	1.077E+02
30.000	2.550E+01	4.263E+00	6.129E+00	3.550E+01
40.000	1.005E+01	2.708E+00	6.243E+00	1.900E+01
50.000	4.874E+00	1.884E+00	6.237E+00	1.300E+01
60.000	2.702E+00	1.350E+00	6.174E+00	1.026E+01
80.000	1.070E+00	8.105E-01	6.976E+00	7.856E+00
100.000	5.244E-01	5.375E-01	5.756E+00	6.817E+00
150.000	1.463E-01	2.507E-01	5.248E+00	5.645E+00
200.000	6.036E-03	1.438E-01	4.834E+00	5.038E+00
300.000	1.797E-02	6.480E-02	4.221E+00	4.304E+00
400.000	7.844E-03	3.650E-02	3.788E+00	3.833E+00
500.000	4.209E-03	2.330E-02	3.492E+00	3.492E+00
600.000	2.569E-03	1.610E-02	3.205E+00	3.223E+00
800.000	1.214E-03	9.005E-03	2.816E+00	2.827E+00
1000.000	6.969E-04	5.600E-03	2.533E+00	2.539E+00

FLUORESCENT ENERGIES

1.254	2.107E+04	8.304E+01	7.947E-01	2.115E+04
1.297	1.914E+04	8.244E+01	8.300E-01	1.923E+04

12 - 2

REVISED 6/03/69

CROSS SECTIONS FOR MAGNESIUM		Z = 12	CY**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	9.912E+02	2.159E+00	1.471E-02	9.933E+02
1.304	4.669E+02	2.039E+00	2.070E-02	4.690E+02
1.305	5.401E+03	2.039E+00	2.072E-02	5.403E+03
1.500	3.911E+03	1.977E+00	2.478E-02	3.913E+03
2.000	1.944E+03	1.805E+00	3.272E-02	1.946E+03
3.000	6.783E+02	1.527E+00	4.561E-02	6.799E+02
4.000	3.079E+02	1.308E+00	5.742E-02	3.093E+02
5.000	1.633E+02	1.121E+00	6.865E-02	1.645E+02
6.000	9.605E+01	9.591E-01	7.912E-02	9.709E+01
8.000	4.071E+01	7.076E-01	9.718E-02	4.152E+01
10.000	2.061E+01	5.342E-01	1.111E-01	2.125E+01
15.000	5.814E+00	3.017E-01	3.202E-01	6.247E+00
20.000	2.329E+00	1.956E-01	4.255E-01	2.668E+00
30.000	9.316E-01	1.056E-01	5.185E-01	8.589E-01
40.000	2.488E-01	6.705E-02	5.466E-01	4.704E-01
50.000	1.207E-01	4.666E-02	5.456E-01	3.218E-01
60.000	6.690E-02	3.441E-02	5.299E-01	2.542E-01
80.000	2.649E-02	2.007E-02	4.802E-01	1.945E-01
100.000	1.299E-02	1.331E-02	4.255E-01	1.688E-01
150.000	3.624E-03	6.208E-03	3.002E-01	1.398E-01
200.000	1.495E-03	3.561E-03	1.975E-01	1.248E-01
300.000	4.449E-04	1.605E-03	1.045E-01	1.066E-01
400.000	1.942E-04	9.039E-04	9.382E-02	9.432E-02
500.000	1.042E-04	5.770E-04	8.514E-02	8.542E-02
600.000	6.362E-05	3.987E-04	6.936E-02	7.362E-02
800.000	3.005E-05	2.229E-04	6.914E-02	7.000E-02
1000.000	1.726E-05	1.387E-04	6.271E-02	6.287E-02

FLUORESCENT ENERGIES

1.254	5.216E+02	2.056E+00	1.968E-02	5.238E+02
1.297	4.741E+02	2.041E+00	2.055E-02	4.762E+02

12 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR MAGNESIUM

ATOMIC WEIGHT 24.320 GRAMS / MOLE
DENSITY 1.740 GRAMS / CC
ATOMIC DENSITY 4.309E-02 BUNCHES / CC

CONVERSION CONSTANT IS 4.058E+01

K-EDGE AT 1.305 KEV
K-EDGE JUMP 11.592

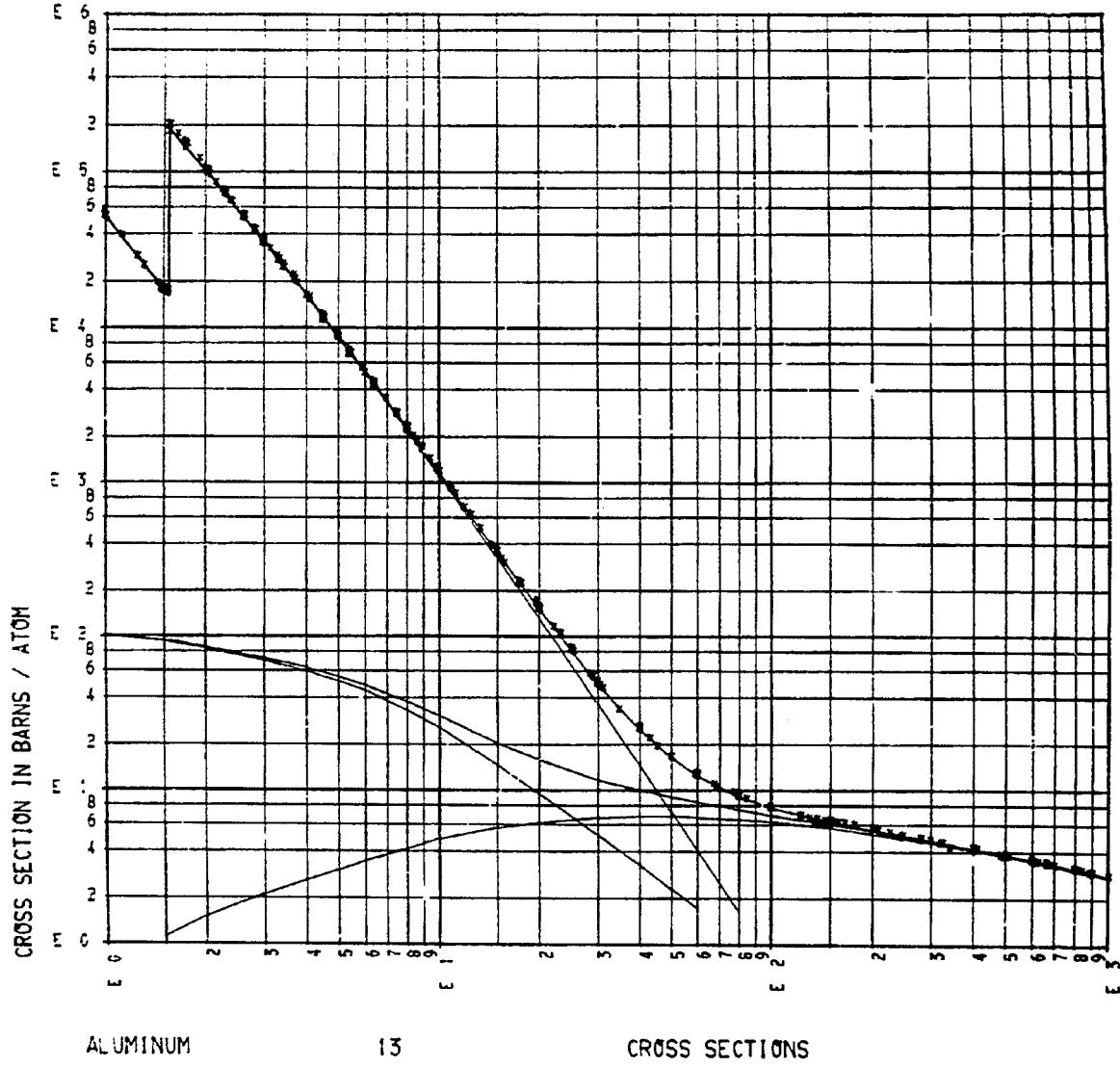
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

N	M	O.	L	C.063	K	1.305
0	0.	0.		1.05973E+01	1.28793E+01	
1	0.	0.		-2.89818E+00	-2.12574E+00	
2	0.	0.		2.34506E-01	-2.99392E-01	
3	0.	0.		0.	2.67643E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.39404E+00	-5.71611E-01
1	1.37858E-01	1.35498E+00
2	-3.59540E-01	-2.22491E-01
3	2.02380E-02	8.30141E-03



13 - 1

REVISED 6/03/69

CROSS SECTIONS FOR ALUMINUM Z = 13 BARNs / ATOM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.263E+04	1.016E+02	6.214E-01	5.274E+04
1.500	1.756E+04	9.243E+01	1.093E+00	1.765E+04
1.559	1.587E+04	9.123E+01	1.139E+00	1.596E+04
1.560	1.599E+05	9.121E+01	1.139E+00	1.900E+05
2.000	1.032E+05	8.372E+01	1.483E+00	1.033E+05
3.000	3.608E+04	6.974E+01	2.088E+00	3.615E+04
4.000	1.549E+04	5.940E+01	2.591E+00	1.655E+04
5.000	8.814E+03	5.123E+01	2.998E+00	8.868E+03
6.000	5.224E+03	4.440E+01	3.424E+00	5.271E+03
8.000	2.246E+03	3.352E+01	4.163E+00	2.284E+03
10.000	1.151E+03	2.567E+01	4.785E+00	1.182E+03
15.000	3.330E+02	1.466E+01	5.676E+00	3.534E+02
20.000	1.359E+02	9.557E+00	6.152E+00	1.516E+02
30.000	3.784E+01	5.142E+00	5.588E+00	4.957E+01
40.000	1.517E+01	3.279E+00	6.717E+00	2.517E+01
50.000	7.453E+00	2.292E+00	6.719E+00	1.646E+01
60.000	4.171E+00	1.699E+00	6.657E+00	1.253E+01
80.000	1.673E+00	9.897E-01	6.452E+00	9.115E+00
100.000	8.266E-01	6.569E-01	6.219E+00	7.703E+00
150.000	2.327E-01	3.071E-01	5.677E+00	5.217E+00
200.000	9.609E-02	1.753E-01	5.232E+00	5.504E+00
300.000	2.839E-02	7.950E-02	4.571E+00	4.679E+00
400.000	1.224E-02	4.480E-02	4.103E+00	4.160E+00
500.000	6.477E-03	2.860E-02	3.750E+00	3.785E+00
600.000	3.895E-03	1.970E-02	3.471E+00	3.495E+00
800.000	1.787E-03	1.100E-02	3.051E+00	3.064E+00
1000.000	9.970E-04	6.900E-03	2.743E+00	2.751E+00

FLUORESCENT ENERGIES

1.487	1.798E+04	9.262E+01	1.080E+00	1.807E+04
1.553	1.603E+04	9.135E+01	1.134E+00	1.612E+04

CROSS SECTIONS FOR ALUMINUM		Z = 13	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.175E+03	2.270E+00	1.388E-02	1.178E+03
1.500	3.921E+02	2.064E+00	2.441E-02	3.942E+02
1.559	3.543E+02	2.037E+00	2.543E-02	3.564E+02
1.560	4.240E+03	2.037E+00	2.544E-02	4.242E+03
2.000	2.304E+03	1.870E+00	3.312E-02	2.306E+03
3.000	8.058E+02	1.557E+00	4.663E-02	8.074E+02
4.000	3.682E+02	1.326E+00	5.786E-02	3.698E+02
5.000	1.968E+02	1.144E+00	6.695E-02	1.980E+02
6.000	1.166E+02	9.914E-01	7.646E-02	1.177E+02
8.000	5.016E+01	7.486E-01	9.296E-02	5.100E+01
10.000	2.571E+01	5.733E-01	1.069E-01	2.639E+01
15.000	7.436E+00	3.274E-01	1.267E-01	7.891E+00
20.000	3.035E+00	2.134E-01	3.744E-01	3.386E+00
30.000	8.450E-01	1.148E-01	4.711E-01	1.107E+00
40.000	3.387E-01	7.322E-02	5.000E-01	5.619E-01
50.000	1.664E-01	5.119E-02	5.000E-01	3.677E-01
60.000	9.314E-02	3.794E-02	4.878E-01	2.797E-01
80.000	3.736E-02	2.210E-02	4.411E-01	2.035E-01
100.000	1.846E-02	1.467E-02	3.899E-01	1.720E-01
150.000	5.197E-03	6.858E-03	1.268E-01	1.388E-01
200.000	2.146E-03	3.937E-03	1.168E-01	1.229E-01
300.000	6.339E-04	1.775E-03	1.021E-01	1.045E-01
400.000	2.733E-04	1.0000E-03	9.162E-02	9.290E-02
500.000	1.446E-04	6.387E-04	8.374E-02	8.452E-02
600.000	8.697E-05	4.399E-04	7.751E-02	7.804E-02
800.000	3.989E-05	2.456E-04	6.813E-02	6.842E-02
1000.000	2.226E-05	1.541E-04	6.125E-02	6.143E-02

FLUORESCENT ENERGIES

1.487	4.015E+02	2.058E+00	2.411E-02	4.036E+02
1.553	3.579E+02	2.040E+00	2.532E-02	3.600E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR ALUMINUM

ATOMIC WEIGHT 26.970 GRAMS / MOLE
DENSITY 2.702 GRAMS / CC
ATOMIC DENSITY 6.034E-02 BURCHES / CC

CONVERSION CONSTANT IS 4.478E+01

K-EDGE AT 1.560 KEV
K-EDGE JUMP 11.988

BARNs / ATOM FIT COEFFICIENTS

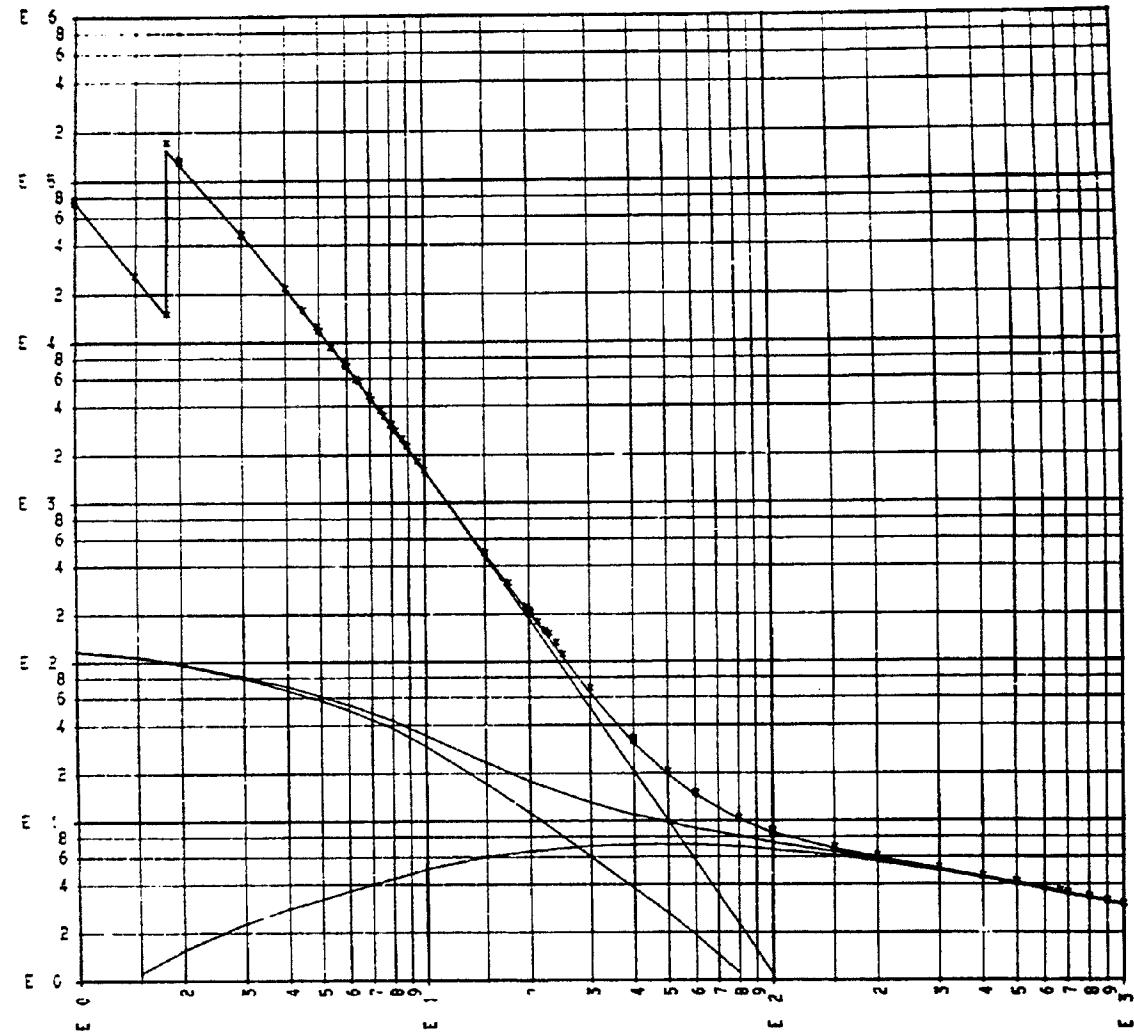
COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	0.087	K	1.560
0	0.	0.	0.	-1.08711E+01	1.31738E+01	-2.18203E+00	
1	0.	0.	0.	-2.77860E+00			
2	0.	0.	0.	1.75853E-01	-2.58965E-01		
3	0.	0.	0.	0.	2.22840E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.51995E+00	-4.39322E-01
1	1.40549E-01	1.30867E+00
2	-3.52441E-01	-2.11648E-01
3	1.93692E-02	7.54210E-03

CROSS SECTION IN BARNS / ATOM



SILICON

14

CROSS SECTIONS

14 - 1

REVISED 6/03/69

CROSS SECTIONS FOR SILICON		Z = 14	BARNES / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.488E+04	1.187E+02	6.053E-01	7.500E+04
1.500	2.521E+04	1.080E+02	1.107E+00	2.532E+04
1.838	1.184E+04	1.004E+02	1.407E+00	1.494E+04
1.839	1.184E+05	1.004E+02	1.408E+00	1.548E+05
2.000	1.269E+05	9.738E+01	1.555E+00	1.370E+05
3.000	4.639E+04	1.984E+01	2.265E+00	4.647E+04
4.000	2.169E+04	6.720E+01	2.824E+00	2.176E+04
5.000	1.125E+04	5.782E+01	3.238E+00	1.181E+04
6.000	1.026E+03	5.034E+01	3.672E+00	1.080E+03
8.000	3.050E+03	3.867E+01	4.421E+00	3.094E+03
10.000	1.570E+03	3.006E+01	5.073E+00	1.605E+03
15.000	4.554E+02	1.739E+01	6.033E+00	4.788E+02
20.000	1.856E+02	1.136E+01	6.548E+00	2.035E+02
30.000	5.137E+01	6.086E+00	7.032E+00	6.449E+01
40.000	2.049E+01	3.836E+00	7.181E+00	3.150E+01
50.000	1.002E+01	2.643E+00	7.192E+00	1.986E+01
60.000	5.591E+00	1.931E+00	7.134E+00	1.466E+01
80.000	2.232E+00	1.266E+00	6.924E+00	1.026E+01
100.000	1.100E+00	7.454E-01	6.581E+00	8.828E+00
150.000	3.094E-01	3.442E-01	6.105E+00	6.159E+00
200.000	1.281E-01	1.968E-01	5.529E+00	5.954E+00
300.000	3.826E-02	8.840E-02	4.919E+00	5.045E+00
400.000	1.671E-02	4.980E-02	4.417E+00	4.484E+00
500.000	8.970E-03	3.180E-02	4.038E+00	4.079E+00
600.000	5.472E-03	2.190E-02	3.737E+00	3.784E+00
800.000	2.581E-03	1.220E-02	3.285E+00	3.300E+00
1000.000	1.480E-03	7.700E-03	2.954E+00	2.963E+00

FLUORESCENT ENERGIES

1.740	1.712E+04	1.024E+02	1.319E+00	1.722E+04
1.832	1.497E+04	1.005E+02	1.402E+00	1.507E+04

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REVISED 6/03/69

CROSS SECTIONS FOR SILICON		Z = 14	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.606E+03	2.545E+00	1.298E-02	1.608E+03
1.500	5.405E+02	2.316E+00	2.374E-02	5.429E+02
1.838	3.182E+02	2.183E+00	3.018E-02	3.204E+02
1.839	3.318E+03	2.153E+00	3.020E-02	3.320E+03
2.000	2.722E+03	2.088E+00	3.334E-02	2.724E+03
3.000	9.947E+02	1.712E+00	4.857E-02	9.955E+02
4.000	4.652E+02	1.441E+00	6.056E-02	4.667E+02
5.000	2.520E+02	1.240E+00	8.943E-02	2.533E+02
6.000	1.507E+02	1.079E+00	7.874E-02	1.518E+02
8.000	6.541E+01	8.293E-01	9.460E-02	6.634E+01
10.000	3.367E+01	6.446E-01	1.089E-01	3.443E+01
15.000	9.765E+00	3.730E-01	1.292E-01	1.027E+01
20.000	3.979E+00	2.436E-01	1.404E-01	4.363E+00
30.000	1.102E+00	1.305E-01	2.058E-01	1.383E+00
40.000	4.393E-01	8.226E-02	1.940E-01	9.756E-01
50.000	2.149E-01	5.667E-02	5.642E-01	4.258E-01
60.000	1.199E-01	4.141E-02	5.836E-01	5.143E-01
80.000	4.786E-02	2.414E-02	4.855E-01	2.205E-01
100.000	2.359E-02	1.594E-02	4.333E-01	1.828E-01
150.000	9.635E-03	1.381E-03	4.309E-01	1.449E-01
200.000	2.747E-03	4.220E-03	4.201E-01	1.227E-01
300.000	8.202E-04	1.896E-03	4.056E-01	1.082E-01
400.000	5.584E-04	1.038E-03	4.111E-01	9.814E-02
500.000	1.923E-04	6.819E-04	4.119E-01	8.746E-02
600.000	1.173E-04	4.696E-04	4.013E-01	8.022E-02
800.000	5.535E-05	2.616E-04	3.044E-01	7.876E-02
1000.000	3.173E-05	1.661E-04	6.334E-02	6.354E-02

FLUORESCENT ENERGIES

1.740	3.671E+02	2.196E+00	2.829E-02	3.693E+02
1.832	3.209E+02	2.156E+00	3.005E-02	3.251E+02

14 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR SILICON

ATOMIC WEIGHT 28.086 GRAMS / MOLE
DENSITY 2.330 GRAMS / CC
ATOMIC DENSITY 4.996E-02 BUNCHES / CC

CONVERSION CONSTANT IS 4.663E+01

K-EDGE AT 1.839 KEY
K-EDGE JUMP 10.442

BARNs / ATOM FIT COEFFICIENTS

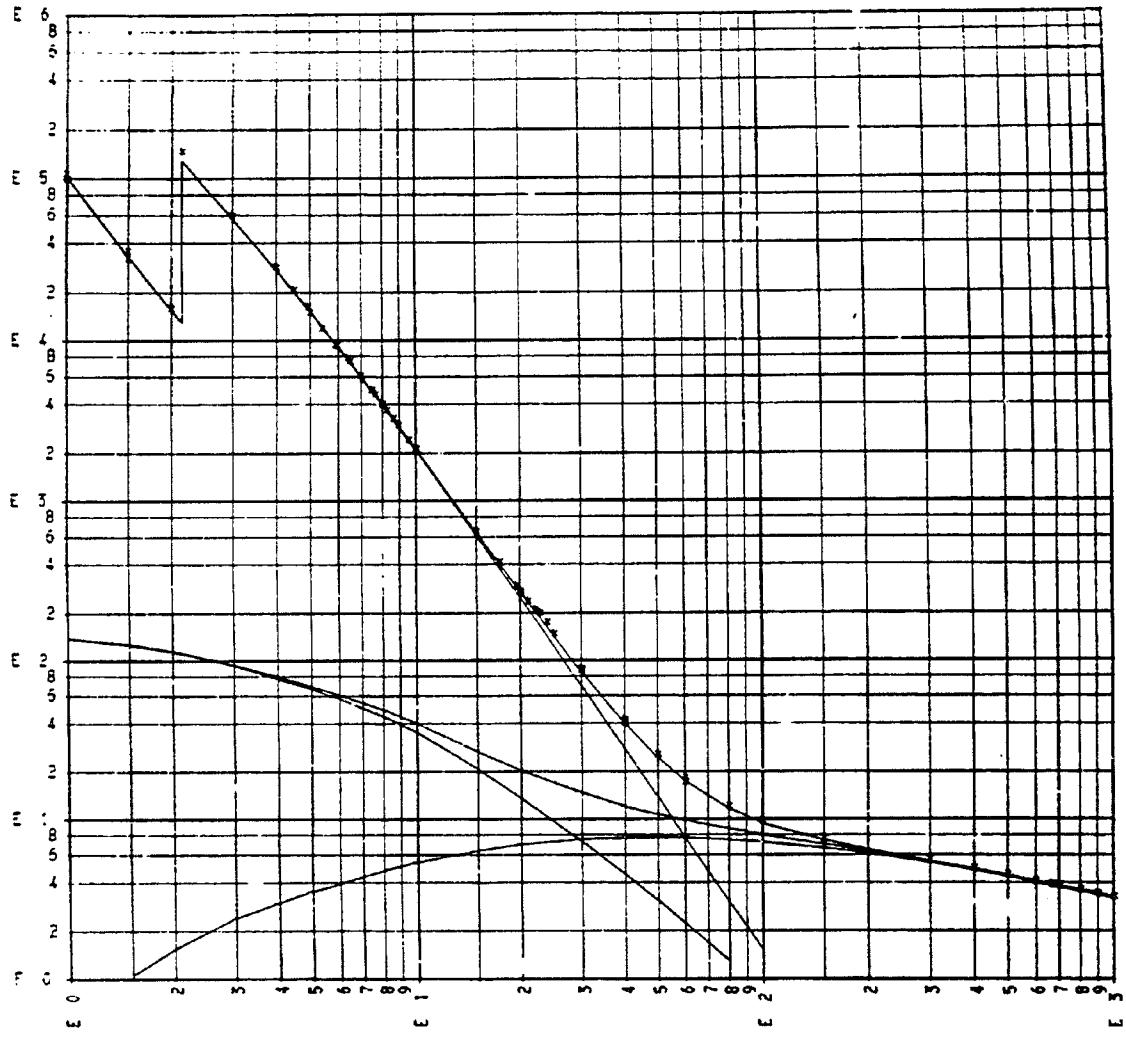
COEFFICIENTS OF PE LN-LN FIT

	N	M	O.	L	0.113	K	1.839
0	C.	C.	C.	1.12237E+01	1.33682E+01		
1	C.	C.	C.	-2.73694E+00	-1.98174E+00		
2	C.	C.	C.	1.27557E-01	-3.16950E-01		
3	C.	C.	C.	0.	2.13928E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.64678E+00	-4.14971E-01
1	1.62780E-01	1.348668E+00
2	-3.58563E-01	-2.22315E-01
3	1.96926E-02	8.41959E-03

CROSS SECTION IN BARNS / ATOM



PHOSPHORUS

15

CROSS SECTIONS

15 - 1

REVISED 6/03/69

CROSS SECTIONS FOR PHOSPHORUS		Z = 15	BARNs / ATOM	
KEY	PHOTC	CohereNT	IncoherenT	TOTAL
1.000	1.039E+05	1.375E+02	6.569E-01	1.040E+05
1.500	3.512E+04	1.257E+02	1.055E+00	3.326E+04
2.000	1.549E+04	1.134E+02	1.544E+00	1.550E+04
2.148	1.291E+04	1.094E+02	1.955E+00	1.302E+04
2.149	1.283E+05	1.094E+02	1.666E+00	1.284E+05
3.000	5.723E+04	1.061E+02	3.715E+00	5.733E+04
4.000	2.131E+04	1.059E+02	6.018E+00	2.139E+04
5.000	1.500E+04	1.056E+02	5.535E+00	1.501E+04
6.000	9.055E+03	1.052E+02	9.755E+00	9.116E+03
8.000	3.985E+03	1.040E+02	2.715E+00	4.035E+03
10.000	2.071E+03	1.034E+02	3.215E+00	2.111E+03
15.000	6.089E+02	1.024E+02	3.555E+00	6.355E+02
20.000	2.560E+02	1.016E+02	3.935E+00	2.603E+02
30.000	6.979E+01	1.008E+02	4.455E+00	6.438E+01
40.000	2.795E+01	1.003E+02	6.305E+00	4.004E+01
50.000	1.371E+01	1.001E+02	6.655E+00	2.440E+01
60.000	7.663E+00	1.000E+02	6.922E+00	2.139E+01
80.000	3.066E+00	1.000E+02	3.915E+00	1.174E+01
100.000	1.514E+00	1.000E+02	1.535E+00	1.493E+00
150.000	4.261E-01	1.000E+02	6.631E+00	3.444E+00
200.000	1.769E-01	1.000E+02	2.024E+00	1.422E+00
300.000	5.293E-02	1.000E+02	2.268E+00	3.426E+00
400.000	2.320E-02	1.000E+02	1.315E+00	1.803E+00
500.000	1.248E-02	1.000E+02	3.255E+00	4.373E+00
600.000	7.631E-03	1.000E+02	6.044E+00	6.336E+00
800.000	3.616E-03	1.000E+02	1.515E+00	3.551E+00
1000.000	2.082E-03	1.000E+02	1.655E+00	3.178E+00

FLUORESCENT ENERGIES

2.015	1.519E+04	1.130E+02	1.555E+00	1.531E+04
2.136	1.509E+04	1.097E+02	1.555E+00	1.520E+04

15 - 2

REVISED 6/03/69

CROSS SECTIONS FOR PHOSPHORUS		Z = 15	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.019E+03	3.673E+00	1.683E-02	2.022E+03
1.500	6.439E+02	2.444E+00	2.051E-02	0.464E+02
2.000	3.611E+02	2.805E+00	3.002E-02	3.033E+02
2.148	2.509E+02	2.127E+00	3.237E-02	2.531E+02
2.149	2.495E+02	2.126E+00	3.239E-02	2.497E+02
3.000	1.113E+03	1.792E+00	4.610E-02	1.115E+03
4.000	6.309E+02	4.899E+00	5.867E-02	6.325E+02
5.000	3.916E+02	2.711E+00	6.874E-02	3.929E+02
6.000	2.261E+02	1.105E+00	1.726E-02	2.272E+02
8.000	1.750E+01	8.571E-01	9.164E-02	8.459E+01
10.000	4.027E+01	6.751E-01	1.035E-01	4.104E+01
15.000	1.184E+01	3.958E-01	1.256E-01	1.236E+01
20.000	4.861E+00	2.597E-01	3.498E-01	5.255E+00
30.000	1.357E+00	1.388E-01	4.498E-01	1.584E+00
40.000	5.436E-01	8.657E-02	4.888E-01	5.245E-01
50.000	2.666E-01	8.899E-02	4.888E-01	4.745E-01
70.000	1.490E-01	4.268E-02	4.788E-01	3.893E-01
80.000	9.962E-02	3.489E-02	4.378E-01	3.882E-01
100.000	2.943E-02	1.667E-02	3.888E-01	3.846E-01
150.000	8.296E-03	1.519E-03	2.708E-01	2.744E-01
200.000	3.440E-03	4.283E-03	1.111E-01	1.064E-01
300.000	1.030E-03	1.915E-03	0.244E-01	0.204E-01
400.000	4.511E-04	8.019E-03	0.1388E-01	0.1351E-01
500.000	2.427E-04	5.022E-04	0.4098E-01	0.5027E-01
600.000	1.484E-04	4.764E-04	0.7848E-01	0.8416E-01
800.000	1.031E-05	3.644E-04	0.8438E-01	0.8766E-01
1000.000	4.648E-05	1.563E-04	0.1538E-01	0.1548E-01
FLUORESCENT ENERGIES				
2.015	2.954E+02	2.197E+00	3.028E-02	2.916E+02
2.136	2.546E+02	2.133E+00	5.218E-02	2.567E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PHOSPHORUS

ATOMIC WEIGHT 30.975 GRAMS / MOLE
DENSITY 1.820 GRAMS / CC
ATOMIC DENSITY 3.539E-02 BUNCHES / CC

CONVERSION CONSTANT IS 5.143E+01

K-EDGE AT 2.149 KEV
K-EDGE JUMP 9.954

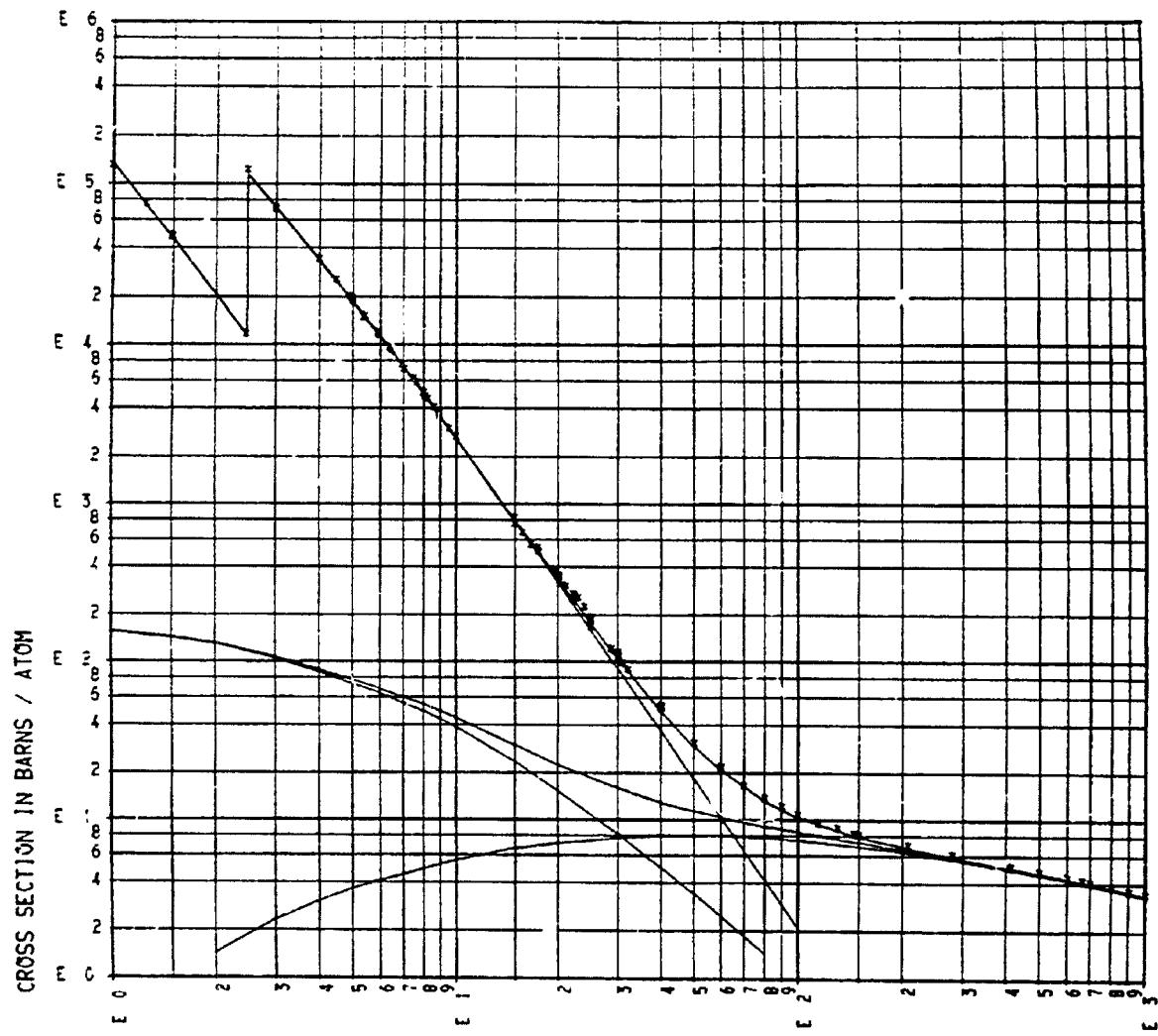
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	L	0.153	K	2.149
0	0.	0.	0.	1.15508E+01	1.33735E+01	-1.86342E+00	
1	0.	0.	0.	1.92200E+00	-1.39440E+01	-3.39440E+01	
2	0.	0.	0.	2.54262E-01	-1.39440E+01	-3.39440E+01	
3	0.	0.	0.	0.	2.88368E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	4.78525E+00	-4.76903E-01
1	1.68708E-01	1.46052E+00
2	-3.60383E-01	-2.51331E-01
3	1.97155E-02	1.07202E-02



SULFUR

16

CROSS SECTIONS

16 - 1 REVISED 6/03/69

CROSS SECTIONS FOR SULFUR		$E = 16$	BARNs / ATOM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	1.350E+05	1.508E+03	4.442E-01	1.358E+05
1.500	1.502E+04	1.508E+03	9.218E-01	4.582E+04
2.000	1.664E+04	1.508E+03	1.431E+00	3.092E+04
2.471	1.445E+04	1.508E+03	1.862E+00	1.565E+04
2.572	1.181E+05	1.508E+03	2.053E+00	1.182E+05
3.000	1.243E+04	1.508E+03	2.561E+00	1.254E+04
4.000	3.403E+04	1.508E+03	3.107E+00	3.410E+04
5.000	1.861E+04	1.508E+03	3.601E+00	1.859E+04
6.000	1.122E+04	1.508E+03	4.129E+00	1.1295E+04
8.000	4.946E+03	1.508E+03	5.000E+00	4.950E+03
10.000	2.581E+03	1.508E+03	6.527E+00	2.587E+03
15.000	1.101E+03	1.508E+03	1.066E+00	1.106E+03
20.000	3.201E+02	1.508E+03	3.288E+00	3.299E+02
30.000	9.166E+01	1.508E+03	9.000E+00	9.166E+01
40.000	3.138E+01	1.508E+03	3.092E+00	3.138E+01
50.000	1.866E+01	3.482E+00	6.092E+00	3.482E+01
60.000	1.051E+01	2.506E+00	1.034E+00	2.506E+01
80.000	4.279E+00	1.462E+00	1.955E+00	1.462E+00
100.000	2.173E+00	9.580E-01	1.999E+00	9.580E-01
150.000	6.132E-01	4.379E-01	6.951E+00	9.008E+00
200.000	2.554E-01	2.489E-01	4.420E+00	3.925E+00
300.000	1.703E-02	1.153E-01	1.591E+00	1.644E+00
400.000	3.356E-02	6.250E-02	1.044E+00	9.142E+00
500.000	1.794E-02	3.299E-02	1.051E+00	1.051E+00
600.000	1.086E-02	2.120E-02	1.051E+00	1.051E+00
800.000	5.036E-03	1.530E-02	3.753E+00	3.753E+00
1000.000	2.836E-03	9.500E-03	3.575E+00	3.575E+00

FLUORESCENT ENERGIES

2.308	1.385E+04	1.232E+02	1.713E+00	1.398E+04
2.464	1.153E+04	1.182E+02	1.855E+00	1.165E+04

16 - 2 REVISED 6/03/69

CROSS SECTIONS FOR SULFUR		Z = 16	CM**2 / GRAM	
KEY	PHOT	Cohérent	Incohérent	Total
1.000	2.548E+03	2.963E+00	8.343E-03	2.551E+03
.500	8.578E+02	1.727E+00	1.731E-02	8.506E+02
.000	3.886E+01	4.470E+00	1.693E-02	3.911E+02
4.000	2.149E+01	2.166E+00	1.693E-02	2.172E+02
4.500	2.178E+01	2.166E+00	1.498E-02	2.220E+02
5.000	1.360E+01	1.022E+00	1.434E-02	1.362E+03
6.000	6.402E+00	6.429E+00	6.835E-02	6.419E+03
7.000	3.496E+00	3.933E+00	6.931E-02	3.510E+03
8.000	2.107E+00	2.055E+00	1.856E-02	2.120E+03
9.000	9.289E+00	9.365E-01	9.334E-02	9.392E+03
10.000	4.848E+00	4.449E-01	1.051E-01	4.933E+03
15.000	1.446E+00	1.454E-01	2.003E-01	1.504E+03
20.000	6.024E+00	6.244E-01	1.376E-01	6.454E+03
30.000	1.721E+00	1.560E-01	1.484E-01	2.026E+03
40.000	1.020E+00	1.065E-01	1.520E-01	1.621E+03
50.000	3.493E+00	3.640E-01	1.526E-01	3.961E+03
60.000	1.924E+00	1.707E-01	1.516E-01	2.554E+03
80.000	8.036E+00	7.45E-01	1.476E-01	2.008E+03
100.000	4.0014E+00	7.93E-01	1.427E-01	1.504E+03
150.000	1.162E+00	1.224E-01	1.302E-01	1.369E+03
200.000	4.815E+00	6.65E-01	1.206E-01	5.611E+03
300.000	1.447E+00	0.90E-01	1.155E-01	1.611E+03
400.000	6.311E+00	1.166E-01	1.173E-01	6.611E+03
500.000	3.369E+00	4.94E-01	6.662E-01	3.611E+03
600.000	2.040E+00	1.184E-01	1.030E-01	2.081E+03
800.000	9.453E+00	8.14E-01	1.049E-01	1.087E+03
1000.000	5.527E+00	1.803E-01	6.335E-02	6.362E+02

FLUORESCENT ENERGIES

2.308	2.602E+02	2.295E+00	3.216E-02	2.626E-02
2.464	2.166E+02	2.219E+00	3.455E-02	2.189E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR SULFUR

ATOMIC WEIGHT 32.066 GRAMS/MOLE
DENSITY 2.000 GRAMS/CC
ATOMIC DENSITY 3.756E-02 BUNCHES/CC

CONVERSION CONSTANT IS 5.324E+01

K-EDGE AT 2.472 KEV
K-EDGE JUMP 10.333

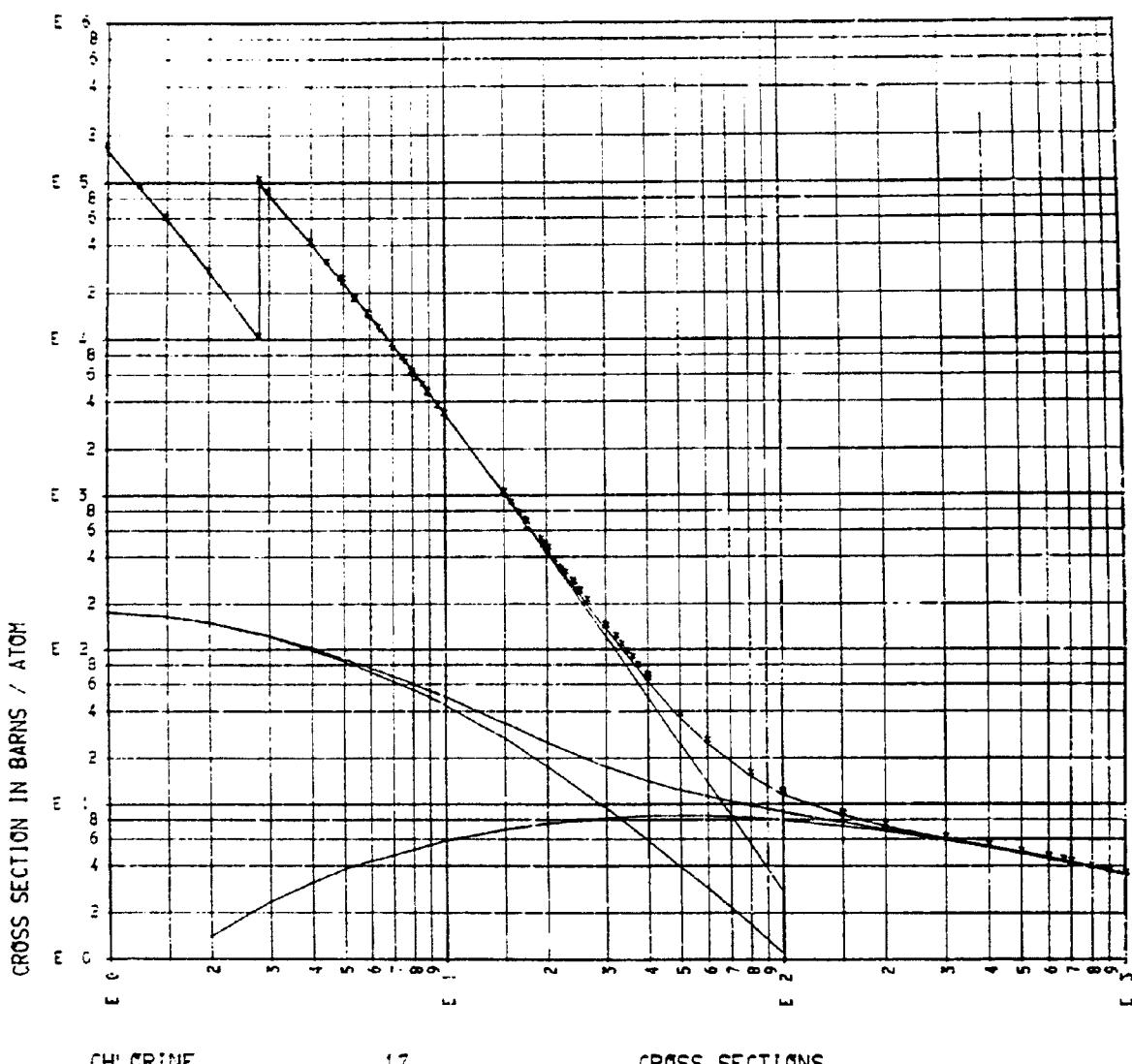
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K	E
O	0.	0.	0.	0.	2.472
1	0.	0.	0.	0.	0.
2	0.	0.	0.	0.	0.
3	0.	0.	0.	0.	0.

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
O	4.92707E+00	-6.56419E-01
1	1.65746E-01	-1.65409E+00
2	-3.59424E-01	-2.98623E-01
3	1.95505E-02	1.42973E-02



CHLORINE

17

CROSS SECTIONS

PAGE 17 - 1

REVISED 6/03/69

CROSS SECTIONS FOR CHLORINE		$E = 17$		BARNS / ATOM
KEY	PHOT	COPHERENT	INCOHERENT	TOTAL
1.000	1.633E+05	1.795E+02	4.213E+01	1.634E+05
1.500	1.690E+04	6.635E+02	1.696E+01	1.906E+04
2.000	1.682E+04	1.116E+02	2.116E+00	1.738E+04
3.000	1.682E+04	1.616E+02	3.161E+00	1.640E+04
4.000	1.682E+04	2.116E+02	4.116E+00	1.750E+04
5.000	1.682E+04	2.616E+02	5.161E+00	1.655E+04
6.000	1.682E+04	3.116E+02	6.161E+00	1.557E+04
10.000	1.682E+04	4.616E+02	1.016E+01	1.433E+04
15.000	1.682E+04	6.316E+02	1.516E+01	1.357E+04
20.000	1.682E+04	8.016E+02	2.016E+01	1.358E+04
30.000	1.682E+04	1.2016E+03	3.016E+01	1.323E+04
40.000	1.682E+04	1.6016E+03	4.016E+01	1.310E+04
50.000	1.682E+04	1.9016E+03	5.016E+01	1.270E+04
60.000	1.682E+04	2.2016E+03	6.016E+01	1.219E+04
80.000	1.682E+04	3.2016E+03	8.016E+01	1.167E+04
100.000	1.682E+04	3.9016E+03	1.0016E+02	1.117E+04
150.000	1.682E+04	5.8016E+03	1.5016E+02	1.017E+04
200.000	1.682E+04	8.8016E+03	2.0016E+02	9.663E+03
300.000	1.682E+04	1.29016E+04	3.0016E+02	9.194E+03
400.000	1.682E+04	1.69016E+04	4.0016E+02	8.747E+03
500.000	1.682E+04	2.09016E+04	5.0016E+02	8.358E+03
600.000	1.682E+04	2.89016E+04	6.0016E+02	8.012E+03
800.000	1.682E+04	3.69016E+04	8.0016E+02	7.667E+03
1000.000	1.682E+04	4.49016E+04	1.0016E+03	7.361E+03
FLUORESCENT ENERGIES				
2.622	1.264E+04	1.320E+02	1.267E+00	1.270E+04
2.615	1.034E+04	1.235E+02	1.237E+00	1.041E+04

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REVISED 6/03/69

CROSS SECTIONS FOR CHLORINE		Z = 17	CM**2 / GRAM	
KEY	PHOTIC	COHERENT	INCOHERENT	TOTAL
1.000	2.773E+03	3.049E+00	7.156E-03	2.776E+03
1.500	1.800E+03	8.255E+00	1.912E-02	1.803E+03
2.000	4.625E+02	5.726E+00	4.606E-02	4.651E+02
2.821	1.745E+02	1.598E+00	1.707E+02	
2.822	1.654E+02	1.598E+00	1.656E+02	
2.900	1.530E+02	1.593E+00	1.432E+03	
2.900	1.039E+02	1.138E+00	7.057E+02	
2.900	3.955E+01	1.435E+00	3.970E+02	
2.900	1.430E+01	1.232E+00	1.433E+02	
2.900	1.097E+01	5.57E-01	1.108E+02	
2.900	6.808E+00	6.288E-01	6.824E+01	
2.900	1.750E+00	4.633E-01	1.818E+01	
20.000	1.351E+00	3.058E-01	1.398E+00	
50.000	2.102E+00	1.654E-01	2.407E+00	
40.000	9.534E-01	1.013E-01	1.006E+00	
50.000	4.222E-01	6.889E-02	3.559E+01	
60.000	3.116E-01	4.934E-02	3.220E+01	
80.000	1.592E-01	4.881E-02	1.652E+01	
100.000	1.760E-01	1.888E-01	1.032E+01	
150.000	1.351E-01	6.623E-03	1.265E+01	
200.000	6.614E-03	1.919E-03	1.062E+01	
300.000	1.687E-03	1.919E-03	1.662E+01	
400.000	1.347E-04	2.311E-03	1.629E+01	
500.000	9.408E-04	1.824E-04	1.639E+01	
600.000	4.601E-04	4.355E-04	1.835E+01	
800.000	1.131E-04	3.023E-04	6.815E+00	
1000.000	6.466E-05	1.865E-04	6.116E+00	

FLUORESCENT ENERGIES

2.622	2.147E+02	2.241E+00	3.409E-02	2.151E+02
2.815	1.756E+02	2.162E+00	5.738E-02	1.761E+02

17 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR CHLORINE

ATOMIC WEIGHT 35.457 GRAMS / MOLE
DENSITY 1.560 GRAMS / CC
ATOMIC DENSITY 2.650E-02 BUNCHES / CC

CONVERSION CONSTANT IS 5.667E+01

K-EDGE AT 2.822 KEV
K-EDGE JUMP 9.487

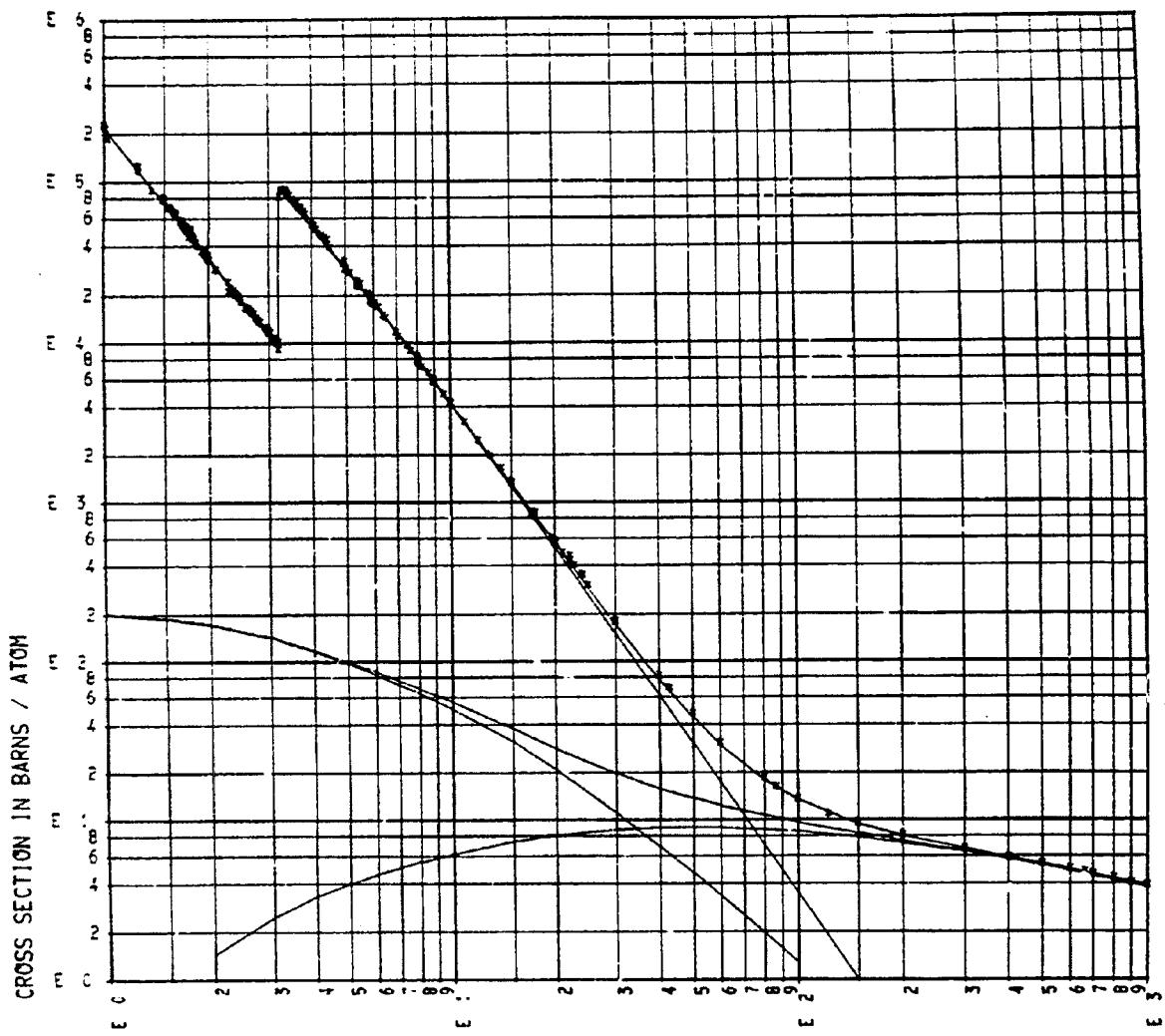
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	P	Q	R
C	0.	0.	0.017	0.	0.238	2.822
1	0.	0.		1.20031E+01	1.36168E+01	
2	0.	0.		1.41694E+03	1.19353E+03	
3	0.	0.		1.40897E-01	-3.54165E-01	
				0.	2.90841E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
C	5.07222E+00	-7.18627E-01
1	1.49127E-01	1.74294E+00
2	-3.52858E-01	-3.19429E-01
3	1.89439E-02	1.58429E-02



ARGON

18

CROSS SECTIONS

18 - 1

REVISED 6/03/69

CROSS SECTIONS FOR ARGON		Z = 18	BARNs / ATOM	
KEY	PHOTs	COHERENT	INCOHERENT	TOTAL
1.000	2.168E+05	2.027E+02	4.617E-01	2.190E+05
1.500	1.434E+04	1.889E+02	9.335E-01	1.453E+04
2.000	3.405E+04	1.731E+02	4.555E+00	3.423E+04
3.000	1.110E+04	1.471E+02	4.533E+00	1.124E+04
3.201	9.267E+03	1.354E+02	6.215E+00	9.366E+03
3.202	9.165E+04	1.354E+02	6.215E+00	9.179E+04
4.000	9.223E+04	1.158E+02	3.322E+00	9.235E+04
5.000	2.909E+04	9.647E+01	4.059E+00	9.649E+04
6.000	1.177E+04	8.219E+01	4.623E+00	1.186E+04
8.000	1.972E+03	6.311E+01	5.111E+00	6.406E+03
10.000	4.203E+03	6.056E+01	1.182E+00	4.220E+03
15.000	1.270E+05	5.120E+01	3.552E+00	1.308E+05
20.000	5.313E+02	4.089E+01	8.070E+00	1.600E+02
30.000	1.522E+02	1.108E+01	8.748E+00	1.120E+02
40.000	6.205E+01	6.887E+00	9.986E+00	6.322E+01
50.000	3.084E+01	4.657E+00	9.040E+00	4.741E+01
60.000	1.741E+01	3.550E+00	9.999E+00	4.322E+01
80.000	1.073E+00	1.954E+00	8.780E+00	1.821E+01
100.000	3.529E+00	1.288E+00	8.500E+00	3.327E+00
150.000	1.012E+00	5.884E-01	8.803E+00	1.444E+00
300.000	4.235E-01	3.544E-01	1.208E+00	5.000E+00
500.000	1.285E-01	1.499E-01	3.011E+00	4.000E+00
400.000	6.644E-02	9.814E-02	5.911E+00	2.500E+00
500.000	3.042E-02	5.817E-02	1.865E+00	2.000E+00
600.000	1.860E-02	3.710E-02	4.608E+00	2.000E+00
800.000	8.800E-03	2.060E-02	3.990E+00	2.000E+00
1000.000	5.349E-03	1.290E-02	5.197E+00	5.616E+00

FLUORESCENT ENERGIES

2.957	1.155E+04	1.427E+02	1.408E+00	1.160E+04
3.192	9.351E+03	1.357E+02	1.619E+00	9.459E+03

18 - 2

REVISED 6/03/69

CROSS SECTIONS FOR ARGON		Z = 18	CM**2 / GRAM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	3.299E+03	3.056E+00	6.962E-03	3.302E+03
1.500	1.121E+03	2.849E+00	1.408E-02	1.124E+03
2.000	5.155E+02	2.510E+00	2.194E-02	5.161E+02
3.000	1.574E+02	2.135E+00	3.698E-02	1.695E+02
3.201	1.396E+02	2.042E+00	3.960E-02	1.417E+02
3.202	1.382E+03	2.042E+00	3.961E-02	1.384E+03
4.000	7.875E+02	1.747E+00	5.009E-02	7.893E+02
5.000	4.386E+02	1.455E+00	6.089E-02	4.401E+02
6.000	2.579E+02	1.239E+00	6.970E-02	2.693E+02
8.000	1.202E+02	9.915E-01	8.310E-02	1.212E+02
10.000	6.338E+01	7.623E-01	9.321E-02	6.423E+01
15.000	1.914E+01	4.704E-01	1.109E-01	1.922E+01
20.000	8.010E+00	3.119E-01	1.217E-01	8.444E+00
30.000	2.295E+00	1.670E-01	3.198E-01	2.594E+00
40.000	9.355E-01	1.038E-01	3.555E-01	1.175E+00
50.000	4.550E-01	1.037E-02	3.633E-01	5.717E-01
60.000	2.625E-01	5.665E-02	3.571E-01	4.488E-01
80.000	1.066E-01	2.951E-02	3.248E-01	2.686E-01
100.000	5.321E-02	1.341E-02	2.822E-01	2.008E-01
150.000	1.526E-02	8.872E-03	1.158E-01	1.478E-01
200.000	6.391E-03	5.042E-03	6.971E-01	1.201E-01
300.000	1.934E-03	2.059E-03	6.154E-01	9.934E-02
400.000	8.510E-04	8.1861E-03	6.850E-01	1.022E-01
500.000	4.586E-04	8.069E-04	6.819E-01	1.846E-01
600.000	2.805E-04	5.994E-04	6.289E-01	1.823E-01
800.000	1.327E-04	3.068E-04	6.366E-01	1.409E-01
1000.000	7.612E-05	1.945E-04	6.124E-01	9.522E-02

FLUORESCENT ENERGIES

2.957	1.742E+02	2.151E+00	3.630E-02	1.764E+02
3.192	1.407E+02	2.046E+00	3.948E-02	1.428E+02

18 - 3

REVISED 6.03.69

MISCELLANEOUS DATA FOR ARGON

ATOMIC WEIGHT 39.944 GRAMS / MOLE
DENSITY 1.784E-03 GRAMS / CC
ATOMIC DENSITY 2.690E-05 BUNCHES / CC

CONVERSION CONSTANT IS 6.632E+01

K-EDGE AT 3.202 KEY
K-EDGE JUMP 9.909

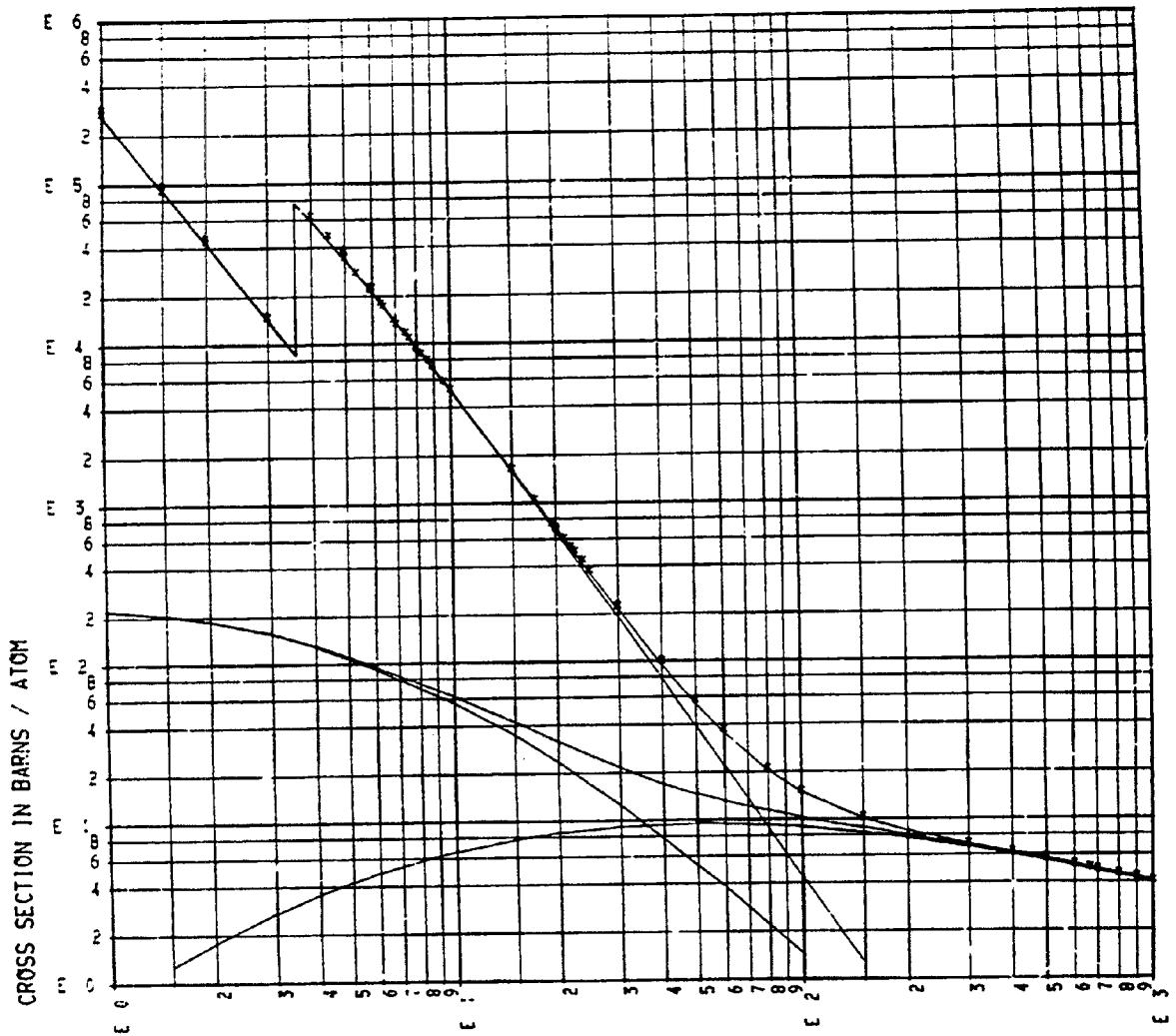
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.027	L	0.287	K	3.202
0	0.	0.		1.22960E+01		1.39491E+01	
1	0.	0.		-2.63279E+00		-1.822276E+00	
2	0.	0.		-2.36600E-02		-3.388275E-01	
3	0.	0.		0.		2.74382E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.21079E+00	-6.82105E-01
1	1.35618E-01	1.74279E+00
2	-3.47214E-01	-3.17646E-01
3	1.84333E-02	1.55467E-02



POTASSIUM

19

CROSS SECTIONS

19 - :

REVISED 6/03/69

CROSS SECTIONS FOR POTASSIUM		Z = 19	BARNES / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.651E+05	2.189E+02	7.655E-01	2.653E+05
1.500	9.315E+04	3.022E+02	1.261E+00	9.336E+04
2.000	4.344E+04	1.858E+02	1.751E+00	4.363E+04
3.000	1.339E+04	1.648E+02	2.669E+00	1.455E+04
3.605	8.520E+03	1.373E+02	3.211E+00	8.761E+03
3.607	1.918E+04	1.573E+02	3.212E+00	1.632E+04
4.000	6.931E+04	1.282E+02	3.544E+00	6.944E+04
5.000	3.892E+04	1.071E+02	4.270E+00	3.894E+04
6.000	2.111E+04	9.158E+01	4.878E+00	2.121E+04
8.000	1.700E+03	6.964E+01	6.691E+00	1.768E+03
10.000	5.190E+03	5.585E+01	6.504E+00	5.535E+03
15.000	1.597E+03	3.498E+01	1.701E+00	1.540E+03
20.000	6.738E+02	2.341E+01	8.451E+00	6.057E+02
30.000	1.941E+02	1.251E+01	9.177E+00	2.158E+02
40.000	1.918E+01	1.735E+00	9.435E+00	1.635E+01
50.000	3.932E+01	5.221E+00	9.498E+00	5.104E+01
60.000	2.217E+01	3.750E+00	9.461E+00	3.538E+01
80.000	8.984E+00	2.193E+00	9.239E+00	2.042E+01
100.000	4.473E+00	1.434E+00	8.951E+00	4.486E+01
150.000	1.278E+00	6.532E-01	8.225E+00	1.161E+01
200.000	5.351E-01	3.706E-01	7.561E+00	8.607E+00
300.000	1.623E-01	1.655E-01	6.558E+00	6.985E+00
400.000	7.182E-02	9.300E-02	5.984E+00	6.149E+00
500.000	3.897E-02	5.940E-02	5.472E+00	5.521E+00
600.000	2.401E-02	4.110E-02	5.067E+00	5.132E+00
800.000	1.154E-02	2.280E-02	4.455E+00	4.490E+00
1000.000	6.725E-03	1.450E-02	4.007E+00	4.028E+00

FLUORESCENT ENERGIES

3.313	1.092E+04	1.451E+02	2.963E+00	1.107E+04
3.589	8.734E+03	1.377E+02	3.197E+00	8.876E+03

19 - 2

REVISED 6/03/69

CROSS SECTIONS FOR POTASSIUM Z = 19 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
0.000	4.083E+03	3.372E+00	1.179E-02	4.086E+03
1.500	1.435E+03	3.115E+00	1.942E-02	1.436E+03
2.000	6.691E+02	2.862E+00	2.697E-02	6.720E+02
3.000	3.217E+02	2.384E+00	4.152E-02	2.241E+02
3.506	1.328E+02	1.114E+00	4.946E-02	1.349E+02
3.607	1.173E+03	1.114E+00	1.948E-02	1.175E+03
3.914	1.355E+02	1.914E+00	5.159E-02	1.155E+02
4.000	9.224E+02	1.650E+00	6.576E-02	9.242E+02
5.000	3.252E+02	1.404E+00	1.512E-02	3.266E+02
6.000	1.494E+02	1.073E+00	8.952E-02	1.506E+02
7.000	1.994E+01	8.502E-01	1.002E-01	8.590E+01
15.000	2.460E+01	3.387E-01	1.86E-01	2.526E+01
20.000	1.038E+01	3.605E-01	3.02E-01	1.087E+01
30.000	2.990E+00	1.921E-01	4.13E-01	3.324E+00
40.000	1.220E+00	1.191E-01	4.53E-01	1.484E+00
50.000	6.057E-01	8.042E-02	4.63E-01	8.324E-01
60.000	3.415E-01	5.775E-02	4.57E-01	5.450E-01
80.000	1.384E-01	3.317E-02	4.233E-01	3.144E-01
100.000	6.889E-02	2.209E-02	3.379E-01	2.388E-01
150.000	1.959E-02	1.006E-02	2.261E-01	1.984E-01
200.000	8.241E-03	5.708E-03	1.171E-01	1.310E-01
300.000	2.500E-03	2.549E-03	1.025E-01	1.016E-01
400.000	1.106E-03	1.432E-03	9.316E-02	9.410E-02
500.000	6.002E-04	9.149E-04	8.429E-02	8.580E-02
600.000	3.698E-04	6.330E-04	7.805E-02	7.905E-02
800.000	1.777E-04	3.512E-04	6.862E-02	6.915E-02
1000.000	1.036E-04	2.202E-04	6.112E-02	6.204E-02

FLUORESCENT ENERGIES

3.313	1.681E+02	2.235E+00	4.563E-02	1.705E+02
3.589	1.345E+02	2.121E+00	4.924E-02	1.367E+02

19 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR POTASSIUM

ATOMIC WEIGHT 39.102 GRAMS / MOLE
DENSITY 0.862 GRAMS / CC
ATOMIC DENSITY 1.328E-02 BUNCHES / CC

CONVERSION CONSTANT IS 6.493E+01

K-EDGE AT 3.607 KEV
K-EDGE JUMP 8.844

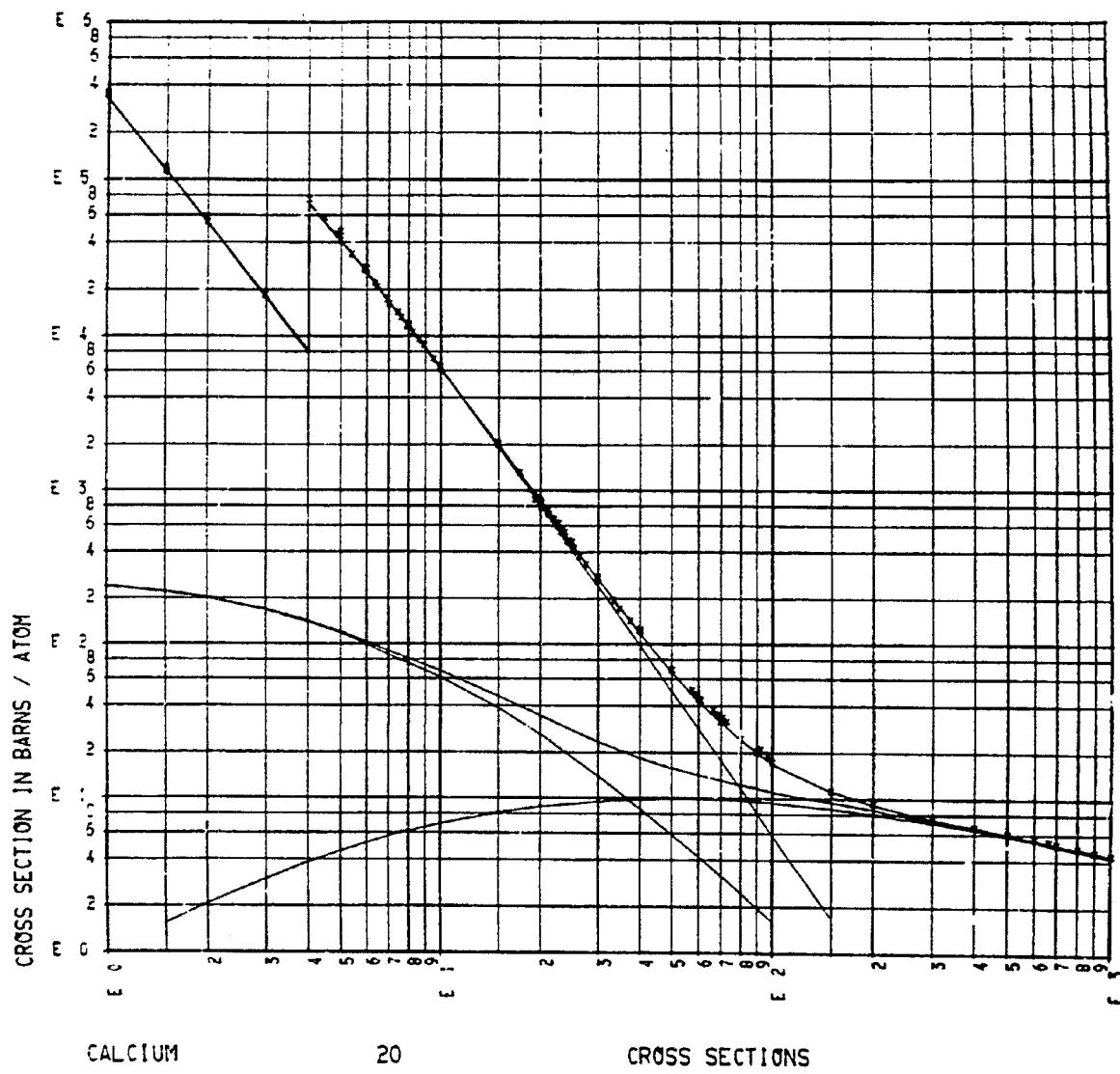
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.034	L	0.341	K	3.607
0	C.	C.		1.24878E+01	1.37976E+01		
1	C.	C.		-2.53656E+00	-1.54016E+00		
2	C.	C.		-1.04892E-01	-3.94528E-01		
3	C.	C.		0.	3.23561E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.25587E+00	-3.44007E-01
1	1.88040E-01	1.49336E+00
2	-3.59523E-01	-2.54135E-01
3	1.93085E-02	1.07684E-02



三

REVISED 5/03/69

IPSSS SECTIONS FOR CALCULATIONS

100

DARNS 1-1938

FLUORESCENT ENCAPSITES

3.691 1.001E+04
4.012 1.938E+03

20 - 2

REVISED 6/03/69

CROSS SECTIONS FOR CALCIUM		Z = 20	CM**2 / GRAM	
KEY	PHOT	CohereNT	IncohoreNT	TotAl
1.000	4.94E+03	5.612E+00	1.427E-02	4.950E+03
1.500	1.73E+03	3.303E+00	3.19E-02	1.735E+03
2.000	6.07E+02	3.014E+00	3.08E-02	8.102E+02
3.000	2.680E+02	3.011E+00	4.471E-02	2.706E+02
4.000	1.203E+02	3.005E+00	5.716E-02	1.225E+02
4.037	1.172E+02	3.000E+00	5.757E-02	1.194E+02
4.038	1.067E+02	3.000E+00	5.758E-02	1.070E+02
5.000	6.143E+02	3.122E+00	6.800E-02	6.162E+02
6.000	3.786E+02	3.096E+00	7.51E-02	3.802E+02
8.000	1.726E+02	3.014E+00	9.191E-02	1.739E+02
10.000	9.256E+01	3.002E+00	9.276E-01	9.338E+01
15.000	2.872E+01	3.000E+00	2.115E-01	2.943E+01
20.000	1.229E+01	3.000E+00	3.288E-01	1.281E+01
30.000	3.632E+00	3.000E+00	4.433E-01	5.988E+00
40.000	1.613E+00	3.000E+00	4.858E-01	1.792E+00
50.000	1.041E+01	3.000E+00	4.990E-01	1.001E+00
60.000	4.366E+01	3.000E+00	4.990E-01	6.487E+01
80.000	1.805E+01	3.000E+00	4.990E-01	6.630E+01
100.000	9.108E+02	3.416E+00	4.412E-01	9.564E+01
150.000	2.651E+02	3.097E+00	1.2999E-01	1.634E+01
200.000	1.111E+02	3.018E+00	1.2011E-01	1.378E+01
300.000	3.372E+03	3.000E+00	1.053E-01	1.113E+01
400.000	1.472E+03	3.000E+00	1.054E-01	9.764E+00
500.000	7.844E+04	9.962E-04	6.3614E-02	8.832E+00
600.000	4.1739E+04	5.882E-04	6.3615E-02	8.130E+00
800.000	2.184E+04	3.832E-04	6.3616E-02	1.107E+00
1000.000	1.221E+04	2.419E-04	6.3618E-02	6.374E-02
FLUORESCENT ENERGIES				
3.691	1.503E+02	2.213E+00	5.337E-02	1.528E+02
4.012	1.193E+02	2.100E+00	5.729E-02	1.214E+02

20 - 5

REVISED 5/03/69

MISCELLANEOUS DATA FOR CALCIUM

ATOMIC WEIGHT 40.080 GRAMS / MOLE
DENSITY 1.550 GRAMS / CC
ATOMIC DENSITY 2.529E-02 BUNCHES / CC

CONVERSION CONSTANT IS 6.666E+01

K-EDGE AT 4.038 KEV
K-EDGE JUMP 9.112

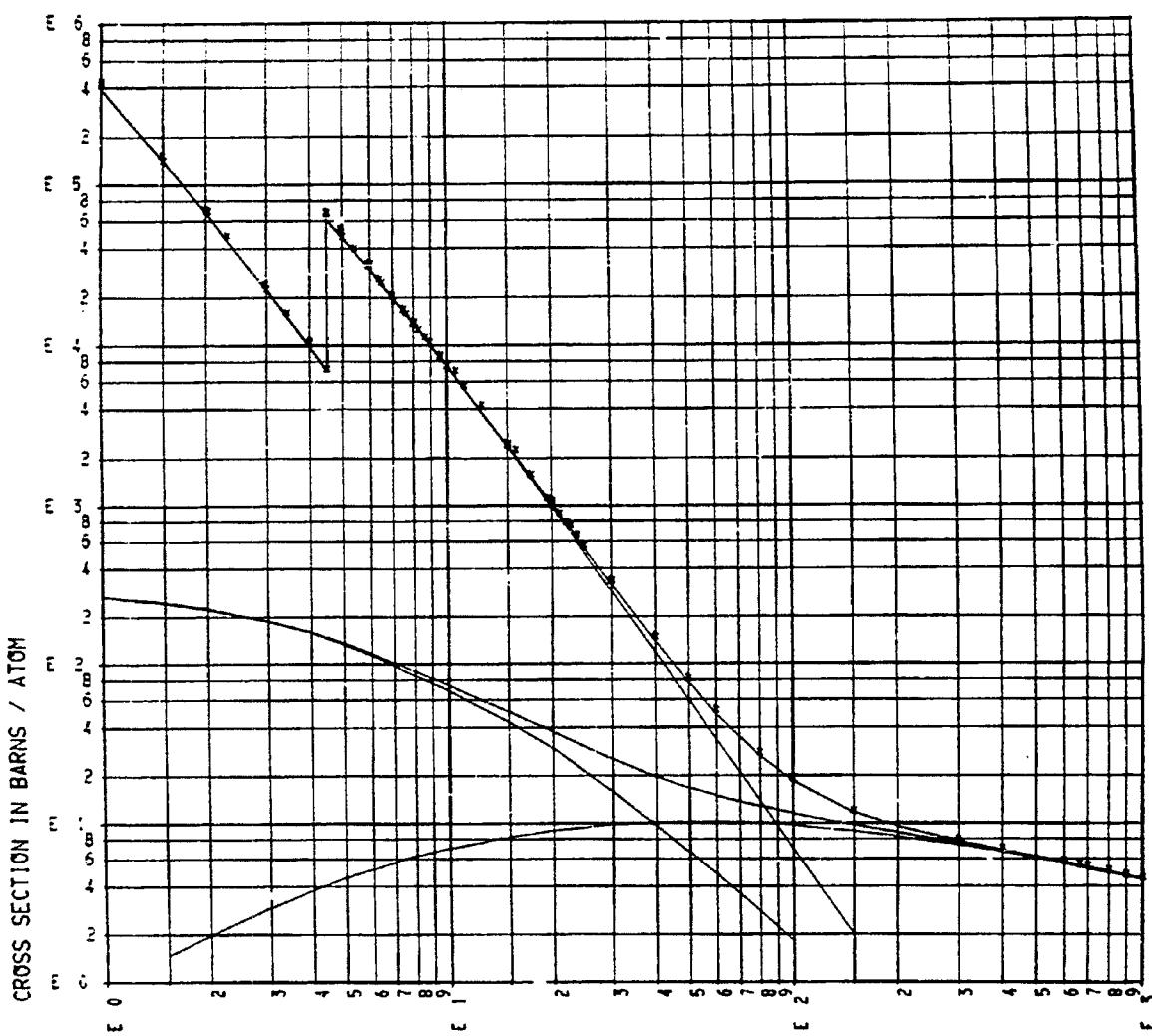
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	P	Q	R
0	0.	0.		1.27044E+01	1.42956E+01	
1	0.	0.		-2.95011E+00	1.16864E+00	
2	0.	0.		-9.43196E-02	-2.03641E-01	
3	0.	0.		0.	2.26263E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.32375E+00	-9.82420E-02
1	2.06585E-01	1.32829E+00
2	-3.61664E-01	-2.13747E-01
3	1.93328E-02	7.73065E-03



SCANDIUM

21

CROSS SECTIONS

21 - 1

REVISED 6/03/69

CROSS SECTIONS FOR SCANDIUM		Z = 21	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.983E+05	2.674E+02	8.902E-01	3.985E+05
1.500	1.4385E+05	2.454E+02	1.483E+00	1.461E+05
2.000	6.839E+04	2.243E+02	2.002E+00	6.922E+04
3.000	2.286E+04	1.876E+02	3.2956E+00	2.305E+04
4.000	1.007E+04	1.571E+02	3.815E+00	1.033E+04
4.492	1.189E+03	1.438E+02	4.191E+00	1.328E+03
4.493	6.156E+04	1.438E+02	4.192E+00	6.161E+04
5.000	4.735E+04	1.324E+02	4.572E+00	4.748E+04
6.000	2.986E+04	1.127E+02	6.232E+00	2.998E+04
8.000	1.399E+04	8.623E+01	6.292E+00	1.408E+04
10.000	7.586E+03	6.790E+01	6.023E+00	7.621E+03
15.000	2.385E+03	4.314E+01	8.356E+00	2.436E+03
20.000	1.019E+03	2.939E+01	9.181E+00	1.058E+03
30.000	2.980E+02	1.578E+01	9.962E+00	3.238E+02
40.000	1.227E+02	9.728E+00	1.029E+01	1.427E+02
50.000	6.150E+01	5.576E+00	1.038E+01	7.825E+01
60.000	3.472E+01	4.720E+00	1.036E+01	4.980E+01
80.000	1.416E+01	2.765E+00	1.014E+01	2.706E+01
100.000	1.077E+00	1.829E+00	9.837E+00	1.872E+01
150.000	2.036E+00	8.225E-01	9.905E+00	1.192E+01
200.000	8.551E-01	4.564E-01	6.383E+00	9.705E+00
300.000	2.505E-01	2.082E-01	5.380E+00	3.899E+00
400.000	1.156E-01	1.170E-01	6.608E+00	6.841E+00
500.000	6.288E-02	4.700E-02	6.645E+00	9.185E+00
600.000	3.882E-02	3.160E-02	6.598E+00	6.688E+00
800.000	1.871E-02	2.810E-02	4.923E+00	4.970E+00
1000.000	1.093E-02	1.810E-02	4.438E+00	4.457E+00

FLUORESCENT ENERGIES

4.090	9.440E+03	1.545E+02	3.884E+00	9.599E+03
4.460	7.331E+03	1.446E+02	4.167E+00	7.480E+03

Z = 21 REVISED 6/03/69

CROSS SECTIONS FOR SCANDIUM		Z = 21	(MM**2 / SPAN)	
KEY	PHOT0	CHEERENT	INCOHERENT	TOTAL
1.000	5.335E+03	3.582E+00	1.192E-02	5.339E+03
1.500	1.953E+03	5.288E+00	1.981E-02	1.951E+03
2.000	9.241E+02	5.005E+00	2.682E-02	9.272E+02
3.000	3.052E+02	3.512E+00	3.962E-02	3.087E+02
4.000	1.349E+02	1.105E+00	5.111E-02	1.371E+02
7.492	9.617E+01	1.926E+00	6.615E-02	9.815E+01
7.493	8.246E+02	1.926E+00	8.515E-02	8.266E+02
7.500	6.342E+02	1.773E+00	6.124E-02	6.361E+02
7.600	4.000E+02	5.09E+00	1.008E-02	4.016E+02
8.000	1.874E+02	1.142E+00	8.428E-03	1.886E+02
10.000	1.016E+02	9.055E-01	9.408E-03	1.026E+02
15.000	3.194E+01	5.179E-01	1.195E-03	3.195E+01
20.000	1.365E+01	3.937E-01	2.303E-03	1.366E+01
30.000	3.992E+00	1.113E-01	5.545E-03	4.106E+00
40.000	1.643E+00	1.503E-01	3.785E-03	1.681E+00
50.000	6.212E-01	8.797E-02	3.906E-03	6.251E-01
60.000	4.651E-01	6.323E-02	3.888E-03	4.700E-01
80.000	1.896E-01	1.044E-02	3.588E-03	1.934E-01
100.000	9.480E-02	4.222E-02	3.158E-03	9.598E-02
150.000	3.123E-02	1.028E-02	1.712E-03	3.140E-02
200.000	1.145E-02	3.248E-03	1.204E-03	1.157E-02
300.000	3.491E-03	1.893E-03	8.843E-04	3.500E-03
400.000	1.549E-03	8.016E-03	5.003E-04	1.553E-03
500.000	8.424E-04	4.001E-03	2.601E-04	8.433E-04
600.000	3.300E-04	9.912E-04	1.600E-04	3.300E-04
800.000	2.506E-04	8.844E-04	9.554E-04	2.506E-04
1000.000	1.464E-04	4.238E-04	9.931E-04	1.464E-04

FLUORESCENT ENERGIES

5.090	1.266E+02	2.069E+00	5.135E-03	1.286E+02
7.460	9.820E+01	1.937E+00	6.882E-03	1.002E+02

21 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR SCANDIUM

ATOMIC WEIGHT 44.960 GRAMS / MOLE
DENSITY 2.992 GRAMS / CC
ATOMIC DENSITY 4.008E-02 BUNCHES / CC

CONVERSION CONSTANT IS 0.465E+01

K-EDGE AT 4.493 KEV
K-EDGE JUMP 8.580

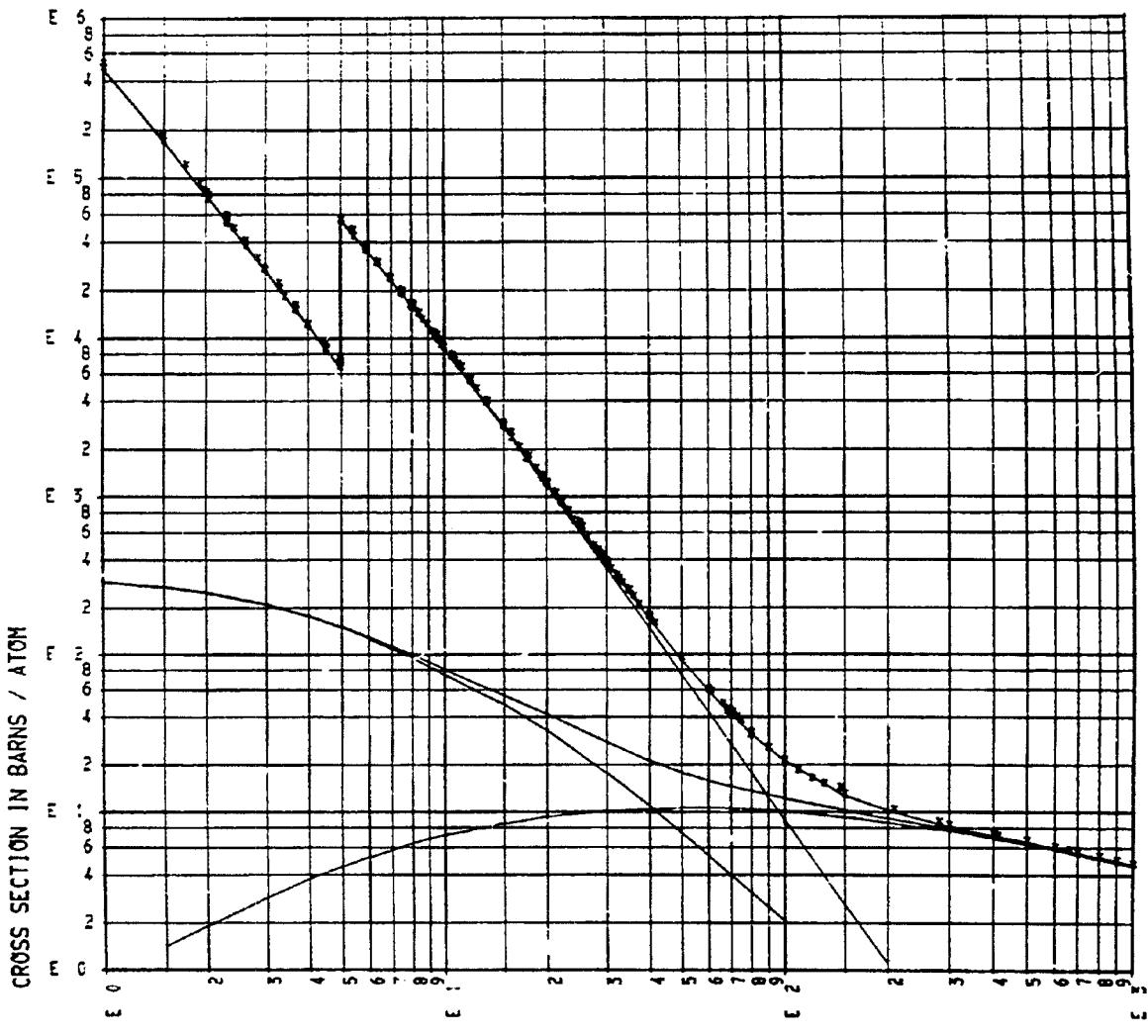
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	L	C	K	4.493
0	0.	0.	0.	0.	0.28949E-01	0.39564E+01	
1	0.	0.	0.	0.	0.49069E+00	0.11260E+01	
2	0.	0.	0.	0.	0.11919E+01	-4.13538E+01	
3	0.	0.	0.	0.	0.	3.34388E+01	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.43942E+00	-1.59831E-01
1	2.00174E-01	0.390555E+00
2	-3.59964E-01	-2.25949E+01
3	1.91027E-02	8.51954E-03



TITANIUM

22

CROSS SECTIONS

22 - 1

REVISED - 6/03/69

CROSS SECTIONS FOR TITANIUM Z = 22 BARNs / ATOM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	4.926E+05	2.958E+02	8.304E-01	4.929E+05
1.500	1.734E+05	2.229E+02	1.417E+00	1.737E+05
2.000	9.113E+04	2.501E+02	1.944E+00	8.138E+04
3.000	2.707E+04	2.098E+02	2.923E+00	2.728E+04
4.000	1.219E+04	1.762E+02	3.810E+00	1.237E+04
4.964	5.627E+03	1.494E+02	4.571E+00	5.781E+03
5.965	5.650E+04	1.494E+02	4.572E+00	5.665E+04
5.000	5.550E+04	1.486E+02	4.559E+00	5.566E+04
6.000	3.478E+04	1.265E+02	5.296E+00	3.491E+04
8.000	1.622E+04	9.520E+01	5.434E+00	1.632E+04
10.000	8.805E+03	7.940E+01	7.245E+00	8.887E+03
15.000	2.795E+03	4.185E+01	8.657E+00	2.852E+03
20.000	1.209E+03	2.811E+01	9.621E+00	1.251E+03
30.000	3.612E+02	1.688E+01	1.035E+01	3.892E+02
40.000	1.513E+02	1.091E+01	1.071E+01	7.729E+02
50.000	7.664E+01	5.373E+00	1.082E+01	9.484E+01
60.000	4.389E+01	3.305E+00	1.080E+01	5.000E+01
80.000	1.820E+01	3.111E+00	1.068E+01	3.189E+01
100.000	9.203E+00	2.036E+00	1.028E+01	2.152E+01
150.000	2.691E+00	2.700E+01	9.478E+00	1.310E+01
200.000	1.138E+00	5.257E+01	8.773E+00	1.044E+01
300.000	3.468E-01	2.347E+01	7.696E+00	6.377E+00
400.000	1.527E-01	1.320E+01	6.926E+00	1.808E+00
500.000	8.207E-02	8.200E+00	6.331E+00	1.431E+00
600.000	5.000E-02	5.820E+00	5.694E+00	1.191E+00
800.000	2.342E-02	3.240E+00	3.137E+00	6.173E+00
1000.000	1.329E-02	2.040E+00	4.559E+00	4.673E+00

FLUORESCENT ENERGIES

4.510	8.687E+03	1.668E+02	4.216E+00	8.856E+03
4.931	6.753E+03	1.502E+02	4.645E+00	6.908E+03

22 - 2

REVISED 6/03/69

CROSS SECTIONS FOR TITANIUM Z = 22 CN**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	6.194E+03	3.720E+00	1.044E-02	6.197E+03
1.500	2.181E+03	3.431E+00	1.782E-02	2.184E+03
2.000	1.020E+03	3.145E+00	2.444E-02	1.023E+03
3.000	3.403E+02	2.638E+00	3.675E-02	3.430E+02
4.000	1.532E+02	2.215E+00	4.790E-02	1.555E+02
4.964	8.333E+01	1.879E+00	5.747E-02	8.526E+01
4.965	7.104E+02	1.879E+00	5.748E-02	7.123E+02
5.000	6.979E+02	1.868E+00	5.782E-02	6.998E+02
6.000	4.373E+02	1.590E+00	6.659E-02	4.390E+02
8.000	2.040E+02	1.197E+00	8.090E-02	2.052E+02
10.000	1.107E+02	9.480E-01	9.109E-02	1.117E+02
15.000	3.514E+01	6.016E-01	1.088E-01	3.585E+01
20.000	1.520E+01	4.125E-01	1.198E-01	1.531E+01
30.000	4.542E+00	2.223E-01	1.301E-01	4.894E+00
40.000	1.902E+00	1.372E-01	1.347E-01	1.174E+00
50.000	9.636E-01	9.370E-02	1.360E-01	1.192E+00
60.000	5.518E-01	6.670E-02	1.358E-01	1.043E+00
80.000	2.288E-01	3.911E-02	1.330E-01	4.009E+00
100.000	1.157E-01	2.560E-02	1.293E-01	2.706E+00
150.000	3.383E-02	1.166E-02	1.192E-01	1.3947E+00
200.000	1.431E-02	6.610E-03	1.103E-01	1.312E+00
300.000	4.360E-03	2.951E-03	9.526E-02	1.041E+00
400.000	1.919E-03	1.060E-03	8.701E-02	1.051E+00
500.000	1.032E-03	1.059E-03	9.960E-02	1.050E+00
600.000	5.287E-04	2.318E-04	2.373E-02	1.050E+00
800.000	2.945E-04	4.074E-04	5.484E-02	1.054E+00
1000.000	1.671E-04	2.665E-04	5.833E-02	5.875E-02

FLUORESCENT ENERGIES

4.510	1.092E+02	2.021E+00	5.301E-02	1.114E+02
4.931	8.491E+01	1.888E+00	5.715E-02	9.666E+01

22 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR TITANIUM

ATOMIC WEIGHT 47.900 GRAMS / MOLE
DENSITY 4.540 GRAMS / CC
ATOMIC DENSITY 5.708E-02 BUNCHES / CC

CONVERSION CONSTANT IS 7.955E+01

K-EDGE AT 4.965 KEV
K-EDGE JUMP 8.530

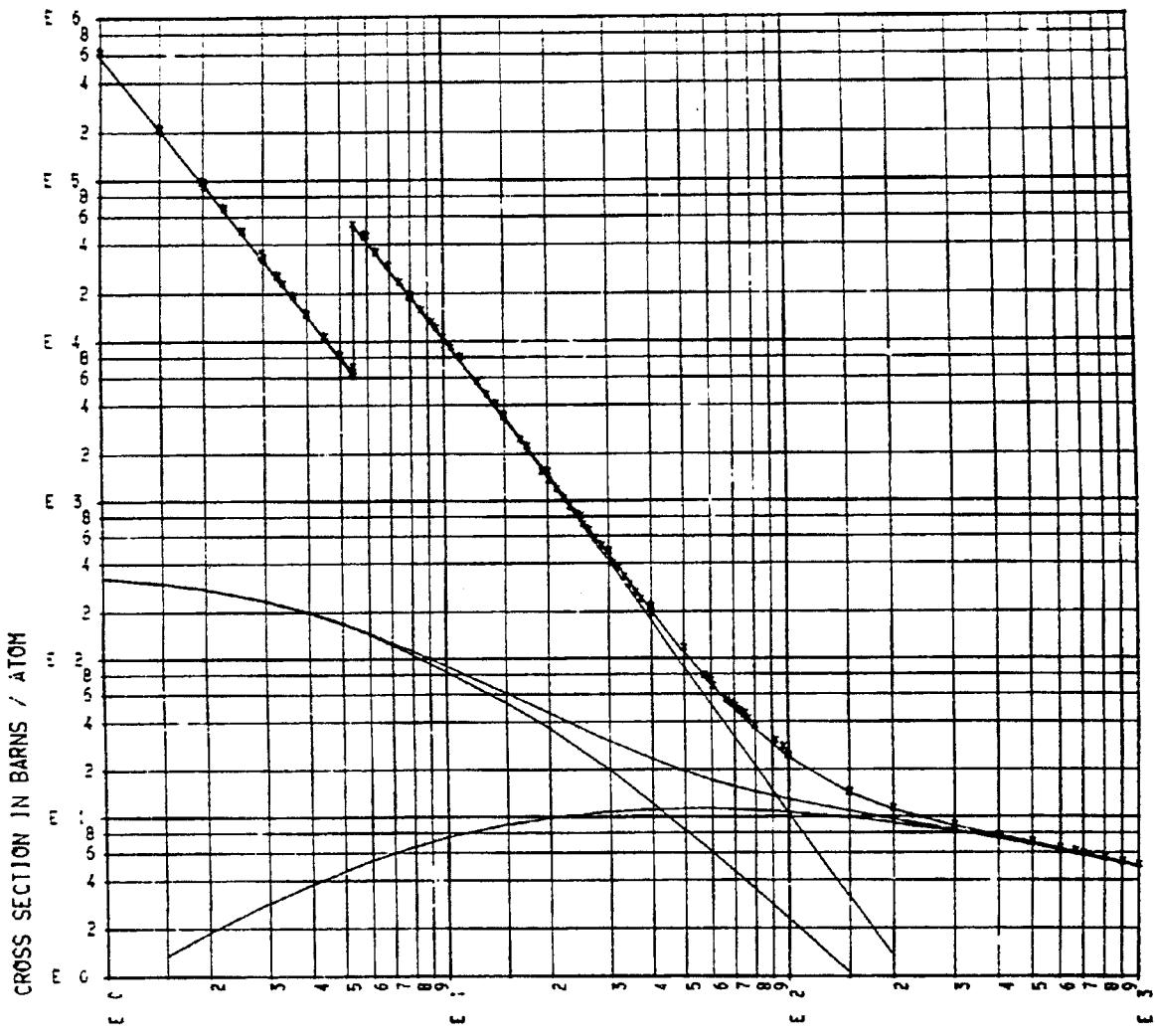
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.059	L	0.531	K	4.965
0	0.	0.		1.31075E+01		1.43505E+01	
1	0.	0.		-2.53575E+00		-1.66322E+00	
2	0.	0.		-9.57177E-02		-3.31535E-01	
3	0.	0.		0.		2.62055E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.55039E+00	-2.30573E-01
1	1.97697E-01	1.45848E+00
2	-3.57694E-01	-2.39160E-01
3	1.89866E-02	9.38528E-03



VANADIUM

23

CROSS SECTIONS

23 - 1

REVISED 6 03/69

CROSS SECTIONS FOR VANADIUM		$Z = 23$	BARS/Å / ATOM	
KEV	PHOT	CHEPENT	INCOHERENT	TOTAL
1.000	5.689E+05	3.257E+03	7.012E-01	5.692E+05
1.500	2.638E+05	8.011E+03	1.342E+00	2.639E+05
2.000	9.571E+04	1.118E+03	1.939E+00	9.572E+04
3.000	3.218E+04	3.642E+02	4.744E+00	3.219E+04
4.000	1.454E+04	1.406E+02	2.044E+00	1.455E+04
5.000	1.155E+04	1.065E+02	1.591E+00	1.156E+04
5.464	1.089E+04	1.024E+02	1.181E+00	1.090E+04
5.465	1.024E+04	1.024E+02	1.225E+00	1.025E+04
6.000	1.235E+04	1.180E+02	1.406E+00	1.236E+04
8.000	1.899E+04	2.645E+02	2.404E+00	1.900E+04
10.000	1.029E+04	1.029E+02	1.427E+00	1.030E+04
15.000	3.232E+03	3.981E+02	9.433E+00	3.233E+03
20.000	1.598E+03	1.990E+02	8.633E+00	1.599E+03
30.000	4.120E+02	5.066E+01	3.744E+00	4.121E+02
40.000	1.120E+02	1.626E+01	1.144E+00	1.121E+02
50.000	3.228E+01	4.666E+00	1.269E+00	3.229E+01
60.000	9.388E+00	1.553E+00	1.258E+00	9.389E+00
80.000	2.101E+00	3.990E+00	1.052E+00	2.102E+00
100.000	5.333E+00	9.944E+00	1.099E+00	5.334E+00
150.000	1.393E+00	2.692E+00	1.038E+00	1.394E+00
200.000	1.393E+00	2.692E+00	1.038E+00	1.394E+00
300.000	4.263E-01	7.464E+00	1.041E+00	4.264E+00
400.000	1.875E-01	3.068E+00	2.332E+00	1.876E+00
500.000	1.005E-01	1.905E+00	1.239E+00	1.006E+00
600.000	5.095E-02	6.916E+00	1.239E+00	5.096E+00
800.000	3.823E-02	3.580E+00	1.391E+00	3.824E+00
1000.000	1.583E-02	2.310E+00	4.849E+00	4.888E+00
FLUORESCENT ENERGIES				
4.952	7.968E+03	1.676E+02	4.572E+00	8.141E+03
5.427	5.140E+03	1.550E+02	4.926E+00	5.300E+03

23 - 2

REVISED 6/03/69

CROSS SECTIONS FOR VANADIUM Z = 23 CM² / GRAM

KEV	PHOT3	COHERENT	INCOHERENT	TOTAL
1.000	6.729E+03	5.650E+00	9.117E-03	6.729E+03
1.500	2.404E+03	3.658E+00	1.590E-02	2.404E+03
2.000	1.135E+03	3.282E+00	2.221E-02	1.135E+03
3.000	3.804E+02	3.756E+00	3.404E-02	3.832E+02
4.000	1.719E+02	3.330E+00	4.484E-02	1.742E+02
5.000	9.168E+01	3.969E+00	5.451E-02	9.370E+01
5.464	7.119E+01	3.821E+00	5.855E-02	7.307E+01
5.465	6.240E+01	3.821E+00	5.856E-02	6.259E+01
6.000	4.867E+02	3.677E+00	6.513E-02	4.894E+02
8.000	2.244E+02	3.258E+00	1.742E-02	2.257E+02
10.000	1.210E+02	3.998E-01	8.604E-02	1.226E+02
15.000	3.819E+01	3.292E-01	1.057E-01	3.892E+01
20.000	1.552E+01	3.314E-01	1.668E-01	1.707E+01
30.000	4.366E+00	3.383E-01	2.708E-01	5.327E+00
40.000	2.094E+00	3.445E-01	3.178E-01	3.570E+00
50.000	1.067E+00	3.512E-01	3.515E-01	1.298E+00
60.000	6.146E-01	3.638E-01	3.306E-01	8.1179E-01
80.000	2.871E-01	3.133E-01	3.045E-01	4.288E-01
100.000	1.309E-01	2.107E-01	2.571E-01	3.847E-01
150.000	3.870E-02	1.234E-01	1.708E-01	1.086E-01
200.000	1.646E-02	6.011E-03	1.063E-01	1.063E-01
300.000	5.039E-03	3.127E-03	9.566E-02	1.054E-02
400.000	2.217E-03	1.359E-03	8.550E-02	9.648E-03
500.000	1.188E-03	1.233E-03	1.823E-02	1.084E-03
600.000	7.206E-04	1.357E-04	1.245E-02	1.056E-03
800.000	3.338E-04	4.315E-04	5.373E-02	5.373E-03
1000.000	1.871E-04	2.731E-04	5.733E-02	5.733E-03

FLUORESCENT ENERGIES

4.952	9.420E+01	1.983E+00	5.405E-02	9.625E+01
5.427	7.258E+01	1.832E+00	5.823E-02	7.448E+01

23 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR TANTALUM

ATOMIC WEIGHT 50.942 GRAMS / MOLE
DENSITY 6.116 GRAMS / CC
ATOMIC DENSITY 7.225E-02 BUNCHES / CC

CONVERSION CONSTANT IS 8.459E+01

K-EDGE AT 5.465 KEV
K-EDGE JUMP 8.770

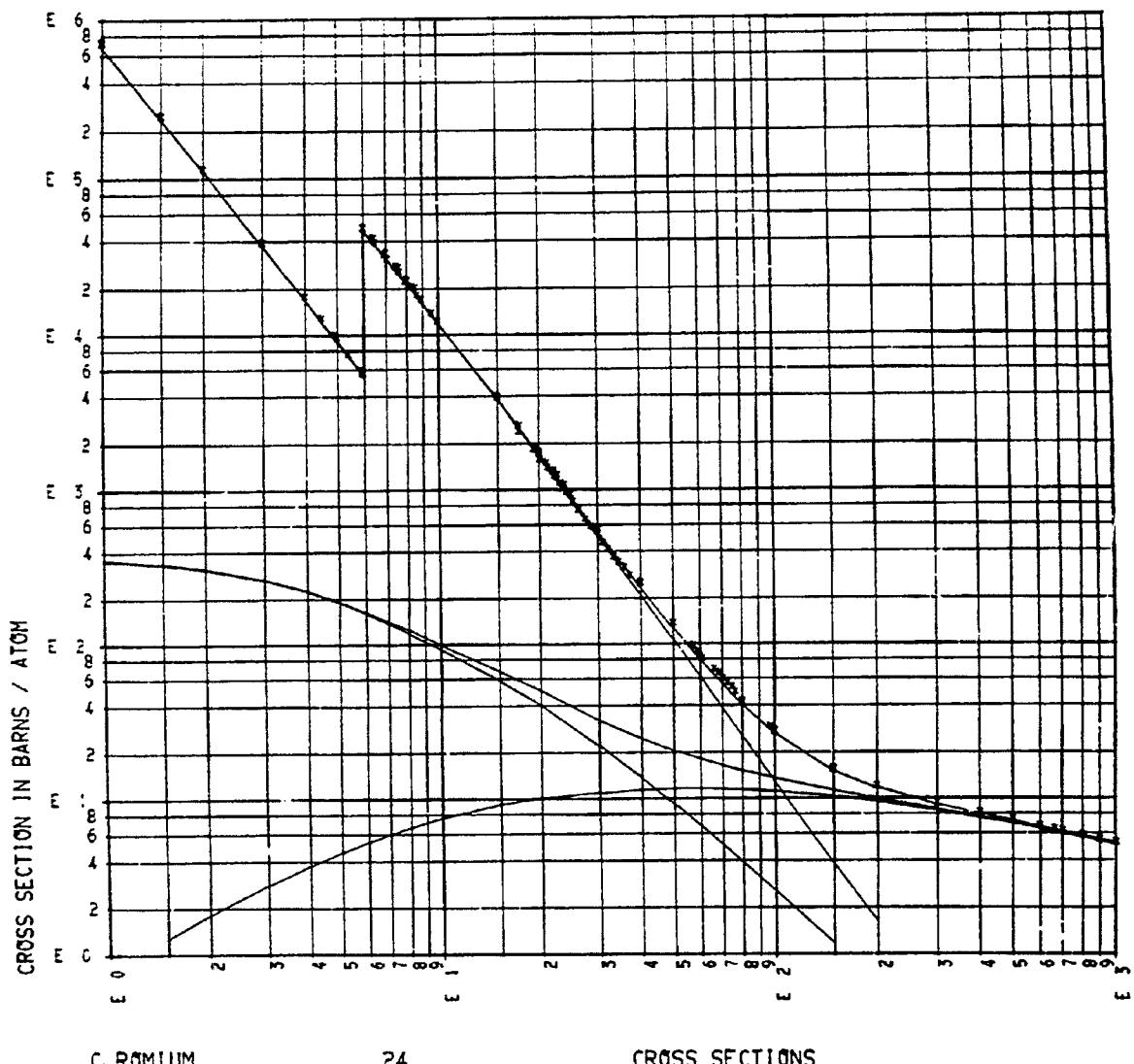
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.067	L	O.604	K	5.465
0	0.	0.		1.32514E+01		1.47601E+01	
1	0.	0.		-2.49765E+00		-1.88867E+00	
2	0.	0.		-1.06383E-01		-3.71861E-01	
3	0.	0.		0.		2.15792E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.65514E+00	-3.08103E-01
1	1.99533E-01	1.52879E+00
2	-3.57487E-01	-2.52768E-01
3	1.89691E-02	1.02571E-02



C. CHROMIUM

24

CROSS SECTIONS

24 - 1

REVISED 6/03/69

CROSS SECTIONS FOR CHROMIUM		Z = 24	BARNs / ATOM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	6.557E+05	3.594E+02	7.136E-01	6.761E+05
1.500	2.396E+05	3.368E+02	1.271E+00	2.400E+05
2.000	1.125E+05	3.126E+02	1.809E+00	1.129E+05
3.000	3.599E+04	2.661E+02	2.827E+00	3.796E+04
4.000	1.599E+04	2.246E+02	3.764E+00	1.722E+04
5.000	9.655E+03	1.895E+02	4.608E+00	9.849E+03
5.988	5.405E+03	1.615E+02	5.356E+00	5.711E+03
5.998	4.143E+04	1.614E+02	5.356E+00	4.759E+04
6.000	4.120E+04	1.612E+02	5.364E+00	4.737E+04
8.000	2.196E+04	1.203E+02	6.637E+00	2.208E+04
10.000	1.193E+04	9.415E+01	7.618E+00	1.203E+04
15.000	3.814E+03	5.899E+01	9.219E+00	3.882E+03
20.000	1.663E+03	4.069E+01	1.018E+01	1.714E+03
30.000	5.044E+02	2.214E+01	1.098E+01	5.375E+02
40.000	2.138E+02	1.371E+01	1.147E+01	2.390E+02
50.000	1.094E+02	9.285E+00	1.164E+01	1.305E+02
60.000	6.313E+01	6.692E+00	1.164E+01	8.146E+01
80.000	2.649E+01	3.934E+00	1.144E+01	4.187E+01
100.000	1.352E+01	2.580E+00	1.114E+01	2.723E+01
150.000	4.004E+00	1.177E+00	1.030E+01	5.488E+01
200.000	1.704E+00	6.682E-01	9.547E+00	1.192E+01
300.000	5.214E-01	2.987E-01	8.384E+00	6.204E+00
400.000	2.291E-01	1.680E-01	1.543E+00	1.940E+00
500.000	1.226E-01	1.073E-01	6.902E+00	1.322E+00
600.000	7.421E-02	1.420E-02	6.394E+00	6.842E+00
800.000	3.427E-02	1.130E-02	6.622E+00	6.699E+00
1000.000	1.916E-02	2.600E-02	6.056E+00	5.104E+00
FLUORESCENT ENERGIES				
5.414	7.211E+03	1.066E+02	4.924E+00	7.396E+03
5.946	5.515E+03	1.625E+02	5.324E+00	5.683E+03

24 - 2

REVISED 6/03/69

CROSS SECTIONS FOR CHROMIUM		Z = 24	CM**2 / GRAM	
KEY	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	7.827E+03	4.162E+00	8.266E-03	7.931E+03
1.500	2.775E+03	3.901E+00	1.472E-02	2.780E+03
2.000	1.304E+03	3.621E+00	2.095E-02	1.307E+03
3.000	4.365E+02	3.082E+00	3.274E-02	4.396E+02
4.000	1.968E+02	2.502E+00	4.360E-02	1.995E+02
5.000	1.049E+02	2.196E+00	5.337E-02	1.071E+02
5.988	6.260E+01	1.870E+00	6.203E-02	6.453E+01
5.989	5.493E+02	1.870E+00	6.204E-02	5.513E+02
6.000	5.467E+02	1.867E+00	6.214E-02	5.486E+02
8.000	2.543E+02	1.393E+00	7.687E-02	2.558E+02
10.000	1.382E+02	1.091E+00	8.824E-02	1.394E+02
15.000	4.417E+01	6.832E-01	1.068E-01	4.496E+01
20.000	1.926E+01	4.713E-01	1.179E-01	1.985E+01
30.000	5.842E+00	2.554E-01	1.273E-01	6.226E+00
40.000	2.476E+00	1.588E-01	1.529E-01	2.758E+00
50.000	1.267E+00	1.075E-01	1.348E-01	1.509E+00
60.000	7.312E-01	7.751E-02	1.348E-01	9.436E-01
80.000	3.068E-01	4.557E-02	1.325E-01	4.849E-01
100.000	1.556E-01	2.988E-02	1.290E-01	3.154E-01
150.000	4.638E-02	1.353E-02	1.193E-01	1.793E-01
200.000	1.974E-02	1.740E-03	1.106E-01	1.381E-01
300.000	6.039E-03	3.460E-03	9.710E-02	1.065E-01
400.000	2.653E-03	1.946E-03	8.137E-02	9.196E-02
500.000	1.420E-03	1.243E-03	7.995E-02	8.261E-02
600.000	8.596E-04	8.594E-04	7.405E-02	7.577E-02
800.000	3.969E-04	4.784E-04	6.514E-02	6.602E-02
1000.000	2.219E-04	3.011E-04	5.960E-02	5.912E-02
FLUORESCENT ENERGIES				
5.414	8.353E+01	2.046E+00	5.703E-02	8.567E+01
5.946	6.387E+01	1.882E+00	6.167E-02	6.582E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR CHROMIUM

ATOMIC WEIGHT 51.996 GRAMS / MOLE
DENSITY 1.90 GRAMS / CC
ATOMIC DENSITY 8.328E-02 BUNCHES / CC

CONVERSION CONSTANT IS 8.634E+01

K-EDGE AT 5.989 KEV
K-EDGE JUMP 8.779

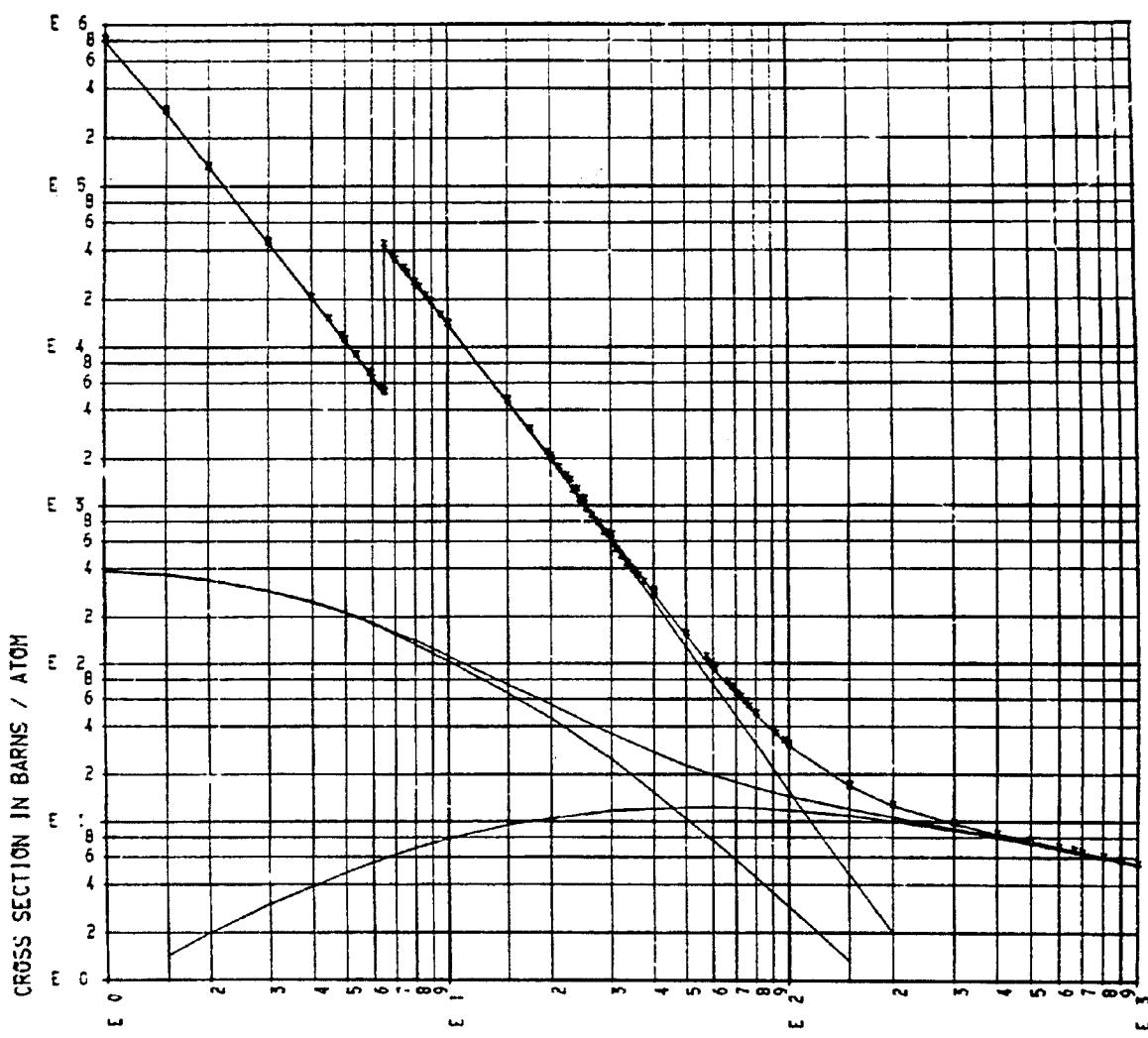
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.674	L	0.682	K	5.989
0	0.	0.		1.342365E+01		1.48019E+01	
1	0.	0.		-2.51532E+00		-1.82430E+00	
2	0.	0.		-1.01999E-01		-2.79116E-01	
3	0.	0.		0.		2.17324E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.77399E+00	-3.87641E-01
1	2.03858E-01	1.59727E+00
2	-3.59699E-01	-2.66240E-01
3	1.92225E-02	1.11523E-02



MANGANESE

25

CROSS SECTIONS

25 - 1

REVISED 6/03/69

CROSS SECTIONS FOR MANGANESE Z = 25 BARNS / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	7.871E+05	3.894E+02	8.108E-01	7.875E+05
1.500	2.810E+05	3.642E+02	1.428E+00	2.813E+05
2.000	1.325E+05	3.376E+02	1.984E+00	1.328E+05
3.000	4.455E+04	2.817E+02	2.986E+00	4.484E+04
4.000	2.013E+04	2.443E+02	3.908E+00	2.038E+04
5.000	1.074E+04	2.075E+02	4.746E+00	1.095E+04
6.000	6.380E+03	1.712E+02	5.502E+00	6.562E+03
6.539	4.977E+03	1.627E+02	5.860E+00	5.145E+03
6.540	4.284E+04	1.628E+02	5.861E+00	4.301E+04
8.000	2.507E+04	1.321E+02	5.793E+00	2.520E+04
10.000	1.366E+04	1.036E+02	5.812E+00	1.377E+04
15.000	4.386E+03	6.461E+01	9.497E+00	4.460E+03
20.000	1.919E+03	4.473E+01	1.052E+01	1.974E+03
30.000	5.847E+02	2.451E+01	1.160E+01	5.208E+02
40.000	2.486E+02	1.523E+01	1.204E+01	2.559E+02
50.000	1.275E+02	1.033E+01	1.218E+01	1.500E+02
60.000	7.377E+01	7.456E+00	1.217E+01	9.340E+01
80.000	3.107E+01	4.390E+00	1.194E+01	4.740E+01
100.000	1.590E+01	2.883E+00	1.151E+01	3.040E+01
150.000	4.739E+00	1.318E+00	1.074E+01	1.529E+01
200.000	2.027E+00	7.482E-01	9.948E+00	1.272E+01
300.000	6.248E-01	3.348E-01	8.734E+00	9.094E+00
400.000	2.162E-01	1.884E-01	8.858E+00	8.328E+00
500.000	1.486E-01	1.203E-01	1.190E+00	1.459E+00
600.000	9.937E-02	8.320E-02	6.550E+00	6.834E+00
800.000	4.206E-02	4.640E-02	5.858E+00	5.947E+00
1000.000	2.357E-02	2.930E-02	5.270E+00	5.523E+00

FLUORESCENT ENERGIES

5.898	6.700E+03	1.799E+02	5.426E+00	5.886E+03
5.490	5.086E+03	1.639E+02	5.828E+00	5.256E+03

25 - 2

REVISED 6/03/69

CROSS SECTIONS FOR MANGANESE Z = 25 CM**2 / GRAM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	8.628E+03	4.268E+00	8.888E-03	8.632E+03
1.500	3.080E+03	3.993E+00	1.566E-02	3.084E+03
2.000	1.452E+03	3.701E+00	2.174E-02	1.456E+03
3.000	4.883E+02	3.153E+00	3.273E-02	4.915E+02
4.000	2.207E+02	2.578E+00	4.284E-02	2.234E+02
5.000	1.178E+02	2.275E+00	6.203E-02	1.201E+02
6.000	6.993E+01	1.942E+00	8.032E-02	7.194E+01
6.539	5.456E+01	1.783E+00	6.424E-02	6.640E+01
6.540	4.696E+02	1.783E+00	6.425E-02	4.715E+02
8.000	2.748E+02	1.454E+00	7.446E-02	2.763E+02
10.000	1.497E+02	1.136E+00	8.564E-02	1.509E+02
15.000	4.808E+01	7.085E-01	1.041E-01	4.890E+01
20.000	2.103E+01	4.903E-01	1.153E-01	2.164E+01
30.000	6.409E+00	2.686E-01	2.122E-01	6.805E+00
40.000	2.726E+00	1.669E-01	3.205E-01	3.025E+00
50.000	1.398E+00	1.133E-01	3.355E-01	1.645E+00
60.000	8.687E-01	8.173E-02	3.344E-01	1.024E+00
80.000	3.405E-01	4.812E-02	3.095E-01	5.196E-01
100.000	1.743E-01	3.160E-02	2.735E-01	3.352E-01
150.000	5.195E-02	1.445E-02	1.777E-01	1.841E-01
200.000	2.222E-02	8.202E-03	1.090E-01	1.395E-01
300.000	6.849E-03	3.670E-03	5.744E-02	1.063E-01
400.000	3.028E-03	2.065E-03	8.615E-02	9.123E-02
500.000	1.629E-03	1.319E-03	1.882E-02	8.117E-02
600.000	9.907E-04	9.120E-04	1.301E-02	1.491E-02
800.000	4.611E-04	5.086E-04	5.422E-02	6.519E-02
1000.000	2.595E-04	3.212E-04	5.111E-02	5.835E-02

FLUORESCENT ENERGIES

5.898	7.344E+01	1.972E+00	5.948E-02	7.549E+01
6.490	5.575E+01	1.797E+00	5.389E-02	6.762E+01

25 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR MANGANESE

ATOMIC WEIGHT 54.940 GRAMS / MOLE
DENSITY 7.420 GRAMS / CC
ATOMIC DENSITY 8.134E-02 BUNCHES / CC

CONVERSION CONSTANT IS 9.122E+01

K-EDGE AT 6.540 KEV
K-EDGE JUMP 8.612

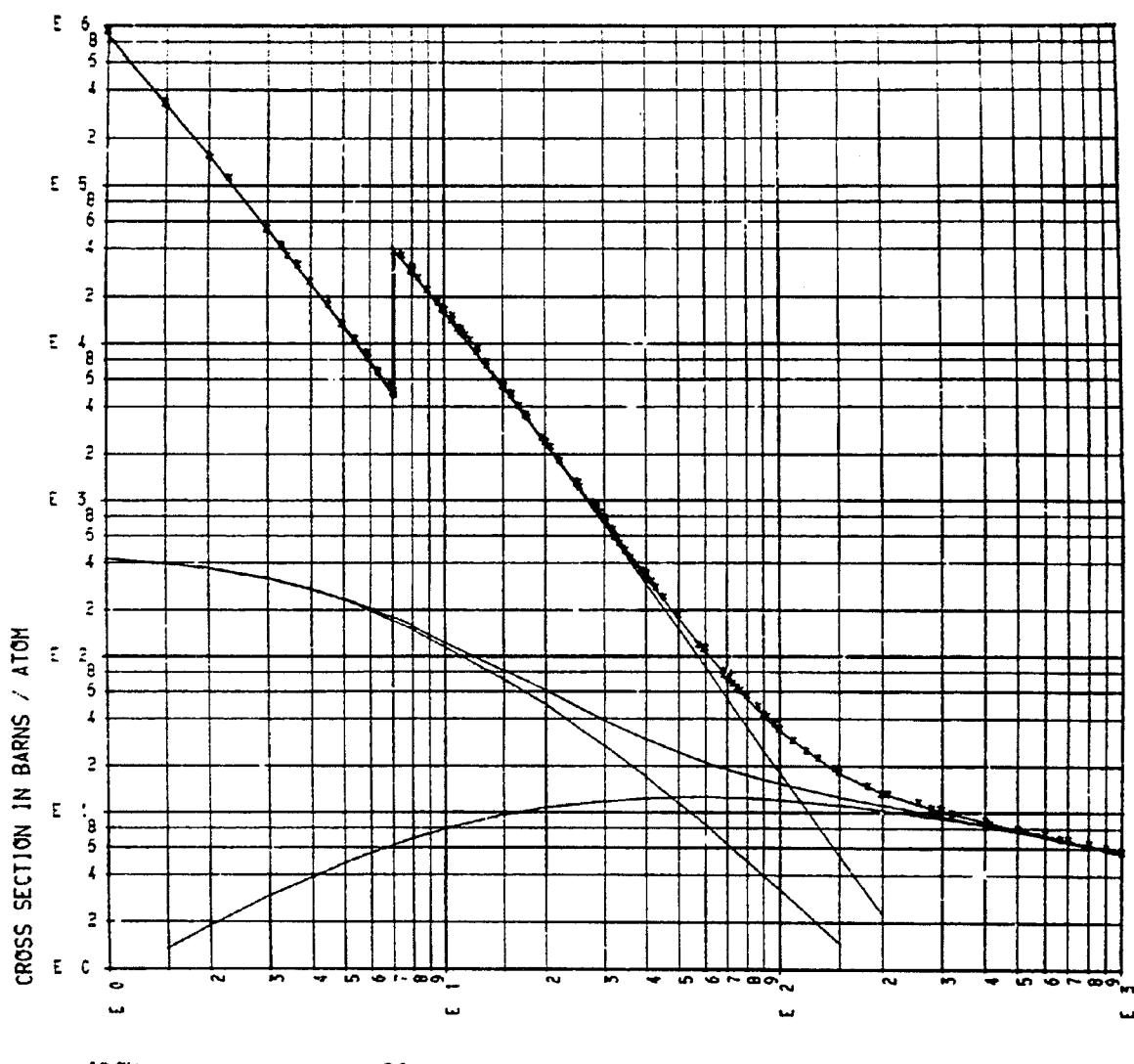
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.084	L	0.754	K	6.540
0	C.	C.		1.35761E+01		1.48965E+01	
1	C.	C.		-2.49761E+00		-1.79872E+00	
2	C.	C.		-1.05943E-01		-2.83664E-01	
3	C.	C.		0.		2.22095E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.84604E+00	-2.47059E-01
1	2.13814E-01	1.49722E+00
2	-3.59718E-01	-2.38781E-01
3	1.91459E-02	8.93208E-03



IRON

26

CROSS SECTIONS

26 - 1

REVISED 5/03/69

CROSS SECTIONS FOR IRON		$Z = 26$	BARNs / ATOM	
KEY	PHOTO	CohéRENT	INCOHERENT	TOTAL
1,000	8.643E+05	4.232E+00	1.430E-01	8.641E+05
1,500	3.203E+05	3.910E+00	1.332E+00	3.207E+05
2,000	1.541E+05	3.699E+00	1.883E+00	1.545E+05
3,000	6.287E+04	3.110E+00	9.080E+00	6.319E+04
4,000	2.408E+04	2.708E+00	8.600E+00	2.435E+04
5,000	1.288E+04	2.306E+00	1.222E+00	1.311E+04
6,000	7.646E+03	1.973E+00	1.603E+00	1.849E+03
7,000	4.665E+03	1.668E+00	1.262E+00	4.838E+03
7,111	3.833E+04	1.668E+00	1.263E+00	3.851E+04
7,112	3.833E+04	1.668E+00	1.263E+00	3.861E+04
8,000	2.845E+04	1.478E+00	8.490E+00	1.903E+04
10,000	1.591E+04	1.151E+00	8.886E+00	1.603E+04
15,000	5.269E+03	7.228E+00	6.699E+01	3.347E+03
20,000	2.521E+03	4.933E+00	3.800E+01	2.388E+03
30,000	1.108E+02	2.718E+00	1.911E+01	7.499E+02
40,000	3.601E+02	1.925E+00	1.241E+01	3.300E+02
50,000	1.531E+02	1.522E+00	1.058E+01	1.772E+02
60,000	8.795E+01	8.322E+00	7.898E+01	1.089E+03
80,000	3.657E+01	4.935E+00	3.371E+01	5.584E+01
100,000	1.852E+01	3.226E+00	2.044E+01	3.378E+01
150,000	5.420E+00	1.477E+00	1.166E+01	1.805E+01
200,000	2.295E+00	8.400E-01	5.358E+01	1.340E+01
300,000	0.921E-01	3.158E-01	2.671E+00	1.013E+01
400,000	3.108E-01	2.115E-01	1.694E+00	1.091E+00
500,000	1.682E-01	8.515E-02	4.758E+00	1.119E+00
600,000	1.032E-01	9.350E-02	6.928E+00	1.122E+00
800,000	4.907E-02	5.210E-02	5.093E+00	5.095E+00
1,000,000	2.828E-02	3.290E-02	5.480E+00	5.541E+00
FLUORESCENT ENERGIES				
6,403	6.329E+03	1.849E+02	5.782E+00	6.522E+03
7,057	4.769E+03	1.678E+02	6.226E+00	4.944E+03

26 - 2

REVISED 6/03, 69

CROSS SECTIONS FOR IRON		Z = 26	CM**2 / GRAM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	9.320E+03	4.564E+00	3.012E-03	9.324E+03
1.500	3.454E+03	4.287E+00	1.436E-02	3.459E+03
2.000	1.652E+03	3.988E+00	2.031E-02	1.666E+03
3.000	5.102E+02	3.419E+00	3.130E-02	5.736E+02
4.000	2.597E+02	2.917E+00	4.162E-02	2.626E+02
5.000	1.389E+02	2.489E+00	5.092E-02	1.414E+02
6.000	8.245E+01	2.127E+00	6.934E-02	8.463E+01
7.000	5.030E+01	1.796E+00	9.753E-02	5.217E+01
8.000	4.134E+02	1.796E+00	9.753E-02	4.162E+02
9.000	3.068E+02	1.594E+00	1.386E-02	3.085E+02
10.000	1.715E+02	1.241E+00	8.504E-02	1.728E+02
15.000	5.678E+01	1.583E-01	1.046E-01	5.765E+01
20.000	2.510E+01	5.320E-01	1.658E-01	2.575E+01
30.000	1.665E+00	1.931E-01	2.845E-01	8.081E+00
40.000	3.242E+00	1.828E-01	3.388E-01	3.559E+00
50.000	1.651E+00	1.242E-01	3.551E-01	1.911E+00
60.000	9.484E-01	8.974E-02	1.351E-01	1.174E+00
80.000	3.943E-01	5.289E-02	1.334E-01	5.805E-01
100.000	1.997E-01	3.479E-02	2.988E-01	3.543E-01
150.000	5.845E-02	1.593E-02	2.046E-01	1.946E-01
200.000	2.475E-02	9.058E-03	1.114E-01	1.452E-01
300.000	7.571E-03	4.052E-03	9.788E-02	1.095E-01
400.000	3.352E-03	2.281E-03	8.809E-02	9.373E-02
500.000	1.814E-03	1.457E-03	8.053E-02	8.389E-02
600.000	1.115E-03	1.008E-03	7.467E-02	7.680E-02
800.000	5.292E-04	5.618E-04	5.569E-02	5.618E-02
1000.000	3.050E-04	3.548E-04	5.909E-02	5.975E-02

FLUORESCENT ENERGIES

6.403	6.824E+01	1.994E+00	5.235E-02	7.033E+01
7.057	5.143E+01	1.809E+00	6.714E-02	5.331E+01

26 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR IRON

ATOMIC WEIGHT 55.850 GRAMS / MOLE
DENSITY 7.860 GRAMS / CC
ATOMIC DENSITY 8.476E-02 BUNCHES / CC

CONVERSION CONSTANT IS 9.274E+01

K-EDGE AT 7.112 KEV
K-EDGE JUMP 8.221

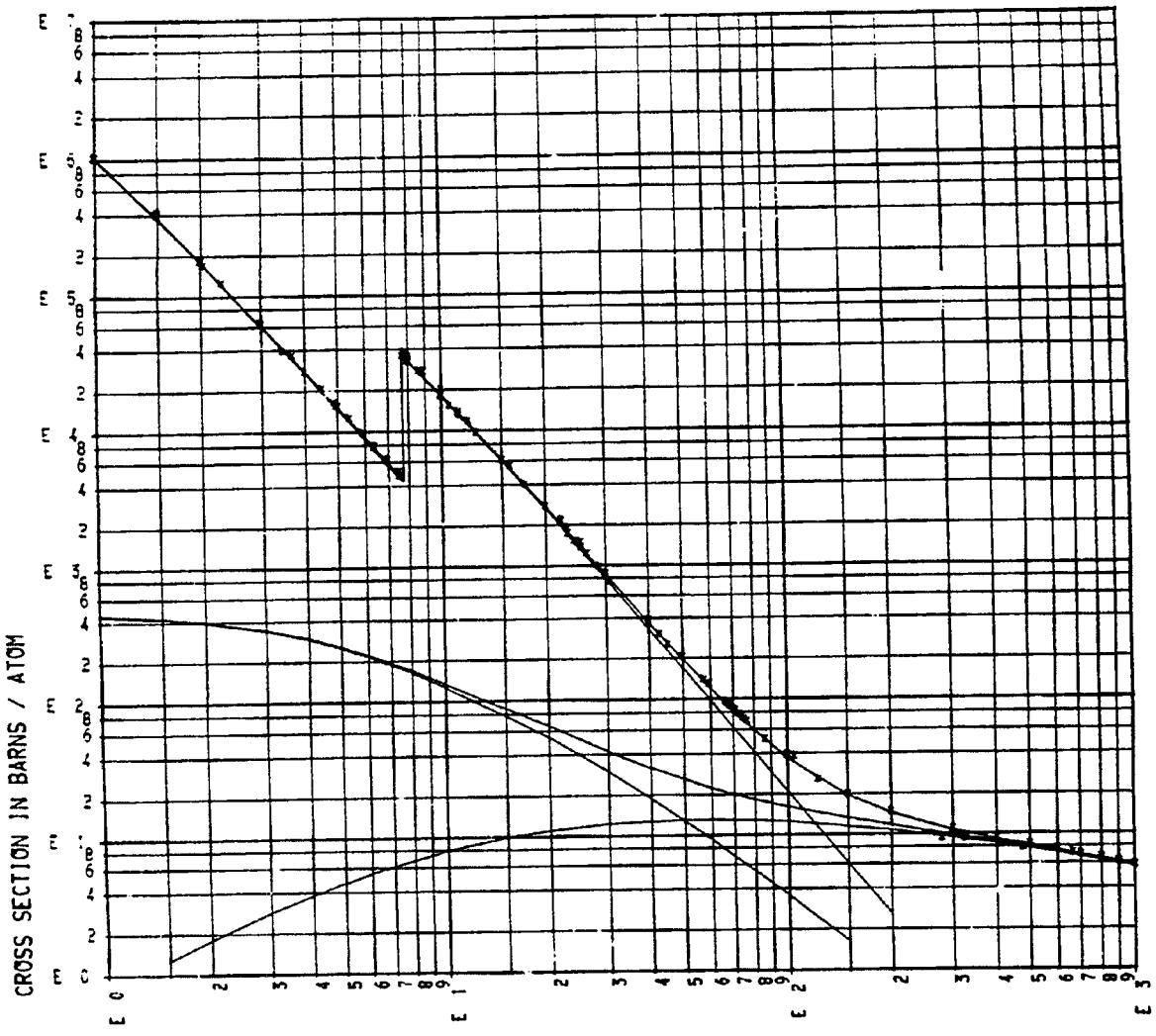
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O.094	L	0.842	K	7.112
0	0.	0.		1.36696E+01		1.43456E+01	
1	0.	0.		-2.39195E+00		-1.23491E+00	
2	0.	0.		-1.37646E-01		-4.18788E-01	
3	0.	0.		0.		3.21662E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.93292E+00	-3.42379E-01
1	2.25038E-01	1.57245E+00
2	-3.61748E-01	-2.53198E-01
3	1.93024E-02	9.85822E-03



COBALT

27

CROSS SECTIONS

27 - 1

REVISED 6/03/69

CROSS SECTIONS FOR COBALT		Z = 27	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.056E+06	4.584E+02	6.882E-01	1.056E+06
1.500	3.757E+05	4.323E+02	1.253E+00	3.771E+05
2.000	1.782E+05	4.035E+02	1.799E+00	1.786E+05
3.000	6.054E+04	3.480E+02	2.840E+00	6.089E+04
4.000	2.766E+04	2.983E+02	3.814E+00	2.796E+04
5.000	1.492E+04	2.553E+02	4.697E+00	1.518E+04
6.000	8.948E+03	2.189E+02	5.500E+00	9.172E+03
7.000	4.393E+03	1.706E+02	6.697E+00	4.570E+03
7.709	3.678E+04	1.706E+02	6.698E+00	3.696E+04
8.000	3.341E+04	1.643E+02	6.896E+00	3.358E+04
10.000	1.851E+04	1.277E+02	8.002E+00	1.864E+04
15.000	6.058E+03	7.850E+01	9.922E+00	6.147E+03
20.000	2.655E+03	5.430E+01	1.109E+01	2.731E+03
30.000	8.124E+02	3.007E+01	1.228E+01	8.347E+02
40.000	3.441E+02	1.882E+01	1.282E+01	3.557E+02
50.000	1.756E+02	1.282E+01	1.301E+01	2.015E+02
60.000	1.011E+02	9.275E+00	1.302E+01	1.234E+02
80.000	4.228E+01	5.472E+00	1.281E+01	6.057E+01
100.000	2.152E+01	3.603E+00	1.248E+01	3.760E+01
150.000	6.370E+00	1.654E+00	1.156E+01	1.958E+01
200.000	2.721E+00	9.410E-01	1.072E+01	1.438E+01
300.000	8.434E-01	4.214E-01	9.423E-01	1.059E+01
400.000	3.770E-01	2.372E-01	8.480E+00	9.094E+00
500.000	2.055E-01	1.516E-01	1.762E+00	8.119E+00
600.000	1.268E-01	1.049E-01	1.190E+00	7.422E+00
800.000	6.083E-02	5.850E-02	6.325E+00	5.444E+00
1000.000	3.527E-02	3.700E-02	5.691E+00	5.163E+00
FLUORESCENT ENERGIES				
6.930	5.943E+03	1.897E+02	6.160E+00	5.144E+03
7.649	4.490E+03	1.719E+02	6.557E+00	4.669E+03

27 - 2

REVISED 6/03/69

CROSS SECTIONS FOR COBALT		Z = 27	CM**2 / GRAM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.079E+04	4.685E+00	7.033E-03	1.079E+04
.500	3.850E+03	4.418E+00	1.280E-02	3.854E+03
2.000	1.821E+03	4.125E+00	1.836E-02	1.825E+03
3.000	6.186E+02	3.556E+00	2.902E-02	6.222E+02
4.000	2.826E+02	3.049E+00	3.898E-02	2.857E+02
5.000	1.824E+02	2.608E+00	4.800E-02	1.551E+02
6.000	9.144E+01	2.257E+00	6.621E-02	9.374E+01
7.008	4.489E+01	1.743E+00	8.844E-02	4.670E+01
.709	3.759E+02	1.743E+00	6.845E-02	3.777E+02
8.000	3.474E+02	1.679E+00	1.042E-02	3.431E+02
10.000	1.891E+02	1.305E+00	8.117E-02	1.905E+02
15.000	6.191E+01	8.022E-01	1.044E-01	6.282E+01
20.000	2.724E+01	5.549E-01	1.335E-01	2.791E+01
30.000	8.302E+00	3.073E-01	2.555E-01	8.135E+00
40.000	3.516E+00	1.924E-01	3.105E-01	3.839E+00
50.000	1.795E+00	1.310E-01	3.350E-01	2.059E+00
60.000	1.034E+00	9.478E-02	3.311E-01	1.261E+00
80.000	4.321E-01	5.592E-02	3.095E-01	6.189E-01
100.000	2.199E-01	3.682E-02	2.188E-01	3.843E-01
150.000	6.510E-02	1.690E-02	1.181E-01	2.601E-01
200.000	2.780E-02	9.616E-03	6.966E-01	4.706E-01
300.000	8.619E-03	4.366E-03	9.530E-02	1.062E-01
400.000	3.852E-03	2.424E-03	8.666E-02	9.184E-02
500.000	2.100E-03	1.549E-03	1.932E-02	1.033E-02
600.000	1.296E-03	1.072E-03	1.348E-02	1.026E-02
800.000	6.216E-04	5.978E-04	6.454E-02	6.585E-02
1000.000	3.505E-04	3.781E-04	5.815E-02	5.890E-02

FLUORESCENT ENERGIES				
6.930	6.073E+01	1.938E+00	6.239E-02	6.278E+01
7.649	4.568E+01	1.757E+00	6.803E-02	4.571E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR COBALT

ATOMIC WEIGHT 58.935 GRAMS/MOLE
DENSITY 8.900 GRAMS/CC
ATOMIC DENSITY 9.095E-02 BUNCHES/CC

CONVERSION CONSTANT IS 9.78EE+01

K-EDGE AT 7.709 KEV
K-EDGE JUMP 8.306

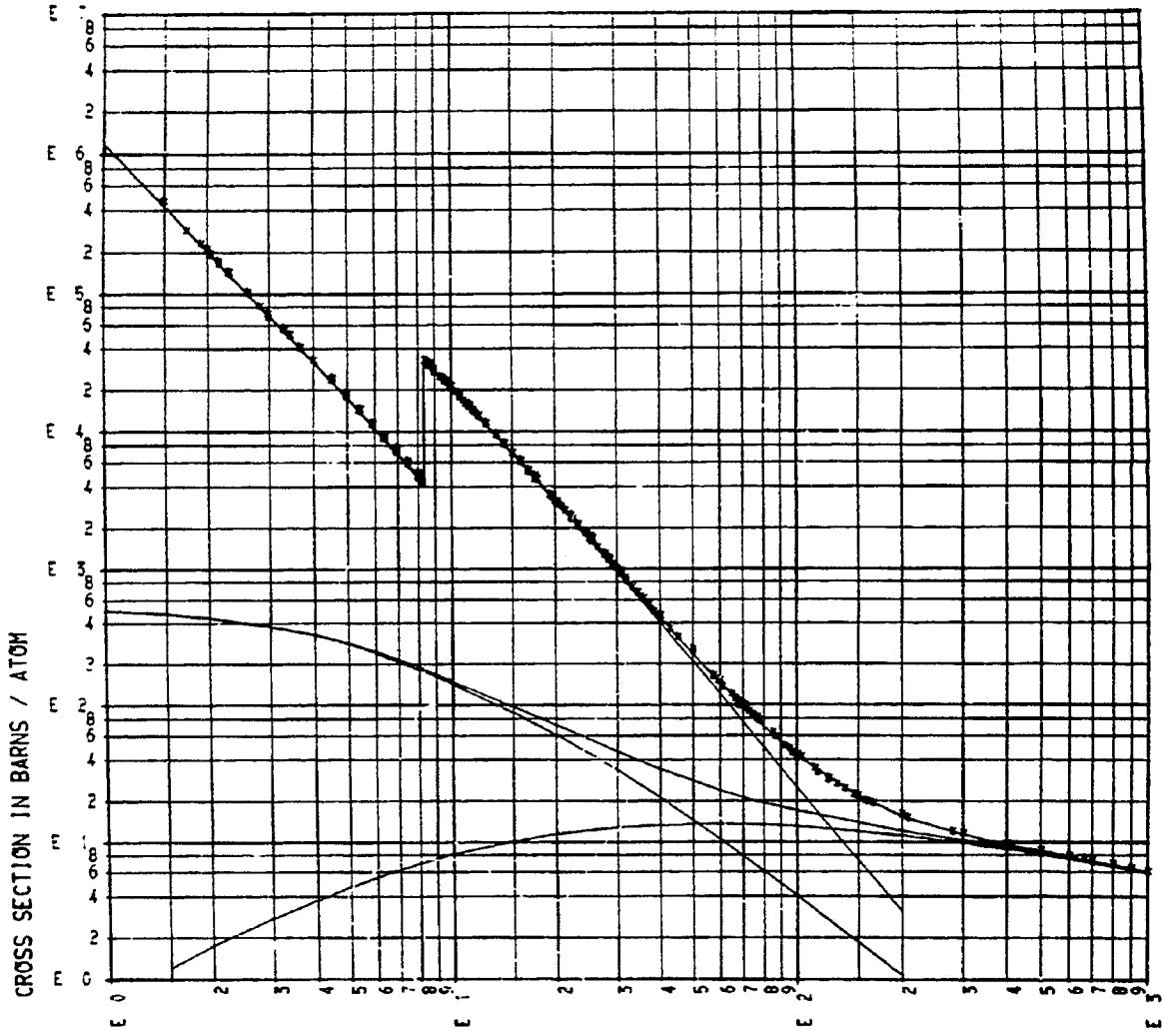
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	C.100	L	C.929	K	C.709
0	0.	0.		1.38699E+01		1.400473E+01	
1	0.	0.		1.500669E+00		1.585339E+00	
2	0.	0.		1.69945E-02		1.86551E-02	
3	0.	0.		0.		3.03265E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.01478E+00	-4.28804E-01
1	2.37959E-01	1.64129E+00
2	-3.64056E-01	-2.66013E-01
3	1.94754E-02	1.06512E-02



NICKEL

28

CROSS SECTIONS

CROSS SECTIONS FOR NICKEL		Z = 28	BARNES / ATOM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	1.021E+06	4.950E+02	6.437E-01	1.022E+06
1.011	9.937E+05	4.842E+02	6.344E-01	9.942E+05
1.012	1.150E+06	4.942E+02	6.344E-01	1.150E+06
1.500	4.269E+05	4.589E+02	1.88E+00	4.214E+05
2.000	2.033E+05	4.389E+02	1.730E+00	2.038E+05
3.000	6.971E+04	4.806E+02	1.179E+00	7.010E+04
4.000	3.205E+04	4.219E+02	1.098E+00	3.235E+04
5.000	1.736E+04	4.816E+02	6.113E+00	1.755E+04
6.000	1.045E+04	4.422E+02	4.944E+00	1.070E+04
8.000	4.638E+03	3.822E+02	9.936E+00	4.827E+03
8.332	4.130E+03	4.147E+02	1.58E+00	4.318E+03
8.333	3.243E+04	4.147E+02	1.38E+00	2.615E+04
10.000	2.039E+04	4.147E+02	1.012E+00	2.050E+04
15.000	6.900E+03	8.642E+01	1.042E+01	8.992E+03
20.000	3.683E+03	5.966E+01	1.87E+01	8.154E+03
30.000	1.951E+02	3.131E+01	2.65E+01	4.9.968E+02
40.000	4.040E+02	2.065E+01	3.23E+01	4.39.380E+02
50.000	2.062E+02	1.425E+01	3.44E+01	2.358E+02
60.000	1.186E+02	1.022E+01	3.46E+01	1.423E+02
90.000	4.935E+01	6.944E+00	5.26E+01	8.718E+01
130.000	2.501E+01	4.619E+00	1.26E+01	1.794E+01
150.000	1.339E+00	1.846E+00	1.08E+01	1.628E+01
200.000	3.116E+00	1.053E+00	1.08E+01	1.126E+01
300.000	9.608E-01	4.720E-01	1.09E+00	4.807E+00
400.000	4.291E-01	2.657E-01	1.09E+00	4.487E+00
500.000	2.343E-01	1.698E-01	1.09E+00	1.452E+00
600.000	1.451E-01	1.175E-01	1.09E+00	1.098E+00
800.000	7.024E-02	6.550E-02	6.938E+00	6.695E+00
1000.000	4.119E-02	4.150E-02	6.901E+00	5.984E+00

FLUORESCENT ENERGIES

7.477	5.614E+03	1.548E+02	6.556E+00	5.820E+03
8.254	4.228E+03	1.57E+02	7.097E+00	4.411E+03

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REVISED 6/03/69

CROSS SECTIONS FOR NICKEL		Z = 28	CM**2 / GRAM	
KEY	PHOT	Cohesive	Incohesive	Total
1.000	1.048E+04	5.079E+00	6.005E-03	1.048E+04
1.011	1.020E+04	5.072E+00	6.015E-03	1.020E+04
1.012	1.180E+04	5.071E+00	6.026E-03	1.180E+04
1.500	4.381E+03	4.802E+00	6.019E-03	4.385E+03
2.000	2.086E+03	4.503E+00	6.017E-03	2.091E+03
3.000	1.154E+02	3.905E+00	2.852E-02	7.193E+02
4.000	3.289E+02	3.564E+00	2.868E-02	3.323E+02
5.000	1.782E+02	2.890E+00	2.935E-02	1.811E+02
6.000	1.073E+02	2.485E+00	3.038E-02	1.098E+02
8.000	4.789E+01	1.870E+00	3.117E-02	4.854E+01
8.332	4.238E+01	1.787E+00	3.248E-02	4.424E+01
8.333	3.328E+02	1.786E+00	3.329E-02	3.346E+02
10.000	2.092E+02	1.453E+00	3.299E-02	2.108E+02
15.000	1.081E+01	8.858E-01	4.019E-01	1.180E+01
20.000	3.164E+01	6.122E-01	5.619E-01	3.237E+01
30.000	9.759E+00	3.405E-01	3.698E-01	1.023E+01
40.000	4.145E+00	2.141E-01	2.358E-01	4.495E+00
50.000	2.116E+00	1.452E-01	1.658E-01	2.400E+00
60.000	1.217E+00	1.059E-01	1.268E-01	1.461E+00
80.000	5.064E-01	6.255E-02	7.056E-02	6.056E-01
100.000	2.557E-01	4.124E-02	4.819E-02	3.045E-01
150.000	1.531E-02	1.896E-02	2.289E-02	1.722E-02
200.000	3.198E-02	1.081E-02	1.369E-02	3.568E-02
300.000	9.860E-03	4.843E-03	5.602E-03	1.449E-02
400.000	4.403E-03	2.227E-03	2.822E-03	7.335E-03
500.000	3.404E-03	1.742E-03	2.359E-03	5.135E-03
600.000	2.489E-03	1.206E-03	1.595E-03	3.984E-03
800.000	1.207E-04	6.721E-04	8.705E-04	8.705E-04
1000.000	4.226E-04	4.259E-04	6.055E-04	6.140E-04

FLUORESCENT ENERGIES

7.477	5.761E+01	1.999E+00	5.738E-02	5.973E+01
8.264	4.338E+01	1.805E+00	2.822E-02	4.526E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR NICKEL

ATOMIC WEIGHT 58.690 GRAMS / MOLE
DENSITY 8.900 GRAMS / CC
ATOMIC DENSITY 9.133E-02 BUNCHES / CC

CONVERSION CONSTANT IS 9.745E+01

L-EDGES AT 0.855 0.872 1.012
L-EDGE JUMPS 2.112 1.410 1.160
L-EDGE FIT JUMPS 4.534 1.656 1.160

K-EDGE AT 8.333 KEV
K-EDGE JUMP 7.855

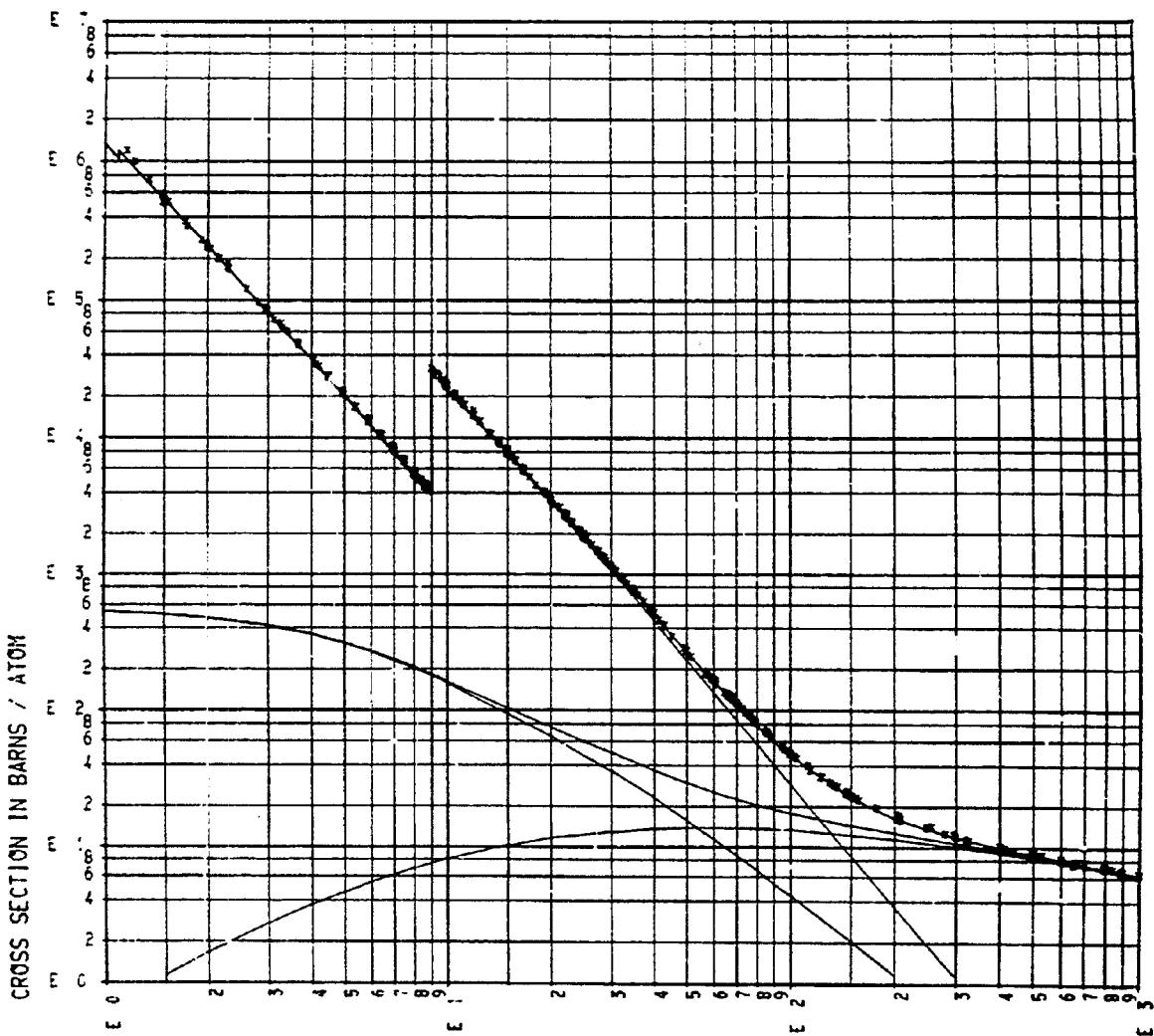
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.13	L	1.012	K	8.333
0	0.	0.		1.39848E+01	1.42388E+01		
1	0.	0.		1.48080E+00	1.51738E+01		
2	0.	0.		1.69116E+02	1.78070E+01		
3	0.	0.		0.	3.66138E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.09204E+00	-5.04360E-01
1	2.52277E-01	1.70040E+00
2	-3.66568E-01	-2.76443E-01
3	1.95586E-02	1.12628E-02



COPPER

29

CROSS SECTIONS

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REVISED 6-03-69

CROSS SECTIONS FOR COPPER		$\sigma = 39$	BARNS / ATOM	
KEY	PHITS	COHERENT	INCOHERENT	TOTAL
1.000	1.323E+06	6.364E+02	6.002E+01	1.524E+06
1.999	1.036E+06	1.023E+01	1.036E+01	1.036E+06
1.100	1.193E+06	1.033E+01	1.033E+01	1.193E+06
1.500	5.313E+05	1.344E+00	1.344E+00	5.313E+05
2.000	5.474E+05	1.666E+00	1.666E+00	5.474E+05
3.000	3.000E+05	2.036E+00	2.036E+00	3.000E+05
4.000	3.141E+05	2.407E+00	2.407E+00	3.141E+05
6.000	2.230E+05	3.404E+00	3.404E+00	2.230E+05
8.000	2.000E+05	4.000E+00	4.000E+00	2.000E+05
10.000	1.800E+05	4.400E+00	4.400E+00	1.800E+05
15.000	1.297E+05	6.000E+00	6.000E+00	1.297E+05
20.000	1.185E+05	6.667E+00	6.667E+00	1.185E+05
30.000	3.479E+04	1.000E+01	1.000E+01	3.479E+04
40.000	4.563E+04	1.333E+01	1.333E+01	4.563E+04
50.000	3.396E+04	1.667E+01	1.667E+01	3.396E+04
60.000	2.000E+04	2.000E+01	2.000E+01	2.000E+04
80.000	1.000E+04	3.333E+01	3.333E+01	1.000E+04
100.000	6.325E+03	4.667E+01	4.667E+01	6.325E+03
150.000	3.163E+03	7.333E+01	7.333E+01	3.163E+03
200.000	2.108E+03	1.000E+02	1.000E+02	2.108E+03
300.000	1.154E+03	1.500E+02	1.500E+02	1.154E+03
400.000	8.157E+02	2.000E+02	2.000E+02	8.157E+02
500.000	5.771E+02	2.667E+02	2.667E+02	5.771E+02
600.000	4.258E+02	3.333E+02	3.333E+02	4.258E+02
800.000	3.118E+02	4.000E+02	4.000E+02	3.118E+02
1000.000	2.125E+02	5.000E+02	5.000E+02	2.125E+02
1500.000	1.417E+02	7.333E+02	7.333E+02	1.417E+02
2000.000	9.447E+01	1.000E+03	1.000E+03	9.447E+01
3000.000	5.968E+01	1.500E+03	1.500E+03	5.968E+01
4000.000	4.179E+01	2.000E+03	2.000E+03	4.179E+01
5000.000	3.089E+01	2.667E+03	2.667E+03	3.089E+01
6000.000	2.313E+01	3.333E+03	3.333E+03	2.313E+01
8000.000	1.659E+01	4.000E+03	4.000E+03	1.659E+01
10000.000	1.242E+01	5.000E+03	5.000E+03	1.242E+01
15000.000	8.286E+00	7.333E+03	7.333E+03	8.286E+00
20000.000	5.857E+00	1.000E+04	1.000E+04	5.857E+00
30000.000	3.904E+00	1.500E+04	1.500E+04	3.904E+00
40000.000	2.736E+00	2.000E+04	2.000E+04	2.736E+00
50000.000	2.057E+00	2.667E+04	2.667E+04	2.057E+00
60000.000	1.542E+00	3.333E+04	3.333E+04	1.542E+00
80000.000	1.094E+00	4.000E+04	4.000E+04	1.094E+00
100000.000	8.286E+00	5.000E+04	5.000E+04	8.286E+00
150000.000	5.857E+00	7.333E+04	7.333E+04	5.857E+00
200000.000	4.179E+00	1.000E+05	1.000E+05	4.179E+00
300000.000	2.736E+00	1.500E+05	1.500E+05	2.736E+00
400000.000	1.951E+00	2.000E+05	2.000E+05	1.951E+00
500000.000	1.466E+00	2.667E+05	2.667E+05	1.466E+00
600000.000	1.122E+00	3.333E+05	3.333E+05	1.122E+00
800000.000	7.886E+00	4.000E+05	4.000E+05	7.886E+00
1000000.000	5.857E+00	5.000E+05	5.000E+05	5.857E+00
1500000.000	3.904E+00	7.333E+05	7.333E+05	3.904E+00
2000000.000	2.736E+00	1.000E+06	1.000E+06	2.736E+00
3000000.000	1.702E+00	1.500E+06	1.500E+06	1.702E+00
4000000.000	1.201E+00	2.000E+06	2.000E+06	1.201E+00
5000000.000	9.008E+00	2.667E+06	2.667E+06	9.008E+00
6000000.000	6.755E+00	3.333E+06	3.333E+06	6.755E+00
8000000.000	4.771E+00	4.000E+06	4.000E+06	4.771E+00
10000000.000	3.579E+00	5.000E+06	5.000E+06	3.579E+00
15000000.000	2.389E+00	7.333E+06	7.333E+06	2.389E+00
20000000.000	1.659E+00	1.000E+07	1.000E+07	1.659E+00
30000000.000	1.039E+00	1.500E+07	1.500E+07	1.039E+00
40000000.000	7.273E+00	2.000E+07	2.000E+07	7.273E+00
50000000.000	5.227E+00	2.667E+07	2.667E+07	5.227E+00
60000000.000	4.068E+00	3.333E+07	3.333E+07	4.068E+00
80000000.000	2.778E+00	4.000E+07	4.000E+07	2.778E+00
100000000.000	2.039E+00	5.000E+07	5.000E+07	2.039E+00
150000000.000	1.359E+00	7.333E+07	7.333E+07	1.359E+00
200000000.000	9.499E+00	1.000E+08	1.000E+08	9.499E+00
300000000.000	6.333E+00	1.500E+08	1.500E+08	6.333E+00
400000000.000	4.489E+00	2.000E+08	2.000E+08	4.489E+00
500000000.000	3.359E+00	2.667E+08	2.667E+08	3.359E+00
600000000.000	2.519E+00	3.333E+08	3.333E+08	2.519E+00
800000000.000	1.746E+00	4.000E+08	4.000E+08	1.746E+00
1000000000.000	1.298E+00	5.000E+08	5.000E+08	1.298E+00
1500000000.000	8.686E+00	7.333E+08	7.333E+08	8.686E+00
2000000000.000	6.484E+00	1.000E+09	1.000E+09	6.484E+00
3000000000.000	4.322E+00	1.500E+09	1.500E+09	4.322E+00
4000000000.000	3.088E+00	2.000E+09	2.000E+09	3.088E+00
5000000000.000	2.266E+00	2.667E+09	2.667E+09	2.266E+00
6000000000.000	1.699E+00	3.333E+09	3.333E+09	1.699E+00
8000000000.000	1.133E+00	4.000E+09	4.000E+09	1.133E+00
10000000000.000	8.551E+00	5.000E+09	5.000E+09	8.551E+00
15000000000.000	5.674E+00	7.333E+09	7.333E+09	5.674E+00
20000000000.000	4.049E+00	1.000E+10	1.000E+10	4.049E+00
30000000000.000	2.699E+00	1.500E+10	1.500E+10	2.699E+00
40000000000.000	1.866E+00	2.000E+10	2.000E+10	1.866E+00
50000000000.000	1.344E+00	2.667E+10	2.667E+10	1.344E+00
60000000000.000	1.008E+00	3.333E+10	3.333E+10	1.008E+00
80000000000.000	6.721E+00	4.000E+10	4.000E+10	6.721E+00
100000000000.000	4.747E+00	5.000E+10	5.000E+10	4.747E+00
150000000000.000	3.148E+00	7.333E+10	7.333E+10	3.148E+00
200000000000.000	2.199E+00	1.000E+11	1.000E+11	2.199E+00
300000000000.000	1.466E+00	1.500E+11	1.500E+11	1.466E+00
400000000000.000	1.024E+00	2.000E+11	2.000E+11	1.024E+00
500000000000.000	7.683E+00	2.667E+11	2.667E+11	7.683E+00
600000000000.000	5.515E+00	3.333E+11	3.333E+11	5.515E+00
800000000000.000	3.703E+00	4.000E+11	4.000E+11	3.703E+00
1000000000000.000	2.625E+00	5.000E+11	5.000E+11	2.625E+00
1500000000000.000	1.746E+00	7.333E+11	7.333E+11	1.746E+00
2000000000000.000	1.298E+00	1.000E+12	1.000E+12	1.298E+00
3000000000000.000	8.686E+00	1.500E+12	1.500E+12	8.686E+00
4000000000000.000	6.484E+00	2.000E+12	2.000E+12	6.484E+00
5000000000000.000	4.322E+00	2.667E+12	2.667E+12	4.322E+00
6000000000000.000	3.088E+00	3.333E+12	3.333E+12	3.088E+00
8000000000000.000	2.132E+00	4.000E+12	4.000E+12	2.132E+00
10000000000000.000	1.549E+00	5.000E+12	5.000E+12	1.549E+00
15000000000000.000	1.039E+00	7.333E+12	7.333E+12	1.039E+00
20000000000000.000	7.273E+00	1.000E+13	1.000E+13	7.273E+00
30000000000000.000	4.851E+00	1.500E+13	1.500E+13	4.851E+00
40000000000000.000	3.434E+00	2.000E+13	2.000E+13	3.434E+00
50000000000000.000	2.426E+00	2.667E+13	2.667E+13	2.426E+00
60000000000000.000	1.746E+00	3.333E+13	3.333E+13	1.746E+00
80000000000000.000	1.298E+00	4.000E+13	4.000E+13	1.298E+00
100000000000000.000	9.686E+00	5.000E+13	5.000E+13	9.686E+00
150000000000000.000	6.484E+00	7.333E+13	7.333E+13	6.484E+00
200000000000000.000	4.322E+00	1.000E+14	1.000E+14	4.322E+00
300000000000000.000	2.888E+00	1.500E+14	1.500E+14	2.888E+00
400000000000000.000	1.925E+00	2.000E+14	2.000E+14	1.925E+00
500000000000000.000	1.344E+00	2.667E+14	2.667E+14	1.344E+00
600000000000000.000	9.686E+00	3.333E+14	3.333E+14	9.686E+00
800000000000000.000	6.484E+00	4.000E+14	4.000E+14	6.484E+00
1000000000000000.000	4.322E+00	5.000E+14	5.000E+14	4.322E+00
1500000000000000.000	2.888E+00	7.333E+14	7.333E+14	2.888E+00
2000000000000000.000	1.925E+00	1.000E+15	1.000E+15	1.925E+00
3000000000000000.000	1.344E+00	1.500E+15	1.500E+15	1.344E+00
4000000000000000.000	9.686E+00	2.000E+15	2.000E+15	9.686E+00
5000000000000000.000	6.484E+00	2.667E+15	2.667E+15	6.484E+00
6000000000000000.000	4.322E+00	3.333E+15	3.333E+15	4.322E+00
8000000000000000.000	2.888E+00	4.000E+15	4.000E+15	2.888E+00
10000000000000000.000	1.925E+00	5.000E+15	5.000E+15	1.925E+00
15000000000000000.000	1.344E+00	7.333E+15	7.333E+15	1.344E+00
20000000000000000.000	9.686E+00	1.000E+16	1.000E+16	9.686E+00
30000000000000000.000	6.484E+00	1.500E+16	1.500E+16	6.484E+00
40000000000000000.000	4.322E+00	2.000E+16	2.000E+16	4.322E+00
50000000000000000.000	2.888E+00	2.667E+16	2.667E+16	2.888E+00
60000000000000000.000	1.925E+00	3.333E+16	3.333E+16	1.925E+00
80000000000000000.000	1.344E+00	4.000E+16	4.000E+16	1.344E+00
100000000000000000.000	9.686E+00	5.000E+16	5.000E+16	9.686E+00
150000000000000000.000	6.484E+00	7.333E+16	7.333E+16	6.484E+00
200000000000000000.000	4.322E+00	1.000E+17	1.000E	

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REVISED 6/03/69

CROSS SECTIONS FOR COPPER		Z = 29	CN**2 / SPAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.254E+04	5.074E+00	5.756E-03	1.255E+0
1.999	9.818E+03	5.019E+00	5.657E-03	9.823E+0
1.100	1.156E+04	5.018E+00	5.666E-03	1.157E+0
1.500	5.041E+03	4.840E+00	4.075E-02	5.046E+0
2.000	2.345E+03	4.559E+00	3.585E-02	2.350E+03
3.000	1.821E+02	4.005E+00	2.584E-02	1.868E+02
4.000	3.546E+02	3.470E+00	3.530E-02	3.581E+02
5.000	1.904E+02	2.987E+00	4.401E-02	1.934E+02
6.000	1.140E+02	2.671E+00	5.200E-02	1.166E+02
8.000	6.028E+01	1.933E+00	5.605E-02	5.228E+01
8.978	5.10E+01	1.697E+00	7.186E-02	3.187E+01
8.979	5.122E+02	1.697E+00	7.187E-02	2.889E+02
10.000	2.177E+02	1.499E+00	7.705E-02	2.193E+02
15.000	3.719E+01	9.086E-01	9.804E-02	3.719E+01
20.000	3.314E+01	6.245E-01	1.104E-01	3.388E+01
50.000	1.034E+01	3.479E-01	1.237E-01	1.081E+01
40.000	4.439E+00	2.195E-01	1.294E-01	4.788E+00
50.000	2.284E+00	1.503E-01	1.315E-01	2.566E+00
60.000	1.323E+00	1.090E-01	1.318E-01	1.564E+00
80.000	5.566E-01	6.437E-02	1.298E-01	1.808E-01
100.000	2.842E-01	4.250E-02	1.266E-01	4.033E-01
150.000	8.428E-02	1.958E-02	1.175E-01	2.131E-01
200.000	3.595E-02	1.117E-02	1.092E-01	1.501E-01
300.000	1.108E-02	6.014E-03	9.584E-02	1.119E-01
400.000	4.921E-03	2.821E-03	8.629E-02	9.403E-02
500.000	2.656E-03	1.804E-03	7.899E-02	9.349E-02
600.000	1.636E-03	1.249E-03	7.318E-02	7.906E-02
800.000	7.759E-04	6.961E-04	6.438E-02	6.586E-02
1000.000	4.458E-04	4.407E-04	5.792E-02	5.881E-02
FLUORESCENT ENERGIES				
8.047	4.944E+01	1.921E+00	6.634E-02	5.145E+01
8.904	3.657E+01	1.713E+00	7.143E-02	3.876E+01

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REVISED 6.03.69

MISCELLANEOUS DATA FOR COPPER

ATOMIC WEIGHT 63.540 GRAMS / MOLE
DENSITY 8.940 GRAMS / CC
ATOMIC DENSITY 8.474E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.066E+02

L-EDGES AT 0.932 0.952 1.100
L-EDGE JUMPS 2.874 1.410 1.150
L-EDGE FIT JUMPS 4.101 1.636 1.160

K-EDGE AT 8.979 KEV
K-EDGE JUMP 7.967

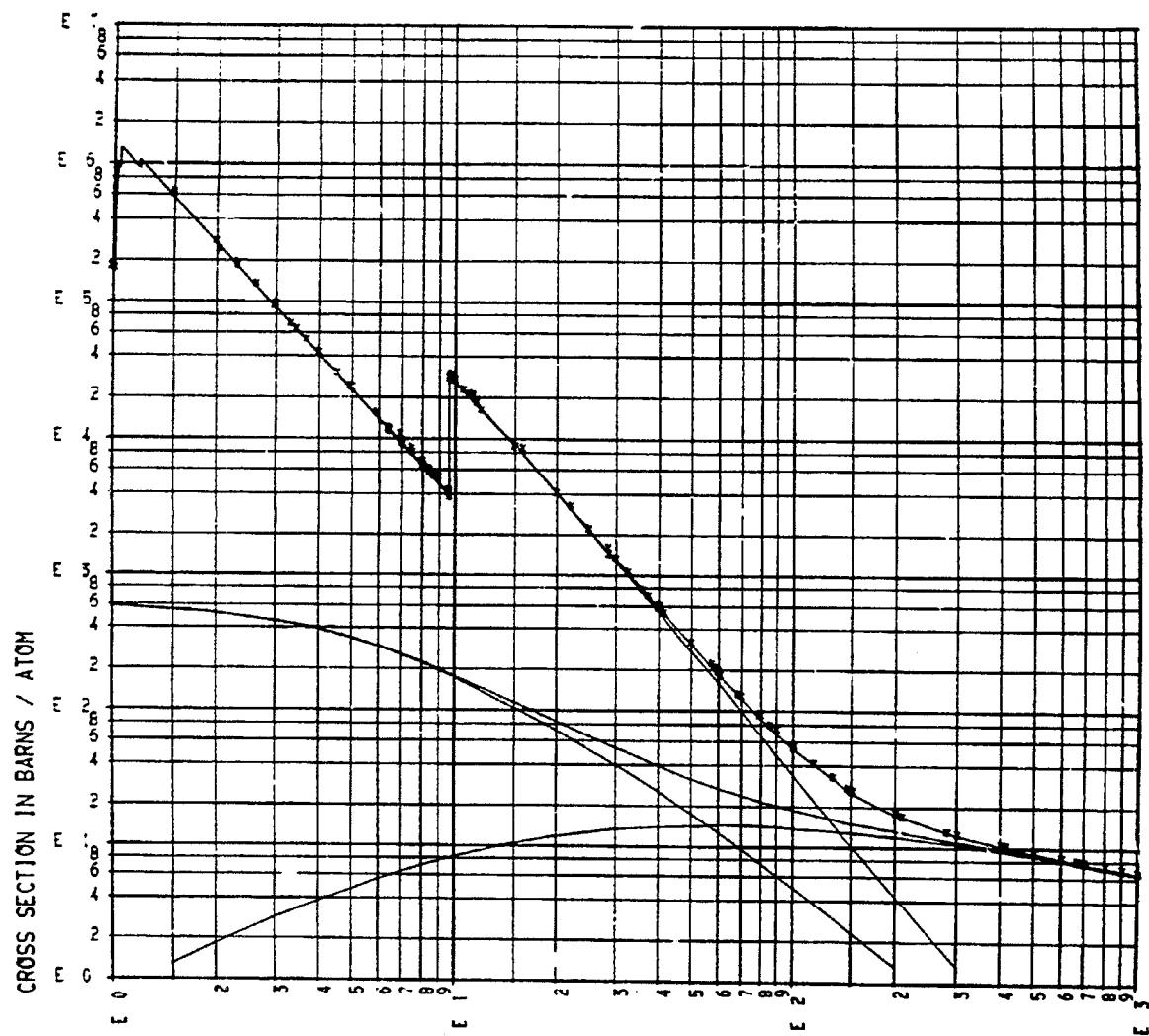
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	C.180	L	1.100	K	8.979
0	0.	0.		1.42439E+01		1.45809E+01	
1	0.	0.		1.58577E+00		1.18037E+00	
2	0.	0.		1.67398E-02		1.13850E-02	
3	0.	0.		0.		3.12088E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.17739E+00	-5.70210E-01
1	2.03123E-01	1.75042E+00
2	-3.72360E-01	-2.84555E-01
3	2.01638E-02	1.16930E-02



ZIIC

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CROSS SECTIONS

PAGE 30 - I

REVISED 6/03/69

CROSS SECTIONS FOR ZINC

Z = 30

BARNs / ATOM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
.000	1.728E+05	5.720E+02	6.919E-01	1.733E+05
.020	1.690E+05	5.707E+02	1.128E-01	1.696E+05
.021	9.608E+05	5.706E+02	1.139E-01	9.614E+05
.043	9.085E+05	5.692E+02	1.372E-01	9.091E+05
.044	1.278E+06	5.691E+02	1.383E-01	1.278E+06
.195	8.957E+05	5.599E+02	9.052E-01	8.963E+05
.196	1.037E+06	5.599E+02	9.063E-01	1.037E+06
.500	5.703E+05	5.448E+02	1.236E+00	5.708E+05
2.000	2.658E+05	5.137E+02	1.834E+00	2.664E+05
3.000	9.000E-04	4.504E+02	2.863E+00	9.043E+04
4.000	4.151E+04	3.918E+02	3.854E+00	4.191E+04
5.000	2.271E+04	3.392E+02	4.743E+00	2.305E+04
6.000	1.388E+04	2.936E+02	5.885E+00	1.416E+04
8.000	6.320E+03	2.224E+02	1.022E+00	6.349E+03
9.658	3.773E+03	1.799E+02	1.14E+00	3.861E+03
9.659	2.867E+04	1.798E+02	1.15E+00	2.886E+04
10.000	2.625E+04	1.729E+02	9.99E+00	2.643E+04
15.000	8.999E+03	1.044E+02	1.054E+01	9.114E+03
20.000	4.056E+03	7.159E+01	1.191E+01	4.140E+03
30.000	1.266E+03	4.011E+01	3.39E+01	1.320E+03
40.000	5.420E+02	2.545E+01	1.404E+01	5.815E+02
50.000	2.782E+02	1.748E+01	1.429E+01	3.100E+02
60.000	1.607E+02	1.271E+01	1.435E+01	1.878E+02
80.000	6.734E+01	7.510E+00	1.413E+01	8.898E+01
100.000	3.429E+01	4.967E+00	1.378E+01	5.304E+01
150.000	1.014E+01	2.295E+00	1.281E+01	2.524E+01
200.000	4.324E+00	1.310E+00	1.189E+01	1.752E+01
300.000	1.340E+00	5.880E-01	1.046E+01	1.238E+01
400.000	5.999E-01	3.513E-01	9.415E+00	1.035E+01
500.000	3.281E-01	2.118E-01	8.619E+00	9.169E+00
600.000	2.033E-01	1.467E-01	8.985E+00	8.335E+00
800.000	9.845E-02	8.190E-02	7.026E+00	7.207E+00
1000.000	5.771E-02	5.190E-02	6.321E+00	6.451E+00

FLUORESCENT ENERGIES

8.638	5.122E+03	2.040E+02	1.480E+00	5.336E+03
9.571	3.867E+03	1.817E+02	8.051E+00	4.058E+03
1.009	1.711E+05	5.714E+02	1.013E-01	1.716E+05
1.032	9.342E+05	5.699E+02	1.255E-01	9.347E+05

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REVISED 6/03/69

CROSS SECTIONS FOR ZINC		Z = 30	CM**2 / GRAM	
KEY	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	1.591E+03	5.269E+00	6.373E-03	1.597E+03
1.020	1.557E+03	5.257E+00	6.366E-03	1.562E+03
1.021	8.851E+03	5.256E+00	6.376E-03	8.856E+03
1.043	8.369E+03	5.243E+00	6.791E-03	8.374E+03
1.044	1.177E+04	5.242E+00	6.801E-03	1.178E+04
1.195	8.251E+03	5.158E+00	8.338E-03	8.256E+03
1.196	9.550E+03	5.157E+00	8.349E-03	9.556E+03
1.500	5.253E+03	5.018E+00	1.175E-02	5.258E+03
2.000	2.449E+03	4.732E+00	1.689E-02	2.454E+03
3.000	8.290E+02	4.149E+00	2.638E-02	8.332E+02
4.000	3.824E+02	3.609E+00	3.532E-02	3.860E+02
5.000	2.092E+02	3.125E+00	4.369E-02	2.124E+02
6.000	1.275E+02	2.704E+00	5.144E-02	1.303E+02
8.000	5.821E+01	2.048E+00	6.515E-02	6.033E+01
9.658	3.475E+01	1.657E+00	7.475E-02	3.648E+01
9.659	2.641E+02	1.657E+00	7.475E-02	2.659E+02
10.000	2.418E+02	1.592E+00	7.667E-02	2.435E+02
15.000	8.289E+01	9.621E-01	9.709E-02	8.395E+01
20.000	3.737E+01	6.604E-01	1.097E-01	3.814E+01
30.000	1.166E+01	3.695E-01	2.333E-01	1.216E+01
40.000	4.993E+00	2.344E-01	2.944E-01	5.357E+00
50.000	2.563E+00	1.611E-01	3.165E-01	2.855E+00
60.000	1.480E+00	1.171E-01	3.208E-01	1.729E+00
80.000	6.203E-01	6.918E-02	3.822E-01	8.197E-01
100.000	3.138E-01	4.575E-02	2.725E-01	4.889E-01
150.000	9.337E-02	2.114E-02	1.866E-01	2.325E-01
200.000	3.983E-02	1.207E-02	1.095E-01	1.614E-01
300.000	1.234E-02	6.416E-03	6.632E-02	1.141E-01
400.000	5.526E-03	3.052E-03	8.572E-02	9.530E-02
500.000	3.022E-03	1.951E-03	1.939E-02	9.437E-02
600.000	1.873E-03	1.351E-03	1.356E-02	1.678E-02
800.000	9.069E-04	7.544E-04	6.472E-02	6.638E-02
1000.000	5.316E-04	4.781E-04	5.823E-02	5.924E-02
FLUORESCENT ENERGIES				
8.638	4.718E+01	1.879E+00	6.890E-02	4.915E+01
9.571	3.562E+01	1.574E+00	1.425E-02	3.758E+01
1.009	1.576E+03	5.264E+00	6.450E-03	1.581E+03
1.032	8.605E+03	5.249E+00	6.683E-03	8.610E+03

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REVISED 6/03/69

MISCELLANEOUS DATA FOR ZINC

ATOMIC WEIGHT 65.380 GRAMS / MOLE
DENSITY 7.140 GRAMS / CC
ATOMIC DENSITY 6.577E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.086E+02

L-EDGES AT 1.021 1.044 1.196
L-EDGE JUMPS 5.684 1.410 1.160
L-EDGE FIT JUMPS 9.297 1.636 1.160

K-EDGE AT 9.659 KEY
K-EDGE JUMP 7.502

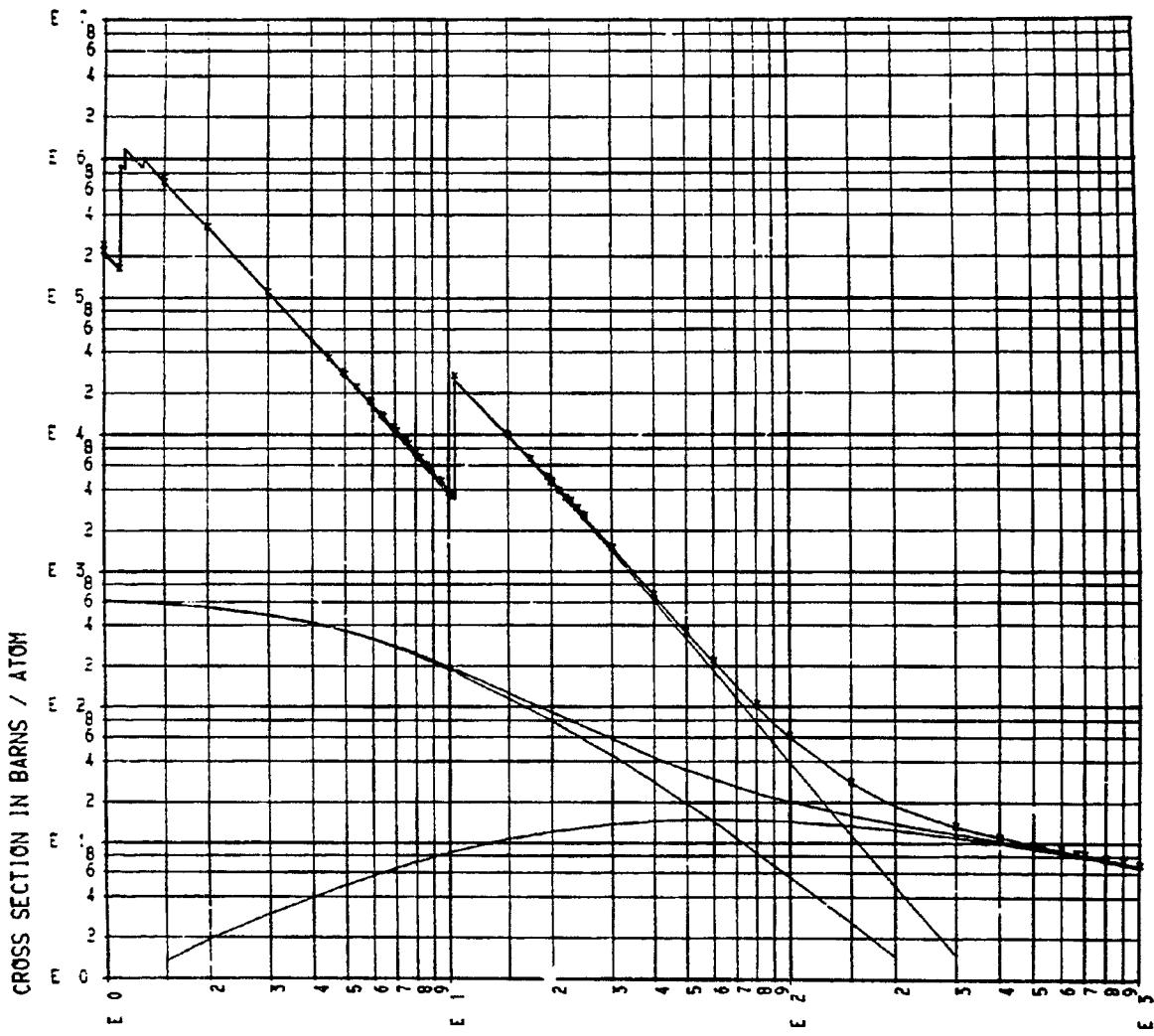
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	L	K
0	0.	1.20597E+01	1.43221E+01	1.44116E+01	
1	0.	-1.10258E+00	1.62384E+00	-9.33983E-01	
2	0.	0.	1.64926E-02	1.17357E-01	
3	0.	0.	0.	5.62829E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.23402E+00	-4.20535E-01
1	2.84312E-01	1.53400E+00
2	-3.72143E-01	-2.53646E-01
3	2.00625E-02	9.27233E-03



GALLIUM

31

CROSS SECTIONS

31 - 1 REVISED 6/03/69

CROSS SECTIONS FOR GALLIUM Z = 31 BARNs / ATOM

KEV	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	2.121E+05	6.073E+02	1.217E-01	2.127E+05
1.114	1.586E+05	5.989E+02	8.501E-01	1.592E+05
1.116	8.995E+05	5.988E+02	8.513E-01	9.001E+05
1.141	8.479E+05	5.970E+02	8.816E-01	8.485E+05
1.142	1.193E+06	5.970E+02	8.827E-01	1.194E+06
1.301	8.528E+05	5.870E+02	1.076E+00	8.534E+05
1.302	9.873E+05	5.869E+02	1.077E+00	9.879E+05
1.500	6.837E+05	5.762E+02	1.335E+00	6.843E+05
2.000	3.210E+05	5.421E+02	1.931E+00	3.216E+05
3.000	1.083E+05	4.757E+02	3.985E+00	1.088E+05
4.000	4.933E+04	4.154E+02	3.955E+00	4.975E+04
5.000	2.658E+04	3.617E+02	4.876E+00	2.695E+04
6.000	1.595E+04	3.149E+02	5.716E+00	1.627E+04
8.000	1.049E+03	2.406E+02	1.207E+00	1.296E+03
10.000	3.710E+03	1.877E+02	8.498E+00	3.906E+03
10.366	3.343E+03	1.797E+02	8.678E+00	3.631E+03
10.367	2.473E+04	1.797E+02	8.678E+00	2.492E+04
15.000	9.724E+03	1.133E+02	1.076E+01	9.848E+03
20.000	4.489E+03	7.766E+01	1.218E+01	4.519E+03
30.000	1.430E+03	4.368E+01	1.373E+01	1.488E+03
40.000	6.165E+02	2.793E+01	1.455E+01	6.389E+02
50.000	3.171E+02	1.931E+01	1.470E+01	3.511E+02
60.000	1.832E+02	1.410E+01	1.476E+01	1.205E+02
80.000	7.659E+01	8.350E+00	1.455E+01	9.487E+01
100.000	3.889E+01	5.523E+00	1.421E+01	8.863E+01
150.000	1.144E+01	2.562E+00	1.322E+01	1.422E+01
200.000	4.871E+00	1.455E+00	1.227E+01	1.496E+01
300.000	1.513E+00	6.580E+01	1.079E+01	1.696E+01
400.000	6.824E-01	3.710E+01	9.726E+00	1.718E+01
500.000	3.169E-01	2.374E+01	9.904E+00	1.398E+00
600.000	2.362E-01	1.643E+01	8.250E+00	8.668E+00
800.000	1.172E-01	9.180E+02	1.303E+00	1.312E+00
1000.000	7.049E-02	5.820E+02	5.532E+00	5.661E+00

FLUORESCENT ENERGIES

9.251	4.641E+03	2.047E+02	9.023E+00	4.858E-03
10.263	3.441E+03	1.819E+02	8.827E+00	3.532E+03
1.096	1.657E+05	6.001E+02	8.294E-01	1.653E+05
1.122	8.852E+05	5.985E+02	8.594E-01	8.858E+05

CROSS SECTIONS FOR GALLIUM Z = 31 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
.000	1.832E+03	5.246E+00	6.234E-03	1.837E+03
.114	1.370E+03	5.173E+00	7.343E-03	1.375E+03
.115	1.770E+03	5.173E+00	7.353E-03	1.776E+03
.141	7.325E+03	5.157E+00	7.615E-03	7.350E+03
.142	1.050E+04	5.157E+00	7.625E-03	1.051E+04
.301	7.567E+03	5.070E+00	9.292E-03	7.372E+03
.302	8.528E+03	5.070E+00	9.303E-03	8.534E+03
.500	5.906E+03	4.977E+00	1.153E-02	5.911E+03
2.000	2.773E+03	4.683E+00	1.659E-02	2.778E+03
3.000	9.354E+02	4.109E+00	2.578E-02	9.395E+02
4.000	4.261E+02	3.589E+00	3.426E-02	4.298E+02
5.000	2.296E+02	3.125E+00	4.212E-02	2.328E+02
6.000	1.377E+02	2.720E+00	4.938E-02	1.405E+02
8.000	6.089E+01	2.078E+00	6.226E-02	6.303E+01
10.000	3.205E+01	1.621E+00	7.341E-02	3.374E+01
10.365	2.888E+01	1.552E+00	7.496E-02	3.050E+01
10.367	2.136E+02	1.552E+00	7.496E-02	2.153E+02
15.000	8.400E+01	9.790E-01	9.295E-02	8.501E+01
20.000	3.878E+01	6.708E-01	1.052E-01	3.955E+01
30.000	1.235E+01	3.773E-01	1.186E-01	1.285E+01
40.000	5.326E+00	2.413E-01	1.246E-01	5.692E+00
50.000	2.739E+00	1.668E-01	1.270E-01	3.033E+00
60.000	1.582E+00	1.218E-01	1.275E-01	1.832E+00
80.000	6.616E-01	7.196E-02	1.258E-01	8.594E-01
100.000	3.360E-01	4.771E-02	1.227E-01	5.064E-01
150.000	9.882E-02	2.213E-02	1.142E-01	2.351E-01
200.000	4.207E-02	1.265E-02	1.060E-01	1.601E-01
300.000	1.307E-02	5.684E-03	9.321E-02	1.120E-01
400.000	5.895E-03	3.205E-03	8.401E-02	6.317E-02
500.000	3.255E-03	2.051E-03	7.691E-02	8.222E-02
600.000	2.040E-03	1.419E-03	7.126E-02	7.472E-02
800.000	1.013E-03	7.930E-04	6.308E-02	6.489E-02
1000.000	6.089E-04	5.027E-04	5.642E-02	5.734E-02

FLUORESCENT ENERGIES

9.251	4.009E+01	1.768E+00	6.931E-02	4.136E+01
10.263	2.972E+01	1.571E+00	7.452E-02	3.137E+01
1.095	1.432E+03	5.184E+00	7.164E-03	1.437E+03
1.122	7.647E+03	5.158E+00	7.424E-03	7.652E+03

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REVISED 6/03/69

MISCELLANEOUS DATA FOR GALLIUM

ATOMIC WEIGHT 69.720 GRAMS / MOLE
DENSITY 5.903 GRAMS / CC
ATOMIC DENSITY 5.099E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.158E+02

L-EDGES AT 1.115 1.142 1.302
L-EDGE JUMPS 9.671 1.410 1.160
L-EDGE FIT JUMPS 9.276 1.636 1.150

K-EDGE AT 10.367 KEY
K-EDGE JUMP 7.400

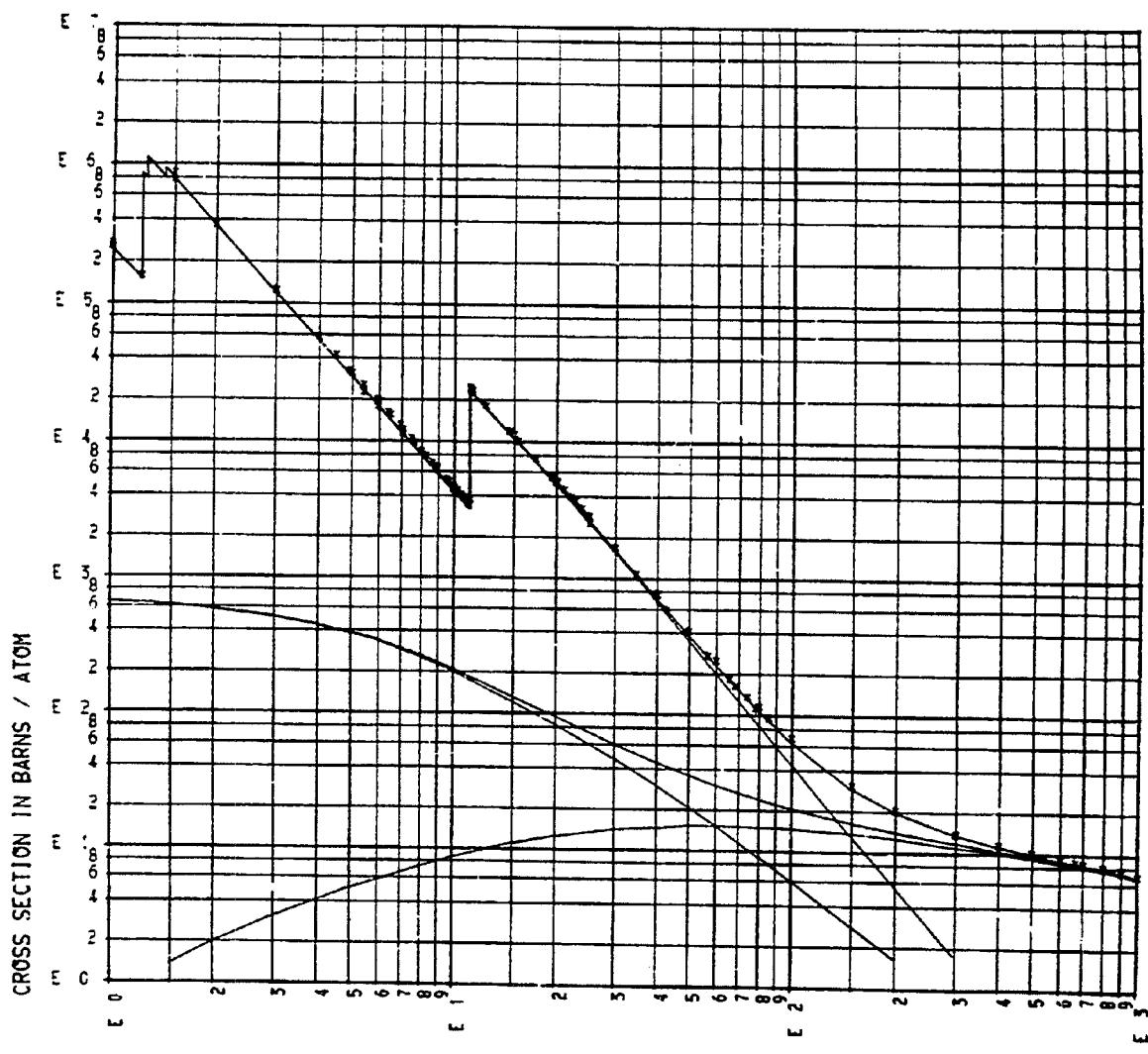
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	R	M	N	L	K
0	0.		0.158	1.302	10.367
1	0.		1.22646E+01	1.44195E+01	1.36182E+01
2	0.		-2.68965E+00	1.64469E+00	-3.18459E-01
3	0.		0.	1.51204E-02	-3.111348E-02
			0.	0.	4.68138E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.28298E+00	-3.58218E-01
1	2.91334E-01	1.60650E+00
2	-3.69391E-01	-2.44908E-01
3	1.97029E-02	8.61898E-03



GERMANIUM

32

CROSS SECTIONS

32 - 1

REVISED 6/03/69

CROSS SECTIONS FOR GERMANIUM		Z = 32	BARNs / ATOM	
KEY	PHOTs	COHERENT	INCOHERENT	TOTAL
0.000	2.461E+05	6.466E+02	7.287E-01	2.467E+05
1.217	1.497E+05	5.299E+02	9.823E-01	1.505E+05
1.218	8.538E+05	5.298E+02	9.836E-01	8.544E+05
1.248	1.394E+05	6.278E+02	1.021E+00	8.001E+05
1.249	1.125E+05	6.277E+02	1.022E+00	1.125E+05
1.413	8.057E+05	6.617E+02	1.237E+00	9.053E+05
1.414	9.328E+05	6.617E+02	1.238E+00	9.334E+05
1.500	1.948E+05	1.256E+02	1.356E+00	1.955E+05
2.000	3.639E+05	5.015E+02	1.912E+00	3.649E+05
3.000	1.203E+05	5.028E+02	3.090E+00	1.208E+05
4.000	6.462E+04	4.395E+02	4.099E+00	6.566E+04
5.000	2.954E+04	3.841E+02	5.019E+00	2.992E+04
6.000	1.784E+04	3.366E+02	6.864E+00	1.819E+04
8.000	8.035E+03	2.589E+02	1.360E+00	8.301E+03
10.000	3.317E+03	2.029E+02	8.684E+00	3.429E+03
11.103	3.224E+03	1.787E+02	9.228E+00	3.412E+03
11.104	2.329E+04	1.787E+02	9.229E+00	2.348E+04
15.000	1.078E+04	1.226E+02	1.099E+01	1.091E+04
20.000	4.964E+03	8.581E+01	1.246E+01	5.061E+03
30.000	1.583E+03	4.734E+01	1.408E+01	1.644E+03
40.000	8.844E+02	3.046E+01	1.482E+01	9.329E+03
50.000	3.532E+02	1.735E+01	1.611E+01	3.693E+03
60.000	2.047E+02	1.550E+01	1.618E+01	2.353E+03
80.000	8.507E+01	9.152E+00	1.499E+01	1.162E+03
100.000	4.392E+01	5.078E+00	1.464E+01	5.464E+01
150.000	1.304E+01	2.827E+00	1.363E+01	1.949E+01
200.000	5.583E+00	1.519E+00	1.269E+01	1.985E+01
300.000	1.747E+00	1.280E+00	1.111E+01	1.359E+01
400.000	7.909E-01	1.110E+00	1.004E+01	1.124E+01
500.000	4.576E-01	1.022E+00	9.190E+00	8.905E+00
600.000	2.744E-01	9.813E+00	8.516E+00	8.471E+00
800.000	1.361E-01	9.011E+00	7.524E+00	7.862E+00
1000.000	8.163E-02	6.446E-02	6.742E+00	6.888E+00

FLUORESCENT ENERGIES

9.885	4.458E+03	2.655E+02	8.610E+00	4.673E+03
10.981	3.325E+03	1.811E+02	9.159E+00	3.516E+03
1.186	1.598E+05	6.321E+02	9.440E-01	1.504E+05
1.216	1.500E+05	6.300E+02	9.811E-01	1.506E+05

32 - 2

REVISED 6/03/69

CROSS SECTIONS FOR GERMANIUM		Z = 32	CM**2 / GRAM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.041E+03	5.365E+00	6.021E-03	2.047E+03
1.217	1.242E+03	5.226E+00	8.150E-03	1.247E+03
1.218	1.083E+03	5.226E+00	8.160E-03	1.088E+03
1.248	6.633E+03	5.209E+00	8.472E-03	6.638E+03
1.249	9.332E+03	5.208E+00	8.483E-03	9.337E+03
1.413	6.684E+03	5.123E+00	1.026E-02	6.689E+03
1.414	7.739E+03	5.122E+00	1.027E-02	7.744E+03
1.500	6.595E+03	5.082E+00	1.126E-02	6.500E+03
2.000	3.019E+03	4.770E+00	1.603E-02	3.024E+03
3.000	9.981E+02	4.172E+00	2.664E-02	1.002E+03
4.000	4.532E+02	3.646E+00	3.401E-02	4.568E+02
5.000	2.450E+02	3.187E+00	4.164E-02	2.483E+02
6.000	1.480E+02	2.788E+00	4.865E-02	1.509E+02
8.000	6.665E+01	2.148E+00	6.106E-02	6.881E+01
10.000	3.582E+01	1.684E+00	7.205E-02	3.651E+01
11.103	2.675E+01	1.483E+00	7.556E-02	2.830E+01
11.104	1.932E+02	1.482E+00	7.557E-02	1.948E+02
15.000	8.941E+01	1.017E+00	9.118E-02	9.052E+01
20.000	4.119E+01	6.958E-01	1.054E-01	4.199E+01
30.000	1.513E+01	3.928E-01	1.668E-01	1.364E+01
40.000	5.678E+00	2.526E-01	2.050E-01	5.034E+00
50.000	2.950E+00	1.754E-01	2.054E-01	3.231E+00
60.000	1.698E+00	1.286E-01	2.089E-01	1.933E+00
80.000	1.141E-01	7.593E-02	2.144E-01	1.442E-01
100.000	3.644E-01	5.043E-02	2.131E-01	5.365E-01
150.000	1.081E-01	2.343E-02	2.150E-01	2.447E-01
200.000	4.632E-02	1.343E-02	2.050E-01	2.049E-01
300.000	1.449E-02	6.040E-03	1.930E-01	1.127E-01
400.000	6.562E-03	3.410E-03	1.830E-01	3.220E-01
500.000	3.630E-03	2.180E-03	1.726E-01	2.056E-01
600.000	2.277E-03	1.509E-03	1.655E-01	1.443E-01
800.000	1.129E-03	8.438E-04	9.328E-02	5.523E-02
1000.000	5.773E-04	5.343E-04	5.394E-02	5.115E-02

FLUORESCENT ENERGIES

9.885	3.699E+01	1.705E+00	1.143E-02	3.877E+01
10.981	2.758E+01	1.503E+00	1.602E-02	2.916E+01
11.186	1.326E+03	5.244E+00	1.832E-03	1.331E+03
11.216	1.244E+03	5.227E+00	8.140E-03	1.250E+03

32 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR GERMANIUM

ATOMIC WEIGHT 72.590 GRAMS / MOLE
DENSITY 5.323 GRAMS / CC
ATOMIC DENSITY 4.416E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.205E+02

L-EDGES AT 1.218 1.349 1.414
L-EDGE JUMPS 5.104 1.310 1.160
L-EDGE FIT JUMPS 9.329 1.636 1.160

K-EDGE AT 11.104 KEY
K-EDGE JUMP 7.224

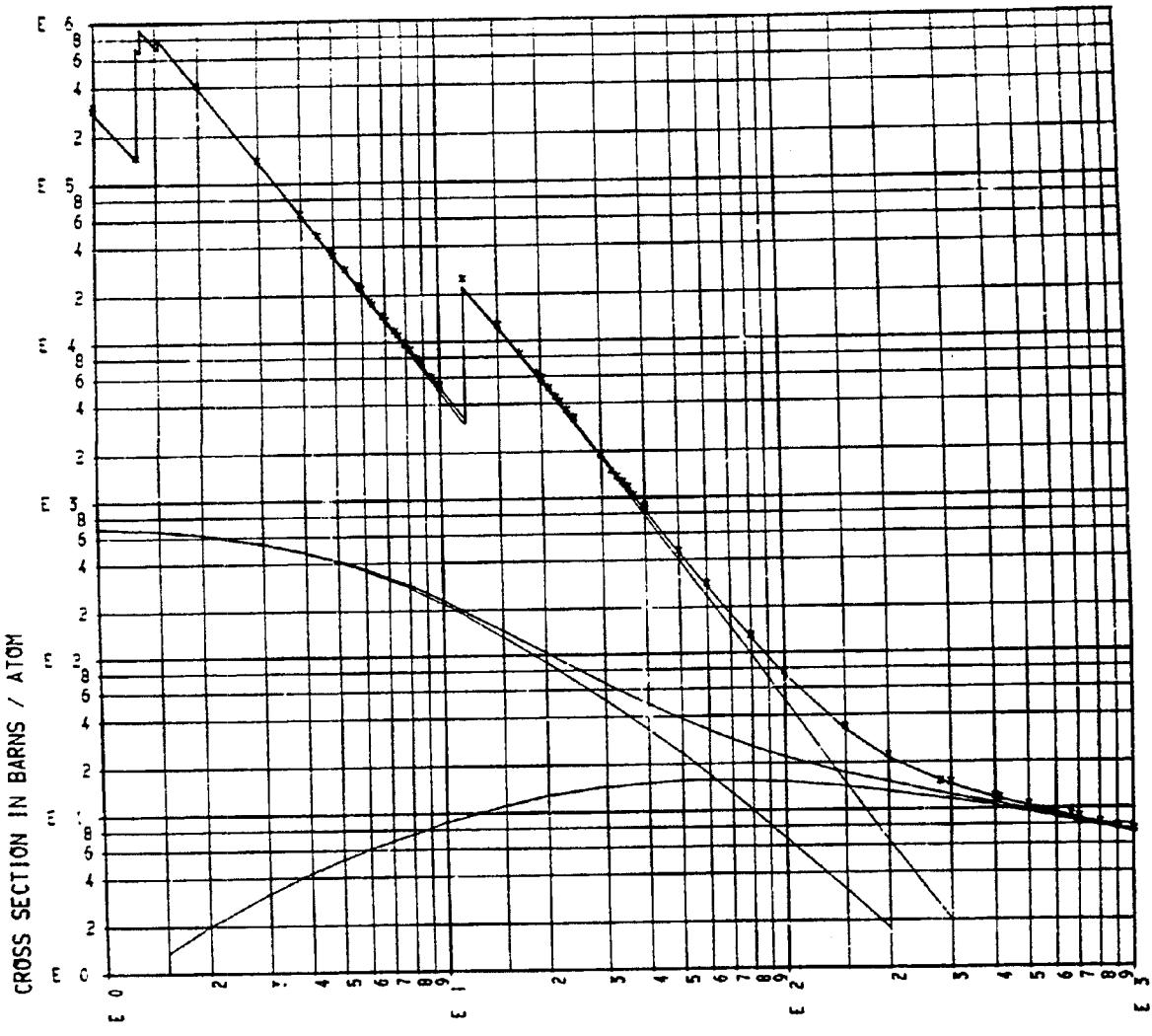
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LIN-LIN FIT

	R	Y	C.181	C. 1.414	K 11.104
0	C.		1.24133E+01	1.49813E+01	1.39288E+01
1	C.		-2.53088E+00	1.69288E+00	1.13348E+00
2	C.		C.	1.08388E-02	1.12848E-02
3	C.		C.	C.	4.31277E-02

COEFFICIENTS OF SCATTERING LIN-LIN FIT

	COHERENT	INCOHERENT
0	6.33896E+00	-3.34383E-01
1	2.91512E-01	1.60237E+00
2	-3.65543E-01	-2.45555E-01
3	1.92896E-02	8.71239E-03



ARSENIC

33

CROSS SECTIONS

33 - 1

REVISED 6/03/69

CROSS SECTIONS FOR ARSENIC		Z = 33	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.791E+05	6.882E+02	7.057E-01	2.798E+05
1.324	1.417E+05	6.627E+02	1.100E+00	1.424E+05
1.325	6.909E+05	6.926E+02	1.102E+00	6.916E+05
1.359	6.480E+05	6.604E+02	1.147E+00	6.487E+05
1.360	9.120E+05	6.603E+02	1.148E+00	6.612E+05
1.500	1.110E+05	6.910E+02	1.341E+00	1.111E+05
1.529	1.171E+05	6.488E+02	1.375E+00	1.171E+05
1.530	1.842E+05	6.481E+02	1.377E+00	1.848E+05
2.000	3.936E+05	6.109E+02	1.985E+00	3.942E+05
3.000	1.357E+05	6.522E+02	3.177E+00	1.357E+05
4.000	6.273E+04	4.645E+02	4.233E+00	4.580E+04
5.000	3.417E+04	4.091E+02	5.174E+00	3.417E+04
6.000	2.668E+04	3.912E+02	6.028E+00	2.668E+04
8.000	1.261E+03	2.775E+02	1.532E+00	5.638E+03
10.000	1.922E+03	2.186E+02	8.810E+00	1.491E+03
11.867	3.014E+03	1.744E+02	9.140E+00	2.028E+03
11.868	2.168E+04	1.744E+02	9.141E+00	2.168E+04
15.000	1.205E+04	1.323E+02	1.177E+01	7.372E+03
20.000	9.534E+03	9.034E+01	1.270E+01	8.835E+03
30.000	1.818E+03	5.111E+01	1.440E+01	3.617E+03
40.000	1.885E+02	3.301E+01	1.519E+01	4.555E+02
50.000	4.059E+02	2.302E+01	1.968E+01	5.087E+02
60.000	2.356E+02	1.692E+01	1.924E+01	2.417E+02
80.000	9.874E+01	9.987E+00	1.034E+01	1.915E+01
100.000	5.021E+01	6.640E+00	6.926E+00	1.135E+01
150.000	1.480E+01	3.095E+00	1.404E+01	1.193E+01
200.000	6.311E+00	1.174E+00	1.304E+01	1.425E+01
300.000	1.965E+00	1.990E+01	1.149E+01	1.069E+01
400.000	8.920E-01	4.610E+01	1.035E+01	1.069E+01
500.000	4.550E-01	2.084E+01	4.75E+00	4.826E+01
600.000	3.118E-01	1.995E+01	8.180E+00	1.929E+01
800.000	1.564E-01	1.717E+01	1.725E+00	1.894E+00
1000.000	9.498E-02	1.070E+02	6.952E+00	1.118E+00
FLUORESCENT ENERGIES				
10.543	4.230E+03	2.049E+02	9.687E+00	4.446E+03
11.725	3.120E+03	1.801E+02	9.672E+00	3.310E+03
1.282	1.532E+05	6.656E+02	1.046E+00	1.539E+05
1.317	1.436E+05	6.632E+02	1.091E+00	1.443E+05

CROSS SECTIONS FOR ARSENIC		Z = 33	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.243E+03	5.532E+00	5.673E-03	2.249E+03
1.324	1.139E+03	5.327E+00	8.845E-03	1.145E+03
1.325	5.554E+03	5.327E+00	8.856E-03	5.560E+03
1.359	5.209E+03	5.308E+00	9.218E-03	5.215E+03
1.360	5.351E+03	5.308E+00	9.229E-03	5.337E+03
1.360	5.116E+03	5.238E+00	1.078E-02	5.721E+03
1.360	5.116E+03	5.215E+00	1.06E-02	5.449E+03
1.360	5.443E+03	5.215E+00	1.07E-02	5.309E+03
1.530	5.304E+03	5.215E+00	1.596E-02	5.169E+03
2.000	3.164E+03	4.911E+00	1.596E-02	3.095E+03
3.000	1.091E+03	4.278E+00	2.554E-02	5.080E+03
4.000	5.043E+02	3.344E+00	3.403E-02	2.780E+02
5.000	2.147E+02	3.270E+00	4.159E-02	1.691E+02
6.000	1.662E+02	2.871E+00	4.845E-02	1.674E+01
8.000	7.445E+01	2.230E+00	6.055E-02	4.139E+01
10.000	3.957E+01	1.751E+00	7.082E-02	2.574E+01
11.867	2.423E+01	1.426E+00	7.830E-02	1.758E+02
11.868	1.743E+02	1.426E+00	7.830E-02	9.801E+01
15.000	9.688E+01	1.063E+00	8.983E-02	4.511E+01
20.000	4.529E+01	7.252E-01	1.022E-01	4.511E+01
30.000	1.461E+01	4.109E-01	1.158E-01	1.126E+00
40.000	6.338E+00	3.654E-01	2.211E-01	3.581E+00
50.000	3.271E+00	2.850E-01	2.471E-01	2.155E+00
60.000	1.894E+00	2.350E-01	2.544E-01	1.693E+00
80.000	1.931E-01	8.028E-02	2.391E-01	1.693E+00
100.000	4.036E-01	5.338E-02	1.211E-01	5.338E-01
150.000	1.190E-01	2.488E-02	1.28E-01	1.190E-01
200.000	5.074E-02	1.426E-02	0.495E-01	1.426E-01
300.000	1.582E-02	4.285E-03	9.233E-02	9.233E-02
400.000	7.170E-03	3.625E-03	9.318E-02	9.318E-02
500.000	3.979E-03	2.318E-03	7.616E-02	7.616E-02
600.000	2.501E-03	1.504E-03	1.058E-02	1.058E-02
800.000	1.257E-03	8.919E-04	6.211E-02	6.211E-02
1000.000	7.635E-04	5.583E-04	5.589E-02	5.589E-02

FLUORESCENT ENERGIES

10.543	3.401E+01	1.547E+00	1.305E-02	3.574E+01
11.725	2.508E+01	1.447E+00	1.398E-02	2.661E+01
11.282	1.232E+03	5.350E+00	8.405E-03	1.237E+03
1.317	1.154E+03	5.331E+00	8.771E-03	1.159E+03

53 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR ARSENIC

ATOMIC WEIGHT 74.920 GRAMS / MOLE
DENSITY 5.730 GRAMS / CC
ATOMIC DENSITY 4.605E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.244E+02

L-EDGES AT	1.325	1.360	1.530
L-EDGE JUMPS	1.016	1.410	1.160
L-EDGE FIT JUMPS	1.973	1.636	1.160

K-EDGE AT 11.868 KEV
K-EDGE JUMP 11.195

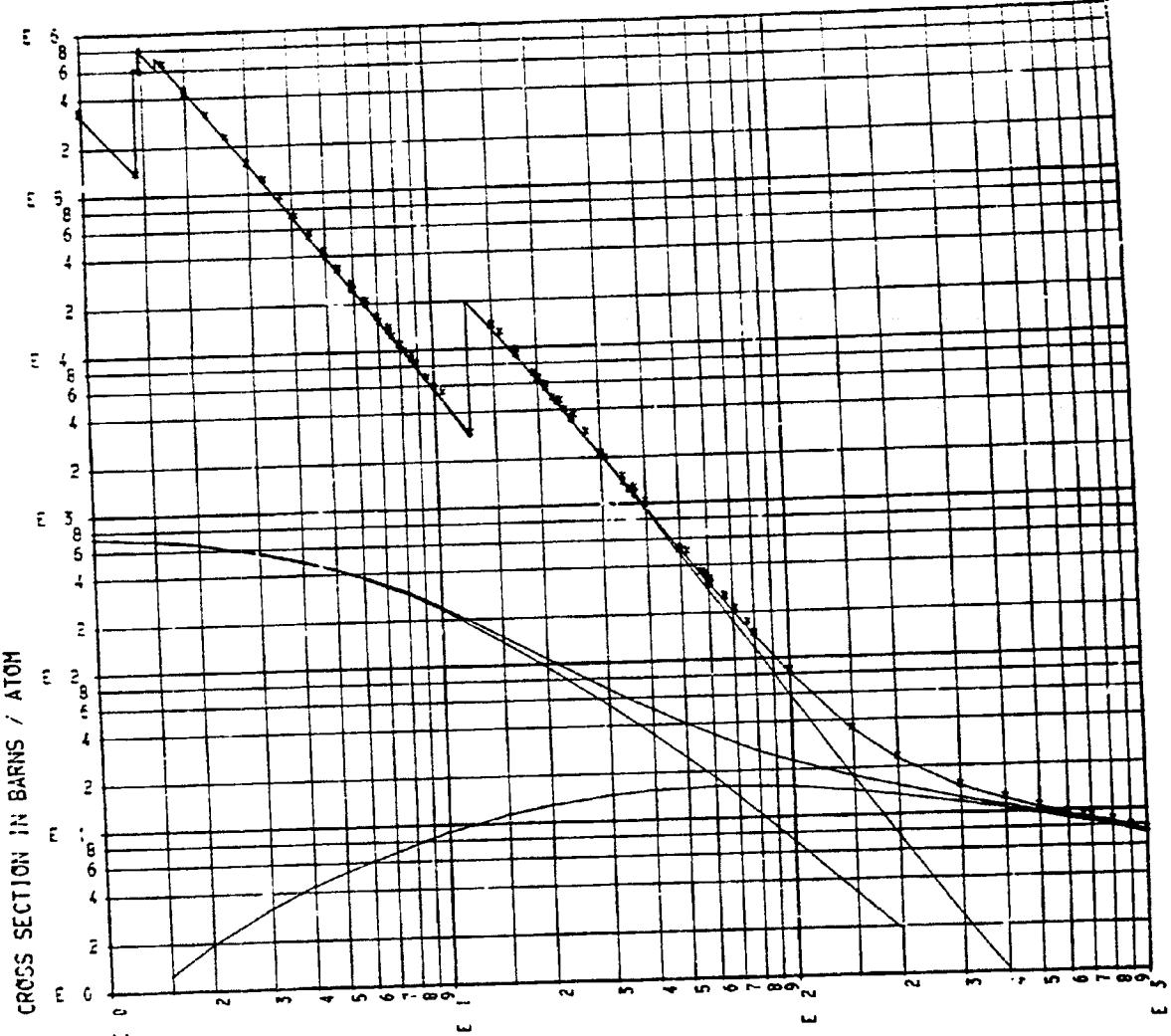
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.25392E+01	1.46431E+01	1.54722E+01
1	0.	-2.41380E+00	1.48397E+00	-1.73613E+00
2	0.	0.	1.96186E-02	-6.50266E-02
3	0.	0.	0.	4.92117E-03

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.39750E+00	-3.39189E-01
1	2.88866E-01	1.62535E+00
2	-3.61747E-01	-2.50783E-01
3	1.88768E-02	9.09103E-03



CROSS SECTION IN BARNS / ATOM

SELENIUM

34

CROSS SECTIONS

CROSS SECTIONS FOR SELENIUM		Z = 34	BARNES / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.204E+05	7.316E+02	6.149E+01	3.211E+05
1.435	1.348E+05	6.972E+02	1.153E+00	1.355E+05
1.436	1.83E+05	6.972E+02	1.154E+00	1.189E+05
1.476	5.777E+05	6.946E+02	1.211E+00	5.784E+05
1.477	1.325E+05	6.945E+02	1.212E+00	1.339E+05
1.500	1.821E+05	6.931E+02	1.249E+00	1.834E+05
1.652	1.585E+05	6.782E+02	1.439E+00	1.655E+05
1.653	1.322E+05	6.781E+02	1.440E+00	1.339E+05
2.000	4.417E+05	6.495E+02	1.912E+00	4.423E+05
3.000	1.553E+05	5.642E+02	3.183E+00	1.558E+05
4.000	1.241E+04	4.911E+02	4.310E+00	1.290E+04
5.000	3.959E+04	4.301E+02	5.298E+00	4.003E+04
6.000	2.399E+04	3.785E+02	6.119E+00	2.437E+04
8.000	1.072E+04	2.962E+02	7.705E+00	1.103E+04
10.000	5.614E+03	2.346E+02	9.078E+00	9.918E+03
12.651	2.864E+03	1.761E+02	1.039E+01	3.051E+03
12.658	1.971E+04	1.761E+02	1.039E+01	1.990E+04
15.000	1.301E+04	1.424E+02	1.45E+01	1.322E+04
20.000	8.275E+03	9.708E+01	3.01E+01	8.385E+03
30.000	2.088E+03	6.499E+01	4.76E+01	3.133E+03
40.000	9.210E+02	3.560E+01	5.58E+01	3.644E+03
50.000	4.804E+02	2.488E+01	5.93E+01	4.406E+03
60.000	2.800E+02	1.832E+01	6.02E+01	3.434E+03
80.000	1.183E+02	1.081E+01	5.85E+01	3.167E+03
100.000	6.042E+01	7.193E+00	5.49E+01	5.565E+03
150.000	1.785E+01	3.358E+00	4.45E+01	3.895E+03
200.000	7.596E+00	1.926E+00	3.43E+01	1.900E+03
300.000	2.350E+00	8.580E-01	1.18E+01	1.220E+03
400.000	1.055E+00	4.890E-01	6.63E+00	1.008E+03
500.000	5.807E-01	3.130E-01	9.750E+00	1.024E+03
600.000	3.628E-01	2.161E-01	9.045E+00	6.427E+02
800.000	1.792E-01	1.213E-01	8.126E+00	1.346E+02
1000.000	1.074E-01	7.680E-02	1.152E+00	1.346E+02

FLUORESCENT ENERGIES				
		2.039E+02	9.695E+00	4.230E+03
11.221	4.062E+03	1.789E+02	1.031E+01	3.163E+03
12.495	2.973E+03	1.789E+02	1.130E+00	3.322E+03
1.419	1.384E+05	6.983E+02	1.078E+00	1.430E+05
1.379	1.483E+05	7.009E+02		

CROSS SECTIONS FOR Selenium		Z = 34	CH**2	SPAX
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.444E+03	5.580E+00	4.690E-03	2.449E+03
1.435	1.028E+03	5.516E+00	8.192E-03	1.033E+03
1.436	4.715E+03	5.518E+00	8.192E-03	4.721E+03
1.437	4.406E+03	5.518E+00	9.233E-03	4.411E+03
1.438	4.202E+03	5.518E+00	9.244E-03	4.202E+03
1.439	4.019E+03	5.518E+00	9.496E-03	4.019E+03
1.440	4.019E+03	5.518E+00	1.098E-02	4.019E+03
1.441	4.019E+03	5.518E+00	1.099E-02	4.019E+03
1.442	4.019E+03	5.518E+00	1.099E-02	4.019E+03
1.443	4.402E+03	5.518E+00	1.099E-02	4.402E+03
2.000	3.569E+03	4.554E+00	4.652E-02	3.574E+03
3.000	1.845E+03	4.303E+00	2.428E-02	1.89E+03
4.000	3.623E+02	5.746E+00	3.287E-02	5.561E+02
5.000	3.020E+02	5.280E+00	4.704E-02	3.053E+02
6.000	1.829E+02	5.887E+00	4.713E-02	1.859E+02
8.000	8.179E+01	5.259E+00	8.777E-02	8.410E+01
10.000	3.228E+01	5.289E+00	9.222E-02	5.13E+00
12.651	2.188E+01	5.343E+00	9.623E-02	3.327E+00
12.652	1.634E+02	3.343E+00	9.923E-02	1.618E+02
15.000	9.967E+01	5.086E+00	9.733E-02	1.008E+02
20.000	4.1786E+01	4.469E-01	9.235E-01	4.810E+01
30.000	1.1593E+01	4.194E-01	1.206E-01	1.645E+01
40.000	3.025E+00	2.316E-01	1.866E-01	3.415E+00
50.000	3.564E+00	1.891E-01	2.155E-01	3.970E+00
60.000	1.556E+00	1.391E-01	2.222E-01	1.398E+00
80.000	9.027E-01	1.247E-02	2.092E-01	1.105E+00
100.000	4.608E-01	2.486E-02	1.917E-01	3.338E-01
150.000	1.561E-01	2.561E-02	1.622E-01	1.720E-01
200.000	5.794E-02	1.469E-02	1.624E-01	1.575E-01
300.000	1.793E-02	6.621E-03	1.624E-01	1.444E-01
400.000	8.051E-03	3.730E-03	1.731E-01	9.309E-02
500.000	4.429E-03	2.391E-03	1.844E-01	1.326E-02
600.000	2.767E-03	1.653E-03	1.894E-01	1.341E-02
800.000	1.557E-03	1.252E-04	1.989E-01	1.427E-02
1000.000	8.195E-04	5.658E-04	2.463E-01	6.603E-02

FLUORESCENT ENERGIES

11.221	3.098E+01	1.555E+00	1.394E-02	3.265E+01
12.495	2.268E+01	1.364E+00	1.865E-02	2.413E+01
1.419	1.055E+03	5.326E+00	8.622E-03	1.051E+03
1.379	1.131E+03	6.346E+00	8.203E-03	1.136E+03

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REVISED 6 03 69

MISCELLANEOUS DATA FOR SELENIUM

ATOMIC WEIGHT 78.960 GRAMS MOLE
DENSITY 4.930 GRAMS CC
ATOMIC DENSITY 3.663E-02 GRAMS CC

CONVERSION CONSTANT IS 1.511E+02

L-EDGES AT 1.436 1.417 1.653
L-EDGE JUMPS 4.989 4.916 4.990
L-EDGE FIT JUMPS 1.622 1.636 1.660

K-EDGE AT 12.658 KEV
K-EDGE JUMP 5.884

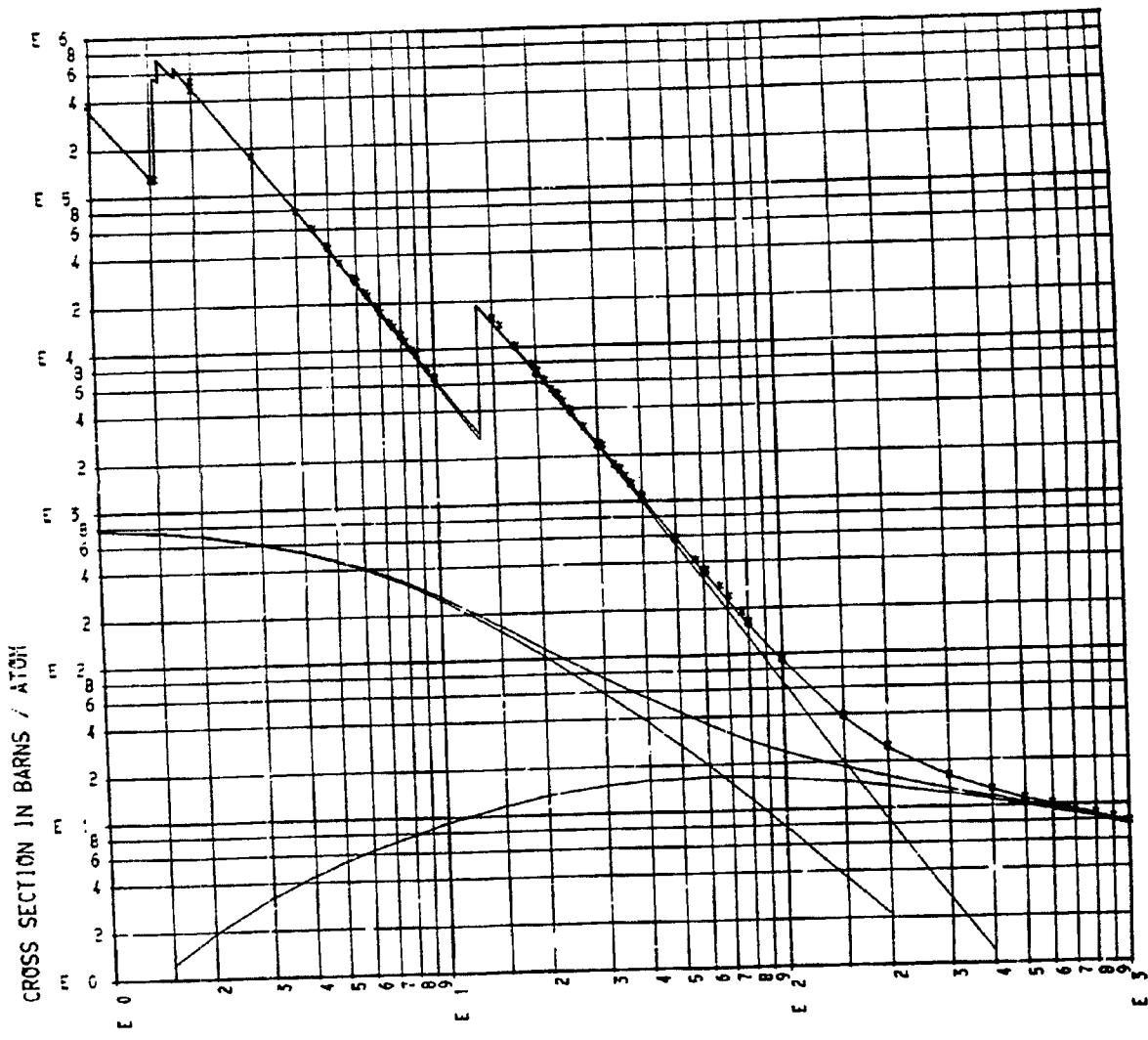
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE UN-LIN FIT

	N	M	C	L	K
0	0.	-1.26773E+01	1.47048E+01	1.30756E+01	
1	0.	-2.39750E+00	-2.38853E+00	-1.85235E+00	
2	0.	0.	-1.05077E-01	-3.94244E-01	
3	0.	0.	0.	5.72230E-02	

COEFFICIENTS OF SCATTERING LN-LIN FIT

	COHERENT	INCOHERENT
0	6.45637E+00	-4.32927E-01
1	2.86737E-01	-1.22833E+00
2	-3.58794E-01	-2.11138E-01
3	1.85618E-02	1.11735E-02



BROMINE

35

CROSS SECTIONS

CROSS SECTIONS FOR BROMINE		Z = 35	BARNES / ATOM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.484E+05	7.767E+02	6.000E-01	5.492E+05
1.500	1.329E+05	1.366E+02	1.332E+00	1.336E+05
1.549	1.231E+05	1.313E+02	1.295E+00	1.238E+05
1.550	5.935E+05	1.512E+02	1.296E+00	6.643E+05
1.595	5.245E+05	1.265E+02	1.254E+00	5.262E+05
1.596	1.304E+05	1.255E+02	1.256E+00	1.391E+05
1.781	9.902E+05	1.088E+02	1.000E+00	9.609E+05
1.782	5.489E+05	1.087E+02	1.005E+00	5.496E+05
2.000	4.840E+05	6.905E+02	5.974E+00	4.847E+05
3.000	1.695E+05	1.986E+02	1.232E+00	1.691E+05
4.000	1.908E+04	1.196E+02	1.144E+00	1.901E+04
5.000	4.332E+04	1.845E+02	1.444E+00	4.378E+04
6.000	1.331E+04	4.005E+02	3.518E+00	1.321E+04
8.000	1.183E+04	3.151E+02	1.698E+00	1.180E+04
10.000	6.301E+03	2.510E+02	2.280E+00	6.300E+03
13.413	1.571E+03	1.478E+02	1.099E+01	1.663E+03
13.474	1.865E+04	1.748E+03	1.039E+01	1.885E+04
15.000	1.435E+04	1.529E+03	1.568E+01	1.434E+04
20.000	6.896E+05	1.047E+02	3.229E+01	6.903E+05
30.000	2.297E+03	5.899E+01	5.010E+01	2.300E+03
40.000	1.016E+03	3.823E+01	3.966E+01	1.013E+03
50.000	5.307E+02	2.674E+01	2.639E+01	5.303E+02
60.000	3.099E+02	1.971E+01	1.644E+01	3.100E+02
80.000	1.314E+02	1.163E+01	1.227E+01	1.313E+02
100.000	6.724E+01	7.335E+00	5.918E+01	6.725E+01
150.000	1.697E+01	3.612E+00	4.866E+01	1.697E+01
200.000	8.530E+00	2.072E+00	3.881E+01	8.531E+00
300.000	2.654E+00	9.340E-01	2.213E+01	2.654E+00
400.000	1.196E+00	5.270E-01	1.097E+01	1.196E+00
500.000	6.599E-01	3.370E-01	1.004E+01	6.599E+00
600.000	4.131E-01	2.333E-01	5.095E+00	4.131E+00
800.000	2.047E-01	1.305E-01	8.327E+00	8.327E+00
1000.000	1.230E-01	8.270E-02	1.372E+00	1.372E+00

FLUORESCENT ENERGIES

11.923	3.802E+03	2.028E+02	1.025E+01	4.022E+03
13.290	2.784E+03	1.778E+02	1.090E+01	2.974E+03
1.480	1.372E+05	1.379E+02	1.203E+00	1.379E+05
1.526	1.276E+05	1.358E+02	1.265E+00	1.293E+05

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REVISED 6/05/69

CROSS SECTIONS FOR BROMINE		Z = 35	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.526E+03	5.853E+00	4.521E-03	2.632E+03
.500	1.001E+03	5.551E+00	9.284E-03	1.001E+03
.549	9.278E+02	5.511E+00	9.756E-03	9.333E+02
.550	4.247E+03	5.510E+00	9.765E-03	4.252E+03
.595	3.953E+03	5.255E+00	1.021E-02	3.958E+03
.595	5.564E+03	5.124E+00	1.021E-02	5.570E+03
.781	4.221E+03	5.341E+00	1.210E-02	4.227E+03
.782	4.890E+03	5.341E+00	1.211E-02	4.895E+03
2.000	3.647E+03	5.120E+00	1.446E-02	3.653E+03
3.000	1.278E+03	4.911E+00	1.436E-02	1.282E+03
4.000	9.959E+02	3.918E+00	3.326E-02	9.999E+02
5.000	3.264E+02	3.425E+00	4.102E-02	3.299E+02
6.000	1.583E+02	3.018E+00	4.786E-02	2.013E+02
8.000	8.917E+01	2.374E+00	6.952E-02	9.161E+01
10.000	4.748E+01	1.891E+00	6.993E-02	4.942E+01
13.473	2.017E+01	1.318E+00	8.282E-02	2.157E+01
13.474	1.406E+02	1.317E+00	8.282E-02	1.420E+02
15.000	1.082E+02	1.152E+00	8.802E-02	1.095E+02
20.000	5.197E+01	1.848E-01	1.001E-01	5.285E+01
30.000	1.731E+01	4.445E-01	1.38E-01	1.787E+01
40.000	1.652E+00	2.881E-01	2.03E-01	8.061E+00
50.000	3.999E+00	2.016E-01	1.23E-01	4.323E+00
60.000	2.335E+00	1.485E-01	1.239E-01	2.607E+00
80.000	9.899E-01	8.760E-02	1.226E-01	1.200E+00
100.000	5.067E-01	9.829E-02	1.199E-01	6.849E-01
150.000	1.505E-01	1.122E-02	1.195E-01	1.845E-01
200.000	6.428E-02	1.561E-02	1.041E-01	1.845E-01
300.000	2.000E-02	1.038E-03	1.147E-02	9.365E-03
400.000	9.014E-03	3.971E-03	8.267E-03	9.365E-03
500.000	4.973E-03	2.140E-03	1.556E-02	8.317E-03
600.000	3.113E-03	1.588E-03	1.015E-02	1.503E-03
800.000	1.543E-03	9.834E-04	6.215E-02	6.528E-03
1000.000	9.267E-04	6.232E-04	9.555E-02	6.710E-03

FLUORESCENT ENERGIES

11.923	2.865E+01	1.528E+00	1.727E-02	3.031E+01
13.290	2.098E+01	1.340E+00	8.219E-02	2.344E+01
14.480	1.034E+03	9.551E+00	9.055E-03	1.040E+03
11.525	9.614E+02	9.530E+00	9.553E-03	9.669E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR BROMINE

ATOMIC WEIGHT 79.920 GRAMS / MOLE
DENSITY 3.120 GRAMS / CC
ATOMIC DENSITY 2.351E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.327E+02

L-EDGES AT 1.550 1.596 1.782
L-EDGE JUMPS 4.577 1.410 1.160
L-EDGE FIT JUMPS 7.486 1.636 1.160

K-EDGE AT 13.474 KEY
K-EDGE JUMP 6.974

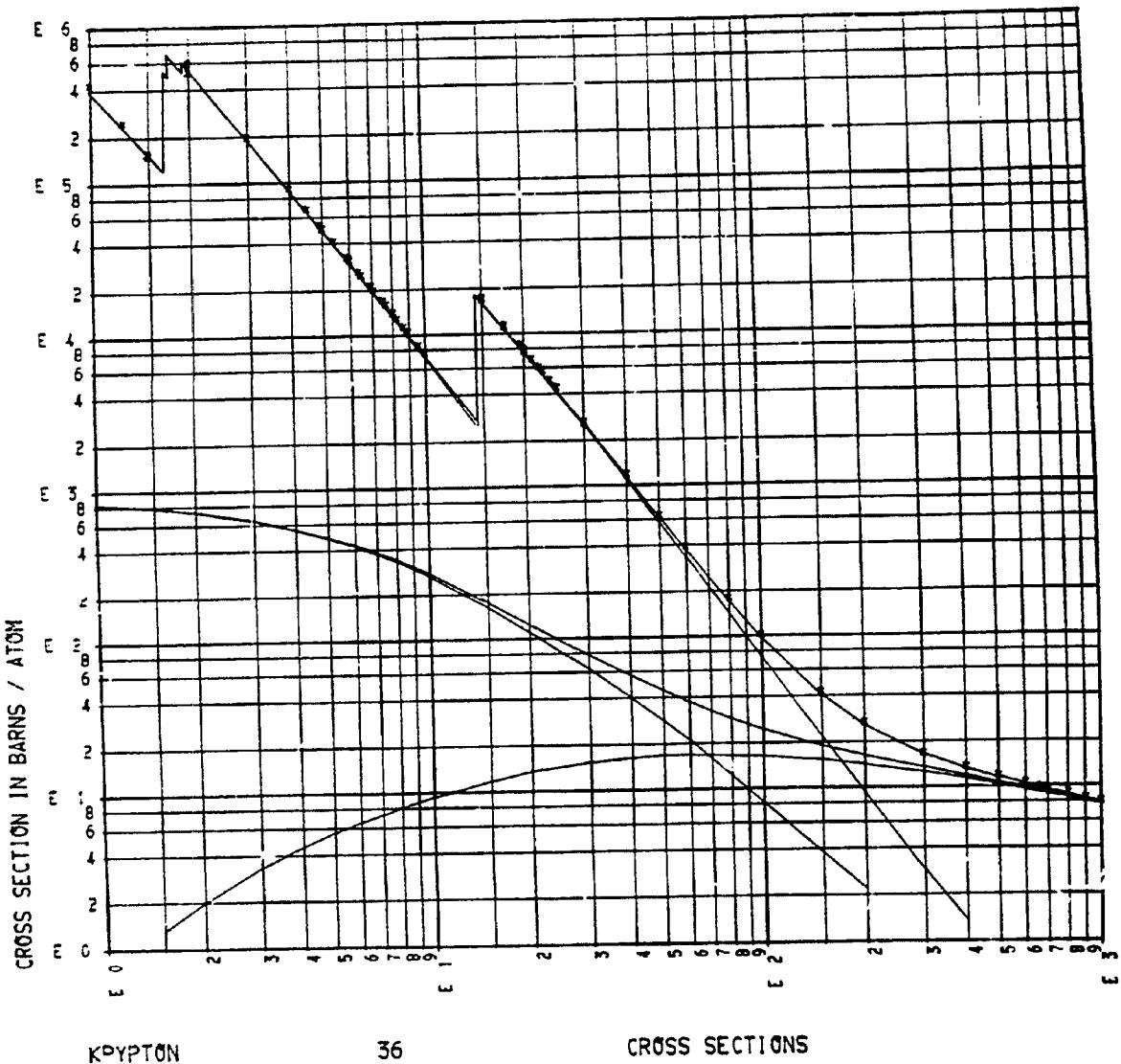
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	L	K
0	0.	1.27612E+01	1.48136E+01	1.32205E+01	
1	0.	-2.37730E+00	-2.42347E+00	-1.37130E+00	
2	0.	0.	9.14590E-02	6.83203E-02	
3	0.	0.	0.	4.95424E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.51444E+00	-4.48001E-01
1	2.86324E-01	1.76682E+00
2	-3.57027E-01	-2.85099E-01
3	1.83557E-02	1.17865E-02



CROSS SECTIONS FOR KRYPTON		Z = 36	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.963E+05	8.234E+02	6.494E-01	3.971E+05
1.500	1.585E+05	7.820E+02	1.292E+00	1.593E+05
1.674	1.237E+05	7.652E+02	1.522E+00	1.244E+05
1.675	5.157E+05	7.631E+02	1.523E+00	5.164E+05
1.725	4.789E+05	7.582E+02	1.591E+00	4.796E+05
1.726	6.142E+05	7.581E+02	1.593E+00	6.150E+05
1.919	5.157E+05	7.405E+02	1.866E+00	5.164E+05
1.920	5.974E+05	7.404E+02	1.868E+00	5.981E+05
2.000	3.385E+05	7.332E+02	1.985E+00	3.392E+05
3.000	1.891E+05	6.355E+02	3.324E+00	1.897E+05
4.000	8.842E+04	5.601E+02	4.544E+00	8.856E+04
5.000	4.855E+04	4.803E+02	5.613E+00	4.904E+04
6.000	2.956E+04	4.232E+02	6.545E+00	2.999E+04
8.000	1.335E+04	3.343E+02	8.114E+00	1.369E+04
10.000	1.132E+03	2.671E+02	9.419E+00	1.409E+05
14.321	2.554E+03	1.736E+02	1.566E+01	2.739E+03
14.322	1.799E+04	1.736E+02	1.57E+01	1.817E+04
15.000	1.603E+04	1.639E+02	1.88E+01	1.620E+04
20.000	1.531E+03	1.115E+02	3.54E+01	1.756E+03
30.000	2.523E+03	6.312E+01	8.42E+01	2.602E+03
40.000	1.112E+03	4.090E+01	1.632E+01	1.170E+03
50.000	5.810E+02	2.861E+01	5.72E+01	6.263E+02
60.000	3.394E+02	2.108E+01	6.84E+01	3.473E+02
80.000	1.441E+02	1.243E+01	1.669E+01	1.733E+02
100.000	1.395E+01	8.269E+00	1.535E+01	1.855E+01
150.000	2.209E+01	3.860E+00	5.255E+01	4.121E+01
200.000	9.491E+00	2.214E+00	4.200E+01	2.590E+01
300.000	2.978E+00	9.980E-01	2.51E+01	1.349E+01
400.000	1.351E+00	5.630E-01	1.28E+01	1.519E+01
500.000	7.490E-01	3.600E-01	1.033E+01	1.145E+01
600.000	4.708E-01	2.493E-01	9.514E+00	1.029E+01
800.000	2.347E-01	1.395E-01	8.426E+00	8.800E+00
1000.000	1.416E-01	8.840E-02	1.582E+00	1.812E+00
FLUORESCENT ENERGIES				
12.648	3.643E+03	2.017E+02	1.077E+01	3.865E+03
14.112	2.664E+03	1.767E+02	1.147E+01	2.853E+03
1.587	1.395E+05	7.723E+02	1.405E+00	1.403E+05
1.638	1.299E+05	7.669E+02	1.473E+00	1.307E+05

CROSS SECTIONS FOR KRYPTON		Z = 36	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.848E+03	5.917E+00	4.667E-03	2.854E+03
1.500	1.139E+03	5.620E+00	9.282E-03	1.145E+03
1.574	8.888E+02	5.485E+00	1.094E-02	8.943E+02
1.675	3.706E+03	5.484E+00	1.095E-02	3.711E+03
1.725	3.441E+03	5.449E+00	1.144E-02	3.447E+03
1.726	4.845E+03	5.448E+00	1.145E-02	4.851E+03
1.919	3.706E+03	5.322E+00	1.341E-02	3.711E+03
1.920	4.293E+03	5.321E+00	1.342E-02	4.299E+03
2.000	3.870E+03	5.273E+00	1.427E-02	3.875E+03
3.000	1.359E+03	4.567E+00	2.389E-02	1.363E+03
4.000	6.355E+02	3.957E+00	3.256E-02	6.359E+02
5.000	3.489E+02	3.452E+00	4.034E-02	3.524E+02
6.000	2.124E+02	3.041E+00	4.704E-02	2.155E+02
8.000	9.592E+01	2.402E+00	5.831E-02	9.838E+01
10.000	5.126E+01	1.924E+00	6.769E-02	5.325E+01
14.321	1.836E+01	1.248E+00	8.311E-02	1.964E+01
14.322	1.293E+02	1.248E+00	8.312E-02	1.306E+02
15.000	1.152E+02	1.178E+00	8.534E-02	1.164E+02
20.000	5.484E+01	8.014E-01	9.729E-02	5.574E+01
30.000	1.813E+01	4.537E-01	1.088E-01	1.870E+01
40.000	7.995E+00	2.939E-01	1.173E-01	8.465E+00
50.000	4.175E+00	2.056E-01	2.022E-01	4.501E+00
60.000	2.439E+00	1.518E-01	2.108E-01	2.712E+00
80.000	1.036E+00	8.934E-02	1.998E-01	1.245E+00
100.000	5.315E-01	5.943E-02	1.044E-01	1.083E-01
150.000	1.588E-01	2.774E-02	1.697E-01	2.952E-01
200.000	6.821E-02	1.591E-02	1.020E-01	1.862E-01
300.000	2.140E-02	1.122E-03	6.994E-02	1.185E-01
400.000	9.709E-03	4.046E-03	9.105E-02	9.481E-02
500.000	3.383E-03	2.587E-03	1.424E-02	8.221E-02
600.000	3.383E-03	1.792E-03	6.880E-02	7.398E-02
800.000	1.686E-03	1.005E-03	6.056E-02	6.325E-02
1000.000	1.017E-03	6.353E-04	5.449E-02	5.673E-02
FLUORESCENT ENERGIES				
12.648	2.618E+01	1.449E+00	1.742E-02	2.778E+01
14.112	1.914E+01	1.279E+00	8.242E-02	2.051E+01
1.587	1.003E+03	5.550E+00	1.010E-02	1.008E+03
1.638	9.335E+02	5.512E+00	1.059E-02	9.391E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR KRYPTON

ATOMIC HEIGHT 83.800 GRAMS / MOLE
DENSITY 3.740E-03 GRAMS / CC
ATOMIC DENSITY 2.688E-05 BUNCHES / CC

CONVERSION CONSTANT IS 1.591E-02

L-EDGES AT	1.675	1.726	1.920
L-EDGE JUMPS	4.170	4.410	4.650
L-EDGE FIT JUMPS	5.820	6.636	7.160

K-EDGE AT 14.322 KEY
K-EDGE JUMP 7.043

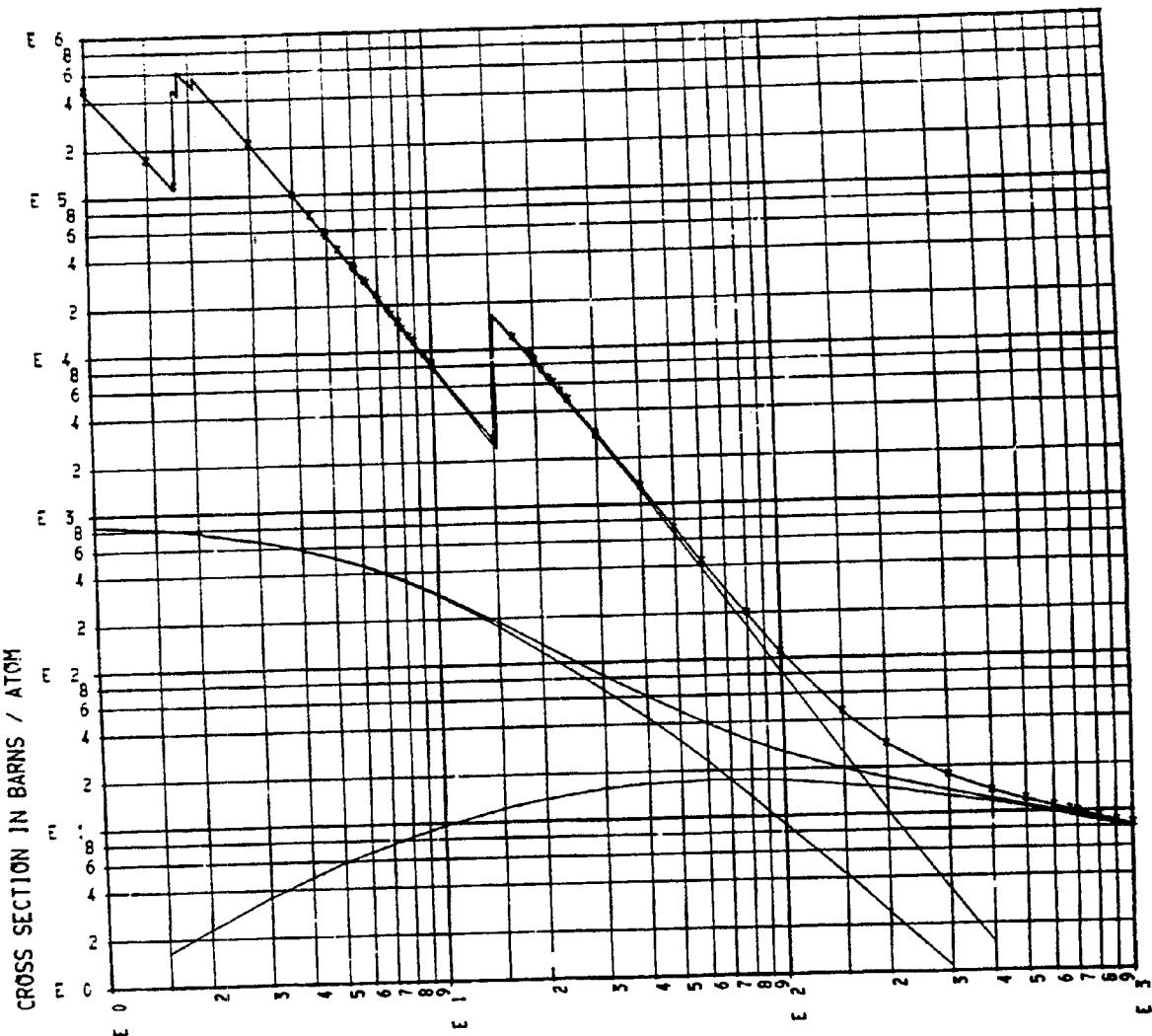
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

N	M	0.288	L	1.920	K	14.322
0	0.	1.26898E+01	1.49190E+01	1.35927E+01	-3.05214E-02	
1	0.	-2.26021E+00	-2.42418E+00	-2.51340E-01		
2	0.	0.	18.76447E-02	4.77616E-02		
3	0.	0.	0.	0.	4.77616E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.57129E+00	-3.91810E-01
1	2.87711E-01	1.7301GE+00
2	-3.56311E-01	-2.76824E-01
3	1.82470E-02	1.11280E-02



RUBIDIUM

37

CROSS SECTIONS

CROSS SECTIONS FOR RUBIDIUM Z = 37 BARNS / ATOM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	4.552E+05	8.558E+02	9.649E-01	4.561E+05
1.500	1.730E+05	8.086E+02	1.620E+00	1.738E+05
1.804	1.113E+05	1.769E+02	2.021E+00	1.121E+05
1.805	4.702E+05	1.768E+02	2.022E+00	4.710E+05
1.862	4.349E+05	1.715E+02	2.099E+00	4.357E+05
1.863	6.125E+05	1.714E+02	2.100E+00	6.132E+05
2.000	5.123E+05	1.598E+02	2.287E+00	5.130E+05
2.064	4.731E+05	1.517E+02	2.368E+00	4.738E+05
2.065	5.481E+05	1.516E+02	2.369E+00	5.488E+05
3.000	2.102E+05	6.634E+02	3.578E+00	2.109E+05
4.000	9.865E+04	5.764E+02	4.773E+00	9.923E+04
5.000	5.427E+04	5.035E+02	5.844E+00	5.478E+04
6.000	3.306E+04	4.439E+02	6.787E+00	3.352E+04
8.000	1.494E+04	3.522E+02	8.368E+00	1.530E+04
10.000	2.975E+03	2.835E+02	9.672E+00	8.269E+03
15.000	2.489E+03	1.749E+02	1.214E+01	2.676E+03
15.199	2.395E+03	1.719E+02	1.221E+01	2.580E+03
15.200	1.641E+04	1.719E+02	1.221E+01	1.660E+04
20.000	8.254E+03	1.189E+02	1.383E+01	8.387E+03
30.000	2.791E+03	6.740E+01	1.576E+01	2.874E+03
40.000	1.243E+03	4.384E+01	1.570E+01	1.304E+03
50.000	6.526E+02	3.078E+01	1.712E+01	1.005E+02
60.000	3.823E+02	2.276E+01	1.726E+01	4.223E+02
80.000	1.527E+02	1.341E+01	1.711E+01	1.932E+02
100.000	8.351E+01	8.931E+00	1.675E+01	1.092E+02
150.000	2.491E+01	4.178E+00	1.561E+01	4.478E+01
200.000	1.058E+01	2.399E+00	1.458E+01	2.766E+01
300.000	3.346E+00	1.082E+00	1.286E+01	1.728E+01
400.000	1.518E+00	5.110E-01	1.199E+01	1.372E+01
500.000	8.433E-01	3.900E-01	1.062E+01	1.188E+01
600.000	5.314E-01	2.699E-01	9.838E+00	1.054E+01
800.000	2.666E-01	1.515E-01	8.659E+00	9.078E+00
1000.000	1.621E-01	9.500E-02	7.793E+00	8.051E+00

FLUORESCENT ENERGIES

13.394	3.446E+03	2.002E+02	1.139E+01	3.667E+03
14.960	2.508E+03	1.755E+02	1.212E+01	2.696E+03
1.694	1.294E+05	1.855E+02	1.874E+00	1.302E+05
1.752	1.194E+05	1.818E+02	1.951E+00	1.202E+05

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REVISED 6/03/69

CROSS SECTIONS FOR RUBIDIUM		Z = 37	CM**2 / GRAM	
KEV	PHOTO	Cohérent	Incohérent	Total
1.000	3.207E+03	6.030E+00	6.798E-03	3.213E+03
1.500	1.219E+03	5.697E+00	1.142E-02	1.224E+03
2.004	1.844E+02	5.473E+00	1.424E-02	1.899E+02
2.505	3.313E+03	5.473E+00	1.425E-02	3.318E+03
3.052	3.064E+03	5.435E+00	1.479E-02	3.070E+03
3.853	4.316E+03	5.435E+00	1.480E-02	4.320E+03
2.000	3.609E+03	5.352E+00	1.511E-02	3.615E+03
2.064	3.333E+03	5.235E+00	1.668E-02	3.338E+03
2.655	3.862E+03	5.235E+00	1.669E-02	3.867E+03
3.000	1.481E+03	4.674E+00	2.521E-02	1.486E+03
4.000	6.951E+02	4.651E+00	3.365E-02	6.992E+02
5.000	3.823E+02	3.547E+00	4.117E-02	3.859E+02
6.000	2.330E+02	3.127E+00	4.782E-02	2.361E+02
8.000	1.052E+02	2.481E+00	5.896E-02	1.078E+02
10.000	5.619E+01	1.993E+00	6.815E-02	5.826E+01
15.000	1.754E+01	1.232E+00	8.551E-02	1.886E+01
15.199	1.688E+01	1.211E+00	8.602E-02	1.817E+01
15.200	1.156E+02	1.211E+00	8.603E-02	1.169E+02
20.000	5.815E+01	8.379E-01	9.742E-02	5.909E+01
30.000	1.966E+01	4.748E-01	1.100E-01	2.025E+01
40.000	8.759E+00	3.089E-01	1.766E-01	9.185E+00
50.000	4.598E+00	2.166E-01	2.065E-01	4.936E+00
60.000	2.693E+00	1.604E-01	2.165E-01	2.975E+00
80.000	1.446E+00	1.442E-02	2.065E-01	1.361E+00
100.000	5.884E-01	9.292E-02	1.808E-01	1.693E-01
150.000	1.735E-01	9.444E-02	1.045E-01	3.153E-01
200.000	7.526E-02	6.901E-02	1.027E-01	1.949E-01
300.000	2.357E-02	1.623E-03	9.658E-02	1.218E-01
400.000	1.070E-02	1.305E-03	1.044E-02	9.665E-02
500.000	5.941E-03	1.481E-03	1.419E-02	8.348E-02
600.000	3.744E-03	1.902E-03	1.931E-02	1.496E-02
800.000	1.879E-03	1.067E-03	1.610E-02	1.390E-02
1000.000	1.142E-03	6.764E-04	6.490E-02	6.572E-02

FLUORESCENT ENERGIES

13.394	2.428E+01	1.410E+00	8.026E-02	2.584E+01
14.960	1.767E+01	1.236E+00	8.539E-02	1.900E+01
1.694	9.115E+02	5.549E+00	1.321E-02	9.132E+02
1.752	8.411E+02	5.508E+00	1.373E-02	8.467E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR RUBIDIUM

ATOMIC WEIGHT 85.480 GRAMS / MOLE
DENSITY 1.532 GRAMS / CC
ATOMIC DENSITY 1.079E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.419E+02

L-EDGES AT 1.805 1.863 2.065
L-EDGE JUMPS 4.223 1.410 1.160
L-EDGE FIT JUMPS 6.908 1.636 1.160

K-EDGE AT 15.200 KEY
K-EDGE JUMP 6.853

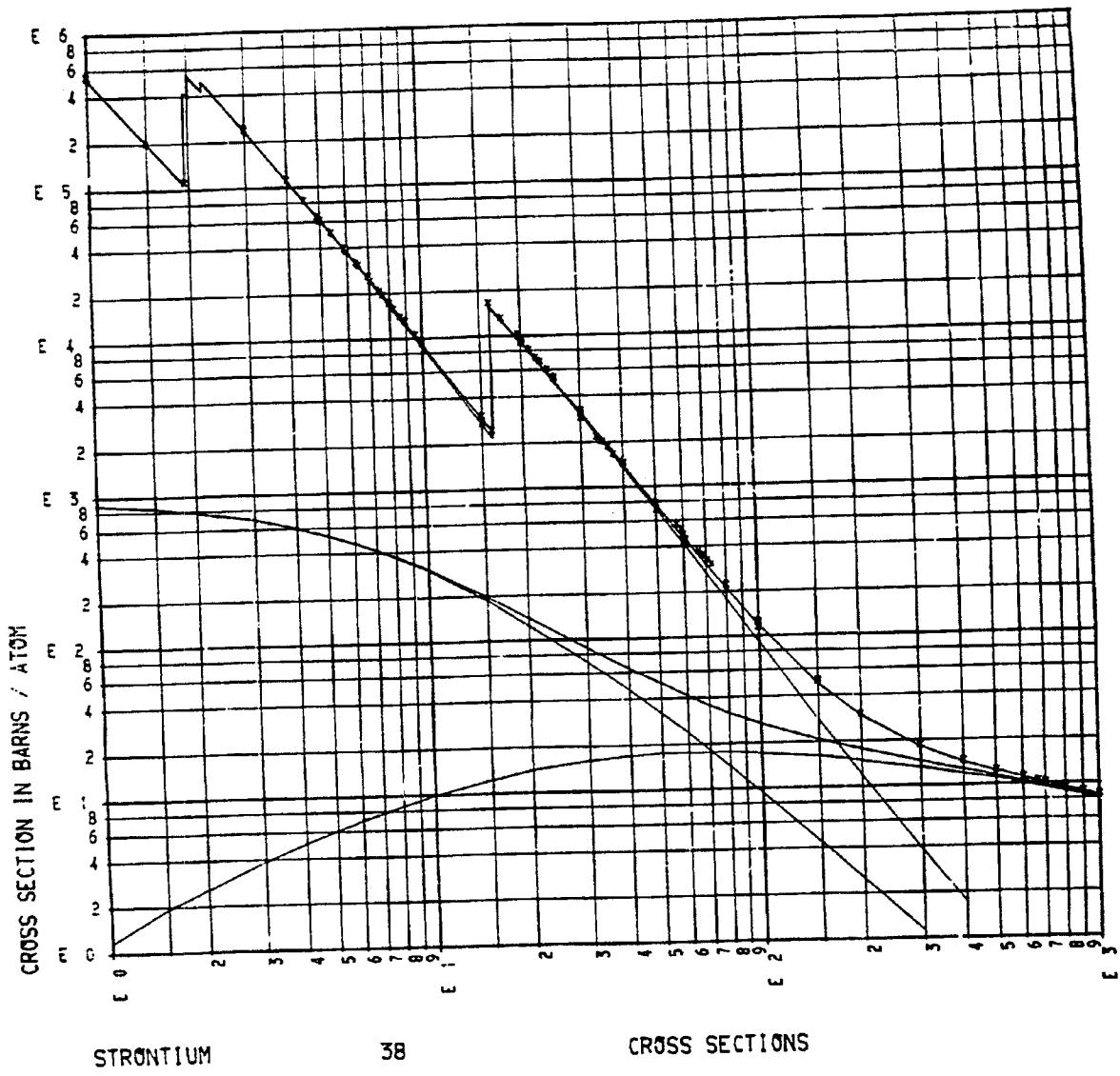
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	Q	L	K
0	0.	1.30285E+01		1.43985E+01	1.30284E+01
1	0.	1.38693E+00		-2.39108E+00	3.82336E-01
2	0.	0.		-9.59473E-02	-1.32427E-01
3	0.	0.		0.	5.29874E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.59750E+00	-1.28039E-01
1	3.02389E-01	1.53044E+00
2	-3.56755E-01	-2.27403E-01
3	1.81706E-02	7.39033E-03



CROSS SECTIONS FOR STRONTIUM		Z = 38	BARNs / ATOM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	5.173E+05	8.964E+02	1.174E+00	5.182E+05
1.500	1.982E+05	8.419E+02	1.917E+00	1.990E+05
1.932	1.079E+05	7.937E+02	2.510E+00	1.087E+05
1.940	4.216E+05	7.937E+02	2.511E+00	4.224E+05
2.000	3.912E+05	7.881E+02	2.593E+00	3.920E+05
2.006	3.884E+05	7.873E+02	2.600E+00	3.892E+05
2.007	5.469E+05	7.872E+02	2.602E+00	5.477E+05
2.215	4.287E+05	7.621E+02	2.867E+00	4.295E+05
2.215	4.967E+05	7.619E+02	2.868E+00	4.975E+05
3.000	2.314E+05	6.893E+02	3.864E+00	2.321E+05
4.000	1.097E+05	6.016E+02	6.033E+00	1.103E+05
5.000	6.057E+04	5.268E+02	6.097E+00	6.110E+04
6.000	3.694E+04	4.648E+02	7.046E+00	3.741E+04
8.000	1.664E+04	3.697E+02	8.640E+00	1.702E+04
10.000	8.840E+03	2.992E+02	9.944E+00	9.149E+03
15.000	2.711E+03	1.861E+02	1.241E+01	2.909E+03
16.104	2.194E+03	1.695E+02	1.281E+01	2.377E+03
16.105	1.548E+04	1.695E+02	1.281E+01	1.567E+04
20.000	8.939E+03	1.256E+02	1.413E+01	9.080E+03
30.000	3.026E+03	1.161E+01	1.610E+01	3.114E+03
40.000	1.355E+03	4.649E+01	1.701E+01	1.419E+03
50.000	1.159E+02	3.252E+01	1.752E+01	1.659E+02
60.000	4.218E+02	2.398E+01	1.767E+01	4.635E+02
80.000	1.814E+02	1.413E+01	1.753E+01	3.151E+02
100.000	9.386E+01	9.400E+00	1.777E+01	1.204E+03
150.000	2.839E+01	4.389E+00	1.607E+01	4.885E+02
200.000	1.227E+01	2.517E+00	1.496E+01	2.975E+02
300.000	3.864E+00	1.135E+00	1.320E+01	1.820E+01
400.000	1.752E+00	6.400E-01	1.190E+01	1.429E+01
500.000	9.687E-01	4.030E-01	1.095E+01	1.228E+01
600.000	6.066E-01	2.830E-01	1.010E+01	1.099E+01
800.000	2.997E-01	1.588E-01	8.893E+00	9.351E+00
1000.000	1.791E-01	1.007E-01	8.003E+00	8.283E+00

FLUORESCENT ENERGIES

14.164	3.204E+03	1.990E+02	1.203E+01	3.421E+03
15.834	2.307E+03	1.733E+02	1.272E+01	2.494E+03
1.806	1.277E+05	8.068E+02	2.329E+00	1.285E+05
1.872	1.173E+05	8.002E+02	2.419E+00	1.181E+05

CROSS SECTIONS FOR STRONTIUM		Z = 38	CM**2 / GRAM	
KEV	PHOTO	Cohérent	Incohérent	Total
1.000	3.556E+03	6.162E+00	8.072E-03	3.562E+03
1.500	1.362E+03	5.787E+00	1.317E-02	1.368E+03
1.939	7.420E+02	5.456E+00	1.725E-02	1.474E+02
1.940	2.898E+03	5.455E+00	1.726E-02	2.903E+03
2.000	2.689E+03	5.417E+00	1.782E-02	2.695E+03
2.005	2.659E+03	5.412E+00	1.787E-02	2.675E+03
2.007	3.759E+03	5.411E+00	1.788E-02	3.765E+03
2.215	2.947E+03	5.238E+00	1.970E-02	2.952E+03
2.216	3.414E+03	5.237E+00	1.971E-02	3.419E+03
3.000	1.591E+03	4.738E+00	2.656E-02	1.596E+03
4.000	7.538E+02	4.135E+00	3.460E-02	7.580E+02
5.000	4.163E+02	3.621E+00	4.191E-02	4.200E+02
6.000	2.539E+02	3.195E+00	4.843E-02	2.572E+02
8.000	1.144E+02	2.541E+00	5.939E-02	1.170E+02
10.000	6.076E+01	2.057E+00	6.835E-02	6.289E+01
15.000	1.863E+01	1.279E+00	8.531E-02	2.600E+01
16.104	1.506E+01	1.165E+00	8.808E-02	1.634E+01
16.105	1.064E+02	1.165E+00	8.808E-02	1.077E+02
20.000	6.144E+01	8.700E-01	9.707E-02	6.241E+01
30.000	2.080E+01	4.922E-01	1.107E-01	2.140E+01
40.000	9.316E+00	3.193E-01	1.173E-01	9.752E+00
50.000	4.921E+00	2.235E-01	1.204E-01	5.265E+00
60.000	2.899E+00	1.648E-01	1.214E-01	3.186E+00
80.000	1.247E+00	9.714E-02	1.205E-01	1.464E+00
100.000	5.451E-01	6.461E-02	1.180E-01	8.278E-01
150.000	1.951E-01	3.017E-02	1.105E-01	3.358E-01
200.000	8.431E-02	1.730E-02	1.029E-01	2.045E-01
300.000	2.656E-02	7.801E-03	9.072E-02	1.251E-01
400.000	1.204E-02	4.399E-03	8.178E-02	9.822E-02
500.000	6.556E-03	2.811E-03	7.492E-02	8.439E-02
600.000	4.169E-03	1.945E-03	6.944E-02	7.556E-02
800.000	2.060E-03	1.092E-03	6.112E-02	6.427E-02
1000.000	1.231E-03	6.922E-04	5.501E-02	5.693E-02

FLUORESCENT ENERGIES

14.164	2.202E+01	1.368E+00	8.268E-02	2.351E+01
15.834	1.586E+01	1.191E+00	8.741E-02	1.714E+01
1.806	8.778E+02	5.545E+00	1.601E-02	8.836E+02
1.872	8.064E+02	5.500E+00	1.662E-02	8.120E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR STRONTIUM

ATOMIC WEIGHT 87.620 GRAMS / MOLE
DENSITY 2.540 GRAMS / CC
ATOMIC DENSITY 1.746E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.455E+02

L-EDGES AT	1.940	2.007	2.216
L-EDGE JUMPS	3.906	4.410	4.460
L-EDGE FIT JUMPS	6.388	6.636	6.660

K-EDGE AT 16.105 KEY
K-EDGE JUMP 7.058

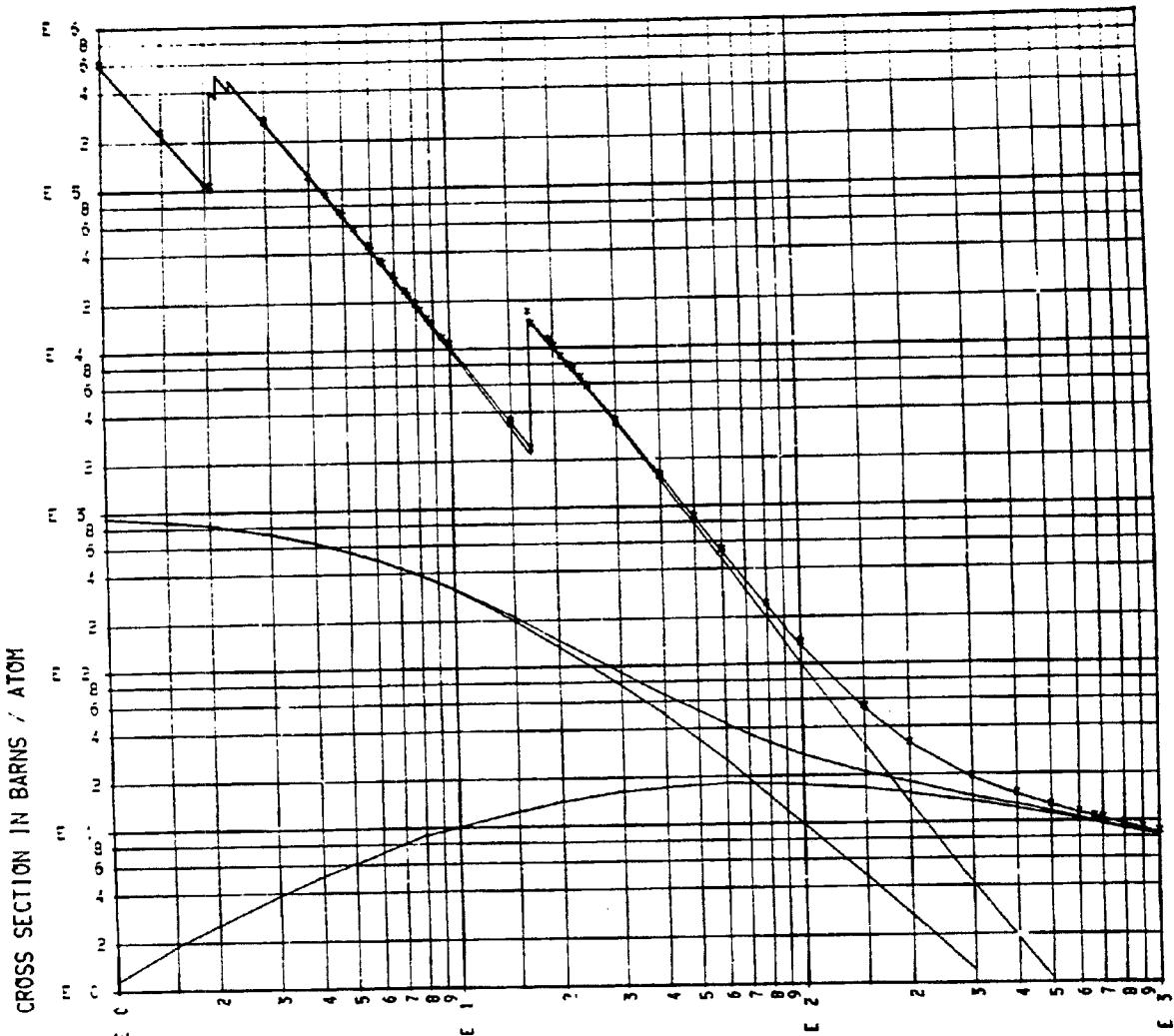
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.358	L	2.216	K	16.105
0	0.		1.31565E+01	1.50114E+01	1.35888E+01		
1	0.		-2.36655E+00	-2.28169E+00	2.20194E-03		
2	0.		0.	-1.26485E-01	-6.39940E-01		
3	0.		0.	0.	4.60070E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	5.62203E+00	7.99161E-02
1	3.24559E-01	1.38397E+00
2	-3.61651E-01	-1.92225E-01
3	1.84800E-02	4.78611E-03



YTTRIUM

39

CROSS SECTIONS

39 - 1

REVISED 6/03/69

CROSS SECTIONS FOR YTTRIUM		Z = 39	BARNs / ATOM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	5.839E+05	9.465E+02	1.148E+00	5.848E+05
1.500	2.178E+05	8.885E+02	1.902E+00	2.187E+05
2.000	1.082E+05	8.298E+02	2.597E+00	1.091E+05
2.079	9.849E+04	8.190E+02	2.700E+00	9.931E+04
2.080	3.975E+05	8.189E+02	2.701E+00	3.983E+05
2.155	3.635E+05	8.092E+02	2.798E+00	3.643E+05
2.156	9.120E+05	8.090E+02	2.800E+00	9.128E+05
2.372	4.020E+05	7.834E+02	3.081E+00	4.028E+05
2.373	4.658E+05	7.833E+02	3.082E+00	4.666E+05
3.000	2.554E+05	7.234E+02	3.897E+00	2.562E+05
4.000	1.206E+05	6.311E+02	5.091E+00	1.212E+05
5.000	6.672E+04	5.526E+02	6.184E+00	6.728E+04
6.000	4.086E+04	4.876E+02	7.169E+00	4.136E+04
8.000	1.863E+04	3.885E+02	9.100E+00	1.903E+04
10.000	1.003E+04	3.156E+02	1.015E+01	1.035E+04
15.000	3.182E+03	1.978E+02	1.267E+01	3.392E+03
17.079	2.190E+03	1.667E+02	1.343E+01	2.370E+03
17.080	1.501E+04	1.667E+02	1.343E+01	1.519E+04
20.000	1.004E+04	1.347E+02	1.441E+01	1.019E+04
30.000	3.399E+03	7.610E+01	1.644E+01	3.491E+03
40.000	1.518E+03	4.933E+01	1.744E+01	1.585E+03
50.000	7.998E+02	3.450E+01	1.791E+01	8.522E+02
60.000	4.701E+02	2.541E+01	1.808E+01	5.138E+02
80.000	2.613E+02	1.498E+01	1.795E+01	2.343E+02
100.000	1.039E+02	9.958E+00	1.759E+01	1.314E+02
150.000	3.127E+01	4.645E+00	1.648E+01	5.240E+01
200.000	1.349E+01	2.564E+00	1.535E+01	3.151E+01
300.000	4.255E+00	1.200E+00	1.357E+01	1.903E+01
400.000	1.937E+00	6.770E-01	1.221E+01	1.482E+01
500.000	1.077E+00	4.330E-01	1.118E+01	1.269E+01
600.000	6.792E-01	3.000E-01	1.037E+01	1.135E+01
800.000	3.394E-01	1.679E-01	9.020E+00	9.527E+00
1000.000	2.054E-01	1.065E-01	8.213E+00	8.525E+00

FLUORESCENT ENERGIES

14.957	3.208E+03	1.985E+02	1.265E+01	3.419E+03
16.736	2.322E+03	1.712E+02	1.331E+01	2.507E+03
1.922	1.192E+05	8.377E+02	2.488E+00	1.201E+05
1.996	1.087E+05	8.302E+02	2.591E+00	1.096E+05

CROSS SECTIONS FOR YTTRIUM Z = 39 CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.955E+03	6.412E+00	7.777E-03	3.962E+03
1.500	1.476E+03	6.019E+00	1.288E-02	1.482E+03
2.000	7.331E+02	5.621E+00	1.759E-02	7.387E+02
2.079	6.672E+02	5.548E+00	1.829E-02	6.727E+02
2.080	2.693E+03	5.547E+00	1.830E-02	2.698E+03
2.155	2.463E+03	5.481E+00	1.896E-02	2.468E+03
2.156	3.468E+03	5.481E+00	1.897E-02	3.474E+03
2.372	2.723E+03	5.307E+00	2.087E-02	2.728E+03
2.373	3.155E+03	5.306E+00	2.088E-02	3.161E+03
3.000	1.730E+03	4.900E+00	2.640E-02	1.735E+03
4.000	8.170E+02	4.275E+00	3.449E-02	8.215E+02
5.000	4.520E+02	3.744E+00	4.189E-02	4.557E+02
6.000	2.768E+02	3.303E+00	4.856E-02	2.802E+02
8.000	1.262E+02	2.632E+00	6.164E-02	1.289E+02
10.000	6.792E+01	2.138E+00	6.876E-02	7.013E+01
15.000	2.155E+01	1.340E+00	8.583E-02	2.298E+01
17.079	1.483E+01	1.129E+00	9.096E-02	1.605E+01
17.080	1.017E+02	1.129E+00	9.096E-02	1.029E+02
20.000	6.805E+01	9.121E-01	9.761E-02	6.905E+01
30.000	2.302E+01	5.155E-01	1.114E-01	2.365E+01
40.000	1.028E+01	3.341E-01	1.814E-01	1.074E+01
50.000	5.418E+00	2.337E-01	1.213E-01	5.773E+00
60.000	3.185E+00	1.722E-01	1.225E-01	3.479E+00
80.000	1.364E+00	1.015E-01	1.216E-01	1.587E+00
100.000	7.035E-01	6.146E-02	1.192E-01	8.902E-01
150.000	2.118E-01	3.147E-02	1.116E-01	3.549E-01
200.000	9.140E-02	1.805E-02	1.040E-01	2.134E-01
300.000	2.883E-02	8.129E-03	9.192E-02	1.289E-01
400.000	1.312E-02	4.586E-03	8.271E-02	1.004E-01
500.000	7.293E-03	2.933E-03	7.573E-02	8.596E-02
600.000	4.594E-03	2.032E-03	7.025E-02	7.687E-02
800.000	2.299E-03	1.137E-03	6.110E-02	5.454E-02
1000.000	1.392E-03	7.214E-04	5.564E-02	5.175E-02

FLUORESCENT ENERGIES

14.957	2.173E+01	1.344E+00	8.569E-02	2.316E+01
16.736	1.573E+01	1.160E+00	9.014E-02	1.698E+01
1.922	8.075E+02	5.675E+00	1.685E-02	8.134E+02
1.995	7.367E+02	5.624E+00	1.755E-02	7.423E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR YTTRIUM

ATOMIC WEIGHT 88.905 GRAMS / MOLE
DENSITY 4.450 GRAMS / CC
ATOMIC DENSITY 3.014E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.476E+02

L-EDGES AT	2.080	2.156	2.373
L-EDGE JUMPS	4.036	4.410	4.160
L-EDGE FIT JUMPS	6.501	6.636	4.160

K-EDGE AT 17.080 KEV
K-EDGE JUMP 5.855

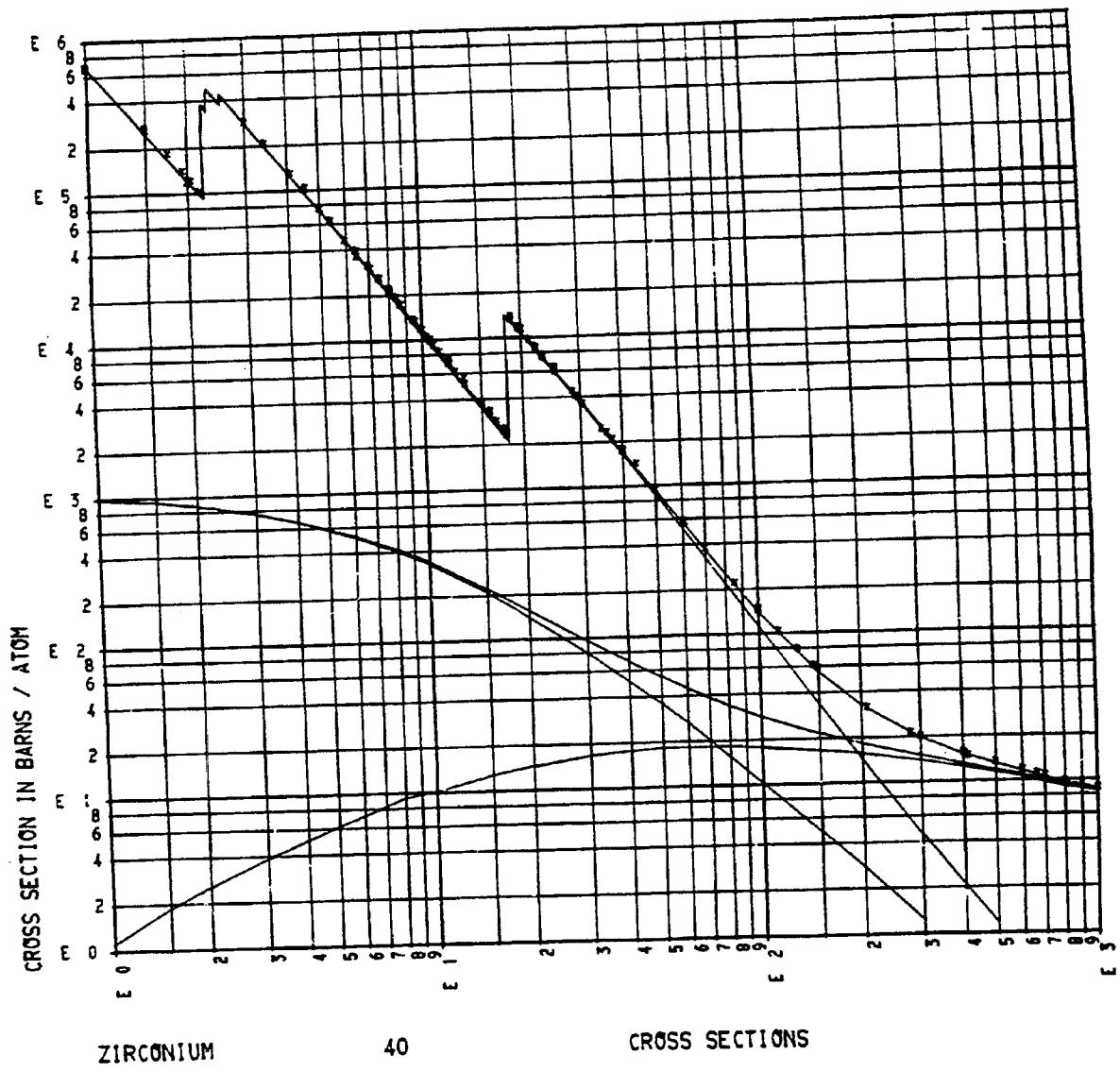
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.395	L	2.373	K	17.080
0	0.		1.32775E+01		1.51822E+01		1.34674E+01
1	0.		-2.43174E+00		-2.38946E+00		-1.91023E-01
2	0.		0.		-8.81174E-02		-6.86616E-01
3	0.		0.		0.		4.97355E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.67096E+00	6.29057E-02
1	3.25075E-01	1.41577E+00
2	-3.60613E-01	-1.99713E-01
3	1.83326E-02	5.33312E-03



CROSS SECTIONS FOR ZIRCONIUM		Z = 40	BARNs / ATOM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	6.944E+05	9.987E+02	1.107E+00	6.954E+05
1.500	2.518E+05	9.383E+02	1.872E+00	2.527E+05
2.000	1.226E+05	8.756E+02	2.585E+00	1.235E+05
2.222	9.420E+04	8.445E+02	2.879E+00	9.505E+04
2.223	3.746E+05	8.443E+02	2.880E+00	3.754E+05
2.306	3.413E+05	8.337E+02	2.991E+00	3.421E+05
2.307	4.807E+05	8.336E+02	2.992E+00	4.815E+05
2.531	3.796E+05	8.073E+02	3.290E+00	3.804E+05
2.532	4.399E+05	8.072E+02	3.291E+00	4.407E+05
3.000	2.844E+05	7.512E+02	3.915E+00	2.852E+05
4.000	1.341E+05	6.632E+02	5.135E+00	1.347E+05
5.000	7.405E+04	5.803E+02	6.257E+00	7.464E+04
6.000	4.529E+04	5.118E+02	7.275E+00	4.581E+04
8.000	2.059E+04	4.080E+02	9.445E+00	2.101E+04
10.000	1.105E+04	3.325E+02	1.035E+01	1.140E+04
15.000	3.489E+03	2.099E+02	1.292E+01	3.712E+03
17.997	2.058E+03	1.551E+02	1.401E+01	2.237E+03
17.998	1.389E+04	1.651E+02	1.401E+01	1.407E+04
20.000	1.059E+04	1.431E+02	1.469E+01	1.085E+04
30.000	3.700E+03	8.078E+01	1.677E+01	3.798E+03
40.000	1.668E+03	5.231E+01	1.781E+01	1.738E+03
50.000	8.822E+02	3.654E+01	1.830E+01	9.370E+02
60.000	5.192E+02	2.689E+01	1.848E+01	5.645E+02
80.000	2.222E+02	1.585E+01	1.837E+01	2.564E+02
100.000	1.144E+02	1.053E+01	1.800E+01	1.429E+02
150.000	3.424E+01	4.908E+00	1.688E+01	5.602E+01
200.000	1.470E+01	2.813E+00	1.573E+01	3.324E+01
300.000	4.611E+00	1.267E+00	1.392E+01	1.980E+01
400.000	2.096E+00	7.150E-01	1.252E+01	1.533E+01
500.000	1.166E+00	4.570E-01	1.147E+01	1.309E+01
600.000	7.361E-01	3.160E-01	1.063E+01	1.168E+01
800.000	3.710E-01	1.772E-01	9.207E+00	9.755E+00
000.000	2.267E-01	1.124E-01	8.423E+00	8.762E+00

FLUORESCENT ENERGIES

15.774	3.016E+03	1.965E+02	1.321E+01	3.227E+03
17.666	2.172E+03	1.692E+02	1.390E+01	2.356E+03
2.042	1.164E+05	8.694E+02	2.641E+00	1.173E+05
2.124	1.055E+05	8.577E+02	2.749E+00	1.063E+05

CROSS SECTIONS FOR ZIRCONIUM Z = 40 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	4.585E+03	6.593E+00	1.309E-03	4.591E+03
1.500	1.662E+03	6.195E+00	1.236E-02	1.669E+03
2.000	8.094E+02	5.781E+00	1.707E-02	8.151E+02
2.222	6.220E+02	5.575E+00	1.901E-02	6.276E+02
2.223	2.473E+03	5.574E+00	1.902E-02	2.478E+03
2.306	2.253E+03	5.504E+00	1.974E-02	2.259E+03
2.307	3.174E+03	5.504E+00	1.975E-02	3.179E+03
2.531	2.506E+03	5.330E+00	2.172E-02	2.512E+03
2.532	2.904E+03	5.330E+00	2.173E-02	2.910E+03
3.000	1.878E+03	5.026E+00	2.585E-02	1.885E+03
4.000	8.852E+02	4.378E+00	3.390E-02	8.896E+02
5.000	4.889E+02	3.931E+00	4.131E-02	4.928E+02
6.000	2.990E+02	3.379E+00	4.803E-02	3.024E+02
8.000	1.359E+02	2.693E+00	6.235E-02	1.387E+02
10.000	1.298E+01	2.195E+00	6.833E-02	1.525E+01
15.000	2.304E+01	1.386E+00	8.530E-02	2.451E+01
17.997	1.359E+01	1.090E+00	9.252E-02	1.477E+01
17.998	9.170E+01	1.090E+00	9.253E-02	9.289E+01
20.000	7.059E+01	9.446E-01	9.699E-02	1.163E+01
30.000	2.443E+01	5.333E-01	1.107E-01	2.507E+01
40.000	1.101E+01	3.453E-01	1.176E-01	1.148E+01
50.000	5.824E+00	2.412E-01	1.208E-01	6.198E+00
60.000	3.428E+00	1.775E-01	1.220E-01	3.727E+00
80.000	1.467E+00	1.046E-01	1.213E-01	1.693E+00
100.000	7.552E-01	6.953E-02	1.188E-01	9.436E-01
150.000	2.260E-01	3.240E-02	1.114E-01	3.599E-01
200.000	9.705E-02	1.857E-02	1.039E-01	2.195E-01
300.000	3.045E-02	8.365E-03	9.190E-02	1.307E-01
400.000	1.384E-02	4.721E-03	8.266E-02	1.012E-01
500.000	7.697E-03	3.017E-03	7.573E-02	8.644E-02
600.000	4.860E-03	2.086E-03	7.018E-02	7.713E-02
800.000	2.450E-03	1.170E-03	6.019E-02	6.441E-02
1000.000	1.497E-03	7.421E-04	5.561E-02	5.785E-02

FLUORESCENT ENERGIES

15.774	1.991E+01	1.297E+00	8.724E-02	2.131E+01
17.666	1.434E+01	1.111E+00	9.170E-02	1.555E+01
2.042	7.683E+02	5.740E+00	1.743E-02	7.741E+02
2.124	6.963E+02	5.663E+00	1.815E-02	7.020E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR ZIRCONIUM

ATOMIC WEIGHT 91.220 GRAMS / MOLE
DENSITY 6.530 GRAMS / CC
ATOMIC DENSITY 4.311E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.615E+02

L-EDGES AT	2.223	2.387	2.532
L-EDGE JUMPS	3.976	1.410	1.160
L-EDGE FIT JUMPS	6.503	1.636	1.160

K-EDGE AT 17.998 KEV
K-EDGE JUMP 6.750

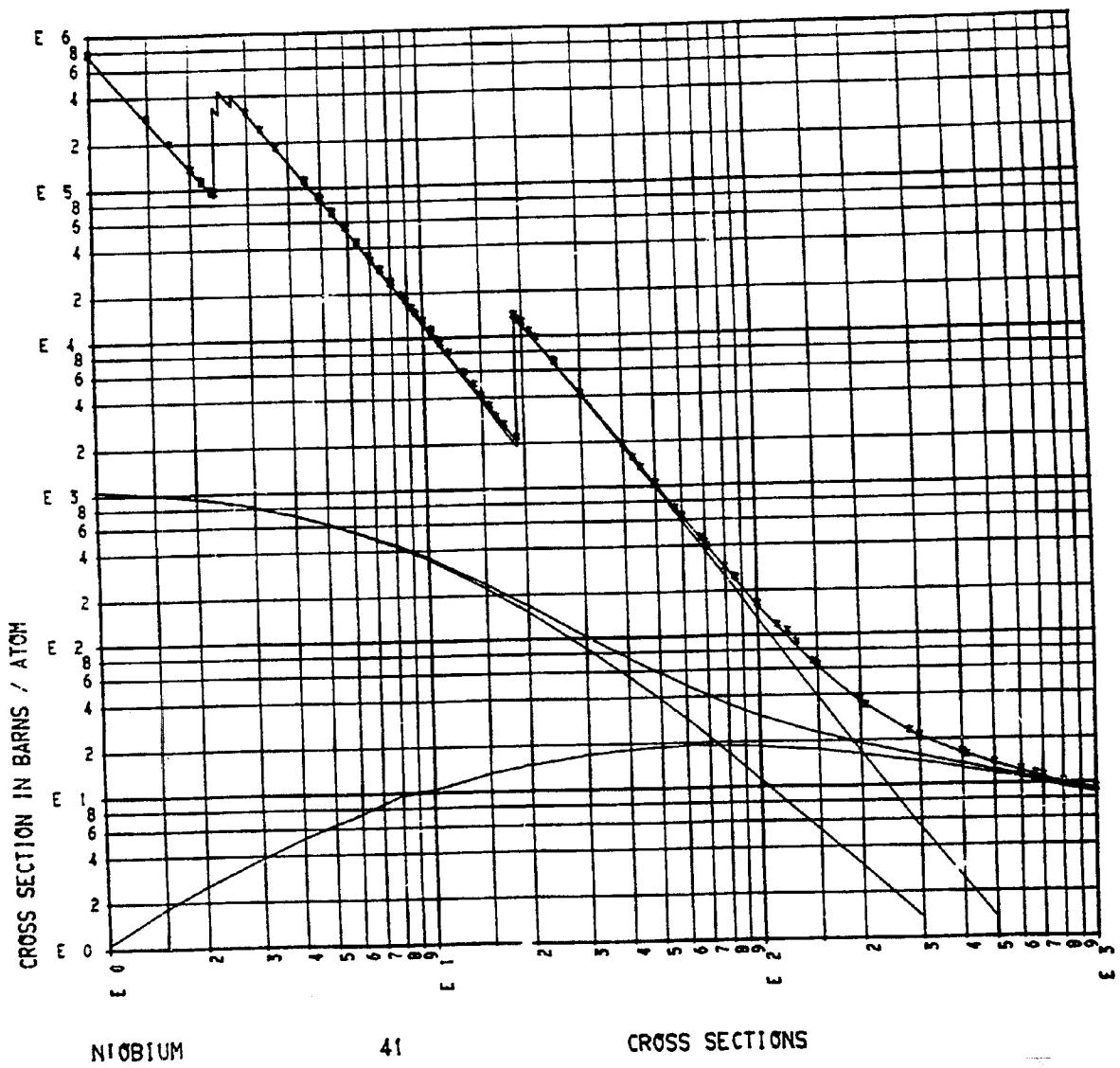
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.34508E+01	1.52906E+01	1.27538E+01
1	0.	-2.50201E+00	-2.38703E+00	6.97409E-01
2	0.	0.	-9.12292E-02	-7.89307E-01
3	0.	0.	0.	5.64531E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.72275E+00	3.66697E-02
1	3.23964E-01	1.45207E+00
2	-3.59463E-01	-2.08122E-01
3	1.81890E-02	5.95139E-03



CROSS SECTIONS FOR NICKEL		Z = 41	BARNs / ATOM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
.000	7.617E+05	1.057E+03	1.054E+00	7.628E+05
1.500	2.763E+05	9.976E+02	1.825E+00	2.773E+05
2.000	1.345E+05	9.331E+02	2.556E+00	1.355E+05
2.370	8.799E+04	8.795E+02	3.056E+00	8.887E+04
2.371	3.321E+05	8.794E+02	3.057E+00	3.330E+05
2.464	3.023E+05	8.675E+02	3.183E+00	3.032E+05
2.465	4.258E+05	8.675E+02	3.185E+00	4.267E+05
2.697	3.412E+05	8.406E+02	3.501E+00	3.421E+05
2.698	3.954E+05	8.405E+02	3.502E+00	3.963E+05
3.000	3.037E+05	8.098E+02	3.916E+00	3.045E+05
4.000	1.461E+05	7.026E+02	5.166E+00	1.468E+05
5.000	8.158E+04	6.126E+02	6.316E+00	8.220E+04
6.000	5.015E+04	5.390E+02	7.365E+00	5.070E+04
8.000	2.285E+04	4.293E+02	9.671E+00	2.329E+04
10.000	1.223E+04	3.505E+02	1.054E+01	1.259E+04
15.000	3.792E+03	2.228E+02	1.317E+01	4.028E+03
18.985	1.881E+03	1.632E+02	1.463E+01	2.059E+03
18.986	1.340E+04	1.632E+02	1.464E+01	1.358E+04
20.000	1.176E+04	1.521E+02	1.498E+01	1.193E+04
30.000	4.072E+03	8.582E+01	7.10E+01	4.175E+03
40.000	1.845E+03	5.563E+01	8.17E+01	1.919E+03
50.000	9.816E+02	3.888E+01	8.69E+01	1.039E+03
60.000	5.810E+02	2.862E+01	8.88E+01	6.285E+02
80.000	2.511E+02	1.687E+01	1.878E+01	2.868E+02
100.000	1.303E+02	1.121E+01	1.842E+01	1.599E+02
150.000	3.947E+01	5.227E+00	1.729E+01	6.199E+01
200.000	1.705E+01	2.996E+00	1.611E+01	3.616E+01
300.000	5.362E+00	1.350E+00	1.427E+01	2.098E+01
400.000	2.426E+00	7.610E-01	1.283E+01	1.602E+01
500.000	1.340E+00	4.870E-01	1.175E+01	1.358E+01
600.000	8.380E-01	3.370E-01	1.090E+01	1.208E+01
800.000	4.136E-01	1.887E-01	9.413E+00	1.002E+01
1000.000	2.471E-01	1.197E-01	8.633E+00	9.060E+00

FLUORESCENT ENERGIES

16.614	2.798E+03	1.947E+02	1.379E+01	3.011E+03
18.621	1.992E+03	1.674E+02	1.451E+01	2.176E+03
2.166	1.102E+05	9.075E+02	2.780E+00	1.111E+05
2.257	9.943E+04	8.946E+02	2.903E+00	1.003E+05

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REVISED 6/03/69

CROSS SECTIONS FOR NIOBIUM Z = 41 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	4.938E+03	6.850E+00	6.832E-03	4.945E+03
1.500	1.791E+03	6.467E+00	1.183E-02	1.791E+03
2.000	8.721E+02	6.049E+00	1.657E-02	8.782E+02
2.370	5.704E+02	5.701E+00	1.981E-02	5.761E+02
2.371	2.153E+03	5.700E+00	1.982E-02	2.158E+03
2.464	1.960E+03	5.624E+00	2.064E-02	1.965E+03
2.465	2.760E+03	5.624E+00	2.055E-02	2.766E+03
2.691	2.212E+03	5.449E+00	2.269E-02	2.217E+03
2.698	2.563E+03	5.449E+00	2.270E-02	2.569E+03
3.000	1.969E+03	5.250E+00	2.539E-02	1.974E+03
4.000	9.473E+02	4.554E+00	3.349E-02	9.519E+02
5.000	5.288E+02	3.971E+00	4.094E-02	5.328E+02
6.000	3.251E+02	3.494E+00	4.774E-02	3.287E+02
8.000	1.481E+02	2.783E+00	6.269E-02	1.510E+02
10.000	7.928E+01	2.272E+00	8.832E-02	8.162E+01
15.000	2.458E+01	1.444E+00	8.537E-02	2.611E+01
18.985	1.219E+01	1.058E+00	9.487E-02	1.335E+01
18.986	8.687E+01	1.058E+00	9.487E-02	8.802E+01
20.000	1.624E+01	9.858E-01	9.711E-02	1.732E+01
30.000	2.640E+01	5.563E-01	1.08E-01	2.706E+01
40.000	1.795E+01	3.606E-01	1.178E-01	1.244E+01
50.000	6.363E+00	2.520E-01	1.212E-01	6.736E+00
60.000	3.766E+00	1.856E-01	1.224E-01	4.074E+00
80.000	1.628E+00	1.094E-01	1.217E-01	1.859E+00
100.000	8.445E-01	7.269E-02	1.194E-01	1.037E+00
150.000	2.559E-01	3.388E-02	1.121E-01	4.018E-01
200.000	1.105E-01	1.942E-02	1.044E-01	2.344E-01
300.000	3.476E-02	8.751E-03	9.250E-02	1.360E-01
400.000	1.573E-02	4.933E-03	8.317E-02	1.038E-01
500.000	8.684E-03	3.157E-03	7.617E-02	8.801E-02
600.000	5.432E-03	2.185E-03	7.066E-02	7.827E-02
800.000	2.681E-03	1.223E-03	6.102E-02	6.492E-02
1000.000	1.602E-03	7.759E-04	5.596E-02	5.834E-02

FLUORESCENT ENERGIES

16.614	1.815E+01	1.262E+00	8.937E-02	1.952E+01
18.621	1.292E+01	1.085E+00	9.405E-02	1.410E+01
2.166	7.144E+02	5.883E+00	1.802E-02	1.204E+02
2.257	6.445E+02	5.799E+00	1.882E-02	6.504E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR NICKELUM

ATOMIC WEIGHT 92.906 GRAMS / MOLE
DENSITY 8.570 GRAMS / CC
ATOMIC DENSITY 5.555E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.543E+02

L-EDGES AT	2.371	2.465	2.698
L-EDGE JUMPS	3.772	4.10	4.160
L-EDGE FIT JUMPS	6.173	6.636	6.660

K-EDGE AT 18.986 KEY
K-EDGE JUMP 7.126

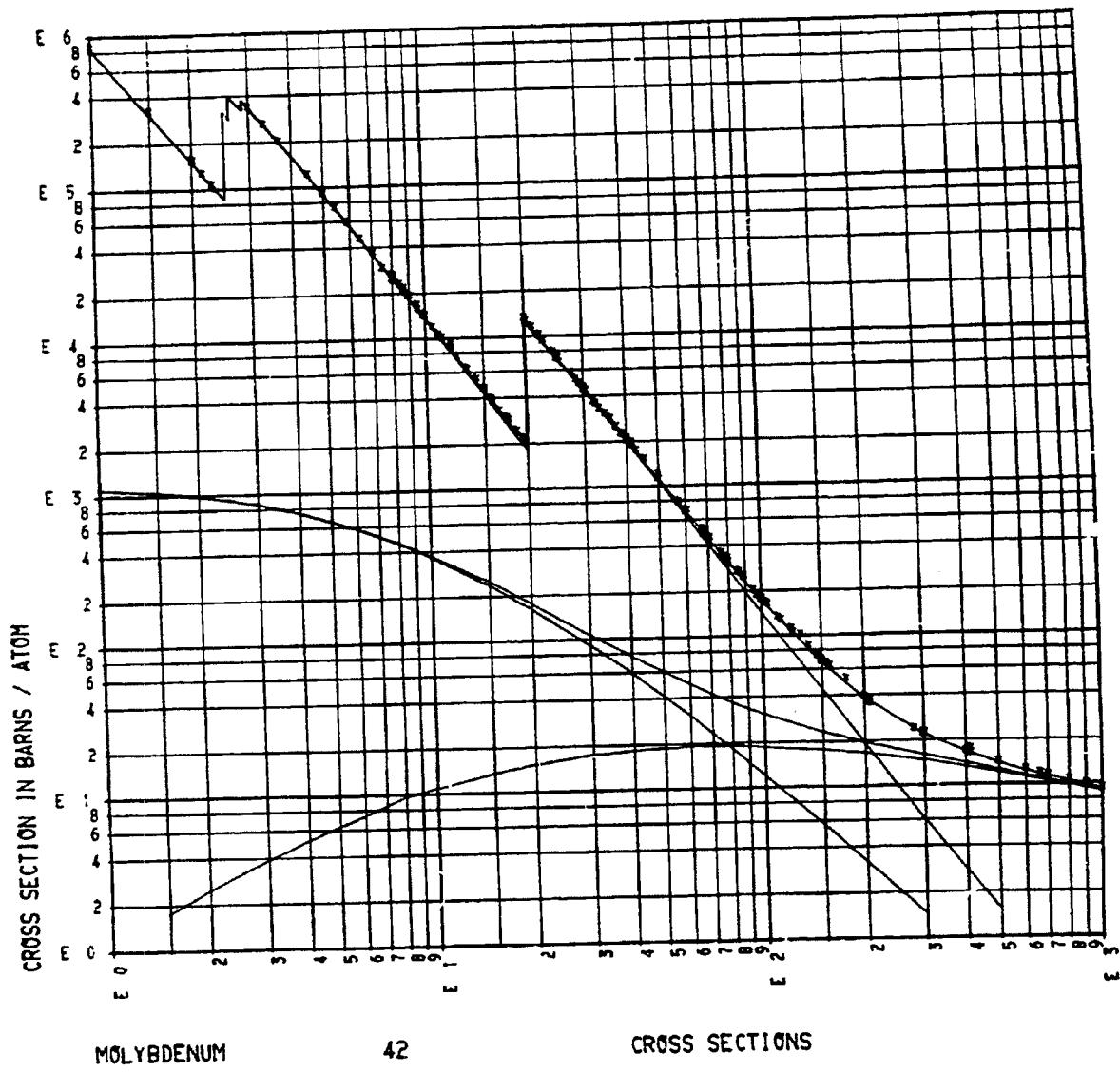
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	O	P	Q	R	S
0	0.		1.35434E+01	1.52088E+01	1.33843E+01		
1	0.		-2.50135E+00	-2.26278E+00	-2.81038E-01		
2	0.		0.	1.36759E-01	-6.86601E-01		
3	0.		0.	0.	4.36601E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.79013E+00	2.02289E-04
1	3.11282E-01	1.49347E+00
2	-3.55233E-01	-2.17419E-01
3	1.78231E-02	6.62245E-03



CROSS SECTIONS FOR MOLYBDENUM Z = 42 BARNS / ATOM

KEV	PHOTO	COPHERENT	INCOHERENT	TOTAL
1.000	8.533E+05	1.111E+03	9.916E-01	8.544E+05
1.500	3.116E+05	1.051E+03	3.766E+00	3.126E+05
2.000	1.524E+05	9.843E+02	3.511E+00	1.534E+05
2.519	8.592E+04	9.084E+02	3.221E+00	8.683E+04
2.520	3.158E+05	9.083E+02	3.239E+00	3.167E+05
2.624	2.856E+05	8.955E+02	3.374E+00	2.865E+05
2.625	4.023E+05	8.954E+02	3.375E+00	4.032E+05
2.865	3.232E+05	8.585E+02	3.113E+00	3.240E+05
2.866	3.245E+05	8.584E+02	3.114E+00	3.254E+05
3.000	3.538E+05	8.540E+02	3.094E+00	3.547E+05
4.000	1.600E+05	1.400E+03	1.835E+00	1.601E+05
5.000	8.923E+04	6.445E+02	3.61E+00	8.988E+04
6.000	5.490E+02	9.663E+02	4.395E+00	5.491E+02
8.000	2.811E+04	4.505E+02	1.19E+00	3.889E+04
10.000	1.351E+04	3.683E+02	1.04E+01	1.389E+04
15.000	4.250E+03	2.359E+02	3.585E+01	4.499E+03
19.998	1.828E+03	1.612E+02	5.362E+01	2.005E+03
19.999	1.274E+04	1.612E+02	5.362E+01	1.281E+04
20.000	1.274E+04	1.612E+02	5.362E+01	1.280E+04
30.000	4.413E+03	1.13E+02	3.48E+01	4.522E+03
40.000	2.010E+03	9.92E+01	85.7E+01	2.088E+03
50.000	1.077E+03	4.47E+02	9.10E+01	1.134E+03
60.000	6.414E+02	3.657E+02	9.30E+01	6.412E+02
80.000	2.805E+02	1.863E+02	9.23E+01	3.117E+02
100.000	1.469E+02	1.198E+02	8.84E+01	1.557E+02
150.000	4.529E+01	6.592E+02	1.69E+02	6.858E+01
200.000	1.978E+01	3.207E+02	6.45E+02	3.948E+01
300.000	6.290E+00	1.445E+02	4.57E+02	2.230E+01
400.000	2.857E+00	8.150E+01	3.45E+02	1.801E+01
500.000	1.577E+00	5.222E+01	2.04E+02	1.474E+01
600.000	9.841E-01	3.51CE-01	1.16E+01	1.070E+01
800.000	4.813E-01	2.019E-01	9.825E+00	5.601E+00
1000.000	2.842E-01	1.282E-01	8.843E+00	9.255E+00

FLUORESCENT ENERGIES

17.478	2.714E+03	1.927E+02	1.450E+01	2.928E+03
19.607	1.937E+03	1.655E+02	1.523E+01	2.119E+03
2.283	1.085E+05	9.386E+02	2.914E+00	1.095E+05
2.395	9.740E+04	9.245E+02	3.055E+00	9.835E+04

CROSS SECTIONS FOR MOLYBDENUM		Z = 42	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.356E+03	6.976E+00	6.224E-03	5.363E+03
1.500	1.956E+03	6.595E+00	1.108E-02	1.962E+03
2.000	9.568E+02	6.178E+00	1.576E-02	9.630E+02
2.519	5.393E+02	5.702E+00	2.026E-02	5.456E+02
2.520	5.982E+03	5.701E+00	2.027E-02	5.988E+03
2.624	1.792E+03	8.621E+00	3.118E-02	1.798E+03
2.625	2.525E+03	8.620E+00	3.119E-02	2.531E+03
2.865	2.028E+03	3.451E+00	2.331E-02	2.034E+03
2.866	2.351E+03	3.451E+00	2.331E-02	2.356E+03
3.000	2.095E+03	5.364E+00	2.456E-02	2.101E+03
4.000	1.004E+03	4.645E+00	3.553E-02	1.009E+03
5.000	5.601E+02	4.645E+00	3.992E-02	5.642E+02
6.000	3.446E+02	3.557E+00	4.669E-02	3.482E+02
8.000	1.576E+02	2.828E+00	6.138E-02	1.605E+02
10.000	8.479E+01	2.312E+00	8.927E-02	8.417E+01
15.000	2.657E+01	1.481E+00	8.524E-02	2.824E+01
19.998	1.148E+01	1.012E+00	9.640E-02	1.258E+01
19.999	7.995E+00	1.012E+00	9.640E-02	8.105E+00
20.000	7.994E+00	1.012E+00	9.640E-02	8.105E+00
30.000	2.769E+01	5.720E-01	1.097E-01	3.838E+01
40.000	1.262E+01	3.716E-01	1.097E-01	1.311E+01
50.000	6.757E+00	2.603E-01	1.199E-01	1.377E+00
60.000	4.026E+00	1.919E-01	2.122E-01	4.339E+00
80.000	1.760E+00	1.131E-01	2.055E-01	1.994E+00
100.000	9.220E-01	7.523E-02	1.182E-01	1.116E+00
150.000	2.843E-01	3.511E-02	1.110E-01	2.304E-01
200.000	1.242E-01	2.013E-02	1.035E-01	2.473E-01
300.000	3.948E-02	9.070E-03	9.142E-02	1.400E-01
400.000	1.793E-02	5.116E-03	8.246E-02	1.059E-01
500.000	9.900E-03	3.275E-03	7.555E-02	8.874E-02
600.000	6.177E-03	2.266E-03	7.005E-02	8.849E-02
800.000	3.021E-03	1.257E-03	6.157E-02	6.595E-02
1000.000	1.784E-03	8.047E-04	6.550E-02	6.809E-02

FLUORESCENT ENERGIES				
17.478	1.703E+01	1.209E+00	9.100E-02	1.838E+01
19.607	1.216E+01	1.039E+00	9.559E-02	1.330E+01
2.293	6.812E+02	5.891E+00	1.829E-02	6.873E+02
2.395	6.114E+02	5.803E+00	1.917E-02	6.173E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR MOLYBDENUM

ATOMIC WEIGHT 95.950 GRAMS / MOLE
DENSITY 10.220 GRAMS / CC
ATOMIC DENSITY 6.415E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.693E+02

L-EDGES AT	2.520	2.625	2.866
L-EDGE JUMPS	3.675	1.410	1.160
L-EDGE FIT JUMPS	6.011	1.636	1.160

K-EDGE AT 19.999 KEV
K-EDGE JUMP 6.968

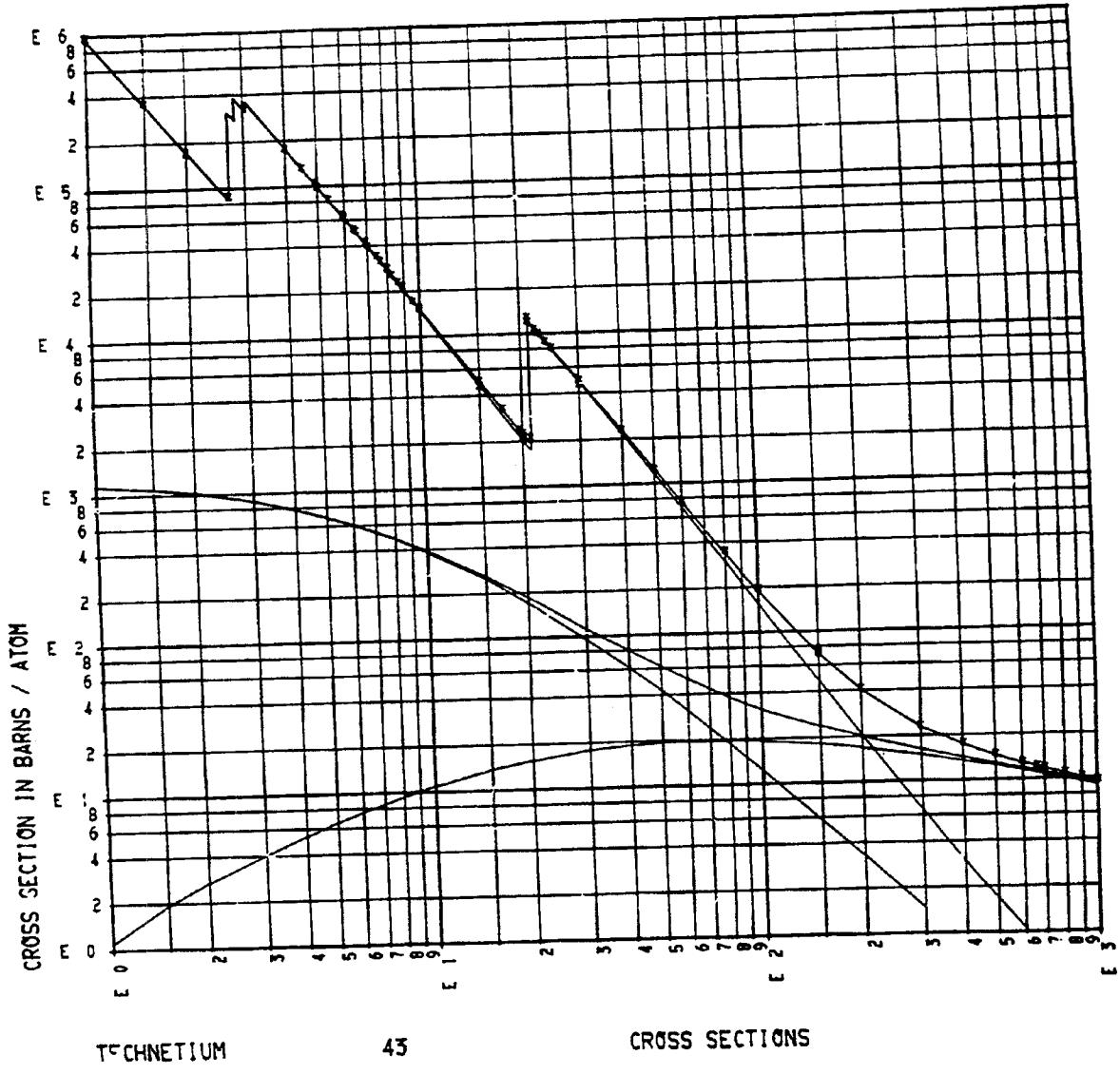
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.505	L	2.866	K	19.999
0	0.		1.36568E+01	1.53494E+01		1.39853E+01	
1	0.		-2.48482E+00	-2.26646E+00		-1.12426E-01	
2	0.		0.	1.16881E-01		1.91094E-01	
3	0.		0.	0.		4.17843E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.84600E+00	-5.62860E-02
1	3.02797E-01	1.55778E+00
2	-3.51131E-01	-2.33341E-01
3	1.74403E-02	7.85506E-03



45 - 1 REVISED 6/03/69

CROSS SECTIONS FOR TECHNETIUM Z = 45 BARNS / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	9.364E+05	1.163E+03	1.101E+00	9.376E+05
1.500	3.471E+05	1.098E+03	1.937E+00	3.482E+05
2.000	1.717E+05	1.029E+03	2.703E+00	1.727E+05
2.576	8.419E+04	1.289E+02	3.644E+00	8.512E+04
2.577	3.023E+05	1.288E+02	3.645E+00	3.033E+05
2.792	2.717E+05	1.152E+02	3.806E+00	2.727E+05
2.793	3.828E+05	1.151E+02	3.807E+00	3.837E+05
3.000	3.191E+05	8.926E+02	4.097E+00	3.200E+05
3.042	3.079E+05	8.864E+02	4.151E+00	3.086E+05
3.043	3.569E+05	8.862E+02	4.152E+00	3.576E+05
4.000	1.761E+05	1.745E+02	3.367E+00	1.768E+05
6.000	9.783E+04	6.745E+02	6.335E+00	9.851E+04
8.000	6.009E+04	9.935E+02	7.607E+00	6.059E+04
10.000	2.748E+04	1.110E+02	9.480E+00	2.796E+04
15.000	1.481E+04	3.853E+02	1.099E+01	1.521E+04
20.000	4.697E+03	2.487E+02	1.369E+01	4.959E+03
21.044	2.039E+03	1.705E+02	1.555E+01	2.225E+03
21.045	1.186E+03	1.592E+02	1.581E+01	1.931E+03
30.000	1.194E+04	1.592E+02	1.581E+01	1.211E+04
40.000	4.784E+03	9.505E+01	1.121E+01	4.898E+03
50.000	2.187E+03	6.192E+01	1.890E+01	2.258E+03
60.000	1.159E+03	4.303E+01	1.943E+01	1.231E+03
80.000	6.935E+02	3.152E+01	1.959E+01	1.441E+03
100.000	3.005E+02	1.859E+01	1.911E+01	3.387E+02
150.000	1.550E+02	1.233E+01	1.924E+01	1.876E+02
200.000	4.139E+01	5.125E+00	1.809E+01	1.121E+01
300.000	2.053E+01	3.276E+00	1.681E+01	4.068E+01
400.000	6.512E+00	1.474E+00	1.490E+01	2.289E+01
500.000	2.977E+00	8.310E-01	1.345E+01	1.725E+01
600.000	1.663E+00	5.320E-01	1.232E+01	1.452E+01
800.000	1.052E+00	3.680E-01	1.142E+01	1.284E+01
1000.000	5.319E-01	2.060E-01	1.046E+01	1.080E+01
	3.253E-01	1.306E-01	9.053E+00	9.509E+00

FLUORESCENT ENERGIES

18.410	2.593E+03	1.902E+02	1.499E+01	2.802E+03
20.585	1.873E+03	1.640E+02	1.570E+01	2.053E+03
2.424	1.072E+05	9.615E+02	3.292E+00	1.082E+05
2.538	9.583E+04	9.462E+02	3.451E+00	9.581E+04

CROSS SECTIONS FOR TECHNETIUM		I = 45	CM**2 / GRAM	
KEY	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	5.697E+03	7.078E+00	6.698E-03	5.704E+03
1.500	2.112E+03	6.692E+00	1.178E-02	2.118E+03
2.000	1.044E+03	6.254E+00	1.644E-02	1.051E+03
2.576	5.121E+02	5.651E+00	2.217E-02	5.179E+02
2.577	1.839E+03	5.650E+00	2.218E-02	5.845E+03
2.792	1.653E+03	5.568E+00	2.315E-02	1.659E+03
2.793	2.329E+03	5.567E+00	2.315E-02	2.334E+03
3.000	1.941E+03	5.429E+00	2.492E-02	1.946E+03
3.042	1.873E+03	5.392E+00	2.525E-02	1.879E+03
3.043	2.171E+03	5.391E+00	2.526E-02	2.177E+03
4.000	1.071E+03	4.709E+00	3.285E-02	1.076E+03
5.000	5.951E+02	4.106E+00	3.974E-02	5.993E+02
6.000	3.655E+02	3.610E+00	4.621E-02	3.692E+02
8.000	1.672E+02	2.859E+00	5.767E-02	1.701E+02
10.000	9.009E+01	2.347E+00	6.685E-02	9.250E+01
15.000	2.857E+01	1.513E+00	8.331E-02	3.012E+01
20.000	1.240E+01	1.038E+00	9.459E-02	1.353E+01
21.044	1.058E+01	9.664E-01	9.619E-02	1.176E+01
21.045	1.261E+01	9.683E-01	9.619E-02	1.367E+01
30.000	2.910E+01	5.843E-01	1.081E-01	2.919E+01
40.000	1.331E+01	3.767E-01	1.150E-01	3.800E+01
50.000	7.110E+00	2.617E-01	1.184E-01	4.490E+00
60.000	4.219E+00	1.918E-01	1.198E-01	4.530E+00
80.000	1.828E+00	1.131E-01	1.193E-01	2.060E+00
100.000	9.493E-01	7.501E-02	1.171E-01	1.141E-00
150.000	2.883E-01	3.483E-02	1.101E-01	4.332E-01
200.000	1.249E-01	1.993E-02	1.026E-01	2.475E-01
300.000	3.961E-02	8.967E-03	9.067E-02	1.393E-01
400.000	1.811E-02	5.055E-03	8.180E-02	1.050E-01
500.000	1.011E-02	3.236E-03	4.496E-02	8.931E-02
600.000	6.402E-03	2.259E-03	6.950E-02	8.814E-02
800.000	3.236E-03	1.253E-03	5.119E-02	6.568E-02
1000.000	1.979E-03	7.945E-04	5.507E-02	5.784E-02
FLUORESCENT ENERGIES				
18.410	1.577E+01	1.157E+00	9.119E-02	1.705E+01
20.585	1.140E+01	9.979E-01	9.549E-02	1.249E+01
2.424	6.524E+02	5.849E+00	2.003E-02	5.565E+02
2.538	5.830E+02	5.756E+00	2.100E-02	5.889E+02

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REVISED 6.03.69

MISCELLANEOUS DATA FOR TECHNETIUM

ATOMIC WEIGHT 99.000 GRAMS / MOLE
DENSITY 11.560 GRAMS / CC
ATOMIC DENSITY 6.996E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.644E-02

L-EDGES AT	2.677	2.793	3.043
L-EDGE JUMPS	3.591	4.416	5.160
L-EDGE FIT JUMPS	5.874	6.636	7.160

K-EDGE AT 21.045 KEV
K-EDGE JUMP 6.798

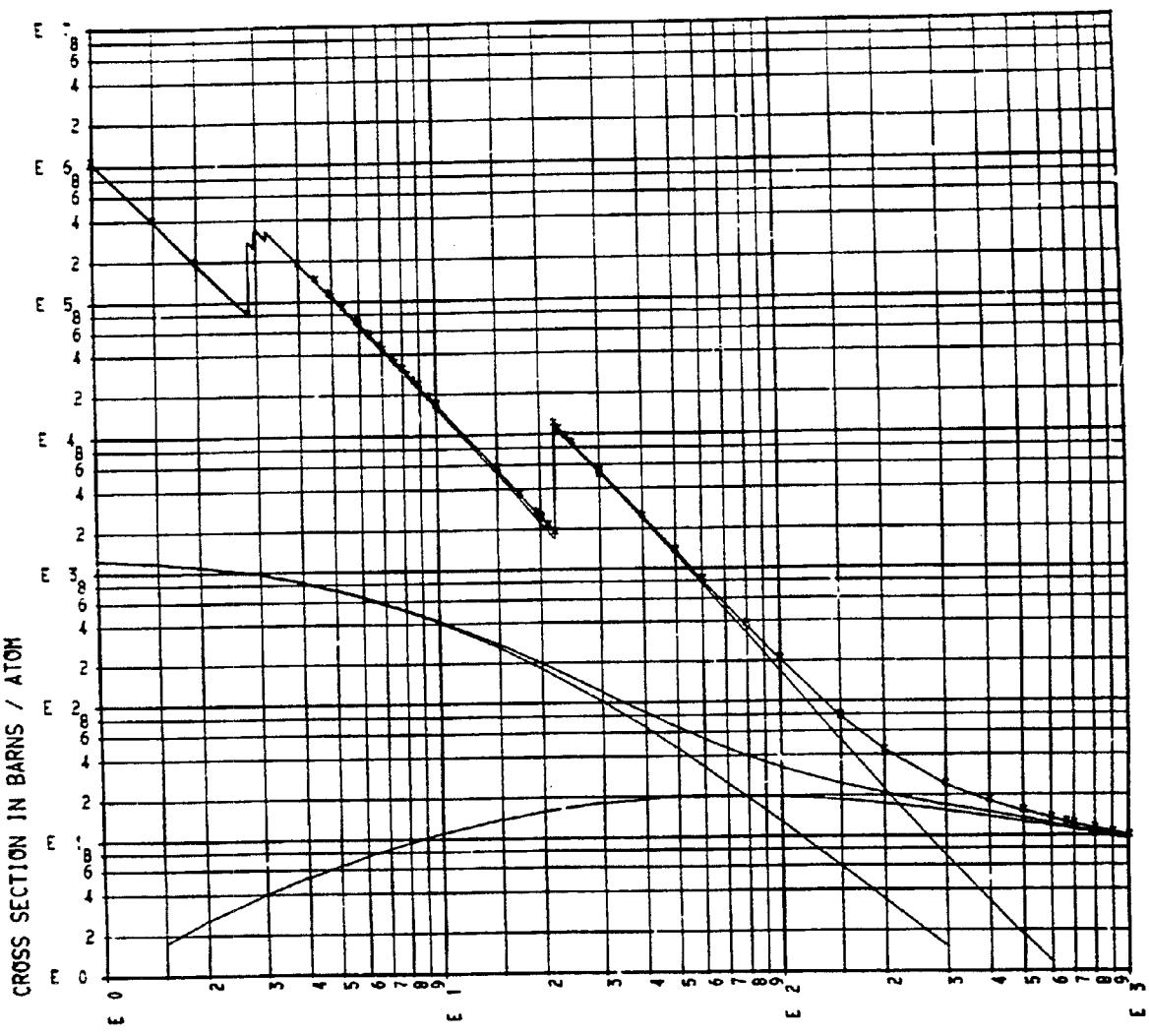
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	R	S	Q	L	K
0	0.		1.37498E-1	1.55086E+01	1.28214E+01
1	0.		-2.44737E-10	1.33733E+00	1.09199E-01
2	0.		0.	1.81857E-02	1.48109E-02
3	0.		0.	0.	6.68668E-03

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.87599E+00	1.57616E-02
1	3.26155E-01	1.44950E+00
2	-3.58969E-01	-2.04890E-01
3	1.80482E-02	5.64745E-03



RUTHENIUM

44

CROSS SECTIONS

CROSS SECTIONS FOR RUTHENIUM Z = 44 BARNs / ATOM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.065E+06	1.226E+03	9.448E-01	1.066E+05
1.500	3.894E+05	1.153E+03	1.748E+00	3.905E+05
2.000	1.308E+05	1.093E+03	2.560E+00	1.918E+05
2.837	8.014E+04	9.694E+02	3.770E+00	8.111E+04
2.838	2.750E+05	9.693E+02	3.771E+00	2.750E+05
2.965	2.454E+05	9.546E+02	3.960E+00	2.474E+05
2.967	3.472E+05	9.545E+02	3.961E+00	3.481E+05
3.000	3.377E+05	9.509E+02	4.010E+00	3.387E+05
3.223	2.823E+05	9.110E+02	4.300E+00	2.832E+05
3.224	3.272E+05	9.111E+02	4.301E+00	3.281E+05
4.000	1.893E+05	1.227E+02	5.305E+00	1.902E+05
5.000	1.063E+05	1.149E+02	6.507E+00	1.070E+05
6.000	6.570E+04	6.268E+02	1.611E+00	6.633E+04
8.000	3.027E+04	4.954E+02	9.449E+00	3.078E+04
10.000	1.637E+04	4.659E+02	1.103E+00	1.651E+04
15.000	5.199E+03	3.295E+02	3.877E+00	5.412E+03
20.000	2.250E+03	1.808E+02	5.708E+00	2.443E+03
23.119	1.671E+03	1.515E+02	5.522E+00	1.944E+03
23.121	1.130E+04	1.514E+02	6.532E+00	1.143E+04
30.000	5.167E+03	1.015E+02	8.073E+00	5.286E+03
40.000	2.375E+03	6.499E+01	9.255E+00	4.559E+03
50.000	1.273E+03	4.491E+01	9.984E+00	3.558E+03
60.000	7.573E+02	3.216E+01	2.008E+01	8.161E+02
80.000	3.290E+02	1.933E+01	2.001E+01	3.964E+02
100.000	1.712E+02	1.279E+01	1.965E+01	1.936E+02
150.000	9.210E+01	5.917E+00	8.849E+00	1.051E+01
200.000	2.261E+01	3.380E+00	7.256E+00	3.633E+01
300.000	7.181E+00	1.918E+00	5.278E+00	1.918E+01
400.000	3.289E+00	8.560E-01	3.765E+00	1.591E+01
500.000	1.840E+00	4.480E-01	2.61E+00	1.900E+01
600.000	1.166E+00	3.790E-01	1.69E+00	1.324E+01
800.000	5.913E-01	2.120E-01	0.822E+01	1.102E+01
1000.000	3.628E-01	1.344E-01	9.264E+00	9.761E+00

FLUORESCENT ENERGIES

19.278	2.504E+03	1.897E+02	1.652E+01	2.712E+03
21.655	1.778E+03	1.621E+02	1.620E+01	1.957E+03
2.558	1.036E+05	1.004E+03	3.361E+00	1.047E+05
2.683	9.204E+04	9.881E+02	3.544E+00	9.306E+04

CROSS SECTIONS FOR RUTHENIUM Z = 44 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	6.344E+03	7.305E+00	5.630E-03	6.352E+03
1.500	2.320E+03	6.932E+00	1.042E-02	2.327E+03
2.000	1.137E+03	5.613E+00	1.525E-02	1.143E+03
2.837	4.275E+02	5.776E+00	2.247E-02	4.833E+02
2.838	1.639E+03	5.776E+00	2.247E-02	1.644E+03
2.966	1.468E+03	5.688E+00	2.360E-02	1.474E+03
2.967	2.069E+03	5.688E+00	2.360E-02	2.074E+03
3.000	2.013E+03	5.666E+00	2.389E-02	2.018E+03
3.223	1.682E+03	5.459E+00	2.562E-02	1.688E+03
3.224	1.950E+03	5.455E+00	2.562E-02	1.955E+03
4.000	1.128E+03	4.903E+00	3.161E-02	1.133E+03
5.000	6.532E+02	4.260E+00	3.877E-02	6.375E+02
6.000	3.915E+02	3.735E+00	4.535E-02	3.953E+02
8.000	1.804E+02	2.958E+00	6.630E-02	1.834E+02
10.000	9.757E+01	2.419E+00	6.513E-02	1.001E+02
15.000	3.098E+01	1.557E+00	8.265E-02	3.263E+01
20.000	1.340E+01	1.077E+00	9.403E-02	1.458E+01
22.116	9.955E+00	9.582E-01	9.724E-02	1.099E+01
22.117	6.734E+01	9.382E-01	9.724E-02	6.838E+01
30.000	3.079E+01	6.046E-01	1.077E-01	3.150E+01
40.000	1.415E+01	3.873E-01	1.471E-01	1.466E+01
50.000	7.588E+00	2.676E-01	1.822E-01	1.973E+00
60.000	4.512E+00	1.952E-01	1.972E-01	4.021E+00
80.000	1.961E+00	1.152E-01	1.925E-01	1.935E+00
100.000	1.020E+00	1.021E-02	1.171E-01	1.035E+00
150.000	3.105E-01	3.526E-02	1.022E-01	3.055E-01
200.000	1.347E-01	2.014E-02	1.028E-01	1.350E-01
300.000	4.279E-02	9.046E-03	9.999E-02	1.128E-01
400.000	1.960E-02	5.101E-03	8.199E-02	1.167E-01
500.000	1.096E-02	3.255E-03	5.514E-02	8.931E-02
600.000	6.949E-03	2.258E-03	5.986E-02	8.882E-02
800.000	3.523E-03	1.253E-03	6.090E-02	6.569E-02
1000.000	2.162E-03	8.009E-04	5.520E-02	5.816E-02

FLUORESCENT ENERGIES

19.278	1.492E+01	1.130E+00	9.249E-02	1.616E+01
21.655	1.050E+01	9.659E-01	9.656E-02	1.166E+01
2.558	6.175E+02	5.985E+00	2.003E-02	6.237E+02
2.683	5.484E+02	5.888E+00	2.112E-02	5.545E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR RUTHENIUM

ATOMIC WEIGHT	101.070	GRAMS / MOLE
DENSITY	12.410	GRAMS / CC
ATOMIC DENSITY	7.395E-02	BUNCHES / CC

CONVERSION CONSTANT IS 1.678E+02

L-EDGES AT	2.838	2.967	3.224
L-EDGE JUMPS	3.431	1.410	1.160
L-EDGE FIT JUMPS	5.513	1.636	1.160

K-EDGE AT	22.117	KEV
K-EDGE JUMP	6.765	

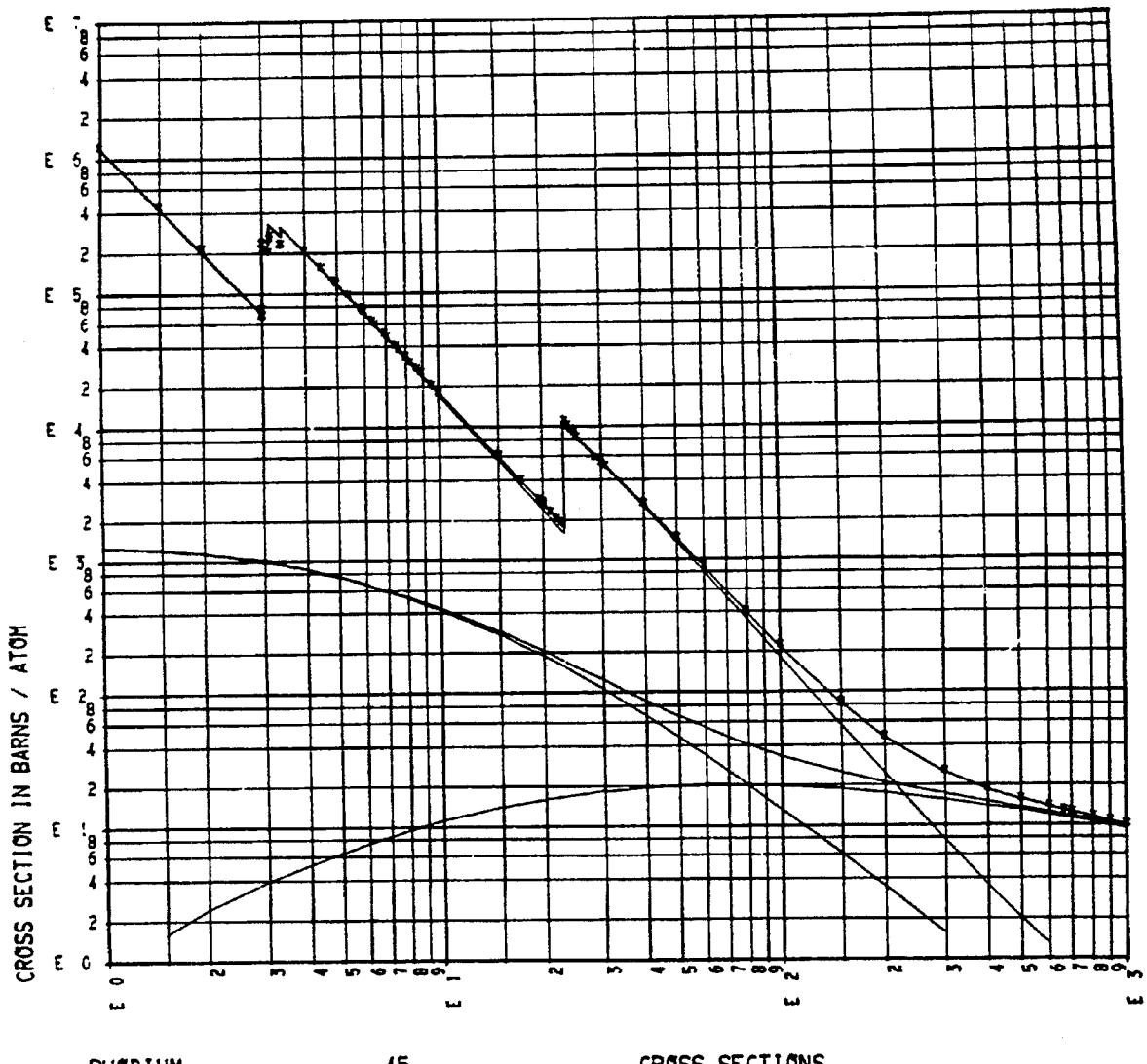
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.585	L	3.224	K	22.117
0	0.		1.38782E+01		1.54734E+01		1.26658E+01
1	0.		-2.48066E+00		-2.23080E+00		8.85020E-01
2	0.		0.		-1.19454E-01		-8.11144E-01
3	0.		0.		0.		5.73759E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.93136E+00	-4.24981E-02
1	3.34794E-01	1.54639E+00
2	-3.63497E-01	-2.26470E-01
3	1.84429E-02	7.18375E-03



RHODIUM

45

CROSS SECTIONS

CROSS SECTIONS FOR RHODIUM		Z = 45	BARNs / ATOM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.241E+06	1.285E+03	8.293E-01	1.242E+06
1.500	4.301E+05	1.222E+03	1.599E+00	4.313E+05
2.000	2.028E+05	1.150E+03	2.420E+00	2.040E+05
3.000	1.030E+04	1.002E+03	3.912E+00	1.130E+04
3.002	1.017E+04	1.002E+03	3.915E+00	1.118E+04
3.003	2.611E+05	1.002E+03	3.916E+00	2.621E+05
3.145	3.266E+05	9.790E+02	4.104E+00	3.336E+05
3.146	3.277E+05	9.788E+02	4.105E+00	3.287E+05
3.411	2.673E+05	9.399E+02	4.455E+00	2.682E+05
3.412	3.098E+05	9.398E+02	4.456E+00	3.108E+05
4.000	2.057E+05	8.676E+02	5.235E+00	2.076E+05
5.000	1.160E+05	7.533E+02	6.467E+00	1.167E+05
6.000	7.173E+04	6.596E+02	7.602E+00	7.240E+04
8.000	3.310E+04	5.210E+02	9.511E+00	3.363E+04
10.000	1.793E+04	4.258E+02	1.124E+01	1.837E+04
15.000	5.720E+03	2.171E+02	4.144E+01	6.012E+03
20.000	2.486E+03	1.912E+02	6.609E+01	2.694E+03
25.219	1.602E+03	1.554E+02	6.915E+01	1.774E+03
23.220	1.046E+04	1.554E+02	6.915E+01	1.063E+04
30.000	5.478E+03	1.070E+02	1.841E+01	5.604E+03
40.000	2.550E+03	6.819E+01	1.962E+01	2.637E+03
50.000	1.377E+03	4.691E+01	2.023E+01	1.444E+03
60.000	8.236E+02	3.412E+01	2.048E+01	8.776E+02
80.000	3.596E+02	2.013E+01	2.042E+01	4.602E+02
100.000	1.876E+02	1.330E+01	2.006E+01	2.210E+02
150.000	5.730E+01	6.135E+00	1.820E+01	8.233E+01
200.000	2.489E+01	3.500E+00	1.763E+01	4.602E+01
300.000	7.912E+00	1.571E+00	1.557E+01	2.505E+01
400.000	3.626E+00	8.850E-01	1.406E+01	1.897E+01
500.000	2.030E+00	5.660E-01	1.289E+01	1.649E+01
600.000	1.289E+00	3.920E-01	1.195E+01	1.365E+01
800.000	6.554E-01	2.190E-01	1.057E+01	1.144E+01
1000.000	4.036E-01	1.390E-01	9.473E+00	1.002E+01

FLUORESCENT ENERGIES

20.214	2.410E+03	1.884E+02	1.615E+01	2.615E+03
22.721	1.707E+03	1.601E+02	1.679E+01	1.885E+03
2.696	9.294E+04	1.039E+03	3.447E+00	9.408E+04
2.834	8.157E+04	1.022E+03	3.657E+00	8.264E+04

CROSS SECTIONS FOR RHODIUM		Z = 45	CM**2 / GRAM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	7.261E+03	7.522E+00	4.853E-03	7.268E+03
1.500	2.517E+03	1.151E+00	9.358E-03	2.524E+03
2.000	1.187E+03	6.730E+00	1.416E-02	1.194E+03
3.000	4.114E+02	5.866E+00	2.289E-02	4.113E+02
3.002	4.107E+02	5.864E+00	2.291E-02	4.116E+02
3.003	1.528E+03	5.863E+00	2.292E-02	1.534E+03
3.145	1.361E+03	5.729E+00	2.401E-02	1.361E+03
3.146	1.918E+03	5.728E+00	2.402E-02	1.923E+03
3.411	1.564E+03	5.501E+00	2.607E-02	1.570E+03
3.412	1.813E+03	5.500E+00	2.608E-02	1.819E+03
4.000	1.210E+03	5.077E+00	3.064E-02	1.215E+03
5.000	6.787E+02	4.409E+00	3.785E-02	6.832E+02
6.000	4.198E+02	3.860E+00	4.449E-02	4.237E+02
8.000	1.937E+02	3.049E+00	5.566E-02	1.958E+02
10.000	1.049E+02	2.492E+00	6.578E-02	1.070E+02
15.000	3.348E+01	1.521E+00	8.275E-02	3.518E+01
20.000	1.455E+01	1.119E+00	9.415E-02	1.576E+01
23.219	9.374E+00	9.094E-01	9.895E-02	1.038E+01
23.220	6.122E+01	9.093E-01	9.895E-02	6.223E+01
30.000	3.206E+01	6.264E-01	1.077E-01	3.279E+01
40.000	1.492E+01	3.991E-01	1.481E-01	1.543E+01
50.000	8.059E+00	2.745E-01	1.831E-01	8.452E+00
60.000	4.816E+00	1.997E-01	1.991E-01	5.136E+00
80.000	2.105E+00	1.178E-01	1.955E-01	2.342E+00
100.000	1.098E+00	7.784E-02	1.244E-01	1.293E+00
150.000	3.353E-01	3.590E-02	1.066E-01	4.818E-01
200.000	1.456E-01	2.048E-02	0.632E-01	2.593E-01
300.000	4.630E-02	9.194E-03	9.112E-02	1.465E-01
400.000	2.122E-02	5.179E-03	8.228E-02	1.081E-01
500.000	1.188E-02	3.312E-03	5.544E-02	9.063E-02
600.000	7.541E-03	2.294E-03	6.993E-02	1.577E-02
800.000	3.836E-03	1.282E-03	6.186E-02	6.696E-02
1000.000	2.362E-03	8.135E-04	5.944E-02	5.861E-02

FLUORESCENT ENERGIES

20.214	1.410E+01	1.103E+00	9.450E-02	1.530E+01
22.721	9.992E+00	9.372E-01	9.824E-02	1.103E+01
2.696	5.439E+02	6.082E+00	2.017E-02	5.504E+02
2.834	4.774E+02	5.980E+00	2.140E-02	4.836E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR RHODIUM

ATOMIC WEIGHT 102.910 GRAMS / MOLE
DENSITY 12.440 GRAMS / CC
ATOMIC DENSITY 7.280E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.709E+02

L-EDGES AT	3.003	3.146	3.412
L-EDGE JUMPS	3.721	1.410	1.160
L-EDGE FIT JUMPS	6.086	1.636	1.160

K-EDGE AT 23.220 KEV
K-EDGE JUMP 6.532

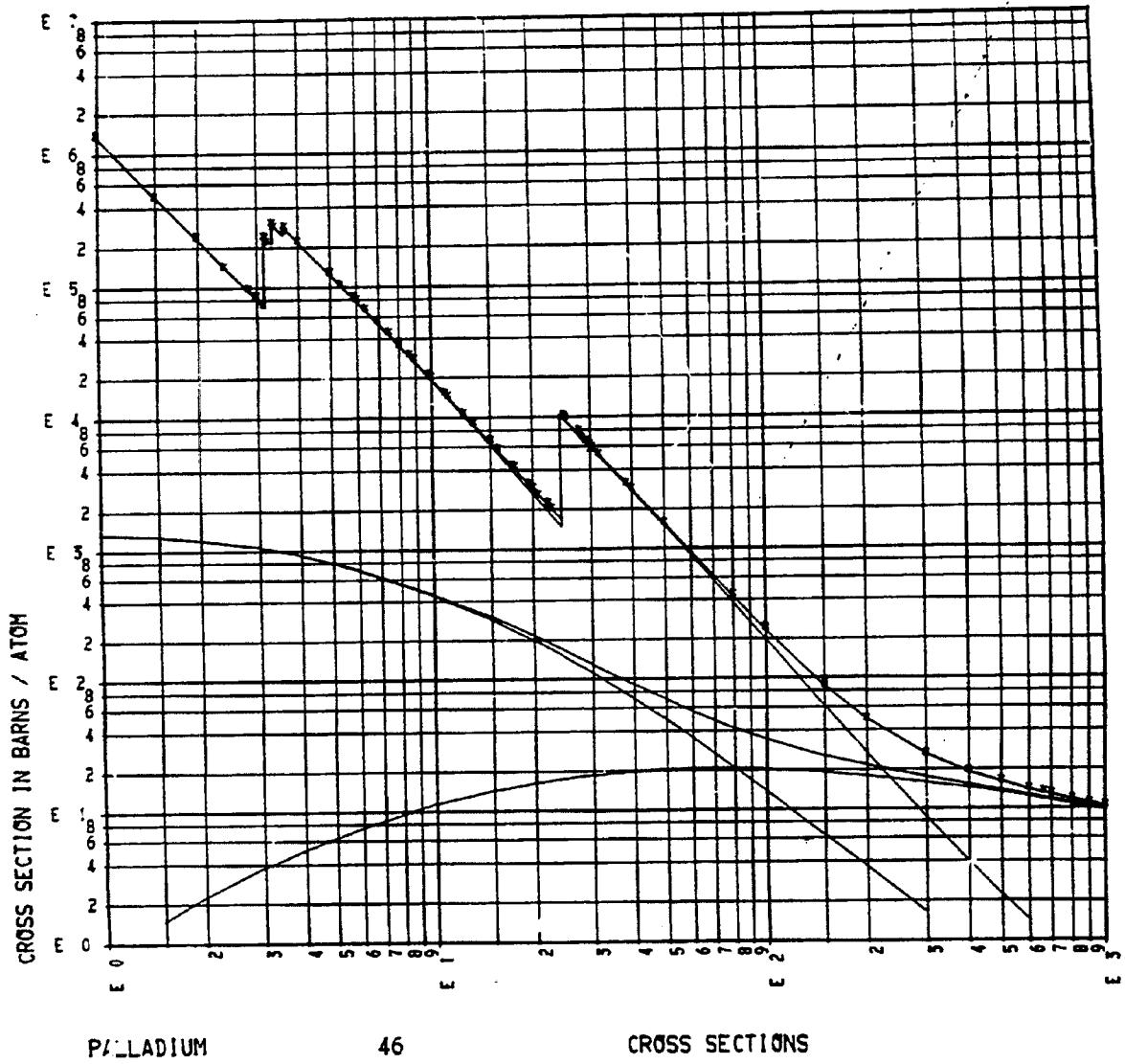
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.627	L	3.412	K	23.220
0	G.		1.40312E+01		1.55757E+01		1.21760E+01
1	G.		-2.61303E+00		-2.24976E+00		-1.19682E+00
2	G.		0.		-1.13377E-01		-8.66697E-01
3	G.		0.		0.		6.06931E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	6.97547E+00	-1.60399E-01
1	3.46394E-01	1.64861E+00
2	-3.67794E-01	-2.50238E-01
3	1.87885E-02	8.93818E-03



CROSS SECTIONS FOR PALLADIUM			Z = 46	BARNs / ATOM
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.382E+06	1.352E+03	7.408E-01	1.384E+06
1.500	4.872E+05	1.292E+03	1.481E+00	4.885E+05
2.000	2.324E+05	1.220E+03	2.282E+00	2.337E+05
3.000	8.192E+04	1.065E+03	3.797E+00	8.299E+04
3.172	7.098E+04	1.036E+03	4.030E+00	7.202E+04
3.173	2.414E+05	1.036E+03	4.031E+00	2.425E+05
3.329	2.144E+05	1.011E+03	4.242E+00	2.154E+05
3.330	3.021E+05	1.011E+03	4.244E+00	3.031E+05
3.604	2.481E+05	9.793E+02	4.617E+00	2.491E+05
3.605	2.876E+05	9.712E+02	4.618E+00	2.886E+05
4.000	2.215E+05	9.213E+02	5.159E+00	2.224E+05
5.000	1.252E+05	1.981E+02	5.413E+00	1.251E+05
6.000	1.187E+04	6.970E+02	5.581E+00	1.858E+04
8.000	3.616E+04	6.485E+02	9.663E+00	3.672E+04
10.000	1.966E+04	4.476E+02	1.371E+01	2.012E+04
15.000	6.286E+03	2.921E+02	4.371E+01	5.592E+03
20.000	2.129E+03	2.022E+02	6.336E+01	2.948E+03
24.349	1.524E+03	1.535E+02	1.747E+01	1.595E+03
24.350	1.056E+04	1.535E+02	1.747E+01	1.073E+04
30.000	6.077E+03	1.130E+02	1.873E+01	6.209E+03
40.000	2.768E+03	7.169E+01	1.997E+01	2.860E+03
50.000	1.481E+03	4.917E+01	2.060E+01	5.50E+03
60.000	8.811E+02	3.569E+01	2.087E+01	9.37E+02
80.000	3.847E+02	2.106E+01	2.083E+01	4.206E+02
100.000	2.014E+02	1.390E+01	2.047E+01	2.357E+02
150.000	6.219E+01	6.397E+00	1.929E+01	8.788E+01
200.000	2.728E+01	3.646E+00	1.801E+01	4.894E+01
300.000	8.784E+00	1.635E+00	1.593E+01	2.634E+01
400.000	4.048E+00	9.210E-01	1.437E+01	1.934E+01
500.000	2.269E+00	5.900E-01	1.317E+01	5.035E+01
600.000	1.437E+00	4.080E-01	1.222E+01	4.066E+01
800.000	7.238E-01	2.280E-01	1.076E+01	1.171E+01
1000.000	4.395E-01	1.446E-01	9.592E+00	1.027E+01
FLUORESCENT ENERGIES				
21.175	2.304E+03	1.867E+02	1.667E+01	2.510E+03
23.816	1.627E+03	1.583E+02	1.734E+01	1.803E+03
2.838	9.450E+04	1.086E+03	3.542E+00	9.563E+04
2.990	8.263E+04	1.067E+03	3.782E+00	8.370E+04

CROSS SECTIONS FOR PALLADIUM Z = 46 CM**2 / GRAM

KEV	PHOT0	COHERENT	INCOHERENT	TOTAL
1.000	7.824E+03	7.654E+00	4.193E-03	7.832E+03
1.500	2.757E+03	7.313E+00	8.382E-03	2.765E+03
2.000	1.316E+03	6.906E+00	1.291E-02	1.323E+03
3.000	4.637E+02	6.032E+00	2.149E-02	4.698E+02
3.172	4.018E+02	5.865E+00	2.231E-02	4.076E+02
3.173	1.367E+03	5.864E+00	2.282E-02	1.373E+03
3.329	1.214E+03	5.723E+00	2.401E-02	1.219E+03
3.330	1.710E+03	5.722E+00	2.402E-02	1.716E+03
3.604	1.404E+03	5.498E+00	2.613E-02	1.410E+03
3.605	1.628E+03	5.497E+00	2.614E-02	1.634E+03
4.000	1.254E+03	5.215E+00	2.920E-02	1.259E+03
5.000	7.089E+02	4.517E+00	3.630E-02	4.535E+02
6.000	4.408E+02	3.945E+00	4.291E-02	4.448E+02
8.000	2.047E+02	3.105E+00	5.469E-02	2.078E+02
10.000	1.113E+02	2.533E+00	6.436E-02	1.139E+02
15.000	3.558E+01	1.653E+00	8.133E-02	3.721E+01
20.000	1.545E+01	1.145E+00	9.258E-02	1.668E+01
24.349	8.624E+00	8.687E-01	9.888E-02	9.592E+00
24.350	5.978E+01	8.687E-01	9.888E-02	6.074E+01
30.000	3.440E+01	6.395E-01	1.660E-01	3.615E+01
40.000	1.567E+01	4.058E-01	1.130E-01	1.619E+01
50.000	9.381E+00	2.783E-01	1.166E-01	8.775E+00
60.000	4.987E+00	2.020E-01	1.181E-01	5.301E+00
80.000	2.177E+00	1.192E-01	1.179E-01	2.415E+00
100.000	1.140E+00	7.866E-02	1.159E-01	1.334E+00
150.000	3.520E-01	3.621E-02	1.092E-01	4.714E-01
200.000	1.544E-01	2.054E-02	1.020E-01	2.770E-01
300.000	4.972E-02	9.255E-03	9.015E-02	4.915E-01
400.000	2.291E-02	5.213E-03	8.135E-02	6.095E-01
500.000	1.284E-02	3.340E-03	1.451E-02	9.076E-02
600.000	8.133E-03	2.309E-03	6.915E-02	9.959E-02
800.000	4.097E-03	1.291E-03	5.089E-02	6.061E-02
1000.000	2.488E-03	8.185E-04	5.480E-02	5.811E-02

FLUORESCENT ENERGIES

21.175	1.304E+01	1.057E+00	9.437E-02	1.421E+01
23.816	9.208E+00	8.961E-01	9.815E-02	1.021E+01
2.838	5.349E+02	6.145E+00	2.005E-02	5.413E+02
2.990	4.677E+02	5.039E+00	2.140E-02	4.738E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PALLADIUM

ATOMIC WEIGHT 106.400 GRAMS / MOLE
DENSITY 12.160 GRAMS / CC
ATOMIC DENSITY 6.883E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.767E+02

L-EDGES AT	3.173	3.330	3.605
L-EDGE JUMPS	3.402	3.410	3.460
L-EDGE FIT JUMPS	5.864	5.636	5.160

K-EDGE AT 24.350 KEV
K-EDGE JUMP 6.932

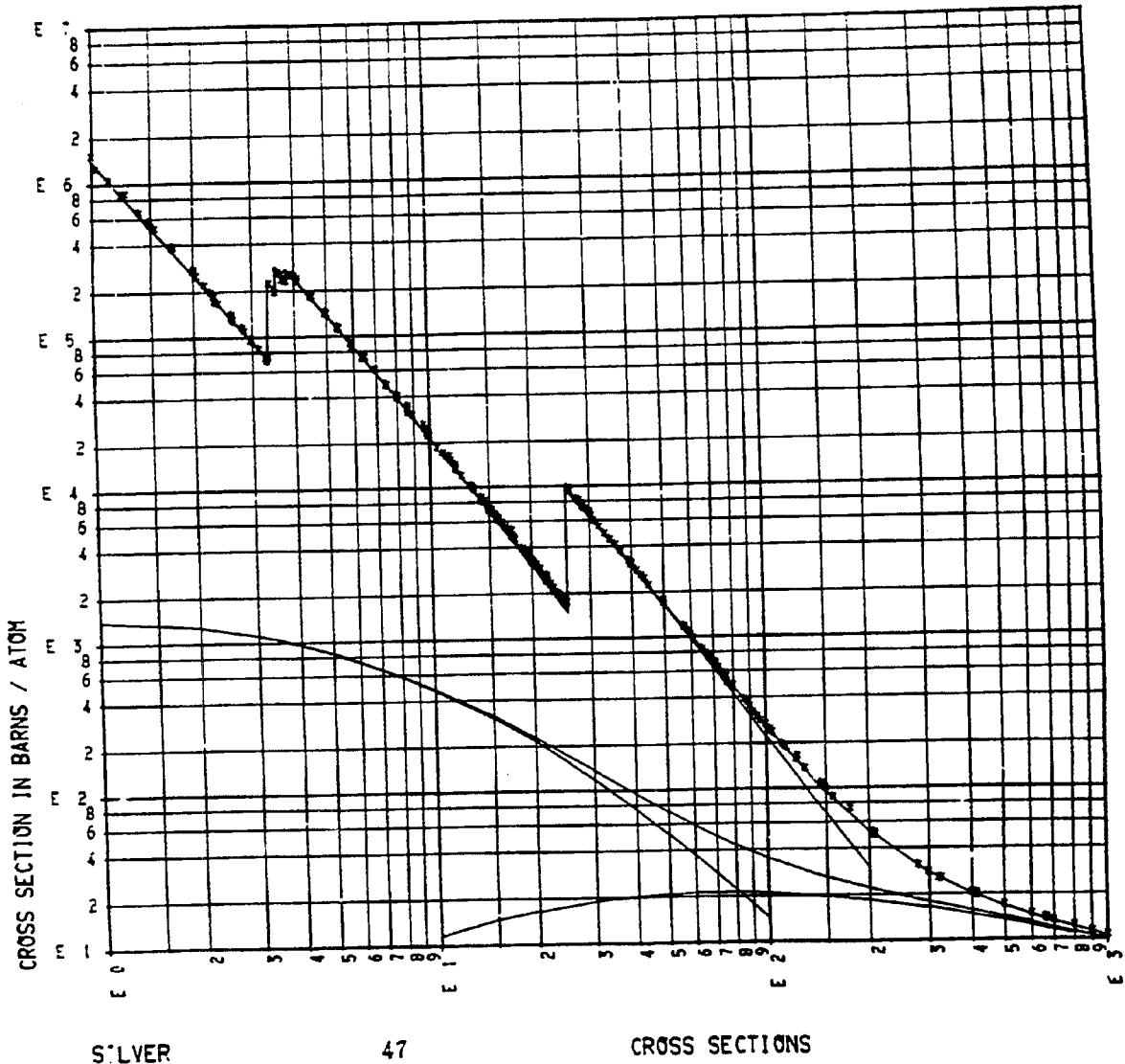
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	A	B	C	D	E	F
		0.670		3.605		24.350
0	0.	1.41392E+01	1.55649E+01	1.39389E+01		
1	0.	-2.57206E+00	-2.17229E+00	-1.64528E-01		
2	0.	6.	-1.27652E-01	-6.62100E-01		
3	0.	0.	0.	4.76289E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.03216E+00	-2.67554E-01
1	3.49838E-01	1.73740E+00
2	-3.70099E-01	-2.69883E-01
3	1.89983E-02	1.03248E-02



SILVER

47

CROSS SECTIONS

CROSS SECTIONS FOR SILVER		Z = 47	BARNs / ATOM	
KEV	PHOT	CohereNT	IncoherenT	Total
1.000	1.423E+06	1.408E+03	8.694E-01	1.423E+06
1.500	5.199E+05	3.344E+03	1.625E+00	5.213E+05
2.000	2.547E+05	1.269E+03	2.399E+00	2.560E+05
3.000	9.315E+04	1.111E+03	3.884E+00	9.426E+04
3.350	7.084E+04	1.052E+03	4.360E+00	7.190E+04
3.351	2.283E+05	1.052E+03	4.352E+00	2.294E+05
3.533	2.014E+05	1.026E+03	4.596E+00	2.026E+05
3.524	2.838E+05	1.026E+03	4.598E+00	2.848E+05
3.805	2.340E+05	9.880E+02	4.983E+00	2.350E+05
3.806	2.712E+05	9.878E+02	4.984E+00	2.722E+05
4.000	2.391E+05	9.537E+02	5.250E+00	2.401E+05
5.000	1.350E+05	8.363E+02	6.505E+00	1.358E+05
6.000	8.391E+04	7.308E+02	6.673E+00	8.455E+04
8.000	3.903E+04	5.743E+02	9.768E+00	3.961E+04
10.000	2.128E+04	4.681E+02	1.152E+01	2.176E+04
15.000	5.869E+03	3.065E+02	1.460E+01	5.190E+03
20.000	3.011E+03	2.131E+02	1.663E+01	3.241E+03
25.513	1.477E+03	1.511E+02	1.805E+01	1.646E+03
25.514	9.721E+03	1.511E+02	1.805E+01	9.890E+03
30.000	6.411E+03	1.193E+02	1.905E+01	5.545E+03
40.000	2.984E+03	1.525E+01	2.032E+01	3.079E+03
50.000	1.618E+03	5.151E+01	2.098E+01	1.691E+03
60.000	9.722E+02	3.735E+01	2.126E+01	1.031E+03
80.000	4.294E+02	2.204E+01	2.124E+01	4.727E+02
100.000	2.262E+02	1.453E+01	2.088E+01	2.616E+02
150.000	7.026E+01	6.679E+00	1.969E+01	9.563E+01
200.000	3.080E+01	3.804E+00	1.839E+01	5.300E+01
300.000	9.848E+00	1.705E+00	1.627E+01	2.782E+01
400.000	4.496E+00	9.500E-01	1.468E+01	2.614E+01
500.000	2.495E+00	6.150E-01	1.346E+01	1.657E+01
600.000	1.566E+00	4.260E-01	1.248E+01	1.447E+01
800.000	7.749E-01	2.360E-01	1.099E+01	1.200E+01
1000.000	4.631E-01	1.509E-01	9.892E+00	1.051E+01

FLUORESCENT ENERGIES

22.162	2.230E+03	1.843E+02	1.721E+01	2.436E+03
24.942	1.518E+03	1.560E+02	1.791E+01	1.753E+03
2.984	9.439E+04	1.113E+03	3.860E+00	9.551E+04
3.151	8.246E+04	1.085E+03	4.089E+00	8.356E+04

CROSS SECTIONS FOR SILVER		Z = 47	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	7.937E+03	7.860E+00	4.853E-03	7.944E+03
1.500	2.905E+03	7.501E+00	9.072E-03	2.910E+03
2.000	1.422E+03	7.083E+00	1.339E-02	1.429E+03
3.000	5.200E+02	6.205E+00	2.168E-02	5.262E+02
3.350	3.955E+02	5.875E+00	2.434E-02	4.014E+02
3.351	1.275E+03	5.874E+00	2.435E-02	1.281E+03
3.523	1.125E+03	5.730E+00	2.566E-02	1.130E+03
3.524	1.584E+03	5.729E+00	2.567E-02	1.590E+03
3.805	1.306E+03	5.515E+00	2.782E-02	1.312E+03
3.806	1.514E+03	5.515E+00	2.782E-02	1.520E+03
4.000	1.335E+03	5.380E+00	2.931E-02	1.340E+03
5.000	7.536E+02	4.669E+00	3.632E-02	7.583E+02
6.000	4.684E+02	4.080E+00	4.283E-02	4.726E+02
8.000	2.179E+02	3.206E+00	5.453E-02	2.211E+02
10.000	1.188E+02	2.515E+00	6.429E-02	1.215E+02
15.000	3.855E+01	1.711E+00	8.150E-02	4.014E+01
20.000	1.681E+01	1.189E+00	9.283E-02	1.809E+01
25.513	8.246E+00	8.436E-01	1.007E-01	9.190E+00
25.514	5.427E+01	8.436E-01	1.007E-01	5.921E+01
30.000	3.579E+01	6.641E-01	1.064E-01	3.656E+01
40.000	1.666E+01	4.201E-01	1.135E-01	1.712E+01
50.000	9.033E+00	2.876E-01	1.171E-01	9.438E+00
60.000	5.427E+00	2.085E-01	1.187E-01	5.754E+00
80.000	2.397E+00	1.231E-01	1.186E-01	2.639E+00
100.000	1.263E+00	8.113E-02	1.186E-01	1.461E+00
150.000	3.922E-01	3.729E-02	1.099E-01	5.395E-01
200.000	1.719E-01	2.124E-02	1.027E-01	2.959E-01
300.090	5.498E-02	9.518E-03	3.081E-02	1.553E-01
400.000	2.510E-02	5.359E-03	8.196E-02	1.124E-01
500.000	1.393E-02	3.433E-03	5.513E-02	9.249E-02
600.000	8.741E-03	2.378E-03	5.967E-02	8.078E-02
800.000	4.326E-03	1.329E-03	6.135E-02	6.701E-03
1000.000	2.585E-03	8.424E-04	5.522E-02	5.865E-02

FLUORESCENT ENERGIES

22.162	1.245E+01	1.029E+00	9.609E-02	1.360E+01
24.942	8.810E+00	8.710E-01	9.998E-02	9.788E+00
2.984	5.269E+02	6.215E+00	2.155E-02	5.332E+02
3.151	4.604E+02	6.056E+00	2.283E-02	4.655E+02

47 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR SILVER

ATOMIC WEIGHT	107.880	GRAMS / MOLE
DENSITY	10.500	GRAMS / CC
ATOMIC DENSITY	5.862E-02	BUNCHES / CC

CONVERSION CONSTANT IS 1.791E+02

L-EDGES AT	3.351	3.524	3.806
L-EDGE JUMPS	3.223	1.410	1.160
L-EDGE FIT JUMPS	5.272	1.656	1.160

K-EDGE AT	25.514	KEV
K-EDGE JUMP	6.582	

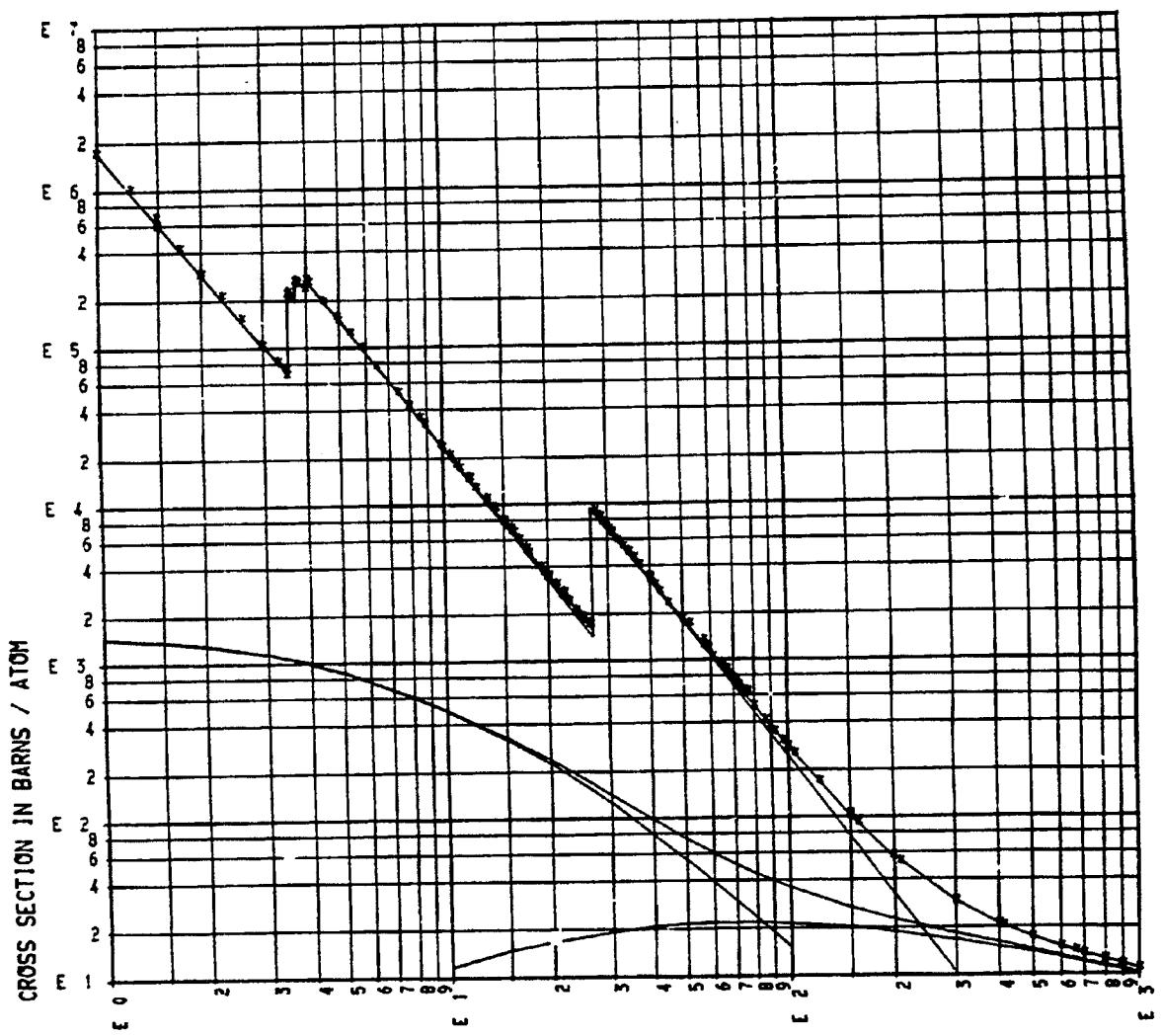
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.717	L	3.806	K	25.514
0	0.		1.41673E+01		1.56869E+01		1.33926E+01
1	0.		-2.48078E+00		-2.22636E+00		4.41380E-01
2	0.		0.		-1.12223E-01		-6.93771E-01
3	0.		0.		0.		4.82085E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.06446E+00	-1.66475E-01
1	3.63456E-01	1.65794E+00
2	-3.73597E-01	-2.48740E-01
3	1.92478E-02	8.66218E-03



CADMUM

48

CROSS SECTIONS

48 - : REVISED 6/03/69

CROSS SECTIONS FOR CADMIUM		Z = 48	BARNs / ATOM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	1.706E+06	1.467E+03	9.726E-01	1.707E+06
1.500	6.122E+05	1.398E+03	1.784E+00	6.136E+05
2.000	2.959E+05	1.319E+03	2.570E+00	2.972E+05
3.000	1.062E+05	1.156E+03	4.039E+00	1.073E+05
3.536	7.008E+04	1.067E+03	4.768E+00	7.115E+04
3.537	2.277E+05	1.067E+03	4.770E+00	2.288E+05
3.726	1.990E+05	1.041E+03	5.027E+00	2.000E+05
3.727	2.803E+05	1.040E+03	5.029E+00	2.814E+05
4.000	2.533E+05	1.005E+03	5.401E+00	2.545E+05
4.017	2.307E+05	1.002E+03	5.422E+00	2.317E+05
4.018	2.675E+05	1.002E+03	5.424E+00	2.685E+05
5.000	1.507E+05	8.741E+02	6.653E+00	1.516E+05
6.000	9.285E+04	7.647E+02	7.815E+00	9.362E+04
8.000	4.278E+04	6.007E+02	9.907E+00	4.339E+04
10.000	2.324E+04	4.890E+02	1.168E+01	2.374E+04
15.000	7.512E+03	3.209E+02	1.484E+01	7.848E+03
20.000	3.318E+03	2.241E+02	1.591E+01	3.559E+03
26.710	1.439E+03	1.487E+02	1.864E+01	1.607E+03
26.711	9.362E+03	1.487E+02	1.864E+01	9.529E+03
30.000	6.971E+03	1.251E+02	1.938E+01	7.115E+03
40.000	3.268E+03	7.901E+01	2.068E+01	3.368E+03
50.000	1.776E+03	5.402E+01	2.135E+01	1.852E+03
60.000	1.067E+03	3.914E+01	2.165E+01	1.128E+03
80.000	4.702E+02	2.311E+01	2.164E+01	5.150E+02
100.000	2.470E+02	1.523E+01	2.128E+01	2.835E+02
150.000	7.622E+01	6.992E+00	2.009E+01	1.635E+02
200.000	3.332E+01	3.980E+00	1.877E+01	5.607E+01
300.000	1.066E+01	1.784E+00	1.660E+01	2.905E+01
400.000	4.896E+00	1.005E+00	1.499E+01	2.089E+01
500.000	2.741E+00	6.430E-01	1.374E+01	1.713E+01
600.000	1.738E+00	4.450E-01	1.274E+01	1.493E+01
800.000	8.801E-01	2.490E-01	1.122E+01	1.235E+01
1000.000	5.388E-01	1.580E-01	1.010E+01	1.080E+01

FLUORESCENT ENERGIES

23.172	2.169E+03	1.819E+02	1.777E+01	2.375E+03
26.093	1.540E+03	1.537E+02	1.849E+01	1.713E+03
3.133	9.515E+04	1.132E+03	4.220E+00	9.630E+04
3.316	8.243E+04	1.101E+03	4.469E+00	8.355E+04

48 - 2

REVISED 6/03/69

CROSS SECTIONS FOR CADMIUM		Z = 48	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	9.140E+03	7.858E+00	5.211E-03	9.148E+03
1.500	3.280E+03	3.40E+00	9.550E-03	3.288E+03
2.000	1.585E+03	1.68E+00	1.377E-02	1.592E+03
3.000	5.689E+02	6.165E+00	2.164E-02	5.751E+02
3.536	3.755E+02	5.79E+00	2.655E-02	3.812E+02
3.537	1.220E+03	5.78E+00	2.555E-02	1.226E+03
3.538	1.066E+03	5.575E+00	2.693E-02	1.072E+03
3.727	1.502E+03	5.574E+00	2.694E-02	1.508E+03
4.000	1.250E+03	5.385E+00	2.894E-02	1.255E+03
4.017	1.236E+03	5.311E+00	2.905E-02	1.241E+03
4.018	1.433E+03	5.370E+00	2.906E-02	1.438E+03
5.000	8.073E+02	4.683E+00	3.565E-02	8.016E+02
6.000	4.974E+02	4.097E+00	4.187E-02	5.016E+02
8.000	2.292E+02	3.219E+00	5.308E-02	2.325E+02
10.000	1.245E+02	2.620E+00	6.258E-02	1.212E+02
15.000	4.025E+01	1.719E+00	9.498E-02	4.025E+01
20.000	1.778E+01	1.201E+00	9.058E-02	1.901E+01
25.710	7.712E+00	7.966E-01	9.985E-02	8.608E+00
25.711	5.016E+01	7.966E-01	9.985E-02	5.105E+01
30.000	3.735E+01	6.705E-01	1.038E-01	5.804E+01
40.000	1.751E+01	4.233E-01	1.108E-01	5.920E+00
50.000	9.516E+00	2.894E-01	1.441E-01	9.043E+00
60.000	5.717E+00	2.097E-01	1.668E-01	5.759E+00
80.000	2.519E+00	1.238E-01	1.699E-01	2.619E+00
100.000	1.323E+00	8.158E-02	1.775E-01	5.335E-01
150.000	4.084E-01	3.746E-02	2.775E-01	3.004E-01
200.000	1.785E-01	2.132E-02	3.006E-01	5.556E-01
300.000	5.712E-02	6.568E-03	8.896E-02	1.1119E-01
400.000	2.623E-02	3.384E-03	8.031E-02	9.1172E-02
500.000	1.469E-02	3.445E-03	7.362E-02	7.9971E-02
600.000	9.311E-03	2.384E-03	6.827E-02	6.9111E-02
800.000	4.715E-03	1.334E-03	6.012E-02	5.786E-02
1000.000	2.887E-03	8.465E-04	5.412E-02	5.786E-02

FLUORESCENT ENERGIES

23.172	1.162E+01	9.744E-01	9.518E-02	1.272E+01
26.093	8.250E+00	8.235E-01	9.907E-02	9.179E+00
3.133	5.098E+02	5.056E+00	2.261E-02	5.159E+02
3.316	4.416E+02	5.901E+00	2.394E-02	4.476E+02

48 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR CADMIUM

ATOMIC WEIGHT 112.410 GRAMS / MOLE
DENSITY 8.650 GRAMS / CC
ATOMIC DENSITY 4.634E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.866E+02

L-EDGES AT	3.537	3.727	4.018
L-EDGE JUMPS	3.249	3.410	3.636
L-EDGE FIT JUMPS	3.314	3.636	3.636

K-EDGE AT 26.711 KEV
K-EDGE JUMP 6.505

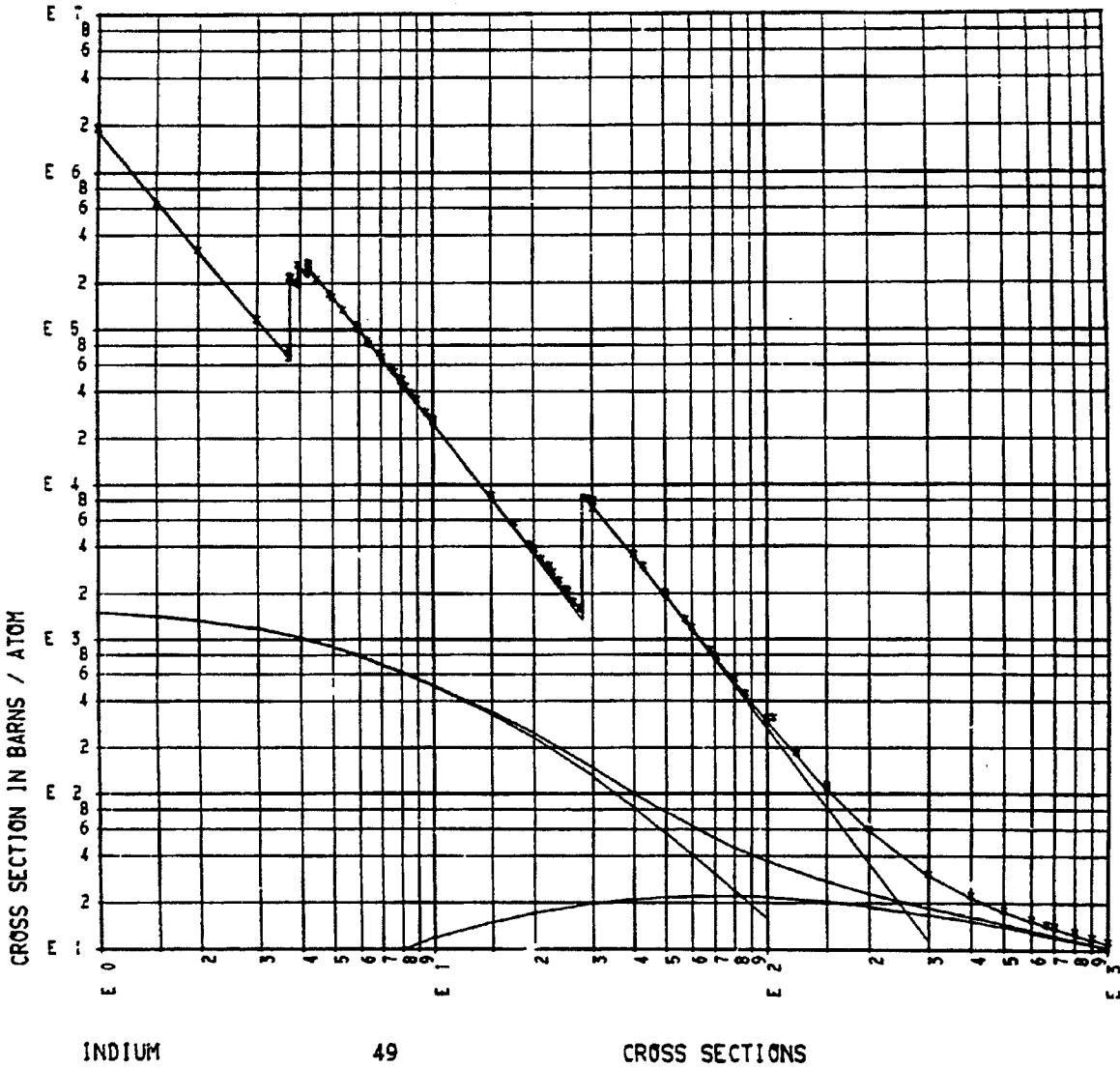
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.770	L	4.018	R	26.711
0	0.		1.43497E+01		1.59668E+01		1.5254E+01
1	0.		-2.52756E+00		-2.38363E+00		-2.17714E+00
2	0.		0.		18.01104E-02		18.51424E-02
3	0.		0.		0.		5.73120E-03

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.09856E+00	-5.16701E-02
1	3.72199E-01	1.57426E+00
2	-3.75345E-01	-2.27646E-01
3	1.93481E-02	7.05650E-03



CROSS SECTIONS FOR INDIUM Z = 49 BARNS / ATOM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.815E+06	1.522E+03	1.007E+00	1.816E+06
1.500	6.602E+05	1.447E+03	1.850E+00	6.617E+05
2.000	3.222E+05	1.365E+03	2.664E+00	3.335E+05
3.000	1.172E+05	1.198E+03	1.175E+00	1.184E+05
3.729	6.812E+04	1.080E+03	6.182E+00	6.921E+04
3.730	6.811E+05	1.080E+03	5.183E+00	2.228E+05
3.937	1.320E+05	1.052E+03	5.469E+00	1.353E+05
3.938	1.320E+05	1.052E+03	5.470E+00	2.716E+05
4.000	1.695E+05	1.044E+03	5.556E+00	2.606E+05
4.237	2.228E+05	1.008E+03	5.856E+00	2.335E+05
4.238	2.228E+05	1.008E+03	5.858E+00	2.390E+05
5.000	1.655E+05	9.107E+02	6.814E+00	1.665E+05
6.000	1.012E+05	7.981E+02	1.915E+00	1.020E+05
8.000	4.615E+04	6.273E+02	1.006E+01	4.519E+04
10.000	2.496E+04	5.101E+02	1.202E+01	2.548E+04
15.000	8.056E+03	3.354E+02	1.819E+01	8.406E+03
20.000	3.513E+03	2.333E+02	1.727E+01	3.825E+03
27.939	1.373E+03	1.462E+02	1.929E+01	1.539E+03
27.940	8.592E+03	1.462E+02	1.929E+01	8.757E+03
30.000	1.210E+03	1.315E+02	1.197E+01	3.362E+03
40.000	3.456E+03	8.299E+01	2.106E+01	3.550E+03
50.000	1.905E+03	6.569E+01	2.114E+01	1.983E+03
60.000	1.155E+03	4.107E+01	2.205E+01	1.319E+03
80.000	5.153E+02	2.426E+01	2.265E+01	5.515E+02
100.000	2.724E+02	1.598E+01	2.169E+01	3.171E+02
150.000	8.470E+01	1.334E+00	2.049E+01	1.129E+02
200.000	3.708E+01	4.174E+00	1.919E+01	3.641E+01
300.000	1.185E+01	1.870E+00	1.694E+01	3.066E+01
400.000	5.424E+00	1.053E+00	1.530E+01	1.178E+01
500.000	3.026E+00	6.740E-01	1.403E+01	1.175E+01
600.000	1.911E+00	4.670E-01	1.301E+01	1.539E+01
800.000	9.619E-01	2.811E-01	1.148E+01	2.688E+01
1000.000	6.859E-01	1.550E-01	1.031E+01	1.106E+01

FLUORESCENT ENERGIES

24.207	2.069E+03	1.793E+02	1.840E+01	2.274E+03
27.274	1.471E+03	1.513E+02	1.914E+01	1.643E+03
3.287	9.332E+04	1.147E+03	4.572E+00	9.449E+04
3.487	8.053E+04	1.115E+03	4.848E+00	8.168E+04

49 - 2

REVISED 6/03/69

CROSS SECTIONS FOR INDIUM Z = 49 CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	9.520E+03	7.984E+00	6.282E-03	9.528E+03
1.500	3.463E+03	7.592E+00	9.704E-03	3.471E+03
2.000	1.590E+03	7.158E+00	1.397E-02	1.697E+03
3.000	6.147E+02	6.283E+00	2.190E-02	6.310E+02
3.729	3.573E+02	5.664E+00	2.718E-02	3.630E+02
3.730	3.573E+02	5.663E+00	2.719E-02	3.630E+02
3.937	1.007E+03	5.619E+00	2.869E-02	1.013E+03
3.938	1.419E+03	5.318E+00	2.869E-02	1.425E+03
4.000	1.361E+03	5.477E+00	2.914E-02	1.367E+03
4.237	1.572E+03	5.288E+00	3.012E-02	1.573E+03
4.238	1.353E+03	5.287E+00	3.072E-02	1.359E+03
5.000	8.683E+02	4.777E+00	3.574E-02	8.731E+02
6.000	5.506E+02	4.186E+00	4.183E-02	5.548E+02
8.000	2.421E+02	3.290E+00	6.277E-02	2.454E+02
10.000	1.309E+02	2.676E+00	9.305E-02	1.337E+02
15.000	4.229E+01	1.894E+00	1.967E-02	4.409E+01
20.000	1.874E+01	1.234E+00	6.058E-02	2.006E+01
27.939	1.203E+00	1.670E-01	1.012E-01	8.671E+00
27.940	1.507E+01	7.670E-01	1.012E-01	4.593E+01
30.000	3.782E+01	6.900E-01	1.036E-01	3.889E+01
40.000	1.813E+01	4.351E-01	1.05E-01	1.867E+01
50.000	9.992E+00	2.974E-01	1.040E-01	1.040E+01
60.000	6.661E+00	2.154E-01	1.061E-01	3.392E+00
80.000	2.703E+00	1.272E-01	1.087E-01	3.945E+00
100.000	1.429E+00	8.382E-02	1.138E-01	1.627E+00
150.000	4.443E-01	3.847E-02	1.075E-01	5.930E-01
200.000	1.945E-01	2.189E-02	1.004E-01	3.169E-01
300.000	6.215E-02	9.808E-03	8.885E-02	1.060E-01
400.000	2.845E-02	5.523E-03	8.025E-02	1.433E-01
500.000	1.587E-02	3.535E-03	7.359E-02	2.399E-01
600.000	1.003E-02	2.450E-03	6.824E-02	6.824E-02
800.000	5.455E-03	1.369E-03	5.011E-02	5.652E-02
1000.000	3.073E-03	8.655E-04	5.408E-02	5.802E-02

FLUORESCENT ENERGIES

24.207	1.085E+01	9.405E-01	9.649E-02	1.193E+01
27.274	7.717E+00	7.938E-01	1.004E-01	8.619E+00
3.287	4.895E+02	6.015E+00	2.398E-02	4.956E+02
3.487	4.224E+02	5.848E+00	2.543E-02	4.284E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR INDIUM

ATOMIC WEIGHT 114.820 GRAMS / MOLE
DENSITY 2.280 GRAMS / CC
ATOMIC DENSITY 3.810E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.907E+02

L-EDGES AT	3.730	3.938	4.238
L-EDGE JUMPS	3.255	3.410	3.760
L-EDGE FIT JUMPS	5.324	5.636	5.950

K-EDGE AT 27.940 KEY
K-EDGE JUMP 6.257

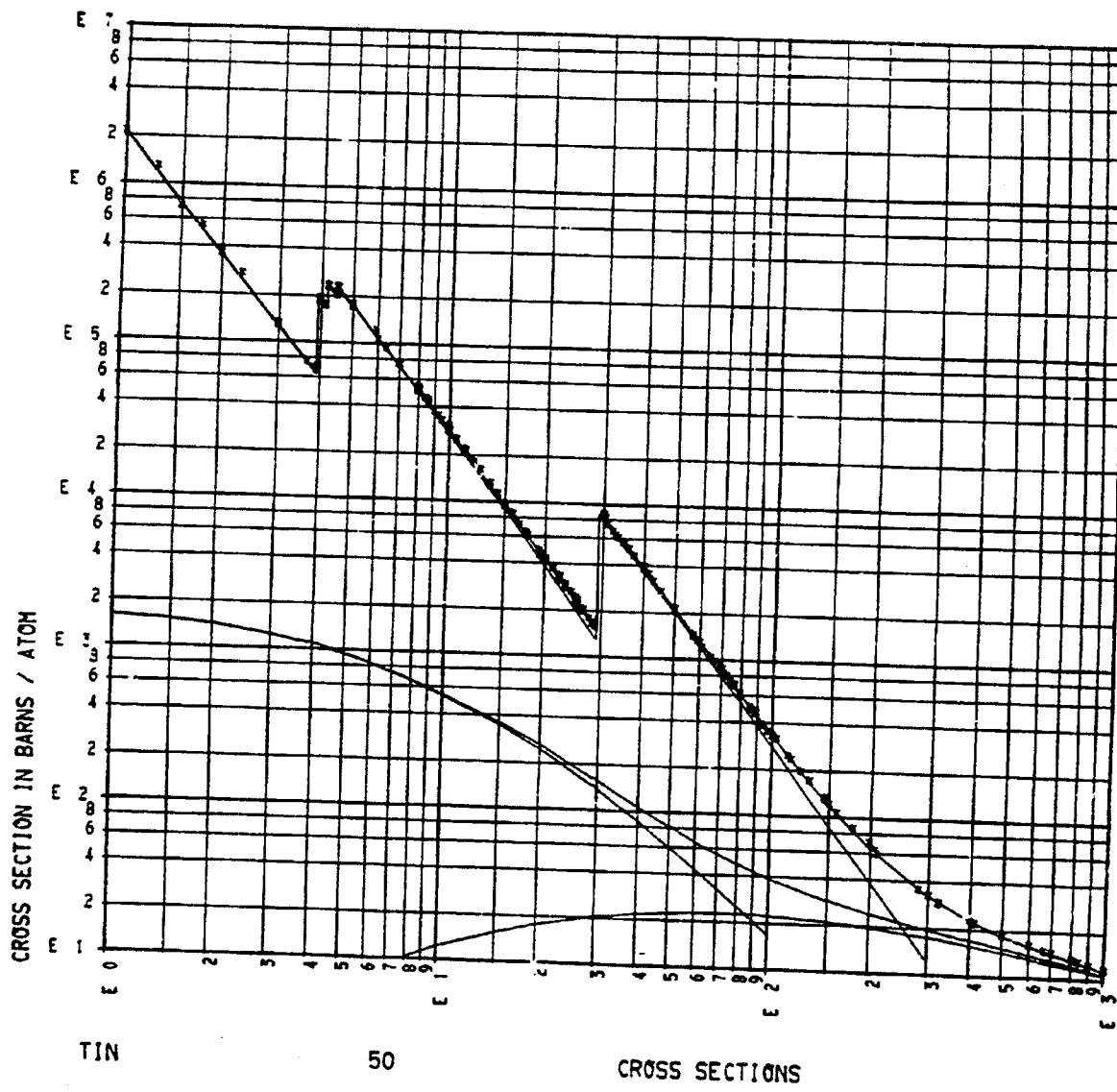
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.825	L	4.238	K	27.940
0	0.		1.44115E+01	1.62101E+01		1.18198E+01	
1	0.		-2.49401E+00	-2.51838E+00		1.45768E+00	
2	0.		0.	-5.40061E-02		-8.88529E-01	
3	0.		0.	0.		6.05982E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.12708E+00	-8.17283E-03
1	3.82082E-01	1.55865E+00
2	-3.76855E-01	-2.24492E-01
3	1.94151E-02	5.85776E-03



50 - I

REVISED 6/03/69

CROSS SECTIONS FOR TIN		Z = 50	BARNS / ATOM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.100E+06	1.583E+03	1.013E+00	2.101E+06
1.500	7.412E+05	1.503E+03	1.816E+00	7.427E+05
2.000	3.541E+05	1.415E+03	2.724E+00	3.555E+05
3.000	1.250E+05	1.241E+03	4.295E+00	1.262E+05
3.928	6.257E+04	1.093E+03	5.606E+00	6.366E+04
3.929	1.914E+05	1.093E+03	5.608E+00	1.925E+05
4.000	1.830E+05	1.085E+03	5.708E+00	1.841E+05
4.155	1.664E+05	1.059E+03	5.907E+00	1.675E+05
4.156	2.345E+05	1.059E+03	5.908E+00	2.355E+05
4.464	1.958E+05	1.044E+03	6.302E+00	1.968E+05
4.465	2.270E+05	1.044E+03	6.303E+00	2.280E+05
5.000	1.702E+05	9.81472E+02	6.981E+00	1.712E+05
6.000	1.064E+05	9.81388E+02	6.145E+00	1.073E+05
7.000	4.995E+04	9.81388E+02	6.283E+00	9.061E+04
10.000	2.142E+04	5.61458E+02	1.219E+01	5.756E+04
15.000	8.958E+03	3.8188E+02	1.642E+01	9.523E+03
20.000	3.950E+03	2.4566E+02	1.956E+01	4.224E+03
29.199	1.315E+03	1.438E+02	1.996E+01	1.479E+03
29.200	8.611E+03	1.438E+02	1.996E+01	8.611E+03
30.000	1.942E+03	1.381E+02	1.998E+01	8.100E+03
40.000	8.734E+03	1.108E+02	1.998E+01	8.843E+03
50.000	2.037E+03	6.950E+01	1.998E+01	1.119E+03
60.000	1.228E+03	4.431E+01	1.944E+01	1.234E+03
80.000	5.449E+02	2.048E+01	1.935E+01	5.338E+02
100.000	2.871E+02	1.678E+01	2.101E+01	3.266E+02
150.000	8.960E+01	1.022E+00	1.089E+01	1.182E+02
200.000	3.936E+01	4.383E+00	1.953E+01	6.327E+01
300.000	1.253E+01	9.633E+00	1.228E+01	3.188E+01
400.000	6.799E+00	1.105E+00	5.501E+01	6.261E+01
500.000	3.234E+00	1.012E+01	4.311E+01	1.825E+01
600.000	2.040E+00	4.900E+01	3.227E+01	1.580E+01
800.000	1.621E+00	2.140E+01	1.666E+01	1.299E+01
1000.000	6.172E-01	1.140E+01	1.052E+01	1.131E+01

FLUORESCENT ENERGIES				
25.270	2.003E+03	1.767E+02	1.897E+01	2.208E+03
28.483	1.414E+03	1.490E+02	1.974E+01	1.584E+03
3.444	8.770E+04	1.165E+03	4.923E+00	8.891E+04
3.662	7.491E+04	1.129E+03	5.231E+00	7.608E+04

50 - 2

REVISED 6/03/69

CROSS SECTIONS FOR TIN

Z = 50

CM**2 / GRAM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.065E+04	8.033E+00	5.140E-03	1.066E+04
1.500	3.761E+03	7.629E+00	9.519E-03	3.769E+03
2.000	1.797E+03	7.161E+00	1.382E-02	1.804E+03
3.000	6.343E+02	6.296E+00	2.179E-02	6.406E+02
3.928	3.175E+02	5.545E+00	2.845E-02	3.230E+02
3.929	9.714E+02	5.544E+00	2.845E-02	9.770E+02
4.000	9.288E+02	5.497E+00	2.896E-02	9.343E+02
4.155	8.443E+02	5.373E+00	2.997E-02	8.497E+02
4.156	1.190E+03	5.372E+00	2.998E-02	1.195E+03
4.464	9.935E+02	5.146E+00	3.198E-02	9.983E+02
4.465	1.152E+03	5.146E+00	3.198E-02	1.157E+03
5.000	8.638E+02	4.806E+00	3.542E-02	8.686E+02
6.000	5.400E+02	4.220E+00	4.133E-02	5.443E+02
8.000	2.534E+02	3.321E+00	5.191E-02	2.568E+02
10.000	1.391E+02	2.598E+00	6.185E-02	1.419E+02
15.000	4.545E+01	1.776E+00	8.824E-02	4.731E+01
20.000	2.009E+01	1.251E+00	8.905E-02	2.043E+01
29.199	6.672E+00	1.298E-01	1.010E-01	7.603E+00
29.200	4.318E+01	1.298E+01	1.010E-01	4.401E+01
30.000	4.030E+01	1.009E+01	1.019E-01	4.110E+01
40.000	1.895E+01	4.419E+01	1.087E-01	1.993E+01
50.000	1.034E+01	3.019E+01	1.087E-01	1.035E+01
60.000	6.233E+00	2.188E+01	1.395E-01	6.565E+00
80.000	2.765E+00	1.293E+01	1.395E-01	3.000E+00
100.000	1.460E+00	8.516E-02	1.1021E-01	1.461E+00
150.000	4.546E-01	3.908E-02	1.1060E-01	4.9991E+00
200.000	1.997E-01	2.224E-02	1.1060E-01	3.210E+00
300.000	6.411E-02	9.961E-03	1.1968E-02	1.618E+00
400.000	2.941E-02	6.612E-03	1.1931E-02	1.442E+00
500.000	1.641E-02	3.587E-03	1.261E-02	1.650E+00
600.000	1.035E-02	2.486E-03	1.733E-02	8.011E+00
800.000	5.181E-03	1.396E-03	9.932E-02	6.589E+00
1000.000	3.132E-03	8.629E-04	5.338E-02	5.739E+00

FLUORESCENT ENERGIES

25.270	1.016E+01	8.966E-01	9.625E-02	1.120E+01
28.483	7.172E+00	1.561E-01	1.001E-01	8.038E+00
3.444	4.450E+02	5.899E+00	2.498E-02	4.511E+02
3.662	3.801E+02	5.731E+00	2.654E-02	3.865E+02

50 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR TIN

ATOMIC WEIGHT 118.690 GRAMS / MOLE
DENSITY 5.750 GRAMS / CC
ATOMIC DENSITY 2.918E-02 BUNCHES / CC

CONVERSION CONSTANT IS 1.971E+02

L-EDGES AT 3.929 4.156 4.465
L-EDGE JUMPS 3.060 1.410 1.160
L-EDGE FIT JUMPS 5.005 1.636 1.160

K-EDGE AT 29.200 KEV
K-EDGE JUMP 6.473

BARNs / ATOM FIT COEFFICIENTS

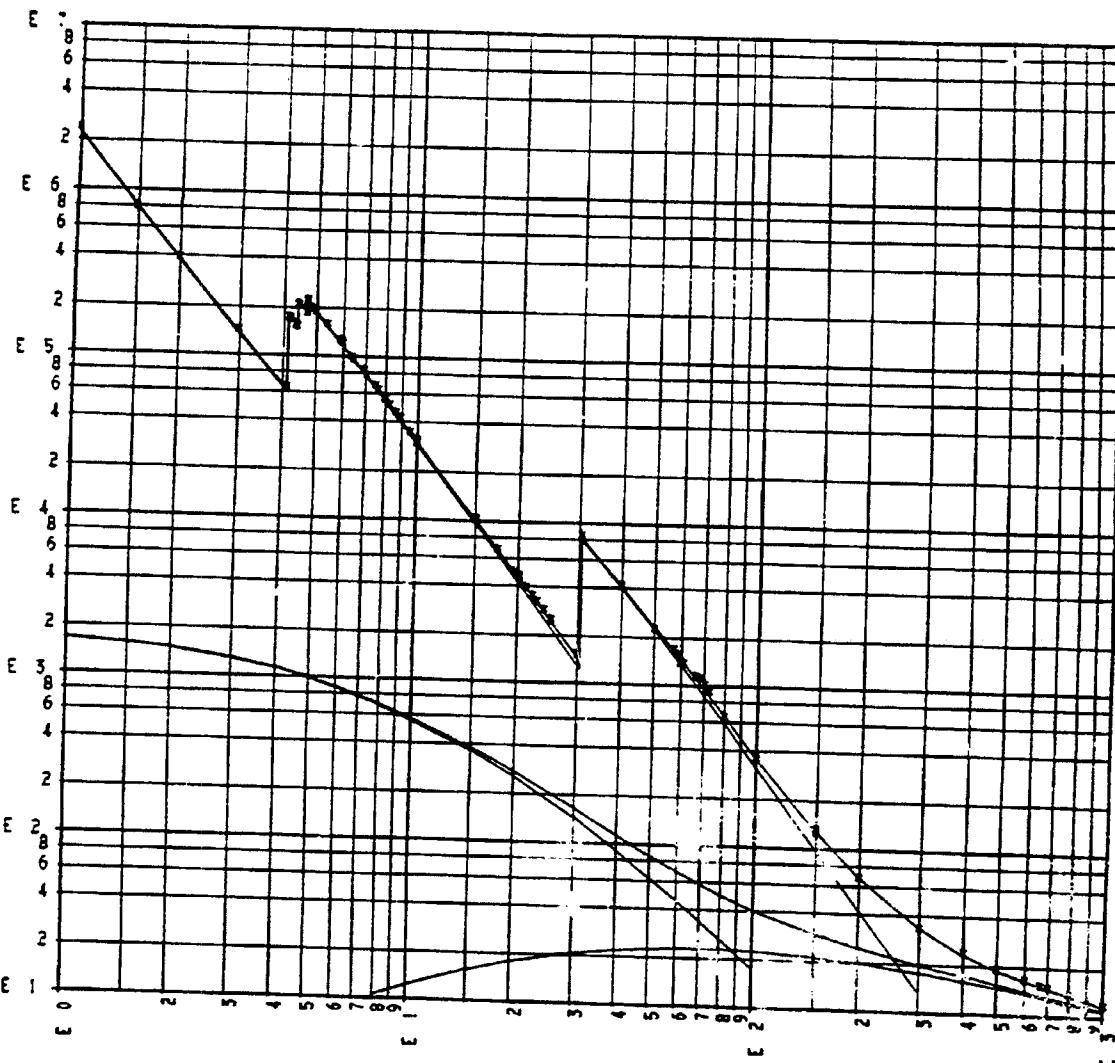
COEFFICIENTS OF PE LN-LN FIT

	N	M	G.884	L	4.465	K	29.200
0	C.		1.45572E+01		1.58638E+01		1.30323E+01
1	C.		-2.56792E+00		-2.19010E+00		-1.90788E-01
2	C.		0.		-1.13539E-01		-1.62349E-01
3	C.		0.		0.		5.27872E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.16085E+00	1.42151E-02
1	3.85512E-01	1.55154E+00
2	-3.76481E-01	-2.24736E-01
3	1.93305E-02	6.91395E-03

CROSS SECTION IN BARNS / ATOM



ANTIMONY

51

CROSS SECTIONS

51 - 1

REVISED 6/03/69

CROSS SECTIONS FOR ANTIMONY Z = 51 BARNS / ATOM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.251E+06	1.647E+03	9.894E-01	2.252E+06
1.500	1.986E+05	1.562E+03	1.863E+00	8.001E+05
2.000	3.828E+05	1.459E+03	2.749E+00	3.843E+05
3.000	1.358E+05	1.285E+03	4.397E+00	1.371E+05
4.000	6.512E+04	1.123E+03	5.857E+00	6.525E+04
4.131	5.997E+04	1.022E+03	6.029E+00	6.108E+04
4.132	5.762E+05	1.011E+03	6.030E+00	1.773E+05
4.380	1.528E+05	1.064E+03	5.353E+00	1.538E+05
4.381	2.153E+05	1.064E+03	5.354E+00	2.164E+05
4.697	1.813E+05	1.011E+03	5.163E+00	1.823E+05
4.698	2.101E+05	1.021E+03	5.164E+00	2.112E+05
5.000	1.800E+05	9.936E+02	5.152E+00	1.810E+05
6.000	1.136E+05	8.655E+02	5.328E+00	1.145E+05
8.000	5.393E+04	6.823E+02	5.041E+01	5.463E+04
10.000	2.978E+04	5.542E+02	5.222E+01	5.035E+04
15.000	9.766E+03	3.548E+02	5.556E+01	1.015E+04
20.000	4.305E+03	2.589E+02	5.719E+01	5.581E+03
30.000	1.304E+03	1.449E+02	5.036E+01	1.410E+03
30.490	1.242E+03	1.411E+02	5.044E+01	1.404E+03
30.491	1.891E+03	1.412E+02	5.044E+01	8.053E+03
40.000	4.622E+03	9.138E+01	5.174E+01	4.115E+03
50.000	2.271E+03	5.245E+01	5.247E+01	2.356E+03
60.000	3.855E+03	4.527E+01	5.283E+01	4.653E+03
80.000	6.174E+03	3.577E+01	5.284E+01	3.970E+03
100.000	3.245E+03	1.754E+01	5.244E+01	3.645E+03
150.000	9.092E+02	8.094E+00	5.229E+01	1.285E+02
200.000	4.280E+01	4.502E+00	5.990E+01	5.731E+01
300.000	1.350E+01	2.653E+00	5.262E+01	3.319E+01
400.000	6.194E+00	1.622E+00	5.911E+01	2.326E+01
500.000	3.478E+00	1.430E+00	5.059E+01	1.881E+01
600.000	2.227E+00	1.150E+00	5.553E+01	1.628E+01
800.000	1.160E+00	8.70E+00	5.198E+01	1.331E+01
1000.000	7.361E-01	1.830E-01	1.035E+01	1.165E+01

FLUORESCENT ENERGIES

26.357	1.910E+03	1.743E+02	1.949E+01	2.113E+03
29.723	1.340E+03	1.469E+02	2.070E+01	1.508E+03
3.605	8.494E+04	1.179E+03	8.261E+00	8.617E+04
3.843	7.213E+04	1.144E+03	8.628E+00	1.331E+04

CROSS SECTIONS FOR ANTIMONY		Z = 51	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.113E+04	8.144E+00	4.894E-03	1.114E+04
1.500	3.950E+03	2.727E+00	9.216E-03	3.958E+03
2.000	1.894E+03	2.264E+00	1.350E-02	1.901E+03
3.000	6.718E+02	6.357E+00	2.155E-02	6.782E+02
4.000	3.221E+02	5.554E+00	2.897E-02	3.277E+02
4.131	2.966E+02	5.449E+00	2.982E-02	3.021E+02
4.132	8.717E+02	8.448E+00	2.983E-02	8.772E+02
4.380	7.556E+02	6.263E+00	3.142E-02	7.609E+02
4.381	1.065E+03	5.262E+00	3.143E-02	1.076E+03
4.697	8.965E+02	5.049E+00	3.345E-02	8.016E+02
4.698	1.039E+03	5.049E+00	3.346E-02	1.044E+03
9.000	8.901E+02	4.865E+00	3.538E-02	8.950E+02
6.000	5.619E+02	3.281E+00	4.118E-02	5.662E+02
8.000	2.668E+02	3.375E+00	5.150E-02	2.702E+02
10.000	1.473E+02	2.740E+00	6.045E-02	1.501E+02
15.000	4.831E+01	1.804E+00	1.598E-02	5.019E+01
20.000	2.129E+01	1.276E+00	8.781E-02	2.256E+01
30.000	6.452E+00	1.169E-01	1.007E-01	1.269E+00
30.490	6.145E+00	6.993E-01	1.011E-01	6.946E+00
30.491	3.903E+01	6.993E-01	1.011E-01	3.983E+01
40.000	2.009E+01	4.520E-01	1.012E-01	2.066E+01
50.000	1.123E+01	3.089E-01	1.012E-01	1.155E+01
60.000	6.851E+00	2.239E-01	1.129E-01	1.188E+00
80.000	3.054E+00	1.324E-01	1.130E-01	3.299E+00
100.000	1.605E+00	8.723E-02	1.134E-01	1.803E+00
150.000	4.901E-01	4.003E-02	1.093E-01	6.354E-01
200.000	2.117E-01	2.279E-02	9.844E-02	3.329E-01
300.000	6.579E-02	1.020E-02	8.113E-02	1.642E-01
400.000	3.059E-02	5.748E-03	1.872E-02	1.151E-01
500.000	1.720E-02	3.675E-03	1.218E-02	9.505E-02
600.000	1.101E-02	2.547E-03	9.694E-03	8.050E-02
800.000	5.739E-03	1.420E-03	5.896E-02	6.612E-02
1000.000	3.641E-03	9.052E-04	5.308E-02	5.762E-02

FLUORESCENT ENERGIES				
26.357	9.446E+00	8.619E-01	9.640E-02	1.045E+01
29.723	6.530E+00	7.265E-01	1.004E-01	1.461E+00
3.605	4.201E+02	5.832E+00	2.612E-02	4.262E+02
3.843	3.568E+02	5.659E+00	2.784E-02	3.626E+02

51 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR ANTIMONY

ATOMIC WEIGHT 121.760 GRAMS / MOLE
DENSITY 6.691 GRAMS / CC
ATOMIC DENSITY 3.310E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.0225E+02

L-EDGES AT	4.132	4.381	4.698
L-EDGE JUMPS	2.939	1.410	1.160
L-EDGE FIT JUMPS	4.807	1.636	1.160

K-EDGE AT 30.491 KEY
K-EDGE JUMP 6.352

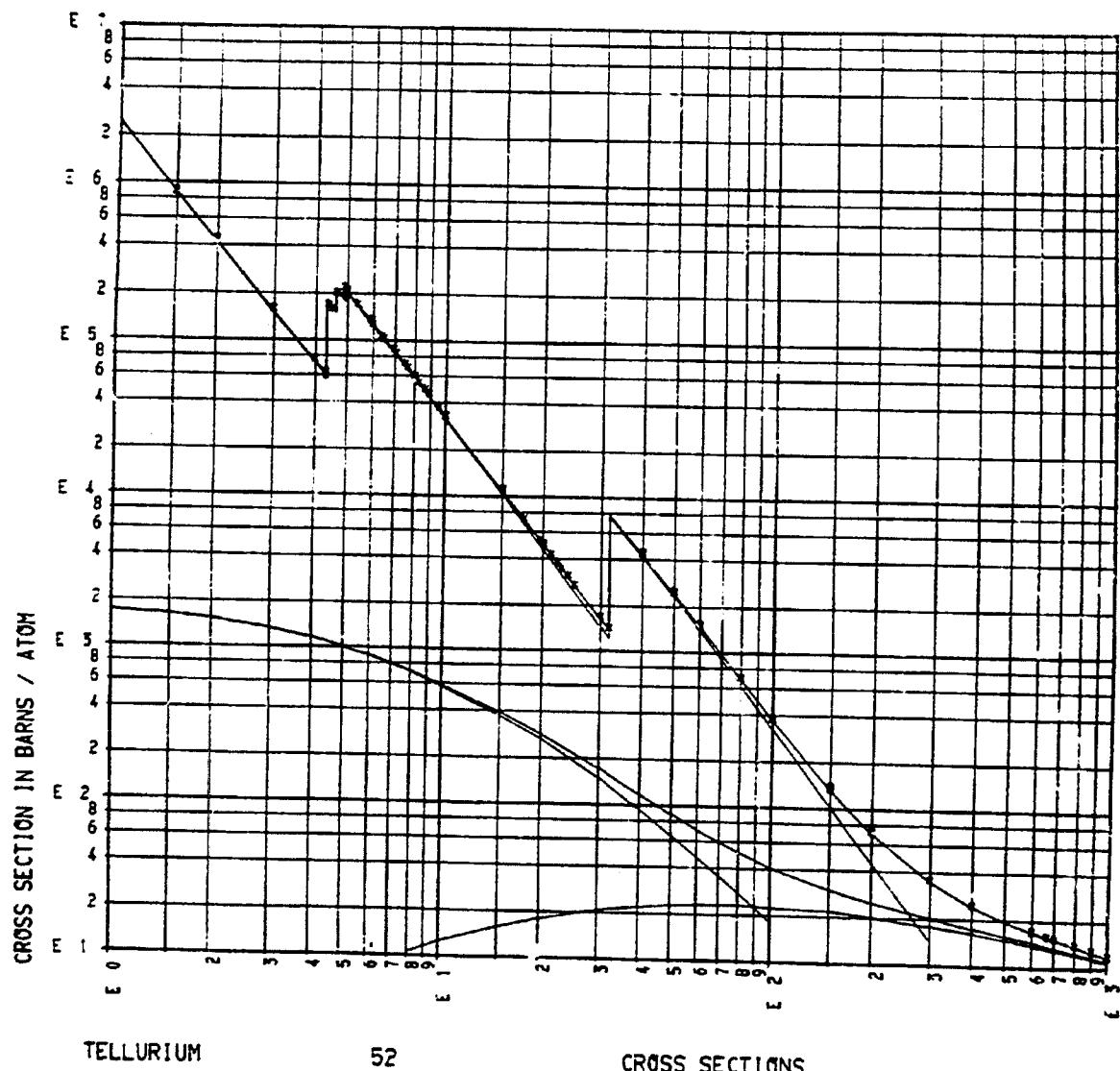
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	0.944	L	4.698	K	30.491
0	0.		1.46268E+01		1.57557E+01		9.06999E+00
1	0.		-2.55562E+00		-2.04460E+00		3.28791E+00
2	0.		0.		1.40745E-01		1.26203E+00
3	0.		0.		0.		8.53470E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.19665E+00	1.56362E-02
1	3.85543E-01	1.57175E+00
2	-3.75054E-01	-2.28753E-01
3	1.91608E-02	7.26386E-03



TELLURIUM

52

CROSS SECTIONS

CROSS SECTIONS FOR TELLURIUM		Z = 52	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.335E+06	1.712E+03	9.055E+01	2.337E+06
1.005	2.306E+06	1.711E+03	9.131E+01	2.308E+06
1.006	2.415E+06	1.711E+03	9.146E+01	2.417E+06
1.500	8.744E+05	1.624E+03	1.785E+00	8.760E+05
1.000	4.207E+05	1.525E+03	2.701E+00	4.222E+05
3.000	1.500E+05	1.532E+03	4.446E+00	1.513E+05
4.000	1.217E+04	1.163E+03	5.968E+00	1.334E+04
4.340	5.865E+04	1.109E+03	6.429E+00	5.976E+04
4.341	1.747E+05	1.095E+03	6.427E+00	1.758E+05
4.611	1.497E+05	1.071E+03	6.788E+00	1.508E+05
4.612	2.110E+05	1.070E+03	6.790E+00	2.121E+05
4.938	1.770E+05	1.028E+03	6.223E+00	1.781E+05
4.939	2.053E+05	1.028E+03	6.224E+00	2.063E+05
5.000	1.969E+05	1.020E+03	6.305E+00	1.999E+05
6.000	1.239E+05	8.993E+02	8.496E+00	1.248E+05
8.000	5.800E+04	8.106E+02	1.060E+01	5.872E+04
10.000	3.185E+04	5.770E+02	2.566E+01	3.244E+04
15.000	1.047E+04	3.798E+02	5.933E+01	1.086E+04
20.000	4.666E+03	2.695E+02	8.144E+01	4.954E+03
30.000	1.455E+03	1.520E+02	2.074E+01	1.628E+03
31.812	1.227E+03	1.388E+02	2.102E+01	1.386E+03
31.813	7.613E+03	1.388E+02	2.02E+01	7.733E+03
40.000	4.232E+03	9.588E+01	2.13E+01	4.350E+03
50.000	2.334E+03	6.556E+01	2.286E+01	2.423E+03
60.000	1.416E+03	4.544E+01	3.211E+01	1.487E+03
80.000	6.318E+02	2.813E+01	3.225E+01	6.832E+02
100.000	3.342E+02	1.854E+01	2.250E+01	3.195E+02
150.000	1.041E+02	8.511E+00	1.695E+01	1.843E+02
200.000	4.578E+01	4.845E+00	1.028E+01	4.990E+01
300.000	1.477E+01	2.170E+00	1.793E+01	3.490E+01
400.000	6.837E+00	1.223E+00	6.222E+01	2.428E+01
500.000	3.858E+00	1.820E+01	4.888E+01	1.952E+01
600.000	2.465E+00	5.420E+01	3.808E+01	5.881E+01
800.000	1.269E+00	3.030E+01	2.158E+01	3.222E+01
1000.000	7.893E-01	1.920E+01	1.094E+01	1.92E+01

FLUORESCENT ENERGIES

27.471	1.874E+03	1.721E+02	5.015E+01	2.073E+03
30.993	1.324E+03	1.445E+02	5.089E+01	1.489E+03
3.769	8.396E+04	1.196E+03	5.613E+00	8.519E+04
4.029	7.086E+04	1.158E+03	5.007E+00	7.202E+04

CROSS SECTIONS FOR TELLURIUM

Z = 52

CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.102E+04	8.082E+00	4.274E-03	1.103E+04
1.005	1.088E+04	8.077E+00	4.310E-03	1.089E+04
1.006	1.140E+04	8.076E+00	4.317E-03	1.141E+04
1.500	4.127E+03	7.666E+00	8.425E-03	4.135E+03
2.000	1.986E+03	7.199E+00	1.275E-02	1.993E+03
3.000	1.080E+02	6.286E+00	2.098E-02	7.143E+02
4.000	3.406E+02	5.490E+00	2.817E-02	3.462E+02
4.340	2.768E+02	5.233E+00	3.033E-02	2.821E+02
4.341	8.246E+02	5.233E+00	3.033E-02	8.299E+02
4.611	7.057E+02	5.055E+00	3.204E-02	7.118E+02
4.612	9.959E+02	5.050E+00	3.205E-02	1.001E+03
4.938	8.355E+02	4.851E+00	3.409E-02	8.405E+02
4.939	9.688E+02	4.850E+00	3.410E-02	9.737E+02
5.000	9.386E+02	4.815E+00	3.448E-02	9.435E+02
6.000	5.848E+02	4.245E+00	4.010E-02	5.891E+02
8.000	2.738E+02	3.354E+00	5.035E-02	2.772E+02
10.000	1.503E+02	2.123E+00	1.019E-02	1.531E+02
15.000	4.941E+01	1.793E+00	1.519E-02	5.128E+01
20.000	2.202E+01	1.273E+00	2.562E-02	2.338E+01
30.000	6.869E+00	1.173E-01	9.789E-02	1.084E+00
31.812	5.789E+00	5.551E-01	9.976E-02	6.544E+00
31.813	3.593E+01	5.551E-01	9.976E-02	3.669E+01
40.000	1.997E+01	4.525E-01	1.045E-01	2.053E+01
50.000	1.102E+01	3.094E-01	1.095E-01	1.144E+01
60.000	6.685E+00	2.244E-01	1.095E-01	1.019E+00
80.000	2.982E+00	1.528E-01	1.095E-01	3.224E+00
100.000	1.577E+00	8.751E-02	1.062E-01	1.631E+00
150.000	4.916E-01	4.017E-02	1.024E-01	5.541E+01
200.000	2.161E-01	2.287E-02	9.572E-02	3.346E+01
300.000	6.972E-02	1.024E-02	4.715E-02	1.647E+01
400.000	3.227E-02	5.172E-03	1.656E-02	1.146E+01
500.000	1.821E-02	3.691E-03	1.023E-02	9.213E+00
600.000	1.164E-02	2.558E-03	5.133E-03	1.933E+00
800.000	5.988E-03	1.430E-03	5.735E-03	6.476E-03
1000.000	3.725E-03	9.062E-04	5.164E-03	5.627E-03

FLUORESCENT ENERGIES

27.471	8.847E+00	8.124E-01	9.508E-02	9.785E+00
30.993	6.247E+00	6.821E-01	9.861E-02	7.038E+00
3.769	3.963E+02	5.646E+00	2.650E-02	4.021E+02
4.029	3.344E+02	5.467E+00	2.855E-02	3.399E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR TELLURIUM

ATOMIC WEIGHT 127.600 GRAMS / MOLE
DENSITY 6.240 GRAMS / CC
ATOMIC DENSITY 2.945E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.119E+02

L-EDGES AT	4.341	4.612	4.939
L-EDGE JUMPS	2.979	1.410	1.160
L-EDGE FIT JUMPS	4.872	1.636	1.160

K-EDGE AT 31.815 KEV
K-EDGE JUMP 6.207

BARNS / ATOM FIT COEFFICIENTS

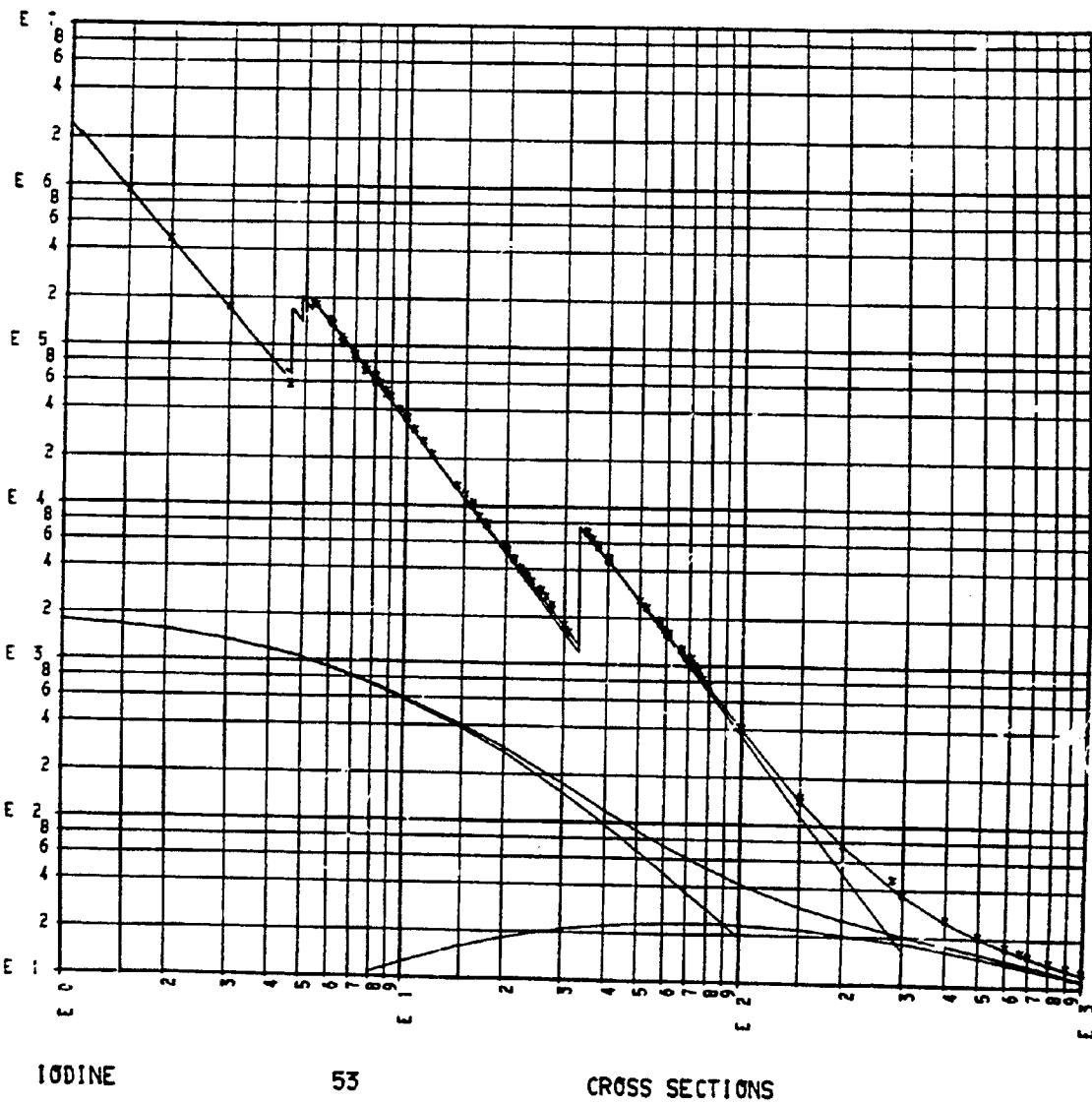
COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.47125E+01	1.61087E+01	1.16656E+01
1	0.	-2.54324E+00	-2.27876E+00	1.71052E+00
2	0.	0.	-9.29405E-02	-9.48281E-01
3	0.	0.	0.	0.53213E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.23464E+00	-4.07579E-02
1	3.82493E-01	1.64267E+00
2	-3.72715E-01	-2.47897E-01
3	1.89194E-02	8.80567E-03

CROSS SECTION IN BARNS / ATOM



IODINE

53

CROSS SECTIONS

53 - 1

REVISED 6/03/69

CROSS SECTIONS FOR IODINE

Z = 53

BARNES / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.424E+06	1.780E+03	8.946E-01	2.426E+06
1.071	2.044E+06	1.764E+03	1.005E+00	2.046E+06
1.072	2.142E+06	1.764E+03	1.007E+00	2.143E+06
1.500	9.304E+05	1.689E+03	1.780E+00	9.321E+05
2.000	4.556E+05	1.585E+03	2.715E+00	4.572E+05
3.000	1.666E+05	1.381E+03	4.521E+00	1.679E+05
4.000	8.156E+04	1.205E+03	6.100E+00	8.277E+04
4.556	5.905E+04	1.112E+03	5.868E+00	6.017E+04
4.557	1.685E+05	1.115E+03	5.870E+00	1.697E+05
4.851	1.430E+05	1.076E+03	7.273E+00	1.441E+05
4.852	2.015E+05	1.076E+03	7.274E+00	2.026E+05
5.000	1.861E+05	1.057E+03	7.475E+00	1.872E+05
5.187	1.689E+05	1.031E+03	7.705E+00	1.699E+05
5.188	1.558E+05	1.031E+03	7.707E+00	1.568E+05
6.000	1.330E+05	9.335E+02	8.686E+00	1.340E+05
8.000	6.157E+04	7.395E+02	1.080E+01	6.232E+04
10.000	3.367E+04	6.005E+02	1.267E+01	3.428E+04
15.000	1.110E+04	3.951E+02	1.608E+01	1.151E+04
20.000	5.002E+03	2.814E+02	1.835E+01	5.302E+03
30.000	1.603E+03	1.592E+02	2.104E+01	1.783E+03
33.168	1.205E+03	1.362E+02	2.153E+01	1.364E+03
33.169	7.432E+03	1.362E+02	2.153E+01	7.589E+03
40.000	4.597E+03	1.006E+02	2.247E+01	4.720E+03
50.000	2.544E+03	6.882E+01	2.323E+01	2.635E+03
60.000	1.548E+03	4.993E+01	2.359E+01	1.622E+03
80.000	6.946E+02	2.956E+01	2.364E+01	7.478E+02
100.000	3.691E+02	1.950E+01	2.330E+01	4.119E+02
150.000	1.159E+02	8.954E+00	2.208E+01	1.469E+02
200.000	5.113E+01	5.098E+00	2.066E+01	5.688E+01
300.000	1.652E+01	2.284E+00	1.830E+01	3.711E+01
400.000	7.629E+00	1.287E+00	1.653E+01	2.545E+01
500.000	4.285E+00	8.230E-01	1.516E+01	2.021E+01
600.000	2.723E+00	5.700E-01	1.406E+01	1.736E+01
800.000	1.383E+00	3.196E-01	1.239E+01	1.403E+01
1000.000	8.488E-01	2.020E-01	1.115E+01	1.220E+01

FLUORESCENT ENERGIES

28.610	1.831E+03	1.702E+02	2.071E+01	2.026E+03
32.292	1.301E+03	1.420E+02	2.140E+01	1.465E+03
3.937	8.484E+04	1.214E+03	6.000E+00	8.507E+04
4.220	7.141E+04	1.168E+03	6.405E+00	7.260E+04

CROSS SECTIONS FOR IODINE		Z = 53	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.150E+04	8.448E+00	4.245E-03	1.151E+04
1.071	9.701E+03	8.373E+00	4.769E-03	9.710E+03
1.072	1.016E+04	8.372E+00	4.777E-03	1.017E+04
1.500	4.415E+03	8.013E+00	8.447E-03	4.423E+03
2.000	2.162E+03	7.522E+00	1.288E-02	2.170E+03
3.000	7.904E+02	6.554E+00	2.145E-02	7.970E+02
4.000	3.871E+02	5.717E+00	2.895E-02	3.928E+02
4.556	2.802E+02	5.299E+00	3.259E-02	2.855E+02
4.557	8.002E+02	5.298E+00	3.260E-02	8.055E+02
4.851	6.785E+02	5.108E+00	3.451E-02	6.836E+02
4.852	9.561E+02	5.107E+00	3.452E-02	9.512E+02
5.000	8.831E+02	5.018E+00	3.548E-02	8.881E+02
5.187	8.013E+02	4.894E+00	3.657E-02	8.062E+02
5.188	9.290E+02	4.893E+00	3.657E-02	9.340E+02
6.000	6.313E+02	4.430E+00	4.122E-02	5.358E+02
8.000	2.922E+02	3.509E+00	5.125E-02	2.957E+02
10.000	1.598E+02	2.850E+00	6.013E-02	1.627E+02
15.000	5.269E+01	1.875E+00	7.631E-02	9.464E+01
20.000	2.374E+01	1.335E+00	8.708E-02	2.516E+01
30.000	7.607E+00	7.556E-01	9.985E-02	8.463E+00
33.168	5.725E+00	6.466E-01	1.022E-01	6.473E+00
33.169	3.527E+01	6.465E-01	1.022E-01	3.602E+01
40.000	2.182E+01	4.773E-01	1.066E-01	2.240E+01
50.000	1.207E+01	3.266E-01	1.102E-01	1.251E+01
60.000	1.348E+00	2.369E-01	1.119E-01	1.696E+00
80.000	3.295E+00	1.403E-01	1.122E-01	3.549E+00
100.000	1.751E+00	9.251E-02	1.106E-01	1.955E+00
150.000	5.499E-01	4.249E-02	1.048E-01	6.972E-01
200.000	2.426E-01	2.419E-02	9.804E-02	3.649E-01
300.000	1.841E-02	1.084E-02	8.584E-02	1.761E-01
400.000	3.620E-02	6.101E-03	7.844E-02	1.308E-01
500.000	2.033E-02	3.906E-03	7.194E-02	9.618E-02
600.000	1.292E-02	2.705E-03	6.672E-02	8.235E-02
800.000	6.564E-03	1.514E-03	5.886E-02	6.587E-02
1000.000	4.028E-03	9.586E-04	5.291E-02	5.790E-02
FLUORESCENT ENERGIES				
28.610	8.691E+00	8.077E-01	9.826E-02	9.614E+00
32.292	6.176E+00	6.740E-01	1.015E-01	6.953E+00
3.937	4.026E+02	5.761E+00	2.847E-02	4.084E+02
4.220	3.389E+02	5.541E+00	3.046E-02	3.445E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR IODINE

ATOMIC WEIGHT 126.910 GRAMS / MOLE
DENSITY 4.940 GRAMS / CC
ATOMIC DENSITY 2.344E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.107E+02

L-EDGES AT 4.557 4.852 5.188
L-EDGE JUMPS 2.856 1.410 1.160
L-EDGE FIT JUMPS 4.571 1.636 1.160

K-EDGE AT 33.169 KEY
K-EDGE JUMP 6.161

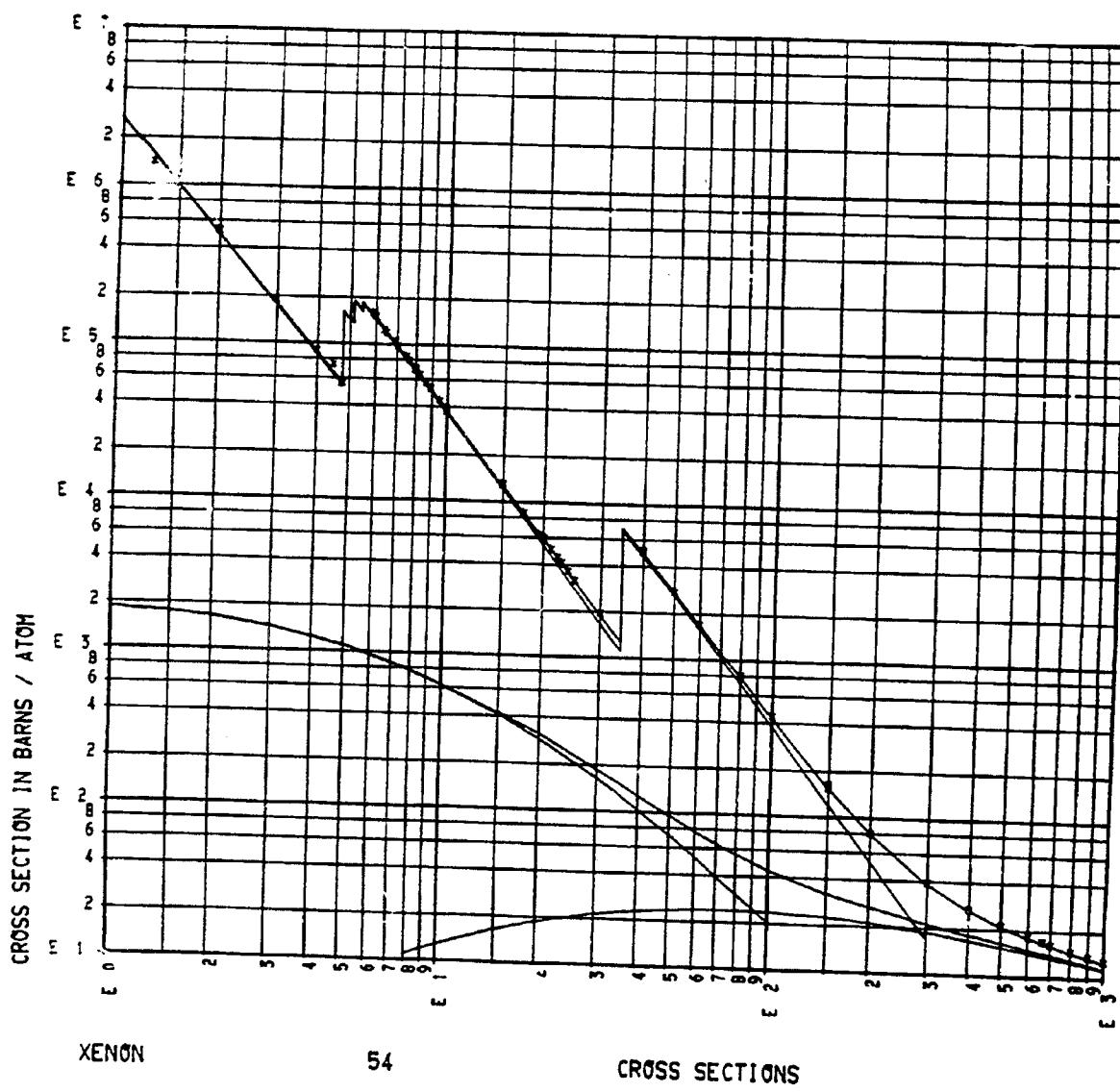
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.47496E+01	1.64086E+01	1.21076E+01
1	0.	-2.48179E+00	-2.48214E+00	1.43635E+00
2	0.	0.	-5.07179E-02	-8.82358E-01
3	0.	0.	0.	6.03575E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.27415E+00	-4.04420E-02
1	3.77223E-01	1.65596E+00
2	-3.69728E-01	-2.51067E-01
3	1.86280E-02	9.04874E-03



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REVISED 6/03/69

CROSS SECTIONS FOR XENON

Z = 54

BARNs / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.450E+06	1.850E+03	9.421E-01	2.452E+06
1.142	1.759E+06	1.818E+03	1.173E+00	1.771E+06
1.143	1.854E+06	1.818E+03	1.175E+00	1.856E+06
1.500	9.523E+05	1.755E+03	1.839E+00	9.540E+05
2.000	4.705E+05	1.648E+03	2.788E+00	4.722E+05
3.000	1.742E+05	1.433E+03	4.610E+00	1.756E+05
4.000	8.607E+04	1.248E+03	6.254E+00	8.732E+04
4.780	5.562E+04	1.125E+03	7.356E+00	5.675E+04
4.781	1.601E+05	1.124E+03	7.358E+00	1.612E+05
5.000	1.426E+05	1.095E+03	7.664E+00	1.437E+05
5.099	1.355E+05	1.081E+03	7.788E+00	1.366E+05
5.100	1.910E+05	1.081E+03	7.789E+00	1.921E+05
5.451	1.605E+05	1.033E+03	8.225E+00	6.617E+05
5.452	1.862E+05	1.033E+03	8.226E+00	1.873E+05
6.000	1.450E+05	9.679E+02	8.895E+00	1.460E+05
8.000	6.769E+04	7.587E+02	1.101E+01	6.847E+04
10.000	3.713E+04	6.248E+02	1.283E+01	3.777E+04
15.000	1.220E+04	4.106E+02	1.630E+01	1.263E+04
20.000	5.445E+03	2.933E+02	1.861E+01	5.757E+03
30.000	1.705E+03	1.667E+02	2.135E+01	1.893E+03
34.581	1.128E+03	1.336E+02	2.206E+01	1.283E+03
34.582	6.853E+03	1.336E+02	2.206E+01	7.009E+03
40.000	4.744E+03	1.054E+02	2.281E+01	4.872E+03
50.000	2.645E+03	7.222E+01	2.359E+01	2.741E+03
60.000	1.617E+03	5.243E+01	2.397E+01	1.693E+03
80.000	7.279E+02	3.107E+01	2.404E+01	1.830E+02
100.000	3.871E+02	2.050E+01	2.376E+01	4.313E+02
150.000	1.215E+02	9.423E+00	2.247E+01	1.534E+02
200.000	5.356E+01	5.366E+00	2.103E+01	7.996E+01
300.000	1.734E+01	2.405E+00	1.864E+01	3.838E+01
400.000	8.043E+00	1.355E+00	1.684E+01	2.624E+01
500.000	4.547E+00	8.560E-01	1.544E+01	2.086E+01
600.000	2.912E+00	6.010E-01	1.432E+01	1.784E+01
800.000	1.505E+00	3.350E-01	1.262E+01	1.446E+01
1000.000	9.402E-01	2.130E-01	1.136E+01	1.251E+01

FLUORESCENT ENERGIES

29.802	1.738E+03	1.682E+02	2.131E+01	1.928E+03
33.644	1.221E+03	1.394E+02	2.192E+01	1.383E+03
4.111	8.048E+04	1.228E+03	6.412E+00	8.173E+04
4.422	5.731E+04	1.177E+03	6.852E+00	6.851E+04

CROSS SECTIONS FOR XENON

Z = 54

CM**2 / GRAM

KEV	PHOTO	COCHERENT	INCOHERENT	TOTAL
1.000	1.124E+04	8.485E+00	4.321E-03	1.124E+04
1.142	8.115E+03	8.341E+00	5.380E-03	8.124E+03
1.143	8.503E+03	8.340E+00	5.387E-03	8.511E+03
1.500	4.368E+03	8.052E+00	8.437E-03	4.376E+03
2.000	2.158E+03	7.557E+00	1.279E-02	2.166E+03
3.000	1.990E+02	6.574E+00	2.114E-02	8.056E+02
4.000	3.948E+02	5.725E+00	2.868E-02	4.005E+02
4.780	2.551E+02	5.158E+00	3.374E-02	2.603E+02
4.781	2.344E+02	5.157E+00	3.375E-02	2.396E+02
5.000	6.540E+02	5.024E+00	3.516E-02	6.591E+02
5.099	6.216E+02	4.958E+00	3.572E-02	6.266E+02
5.100	8.760E+02	4.957E+00	3.573E-02	8.810E+02
5.451	7.367E+02	4.738E+00	3.773E-02	7.419E+02
5.452	8.542E+02	4.738E+00	3.773E-02	8.590E+02
6.000	6.550E+02	4.440E+00	4.080E-02	6.695E+02
8.000	3.105E+02	3.526E+00	5.051E-02	3.140E+02
10.000	1.703E+02	2.856E+00	5.886E-02	1.732E+02
15.000	5.596E+01	1.883E+00	7.477E-02	5.791E+01
20.000	2.497E+01	1.345E+00	8.537E-02	2.541E+01
30.000	7.821E+00	7.645E-01	9.794E-02	8.584E+00
34.581	5.172E+00	6.128E-01	1.012E-01	5.886E+00
34.582	3.143E+01	6.128E-01	1.012E-01	3.215E+01
40.000	2.176E+01	4.836E-01	1.046E-01	2.235E+01
50.000	1.213E+01	3.313E-01	1.082E-01	1.257E+01
60.000	7.416E+00	2.405E-01	1.100E-01	7.567E+00
80.000	3.539E+00	1.425E-01	1.103E-01	3.592E+00
100.000	1.776E+00	9.403E-02	1.087E-01	1.978E+00
150.000	5.572E-01	4.322E-02	1.031E-01	1.035E-01
200.000	2.457E-01	2.461E-02	9.647E-02	3.668E-01
300.000	7.953E-02	1.103E-02	8.149E-02	1.761E-01
400.000	3.689E-02	6.215E-03	1.124E-02	1.203E-01
500.000	2.086E-02	3.972E-03	1.084E-02	9.567E-02
600.000	1.336E-02	2.757E-03	9.570E-02	8.181E-02
800.000	6.901E-03	1.537E-03	9.188E-02	5.632E-02
1000.000	4.313E-03	9.170E-04	5.211E-02	5.740E-02

FLUORESCENT ENERGIES

29.802	7.971E+00	7.717E-01	9.772E-02	8.843E+00
53.644	5.603E+00	6.396E-01	1.006E-01	6.346E+00
4.111	3.692E+02	5.634E+00	2.941E-02	3.749E+02
4.422	3.087E+02	5.398E+00	3.143E-02	3.143E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR XENON

ATOMIC WEIGHT 131.300 GRAMS / MOLE
DENSITY 5.900E-03 GRAMS / CC
ATOMIC DENSITY 2.706E-05 BUNCHES / CC

CONVERSION CONSTANT IS 2.180E+02

L-EDGES AT	4.781	5.100	5.452
L-EDGE JUMPS	2.879	1.410	1.160
L-EDGE FIT JUMPS	4.708	1.636	1.160

K-EDGE AT 34.582 KEY
K-EDGE JUMP 6.078

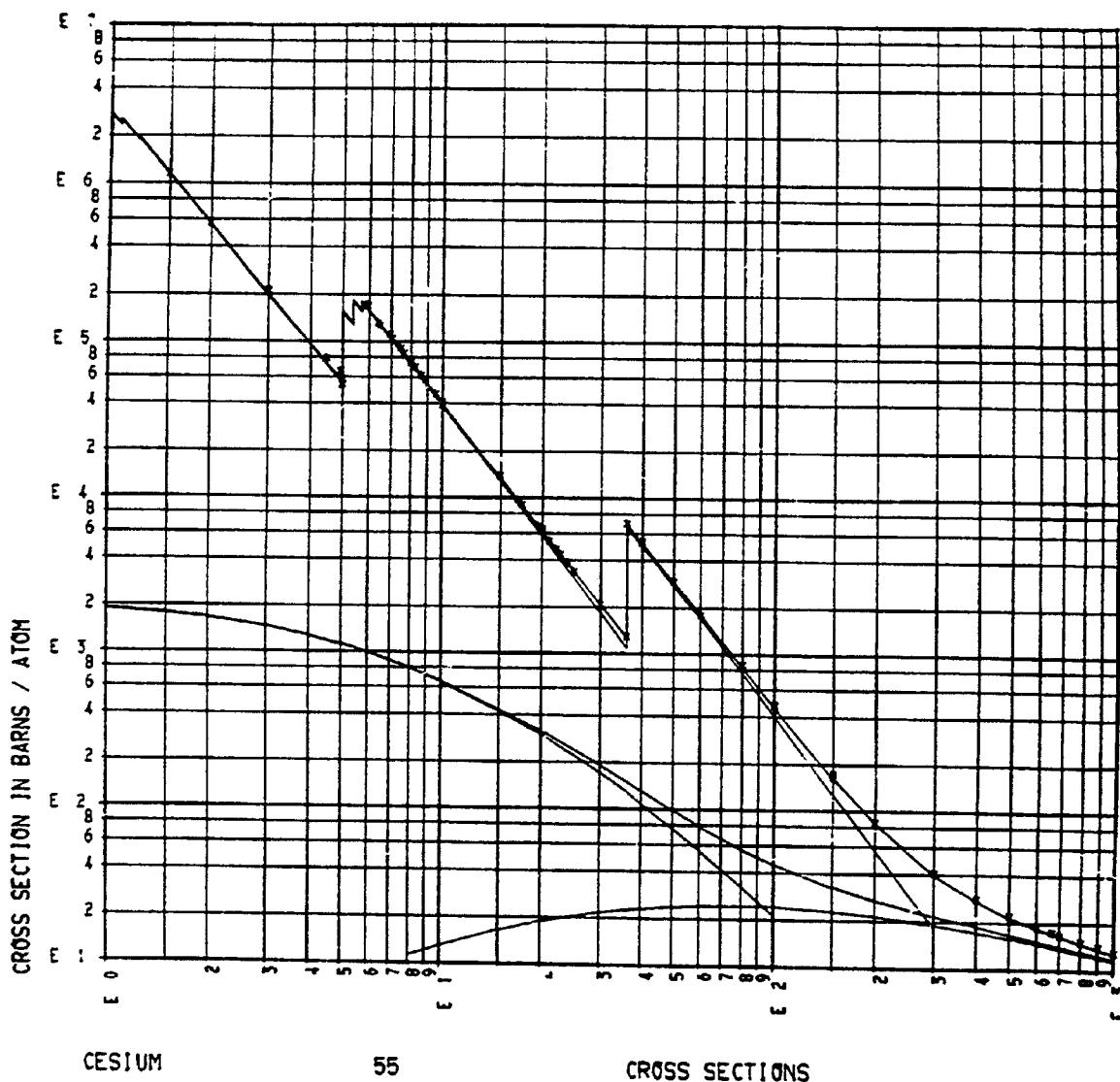
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.47603E+01	1.63098E+01	1.16857E+01
1	0.	-2.45068E+00	-2.31679E+00	2.08357E+00
2	0.	0.	-8.54498E-02	-1.01209E+00
3	0.	0.	0.	6.90310E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.31469E+00	-2.82407E-03
1	3.70315E-01	1.64039E+00
2	-3.66280E-01	-2.47642E-01
3	1.83025E-02	8.82144E-03



CROSS SECTIONS FOR CESIUM

Z = 55

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
.000	2.161E+06	1.897E+03	1.274E+00	2.163E+06
.001	2.155E+06	1.896E+03	1.276E+00	2.157E+06
.002	2.148E+06	1.896E+03	1.278E+00	2.150E+06
.070	2.327E+06	1.819E+03	1.392E+00	2.329E+06
.071	2.343E+06	1.819E+03	1.394E+00	2.345E+06
.217	1.840E+06	1.847E+03	1.647E+00	1.842E+06
.218	1.928E+06	1.847E+03	1.649E+00	1.930E+06
.500	1.138E+05	1.96E+03	2.165E+00	1.140E+06
.000	5.494E+05	6.89E+03	3.082E+00	5.511E+05
.000	1.968E+05	4.76E+03	4.856E+00	1.983E+05
.000	9.503E+04	2.87E+03	6.489E+00	9.632E+04
.000	5.402E+04	1.3CE+03	7.912E+00	5.515E+04
.011	5.372E+04	1.28E+03	7.926E+00	5.485E+04
.012	1.529E+05	1.28E+03	7.927E+00	1.541E+05
.358	1.282E+05	1.079E+03	8.361E+00	1.293E+05
.359	1.807E+05	1.079E+03	8.363E+00	1.818E+05
.112	1.526E+05	0.34E+03	8.800E+00	1.536E+05
.113	1.769E+05	0.33E+03	8.801E+00	1.780E+05
.600	1.553E+05	9.99E+02	9.153E+00	1.563E+05
.800	1.198E+04	1.966E+02	1.278E+01	1.278E+04
.10.000	3.939E+04	6.484E+02	3.08E+01	4.005E+04
.15.000	1.299E+04	4.26E+02	6.56E+01	1.343E+04
.20.000	5.850E+03	3.051E+02	8.91E+01	6.174E+03
.30.000	1.812E+03	1.74E+02	2.169E+01	2.058E+03
.35.984	1.116E+03	1.313E+02	2.261E+01	1.270E+03
.35.985	6.638E+03	1.313E+02	2.261E+01	6.792E+03
.40.000	5.073E+03	1.05E+02	2.317E+01	5.206E+03
.50.000	2.827E+03	7.581E+01	2.397E+01	2.937E+03
.60.000	1.728E+03	5.309E+01	2.436E+01	1.808E+03
.80.000	1.790E-02	3.268E+01	2.443E+01	8.362E+02
.100.000	4.149E+02	2.158E+01	2.410E+01	4.606E+02
.150.000	1.305E+02	9.929E+00	2.287E+01	1.634E+02
.200.000	5.776E+01	5.657E+00	2.141E+01	8.482E+01
.300.000	1.877E+01	2.536E+00	1.898E+01	4.028E+01
.400.000	8.724E+00	1.429E+00	1.715E+01	2.730E+01
.500.000	4.938E+00	9.140E-01	1.573E+01	2.158E+01
.600.000	3.154E+00	6.330E-01	1.459E+01	1.839E+01
.800.000	1.635E+00	3.550E-01	1.285E+01	1.484E+01
1000.000	1.021E+00	2.250E-01	1.157E+01	1.282E+01

FLUORESCENT ENERGIES

30.970	1.710E+03	1.659E+02	2.185E+01	1.899E+03
34.924	1.209E+03	1.372E+02	2.247E+01	1.370E+03
4.286	1.979E+04	1.236E+03	6.899E+00	8.106E+04
4.520	6.598E+04	1.183E+03	1.375E+00	6.720E+04

CROSS SECTIONS FOR CESIUM Z = 55 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
.000	9.791E+03	8.594E+00	5.774E-03	9.800E+03
.001	9.766E+03	8.593E+00	5.782E-03	9.775E+03
.002	1.245E+04	8.592E+00	5.789E-03	1.246E+04
.070	1.055E+04	8.516E+00	6.308E-03	1.055E+04
.071	1.152E+04	8.515E+00	6.316E-03	1.153E+04
.217	8.338E+03	8.369E+00	2.464E-03	8.346E+03
.218	8.737E+03	8.369E+00	2.472E-03	8.745E+03
.500	5.157E+03	8.136E+00	9.809E-03	5.165E+03
2.000	2.489E+03	7.651E+00	1.397E-02	2.497E+03
3.000	8.920E+02	6.688E+00	2.200E-02	8.987E+02
4.000	4.306E+02	5.832E+00	2.940E-02	4.365E+02
5.000	2.448E+02	5.121E+00	3.585E-02	2.499E+02
5.011	2.434E+02	5.113E+00	3.591E-02	2.486E+02
5.012	6.930E+02	5.113E+00	3.592E-02	5.982E+02
5.358	5.810E+02	4.889E+00	3.789E-02	5.859E+02
5.359	8.187E+02	4.888E+00	3.789E-02	8.237E+02
5.712	6.914E+02	4.683E+00	3.988E-02	6.961E+02
5.713	8.017E+02	4.683E+00	3.988E-02	8.064E+02
6.000	7.038E+02	4.531E+00	4.147E-02	7.084E+02
8.000	3.261E+02	3.610E+00	5.105E-02	3.298E+02
10.000	1.785E+02	2.938E+00	5.926E-02	1.815E+02
15.000	5.887E+01	1.931E+00	7.505E-02	6.088E+01
20.000	2.651E+01	1.383E+00	8.569E-02	2.798E+01
30.000	8.481E+00	7.898E-01	9.828E-02	9.369E+00
35.984	5.057E+00	5.149E-01	1.025E-01	5.754E+00
35.985	3.008E+01	5.948E-01	1.025E-01	3.078E+01
40.000	2.298E+01	5.008E-01	1.050E-01	2.359E+01
50.000	1.281E+01	3.435E-01	1.086E-01	1.326E+01
60.000	7.832E+00	2.496E-01	1.104E-01	8.192E+00
80.000	3.530E+00	1.481E-01	1.107E-01	3.789E+00
100.000	1.880E+00	9.777E-02	1.092E-01	2.081E+00
150.000	5.920E-01	4.499E-02	1.036E-01	7.406E-01
200.000	2.617E-01	2.563E-02	9.701E-02	3.844E-01
300.000	8.504E-02	1.149E-02	8.599E-02	1.825E-01
400.000	3.953E-02	6.475E-03	7.701E-02	1.237E-01
500.000	2.238E-02	4.142E-03	4.126E-02	9.778E-02
600.000	1.434E-02	2.868E-03	6.610E-02	8.331E-02
800.000	7.409E-03	1.609E-03	5.823E-02	5.725E-02
1000.000	4.626E-03	1.020E-03	5.243E-02	5.807E-02

FLUORESCENT ENERGIES

30.970	7.747E+00	7.516E-01	9.900E-02	8.603E+00
34.984	5.479E+00	6.216E-01	1.018E-01	6.206E+00
4.286	3.615E+02	5.602E+00	3.126E-02	3.673E+02
4.620	2.990E+02	5.362E+00	3.342E-02	3.045E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR CESIUM

ATOMIC WEIGHT 132.910 GRAMS / MOLE
DENSITY 1.873 GRAMS / CC
ATOMIC DENSITY 8.487E-03 BUNCHES / CC

CONVERSION CONSTANT IS 2.207E+02

L-EDGES AT	5.012	5.359	5.713
L-EDGE JUMPS	2.847	1.410	1.160
L-EDGE FIT JUMPS	4.657	1.636	1.160

K-EDGE AT 35.985 KEV
K-EDGE JUMP 5.949

BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

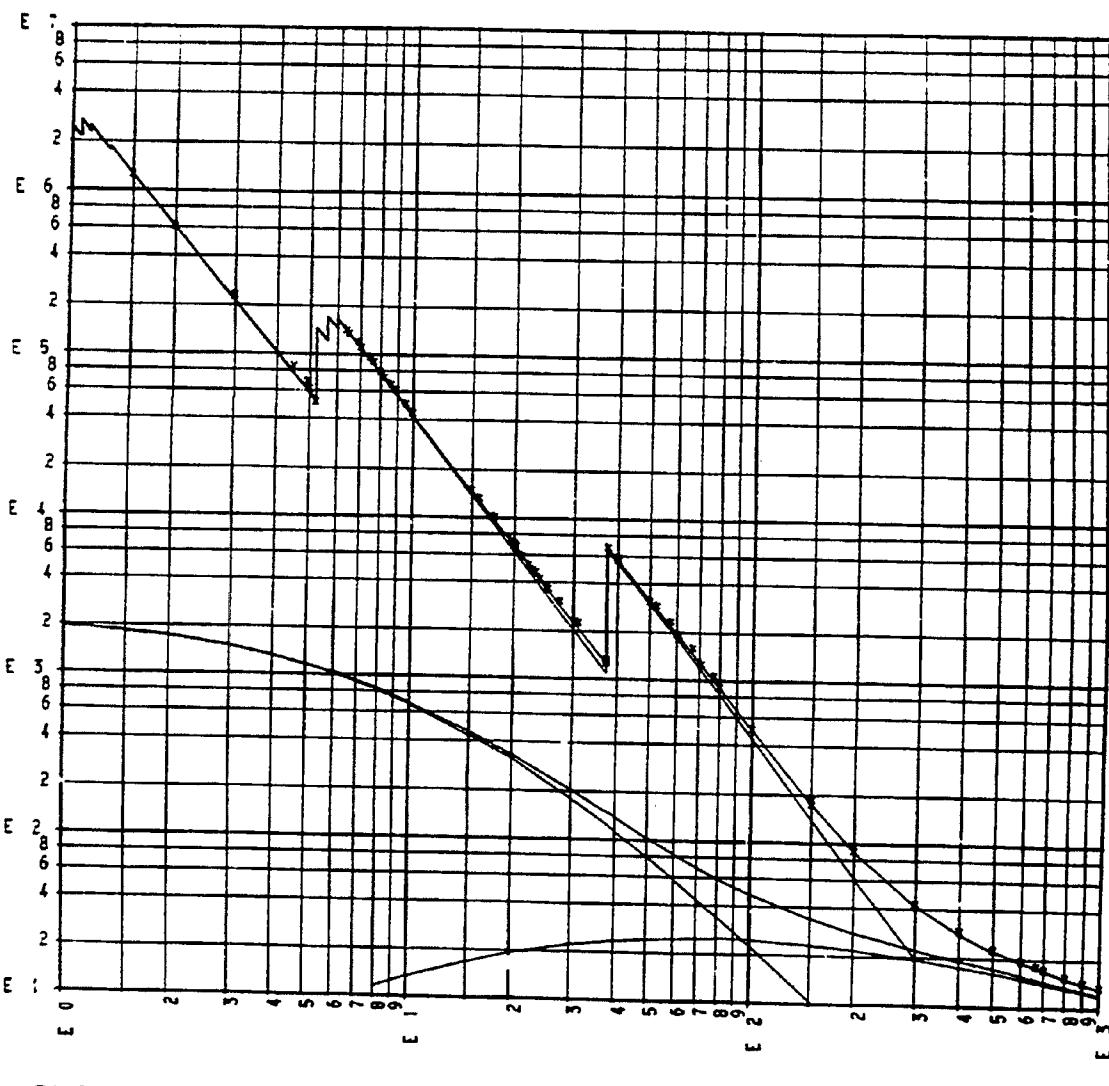
	N	M	L	K
0	0.	1.49713E+01	1.65418E+01	1.13757E+01
1	0.	-2.53145E+00	-2.45363E+00	1.94161E+00
2	0.	0.	-5.42849E-02	-9.83232E-01
3	0.	0.	0.	6.71986E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

COHERENT INCOHERENT

0	7.33490E+00	1.84861E-01
1	3.76825E-01	1.50030E+00
2	-3.65713E-01	-2.13333E-01
3	1.81843E-02	6.24264E-03

CROSS SECTION IN BARNS / ATOM



BARIUM

56

CROSS SECTIONS

CROSS SECTIONS FOR BARIUM		Z = 56	BARNs / ATOM	
KEY	PHOTO	CohereNT	INCOHERENT	TOTAL
1.000	2.403E+06	1.955E+03	1.514E+00	2.405E+06
1.060	2.070E+06	1.938E+03	1.624E+00	2.072E+06
1.061	2.657E+06	1.938E+03	1.626E+00	2.659E+06
1.130	2.261E+06	1.921E+03	1.756E+00	2.263E+06
1.131	2.447E+06	1.920E+03	1.756E+00	2.449E+06
1.202	1.740E+06	1.894E+03	2.063E+00	1.742E+06
1.293	1.841E+06	1.883E+03	2.055E+00	1.843E+06
1.500	1.258E+06	1.843E+03	2.470E+00	1.260E+06
2.000	6.017E+05	1.730E+03	3.386E+00	6.034E+05
3.000	2.128E+05	5.16E+03	5.13CE+00	2.143E+05
4.000	1.018E+05	3.26E+03	6.744E+00	1.031E+05
5.000	5.745E+04	1.68E+03	8.175E+00	5.863E+04
5.246	5.080E+04	1.29E+03	8.487E+00	5.193E+04
5.247	1.442E+05	1.28E+03	8.489E+00	1.454E+05
5.623	1.201E+05	0.77E-03	8.950E+00	1.212E+05
5.624	1.693E+05	0.77E-03	8.961E+00	1.704E+05
5.986	1.435E+05	0.33E+03	9.409E+00	1.465E+05
5.987	1.564E+05	0.33E+03	9.410E+00	1.574E+05
6.000	1.554E+05	1.032E+03	9.426E+00	1.565E+05
8.000	2.689E+04	8.24E+02	1.154E+01	2.703E+04
10.000	4.222E+04	6.72E+02	1.334E+01	4.290E+04
15.000	1.404E+04	4.417E+02	1.583E+01	1.450E+04
20.000	6.372E+03	3.162E+02	1.921E+01	2.085E+03
30.000	2.066E+03	1.820E+02	2.203E+01	2.270E+03
37.440	1.110E+03	1.288E+02	2.318E+01	1.262E+03
37.441	6.437E+03	1.288E+02	2.318E+01	5.589E+03
40.000	5.456E+03	1.157E+02	2.353E+01	5.696E+03
50.000	3.069E+03	7.947E+01	2.434E+01	3.173E+03
60.000	1.885E+03	5.780E+01	2.474E+01	1.968E+03
80.000	8.525E+02	3.431E+01	2.483E+01	1.019E+03
100.000	4.539E+02	2.268E+01	2.450E+01	5.011E+02
150.000	1.422E+02	1.045E+01	2.326E+01	1.260E+02
200.000	6.258E+01	5.955E+00	2.178E+01	6.332E+01
300.000	2.020E+01	2.671E+00	1.931E+01	2.219E+01
400.000	9.371E+00	1.504E+00	1.746E+01	8.333E+01
500.000	5.306E+00	9.630E-01	1.601E+01	2.228E+01
600.000	3.407E+00	6.670E-01	1.485E+01	8.893E+01
800.000	1.774E+00	3.730E-01	1.308E+01	5.233E+01
1000.000	1.119E+00	2.370E-01	1.178E+01	3.4E+01

FLUORESCENT ENERGIES

32.191	1.696E+03	1.631E+02	2.239E+01	1.883E+03
36.376	1.203E+03	1.348E+02	2.302E+01	1.362E+03
4.467	7.670E+04	2.444E+02	7.418E+00	7.796E+04
4.828	6.285E+04	1.189E+03	7.932E+00	6.406E+04

CROSS SECTIONS FOR BARIUM

Z = 56

CM**2

GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.054E+04	8.571E+00	6.638E-03	1.055E+04
1.060	9.075E+03	8.499E+00	7.121E-03	9.083E+03
1.091	1.165E+04	8.498E+00	7.130E-03	1.166E+04
1.150	9.913E+03	8.421E+00	7.693E-03	9.922E+03
1.181	1.075E+04	8.419E+00	7.701E-03	1.074E+04
1.292	7.629E+03	8.258E+00	9.043E-03	7.637E-03
1.293	8.070E+03	8.257E+00	9.052E-03	8.079E+03
1.500	5.515E+03	8.081E+00	1.083E-02	5.523E+03
2.000	2.638E+03	7.587E+00	1.484E-02	2.646E+03
3.000	9.331E+02	6.548E+00	2.249E-02	9.337E+02
4.000	4.463E+02	6.813E+00	3.957E-02	4.522E+02
5.000	2.519E+02	6.109E+00	5.884E-02	2.570E+02
5.245	2.227E+02	6.948E+00	5.721E-02	2.277E+02
5.247	6.323E+02	4.947E+00	5.792E-02	6.373E+02
5.623	5.267E+02	4.724E+00	5.928E-02	5.314E+02
5.624	7.422E+02	4.724E+00	5.929E-02	7.470E+02
5.986	6.292E+02	4.531E+00	4.125E-02	6.338E+02
5.987	7.296E+02	4.530E+00	4.126E-02	7.342E+02
6.000	7.254E+02	4.524E+00	4.133E-02	7.300E+02
8.000	3.371E+02	3.613E+00	5.659E-02	3.408E+02
10.000	1.851E+02	2.947E+00	5.849E-02	1.881E+02
15.000	6.156E+01	1.937E+00	1.380E-02	6.357E+01
20.000	2.1794E+01	1.390E+00	8.424E-03	2.941E+01
30.000	9.060E+00	1.979E-01	6.659E-03	9.955E+00
37.440	4.856E+00	5.649E-01	1.016E-01	5.533E+00
77.441	2.822E+01	5.649E-01	1.016E-01	2.889E+01
40.000	2.392E+01	5.073E-01	1.032E-01	2.463E+01
50.000	1.345E+01	3.484E-01	1.067E-01	1.391E+01
60.000	8.266E+00	2.534E-01	1.095E-01	8.627E+00
80.000	3.738E+00	1.504E-01	1.085E-01	3.997E+00
100.000	1.990E+00	9.943E-02	1.074E-01	1.109E+00
150.000	6.237E-01	4.580E-02	1.026E-01	7.118E-01
200.000	2.744E-01	2.611E-02	9.551E-02	3.900E-01
300.000	8.859E-02	1.171E-02	8.469E-02	1.850E-01
400.000	4.109E-02	6.594E-03	5.653E-02	1.242E-01
500.000	2.327E-02	4.222E-03	3.230E-02	1.142E-02
600.000	1.494E-02	2.924E-03	6.511E-02	9.098E-02
800.000	7.780E-03	1.635E-03	5.737E-02	6.678E-02
1000.000	4.908E-03	1.039E-03	5.165E-02	5.160E-02

FLUORESCENT ENERGIES

32.191	7.435E+00	7.149E-01	9.816E-02	8.258E+00
36.376	5.276E+00	5.909E-01	1.009E-01	5.912E+00
4.467	3.363E+02	5.453E+00	3.252E-02	3.419E+02
4.828	2.755E+02	5.213E+00	3.478E-02	2.809E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR BARIUM

ATOMIC WEIGHT 137.360 GRAMS / MOLE
DENSITY 5.500 GRAMS / CC
ATOMIC DENSITY 1.535E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.281E+02

L-EDGES AT	5.247	5.624	5.987
L-EDGE JUMPS	2.859	1.410	1.160
L-EDGE FIT JUMPS	4.644	1.636	1.160

K-EDGE AT 37.441 KEV
K-EDGE JUMP 5.800

BARNs / ATOM FIT COEFFICIENTS

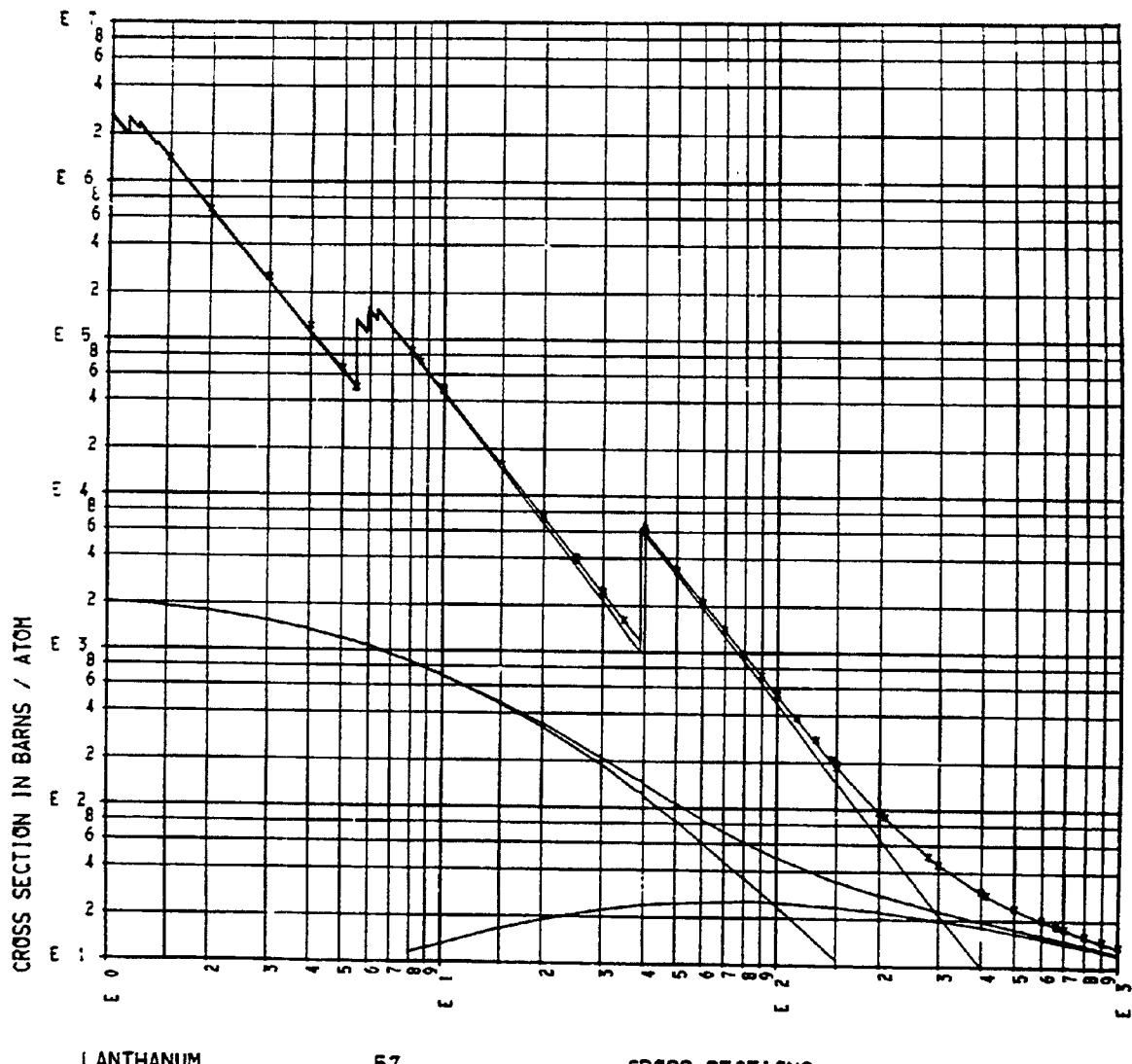
COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.50844E+01	1.66217E+01	1.02250E+01
1	0.	-2.56341E+00	-2.48972E+00	2.67835E+00
2	0.	0.	-1.49623E-02	-1.12648E+00
3	0.	0.	0.	-1.62669E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

COHERENT INCOHERENT

0	7.35812E+00	3.44376E-01
1	3.79361E-01	1.38742E+00
2	-3.64099E-01	-1.86356E-01
3	1.79817E-02	4.24917E-03



57 - 1 REVISED 6/03/69

CROSS SECTIONS FOR LANTHANUM		Z = 57	BARN / ATOM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.626E+06	2.028E+03	1.603E+00	2.628E+06
1.124	1.941E+06	1.993E+03	1.839E+00	1.943E+06
1.125	2.505E+06	1.993E+03	1.840E+00	2.507E+06
1.204	2.102E+06	1.973E+03	1.993E+00	2.104E+06
1.205	2.295E+06	1.972E+03	1.995E+00	2.297E+06
1.362	1.673E+06	1.937E+03	2.303E+00	1.675E+06
1.363	1.770E+06	1.937E+03	2.305E+00	1.772E+06
1.500	1.382E+06	1.909E+03	2.579E+00	1.384E+06
2.000	6.574E+05	1.789E+03	3.491E+00	6.592E+05
3.000	2.307E+05	1.554E+03	5.237E+00	2.322E+05
4.000	1.097E+05	1.368E+03	6.845E+00	1.111E+05
5.000	6.166E+04	1.202E+03	8.287E+00	6.287E+04
5.482	4.861E+04	1.131E+03	8.902E+00	4.975E+04
5.483	1.321E+05	1.131E+03	8.903E+00	1.332E+05
5.890	1.101E+05	1.079E+03	9.413E+00	1.112E+05
5.891	1.552E+05	1.079E+03	9.415E+00	1.563E+05
6.000	1.481E+05	1.065E+03	9.550E+00	1.492E+05
6.266	1.325E+05	1.030E+03	9.844E+00	1.336E+05
6.267	1.537E+05	1.030E+03	9.845E+00	1.547E+05
8.000	8.175E+04	8.528E+02	1.168E+01	9.261E+04
10.000	4.544E+04	5.967E+02	1.308E+01	4.615E+04
15.000	1.525E+04	4.579E+02	1.663E+01	1.573E+04
20.000	6.892E+03	3.29CE+02	1.914E+01	7.240E+03
30.000	2.189E+03	1.900E+02	2.221E+01	2.401E+03
38.924	1.030E+03	1.267E+02	2.364E+01	1.180E+03
38.925	6.235E+03	1.267E+02	2.354E+01	6.385E+03
40.000	5.820E+03	1.212E+02	2.380E+01	5.965E+03
50.000	3.267E+03	8.338E+01	2.466E+01	3.375E+03
60.000	2.006E+03	6.071E+01	2.509E+01	2.092E+03
80.000	9.085E+02	3.607E+01	2.521E+01	9.698E+02
100.000	4.850E+02	2.387E+01	2.488E+01	5.338E+02
150.000	1.530E+02	1.101E+01	2.365E+01	1.817E+02
200.000	6.755E+01	6.279E+00	2.215E+01	9.609E+01
300.000	2.195E+01	2.817E+00	1.965E+01	4.442E+01
400.000	1.020E+01	1.588E+00	1.776E+01	2.954E+01
500.000	5.770E+00	1.016E+00	1.629E+01	2.308E+01
600.000	3.696E+00	1.040E-01	1.511E+01	1.951E+01
800.000	1.912E+00	3.940E-01	1.332E+01	1.563E+01
1000.000	1.195E+00	2.500E-01	1.199E+01	1.344E+01

FLUORESCENT ENERGIES

33.440	1.599E+03	1.604E+02	2.280E+01	1.786E+03
37.799	1.121E+03	1.326E+02	2.348E+01	1.279E+03
4.651	7.433E+04	1.254E+03	1.789E+00	1.561E+04
5.043	6.031E+04	1.196E+03	8.342E+00	6.151E+04

CROSS SECTIONS FOR LANTHANUM

Z = 57

CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.138E+04	8.791E+00	6.949E-03	1.139E+04
1.124	8.416E+03	8.540E+00	7.970E-03	8.425E+03
1.125	1.086E+04	8.639E+00	7.979E-03	1.087E+04
1.204	9.112E+03	8.552E+00	8.64CE-03	9.121E+03
1.205	9.951E+03	8.551E+00	8.648E-03	9.959E+03
1.362	7.252E+03	8.397E+00	9.984E-03	7.261E+03
1.363	7.673E+03	8.396E+00	9.993E-03	7.681E+03
1.500	5.991E+03	8.277E+00	1.118E-02	6.000E+03
2.000	2.850E+03	7.755E+00	1.513E-02	2.858E+03
3.000	1.000E+03	6.781E+00	2.270E-02	1.007E+03
4.000	4.757E+02	5.929E+00	3.270E-02	4.815E+02
5.000	2.673E+02	5.213E+00	3.593E-02	2.725E+02
5.482	2.107E+02	4.904E+00	3.859E-02	2.157E+02
5.483	5.726E+02	4.904E+00	3.860E-02	5.776E+02
5.890	4.773E+02	4.676E+00	4.081E-02	4.820E+02
5.891	6.727E+02	4.676E+00	4.082E-02	6.774E+02
6.000	6.420E+02	4.619E+00	4.140E-02	6.466E+02
6.266	5.746E+02	4.467E+00	4.268E-02	5.791E+02
6.267	5.662E+02	4.467E+00	4.268E-02	5.707E+02
8.000	3.544E+02	3.597E+00	5.664E-02	3.581E+02
10.000	1.970E+02	3.026E+00	5.670E-02	2.001E+02
15.000	6.612E+01	1.985E+00	1.210E-02	6.811E+01
20.000	2.988E+01	1.426E+00	8.298E-02	3.139E+01
30.000	9.489E+00	8.236E-01	9.529E-02	1.041E+01
38.924	4.466E+00	5.491E-01	1.025E-01	5.118E+00
38.925	2.703E+01	5.491E-01	1.025E-01	2.768E+01
40.000	2.523E+01	5.253E-01	1.032E-01	2.586E+01
50.000	1.416E+01	3.615E-01	1.059E-01	1.463E+01
60.000	8.695E+00	2.632E-01	1.086E-01	9.057E+00
80.000	3.939E+00	1.554E-01	1.093E-01	4.204E+00
100.000	2.103E+00	1.035E-01	1.073E-01	2.314E+00
150.000	6.633E-01	4.773E-02	1.025E-01	8.136E-01
200.000	2.933E-01	2.722E-02	9.607E-02	4.166E-01
300.000	9.518E-02	1.221E-02	8.519E-02	1.926E-01
400.000	4.421E-02	6.884E-03	7.699E-02	1.261E-01
500.000	2.501E-02	4.405E-03	5.062E-02	1.000E-01
600.000	1.602E-02	3.052E-03	5.551E-02	8.458E-02
800.000	8.287E-03	1.708E-03	5.175E-02	5.774E-02
1000.000	5.182E-03	1.084E-03	5.198E-02	5.825E-02

FLUORESCENT ENERGIES

33.440	6.931E+00	6.955E-01	9.883E-02	7.742E+00
37.799	4.862E+00	5.747E-01	1.018E-01	5.544E+00
4.651	3.222E+02	5.435E+00	3.377E-02	3.278E+02
5.043	2.614E+02	5.183E+00	3.617E-02	2.667E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR LANTHANUM

ATOMIC WEIGHT 138.920 GRAMS / MOLE
DENSITY 6.150 GRAMS / CC
ATOMIC DENSITY 2.666E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.307E+02

L-EDGES AT	5.483	5.891	6.267
L-EDGE JUMPS	2.717	2.410	1.160
L-EDGE FIT JUMPS	4.444	1.636	1.160

K-EDGE AT 38.925 KEV
K-EDGE JUMP 6.053

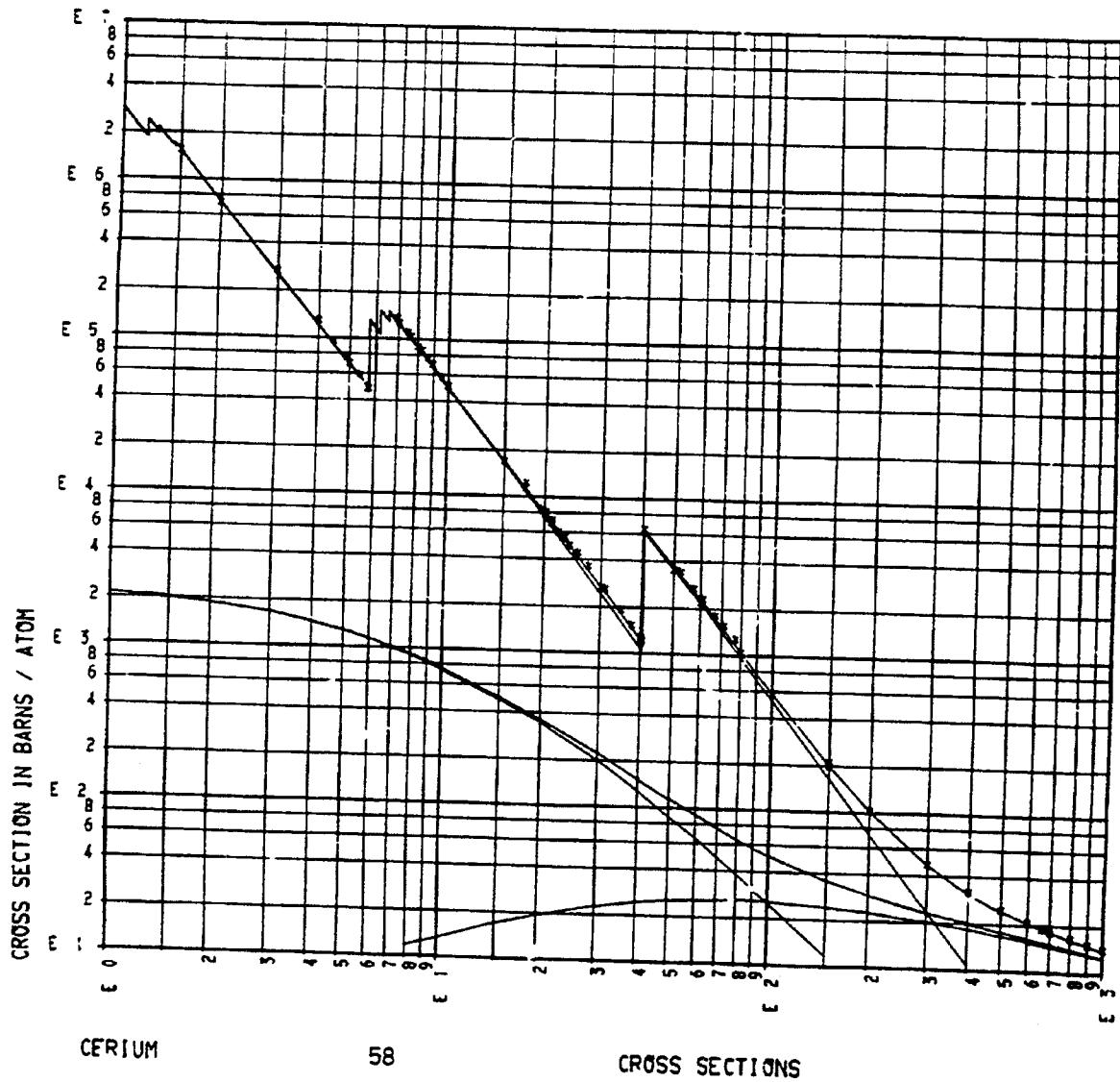
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	0.	1.363	6.267	38.925
1	0.	1.51863E+01	1.63134E+01	1.09780E+01
2	0.	-2.58287E+00	-2.20155E+00	2.23814E+00
3	0.	0.	-9.80569E-02	-1.03549E+00
		0.	0.	7.02339E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.39532E+00	4.09104E-01
1	3.69895E-01	1.33075E+00
2	-3.59376E-01	-1.70683E-01
3	1.75406E-02	3.04111E-03



CERIUM

58

CROSS SECTIONS

CROSS SECTIONS FOR CERIUM

Z = 58

BARNs / ATOM

KEY	PHOT	COCERENT	INCOHERENT	TOTAL
1.000	2.834E+06	2.107E+03	1.657E+00	2.836E+06
1.185	1.828E+06	2.058E+03	2.016E+00	1.830E+06
1.186	2.375E+06	2.057E+03	2.018E+00	2.377E+06
1.275	1.970E+06	2.037E+03	2.194E+00	1.972E+06
1.276	2.522E+06	2.037E+03	2.196E+00	2.154E+06
1.433	1.895E+06	2.048E+03	2.511E+00	1.897E+06
1.434	1.887E+06	2.048E+03	2.513E+00	1.889E+06
1.500	1.362E+06	1.992E+03	2.647E+00	1.504E+06
2.000	1.148E+05	1.874E+03	3.557E+00	1.167E+05
3.000	2.909E+05	1.948E+03	5.302E+00	2.926E+05
4.000	1.194E+05	1.444E+03	6.909E+00	1.208E+05
5.000	6.711E+04	1.269E+03	8.363E+00	6.832E+04
5.123	4.136E+04	1.60E+03	9.291E+00	4.852E+04
5.124	1.296E+05	1.558E+03	9.292E+00	1.308E+05
6.000	1.147E+05	1.123E+03	9.639E+00	1.159E+05
6.164	1.070E+05	1.006E+03	9.823E+00	1.081E+05
6.165	1.507E+05	1.006E+03	9.824E+00	1.019E+05
6.548	1.288E+05	1.049E+03	1.025E+01	1.099E+05
6.549	1.494E+05	1.049E+03	1.026E+01	1.563E+05
8.000	8.840E+04	8.970E+02	1.179E+01	8.930E+04
10.000	4.894E+04	7.312E+02	1.318E+01	4.966E+04
15.000	1.644E+04	4.788E+02	1.677E+01	1.693E+04
20.000	1.480E+03	3.437E+02	1.934E+01	1.843E+03
30.000	2.422E+03	1.991E+02	2.249E+01	2.543E+03
40.000	1.074E+03	1.273E+02	2.413E+01	1.225E+03
40.443	1.041E+03	1.251E+02	2.417E+01	1.190E+03
40.444	6.140E+03	1.251E+02	2.417E+01	6.289E+03
50.000	3.552E+03	8.081E+01	2.502E+01	3.656E+03
60.000	2.182E+03	6.399E+01	2.546E+01	2.271E+03
80.000	9.656E+02	3.804E+01	2.553E+01	1.150E+03
100.000	5.353E+02	2.519E+01	2.528E+01	5.578E+02
150.000	3.345E+02	1.644E+01	2.405E+01	2.003E+02
200.000	1.347E+01	6.641E+00	2.253E+01	1.016E+02
300.000	2.343E+01	3.981E+00	1.998E+01	3.639E+01
400.000	1.089E+01	1.68CE+00	1.807E+01	3.064E+01
500.000	6.180E+00	1.075E+00	1.658E+01	2.883E+01
600.000	3.976E+00	1.450E+01	1.538E+01	2.010E+01
800.000	2.180E+00	4.170E+01	1.354E+01	1.504E+01
1000.000	1.318E+00	2.656E+01	1.220E+01	1.378E+01

FLUORESCENT ENERGIES

34.717	1.602E+03	1.587E+02	2.331E+01	1.789E+03
35.265	1.132E+03	3.111E+02	2.402E+01	1.288E+03
4.840	7.299E+04	2.933E+03	9.133E+00	1.311E+04
5.262	5.882E+04	2.227E+03	8.702E+00	6.007E+04

CROSS SECTIONS FOR CERIUM Z = 58 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.218E+04	9.054E+00	7.121E-03	1.219E+04
1.185	7.858E+03	8.844E+00	8.654E-03	7.867E+03
1.186	1.021E+04	8.843E+00	9.673E-03	1.022E+04
1.275	8.467E+03	8.754E+00	9.429E-03	8.476E+03
1.276	9.247E+03	8.753E+00	9.437E-03	9.256E+03
1.433	6.853E+03	8.614E+00	1.079E-02	6.862E+03
1.434	7.252E+03	8.613E+00	1.080E-02	7.260E+03
1.500	6.456E+03	8.559E+00	1.138E-02	6.465E+03
2.000	3.072E+03	8.055E+00	1.529E-02	3.080E+03
3.000	1.078E+03	7.083E+00	2.279E-02	1.086E+03
4.000	5.131E+02	6.205E+00	2.969E-02	5.194E+02
5.000	2.884E+02	5.455E+00	3.594E-02	2.939E+02
5.123	2.035E+02	4.983E+00	3.993E-02	2.085E+02
5.724	5.571E+02	4.983E+00	3.993E-02	5.621E+02
6.000	4.930E+02	4.828E+00	4.143E-02	4.979E+02
6.164	4.597E+02	4.728E+00	4.222E-02	4.644E+02
6.165	6.479E+02	4.727E+00	4.222E-02	6.526E+02
6.548	5.537E+02	4.510E+00	4.404E-02	5.583E+02
6.549	6.421E+02	4.509E+00	4.405E-02	6.466E+02
8.000	3.799E+02	3.855E+00	5.067E-02	3.838E+02
10.000	2.103E+02	3.143E+00	5.665E-02	2.135E+02
15.000	7.064E+01	2.058E+00	7.207E-02	7.277E+01
20.000	3.215E+01	1.477E+00	8.312E-02	3.371E+01
30.000	1.041E+01	8.555E-01	9.566E-02	1.136E+01
40.000	4.614E+00	5.473E-01	1.037E-01	5.266E+00
40.443	4.472E+00	5.377E-01	1.039E-01	5.114E+00
40.444	2.639E+01	5.377E-01	1.039E-01	2.703E+01
50.000	1.527E+01	3.773E-01	1.075E-01	1.575E+01
60.000	9.377E+00	2.750E-01	1.094E-01	9.761E+00
80.000	4.240E+00	1.635E-01	1.106E-01	4.514E+00
100.000	2.257E+00	1.083E-01	1.086E-01	2.474E+00
150.000	7.076E-01	5.001E-02	1.034E-01	8.610E-01
200.000	3.115E-01	2.854E-02	9.683E-02	4.368E-01
300.000	1.007E-01	1.281E-02	8.587E-02	1.994E-01
400.000	4.680E-02	7.220E-03	7.766E-02	1.317E-01
500.000	2.656E-02	4.620E-03	7.126E-02	1.024E-01
600.000	1.709E-02	3.202E-03	6.610E-02	8.639E-02
800.000	8.940E-03	1.792E-03	5.819E-02	8.892E-02
1000.000	5.664E-03	1.139E-03	5.243E-02	5.924E-02

FLUORESCENT ENERGIES

34.717	6.887E+00	6.819E-01	1.002E-01	7.689E+00
39.255	4.866E+00	5.635E-01	1.032E-01	5.537E+00
4.840	3.137E+02	5.558E+00	3.496E-02	3.194E+02
5.262	2.528E+02	5.271E+00	3.740E-02	2.582E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR CERIUM

ATOMIC WEIGHT 140.130 GRAMS / MOLE
DENSITY 9.670 GRAMS / CC
ATOMIC DENSITY 2.867E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.327E+02

L-EDGES AT	5.724	6.165	6.549
L-EDGE JUMPS	2.737	1.410	1.160
L-EDGE FIT JUMPS	4.477	1.636	1.160

K-EDGE AT 40.444 KEV
K-EDGE JUMP 5.901

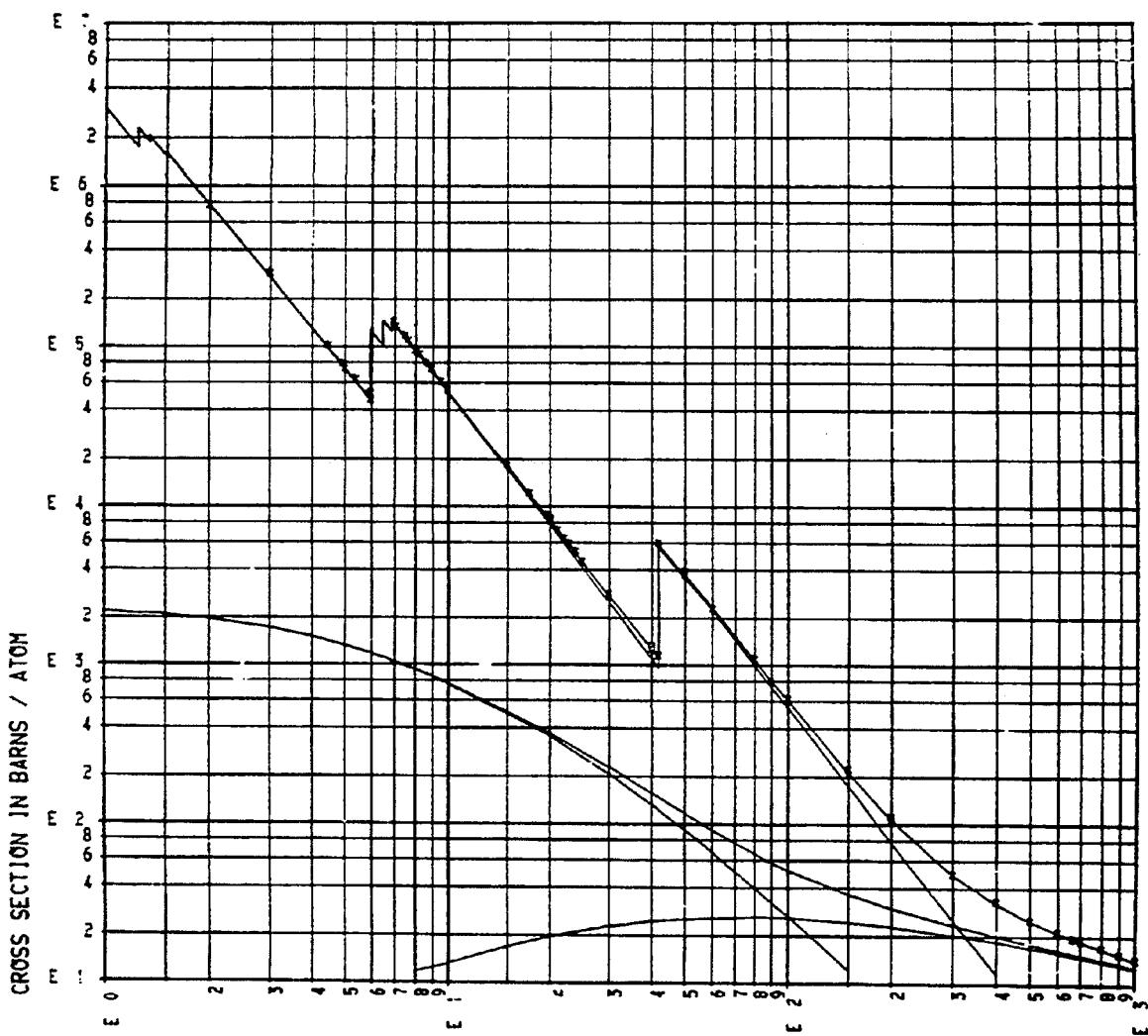
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
		1.434	6.549	40.444
0	0.	1.52693E+01	1.65862E+01	1.02725E+01
1	0.	-2.58174E+00	-2.36288E+00	2.74562E+00
2	0.	0.	-6.54708E-02	-1.14174E+00
3	0.	0.	0.	7.74162E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.44255E+00	4.39881E-01
1	3.71328E-01	1.30925E+00
2	-3.59642E-01	-1.64548E-01
3	1.75852E-02	2.52641E-03



PRASEODYMIUM

59

CROSS SECTIONS

CROSS SECTIONS FOR PRASEODYMIUM Z = 59 BARNS / ATOM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.015E+06	2.184E+03	1.673E+00	3.016E+06
1.236	1.749E+06	2.123E+03	2.136E+00	1.751E+06
1.237	2.287E+06	2.123E+03	2.138E+00	2.299E+06
1.336	1.876E+06	2.101E+03	2.337E+00	1.878E+06
1.337	2.049E+06	2.101E+03	2.339E+00	2.051E+06
1.500	1.525E+06	2.068E+03	2.671E+00	1.527E+06
1.507	1.507E+06	2.065E+03	2.684E+00	1.509E+06
1.508	1.594E+06	2.066E+03	2.686E+00	1.596E+06
2.000	7.714E+05	1.949E+03	3.581E+00	7.733E+05
3.000	2.720E+05	1.717E+03	5.328E+00	2.737E+05
4.000	1.298E+05	1.506E+03	9.939E+00	1.313E+05
5.000	1.315E+04	1.325E+03	8.404E+00	7.449E+04
5.964	4.649E+04	1.177E+03	9.649E+00	4.768E+04
5.965	1.253E+05	1.177E+03	9.651E+00	1.265E+05
6.000	1.234E+05	1.173E+03	9.695E+00	1.246E+05
6.440	1.025E+05	1.110E+03	1.019E+01	1.036E+05
6.441	1.444E+05	1.109E+03	1.019E+01	1.455E+05
6.834	1.235E+05	1.059E+03	1.062E+01	1.246E+05
6.835	1.433E+05	1.059E+03	1.063E+01	1.443E+05
8.000	9.443E+04	9.362E+02	1.187E+01	9.538E+04
10.000	5.202E+04	7.630E+02	1.327E+01	5.280E+04
15.000	1.734E+04	4.986E+02	1.692E+01	1.785E+04
20.000	7.853E+03	3.579E+02	1.954E+01	8.230E+03
30.000	2.528E+03	2.081E+02	2.277E+01	2.759E+03
40.000	1.118E+03	1.336E+02	2.445E+01	1.276E+03
41.990	9.728E+02	1.236E+02	2.465E+01	1.121E+03
41.991	5.661E+03	1.236E+02	2.465E+01	5.810E+03
50.000	3.616E+03	9.229E+01	2.537E+01	3.734E+03
60.000	2.233E+03	6.735E+01	2.583E+01	2.327E+03
80.000	1.021E+03	4.006E+01	2.598E+01	1.087E+03
100.000	5.487E+02	2.656E+01	2.567E+01	6.009E+02
150.000	1.751E+02	1.229E+01	2.444E+01	2.118E+02
200.000	7.796E+01	7.017E+00	2.291E+01	1.079E+02
300.000	2.552E+01	3.151E+00	2.032E+01	4.899E+01
400.000	1.191E+01	1.777E+00	1.838E+01	3.207E+01
500.000	6.757E+00	1.137E+00	1.686E+01	2.475E+01
500.000	4.336E+00	1.880E-01	1.564E+01	2.076E+01
800.000	2.245E+00	4.410E-01	1.377E+01	1.646E+01
1000.000	1.404E+00	2.800E-01	1.241E+01	1.409E+01

FLUORESCENT ENERGIES

36.023	1.504E+03	1.570E+02	2.382E+01	1.689E+03
40.745	1.060E+03	1.297E+02	2.452E+01	1.214E+03
5.034	7.189E+04	1.319E+03	8.449E+00	7.322E+04
5.489	5.765E+04	1.245E+03	9.042E+00	5.882E+04

CROSS SECTIONS FOR PRASEODYMIUM Z = 59 CR**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.289E+04	9.336E+00	7.150E-03	1.290E+04
1.236	7.474E+03	9.073E+00	9.130E-03	7.484E+03
1.237	9.774E+03	9.072E+00	9.139E-03	9.783E+03
1.336	8.019E+03	8.979E+00	9.988E-03	8.028E+03
1.337	8.758E+03	8.978E+00	9.996E-03	8.757E+03
1.500	6.516E+03	8.839E+00	1.142E-02	6.525E+03
1.507	6.438E+03	8.831E+00	1.147E-02	6.447E+03
1.508	6.813E+03	8.830E+00	1.148E-02	6.822E+03
2.000	3.297E+03	8.328E+00	1.530E-02	3.305E+03
3.000	1.162E+03	1.339E+00	2.277E-02	1.170E+03
4.000	5.549E+02	6.437E+00	2.966E-02	5.613E+02
5.000	3.126E+02	5.661E+00	3.592E-02	3.183E+02
5.964	1.987E+02	5.032E+00	4.124E-02	2.038E+02
5.965	5.355E+02	5.031E+00	4.124E-02	5.406E+02
6.000	5.274E+02	5.011E+00	4.143E-02	5.324E+02
6.440	4.379E+02	4.742E+00	4.355E-02	4.427E+02
6.441	6.172E+02	4.742E+00	4.355E-02	6.220E+02
6.834	5.280E+02	4.527E+00	4.541E-02	5.326E+02
6.835	6.122E+02	4.527E+00	4.541E-02	6.168E+02
8.000	4.036E+02	4.061E+00	5.073E-02	4.076E+02
10.000	2.223E+02	3.261E+00	5.571E-02	2.256E+02
15.000	7.409E+01	1.131E+00	1.231E-02	7.629E+01
20.000	3.356E+01	1.529E+00	8.351E-02	3.517E+01
30.000	1.080E+01	8.892E-01	9.731E-02	1.179E+01
40.000	4.776E+00	5.709E-01	1.045E-01	5.452E+00
41.990	4.157E+00	5.291E-01	1.053E-01	4.791E+00
41.991	2.420E+01	5.280E-01	1.053E-01	2.483E+01
50.000	1.545E+01	3.944E-01	1.084E-01	1.596E+01
60.000	9.545E+00	2.878E-01	1.104E-01	9.943E+00
80.000	4.363E+00	1.712E-01	1.110E-01	4.645E+00
100.000	2.345E+00	1.135E-01	1.097E-01	2.568E+00
150.000	7.482E-01	5.252E-02	1.044E-01	9.052E-01
200.000	3.332E-01	2.999E-02	9.791E-02	4.611E-01
300.000	1.091E-01	1.347E-02	8.584E-02	2.094E-01
400.000	5.090E-02	7.594E-03	8.855E-02	1.370E-01
500.000	2.888E-02	4.859E-03	7.205E-02	1.058E-01
600.000	1.853E-02	3.368E-03	6.684E-02	8.874E-02
800.000	9.596E-03	1.885E-03	5.885E-02	7.033E-02
1000.000	5.999E-03	1.197E-03	5.304E-02	6.023E-02

FLUORESCENT ENERGIES

36.023	6.429E+00	6.708E-01	1.018E-01	7.219E+00
40.746	4.531E+00	5.542E-01	1.048E-01	5.190E+00
5.034	3.072E+02	5.636E+00	3.611E-02	3.129E+02
5.489	2.460E+02	5.319E+00	3.864E-02	2.514E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PRASEODYMIUM

ATOMIC WEIGHT 140.920 GRAMS / MOLE
DENSITY 6.769 GRAMS / CC
ATOMIC DENSITY 2.893E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.340E+02

L-EDGES AT	5.965	6.441	6.835
L-EDGE JUMPS	2.695	1.410	1.160
L-EDGE FIT JUMPS	4.408	1.636	1.160

K-EDGE AT 41.991 KEY
K-EDGE JUMP 5.820

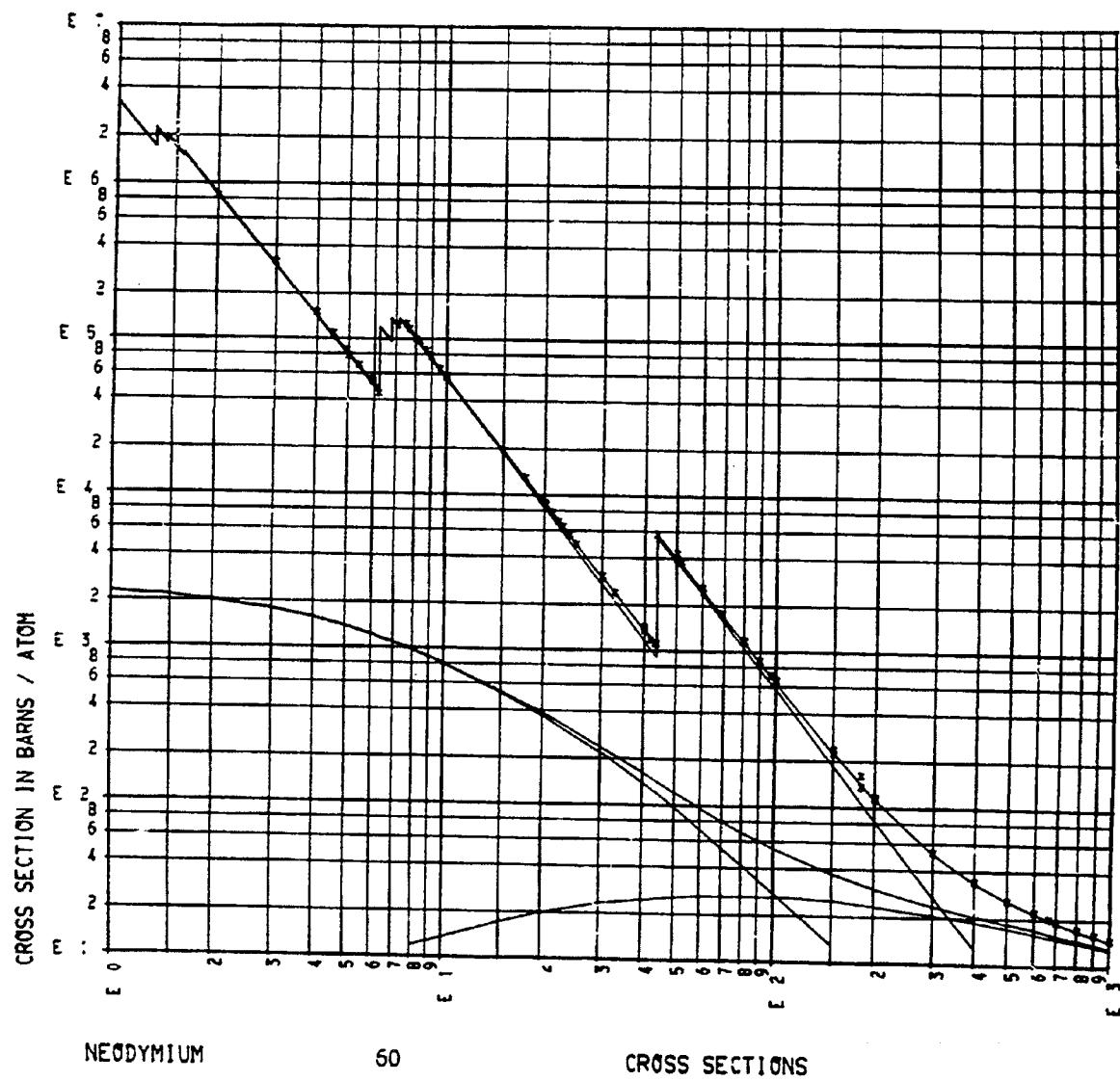
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	1.508	L	6.835	K	41.991
0	C.		1.53379E+01		1.67179E+01		1.10156E+01
1	O.		-2.57086E+00		-2.40326E+00		2.22056E+00
2	O.		0.		-6.12619E-02		-1.02216E+00
3	O.		0.		0.		6.90465E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.48347E+00	4.49124E-01
1	3.68431E-01	1.30351E+00
2	-3.57689E-01	-1.61841E-01
3	1.74099E-02	2.27394E-03



CROSS SECTIONS FOR NEODYMIUM Z = 60 BARNS / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.216E+06	2.264E+03	1.654E+00	2.218E+06
1.003	2.199E+06	2.263E+03	1.660E+00	2.201E+06
1.004	3.247E+06	2.263E+03	1.662E+00	3.249E+06
1.293	1.686E+06	2.189E+03	2.231E+00	1.688E+06
1.294	2.215E+06	2.189E+03	2.233E+00	2.217E+06
1.403	1.796E+06	2.165E+03	2.453E+00	1.798E+06
1.404	1.979E+06	2.165E+03	2.455E+00	1.981E+06
1.500	1.667E+06	2.147E+03	2.652E+00	1.670E+06
1.574	1.472E+06	2.126E+03	2.787E+00	1.474E+06
1.575	1.558E+06	2.125E+03	2.788E+00	1.560E+06
2.000	8.390E+05	2.025E+03	3.564E+00	8.410E+05
3.000	2.935E+05	1.708E+03	5.317E+00	2.953E+05
4.000	1.393E+05	1.571E+03	6.935E+00	1.409E+05
5.000	1.818E+04	1.382E+03	8.412E+00	7.957E+04
6.000	4.875E+04	1.224E+03	9.718E+00	4.999E+04
6.207	4.465E+04	1.192E+03	9.955E+00	4.585E+04
6.208	1.189E+05	1.192E+03	9.956E+00	1.201E+05
6.721	9.681E+04	1.120E+03	1.053E+01	9.794E+04
6.722	1.364E+05	1.120E+03	1.053E+01	1.376E+05
7.125	1.173E+05	1.070E+03	1.098E+01	1.184E+05
7.126	1.360E+05	1.070E+03	1.098E+01	1.571E+05
8.000	1.005E+05	9.772E+02	1.192E+01	1.015E+05
10.000	5.573E+04	7.962E+02	1.337E+01	5.654E+04
15.000	1.867E+04	5.193E+02	1.708E+01	1.920E+04
20.000	8.441E+03	3.724E+02	1.975E+01	8.833E+03
30.000	2.692E+03	2.133E+02	2.305E+01	2.932E+03
40.000	1.176E+03	1.400E+02	2.478E+01	1.341E+03
43.568	9.168E+02	1.220E+02	2.514E+01	1.064E+03
43.569	5.487E+03	1.220E+02	2.514E+01	5.634E+03
50.000	3.842E+03	9.594E+01	2.572E+01	3.964E+03
60.000	2.370E+03	6.084E+01	2.620E+01	2.467E+03
80.000	1.084E+03	4.216E+01	2.636E+01	1.152E+03
100.000	5.836E+02	2.798E+01	2.605E+01	6.377E+02
150.000	1.873E+02	1.297E+01	2.483E+01	2.251E+02
200.000	8.378E+01	7.410E+00	2.329E+01	1.145E+02
300.000	2.758E+01	3.329E+00	2.065E+01	5.156E+01
400.000	1.290E+01	1.877E+00	1.868E+01	3.346E+01
500.000	7.324E+00	1.202E+00	1.714E+01	2.567E+01
600.000	4.695E+00	8.330E-01	1.590E+01	2.143E+01
800.000	2.421E+00	4.660E-01	1.400E+01	1.689E+01
1000.000	1.504E+00	2.960E-01	1.262E+01	1.442E+01

FLUORESCENT ENERGIES

37.359	1.431E+03	1.554E+02	2.436E+01	1.614E+03
42.269	1.001E+03	1.281E+02	2.501E+01	1.155E+03
5.431	6.311E+04	1.308E+03	8.981E+00	6.444E+04
5.956	4.969E+04	1.230E+03	9.562E+00	5.093E+04

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REVISED 6/03/69

CROSS SECTIONS FOR NEODYMIUM Z = 60 CM² / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
.000	9.250E+03	9.450E+00	6.905E-03	9.259E+03
.003	9.178E+03	9.446E+00	6.929E-03	9.188E+03
.004	1.355E+04	9.445E+00	6.937E-03	1.356E+04
.293	7.039E+03	9.137E+00	9.313E-03	7.048E+03
.294	9.246E+03	9.136E+00	9.321E-03	9.255E+03
.403	7.499E+03	9.040E+00	1.024E-02	7.508E+03
.404	8.262E+03	9.039E+00	1.025E-02	8.271E+03
.500	6.961E+03	8.961E+00	1.107E-02	6.970E+03
1.574	6.145E+03	8.874E+00	1.163E-02	6.154E+03
1.575	6.503E+03	8.873E+00	1.164E-02	6.511E+03
2.000	3.502E+03	8.453E+00	1.438E-02	3.511E+03
3.000	1.225E+03	1.466E+00	2.220E-02	1.233E+03
4.000	5.817E+02	6.558E+00	2.895E-02	5.883E+02
5.000	3.263E+02	5.771E+00	3.512E-02	3.322E+02
6.000	2.035E+02	5.109E+00	4.057E-02	2.087E+02
6.207	1.864E+02	4.976E+00	4.155E-02	1.914E+02
6.208	4.962E+02	4.975E+00	4.155E-02	5.012E+02
6.721	4.041E+02	4.676E+00	4.397E-02	4.688E+02
6.722	5.696E+02	4.676E+00	4.398E-02	5.743E+02
7.125	4.896E+02	4.467E+00	4.563E-02	4.941E+02
7.126	5.677E+02	4.467E+00	4.584E-02	5.723E+02
8.000	4.196E+02	4.079E+00	4.975E-02	4.237E+02
10.000	2.327E+02	3.324E+00	5.581E-02	2.356E+02
15.000	7.792E+01	2.168E+00	7.130E-02	8.016E+01
20.000	3.524E+01	1.555E+00	8.245E-02	3.687E+01
30.000	1.124E+01	9.071E-01	9.622E-02	1.224E+01
40.000	4.908E+00	5.845E-01	1.034E-01	5.596E+00
43.568	3.827E+00	5.094E-01	1.029E-01	4.441E+00
43.569	2.291E+01	5.094E-01	1.049E-01	2.352E+01
50.000	1.604E+01	4.647E-01	1.074E-01	1.655E+01
60.000	9.893E+00	2.957E-01	1.094E-01	1.030E+01
80.000	4.524E+00	1.760E-01	1.100E-01	4.810E+00
100.000	2.436E+00	1.168E-01	1.088E-01	2.662E+00
150.000	7.817E-01	5.413E-02	1.037E-01	9.395E-01
200.000	3.497E-01	3.093E-02	9.718E-02	4.779E-01
300.000	1.151E-01	1.390E-02	8.620E-02	3.152E-01
400.000	5.387E-02	7.835E-03	7.798E-02	1.397E-01
500.000	3.057E-02	5.018E-03	7.155E-02	1.071E-01
600.000	1.960E-02	3.477E-03	6.657E-02	8.945E-02
800.000	1.011E-02	1.945E-03	5.844E-02	1.049E-02
1000.000	6.279E-03	1.236E-03	5.268E-02	6.020E-02

FLUORESCENT ENERGIES

37.359	5.975E+00	6.488E-01	1.017E-01	6.739E+00
42.269	4.180E+00	5.349E-01	1.044E-01	4.820E+00
5.431	2.634E+02	5.461E+00	3.749E-02	2.690E+02
5.956	2.074E+02	5.135E+00	4.033E-02	2.126E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR NEODYMIUM

ATOMIC WEIGHT 144.270 GRAMS / MOLE
DENSITY 6.960 GRAMS / CC
ATOMIC DENSITY 2.905E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.396E+02

L-EDGES AT	6.208	6.722	7.126
L-EDGE JUMPS	2.662	1.410	1.160
L-EDGE FIT JUMPS	4.354	1.636	1.160

K-EDGE AT 43.569 KEY
K-EDGE JUMP 5.986

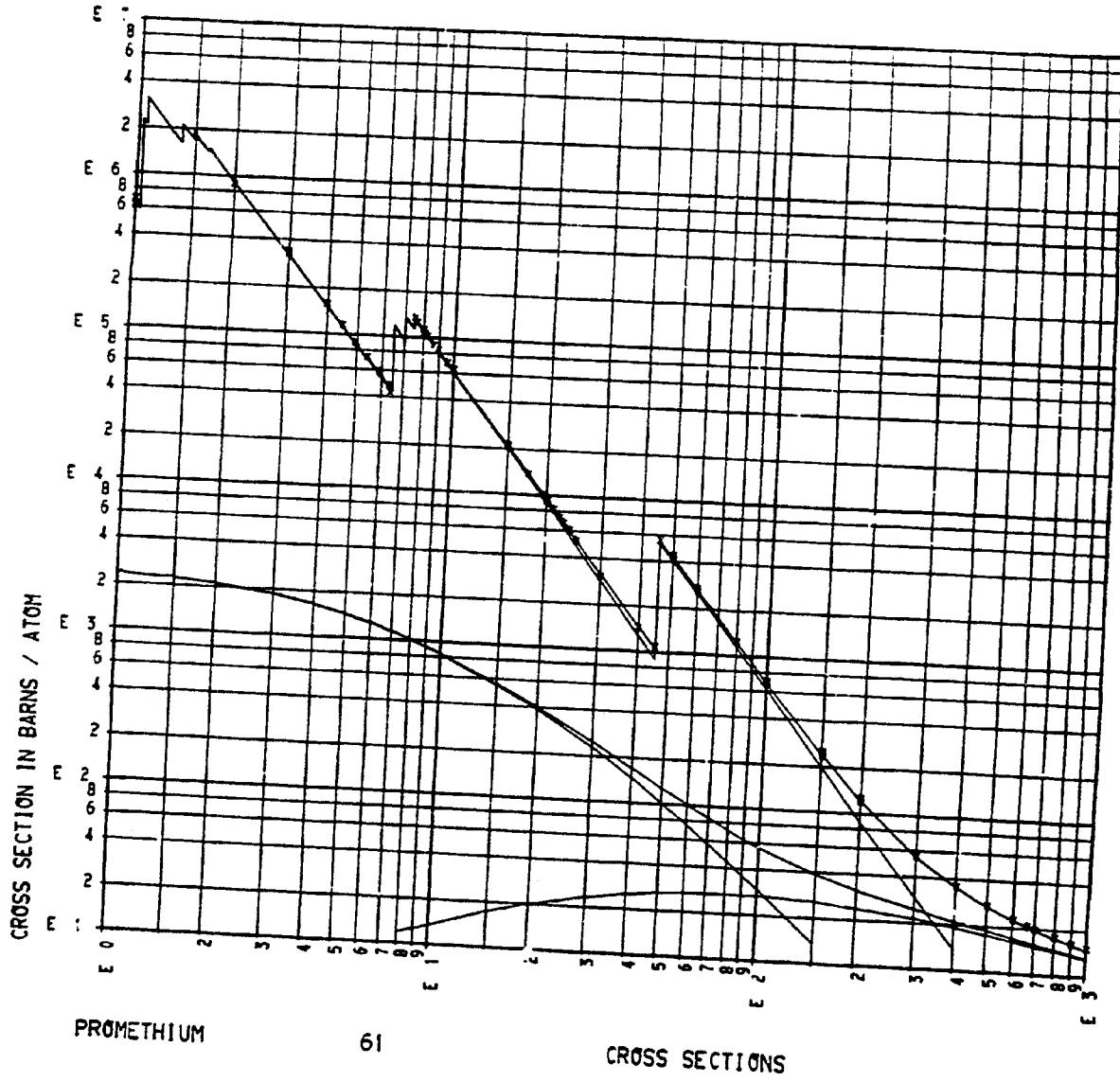
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	T	U	K
0	0.	1.54353E+01	1.65964E+01	1.17632E+01		
1	0.	-2.59006E+00	-2.25073E+00	-1.79481E+00		
2	0.	0.	-8.72426E-02	-3.36651E-01		
3	0.	0.	0.	6.35332E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.52334E+00	4.37283E-01
1	3.66462E-01	1.31370E+00
2	-3.56048E-01	-1.62866E-01
3	1.72620E-02	2.29377E-03



PROMETHIUM

61

CROSS SECTIONS

61 - 1 REVISED 6/03/69

CROSS SECTIONS FOR PROMETHIUM		Z = 61	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.250E+05	2.344E+03	1.602E+00	6.274E+05
1.029	5.803E+05	2.336E+03	1.651E+00	5.827E+05
1.030	2.218E+06	2.335E+03	1.659E+00	2.220E+06
1.055	2.084E+06	2.328E+03	1.677E+00	2.087E+06
1.056	3.076E+06	2.328E+03	1.699E+00	3.080E+06
1.356	1.608E+06	2.255E+03	2.300E+00	1.610E+06
1.357	2.113E+06	2.255E+03	2.302E+00	2.115E+06
1.471	1.714E+06	2.232E+03	2.534E+00	1.716E+06
1.472	1.888E+06	2.231E+03	2.536E+00	1.890E+06
1.580	1.798E+06	2.225E+03	2.593E+00	1.800E+06
1.650	1.404E+06	2.184E+03	2.866E+00	1.406E+06
1.651	1.486E+06	2.184E+03	2.868E+00	1.488E+06
2.000	9.030E+05	2.103E+03	3.508E+00	9.051E+05
3.000	3.152E+05	1.861E+03	5.270E+00	3.170E+05
4.000	1.433E+05	1.558E+03	6.899E+00	1.510E+05
5.000	8.367E+04	1.442E+03	8.388E+00	8.912E+04
6.000	5.212E+04	1.277E+03	9.711E+00	5.340E+04
6.459	4.304E+04	1.206E+03	1.024E+01	4.426E+04
6.460	1.163E+05	1.206E+03	1.024E+01	1.179E+05
7.012	9.368E+04	1.131E+03	1.087E+01	9.482E+04
7.013	1.520E+05	1.131E+03	1.087E+01	1.332E+05
7.427	1.135E+05	1.081E+03	1.33E+01	1.46E+05
7.428	1.316E+05	1.081E+03	1.33E+01	1.327E+05
8.000	1.081E+05	1.202E+03	1.95E+01	1.091E+05
10.000	5.954E+04	8.308E+02	3.48E+01	6.038E+04
15.000	1.983E+04	5.469E+02	1.724E+01	2.038E+04
20.000	8.971E+03	3.875E+02	1.996E+01	9.378E+03
30.000	2.681E+03	2.269E+02	2.333E+01	3.131E+03
40.000	1.270E+03	1.467E+02	2.510E+01	1.442E+03
45.183	8.952E+02	1.205E+02	2.563E+01	1.041E+03
45.184	5.290E+03	1.205E+02	2.563E+01	5.437E+03
50.000	4.073E+03	1.018E+02	2.607E+01	4.301E+03
60.000	2.518E+03	7.454E+01	2.656E+01	2.519E+03
80.000	1.153E+03	4.437E+01	2.675E+01	1.225E+03
100.000	6.215E+02	2.948E+01	2.645E+01	5.775E+02
150.000	1.994E+02	1.358E+01	2.522E+01	2.383E+02
200.000	8.921E+01	7.826E+00	2.365E+01	1.207E+02
300.000	2.938E+01	3.518E+00	2.099E+01	5.389E+01
400.000	1.377E+01	1.985E+00	1.899E+01	3.474E+01
500.000	7.830E+00	1.276E+00	1.743E+01	2.653E+01
600.000	5.033E+00	8.800E-01	1.617E+01	2.208E+01
800.000	2.610E+00	4.930E-01	1.423E+01	1.733E+01
1000.000	1.633E+00	3.130E-01	1.283E+01	1.478E+01

FLUORESCENT ENERGIES

38.649	1.401E+03	1.546E+02	2.488E+01	1.582E+03
43.945	9.696E+02	1.261E+02	2.550E+01	1.122E+03
5.636	6.131E+04	1.332E+03	9.235E+00	6.257E+04
6.206	4.774E+04	1.244E+03	9.950E+00	4.900E+04

CROSS SECTIONS FOR PROMETHIUM		Z = 61	CM**2 / SPAM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
.000	2.561E+03	9.604E+00	6.563E-03	2.570E+03
.029	2.378E+03	9.569E+00	6.796E-03	2.387E+03
.030	9.087E+03	9.568E+00	6.198E-03	9.097E+03
.055	8.539E+03	9.539E+00	6.994E-03	8.548E+03
.056	1.261E+04	9.538E+00	7.002E-03	1.262E+04
.356	6.589E+03	9.239E+00	9.423E-03	5.598E+03
.357	8.656E+03	9.236E+00	9.432E-03	8.665E+03
.411	1.020E+03	9.143E+00	1.038E-02	1.029E+03
.472	1.735E+03	9.142E+00	1.039E-02	1.744E+03
.500	1.366E+03	9.120E+00	1.062E-02	1.375E+03
.550	5.751E+03	8.950E+00	1.144E-02	5.760E+03
.651	6.087E+03	8.948E+00	1.175E-02	6.096E+03
.900	3.700E+03	8.614E+00	1.437E-02	3.708E+03
.900	1.291E+03	8.626E+00	1.159E-02	1.295E+03
.000	6.118E-02	5.710E+00	8.266E-02	6.185E+02
.000	3.426E+02	5.909E+00	4.317E-02	3.487E+02
.000	2.135E+02	5.233E+00	3.979E-02	2.188E+02
.459	1.763E+02	4.941E+00	4.196E-02	1.813E+02
.450	4.764E+02	4.940E+00	4.196E-02	4.813E+02
.012	3.838E+02	4.633E+00	4.452E-02	3.885E+02
.013	5.410E+02	4.633E+00	4.452E-02	5.456E+02
.427	4.648E+02	4.429E+00	4.64CE-02	4.693E+02
.428	5.390E+02	4.429E+00	4.641E-02	5.435E+02
8.000	1.428E+02	4.178E+00	4.896E-02	4.470E+02
10.000	2.439E+02	3.404E+00	5.523E-02	2.474E+02
15.000	8.123E+01	2.216E+00	1.053E-02	8.352E+01
20.000	3.675E+01	1.588E+00	8.178E-02	3.842E+01
30.000	1.180E+01	9.295E-01	9.558E-02	1.283E+01
40.000	5.205E+00	6.011E-01	1.028E-01	5.908E+00
45.183	3.658E+00	4.942E-01	1.050E-01	4.267E+00
45.184	2.167E+01	4.942E-01	1.050E-01	2.227E+01
50.000	1.669E+01	4.172E-01	1.058E-01	1.721E+01
60.000	1.031E+01	3.054E-01	1.088E-01	1.073E+01
80.000	4.726E+00	1.818E-01	1.096E-01	5.017E+00
100.000	2.546E+00	1.208E-01	1.084E-01	2.715E+00
150.000	8.171E-01	5.606E-02	1.033E-01	9.765E-01
200.000	3.655E-01	3.206E-02	9.689E-02	4.944E-01
300.000	1.204E-01	1.441E-02	8.600E-02	2.208E-01
400.000	5.540E-02	8.132E-03	7.780E-02	1.423E-01
500.000	3.208E-02	5.203E-03	7.141E-02	1.087E-01
600.000	2.062E-02	3.605E-03	6.625E-02	9.047E-02
800.000	1.069E-02	2.020E-03	5.830E-02	1.101E-02
1000.000	6.688E-03	1.282E-03	5.256E-02	6.053E-02

FLUORESCENT ENERGIES

38.649	5.739E+00	6.332E-01	1.019E-01	6.482E+00
43.945	3.972E+00	5.168E-01	1.045E-01	4.596E+00
5.636	2.512E+02	5.456E+00	3.783E-02	2.568E+02
5.205	1.956E+02	5.097E+00	4.077E-02	2.008E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PROMETHIUM

ATOMIC WEIGHT 147.000 GRAMS / MOLE
DENSITY 6.782 GRAMS / CC
ATOMIC DENSITY 2.779E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.441E+02

L-EDGES AT	6.460	7.013	7.428
L-EDGE JUMPS	2.702	1.410	1.160
L-EDGE FIT JUMPS	4.419	1.636	1.160

K-EDGE AT 45.184 KEV
K-EDGE JUMP 5.910

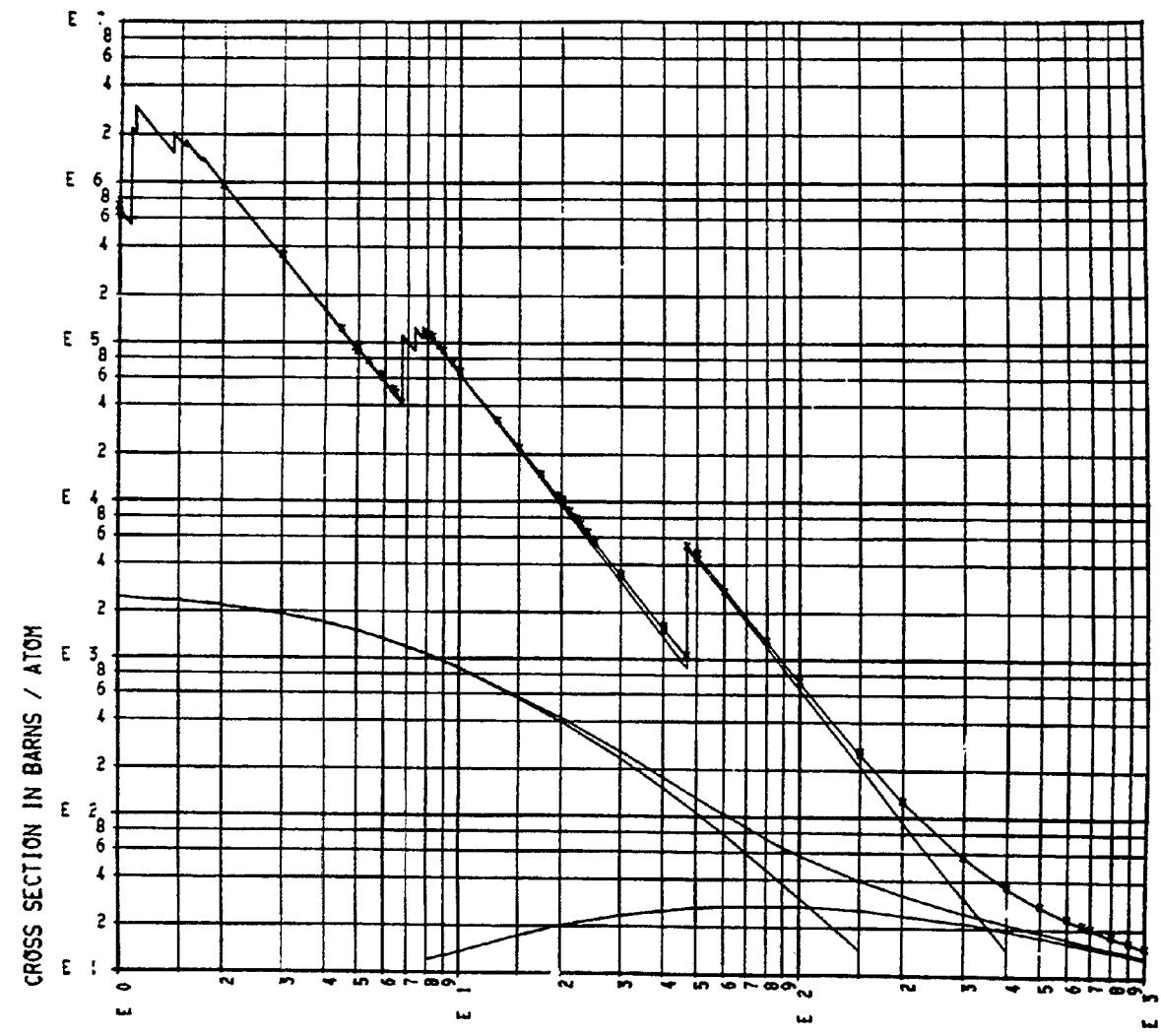
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.55131E+01	1.55131E+01	1.68369E+01	1.13864E+01
1	-2.59623E+00	-2.59623E+00	-2.38881E+00	2.05593E+00
2	0.	0.	-6.45041E-02	-9.88180E-01
3	0.	0.	0.	6.69106E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.56222E+00	4.05823E-01
1	3.65055E-01	1.33837E+00
2	-3.54511E-01	-1.67229E-01
3	1.71214E-02	2.55570E-03



SAMARIUM

62

CROSS SECTIONS

CROSS SECTIONS FOR SAMARIUM Z = 62 BARNS / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	6.672E+05	2.426E+03	1.521E+00	6.696E+05
1.081	5.443E+05	2.403E+03	1.673E+00	5.467E+05
1.082	2.128E+06	2.403E+03	1.675E+00	2.130E+06
1.107	2.004E+06	2.396E+03	1.722E+00	2.007E+06
1.108	2.941E+06	2.395E+03	1.724E+00	2.944E+06
1.420	1.538E+06	2.323E+03	2.335E+00	1.540E+06
1.421	2.034E+06	2.323E+03	2.338E+00	2.036E+06
1.500	1.766E+06	2.307E+03	2.498E+00	1.768E+06
1.541	1.645E+06	2.295E+03	2.573E+00	1.648E+06
1.542	1.813E+06	2.295E+03	2.574E+00	1.815E+06
1.728	1.346E+06	2.245E+03	2.915E+00	1.349E+06
1.729	1.425E+06	2.244E+03	2.916E+00	1.427E+06
2.000	9.740E+05	2.182E+03	3.418E+00	9.762E+05
3.000	3.376E+05	1.936E+03	5.191E+00	3.395E+05
4.000	1.592E+05	1.705E+03	8.833E+00	1.609E+05
5.000	8.885E+04	1.504E+03	8.334E+00	9.036E+04
6.000	5.517E+04	1.333E+03	9.674E+00	5.652E+04
7.716	4.109E+04	1.220E+03	1.051E+01	4.233E+04
6.717	1.101E+05	1.220E+03	1.051E+01	1.114E+05
7.311	8.817E+04	1.142E+03	1.19E+01	8.932E+04
7.312	1.243E+05	1.142E+03	1.19E+01	1.254E+05
7.736	1.071E+05	1.093E+03	1.67E+01	1.082E+05
7.737	1.242E+05	1.093E+03	1.67E+01	1.253E+05
8.000	1.137E+05	1.064E+03	1.96E+01	1.148E+05
10.000	6.291E+04	8.669E+02	3.59E+01	6.379E+04
15.000	2.112E+04	5.634E+02	7.41E+01	2.170E+04
20.000	9.622E+03	4.032E+02	2.017E+01	1.005E+04
30.000	3.123E+03	2.367E+02	2.361E+01	3.384E+03
40.000	1.389E+03	1.537E+02	2.543E+01	1.568E+03
46.834	8.870E+02	1.193E+02	2.512E+01	1.032E+03
46.835	5.134E+03	1.193E+02	2.512E+01	5.280E+03
50.000	4.328E+03	1.070E+02	2.641E+01	4.461E+03
60.000	2.667E+03	7.841E+01	2.693E+01	2.772E+03
80.000	1.218E+03	4.669E+01	2.713E+01	1.292E+03
100.000	6.556E+02	3.105E+01	2.684E+01	1.135E+03
150.000	2.106E+02	1.444E+01	2.561E+01	2.506E+02
200.000	9.439E+01	8.264E+00	2.402E+01	1.267E+02
300.000	3.124E+01	3.718E+00	2.132E+01	5.627E+01
400.000	1.469E+01	2.097E+00	1.930E+01	3.609E+01
500.000	8.383E+00	1.343E+00	1.771E+01	2.744E+01
600.000	5.401E+00	9.300E-01	1.643E+01	2.276E+01
800.000	2.811E+00	5.210E-01	1.447E+01	1.780E+01
1000.000	1.762E+00	3.310E-01	1.304E+01	1.513E+01

FLUORESCENT ENERGIES

40.124	1.377E+03	1.529E+02	2.544E+01	1.555E+03
45.400	9.690E+02	1.254E+02	2.598E+01	1.121E+03
5.846	5.905E+04	1.356E+03	9.470E+00	6.043E+04
6.456	4.556E+04	1.259E+03	1.021E+01	4.684E+04

CROSS SECTIONS FOR SAMARIUM		Z = 62	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.673E+03	9.718E+00	6.093E-03	2.682E+03
1.081	2.180E+03	9.625E+00	6.702E-03	2.190E+03
1.082	8.522E+03	9.624E+00	6.709E-03	8.532E+03
1.107	8.028E+03	9.597E+00	6.900E-03	8.038E+03
1.108	1.178E+04	9.595E+00	6.907E-03	1.179E+04
1.420	6.161E+03	9.305E+00	9.357E-03	6.170E+03
1.421	8.147E+03	9.304E+00	9.365E-03	8.156E+03
1.500	7.072E+03	9.241E+00	1.001E-02	7.082E+03
1.541	6.591E+03	9.193E+00	1.030E-02	6.600E+03
1.542	7.263E+03	9.192E+00	1.031E-02	7.272E+03
1.728	5.393E+03	8.991E+00	1.167E-02	5.402E+03
1.729	5.708E+03	8.990E+00	1.168E-02	5.717E+03
2.000	3.902E+03	8.740E+00	1.369E-02	3.910E+03
3.000	1.352E+03	1.755E+00	2.079E-02	1.360E+03
4.000	6.376E+02	6.835E+00	2.737E-02	6.445E+02
5.000	3.559E+02	6.026E+00	3.338E-02	3.620E+02
6.000	2.210E+02	5.338E+00	3.875E-02	2.264E+02
6.716	1.646E+02	4.889E+00	4.211E-02	1.695E+02
6.717	4.411E+02	4.868E+00	4.211E-02	4.461E+02
7.311	3.532E+02	4.575E+00	4.483E-02	3.578E+02
7.312	4.978E+02	4.574E+00	4.483E-02	5.024E+02
7.736	4.291E+02	4.377E+00	4.674E-02	4.336E+02
7.737	4.976E+02	4.376E+00	4.674E-02	5.021E+02
8.000	4.556E+02	4.263E+00	4.791E-02	4.599E+02
10.000	2.520E+02	3.473E+00	5.444E-02	2.555E+02
15.000	8.461E+01	2.257E+00	5.974E-02	8.694E+01
20.000	3.854E+01	1.615E+00	8.079E-02	4.024E+01
30.000	1.251E+01	9.483E-01	9.457E-02	1.355E+01
40.000	5.564E+00	6.156E-01	1.019E-01	6.281E+00
46.834	3.553E+00	4.778E-01	1.046E-01	4.135E+00
46.835	2.057E+01	4.778E-01	1.046E-01	2.115E+01
50.000	1.734E+01	4.284E-01	1.058E-01	1.787E+01
60.000	1.068E+01	3.141E-01	1.079E-01	1.110E+01
80.000	4.879E+00	1.870E-01	1.087E-01	5.174E+00
100.000	2.626E+00	1.244E-01	1.075E-01	2.858E+00
150.000	8.434E-01	5.784E-02	1.026E-01	1.004E+00
200.000	3.781E-01	3.310E-02	9.622E-02	5.074E-01
300.000	1.251E-01	1.489E-02	8.540E-02	2.254E-01
400.000	5.885E-02	8.400E-03	7.731E-02	1.446E-01
500.000	3.358E-02	5.380E-03	7.094E-02	1.099E-01
600.000	2.163E-02	3.725E-03	6.581E-02	9.117E-02
800.000	1.126E-02	2.087E-03	5.796E-02	7.131E-02
1000.000	7.058E-03	1.326E-03	5.223E-02	6.062E-02

FLUORESCENT ENERGIES

40.124	5.515E+00	6.125E-01	1.019E-01	6.230E+00
45.400	3.981E+00	5.023E-01	1.041E-01	4.491E+00
5.846	2.365E+02	5.431E+00	3.794E-02	2.421E+02
6.456	1.825E+02	5.042E+00	4.090E-02	1.876E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR SAMARIUM

ATOMIC WEIGHT 150.350 GRAMS / MOLE
DENSITY 7.536 GRAMS / CC
ATOMIC DENSITY 3.019E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.496E+02

L-EDGES AT	6.717	7.312	7.737
L-EDGE JUMPS	2.580	1.410	1.160
L-EDGE FIT JUMPS	4.383	1.636	1.160

K-EDGE AT 46.835 KEY
K-EDGE JUMP 5.789

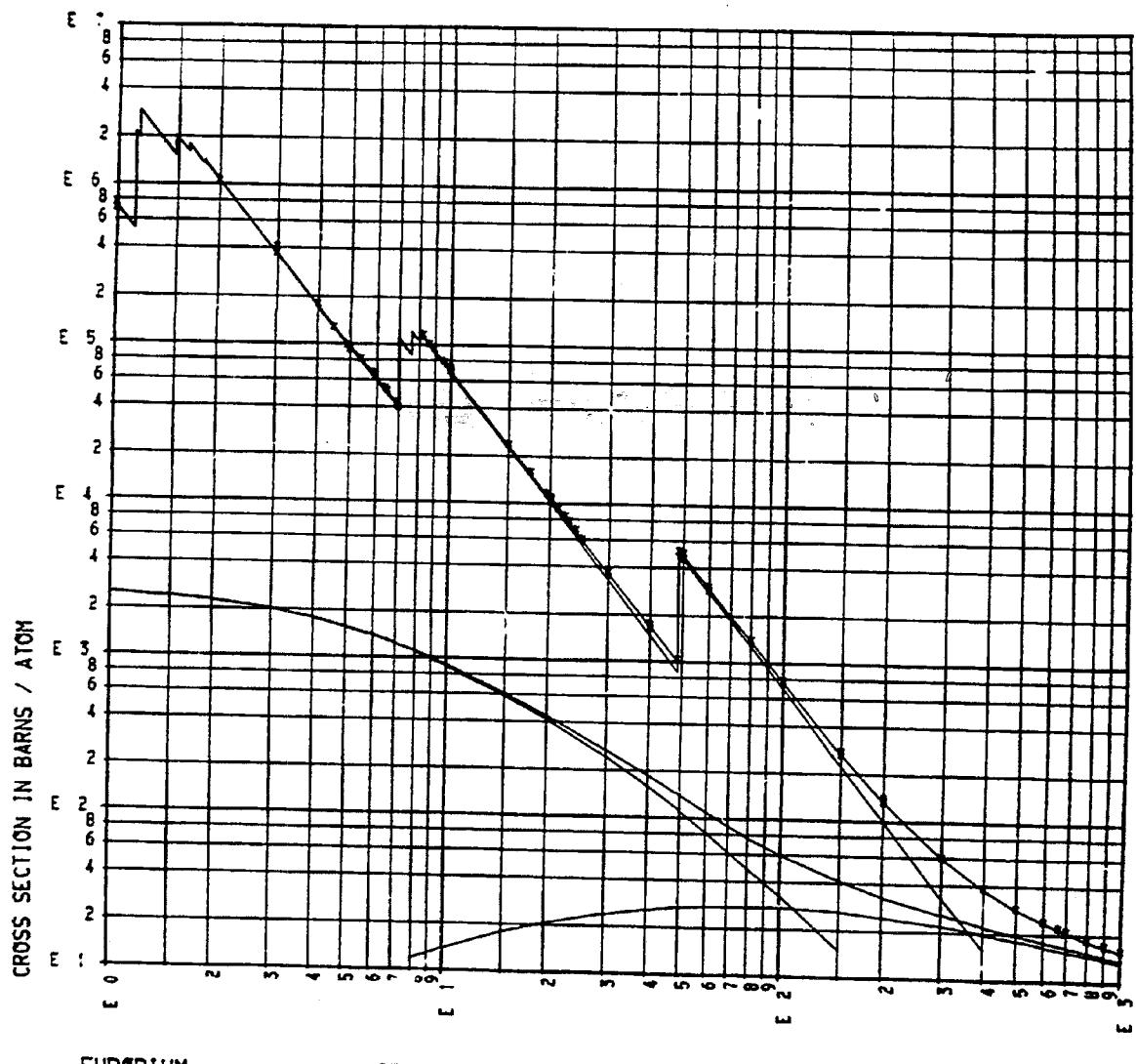
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.56006E+01	1.56006E+01	1.68725E+01	1.19223E+01
1	-2.61328E+00	-2.61328E+00	-2.39051E+00	1.79546E+00
2	0.	0.	-6.01080E-02	-9.42902E-01
3	0.	0.	0.	6.44202E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.60020E+00	3.55383E-01
1	3.64134E-01	1.37733E+00
2	-3.53086E-01	-1.74941E-01
3	1.69894E-02	3.06213E-03



EUROPIUM

63

CROSS SECTIONS

CROSS SECTIONS FOR EUROPIUM Z = 63 BARNES / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	7.159E+05	2.509E+03	1.418E+00	7.194E+05
1.127	5.232E+05	2.473E+03	1.651E+00	5.257E+05
1.128	2.106E+06	2.473E+03	1.653E+00	2.109E+06
1.157	1.970E+06	2.466E+03	1.707E+00	1.972E+06
1.158	2.904E+06	2.465E+03	1.709E+00	2.906E+06
1.480	1.521E+06	2.393E+03	2.333E+00	1.524E+06
1.481	1.995E+06	2.393E+03	2.335E+00	1.997E+06
1.500	1.929E+06	2.390E+03	2.374E+00	1.931E+06
1.612	1.595E+06	2.357E+03	2.577E+00	1.598E+06
1.613	1.773E+06	2.357E+03	2.579E+00	1.776E+06
1.799	1.330E+06	2.309E+03	2.922E+00	1.332E+06
1.800	1.408E+06	2.308E+03	2.924E+00	1.410E+06
2.000	1.067E+06	2.263E+03	3.298E+00	1.069E+06
3.000	3.665E+05	2.012E+03	5.082E+00	3.685E+05
4.000	1.717E+05	1.777E+03	6.741E+00	1.735E+05
5.000	9.539E+04	1.568E+03	8.252E+00	9.696E+04
6.000	5.900E+04	1.390E+03	9.609E+00	6.040E+04
6.976	3.966E+04	1.236E+03	1.076E+01	4.091E+04
6.977	1.080E+05	1.236E+03	1.077E+01	1.092E+05
7.617	8.553E+04	1.154E+03	1.150E+01	8.669E+04
7.618	1.205E+05	1.154E+03	1.150E+01	1.217E+05
8.000	1.058E+05	1.110E+03	1.194E+01	1.069E+05
8.051	1.040E+05	1.044E+03	1.199E+01	1.052E+05
8.052	1.206E+05	1.044E+03	1.199E+01	1.218E+05
10.000	6.755E+04	9.043E+02	1.390E+01	6.847E+04
15.000	2.256E+04	5.868E+02	1.777E+01	2.317E+04
20.000	1.027E+04	4.194E+02	2.060E+01	1.071E+04
30.000	3.346E+03	2.468E+02	2.401E+01	3.617E+03
40.000	1.496E+03	1.608E+02	2.582E+01	1.683E+03
48.519	8.682E+02	1.180E+02	2.667E+01	1.013E+03
48.520	4.943E+03	1.180E+02	2.667E+01	5.088E+03
50.000	4.573E+03	1.122E+02	2.680E+01	4.712E+03
60.000	2.830E+03	8.242E+01	2.732E+01	2.940E+03
80.000	1.300E+03	4.908E+01	2.752E+01	1.376E+03
100.000	7.020E+02	3.268E+01	2.724E+01	7.619E+02
150.000	2.263E+02	1.522E+01	2.600E+01	2.675E+02
200.000	1.016E+02	8.719E+00	2.440E+01	1.347E+02
300.000	3.364E+01	3.925E+00	2.167E+01	5.924E+01
400.000	1.581E+01	2.215E+00	1.960E+01	3.763E+01
500.000	9.019E+00	1.418E+00	1.799E+01	2.843E+01
600.000	5.808E+00	9.820E-01	1.669E+01	2.348E+01
800.000	3.020E+00	5.500E-01	1.471E+01	1.828E+01
1000.000	1.891E+00	3.500E-01	1.325E+01	1.549E+01

FLUORESCENT ENERGIES

41.529	1.346E+03	1.514E+02	2.598E+01	1.525E+03
47.027	9.481E+02	1.241E+02	2.653E+01	1.100E+03
6.059	5.750E+04	1.379E+03	9.680E+00	5.889E+04
6.714	4.387E+04	1.273E+03	1.046E+01	4.517E+04

CROSS SECTIONS FOR EUROPIUM Z = 63 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.841E+03	9.943E+00	5.620E-03	2.851E+03
1.127	2.073E+03	9.800E+00	6.541E-03	2.083E+03
1.128	8.345E+03	9.799E+00	6.548E-03	8.355E+03
1.157	7.805E+03	9.769E+00	5.763E-03	7.815E+03
1.158	1.150E+04	9.768E+00	5.770E-03	1.151E+04
1.480	6.027E+03	9.483E+00	5.246E-03	6.037E+03
1.481	7.903E+03	9.482E+00	5.254E-03	7.913E+03
1.500	7.642E+03	9.468E+00	5.405E-03	7.652E+03
1.612	6.322E+03	9.339E+00	5.021E-02	6.331E+03
1.613	7.026E+03	9.338E+00	5.022E-02	7.035E+03
1.799	5.270E+03	9.147E+00	5.158E-02	5.279E+03
1.800	5.578E+03	9.146E+00	5.158E-02	5.587E+03
2.000	4.226E+03	8.965E+00	5.307E-02	4.235E+03
3.000	1.452E+03	7.972E+00	2.013E-02	1.460E+03
4.000	6.804E+02	7.039E+00	2.671E-02	6.875E+02
5.000	3.779E+02	5.212E+00	3.269E-02	3.842E+02
6.000	2.338E+02	5.506E+00	3.807E-02	2.393E+02
6.976	1.572E+02	4.896E+00	4.265E-02	1.621E+02
6.977	4.279E+02	4.895E+00	4.266E-02	4.328E+02
7.617	3.389E+02	4.571E+00	4.557E-02	3.435E+02
7.618	4.776E+02	4.570E+00	4.558E-02	4.823E+02
8.000	4.193E+02	4.399E+00	4.129E-02	4.237E+02
8.051	4.122E+02	4.373E+00	4.174E-02	4.166E+02
8.052	4.780E+02	4.373E+00	4.175E-02	4.824E+02
10.000	2.577E+02	3.583E+00	5.507E-02	2.713E+02
15.000	8.940E+01	2.325E+00	7.042E-02	9.180E+01
20.000	4.070E+01	1.662E+00	8.161E-02	4.244E+01
30.000	1.326E+01	9.780E-01	9.512E-02	1.433E+01
40.000	5.928E+00	6.372E-01	1.023E-01	6.668E+00
48.519	3.440E+00	4.675E-01	1.057E-01	4.013E+00
48.520	1.959E+01	4.675E-01	1.057E-01	2.016E+01
50.000	1.812E+01	4.447E-01	1.052E-01	1.867E+01
60.000	1.121E+01	3.266E-01	1.082E-01	1.165E+01
80.000	5.150E+00	1.945E-01	1.091E-01	5.453E+00
100.000	2.781E+00	1.295E-01	1.079E-01	3.019E+00
150.000	8.967E-01	6.032E-02	1.030E-01	1.060E+00
200.000	4.026E-01	3.455E-02	9.667E-02	5.338E-01
300.000	1.333E-01	1.555E-02	8.588E-02	2.347E-01
400.000	6.266E-02	8.776E-03	7.767E-02	1.491E-01
500.000	3.573E-02	5.618E-03	7.128E-02	1.126E-01
600.000	2.301E-02	3.891E-03	6.614E-02	9.304E-02
800.000	1.197E-02	2.179E-03	5.829E-02	7.243E-02
1000.000	7.494E-03	1.387E-03	5.249E-02	6.137E-02

FLUORESCENT ENERGIES

41.529	5.333E+00	6.000E-01	1.029E-01	6.041E+00
47.027	3.757E+00	4.915E-01	1.051E-01	4.357E+00
6.059	2.278E+02	5.464E+00	3.835E-02	2.333E+02
6.714	1.738E+02	5.044E+00	4.144E-02	1.790E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR EUROPIUM

ATOMIC WEIGHT 152.000 GRAMS / MOLE
DENSITY 5.259 GRAMS / CC
ATOMIC DENSITY 2.084E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.524E+02

L-EDGES AT 6.977 7.518 8.052
L-EDGE JUMPS 2.723 1.410 1.160
L-EDGE FIT JUMPS 4.453 1.636 1.160

K-EDGE AT 48.520 KEV
K-EDGE JUMP 5.694

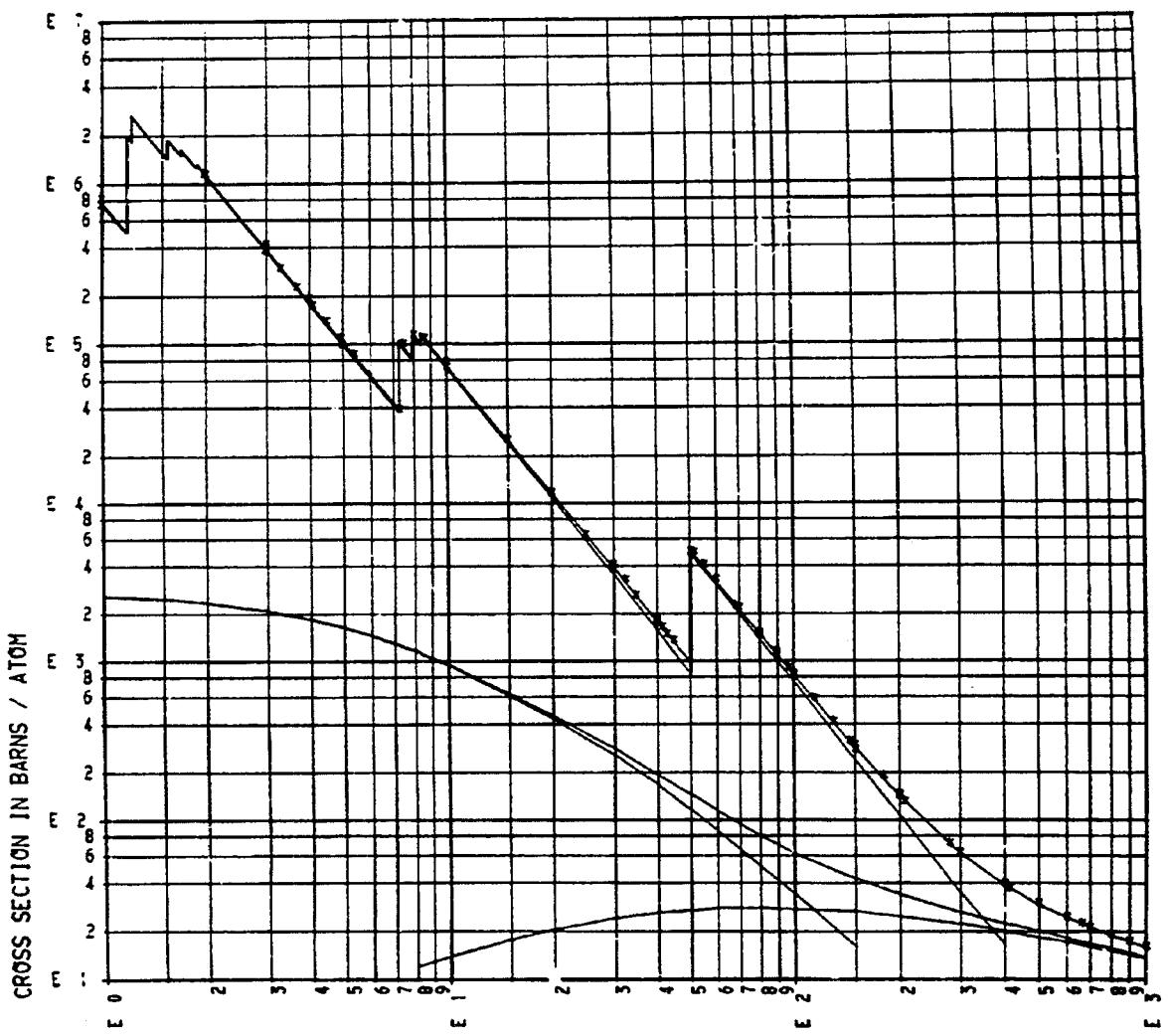
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.57063E+01	1.57063E+01	1.70692E+01	1.16168E+01
1	-2.63481E+00	-2.63481E+00	-2.48046E+00	1.97533E+00
2	0.	0.	-4.47055E-02	-9.70901E-01
3	0.	0.	0.	6.58459E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.63711E+00	2.80316E-01
1	5.63957E-01	1.44016E+00
2	-3.51909E-01	-1.88641E-01
3	1.68783E-02	4.01226E-03



GADOLINIUM

64

CROSS SECTIONS

64 - 1 REVISED 6/03/69

CROSS SECTIONS FOR GADOLINIUM		Z = 64	BARNs / ATOM	
KEY	PHOT	CCHERENT	INCCHERENT	TOTAL
1.000	7.632E+05	2.591E+03	1.404E+00	2.658E+05
1.180	4.956E+05	2.540E+03	1.733E+00	4.982E+05
1.181	1.892E+05	2.539E+03	1.735E+00	1.895E+05
2.220	1.759E+05	2.525E+03	1.808E+00	1.741E+05
2.221	2.547E+05	2.529E+03	1.810E+00	2.549E+05
2.500	1.489E+06	2.466E+03	2.351E+00	1.491E+06
2.543	1.383E+06	2.453E+03	2.429E+00	1.386E+06
2.544	1.825E+05	2.455E+03	2.430E+00	1.828E+05
2.689	1.444E+06	2.410E+03	2.694E+00	1.447E+06
2.690	1.590E+05	2.410E+03	2.696E+00	1.593E+05
2.881	1.203E+05	2.361E+03	3.049E+00	1.205E+05
2.882	1.285E+05	2.360E+03	3.050E+00	1.288E+05
2.000	1.697E+05	2.333E+03	3.271E+00	1.699E+05
3.000	3.809E+05	2.073E+03	9.056E+00	3.829E+05
4.000	1.798E+05	1.832E+03	6.721E+00	1.811E+05
5.000	1.005E+05	1.619E+03	8.239E+00	1.021E+05
6.000	6.245E+04	1.437E+03	9.606E+00	6.390E+04
7.242	3.823E+04	1.242E+03	1.108E+01	3.949E+04
7.243	1.033E+05	1.242E+03	1.108E+01	1.045E+05
7.930	8.119E+04	1.58E+03	1.187E+01	8.236E+04
7.931	1.144E+05	1.58E+03	1.187E+01	1.156E+05
8.000	1.118E+05	1.50E+03	1.195E+01	1.130E+05
8.375	9.900E+04	1.03E+03	2.300E+01	1.001E+05
8.376	1.148E+05	1.03E+03	2.300E+01	1.159E+05
10.000	1.150E+04	9.381E+02	1.377E+01	1.245E+04
15.000	2.395E+04	6.089E+02	1.771E+01	2.458E+04
20.000	1.093E+04	4.348E+02	2.057E+01	1.138E+04
30.000	3.572E+03	2.567E+02	2.414E+01	3.892E+03
40.000	1.601E+03	1.679E+02	2.605E+01	1.795E+03
50.000	8.553E+02	1.175E+02	2.711E+01	9.999E+02
50.239	8.439E+02	1.166E+02	2.711E+01	8.875E+02
50.240	4.867E+03	1.166E+02	2.711E+01	5.011E+03
50.000	3.070E+03	8.645E+01	2.755E+01	3.184E+03
80.000	1.416E+03	5.149E+01	2.788E+01	1.495E+03
100.000	7.643E+02	3.431E+01	2.751E+01	8.262E+02
150.000	2.446E+02	1.601E+01	2.639E+01	2.870E+02
200.000	1.089E+02	9.179E+00	2.477E+01	1.429E+02
300.000	3.568E+01	4.134E+00	2.199E+01	6.180E+01
400.000	1.669E+01	2.335E+00	1.991E+01	3.893E+01
500.000	9.508E+00	1.494E+00	1.828E+01	2.928E+01
600.000	6.134E+00	1.035E+00	1.696E+01	2.413E+01
800.000	3.217E+00	5.800E-01	1.493E+01	1.873E+01
1000.000	2.041E+00	3.590E-01	1.346E+01	1.587E+01

FLUORESCENT ENERGIES

42.983	1.308E+03	1.496E+02	2.638E+01	1.487E+03
48.718	9.201E+02	1.225E+02	2.698E+01	1.070E+03
6.275	5.556E+04	1.388E+03	9.938E+00	5.698E+04
6.979	4.211E+04	1.278E+03	1.077E+01	4.341E+04

CROSS SECTIONS FOR GADOLINIUM Z = 64 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
.000	2.923E+03	9.924E+00	5.377E-03	2.933E+03
.180	1.898E+03	9.725E+00	6.636E-03	1.908E+03
.181	1.247E+03	9.725E+00	6.643E-03	1.257E+03
.220	6.658E+03	9.687E+00	6.924E-03	6.668E+03
.221	9.753E+03	9.686E+00	6.931E-03	9.763E+03
.500	5.702E+03	9.446E+00	9.004E-03	5.711E+03
.543	5.297E+03	9.394E+00	9.300E-03	5.306E+03
.544	6.991E+03	9.395E+00	9.307E-03	7.000E+03
.689	5.531E+03	9.231E+00	1.032E-02	5.541E+03
.690	6.091E+03	9.230E+00	1.032E-02	6.100E+03
.881	4.606E+03	9.041E+00	1.167E-02	4.615E+03
.882	4.922E+03	9.040E+00	1.168E-02	4.931E+03
2.000	4.200E+03	8.934E+00	1.253E-02	4.209E+03
3.000	1.459E+03	7.938E+00	1.936E-02	1.467E+03
4.000	6.887E+02	7.017E+00	2.574E-02	6.958E+02
5.000	3.848E+02	6.202E+00	3.155E-02	3.911E+02
6.000	2.392E+02	5.503E+00	3.679E-02	2.447E+02
7.242	1.464E+02	4.758E+00	4.243E-02	1.512E+02
7.243	3.955E+02	4.757E+00	4.244E-02	4.003E+02
7.930	3.109E+02	4.434E+00	4.546E-02	3.154E+02
7.931	4.383E+02	4.434E+00	4.546E-02	4.428E+02
8.000	4.283E+02	4.404E+00	4.576E-02	4.328E+02
8.375	3.791E+02	4.224E+00	4.712E-02	3.834E+02
8.376	4.397E+02	4.224E+00	4.712E-02	4.439E+02
10.000	2.738E+02	3.593E+00	5.273E-02	2.775E+02
15.000	9.172E+01	2.332E+00	6.782E-02	9.412E+01
20.000	4.185E+01	1.665E+00	7.878E-02	4.359E+01
30.000	1.368E+01	9.831E-01	9.245E-02	1.475E+01
40.000	6.133E+00	6.430E-01	9.976E-02	6.876E+00
50.000	3.276E+00	4.499E-01	1.038E-01	3.829E+00
50.239	3.232E+00	4.465E-01	1.038E-01	3.782E+00
50.240	1.864E+01	4.465E-01	1.038E-01	1.919E+01
60.000	1.176E+01	3.311E-01	1.059E-01	1.219E+01
80.000	5.423E+00	1.972E-01	1.068E-01	5.727E+00
100.000	2.927E+00	1.314E-01	1.057E-01	3.154E+00
150.000	9.366E-01	6.132E-02	1.011E-01	1.099E+00
200.000	4.172E-01	3.515E-02	9.486E-02	5.472E-01
300.000	1.366E-01	1.583E-02	8.421E-02	2.367E-01
400.000	6.391E-02	8.935E-03	7.625E-02	1.491E-01
500.000	3.641E-02	5.722E-03	7.001E-02	1.121E-01
600.000	2.349E-02	3.964E-03	6.495E-02	9.240E-02
800.000	1.232E-02	2.221E-03	5.718E-02	7.172E-02
1000.000	7.815E-03	1.413E-03	5.155E-02	6.077E-02

FLUORESCENT ENERGIES

42.983	5.010E+00	5.731E-01	1.010E-01	5.693E+00
48.719	3.524E+00	4.690E-01	1.033E-01	4.099E+00
6.275	2.128E+02	5.315E+00	3.806E-02	2.182E+02
6.979	1.612E+02	4.896E+00	4.126E-02	1.662E+02

64 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR GADOLINIUM

ATOMIC WEIGHT 157.260 GRAMS / MOLE
DENSITY 7.950 GRAMS / CC
ATOMIC DENSITY 3.045E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.611E+02

L-EDGES AT	7.243	7.931	8.376
L-EDGE JUMPS	2.701	1.410	1.160
L-EDGE FIT JUMPS	4.418	1.636	1.160

K-EDGE AT 50.240 KEV
K-EDGE JUMP 5.767

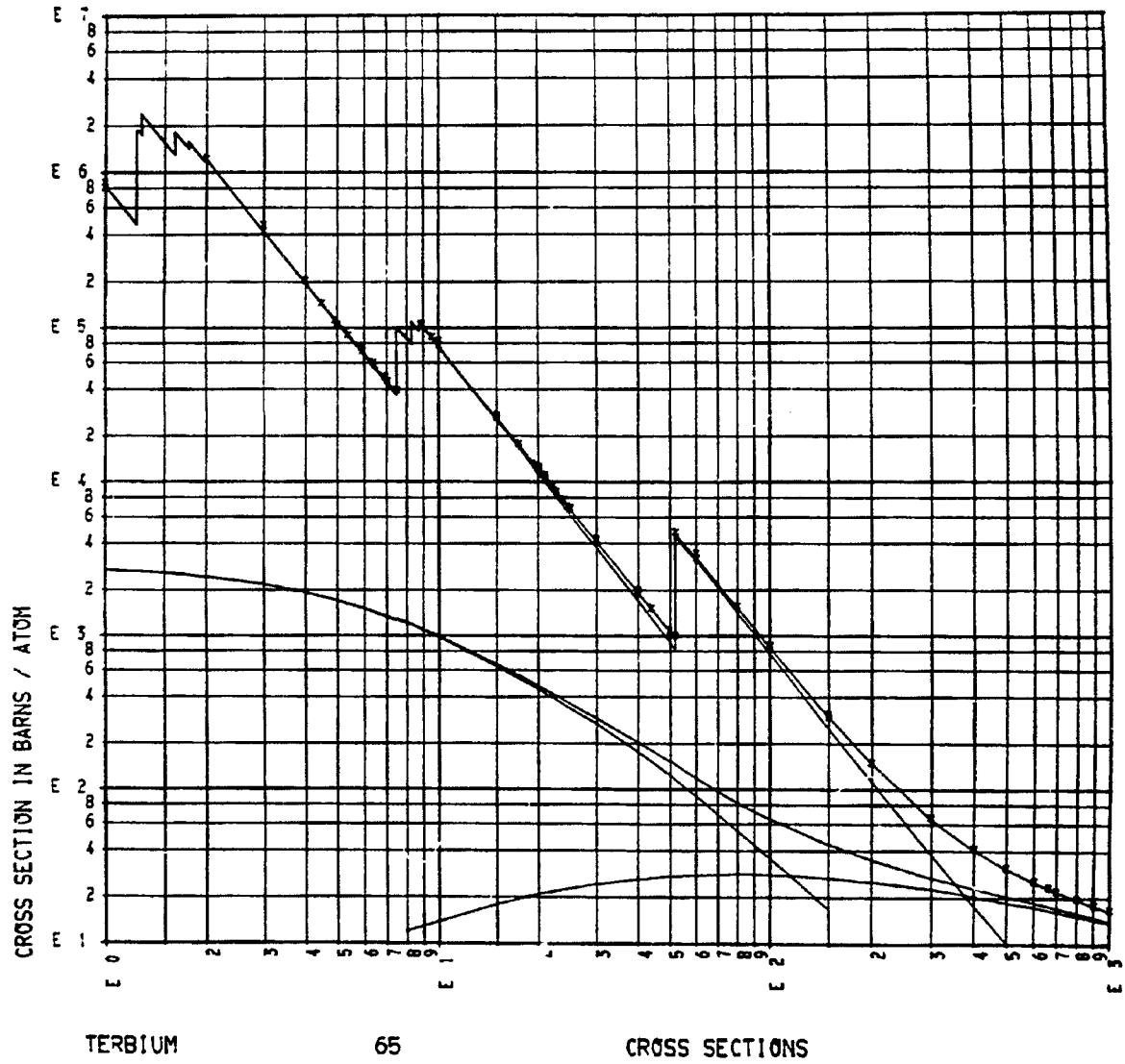
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.57159E+01	1.57159E+01	1.71159E+01	9.91968E+00
1	-2.60843E+00	-2.60843E+00	-2.47838E+00	3.03111E+00
2	0.	0.	-4.37107E-02	-1.17520E+00
3	0.	0.	0.	7.86751E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.66938E+00	2.73133E-01
1	3.59752E-01	1.43842E+00
2	-3.48899E-01	-1.86137E-01
3	1.65890E-02	3.75240E-03



TERBIUM

65

CROSS SECTIONS

CROSS SECTIONS FOR TERBIUM

Z = 65

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	8.187E+05	2.680E+03	1.390E+00	8.214E+05
1.239	4.649E+05	2.615E+03	1.826E+00	4.675E+05
1.240	1.877E+06	2.615E+03	1.828E+00	1.879E+06
1.279	1.729E+06	2.506E+03	1.902E+00	1.732E+06
1.280	2.381E+06	2.605E+03	1.904E+00	2.383E+06
1.500	1.566E+06	2.558E+03	2.330E+00	1.569E+06
1.610	1.299E+06	2.526E+03	2.528E+00	1.302E+06
1.611	1.825E+06	2.526E+03	2.530E+00	1.827E+06
1.767	1.429E+06	2.484E+03	2.814E+00	1.432E+06
1.768	1.574E+06	2.483E+03	2.816E+00	1.577E+06
1.966	1.189E+06	2.436E+03	3.182E+00	1.192E+06
1.967	1.271E+06	2.436E+03	3.184E+00	1.273E+06
2.000	1.216E+06	2.428E+03	3.246E+00	1.219E+06
3.000	4.169E+05	2.169E+03	5.032E+00	4.191E+05
4.000	1.951E+05	1.923E+03	5.703E+00	1.970E+05
5.000	1.082E+05	1.701E+03	8.229E+00	1.099E+05
6.000	6.687E+04	1.509E+03	9.504E+00	6.839E+04
7.514	3.692E+04	1.268E+03	1.141E+01	3.819E+04
7.515	1.002E+05	1.267E+03	1.141E+01	1.014E+05
8.000	8.487E+04	1.207E+03	1.197E+01	8.609E+04
8.251	7.819E+04	1.173E+03	1.222E+01	7.938E+04
8.252	1.102E+05	1.173E+03	1.222E+01	1.114E+05
8.707	9.557E+04	1.117E+03	1.267E+01	9.670E+04
8.708	1.108E+05	1.117E+03	1.267E+01	1.120E+05
10.000	7.665E+04	9.835E+02	1.390E+01	7.755E+04
15.000	2.574E+04	6.364E+02	1.789E+01	2.639E+04
20.000	1.176E+04	4.535E+02	2.079E+01	1.223E+04
30.000	3.845E+03	2.680E+02	2.442E+01	4.137E+03
40.000	1.723E+03	1.758E+02	2.637E+01	1.926E+03
50.000	9.199E+02	1.234E+02	2.744E+01	1.071E+03
51.995	8.236E+02	1.158E+02	2.756E+01	9.669E+02
51.996	4.549E+03	1.158E+02	2.756E+01	4.692E+03
60.000	3.128E+03	9.097E+01	2.801E+01	3.247E+03
80.000	1.446E+03	5.416E+01	2.826E+01	1.528E+03
100.000	7.839E+02	3.613E+01	2.800E+01	8.480E+02
150.000	2.543E+02	1.689E+01	2.678E+01	2.980E+02
200.000	1.146E+02	9.689E+00	2.514E+01	1.495E+02
300.000	3.815E+01	4.367E+00	2.233E+01	6.485E+01
400.000	1.801E+01	2.465E+00	2.022E+01	4.069E+01
500.000	1.030E+01	1.578E+00	1.856E+01	3.044E+01
600.000	6.653E+00	1.094E+00	1.722E+01	2.497E+01
800.000	3.478E+00	6.130E-01	1.516E+01	1.925E+01
1000.000	2.189E+00	3.900E-01	1.367E+01	1.625E+01

FLUORESCENT ENERGIES

44.470	1.279E+03	1.486E+02	2.687E+01	1.457E+03
50.391	8.998E+02	1.218E+02	2.746E+01	1.049E+03
6.495	5.424E+04	1.419E+03	1.020E+01	5.570E+04
7.249	4.059E+04	1.303E+03	1.110E+01	4.191E+04

CROSS SECTIONS FOR TERBIUM

Z = 65

CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	3.102E+03	1.015E+01	5.267E-03	3.112E+03
1.239	1.762E+03	9.909E+00	6.921E-03	1.772E+03
1.240	7.111E+03	9.908E+00	6.928E-03	7.121E+03
1.279	6.553E+03	9.873E+00	7.207E-03	6.563E+03
1.280	9.021E+03	9.872E+00	7.214E-03	9.031E+03
1.500	5.934E+03	9.695E+00	8.829E-03	5.944E+03
1.610	4.923E+03	9.571E+00	9.580E-03	4.932E+03
1.611	5.914E+03	9.570E+00	9.587E-03	5.924E+03
1.767	5.417E+03	9.411E+00	1.066E-02	5.426E+03
1.768	5.965E+03	9.410E+00	1.067E-02	5.974E+03
1.966	4.507E+03	9.231E+00	1.206E-02	4.515E+03
1.967	4.816E+03	9.230E+00	1.207E-02	4.825E+03
2.000	4.609E+03	9.202E+00	1.230E-02	4.618E+03
3.000	1.580E+03	8.220E+00	1.907E-02	1.588E+03
4.000	7.392E+02	7.286E+00	2.540E-02	7.465E+02
5.000	4.101E+02	6.445E+00	3.118E-02	4.166E+02
6.000	2.534E+02	5.720E+00	3.639E-02	2.592E+02
7.514	1.399E+02	4.803E+00	4.323E-02	1.447E+02
7.515	3.795E+02	4.803E+00	4.324E-02	3.844E+02
8.000	3.216E+02	4.574E+00	4.536E-02	3.262E+02
8.251	2.963E+02	4.447E+00	4.631E-02	3.008E+02
8.252	4.177E+02	4.446E+00	4.631E-02	4.222E+02
8.707	3.622E+02	4.233E+00	4.801E-02	3.664E+02
8.708	4.200E+02	4.232E+00	4.801E-02	4.243E+02
10.000	2.905E+02	3.727E+00	5.267E-02	2.942E+02
15.000	9.754E+01	2.412E+00	6.779E-02	1.000E+02
20.000	4.455E+01	1.719E+00	7.878E-02	4.635E+01
30.000	1.457E+01	1.015E+00	9.254E-02	1.568E+01
40.000	6.530E+00	6.663E-01	9.993E-02	7.297E+00
50.000	3.486E+00	4.676E-01	1.040E-01	4.057E+00
51.995	3.121E+00	4.388E-01	1.044E-01	3.664E+00
51.996	1.724E+01	4.387E-01	1.044E-01	1.778E+01
60.000	1.185E+01	3.447E-01	1.061E-01	1.231E+01
80.000	5.478E+00	2.052E-01	1.071E-01	5.790E+00
100.000	2.970E+00	1.369E-01	1.061E-01	3.214E+00
150.000	9.638E-01	6.400E-02	1.015E-01	1.129E+00
200.000	4.344E-01	3.672E-02	9.527E-02	5.663E-01
300.000	1.446E-01	1.655E-02	8.462E-02	2.457E-01
400.000	6.823E-02	9.341E-03	7.662E-02	1.542E-01
500.000	3.904E-02	5.980E-03	7.033E-02	1.153E-01
600.000	2.521E-02	4.146E-03	6.525E-02	9.461E-02
800.000	1.318E-02	2.323E-03	5.745E-02	7.295E-02
1000.000	8.294E-03	1.478E-03	5.180E-02	6.157E-02

FLUORESCENT ENERGIES

44.470	4.847E+00	5.632E-01	1.018E-01	5.522E+00
50.391	3.410E+00	4.617E-01	1.041E-01	3.976E+00
6.495	2.055E+02	5.379E+00	3.867E-02	2.111E+02
7.249	1.538E+02	4.939E+00	4.206E-02	1.588E+02

65 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR TERBIUM

ATOMIC WEIGHT 158.930 GRAMS / MOLE
DENSITY 8.272 GRAMS / CC
ATOMIC DENSITY 3.135E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.639E+02

L-EDGES AT	7.515	8.252	8.708
L-EDGE JUMPS	2.713	1.410	1.160
L-EDGE FIT JUMPS	4.438	1.636	1.160

K-EDGE AT 51.996 KEV
K-EDGE JUMP 5.523

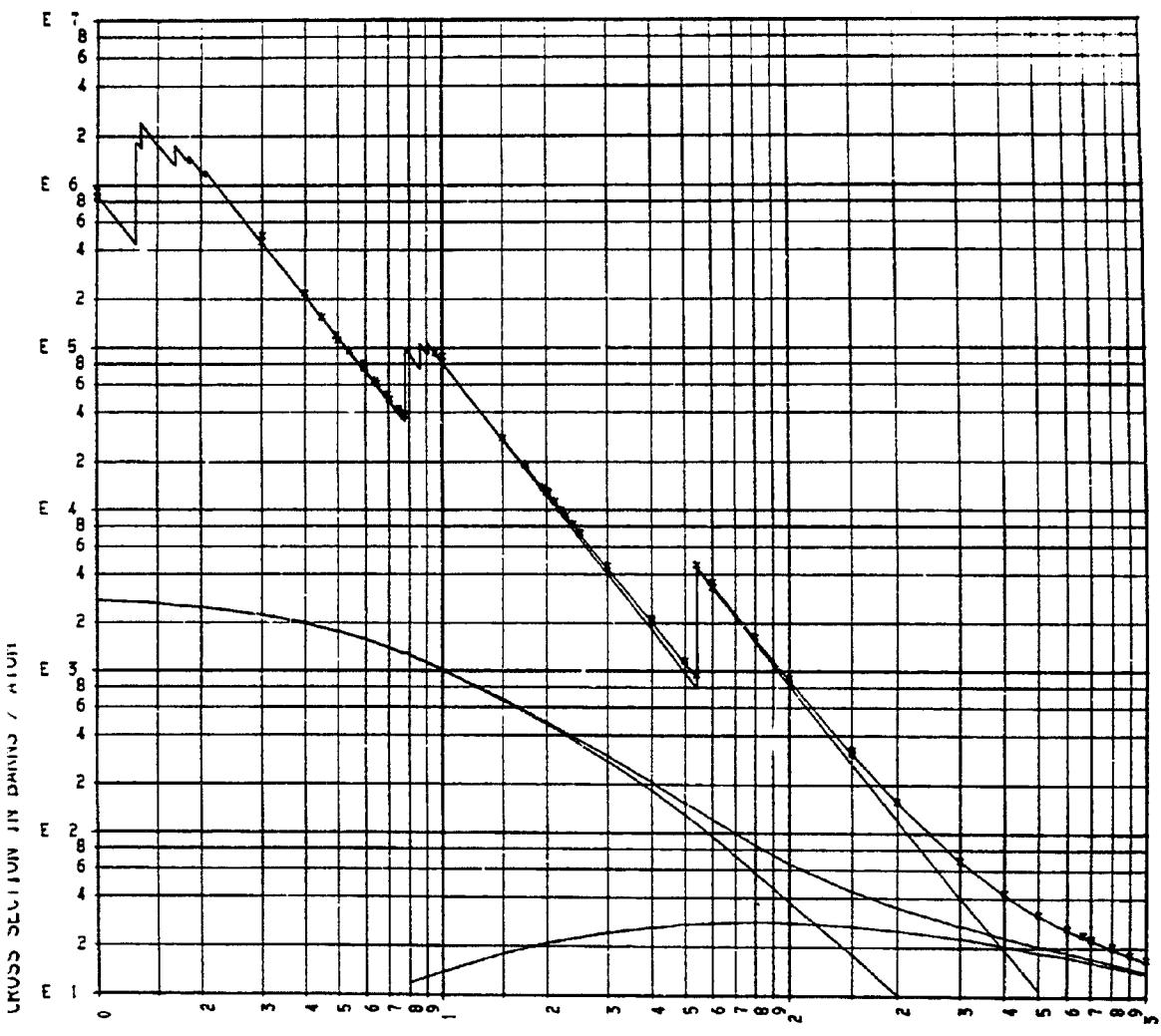
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	1.967	L	8.708	K	51.996
0	1.58415E+01	1.58415E+01		1.71499E+01		1.13818E+01	
1	-2.64040E+00	-2.64040E+00		-2.45507E+00		2.14447E+00	
2	0.	0.		-4.71370E-02		-9.99222E-01	
3	0.	0.		0.		6.75569E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.70798E+00	2.57539E-01
1	3.65345E-01	1.45064E+00
2	-3.50031E-01	-1.87591E-01
3	1.66927E-02	3.79932E-03



DYSPROSIUM

66

CROSS SECTIONS

CROSS SECTIONS FOR DYSPROSIUM Z = 66 BARNs / ATOM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	8.708E+05	2.767E+03	1.376E+00	8.736E+05
1.294	4.395E+05	2.689E+03	1.913E+00	4.422E+05
1.295	1.809E+06	2.689E+03	1.915E+00	1.811E+06
1.334	1.672E+06	2.680E+03	1.989E+00	1.675E+06
1.335	2.434E+06	2.680E+03	1.991E+00	2.436E+06
1.500	1.787E+06	2.645E+03	2.311E+00	1.789E+06
1.676	1.331E+06	2.593E+03	2.627E+00	1.334E+06
1.677	1.768E+06	2.593E+03	2.629E+00	1.771E+06
1.842	1.378E+06	2.550E+03	2.930E+00	1.381E+06
1.843	1.518E+06	2.550E+03	2.932E+00	1.521E+06
2.000	1.222E+06	2.513E+03	3.223E+00	1.225E+06
2.045	1.152E+06	2.498E+03	3.302E+00	1.154E+06
2.046	1.231E+06	2.498E+03	3.304E+00	1.234E+06
3.000	4.460E+05	2.250E+03	5.011E+00	4.482E+05
4.000	2.079E+05	1.998E+03	6.586E+00	2.099E+05
5.000	1.150E+05	1.770E+03	8.220E+00	1.168E+05
6.000	7.091E+04	1.572E+03	9.605E+00	7.249E+04
7.789	3.549E+04	1.285E+03	1.175E+01	3.678E+04
7.790	9.751E+04	1.284E+03	1.175E+01	9.881E+04
8.000	9.080E+04	1.258E+03	1.199E+01	9.207E+04
8.580	7.526E+04	1.180E+03	1.260E+01	7.645E+04
8.581	1.061E+05	1.180E+03	1.260E+01	1.073E+05
9.046	9.206E+04	1.124E+03	1.307E+01	9.326E+04
9.047	1.068E+05	1.124E+03	1.307E+01	1.079E+05
10.000	8.153E+04	1.025E+03	1.403E+01	8.257E+04
15.000	2.720E+04	6.627E+02	1.808E+01	2.788E+04
20.000	1.240E+04	4.715E+02	2.102E+01	1.290E+04
30.000	4.065E+03	2.790E+02	2.469E+01	4.369E+03
40.000	1.831E+03	1.837E+02	2.669E+01	2.041E+03
50.000	9.823E+02	1.292E+02	2.778E+01	1.139E+03
53.788	8.007E+02	1.148E+02	2.801E+01	9.435E+02
53.789	4.392E+03	1.148E+02	2.801E+01	4.534E+03
60.000	3.300E+03	9.547E+01	2.836E+01	5.424E+03
80.000	1.527E+03	5.683E+01	2.864E+01	1.613E+03
100.000	8.295E+02	3.795E+01	2.838E+01	8.959E+02
150.000	2.699E+02	1.777E+01	2.716E+01	3.148E+02
200.000	1.219E+02	1.020E+01	2.551E+01	1.576E+02
300.000	4.368E+01	4.600E+00	2.257E+01	5.795E+01
400.000	1.923E+01	2.597E+00	2.052E+01	4.235E+01
500.000	1.102E+01	1.663E+00	1.884E+01	3.152E+01
600.000	7.120E+00	1.152E+00	1.748E+01	2.575E+01
800.000	3.725E+00	6.460E-01	1.540E+01	1.977E+01
1000.000	2.345E+00	4.110E-01	1.388E+01	1.664E+01

FLUORESCENT ENERGIES

45.985	1.241E+03	1.475E+02	2.737E+01	1.418E+03
52.178	8.718E+02	1.206E+02	2.791E+01	1.021E+03
6.720	5.250E+04	1.440E+03	1.048E+01	5.399E+04
7.528	3.884E+04	1.319E+03	1.144E+01	4.019E+04

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REVISED 6/03/69

CROSS SECTIONS FOR DYSPROSIUM Z = 66 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.227E+03	1.025E+01	5.099E-03	3.237E+03
1.294	1.629E+03	9.965E+00	7.090E-03	1.639E+03
1.295	6.703E+03	9.964E+00	7.097E-03	6.713E+03
1.334	6.196E+03	9.931E+00	7.372E-03	6.206E+03
1.335	9.019E+03	9.930E+00	7.379E-03	9.329E+03
1.500	6.621E+03	9.802E+00	8.564E-03	6.631E+03
1.676	4.933E+03	9.611E+00	9.737E-03	4.942E+03
1.677	6.553E+03	9.610E+00	9.743E-03	6.562E+03
1.842	5.108E+03	9.452E+00	1.086E-02	5.118E+03
1.843	5.626E+03	9.451E+00	1.087E-02	5.635E+03
2.000	4.529E+03	9.315E+00	1.194E-02	4.538E+03
2.045	4.269E+03	9.258E+00	1.224E-02	4.278E+03
2.046	4.562E+03	9.257E+00	1.224E-02	4.571E+03
3.000	1.653E+03	8.339E+00	1.857E-02	1.661E+03
4.000	7.705E+02	7.405E+00	2.478E-02	7.779E+02
5.000	4.253E+02	6.560E+00	3.046E-02	4.328E+02
6.000	2.628E+02	5.826E+00	3.560E-02	2.687E+02
7.789	1.315E+02	4.760E+00	4.353E-02	1.363E+02
7.790	3.614E+02	4.760E+00	4.353E-02	3.662E+02
8.000	3.365E+02	4.662E+00	4.443E-02	3.412E+02
8.580	2.789E+02	4.373E+00	4.668E-02	2.833E+02
8.581	3.931E+02	4.373E+00	4.668E-02	3.976E+02
9.046	3.412E+02	4.166E+00	4.845E-02	3.454E+02
9.047	3.956E+02	4.166E+00	4.845E-02	3.999E+02
10.000	3.022E+02	3.800E+00	5.199E-02	3.060E+02
15.000	1.008E+02	2.455E+00	5.700E-02	1.033E+02
20.000	4.597E+01	1.747E+00	7.790E-02	4.780E+01
30.000	1.507E+01	1.034E+00	9.150E-02	1.619E+01
40.000	6.784E+00	6.806E-01	9.891E-02	7.564E+00
50.000	3.640E+00	4.790E-01	1.030E-01	4.222E+00
53.788	2.967E+00	4.253E-01	1.038E-01	3.497E+00
53.789	1.628E+01	4.253E-01	1.038E-01	1.680E+01
60.000	1.223E+01	3.538E-01	1.051E-01	1.269E+01
80.000	5.661E+00	2.106E-01	1.061E-01	5.977E+00
100.000	3.074E+00	1.406E-01	1.052E-01	3.320E+00
150.000	1.000E+00	6.585E-02	1.007E-01	1.167E+00
200.000	4.517E-01	3.780E-02	9.454E-02	5.841E-01
300.000	1.508E-01	1.705E-02	8.401E-02	2.518E-01
400.000	7.128E-02	9.624E-03	7.605E-02	1.569E-01
500.000	4.083E-02	6.163E-03	6.982E-02	1.158E-01
600.000	2.639E-02	4.269E-03	6.478E-02	9.544E-02
800.000	1.381E-02	2.394E-03	5.707E-02	7.327E-02
1000.000	8.690E-03	1.523E-03	5.144E-02	6.165E-02

FLUORESCENT ENERGIES

45.985	4.598E+00	5.464E-01	1.014E-01	5.254E+00
52.178	3.231E+00	4.469E-01	1.034E-01	3.782E+00
6.720	1.946E+02	5.337E+00	3.885E-02	2.001E+02
7.528	1.440E+02	4.888E+00	4.240E-02	1.489E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR DYSPROSIUM

ATOMIC WEIGHT 162.510 GRAMS / MOLE
DENSITY 8.536 GRAMS / CC
ATOMIC DENSITY 3.163E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.698E+02

L-EDGES AT	7.790	8.581	9.047
L-EDGE JUMPS	2.748	1.410	1.160
L-EDGE FIT JUMPS	4.494	1.636	1.160

K-EDGE AT 53.789 KEV
K-EDGE JUMP 5.485

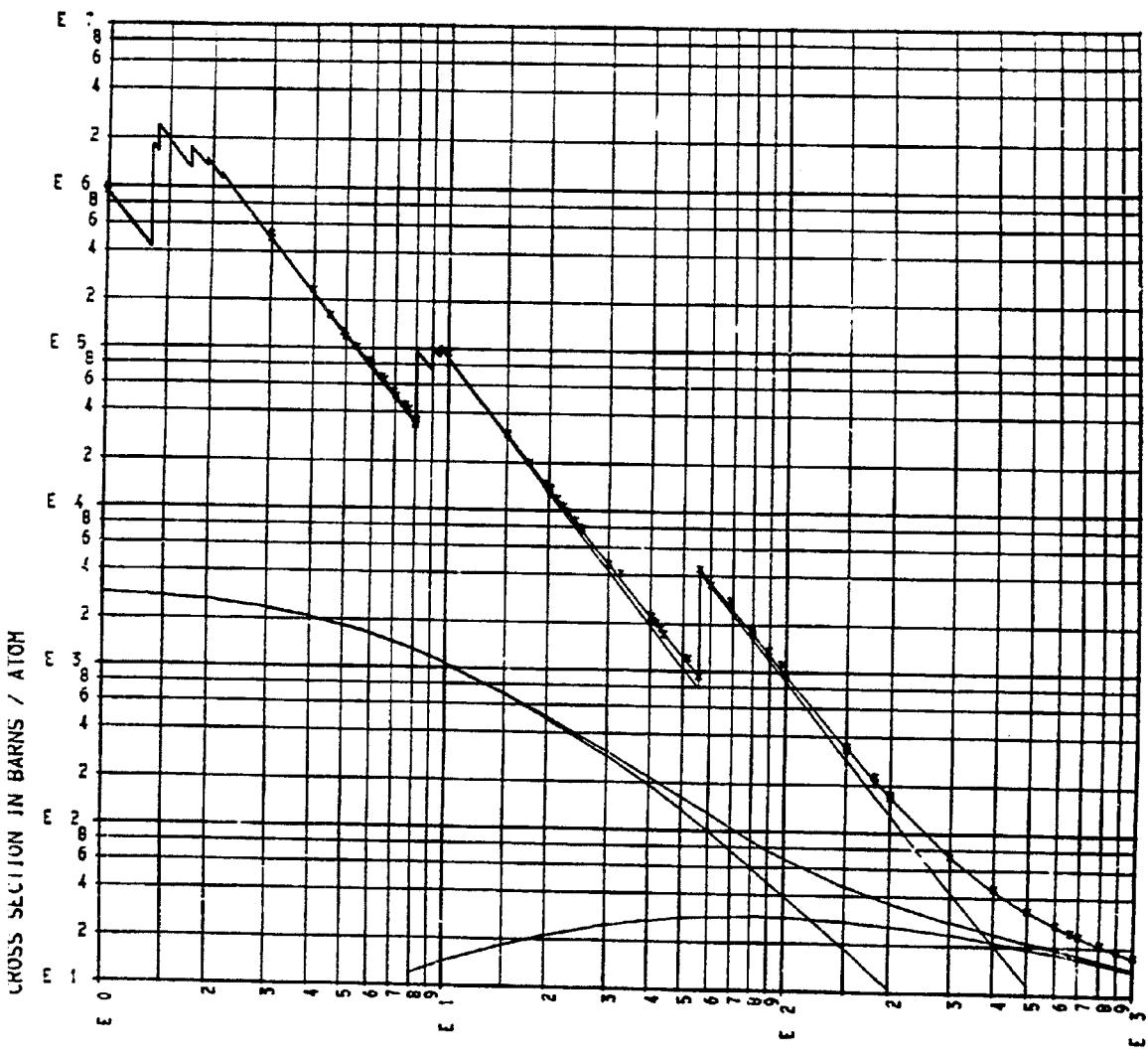
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.59225E+01	1.59225E+01	1.73446E+01	1.14845E+01
1	-2.65289E+00	-2.65289E+00	-2.54821E+00	2.10451E+00
2	0.	0.	-3.17606E-02	-9.89870E-01
3	0.	0.	0.	6.69382E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.74188E+00	2.42685E-01
1	3.67107E-01	1.46266E+00
2	-3.49433E-01	-1.89102E-01
3	1.66273E-02	3.85628E-03



HOLMIUM

67

CROSS SECTIONS

CROSS SECTIONS FOR HOLMIUM

Z = 67

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	9.310E+05	2.856E+03	1.362E+00	9.338E+05
1.344	4.216E+05	2.766E+03	1.991E+00	4.244E+05
1.345	1.779E+06	2.765E+03	1.993E+00	1.781E+06
1.389	1.632E+06	2.756E+03	2.077E+00	1.635E+06
1.390	2.360E+06	2.756E+03	2.079E+00	2.363E+06
1.500	1.925E+06	2.733E+03	2.293E+00	1.928E+06
1.738	1.297E+06	2.664E+03	2.721E+00	1.300E+06
1.739	1.734E+06	2.664E+03	2.723E+00	1.737E+06
1.921	1.328E+06	2.618E+03	3.056E+00	1.331E+06
1.922	1.463E+06	2.618E+03	3.058E+00	1.466E+06
2.000	1.315E+06	2.600E+03	3.203E+00	1.518E+06
2.126	1.117E+06	2.558E+03	3.424E+00	1.119E+06
2.127	1.193E+06	2.558E+03	3.426E+00	1.196E+06
3.000	4.719E+05	2.333E+03	4.990E+00	4.772E+05
4.000	2.197E+05	2.075E+03	6.671E+00	2.218E+05
5.000	1.208E+05	1.841E+03	8.212E+00	1.227E+05
6.000	7.415E+04	1.636E+03	9.508E+00	7.580E+04
8.000	3.431E+04	1.311E+03	1.202E+01	3.563E+04
8.070	3.352E+04	1.300E+03	1.210E+01	3.483E+04
8.071	9.536E+04	1.300E+03	1.210E+01	9.727E+04
8.918	7.308E+04	1.187E+03	1.302E+01	7.428E+04
8.919	1.030E+05	1.187E+03	1.302E+01	1.042E+05
9.394	8.942E+04	1.132E+03	1.353E+01	9.056E+04
9.395	1.037E+05	1.132E+03	1.353E+01	1.048E+05
10.000	8.746E+04	1.069E+03	1.417E+01	8.854E+04
15.000	2.892E+04	6.900E+02	1.821E+01	2.963E+04
20.000	1.319E+04	4.902E+02	2.125E+01	2.370E+04
30.000	4.358E+03	2.903E+02	2.495E+01	4.673E+03
40.000	1.986E+03	1.917E+02	2.701E+01	2.205E+03
50.000	1.080E+03	1.352E+02	2.812E+01	1.243E+03
55.617	8.073E+02	1.37E+02	2.847E+01	9.495E+02
55.618	4.301E+03	1.37E+02	2.847E+01	4.443E+03
60.000	3.545E+03	1.001E+02	2.872E+01	3.674E+03
80.000	1.664E+03	5.957E+01	2.901E+01	1.752E+03
100.000	9.068E+02	3.981E+01	2.977E+01	9.254E+02
150.000	2.938E+02	1.867E+01	2.755E+01	3.400E+02
200.000	1.315E+02	1.072E+01	2.588E+01	1.682E+02
300.000	4.335E+01	4.839E+00	2.301E+01	1.120E+01
400.000	2.036E+01	2.732E+00	2.083E+01	4.392E+01
500.000	1.164E+01	1.750E+00	1.912E+01	3.251E+01
600.000	7.534E+00	1.212E+00	1.775E+01	2.650E+01
800.000	3.981E+00	6.800E-01	1.563E+01	2.029E+01
1000.000	2.546E+00	4.330E-01	1.409E+01	1.707E+01

FLUORESCENT ENERGIES

47.528	1.240E+03	1.464E+02	2.786E+01	1.416E+03
53.934	8.780E+02	1.196E+02	2.837E+01	1.026E+03
6.948	5.005E+04	1.461E+03	1.077E+01	5.158E+04
7.810	3.659E+04	1.335E+03	1.180E+01	3.795E+04

CROSS SECTIONS FOR HOLMIUM Z = 67 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.399E+03	1.043E+01	4.973E-03	3.410E+03
1.344	1.540E+03	1.010E+01	7.271E-03	1.550E+03
1.345	6.495E+03	1.010E+01	7.278E-03	6.505E+03
1.389	5.958E+03	1.006E+01	7.505E-03	5.968E+03
1.390	8.619E+03	1.006E+01	7.592E-03	8.629E+03
1.500	7.028E+03	9.978E+00	8.373E-03	7.039E+03
1.738	4.737E+03	9.727E+00	9.935E-03	4.747E+03
1.739	6.333E+03	9.725E+00	9.942E-03	6.343E+03
1.921	4.851E+03	9.560E+00	1.116E-02	4.860E+03
1.922	5.342E+03	9.559E+00	1.117E-02	5.351E+03
2.000	4.802E+03	9.493E+00	1.170E-02	4.811E+03
2.126	4.077E+03	9.340E+00	1.250E-02	4.086E+03
2.127	4.357E+03	9.339E+00	1.251E-02	4.366E+03
3.000	1.734E+03	8.517E+00	1.822E-02	1.742E+03
4.000	8.023E+02	7.578E+00	2.436E-02	8.099E+02
5.000	4.413E+02	6.722E+00	2.998E-02	4.480E+02
6.000	2.707E+02	5.975E+00	3.508E-02	2.768E+02
8.000	1.253E+02	4.786E+00	4.389E-02	1.301E+02
8.070	1.224E+02	4.748E+00	4.417E-02	1.272E+02
8.071	3.504E+02	4.747E+00	4.418E-02	3.552E+02
8.918	2.669E+02	4.334E+00	4.755E-02	2.712E+02
8.919	3.762E+02	4.333E+00	4.755E-02	3.805E+02
9.394	3.265E+02	4.132E+00	4.941E-02	3.307E+02
9.395	3.786E+02	4.132E+00	4.941E-02	3.828E+02
10.000	3.193E+02	3.902E+00	5.174E-02	3.233E+02
15.000	1.056E+02	2.520E+00	6.671E-02	1.082E+02
20.000	4.815E+01	1.790E+00	7.759E-02	5.001E+01
30.000	1.591E+01	1.060E+00	9.117E-02	1.706E+01
40.000	7.253E+00	6.999E-01	9.862E-02	8.052E+00
50.000	3.943E+00	4.938E-01	1.027E-01	4.539E+00
55.617	2.948E+00	4.152E-01	1.039E-01	3.467E+00
55.618	1.571E+01	4.152E-01	1.039E-01	1.622E+01
60.000	1.294E+01	3.655E-01	1.049E-01	1.342E+01
80.000	6.074E+00	2.175E-01	1.059E-01	5.397E+00
100.000	3.311E+00	1.454E-01	1.050E-01	3.561E+00
150.000	1.073E+00	6.816E-02	1.006E-01	1.242E+00
200.000	4.805E-01	3.916E-02	9.450E-02	6.142E-01
300.000	1.583E-01	1.767E-02	8.402E-02	2.600E-01
400.000	7.433E-02	9.975E-03	7.606E-02	1.604E-01
500.000	4.250E-02	6.390E-03	6.981E-02	1.187E-01
600.000	2.751E-02	4.425E-03	6.481E-02	9.675E-02
800.000	1.454E-02	2.483E-03	5.707E-02	1.409E-02
1000.000	9.295E-03	1.581E-03	5.145E-02	6.232E-02

FLUORESCENT ENERGIES

47.528	4.529E+00	5.345E-01	1.017E-01	5.171E+00
53.934	3.206E+00	4.365E-01	1.036E-01	3.748E+00
6.948	1.828E+02	5.336E+00	3.933E-02	1.883E+02
7.810	1.336E+02	4.875E+00	4.308E-02	1.386E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR HOLMIUM

ATOMIC WEIGHT 164.940 GRAMS / MOLE
DENSITY 8.803 GRAMS / CC
ATOMIC DENSITY 3.214E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.739E+02

L-EDGES AT	8.071	8.919	9.395
L-EDGE JUMPS	2.863	1.410	1.160
L-EDGE FIT JUMPS	4.683	1.636	1.160

K-EDGE AT 55.618 KEV
K-EDGE JUMP 5.328

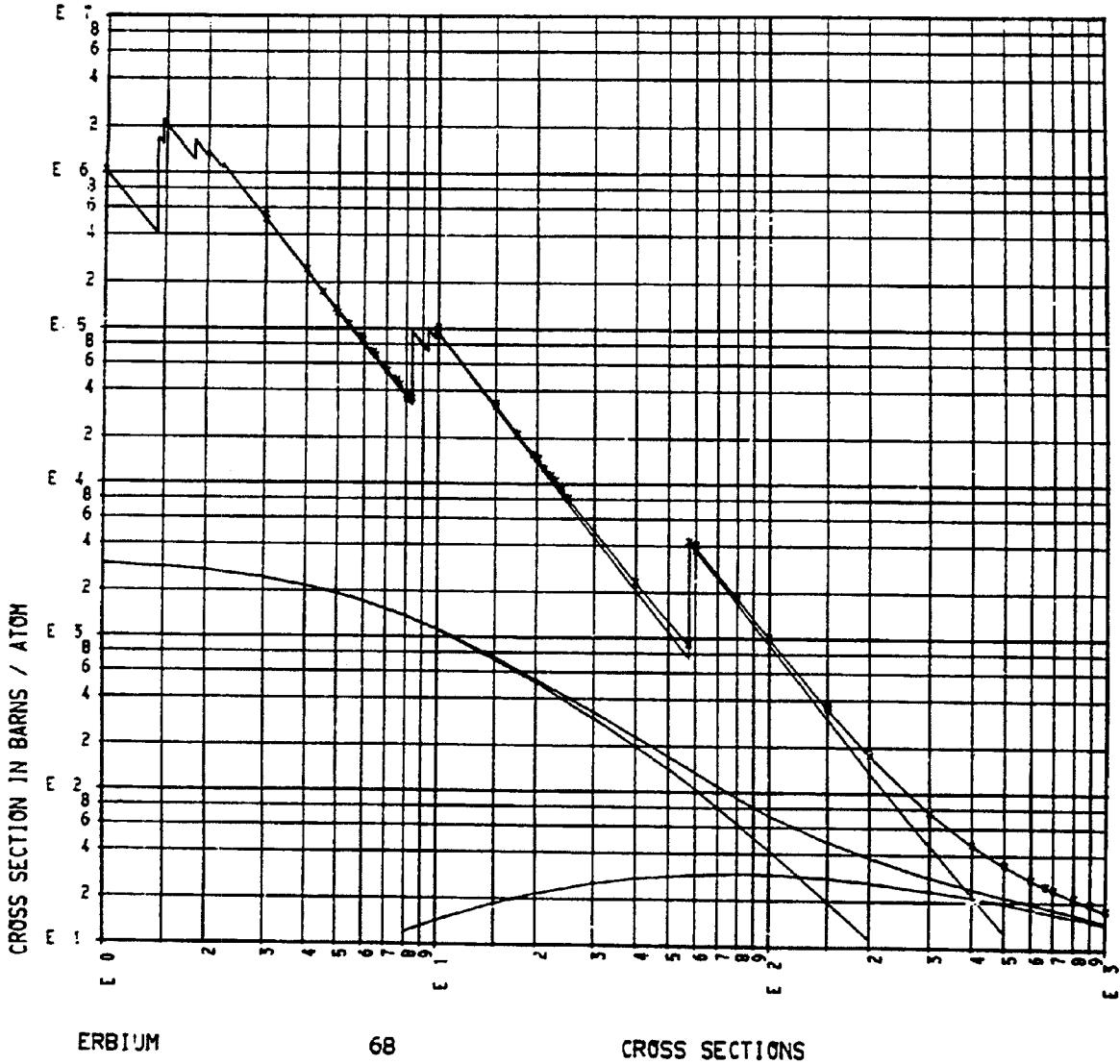
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.60140E+01	1.60140E+01	1.76583E+01	8.75203E+00
1	-2.67903E+00	-2.67903E+00	-2.72523E+00	3.71822E+00
2	0.	0.	-8.19409E-04	-1.29273E+00
3	0.	0.	0.	8.55026E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.77470E+00	2.28493E-01
1	3.69722E-01	1.47438E+00
2	-3.49132E-01	-1.90559E-01
3	1.65862E-02	3.90903E-03



ERBIUM

68

CROSS SECTIONS

CROSS SECTIONS FOR ERBIUM		Z = 68	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.018E+06	2.945E+03	1.348E+00	1.021E+06
1.409	4.069E+05	2.841E+03	2.106E+00	4.097E+05
1.410	1.655E+06	2.841E+03	2.102E+00	1.658E+06
1.454	1.524E+06	2.831E+03	2.187E+00	1.527E+06
1.455	2.191E+06	2.831E+03	2.189E+00	2.194E+06
1.500	2.020E+06	2.822E+03	2.277E+00	2.023E+06
1.810	1.222E+06	2.734E+03	2.834E+00	1.224E+06
1.811	1.630E+06	2.734E+03	2.836E+00	1.633E+06
2.000	1.250E+06	2.688E+03	3.184E+00	1.252E+06
2.005	1.241E+06	2.586E+03	3.193E+00	1.244E+06
2.006	1.379E+06	2.686E+03	3.195E+00	1.382E+06
2.211	1.663E+05	2.618E+03	3.555E+00	1.665E+06
2.212	1.136E+05	2.618E+03	3.557E+00	1.138E+06
3.000	5.025E+05	2.417E+03	4.972E+00	5.050E+05
4.000	2.327E+05	2.154E+03	6.656E+00	2.349E+05
5.000	1.281E+05	1.914E+03	8.206E+00	1.300E+05
6.000	7.864E+04	1.703E+03	9.613E+00	8.036E+04
8.000	3.642E+04	1.365E+03	1.205E+01	3.780E+04
8.357	3.240E+04	1.312E+03	1.246E+01	3.373E+04
8.358	9.503E+04	3.12E+03	1.246E+01	9.635E+04
9.264	7.154E+04	1.94E+03	1.349E+01	7.274E+04
9.265	1.008E+05	1.94E+03	1.349E+01	1.020E+05
9.751	8.757E+04	1.39E+03	1.403E+01	8.872E+04
9.752	1.015E+05	1.39E+03	1.404E+01	1.027E+05
10.000	9.475E+04	1.13E+03	1.431E+01	9.588E+04
15.000	3.093E+04	1.184E+02	1.845E+01	3.157E+04
20.000	1.397E+04	5.095E+02	2.148E+01	1.450E+04
30.000	4.552E+03	3.019E+02	2.525E+01	4.879E+03
40.000	2.054E+03	1.999E+02	2.732E+01	2.281E+03
50.000	1.107E+03	1.414E+02	2.846E+01	1.277E+03
57.485	7.523E+02	1.127E+02	2.893E+01	8.939E+02
57.486	4.136E+03	1.126E+02	2.893E+01	4.279E+03
60.000	3.697E+03	1.048E+02	2.908E+01	3.831E+03
80.000	1.712E+03	6.236E+01	2.939E+01	1.804E+03
100.000	9.310E+02	4.171E+01	2.915E+01	1.002E+03
150.000	3.042E+02	1.958E+01	2.794E+01	3.517E+02
200.000	1.379E+02	1.125E+01	2.625E+01	1.134E+02
300.000	4.626E+01	5.082E+00	2.334E+01	7.468E+01
400.000	2.194E+01	2.870E+00	2.114E+01	4.595E+01
500.000	1.259E+01	1.839E+00	1.940E+01	3.383E+01
600.000	8.143E+00	1.274E+00	1.801E+01	2.745E+01
800.000	4.260E+00	7.150E-01	1.587E+01	2.084E+01
1000.000	2.678E+00	4.540E-01	1.430E+01	1.743E+01

FLUORESCENT ENERGIES

49.099	1.164E+03	1.454E+02	2.837E+01	1.539E+03
55.690	8.214E+02	1.186E+02	2.882E+01	9.694E+02
7.181	4.862E+04	1.483E+03	1.107E+01	5.017E+04
8.103	3.519E+04	1.349E+03	1.217E+01	3.656E+04

CROSS SECTIONS FOR ERBIUM

Z = 68

CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.667E+03	1.061E+01	4.853E-03	3.678E+03
1.409	1.465E+03	1.023E+01	1.561E-03	1.475E+03
1.410	5.958E+03	1.023E+01	7.568E-03	5.969E+03
1.454	5.488E+03	1.019E+01	7.875E-03	5.498E+03
1.455	7.890E+03	1.019E+01	7.882E-03	7.900E+03
1.500	7.272E+03	1.016E+01	8.198E-03	7.282E+03
1.810	4.399E+03	9.843E+00	1.020E-02	4.409E+03
1.811	5.869E+03	9.842E+00	1.021E-02	5.879E+03
2.000	4.500E+03	9.678E+00	1.146E-02	4.509E+03
2.005	4.470E+03	9.671E+00	1.150E-02	4.479E+03
2.006	4.964E+03	9.670E+00	1.150E-02	4.974E+03
2.211	3.826E+03	9.427E+00	1.280E-02	3.836E+03
2.212	4.089E+03	9.426E+00	1.281E-02	4.099E+03
3.000	1.809E+03	8.101E+00	1.790E-02	1.818E+03
4.000	8.379E+02	7.756E+00	2.396E-02	8.457E+02
5.000	4.612E+02	6.890E+00	2.955E-02	4.681E+02
6.000	2.832E+02	6.130E+00	3.461E-02	2.893E+02
8.000	1.311E+02	4.914E+00	4.339E-02	1.361E+02
8.357	1.167E+02	4.723E+00	4.487E-02	1.214E+02
8.358	3.421E+02	4.722E+00	4.487E-02	3.469E+02
9.264	2.576E+02	4.299E+00	4.858E-02	2.619E+02
9.265	3.631E+02	4.298E+00	4.858E-02	3.674E+02
9.751	3.153E+02	4.102E+00	5.053E-02	3.194E+02
9.752	3.656E+02	4.101E+00	5.054E-02	3.698E+02
10.000	3.411E+02	4.008E+00	5.152E-02	3.452E+02
15.000	1.114E+02	2.586E+00	6.643E-02	1.140E+02
20.000	5.029E+01	1.834E+00	7.734E-02	5.220E+01
30.000	1.639E+01	1.087E+00	9.091E-02	1.757E+01
40.000	7.394E+00	1.195E-01	9.837E-02	8.212E+00
50.000	3.986E+00	5.689E-01	1.025E-01	4.598E+00
57.485	2.709E+00	4.056E-01	1.042E-01	3.219E+00
57.486	1.490E+01	4.056E-01	1.042E-01	1.541E+01
60.000	1.331E+01	3.774E-01	1.047E-01	1.379E+01
80.000	6.164E+00	2.245E-01	1.058E-01	6.494E+00
100.000	3.352E+00	1.502E-01	1.050E-01	3.607E+00
150.000	1.095E+00	7.051E-02	1.006E-01	1.266E+00
200.000	4.964E-01	4.053E-02	9.451E-02	6.315E-01
300.000	1.665E-01	1.830E-02	8.404E-02	2.689E-01
400.000	7.898E-02	1.033E-02	7.611E-02	1.554E-01
500.000	4.532E-02	6.621E-03	6.985E-02	1.218E-01
600.000	2.932E-02	4.587E-03	6.484E-02	9.875E-02
800.000	1.534E-02	2.574E-03	5.714E-02	1.505E-02
1000.000	9.642E-03	1.635E-03	5.149E-02	6.276E-02

FLUORESCENT ENERGIES

49.099	4.192E+00	5.235E-01	1.021E-01	4.820E+00
55.690	2.958E+00	4.271E-01	1.038E-01	3.490E+00
7.181	1.751E+02	5.340E+00	3.986E-02	1.806E+02
8.103	1.267E+02	4.858E+00	4.382E-02	1.316E+02

68 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR ERBIUM

ATOMIC WEIGHT 167.270 GRAMS / MOLE
DENSITY 9.051 GRAMS / CC
ATOMIC DENSITY 3.259E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.777E+02

L-EDGES AT	8.358	9.265	9.752
L-EDGE JUMPS	2.933	1.410	1.160
L-EDGE FIT JUMPS	4.796	1.636	1.160

K-EDGE AT 57.486 KEV
K-EDGE JUMP 5.500

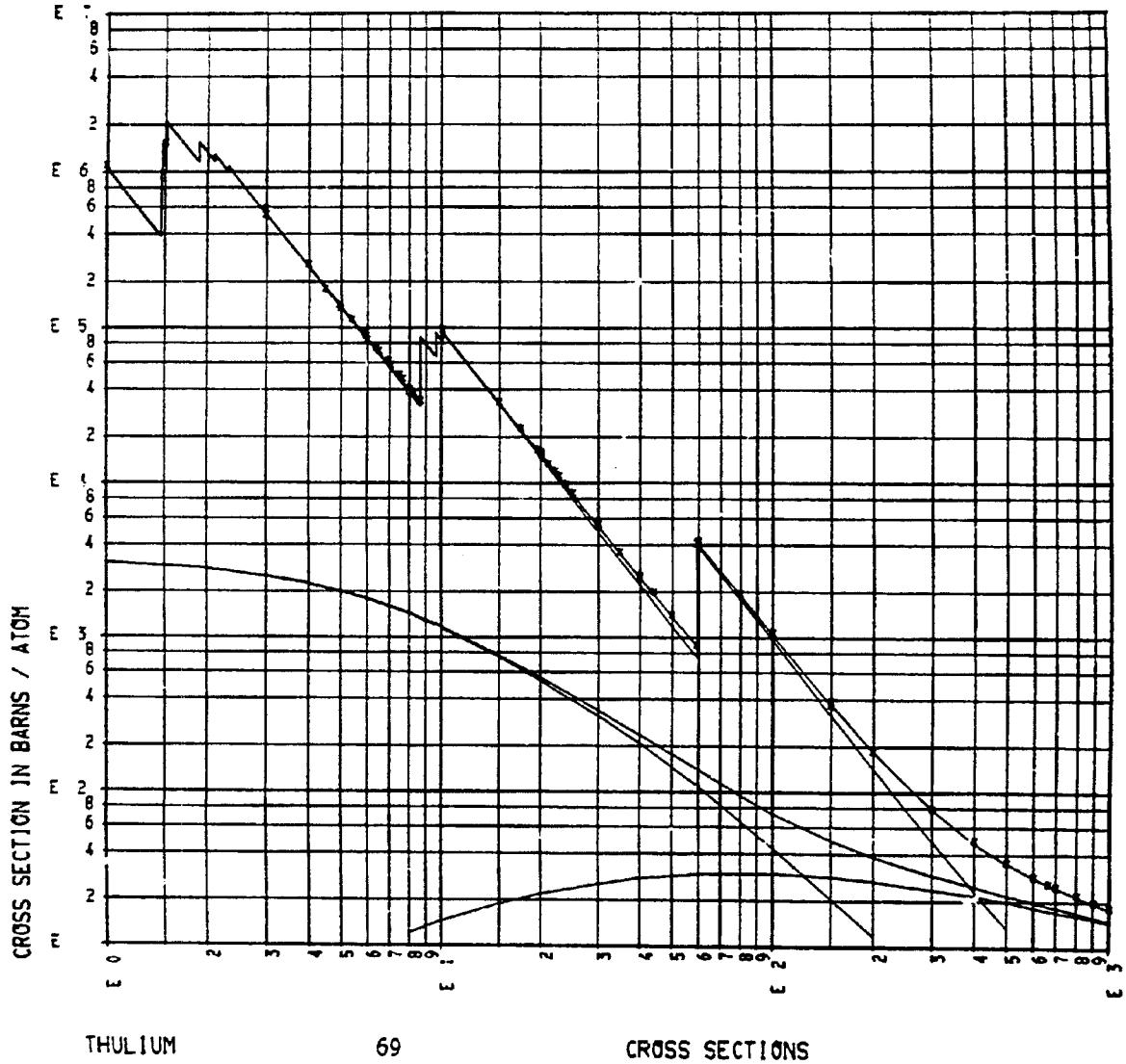
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	2.212	L	9.752	K	57.486
0	1.60672E+01	1.60672E+01		1.77988E+01		1.20195E+01	
1	-2.67587E+00	-2.67587E+00		-2.74671E+00		1.84815E+00	
2	0.	0.		-2.87580E-03		-9.39582E-01	
3	0.	0.		0.		6.38106E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.80643E+00	2.15233E-01
1	3.73226E-01	1.48545E+00
2	-3.49147E-01	-1.91908E-01
3	1.65710E-02	3.95645E-03



THULIUM

69

CROSS SECTIONS

69 - 1

REVISED 6/03/69

CROSS SECTIONS FOR THULIUM		Z = 69	BARNs / ATOM	
KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.079E+05	3.037E+03	1.334E+00	1.082E+06
1.470	3.843E+05	2.919E+03	2.203E+00	3.872E+05
1.471	1.567E+06	2.919E+03	2.205E+00	1.570E+06
1.500	1.487E+06	2.913E+03	2.262E+00	1.490E+06
1.514	1.450E+06	2.905E+03	2.287E+00	1.453E+06
1.515	2.085E+06	2.908E+03	2.289E+00	2.088E+06
1.887	1.158E+06	2.804E+03	2.959E+00	1.161E+06
1.888	1.545E+06	2.804E+03	2.961E+00	1.548E+06
2.000	1.324E+06	2.777E+03	3.168E+00	1.327E+06
2.092	1.174E+06	2.745E+03	3.329E+00	1.176E+06
2.093	1.304E+06	2.745E+03	3.331E+00	1.306E+06
2.306	1.006E+06	2.677E+03	3.706E+00	1.008E+06
2.307	1.075E+06	2.677E+03	3.708E+00	1.077E+06
3.000	8.317E+05	2.602E+03	4.954E+00	5.343E+05
4.000	2.460E+05	2.235E+03	6.643E+00	2.483E+05
5.000	1.355E+05	1.988E+03	8.201E+00	1.373E+05
6.000	8.304E+04	1.771E+03	9.620E+00	8.482E+04
8.000	3.842E+04	1.421E+03	1.209E+01	3.986E+04
8.647	3.120E+04	1.324E+03	1.287E+01	3.253E+04
8.648	8.604E+04	1.324E+03	1.287E+01	8.737E+04
9.517	6.489E+04	1.201E+03	1.401E+01	6.610E+04
9.518	9.456E+04	1.201E+03	1.402E+01	9.268E+04
10.000	8.115E+04	1.159E+03	1.446E+01	8.363E+04
10.115	1.999E+05	1.145E+03	1.456E+01	8.114E+04
10.116	9.276E+04	1.145E+03	1.456E+01	9.392E+04
15.000	3.232E+04	1.477E+02	1.864E+01	3.309E+04
20.000	1.487E+04	5.295E+02	2.117E+01	1.542E+04
30.000	4.931E+03	3.138E+02	3.552E+01	5.271E+03
40.000	2.239E+03	2.683E+02	3.764E+01	2.475E+03
50.000	1.209E+03	1.475E+02	2.880E+01	1.385E+03
59.389	7.501E+02	1.116E+02	2.939E+01	8.910E+02
59.390	4.007E+03	1.116E+02	3.939E+01	4.148E+03
60.000	3.900E+03	1.097E+02	2.943E+01	4.039E+03
80.000	1.801E+03	6.522E+01	2.975E+01	1.896E+03
100.000	9.787E+02	4.365E+01	2.953E+01	1.052E+03
150.000	3.201E+02	2.052E+01	2.832E+01	3.690E+02
200.000	1.454E+02	1.180E+01	2.662E+01	1.838E+02
300.000	4.899E+01	5.331E+00	2.368E+01	1.800E+01
400.000	2.330E+01	3.011E+00	2.144E+01	4.776E+01
500.000	1.340E+01	1.929E+00	1.969E+01	3.502E+01
600.000	8.683E+00	1.336E+00	1.827E+01	2.829E+01
800.000	4.551E+00	7.500E-01	1.510E+01	2.140E+01
1000.000	2.862E+00	4.770E-01	1.450E+01	1.784E+01

FLUORESCENT ENERGIES

50.730	1.161E+03	1.442E+02	2.885E+01	1.335E+03
57.576	8.174E+02	1.173E+02	2.929E+01	9.648E+02
7.181	5.132E+04	1.543E+03	1.110E+01	5.292E+04
8.103	3.713E+04	1.404E+03	1.221E+01	3.855E+04

69 - 2

REVISED 6/03/69

CROSS SECTIONS FOR THULIUM		Z = 69	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.845E+03	1.083E+01	4.756E-03	3.856E+03
1.470	1.370E+03	1.041E+01	7.854E-03	1.380E+03
1.477	5.585E+03	1.040E+01	7.361E-03	5.596E+03
1.500	5.301E+03	1.038E+01	8.064E-03	5.311E+03
1.514	5.170E+03	1.037E+01	8.152E-03	5.181E+03
1.515	7.434E+03	1.037E+01	8.158E-03	7.444E+03
1.887	4.128E+03	9.996E+00	1.055E-02	4.138E+03
1.888	5.508E+03	9.996E+00	1.055E-02	5.518E+03
2.000	4.720E+03	9.901E+00	1.129E-02	4.730E+03
2.092	4.184E+03	9.787E+00	1.187E-02	4.194E+03
2.093	4.647E+03	9.786E+00	1.187E-02	4.657E+03
2.306	3.585E+03	9.545E+00	1.321E-02	3.594E+03
2.307	3.831E+03	9.544E+00	1.322E-02	3.841E+03
3.000	1.896E+03	8.920E+00	1.766E-02	1.905E+03
4.000	8.771E+02	7.956E+00	2.368E-02	8.851E+02
5.000	4.824E+02	7.087E+00	2.924E-02	4.896E+02
6.000	2.960E+02	6.312E+00	3.429E-02	3.024E+02
8.000	1.370E+02	5.065E+00	4.510E-02	1.421E+02
8.547	1.112E+02	4.719E+00	4.587E-02	1.160E+02
8.648	3.067E+02	4.719E+00	4.588E-02	3.115E+02
9.617	2.313E+02	4.283E+00	4.996E-02	2.355E+02
9.618	3.261E+02	4.283E+00	4.996E-02	3.304E+02
10.000	2.940E+02	4.133E+00	5.155E-02	2.981E+02
10.115	2.851E+02	4.083E+00	5.192E-02	2.893E+02
10.115	3.307E+02	4.082E+00	5.192E-02	3.348E+02
15.000	1.152E+02	2.666E+00	6.645E-02	1.174E+02
20.000	5.300E+01	1.888E+00	7.739E-02	5.497E+01
30.000	1.758E+01	1.119E+00	9.098E-02	1.879E+01
40.000	7.982E+00	7.424E-01	9.853E-02	8.823E+00
50.000	4.310E+00	5.262E-01	1.027E-01	4.939E+00
59.389	2.674E+00	3.977E-01	1.048E-01	3.175E+00
59.390	1.428E+01	3.977E-01	1.048E-01	1.479E+01
60.000	1.390E+01	3.910E-01	1.049E-01	1.440E+01
80.000	6.420E+00	2.325E-01	1.061E-01	6.759E+00
100.000	3.489E+00	1.556E-01	1.053E-01	3.750E+00
150.000	1.141E+00	7.316E-02	1.010E-01	1.315E+00
200.000	5.184E-01	4.208E-02	9.490E-02	6.554E-01
300.000	1.746E-01	1.900E-02	8.442E-02	2.781E-01
400.000	8.308E-02	1.073E-02	7.643E-02	1.702E-01
500.000	4.778E-02	6.877E-03	7.019E-02	1.248E-01
600.000	3.095E-02	4.763E-03	6.513E-02	1.008E-01
800.000	1.622E-02	2.674E-03	5.739E-02	7.629E-02
1000.000	1.020E-02	1.700E-03	5.169E-02	6.359E-02

FLUORESCENT ENERGIES

50.730	4.140E+00	5.140E-01	1.028E-01	4.759E+00
57.576	2.914E+00	4.183E-01	1.044E-01	3.439E+00
7.181	1.829E+02	5.502E+00	3.956E-02	1.887E+02
8.103	1.324E+02	5.007E+00	4.354E-02	1.374E+02

69 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR THULIUM

ATOMIC WEIGHT 168.940 GRAMS / MOLE
DENSITY 9.332 GRAMS / CC
ATOMIC DENSITY 3.327E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.805E+02

L-EDGES AT	8.648	9.618	10.116
L-EDGE JUMPS	2.758	1.410	1.160
L-EDGE FIT JUMPS	4.511	1.636	1.160

K-EDGE AT 59.390 KEV
K-EDGE JUMP 5.342

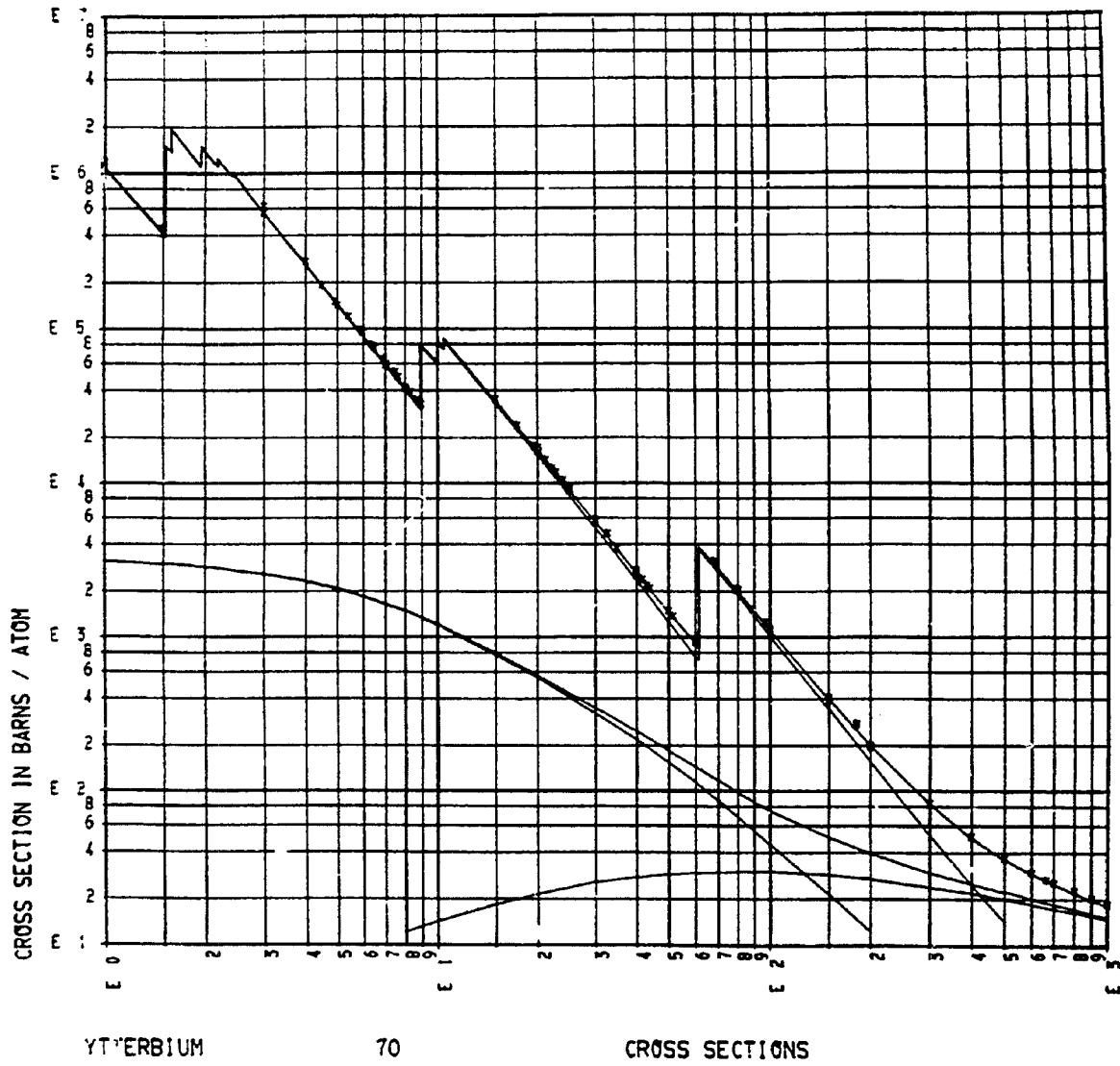
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
	2.307		10.116	59.390
0	1.61269E+01	1.61269E+01	1.74250E+01	1.25613E+01
	-2.67886E+00	-2.67886E+00	-2.51103E+00	1.57523E+00
2	0.	0.	-3.29454E-02	-8.90467E-01
3	0.	0.	0.	6.09779E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.83711E+00	2.02656E-01
1	5.77547E-01	1.49625E+00
2	-3.49441E-01	-1.93234E-01
3	1.65780E-02	4.00233E-03



70 - 1

REVISED 6/03/69

CROSS SECTIONS FOR YTTERBIUM Z = 70 BARNS / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.100E+06	3.129E+03	1.321E+00	1.103E+06
1.500	4.152E+05	3.005E+03	2.248E+00	4.182E+05
1.527	3.977E+05	2.996E+03	2.296E+00	4.007E+05
1.528	1.492E+06	2.996E+03	2.297E+00	1.495E+06
1.577	1.371E+06	2.980E+03	2.384E+00	1.374E+06
1.578	1.959E+06	2.980E+03	2.386E+00	1.962E+06
1.950	1.112E+05	2.880E+03	3.063E+00	1.115E+05
1.951	1.480E+06	2.880E+03	3.062E+00	1.483E+06
2.000	1.385E+06	2.868E+03	3.153E+00	1.388E+06
2.170	1.113E+06	2.810E+03	3.451E+00	1.116E+06
2.171	1.247E+06	2.809E+03	3.452E+00	1.250E+06
2.397	9.568E+05	2.740E+03	3.852E+00	9.595E+05
2.398	1.023E+06	2.740E+03	3.854E+00	1.025E+06
3.000	5.614E+05	2.589E+03	4.938E+00	5.540E+05
4.000	2.599E+05	2.317E+03	6.632E+00	2.622E+05
5.000	1.430E+05	2.064E+03	8.197E+00	1.451E+05
6.000	8.778E+04	1.840E+03	9.628E+00	8.963E+04
8.000	4.064E+04	1.478E+03	1.212E+01	4.213E+04
8.942	3.016E+04	1.336E+03	1.314E+01	3.151E+04
8.943	1.761E+04	1.336E+03	1.314E+01	7.896E+04
9.977	5.869E+04	1.209E+03	1.422E+01	5.991E+04
9.978	8.273E+04	1.209E+03	1.422E+01	8.395E+04
10.000	8.226E+04	1.207E+03	1.425E+01	8.348E+04
10.487	7.281E+04	1.147E+03	1.469E+01	7.397E+04
10.488	8.444E+04	1.147E+03	1.469E+01	8.560E+04
15.000	3.335E+04	1.782E+02	1.846E+01	3.414E+04
20.000	1.559E+04	5.502E+02	2.163E+01	1.616E+04
30.000	5.228E+03	3.261E+02	2.568E+01	5.580E+03
40.000	2.373E+03	2.168E+02	2.789E+01	2.618E+03
50.000	1.276E+03	1.540E+02	2.910E+01	1.459E+03
60.000	7.638E+02	1.146E+02	2.975E+01	9.082E+02
61.331	7.179E+02	1.104E+02	2.979E+01	8.581E+02
61.332	3.727E+03	1.104E+02	2.979E+01	3.867E+03
80.000	1.916E+03	6.811E+01	3.012E+01	2.014E+03
100.000	1.070E+03	4.561E+01	2.990E+01	1.146E+03
150.000	3.584E+02	2.147E+01	2.871E+01	4.085E+02
200.000	1.650E+02	1.235E+01	2.699E+01	2.023E+02
300.000	5.420E+01	5.582E+00	2.402E+01	8.381E+01
400.000	2.542E+01	3.153E+00	2.175E+01	5.632E+01
500.000	1.446E+01	2.020E+00	1.997E+01	3.644E+01
600.000	9.292E+00	1.399E+00	1.853E+01	2.922E+01
800.000	4.830E+00	7.850E-01	1.634E+01	2.195E+01
1000.000	3.036E+00	5.000E-01	1.471E+01	1.825E+01

FLUORESCENT ENERGIES

52.360	1.120E+03	1.429E+02	2.927E+01	1.294E+03
59.352	7.875E+02	1.166E+02	2.972E+01	9.342E+02
7.414	4.981E+04	1.567E+03	1.141E+01	5.143E+04
8.401	3.565E+04	1.414E+03	1.256E+01	3.708E+04

CROSS SECTIONS FOR YTTERBIUM Z = 70 CM**2 / GPM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	3.829E+03	1.089E+01	4.597E-03	3.840E+03
1.500	1.445E+03	1.046E+01	7.824E-03	1.455E+03
1.527	1.384E+03	1.043E+01	7.989E-03	1.395E+03
1.528	5.194E+03	1.043E+01	7.996E-03	5.204E+03
1.517	4.773E+03	1.037E+01	8.298E-03	4.783E+03
1.578	6.820E+03	1.037E+01	8.304E-03	6.830E+03
1.950	3.870E+03	1.002E+01	1.065E-02	3.880E+03
1.951	5.152E+03	1.002E+01	1.066E-02	5.162E+03
2.000	4.821E+03	9.982E+00	1.097E-02	4.831E+03
2.170	3.875E+03	9.779E+00	1.201E-02	3.885E+03
2.171	4.341E+03	9.778E+00	1.202E-02	4.351E+03
2.397	3.330E+03	9.536E+00	1.341E-02	3.339E+03
2.398	3.559E+03	9.535E+00	1.341E-02	3.569E+03
3.000	1.954E+03	9.011E+00	1.719E-02	1.963E+03
4.000	9.046E+02	8.063E+00	2.308E-02	9.127E+02
5.000	4.977E+02	7.184E+00	2.853E-02	5.049E+02
6.000	3.055E+02	6.405E+00	3.351E-02	3.119E+02
8.000	1.414E+02	5.145E+00	4.220E-02	1.465E+02
8.942	1.050E+02	4.651E+00	4.573E-02	1.097E+02
8.943	2.701E+02	4.651E+00	4.574E-02	2.748E+02
9.977	2.042E+02	4.210E+00	4.950E-02	2.085E+02
9.978	2.879E+02	4.209E+00	4.950E-02	2.922E+02
10.000	2.863E+02	4.201E+00	4.958E-02	2.905E+02
10.487	2.534E+02	3.991E+00	5.111E-02	2.574E+02
10.488	2.939E+02	3.991E+00	5.111E-02	2.979E+02
15.000	1.611E+02	2.708E+00	6.424E-02	1.188E+02
20.000	5.425E+01	1.915E+00	7.529E-02	5.624E+01
30.000	1.820E+01	1.135E+00	8.939E-02	1.942E+01
40.000	8.260E+00	7.545E-01	9.706E-02	9.112E+00
50.000	4.439E+00	5.359E-01	1.013E-01	5.077E+00
60.000	2.659E+00	3.988E-01	1.036E-01	3.161E+00
61.331	2.499E+00	3.842E-01	1.037E-01	2.986E+00
61.332	1.297E+01	3.841E-01	1.037E-01	1.346E+01
80.000	6.668E+00	2.371E-01	1.048E-01	7.010E+00
100.000	3.724E+00	1.587E-01	1.041E-01	3.987E+00
150.000	1.247E+00	7.471E-02	9.991E-02	1.422E+00
200.000	5.672E-01	4.300E-02	9.393E-02	7.041E-01
300.000	1.886E-01	1.943E-02	8.361E-02	2.917E-01
400.000	8.848E-02	1.097E-02	7.569E-02	1.751E-01
500.000	5.031E-02	7.030E-03	6.949E-02	1.268E-01
600.000	3.234E-02	4.869E-03	6.450E-02	1.017E-01
800.000	1.681E-02	2.752E-03	5.686E-02	7.640E-02
1000.000	1.057E-02	1.740E-03	5.120E-02	6.351E-02

FLUORESCENT ENERGIES

52.360	3.899E+00	4.973E-01	1.019E-01	4.503E+00
59.352	2.741E+00	4.059E-01	1.034E-01	3.251E+00
7.414	1.734E+02	5.452E+00	3.970E-02	1.790E+02
8.401	1.241E+02	4.922E+00	4.372E-02	1.291E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR YTTERBIUM

ATOMIC WEIGHT 173.040 GRAMS / MOLE
DENSITY 6.977 GRAMS / CC
ATOMIC DENSITY 2.428E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.873E+02

L-EDGES AT	8.943	9.978	10.488
L-EDGE JUMPS	2.573	1.410	1.160
L-EDGE FIT JUMPS	4.208	1.636	1.160

K-EDGE AT 61.332 KEV
K-EDGE JUMP 5.192

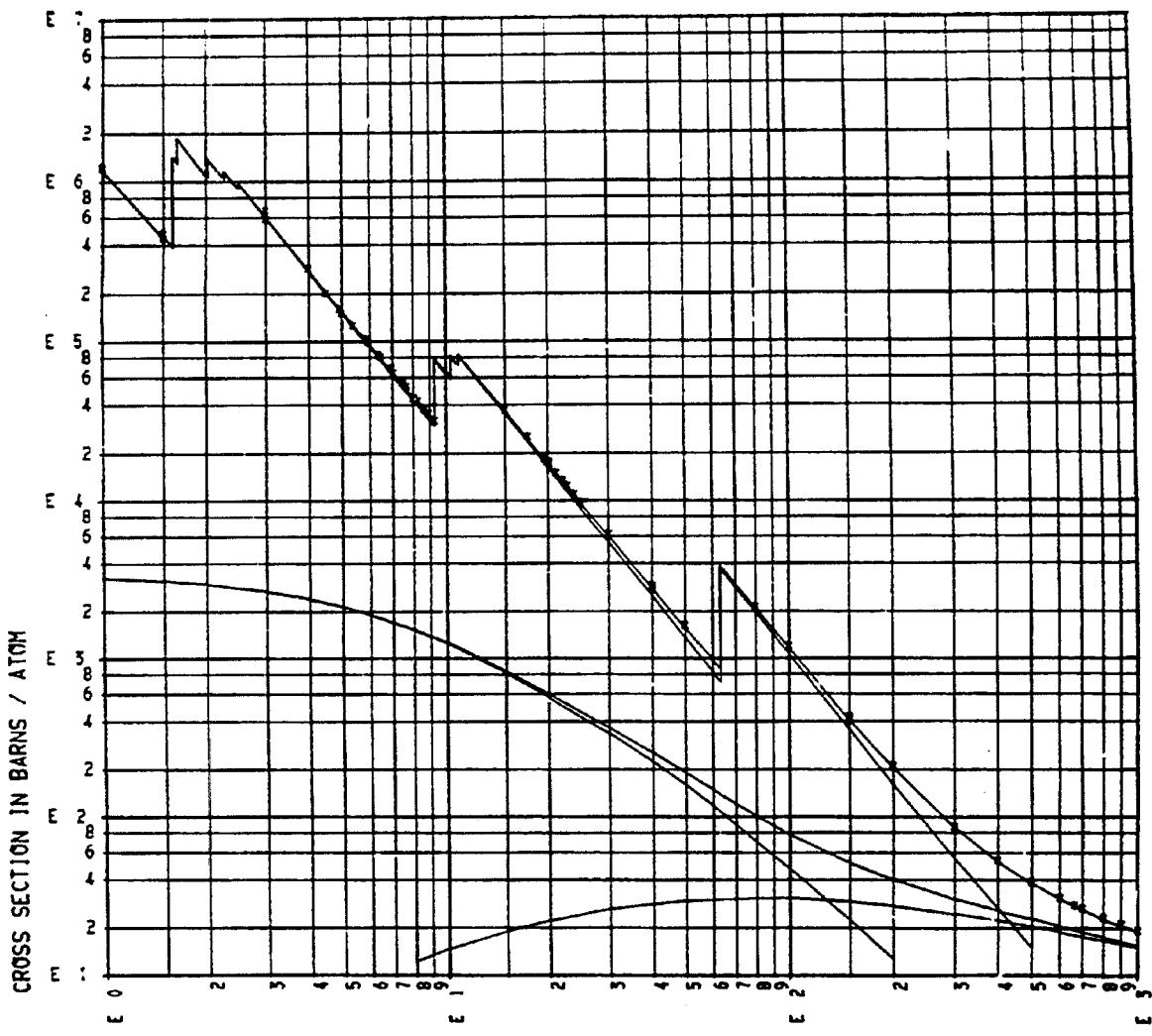
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.39111E+01	1.61794E+01	1.69795E+01	7.42791E+00
1	-2.40380E+00	-2.67715E+00	-2.22577E+00	4.28955E+00
2	0.	0.	-7.32557E-02	-1.35167E+00
3	0.	0.	0.	8.66136E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.86662E+00	2.02248E-01
1	3.82933E-01	1.48804E+00
2	-3.50126E-01	-1.89143E-01
3	1.66173E-02	3.62264E-03



LUTETIUM

71

CROSS SECTIONS

71 - 1 REVISED 6/03/69

CROSS SECTIONS FOR LUTETIUM Z = 71 BARNS / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.180E+06	3.220E+03	1.320E+00	1.184E+06
1.500	4.445E+05	3.090E+03	2.262E+00	4.476E+05
1.588	3.875E+05	3.061E+03	2.419E+00	3.905E+05
1.589	1.416E+06	3.061E+03	2.421E+00	1.419E+06
1.638	1.306E+06	3.045E+03	2.509E+00	1.309E+06
1.639	1.866E+06	3.045E+03	2.510E+00	1.869E+06
2.000	1.096E+06	2.947E+03	3.172E+00	1.099E+06
2.025	1.060E+06	2.937E+03	3.216E+00	1.063E+06
2.026	1.412E+06	2.937E+03	3.217E+00	1.415E+06
2.264	1.049E+06	2.855E+03	3.635E+00	1.052E+06
2.265	1.163E+06	2.855E+03	3.637E+00	1.168E+06
2.491	9.034E+05	2.787E+03	4.038E+00	9.062E+05
2.492	9.746E+05	2.787E+03	4.039E+00	9.774E+05
3.000	5.938E+05	2.658E+03	4.953E+00	5.964E+05
4.000	2.753E+05	2.381E+03	6.446E+00	2.777E+05
5.000	1.517E+05	2.126E+03	8.222E+00	1.538E+05
6.000	9.321E+04	1.898E+03	9.671E+00	9.512E+04
8.000	4.322E+04	1.528E+03	1.221E+01	4.476E+04
9.243	2.939E+04	1.342E+03	1.375E+01	3.074E+04
9.244	7.599E+04	1.342E+03	1.375E+01	7.835E+04
10.000	6.278E+04	1.250E+03	1.467E+01	6.404E+04
10.348	5.743E+04	1.205E+03	1.499E+01	5.865E+04
10.349	8.096E+04	1.205E+03	1.499E+01	8.218E+04
10.869	7.125E+04	1.143E+03	1.547E+01	7.241E+04
10.870	8.263E+04	1.143E+03	1.547E+01	8.379E+04
15.000	3.549E+04	8.070E+02	1.900E+01	3.631E+04
20.000	1.655E+04	5.701E+02	2.212E+01	1.713E+04
30.000	5.557E+03	3.379E+02	2.602E+01	5.921E+03
40.000	2.538E+03	2.250E+02	2.824E+01	2.792E+03
50.000	1.375E+03	1.600E+02	2.946E+01	1.564E+03
60.000	8.297E+02	1.192E+02	3.013E+01	9.790E+02
63.313	7.145E+02	1.087E+02	3.020E+01	8.534E+02
63.314	3.731E+03	1.087E+02	3.020E+01	3.870E+03
80.000	1.995E+03	7.086E+01	3.050E+01	2.097E+03
100.000	1.088E+03	4.746E+01	3.029E+01	1.166E+03
150.000	3.583E+02	2.236E+01	2.909E+01	4.098E+02
200.000	1.635E+02	1.287E+01	2.736E+01	2.037E+02
300.000	5.534E+01	5.818E+00	2.436E+01	8.552E+01
400.000	2.640E+01	3.286E+00	2.205E+01	5.174E+01
500.000	1.521E+01	2.106E+00	2.025E+01	3.756E+01
600.000	9.863E+00	1.458E+00	1.879E+01	3.011E+01
800.000	5.173E+00	8.190E-01	1.657E+01	2.256E+01
1000.000	3.253E+00	5.210E-01	1.492E+01	1.869E+01

FLUORESCENT ENERGIES

54.063	1.107E+03	1.411E+02	2.975E+01	1.280E+03
61.282	7.823E+02	1.150E+02	3.016E+01	9.276E+02
7.654	4.864E+04	1.580E+03	1.178E+01	5.025E+04
8.708	3.446E+04	1.416E+03	1.309E+01	3.590E+04

71 - 2

REVISED 6/03/69

CROSS SECTIONS FOR LUTETIUM Z = 71 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	4.062E+03	1.108E+01	4.543E-03	4.073E+03
1.500	1.530E+03	1.063E+01	1.785E-03	1.541E+03
1.588	1.334E+03	1.053E+01	8.324E-03	1.344E+03
1.589	4.873E+03	1.053E+01	8.331E-03	4.884E+03
1.638	4.493E+03	1.048E+01	8.633E-03	4.504E+03
1.639	6.421E+03	1.048E+01	8.640E-03	6.431E+03
2.000	3.773E+03	1.014E+01	1.092E-02	3.783E+03
2.025	3.649E+03	1.011E+01	1.107E-02	3.660E+03
2.026	4.860E+03	1.011E+01	1.107E-02	4.870E+03
2.264	3.612E+03	9.827E+00	1.251E-02	3.622E+03
2.265	4.009E+03	9.826E+00	1.252E-02	4.018E+03
2.491	3.109E+03	9.591E+00	1.390E-02	3.119E+03
2.492	3.354E+03	9.590E+00	1.390E-02	3.364E+03
3.000	2.043E+03	9.148E+00	1.705E-02	2.053E+03
4.000	9.476E+02	8.196E+00	2.287E-02	9.558E+02
5.000	5.221E+02	7.316E+00	2.830E-02	5.294E+02
6.000	3.208E+02	6.533E+00	3.328E-02	3.274E+02
8.000	1.488E+02	5.261E+00	4.202E-02	1.541E+02
9.243	1.011E+02	4.619E+00	4.732E-02	1.056E+02
9.244	2.650E+02	4.619E+00	4.733E-02	2.696E+02
10.000	2.151E+02	4.302E+00	5.049E-02	2.204E+02
10.348	1.977E+02	4.147E+00	5.160E-02	2.019E+02
10.349	2.786E+02	4.147E+00	5.161E-02	2.828E+02
10.869	2.452E+02	3.934E+00	5.325E-02	2.492E+02
10.870	2.844E+02	3.934E+00	5.325E-02	2.884E+02
15.000	1.221E+02	2.777E+00	6.539E-02	1.250E+02
20.000	5.690E+01	1.962E+00	1.613E-02	5.894E+01
30.000	1.912E+01	1.163E+00	8.955E-02	2.038E+01
40.000	8.736E+00	7.743E-01	9.719E-02	9.607E+00
50.000	4.731E+00	5.508E-01	1.014E-01	5.383E+00
60.000	2.855E+00	4.104E-01	1.037E-01	3.369E+00
63.313	2.459E+00	3.742E-01	1.039E-01	2.937E+00
63.314	1.284E+01	3.742E-01	1.039E-01	1.332E+01
80.000	6.868E+00	2.439E-01	1.050E-01	7.216E+00
100.000	3.746E+00	1.634E-01	1.042E-01	4.014E+00
150.000	1.233E+00	1.695E-02	1.001E-01	1.410E+00
200.000	5.625E-01	4.430E-02	9.416E-02	7.010E-01
300.000	1.905E-01	2.002E-02	8.384E-02	2.943E-01
400.000	9.086E-02	1.131E-02	7.589E-02	1.781E-01
500.000	5.234E-02	7.248E-03	6.969E-02	1.293E-01
600.000	3.394E-02	5.018E-03	6.467E-02	1.036E-01
800.000	1.780E-02	2.819E-03	5.703E-02	7.765E-02
1000.000	1.120E-02	1.793E-03	5.135E-02	6.434E-02

FLUORESCENT ENERGIES

54.063	3.810E+00	4.855E-01	1.024E-01	4.404E+00
61.282	2.692E+00	3.958E-01	1.038E-01	3.192E+00
7.654	1.674E+02	5.439E+00	4.054E-02	1.730E+02
8.708	1.186E+02	4.874E+00	4.506E-02	1.236E+02

71 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR LUTETIUM

ATOMIC WEIGHT 174.990 GRAMS / MOLE
DENSITY 9.842 GRAMS / CC
ATOMIC DENSITY 3.387E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.906E+02

L-EDGES AT	9.244	10.349	10.870
L-EDGE JUMPS	2.620	1.410	1.160
L-EDGE FIT JUMPS	4.285	1.636	1.160

K-EDGE AT 63.314 KEY
K-EDGE JUMP 5.222

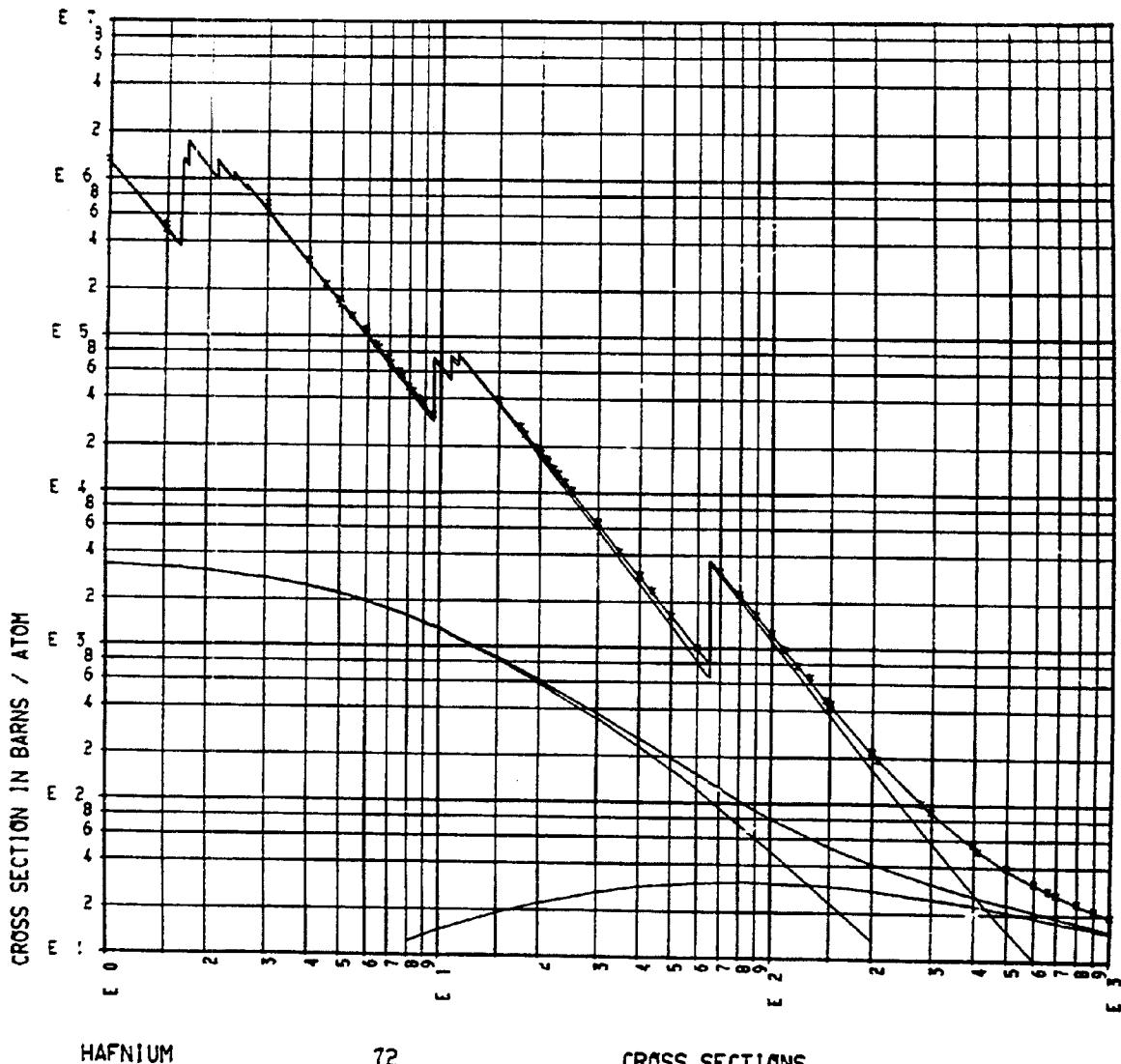
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.39813E+01	1.62289E+01	1.72638E+01	1.26387E+01
1	-2.40841E+00	-2.67128E+00	-2.37189E+00	1.55476E+00
2	0.	0.	-4.95994E-02	-8.81094E-01
3	0.	0.	0.	6.02036E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.89137E+00	1.97176E-01
1	3.86034E-01	1.50264E+00
2	-3.49756E-01	-1.92474E-01
3	1.65480E-02	3.85751E-03



HAFNIUM

72

CROSS SECTIONS

CROSS SECTIONS FOR HAFNIUM		Z = 72	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.270E+06	3.313E+03	1.313E+00	1.274E+06
.500	4.746E+05	3.180E+03	2.269E+00	4.778E+05
.661	3.705E+05	3.127E+03	2.558E+00	3.736E+05
.662	1.320E+06	3.126E+03	2.560E+00	1.323E+06
.717	1.210E+06	3.109E+03	2.660E+00	1.213E+06
.718	1.718E+06	3.109E+03	2.662E+00	1.721E+06
2.000	1.146E+06	3.031E+03	3.184E+00	1.149E+06
2.109	9.945E+05	2.990E+03	3.374E+00	9.975E+05
2.110	1.322E+06	2.990E+03	3.376E+00	1.325E+06
2.363	9.772E+05	2.904E+03	3.821E+00	9.801E+05
2.364	1.094E+06	2.904E+03	3.823E+00	1.096E+06
2.601	8.477E+05	2.933E+03	4.245E+00	8.505E+05
2.602	9.145E+05	2.833E+03	4.246E+00	9.174E+05
3.000	6.257E+05	2.731E+03	4.962E+00	6.285E+05
4.000	2.906E+05	2.448E+03	6.657E+00	2.930E+05
5.000	1.603E+05	2.188E+03	8.244E+00	1.625E+05
6.000	9.858E+04	1.956E+03	9.713E+00	1.005E+05
8.000	4.578E+04	1.575E+03	1.230E+01	4.737E+04
9.560	2.847E+04	1.346E+03	1.423E+01	2.983E+04
9.561	6.877E+04	1.346E+03	1.423E+01	7.013E+04
10.000	6.166E+04	1.293E+03	1.476E+01	6.296E+04
10.738	5.180E+04	1.198E+03	1.545E+01	5.301E+04
10.739	7.302E+04	1.198E+03	1.545E+01	7.423E+04
11.271	6.482E+04	1.138E+03	1.594E+01	6.597E+04
11.272	7.517E+04	1.138E+03	1.594E+01	7.633E+04
15.000	3.673E+04	8.363E+02	1.915E+01	3.758E+04
20.000	1.747E+04	5.903E+02	2.230E+01	1.808E+04
30.000	5.906E+03	3.499E+02	2.627E+01	6.282E+03
40.000	2.665E+03	2.333E+02	2.853E+01	2.927E+03
50.000	1.416E+03	1.662E+02	2.978E+01	1.612E+03
60.000	8.364E+02	1.240E+02	3.047E+01	9.908E+02
65.350	6.516E+02	1.070E+02	3.059E+01	7.891E+02
65.351	3.550E+03	1.070E+02	3.059E+01	3.687E+03
80.000	2.101E+03	7.366E+01	3.086E+01	2.205E+03
100.000	1.157E+03	4.936E+01	3.067E+01	1.237E+03
150.000	3.799E+02	2.327E+01	2.948E+01	4.327E+02
200.000	1.715E+02	1.340E+01	2.773E+01	2.126E+02
300.000	5.710E+01	6.058E+00	2.470E+01	8.785E+01
400.000	2.705E+01	3.422E+00	2.236E+01	5.283E+01
500.000	1.560E+01	2.193E+00	2.053E+01	3.832E+01
600.000	1.019E+01	1.518E+00	1.905E+01	3.077E+01
800.000	5.477E+00	8.530E-01	1.680E+01	2.313E+01
1000.000	3.563E+00	5.420E-01	1.513E+01	1.923E+01

FLUORESCENT ENERGIES

55.757	1.034E+03	1.395E+02	3.019E+01	1.205E+03
63.209	7.182E+02	1.133E+02	3.054E+01	8.624E+02
7.898	4.737E+04	1.594E+03	1.217E+01	4.899E+04
9.021	3.323E+04	1.418E+03	1.357E+01	3.468E+04

CROSS SECTIONS FOR HAFNIUM		Z = 72	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	4.286E+03	1.118E+01	4.430E-03	4.297E+03
.500	1.601E+03	1.073E+01	7.556E-03	1.612E+03
1.661	1.250E+03	1.055E+01	8.632E-03	1.261E+03
.662	4.452E+03	1.055E+01	8.638E-03	4.463E+03
1.717	4.082E+03	1.049E+01	8.976E-03	4.092E+03
1.718	5.797E+03	1.049E+01	8.982E-03	5.807E+03
2.000	3.866E+03	1.023E+01	1.074E-02	3.876E+03
2.109	3.356E+03	1.009E+01	1.138E-02	3.366E+03
2.110	4.459E+03	1.009E+01	1.139E-02	4.469E+03
2.363	3.297E+03	9.798E+00	1.289E-02	3.307E+03
2.364	3.690E+03	9.797E+00	1.290E-02	3.700E+03
2.601	2.860E+03	9.559E+00	1.432E-02	2.870E+03
2.602	3.086E+03	9.558E+00	1.433E-02	3.095E+03
3.000	2.111E+03	9.214E+00	1.574E-02	2.120E+03
4.000	9.804E+02	8.259E+00	2.246E-02	9.887E+02
5.000	5.408E+02	7.381E+00	2.781E-02	5.482E+02
5.000	3.326E+02	6.599E+00	3.277E-02	3.392E+02
8.000	1.545E+02	5.326E+00	4.150E-02	1.598E+02
9.560	9.606E+01	4.542E+00	4.800E-02	1.006E+02
9.561	2.320E+02	4.542E+00	4.801E-02	2.366E+02
10.000	2.080E+02	4.363E+00	4.980E-02	2.124E+02
10.738	1.748E+02	4.043E+00	5.213E-02	1.789E+02
10.739	2.464E+02	4.043E+00	5.213E-02	2.505E+02
11.271	2.187E+02	3.839E+00	5.378E-02	2.226E+02
11.272	2.536E+02	3.839E+00	5.378E-02	2.575E+02
15.000	1.239E+02	2.822E+00	6.461E-02	1.268E+02
20.000	5.894E+01	1.992E+00	7.524E-02	6.101E+01
30.000	1.993E+01	1.181E+00	8.863E-02	2.120E+01
40.000	8.991E+00	7.872E-01	9.626E-02	9.874E+00
50.000	4.777E+00	5.608E-01	1.005E-01	5.438E+00
60.000	2.822E+00	4.183E-01	1.028E-01	3.345E+00
65.350	2.198E+00	3.609E-01	1.032E-01	2.663E+00
65.351	1.198E+01	3.609E-01	1.032E-01	1.244E+01
80.000	7.089E+00	2.485E-01	1.041E-01	7.441E+00
100.000	3.903E+00	1.665E-01	1.035E-01	4.173E+00
150.000	1.282E+00	7.850E-02	9.946E-02	1.460E+00
200.000	5.786E-01	4.521E-02	9.356E-02	1.174E-01
300.000	1.926E-01	2.044E-02	8.334E-02	2.964E-01
400.000	9.128E-02	1.155E-02	7.544E-02	1.783E-01
500.000	5.264E-02	7.399E-03	6.937E-02	1.293E-01
600.000	3.437E-02	5.122E-03	6.431E-02	1.038E-01
800.000	1.848E-02	2.878E-03	5.669E-02	7.804E-02
1000.000	1.202E-02	1.829E-03	5.105E-02	6.490E-02

FLUORESCENT ENERGIES

55.757	3.487E+00	4.707E-01	1.019E-01	4.066E+00
53.209	2.423E+00	3.823E-01	1.030E-01	2.910E+00
7.898	1.598E+02	5.377E+00	4.106E-02	1.653E+02
9.021	1.121E+02	4.784E+00	4.578E-02	1.170E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR HAFNIUM

ATOMIC WEIGHT 178.500 GRAMS / MOLE
DENSITY 13.300 GRAMS / CC
ATOMIC DENSITY 4.487E-02 BUNCHES / CC

CONVERSION CONSTANT IS 2.964E+02

L-EDGES AT	9.561	10.739	11.272
L-EDGE JUMPS	2.415	1.410	1.160
L-EDGE FIT JUMPS	3.951	1.635	1.160

K-EDGE AT 65.351 KEV
K-EDGE JUMP 5.448

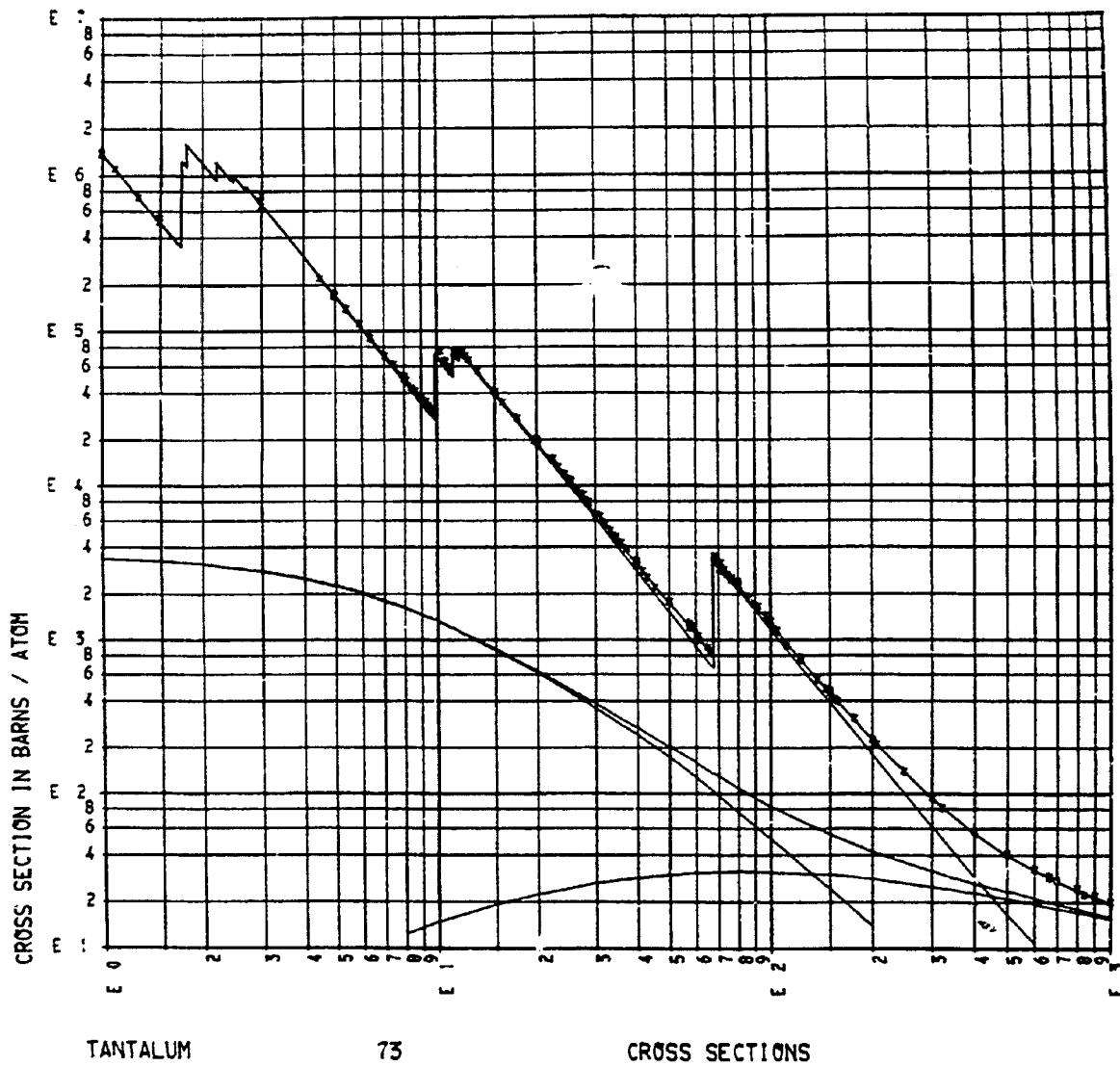
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.40548E+01	1.62758E+01	1.64329E+01	1.58166E+00
1	-2.42829E+00	-2.66522E+00	-1.82851E+00	4.47037E+00
2	0.	0.	-1.32268E-01	-1.42808E+00
3	0.	0.	0.	9.39044E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COSHERENT	INCOHERENT
0	7.91803E+00	1.99469E-01
1	3.87021E-01	1.50233E+00
2	-3.48881E-01	-1.91385E-01
3	1.64406E-02	3.74011E-03



CROSS SECTION IN BARNs / ATOM

TANTALUM

73

CROSS SECTIONS

CROSS SECTIONS FOR TANTALUM		Z = 73	BARNES / ATOM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	1.371E+06	3.409E+03	1.299E+00	1.373E+05
1.500	5.033E+05	3.273E+03	2.267E+00	5.035E+05
1.734	3.517E+05	3.195E+03	2.692E+00	3.549E+05
1.735	1.213E+06	3.194E+03	2.694E+00	1.216E+06
1.792	1.113E+06	3.177E+03	2.890E+00	1.115E+06
1.793	1.581E+06	3.177E+03	2.801E+00	1.584E+06
2.000	1.182E+06	3.119E+03	3.189E+00	1.185E+06
2.193	9.250E+05	3.045E+03	3.527E+00	9.281E+05
2.194	1.229E+06	3.045E+03	3.528E+00	1.232E+06
2.468	8.988E+05	2.954E+03	4.012E+00	8.017E+05
2.469	1.006E+06	2.953E+03	4.014E+00	1.009E+06
2.702	7.912E+05	2.885E+03	4.450E+00	7.941E+05
2.703	8.537E+05	2.885E+03	4.431E+00	8.566E+05
3.000	6.469E+05	2.807E+03	4.966E+00	6.437E+05
4.000	3.008E+05	2.516E+03	6.654E+00	3.033E+05
5.000	1.661E+05	2.250E+03	8.263E+00	1.684E+05
6.000	1.022E+05	2.014E+03	9.752E+00	1.043E+05
8.000	4.754E+04	1.629E+03	1.238E+01	4.919E+04
9.880	2.711E+04	1.351E+03	1.471E+01	2.848E+04
9.881	7.049E+04	1.351E+03	1.472E+01	7.186E+04
10.000	6.835E+04	1.336E+03	1.486E+01	6.970E+04
11.135	5.179E+04	1.192E+03	1.593E+01	5.300E+04
11.136	7.300E+04	1.192E+03	1.593E+01	7.421E+04
11.679	6.453E+04	1.133E+03	1.642E+01	6.568E+04
11.680	7.484E+04	1.133E+03	1.642E+01	7.599E+04
15.000	3.897E+04	8.661E+02	1.930E+01	3.986E+04
20.000	1.823E+04	6.110E+02	2.248E+01	1.887E+04
30.000	6.148E+03	3.621E+02	2.651E+01	6.537E+03
40.000	2.809E+03	2.417E+02	2.882E+01	3.080E+03
50.000	1.520E+03	1.724E+02	3.011E+01	1.123E+03
60.000	9.164E+02	1.288E+02	3.081E+01	1.076E+03
67.413	6.618E+02	1.051E+02	3.098E+01	7.979E+02
67.414	3.321E+03	1.051E+02	3.090E+01	3.457E+03
80.000	2.140E+03	7.647E+01	3.123E+01	2.248E+03
100.000	1.189E+03	5.126E+01	3.104E+01	1.271E+03
150.000	3.970E+02	2.418E+01	2.986E+01	4.511E+02
200.000	1.811E+02	1.393E+01	2.809E+01	2.231E+02
300.000	6.680E+01	6.298E+00	2.503E+01	9.213E+01
400.000	2.881E+01	3.558E+00	2.266E+01	5.502E+01
500.000	1.653E+01	2.280E+00	2.081E+01	3.962E+01
600.000	1.071E+01	1.579E+00	1.932E+01	3.161E+01
800.000	5.644E+00	8.860E-01	1.704E+01	2.357E+01
1000.000	3.586E+00	5.640E-01	1.534E+01	1.949E+01

FLUORESCENT ENERGIES

57.524	1.030E+03	1.378E+02	3.065E+01	1.200E+03
65.210	7.261E+02	1.114E+02	3.093E+01	8.689E+02
8.145	4.532E+04	1.603E+03	1.256E+01	4.695E+04
9.341	3.148E+04	1.420E+03	1.405E+01	3.293E+04

CROSS SECTIONS FOR TANTALUM Z = 73 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	4.564E+03	1.135E+01	4.323E-03	4.575E+03
1.500	1.675E+03	1.089E+01	7.545E-03	1.685E+03
1.734	1.171E+03	1.063E+01	8.961E-03	1.181E+03
1.735	4.038E+03	1.063E+01	8.967E-03	4.048E+03
1.792	3.705E+03	1.057E+01	9.318E-03	3.716E+03
1.793	5.262E+03	1.057E+01	9.324E-03	5.273E+03
2.000	3.934E+03	1.038E+01	1.061E-02	3.945E+03
2.193	3.079E+03	1.014E+01	1.174E-02	3.089E+03
2.194	4.092E+03	1.014E+01	1.174E-02	4.102E+03
2.468	2.991E+03	9.830E+00	1.335E-02	3.001E+03
2.469	3.348E+03	9.829E+00	1.336E-02	3.358E+03
2.702	2.633E+03	9.602E+00	1.474E-02	2.643E+03
2.703	2.841E+03	9.601E+00	1.475E-02	2.851E+03
3.000	2.153E+03	9.344E+00	1.653E-02	2.162E+03
4.000	1.001E+03	8.373E+00	2.218E-02	1.010E+03
5.000	5.528E+02	7.489E+00	2.750E-02	5.603E+02
6.000	3.403E+02	6.703E+00	3.246E-02	3.470E+02
8.000	1.582E+02	5.421E+00	4.120E-02	1.637E+02
9.880	9.023E+01	4.496E+00	4.897E-02	9.477E+01
9.881	2.346E+02	4.496E+00	4.898E-02	2.392E+02
10.000	2.275E+02	4.448E+00	4.946E-02	2.320E+02
11.135	1.724E+02	3.968E+00	5.301E-02	1.764E+02
11.136	2.430E+02	3.967E+00	5.301E-02	2.470E+02
11.679	2.148E+02	3.771E+00	5.466E-02	2.186E+02
11.580	2.491E+02	3.770E+00	5.457E-02	2.529E+02
15.000	1.297E+02	2.883E+00	6.424E-02	1.326E+02
20.000	6.069E+01	2.034E+00	7.482E-02	6.279E+01
30.000	2.046E+01	1.205E+00	8.823E-02	2.176E+01
40.000	9.351E+00	8.046E-01	9.592E-02	1.025E+01
50.000	5.060E+00	5.739E-01	1.002E-01	5.734E+00
60.000	3.050E+00	4.285E-01	1.025E-01	3.581E+00
67.413	2.203E+00	3.498E-01	1.051E-01	2.656E+00
67.414	1.105E+01	3.498E-01	1.031E-01	1.150E+01
80.000	7.124E+00	2.545E-01	1.039E-01	7.482E+00
100.000	3.957E+00	1.706E-01	1.033E-01	4.231E+00
150.000	1.321E+00	8.047E-02	9.938E-02	1.501E+00
200.000	6.026E-01	4.636E-02	9.349E-02	7.425E-01
300.000	2.024E-01	2.096E-02	8.331E-02	3.066E-01
400.000	9.587E-02	1.184E-02	7.542E-02	1.831E-01
500.000	5.502E-02	7.588E-03	6.926E-02	1.319E-01
600.000	3.565E-02	5.255E-03	6.430E-02	1.052E-01
800.000	1.878E-02	2.949E-03	5.671E-02	7.845E-02
1000.000	1.194E-02	1.877E-03	5.106E-02	6.487E-02

FLUORESCENT ENERGIES

57.524	3.428E+00	4.585E-01	1.020E-01	3.993E+00
65.210	2.417E+00	3.707E-01	1.029E-01	2.892E+00
8.145	1.509E+02	5.335E+00	4.181E-02	1.563E+02
9.341	1.048E+02	4.725E+00	4.677E-02	1.096E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR TANTALUM

ATOMIC WEIGHT 180.950 GRAMS / MOLE
DENSITY 16.600 GRAMS / CC
ATOMIC DENSITY 5.525E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.005E+02

L-EDGES AT	9.881	11.136	11.680
L-EDGE JUMPS	2.600	1.410	1.160
L-EDGE FIT JUMPS	4.253	1.636	1.160

K-EDGE AT 67.414 KEV
K-EDGE JUMP 5.018

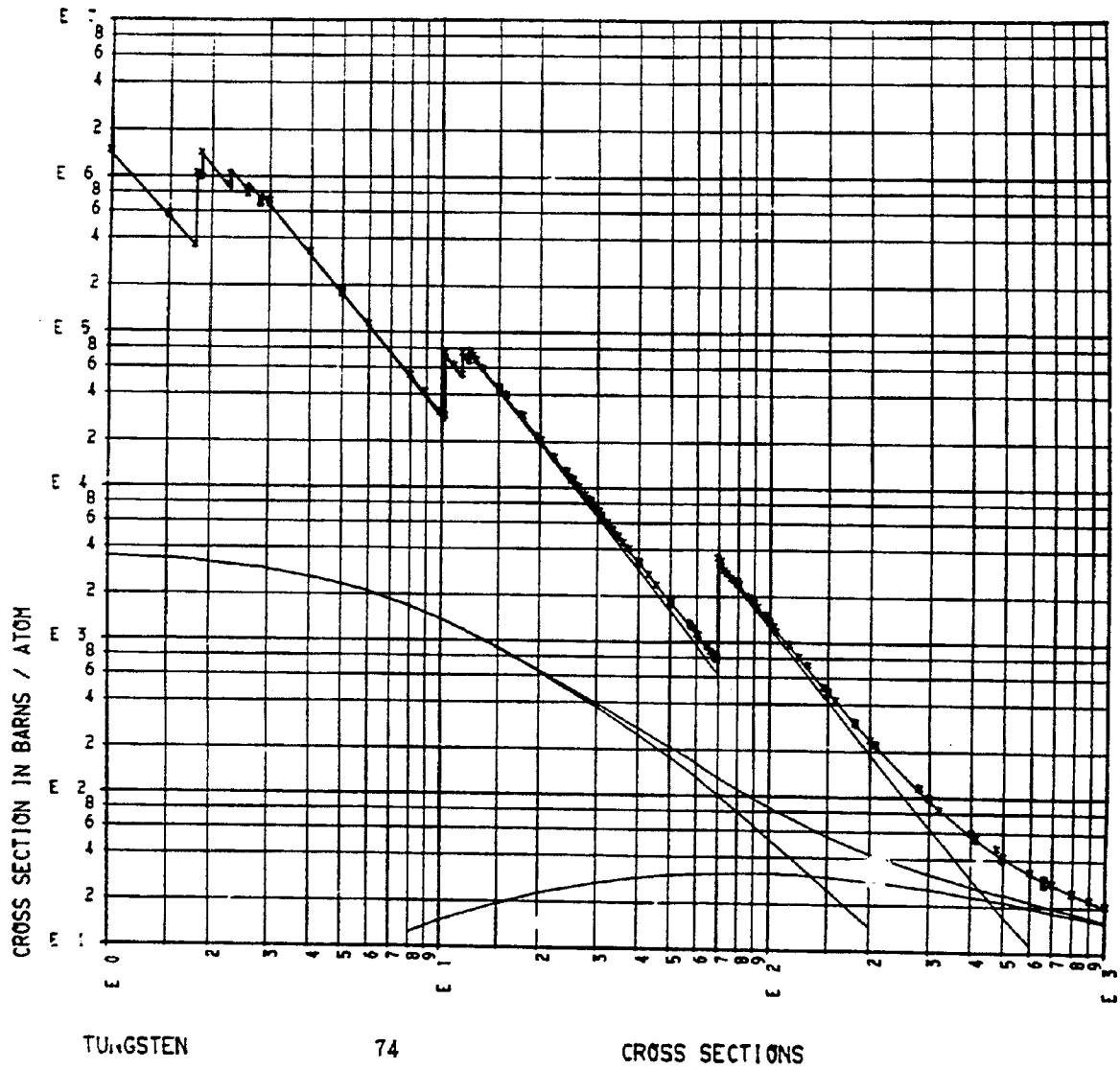
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.41313E+01	1.63038E+01	1.72410E+01	8.65271E+00
1	-2.47214E+00	-2.66148E+00	-2.30313E+00	3.73117E+00
2	0.	0.	-5.91006E-02	-1.26359E+00
3	0.	0.	0.	8.23539E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.94534E+00	1.96871E-01
1	3.87299E-01	1.50623E+00
2	-3.47926E-01	-1.91396E-01
3	1.63299E-02	3.70889E-03



TUNGSTEN

74

CROSS SECTIONS

CROSS SECTIONS FOR TUNGSTEN

Z = 74

BARNs / ATOM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.402E+06	3.507E+03	1.281E+00	1.406E+06
1.500	5.461E+05	3.369E+03	2.158E+00	5.495E+05
1.808	3.537E+05	3.265E+03	2.824E+00	3.570E+05
1.809	1.075E+06	3.265E+03	2.825E+00	1.078E+06
1.870	9.857E+05	3.247E+03	2.940E+00	9.889E+05
1.871	1.391E+06	3.246E+03	2.942E+00	1.395E+06
2.000	1.169E+06	3.210E+03	3.187E+00	1.173E+06
2.280	8.311E+05	3.102E+03	3.678E+00	8.342E+05
2.281	1.102E+06	3.102E+03	3.680E+00	1.105E+06
2.574	8.044E+05	3.005E+03	4.200E+00	8.074E+05
2.575	9.078E+05	3.005E+03	4.202E+00	9.108E+05
2.817	7.183E+05	2.935E+03	4.636E+00	7.212E+05
2.818	7.750E+05	2.935E+03	4.637E+00	7.780E+05
3.000	6.584E+05	2.887E+03	4.966E+00	5.613E+05
4.000	3.110E+05	2.586E+03	6.668E+00	5.136E+05
5.000	1.738E+05	2.314E+03	8.279E+00	1.762E+05
6.000	1.081E+05	2.073E+03	9.899E+00	1.102E+05
8.000	5.106E+04	1.679E+03	1.347E+01	5.275E+04
10.000	2.854E+04	1.380E+03	1.494E+01	2.994E+04
10.203	2.708E+04	1.351E+03	1.514E+01	2.845E+04
10.204	7.088E+04	1.351E+03	1.514E+01	1.225E+04
11.541	5.156E+04	1.186E+03	1.639E+01	5.276E+04
11.542	7.268E+04	1.186E+03	1.640E+01	7.388E+04
12.097	6.433E+04	1.128E+03	1.690E+01	6.547E+04
12.098	7.461E+04	1.128E+03	1.690E+01	7.575E+04
15.000	4.250E+04	8.964E+02	1.943E+01	5.342E+04
20.000	1.981E+04	6.322E+02	2.265E+01	2.046E+04
30.000	6.618E+03	3.745E+02	2.675E+01	7.019E+03
40.000	2.996E+03	2.502E+02	2.911E+01	3.276E+03
50.000	1.607E+03	1.787E+02	3.043E+01	1.816E+03
60.000	9.609E+02	1.335E+02	3.115E+01	1.126E+03
69.523	6.319E+02	1.031E+02	3.137E+01	7.664E+02
69.524	3.233E+03	1.031E+02	3.137E+01	3.367E+03
80.000	2.267E+03	7.928E+01	3.159E+01	2.378E+03
100.000	1.269E+03	5.315E+01	3.141E+01	1.353E+03
150.000	4.265E+02	2.508E+01	3.024E+01	4.818E+02
200.000	1.944E+02	1.445E+01	2.846E+01	2.374E+02
300.000	6.492E+01	6.536E+00	2.537E+01	9.682E+01
400.000	3.053E+01	3.692E+00	2.297E+01	5.719E+01
500.000	1.740E+01	2.366E+00	2.109E+01	4.085E+01
600.000	1.120E+01	1.638E+00	1.958E+01	3.242E+01
800.000	5.838E+00	9.200E-01	1.727E+01	2.403E+01
1000.000	3.678E+00	5.850E-01	1.555E+01	1.981E+01

FLUORESCENT ENERGIES

59.310	9.927E+02	1.360E+03	5.110E+01	1.160E+03
67.233	6.951E+02	1.093E+02	5.132E+01	8.364E+02
8.396	4.502E+04	1.609E+03	1.297E+01	4.666E+04
9.670	3.115E+04	1.421E+03	1.454E+01	3.260E+04

CROSS SECTIONS FOR TUNGSTEN		Z = 74	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	4.592E+03	1.148E+01	4.195E-03	4.603E+03
1.500	1.788E+03	1.103E+01	7.394E-03	1.799E+03
1.808	1.158E+03	1.069E+01	9.248E-03	1.169E+03
1.809	3.519E+03	1.069E+01	9.254E-03	3.530E+03
1.870	3.228E+03	1.063E+01	9.629E-03	3.238E+03
1.871	4.556E+03	1.063E+01	9.635E-03	4.567E+03
2.000	3.829E+03	1.051E+01	1.044E-02	3.840E+03
2.280	2.721E+03	1.016E+01	1.204E-02	2.732E+03
2.281	3.609E+03	1.016E+01	1.205E-02	3.620E+03
2.574	2.634E+03	9.841E+00	1.375E-02	2.644E+03
2.575	2.973E+03	9.840E+00	1.376E-02	2.982E+03
2.817	2.352E+03	9.611E+00	1.518E-02	2.362E+03
2.818	2.538E+03	9.610E+00	1.519E-02	2.547E+03
3.000	2.156E+03	9.454E+00	1.626E-02	2.165E+03
4.000	1.018E+03	8.468E+00	2.183E-02	1.027E+03
5.000	5.693E+02	7.577E+00	2.711E-02	5.769E+02
6.000	3.539E+02	6.787E+00	3.205E-02	3.607E+02
8.000	1.672E+02	5.498E+00	4.083E-02	1.727E+02
10.000	9.346E+01	4.519E+00	4.892E-02	9.803E+01
10.203	8.869E+01	4.424E+00	4.956E-02	9.316E+01
10.204	2.321E+02	4.424E+00	4.957E-02	2.366E+02
11.541	1.688E+02	3.883E+00	5.368E-02	1.728E+02
11.542	2.380E+02	3.883E+00	5.369E-02	2.419E+02
12.097	2.106E+02	3.694E+00	5.535E-02	2.144E+02
12.098	2.443E+02	3.694E+00	5.535E-02	2.480E+02
15.000	1.392E+02	2.935E+00	6.362E-02	1.422E+02
20.000	6.486E+01	2.070E+00	7.417E-02	6.701E+01
30.000	2.167E+01	1.226E+00	8.759E-02	2.298E+01
40.000	9.811E+00	8.195E-01	9.532E-02	1.073E+01
50.000	5.262E+00	5.850E-01	9.964E-02	5.947E+00
60.000	3.146E+00	4.372E-01	1.020E-01	3.686E+00
69.523	2.069E+00	3.376E-01	1.027E-01	2.509E+00
69.524	1.059E+01	3.376E-01	1.027E-01	1.103E+01
80.000	7.425E+00	2.596E-01	1.034E-01	7.788E+00
100.000	4.155E+00	1.740E-01	1.029E-01	4.432E+00
150.000	1.397E+00	8.212E-02	9.902E-02	1.578E+00
200.000	6.367E-01	4.732E-02	9.319E-02	7.772E-01
300.000	2.126E-01	2.140E-02	8.307E-02	3.170E-01
400.000	9.997E-02	1.209E-02	7.522E-02	1.873E-01
500.000	5.697E-02	7.748E-03	6.906E-02	1.338E-01
600.000	3.668E-02	5.364E-03	6.412E-02	1.062E-01
800.000	1.912E-02	3.013E-03	5.655E-02	7.868E-02
1000.000	1.204E-02	1.916E-03	5.092E-02	6.488E-02

FLUORESCENT ENERGIES

59.310	3.251E+00	4.454E-01	1.019E-01	3.799E+00
67.233	2.276E+00	3.580E-01	1.026E-01	2.739E+00
8.396	1.474E+02	5.270E+00	4.246E-02	1.528E+02
9.670	1.020E+02	4.655E+00	4.761E-02	1.067E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR TUNGSTEN

ATOMIC WEIGHT 183.920 GRAMS / MOLE
DENSITY 19.300 GRAMS / CC
ATOMIC DENSITY 6.320E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.054E+02

L-EDGES AT	10.204	11.542	12.098
L-EDGE JUMPS	2.617	1.410	1.160
L-EDGE FIT JUMPS	4.280	1.636	1.160

K-EDGE AT 69.524 KEV
K-EDGE JUMP 5.116

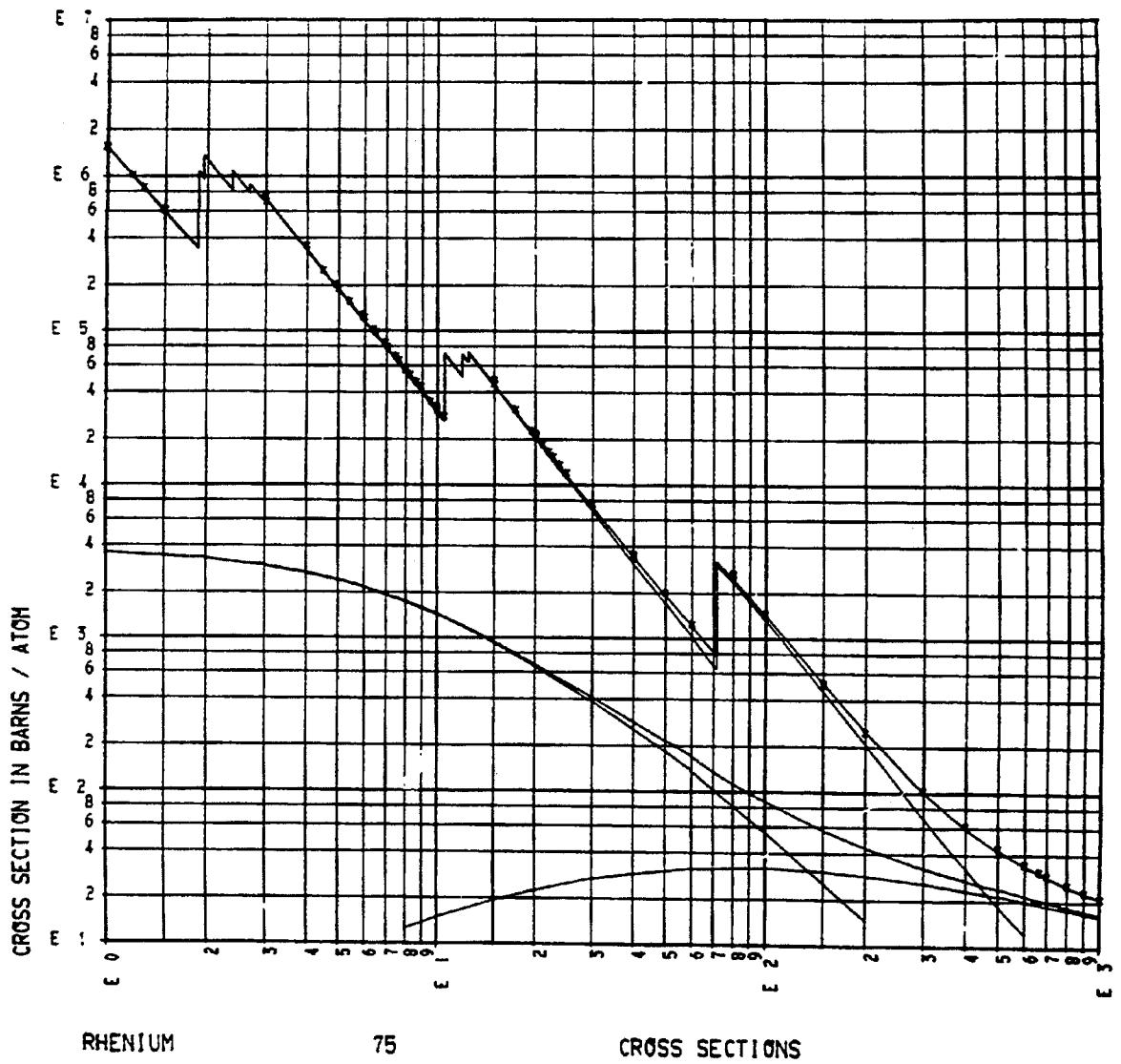
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.41536E+01	1.62613E+01	1.72533E+01	7.57541E+00
1	-2.32582E+00	-2.60672E+00	-2.23674E+00	4.28874E+00
2	0.	0.	-7.27338E-02	-1.34998E+00
3	0.	0.	0.	8.65200E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.97266E+00	1.91015E-01
1	3.87704E-01	1.51240E+00
2	-3.47155E-01	-1.91922E-01
3	1.62372E-02	3.71450E-03



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REVISED 6/03/69

CROSS SECTIONS FOR RHENIUM		Z = 75	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.528E+06	3.605E+03	1.257E+00	1.531E+06
1.500	5.883E+05	3.465E+03	2.242E+00	5.918E+05
1.882	3.450E+05	3.337E+03	2.952E+00	3.483E+05
1.883	1.053E+06	3.336E+03	2.954E+00	1.056E+06
1.948	9.630E+05	3.318E+03	3.078E+00	9.663E+05
1.949	1.359E+06	3.317E+03	3.080E+00	1.363E+06
2.000	1.270E+06	3.303E+03	3.178E+00	1.274E+06
2.366	8.173E+05	3.160E+03	3.822E+00	8.204E+05
2.367	1.084E+06	3.160E+03	3.824E+00	1.087E+06
2.680	7.825E+05	3.058E+03	4.383E+00	7.856E+05
2.681	8.831E+05	3.058E+03	4.385E+00	8.861E+05
2.930	6.995E+05	2.987E+03	4.834E+00	7.025E+05
2.931	7.547E+05	2.987E+03	4.836E+00	7.577E+05
3.000	7.100E+05	2.969E+03	4.961E+00	7.130E+05
4.000	3.337E+05	2.658E+03	6.668E+00	3.364E+05
5.000	1.858E+05	2.378E+03	8.293E+00	1.882E+05
6.000	1.151E+05	2.131E+03	9.824E+00	1.173E+05
8.000	5.411E+04	1.729E+03	1.256E+01	5.586E+04
10.000	3.013E+04	1.424E+03	1.484E+01	3.157E+04
10.533	2.629E+04	1.348E+03	1.534E+01	2.765E+04
10.534	.032E+04	1.348E+03	1.534E+01	1.168E+04
11.956	5.011E+04	1.180E+03	1.664E+01	5.13CE+04
11.957	7.063E+04	1.180E+03	1.664E+01	7.183E+04
12.524	6.239E+04	1.123E+03	1.714E+01	6.353E+04
12.525	7.236E+04	1.123E+03	1.714E+01	7.35CE+04
15.000	4.461E+04	9.273E+02	1.924E+01	4.556E+04
20.000	2.059E+04	6.537E+02	2.253E+01	2.126E+04
30.000	6.895E+03	3.871E+02	2.688E+01	7.310E+03
40.000	3.165E+03	2.588E+02	2.933E+01	3.453E+03
50.000	1.727E+03	1.848E+02	3.071E+01	1.943E+03
60.000	1.052E+03	1.382E+02	3.147E+01	1.222E+03
71.675	6.481E+02	1.009E+02	3.175E+01	7.808E+02
71.676	3.104E+03	1.009E+02	3.175E+01	3.237E+03
80.000	2.383E+03	8.203E+01	3.193E+01	2.497E+03
100.000	1.359E+03	5.499E+01	3.177E+01	1.446E+03
150.000	4.619E+02	2.596E+01	3.062E+01	5.185E+02
200.000	2.099E+02	1.496E+01	2.883E+01	2.537E+02
300.000	6.951E+01	6.765E+00	2.569E+01	1.020E+02
400.000	3.268E+01	3.822E+00	2.327E+01	5.977E+01
500.000	1.875E+01	2.450E+00	2.137E+01	4.257E+01
600.000	1.222E+01	1.696E+00	1.984E+01	3.376E+01
800.000	6.597E+00	9.530E-01	1.749E+01	2.505E+01
1000.000	4.343E+00	6.050E-01	1.575E+01	2.071E+01

FLUORESCENT ENERGIES

61.131	9.999E+02	1.337E+02	3.150E+01	1.166E+03
69.298	7.105E+02	1.071E+02	3.170E+01	8.500E+02
8.651	4.407E+04	1.616E+03	1.331E+01	4.573E+04
10.008	3.006E+04	1.423E+03	1.485E+01	3.150E+04

CROSS SECTIONS FOR RHENIUM

Z = 75

CM**2 / GRAM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	4.941E+03	1.166E+01	4.065E-03	4.953E+03
1.500	1.903E+03	1.121E+01	1.252E-03	1.914E+03
1.882	1.116E+03	1.079E+01	9.548E-03	1.122E+03
1.883	3.405E+03	1.079E+01	9.554E-03	3.416E+03
1.948	3.115E+03	1.073E+01	9.956E-03	3.126E+03
1.949	4.397E+03	1.073E+01	9.952E-03	4.408E+03
2.000	4.109E+03	1.068E+01	1.028E-02	4.120E+03
2.366	2.643E+03	1.022E+01	1.236E-02	2.654E+03
2.367	3.506E+03	1.022E+01	1.237E-02	3.516E+03
2.680	2.531E+03	9.892E+00	1.418E-02	2.541E+03
2.681	2.859E+03	9.891E+00	1.418E-02	2.866E+03
2.930	2.262E+03	9.663E+00	1.564E-02	2.272E+03
2.931	2.441E+03	9.662E+00	1.564E-02	2.445E+03
3.000	2.297E+03	9.603E+00	1.605E-02	2.306E+03
4.000	1.079E+03	8.597E+00	2.157E-02	1.088E+03
5.000	6.009E+02	7.692E+00	2.582E-02	6.087E+02
6.000	3.724E+02	5.894E+00	3.177E-02	3.793E+02
8.000	1.750E+02	3.594E+00	4.061E-02	1.807E+02
10.000	9.745E+01	4.606E+00	4.800E-02	1.021E+02
10.533	8.503E+01	4.361E+00	4.962E-02	8.944E+01
10.534	2.274E+02	4.361E+00	4.962E-02	2.318E+02
11.956	1.621E+02	3.816E+00	5.381E-02	1.659E+02
11.957	2.285E+02	3.816E+00	5.382E-02	2.323E+02
12.524	2.018E+02	3.633E+00	5.544E-02	2.055E+02
12.525	2.340E+02	3.633E+00	5.544E-02	2.377E+02
15.000	1.443E+02	2.999E+00	5.223E-02	1.474E+02
20.000	6.659E+01	2.114E+00	7.286E-02	6.878E+01
30.000	2.230E+01	1.252E+00	8.693E-02	2.364E+01
40.000	1.024E+01	8.369E-01	9.488E-02	1.117E+01
50.000	5.587E+00	5.978E-01	9.933E-02	6.284E+00
60.000	3.403E+00	4.469E-01	1.018E-01	3.952E+00
71.675	2.096E+00	3.264E-01	1.027E-01	2.525E+00
71.676	1.004E+01	3.264E-01	1.027E-01	1.047E+01
80.000	7.706E+00	2.653E-01	1.033E-01	8.075E+00
100.000	4.396E+00	1.779E-01	1.028E-01	4.676E+00
150.000	1.494E+00	8.395E-02	9.903E-02	1.677E+00
200.000	6.789E-01	4.838E-02	9.324E-02	8.206E-01
300.000	2.248E-01	2.188E-02	8.311E-02	3.298E-01
400.000	1.057E-01	1.236E-02	7.528E-02	1.933E-01
500.000	6.064E-02	7.924E-03	6.913E-02	1.377E-01
600.000	3.952E-02	5.486E-03	6.418E-02	1.092E-01
800.000	2.134E-02	3.082E-03	5.659E-02	8.101E-02
1000.000	1.405E-02	1.957E-03	5.097E-02	6.697E-02

FLUORESCENT ENERGIES

61.131	3.234E+00	4.324E-01	1.019E-01	3.770E+00
69.298	2.298E+00	3.464E-01	1.025E-01	2.749E+00
8.651	1.425E+02	5.225E+00	4.306E-02	1.479E+02
10.008	9.724E+01	4.602E+00	4.802E-02	1.019E+02

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PHENIX

ATOMIC WEIGHT 186.200 GRAMS / MOLE
DENSITY 21.020 GRAMS / CC
ATOMIC DENSITY 6.799E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.092E+02

L-EDGES AT 10.534 11.957 12.525
L-EDGE JUMPS 2.675 1.410 1.160
L-EDGE FIT JUMPS 4.375 1.636 1.160

K-EDGE AT 71.676 KEY
K-EDGE JUMP 4.789

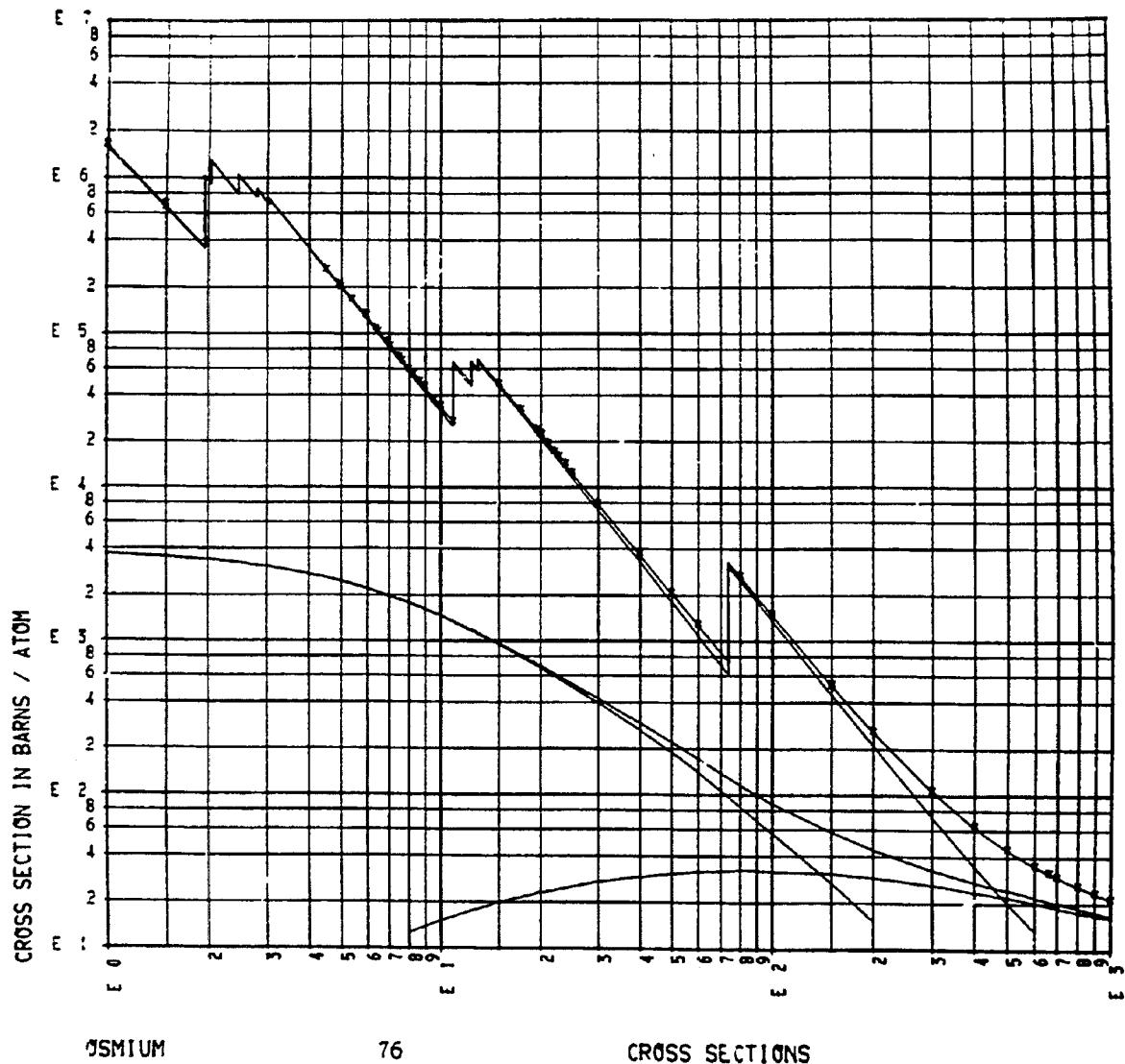
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
	2.931	12.525	71.676	
0	1.42392E+01	1.63564E+01	1.78750E+01	1.35944E+00
1	-2.35326E+00	-2.62453E+00	-2.61051E+00	7.79444E+00
2	0.	0.	-1.35093E-02	-1.99822E+00
3	0.	0.	0.	1.26225E-01

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	7.99940E+00	1.89644E-01
1	3.88739E-01	1.50867E+00
2	-3.46726E-01	-1.89570E-01
3	1.61751E-02	3.49584E-03



OSMIUM

76

CROSS SECTIONS

CROSS SECTIONS FOR OSMIUM

Z = 76

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.590E+06	3.706E+03	1.169E+00	1.594E+06
1.500	6.466E+05	3.564E+03	2.133E+00	6.501E+05
1.959	3.575E+05	3.410E+03	3.000E+00	3.609E+05
1.960	1.008E+06	3.410E+03	3.002E+00	1.012E+06
2.000	9.562E+05	3.398E+03	3.081E+00	9.596E+05
2.030	9.194E+05	3.385E+03	3.134E+00	9.228E+05
2.031	1.298E+06	3.385E+03	3.135E+00	1.301E+06
2.456	2.873E+05	3.219E+03	3.891E+00	2.905E+05
2.457	1.044E+06	3.219E+03	3.893E+00	1.047E+06
2.791	7.467E+05	3.112E+03	4.499E+00	7.498E+05
2.792	8.427E+05	3.112E+03	4.501E+00	8.458E+05
3.000	6.975E+05	3.054E+03	4.884E+00	7.005E+05
3.049	6.584E+05	3.035E+03	4.968E+00	6.714E+05
3.050	7.212E+05	3.034E+03	4.970E+00	7.243E+05
4.000	3.533E+05	2.732E+03	6.514E+00	3.561E+05
5.000	1.964E+05	2.444E+03	8.242E+00	1.988E+05
6.000	1.216E+05	2.191E+03	9.813E+00	1.238E+05
8.000	5.701E+04	1.780E+03	1.260E+01	5.880E+04
10.000	3.169E+04	1.468E+03	1.517E+01	3.317E+04
10.870	2.544E+04	1.346E+03	1.602E+01	2.681E+04
10.871	6.436E+04	1.346E+03	1.602E+01	6.572E+04
12.383	4.603E+04	1.174E+03	1.745E+01	4.722E+04
12.384	6.489E+04	1.174E+03	1.745E+01	6.608E+04
12.963	5.766E+04	1.119E+03	1.798E+01	5.880E+04
12.964	6.688E+04	1.118E+03	1.798E+01	6.801E+04
15.000	4.580E+04	9.586E+02	1.978E+01	4.578E+04
20.000	2.155E+04	6.757E+02	2.305E+01	2.225E+04
30.000	7.323E+03	3.999E+02	2.724E+01	7.750E+03
40.000	3.366E+03	2.573E+02	2.969E+01	3.663E+03
50.000	1.829E+03	1.909E+02	3.107E+01	2.051E+03
60.000	1.107E+03	1.428E+02	3.184E+01	1.281E+03
73.871	6.208E+02	9.859E+01	3.218E+01	7.516E+02
73.872	3.144E+03	9.859E+01	3.218E+01	3.275E+03
80.000	2.540E+03	8.474E+01	3.231E+01	2.657E+03
100.000	1.391E+03	5.681E+01	3.216E+01	1.480E+03
150.000	4.630E+02	2.681E+01	3.106E+01	5.208E+02
200.000	2.133E+02	1.545E+01	2.919E+01	2.579E+02
300.000	7.327E+01	6.989E+00	2.505E+01	1.063E+02
400.000	3.530E+01	3.948E+00	2.358E+01	6.282E+01
500.000	2.046E+01	2.530E+00	2.165E+01	4.464E+01
600.000	1.333E+01	1.752E+00	2.010E+01	3.518E+01
800.000	7.020E+00	9.840E-01	1.774E+01	2.574E+01
1000.000	4.418E+00	6.260E-01	1.597E+01	2.101E+01

FLUORESCENT ENERGIES

62.991	9.667E+02	1.309E+02	3.192E+01	1.131E+03
71.404	6.823E+02	1.047E+02	3.212E+01	8.200E+02
8.910	4.294E+04	1.622E+03	1.378E+01	4.461E+04
10.354	2.892E+04	1.416E+03	1.552E+01	3.035E+04

CROSS SECTIONS FOR OSMIUM

Z = 76

CM**2 / GRAM

KEY	PHOT0	COHERENT	INCOHERENT	TOTAL
1.000	5.036E+03	1.173E+01	3.702E-03	5.047E+03
1.500	2.047E+03	1.128E+01	6.754E-03	2.059E+03
1.959	1.132E+03	1.080E+01	9.501E-03	1.143E+03
1.960	3.193E+03	1.080E+01	9.507E-03	3.204E+03
2.000	3.028E+03	1.076E+01	9.756E-03	3.038E+03
2.030	2.911E+03	1.072E+01	9.922E-03	2.922E+03
2.031	4.110E+03	1.072E+01	9.928E-03	4.121E+03
2.456	2.493E+03	1.019E+01	1.232E-02	2.503E+03
2.457	3.307E+03	1.019E+01	1.233E-02	3.317E+03
2.791	2.364E+03	9.855E+00	1.425E-02	2.374E+03
2.792	2.668E+03	9.854E+00	1.425E-02	2.678E+03
3.000	2.209E+03	9.669E+00	1.546E-02	2.218E+03
3.049	2.116E+03	9.609E+00	1.573E-02	2.126E+03
3.050	2.284E+03	9.607E+00	1.574E-02	2.293E+03
4.000	1.119E+03	8.651E+00	2.094E-02	1.127E+03
5.000	6.219E+02	7.740E+00	2.610E-02	6.296E+02
5.000	3.849E+02	6.939E+00	3.107E-02	3.918E+02
8.000	1.805E+02	5.637E+00	3.990E-02	1.862E+02
10.000	1.003E+02	4.649E+00	4.803E-02	1.050E+02
10.870	8.057E+01	4.261E+00	5.073E-02	8.488E+01
10.871	2.038E+02	4.261E+00	5.073E-02	2.081E+02
12.383	1.458E+02	3.717E+00	5.525E-02	1.495E+02
12.384	2.055E+02	3.716E+00	5.525E-02	2.092E+02
12.963	1.826E+02	3.542E+00	5.693E-02	1.862E+02
12.964	2.118E+02	3.542E+00	5.693E-02	2.154E+02
15.000	1.450E+02	3.035E+00	6.263E-02	1.481E+02
20.000	6.823E+01	2.140E+00	7.299E-02	7.044E+01
30.000	2.319E+01	1.266E+00	8.625E-02	2.454E+01
40.000	1.066E+01	8.464E-01	9.401E-02	1.160E+01
50.000	5.792E+00	6.046E-01	9.838E-02	6.495E+00
60.000	3.504E+00	4.521E-01	1.008E-01	4.057E+00
73.871	1.966E+00	3.122E-01	1.019E-01	2.380E+00
73.872	9.956E+00	3.122E-01	1.019E-01	1.037E+01
80.000	8.041E+00	2.683E-01	1.033E-01	8.412E+00
100.000	4.404E+00	1.799E-01	1.018E-01	4.686E+00
150.000	1.466E+00	8.489E-02	9.816E-02	1.649E+00
200.000	6.753E-01	4.892E-02	9.243E-02	8.157E-01
300.000	2.320E-01	2.213E-02	8.249E-02	3.366E-01
400.000	1.118E-01	1.250E-02	7.466E-02	1.989E-01
500.000	6.480E-02	8.011E-03	6.855E-02	1.414E-01
600.000	4.220E-02	5.548E-03	6.364E-02	1.114E-01
800.000	2.223E-02	3.116E-03	5.617E-02	8.152E-02
1000.000	1.399E-02	1.982E-03	5.057E-02	6.654E-02

FLUORESCENT ENERGIES

62.991	3.061E+00	4.146E-01	1.011E-01	3.581E+00
71.404	2.160E+00	3.316E-01	1.017E-01	2.597E+00
8.910	1.360E+02	5.136E+00	4.364E-02	1.412E+02
10.354	9.157E+01	4.483E+00	4.914E-02	9.611E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR OSMIUM

ATOMIC WEIGHT 190.200 GRAMS / MOLE
DENSITY 22.500 GRAMS / CC
ATOMIC DENSITY 7.124E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.158E+02

L-EDGES AT	10.871	12.384	12.964
L-EDGE JUMPS	2.529	1.410	1.160
L-EDGE FIT JUMPS	4.137	1.656	1.160

K-EDGE AT 73.872 KEV
K-EDGE JUMP 5.065

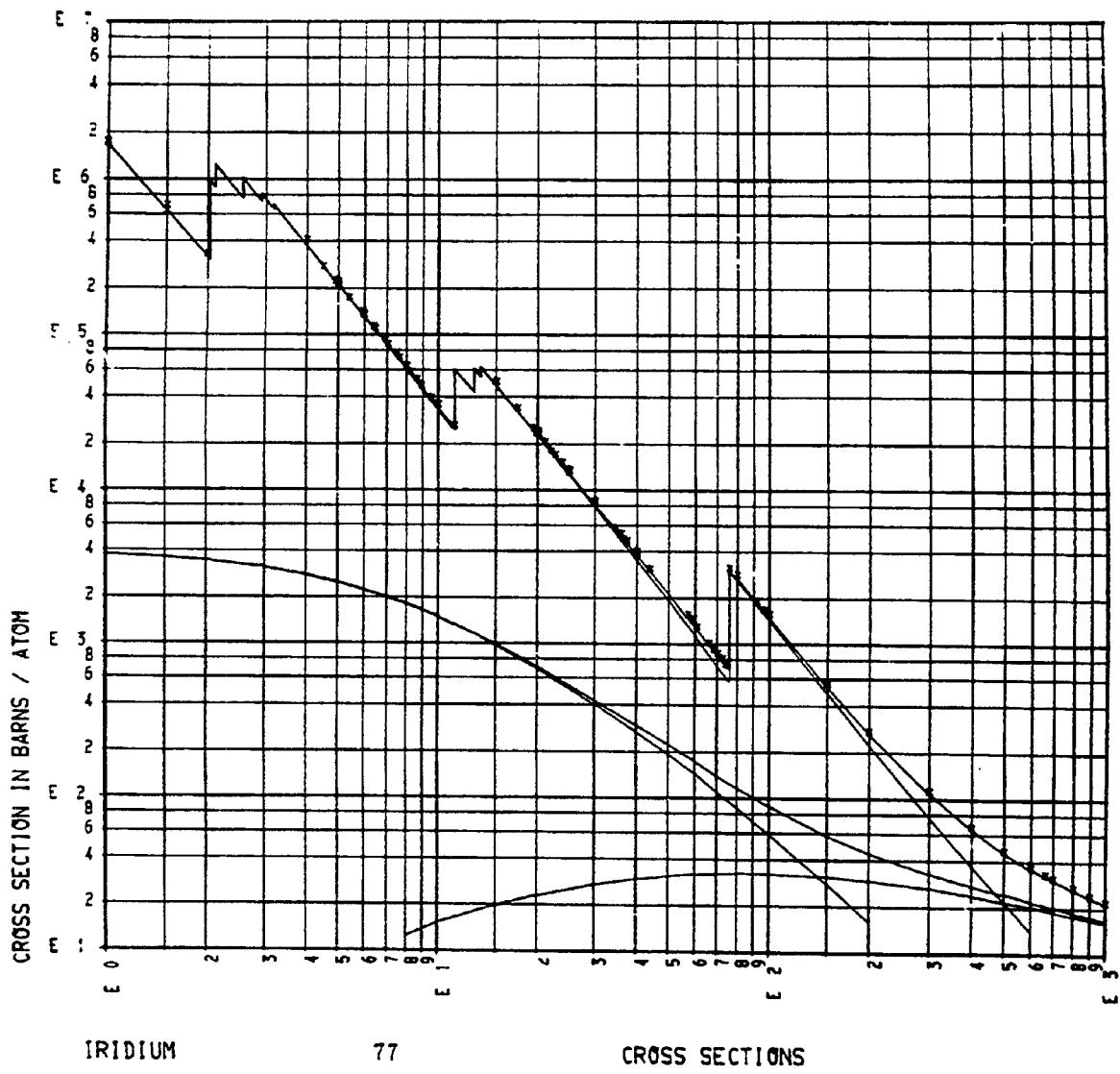
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	3.050	L	12.964	K	73.872
0	1.42795E+01	1.64233E+01		1.73525E+01	1.37534E+01		
1	-2.21971E+00	-2.63163E+00		-2.28550E+00	1.02122E+00		
2	0.	0.		-5.88047E-02	-7.77126E-01		
3	0.	0.		0.	5.38811E-02		

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.02574E+00	1.16448E-01
1	3.90458E-01	1.57515E+00
2	-3.46658E-01	-2.05532E-01
3	1.61455E-02	4.66731E-03



CROSS SECTIONS FOR IRIDIUM

Z = 77

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.693E+05	3.807E+03	1.110E+00	1.697E+05
1.500	6.394E+05	3.664E+03	2.058E+00	6.431E+05
2.000	3.204E+05	3.496E+03	3.013E+00	3.239E+05
2.040	3.055E+05	3.477E+03	3.083E+00	3.090E+05
2.041	9.811E+05	3.477E+03	3.085E+00	9.845E+05
2.115	8.928E+05	3.444E+03	3.216E+00	8.962E+05
2.116	1.253E+06	3.444E+03	3.218E+00	1.256E+06
2.549	7.651E+05	3.279E+03	3.997E+00	7.684E+05
2.550	1.021E+06	3.279E+03	3.999E+00	1.024E+06
2.908	1.211E+05	3.167E+03	4.660E+00	1.243E+05
2.909	8.138E+05	3.167E+03	4.662E+00	8.170E+05
3.000	1.501E+05	3.141E+03	4.832E+00	7.532E+05
3.171	6.477E+05	3.074E+03	5.128E+00	6.507E+05
3.172	6.989E+05	3.074E+03	5.130E+00	7.020E+05
4.000	3.781E+05	2.809E+03	6.579E+00	3.810E+05
5.000	2.094E+05	2.512E+03	8.214E+00	2.119E+05
6.000	1.292E+05	2.252E+03	9.813E+00	1.315E+05
8.000	6.032E+04	1.832E+03	1.265E+01	6.216E+04
10.000	3.340E+04	1.513E+03	1.524E+01	3.493E+04
11.214	2.456E+04	1.343E+03	1.643E+01	2.502E+04
11.215	5.886E+04	1.343E+03	1.643E+01	6.022E+04
12.823	4.247E+04	1.168E+03	1.794E+01	4.366E+04
12.824	5.987E+04	1.168E+03	1.794E+01	6.106E+04
13.423	5.352E+04	1.113E+03	1.848E+01	5.465E+04
13.424	6.207E+04	1.113E+03	1.848E+01	6.320E+04
15.000	4.713E+04	9.905E+02	1.988E+01	4.814E+04
20.000	2.273E+04	6.983E+02	2.318E+01	2.345E+04
30.000	7.831E+03	4.128E+02	2.746E+01	8.271E+03
40.000	3.579E+03	2.158E+02	2.996E+01	3.685E+03
50.000	1.920E+03	1.970E+02	3.138E+01	2.148E+03
60.000	1.143E+03	1.472E+02	3.217E+01	1.322E+03
76.111	5.729E+02	9.611E+01	3.258E+01	7.016E+02
76.112	2.965E+03	9.611E+01	3.258E+01	3.094E+03
80.000	2.601E+03	8.737E+01	3.267E+01	2.722E+03
100.000	1.440E+03	5.856E+01	3.252E+01	1.531E+03
150.000	4.853E+02	2.763E+01	3.138E+01	5.443E+02
200.000	2.247E+02	1.592E+01	2.956E+01	2.702E+02
300.000	7.747E+01	1.201E+00	2.638E+01	1.111E+02
400.000	3.735E+01	4.068E+00	2.388E+01	6.530E+01
500.000	2.166E+01	2.607E+00	2.194E+01	4.621E+01
600.000	1.411E+01	1.805E+00	2.037E+01	3.629E+01
800.000	7.440E+00	1.04E+00	1.797E+01	2.642E+01
1000.000	4.590E+00	6.450E-01	1.618E+01	2.152E+01

FLUORESCENT ENERGIES

64.886	9.104E+02	1.279E+02	3.231E+01	1.073E+03
73.549	6.328E+02	1.022E+02	3.252E+01	7.686E+02
9.173	4.198E+04	1.629E+03	1.418E+01	4.366E+04
10.706	2.788E+04	1.409E+03	1.594E+01	2.931E+04

JSS SECTIONS FOR IRIDIUM Z = 77 CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.306E+03	1.193E+01	3.478E-03	5.316E+03
1.500	2.004E+03	1.148E+01	6.449E-03	2.015E+03
2.000	1.004E+03	1.095E+01	9.441E-03	1.015E+03
2.040	9.574E+02	1.090E+01	9.661E-03	9.683E+02
2.041	3.074E+03	1.089E+01	9.667E-03	3.085E+03
2.115	2.797E+03	1.079E+01	1.008E-02	2.808E+03
2.116	3.925E+03	1.079E+01	1.008E-02	3.936E+03
2.549	2.397E+03	1.028E+01	1.252E-02	2.408E+03
2.550	3.200E+03	1.027E+01	1.253E-02	3.210E+03
2.908	2.260E+03	9.924E+00	1.460E-02	2.269E+03
2.909	2.550E+03	9.923E+00	1.461E-02	2.560E+03
3.000	2.350E+03	9.842E+00	1.514E-02	2.360E+03
3.171	2.029E+03	9.633E+00	1.607E-02	2.039E+03
3.172	2.190E+03	9.632E+00	1.607E-02	2.200E+03
4.000	1.185E+03	8.802E+00	2.062E-02	1.194E+03
5.000	6.562E+02	7.872E+00	2.574E-02	6.641E+02
6.000	4.049E+02	7.058E+00	3.075E-02	4.120E+02
8.000	1.890E+02	5.739E+00	3.954E-02	1.948E+02
10.000	1.047E+02	4.741E+00	4.775E-02	1.095E+02
11.214	7.727E+01	4.209E+00	5.148E-02	8.153E+01
11.215	1.844E+02	4.208E+00	5.148E-02	1.887E+02
12.823	1.331E+02	3.559E+00	5.621E-02	1.366E+02
12.824	1.876E+02	3.559E+00	5.621E-02	1.913E+02
13.423	1.677E+02	3.488E+00	5.792E-02	1.712E+02
13.424	1.945E+02	3.488E+00	5.792E-02	1.980E+02
15.000	1.477E+02	3.104E+00	6.229E-02	1.508E+02
20.000	7.123E+01	2.188E+00	1.263E-02	7.349E+01
30.000	2.454E+01	1.294E+00	8.604E-02	2.592E+01
40.000	1.121E+01	8.644E-01	9.388E-02	1.217E+01
50.000	6.016E+00	6.172E-01	9.833E-02	6.731E+00
60.000	3.580E+00	4.613E-01	1.008E-01	4.143E+00
76.111	1.795E+00	3.012E-01	1.021E-01	2.198E+00
76.112	9.292E+00	3.011E-01	1.021E-01	9.695E+00
80.000	8.152E+00	2.738E-01	1.024E-01	8.528E+00
100.000	4.511E+00	1.835E-01	1.019E-01	4.796E+00
150.000	1.521E+00	8.658E-02	9.833E-02	1.706E+00
200.000	7.041E-01	4.988E-02	9.263E-02	8.466E-01
300.000	2.428E-01	2.256E-02	8.266E-02	3.480E-01
400.000	1.170E-01	1.275E-02	1.483E-02	2.046E-01
500.000	6.787E-02	8.169E-03	6.875E-02	1.448E-01
600.000	4.422E-02	5.656E-03	6.383E-02	1.137E-01
800.000	2.331E-02	3.177E-03	5.631E-02	8.280E-02
1000.000	1.470E-02	2.021E-03	5.070E-02	6.742E-02

FLUORESCENT ENERGIES

64.886	2.853E+00	4.009E-01	1.012E-01	3.363E+00
73.549	1.983E+00	3.202E-01	1.019E-01	2.408E+00
9.173	1.315E+02	5.105E+00	4.443E-02	1.368E+02
10.706	8.737E+01	4.416E+00	4.994E-02	9.185E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR IRIDIUM

ATOMIC WEIGHT 192.200 GRAMS / MOLE
DENSITY 22.420 GRAMS / CC
ATOMIC DENSITY 7.025E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.131E+02

L-EDGES AT	11.215	12.824	13.424
L-EDGE JUMPS	2.302	1.410	1.160
L-EDGE FIT JUMPS	3.904	1.636	1.160

K-EDGE AT 76.112 KEV
K-EDGE JUMP 5.176

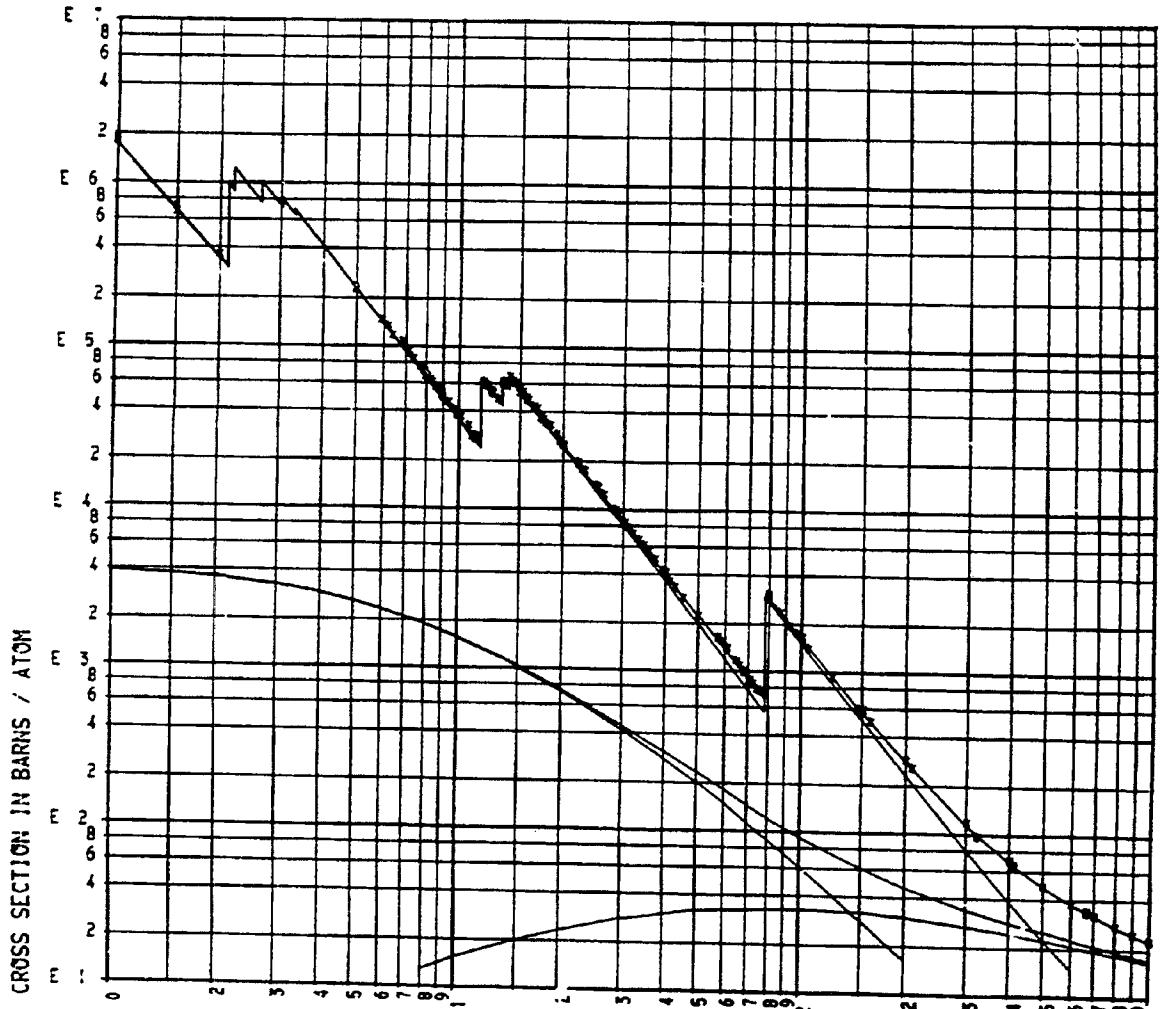
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.43422E+01	1.65144E+01	1.65270E+01	1.25506E+01
1	-2.40183E+00	-2.64832E+00	-1.75315E+00	1.53090E+00
2	0.	0.	-1.35232E-01	-8.15676E-01
3	0.	0.	0.	5.92011E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.05150E+00	7.19908E-02
1	3.93143E-01	1.61204E+00
2	-3.47052E-01	-2.13186E-01
3	1.61573E-02	5.20497E-03



PLATINUM

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CROSS SECTIONS

CROSS SECTIONS FOR PLATINUM		Z = 78	BARNs / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	1.756E+06	3.916E+03	1.072E+00	1.760E+06
1.500	6.776E+05	3.776E+03	2.009E+00	6.814E+05
2.000	3.448E+05	3.608E+03	2.957E+00	3.484E+05
2.121	3.004E+05	3.553E+03	3.181E+00	3.039E+05
2.122	1.019E+06	3.553E+03	3.183E+00	1.023E+06
2.201	9.229E+05	3.519E+03	3.324E+00	9.264E+05
2.202	1.289E+06	3.519E+03	3.326E+00	1.293E+06
2.644	7.845E+05	3.354E+03	4.133E+00	7.878E+05
2.645	1.047E+06	3.354E+03	4.134E+00	1.050E+06
3.000	7.437E+05	3.245E+03	4.801E+00	7.469E+05
3.025	7.271E+05	3.235E+03	4.844E+00	7.303E+05
3.026	8.206E+05	3.234E+03	4.846E+00	8.238E+05
3.296	6.506E+05	3.128E+03	5.316E+00	6.537E+05
3.297	7.021E+05	3.127E+03	5.318E+00	7.052E+05
4.000	4.153E+05	2.899E+03	6.557E+00	4.182E+05
5.000	2.255E+05	2.589E+03	8.206E+00	2.291E+05
6.000	1.381E+05	2.319E+03	9.820E+00	1.404E+05
8.000	6.319E+04	1.886E+03	1.270E+01	6.509E+04
10.000	3.447E+04	1.559E+03	1.536E+01	3.604E+04
11.563	2.323E+04	1.342E+03	1.683E+01	2.459E+04
11.564	6.115E+04	1.342E+03	1.683E+01	6.251E+04
13.272	4.286E+04	1.163E+03	1.842E+01	4.404E+04
13.273	6.042E+04	1.163E+03	1.842E+01	6.161E+04
13.891	5.370E+04	1.109E+03	1.898E+01	5.483E+04
13.892	6.228E+04	1.109E+03	1.898E+01	6.341E+04
15.000	5.101E+04	1.024E+03	1.995E+01	5.205E+04
20.000	2.395E+04	2.217E+02	2.331E+01	2.470E+04
30.000	8.084E+03	4.231E+02	2.768E+01	8.538E+03
40.000	3.687E+03	2.844E+02	3.024E+01	4.001E+03
50.000	1.988E+03	2.028E+02	3.169E+01	2.223E+03
60.000	1.194E+03	1.514E+02	3.250E+01	1.378E+03
78.394	5.604E+02	9.346E+01	3.298E+01	5.869E+02
78.395	2.872E+03	9.346E+01	3.298E+01	2.998E+03
80.000	2.720E+03	8.988E+01	3.302E+01	2.843E+03
100.000	1.492E+03	6.022E+01	3.289E+01	1.585E+03
150.000	4.969E+02	2.839E+01	3.176E+01	5.571E+02
200.000	2.288E+02	1.635E+01	2.993E+01	2.751E+02
300.000	7.873E+01	1.394E+00	2.572E+01	1.128E+02
400.000	3.807E+01	4.177E+00	2.419E+01	6.644E+01
500.000	2.219E+01	2.677E+00	2.222E+01	4.709E+01
600.000	1.455E+01	1.854E+00	2.063E+01	3.703E+01
800.000	7.773E+00	1.041E+00	1.821E+01	2.702E+01
1000.000	4.969E+00	6.626E-01	1.639E+01	2.202E+01

FLUORESCENT ENERGIES

66.820	8.806E+02	1.247E+02	3.269E+01	1.041E+03
75.736	6.179E+02	9.947E+01	3.292E+01	7.514E+02
9.441	4.030E+04	1.638E+03	1.458E+01	4.198E+04
11.069	2.616E+04	1.404E+03	1.635E+01	2.759E+04

CROSS SECTIONS FOR PLATINUM Z = 78 CM**2 . GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	5.421E+03	1.209E+01	3.309E-03	5.433E+03
1.500	2.092E+03	1.166E+01	6.202E-03	2.104E+03
2.000	1.064E+03	1.114E+01	9.159E-03	1.076E+03
2.121	9.273E+02	1.097E+01	9.821E-03	9.383E+02
2.122	3.146E+03	1.097E+01	9.826E-03	3.157E+03
2.201	2.849E+03	1.086E+01	1.026E-02	2.860E+03
2.202	3.980E+03	1.086E+01	1.027E-02	3.991E+03
2.644	2.422E+03	1.036E+01	1.276E-02	2.432E+03
2.645	3.232E+03	1.035E+01	1.276E-02	3.243E+03
3.000	2.296E+03	1.002E+01	1.482E-02	2.306E+03
3.025	2.245E+03	9.986E+00	1.495E-02	2.255E+03
3.026	2.533E+03	9.985E+00	1.496E-02	2.543E+03
3.296	2.008E+03	9.655E+00	1.641E-02	2.018E+03
3.297	2.167E+03	9.654E+00	1.642E-02	2.177E+03
4.000	1.282E+03	8.949E+00	2.024E-02	1.291E+03
5.000	6.993E+02	7.992E+00	2.533E-02	7.073E+02
6.000	4.262E+02	7.158E+00	3.031E-02	4.334E+02
8.000	1.951E+02	5.821E+00	3.921E-02	2.009E+02
10.000	1.064E+02	4.814E+00	4.723E-02	1.113E+02
11.563	7.172E+01	4.144E+00	5.195E-02	7.592E+01
11.564	1.888E+02	4.143E+00	5.195E-02	1.930E+02
13.272	1.323E+02	3.591E+00	5.687E-02	1.360E+02
13.273	1.865E+02	3.591E+00	5.687E-02	1.902E+02
13.891	1.658E+02	3.424E+00	5.859E-02	1.693E+02
13.892	1.923E+02	3.424E+00	5.859E-02	1.957E+02
15.000	1.575E+02	3.160E+00	6.162E-02	1.607E+02
20.000	7.394E+01	2.228E+00	7.196E-02	7.624E+01
30.000	2.496E+01	1.515E+00	8.545E-02	2.636E+01
40.000	1.138E+01	8.772E-01	9.335E-02	1.235E+01
50.000	6.138E+00	6.261E-01	9.783E-02	6.862E+00
60.000	3.687E+00	4.675E-01	1.003E-01	4.254E+00
78.394	1.730E+00	2.885E-01	1.018E-01	2.120E+00
78.395	8.866E+00	2.885E-01	1.018E-01	9.256E+00
80.000	8.398E+00	2.775E-01	1.019E-01	8.778E+00
100.000	4.606E+00	1.859E-01	1.015E-01	4.894E+00
150.000	1.534E+00	8.764E-02	9.804E-02	1.720E+00
200.000	7.054E-01	5.048E-02	9.240E-02	8.493E-01
300.000	2.430E-01	2.283E-02	8.249E-02	3.483E-01
400.000	1.175E-01	1.289E-02	7.468E-02	2.051E-01
500.000	6.850E-02	8.264E-03	6.859E-02	1.454E-01
600.000	4.490E-02	5.723E-03	6.369E-02	1.143E-01
800.000	2.400E-02	3.214E-03	5.622E-02	8.343E-02
1000.000	1.534E-02	2.044E-03	5.060E-02	6.798E-02

FLUORESCENT ENERGIES

66.820	2.719E+00	3.850E-01	1.009E-01	3.214E+00
75.736	1.907E+00	3.071E-01	1.016E-01	2.320E+00
9.441	1.244E+02	5.056E+00	4.502E-02	1.296E+02
11.069	8.075E+01	4.335E+00	5.048E-02	8.517E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PLATINUM

ATOMIC WEIGHT 195.090 GRAMS / MOLE
DENSITY 21.370 GRAMS / CC
ATOMIC DENSITY 6.597E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.239E+02

L-EDGES AT	11.564	13.273	13.892
L-EDGE JUMPS	2.632	1.410	1.160
L-EDGE FIT JUMPS	4.305	1.655	1.160

K-EDGE AT 78.395 KEV
K-EDGE JUMP 5.125

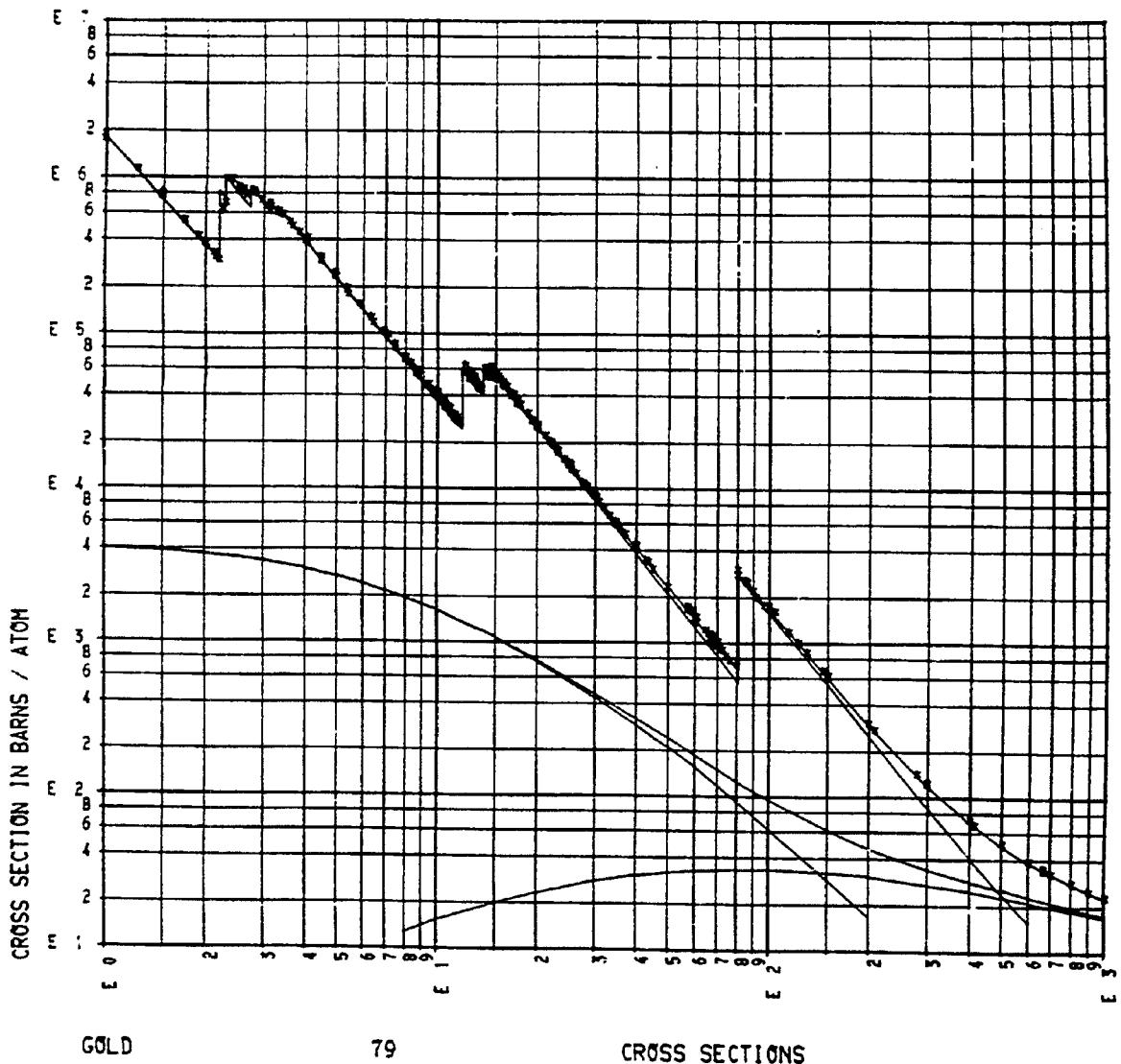
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	3.297	L	13.892	K	78.395
0	1.43785E+01	1.67024E+01		1.73636E+01		1.27882E+01	
1	-2.34834E+00	-2.71631E+00		-2.21112E+00		1.65605E+00	
2	0.	0.		-7.30934E-02		-8.98523E-01	
3	0.	0.		0.		6.18550E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.08084E+00	4.20186E-02
1	3.95790E-01	1.63611E+00
2	-3.48032E-01	-2.179.4E-01
3	1.62345E-02	5.52670E-03



GOLD

79

CROSS SECTIONS

CROSS SECTIONS FOR GOLD

Z = 79

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	1.867E+06	4.021E+03	1.042E+00	1.871E+06
1.500	7.263E+05	3.880E+03	1.964E+00	7.302E+05
2.000	3.717E+05	3.710E+03	2.916E+00	3.754E+05
2.205	2.962E+05	3.617E+03	3.283E+00	2.998E+05
2.206	5.597E+05	3.616E+03	3.284E+00	6.733E+05
2.290	6.082E+05	3.582E+03	3.437E+00	6.118E+05
2.291	1.079E+05	3.581E+03	3.458E+00	1.082E+06
2.742	6.787E+05	3.418E+03	4.276E+00	6.821E+05
2.743	8.671E+05	3.417E+03	4.278E+00	8.705E+05
3.000	6.883E+05	3.338E+03	4.768E+00	6.916E+05
3.148	6.079E+05	3.276E+03	5.025E+00	6.112E+05
3.149	6.862E+05	3.275E+03	5.027E+00	6.894E+05
3.424	5.529E+05	3.156E+03	5.508E+00	5.561E+05
3.425	5.967E+05	3.159E+03	5.509E+00	5.999E+05
4.000	3.999E+05	2.981E+03	6.525E+00	4.029E+05
5.000	2.250E+05	2.662E+03	8.207E+00	2.276E+05
6.000	1.406E+05	2.383E+03	9.817E+00	1.430E+05
8.000	6.696E+04	1.939E+03	1.276E+01	6.891E+04
10.000	3.767E+04	1.605E+03	1.525E+01	3.929E+04
11.917	2.397E+04	1.341E+03	1.712E+01	2.532E+04
11.918	5.844E+04	1.341E+03	1.712E+01	5.980E+04
13.732	4.056E+04	1.158E+03	1.879E+01	4.174E+04
13.733	5.718E+04	1.158E+03	1.879E+01	5.836E+04
14.352	5.101E+04	1.106E+03	1.934E+01	5.214E+04
14.353	5.916E+04	1.106E+03	1.934E+01	6.029E+04
15.000	5.277E+04	1.057E+03	1.991E+01	5.384E+04
20.000	2.485E+04	1.453E+02	2.330E+01	2.562E+04
30.000	8.438E+03	4.396E+02	2.784E+01	8.906E+03
40.000	3.870E+03	2.930E+02	3.048E+01	4.193E+03
50.000	2.098E+03	2.087E+02	3.198E+01	2.339E+03
60.000	1.266E+03	1.557E+02	3.282E+01	1.455E+03
80.000	5.655E+02	9.239E+01	3.337E+01	6.912E+02
80.722	5.513E+02	9.099E+01	3.336E+01	6.757E+02
80.723	2.710E+03	9.099E+01	3.336E+01	2.835E+03
100.000	1.580E+03	6.187E+01	3.325E+01	1.675E+03
150.000	5.441E+02	2.915E+01	3.214E+01	6.054E+02
200.000	2.511E+02	1.578E+01	3.029E+01	2.982E+02
300.000	8.517E+01	7.588E+00	2.703E+01	1.198E+02
400.000	4.059E+01	4.286E+00	2.449E+01	6.937E+01
500.000	2.343E+01	2.747E+00	2.250E+01	4.868E+01
600.000	1.529E+01	1.902E+00	2.089E+01	3.808E+01
800.000	8.192E+00	1.068E+00	1.842E+01	2.768E+01
1000.000	5.308E+00	6.800E-01	1.659E+01	2.258E+01

FLUORESCENT ENERGIES

68.779	8.636E+02	1.215E+02	3.308E+01	1.022E+03
77.968	6.077E+02	9.681E+01	3.332E+01	7.388E+02
9.711	4.063E+04	1.645E+03	1.490E+01	4.230E+04
11.439	2.663E+04	1.398E+03	1.666E+01	2.806E+04

CROSS SECTIONS FOR GOLD		Z = 79	CM**2 / GRAM	
KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	5.701E+03	1.228E+01	3.183E-03	5.714E+03
1.500	2.218E+03	1.165E+01	5.997E-03	2.230E+03
2.000	1.135E+03	1.133E+01	8.906E-03	1.147E+03
2.205	9.045E+02	1.105E+01	1.002E-02	9.155E+02
2.206	2.045E+03	1.104E+01	1.003E-02	2.056E+03
2.290	1.857E+03	1.094E+01	1.050E-02	1.868E+03
2.291	3.294E+03	1.094E+01	1.050E-02	3.305E+03
2.742	2.073E+03	1.044E+01	1.306E-02	2.083E+03
2.743	2.648E+03	1.044E+01	1.306E-02	2.658E+03
3.000	2.102E+03	1.020E+01	1.456E-02	2.112E+03
3.148	1.857E+03	1.000E+01	1.535E-02	1.867E+03
3.149	2.096E+03	1.000E+01	1.535E-02	2.106E+03
3.424	1.689E+03	9.679E+00	1.682E-02	1.698E+03
3.425	1.822E+03	9.678E+00	1.683E-02	1.832E+03
4.000	1.221E+03	9.105E+00	1.933E-02	1.231E+03
5.000	6.871E+02	8.129E+00	2.506E-02	6.952E+02
6.000	4.294E+02	7.279E+00	2.998E-02	4.367E+02
8.000	2.045E+02	5.921E+00	3.898E-02	2.105E+02
10.000	1.150E+02	4.902E+00	4.658E-02	1.200E+02
11.917	7.319E+01	4.094E+00	5.227E-02	7.734E+01
11.918	1.785E+02	4.094E+00	5.228E-02	1.826E+02
13.732	1.239E+02	3.537E+00	5.738E-02	1.275E+02
13.733	1.746E+02	3.537E+00	5.738E-02	1.782E+02
14.352	1.558E+02	3.379E+00	5.907E-02	1.592E+02
14.353	1.807E+02	3.379E+00	5.907E-02	1.841E+02
15.000	1.611E+02	3.227E+00	6.081E-02	1.644E+02
20.000	7.589E+01	2.210E+00	7.116E-02	7.824E+01
30.000	2.577E+01	1.342E+00	8.502E-02	2.720E+01
40.000	1.182E+01	8.948E-01	9.309E-02	1.281E+01
50.000	6.408E+00	6.373E-01	9.768E-02	7.143E+00
60.000	3.867E+00	4.754E-01	1.002E-01	4.442E+00
80.000	1.727E+00	2.822E-01	1.019E-01	2.111E+00
80.722	1.684E+00	2.779E-01	1.019E-01	2.064E+00
80.723	8.278E+00	2.779E-01	1.019E-01	8.657E+00
100.000	4.825E+00	1.890E-01	1.019E-01	5.116E+00
150.000	1.662E+00	8.902E-02	9.814E-02	1.849E+00
200.000	7.670E-01	5.126E-02	9.251E-02	9.108E-01
300.000	2.601E-01	2.317E-02	8.254E-02	3.658E-01
400.000	1.240E-01	1.309E-02	7.481E-02	2.119E-01
500.000	7.157E-02	8.389E-03	6.872E-02	1.487E-01
600.000	4.670E-02	5.809E-03	6.380E-02	1.163E-01
800.000	2.502E-02	3.262E-03	5.626E-02	8.455E-02
1000.000	1.621E-02	2.077E-03	5.068E-02	6.897E-02

FLUORESCENT ENERGIES

68.779	2.637E+00	3.711E-01	1.010E-01	3.121E+00
77.968	1.856E+00	2.956E-01	1.018E-01	2.256E+00
9.711	1.241E+02	5.025E+00	4.550E-02	1.292E+02
11.439	8.134E+01	4.270E+00	5.089E-02	8.569E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR GOLD

ATOMIC WEIGHT 197.200 GRAMS / MOLE
DENSITY 19.370 GRAMS / CC
ATOMIC DENSITY 5.916E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.274E+02

L-EDGES AT	11.918	13.733	14.353
L-EDGE JUMPS	2.439	1.410	1.160
L-EDGE FIT JUMPS	3.989	1.636	1.160

K-EDGE AT 80.723 KEV
K-EDGE JUMP 4.916

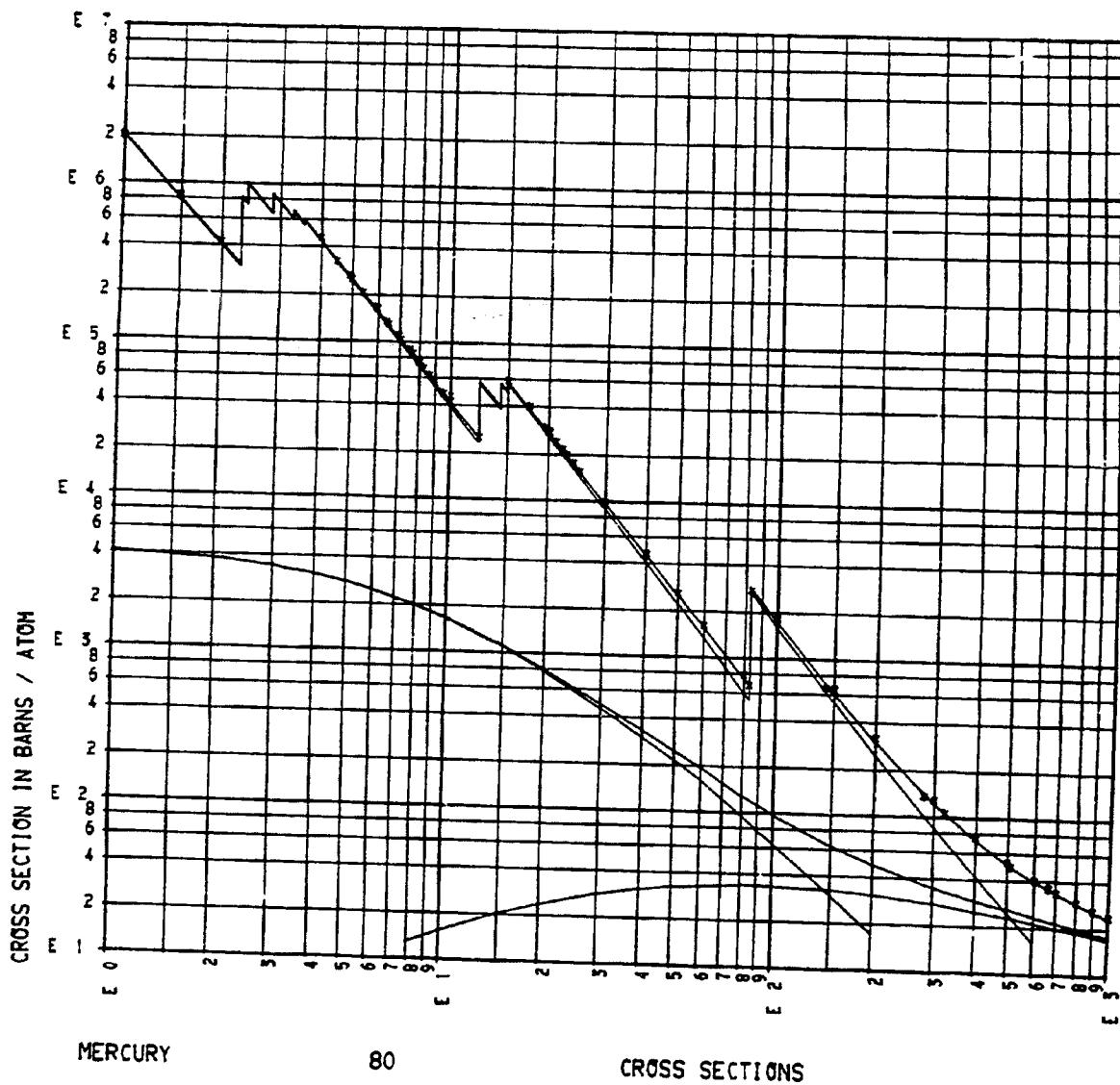
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
	3.425	14.353	80.723	
0	1.44398E+01	1.64734E+01	1.74240E+01	4.96352E+00
1	-2.32838E+00	-2.57834E+00	-2.23911E+00	5.79212E+00
2	0.	0.	-6.63720E-02	-1.61842E+00
3	0.	0.	0.	1.02911E-01

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.10524E+00	1.56916E-02
1	4.00576E-01	1.65406E+00
2	-3.49340E-01	-2.20982E-01
3	1.63264E-02	5.70751E-03



CROSS SECTIONS FOR MERCURY

Z = 80

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.022E+06	4.121E+03	1.152E+00	2.026E+06
1.500	7.860E+05	3.975E+03	2.127E+00	7.900E+05
2.000	4.021E+05	3.799E+03	5.089E+00	4.059E+05
2.294	2.921E+05	3.666E+03	3.617E+00	2.957E+05
2.295	8.067E+05	3.666E+03	3.619E+00	8.104E+05
2.384	7.305E+05	3.629E+03	3.781E+00	7.342E+05
2.385	1.014E+06	3.629E+03	3.783E+00	1.018E+06
2.846	6.400E+05	3.466E+03	4.637E+00	6.435E+05
2.847	8.596E+05	3.455E+03	4.639E+00	8.630E+05
3.000	7.499E+05	3.418E+03	4.927E+00	7.534E+05
3.279	5.948E+05	3.302E+03	5.413E+00	5.981E+05
3.280	6.713E+05	3.301E+03	5.414E+00	6.745E+05
3.561	5.419E+05	3.197E+03	5.906E+00	5.451E+05
3.562	5.848E+05	3.196E+03	5.908E+00	5.880E+05
4.000	4.322E+05	3.054E+03	6.679E+00	4.353E+05
5.000	2.416E+05	2.729E+03	8.350E+00	2.443E+05
6.000	1.502E+05	2.445E+03	9.947E+00	1.527E+05
8.000	7.096E+04	1.990E+03	1.289E+01	7.296E+04
10.000	3.966E+04	1.650E+03	1.541E+01	4.133E+04
12.283	2.321E+04	1.338E+03	1.763E+01	2.456E+04
12.284	5.570E+04	1.337E+03	1.764E+01	5.706E+04
14.208	3.857E+04	1.152E+03	1.941E+01	3.935E+04
14.209	5.438E+04	1.152E+03	1.941E+01	5.555E+04
14.845	4.865E+04	1.101E+03	1.997E+01	4.977E+04
14.846	5.643E+04	1.101E+03	1.998E+01	5.755E+04
15.000	5.496E+04	1.089E+03	2.011E+01	5.607E+04
20.000	2.523E+04	7.689E+02	2.352E+01	2.702E+04
30.000	9.028E+03	4.532E+02	2.809E+01	9.509E+03
40.000	4.164E+03	3.018E+02	3.077E+01	4.497E+03
50.000	2.263E+03	2.148E+02	3.230E+01	2.510E+03
60.000	1.366E+03	1.601E+02	3.315E+01	1.559E+03
80.000	6.091E+02	9.503E+01	3.373E+01	1.388E+02
83.102	5.468E+02	8.903E+01	3.371E+01	6.695E+02
83.103	2.747E+03	8.903E+01	3.371E+01	2.870E+03
100.000	1.625E+03	6.362E+01	3.362E+01	1.722E+03
150.000	5.269E+02	2.996E+01	3.252E+01	5.894E+02
200.000	2.429E+02	1.725E+01	3.066E+01	2.908E+02
300.000	8.515E+01	7.794E+00	2.736E+01	1.203E+02
400.000	4.195E+01	4.403E+00	2.480E+01	1.115E+01
500.000	2.480E+01	2.822E+00	2.278E+01	5.040E+01
600.000	1.541E+01	1.954E+00	2.115E+01	3.951E+01
800.000	8.834E+00	1.098E+00	1.865E+01	2.859E+01
1000.000	5.630E+00	6.970E-01	1.680E+01	2.313E+01

FLUORESCENT ENERGIES

70.821	8.576E+02	1.185E+02	3.348E+01	1.013E+03
80.258	6.035E+02	9.451E+01	3.372E+01	7.318E+02
9.987	3.980E+04	1.651E+03	1.539E+01	4.147E+04
11.823	2.553E+04	1.391E+03	1.720E+01	2.705E+04

CROSS SECTIONS FOR MERCURY Z = 80 CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	6.070E+03	1.237E+01	3.457E-03	6.082E+03
1.500	2.360E+03	1.193E+01	6.386E-03	2.372E+03
2.000	1.207E+03	1.141E+01	9.273E-03	1.218E+03
2.294	9.768E+02	1.101E+01	1.086E-02	8.879E+02
2.295	2.422E+03	1.100E+01	1.087E-02	2.433E+03
2.384	2.193E+03	1.090E+01	1.135E-02	2.204E+03
2.385	3.046E+03	1.089E+01	1.136E-02	3.057E+03
2.846	1.921E+03	1.040E+01	1.392E-02	1.932E+03
2.847	2.581E+03	1.040E+01	1.393E-02	2.591E+03
3.000	2.251E+03	1.026E+01	1.479E-02	2.262E+03
3.279	1.786E+03	9.912E+00	1.625E-02	1.795E+03
3.280	2.015E+03	9.910E+00	1.625E-02	2.025E+03
3.561	1.627E+03	9.596E+00	1.773E-02	1.636E+03
3.562	1.756E+03	9.595E+00	1.774E-02	1.765E+03
4.000	1.298E+03	9.169E+00	2.005E-02	1.307E+03
5.000	7.253E+02	8.191E+00	2.507E-02	7.335E+02
6.000	4.509E+02	7.339E+00	2.986E-02	4.583E+02
8.000	2.130E+02	5.975E+00	3.869E-02	2.190E+02
10.000	1.191E+02	4.952E+00	4.625E-02	1.241E+02
12.283	6.967E+01	4.016E+00	5.294E-02	7.374E+01
12.284	1.672E+02	4.015E+00	5.294E-02	7.713E+02
14.208	1.158E+02	3.458E+00	5.826E-02	1.193E+02
14.209	1.633E+02	3.458E+00	5.826E-02	1.668E+02
14.845	1.461E+02	3.306E+00	5.996E-02	1.494E+02
14.846	1.694E+02	3.305E+00	5.997E-02	1.728E+02
15.000	1.650E+02	3.270E+00	6.038E-02	1.683E+02
20.000	7.675E+01	2.308E+00	7.061E-02	8.113E+01
30.000	2.710E+01	1.360E+00	8.432E-02	2.855E+01
40.000	1.250E+01	9.061E-01	9.238E-02	1.350E+01
50.000	6.793E+00	6.448E-01	9.697E-02	7.535E+00
60.000	4.101E+00	4.807E-01	9.953E-02	4.692E+00
80.000	1.829E+00	2.853E-01	1.012E-01	2.215E+00
83.102	1.642E+00	2.673E-01	1.012E-01	2.010E+00
83.103	8.248E+00	2.673E-01	1.012E-01	8.617E+00
100.000	4.879E+00	1.910E-01	1.009E-01	5.171E+00
150.000	1.582E+00	8.993E-02	9.762E-02	1.169E+00
200.000	7.292E-01	5.177E-02	9.204E-02	8.730E-01
300.000	2.556E-01	2.340E-02	8.214E-02	3.612E-01
400.000	1.259E-01	1.322E-02	7.445E-02	2.136E-01
500.000	7.445E-02	8.472E-03	6.839E-02	1.513E-01
600.000	4.925E-02	5.866E-03	6.350E-02	1.186E-01
800.000	2.652E-02	3.296E-03	5.606E-02	8.582E-02
1000.000	1.690E-02	2.092E-03	5.045E-02	6.944E-02

FLUORESCENT ENERGIES

70.821	2.575E+00	3.559E-01	1.005E-01	3.041E+00
80.258	1.812E+00	2.837E-01	1.012E-01	2.197E+00
9.987	1.195E+02	4.958E+00	4.620E-02	1.245E+02
11.823	7.696E+01	4.175E+00	5.163E-02	8.121E+01

BC - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR MERCURY

ATOMIC WEIGHT 200.510 GRAMS / MOLE
DENSITY 13.545 GRAMS / CC
ATOMIC DENSITY 4.067E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.331E+02

L-EDGES AT	12.284	14.209	14.846
L-EDGE JUMPS	2.400	1.410	1.160
L-EDGE FIT JUMPS	3.926	1.636	1.160

K-EDGE AT 83.103 KEY
K-EDGE JUMP 5.025

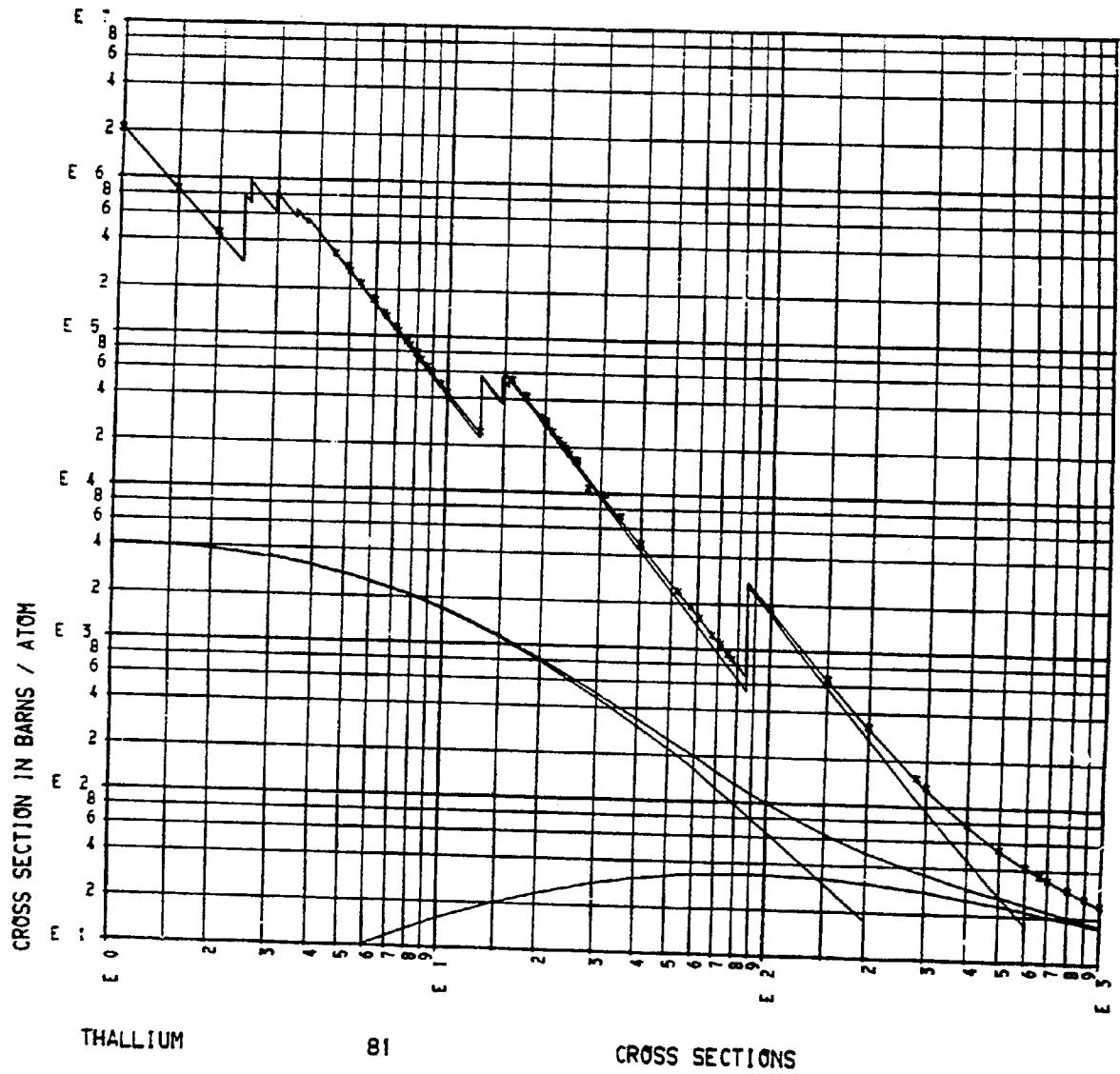
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	3.562	L	14.846	K	83.103
0	1.45195E+01	1.65903E+01		1.71857E+01		1.97594E+01	
1	-2.33016E+00	-2.50670E+00		-2.68470E+00		-3.03990E+00	
2	0.	0.		-8.53294E-02		-2.76981E-01	
3	0.	0.		0.		2.68856E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.12542E+00	1.14587E-01
1	4.05858E-01	1.58076E+00
2	-3.50329E-01	-2.02968E-01
3	1.63772E-02	4.35692E-03



CROSS SECTIONS FOR THALLIUM		Z = 81	BARNS / ATOM	
KEY	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	2.079E+06	4.216E+03	1.170E+00	2.083E+06
1.500	8.289E+05	4.061E+03	2.170E+00	8.330E+05
2.000	4.317E+05	3.878E+03	3.158E+00	4.356E+05
2.388	2.888E+05	3.704E+03	3.889E+00	2.925E+05
2.389	1.700E+05	3.704E+03	3.891E+00	1.737E+05
2.484	6.953E+05	3.667E+03	4.071E+00	6.990E+05
2.485	9.656E+05	3.566E+03	4.073E+00	9.693E+05
2.955	6.138E+05	3.506E+03	4.976E+00	6.173E+05
2.956	8.243E+05	3.505E+03	4.978E+00	8.279E+05
3.000	7.931E+05	3.492E+03	5.064E+00	7.966E+05
3.415	5.651E+05	3.321E+03	5.797E+00	5.684E+05
3.416	6.379E+05	3.321E+03	5.799E+00	6.412E+05
3.699	5.180E+05	3.220E+03	5.302E+00	5.212E+05
3.700	5.590E+05	3.220E+03	6.303E+00	5.622E+05
4.000	4.559E+05	3.124E+03	6.838E+00	4.590E+05
5.000	2.543E+05	2.793E+03	8.511E+00	2.571E+05
6.000	1.578E+05	2.505E+03	1.010E+01	1.604E+05
8.000	7.437E+04	2.042E+03	1.304E+01	7.642E+04
10.000	4.148E+04	1.594E+03	1.557E+01	4.319E+04
12.656	2.240E+04	1.334E+03	1.813E+01	2.375E+04
12.657	5.595E+04	1.334E+03	1.813E+01	5.731E+04
14.597	3.792E+04	1.146E+03	1.997E+01	3.908E+04
14.698	5.345E+04	1.146E+03	1.997E+01	5.462E+04
15.000	5.069E+04	1.122E+03	2.023E+01	5.183E+04
15.343	4.778E+04	1.092E+03	2.048E+01	4.889E+04
15.344	5.542E+04	1.092E+03	2.048E+01	5.653E+04
20.000	2.764E+04	7.928E+02	2.368E+01	2.845E+04
30.000	9.419E+03	4.674E+02	2.836E+01	9.915E+03
40.000	4.351E+03	3.111E+02	3.107E+01	4.594E+03
50.000	2.378E+03	2.220E+02	3.263E+01	2.633E+03
60.000	1.447E+03	1.656E+02	3.350E+01	1.647E+03
80.000	6.572E+02	9.830E+01	3.409E+01	7.896E+02
85.527	5.465E+02	8.760E+01	3.406E+01	6.682E+02
85.528	2.567E+03	8.759E+01	3.406E+01	2.769E+03
100.000	1.749E+03	6.583E+01	3.398E+01	1.849E+03
150.000	5.865E+02	3.101E+01	3.289E+01	6.504E+02
200.000	2.724E+02	1.785E+01	3.102E+01	3.215E+02
300.000	9.493E+01	8.071E+00	2.772E+01	1.507E+02
400.000	4.619E+01	4.559E+00	2.510E+01	7.585E+01
500.000	2.696E+01	2.922E+00	2.306E+01	5.294E+01
600.000	1.764E+01	2.023E+00	2.141E+01	4.108E+01
800.000	9.339E+00	1.136E+00	1.890E+01	2.938E+01
1000.000	5.884E+00	7.230E-01	1.701E+01	2.362E+01

FLUORESCENT ENERGIES

72.860	8.494E+02	1.165E+02	3.390E+01	1.003E+03
82.558	6.025E+02	9.310E+01	3.407E+01	7.298E+02
10.266	3.873E+04	1.649E+03	1.584E+01	4.041E+04
12.210	2.461E+04	1.384E+03	1.771E+01	2.602E+04

CROSS SECTIONS FOR THALLIUM		Z = 81	CM**2 / GRAM	
KEV	PHOTC	COHERENT	INCOHERENT	TOTAL
1.000	6.126E+03	1.242E+01	3.448E-03	6.138E+03
1.500	2.442E+03	1.197E+01	6.394E-03	2.454E+03
2.000	1.272E+03	1.143E+01	9.335E-03	1.283E+03
2.388	8.509E+02	1.092E+01	1.145E-02	8.518E+02
2.389	2.269E+03	1.091E+01	1.147E-02	2.280E+03
2.484	2.049E+03	1.080E+01	1.195E-02	2.060E+03
2.485	2.845E+03	1.080E+01	1.200E-02	2.856E+03
2.955	1.809E+03	1.033E+01	1.466E-02	1.819E+03
2.956	2.429E+03	1.033E+01	1.467E-02	2.439E+03
3.000	2.337E+03	1.029E+01	1.492E-02	2.347E+03
3.415	1.665E+03	9.786E+00	1.708E-02	1.675E+03
3.416	1.880E+03	9.785E+00	1.709E-02	1.889E+03
3.699	1.526E+03	9.489E+00	1.857E-02	1.536E+03
3.700	1.647E+03	9.488E+00	1.857E-02	1.657E+03
4.000	1.343E+03	9.206E+00	2.015E-02	1.353E+03
5.000	7.493E+02	8.231E+00	2.508E-02	7.576E+02
6.000	4.651E+02	7.380E+00	2.976E-02	4.725E+02
8.000	2.191E+02	6.016E+00	3.842E-02	2.252E+02
10.000	1.222E+02	4.991E+00	4.588E-02	1.273E+02
12.656	6.601E+01	3.932E+00	5.341E-02	6.999E+01
12.657	1.649E+02	3.931E+00	5.342E-02	1.689E+02
14.697	1.117E+02	3.376E+00	5.883E-02	1.152E+02
14.698	1.575E+02	3.376E+00	5.883E-02	1.609E+02
15.000	1.494E+02	3.306E+00	5.961E-02	1.527E+02
15.343	1.408E+02	3.218E+00	6.035E-02	1.441E+02
15.344	1.633E+02	3.216E+00	6.035E-02	1.666E+02
20.000	8.143E+01	2.336E+00	6.978E-02	8.384E+01
30.000	2.776E+01	1.377E+00	8.351E-02	2.922E+01
40.000	1.282E+01	9.183E-01	9.155E-02	1.383E+01
50.000	7.008E+00	6.542E-01	9.619E-02	7.759E+00
60.000	4.265E+00	4.880E-01	9.871E-02	4.852E+00
80.000	1.936E+00	2.896E-01	1.004E-01	2.326E+00
85.527	1.610E+00	2.581E-01	1.004E-01	1.969E+00
85.528	7.858E+00	2.581E-01	1.004E-01	8.217E+00
100.000	5.154E+00	1.940E-01	1.001E-01	5.448E+00
150.000	1.728E+00	9.137E-02	9.691E-02	1.916E+00
200.000	8.028E-01	5.261E-02	9.140E-02	9.468E-01
300.000	2.797E-01	2.378E-02	8.168E-02	3.852E-01
400.000	1.361E-01	1.343E-02	7.396E-02	2.235E-01
500.000	7.945E-02	8.610E-03	6.795E-02	2.560E-01
600.000	5.199E-02	5.961E-03	6.309E-02	1.210E-01
800.000	2.752E-02	3.347E-03	5.569E-02	8.656E-02
1000.000	1.734E-02	2.130E-03	5.012E-02	6.959E-02

FLUORESCENT ENERGIES

72.860	2.503E+00	3.432E-01	9.988E-02	2.954E+00
82.558	1.775E+00	2.743E-01	1.004E-01	2.151E+00
10.266	1.141E+02	4.860E+00	4.666E-02	1.191E+02
12.210	7.250E+01	4.077E+00	5.219E-02	7.667E+01

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REVISED 5/03/69

MISCELLANEOUS DATA FOR THALLIUM

ATOMIC WEIGHT 204.390 GRAMS / MOLE
DENSITY 11.860 GRAMS / CC
ATOMIC DENSITY 3.495E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.394E+02

L-EDGES AT 13.651 14.698 15.344
L-EDGE JUMPS 2.498 1.410 1.150
L-EDGE FIT JUMPS 4.085 1.636 1.160

K-EDGE AT 85.528 KEV
K-EDGE JUMP 4.880

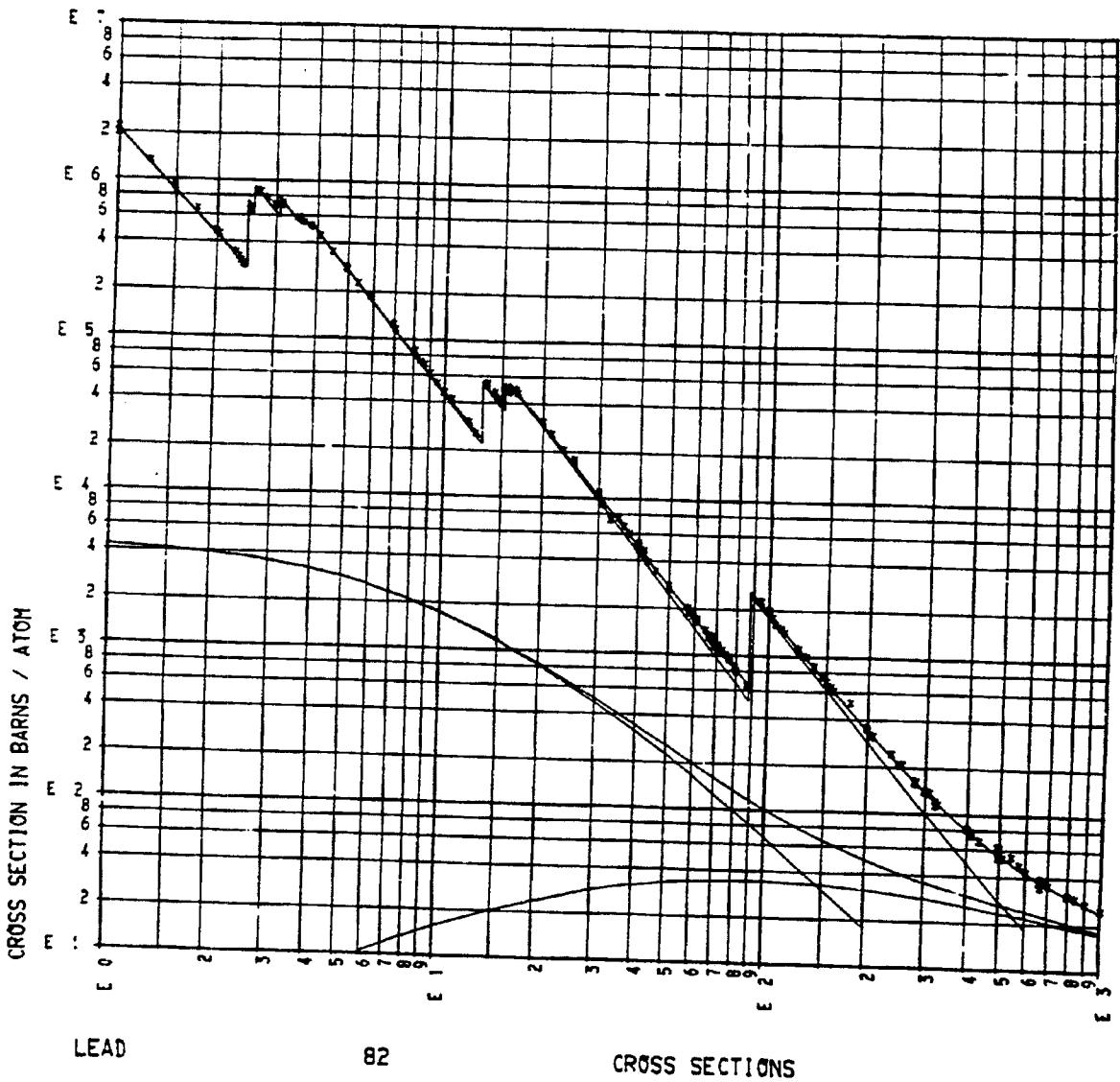
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
	3.700	15.344	85.528	
0	1.45473E+01	1.66564E+01	1.77379E+01	1.52879E+01
1	-2.26773E+00	-2.61593E+00	-2.37746E+00	2.73654E-01
2	0.	0.	-4.33223E-02	-6.38890E-01
3	0.	0.	0.	4.57495E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.14399E+00	1.47052E-01
1	4.08692E-01	1.56695E+00
2	-3.49802E-01	-2.00347E-01
3	1.62888E-02	4.20901E-03



CROSS SECTIONS FOR LEAD

Z = 82

BARNs / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.142E+06	4.317E+03	1.185E+00	2.146E+06
1.500	8.591E+05	4.154E+03	2.210E+00	8.633E+05
2.000	4.493E+05	3.964E+03	3.242E+00	4.533E+05
2.483	2.760E+05	3.747E+03	4.170E+00	2.798E+05
2.484	2.362E+05	3.747E+03	4.172E+00	2.400E+05
2.585	6.633E+05	3.708E+03	4.370E+00	6.670E+05
2.586	9.213E+05	3.708E+03	4.372E+00	9.250E+05
3.000	6.248E+05	3.567E+03	5.196E+00	6.283E+05
3.065	5.907E+05	3.538E+03	5.313E+00	5.942E+05
3.066	7.934E+05	3.537E+03	5.314E+00	7.969E+05
3.553	5.396E+05	3.342E+03	6.190E+00	5.429E+05
3.554	6.090E+05	3.342E+03	6.192E+00	6.124E+05
3.849	4.944E+05	3.241E+03	6.724E+00	4.976E+05
3.850	5.336E+05	3.241E+03	6.726E+00	5.368E+05
4.000	4.828E+05	3.193E+03	6.997E+00	4.860E+05
5.000	2.694E+05	2.858E+03	8.675E+00	2.722E+05
6.000	1.672E+05	2.556E+03	1.026E+01	1.698E+05
8.000	2.879E+04	2.093E+03	1.319E+01	8.090E+04
10.000	4.396E+04	1.738E+03	1.556E+01	4.571E+04
13.034	2.198E+04	1.332E+03	1.843E+01	2.333E+04
13.035	5.421E+04	1.331E+03	1.843E+01	5.556E+04
15.000	3.754E+04	1.155E+03	2.016E+01	3.871E+04
15.197	3.627E+04	1.137E+03	2.031E+01	3.743E+04
15.198	5.114E+04	1.137E+03	2.031E+01	5.230E+04
15.859	4.573E+04	1.081E+03	2.080E+01	4.683E+04
15.860	5.303E+04	1.081E+03	2.080E+01	5.414E+04
20.000	2.875E+04	9.170E+02	2.367E+01	2.959E+04
30.000	9.745E+03	4.812E+02	2.854E+01	1.025E+04
40.000	4.482E+03	3.201E+02	3.132E+01	4.833E+03
50.000	2.441E+03	2.275E+02	3.292E+01	2.701E+03
60.000	1.480E+03	1.593E+02	3.382E+01	1.684E+03
80.000	6.686E+02	1.005E+02	3.443E+01	8.035E+02
88.005	5.128E+02	8.515E+01	3.439E+01	6.324E+02
88.006	2.456E+03	8.515E+01	3.459E+01	2.576E+03
100.000	1.777E+03	6.727E+01	3.434E+01	1.870E+03
150.000	6.203E+02	3.164E+01	3.327E+01	6.852E+02
200.000	2.905E+02	1.821E+01	3.139E+01	3.401E+02
300.000	1.005E+02	8.226E+00	2.804E+01	1.368E+02
400.000	4.833E+01	4.647E+00	2.540E+01	7.837E+01
500.000	2.793E+01	2.977E+00	2.334E+01	5.425E+01
600.000	1.815E+01	2.062E+00	2.167E+01	4.188E+01
800.000	9.549E+00	1.158E+00	1.912E+01	2.983E+01
1000.000	6.028E+00	7.360E-01	1.722E+01	2.398E+01

FLUORESCENT ENERGIES

74.957	8.004E+02	1.131E+02	3.429E+01	9.500E+02
84.922	5.663E+02	9.061E+01	3.441E+01	6.916E+02
10.549	3.822E+04	1.647E+03	1.610E+01	3.991E+04
12.611	2.396E+04	1.376E+03	1.805E+01	2.537E+04

CROSS SECTIONS FOR LEAD

Z = 82

CM**2 / GRAM

KEV	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	6.225E+03	1.255E+01	3.444E-03	5.237E+03
1.500	2.497E+03	1.207E+01	6.423E-03	2.509E+03
2.000	1.306E+03	1.152E+01	9.423E-03	1.318E+03
2.483	8.022E+02	1.089E+01	1.212E-02	8.131E+02
2.484	2.140E+03	1.089E+01	1.212E-02	2.151E+03
2.585	1.928E+03	1.078E+01	1.270E-02	1.939E+03
2.586	2.678E+03	1.078E+01	1.271E-02	2.688E+03
3.000	1.816E+03	1.037E+01	1.510E-02	1.826E+03
3.065	1.717E+03	1.028E+01	1.544E-02	1.727E+03
3.066	2.305E+03	1.028E+01	1.545E-02	2.315E+03
3.553	1.568E+03	9.715E+00	1.799E-02	1.578E+03
3.554	1.770E+03	9.714E+00	1.800E-02	1.780E+03
3.849	1.437E+03	9.420E+00	1.954E-02	1.446E+03
3.850	1.551E+03	9.419E+00	1.955E-02	1.560E+03
4.000	1.403E+03	9.282E+00	2.034E-02	1.413E+03
5.000	7.829E+02	8.307E+00	2.521E-02	7.912E+02
6.000	4.860E+02	7.455E+00	2.982E-02	4.935E+02
8.000	2.290E+02	6.084E+00	3.834E-02	2.351E+02
10.000	1.278E+02	5.052E+00	4.522E-02	1.329E+02
13.034	6.389E+01	3.870E+00	5.357E-02	6.781E+01
13.035	1.575E+02	3.870E+00	5.357E-02	1.615E+02
15.000	1.091E+02	3.357E+00	5.859E-02	1.125E+02
15.197	1.054E+02	3.305E+00	5.902E-02	1.088E+02
15.198	1.486E+02	3.305E+00	5.902E-02	1.520E+02
15.859	1.329E+02	3.141E+00	6.044E-02	1.361E+02
15.860	1.541E+02	3.141E+00	6.045E-02	1.573E+02
20.000	8.357E+01	2.375E+00	6.880E-02	8.602E+01
30.000	2.832E+01	1.399E+00	8.295E-02	2.981E+01
40.000	1.303E+01	9.303E-01	9.103E-02	1.405E+01
50.000	7.094E+00	6.611E-01	9.568E-02	7.851E+00
60.000	4.303E+00	4.922E-01	9.830E-02	4.893E+00
80.000	1.943E+00	2.922E-01	1.001E-01	2.335E+00
88.005	1.491E+00	2.475E-01	9.996E-02	1.838E+00
88.006	7.139E+00	2.475E-01	9.996E-02	1.486E+00
100.000	5.156E+00	1.955E-01	9.981E-02	5.461E+00
150.000	1.803E+00	9.197E-02	9.670E-02	1.992E+00
200.000	8.445E-01	5.292E-02	9.123E-02	9.886E-01
300.000	2.922E-01	2.391E-02	8.150E-02	3.976E-01
400.000	1.405E-01	1.351E-02	7.382E-02	2.278E-01
500.000	8.118E-02	8.653E-03	6.784E-02	1.577E-01
600.000	5.275E-02	5.993E-03	6.298E-02	1.217E-01
800.000	2.775E-02	3.366E-03	5.557E-02	8.669E-02
1000.000	1.752E-02	2.139E-03	5.005E-02	6.971E-02

FLUORESCENT ENERGIES

74.957	2.326E+00	3.288E-01	9.967E-02	2.761E+00
84.922	1.646E+00	2.633E-01	1.000E-01	2.010E+00
10.549	1.111E+02	4.787E+00	4.680E-02	1.160E+02
12.611	6.955E+01	4.001E+00	5.245E-02	7.373E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR LEAD

ATOMIC WEIGHT 207.210 GRAMS / MOLE
DENSITY 11.340 GRAMS / CC
ATOMIC DENSITY 3.296E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.441E+02

L-EDGES AT	13.035	15.198	15.860
L-EDGE JUMPS	2.465	1.410	1.160
L-EDGE FIT JUMPS	4.034	1.636	1.160

K-EDGE AT 88.006 KEV
K-EDGE JUMP 4.789

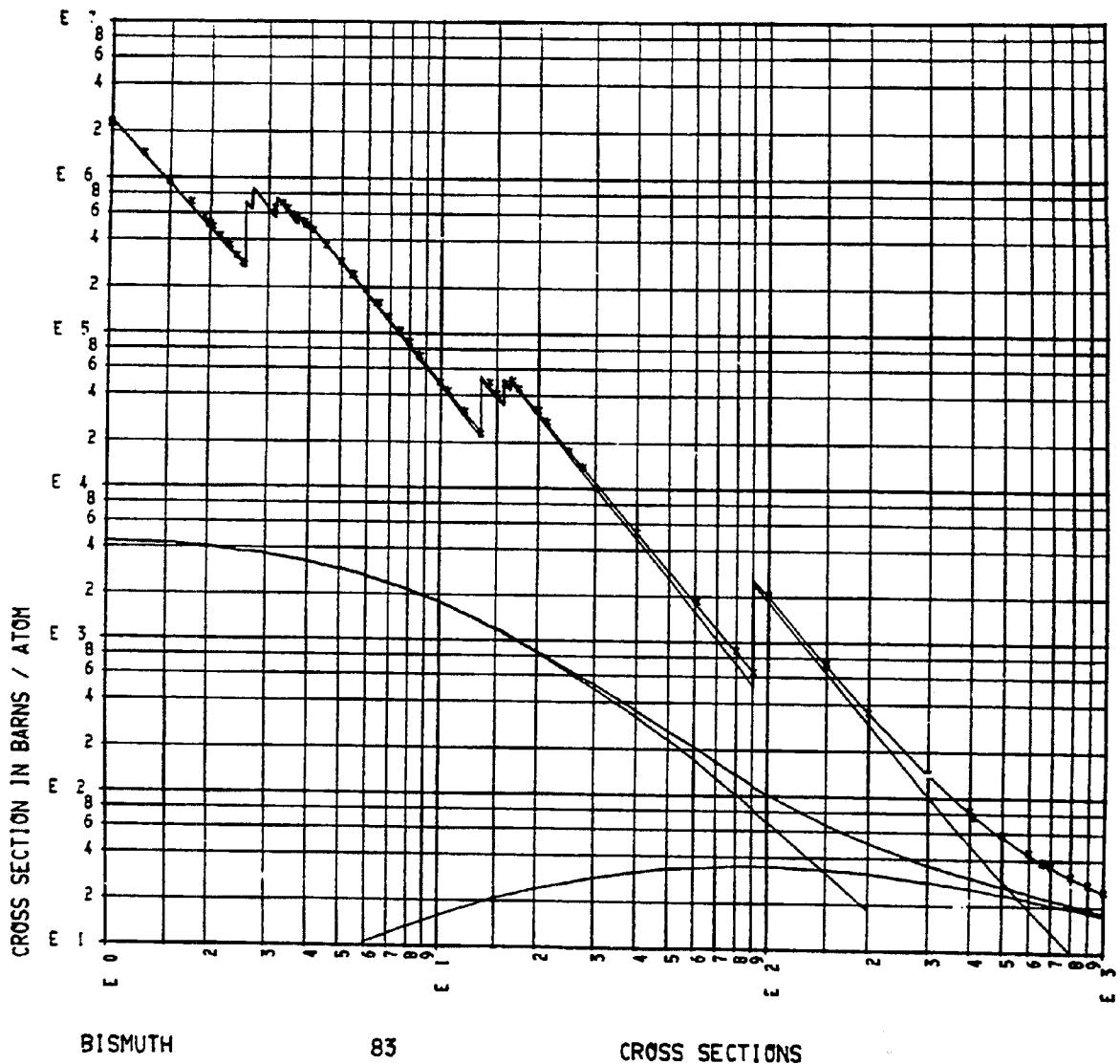
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	3.850	L	15.860	K	88.006
0	1.45771E+01	1.67131E+01		1.77963E+01		8.63374E+00	
1	-2.25279E+00	-2.61538E+00		-2.37691E+00		3.59400E+00	
2	0.	0.		-4.55883E-02		-1.21312E+00	
3	0.	0.		0.		7.74601E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.15996E+00	1.82167E-01
1	4.18031E-01	1.54661E+00
2	-3.52330E-01	-1.95793E-01
3	1.64660E-02	3.90772E-03



CROSS SECTIONS FOR BISMUTH		Z = 83	BARNES / ATOM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.381E+06	4.417E+03	1.183E+00	2.386E+06
1.500	9.336E+05	4.246E+03	2.228E+00	9.379E+05
2.000	4.804E+05	4.048E+03	3.297E+00	4.845E+05
2.578	2.673E+05	3.788E+03	4.450E+00	2.711E+05
2.579	6.823E+05	3.788E+03	4.452E+00	6.861E+05
2.686	6.142E+05	3.748E+03	4.671E+00	6.179E+05
2.687	8.479E+05	3.747E+03	4.673E+00	8.516E+05
3.000	6.376E+05	3.641E+03	5.322E+00	6.413E+05
3.176	5.502E+05	3.562E+03	5.644E+00	5.538E+05
3.177	7.435E+05	3.562E+03	5.646E+00	7.471E+05
3.695	5.031E+05	3.352E+03	5.596E+00	5.064E+05
3.696	5.679E+05	3.362E+03	5.598E+00	5.713E+05
3.998	4.635E+05	3.262E+03	7.154E+00	4.668E+05
3.999	5.002E+05	3.262E+03	7.156E+00	5.035E+05
4.000	4.999E+05	3.261E+03	7.158E+00	5.032E+05
5.000	2.807E+05	2.922E+03	8.844E+00	2.836E+05
6.000	1.752E+05	2.625E+03	1.043E+01	1.778E+05
8.000	8.323E+04	2.145E+03	1.335E+01	8.539E+04
10.000	4.673E+04	1.782E+03	1.591E+01	4.853E+04
13.417	2.185E+04	1.329E+03	1.929E+01	2.320E+04
13.418	5.109E+04	1.329E+03	1.929E+01	5.243E+04
15.000	3.845E+04	1.188E+03	2.075E+01	3.965E+04
15.707	3.417E+04	1.125E+03	2.127E+01	3.532E+04
15.708	4.818E+04	1.124E+03	2.127E+01	4.932E+04
16.384	4.324E+04	1.069E+03	2.176E+01	4.433E+04
16.385	5.015E+04	1.069E+03	2.176E+01	5.125E+04
20.000	2.999E+04	8.416E+02	2.421E+01	3.086E+04
30.000	1.039E+04	4.951E+02	2.886E+01	1.091E+04
40.000	4.838E+03	3.284E+02	3.165E+01	5.198E+03
50.000	2.657E+03	2.328E+02	3.326E+01	2.923E+03
60.000	1.621E+03	1.729E+02	3.417E+01	1.828E+03
80.000	7.370E+02	1.027E+02	3.480E+01	8.745E+02
90.526	5.238E+02	8.264E+01	3.475E+01	6.412E+02
90.527	2.476E+03	8.263E+01	3.475E+01	2.593E+03
100.000	1.912E+03	6.865E+01	3.472E+01	2.016E+03
150.000	6.551E+02	3.224E+01	3.365E+01	1.210E+02
200.000	3.045E+02	1.854E+01	3.175E+01	3.548E+02
300.000	1.051E+02	8.371E+00	2.836E+01	1.418E+02
400.000	5.071E+01	4.728E+00	2.571E+01	8.115E+01
500.000	2.950E+01	3.029E+00	2.362E+01	5.615E+01
600.000	1.931E+01	2.098E+00	2.194E+01	4.335E+01
800.000	1.033E+01	1.178E+00	1.935E+01	3.086E+01
1000.000	6.627E+00	7.490E-01	1.743E+01	2.481E+01

FLUORESCENT ENERGIES

77.097	8.156E+02	1.098E+02	3.472E+01	9.614E+02
87.335	5.784E+02	8.801E+01	3.477E+01	7.016E+02
10.836	3.797E+04	1.645E+03	1.677E+01	3.967E+04
13.021	2.361E+04	1.369E+03	1.892E+01	2.501E+04

CROSS SECTIONS FOR BISMUTH		Z = 83	CM**2 / GRAM	
KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	6.862E+03	1.273E+01	3.409E-03	6.875E+03
1.500	2.690E+03	1.224E+01	6.420E-02	2.703E+03
2.000	1.384E+03	1.167E+01	9.501E-02	1.396E+03
2.578	7.703E+02	1.092E+01	1.282E-02	7.812E+02
2.579	1.966E+03	1.092E+01	1.283E-02	1.977E+03
2.686	1.770E+03	1.080E+01	1.346E-02	1.781E+03
2.687	2.443E+03	1.080E+01	1.347E-02	2.454E+03
3.000	1.837E+03	1.049E+01	1.534E-02	1.848E+03
3.176	1.585E+03	1.027E+01	1.626E-02	1.596E+03
3.177	2.143E+03	1.026E+01	1.627E-02	2.153E+03
3.695	1.450E+03	9.688E+00	1.901E-02	1.459E+03
3.696	1.636E+03	9.687E+00	1.901E-02	1.646E+03
3.998	1.336E+03	9.400E+00	2.051E-02	1.345E+03
3.999	1.441E+03	9.399E+00	2.062E-02	1.451E+03
4.000	1.441E+03	9.398E+00	2.063E-02	1.450E+03
5.000	8.089E+02	8.420E+00	2.548E-02	8.173E+02
6.000	5.047E+02	7.564E+00	3.004E-02	5.123E+02
8.000	2.398E+02	6.181E+00	3.846E-02	2.461E+02
10.000	1.347E+02	5.136E+00	4.585E-02	1.399E+02
13.417	6.296E+01	3.829E+00	5.559E-02	6.685E+01
13.418	1.472E+02	3.829E+00	5.559E-02	1.511E+02
15.000	1.108E+02	3.423E+00	5.980E-02	1.143E+02
15.707	9.648E+01	3.241E+00	6.129E-02	1.018E+02
15.708	1.388E+02	3.240E+00	6.130E-02	1.421E+02
16.384	1.246E+02	3.081E+00	6.270E-02	1.278E+02
16.385	1.445E+02	3.081E+00	6.270E-02	1.477E+02
20.000	8.643E+01	2.425E+00	6.976E-02	8.892E+01
30.000	2.994E+01	1.427E+00	8.316E-02	3.145E+01
40.000	1.394E+01	9.464E-01	9.120E-02	1.498E+01
50.000	7.655E+00	6.707E-01	9.584E-02	8.422E+00
60.000	4.670E+00	4.982E-01	9.846E-02	5.267E+00
80.000	2.124E+00	2.959E-01	1.003E-01	2.520E+00
90.526	1.509E+00	2.381E-01	1.001E-01	1.848E+00
90.527	7.134E+00	2.381E-01	1.001E-01	7.473E+00
100.000	5.510E+00	1.978E-01	1.000E-01	5.808E+00
150.000	1.888E+00	9.291E-02	9.697E-02	2.078E+00
200.000	8.775E-01	5.342E-02	9.150E-02	1.022E+00
300.000	3.028E-01	2.412E-02	8.172E-02	4.086E-01
400.000	1.461E-01	1.362E-02	7.409E-02	2.339E-01
500.000	8.501E-02	8.728E-03	6.808E-02	1.616E-01
600.000	5.565E-02	6.046E-03	6.322E-02	1.249E-01
800.000	2.976E-02	3.395E-03	5.576E-02	8.891E-02
1000.000	1.910E-02	2.158E-03	5.023E-02	7.149E-02

FLUORESCENT ENERGIES

77.097	2.350E+00	3.164E-01	1.000E-01	2.770E+00
87.335	1.667E+00	2.536E-01	1.002E-01	2.022E+00
10.836	1.094E+02	4.740E+00	4.833E-02	1.143E+02
13.021	6.804E+01	3.946E+00	5.451E-02	7.207E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR BISMUTH

ATOMIC WEIGHT 209.000 GRAMS / MOLE
DENSITY 9.800 GRAMS / CC
ATOMIC DENSITY 2.624E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.470E+02

L-EDGES AT	13.418	15.708	16.385
L-EDGE JUMPS	2.338	1.410	1.160
L-EDGE FIT JUMPS	3.824	1.636	1.160

K-EDGE AT 90.527 KEV
K-EDGE JUMP 4.727

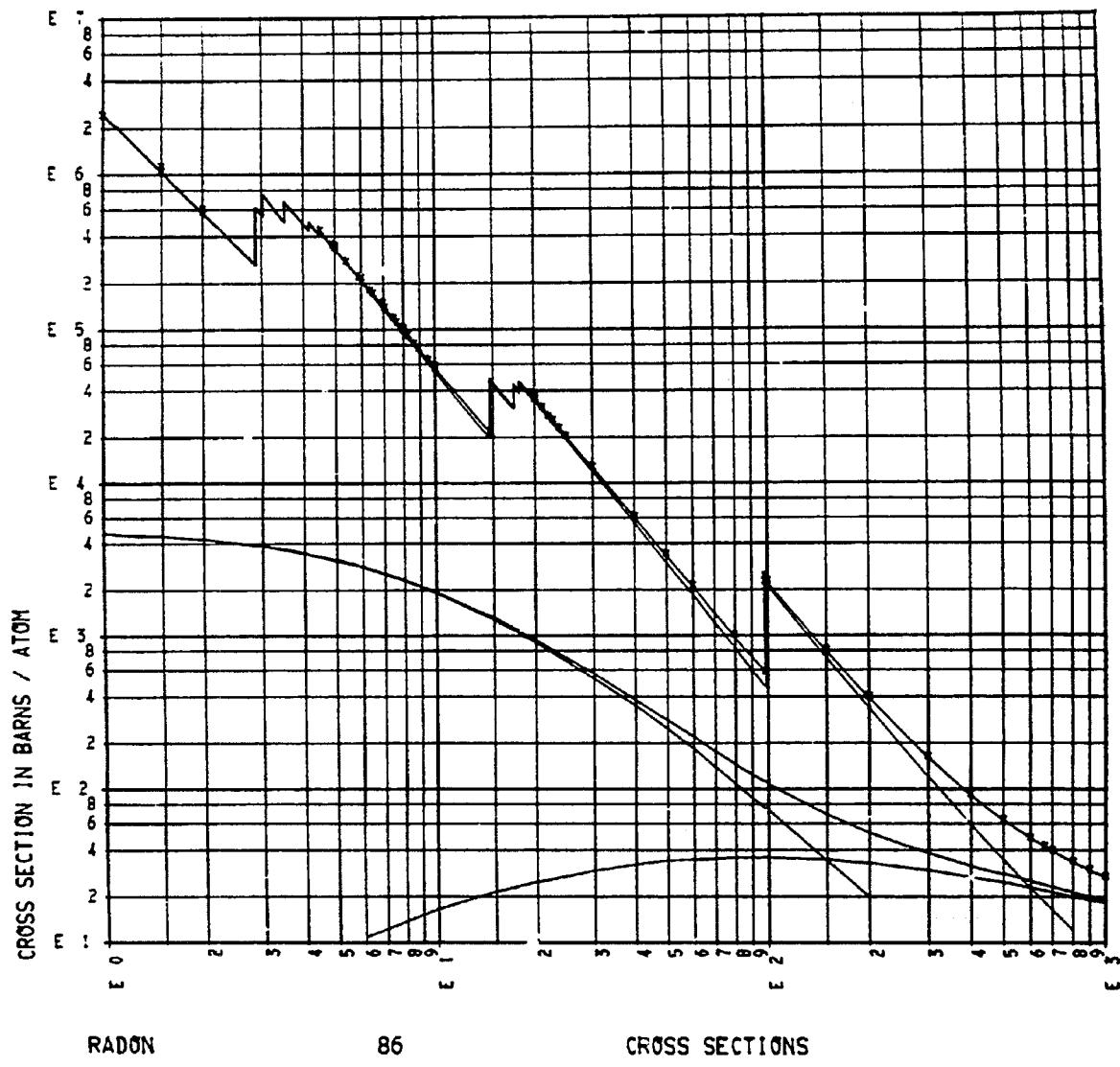
BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	1.46832E+01	1.67078E+01	1.75348E+01	9.44293E+00
1	-2.30940E+00	-2.58648E+00	-2.23353E+00	3.44965E+00
2	0.	0.	-5.96161E-02	-1.19886E+00
3	0.	0.	0.	7.83484E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.17489E+00	1.89860E-01
1	4.27916E-01	1.56125E+00
2	-3.55068E-01	-2.00932E-01
3	1.66601E-02	4.36768E-03



CROSS SECTIONS FOR RADON

Z = 86

BARNs / ATOM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.423E+06	4.740E+03	1.150E+00	2.428E+06
1.096	1.993E+06	4.696E+03	1.336E+00	1.998E+06
1.097	2.037E+06	4.696E+03	1.338E+00	2.042E+06
1.500	1.047E+06	4.549E+03	2.232E+00	1.051E+06
2.000	5.672E+05	4.329E+03	3.374E+00	5.716E+05
2.885	2.600E+05	3.919E+03	5.326E+00	2.639E+05
2.886	6.059E+05	3.919E+03	5.328E+00	6.098E+05
3.000	5.477E+05	3.878E+03	5.591E+00	5.515E+05
3.013	5.415E+05	3.871E+03	5.617E+00	5.454E+05
3.014	7.444E+05	3.871E+03	5.619E+00	7.482E+05
3.533	4.917E+05	3.640E+03	6.661E+00	4.954E+05
3.534	6.646E+05	3.640E+03	6.663E+00	6.682E+05
4.000	4.810E+05	3.469E+03	7.607E+00	4.845E+05
4.157	4.350E+05	3.405E+03	7.887E+00	4.385E+05
4.158	4.911E+05	3.405E+03	7.889E+00	4.945E+05
4.477	4.050E+05	3.285E+03	8.455E+00	4.083E+05
4.478	4.371E+05	3.285E+03	8.457E+00	4.404E+05
5.000	3.278E+05	3.114E+03	9.379E+00	3.309E+05
6.000	2.037E+05	2.805E+03	1.099E+01	2.065E+05
8.000	9.616E+04	2.302E+03	1.390E+01	9.848E+04
10.000	5.372E+04	1.918E+03	1.648E+01	5.565E+04
14.611	1.997E+04	1.321E+03	2.108E+01	2.131E+04
14.612	4.681E+04	1.321E+03	2.108E+01	4.815E+04
15.000	4.381E+04	1.288E+03	2.144E+01	4.511E+04
17.333	3.034E+04	1.087E+03	2.313E+01	3.145E+04
17.334	4.277E+04	1.086E+03	2.313E+01	4.388E+04
18.054	3.854E+04	1.036E+03	2.364E+01	3.960E+04
18.055	4.470E+04	1.035E+03	2.364E+01	4.576E+04
20.000	3.438E+04	9.173E+02	2.494E+01	3.533E+04
30.000	1.197E+04	5.379E+02	2.966E+01	1.254E+04
40.000	5.581E+03	3.555E+02	3.253E+01	5.967E+03
50.000	3.062E+03	2.484E+02	3.422E+01	3.345E+03
60.000	1.865E+03	1.832E+02	3.518E+01	2.084E+03
80.000	8.449E+02	1.089E+02	3.587E+01	9.897E+02
98.416	4.741E+02	7.488E+01	3.582E+01	5.848E+02
98.417	2.238E+03	7.487E+01	3.582E+01	2.349E+03
100.000	2.145E+03	7.261E+01	3.582E+01	2.254E+03
150.000	7.325E+02	3.393E+01	3.478E+01	8.012E+02
200.000	3.441E+02	1.946E+01	3.285E+01	3.965E+02
300.000	1.216E+02	8.772E+00	2.936E+01	1.597E+02
400.000	5.961E+01	4.952E+00	2.662E+01	9.119E+01
500.000	3.497E+01	3.172E+00	2.447E+01	6.261E+01
600.000	2.296E+01	2.199E+00	2.272E+01	4.788E+01
800.000	1.220E+01	1.233E+00	2.004E+01	3.348E+01
1000.000	7.699E+00	7.840E-01	1.806E+01	2.654E+01

FLUORESCENT ENERGIES

83.800	7.423E+02	1.001E+02	3.586E+01	8.797E+02
94.877	5.251E+02	8.000E+01	3.583E+01	6.418E+02
11.724	3.547E+04	1.640E+03	1.827E+01	3.721E+04
14.316	2.106E+04	1.348E+03	2.080E+01	2.244E+04

CROSS SECTIONS FOR RADON

Z = 86

CM**2 / GRAM

KEV	PHOT0	COHERENT	INCOHERENT	TOTAL
1.000	6.573E+03	1.286E+01	3.120E-03	6.586E+03
1.095	5.408E+03	1.274E+01	3.624E-03	5.421E+03
1.097	5.527E+03	1.274E+01	3.630E-03	5.540E+03
1.500	2.839E+03	1.234E+01	6.054E-03	2.851E+03
2.000	1.539E+03	1.174E+01	9.154E-03	1.551E+03
2.885	7.054E+02	1.063E+01	1.445E-02	7.160E+02
2.886	1.644E+03	1.063E+01	1.445E-02	1.654E+03
3.000	1.486E+03	1.052E+01	1.517E-02	1.496E+03
3.013	1.459E+03	1.050E+01	1.524E-02	1.480E+03
3.014	2.019E+03	1.050E+01	1.524E-02	2.030E+03
3.533	1.334E+03	9.875E+00	1.807E-02	1.344E+03
3.534	1.803E+03	9.874E+00	1.807E-02	1.812E+03
4.000	1.305E+03	9.411E+00	2.064E-02	1.314E+03
4.157	1.180E+03	9.238E+00	2.140E-02	1.189E+03
4.158	1.332E+03	9.237E+00	2.140E-02	1.342E+03
4.477	1.099E+03	8.912E+00	2.294E-02	1.108E+03
4.478	1.186E+03	8.911E+00	2.294E-02	1.195E+03
5.000	8.893E+02	8.447E+00	2.544E-02	8.978E+02
6.000	5.526E+02	7.610E+00	2.980E-02	5.603E+02
8.000	2.609E+02	6.245E+00	3.771E-02	2.672E+02
10.000	1.457E+02	5.202E+00	4.471E-02	1.510E+02
14.611	5.418E+01	3.585E+00	5.718E-02	5.782E+01
14.612	1.270E+02	3.585E+00	5.718E-02	1.306E+02
15.000	1.188E+02	3.493E+00	5.816E-02	1.224E+02
17.333	8.230E+01	2.948E+00	6.275E-02	8.531E+01
17.334	1.160E+02	2.947E+00	6.275E-02	1.190E+02
18.054	1.046E+02	2.809E+00	6.412E-02	1.074E+02
18.055	1.213E+02	2.809E+00	6.412E-02	1.241E+02
20.000	9.328E+01	2.488E+00	6.767E-02	9.583E+01
30.000	3.247E+01	1.459E+00	8.045E-02	3.401E+01
40.000	1.514E+01	9.591E-01	8.826E-02	1.619E+01
50.000	8.308E+00	6.738E-01	9.284E-02	9.074E+00
60.000	5.060E+00	4.971E-01	9.545E-02	5.653E+00
80.000	2.292E+00	2.955E-01	9.731E-02	2.685E+00
98.416	1.286E+00	2.031E-01	9.718E-02	1.587E+00
98.417	6.071E+00	2.031E-01	9.718E-02	6.372E+00
100.000	5.820E+00	1.970E-01	9.717E-02	6.114E+00
150.000	1.987E+00	9.204E-02	9.437E-02	2.174E+00
200.000	9.336E-01	5.279E-02	8.911E-02	1.076E+00
300.000	3.298E-01	2.380E-02	7.964E-02	4.332E-01
400.000	1.617E-01	1.343E-02	1.223E-02	2.474E-01
500.000	9.487E-02	8.605E-03	6.638E-03	1.699E-01
600.000	6.229E-02	5.966E-03	6.164E-03	1.299E-01
800.000	3.310E-02	3.345E-03	5.427E-02	9.082E-02
1000.000	2.089E-02	2.127E-03	4.899E-02	7.200E-02

FLUORESCENT ENERGIES

83.800	2.014E+00	2.717E-01	9.728E-02	2.386E+00
94.877	1.425E+00	2.170E-01	9.720E-02	1.741E+00
11.724	9.623E+01	4.450E+00	4.957E-02	1.009E+02
14.316	5.714E+01	3.657E+00	5.643E-02	6.088E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR RADON

ATOMIC WEIGHT 222.000 GRAMS / MOLE
DENSITY 9.730E-03 GRAMS / CC
ATOMIC DENSITY 2.640E-05 BUNCHES / CC

CONVERSION CONSTANT IS 3.686E+02

L-EDGES AT	14.612	17.334	18.055
L-EDGE JUMPS	2.344	1.410	1.160
L-EDGE FIT JUMPS	3.834	1.636	1.160

K-EDGE AT 98.417 KEY
K-EDGE JUMP 4.721

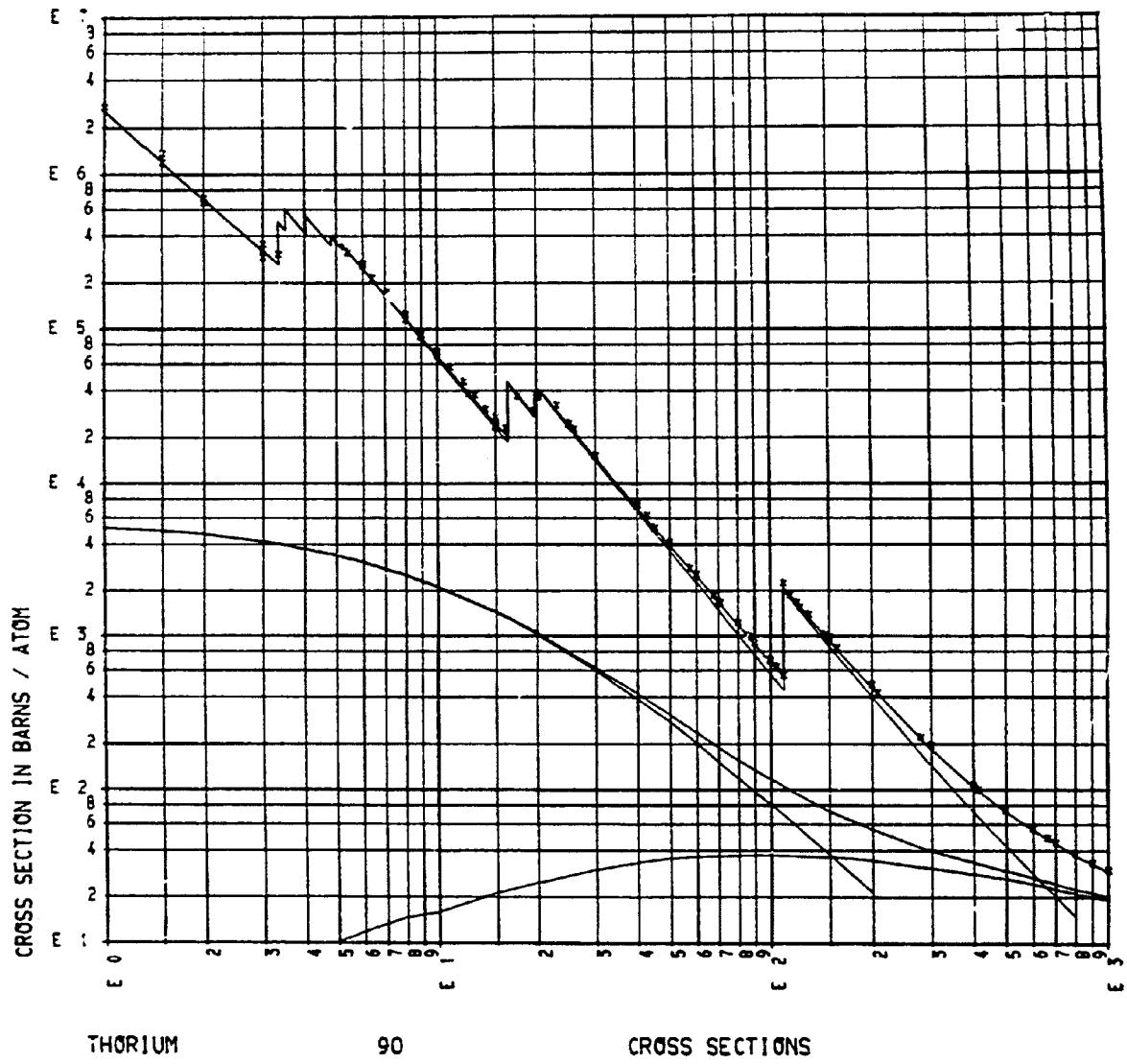
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	L	K
0	4.478	18.055	98.417	
1	1.47243E+01	1.69000E+01	1.75028E+01	1.51782E+01
2	-2.12905E+00	-2.60945E+00	-2.13876E+00	3.49021E-01
3	0.	0.	-7.24638E-02	-6.37658E-01
	0.	0.	0.	4.51377E-02

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.22553E+00	1.96619E-01
1	4.51478E-01	1.60080E+00
2	-3.62056E-01	-2.13800E-01
3	1.71556E-02	5.51717E-03



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REVISED 6/03/69

CROSS SECTIONS FOR THORIUM		Z = 90	BARNs / ATOM	
KEY	PHOTON	COHERENT	INCOHERENT	TOTAL
1.000	2.544E+06	5.137E+03	1.035E+00	2.549E+06
1.329	1.477E+06	4.969E+03	1.721E+00	1.482E+06
1.330	1.510E+06	4.969E+03	1.723E+00	1.515E+06
1.500	1.200E+06	4.899E+03	2.136E+00	1.205E+06
2.000	6.923E+05	4.646E+03	3.316E+00	6.969E+05
3.000	3.189E+05	4.165E+03	5.798E+00	3.230E+05
3.331	2.610E+05	4.003E+03	8.572E+00	2.650E+05
3.332	4.992E+05	4.002E+03	8.574E+00	5.032E+05
3.490	4.429E+05	3.932E+03	6.949E+00	4.468E+05
3.491	6.025E+05	3.932E+03	6.951E+00	6.064E+05
4.000	4.238E+05	3.734E+03	8.181E+00	4.275E+05
4.045	4.117E+05	3.714E+03	8.276E+00	4.154E+05
4.046	5.552E+05	3.714E+03	8.272E+00	5.59CE+05
4.230	3.512E+05	3.414E+03	9.816E+00	3.546E+05
4.831	3.998E+05	3.413E+03	9.818E+00	4.032E+05
5.000	3.658E+05	3.358E+03	1.015E+01	3.691E+05
5.181	3.336E+05	3.292E+03	1.046E+01	3.370E+05
5.182	3.602E+05	3.292E+03	1.046E+01	3.635E+05
6.000	2.466E+05	3.034E+03	1.84E+01	2.496E+05
8.000	1.172E+05	2.506E+03	4.74E+01	1.197E+05
10.000	6.581E+04	2.097E+03	5.933E+01	6.792E+04
15.000	2.307E+04	1.421E+03	2.118E+01	2.451E+04
15.299	1.861E+04	1.292E+03	2.216E+01	1.992E+04
15.300	4.443E+04	1.292E+03	2.217E+01	4.515E+04
19.691	2.688E+04	1.039E+03	2.458E+01	2.795E+04
19.692	3.790E+04	1.039E+03	2.458E+01	3.897E+04
20.000	3.537E+04	1.021E+03	2.479E+01	3.741E+04
20.469	3.419E+04	9.904E+02	2.506E+01	3.521E+04
20.470	3.966E+04	9.903E+02	2.506E+01	4.067E+04
30.000	1.433E+04	5.986E+02	2.993E+01	1.496E+04
40.000	6.649E+03	3.907E+02	3.333E+01	7.073E+03
50.000	3.652E+03	2.728E+02	3.526E+01	3.970E+03
60.000	2.248E+03	2.004E+02	3.634E+01	2.485E+03
80.000	1.040E+03	1.192E+02	3.719E+01	1.196E+03
100.000	5.714E+02	7.931E+01	3.722E+01	8.879E+02
109.648	4.461E+02	6.784E+01	3.701E+01	5.510E+02
109.649	1.959E+03	6.784E+01	3.701E+01	2.064E+03
150.000	8.624E+02	3.591E+01	3.629E+01	9.355E+02
200.000	4.075E+02	2.114E+01	3.432E+01	4.630E+02
300.000	1.447E+02	9.514E+00	3.027E+01	1.845E+02
400.000	7.128E+01	5.369E+00	2.787E+01	1.045E+02
500.000	4.201E+01	3.438E+00	2.565E+01	7.110E+01
600.000	2.772E+01	2.383E+00	2.381E+01	5.392E+01
800.000	1.490E+01	1.337E+00	2.072E+01	3.696E+01
1000.000	9.524E+00	8.510E-01	1.894E+01	2.931E+01

FLUORESCENT ENERGIES

93.334	6.876E+02	8.996E+01	3.721E+01	8.162E+02
105.592	4.937E+02	7.232E+01	3.709E+01	6.034E+02
12.966	3.362E+04	1.634E+03	1.912E+01	3.535E+04
16.200	1.890E+04	1.301E+03	2.209E+01	2.023E+04

CROSS SECTIONS FOR THORIUM

Z = 90

CM**2 / GRAM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	6.604E+03	1.333E+01	2.687E-03	6.617E+03
1.329	3.834E+03	1.290E+01	4.456E-03	3.847E+03
1.330	3.920E+03	1.290E+01	4.472E-03	3.933E+03
1.500	3.115E+03	1.272E+01	5.545E-03	3.128E+03
2.000	1.797E+03	1.206E+01	8.608E-03	1.809E+03
3.000	8.277E+02	1.081E+01	1.505E-02	8.386E+02
3.331	6.776E+02	1.039E+01	1.706E-02	6.880E+02
3.332	1.296E+03	1.039E+01	1.707E-02	1.306E+03
3.490	1.150E+03	1.021E+01	1.804E-02	1.160E+03
3.491	1.564E+03	1.021E+01	1.804E-02	1.574E+03
4.000	1.100E+03	9.693E+00	2.124E-02	1.110E+03
4.045	1.069E+03	9.641E+00	2.147E-02	1.078E+03
4.046	1.441E+03	9.640E+00	2.147E-02	1.451E+03
4.830	9.117E+02	8.862E+00	2.548E-02	9.206E+02
4.831	1.038E+03	8.861E+00	2.549E-02	1.047E+03
5.000	9.495E+02	8.717E+00	2.635E-02	9.583E+02
5.181	8.661E+02	8.546E+00	2.715E-02	8.747E+02
5.182	9.349E+02	8.545E+00	2.716E-02	9.435E+02
6.000	6.400E+02	7.875E+00	3.074E-02	6.479E+02
8.000	3.042E+02	5.504E+00	3.826E-02	3.107E+02
10.000	1.708E+02	5.445E+00	4.135E-02	1.763E+02
15.000	5.988E+01	3.688E+00	6.498E-02	6.362E+01
16.299	4.830E+01	3.354E+00	5.754E-02	5.172E+01
16.300	1.153E+02	3.353E+00	5.754E-02	1.188E+02
19.691	6.979E+01	2.698E+00	6.381E-02	7.255E+01
19.692	9.839E+01	2.697E+00	6.381E-02	1.072E+02
20.000	9.441E+01	2.649E+00	6.435E-02	9.712E+01
20.469	8.876E+01	2.571E+00	6.505E-02	9.140E+01
20.470	1.030E+02	2.571E+00	6.505E-02	1.056E+02
30.000	3.719E+01	1.554E+00	1.770E-02	3.883E+01
40.000	1.726E+01	1.014E+00	8.652E-02	1.836E+01
50.000	9.506E+00	2.082E-01	9.153E-02	1.031E+01
60.000	5.836E+00	5.201E-01	9.434E-02	6.450E+00
80.000	2.700E+00	3.095E-01	9.554E-02	3.106E+00
100.000	1.483E+00	2.059E-01	9.662E-02	1.786E+00
109.648	1.158E+00	1.761E-01	9.607E-02	1.430E+00
109.649	5.085E+00	1.761E-01	9.607E-02	5.357E+00
150.000	2.239E+00	9.583E-02	9.421E-02	2.429E+00
200.000	1.058E+00	5.487E-02	8.909E-02	1.202E+00
300.000	3.757E-01	2.470E-02	7.858E-02	4.790E-01
400.000	1.850E-01	1.394E-02	7.235E-02	2.713E-01
500.000	1.091E-01	8.925E-03	6.659E-02	1.846E-01
600.000	7.197E-02	6.186E-03	6.181E-02	1.400E-01
800.000	3.868E-02	3.471E-03	5.379E-02	9.594E-02
1000.000	2.472E-02	2.209E-03	4.917E-02	7.610E-02

FLUORESCENT ENERGIES

93.334	1.785E+00	2.335E-01	9.660E-02	2.119E+00
105.592	1.282E+00	1.877E-01	9.629E-02	1.566E+00
12.966	8.727E+01	4.242E+00	4.963E-02	9.177E+01
16.200	4.907E+01	3.377E+00	5.735E-02	5.251E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR THORIUM

ATOMIC WEIGHT 232.000 GRAMS / MOLE
DENSITY 11.700 GRAMS / CC
ATOMIC DENSITY 3.037E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.852E+02

L-EDGES AT 16.300 19.692 20.470
L-EDGE JUMPS 2.388 1.410 1.160
L-EDGE FIT JUMPS 3.906 1.636 1.160

K-EDGE AT 109.649 KEV
K-EDGE JUMP 4.391

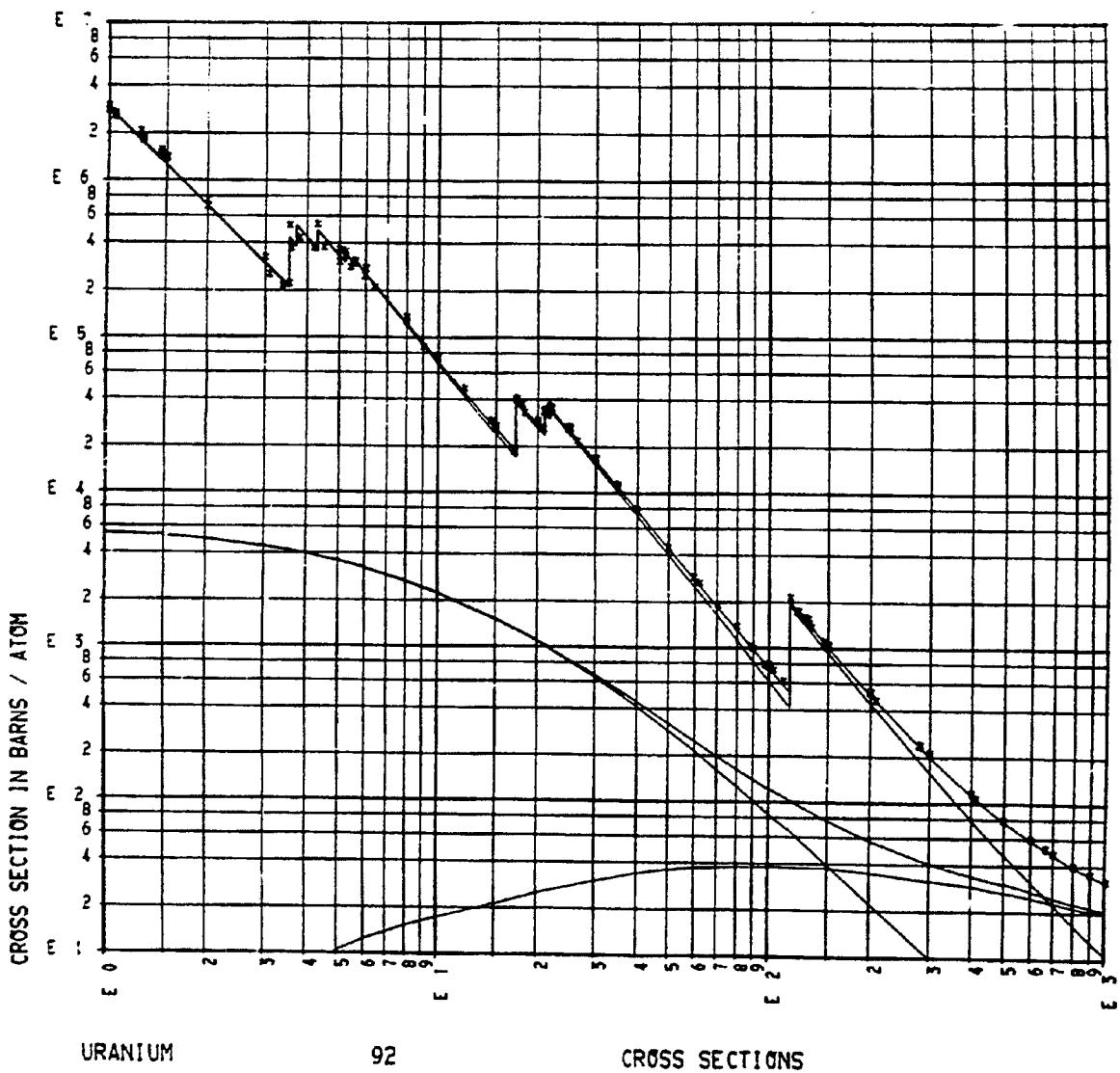
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	S	1.182	L	20.470	K	109.649
0	1.47730E+01	1.70483E+01			1.85481E+01		1.34336E+01	
1	-1.91192E+00	-2.58569E+00			-2.61281E+00		-1.34805E+00	
2	0.	0.			-7.90574E-03		-8.13282E-01	
3	0.	0.			0.		5.55664E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.27843E+00	1.70890E-01
1	4.79056E-01	1.65561E+00
2	-3.67657E-01	-2.29702E-01
3	1.74621E-02	6.92516E-03



CROSS SECTIONS FOR URANIUM Z = 92 BARNS / ATOM

KEY	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	2.899E+06	5.385E+03	9.549E-01	2.904E+06
1.440	1.338E+05	5.173E+03	1.896E+00	1.343E+05
1.441	1.368E+05	5.173E+03	1.898E+00	1.373E+05
1.500	1.256E+05	5.150E+03	2.047E+00	1.261E+05
2.000	6.822E+05	4.896E+03	3.220E+00	6.871E+05
3.000	2.886E+05	4.397E+03	5.827E+00	2.930E+05
3.551	2.018E+05	4.123E+03	7.246E+00	2.066E+05
3.552	4.266E+05	4.122E+03	7.249E+00	4.308E+05
3.727	3.771E+05	4.047E+03	7.714E+00	3.811E+05
3.728	6.130E+05	4.046E+03	7.717E+00	5.170E+05
4.000	4.281E+05	3.939E+03	8.452E+00	4.320E+05
4.303	3.549E+05	3.802E+03	9.091E+00	3.587E+05
4.304	4.786E+05	3.801E+03	9.093E+00	4.824E+05
5.000	3.257E+05	3.535E+03	1.655E+01	3.292E+05
5.180	2.974E+05	3.464E+03	1.888E+01	3.009E+05
5.181	3.385E+05	3.464E+03	1.888E+01	3.420E+05
5.548	2.839E+05	3.332E+03	1.544E+01	2.873E+05
5.549	3.065E+05	3.332E+03	1.544E+01	3.098E+05
6.000	2.508E+05	3.187E+03	2.333E+01	2.540E+05
8.000	1.198E+05	2.628E+03	5.21E+01	1.224E+05
10.000	6.750E+04	2.199E+03	1.10E+01	6.972E+04
15.000	2.382E+04	1.495E+03	2.117E+01	2.534E+04
17.165	1.684E+04	1.293E+03	2.281E+01	1.815E+04
17.167	3.844E+04	1.283E+03	2.281E+01	3.975E+04
20.000	2.620E+04	1.077E+03	2.483E+01	2.736E+04
20.946	2.338E+04	1.015E+03	2.538E+01	2.442E+04
20.947	3.297E+04	1.015E+03	2.539E+01	3.401E+04
21.755	2.997E+04	9.659E+02	2.585E+01	3.097E+04
21.756	3.477E+04	9.658E+02	2.585E+01	3.576E+04
30.000	1.536E+04	6.326E+02	3.614E+01	1.603E+04
40.000	7.302E+03	4.124E+02	3.375E+01	7.748E+03
50.000	4.067E+03	2.876E+02	3.580E+01	4.391E+03
60.000	2.508E+03	2.110E+02	3.693E+01	2.756E+03
80.000	1.158E+03	1.256E+02	3.786E+01	1.322E+03
100.000	6.307E+02	8.355E+01	3.793E+01	7.522E+02
115.602	4.234E+02	6.506E+01	3.761E+01	5.260E+02
115.603	1.867E+03	6.506E+01	3.761E+01	1.969E+03
150.000	9.417E+02	3.886E+01	3.704E+01	1.018E+03
200.000	4.445E+02	2.224E+01	3.506E+01	5.018E+02
300.000	1.580E+02	1.001E+01	3.073E+01	1.987E+02
400.000	7.799E+01	5.647E+00	2.849E+01	1.121E+02
500.000	4.609E+01	3.616E+00	2.624E+01	7.595E+01
600.000	3.050E+01	2.507E+00	2.435E+01	5.736E+01
800.000	1.648E+01	1.406E+00	2.106E+01	3.895E+01
1000.000	1.059E+01	8.950E-01	1.938E+01	3.086E+01

FLUORESCENT ENERGIES

98.428	6.585E+02	8.601E+01	3.793E+01	7.829E+02
111.289	4.700E+02	6.947E+01	3.769E+01	5.777E+02
13.613	3.056E+04	1.640E+03	2.012E+01	3.228E+04
17.218	3.816E+04	1.278E+03	2.285E+01	3.946E+04

CROSS SECTIONS FOR URANIUM

Z = 92

CM**2 / GRAM

KEV	PHOTO	COHERENT	INCOHERENT	TOTAL
1.000	7.334E+03	1.362E+01	2.416E-03	7.348E+03
1.440	3.384E+03	1.309E+01	4.796E-03	3.397E+03
1.441	3.460E+03	1.309E+01	4.802E-03	3.473E+03
1.500	3.177E+03	1.303E+01	5.178E-03	3.190E+03
2.000	1.726E+03	1.239E+01	8.146E-03	1.738E+03
3.000	7.302E+02	1.112E+01	1.474E-02	7.413E+02
3.551	5.106E+02	1.043E+01	1.833E-02	5.210E+02
3.552	1.079E+03	1.043E+01	1.834E-02	1.090E+03
3.727	9.538E+02	1.024E+01	1.951E-02	9.641E+02
3.728	1.298E+03	1.024E+01	1.952E-02	1.308E+03
4.000	1.083E+03	9.964E+00	2.138E-02	1.093E+03
4.303	8.977E+02	9.617E+00	2.306E-02	9.074E+02
4.304	1.211E+03	9.616E+00	2.300E-02	1.220E+03
5.000	8.238E+02	8.942E+00	2.671E-02	8.328E+02
5.180	7.523E+02	8.764E+00	2.753E-02	7.611E+02
5.181	8.563E+02	8.763E+00	2.753E-02	8.651E+02
5.548	7.183E+02	8.429E+00	2.918E-02	7.267E+02
5.549	7.794E+02	8.428E+00	2.919E-02	7.838E+02
6.000	6.344E+02	8.062E+00	3.119E-02	6.424E+02
8.000	3.029E+02	6.647E+00	3.848E-02	3.098E+02
10.000	1.708E+02	5.563E+00	4.326E-02	1.764E+02
15.000	6.026E+01	3.782E+00	5.355E-02	6.409E+01
17.166	4.261E+01	3.245E+00	5.771E-02	4.591E+01
17.167	9.125E+01	3.245E+00	5.771E-02	1.005E+02
20.000	6.643E+01	2.725E+00	6.281E-02	6.922E+01
20.946	5.916E+01	2.567E+00	6.422E-02	6.179E+01
20.947	8.340E+01	2.567E+00	6.422E-02	8.603E+01
21.755	7.583E+01	2.443E+00	6.539E-02	7.833E+01
21.756	8.795E+01	2.443E+00	6.539E-02	9.046E+01
30.000	3.887E+01	1.600E+00	7.625E-02	4.054E+01
40.000	1.847E+01	1.043E+00	8.538E-02	1.960E+01
50.000	1.029E+01	7.275E-01	9.056E-02	1.111E+01
60.000	6.344E+00	5.338E-01	9.342E-02	6.971E+00
80.000	2.929E+00	3.178E-01	9.578E-02	3.343E+00
100.000	1.596E+00	2.114E-01	9.595E-02	1.903E+00
115.602	1.071E+00	1.646E-01	9.514E-02	1.531E+00
115.603	4.722E+00	1.646E-01	9.514E-02	4.982E+00
150.000	2.382E+00	9.830E-02	9.370E-02	2.574E+00
200.000	1.124E+00	5.626E-02	8.869E-02	1.269E+00
300.000	3.997E-01	2.532E-02	7.774E-02	5.028E-01
400.000	1.973E-01	1.429E-02	7.207E-02	2.837E-01
500.000	1.166E-01	9.147E-03	6.638E-02	1.921E-01
600.000	7.715E-02	6.342E-03	6.160E-02	1.451E-01
800.000	4.169E-02	3.557E-03	5.328E-02	9.853E-02
1000.000	2.678E-02	2.264E-03	4.903E-02	7.807E-02

FLUORESCENT ENERGIES

98.428	1.666E+00	2.176E-01	9.594E-02	1.981E+00
111.289	1.189E+00	1.758E-01	9.535E-02	1.462E+00
13.613	7.731E+01	4.148E+00	5.089E-02	8.166E+01
17.218	9.653E+01	3.234E+00	5.781E-02	9.982E+01

92 - 3

REVISED 6/03/69

MISCELLANEOUS DATA FOR URANIUM

ATOMIC WEIGHT 238.070 GRAMS / MOLE
DENSITY 19.050 GRAMS / CC
ATOMIC DENSITY 4.819E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.953E+02

L-EDGES AT	17.167	20.947	21.756
L-EDGE JUMPS	2.282	1.410	1.160
L-EDGE FIT JUMPS	3.733	1.636	1.160

K-EDGE AT 115.603 KEV
K-EDGE JUMP 4.410

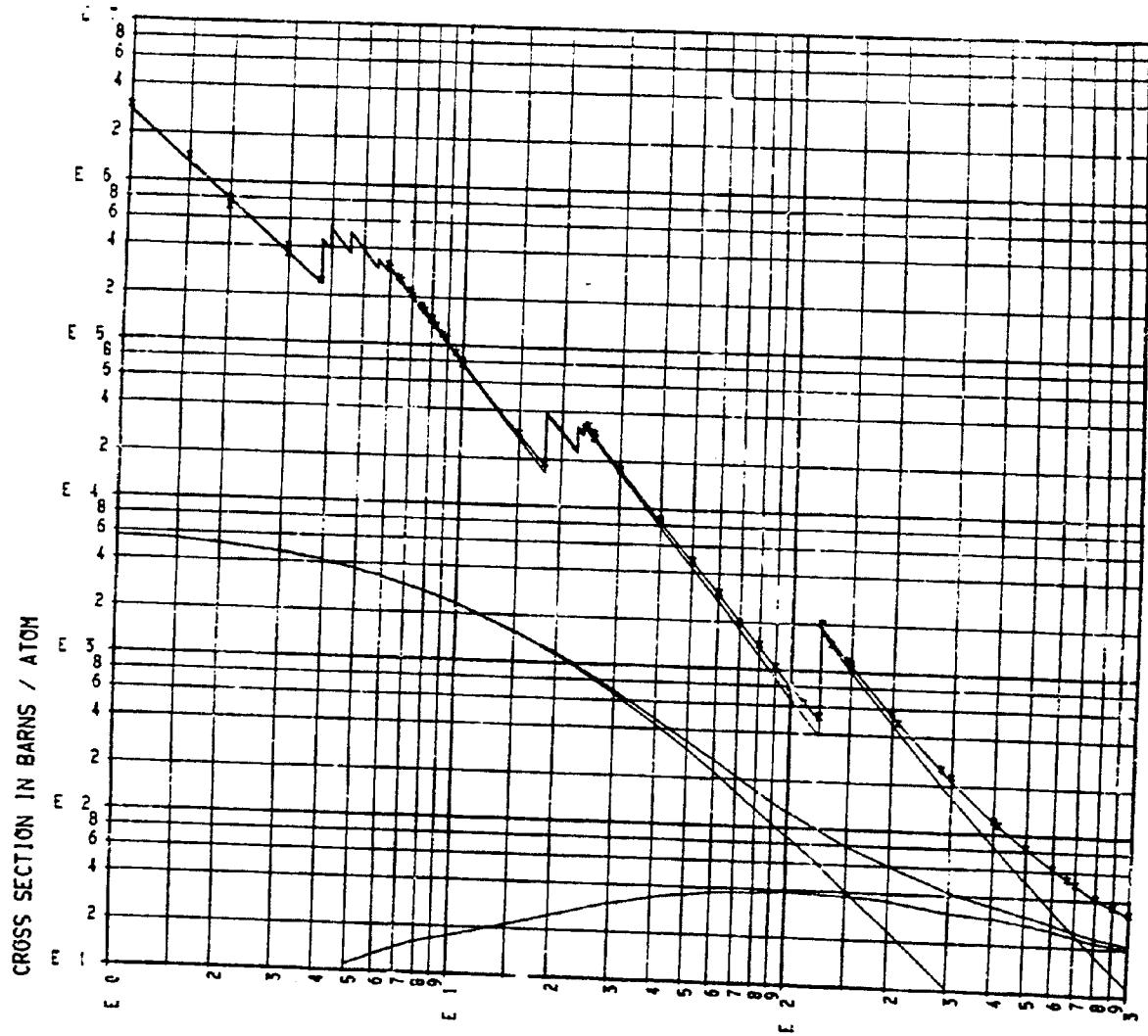
BARNs / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	5.549	L	21.756	K	115.603
0	1.49036E+01	1.70353E+01		1.75258E+01		1.37951E+01	
1	-2.12148E+00	-2.56903E+00		-2.07237E+00		1.23983E+00	
2	0.	0.		-7.23932E-02		-8.01545E-01	
3	0.	0.		0.		5.53596E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.33010E+00	1.08277E-01
1	4.78314E-01	1.74158E+00
2	-3.67250E-01	-2.54104E-01
3	1.74129E-02	8.95056E-03



PLUTONIUM

94

CROSS SECTIONS

CROSS SECTIONS FOR PLUTONIUM Z = 94 BARNS / ATSM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	2.757E+06	5.640E+03	8.666E-01	2.763E+06
1.500	1.288E+06	5.409E+03	1.938E+00	1.293E+06
1.558	1.199E+06	5.375E+03	2.061E+00	1.205E+06
1.559	1.227E+05	5.374E+03	2.063E+00	1.232E+06
2.000	1.685E+05	5.156E+03	3.090E+00	1.737E+05
3.000	3.590E+05	4.642E+03	5.811E+00	3.636E+05
3.773	2.334E+05	4.251E+03	8.023E+00	2.377E+05
3.774	4.435E+05	4.250E+03	8.026E+00	4.478E+05
3.958	3.889E+05	4.169E+03	8.613E+00	3.931E+05
3.969	5.268E+05	4.169E+03	8.616E+00	5.310E+05
4.000	5.162E+05	4.156E+03	8.711E+00	5.203E+05
4.554	3.674E+05	3.899E+03	9.966E+00	3.713E+05
4.555	4.955E+05	3.899E+03	9.968E+00	4.994E+05
5.000	3.881E+05	3.724E+03	1.058E+01	3.918E+05
5.539	2.967E+05	3.510E+03	1.199E+01	3.003E+05
5.540	3.378E+05	3.510E+03	1.200E+01	3.413E+05
5.913	2.847E+05	3.380E+03	1.269E+01	2.881E+05
5.914	3.074E+05	3.380E+03	1.269E+01	3.108E+05
6.000	2.960E+05	3.352E+03	1.285E+01	2.993E+05
8.000	1.392E+05	2.757E+03	1.572E+01	1.420E+05
10.000	1.756E+04	2.307E+03	1.730E+01	1.988E+04
15.000	2.679E+04	1.512E+03	2.110E+01	2.838E+04
18.052	1.649E+04	1.276E+03	2.341E+01	1.779E+04
18.053	3.712E+04	1.276E+03	2.341E+01	3.842E+04
20.000	2.871E+04	1.136E+03	2.480E+01	2.987E+04
22.262	2.191E+04	9.889E+02	2.615E+01	2.293E+04
22.263	3.089E+04	9.889E+02	2.615E+01	3.191E+04
23.094	2.815E+04	9.428E+02	2.662E+01	2.912E+04
23.095	3.265E+04	9.428E+02	2.662E+01	3.362E+04
30.000	1.671E+04	6.682E+02	3.029E+01	1.741E+04
40.000	7.900E+03	4.354E+02	3.415E+01	8.569E+03
50.000	4.376E+03	3.035E+02	3.631E+01	4.716E+03
60.000	2.684E+03	2.227E+02	3.750E+01	2.944E+03
80.000	1.228E+03	1.326E+02	3.852E+01	1.399E+03
100.000	6.630E+02	8.819E+01	3.862E+01	7.898E+02
121.759	3.824E+02	6.243E+01	3.821E+01	4.830E+02
121.760	1.731E+03	6.243E+01	3.821E+01	1.832E+03
150.000	1.000E+03	4.100E+01	3.778E+01	1.079E+03
200.000	4.749E+02	2.347E+01	3.580E+01	5.342E+02
300.000	1.714E+02	1.056E+01	3.114E+01	2.131E+02
400.000	8.554E+01	5.957E+00	2.911E+01	1.206E+02
500.000	5.085E+01	3.815E+00	2.683E+01	8.149E+01
600.000	3.370E+01	2.645E+00	2.490E+01	6.125E+01
800.000	1.812E+01	1.464E+00	2.137E+01	4.097E+01
1000.000	1.149E+01	9.440E-01	1.982E+01	3.226E+01

FLUORESCENT ENERGIES

103.653	5.997E+02	8.281E+01	3.854E+01	7.221E+02
117.146	4.260E+02	6.681E+01	3.829E+01	5.319E+02
14.279	3.048E+04	1.647E+02	2.060E+01	3.219E+04
18.278	3.596E+04	1.258E+03	2.358E+01	3.727E+04

CROSS SECTIONS FOR PLUTONIUM Z = 94 CM**2 / GRAM

KEY	PHOT	COHERENT	INCOHERENT	TOTAL
1.000	6.945E+03	1.421E+01	2.183E-03	6.959E+03
1.500	3.244E+03	1.362E+01	4.881E-03	3.258E+03
1.558	3.021E+03	1.354E+01	5.191E-03	3.035E+03
1.559	3.090E+03	1.354E+01	5.197E-03	3.103E+03
2.000	1.936E+03	1.299E+01	7.783E-03	1.949E+03
3.000	9.042E+02	1.169E+01	1.464E-02	9.159E+02
3.773	5.880E+02	1.071E+01	2.021E-02	5.987E+02
3.774	1.117E+03	1.071E+01	2.022E-02	1.128E+03
3.968	9.796E+02	1.050E+01	2.169E-02	9.901E+02
3.969	1.327E+03	1.050E+01	2.170E-02	1.337E+03
4.000	1.300E+03	1.047E+01	2.194E-02	1.311E+03
4.554	9.253E+02	9.822E+00	2.510E-02	9.352E+02
4.555	1.248E+03	9.821E+00	2.511E-02	1.258E+03
5.000	9.775E+02	9.380E+00	2.766E-02	9.869E+02
5.539	7.474E+02	8.842E+00	3.021E-02	7.563E+02
5.540	8.508E+02	8.841E+00	3.021E-02	8.597E+02
5.913	1.172E+02	8.514E+00	3.196E-02	7.258E+02
5.914	7.742E+02	8.513E+00	3.197E-02	7.828E+02
6.000	7.455E+02	8.442E+00	3.237E-02	7.540E+02
8.000	3.507E+02	6.945E+00	3.960E-02	3.577E+02
10.000	1.954E+02	5.810E+00	4.358E-02	2.012E+02
15.000	6.748E+01	3.960E+00	5.315E-02	7.149E+01
18.052	4.153E+01	3.214E+00	5.897E-02	4.480E+01
18.053	9.349E+01	3.214E+00	5.898E-02	9.676E+01
20.000	7.233E+01	2.862E+00	5.247E-02	7.525E+01
22.252	5.519E+01	2.491E+00	6.586E-02	5.775E+01
22.263	7.781E+01	2.491E+00	6.586E-02	8.037E+01
23.094	7.091E+01	2.375E+00	6.706E-02	7.335E+01
23.095	8.224E+01	2.375E+00	6.706E-02	8.468E+01
30.000	4.210E+01	1.683E+00	7.630E-02	4.386E+01
40.000	1.990E+01	1.097E+00	8.602E-02	2.108E+01
50.000	1.102E+01	7.645E-01	9.146E-02	1.188E+01
60.000	6.761E+00	5.608E-01	9.446E-02	7.417E+00
80.000	3.092E+00	3.340E-01	9.703E-02	3.523E+00
100.000	1.670E+00	2.221E-01	9.728E-02	1.989E+00
121.759	9.631E-01	1.573E-01	9.624E-02	1.217E+00
121.760	4.361E+00	1.573E-01	9.524E-02	4.614E+00
150.000	2.519E+00	1.033E-01	9.516E-02	2.718E+00
200.000	1.196E+00	5.911E-02	9.017E-02	1.345E+00
300.000	4.318E-01	2.659E-02	7.844E-02	5.308E-01
400.000	2.155E-01	1.500E-02	7.332E-02	3.038E-01
500.000	1.281E-01	9.609E-03	6.758E-02	2.053E-01
600.000	8.490E-02	6.662E-03	6.272E-02	1.543E-01
800.000	4.564E-02	3.738E-03	5.383E-02	1.032E-01
1000.000	2.895E-02	2.378E-03	4.992E-02	8.125E-02

FLUORESCENT ENERGIES

103.653	1.511E+00	2.086E-01	9.709E-02	1.819E+00
117.146	1.073E+00	1.683E-01	9.645E-02	1.340E+00
14.279	7.678E+01	4.148E+00	5.188E-02	8.107E+01
18.278	9.063E+01	3.169E+00	5.939E-02	9.387E+01

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REVISED 6/03/69

MISCELLANEOUS DATA FOR PLUTONIUM

ATOMIC WEIGHT 239.100 GRAMS / MOLE
DENSITY 19.700 GRAMS / CC
ATOMIC DENSITY 4.962E-02 BUNCHES / CC

CONVERSION CONSTANT IS 3.970E+02

L-EDGES AT	18.053	22.263	23.095
L-EDGE JUMPS	2.251	1.410	1.160
L-EDGE FIT JUMPS	3.682	1.636	1.160

K-EDGE AT 121.760 KEY
K-EDGE JUMP 4.528

BARNS / ATOM FIT COEFFICIENTS

COEFFICIENTS OF PE LN-LN FIT

	N	M	S.914	L	23.095	K	121.760
0	1.48535E+01	1.72953E+01		1.75519E+01		1.82787E+01	
1	-1.87733E+00	-2.62164E+00		-2.02162E+00		-1.17371E+00	
2	0.	0.		-8.22940E-02		-3.68344E-01	
3	0.	0.		0.		2.98738E-02	

COEFFICIENTS OF SCATTERING LN-LN FIT

	COHERENT	INCOHERENT
0	8.38174E+00	3.88791E-02
1	4.77085E-01	1.82229E+00
2	-3.66556E-01	-2.76009E-01
3	1.73422E-02	1.07392E-02