AFCRL-69-0071

THERMAL NEUTRON CAPTURE GAMMA-RAY SPECTRA OF THE ELEMENTS

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Project No. 5620
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MITNE-85

SCIENTIFIC REPORT NO. 2

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ABSTRACT

A determination of the energy and intensity of the gamma rays resulting from thermal neutron capture in 74 natural elements is reported. The measurements include energies above 200 keV and were done with a Ge(Li) detector.

I. Introduction

The compilation of thermal neutron capture γ rays presented in this report was obtained using the M.I.T. Ge(Li) spectrometer. This spectrometer consists of a 30 cm^3 coaxial Ge(Li) detector placed between two 6-inch-diameter by 3-inch-thick NaI crystals. This instrument, which is capable of operating as a triple coincidence pair spectrometer at high energies and in the Compton suppression mode at low energies, has been described in the literature (1,2). The spectrometer was placed next to the M.I.T. reactor as shown in Fig. 1. In this geometry the samples received a highly thermal flux (Cd ratio $>$ 3000) of approximately 5×10^8 $n/cm^2 sec$. The sample to detector distance was 1 meter and for all but a few of the very lowest cross section samples a 3/8-inch or a 5/8-inch collimator was placed between the source and detector. The overall energy resolution of the system varied from $\sim$ 4 keV at low energy to 7 keV at high energy ($\sim$ 8 MeV). It was not possible to reproduce a plot of each spectra in this report. However, Figs. 2 and 3 give the spectra of Ge and Sc which are typical of most of the spectra.

II. Energy Determination

The determination of the energy of a spectral peak required three steps. First, the exact channel number of the peak center was determined. Second, this position was corrected for instrumental nonlinearities. Finally the energy of the peak center was determined using lines of known energy which were present in the

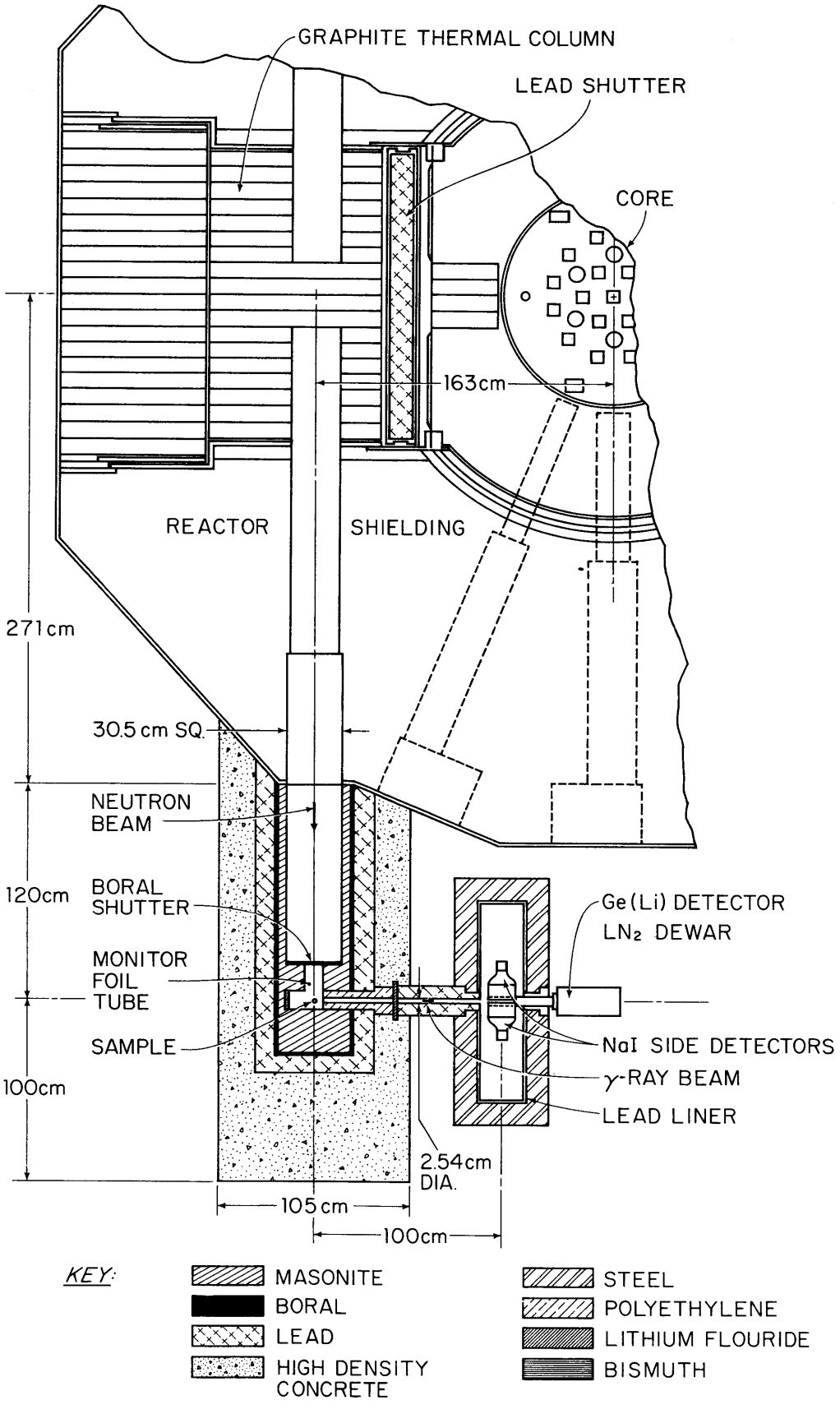

FIGURE 1 PLAN VIEW OF EXTERNAL NEUTRON BEAM FACILITY AND GAMMA SPECTROMETER

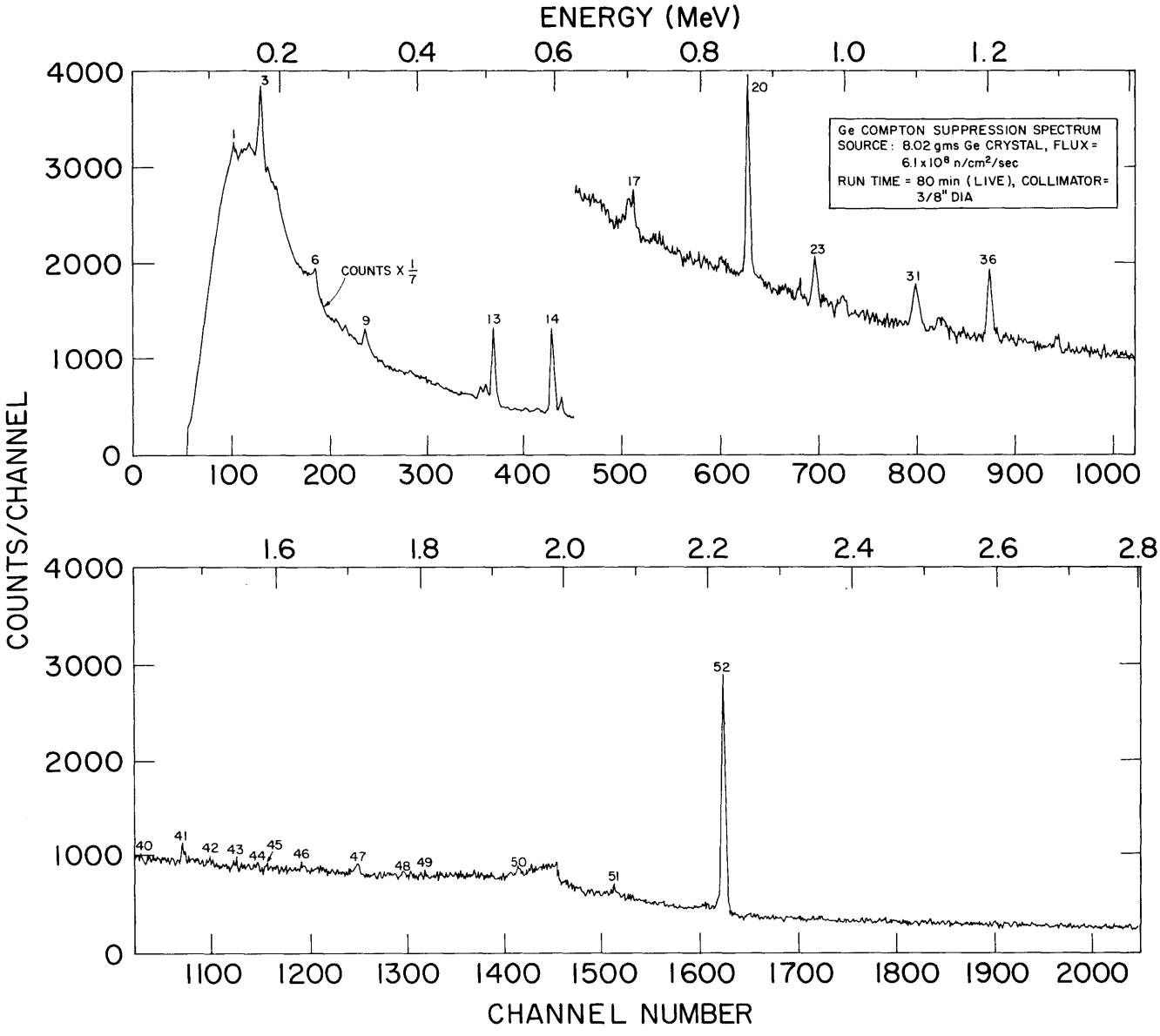

FIGURE 2a GERMANIUM COMPTON SUPPRESSION SPECTRUM

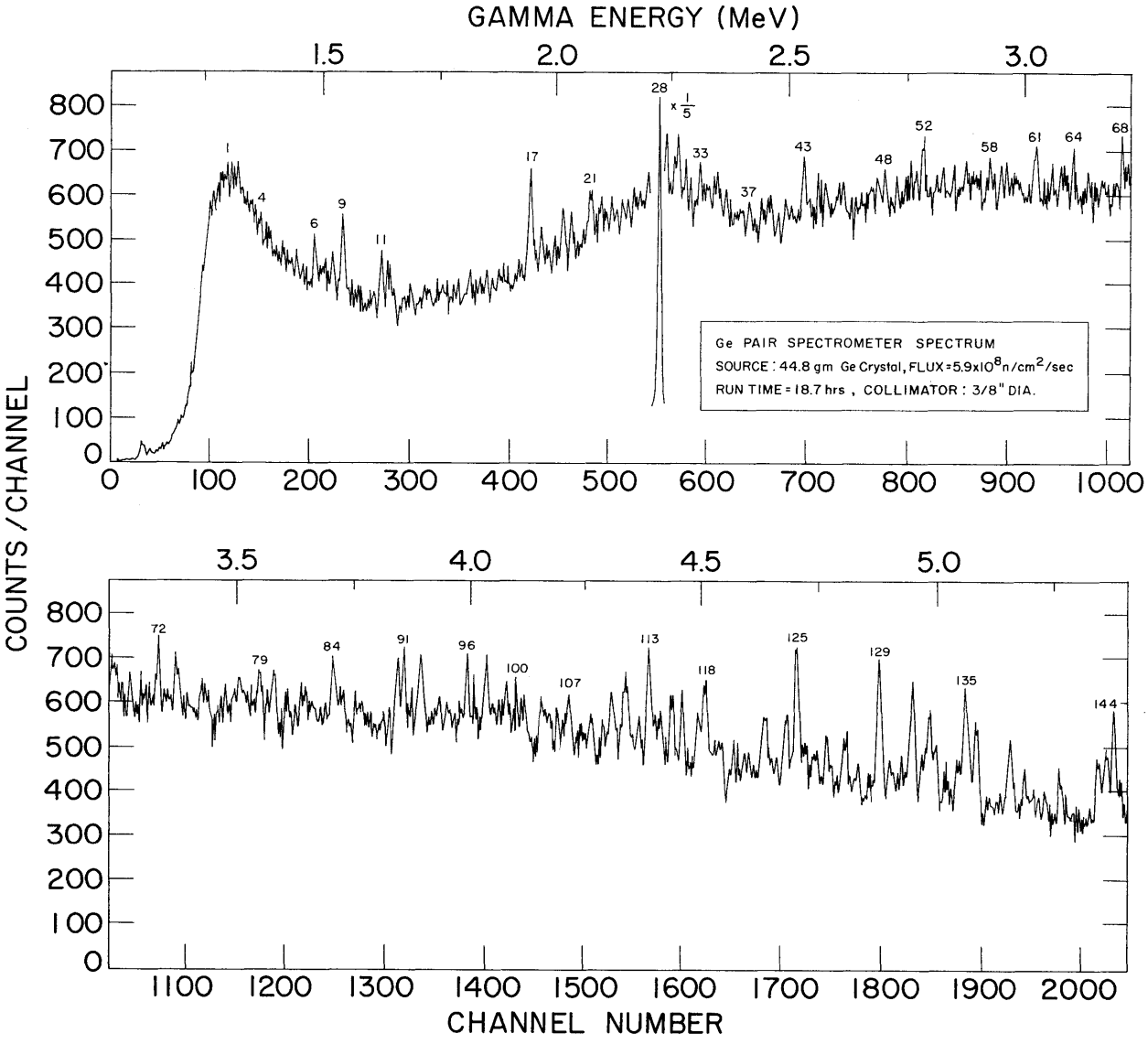
GAMMA ENERGY (MeV)
1.5
2.0
2.5
3.0
3.5
4.0
4.5
5.0
COUNTS / CHANNEL
CHANNEL NUMBER
Ge PAIR SPECTROMETER SPECTRUM
SOURCE : 44.8 gm Ge Crystal, FLUX = 5.9x10^8 n/cm^2/sec
RUN TIME = 18.7 hrs , COLLIMATOR : 3/8" DIA.
x 1/5

FIGURE 2b

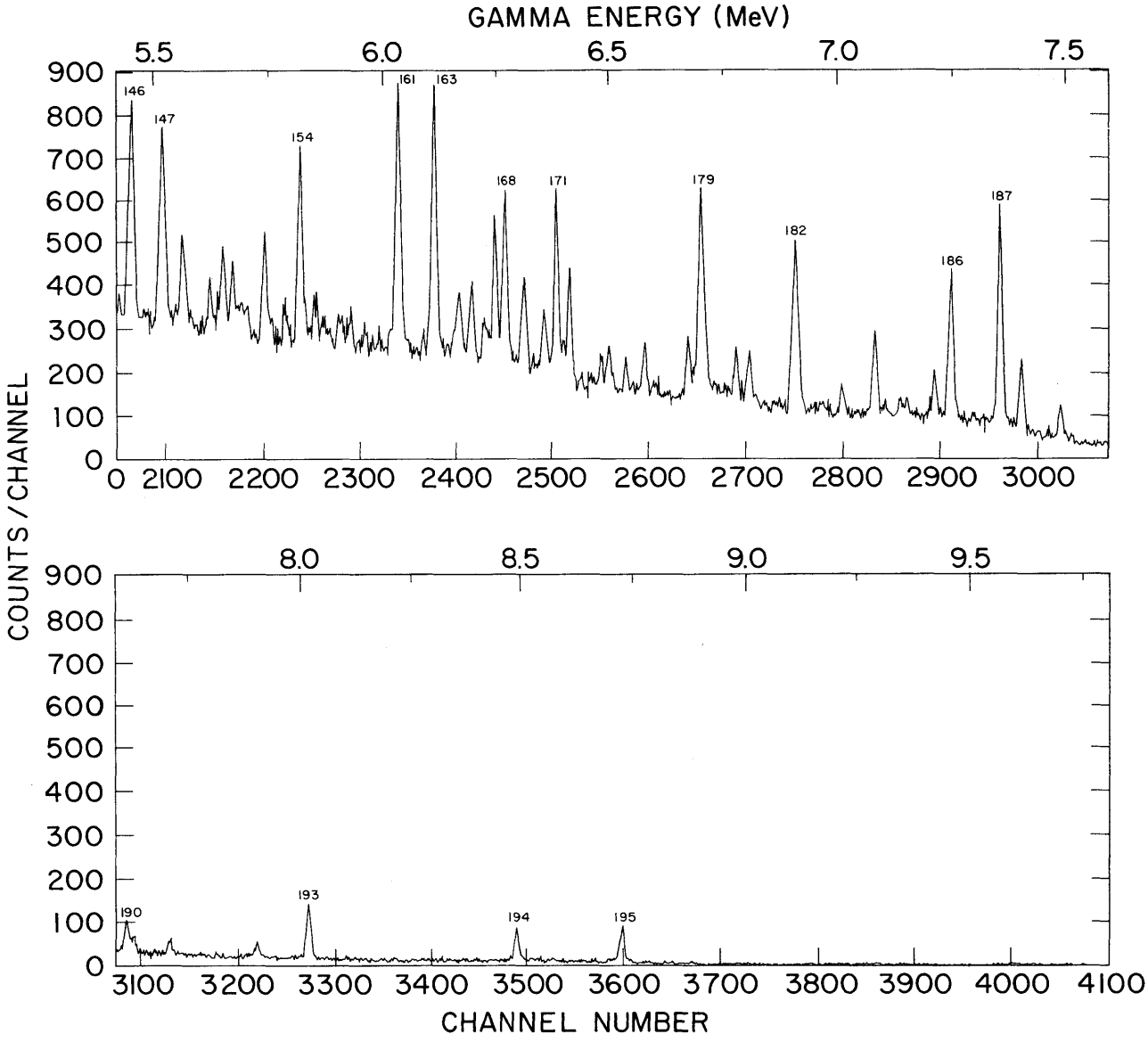

FIGURE 2c GERMANIUM PAIR SPECTROMETER SPECTRUM

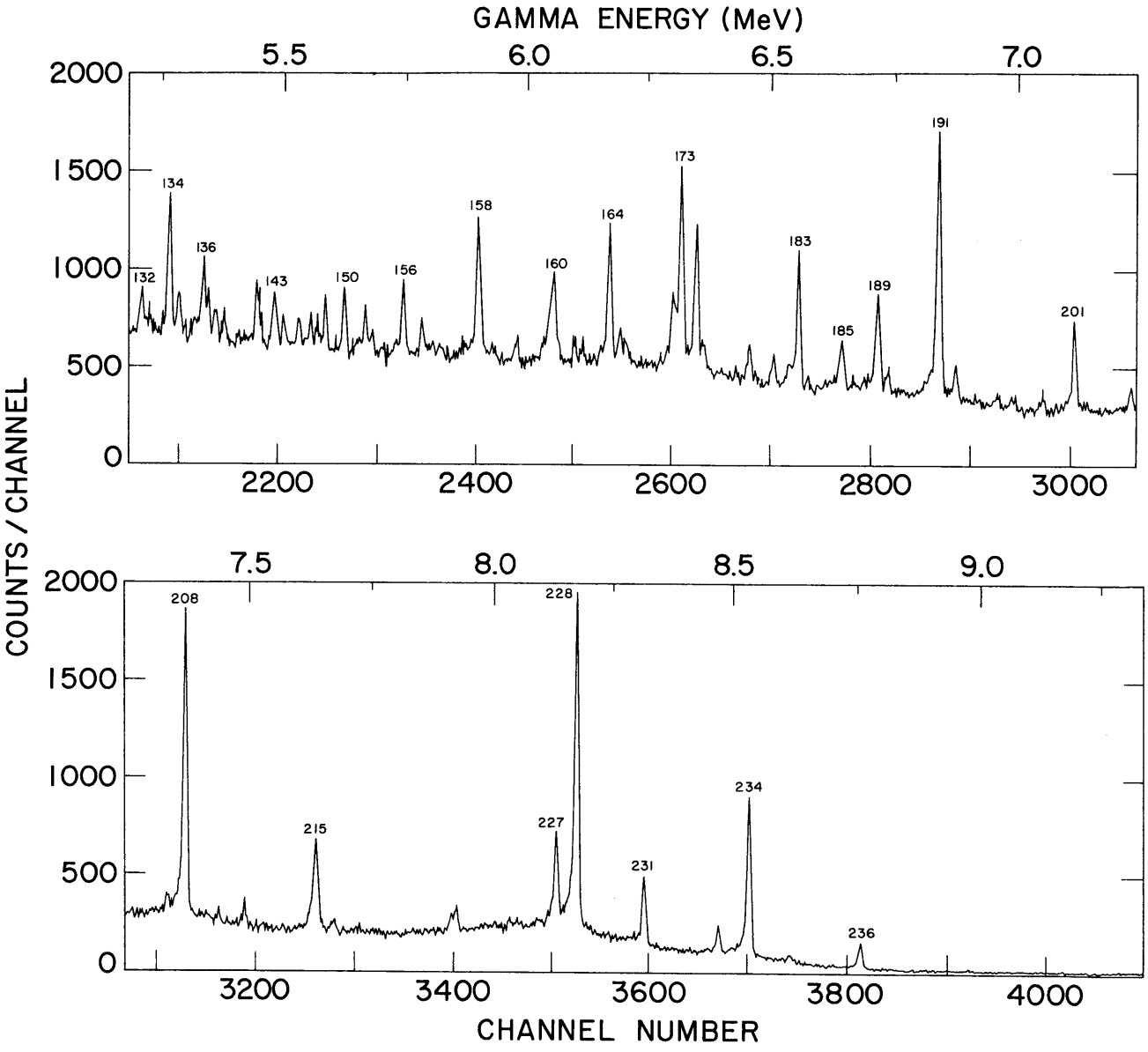

FIGURE 3a SCANDIUM PAIR SPECTROMETER SPECTRUM

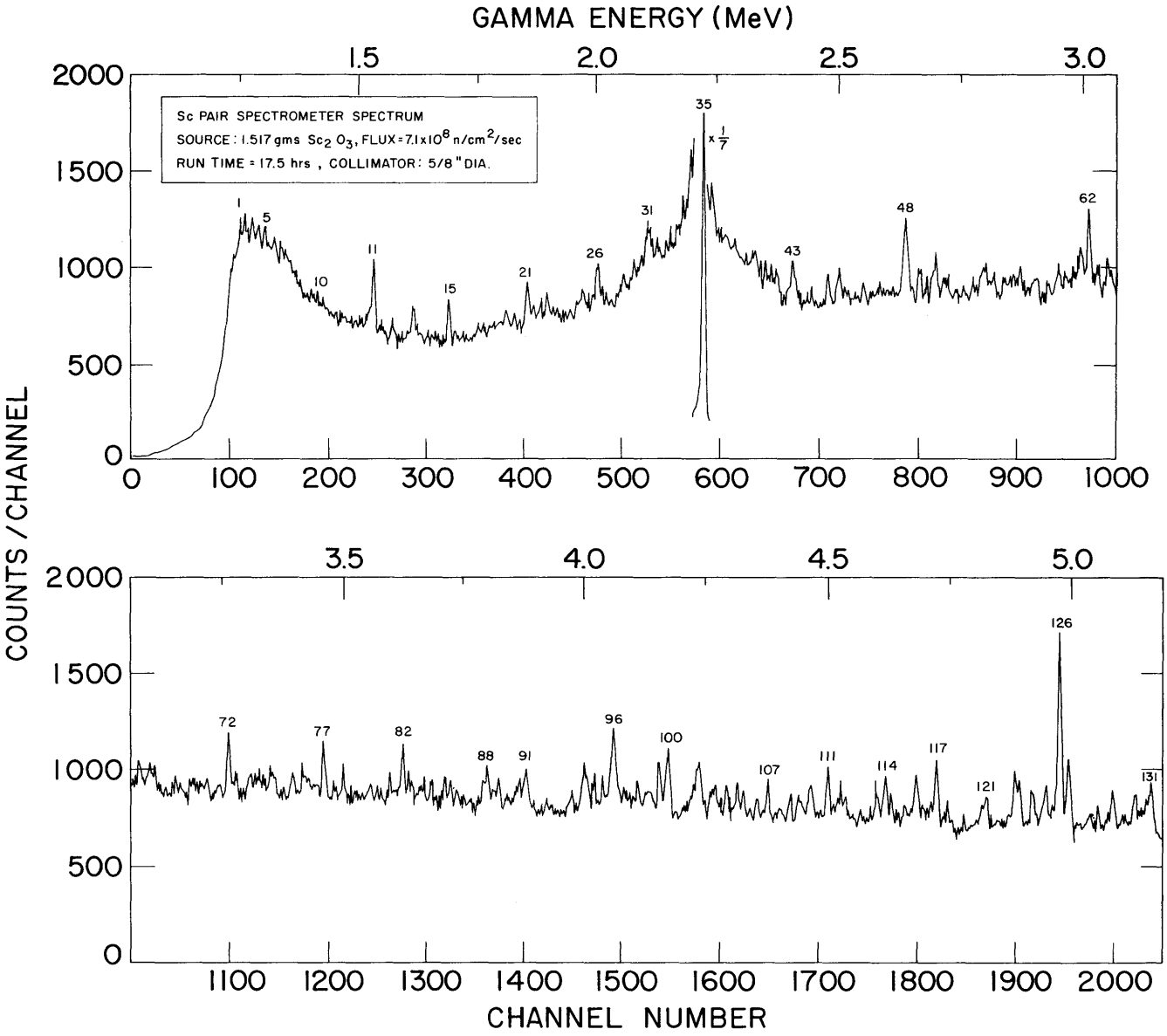
GAMMA ENERGY (MeV)
1.5
2.0
2.5
3.0
Sc PAIR SPECTROMETER SPECTRUM
SOURCE : 1.517 gms Sc_2O_3, FLUX = 7.1×10^8 n/cm^2/sec
RUN TIME = 17.5 hrs , COLLIMATOR : 5/8" DIA.
x 1/7
1
5
10
11
15
21
26
31
35
43
48
62
2000
1500
1000
500
0
0
100
200
300
400
500
600
700
800
900
1000
3.5
4.0
4.5
5.0
72
77
82
88
91
96
100
107
111
114
117
121
126
131
1100
1200
1300
1400
1500
1600
1700
1800
1900
2000
COUNTS / CHANNEL
CHANNEL NUMBER

FIGURE 3b

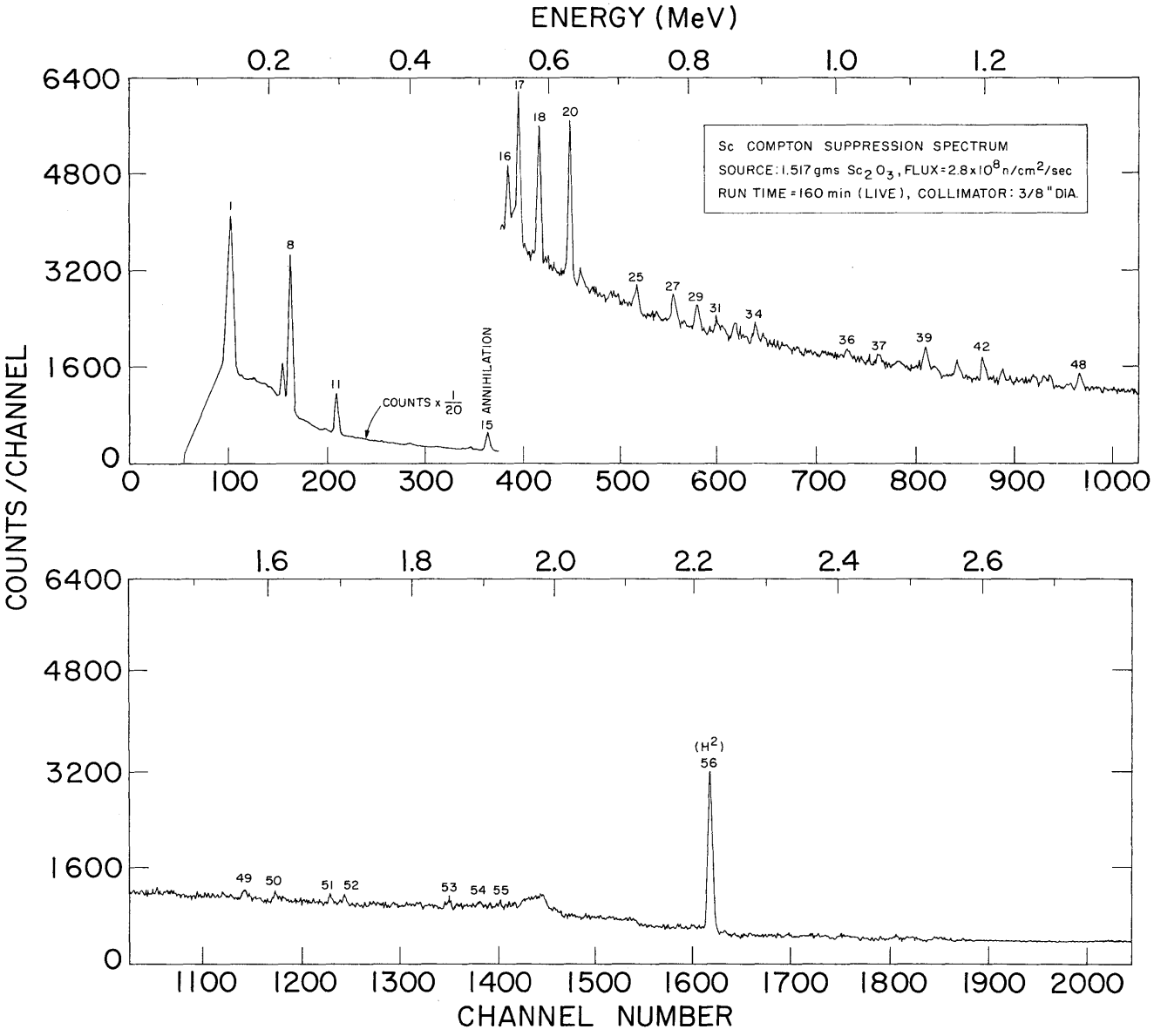

FIGURE 3c SCANDIUM COMPTON SUPPRESSION SPECTRUM

spectrum. A computer code was developed for carrying out these operations (3,4).

2.1 Location of Peak Center

The data reduction program first smooths the original spectrum by a Fourier transformation method. In this procedure the original spectrum (counts vs channel number) is transformed into reciprocal channel number space. It is then multiplied by an appropriate filter function and transformed back into channel number space. The result is a smoothed version of the original spectrum. The peak centers are then obtained as the points of zero slope of all maxima. This procedure was checked by also determining peak centers by fitting an appropriate Gaussian function to them and then finding the centroid of the Gaussian. It was found that both procedures gave the same answer to within 0.1 channels or in our case 0.2 keV. The simpler zero slope critera was therefore adopted.

2.2 Electronic Nonlinearity

It is well known that present day electronic systems are apt to have nonlinearities of the order one part in a thousand. When a 4096 channel ADC is used, therefore, it becomes necessary to determine the nonlinearities of the system. This was done with an EDC Model MV100N precision millivolt standard whose output voltage, which was accurate to better than 1 part in 10^4, could be varied over the range of signal input voltages. The relative positions of peaks of accurately known input voltage were then used to determine system nonlinearities. The linearity corrections over most of the range were less than $\pm$ 1 channel or

in our case ± 2 keV. However, at the extremes these corrections were as much as 6 keV or more. Fortunately, only rarely do useful peaks fall in these extremes. Linearity runs were made once a week. During 18 months of operation no significant changes in this linearity correction were observed.

2.3 Calibration Lines

The primary energy standards used in these measurements are listed in Table I. In low energy runs the annihilation line is always present as the result of positrons formed by pair production interactions. In addition because of some hydrogenous shielding and the polyethylene sample vial the hydrogen line at 2223.3 keV was also very prominent. These two lines were usually used as the two energy calibration lines for low energy spectra. Occasionally, however, one of the source lines fell close enough to one of these lines to shift its energy slightly. This could immediately be detected because it would shift the single and the double escape peaks of hydrogen from their known values of 1201.3 keV and 1712.3 keV. These two lines were not used as calibration lines so they provided a convenient check that the energy calibration procedure had been carried out properly.

In the high energy portion of the spectrum the hydrogen line appears as expected but normally none of the other primary standards appear. It was decided to make the sample holder from lead and use the high energy lead line for calibration. This is a particularly convenient calibration line since it is the only prominent line in the lead spectra. The spectrum being observed is not complicated with a large number of other lines as it would

TABLE I

Primary Energy Standards

Source	Energy (keV)	Reference
annihilation	511.006 ± .005	(a)
Na^{24}	1368.53 ± .04	(b)
$H^1(n,\gamma)H^2$	2223.29 ± .07	(c)
ThC"	2614.47 ± .10	(b)
$Be^9(n,\gamma)Be^{10}$	6809.4 ± .4	(d)
$N^{14}(n,\gamma)N^{15}$	6322.00 ± .45	(d)
$Na^{23}(n,\gamma)Na^{24}$	6395.1 ± .4	(d)

(a) Electron rest mass from 1963 atomic constants.

(b) Murray, G., et al., Nucl. Phys. 63 (1965) 353.

(c) Greenwood, R. C., W. W. Black, Phys. Letters 21, 7 (702) 1966.

(d) Greenwood, R. C., "Precise Measurements of Primary Capture Gamma-Ray Energies Using a 'Boot-Strap' Method", paper presented at ANL Slow Neutron Capture Conference, November 2-4, 1966.

be with most other materials.

In order to use the lead line it was necessary to determine its energy accurately. This was accomplished by three separate runs in which its energy was determined relative to the three high energy standards in Table I. The results of these runs are listed in Table II. The value used for the lead line was 7367.7 ± 0.5 keV. The hydrogen and lead lines were used for calibration except for a few cases where source peaks fell so close to them that their energy was slightly shifted. In order to be sure that the energy calibration procedure was correct a number of weak background lines that appeared in every spectrum were used as checks.

TABLE II

Values of the Energy of the Capture γ Ray
From the $Pb^{207}(n,\gamma)Pb^{208}$ Reaction

Run Number	Calibration Sources	Energy of γ Ray from $Pb^{207}(n,\gamma)Pb^{208}$ (keV)
1	H and Be	7367.48 $\pm$ 1.0
2	H and N	7367.68 $\pm$ 1.0
3	H and Na	7368.02 $\pm$ 1.0
		Mean = 7367.73 $\pm$ 0.5 keV

These lines are listed in Table III. The iron lines came from the detector shield, the copper from the cold finger, aluminum from the dewar, and carbon from shielding materials. If most of these lines fell within 1 keV of the known value the energy calibration was assumed to be satisfactory.

TABLE III

Weak Background Lines

Energy	Source
7914.5	Cu
7723.8	Al
7645.6	Fe
7631.6	Fe
6736.4	Pb
6116.3	Ge
4945.2	C
3683.9	C
1532.8	*

* This line, which appeared in all triple coincidence runs, was previously (2) identified as an Fe line. It has now been established that it results from an annihilation photon being detected in the Ge(Li) detector and the triple coincidence requirement is satisfied either by chance or by one of a number of real processes that can be postulated. Since the actual energy recorded in triple coincidence is 1022 keV less than the incident γ-ray energy, this annihilation line appears at 511 + 1022 = 1533 keV when compared to the calibration lines in the spectra.

2.4 Errors in Energy

The reproducibility of the energy of a line depends upon the number of counts recorded in the peak and also to some extent on the background present. Generally, however, after a number of checks it was determined that except for the very

weakest lines in the spectra all lines were reproducible to within ± 1 keV. In the case of prominent lines the reproducibility was easily within ± 0.5 keV. Some of the very weak lines were slightly worse than 1 keV but all lines strong enough to be reported were within ± 1 keV.

The accuracy of the energy determination depends upon the accuracy of the standards used. In our case, the largest error was ± 0.5 keV of the Pb^{207} line. It was not possible to make a meaningful comparison with other work at high energies to check our accuracy since we used the most accurately known high energy lines to determine the Pb^{207} standard. At low energy, however, it was possible to compare our results with the considerably more accurate results of a bent crystal spectrometer. Such a comparison is given in Table IV where the present work is compared to the results of Van Assche. All results fall well within the ± 1 keV error assigned to the present results.

One other check of internal consistency of the energy values over the entire energy spectra was afforded by the two-step cascades to the ground state. In each run usually between 5 and 15 of these cascades were found and invariably the sums of their energies after a recoil correction was applied agreed within ± 1 keV.

3. Intensity Determination

The intensity of each line expressed as the number of γ's/100 captures is listed in the table. The procedure for determining the intensity was as follows:

TABLE IV

Prominent Low Energy Capture γ Rays of $Sc^{45}(n,\gamma)Sc^{46}$

Present Work ($\sigma = \pm 1$ keV)	Van Assche, et al.[a] (error in eV)	
217.0	216.368	(5)
228.6	227.769	(8)
	228.710	
295.6	295.243	(14)
400.1	399.745	(40)
486.2	485.999	(25)
539.6	539.400	(45)
554.8	554.530	(40)
585.2	584.800	(50)
627.9	627.500	(70)
722.2	721.890	(90)
774.1	773.970	(100)
808.1	807.690	(70)
888.6	889.150	(80)
899.9	898.780	(220)
1058.4	1058.040	(400)

(a) Van Assche, et al., Nuclear Physics, 84 (1966) 661.

1. Determination of the number of counts in the peak.

2. Calculation of the number of γ's emitted by the source using intrinsic and geometric efficiency factors that had been determined by previous measurement (2). A correction for γ-ray self absorption in the sample was also included.

3. Calculation of the total number of captures in the sample using a measured total exposure (nvt) and cross section values listed in Table 5. A correction for neutron flux depression in the sample was included.

4. The results of steps 2 and 3 were then used to get the desired intensity.

3.1 Peak Areas

The computer code referred to above determined the peak area by subtracting the background and summing the total number of counts in the peak. The background was determined by connecting the minima in the smoothed spectra taking care not to include minima from partially resolved doublets. No peaks of less than 100 counts were included but many of the weakest reported peaks had between 100 and 200 counts. Very strong peaks often had more than 20,000 counts.

A number of checks were made to estimate the error in peak area determinations. The area of strong peaks ($>$ 5000 counts) was found to be reproducible within $\pm$ 5% or better, but in the case of weak peaks, as expected, the error was directly related to the statistical accuracy in the number of counts. At low energies ($<$ 4 MeV) where the background was somewhat higher weak peaks had area errors of $\pm$ 20% to $\pm$ 50% as determined by reproducibility from a series of runs on the same sample.

In this work we have not attempted to determine the accuracy of the peak area of each line reported. We feel that the intensity accuracy of the majority of the lines reported are

within ± 20%. As mentioned above, however, the most prominent lines in each spectra should be at least a factor of 2 better than this and the very worst may be a factor of 2 worse. Note also that all intensities are per 100 captures in all isotopes of the sample, not per 100 captures in just the isotope in question. Special Note. The number of significant figures in the intensities listed is a result of the way the computer printed out the result and in no case are intensities thought to be better than ± 10%.

3.2 Fraction of γ Rays Observed

It is possible to estimate the fraction of capture γ rays emitted that have been observed in the following way.

$$\frac{\sum_i E_i I_i}{\overline{B}} = \% \text{ of } \gamma\text{'s observed}$$

Where the sum is over all lines in the spectrum and E_i is the γ-ray energy, I_i is the intensity in units of number/100 captures, and $\overline{B}$ is the average binding energy of all the isotopes weighed by their percentage abundance and capture cross section as shown below.

$$\overline{B} = \frac{\sum_i N_i \sigma_i B_i}{N \sigma_t}$$

Where i refers to the i^{th} isotope of the element, N_i is the number of atoms/cm^3, the σ_i's are capture cross sections, I_i is the intensity of all lines except the decay line, N is the number of atoms of the element, and σ_t the total capture cross section of the element. The values of $\overline{B}$ and the percentage

of γ rays observed have been calculated by Harper (5) and are listed in Table 5.

The accuracy of the percentages listed in the last column are hard to judge since they depend not only on errors in I_i but also errors in σ_i, σ_t, and B_i which in some cases are rather large. We feel that in most cases the error of the observed percentage is within $\pm$ 15%. This error is arrived at by carefully looking at plots of the spectra and noting that in a number of cases (e.g., Na, P, Ti, Va, Cr, Fe, Ni, Cu, Ga) the background was quite flat, indicating no appreciable unresolved region. In these cases the observed percentages come out to be 100% $\pm$ 15% which indicates that all the important γ rays have been observed. Conversely, the high Z elements show quite large unresolved regions and as expected the observed percentages are quite low. This effect can be seen by comparing the backgrounds in Figs. 2 and 3.

Special mention should be made about the case of F where the calculated percentage is 197. This is clearly wrong and we suspect the error is in the intensities below 2 MeV. Because of its very low value of σ_t these lines are all very weak and so all lines have much larger intensity errors than most elements. The literature value of $\sigma_t < 10$ mb also indicates that this might be the source of the error.

References

1. Orphan, V. J. and N. C. Rasmussen, "A Ge(Li) Spectrometer for Studying Neutron Capture Gamma Rays" Nuclear Instruments and Methods, 48, 2 (1967).

2. Orphan, V. J. and N. C. Rasmussen, "A Study of Thermal Neutron Capture Gamma Rays Using a Lithium Drifted Germanium Spectrometer", AFCRL-67-0104, January 1967.

3. Inouye, T., T. Harper and N. C. Rasmussen, "The Application of Fourier Transforms to the Analysis of Spectral Data", Transactions of the American Nuclear Society, 11, 1 (June 1968).

4. Inouye, T., T. Harper and N. C. Rasmussen, "The Application of Fourier Transforms to the Analysis of Spectral Data" Nuclear Instruments and Methods, 67, 1 (January 1969).

5. Harper, T., (Private communication).

TABLE V

Percent of Capture γ Rays Observed

Z	Element	σt	$\overline{BE}$ (keV)	% of Capture Gamma Rays Observed
1	hydrogen	-	-	-
2	helium	-	-	-
3	lithium	33 mb	2340.0	53.9
4	beryllium	9.5 mb	6815.0	99.4
5	boron	752 b	11007.0	1.5
6	carbon	3.4 mb	4945.2	98.1
7	nitrogen	75 mb	10834.8	100.8
8	oxygen	-	-	-
9	fluorine	10 mb	6597.3	185.3
10	neon	-	-	-
11	sodium	534 mb	6956.6	115.8
12	magnesium	63 mb	9103.3	83.9
13	aluminum	235 mb	7723.8	61.2
14	silicon	160 mb	8767.6	111.9
15	phosphorus	190 mb	7936.8	110.1
16	sulfur	512 mb	8641.3	76.3
17	chlorine	33.2 b	8576.5	77.0
18	argon	-	-	-
19	potassium	2.10 b	7750.0	74.4
20	calcium	430 mb	8400.0	72.2
21	scandium	24.0 b	8766.6	74.9
22	titanium	6.09 b	8269.7	116.2
23	vanadium	5.00 b	7383.7	104.8
24	chromium	3.10 b	9256.8	84.2
25	manganese	13.3 b	7270.4	86.1
26	iron	2.62 b	7848.0	91.3
27	cobalt	38.0 b	7491.1	73.2
28	nickel	4.6 b	8527.8	110.4
29	copper	3.85 b	7750.0	92.1
30	zinc	1.10 b	8120.0*	57.4

TABLE V (Continued)

Z	Element	σ_t	$\overline{BE}$ (keV)	% of Capture Gamma Rays Observed
31	gallium	3.0 b	6970.0	94.6
32	germanium	2.45 b	8490.8	42.9
33	arsenic	4.5 b	7326.0	26.6
34	selenium	12.3 b	8201.0	36.8
35	bromine	6.7 b	7835.0	17.5
36	krypton	-	-	-
37	rubidium	0.73 b	4386.0*	39.7
38	strontium	1.21 b	10800.0	62.2
39	yttrium	1.31 b	6869.0	102.5
40	zirconium	185 mb	8680.0	47.4
41	niobium	1.16 b	7213.0	24.7
42	molybdenum	2.7 b	8752.0	30.4
43	technetium	-	-	-
44	ruthenium	2.56 b	8277.0	25.7
45	rhodium	156 b	7001.8	19.0
46	palladium	8.0 b	6260.0*	31.0
47	silver	63.0 b	6959.3	24.5
48	cadmium	3620 b	9043.1	31.2
49	indium	198 b	6722.8	10.7
50	tin	625 mb	9300.0*	17.3
51	antimony	5.5 b	6685.0	15.4
52	tellurium	4.85 b	8594.0	32.2
53	iodine	6.6 b	6799.0	22.8
54	xenon	-	-	-
55	cesium	29.0 b	6740.0*	24.0
56	barium	1.2 b	7922.0	48.5
57	lanthanum	8.9 b	5097.6	49.9
58	cerium	730 mb	5432.7	53.5
59	praseodymium	11.3 b	5842.9	25.5
60	neodymium	52 b	7531.8	36.5
61	promethium	-	-	-

TABLE V (Continued)

Z	Element	σ_t	$\overline{BE}$ (keV)	% of Capture Gamma Rays Observed
62	samarium	5840 b	7981.9	19.3
63	europium	4360 b	6294.8	16.0
64	gadolinium	39100 b	8038.1	11.7
65	terbium	46 b	6400.0	7.7
66	dysprosium	929 b	6036.0	29.4
67	holmium	65 b	6331.0	10.0
68	erbium	199 b	7770.0	21.3
69	thulium	126 b	6380.0	13.8
70	ytterbium	39 b	6250.5	25.2
71	lutetium	133 b	6715.0	9.1
72	hafnium	105 b	7204.4	21.6
73	tantalum	19.1 b	6062.5	14.2
74	tungsten	19.1 b	5861.4	34.8
75	rhenium	86 b	5972.2*	9.3
76	osmium	15.3 b	7000.0*	11.3
77	iridium	460 b	6138.3	22.1
78	platinum	9.6 b	7716.4	32.3
79	gold	99.6 b	6512.1	45.0
80	mercury	372 b	8028.3	70.9
81	thallium	3.3 b	6644.8*	37.5
82	lead	170 mb	7270.0	100.7
83	bismuth	34 mb	4599.7*	72.6

*Not well known.

TABLE VI

Energy and Intensity Listing

The energies are measured γ-ray energies in keV and do not include a recoil correction. The intensities are number/100 captures. The number of significant figures in the intensity values is a result of the computer output format; generally speaking the accuracy is 20% or better. All the identified decay lines from activity induced into the sample are marked D. A number of the cases have been recomputed since the prepublication copy of MITNE-85 and the results included in Nuclear Data, Vol. 3, Nos. 4-6, 1967. This has resulted in some changes. Where these differences exist this listing is considered to be the preferred value from our data.

LITHIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
477.6	.84	2032.5	29.37	4555.6	.28
538.4	1.20	2117.4	2.04	4734.0	.43
558.8	5.43	2184.0	7.37	5033.3	.39
707.6	2.23	3492.7	.60	6017.3	.45
869.1	2.93	3529.7	.43	6320.4	.28
980.7	3.19	3585.2	.49	6771.0	.34
1891.4	2.97	4508.3	.47	7246.7	1.31

BERYLLIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
853.5	25.36	3368.2	34.20	5958.1	2.00
2589.9	24.00	3444.4	11.80	6810.0	62.50

BORON

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
247.7	.84	452.8	1.20	2532.3	.35
258.1	1.65	477.7 D	470.00	3308.0	.16
263.6	.55	497.5	2.22	3505.0	.19
265.5	.72	501.7	1.91	4443.0	.27
270.9	.73	1858.6	.90	4710.2	.12
275.7	.61	1889.4	1.36	6759.3	.14
281.4	1.26	1993.9	.60	7005.1	.17
440.2	.98	2072.7	.53		

CARBON

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
1261.2	29.20	3683.9	31.80	4945.2	67.00

NITROGEN

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
244.3	.93	1887.9	27.45	5532.0	17.79
253.1	4.64	2062.3	3.74	5560.3	9.05
277.9	2.17	2157.4	3.65	5619.1	1.09
326.0	2.98	2174.7	2.65	6321.4	16.65
336.9	.96	2356.7	4.45	6419.4	1.11
369.1	1.15	2519.0	9.43	6505.4	.86
473.3	2.23	3530.5	9.58	6759.4	.92
479.7	2.07	3675.4	15.52	7299.5	8.36
596.8	4.38	3855.8	1.39	7413.6	1.20
695.6	2.73	4507.6	15.81	8308.7	4.22
865.8	2.30	5267.1	25.41	9151.4	1.76
1678.6	6.04	5296.7	18.58	10827.7	15.00

FLUORINE

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
279.6	22.27	1749.0	50.13	4127.2	3.40
287.5	5.59	1781.1	20.40	4199.9	2.51
298.9	7.40	1797.5	24.70	4260.4	2.60
326.7	36.38	1889.5	55.44	4293.7	2.66
332.6	4.32	1942.5	16.09	4416.1	3.20
339.5	5.34	2452.8	11.17	4555.3	4.49
396.3	9.94	2528.1	9.23	4612.5	3.47
441.6	6.91	2601.9	9.81	4986.6	2.61
474.1	20.52	2632.1	5.87	5005.6	2.06
480.7	9.97	2661.7	6.95	5031.4	4.47
558.9	19.57	2682.8	8.48	5060.9	2.04
582.2	14.22	2699.3	4.93	5519.4	3.33
596.2	88.77	3016.8	4.38	5616.6	3.40
608.6	10.79	3051.9	5.73	5667.9	3.77
707.1	18.46	3074.4	10.06	5688.0	2.43
806.9	14.30	3262.6	3.76	6017.1	10.54
868.2	31.70	3488.7	8.00	6174.8	4.54
1631.7 D	98.88	3522.3	2.86	6320.9	3.02
1651.9	24.18	3589.3	12.13	6600.7	8.81
1718.9	23.85	3630.3	4.22		

SODIUM

ENERGY KEV	INTVNSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
472.4	69.29	2123.8	2.69	3411.6	1.72
499.1	.80	2137.5	1.50	3453.9	.41
560.2	2.55	2197.7	2.54	3468.7	.64
596.8	1.25	2250.8	1.15	3504.7	2.28
668.3	.49	2361.3	2.42	3546.6	.98
781.1	3.06	2397.7	2.18	3588.0	17.31
799.9	2.54	2414.9	6.43	3644.4	2.02
834.7	1.03	2504.6	.89	3723.6	.59
836.1	.93	2517.6	17.12	3865.3	.57
870.6	25.39	2594.1	2.14	3878.5	6.23
1003.8	.99	2716.0	1.00	3982.0	21.58
1345.5	2.20	2754.4D	102.38	4091.0	.35
1369.0D	6.36	2808.9	4.46	4187.8	1.68
		2862.7	11.75	4220.1	.32
1634.4	8.63	2903.1	2.93	4445.1	.82
1748.9	2.43	2982.4	3.68	4729.9	.57
1889.6	2.63	3026.2	4.01	5116.1	.52
1932.2	1.38	3098.1	9.67	5270.4	.40
1949.0	2.32	3117.0	.98	5297.9	.42
1965.4	1.22	3213.5	1.53	5616.7	5.99
1983.7	1.91	3279.6	1.16	6091.0	.30
2027.2	19.81	3370.5	4.03	6395.4	25.69
2057.0	1.45				

MAGNESIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
277.7	2.56	3160.4	.64	5526.9	1.17
326.6	1.85	3184.7	.45	5545.2	.46
390.0	5.61	3209.4	.94	5560.3	.50
436.3	1.84	3301.1	7.46	5587.9	.30
479.6	1.68	3319.8	.77	5611.5	.51
559.6	5.06	3360.3	.62	5822.7	.28
585.2	21.45	3413.6	5.43	5890.0	.29
608.4	2.18	3478.4	.75	6037.8	.37
693.0	3.40	3498.7	.55	6111.4	1.91
976.2	4.43	3515.2	.52	6175.8	.32
1129.4	7.10	3549.6	.34	6253.3	.51
1632.8	4.62	3562.0	.51	6273.9	.56
1690.1	6.52	3598.2	.29	6319.1	.49
1714.0	2.96	3631.0	.45	6354.8	1.28
1750.0	2.53	3743.7	1.14	6419.5	.39
1808.9	25.16	3808.4	.81	6442.2	.48
1890.2	7.26	3830.7	5.64	6471.2	.28
1982.4	1.57	3870.1	.54	6490.6	.30
2043.4	3.52	3916.7	40.82	6508.3	.46
2048.4	3.26	4078.4	.28	6570.0	.67
2541.0	1.88	4136.9	.35	6600.0	.31
2581.5	.80	4216.5	1.29	6619.2	.29
2607.7	.76	5257.6	.66	6709.3	.45
2623.8	.62	4285.3	.33	6914.2	.64
2642.6	.57	4411.5	.44	7160.5	.41
2658.6	.90	4509.8	.58	7180.3	.56
2709.1	.57	4602.3	.47	7252.4	.63
2828.1	35.69	4966.6	1.16	7304.1	.32
2880.3	3.17	5157.0	.49	7569.9	.46
2938.9	.71	5196.6	.77	7599.8	.40
2963.6	1.31	5224.1	.44	7676.9	.34
3054.1	10.83	5295.9	1.07	8154.4	3.98
3139.5	.95	5451.8	2.77	9282.3	.63

ALUMINUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
248.7	7.49	2411.0	.20	4017.7	.31
329.4	6.36	2422.2	.36	4133.7	4.26
336.0	.69	2454.2	.43	4196.4	.07
345.4	.68	2577.9	.43	4222.7	.07
550.0	.96	2590.7	1.03	4259.9	4.07
758.1	1.42	2626.0	.70	4381.5	.22
830.3	1.69	2709.2	.34	4427.2	.59
983.4	3.92	2727.2	.13	4644.1	.11
1014.0	1.52	2746.7	.11	4660.4	1.28
1623.1	3.22	2821.5	2.58	4690.6	2.52
1778.5D	88.17	2922.6	.14	4734.1	3.49
1823.2	.63	2960.4	6.16	4766.2	.11
1838.0	.41	2972.7	.12	4813.5	.10
1864.6	.41	2985.9	.14	4874.1	.13
1928.0	.48	3034.4	5.82	4903.3	1.84
1947.9	.43	3085.5	.16	5000.4	.10
1967.8	.27	3143.9	.18	5104.1	.14
1980.3	.42	3267.5	.46	5134.2	1.63
2023.8	.23	3304.7	.83	5301.8	.21
2079.7	.31	3347.3	.53	5411.1	1.11
2095.7	.29	3393.0	.23	5585.8	.53
2107.6	1.18	3465.5	4.30	5709.3	.40
2125.3	.27	3530.3	.16	5765.9	.33
2139.9	1.47	3561.8	.41	6019.5	.21
2256.2	.41	3591.7	2.83	6101.6	1.79
2274.0	.75	3622.3	.11	6199.0	.48
2283.7	1.66	3790.2	.83	6316.2	1.47
2299.1	.30	3817.8	.14	6440.7	.37
2332.0	.17	3825.1	.20	6710.6	.33
2356.7	.40	3849.6	1.43	7694.0	4.17
2361.7	.27	3876.3	1.28	7723.8	20.10
2383.7	.30	3935.9	.19		

SILICON

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
246.9	4.27	2780.4	1.93	4733.3	.26
250.5	4.13	3054.6	1.60	4811.2	.35
383.0	.43	3086.5	.54	4837.5	.38
449.9	.42	3101.4	1.26	4934.3	70.55
559.5	.80	3116.4	.35	5070.6	.23
596.2	.99	3278.8	.26	5107.3	3.68
656.0	.53	3306.3	.34	5271.9	1.01
693.2	.76	3432.4	.26	5297.9	.20
752.4	.99	3499.3	.24	6046.8	.30
1151.3	.81	3539.3	79.58	6244.1	.19
1273.2 D	12.25	3632.7	.39	6287.0	.31
1294.0	.91	3661.3	4.61	6380.1	12.62
1332.2	1.13	3770.0	.40	6420.0	.21
2092.9	26.78	3865.3	1.08	6742.3	1.84
2157.5	.98	3954.9	3.06	7055.4	.42
2336.5	1.13	4323.3	.25	7199.3	7.16
2425.9	3.93	4508.8	.28	7277.5	.42
2447.5	.63	4528.8	.44	8471.5	2.31
2509.6	.91				

PHOSPHOROUS

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
227.3	.72	2424.7	1.83	4364.3	5.05
233.0	.49	2460.7	.74	4408.3	.40
243.6	2.40	2553.9	.57	4490.5	1.73
250.9	2.98	2586.1	5.28	4568.3	.23
325.3	1.56	2603.1	.81	4592.7	.32
336.5	.85	2657.0	1.88	4613.7	.50
371.5	.64	2705.1	.72	4629.2	.45
427.7	.59	2774.2	.44	4671.3	15.20
436.1	1.20	2863.1	2.36	4877.1	.77
449.3	.96	2886.2	3.37	4911.9	.66
472.4	2.19	2958.8	.28	5088.3	.63
479.0	2.05	2992.1	.36	5155.2	.27
557.6	3.77	3058.3	6.47	5194.8	1.21
595.2	4.32	3087.8	.43	5266.2	4.80
636.2	13.42	3121.9	1.06	5298.8	.32
706.5	1.87	3152.0	.41	5349.3	.28
869.0	2.23	3168.0	.38	5427.7	.24
915.3	1.30	3185.4	1.89	5532.4	.44
944.6	1.25	3220.6	.31	5619.4	.27
1032.4	1.51	3273.8	5.85	5704.8	3.51
1070.6	9.42	3303.4	.31	5730.7	.23
1321.4	1.72	3318.1	.44	5778.3	.99
1380.6	2.18	3336.7	.36	5816.5	.44
1413.1	15.47	3339.6	.32	5860.1	.29
1629.9	3.09	3368.3	.62	5939.6	.27
1674.1	3.91	3444.1	.99	6036.3	.30
1688.2	2.60	3482.1	.41	6061.9	.36
1734.2	4.29	3522.8	14.49	6194.6	.72
1760.1	1.73	3551.0	.98	6226.1	.26
1890.0	6.66	3594.0	.56	6275.7	.48
1941.9	5.84	3610.6	.40	6319.5	.63
1999.8	1.19	3634.4	.27	6392.0	.43
2021.8	1.82	3741.9	.27	6418.9	.62
2034.1	1.47	3768.2	.49	6504.7	.50
2114.3	7.65	3900.3	17.58	6707.8	.56
2154.2	16.78	3924.9	3.99	6785.3	14.30
2172.6	2.85	3960.3	.43	6915.3	.77
2244.6	1.60	3971.3	.30	7179.2	.45
2250.6	1.25	4129.6	.42	7306.2	.61
2262.7	1.11	4146.8	.35	7421.2	5.85
2276.0	.98	4200.0	2.90	7788.6	.38
2285.1	.89	4261.0	.34	7856.2	1.10
2295.4	1.75	4324.3	.31	7938.1	.30
2309.1	.64				

SULFER

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
841.1	54.27	2864.7	1.28	4639.1	1.49
1358.5	4.33	2931.1	16.05	4869.8	8.24
1597.8	11.84	3220.8	19.46	5047.2	2.26
1890.5	7.09	3370.4	3.78	5420.5	42.44
2379.7	31.97	3398.7	.89	5583.5	.90
2490.8	1.95	3723.1	2.03	7800.0	2.81
2753.2	4.19	4430.8	3.16	8640.9	1.91

CHLORINE

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
294.6	.25	2800.2	.55	4414.4	.21
305.1	.16	2811.8	.20	4458.2	.06
360.0	.10	2845.5	.68	4523.7	.50
395.7	.11	2864.4	6.77	4548.6	.36
437.4	.38	2895.9	.57	4587.0	.26
477.9	.17	2975.3	1.14	4616.5	.58
518.3	11.00	2997.7	1.15	4682.7	.12
541.0	.15	3015.8	.82	4729.4	.59
575.8	.15	3062.2	3.73	4754.3	.15
589.9	.50	3087.9	.31	4794.3	.08
594.6	.56	3116.0	1.42	4829.9	.12
788.6	10.36	3200.8	.28	4883.3	.23
830.8	.20	3253.2	.26	4980.0	3.82
1020.4	.29	3269.1	.11	5017.0	.53
1132.3	.73	3293.3	.18	5079.5	.23
1165.4	10.90	3316.1	.28	5151.8	.12
1327.5	.61	3333.0	.70	5206.4	.27
1600.6	4.33	3374.3	.48	5246.4	.41
1675.8	.68	3429.1	.90	5460.2	.09
1784.9	.73	3476.9	.10	5473.4	.08
1830.2	.73	3481.4	.10	5516.9	1.50
1896.9	.67	3502.2	.73	5584.9	.41
1951.3	21.37	3531.7	.11	5604.2	.24
1957.5	15.13	3561.8	1.08	5637.0	.09
1984.5	.42	3587.4	.15	5715.2	4.62
2004.1	.52	3601.4	.40	5733.5	.23
2034.1	.39	3660.5	.32	5752.9	.17
2074.3	.74	3710.3	.22	5777.7	.16
2092.1	.45	3735.2	.09	5902.9	.94
2106.5	.59	3749.7	.34	5956.2	.27
2129.5	.28	3775.9	.17	6007.9	.08
2157.1	.28	3824.3	1.78	6086.8	.21
2176.9	.30	3963.7	.27	6111.1	15.78
2268.7	.26	3981.1	.83	6267.7	.28
2289.4	.47	4012.3	.09	6340.2	.12
2311.8	.71	4028.2	.35	6358.1	.08
2364.3	.23	4055.1	.83	6375.8	.13
2468.5	.85	4082.6	.55	6422.5	.17
2492.5	.87	4111.6	.12	6487.5	.10
2539.5	.26	4138.4	.39	6620.1	10.00
2624.2	.66	4208.1	.30	6681.6	.12
2649.2	.39	4273.7	.09	6755.9	.09
2676.3	3.27	4298.6	.30	6787.3	.08
2733.1	.15	4329.0	.10	6875.6	.08
2746.0	.29	4358.2	.28	6977.6	1.72
2763.2	.19	4376.7	.13	7004.5	.09

CHLORINE CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
7281.7	.14	7475.8	.20	7790.0	6.63
7413.8	8.52	7562.4	.10	8578.7	2.30

POTASSIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
245.3	.13	2073.2	10.26	3404.3	.70
251.4	.22	2121.7	.27	3428.3	.09
313.8D	.13	2152.6	1.16	3452.3	1.66
359.5	.18	2170.1	.23	3478.8	.14
381.8	.17	2184.6	.66	3521.2	.84
461.2	.11	2291.2	3.44	3526.4	.85
522.5	.34	2309.7	.68	3546.6	4.26
559.5	.35	2325.4	.22	3568.8	.31
572.2	1.26	2345.9	.88	3589.7	.17
575.3	.85	2367.8	.76	3604.4	.09
594.8	.25	2389.9	1.96	3620.0	.28
626.6	.17	2422.0	1.49	3633.6	.38
647.1	1.35	2460.4	.27	3650.9	1.29
682.1	.44	2545.9	3.64	3692.6	2.28
721.9	.27	2575.8	.16	3738.3	1.02
770.6	31.23	2611.8	1.70	3765.6	.10
791.5	.32	2640.0	1.01	3779.2	.63
827.7	.36	2665.1	.21	3822.8	.19
843.3	1.18	2687.1	.14	3839.8	.44
891.1	.71	2703.4	.11	3853.6	.07
923.0	.28	2725.7	.88	3859.5	.07
983.7	.29	2757.0	1.54	3876.5	.25
1086.3	.95	2785.4	.21	3897.1	.23
1159.0	5.89	2805.7	1.90	3911.7	.54
1247.1	2.29	2840.2	1.49	3931.2	.83
1268.7	1.03	2858.0	.18	3945.2	.24
1303.4	1.48	2892.4	.37	3960.1	.79
1356.0	.43	2917.4	.13	3978.6	.75
1373.4	1.44	2925.8	.16	4002.7	1.23
1464.7	.35	2993.0	.57	4062.1	1.17
1478.8	.92	3010.7	.25	4085.6	.57
1489.3	.40	3026.7	.13	4112.1	.35
1523.6D	2.21	3039.9	.43	4136.4	2.61
1564.1	1.95	3055.7	2.03	4170.6	.64
1617.5	7.91	3071.0	.09	4201.1	1.69
1660.9	.50	3099.4	.68	4224.8	.58
1703.4	1.89	3130.4	.51	4243.6	.45
1794.5	1.43	3157.3	.08	4281.3	.17
1825.8	.69	3199.4	.12	4314.2	.26
1859.8	.53	3262.7	2.24	4328.1	.06
1929.3	2.53	3304.4	.78	4346.9	.13
1956.7	2.15	3327.7	.48	4361.1	3.41
2007.6	.99	3336.8	.45	4386.6	1.26
2018.4	1.16	3349.7	.39	4406.9	.21
2041.4	2.67	3364.5	.10	4432.5	.23
2045.7	2.61	3382.6	.45	4473.2	.37

POTASSIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4507.9	.69	5043.1	1.67	5672.5	.11
4559.7	.10	5069.7	1.16	5695.6	4.64
4654.0	.29	5112.8	.10	5729.6	1.62
4671.1	.47	5132.6	.16	5752.0	4.39
4705.5	.09	5173.6	2.49	6387.6	.15
4771.6	.27	5224.1	.39	6420.7	.14
4874.9	.26	5295.3	.21	6851.6	.18
4903.9	.12	5380.3	7.30	6898.3	.10
4928.6	.10	5460.7	.19	6998.6	2.05
4992.1	1.70	5509.7	2.48	7769.0	4.54
5013.7	.81	5562.8	.08		

CALCIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
277.0	.49	2350.4	.52	4643.1	.20
341.0	.60	2376.5	.42	4686.8	.14
363.2	.57	2382.0	.40	4749.7	1.98
520.0	5.94	2474.0	.41	4775.0	.28
660.9	.91	2576.4	.41	4838.7	.41
696.3	1.17	2607.4	.80	4963.6	.66
707.7	1.41	2660.2	1.10	5146.5	.20
726.9	2.13	2692.5	.32	5165.2	.33
836.6	1.19	2709.8	.28	5240.7	.14
867.2	1.57	2767.7	.53	5270.5	.82
980.1	1.36	2811.0	2.39	5297.5	.23
1155.6	1.35	2862.8	.32	5314.2	.41
1388.3	2.20	2893.7	.38	5515.0	1.74
1649.2	1.41	2956.1	.66	5533.8	.36
1671.7	1.93	3003.4	.37	5562.8	.25
1691.3	1.42	3086.3	.46	5692.1	.86
1703.7	1.38	3237.5	.36	5821.3	.15
1724.0	2.10	3240.9	.31	5900.6	3.07
1825.8	1.54	3289.4	.22	5980.6	.50
1855.6	.77	3353.0	.38	6037.9	.42
1880.2	1.02	3436.5	.18	6202.1	.12
1942.5	52.50	3585.7	1.65	6322.6	.39
2000.8	7.20	3610.2	4.58	6352.7	.62
2009.2	5.40	3638.2	.44	6389.9	.53
2035.9	.61	3652.8	.18	6419.9	28.09
2077.6	1.40	3759.7	1.90	6469.9	.14
2094.2	1.60	3802.7	.28	6504.1	.38
2118.4	1.67	3915.9	.45	5697.4	.18
2121.5	1.01	3947.0	.43	6675.5	.35
2129.8	2.53	3981.9	.17	6915.8	.30
2145.3	.67	4218.9	.18	6985.4	.14
2149.4	1.14	4293.2	.34	7106.2	.15
2258.3	.63	4418.9	10.79	7140.6	.15
2264.3	.75	4468.0	.15	7173.2	.16
2294.6	1.80	4515.8	.75	7213.9	.14
2308.6	0.80	4547.0	.26	7253.3	.30
2328.7	0.90	4572.5	.25	7306.3	.66
2341.5	.41	4615.4	.24		

SCANDIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
217.0	6.89	1900.4	1.12	3106.0	.18
228.6	39.36	1975.7	.62	3117.5	.17
250.0	.33	2006.1	1.83	3158.9	.16
280.8	.82	2050.1	.31	3168.0	.10
295.6	15.74	2058.7	.87	3222.0	.18
400.1	1.15	2080.0	.53	3246.5	.30
408.9	.33	2111.4	2.04	3265.8	.78
440.5	.66	2128.5	.45	3281.2	.27
474.4	.33	2155.0	.29	3309.3	.27
486.2	1.80	2168.9	.23	3358.5	.10
539.6	1.64	2244.0	.47	3377.4	.14
554.8	5.25	2262.3	.14	3396.3	.30
585.2	5.08	2288.7	.41	3415.5	.19
627.9	7.05	2330.8	.86	3458.4	.61
643.0	.66	2341.4	.16	3478.9	.18
722.2	1.64	2350.2	.34	3499.6	.33
774.1	1.64	2363.2	.26	3523.7	.08
808.1	1.64	2374.5	.53	3556.3	.27
835.4	.49	2406.3	2.07	3569.9	.08
860.3	.82	2445.0	.18	3596.3	.32
888.6 D	1.31	2477.4	.94	3623.1	.46
899.9	.49	2500.8	.60	3635.4	.16
946.4	.49	2551.1	.37	3642.2	.09
1014.5	.66	2564.6	.17	3711.5	.19
1058.4	.98	2583.3	.18	3722.9	.13
1084.4	1.15	2635.6	3.04	3736.2	.20
1089.5	1.15	2665.5	.68	3800.0	.19
1122.4 D	2.13	2680.6	.19	3822.8	.22
1135.6	.66	2696.4	1.18	3840.7	.19
1165.2	1.31	2715.3	.67	3865.4	.08
1228.0	.98	2739.5	.14	3879.0	.39
1271.4	.82	2754.2	.14	3923.4	.07
1322.8	.82	2773.7	.15	3974.6	.32
1334.7	2.13	2794.6	.56	4000.7	.70
1549.5	2.38	2817.2	.17	4021.8	.26
1572.7	2.53	2837.0	.25	4038.9	.14
1648.4	.62	2871.5	.23	4059.7	1.30
1668.9	.63	2907.2	.20	4083.6	.11
1692.0	3.50	2929.5	.31	4111.1	.15
1706.7	.72	2949.8	.51	4131.9	.33
1754.5	.62	2964.0	.13	4154.0	.44
1812.8	1.14	2994.7	.64	4173.0	.93
1830.4	.61	3012.3	1.08	4202.9	.08
1857.3	2.28	3031.7	.41	4236.4	1.02
1871.7	.49	3051.0	.68	4269.5	.09
1887.0	.62	3085.5	.29	4292.4	.34

SCANDIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4314.0	.28	5316.5	.06	6364.1	.09
4327.7	.17	5335.6	.48	6429.8	.12
4341.3	.07	5346.3	.11	6457.8	.46
4355.0	.21	5361.1	.32	6506.4	.44
4377.6	.45	5378.7	.32	6536.9	.08
4402.0	.07	5407.0	.09	6556.8	1.76
4422.9	.23	5445.6	1.00	6575.3	.14
4439.5	.36	5481.5	.78	6644.2	.81
4464.7	.36	5499.5	.27	6688.4	.08
4498.9	.52	5531.3	.29	6716.7	1.49
4535.4	.07	5554.9	.24	6839.5	4.84
4564.9	.11	5567.8	.12	6874.4	.52
4597.2	.30	5584.5	.38	6960.8	.29
4616.6	.33	5623.5	.84	7052.1	.36
4628.9	.13	5665.6	.33	7117.1	1.51
4656.5	.11	5679.9	.10	7232.5	.42
4680.0	.54	5703.2	.16	7331.0	.21
4721.2	.55	5743.7	.84	7411.5	.12
4744.4	.06	5781.1	.44	7437.6	.21
4777.7	.07	5803.8	.07	7488.7	.38
4823.2	.13	5818.6	.18	7568.9	.09
4883.7	.50	5834.3	.06	7635.9	2.58
4891.3	.41	5897.3	2.08	7673.0	.36
4918.3	.40	5926.0	.19	7691.0	.09
4946.2	.41	5978.9	.34	7889.5	.09
4975.1	2.09	6054.9	2.28	7924.8	.22
4993.9	.71	6097.1	.26	8033.5	.12
5037.5	.20	6170.3	2.23	8116.2	.15
5054.0	.18	6192.4	.21	8132.4	1.93
5085.4	.33	6203.5	.12	8174.7	8.91
5128.6	.29	6259.0	.09	8315.4	1.71
5163.5	.29	6274.7	.09	8470.1	.61
5209.9	.55	6300.2	.36	8531.6	4.60
5226.0	.07	6318.1	1.71	8615.7	.16
5267.2	1.83	6349.8	1.64	8759.7	.83
5285.9	.40				

TITANIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
252.1	.30	2943.0	1.47	5267.7	.22
304.9	.16	3026.8	3.47	5394.5	.16
327.5	.21	3083.5	.66	5445.2	.21
341.7	30.64	3116.3	.22	5476.6	.18
471.7	.30	3131.0	.23	5498.5	.20
480.7	.25	3231.1	.84	5541.3	.21
559.4	.32	3270.6	.25	5561.2	.24
596.6	.35	3307.1	.22	5637.2	.52
649.5	.35	3329.1	.25	5687.3	.20
870.0	.67	3475.5	2.35	5755.1	.19
983.2	2.59	3554.2	1.41	5801.8	.14
1121.6	.98	3709.6	.81	5967.4	.15
1381.4	65.51	3734.0	1.61	6109.1	.39
1498.3	3.74	3870.3	.17	6150.0	.22
1554.2	.99	3903.6	.18	6169.8	.21
1586.0	8.56	3920.4	1.74	6199.7	.16
1761.6	7.91	3997.5	.16	6287.8	.15
1792.4	3.57	4031.8	.23	6333.4	.15
1841.8	1.42	4133.7	.18	6418.0	36.47
1883.0	1.67	4222.4	.20	6481.6	.16
2048.0	1.47	4355.2	.36	6521.1	.16
2086.8	1.04	4673.0	1.02	6555.6	6.49
2277.7	1.02	4713.9	1.24	6759.7	54.07
2371.3	.51	4812.7	.22	6882.0	.31
2496.0	.43	4881.3	5.67	6908.0	.20
2511.8	.44	4920.1	.13	7168.0	.35
2616.0	.85	4966.6	3.74	8009.6	.12
2840.5	.88	5092.0	.18	8262.4	.10

VANADIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
294.8	3.32	2428.2	.31	4750.3	.20
419.5	4.30	2515.5	.26	4772.3	.44
436.6	6.92	2622.7	.29	4883.7	1.63
482.3	.32	2681.9	.17	4993.2	.93
560.6	.34	2762.8	.35	5142.2	4.95
596.2	.66	2792.7	.27	5209.9	5.61
645.9	11.78	2827.3	.30	5267.8	.22
698.4	.91	2841.5	.99	5297.6	.16
712.4	.79	2888.9	.65	5445.7	.11
793.9	3.04	2962.5	.21	5515.5	9.71
823.5	4.51	3034.0	.35	5551.4	.52
846.1	3.73	3101.7	.17	5577.6	.41
1002.2	.83	3265.7	.28	5751.9	8.86
1097.2	.58	3333.6	.34	5891.7	2.78
1255.7	1.05	3419.6	.15	5944.5	.09
1272.9	.78	3503.5	.82	6037.1	.09
1358.7	2.30	3534.5	.59	6084.7	.13
1400.2	1.12	3556.8	.37	6253.9	.09
1433.9 D	69.17	3579.0	1.33	6278.4	.16
1558.4	4.55	3669.2	.25	6319.7	.25
1617.0	3.35	3717.2	.36	6342.5	.15
1664.2	2.03	3733.8	.24	6372.6	.12
1693.9	1.08	3837.2	.14	6464.8	9.56
1777.8	5.37	3863.5	.32	6517.2	18.88
1793.8	.66	3915.0	.17	6555.6	.12
1953.2	1.87	3978.0	.38	6599.7	.17
1960.1	.75	4076.9	.16	6625.9	.16
2002.0	.82	4117.3	2.53	6642.1	.12
2021.2	.80	4193.4	.11	6676.0	.12
2051.0	.54	4254.3	.26	6706.2	.16
2082.7	.60	4282.3	.18	6873.9	11.36
2100.5	1.11	4452.5	1.25	6965.6	.16
2146.0	4.32	4486.9	.39	7069.1	.27
2169.2	.50	4503.0	.15	7162.7	13.91
2271.1	.45	4534.3	.49	7291.5	2.44
2350.0	.54	4568.3	.34	7310.5	4.26
2410.9	.65	4693.1	.22		

CHROMIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
564.2	1.93	3263.5	.46	5269.5	1.13
749.2	9.88	3393.6	.32	5493.7	.64
835.1	24.04	3468.9	.13	5618.8	3.46
988.6	.40	3488.2	.17	5706.6	.72
1151.2	.40	3513.0	.46	5793.6	.34
1585.2	1.33	3596.7	.36	5857.9	.70
1694.8	1.12	3617.7	.79	5999.6	2.27
1783.8	5.43	3720.7	2.16	6136.3	1.66
1898.5	3.82	3785.2	.16	6245.7	.26
1994.7	2.28	3862.7	.44	6282.4	1.18
2238.9	7.45	3928.1	.36	6326.4	.49
2321.0	5.43	4022.3	.14	6372.1	.73
2349.0	.67	4133.9	.38	6645.5	5.29
2377.0	1.28	4323.3	.70	6890.1	1.03
2558.2	.82	4425.6	.49	7099.7	3.88
2601.9	1.39	4455.4	.42	7366.2	6.73
2621.3	.31	4529.7	.19	7939.3	11.41
2670.4	1.15	4626.4	.16	8484.3	4.06
3022.3	1.42	4847.2	.94	8512.3	5.50
3091.6	.23	4872.8	.35	8884.1	24.14
3178.6	.79	5222.9	.61	9720.3	9.82

MANGANESE

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
212.5	6.02	2856.4	.41	4613.8	.14
271.2	2.81	2863.5	.29	4644.6	.77
314.3	3.55	2925.6	.37	4690.0	.85
334.9	.13	2969.8	.30	4724.7	2.33
375.5	.30	3003.2	.70	4780.3	.22
454.0	1.33	3060.2	.27	4792.8	.23
542.9	.19	3144.4	.24	4829.1	.57
558.7	.45	3203.6	.28	4875.6	.84
646.4	.29	3267.5	.83	4907.5	.58
847.0D	15.56	3321.1	.19	4932.7	.17
1140.0	.57	3347.0	.61	4949.7	1.47
1401.7	.76	3372.9	.56	4970.3	.32
1705.4	1.20	3408.5	3.38	5014.7	5.54
1747.0	2.85	3457.4	.23	5034.7	.90
1810.4D	35.80	3498.9	.67	5067.4	3.18
1876.2	.81	3555.5	.28	5111.4	.31
1915.2	2.15	3580.8	.21	5135.1	.13
1987.6	2.36	3626.6	.51	5181.2	3.20
2044.3	2.43	3642.1	.45	5199.0	.38
2062.6	1.89	3667.8	.19	5253.9	1.29
2090.5	.98	3751.4	.33	5405.2	.28
2113.2D	18.85	3783.1	.22	5435.7	2.09
2175.2	2.25	3815.0	1.51	5527.2	6.94
2258.2	.41	3858.4	.57	5586.3	.14
2294.1	1.36	3929.1	.76	5761.1	1.61
2330.9	3.13	3979.7	.30	5921.3	1.01
2369.5	.56	4030.1	.22	6032.6	.44
2437.1	1.13	4101.3	.13	6104.5	1.90
2453.8	.31	4199.6	.13	6430.1	.75
2471.5	.58	4222.7	.88	6556.0	.15
2508.8	.32	4267.7	.51	6783.7	3.46
2521.8	.94	4348.1	.35	6929.0	2.57
2593.7	.75	4380.3	.44	7038.7	.18
2610.1	.28	4413.1	.24	7057.9	11.35
2621.3	.84	4446.2	1.10	7159.9	6.06
2658.0D	.66	4549.8	.33	7243.5	12.05
2676.9	.97	4566.9	1.54	7270.6	3.08
2696.9	.36	4587.8	.33		

IRON

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
230.4	1.53	2527.7	.42	3777.7	.18
277.3	.13	2576.3	.24	3791.7	.16
314.2	.15	2617.7	.09	3845.1	.27
352.5	10.85	2655.9	.13	3854.9	.97
366.9	1.47	2682.3	.41	3900.9	.04
411.3	.69	2698.2	.21	3918.8	.07
479.1	1.77	2721.5	1.43	3932.3	.05
570.3	.44	2751.1	.16	3957.3	.04
597.1	.47	2801.3	.10	3982.6	.16
692.1	4.91	2813.7	.05	4012.5	.39
810.6	.88	2835.5	.58	4035.8	.03
898.2	1.72	2873.8	.42	4074.3	.12
921.1	.79	2922.5	.13	4117.1	.04
1018.9	2.29	2955.6	.36	4142.7	.04
1043.7	.40	2973.4	.20	4157.0	.11
1139.9	.61	3033.5	.05	4218.8	4.02
1260.5	2.38	3062.1	.11	4275.9	.37
1358.0	1.03	3103.9	.66	4295.7	.04
1613.0	5.85	3121.1	.05	4324.7	.04
1668.8	.17	3169.3	.31	4367.6	.03
1724.8	8.03	3186.2	.66	4380.1	.12
1759.0	.39	3225.8	.16	4406.8	1.31
1776.5	.46	3240.4	.21	4462.4	.61
1842.9	.15	3267.8	1.19	4493.4	.04
1859.7	.23	3292.5	.31	4532.4	.05
1891.3	.42	3309.8	.04	4552.5	.04
1912.8	.32	3326.0	.07	4563.4	.03
1972.3	.23	3356.9	.29	4588.0	.08
2000.0	.44	3379.7	.04	4640.9	.04
2021.6	.20	3397.0	.14	4675.8	.27
2067.1	.62	3413.8	1.50	4743.3	.06
2091.4	.21	3437.4	1.35	4810.3	1.66
2109.9	.33	3456.2	.04	4874.0	.07
2129.6	.43	3470.1	.04	4949.1	.51
2153.4	.13	3487.4	.38	5002.2	.06
2165.9	.10	3507.3	.29	5044.2	.05
2191.4	.10	3540.1	.10	5108.9	.04
2250.9	.09	3564.3	.05	5141.5	.14
2273.8	.10	3582.4	.04	5203.6	.06
2293.4	.11	3597.5	.05	5221.5	.08
2305.2	.12	3614.3	.08	5250.6	.09
2366.9	.13	3644.3	.07	5271.9	.03
2412.1	.10	3665.8	.13	5287.9	.05
2425.7	.19	3717.9	.04	5298.8	.05
2470.1	.43	3729.5	.06	5318.6	.06
2497.5	.08	3745.6	.05	5340.9	.03

IRON CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5357.4	.12	6018.5	8.08	7143.3	.09
5386.7	.03	6061.4	.05	7197.9	.04
5420.6	.04	6163.8	.06	7278.9	4.60
5452.9	.06	6267.5	.10	7391.4	.04
5493.4	.14	6380.7	.64	7430.9	.04
5511.7	.07	6455.2	.05	7517.1	.04
5564.0	.05	6507.1	.06	7528.7	.04
5580.3	.04	6573.3	.07	7550.7	.14
5597.8	.05	6598.7	.04	7568.2	.07
5612.6	.04	6685.8	.07	7631.6	27.19
5693.1	.05	6762.3	.04	7645.6	22.14
5746.0	.14	6813.7	.10	8116.0	.05
5770.7	.07	6988.0	.03	8369.8	.07
5786.6	.11	7032.7	.05	8886.0	.64
5820.5	.05	7049.3	.06	9298.4	3.85
5855.5	.06	7091.7	.04	10046.0	.10
5920.5	8.29				

COBALT

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
230.5	17.60	2726.6	.24	4349.7	.17
277.7	15.43	2740.8	.30	4377.0	.46
300.9	.70	2758.1	.17	4395.7	.21
317.7	.29	2802.9	.12	4446.4	.11
335.2	.40	2833.8	.10	4471.3	.17
391.7	2.27	2867.6	.10	4527.7	.20
435.7	.97	2882.9	.25	4547.2	.35
447.6	5.75	2926.7	.56	4607.6	.75
461.9	.76	2954.0	.56	4623.9	.14
484.4	.95	2978.9	.32	4645.9	.28
497.3	3.47	2996.2	.28	4668.4	.13
556.2	11.72	3050.3	.23	4706.4	.15
785.8	4.88	3087.0	.10	4732.6	.17
901.2	.92	3097.9	.18	4781.7	.27
929.8	1.13	3126.0	.22	4834.2	.11
944.9	1.94	3161.5	.10	4884.0	.21
1515.6	2.82	3194.5	.49	4906.3	.86
1688.9	.69	3217.2	.53	4922.5	.50
1701.5	.47	3238.1	.14	5003.0	.53
1774.2	.38	3283.5	.43	5039.3	.21
1801.2	1.14	3335.2	.32	5070.1	.28
1830.3	4.93	3380.1	.75	5128.4	.31
1852.8	1.21	3447.0	.12	5149.3	.10
1879.6	.31	3469.2	.10	5181.7	2.16
1889.9	.96	3484.7	.23	5213.5	.34
1956.5	.77	3561.8	.17	5270.0	1.11
1982.5	.33	3611.6	.23	5357.5	.19
2019.3	.33	3614.2	.25	5510.3	.48
2033.3	1.35	3664.3	.11	5568.4	.22
2153.9	.38	3679.8	.30	5602.9	1.07
2280.0	.51	3732.9	.09	5614.0	.95
2308.6	.37	3749.1	1.33	5638.8	.53
2318.4	.27	3815.6	.47	5660.3	6.21
2353.3	.33	3843.5	.20	5703.1	.53
2370.5	.26	3899.6	.56	5742.7	1.98
2398.9	.19	3930.3	.85	5786.8	.17
2455.3	.38	3967.2	.95	5850.3	.30
2486.9	.13	3995.7	.12	5926.0	1.73
2507.0	.20	4029.2	1.60	5975.9	6.49
2526.9	.17	4079.0	.11	6040.5	.53
2556.7	.13	4129.3	.12	6110.5	.60
2569.2	.43	4152.5	.51	6149.8	.39
2606.8	.28	4208.7	1.11	6274.8	.13
2631.7	.23	4277.2	.19	6486.3	6.29
2652.3	.21	4309.4	.19	6706.0	7.22
2692.5	.20	4330.2	.41	6738.5	.53

COBALT CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
6876.9	7.77	6985.1	2.82	7214.1	4.56
6913.3	.10	7055.9	1.65	7491.1	2.91
6948.4	.68				

NICKEL

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
252.3	.78	3367.3	.11	5780.1	.08
270.1	.29	3383.0	.37	5816.8	2.34
283.1	3.69	3504.8	.24	5836.7	.68
294.8	.10	3561.9	.19	5924.1	.10
339.5	3.07	3638.2	.12	5973.6	.77
363.0	.62	3675.5	.41	6034.1	.19
465.1	14.32	3711.8	.19	6061.9	.09
481.0	.57	3779.3	.17	6105.0	2.08
846.9	1.17	3863.2	.10	6144.0	.08
877.9	4.26	3930.0	.35	6156.5	.15
1189.0	1.16	3972.7	.09	6178.1	.19
1226.8	.45	3988.0	.07	6318.7	.75
1301.6	1.52	4030.3	.26	6368.3	.10
1726.9	.78	4050.1	.33	6470.7	.10
1816.6	.71	4141.2	.13	6536.6	.10
1841.8	.44	4283.6	.40	6555.7	.13
1851.8	.71	4405.1	.14	6583.6	1.95
1950.3	1.49	4419.8	.08	6633.2	.11
2093.4	.29	4507.7	.19	6683.6	.18
2123.4	.89	4588.8	.20	6716.8	.24
2148.1	.48	4649.4	.19	6837.0	11.91
2255.3	.28	4674.6	.18	6888.4	.11
2497.1	.31	4713.6	.12	6901.8	.11
2554.1	1.44	4746.3	.15	6947.4	.11
2577.8	.24	4824.5	.20	6983.1	.12
2685.6	.51	4858.6	1.17	7438.7	.17
2766.3	.24	4975.1	.35	7536.1	4.93
2842.0	1.25	5008.2	.11	7696.8	1.36
2856.5	.16	5067.5	.11	7818.9	9.04
2893.6	.39	5087.2	.13	8006.1	.15
2967.8	.21	5110.8	.13	8069.2	.15
3026.5	.18	5145.5	.23	8120.5	3.47
3042.1	.18	5178.4	.12	8330.1	.14
3133.7	.15	5227.0	.08	8343.6	.17
3151.5	.13	5267.7	.49	8533.4	18.74
3182.4	.28	5312.3	1.11	8790.7	.14
3221.0	.21	5395.5	.08	8807.2	.16
3265.9	.17	5436.0	.55	8820.6	.14
3296.0	.11	5546.8	.10	8855.6	.18
3349.0	.21	5695.4	1.02	8998.8	41.65

COPPER

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
203.1	6.64	3483.8	.13	5151.9	.14
278.3	30.12	3509.8	.16	5188.0	1.09
316.2	.76	3561.2	.17	5244.9	.50
343.9	5.03	3591.0	.55	5258.6	.43
385.2	6.98	3616.7	.12	5319.4	1.00
394.9	.33	3728.7	.16	5417.7	2.02
423.2	.39	3755.5	.23	5449.2	.21
449.4	1.02	3777.7	.19	5527.7	.15
466.2	5.50	3818.7	.12	5556.0	.29
494.2	.36	3844.4	.46	5614.6	.28
579.8	2.68	3885.5	.14	5635.2	.30
608.9	7.94	3900.7	.11	5771.6	.54
619.1	.77	4032.8	.14	5849.6	.10
648.4	2.40	4020.3	.13	5893.9	.12
662.9	1.73	3920.8	.59	6010.4	1.49
768.1	.87	3937.4	.14	6048.8	.14
878.1	1.14	3983.4	.12	6063.0	.41
961.4	.66	4089.0	.13	6133.6	.23
1038.9D	1.68	4114.6	.22	6167.1	.11
1138.6	1.07	4144.8	.22	6224.6	.16
1159.6	.90	4201.5	.34	6244.1	.18
1672.4	1.16	4285.8	.20	6320.2	.28
1744.8	1.02	4297.3	.10	6349.4	.10
1834.3	.62	4320.8	1.42	6393.4	1.09
1853.3	.77	4385.6	.48	6471.2	.31
2136.1	.42	4477.4	.58	6575.6	.14
2439.8	.28	4502.9	.83	6599.5	2.21
2465.5	.36	4562.1	.40	6617.5	.71
2497.6	.70	4585.9	.10	6678.0	3.91
2572.2	.37	4604.9	.71	6790.3	.37
2656.9	.39	4658.2	.64	6832.8	.11
2699.9	.32	4690.0	.09	6987.8	2.99
2731.0	.45	4705.5	.09	7037.0	.18
2797.7	.18	4733.0	.49	7063.6	.46
2859.8	.19	4781.0	.34	7176.1	2.33
2932.4	.30	4804.3	.12	7251.9	3.41
2950.2	.25	4841.8	.14	7277.6	.16
3053.7	.41	4868.4	.09	7306.2	7.45
3140.2	.24	4902.8	.32	7571.3	1.42
3174.7	.21	4982.8	.13	7636.6	14.47
3279.8	.20	5018.4	.37	7755.3	1.29
3317.2	.53	5043.8	1.33	7766.0	.20
3413.7	.13	5084.0	.41	7914.5	28.40
3435.0	.31	5139.8	.11		

ZINC

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
300.2	2.20	2331.9	.28	3833.8	.22
320.8	.42	2348.1	1.67	3875.0	.17
328.2	.21	2367.0	.33	3957.6	.25
332.6	.27	2404.6	.54	3974.1	.24
337.8	1.01	2419.7	1.34	4028.7	.32
366.8	.18	2557.7	.22	4137.9	1.76
393.7	.18	2597.9	.28	4165.0	.37
434.4	.69	2616.0	.18	4184.7	.11
445.7	5.26	2650.1	.33	4245.6	.23
451.1	1.03	2679.8	.20	4291.2	.20
531.4	1.11	2697.1	.35	4336.0	.09
578.6	.92	2709.4	.19	4391.0	.21
595.6	.79	2735.7	.35	4425.9	.30
751.4	2.43	2769.4	.24	4446.9	.16
794.5	.36	2797.9	.21	4503.5	.16
806.5	2.32	2858.2	1.41	4510.0	.13
834.8	2.59	2904.9	.24	4561.4	.14
863.6	.51	2921.5	.15	4583.2	.45
868.4	.52	2949.8	.20	4630.6	.22
910.2	1.36	2983.4	.22	4653.6	.51
933.2	.53	3024.5	.17	4756.7	.30
1007.6	2.94	3069.6	.35	4784.3	.27
1023.2	.44	3094.0	.30	4809.9	.09
1077.5	21.46	3120.3	.23	4828.8	.83
1125.9	1.09	3137.1	.16	4870.3	.18
1261.5	1.93	3191.4	.18	4889.0	.42
1293.3	.61	3208.1	.15	4984.7	.27
1340.3	2.41	3263.1	.17	5035.6	.26
1545.9	1.10	3287.5	.71	5053.5	.15
1594.5	1.44	3313.6	.13	5092.1	.30
1673.3	1.94	3331.8	.15	5113.5	.19
1745.5	1.08	3341.0	.21	5162.2	.24
1812.2	.85	3361.4	.46	5206.2	.18
1826.6	.71	3379.4	.18	5230.0	.15
1883.5	7.67	3399.0	.29	5247.0	.47
1911.7	.40	3437.0	.19	5267.8	.09
1934.5	.61	3459.0	.57	5288.1	.30
1950.3	.56	3535.9	.18	5341.3	.37
1998.2	.44	3565.1	.15	5404.9	.13
2087.6	.60	3586.2	.32	5441.5	.11
2105.7	.42	3611.1	.17	5474.2	3.79
2131.5	.42	3694.9	.10	5520.6	.39
2166.6	.27	3718.2	.17	5560.0	1.06
2259.3	.29	3731.9	.10	5647.5	.44
2286.2	1.08	3775.3	.52	5662.1	.15
2309.9	.35	3818.6	.21	5761.6	.17

ZINC CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5777.0	1.20	6509.4	.91	7011.3	.11
5910.1	1.00	6532.5	.11	7046.1	.15
5982.8	.21	6658.3	1.22	7069.2	1.61
6037.9	1.16	6703.1	.41	7112.0	1.61
6262.9	.51	6769.6	1.07	7188.6	1.01
6288.2	.10	6867.6	2.02	7862.9	11.70
6399.2	.09	6910.3	1.55	8313.5	.83
6421.1	.34	6958.5	3.21	9118.0	1.23
6482.2	.94				

GALLIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
213.6	1.85	2351.9	.65	3991.6	.87
230.9	2.05	2396.2	.60	4013.5	.37
250.9	8.95	2407.4	.59	4032.3	.36
267.6	.65	2453.6	.53	4071.0	.33
277.5	.87	2474.6	.96	4085.6	.32
303.6	2.02	2491.4D	6.18	4136.3	.39
319.0	3.31	2508.2D	12.17	4196.0	1.16
376.6	1.67	2552.0	.71	4311.8	.66
393.7	6.09	2576.4	.85	4337.7	.56
411.4	.87	2603.9	.81	4358.1	1.85
489.1	.55	2626.5	.59	4431.8	1.51
549.7	.25	2640.2	.79	4479.0	.22
560.4	1.48	2676.0	.65	4541.8	1.84
588.1	.31	2692.1	.66	4575.2	.41
631.4 D	1.85	2755.4	.52	4595.7	1.07
651.0	3.96	2789.2	.66	4627.5	.72
659.9	1.18	2828.7 D	1.02	4652.2	.28
671.3	.31	2852.0	.45	4698.9	.90
691.7	10.66	2899.8	.61	4723.0	.36
710.3	1.03	2919.4	.57	4748.5	.28
758.3	1.23	3038.8	.49	4757.4	.58
786.2 D	.94	3111.2	.95	4792.5	1.15
811.5 D	.84	3130.9	2.13	4840.5	3.22
834.5 D	5.98	3158.1	.45	4869.7	2.29
869.3	.77	3169.0	.54	4890.7	1.21
895.4 D	.53	3236.7	.58	5002.9	.46
903.8	.30	3270.0	.37	5018.5	.23
999.3	.36	3300.6	.37	5055.2	.63
1140.6	1.45	3373.4	1.69	5159.1	1.60
1173.6	.61	3420.7	.62	5195.0	3.29
1552.1	3.56	3477.8	.53	5221.3	.46
1595.3 D	6.49	3500.7	.66	5234.4	1.38
1839.7	2.07	3524.4	.84	5270.0	.35
1861.8 D	6.18	3566.0	.74	5301.0	.31
1888.8	2.35	3661.7	.72	5339.1	6.66
1931.7	1.31	3687.2	.97	5370.4	.40
1949.9	1.00	3746.3	.62	5408.6	.29
2015.2	1.58	3764.3	.29	5464.4	.27
2062.5	.97	3777.5	.41	5488.2	2.66
2116.2	.81	3794.1	.27	5541.4	1.67
2126.1	.95	3805.2	.24	5577.8	.44
2202.5 D	14.50	3842.9	.28	5601.5	4.68
2257.0	.74	3860.0	1.37	5625.7	.43
2269.6	.95	3894.8	.49	5651.3	.66
2323.6	.66	3944.8	.91	5692.4	1.92
2342.5	.60	3975.9	.39	5718.7	.59

GALLIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5745.0	.59	6008.0	5.76	6360.0	12.09
5779.6	1.78	6111.4	4.56	6391.5	3.03
5806.0	1.02	6129.9	.79	6512.6	.27
5886.2	.57	6193.1	1.43	6521.6	.29
5901.4	.61	6293.2	.29	7002.7	1.84
5920.0	1.90	6318.4	2.41		

GERMANIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
253.2	3.99	2444.4	.14	3830.5	.13
284.3	.66	2495.7	.16	3847.2	.23
297.6	1.11	2533.1	.43	3861.1	.19
326.1	5.84	2564.1	.25	3896.0	.51
391.9	1.05	2580.0	.30	3935.8	.06
431.4	.79	2618.0	.18	3951.9	.14
492.3	1.24	2676.5	.19	3996.0	.19
348.7	.53	2689.3	.23	4010.5	.10
500.3	1.81	2705.1	.18	4036.2	.29
558.4	.74	2730.5	.18	4078.1	.18
574.9	1.90	2760.1	.18	4156.4	.23
596.0	34.65	2785.4	.49	4190.8	.14
608.6	5.20	2814.0	.11	4219.9	.20
830.2	1.03	2828.3	.18	4264.3	.23
868.1	18.87	2850.3	.14	4289.5	.11
939.2	1.36	2877.3	.14	4309.2	.34
961.1	5.35	2892.0	.14	4339.8	.65
999.5	3.92	2927.9	.51	4368.4	.15
1100.6	9.32	2952.6	.19	4390.2	.49
1471.3	2.32	2964.5	.12	4417.6	.12
1492.0	1.24	3028.1	.51	4440.3	.36
1510.6	1.88	3079.4	.13	4463.9	.28
1601.2	1.06	3107.2	.30	4496.6	.07
1634.0	2.04	3141.0	.16	4513.7	.32
1722.2	.35	3155.6	.08	4551.5	.06
1808.1	.51	3172.2	.28	4574.0	.07
1845.0	.34	3200.4	.11	4640.1	.50
1940.3	2.56	3211.5	.10	4686.3	.28
1965.4	.42	3244.5	.31	4707.7	.66
1981.6	.41	3277.0	.20	4744.0	.10
1995.1	.43	3299.2	.08	4748.7	.09
2013.0	1.40	3336.5	.40	4771.2	.14
2031.2	.66	3377.2	.45	4811.6	.25
2073.2	.98	3429.6	.18	4839.4	.10
2096.4	.34	3479.5	.11	4881.9	.73
2119.3	.19	3497.5	.07	4903.4	.06
2144.1	.21	3510.1	.15	4930.3	.07
2156.6	.19	3519.6	.07	4952.4	.59
2169.0	.30	3553.2	.32	4988.6	.22
2198.4	.18	3583.0	.33	5004.5	.11
2263.7	.25	3611.4	.28	5023.0	.12
2281.5	.26	3627.9	.06	5047.2	.07
2312.3	.46	3640.1	.07	5064.6	.44
2351.6	.23	3665.3	.07	5089.4	.37
2370.0	.40	3710.1	.32	5161.5	.55
2419.9	.34	3816.0	.13	5192.4	.14

GERMANIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5236.9	.13	5961.8	.12	6542.9	.12
5267.3	.23	6019.6	.12	6585.0	.34
5309.0	.06	6036.7	1.87	6680.9	.22
5348.5	.24	6092.4	.07	6707.9	1.96
5368.3	.12	6116.3	2.04	6785.9	.28
5383.9	.34	6171.8	.54	6814.4	.29
5450.2	1.43	6200.2	.48	6915.5	1.58
5518.3	1.53	6226.5	.16	7018.4	.18
5561.5	.52	6251.7	.66	7090.8	.65
5620.7	.22	6274.8	.99	7221.4	.39
5650.2	.27	6319.6	.66	7259.8	1.30
5669.2	.19	6361.7	.31	7415.3	.59
5703.1	.06	6389.4	1.01	7473.6	.06
5740.1	.54	6418.6	.52	7500.6	.33
5783.0	.28	6446.3	.09	7628.5	.19
5817.0	1.24	6466.2	.09	8030.0	.55
5870.2	.10	6488.6	.12	8498.8	.38
5931.1	.14	6506.1	.25	8732.0	.50

ARSENIC

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
200.2	1.03	2596.0	.17	4501.0	.36
212.5	.74	2650.1	.26	4526.2	.07
225.6	.22	2701.5	.12	4542.9	.11
236.7	3.01	2721.6	.13	4567.5	.33
253.6	.68	2743.2	.14	4617.8	.21
264.7	1.01	2782.9	.26	4647.9	.10
282.1	.62	2860.0	.10	4660.4	.05
299.2	1.39	2938.2	.13	4693.9	.12
340.3	.28	2956.4	.33	4731.3	.22
355.6	1.23	2980.5	.23	4760.5	.11
362.0	.84	3062.5	.09	4783.0	.84
379.6	.61	3233.3	.15	4811.6	.06
401.5	1.25	3248.1	.09	4827.0	.15
426.9	1.08	3263.9	.09	4844.0	.15
472.2	4.07	3276.7	.19	4878.0	.09
550.2	.23	3310.1	.14	4893.8	.09
559.9D	1.00	3354.7	.17	4918.1	.14
596.1	.39	3369.9	.29	4959.7	.16
641.5	.35	3403.4	.09	4996.3	.40
648.8D	.22	3417.6	.13	5066.2	.11
706.6	.25	3478.3	.12	5081.0	.42
821.4	.47	3539.3	.10	5119.8	.12
848.1	.29	3580.5	.14	5156.9	.49
1021.3	.24	3614.4	.17	5179.3	.13
1099.1	.26	3627.2	.15	5206.7	.06
1465.9	2.16	3651.8	.21	5302.3	.10
1546.4	.67	3824.1	.07	5374.8	.44
1582.4	.83	3886.9	.06	5397.5	.07
1631.4	.81	3903.2	.07	5416.5	.58
1676.6	.94	3939.4	.20	5467.5	.21
1693.3	.56	3982.0	.09	5580.3	.22
1725.4	.98	4019.9	.11	5613.7	.15
1812.2	.50	4067.3	.09	5629.9	.07
1836.7	.51	4082.2	.07	5661.6	.10
1839.7	.49	4156.7	.34	5674.7	.20
1857.2	.45	4197.9	.06	5689.4	.16
1908.0	.38	4213.9	.09	5695.0	.11
1951.3	.26	4227.9	.07	5757.3	.24
2036.0 D	.25	4247.0	.14	5784.7	.55
2115.9	.29	4271.0	.08	5834.0	.06
2187.1	.27	4346.4	.29	5867.5	.23
2272.1	.27	4369.4	.22	5884.6	.08
2302.0	.28	4389.2	.15	5902.4	.09
2379.9	.20	4424.7	.20	5972.0	.05
2481.8	.23	4466.3	.10	5985.8	.12
2495.7	.25	4483.7	.11	6007.9	.09

ARSENIC CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
6026.8	.32	6391.5	.24	6783.0	.16
6058.3	.62	6402.7	.10	6809.9	2.89
6097.1	.16	6418.9	.31	6881.6	.08
6142.8	.25	6464.8	.21	6926.1	1.04
6181.0	.15	6503.0	.06	6976.4	.18
6200.7	.39	6540.1	.27	7019.5	2.41
6229.3	.07	6585.3	.42	7063.4	.76
6294.5	1.81	6658.2	.06	7164.1	.14
6344.7	.12	6688.8	.07	7241.3	.23
6369.1	.07	6739.5	.08	7283.2	.61

SELENIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
239.6	12.78	2373.1	.14	3589.0	.22
250.5	1.05	2392.8	.51	3626.8	.45
286.4	1.45	2419.3	.12	3647.3	.06
297.8	1.14	2520.9	.20	3663.1	.05
439.9	1.36	2534.6	.16	3689.2	.22
468.4	.40	2563.4	.22	3703.0	.07
484.8	.36	2591.6	.17	3749.8	.13
520.6	3.54	2613.7	.39	3776.1	.21
567.8	.25	2674.8	.43	3795.5	.06
613.9	13.00	2721.2	.29	3807.6	.05
645.6	.50	2749.5	.21	3833.4	.12
695.0	2.75	2771.2	.39	3858.5	.22
736.1	.24	2810.9	.20	3883.4	.09
755.9	1.10	2846.2	.05	3902.9	.65
817.8	.96	2873.3	.60	3947.2	.44
886.9	2.91	2888.4	.07	3970.6	.56
948.2	.30	2927.6	.08	4005.5	.24
992.1	.20	2942.3	.08	4022.3	.09
1004.2	.53	2952.0	.07	4035.1	.09
1145.6	.60	2963.0	.06	4058.3	.38
1162.3	.92	2983.2	.27	4109.2	.14
1187.2	.29	3011.6	.11	4140.1	.10
1239.8	.44	3041.7	.14	4175.1	.20
1296.8	.84	3072.7	.38	4187.4	.08
1309.0	1.44	3111.5	.07	4227.8	.13
1383.6	.43	3123.1	.07	4244.4	.09
1411.9	.33	3157.2	.13	4290.1	.06
1623.7	.33	3176.0	.07	4338.8	.11
1714.4	2.46	3187.2	.29	4355.1	.13
1771.5	.35	3215.9	.05	4379.1	.56
1848.4	.36	3242.2	.11	4413.5	.09
1894.0	.32	3264.3	.05	4436.1	.16
1922.2	.46	3280.0	.14	4504.7	.09
1965.6	.12	3295.7	.06	4527.4	.74
1977.5	.25	3307.0	.06	4546.2	.18
1995.6	1.20	3332.2	.08	4565.7	1.30
2036.1	.33	3348.4	.05	4609.2	.46
2062.1	.27	3366.7	.06	4642.1	.18
2076.5	.33	3386.9	.26	4701.8	.13
2142.7	.30	3413.9	.16	4778.8	.11
2165.7	.11	3441.0	.37	4814.2	.09
2261.7	.20	3467.2	.13	4927.2	.27
2284.1	.36	3483.1	.41	4962.8	.15
2305.3	.10	3517.8	.13	5026.8	1.02
2319.3	.17	3537.0	.11	5079.9	.14
2335.6	.20	3552.3	.24	5100.2	.20

SELENIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5154.7	.30	5906.6	.13	6763.2	.08
5170.1	.08	5969.1	.10	6811.6	.18
5205.8	.24	6008.0	2.89	6870.3	.26
5243.5	.05	6050.3	.24	6904.7	.26
5277.3	.15	6110.7	.07	7114.0	.25
5339.4	.08	6133.8	.12	7179.7	1.64
5371.8	.10	6156.9	.10	7208.8	.36
5465.5	.12	6232.7	1.51	7418.7	2.56
5502.7	.19	6315.5	.24	7492.3	.26
5574.9	.08	6345.1	.12	7734.0	.82
5601.7	2.15	6414.1	1.30	8165.7	.71
5705.4	.26	6500.4	.34	8500.9	.38
5758.5	.06	6601.2	4.31	9188.0	1.06
5776.1	.05	6660.8	.05	9882.9	1.41
5795.8	.63	6676.6	.04	10496.9	.20
5813.8	.08				

BROMINE

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
196.9	6.73	1082.1	.40	2945.8	.10
221.1	6.20	1107.9	.13	3037.6	.09
234.8	1.10	1147.2	.23	3106.0	.10
246.1	14.78	1199.1	4.63	3165.5	.11
273.2	7.46	1248.8	.37	3183.6	.06
288.5	1.92	1318.1D	2.64	3204.1	.09
298.0	.48	1401.1	.28	3220.9	.07
315.9	5.28	1452.0	.32	3253.5	.07
325.7	.21	1474.7D	1.29	3272.7	.06
345.4	2.51	1497.0	.67	3317.4	.07
379.0	.22	1518.9	.35	3343.9	.09
388.3	.26	1627.2	.24	3361.9	.04
402.1	.05	1691.2	.36	3385.1	.08
405.2	.15	1703.8	.43	3417.1	.05
415.6	.13	1722.7	.47	3449.1	.06
420.6	.10	1728.0	.28	3466.4	.05
432.8	.49	1751.4	.57	3491.4	.06
454.4	.12	1833.1	.19	3520.9	.20
469.5	2.96	1874.9	.21	3548.4	.06
482.8	.44	1893.8	.27	3580.9	.06
494.0	.17	1923.4	.29	3598.6	.11
498.9	.06	2066.0	.24	3615.3	.07
543.4 D	1.41	2107.1	.26	3674.1	.04
555.1	7.14	2196.6	.15	3706.5	.03
566.0	.21	2266.9	.28	3788.2	.03
570.6	.47	2278.7	.09	3798.7	.04
593.2	.09	2288.8	.11	3854.5	.07
618.6 D	6.83	2306.3	.12	3891.1	.03
691.4	.39	2320.9	.32	3907.7	.07
699.1 D	2.62	2334.6	.18	3924.3	.05
719.4	.29	2351.1	.08	4161.1	.30
721.7	.11	2366.4	.22	4185.6	.03
732.6	.20	2386.5	.10	4212.8	.08
746.1	.10	2415.8	.07	4234.1	.08
777.2 D	6.28	2426.6	.16	4372.0	.12
816.6	.97	2460.5	.18	4396.6	.07
828.7 D	3.12	2484.4	.07	4426.9	.08
863.1	.25	2598.2	.15	4437.4	.04
866.9	.17	2658.3	.11	4458.1	.03
899.1	.22	2696.6	.05	4485.9	.09
911.4	.66	2719.5	.06	4521.4	.08
920.8	.14	2739.3	.08	4571.8	.03
927.5	.12	2786.8	.06	4610.9	.03
943.5	.12	2818.4	.05	4637.4	.12
951.2	.35	2879.9	.07	4662.4	.02
1043.7 D	1.96	2922.6	.08	4702.1	.03

BROMINE CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4788.7	.03	5507.7	.37	6569.3	.18
4805.7	.06	5534.3	.08	6643.0	.25
4831.6	.04	5568.4	.29	6667.3	.22
4852.3	.09	5607.5	.03	6690.1	.25
4908.1	.04	5613.8	.05	6700.7	.12
4921.0	.03	5638.5	.03	6745.5	.45
4966.6	.03	5651.0	.08	6771.0	.04
5011.2	.05	5674.3	.15	6833.9	.12
5021.7	.11	5868.2	.20	6870.4	.10
5052.3	.26	5914.2	.72	6894.0	.05
5093.2	.08	5952.6	.28	6918.6	.05
5117.4	.04	5999.7	.03	6950.2	.03
5133.5	.12	6043.7	.05	7002.7	.03
5183.3	.05	6055.8	.06	7030.1	.49
5207.0	.06	6146.9	.15	7076.3	.53
5232.3	.03	6171.2	.17	7124.0	.20
5252.2	.06	6195.9	.07	7171.5	.31
5287.2	.14	6221.8	.12	7230.0	.26
5316.0	.16	6246.8	.09	7300.7	.09
5352.3	.04	6270.8	.13	7341.6	.06
5364.5	.04	6312.5	.17	7420.7	.65
5394.3	.18	6354.7	.52	7511.2	.12
5417.3	.06	6438.8	.23	7575.8	1.16
5436.1	.04	6486.8	.04	7609.9	.04
5445.9	.04	6500.2	.09	7893.1	.04
5471.3	.04	6532.2	.34		

RUBIDIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
421.9	2.20	2130.0	.44	3431.1	.09
436.6	.19	2149.7	.46	3485.6	.11
444.6	.15	2170.2	.17	3542.4	.05
448.5	.19	2176.8	1.14	3602.1	.05
453.9	.11	2303.1	.16	3620.7	.07
476.0	4.37	2310.2	.18	3644.2	.09
488.2	1.40	2320.8	.19	3659.1	.08
537.7	3.06	2346.5	.13	3708.0	.06
556.8	12.80	2352.5	.17	3733.3	.07
570.3	.13	2364.0	.17	3762.7	.07
639.7	.86	2387.0	.21	3796.9	.04
666.5	.26	2475.7	.22	3808.1	.05
709.2	.58	2500.0	.21	3824.4	.08
724.0	.93	2532.0	.16	3877.3	.04
746.1	.25	2548.1	.22	3932.7	.07
856.4	.29	2570.4	.24	3980.0	.09
872.7	3.10	2585.7	.32	3992.6	.04
899.2	.35	2598.1	.13	4027.3	.11
912.0 D	.27	2615.6	.09	4150.3	.09
943.8	.27	2642.3	.10	4248.6	.04
964.1	.28	2661.8	.10	4287.8	.06
981.9	.24	2688.0	.12	4319.0	.04
1030.8	3.93	2708.2	.24	4360.7	.23
1104.9	1.19	2728.4	.07	4386.0	.18
1139.5	.28	2759.2	.08	4403.2	.06
1162.1	.26	2784.0	.12	4450.7	.19
1183.7	.30	2797.0	.07	4497.2	.24
1304.6	1.65	2858.9	.18	4515.3	.04
1388.6	1.07	2877.4	.26	4532.0	.13
1404.2	1.44	2924.8	.06	4551.3	.07
1486.4	1.26	2977.6	.14	4570.9	.04
1575.5	1.06	3054.5	.07	4586.4	.05
1587.2	.71	3067.5	.13	4598.6	.18
1631.7	1.12	3106.0	.22	4620.9	.21
1660.4	.65	3130.2	.11	4641.6	.27
1714.6	.40	3136.2	.07	4656.0	.06
1781.8	.60	3157.3	.12	4690.5	.09
1806.1	.49	3198.2	.06	4735.5	.18
1857.0 D	.55	3222.3	.23	4759.6	.06
1871.9	.26	3245.7	.16	4784.2	.05
1889.3	2.56	3284.3	.12	4844.0	.11
1973.0	.27	3310.7	.07	4875.3	.05
1984.6	.29	3332.8	.05	4966.0	.07
2006.9	.39	3354.5	.08	4985.3	.26
2037.5	.33	3391.0	.15	5012.7	.24
2082.0	.18	3413.7	.06	5029.5	.23

RUBIDIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5049.3	.04	5841.0	.13	6601.3	.06
5130.0	.24	5885.9	.32	6619.9	.15
5159.2	.21	5932.6	.09	6706.9	.05
5222.1	.37	5980.7	.40	6831.4	.60
5255.8	.08	6032.2	.04	6915.8	.17
5309.4	.13	6064.5	.34	6943.5	.21
5353.1	.11	6086.1	.06	7151.0	.06
5384.3	.37	6143.7	.06	7176.1	.17
5401.5	.10	6187.9	.37	7211.6	.10
5424.7	.10	6234.7	.05	7261.5	.06
5473.1	.22	6253.5	.12	7278.2	.09
5517.5	.05	6274.1	.08	7306.8	.14
5617.1	.15	6292.8	.08	7345.8	.32
5637.5	.06	6352.4	.15	7415.3	.31
5678.0	.05	6385.4	.20	7438.5	.05
5697.3	.12	6418.4	.15	7544.2	.12
5702.4	.17	6470.7	.51	7624.1	1.92
5728.2	.08	6503.1	.14	7672.5	.07
5760.6	.61	6520.2	.57	7790.3	.07
5800.2	.16	6550.4	.08	8091.6	.21
5818.1	.04	6567.4	.07	8650.9	.24

STRONTIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
387.7	.82	2290.8	.22	3745.5	.19
401.1	.28	2314.9	.21	3756.9	.08
410.4	.17	2336.9	.38	3770.9	.26
418.2	.29	2363.2	.32	3887.9	.11
423.2	.21	2391.5	4.61	3905.3	.10
434.9	1.97	2457.9	2.65	3975.8	.30
484.9	.35	2489.3	.23	4020.4	.20
558.5	14.52	2542.0	.18	4036.2	.35
576.4	.39	2550.6	.37	4079.4	.26
585.7	1.96	2578.1	2.91	4127.8	.19
596.0	.95	2659.9	.77	4157.7	.23
650.9	4.72	2678.2	.41	4259.6	.17
666.5	.25	2736.9	1.02	4276.6	.07
695.5	.63	2766.6	.60	4297.2	.05
723.5	.72	2785.9	.20	4306.0	.28
731.6	.47	2802.3	.24	4324.7	.16
850.4	12.76	2828.2	.17	4350.2	.07
868.9	.36	2902.6	.21	4371.9	.12
897.9	29.59	2957.3	.68	4392.2	.17
960.7	.39	3009.5	5.39	4416.7	.52
1218.6	2.25	3032.3	.29	4500.2	.35
1365.7	1.20	3044.5	.30	4517.6	.07
1382.4	.85	3057.1	.13	4529.6	.22
1535.1	1.71	3090.8	.13	4553.9	.11
1564.3	.72	3111.5	.40	4583.7	.31
1661.9	.95	3135.4	.11	4605.4	1.30
1676.9	.74	3189.8	.25	4635.8	.24
1687.6	.58	3219.1	.91	4671.8	.07
1718.4	3.53	3277.1	.26	4700.5	.14
1738.2	.58	3302.1	.15	4743.6	.09
1774.4	.65	3318.1	.28	4748.6	.07
1786.6	.44	3337.4	.35	4771.9	.10
1799.8	1.52	3356.7	.18	4795.0	.14
1835.9	91.54	3371.7	.24	4810.5	.29
1891.6	.96	3385.8	.11	4852.5	.23
1910.2	.56	3397.6	.20	4912.2	.07
1922.8	.33	3424.7	.56	4945.2	.78
1969.3	.56	3452.4	.20	4988.0	.49
1982.2	.35	3465.5	.13	5007.3	.26
2053.5	.27	3488.8	.47	5056.1	.10
2081.2	.36	3524.0	.24	5075.6	.30
2111.0	1.34	3542.0	.47	5102.9	.13
2142.6	.44	3589.3	.09	5115.2	.17
2168.9	2.27	3620.5	.15	5162.0	1.50
2251.2	.21	3638.8	.25	5200.2	.17
2276.8	3.21	3704.5	.27	5244.0	.25

STRONTIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5276.9	.38	5906.5	.13	6698.9	.85
5301.0	.49	5999.5	.43	6844.3	.60
5322.5	.20	6012.9	.14	6885.1	3.03
5361.6	.35	6101.9	3.55	6941.9	3.40
5386.3	.28	6136.6	.08	6963.8	.11
5397.5	.08	6230.4	.21	7117.6	.09
5409.9	.12	6267.3	5.57	7160.8	.12
5424.1	.90	6322.2	.19	7219.9	.13
5559.2	.08	6343.7	.12	7235.5	.13
5579.5	.09	6390.3	.24	7308.1	.22
5593.1	.22	6417.0	.16	7384.9	.13
5611.1	.09	6463.5	.22	7476.5	.42
5686.1	.70	6487.0	.09	7498.0	.11
5706.7	.13	6507.8	.12	7527.7	4.65
5751.7	.08	6544.7	.08	8039.0	1.20
5790.4	1.57	6585.5	.07	8378.4	1.44
5823.7	.68	6660.6	5.54		

YTTRIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
203.2	15.91	1814.4	2.94	2924.4	.97
233.6	.08	1841.3	.37	2948.4	.21
252.1	3.32	1875.4	.77	2983.9	.39
279.6	.15	1934.3	.61	3002.1	.14
335.5	.17	1952.7	.30	3015.9	.24
376.3	.18	1996.5	.35	3035.2	.20
385.7	.47	2035.1	.32	3054.1	.39
393.6	.13	2070.4	.28	3067.3	.11
398.7	.13	2090.3	.33	3080.6	.21
432.9	.15	2104.8	.91	3097.6	.21
439.8	.84	2120.7	.23	3110.0	.35
447.7	.40	2138.9	.94	3144.1	.13
455.2	8.39	2152.8	.43	3163.4	1.29
478.4	.15	2165.1	.55	3178.2	.11
539.8	.45	2263.2	.38	3215.1	.09
574.6	11.02	2276.8	.43	3230.7	.17
596.6	1.07	2303.5	.27	3255.7	.33
606.7	.37	2314.4	.21	3283.2	.72
615.5	.19	2341.0	.52	3301.4	1.31
628.0	.32	2364.2	.95	3334.7	.09
662.6	.35	2370.8	.24	3354.6	.13
709.0	.27	2380.7	.34	3380.8	.77
776.9	27.53	2406.1	.74	3445.6	.56
897.0	1.26	2446.7	.64	3477.9	.35
915.4	.30	2461.1	.30	3520.5	.08
944.8	1.65	2473.8	.55	3529.4	.08
962.2	.83	2503.7	1.21	3545.0	.78
977.6	.59	2546.6	2.32	3552.7	.19
1058.8	.33	2565.9	.43	3652.0	.08
1106.7	.64	2579.6	.16	3682.6	.19
1119.1	.40	2602.0	.19	3698.0	.33
1186.3	1.89	2622.3	.43	3713.4	.30
1212.2	1.19	2647.0	.28	3728.0	.12
1263.3	.94	2676.4	.21	3750.5	.10
1321.4	.68	2681.6	.18	3869.9	.55
1369.9	1.94	2699.4	.46	3894.5	.07
1417.1	.70	2722.9	.13	3920.7	.16
1559.3	.65	2731.7	.16	3935.7	.07
1658.9	.72	2749.5	2.86	3982.2	.09
1680.6	.57	2786.5	.12	3992.9	.16
1693.2	.51	2819.2	.32	4010.7	.74
1722.3	.61	2836.8	.17	4055.9	.09
1741.3	.86	2848.3	.37	4107.5	4.98
1755.4	.84	2865.0	.21	4168.7	.20
1779.8	1.06	2882.7	.65	4252.7	.09
1798.3	.41	2899.9	.15	4264.4	.19

YTTRIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4285.7	.08	5096.0	.18	5931.7	.11
4312.7	.11	5180.1	.16	5945.1	.08
4352.4	1.55	5301.3	.08	5960.7	.11
4380.2	.07	5313.5	.06	5997.3	.07
4418.3	.06	5340.0	.08	6080.3	72.47
4426.3	.16	5352.5	.11	6154.9	.10
4448.5	.07	5366.8	.07	6172.9	.18
4491.8	.31	5383.6	.07	6180.6	.13
4530.7	.09	5433.3	.10	6192.0	.12
4613.7	.29	5483.4	.21	6201.3	.33
4660.3	.36	5558.6	.10	6225.0	.15
4691.4	.10	5607.0	.47	6232.9	.13
4724.4	.17	5645.4	1.56	6238.7	.38
4789.6	.22	5674.4	.07	6274.4	.07
4812.4	.16	5751.2	.07	6420.2	.29
4830.1	.13	5782.6	.13	6622.6	.17
4876.3	.18	5797.3	.12	6672.0	.10
4923.5	.08	5821.1	.07	6751.4	1.40
5044.5	.23	5903.7	.42	6858.2	.12
5057.1	.06				

ZIRCONIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
251.2	10.28	2497.4	.45	4053.3	.45
266.4	.40	2518.7	.87	4091.6	.39
324.7	.23	2536.7	1.28	4104.7	.79
334.3	.27	2635.5	.54	4121.2	.38
380.1	.28	2655.0	.48	4170.0	.22
387.1	.26	2694.0	2.45	4183.4	.21
391.4	.20	2712.0	.85	4203.5	.36
424.3	.23	2735.3	.50	4225.6	.51
447.4	1.49	2790.0	.45	4262.1	.60
491.9	.92	2846.0	.44	4277.7	.48
561.0	9.05	2873.9	.94	4323.4	.23
596.1	.69	2933.2	1.25	4405.1	.26
668.0	.79	2962.5	.38	4437.5	1.04
731.3	.39	2988.3	.43	4507.3	.28
821.2	.46	3046.4	.42	4530.3	1.65
844.1	2.28	3110.2	.39	4654.8	1.02
902.8	.69	3147.6	.94	4739.0	.25
913.2	3.44	3176.6	.58	4804.0	.32
934.5	38.78	3269.8	.80	4947.8	.42
952.2	.55	3296.7	.26	5007.1	1.05
990.3	1.37	3342.3	.94	5101.6	.19
1132.2	4.14	3372.0	1.22	5135.2	.72
1369.2	.81	3438.4	1.01	5162.9	.36
1404.7	8.91	3474.7	1.26	5182.3	.65
1464.8	1.46	3502.5	1.02	5263.7	2.65
1577.9	2.12	3531.6	.89	5310.2	.89
1631.0	1.36	3579.9	.58	5371.7	.22
1718.4	1.41	3608.0	.86	5408.1	.19
1847.0	3.01	3637.8	.76	5477.7	.18
1890.2	1.87	3662.4	.22	5597.3	.19
1987.9	1.67	3695.7	.48	5724.4	.27
2041.3	.81	3719.8	.39	5815.2	.26
2105.6	1.05	3743.3	.31	5921.5	.66
2135.0	.91	3790.2	.23	6210.4	.20
2190.9	2.03	3858.3	.53	6295.0	15.83
2293.4	.55	3940.9	.53	6465.7	.34
2329.3	1.62	3962.9	.36	7278.4	.25
2354.9	.58	3980.9	.45	7700.5	.68
2436.8	1.11	3999.3	.25	8634.2	.75
2475.1	1.37	4027.9	.61		

NIOBIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
191.0	39.12	1818.8	.22	3114.9	.19
255.1	19.02	1829.2	.13	3130.4	.05
293.4	3.86	1865.6	.25	3143.2	.04
310.2	3.37	1879.2	.34	3155.5	.06
328.4	.29	1979.7	.55	3193.7	.28
337.9	2.79	2019.1	.21	3227.5	.06
384.8	.24	2065.2	.14	3240.7	.06
395.9	.24	2105.7	.15	3260.8	.14
429.9	.24	2121.3	.39	3305.2	.04
458.2	1.17	2173.4	.28	3322.3	.05
482.5	.78	2247.7	.13	3331.1	.04
498.7	1.52	2259.3	.14	3341.4	.08
526.7	.15	2292.2	.20	3359.4	.12
562.5	1.86	2326.7	.12	3369.2	.06
570.9	.44	2337.2	.11	3388.6	.35
639.7	.93	2356.8	.11	3420.5	.06
683.3	.29	2380.0	.13	3430.8	.09
693.1 D	.88	2392.6	.07	3457.6	.12
751.5	.54	2415.3	.08	3480.2	.14
755.3	.39	2495.0	.32	3493.1	.05
776.2	.49	2536.7	.06	3507.6	.20
813.2	.24	2545.5	.08	3544.5	.09
835.7	1.86	2614.8	.13	3559.3	.15
870.7 D	.24	2651.9	.12	3589.3	.04
879.8	.93	2672.4	.21	3604.4	.04
881.6	.93	2693.8	.13	3617.6	.04
895.8	1.52	2710.0	.05	3651.8	.14
911.8	.88	2734.1	.12	3678.7	.21
945.9	1.91	2743.6	.08	3694.2	.07
957.8	.59	2759.2	.15	3720.4	.06
1054.2	.59	2781.3	.07	3729.0	.04
1106.3	.73	2795.0	.06	3744.3	.15
1119.4	.54	2809.0	.11	3761.0	.02
1129.9	.68	2828.9	.05	3774.6	.08
1188.7	.78	2844.6	.05	3792.8	.07
1230.9	.49	2885.0	.04	3811.7	.14
1237.9	.44	2900.2	.17	3838.9	.09
1392.8	.39	2927.3	.05	3857.3	.04
1403.7	.59	2965.9	.12	3867.4	.02
1417.6	.44	2981.8	.05	3881.2	.05
1526.9	.44	2991.8	.06	3890.8	.17
1548.5	.49	3003.6	.05	3906.6	.02
1679.1	.29	3014.9	.05	3921.2	.12
1724.5	1.49	3033.0	.11	3935.9	.11
1761.3	.28	3078.1	.06	3956.5	.05
1784.5	.29	3098.3	.04	3979.0	.33

NIOBIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3999.1	.02	4672.8	.11	5450.6	.33
4016.1	.45	4682.9	.04	5496.9	.80
4035.1	.04	4712.4	.20	5510.4	.08
4044.1	.04	4739.7	.59	5533.8	.09
4055.9	.04	4756.0	.06	5572.2	.11
4090.0	.08	4773.5	.21	5591.8	.37
4102.4	.06	4792.4	.32	5610.8	.21
4115.8	.04	4828.8	.39	5646.3	.11
4131.4	.27	4860.8	.08	5708.2	.07
4156.2	.12	4878.2	.05	5727.1	.09
4176.8	.09	4893.1	.02	5770.7	.28
4196.5	.12	4914.2	.41	5833.9	.08
4208.5	.05	4929.1	.06	5880.1	.07
4224.0	.04	4948.9	.25	5895.3	.84
4240.1	.17	4982.7	.21	5946.8	.19
4261.0	.15	4998.1	.11	5965.4	.13
4273.9	.04	5007.7	.02	5980.3	.11
4305.5	.34	5032.9	.37	5997.0	.12
4329.8	.20	5052.7	.06	6069.9	.08
4349.4	.06	5070.4	.52	6166.5	.05
4362.5	.13	5087.2	.06	6215.2	.04
4386.9	.05	5104.2	1.12	6221.0	.05
4397.5	.04	5129.5	.20	6292.8	.20
4407.0	.02	5180.2	.20	6331.9	.19
4433.6	.28	5194.0	.35	6415.2	.05
4456.4	.09	5209.5	.24	6435.6	.15
4469.5	.11	5232.8	.04	6526.2	.04
4503.3	.40	5253.6	.57	6597.4	.14
4526.3	.07	5284.2	.25	6830.7	1.00
4540.5	.18	5307.7	.37	6877.2	.04
4557.8	.15	5348.8	.31	6915.0	.18
4594.9	.04	5366.0	.41	7110.9	.07
4608.2	.13	5400.5	.41	7167.5	.07
4632.5	.40	5424.8	.05	7186.1	.46
4650.5	.02				

MOLYBDENUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
234.6	.06	1317.7	1.57	2751.0	.11
240.5	.34	1397.0	.37	2767.1	.36
244.5	.66	1440.9	.38	2772.8	.29
252.7	.52	1457.3	.32	2795.4	.35
298.3	.13	1497.5	2.76	2812.4	.16
304.7	.23	1543.0	.47	2832.4	.11
308.2	.09	1553.7	.32	2847.2	.22
314.3	.17	1592.7	.47	2862.3	.09
321.6	.09	1628.6	.62	2877.1	.14
332.5	.06	1649.3	.25	2893.6	.13
337.4	.18	1702.0	.72	2910.7	.09
349.8	.96	1762.0	.51	2915.1	.14
370.3	1.36	1774.3	.25	2928.8	.09
382.4	.10	1831.2	.16	2958.8	.40
389.8	.15	1890.4	.19	2985.6	.11
405.5	.23	1922.7	1.48	2995.8	.05
422.6	.17	1958.4	.44	3010.0	.17
450.4	.10	2009.9	1.71	3023.3	.06
480.8	1.31	2040.8	.12	3044.5	.08
495.1	.12	2064.5	.43	3058.7	.14
528.3	.15	2083.9	.15	3133.1	.30
538.8	.11	2100.5	.14	3155.2	.12
551.1	.11	2112.1	.47	3186.0	.08
574.0	2.03	2133.2	.44	3200.5	.08
581.7	2.46	2153.4	.11	3213.9	.24
591.0	1.50	2280.3	.15	3236.6	.10
609.0	2.05	2354.3	.11	3259.9	.11
647.4	2.49	2356.6	.10	3272.7	.10
678.7	.20	2376.0	.55	3300.1	.23
719.9	8.87	2400.9	.99	3312.3	.06
737.1	2.68	2423.6	.35	3329.9	.16
755.5	.18	2442.7	.09	3350.6	.03
759.8	.34	2451.6	.13	3367.2	.09
778.4	49.26	2486.2	.29	3402.2	.04
811.9	.57	2507.0	.61	3446.1	.04
849.0	17.51	2539.7	.07	3452.5	.10
865.6	.22	2557.8	.18	3473.8	.06
968.1	.93	2586.6	.23	3491.0	.13
1024.1	.19	2600.7	.11	3510.8	.13
1044.5	.20	2637.9	.12	3547.6	.06
1091.0	4.40	2643.4	.08	3606.3	.34
1106.9	.72	2664.5	1.27	3623.1	.09
1163.7	.43	2681.1	.08	3645.9	.43
1188.6	.31	2701.3	.19	3672.9	.08
1229.6	.43	2720.4	.06	3692.9	.38
1265.9	.35	2729.3	.06	3737.1	.27

MOLYBDENUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3751.7	.08	4682.4	.40	5819.4	.22
3790.8	.07	4721.8	.09	5870.2	.17
3808.1	.16	4741.8	.33	5893.0	.03
3830.5	.25	4758.4	.03	5952.2	.40
3850.0	.11	4769.2	.18	5997.3	.03
3882.0	.04	4790.2	.13	6020.9	.21
3898.9	.15	4807.4	.07	6066.9	.22
3916.1	.13	4824.0	.04	6100.7	.03
3933.4	.25	4841.3	.12	6129.1	.45
3954.3	.14	4881.0	.31	6180.3	.09
3972.1	.09	4925.6	.05	6316.6	.02
3997.0	.11	4934.8	.09	6364.6	.75
4019.1	.13	4958.3	.04	6418.5	.07
4072.3	.04	5031.6	.03	6436.2	.03
4114.8	.03	5044.4	.14	6455.4	.16
4143.4	.03	5063.6	.04	6534.4	.03
4180.8	.30	5078.3	.03	6560.2	.08
4206.7	.15	5107.5	.08	6579.2	.04
4228.3	.06	5118.2	.05	6584.1	.03
4255.0	.03	5129.8	.03	6625.1	.73
4268.7	.05	5142.5	.03	6673.6	.35
4278.5	.04	5172.7	.06	6709.3	.05
4294.9	.16	5218.8	.21	6733.9	.08
4309.7	.04	5247.6	.49	6736.6	.07
4326.1	.27	5285.6	.22	6825.5	.02
4356.9	.16	5302.5	.04	6849.4	.03
4380.9	.11	5325.5	.04	6861.6	.02
4402.3	.04	5330.8	.04	6919.3	3.42
4443.3	.64	5387.5	.07	6991.3	.03
4473.1	.08	5405.4	.13	7057.6	.04
4493.4	.11	5427.5	.13	7126.5	.04
4505.1	.14	5460.0	.05	7166.2	.11
4511.9	.11	5476.9	.04	7193.3	.03
4530.7	.04	5531.4	.24	7245.4	.03
4543.7	.25	5545.1	.25	7263.3	.03
4572.7	.04	5602.4	.76	7279.8	.03
4596.2	.05	5650.2	.12	7302.0	.04
4614.3	.25	5694.1	.03	7415.0	.05
4632.0	.04	5713.1	1.33	7527.1	.78
4650.1	.06	5738.5	.29	8373.9	.54
4661.9	.07				

RUTHENIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
261.7	.12	2060.2	.36	3265.3	.12
271.6	.08	2085.6	.30	3294.3	.08
295.7	.63	2127.1	.25	3321.4	.41
303.2	.19	2140.9	.26	3334.1	.12
318.5	.09	2172.5	.21	3343.8	.07
326.9	.08	2273.5	.23	3360.5	.43
345.5	.08	2298.3	.54	3386.0	.45
360.8	.41	2329.9	.17	3416.7	.22
369.6	.08	2334.8	.19	3465.7	.17
403.9	.64	2346.8	.18	3505.4	.35
418.2	.34	2360.0	.32	3513.2	.15
461.2	.24	2374.2	.52	3532.3	.07
475.3	9.96	2381.5	.15	3544.6	.10
498.5 D	.10	2389.6	.21	3611.6	.10
539.8	15.16	2406.6	.17	3639.3	.08
591.7	.47	2442.4	.35	3656.2	.23
610.8 D	.17	2459.9	.36	3718.2	.24
630.6	5.11	2487.9	.28	3762.9	.18
687.1	6.11	2530.4	.84	3787.9	.13
711.0	.36	2579.2	.14	3805.7	.12
723.4	.22	2618.2	.32	3835.2	.07
737.0	.66	2636.6	.26	3858.4	.26
822.9	1.40	2648.4	.13	3889.6	.07
835.6	.30	2659.3	.13	3919.3	.08
849.2	.32	2671.1	.15	3947.7	.34
938.9	.30	2711.8	.26	4008.8	.24
1046.4	.79	2730.0	.16	4025.6	.30
1103.5	1.87	2756.1	.17	4067.9	.14
1301.4	.36	2768.7	.12	4123.4	.20
1362.3	1.18	2786.0	.48	4138.9	.08
1522.1	.46	2790.6	.37	4196.6	.06
1557.4	1.21	2814.7	.14	4203.0	.07
1598.9	.55	2828.7	.15	4245.1	.10
1627.8	3.07	2851.9	.12	4257.7	.07
1650.4	.71	2864.5	.22	4270.1	.31
1700.8	1.45	2922.3	.22	4298.1	.07
1812.6	.97	2948.3	.15	4313.6	.07
1826.9	1.39	2973.5	.19	4327.2	.43
1840.3	.99	3031.5	.16	4351.3	.63
1890.0	.53	3044.4	.18	4395.2	.57
1903.7	.66	3061.5	.12	4422.2	.16
1928.4	.38	3077.7	.09	4478.0	.27
1980.0	.45	3123.7	.14	4501.6	.15
2002.5	.36	3137.7	.10	4549.0	.11
2034.4	.40	3219.1	.36	4566.6	.09
2051.1	.29	3239.0	.21	4587.0	.20

RUTHENIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4607.0	.07	5524.9	.39	6371.1	.22
4627.4	.70	5567.9	.12	6416.3	.07
4654.0	.36	5586.6	.18	6507.8	.15
4673.4	.06	5602.2	.06	6562.3	.19
4713.4	.18	5649.7	.15	6608.1	.09
4750.6	.12	5670.8	.13	6626.8	.41
4809.1	.06	5750.8	.23	6689.5	.27
4829.1	.14	5771.4	.09	6754.3	.21
4881.9	.54	5831.2	.19	6794.9	.11
4903.8	.11	5853.4	.27	6910.9	.09
4989.3	.10	5871.7	.15	6957.1	.34
5022.8	1.09	5894.3	.26	7102.9	.54
5043.8	.08	5910.9	.16	7177.4	.50
5091.7	.16	5942.8	.12	7203.9	.08
5153.0	.29	5974.9	.08	7306.3	.19
5186.7	.08	6038.3	.06	7411.7	.21
5227.0	.05	6066.6	.18	7506.2	.35
5246.1	.08	6165.1	.06	7610.2	.19
5300.9	.31	6184.8	.21	7694.6	.14
5333.7	.24	6209.1	.35	7790.1	.13
5414.8	.05	6273.7	.80	8112.8	.11
5459.2	.16	6298.9	.25	8309.8	.14
5485.2	.07	6324.7	.19	8446.6	.11
5499.1	.09	6342.1	.84	9134.8	.16

RHODIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
217.4	10.24	1251.3	.21	4049.3	.07
236.7	.16	1379.1	.24	4063.6	.08
249.2	.37	1402.4	.21	4084.0	.06
267.9	3.71	1477.8	.40	4101.9	.27
286.7	.23	1822.4	.35	4137.5	.07
305.9	.68	1893.9	.61	4168.4	.10
317.8	.06	1923.6	.37	4172.0	.15
324.1	.71	2173.9	.30	4187.7	.06
334.6	1.01	2311.6	.19	4221.2	.23
357.7	.86	2368.7	.24	4258.1	.08
375.2	.58	2469.0	.18	4306.5	.22
386.0	.16	2482.6	.19	4327.7	.17
421.1	1.02	2579.3	.30	4360.5	.16
428.9	.32	2634.2	.14	4400.9	.13
440.9	1.05	2723.1	.37	4448.2	.17
470.6	1.01	2756.3	.15	4483.8	.32
481.9	.88	2833.8	.28	4510.3	.44
537.6	1.36	2867.3	.30	4633.4	.37
546.9	.32	2924.2	.20	4671.5	.29
556.1D	2.06	2974.4	.30	4726.9	.24
577.1	.13	3018.9	.17	4834.1	.17
580.2	.28	3096.6	.10	4861.2	.14
597.6	.45	3158.1	.10	4901.3	.09
613.1	.61	3198.7	.09	4916.6	.46
620.0	.45	3222.7	.12	4972.6	.22
645.0	2.12	3295.2	.08	5006.6	.16
657.7	.13	3352.3	.13	5022.4	.13
662.2	.16	3402.4	.10	5109.6	.12
695.6	.21	3442.4	.10	5134.7	.09
709.1	.13	3483.6	.26	5154.4	.52
723.1	.11	3542.0	.07	5204.2	.44
753.2	.21	3591.8	.11	5236.5	.07
789.7	1.32	3620.1	.11	5266.2	1.02
819.2	.46	3643.3	.30	5323.0	.09
833.7	.18	3709.5	.11	5347.2	1.34
844.9	.36	3728.0	.17	5396.0	.06
855.1	.18	3747.4	.11	5433.8	.19
863.3	.17	3752.0	.16	5462.4	.12
899.4	.14	3845.0	.10	5524.2	.55
915.8	.15	3859.3	.11	5548.3	.19
931.7	.24	3916.7	.09	5602.2	.09
951.1	.62	3932.1	.11	5617.9	.13
1008.1	.16	3947.7	.12	5674.4	.19
1041.6	.24	3954.3	.08	5694.9	.05
1052.3	.16	3969.2	.24	5765.0	.14
1140.2	.21	4023.0	.12	5796.8	.29

RHODIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5796.8	.29	6082.8	.65	6354.0	.48
5812.5	.16	6108.9	.26	6419.4	.15
5882.1	.13	6138.1	.05	6735.0	.18
5917.2	1.42	6171.8	.67	6785.8	.41
5991.3	.13	6211.4	.69	6997.9	.18
6046.4	.77	6302.9	.16		

PALLADIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
245.7	5.90	1433.9	.42	2707.2	.18
265.7	.53	1482.7	.34	2717.9	.15
277.7	.40	1499.7	.32	2741.5	.41
291.5	1.72	1525.8	.47	2791.0	.15
325.0	3.54	1572.2	3.93	2815.7	.30
338.1	2.56	1644.0	.36	2888.5	.15
358.9	1.16	1657.8	.45	2932.8	.09
396.5	.27	1695.9	.40	2953.7	.18
414.0	.37	1762.2	.40	2965.5	.07
430.1	4.52	1795.6	.27	2984.2	.32
441.0	.40	1808.5	.63	3030.7	.20
453.5	.10	1829.7	.24	3068.4	.12
463.8	.14	1857.0	.22	3148.8	.17
476.1	4.05	1889.3	.71	3161.9	.07
492.6	.75	1908.6	.34	3170.5	.16
559.1	.72	1927.3	.71	3198.7	.06
578.9	.11	1956.3	.21	3217.3	.16
591.2	.12	1987.8	.75	3228.0	.19
601.8	.53	2029.6	.20	3248.8	.12
616.1	10.72	2045.8	.19	3267.1	.31
647.3	.13	2101.7	.18	3294.5	.08
673.2	.15	2113.3	.20	3303.9	.07
684.6	.21	2131.1	.18	3310.2	.09
703.9	.60	2170.4	.15	3323.8	.09
716.9	11.66	2182.4	.16	3336.6	.31
739.0	.19	2196.9	1.10	3390.5	.10
749.0	1.48	2269.6	.35	3401.3	.08
772.7	.18	2287.9	.26	3414.4	.08
793.3	.35	2308.7	.39	3429.7	.07
805.0	1.06	2357.0	.29	3441.1	.07
810.3	.33	2373.8	.25	3464.9	.07
815.8	.26	2397.4	.36	3506.6	.08
838.4	.41	2410.4	.10	3523.5	.16
847.4	1.25	2440.5	.19	3610.7	.09
903.8	.28	2457.5	1.02	3635.2	.17
914.5	.22	2484.3	1.03	3701.3	.09
958.5	.18	2504.1	.11	3714.4	.06
1021.3	.60	2514.5	.15	3739.4	.47
1047.9	9.27	2540.0	.56	3755.4	.08
1086.6	.38	2558.5	.49	3776.6	.28
1127.5	4.02	2592.3	.13	3791.1	.09
1260.8	.26	2614.3	.18	3810.6	.06
1348.8	.66	2628.6	.10	3832.4	.06
1396.7	1.22	2651.3	.27	3863.6	.09
1416.8	.27	2682.0	.13	3875.4	.07
1422.6	.35	2693.3	.10	3909.5	.21

PALLADIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3928.8	.13	5112.3	.07	6220.3	.06
3959.8	.19	5139.6	.10	6235.3	.07
3994.8	.10	5178.3	.21	6254.7	.17
4018.7	.04	5198.3	.06	6295.0	.07
4034.1	.24	5212.9	.49	6308.5	.04
4065.6	.16	5240.3	.05	6330.4	.19
4074.4	.04	5273.9	.23	6361.6	.04
4129.4	.18	5294.8	.07	6372.2	.03
4155.9	.04	5310.9	.07	6434.7	.19
4183.6	.04	5354.8	.05	6451.6	.04
4211.8	.04	5376.6	.10	6462.7	.04
4234.0	.39	5395.0	.06	6489.3	.20
4274.9	.05	5405.0	.04	6543.0	.04
4312.6	.25	5431.8	.23	6590.3	.16
4353.4	.08	5447.4	.05	6624.7	.33
4407.9	.12	5464.9	.20	6652.5	.36
4424.3	.08	5480.3	.21	6674.2	.05
4444.9	.24	5519.4	.16	6711.5	.05
4466.8	.09	5586.9	.06	6735.9	.35
4494.7	.09	5644.9	.05	6812.8	.26
4510.8	.19	5660.9	.04	6935.9	.06
4555.0	.06	5677.9	.09	7061.5	.10
4584.0	.07	5709.5	.07	7075.7	.07
4617.6	.18	5720.3	.16	7122.4	.13
4675.5	.28	5742.4	.16	7162.1	.04
4705.4	.10	5771.3	.06	7193.8	.04
4753.2	.34	5787.9	.08	7218.5	.06
4778.2	.07	5828.4	.82	7249.0	.05
4794.6	1.09	5853.9	.10	7299.8	.05
4811.3	.05	5887.1	.11	7441.4	.05
4824.6	.04	5903.3	.06	7475.9	.12
4864.5	.07	5950.5	.05	7561.9	.05
4920.4	.39	5983.7	.29	7630.1	.10
4978.9	.07	6050.2	.12	7790.5	.05
5018.6	.07	6110.1	.11	8001.2	.16
5042.6	.04	6138.1	.08	8331.0	.16
5100.0	.08	6169.1	.15		

SILVER

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
199.5	35.15	2159.7	.45	3643.5	.19
215.0	3.88	2185.4	.22	3713.6	.07
237.0	13.56	2262.8	.21	3800.8	.11
268.0	3.32	2273.9	.17	3822.0	.10
295.6	5.62	2337.0	.24	3839.7	.20
329.5	.49	2355.6	.27	3901.0	.06
339.6	.26	2368.0	.27	3993.9	.44
350.5	.40	2425.1	.14	4078.4	.22
360.4	2.05	2479.4	.14	4103.7	.20
368.7	.31	2496.8	.22	4118.8	.14
380.4	3.66	2512.1	.16	4140.7	.29
391.6	.28	2533.9	.28	4155.7	.07
409.5	.34	2627.9	.20	4190.6	.12
425.3 D	.16	2640.7	.19	4204.3	.06
465.0	.44	2744.8	.11	4251.3	.29
483.0	.19	2791.4	.15	4268.5	.06
496.0	1.35	2806.0	.21	4309.8	.08
525.4	.96	2864.1	.23	4333.9	.09
537.1	1.49	2890.6	.18	4348.0	.21
549.6	1.02	2914.2	.11	4367.2	.23
588.8	.92	2928.4	.15	4395.3	.31
626.0	.30	2947.9	.10	4431.1	.08
634.0 D	.46	3004.0	.15	4447.9	.10
657.7 D	3.02	3013.4	.10	4460.3	.16
669.8	.42	3063.0	.11	4475.1	.06
700.5	.24	3077.2	.16	4488.8	.06
725.0	.48	3103.0	.19	4528.9	.07
748.9	.74	3117.9	.19	4551.1	.15
758.1	.22	3123.1	.12	4578.6	.09
880.6	.42	3168.6	.08	4605.3	.06
896.4	.28	3213.1	.11	4622.1	.41
1176.4	.40	3247.8	.13	4652.6	.12
1565.9	.62	3276.8	.19	4673.8	.24
1583.7	.94	3291.2	.11	4695.5	.07
1667.3	.91	3311.0	.15	4720.2	.49
1723.8	.42	3375.3	.11	4756.7	.12
1750.0	.36	3389.8	.14	4813.1	.50
1812.2	.33	3414.7	.17	4860.6	.48
1841.6	.44	3451.3	.11	4882.5	.06
1889.7	.51	3488.0	.13	4930.6	.11
1900.5	.21	3502.4	.19	4970.9	.05
1971.7	.34	3523.3	.13	5001.5	.27
1988.7	.37	3543.5	.12	5054.4	.31
2013.0	.25	3555.4	.06	5075.2	.25
2048.6	.48	3582.3	.08	5093.4	.24
2081.8	.44	3614.6	.09	5112.3	.35

SILVER CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5139.3	.12	5549.4	.64	6100.6	.12
5155.7	.23	5577.9	.58	6157.9	.27
5183.6	.07	5612.5	.31	6218.0	.10
5205.3	.57	5639.2	.14	6266.5	.09
5224.5	.12	5699.7	1.56	6384.6	.08
5240.2	.67	5739.9	.13	6446.1	.11
5298.7	.09	5770.8	.28	6538.6	.56
5326.4	.08	5793.1	1.04	6568.0	.07
5357.0	.24	5811.4	.37	6705.7	.16
5386.1	.24	5894.4	.08	6887.5	.10
5421.7	.06	5911.5	.11	6974.3	.21
5440.8	.09	5995.7	.09	7062.3	.07
5463.2	.12	6019.9	.37	7076.3	.29
5497.6	.14	6056.1	1.16	7268.9	.57
5515.1	.45	6080.7	.07		

CADMIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
368.3	.12	2455.8	4.52	3811.3	.05
427.2	.19	2501.8	.13	3825.1	.19
462.7	.24	2530.9	.20	3845.9	.04
477.0	.29	2550.1	1.60	3855.6	.07
539.2	.97	2582.3	.28	3876.8	.10
558.6	79.71	2598.2	.19	3912.1	.32
575.8	2.53	2610.4	.14	3927.7	.06
651.3	15.23	2659.8	3.11	3973.1	.15
707.5	1.50	2675.2	.14	3994.2	.25
724.9	4.30	2700.8	1.22	4070.9	.14
747.3	1.50	2739.5	.34	4097.7	.39
806.0	5.10	2753.2	.17	4124.8	.29
826.6	.73	2767.3	1.44	4140.5	.06
838.9	.49	2799.9	.68	4189.0	.08
923.5	.32	2811.9	.20	4202.3	.07
994.4	.75	2822.1	.09	4222.4	.04
1209.4	3.96	2948.5	.24	4235.3	.13
1283.5	1.94	2951.5	.24	4286.2	.04
1302.6	1.61	2973.5	.07	4297.5	.04
1364.2	5.42	3000.0	1.60	4309.4	.11
1399.3	3.47	3030.5	.21	4331.2	.06
1433.3	.59	3052.6	.45	4344.5	.12
1489.4	2.04	3068.9	.11	4362.7	.10
1660.7	1.63	3108.9	1.12	4391.0	.12
1686.3	.32	3150.4	.10	4403.6	.08
1746.4	.37	3182.7	.06	4483.1	.04
1761.0	.49	3218.2	.49	4499.6	.09
1803.5	.45	3234.7	.10	4514.0	.06
1826.0	.77	3257.3	.10	4543.4	.29
1879.4	.84	3273.4	.05	4556.7	.07
1948.1	.37	3331.0	.54	4596.1	.13
1995.0	.25	3377.9	.06	4612.4	.04
2022.3	.28	3428.4	.06	4626.7	.22
2067.7	.14	3441.8	.05	4646.1	.07
2083.4	.33	3459.4	.06	4683.7	.07
2102.5	.91	3489.7	.20	4695.4	.04
2124.3	.48	3501.1	.06	4728.6	.04
2147.7	.22	3546.2	.36	4745.2	.19
2190.8	.45	3581.4	.04	4772.6	.04
2252.3	.56	3612.9	.31	4782.5	.08
2314.7	.27	3637.5	.07	4810.0	.63
2353.4	.68	3653.9	.13	4834.3	.09
2366.1	.13	3660.0	.06	4873.6	.04
2380.5	.10	3728.1	.11	4899.9	.15
2397.7	1.09	3751.2	.15	4936.5	.19
2427.3	.13	3779.7	.22	4983.6	.12

CADMIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5005.4	.37	5491.1	.11	6230.4	.08
5033.7	.42	5536.2	.04	6254.7	.05
5070.4	.20	5554.8	.18	6292.5	.04
5109.2	.29	5598.0	.10	6403.6	.06
5152.9	.83	5633.1	.04	6461.8	.17
5183.7	.04	5672.0	.20	6517.2	.12
5198.9	.16	5708.0	.22	6587.3	.14
5221.5	.52	5721.5	.14	6605.1	.18
5244.7	.44	5782.8	.66	6823.3	.36
5281.2	.09	5823.9	2.33	7677.7	.36
5300.9	.12	5878.3	.05	7734.7	.27
5324.6	.62	5934.3	.79	7832.1	.16
5384.2	.20	5989.6	.07	8482.4	.39
5431.4	1.08	6042.4	.16	9043.4	.27
5457.5	.18	6215.0	.04		

INDIUM

ENERGY KEV		INTENSITY NO./100	ENERGY KEV		INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
203.9		.48	1595.5		.23	3554.8	.07
214.4		.25	1669.3		.23	3596.9	.04
219.1		.28	1752.8		1.41	3610.6	.05
232.3		.05	1848.3		.27	3703.2	.05
236.3		.15	1981.8		.26	3716.2	.06
273.3		7.07	2004.0		.16	3740.8	.04
285.8		.22	2016.7		.18	3773.8	.11
298.4		1.85	2056.5		.27	3792.0	.10
320.4		.16	2112.1	D	10.94	3811.0	.06
335.6		2.30	2160.0		.17	3876.6	.20
356.9		.11	2187.6		.25	3928.1	.10
368.2		.11	2337.4		.25	3955.5	.03
374.3		.16	2378.9		.09	3978.3	.11
385.3		1.94	2405.2		.16	4006.9	.15
401.8		.06	2486.6		.11	4045.0	.08
417.2	D	7.37	2524.5		.12	4058.7	.08
434.0		1.03	2548.7		.09	4074.6	.15
445.6		.09	2563.4		.10	4121.7	.04
473.5		1.53	2579.9		.15	4134.3	.04
491.3		.62	2630.8		.08	4150.4	.03
547.2		.34	2647.1		.17	4227.5	.25
557.5		1.41	2662.4		.15	4261.9	.04
578.5		.21	2703.9		.08	4309.3	.08
608.3		.98	2743.4		.06	4323.8	.18
622.8		.20	2772.6		.06	4372.7	.09
634.2		.56	2824.7		.06	4420.8	.06
645.6		.25	2878.7		.05	4441.6	.06
717.8		.23	2891.9		.06	4555.2	.04
727.7		.13	2927.9		.05	4580.1	.20
761.6		.12	2969.1		.05	4613.1	.04
819.3		2.77	3053.5		.08	4651.4	.08
848.0		.17	3081.4		.06	4684.6	.03
875.6		.12	3115.4		.08	4700.5	.16
886.0		.59	3161.0		.15	4743.0	.16
915.2		.26	3198.2		.10	4774.9	.45
973.6		.14	3267.6		.06	4807.8	.09
1007.9		.14	3282.0		.06	4823.7	.07
1067.8		.16	3331.4		.14	4849.7	.06
1077.2		.54	3351.0		.18	4869.7	.28
1097.0	D	12.20	3353.3		.18	4913.2	.42
1245.8		.15	3374.5		.08	4969.4	.45
1293.4	D	17.97	3400.0		.06	5005.2	.18
1311.6		.22	3426.0		.07	5032.4	.09
1438.8		.20	3436.2		.05	5103.4	.43
1507.5	D	1.82	3495.2		.05	5118.9	.05
1583.4		.29	3544.9		.15	5141.1	.41

INDIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5172.2	.38	5481.5	.04	5891.9	.61
5246.0	.14	5499.1	.11	6047.4	.04
5319.1	.06	5526.2	.05	6135.2	.03
5333.2	.16	5580.9	.06	6231.1	.04
5358.9	.09	5712.5	.03	6323.2	.07
5384.0	.03	5773.0	.14	6411.4	.11
5409.7	.22	5812.6	.04		

TIN

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
222.3	.26	1293.3	13.06	2709.4	.40
229.5	.18	1506.3	.64	2722.0	.10
240.2	.34	1631.7	.55	2738.0	.14
251.9	1.88	1648.3	.42	2774.5	.20
326.3 D	.13	1666.9	.33	2789.4	.14
332.1	.98	1726.9	.92	2818.0	.09
336.8	.22	1747.4	.50	2843.9	.52
355.2	.30	1781.8	.30	2886.0	.09
359.6	.15	1811.8	.47	2905.0	.11
366.5	.28	1826.9	.31	2930.0	.22
377.3	.44	1863.7	.37	2961.0	.40
385.3	.16	1888.5	.82	2986.3	.09
388.9	.34	1922.5	.22	3000.0	.33
399.8	.23	1944.5	.30	3018.0	.33
411.7	.14	1960.3	.17	3032.9	.10
417.2	.32	1985.8	.22	3057.6	.21
431.4	.22	2022.6	.26	3076.8	.17
433.3	.17	2042.0	.87	3088.5	.17
444.4	.15	2075.2	.24	3121.9	.08
464.3	1.17	2096.9	.30	3155.1	.16
475.0	.28	2112.7	1.54	3169.5	.13
478.4	.35	2125.8	.14	3196.0	.16
533.6	.18	2150.0	.19	3230.2	.10
544.9	.17	2171.0	.14	3249.2	.06
556.4	.58	2179.0	1.17	3269.1	.07
567.0	.26	2245.1	.14	3281.2	.13
608.3	.21	2270.0	.26	3292.2	.05
626.8	.20	2280.2	.11	3334.3	1.01
652.7	.41	2292.1	.19	3355.0	.06
666.0	.21	2307.0	.12	3372.2	.06
710.0	.21	2326.8	.41	3389.2	.06
732.8	.46	2333.4	.13	3403.3	.09
760.8	.34	2356.2	.34	3421.1	.06
819.9	.28	2367.6	.22	3436.9	.06
869.4	.32	2400.4	.11	3459.2	.56
930.6	.32	2417.5	.19	3474.7	.06
959.9	.38	2438.7	.24	3484.7	.09
973.2	1.22	2460.6	.22	3503.1	.19
1004.2	.44	2473.5	.09	3527.3	.07
1040.2	.45	2487.8	.42	3546.2	.09
1048.6	.36	2499.8	.40	3566.9	.06
1069.5	.30	2559.6	.21	3587.5	.30
1171.3	8.04	2585.7	.43	3611.1	.13
1229.5	7.00	2636.1	.11	3631.1	.08
1250.8	.35	2651.7	.58	3648.2	.06
1278.5	.44	2674.8	.46	3658.9	.13

TIN CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3673.5	.08	4483.5	.04	5448.6	.22
3696.0	.07	4513.7	.07	5467.2	.05
3711.7	.43	4548.2	.04	5517.5	.04
3728.7	.05	4600.8	.05	5562.5	.07
3778.7	.16	4612.4	.04	5707.0	.05
3793.1	.04	4649.3	.06	5741.4	.05
3809.5	.23	4674.3	.04	5822.4	.18
3835.4	.05	4696.5	.37	5852.6	.03
3848.6	.06	4764.1	.06	5905.2	.22
3870.1	.08	4784.2	.42	5932.4	.06
3891.7	.14	4810.5	.13	5972.8	.07
3902.6	.05	4828.0	.04	5992.4	.09
3927.1	.07	4867.3	.10	6056.6	.13
3954.0	.11	4892.8	.05	6094.5	.06
3981.5	.14	4913.9	.24	6158.9	.03
4012.5	.04	4936.5	.08	6230.3	.06
4127.8	.06	4959.9	.06	6250.4	.03
4139.6	.05	4975.2	.09	6268.0	.44
4199.0	.08	5007.7	.41	6335.6	.16
4218.8	.04	5043.7	.09	6421.3	.08
4253.2	.06	5082.5	.15	6443.3	.09
4294.0	.07	5114.5	.14	6460.8	.09
4319.8	.32	5134.9	.04	6601.9	.23
4354.8	.04	5150.9	.05	6647.6	.12
4366.1	.04	5171.2	.16	6785.8	.05
4389.2	.03	5219.3	.08	6916.5	.06
4393.0	.07	5298.5	.07	6978.9	.07
4410.4	.06	5323.6	.12	7015.8	.15
4432.3	.06	5362.1	.34	7114.4	.05
4442.5	.06	5392.5	.43	7450.3	.15
4457.2	.05	5423.7	.19	9326.1	.35

ANTIMONY

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
185.3	.11	867.0	.29	3034.0	.08
202.9	1.15	896.8	.18	3063.5	.08
218.3	.15	921.1	1.41	3084.9	.16
231.9	1.11	1019.6	.99	3159.7	.18
283.1	3.31	1095.0	.37	3198.5	.07
310.6	.10	1130.1	.33	3235.7	.18
315.4	.07	1246.6	.39	3334.1	.11
322.8	.09	1292.0	.34	3350.3	.06
332.7	3.68	1390.6	.23	3364.9	.05
345.3	.25	1436.5	.24	3398.0	.07
351.0	.38	1378.0	1.13	3478.0	.10
368.4	.08	1402.0	1.17	3502.2	.07
378.7	.29	1477.5	1.13	3556.4	.07
385.4	.34	1552.5	.68	3609.2	.06
401.6	.13	1576.9	.68	3631.0	.06
419.9	1.24	1631.1	.38	3695.1	.05
435.9	.09	1701.8	.33	3731.1	.05
440.6	.08	1730.4	.51	3772.3	.07
446.2	.08	1772.1	.38	3787.9	.11
452.0	.21	1798.8	.31	3833.1	.06
463.3	.11	1823.1	.41	3866.7	.07
475.7	.18	1870.1	.26	3908.0	.09
480.1	.20	1886.2	.39	3920.9	.05
491.1	.32	1928.2	.19	3971.3	.09
523.8	.25	1944.7	.21	4018.0	.13
546.4	.61	2074.2	.46	4129.7	.05
558.2 D	4.72	2092.8	.17	4179.4	.06
579.8	.29	2191.0	.20	4201.0	.08
601.6	.58	2249.3	.15	4243.6	.06
613.7	.23	2273.1	.16	4288.7	.05
631.9	1.11	2342.1	.13	4304.5	.17
646.8	.37	2370.2	.11	4418.7	.06
650.3	.42	2432.5	.15	4430.7	.05
657.3	.31	2453.6	.28	4457.6	.14
668.0	.14	2497.7	.12	4539.8	.06
690.2 D	.14	2550.7	.11	4567.0	.14
721.1	.20	2594.8	.09	4586.7	.04
723.2	.37	2613.7	.11	4603.0	.12
734.2	.13	2625.6	.22	4623.8	.07
745.8	.46	2648.4	.09	4648.7	.11
761.5	.22	2728.8	.11	4662.1	.06
767.5	.23	2855.0	.10	4689.8	.22
773.4	.17	2878.3	.15	4761.4	.05
807.4	.38	2890.2	.07	4780.7	.09
811.8	.16	2996.8	.07	4819.5	.19
822.5	.18	3022.6	.09	4906.5	.08

ANTIMONY CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4930.3	.15	5468.0	.06	6048.9	.21
5004.9	.26	5519.3	.05	6082.9	.29
5046.3	.07	5537.0	.06	6165.0	.09
5077.4	.06	5562.9	.65	6335.6	.22
5127.0	.20	5600.8	.29	6363.8	.20
5158.8	.08	5619.8	.18	6380.1	.52
5246.1	.09	5684.3	.33	6409.0	.06
5312.3	.12	5801.0	.05	6468.1	.44
5337.2	.09	5868.6	.23	6498.2	.08
5408.4	.28	5886.2	.60	6523.6	1.18
5433.4	.06	5933.3	.05	6728.0	.80
5450.7	.09	6009.4	.26	6805.5	.20

TELLURIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
245.2	.06	1997.9	1.27	3154.7	.81
298.1	.27	2039.1	1.86	3184.1	.12
314.0	.06	2078.2	.58	3222.6	.42
331.6	.07	2090.0	.28	3237.5	.28
336.4	.15	2108.7	.33	3285.5	.06
343.4	2.17	2123.5	.24	3304.3	.06
354.1	.75	2144.2	.53	3319.2	.07
381.5	.20	2184.5	.16	3332.7	.06
417.2	.06	2196.7	.21	3346.9	.72
443.8	.09	2203.2	.60	3365.4	.18
457.8 D	.64	2256.3	.80	3380.6	.13
460.0	.18	2285.8	1.04	3397.3	.18
479.5	.07	2335.2	.17	3416.5	.07
492.8	.08	2346.7	.39	3445.2	.29
545.1	.09	2360.9	.12	3476.9	.09
558.1	.48	2386.0	1.18	3489.1	.11
602.9	16.09	2421.8	.19	3498.2	.11
646.1	1.65	2443.3	.44	3529.6	.10
665.4	.40	2455.6	.13	3544.0	1.18
692.9	.25	2490.5	.47	3572.1	.33
713.0	.13	2539.4	.10	3589.0	.22
722.8	2.83	2610.5	2.63	3611.9	.14
765.8	.10	2636.4	.72	3656.2	.05
788.7	.14	2662.3	.16	3674.4	.09
828.6	.14	2677.1	.09	3722.5	.63
999.6	.18	2705.5	.35	3755.9	.05
1054.7	.25	2727.2	.11	3777.0	.34
1326.0	.42	2747.2	4.50	3816.1	.29
1418.3	1.24	2784.0	.87	3884.1	.24
1437.0	5.50	2797.5	.15	3921.9	.21
1487.1	5.26	2809.7	.38	3946.3	.05
1578.7	2.20	2838.8	.17	3964.9	.25
1659.2	.80	2849.7	.10	3981.1	.06
1674.0	.54	2865.1	.08	4000.2	.06
1691.3	1.99	2894.4	.10	4014.7	.06
1720.5	3.01	2927.2	.77	4044.1	.14
1743.2	.56	2942.2	.34	4080.7	.38
1768.0	.68	2974.0	.35	4119.9	.12
1784.6	.68	2988.0	.18	4135.9	.21
1798.8	.39	3025.7	.33	4153.6	.22
1816.0	.38	3050.9	.39	4191.6	.08
1833.7	.66	3064.1	.08	4206.7	.05
1850.9	.68	3079.4	.09	4229.7	.17
1890.7	.38	3091.8	.55	4254.7	.17
1918.9	4.02	3109.5	.22	4270.6	.15
1956.5	.31	3124.1	.07	4285.6	.06

TELLURIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4323.2	.19	4882.9	.21	5767.5	.07
4346.1	.21	4901.8	.05	5799.4	.19
4374.2	.04	4922.6	.15	5840.3	.16
4389.0	.10	4968.5	.06	5880.6	.71
4410.2	.08	4982.7	.53	5895.2	.11
4433.6	.30	5045.8	.46	5933.9	.04
4444.4	.16	5101.2	.13	5938.5	.05
4459.9	.07	5122.9	.06	5972.4	.40
4475.8	.07	5150.3	.05	6027.2	.61
4492.0	.16	5180.0	.22	6077.1	.06
4510.3	.17	5194.9	.22	6186.5	.29
4532.3	.23	5207.1	.11	6211.1	.92
4568.3	.09	5227.9	.30	6323.0	3.06
4587.9	.05	5250.7	.37	6377.2	.24
4611.9	.44	5278.5	.40	6431.8	.07
4659.0	.11	5323.4	.05	6480.3	.09
4673.5	.07	5349.6	.09	6533.7	.31
4685.1	.31	5373.6	.26	6570.8	.06
4702.3	.04	5458.3	.53	6614.5	.23
4716.3	.09	5498.6	.05	6895.0	.08
4738.8	.05	5536.7	.19	7100.4	.33
4755.6	.07	5560.9	.07	7271.4	.06
4771.8	.04	5619.1	.10	7331.6	.71
4781.6	.11	5649.9	.10	7790.9	.09
4820.7	.20	5668.1	.97	8097.2	.50
4855.0	.12	5713.1	.53	8817.4	.35

IODINE

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
223.6	.22	840.5	.16	2809.9	.16
268.6	.45	856.0	.25	2826.6	.12
280.2	.28	888.8	.24	2857.9	.07
284.6	.07	899.2	.53	2866.9	.07
286.8	.11	908.6	.14	2881.3	.09
291.4	9.95	933.1	.16	2894.6	.12
302.4	2.53	970.1	.15	2915.3	.06
315.1	.18	981.7	.12	2938.0	.20
325.9	.40	1008.9	.16	2997.2	.05
333.6	.22	1069.6	.17	3012.7	.08
336.7	8.47	1073.6	.15	3037.3	.07
345.3	.71	1139.9	.17	3052.6	.11
375.3	.32	1149.3	.23	3103.3	.21
386.2	.25	1227.1	.26	3122.2	.10
392.9	.28	1360.3	.29	3144.6	.10
421.0	3.36	1432.2	.36	3186.5	.24
443.2	8.79	1567.3	.72	3210.0	.09
460.5	.40	1731.2	.29	3290.1	.06
463.8	.24	1754.4	.30	3311.9	.14
482.0	.12	1781.1	.31	3361.8	.04
492.9	.32	1811.1	.32	3373.9	.09
526.8	1.15	1825.1	.31	3397.8	.14
534.6	.25	1887.9	.81	3418.7	.07
543.4	.13	1936.3	.21	3432.2	.11
548.2	.14	1946.7	.19	3485.7	.05
557.3	.25	1984.8	.53	3497.5	.09
559.1	.11	2014.7	.37	3511.3	.06
570.3	.07	2030.9	.25	3534.1	.17
581.2	.20	2046.0	.16	3589.8	.07
590.6	.93	2098.4	.21	3639.1	.12
604.1	.34	2131.1	.21	3656.6	.12
609.6	.62	2144.7	.20	3699.4	.05
614.2	1.89	2196.1	.14	3713.6	.07
620.7	.36	2312.8	.60	3728.5	.04
626.2	.14	2339.1	.14	3746.5	.05
636.4	1.42	2379.2	.15	3761.8	.08
645.1	.46	2415.4	.13	3774.9	.04
648.6	.66	2451.4	.25	3785.6	.04
658.7	.64	2469.3	.15	3810.1	.29
693.7	.81	2504.7	.18	3847.0	.05
696.9	.49	2509.9	.13	3859.0	.09
701.7	.97	2533.9	.14	3941.9	.04
723.9	.17	2619.9	.19	3979.4	.15
736.0	.16	2720.6	.18	4005.6	.06
746.4	.82	2735.5	.09	4017.7	.05
768.4	.14	2744.6	.08	4031.4	.05

IODINE CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4073.3	.21	4757.8	.17	5559.6	.98
4103.3	.37	4771.0	.05	5576.0	.54
4153.8	.13	4783.4	.08	5600.2	.05
4184.6	.05	4804.7	.24	5612.8	.03
4195.9	.06	4851.9	.07	5657.6	.03
4208.1	.03	4877.7	.22	5691.1	.03
4244.5	.05	4893.7	.14	5725.7	.51
4257.6	.12	4913.4	.04	5741.5	.16
4289.6	.06	4950.2	1.41	5777.9	.03
4306.7	.06	5000.4	.28	5794.6	.22
4343.0	.14	5017.7	.37	5819.0	.08
4359.9	.16	5044.5	.15	5891.7	.22
4375.9	.06	5093.7	1.07	5943.4	.05
4393.6	.19	5111.5	.05	5961.1	.06
4408.8	.08	5136.8	.10	5984.4	.20
4426.4	.13	5156.7	.08	6002.4	.09
4465.6	.10	5197.8	1.81	6084.7	.04
4505.4	.10	5226.0	.05	6148.3	.05
4516.9	.03	5247.3	.07	6214.7	.14
4526.6	.03	5297.9	.70	6271.4	.28
4544.5	.24	5339.5	.25	6307.4	.95
4571.0	.05	5357.3	.04	6390.7	.41
4587.3	.12	5360.5	.04	6449.6	.22
4602.4	.19	5384.5	.19	6481.6	.06
4620.6	.30	5418.4	.04	6528.9	.04
4639.2	.06	5463.4	.56	6645.6	.23
4665.3	.20	5482.6	.42	6667.8	.03
4710.9	.21	5496.7	.03	6693.0	.89
4744.7	.05	5523.3	.24	6739.0	.27

CESIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
207.4	1.21	2018.7	.65	4667.5	.12
221.0	.91	2059.2	.65	4686.8	.16
234.8	3.34	2074.2	1.05	4720.8	.56
247.1	1.72	2093.5	.47	4753.9	.36
261.7	.53	2124.2	.34	4770.7	.12
267.8	.74	2169.3	.35	4828.0	.12
295.5	.25	2356.8	.35	4896.6	.14
308.0	4.72	2402.3	.34	4923.6	.57
336.7	.33	2452.1	.70	4967.3	.36
347.6	.23	2696.8	.26	5020.3	1.47
357.4	.83	2788.8	.20	5083.4	.12
378.0	.58	2964.9	.17	5204.6	.31
435.0	1.60	3124.1	.24	5224.0	.51
441.2	1.64	3160.3	.15	5252.6	.93
449.9	1.23	3459.1	.13	5271.9	.26
479.4	1.36	3526.2	.13	5313.8	.22
528.4	.41	3580.8	.17	5377.2	.89
538.7	.63	3597.4	.31	5436.1	.21
560.0	.78	3654.6	.16	5492.9	.37
635.0	.49	3696.4	.17	5505.4	.72
648.3	1.08	3734.8	.12	5570.6	1.15
721.7	.64	3752.1	.20	5611.4	.10
756.7	.43	3776.5	.20	5623.4	.19
798.6	.36	3852.7	.13	5637.4	.64
869.2	.40	3871.2	.14	5729.2	.31
935.0	.43	3934.4	.12	5748.4	.26
967.0	.44	3975.7	.12	5790.2	.28
1208.1	.46	4038.9	.11	5802.5	.15
1300.9	6.01	4069.3	.23	5898.6	.30
1376.7	3.15	4103.8	.35	5916.3	.17
1567.7	1.49	4135.9	.22	5949.8	.24
1628.6	.65	4220.3	.13	5976.8	.18
1678.3	.63	4236.8	.10	6051.9	.82
1730.6	.53	4299.6	.24	6138.6	.09
1753.3	.57	4343.9	.21	6175.1	.58
1785.6	.48	4379.3	.12	6189.3	.31
1807.7	.74	4498.7	.12	6245.1	.12
1890.7	.43	4522.8	.14	6319.9	.10
1912.9	.49	4541.1	.30	6388.4	.16
1924.5	.55	4563.1	.28	6439.7	.36
1959.3	.96	4590.2	.19	6513.7	.09
1974.1	.63	4621.4	.14	6696.8	.60
1996.1	.54	4656.9	.13	6715.3	.21

BARIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
242.5	.23	2126.2	1.47	3339.1	.62
283.3	.86	2156.7	.30	3365.2	.12
311.3	.19	2186.0	2.35	3397.3	.11
328.4	.41	2263.0	.21	3435.9	1.30
334.3	.17	2272.0	.36	3478.5	.11
339.9	.38	2289.1	.29	3503.8	.75
345.5	.82	2297.7	.30	3525.6	.15
357.0	.50	2312.3	.54	3587.7	.12
364.7	.18	2330.3	.62	3618.5	.10
408.9	.56	2340.2	.36	3641.7	5.79
423.7	.27	2375.7	.53	3716.2	.72
454.3	2.30	2396.6	.36	3739.3	.13
463.2	.75	2399.9	.46	3761.9	.48
490.8	.28	2425.6	.39	3800.4	.22
557.5	1.11	2488.1	.24	3816.6	.09
608.3	.63	2492.4	.17	3890.7	.17
627.5	14.03	2537.0	1.50	3922.7	.17
708.0	.67	2564.6	.36	3945.1	.16
732.7	1.24	2594.3	2.06	3964.3	.48
818.7	9.65	2615.3	.23	4001.6	.21
868.2	1.10	2639.4	2.17	4035.9	.06
973.3	.58	2662.7	.64	4096.3	16.60
1047.2	1.29	2680.6	.13	4112.7	.34
1145.1	.51	2719.0	.15	4168.7	.76
1235.2	.62	2732.7	.34	4201.5	.52
1245.9	5.14	2776.4	.16	4243.5	1.31
1435.5	9.80	2805.5	.50	4289.1	.12
1469.9	1.23	2829.0	.48	4322.4	.12
1516.3	1.23	2896.7	.36	4332.9	.23
1573.9	2.00	2928.7	.22	4349.3	.17
1632.1	1.89	2962.7	.17	4369.6	.64
1654.4	.78	2976.4	1.27	4446.9	.27
1669.0	.82	3000.5	.19	4495.7	.08
1693.0	.83	3045.1	.11	4510.7	.15
1708.4	.96	3092.5	.17	4535.8	.37
1718.8	.68	3113.2	.22	4549.5	.09
1776.7	.45	3124.7	.13	4599.3	.29
1820.7	1.48	3144.6	.52	4626.3	.06
1853.7	1.29	3179.5	.34	4641.6	.07
1898.4	1.39	3195.7	.28	4689.7	1.10
1912.7	.38	3209.1	.13	4723.8	2.17
1922.2	.39	3225.6	.21	4755.8	.13
1951.7	.42	3242.8	.24	4772.8	.41
1963.6	.57	3249.9	.16	4852.8	.09
2023.8	1.27	3305.2	.15	4880.3	.40
2113.3	.39	3319.9	.15	4898.2	.15

BARIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4923.9	.20	5383.9	.08	6303.9	.10
4968.0	.75 *	5416.8	.58	6442.9	.16
5010.0	.11	5449.0	.61	6468.4	.10
5043.2	.22	5518.3	.09	6623.2	.40
5090.6	.23	5560.0	.27	6915.0	.17
5107.8	.39	5597.2	.18	7025.4	.15
5177.3	.17	5730.7	5.88	7174.5	.21
5271.8	.84	5814.3	.09	7790.1	.10
5312.6	.76	5972.3	.32	8290.4	.22
5341.6	.10	6027.9	.87	9108.8	.40
5355.0	.08	6062.1	.30		

*Possible 4944.8 line overlaps C background

LANTHANUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
219.6	11.77	1848.1	.42	3054.1	.20
238.5	9.04	1867.5	.76	3082.6	1.30
273.2	7.46	1891.1	.29	3113.1	.59
289.1	9.99	1914.0	.25	3142.9	.43
328.2 D	.93	1974.6	1.08	3162.2	.23
335.8	.16	2045.0	.42	3176.2	.07
389.4	.18	2057.4	.18	3189.4	.68
395.8	.39	2086.7	.34	3218.3	.32
407.2	.19	2126.0	.20	3265.3	.48
423.2	6.92	2149.4	.14	3281.7	.40
446.9	.23	2174.1	.13	3319.1	.29
485.9 D	.81	2195.1	.15	3342.8	.08
496.2	.31	2277.2	.13	3358.3	.17
550.6	2.46	2290.2	.17	3372.5	.08
567.5	4.80	2304.9	.15	3384.4	.15
625.1	1.02	2317.0	.15	3425.0	.62
657.2	1.23	2346.7	.21	3440.5	.38
668.1	.38	2399.3	.43	3460.3	.15
694.2	.33	2423.8	.23	3477.9	.54
708.9	2.73	2439.1	.53	3508.6	.06
722.2	3.14	2457.0	.13	3564.0	.14
735.9	.45	2482.8	.10	3581.8	.13
749.4	.55	2519.9 D	.86	3608.6	1.43
796.7	.64	2547.3	.11	3665.5	.80
803.2	.59	2563.4	.32	3680.0	.77
815.2 D	.40	2583.9	.10	3727.6	.26
867.5	1.65	2608.7	.20	3740.2	.17
880.9	.56	2620.5	.13	3820.0	.22
977.6	.74	2639.6	.53	3847.0	.08
990.4	.78	2668.5	.09	3901.1	.57
1021.4	2.03	2686.4	.12	3951.8	.15
1051.4	.86	2700.0	.10	3974.1	.13
1100.2	2.23	2713.9	.11	4044.8	.22
1252.0	.63	2736.6	.36	4061.6	.25
1259.9	.62	2765.3	1.13	4106.3	.26
1276.6	2.12	2805.1	.38	4125.1	.14
1308.3	1.22	2838.3	.16	4216.6	.04
1328.6	1.25	2863.2	.61	4239.2	.10
1552.0	.80	2885.5	.09	4259.3	.05
1596.2 D	15.20	2897.9	.11	4368.7	.03
1630.7	.69	2925.3	.23	4389.4	2.52
1676.5	.72	2961.4	.11	4416.3	2.45
1735.1	.92	2969.9	.08	4450.0	.07
1778.4	.67	2988.4	.33	4468.1	.03
1806.8	.28	3016.5	.54	4502.8	1.71
1822.4	.62	3036.4	.92	4559.2	.52

LANTHANUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4618.5	.06	4762.1	.04	4996.9	.06
4635.3	.05	4797.0	.03	5046.8	.04
4648.9	.04	4815.9	.04	5097.6	7.11
4677.8	.03	4842.7	7.16	5126.4	1.25
4709.5	.03	4888.6	1.49	5160.8	.94
4747.2	.06	4903.7	.04		

CERIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
374.4	1.30	2244.5	.69	3606.7	.28
383.5	.76	2272.3	1.17	3619.8	1.34
408.6	.73	2358.8	.84	3696.7	.30
662.3	28.81	2369.3	.93	3802.6	.30
752.0	1.19	2385.1	.67	3818.5	.24
787.3	1.13	2496.3	.64	3929.6	.36
798.5	1.20	2563.8	1.22	3970.1	.32
807.2	.94	2784.2	.89	4044.7	.42
1218.0	2.10	2921.2	.41	4140.1	.33
1436.8	4.15	2965.1	.46	4187.9	.25
1454.3	3.32	3018.4	1.40	4256.6	.51
1596.4	2.38	3090.6	1.09	4291.2	9.12
1639.5	2.60	3135.5	.65	4310.4	.38
1709.1	3.31	3168.4	.33	4336.8	4.26
1726.6	3.15	3199.9	.35	4370.5	.28
1810.1	4.55	3315.7	.62	4501.5	.31
1828.1	1.26	3336.9	.28	4766.1	15.92
1893.3	1.19	3371.1	.61	4789.0	.21
1907.1	1.04	3435.0	.61	5003.6	.21
1983.5	1.82	3452.4	.45	5057.4	.27
2041.5	.94	3492.5	.38	5112.0	.33
2071.7	.82	3505.4	.33	5321.2	.19
2082.3	.85	3538.9	.29	5439.0	.42
2189.3	.86	3592.1	.33		

PRASEODYMIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
178.4	8.23	1273.5	.33	3259.2	.05
230.2	.08	1318.3	.49	3268.5	.10
244.5	.07	1328.2	.21	3285.2	.06
281.6	.05	1463.3	.30	3313.9	.50
294.8	.10	1577.7 D	.99	3352.1	.09
327.5	.11	1683.8	.67	3366.1	.27
336.0	.19	1702.8	.27	3386.1	.10
338.6	.13	1796.6	.68	3402.6	.18
350.5	.09	1889.8	.41	3427.1	.10
361.3	.20	1943.3	.20	3451.0	.08
377.8	.07	2244.6	.17	3466.7	.15
384.4	.12	2257.6	.09	3502.7	.05
403.9	.14	2285.0	.15	3534.1	.33
417.8	.08	2288.5	.13	3550.5	.19
430.5	.10	2350.8	.17	3601.6	.41
439.9	.13	2355.2	.14	3630.3	.18
461.3	.56	2407.5	.61	3652.0	1.15
528.6	.32	2436.1	.38	3712.9	.47
546.5	.84	2449.4	.17	3742.9	.17
559.7	1.16	2468.3	.11	3773.5	.09
573.1	1.02	2479.1	.12	3791.0	1.09
612.0	.20	2530.8	.10	3811.7	.08
619.6	.44	2562.3	.51	3826.6	.08
632.0	.91	2582.0	.08	3859.9	.13
645.8	1.56	2597.7	.40	3892.5	.23
661.7	.12	2619.4	.15	3910.5	.18
686.2	.38	2661.3	.10	3923.8	.12
699.8	1.46	2688.5	.14	3946.9	.17
716.9	.17	2713.7	.11	3985.6	.04
747.3	.81	2727.1	.17	4005.5	.14
790.9	.26	2743.5	.07	4013.4	.25
803.0	.60	2839.8	.63	4036.9	.04
848.6	.15	2905.5	.09	4072.9	.05
865.6	.22	2946.3	.38	4091.7	.12
920.0	.15	2963.4	.05	4134.8	.27
942.1	.17	2977.0	.10	4163.6	.09
956.4	.65	2998.6	.37	4220.5	.07
991.4	.68	3029.7	.07	4251.8	.25
1006.6	.99	3053.0	.08	4277.3	.31
1024.2	.39	3064.9	.08	4306.9	.03
1067.3	.24	3134.8	.12	4326.6	.03
1149.5	.21	3149.6	.14	4348.6	.16
1177.9	.40	3167.4	.14	4373.2	.28
1218.1	.27	3192.3	.21	4440.4	.06
1231.2	.41	3221.4	.12	4465.7	.04
1248.5	.22	3227.8	.18	4496.8	.71

PRASEODYMIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4577.3	.04	4865.3	.14	5205.3	.29
4592.4	.12	4920.1	.03	5298.5	.04
4625.1	.04	5005.0	.04	5480.2	.06
4661.4	.06	5021.0	.15	5665.7	2.79
4692.2	2.30	5052.4	.21	5770.2	.28
4723.1	.90	5095.9	1.52	5825.2	.21
4801.4	1.19	5140.2	2.77	5842.9	.97
4832.9	.04				

NEODYMIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
201.5	.36	1672.4	2.41	3099.5	.14
240.1	.14	1868.0	.34	3129.3	.09
248.1	.22	1895.2	.35	3147.3	.23
256.3	9.20	1911.0	.56	3182.4	.10
294.2	.18	1937.5	.18	3199.5	.18
302.6	.08	1951.4	.25	3230.9	.10
309.2	.49	1967.2	.21	3288.0	.05
320.4	.20	2027.9	.20	3299.1	.05
331.3	.07	2055.5	.18	3315.9	.07
338.5	.10	2071.5	.86	3332.8	.17
342.7	.09	2135.3	.27	3365.5	.21
353.8	.10	2171.6	.20	3409.9	.26
376.1	.14	2185.4	.54	3442.6	.24
384.5	.31	2205.8	.16	3459.5	.05
398.5	.15	2250.2	.14	3480.3	.07
428.0	1.37	2270.4	.15	3554.0	.05
436.4	.42	2288.4	.10	3570.3	.21
442.8	.30	2306.1	.30	3592.6	.10
454.5	5.47	2321.1	.69	3640.6	.05
465.2	.15	2346.6	.46	3718.7	.06
477.0	3.02	2371.5	1.17	3735.4	.09
494.8	.14	2409.8	.44	3778.0	.08
539.9	.40	2430.2	.49	3789.9	.07
564.7	1.15	2447.6	.16	3804.9	.36
589.6	1.23	2466.9	.13	3845.4	.04
618.5	23.65	2497.5	.11	3864.7	.05
676.1	.45	2507.4	.11	3892.1	.45
679.3	.41	2526.4	.35	3912.0	.04
683.6	1.08	2540.4	.10	3943.3	.10
696.7	62.14	2560.0	.22	3959.8	.05
742.0	5.90	2571.4	.10	3979.6	.09
779.4	1.53	2584.4	.16	4003.3	.62
794.9	.23	2593.3	.25	4037.3	.07
814.5	8.87	2621.4	.17	4061.6	.07
864.6	8.82	2636.8	.15	4077.5	.16
980.7	1.80	2656.1	.41	4113.7	.17
1017.3	.85	2684.1	.17	4129.6	.12
1030.6	.31	2711.2	.16	4151.8	.07
1138.1	1.31	2737.2	.12	4181.3	.06
1287.5	.89	2826.0	.10	4217.1	.06
1340.5	.77	2839.0	.15	4255.9	.21
1376.4	1.55	2903.7	.26	4270.1	.05
1413.5	3.11	2939.5	.38	4322.1	.18
1482.0	1.79	2955.8	.18	4354.3	.77
1514.6	.69	2989.8	.20	4371.7	.04
1558.7	.72	3020.6	.13	4406.9	.30

NEODYMIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4420.6	.08	4774.4	.18	5448.2	1.20
4437.0	.25	4790.9	.78	5521.2	1.04
4461.0	.04	4817.3	.19	5638.7	.30
4501.7	.17	4836.5	.52	5707.0	.30
4514.3	.04	4866.7	.04	5726.2	.07
4534.6	.30	4915.2	.27	5742.3	.12
4563.1	.44	4949.0	.85	6093.8	.22
4594.8	.17	5042.3	.03	6255.9	2.51
4615.2	.30	5164.1	.04	6303.7	.04
4652.4	.04	5212.0	.12	6324.0	.05
4669.3	.49	5226.7	.04	6473.2	.07
4690.3	.41	5249.0	.06	6502.1	5.53
4715.7	.04	5356.2	.04	6519.9	.06
4747.5	.40	5380.9	.82	7110.8	.31

SAMARIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
246.8	.04	1194.4	2.61	2657.1	.15
252.0	.10	1246.9	.55	2681.8	.06
258.9	.08	1261.5	1.15	2692.4	.08
270.4	.60	1298.7	.29	2705.6	.04
274.9	.73	1309.2	.36	2716.9	.07
298.8	.40	1324.6	1.22	2737.7	.04
305.1	.13	1348.9	2.22	2748.3	.10
315.1	.88	1376.1	.39	2770.0	.05
333.9	83.26	1419.6	.24	2789.7	.12
361.5	.12	1449.8	.32	2821.2	.04
384.1	.11	1485.3	.44	2852.3	.10
404.9	1.46	1514.4	.30	2874.9	.07
418.8	.11	1635.7	.62	2883.7	.05
422.8	.07	1734.9	.35	2901.3	.05
439.4	45.79	1847.1	.45	2906.2	.04
451.4	.25	1553.3	.45	2965.8	.07
463.9	.11	1576.6	.35	2978.5	.05
473.8	.11	1688.7	.19	3000.9	.05
485.9	1.06	1718.3	.22	3017.0	.05
506.3 *	13.80	1791.1	.41	3038.0	.04
525.6	.19	1841.1	.18	3062.9	.05
540.6	.46	1877.8	.20	3085.1	.04
557.5	.13	1889.7	.29	3097.7	.10
571.1	.32	1954.7	.60	3120.7	.05
584.4	7.67	2030.5	.17	3132.1	.08
614.9	.41	2052.3	.09	3177.2	.05
629.2	.30	2093.4	.12	3190.1	.04
636.5	.22	2109.1	.12	3208.6	.04
640.5	5.43	2119.8	.40	3227.3	.09
675.6	2.07	2161.0	.28	3255.0	.06
694.8	.28	2275.5	.08	3267.9	.05
712.1	3.93	2313.4	.16	3309.2	.07
737.5	9.27	2332.0	.17	3324.5	.09
748.9	1.60	2347.4	.10	3378.0	.07
760.6	.27	2379.6	.05	3388.5	.03
783.4	.18	2392.5	.06	3404.2	.05
832.1	1.45	2403.3	.11	3416.1	.03
860.0	.53	2416.5	.16	3438.6	.03
869.9	1.07	2426.1	.14	3452.8	.04
900.0	.24	2475.7	.06	3530.6	.03
922.5	.33	2526.5	.08	3536.1	.02
935.4	.25	2558.7	.10	3562.5	.07
969.8	.29	2575.3	.07	3608.0	.03
1047.5	2.63	2584.6	.06	3622.0	.04
1123.0	.35	2594.3	.06	3632.9	.03
1169.7	4.42	2618.4	.12	3687.2	.09

* Contains 511

SAMARIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3691.0	.08	4399.9	.15	5283.1	.11
3758.8	.03	4425.3	.06	5319.8	.04
3775.3	.09	4458.8	.06	5338.3	.02
3788.2	.05	4484.3	.17	5399.6	.03
3834.?	.02	4503.9	.06	5413.7	.07
3869.8	.05	4538.9	.09	5491.4	.12
3920.0	.04	4556.7	.02	5532.8	.48
3941.4	.02	4570.8	.03	5616.0	.12
3963.3	.04	4603.1	.07	5725.3	.06
3989.7	.06	4633.5	.03	5741.2	.02
4017.4	.04	4653.5	.06	5762.0	.03
4026.1	.04	4674.5	.08	5793.3	.03
4054.9	.08	4775.1	.02	5833.3	.05
4070.2	.03	4809.1	.39	5892.6	.06
4112.0	.04	4851.0	.02	5924.5	.09
4136.3	.04	4869.5	.11	5944.8	.03
4168.9	.12	4888.8	.02	5962.8	.14
4191.6	.03	4969.0	.02	6018.8	.07
4213.3	.03	4996.2	.03	6129.6	.15
4234.5	.10	5020.3	.03	6140.5	.02
4255.1	.05	5046.2	.03	6250.3	.02
4265.7	.02	5051.6	.02	6344.7	.04
4288.0	.02	5077.8	.05	6481.3	.05
4306.7	.02	5095.0	.05	6537.9	.20
4336.5	.05	5173.1	.02	6914.0	.05
4361.0	.07	5239.2	.03	7213.0	.75

EUROPIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
208.0	5.39	1793.2	.25	4361.3	.05
222.3	.70	1890.2	.35	4419.7	.03
246.0 D	.54	1923.2	.24	4468.6	.04
283.8	.16	1941.6	.28	4506.6	.05
300.7	.07	2048.0	.21	4548.1	.04
323.9	.24	2075.9	.14	4585.2	.04
328.9	160.96	2093.5	.21	4631.1	.03
369.4	.62	2108.6	.16	4649.1	.03
374.6	.72	2147.7	.13	4665.3	.04
379.4	61.79	2412.0	.13	4896.4	.05
391.5	.10	2697.5	.26	5141.6	.03
404.4	.10	2716.3	.08	5219.1	.03
408.7	.07	2744.2	.10	5277.0	.05
424.5	.08	2770.2	.10	5379.7	.13
450.1	.07	2859.7	.18	5427.1	.04
459.0	.12	2905.1	.07	5500.9	.08
463.8	.07	2930.8	.09	5530.5	.03
472.9	.11	2953.3	.09	5596.2	.03
841.4 D	1.61	3075.0	.07	5620.7	.05
858.9	.12	3099.3	.08	5744.5	.03
868.0	.13	3276.1	.06	5767.6	.05
963.8 D	1.28	3296.0	.06	5795.5	.03
1004.6	.15	3346.7	.08	5817.3	.07
1101.4	.22	3393.6	.06	5894.9	.03
1132.0	.20	3414.7	.07	5918.3	.14
1314.9	.19	3511.2	.05	5954.8	.03
1328.3 D	.26	3553.5	.07	6020.9	.04
1394.0 D	.22	3580.2	.04	6068.9	.08
1484.5	.24	3643.1	.05	6086.4	.04
1590.8	.24	3768.8	.06	6107.8	.03
1631.1	.19	3982.6	.06	6228.5	.11
1658.6	.29	4130.1	.04	6307.9	.03
1713.9	.24	4284.4	.06	6415.8	.03
1727.9	.20				

GADOLINIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
209.4	.15	961.8	3.08	2600.1	.26
219.3	.14	976.8	1.35	2678.7	.31
231.8	.05	986.3	.18	2702.2	.22
237.1	.44	1000.1	2.12	2746.2	.07
242.6	.49	1021.8	.19	2801.3	.26
247.3	22.18	1038.7	.36	2836.3	.10
255.0	.65	1051.4	.46	2852.8	.07
277.9	.93	1065.5	.38	2869.9	.07
288.9	.15	1096.1	1.11	2903.8	.14
296.9	.57	1107.0	1.47	2984.3	.08
306.0	.06	1118.2	1.30	3002.4	.17
311.7	.10	1140.7	.76	3063.0	.12
324.7	.11	1158.1	.25	3155.3	.15
335.2	.26	1185.4	5.93	3224.8	.05
339.5	.20	1262.5	1.16	3236.9	.06
346.2	.13	1293.8	.32	3308.1	.07
352.0	.09	1324.2	1.55	3347.7	.05
357.6	.09	1350.9	.36	3365.7	.05
364.2	.16	1372.9	.29	3387.1	.07
369.2	.14	1394.8	.30	3404.0	.05
380.3	.09	1554.8	.59	3413.8	.06
391.6	.10	1658.3	.27	3523.1	.04
397.2	.10	1781.8	.25	3565.7	.04
425.3	.17	1799.3	.38	3583.8	.09
447.4	.13	1836.1	.22	3656.3	.08
470.5	.35	1943.6	.18	3684.4	.06
492.4	.14	1991.4	.23	3723.3	.05
527.0	.15	2016.0	.21	3744.9	.05
542.8	.16	2029.9	.15	3826.9	.06
558.6	.18	2089.0	.15	3866.8	.04
596.4	.66	2107.0	.25	3948.3	.04
608.1	.18	2138.3	.12	3990.5	.13
647.3	.26	2155.2	.14	4075.1	.04
691.6	.18	2181.0	.14	4088.8	.04
708.6	.22	2260.?	.15	4223.9	.04
713.5	.19	2303.8	.12	4309.8	.09
735.8	.19	2314.4	.26	4344.7	.15
742.6	.21	2339.1	.10	4359.7	.04
762.6	.16	2362.6	.09	4440.7	.04
768.9	.21	2395.8	.15	4488.8	.17
780.3	1.69	2420.7	.09	4566.4	.03
852.9	.21	2434.0	.09	4618.0	.05
867.3	.34	2469.6	.18	4648.9	.05
897.5	2.82	2501.8	.10	4668.9	.07
916.4	1.04	2518.3	.14	4702.7	.05
943.7	4.24	2576.8	.11	4739.1	.16

GADOLINIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4810.2	.06	5250.7	.05	5676.6	.09
4874.8	.09	5306.3	.09	5784.2	.13
4925.0	.19	5348.0	.03	5902.9	.47
5026.6	.05	5402.8	.20	6145.1	.06
5058.3	.13	5541.8	.10	6419.3	.22
5092.7	.05	5582.6	.24	6670.1	.08
5139.6	.03	5608.8	.07	6749.8	1.32
5155.8	.08	5660.0	.15	6913.2	.07
5179.2	.19				

TERBIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
249.8	.14	1186.0 D	.22	4217.5	.09
277.6	.07	1290.6	.08	4256.4	.08
289.2	.02	1442.6	1.06	4504.0	.06
300.2 D	.03	1656.1	.38	4529.3	.05
311.8	.02	1689.0	.38	4567.6	.04
318.1	.10	1745.8	.47	4580.2	.08
340.2	.26	1778.0	.32	4616.6	.05
351.1	.05	1810.0	.33	4657.1	.05
357.2	.11	1906.5	.27	4682.9	.10
378.9	.06	2051.3	.21	4756.9	.07
405.8	.04	2075.1	.19	4793.3	.07
413.2	.05	2120.2	.20	4811.8	.07
417.1	.04	2170.5	.16	4989.7	.11
428.0	.05	2387.0	.14	5011.9	.11
451.2	.14	2405.5	.17	5030.2	.12
480.7	.10	2455.0	.22	5049.3	.07
482.1	.11	2514.2	.15	5067.1	.14
526.8	.06	2535.8	.12	5099.6	.27
544.2	.04	2731.5	.13	5134.6	.12
559.0	.09	2744.8	.19	5203.0	.08
593.0	.26	2843.4	.11	5226.3	.11
596.6	.34	2878.1	.08	5248.6	.19
609.4	.13	2895.9	.09	5286.5	.08
628.3	.05	2911.6	.11	5321.5	.04
666.9	.06	3011.0	.17	5462.4	.06
708.5	.15	3037.2	.12	5518.0	.08
817.5	.07	3076.1	.07	5522.5	.09
834.7	.05	3169.9	.08	5608.1	.15
850.7	.14	3195.3	.09	5711.8	.05
878.0 D	.06	3248.1	.09	5754.2	.06
898.4 D	.11	3369.7	.07	5777.2	.39
903.6	.06	3374.0	.09	5841.7	.16
945.5	.15	3651.3	.09	5860.0	.06
962.6 D	.19	3665.1	.06	5891.5	.53
976.1 D	.08	3759.7	.11	5953.7	.22
989.7	.05	3788.8	.05	5994.7	.26
997.3	.08	3856.3	.08	6138.8	.27
1041.5 D	.07	3912.0	.08	6218.2	.40
1062.2	.07	4014.2	.08	6242.7	.11
1106.6	.07	4104.2	.07	6271.7	.15
1117.3	.14	4145.3	.07	6316.9	.18
1159.3	.11	4169.5	.04	6420.5	.09

DYSPROSIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
185.7	19.48	1059.9	.85	2901.1	.11
200.3	.42	1071.5	.60	2931.3	.09
208.1	.09	1093.8	.44	2948.5	1.29
215.8	.15	1109.8	.33	2968.6	.30
251.9	.55	1127.4	.64	3013.6	.76
259.5	.12	1221.4	.78	3035.7	.63
282.3	.36	1257.7	.47	3051.6	.10
296.3	.13	1274.7	.69	3071.3	.37
310.6	.12	1291.6	.39	3114.8	.27
316.6	.19	1722.1	.53	3148.7	.14
333.4	.16	1735.4	.88	3159.0	.07
350.7	2.80	1760.2	.95	3170.5	.10
360.4 D	.58	1806.1	.40	3176.5	.05
367.2	.16	1976.5	.55	3198.6	.12
386.8	3.94	2019.8	.40	3215.5	.07
413.2	6.88	2067.4	.87	3239.5	.36
430.3	.61	2088.6	.26	3275.8	1.16
447.3	1.91	2114.0	.73	3316.5	.25
465.8	2.58	2140.8	.22	3349.5	.25
477.1	.89	2190.2	.30	3376.9	.06
497.6	4.36	2268.5	.40	3406.7	.07
538.4	7.08	2314.0	.57	3419.0	.36
556.7	.24	2368.3	.25	3444.7	1.26
569.0	.98	2387.3	.51	3469.1	.05
584.1	1.44	2410.7	.18	3477.9	.21
596.6	.57	2427.6	.15	3492.1	.12
611.8	.26	2444.6	.34	3527.7	.07
622.4	.27	2451.3	.15	3536.0	.09
634.0 D	.19	2506.8	.25	3556.6	.24
648.8	.99	2521.9	.26	3574.4	.07
659.9	.18	2536.1	.17	3608.4	.32
671.7	.17	2554.7	.75	3627.7	.26
688.9	.28	2592.6	.44	3648.7	.08
697.1	.16	2609.2	.35	3709.2	.45
754.6	.64	2660.2	.60	3732.0	.08
762.0	.32	2703.4	2.35	3748.3	.43
787.4	.18	2733.6	1.19	3772.8	.32
795.5	.52	2747.4	.09	3820.9	.22
807.6	.99	2755.3	.21	3841.4	.33
863.1	.37	2783.2	.47	3885.4	.48
883.3	2.53	2804.6	.13	3901.7	.05
912.1	2.81	2810.5	.23	3924.7	.04
930.6	.56	2827.9	.22	3945.2	.14
979.2	1.44	2842.7	.49	3961.0	.25
1017.1 D	.24	2865.7	.27	4068.2	.13
1024.0	.25	2870.7	.22	4083.4	.22

DYSPROSIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4124.2	1.06	4548.6	.07	5177.3	.54
4155.8	.13	4581.5	.03	5264.7	.04
4200.8	.04	4612.4	.61	5335.8	.04
4251.1	.04	4635.2	.09	5373.8	.05
4275.4	.07	4677.7	.05	5415.6	.04
4316.6	.18	4782.8	.04	5449.3	.15
4338.2	.18	4800.6	.04	5556.9	2.23
4407.3	.04	4981.4	.03	5607.3	2.78
4427.8	.06	5110.3	.49	5848.4	.04
4460.0	.15	5143.8	1.36	5879.9	.07
4498.2	.04				

HOLMIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
222.0	2.14	2568.8	.07	4075.2	.05
240.3	4.23	2589.9	.39	4086.7	.04
267.4	.12	2609.6	.11	4170.9	.07
290.4	2.79	2649.3	.14	4239.3	.05
305.7	1.12	2700.4	.08	4291.4	.10
334.3	1.00	2711.9	.10	4349.9	.09
344.9	.12	2726.7	.11	4387.0	.04
358.9	.11	2783.0	.06	4401.5	.05
372.2	1.67	2816.6	.08	4423.3	.05
392.4	.49	2830.6	.16	4466.4	.06
402.1	.55	2863.0	.15	4545.3	.04
411.4	.91	2882.1	.07	4575.9	.09
426.3	3.02	2919.2	.08	4608.2	.13
443.1	.16	2968.3	.05	4640.5	.05
456.3	.75	3041.3	.09	4674.7	.04
488.9	.84	3110.6	.04	4710.7	.11
523.4	.22	3126.9	.05	4734.2	.05
543.2	2.74	3152.3	.12	4780.5	.10
595.1	.14	3166.3	.06	4796.6	.08
613.5	.46	3257.6	.05	4811.7	.06
621.9	.16	3292.1	.08	4828.2	.15
634.7	.51	3310.1	.19	4854.9	.14
644.6	.23	3354.5	.08	4866.6	.04
657.6	.50	3382.1	.08	4903.9	.08
714.6	.50	3418.0	.05	4981.2	.05
802.5	.22	3437.2	.07	5000.9	.05
867.4	.26	3454.1	.04	5013.8	.04
894.4	.29	3484.8	.06	5053.3	.04
947.1	.36	3505.1	.10	5082.8	.29
982.0	.27	3528.0	.03	5106.9	.07
1008.8	.29	3575.5	.20	5128.9	.18
1042.3	.24	3638.5	.04	5157.6	.05
1725.4	.27	3683.5	.12	5181.9	.35
1757.5	.44	3724.7	.10	5212.7	.30
1776.5	.34	3742.2	.05	5239.0	.04
1823.8	.27	3780.7	.10	5281.5	.03
1841.7	.16	3806.5	.05	5299.5	.04
1880.3	.23	3838.2	.05	5338.5	.10
1913.8	.16	3863.5	.05	5413.6	.03
1935.8	.15	3896.9	.21	5428.5	.25
2014.4	.13	3937.3	.05	5475.0	.04
2039.0	.15	3956.1	.06	5524.0	.18
2053.7	.14	3999.9	.07	5549.5	.05
2088.8	.14	4018.3	.13	5580.8	.09
2118.3	.35	4031.2	.05	5605.4	.03
2491.3	.08	4049.0	.05	5651.1	.10

HOLMIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5684.6	.14	5763.1	.36	5919.9	.04
5701.0	.02	5813.4	.71	5982.9	.09
5720.1	.06	5871.2	.25	6052.1	.25

ERBIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
219.4	.90	1107.6	.26	2668.7	.53
260.8	.18	1127.2	.23	2686.2	.24
271.0	.20	1146.4	.28	2711.0	.13
273.5	.12	1229.5	.44	2755.5	.15
285.2	9.53	1277.2	2.33	2782.9	.07
296.4	.24	1309.7	.43	2825.0	.12
308.1	.78	1322.6	.29	2852.1	.09
330.7	.20	1351.2	1.11	2865.7	.06
338.7	.20	1392.9	.58	2879.1	.14
342.9	7.91	1415.0	.49	2893.3	.07
361.8	.18	1552.9	.54	2969.2	.11
365.2	.11	1629.1	.74	2998.7	.12
371.1	.11	1649.4	.80	3013.4	.12
381.0	.23	1731.0	.26	3036.1	.11
387.7	.22	1764.4	.80	3047.7	.13
398.7	.15	1820.6	.21	3067.8	.18
422.2	.78	1833.8	.93	3095.3	.34
447.8	1.55	1892.0	.34	3136.7	.34
456.4	.15	1909.9	.41	3170.5	.11
532.4	.15	1924.8	.22	3193.7	.05
544.5	1.03	1942.1	.21	3205.8	.08
559.7	1.10	1969.0	.20	3216.8	.06
582.5	.14	1983.9	.19	3236.7	.07
600.3	.13	2020.1	.17	3269.6	.05
612.6	.43	2043.9	.27	3295.6	.17
616.8	.48	2047.6	.34	3318.3	.05
620.7	.48	2104.4	.11	3336.5	.12
631.6	3.01	2124.9	.12	3362.0	.08
644.6	.25	2140.5	.27	3392.1	.15
715.7	.95	2159.7	.40	3427.1	.06
719.0	1.24	2173.8	.20	3448.7	.05
730.6	6.04	2247.6	.14	3464.3	.13
740.9	4.09	2269.1	.28	3485.9	.05
755.1	12.67	2341.6	.53	3511.3	.04
777.5	.16	2413.1	.16	3618.7	.30
798.6	1.05	2425.6	.12	3651.1	.06
816.1	26.25	2436.4	.10	3676.5	.33
829.6	2.60	2454.2	.17	3696.1	.13
853.5	3.35	2467.3	.10	3711.9	.04
862.2	.47	2476.8	.12	3727.7	.17
914.5	3.62	2523.4	.39	3743.2	.07
931.1	1.04	2535.4	.14	3760.4	.05
953.6	.25	2551.5	.14	3780.5	.10
965.0	.46	2575.9	.38	3788.6	.05
1024.4	.27	2612.7	.10	3870.2	.04
1093.6	.24	2629.7	.09	3882.7	.10

ERBIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3913.3	.05	4689.0	.10	5371.9	.06
3938.2	.05	4705.1	.04	5406.5	.17
3971.2	.17	4714.6	.06	5433.3	.13
3997.5	.05	4719.1	.03	5468.0	.06
4021.5	.09	4743.5	.07	5506.4	.09
4063.5	.09	4761.0	.04	5531.2	.04
4078.0	.07	4784.2	.05	5570.4	.09
4109.4	.33	4802.2	.11	5620.8	.08
4145.2	.13	4837.7	.03	5641.2	.08
4161.4	.13	4897.4	.10	5673.4	.18
4205.0	.05	4921.4	.41	5711.9	.11
4216.9	.07	4958.9	.05	5748.3	.09
4272.9	.19	4983.8	.13	5771.3	.23
4290.9	.06	5002.6	.07	5856.6	.04
4304.1	.03	5037.3	.33	5877.8	.26
4325.7	.03	5071.2	.08	6051.7	.12
4335.2	.03	5112.3	.28	6113.4	.05
4348.6	.07	5141.8	.04	6137.0	.26
4369.5	.04	5169.2	.26	6171.9	.08
4391.5	.13	5211.6	.48	6199.9	.16
4421.4	.06	5240.9	.09	6229.0	.74
4448.7	.07	5256.9	.10	6366.8	.12
4461.4	.07	5277.8	.07	6422.2	.06
4485.8	.11	5292.9	.33	6495.0	.04
4538.1	.05	5317.8	.06	6577.7	.19
4628.4	.07	5358.9	.20	6676.8	.43
4644.7	.32				

THULIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
205.2	5.35	1838.3	.08	2977.4	.06
220.4	2.42	1859.2	.12	2995.8	.09
237.5	7.09	1872.1	.09	3016.9	.06
311.5	1.67	1907.4	.18	3034.2	.05
371.3	.33	1938.6	.17	3048.9	.06
384.3	1.58	1964.5	.06	3099.0	.14
399.6	.35	1988.9	.08	3165.6	.15
411.8	1.46	2023.0	.07	3185.7	.09
426.8	.60	2046.4	.10	3199.1	.14
446.2	1.08	2083.3	.11	3222.5	.03
456.8	.60	2099.8	.09	3244.8	.07
473.1	.72	2115.2	.20	3277.7	.06
498.2	.30	2133.0	.08	3322.7	.02
536.8	1.68	2153.9	.11	3339.3	.11
552.3	.53	2267.1	.05	3353.7	.02
565.5	2.18	2275.8	.05	3371.5	.03
588.7	1.25	2304.3	.06	3425.8	.07
604.4	.76	2323.3	.04	3440.0	.03
611.2	.42	2331.3	.04	3450.6	.02
638.7	1.85	2364.1	.10	3463.3	.05
650.0	.40	2375.9	.04	3510.6	.02
659.4	.61	2389.9	.04	3519.9	.04
704.2	.50	2407.8	.04	3530.4	.02
708.2	.33	2460.1	.08	3542.7	.05
720.4	1.03	2476.0	.13	3569.5	.04
814.8	.25	2488.0	.03	3579.7	.02
854.2	.84	2506.3	.08	3589.9	.05
943.0	.31	2539.3	.08	3604.1	.02
997.5	.24	2544.3	.09	3627.1	.11
1008.9	.43	2556.9	.04	3646.6	.05
1022.8	.70	2571.8	.05	3660.5	.02
1040.9	.50	2593.0	.09	3681.3	.08
1140.5	.33	2691.6	.11	3708.2	.03
1424.5	.44	2710.1	.05	3735.0	.02
1440.2	.36	2723.0	.03	3749.9	.04
1503.6	.34	2734.6	.06	3780.6	.19
1561.7	.15	2755.7	.04	3794.4	.05
1575.8	.13	2773.2	.04	3824.6	.04
1585.0	.21	2802.0	.03	3836.7	.02
1652.2	.12	2833.4	.09	3866.0	.03
1658.6	.18	2845.9	.07	3875.5	.02
1668.0	.11	2860.6	.04	3892.1	.04
1735.3	.13	2882.8	.03	3915.8	.17
1760.9	.10	2893.5	.02	3941.6	.01
1774.1	.10	2932.0	.03	3952.9	.02
1820.0	.16	2943.7	.02	3967.0	.14

THULIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
3990.1	.11	4671.1	.04	5355.1	.07
4009.5	.02	4690.3	.02	5380.4	.05
4023.1	.06	4733.2	.37	5403.9	.04
4113.6	.03	4774.4	.03	5413.6	.11
4134.7	.08	4803.8	.02	5424.7	.02
4155.2	.11	4835.2	.07	5449.4	.08
4197.0	.07	4846.2	.04	5489.4	.01
4218.1	.01	4882.1	.03	5518.2	.10
4227.8	.01	4904.8	.02	5592.3	.01
4267.3	.03	4921.7	.18	5646.5	.01
4288.0	.02	4945.8	.03	5685.0	.02
4301.3	.02	4957.6	.01	5737.2	.95
4315.9	.05	4974.6	.03	5771.0	.01
4334.9	.02	4987.7	.09	5810.5	.05
4359.1	.10	5027.5	.03	5857.8	.21
4397.2	.16	5050.1	.04	5902.5	.24
4425.0	.17	5076.0	.21	5907.6	.25
4461.8	.08	5109.1	.02	5942.7	.93
4475.9	.03	5124.4	.09	6001.6	.54
4491.0	.02	5152.2	.37	6052.9	.02
4510.1	.02	5196.4	.07	6112.4	.02
4548.9	.05	5212.2	.02	6246.8	.02
4576.8	.08	5238.2	.06	6355.0	.12
4601.5	.02	5277.1	.02	6387.4	.81
4614.1	.05	5293.3	.05	6442.4	.26
4642.5	.10	5311.0	.03	6552.9	.55
4659.1	.03	5326.6	.06		

YTTERBIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
228.5	.17	1812.3	.30	3087.5	1.10
233.7	.40	1853.3	.31	3117.1	.06
241.8	18.42	1890.4	.47	3143.0	.32
245.2	.80	1909.6	.28	3164.9	.21
251.2 D	.19	1914.7	.48	3174.0	.12
266.8 D	.18	1934.2	.27	3189.0	.06
285.3	.31	1961.7	.17	3224.5	.05
308.2 D	.56	1985.2	.14	3248.2	.15
325.7	.58	2023.7	.57	3262.7	.09
336.8	.45	2071.2	.13	3286.8	.15
336.6	.58	2110.4	.23	3305.9	.28
341.9	6.04	2129.3	.31	3329.0	.50
360.7	1.78	2166.7	.43	3356.6	.59
392.8 D	.21	2259.3	.18	3370.9	.08
404.2	.20	2289.6	.17	3387.3	.69
425.6	.67	2302.3	.15	3424.9	.49
433.1	.50	2318.0	.24	3463.4	.11
475.4	2.28	2331.8	.26	3493.7	.07
531.6	.77	2349.7	.21	3504.3	.05
569.6	.57	2400.8	.81	3510.1	.04
589.4	.34	2439.8	.14	3568.2	.17
636.2	3.30	2466.7	.10	3590.0	.33
691.6	.22	2482.6	.07	3632.8	1.41
724.1	.27	2498.3	.14	3659.3	.06
762.8	.20	2516.0	.12	3713.6	.77
809.3	2.20	2554.5	.34	3741.1	.07
822.9	.25	2585.0	1.06	3754.8	.04
855.2	.38	2628.5	.17	3768.5	.04
866.9	.58	2663.2	.45	3782.6	.09
941.8	.33	2685.4	.29	3805.4	.04
1037.7	.29	2700.6	.20	3824.1	.08
1073.7	.99	2729.8	.16	3841.1	.08
1093.1	.28	2734.8	.20	3854.3	.16
1095.4	.29	2769.6	.51	3884.9	2.28
1116.8	.74	2797.1	.29	3929.6	1.09
1129.9	.47	2813.5	.17	3949.1	.04
1167.2	.37	2873.8	.10	3979.6	.06
1216.3	.46	2895.3	.26	3993.3	.06
1239.0	.52	2908.5	.20	4035.2	.15
1378.5	.38	2923.2	.07	4194.0	.18
1455.3	.67	2942.3	.34	4223.6	.03
1588.4	.61	2961.2	.32	4247.7	.17
1633.5	.41	2976.7	.15	4273.1	.03
1675.1	.91	3001.8	.25	4302.0	.08
1716.6	.35	3019.9	.32	4467.6	.10
1793.2	.23	3051.7	.64	4523.6	.07

YTTERBIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4656.1	.04	5392.9	.07	6228.7	.03
4672.8	.04	5515.5	.05	6277.4	.03
4699.6	.03	5539.5	.54	6418.5	.03
4757.5	.24	5640.8	.05	6542.3	.03
4829.6	.84	5690.1	.09	6615.0	.15
4878.3	.05	5826.8	.27	6780.1	.36
4926.0	.04	5857.9	.06	6822.9	.03
5010.4	.63	5901.1	.07	6840.9	.08
5028.6	.03	5921.0	.03	6977.6	.05
5062.5	.05	5966.0	.03	7211.3	.06
5080.4	.04	6009.3	.14	7654.6	.04
5265.7	4.86	6054.2	.08	7790.4	.04
5291.6	.03	6168.4	.05	8017.6	.05
5305.6	.03	6208.5	.06		

LUTETIUM

ENERGY KEV		INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
234.6		.40	2167.9	.14	4458.5	.11
246.2		.08	2292.2	.20	4509.3	.04
259.9	D	.68	2311.5	.30	4524.8	.08
269.4	D	2.39	2372.4	.14	4570.7	.08
286.0		.25	2377.4	.13	4605.8	.12
291.2		.13	2443.4	.11	4624.0	.04
302.2		.39	2477.5	.15	4655.9	.06
310.1		.14	2537.3	.11	4675.7	.04
319.6	D	3.40	2553.4	.13	4689.9	.04
336.4		.41	2662.3	.12	4708.3	.03
348.0		.61	2695.4	.18	4771.0	.03
367.5		3.14	2905.0	.09	4785.8	.05
393.2		.38	2958.4	.09	4799.9	.05
404.1		.22	3059.7	.11	4869.8	.14
413.8		.82	3127.3	.11	4889.1	.04
423.8		.13	3147.6	.10	4903.4	.06
458.1		8.90	3211.1	.06	4983.6	.17
551.5		1.04	3266.4	.06	5020.4	.38
592.9		.15	3324.9	.07	5088.4	.04
691.0		.58	3351.9	.05	5111.3	.09
731.6		.22	3393.7	.12	5166.1	.22
762.0		2.37	3455.7	.06	5192.0	.08
839.9		.27	3609.7	.05	5214.8	.13
877.0		.33	3648.1	.05	5268.1	.06
918.0		.23	3697.0	.05	5320.4	.26
940.5		.37	3711.4	.07	5344.4	.19
954.2		.27	3778.7	.06	5366.1	.07
964.4		.19	3815.7	.08	5395.6	.05
1013.8		.24	3852.1	.33	5442.4	.07
1046.9		.35	3876.1	.09	5465.5	.17
1064.1		.43	3922.6	.06	5498.9	.04
1087.3		.39	3969.9	.13	5569.6	.37
1166.4		.48	4000.9	.04	5601.7	.40
1182.3		.23	4028.4	.05	5729.1	.15
1237.2		.34	4118.6	.04	5769.4	.15
1292.1		.27	4214.9	.06	5824.5	.04
1306.4		.37	4251.8	.05	5896.8	.04
1324.0		.33	4272.4	.16	5922.1	.05
1365.7		.46	4308.6	.16	5984.0	.09
1400.2		.31	4348.1	.05	6256.2	.07
1723.2		.24	4363.5	.08	6437.3	.10
1738.4		.24	4376.5	.04	6621.5	.04
1775.1		.27	4393.4	.07	6761.1	.05
2056.2		.34	4414.1	.16	6803.8	.35
2091.2		.42				

HAFNIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
214.0	56.66	1184.2	.49	3971.8	.12
227.5	.23	1206.4	4.75	3979.2	.25
234.8	.16	1215.7	.40	4009.6	.38
245.2	.23	1228.9	3.99	4098.6	.14
257.6	.33	1268.8	.86	4282.3	.11
268.2	.46	1291.9	.59	4290.1	.20
276.2	.46	1309.6	1.52	4343.5	.89
279.4	.23	1330.7	.92	4372.9	.45
290.9	.33	1421.3	1.19	4392.8	.13
303.9	3.83	1542.7	.82	4487.7	.13
325.8	6.30	1720.6	1.43	4507.8	.13
337.3	.89	1795.4	1.53	4730.5	.13
348.5	.43	1863.6	.48	4752.0	.56
359.2	.16	1893.6	.81	4851.5	.16
371.6	.20	2064.9	.65	4887.3	.12
382.2	.43	2153.8	.51	4916.1	.34
393.3	.20	2325.9	.38	4975.5	.11
404.6	.30	2341.2	.33	4993.8	.13
408.6	.16	2378.8	.36	5207.8	.14
426.8	.92	2412.5	.33	5224.1	.19
482.8	.26	2428.5	.32	5262.2	.22
559.9	.43	2468.5	.82	5311.9	.13
566.8	.20	2537.9	.38	5353.7	.33
581.1	.20	2748.4	.57	5418.4	.59
655.3	.26	2924.4	.26	5471.6	.15
691.7	.26	2947.5	.30	5505.6	.88
743.0	.49	3059.3	.23	5574.3	.32
812.8	.26	3080.7	.24	5609.3	.23
832.4	.40	3173.2	.35	5628.2	.11
967.0	.69	3208.9	.31	5649.6	.22
971.3	.59	3332.9	.30	5679.3	.29
976.3	.69	3446.3	.17	5694.4	.65
986.8	.76	3538.2	.19	5723.5	2.25
1020.4	.33	3625.5	.22	5762.7	.17
1064.5	.66	3651.9	.19	5808.1	.40
1080.3	2.90	3709.4	.15	5989.1	.16
1102.8	2.44	3730.3	.39	6062.1	.15
1142.1	.73	3790.5	.16	6112.3	.74
1150.8	.40	3850.2	.17	6303.0	.15
1166.9	.40	3895.2	.13	6356.9	.38
1175.4	2.01	3912.5	.22		

TANTALUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
237.9	.79	2830.1	.13	4315.5	.47
243.5	1.21	2873.3	.06	4364.7	.11
271.1	32.29	2909.5	.18	4382.8	.13
297.6	6.39	2927.2	.09	4427.9	.03
335.3	.45	2940.1	.09	4443.8	.12
347.0	1.48	2979.7	.10	4457.6	.04
361.4	2.07	3060.6	.05	4483.0	.31
380.3	.37	3136.4	.05	4498.2	.03
402.9	16.81	3157.1	.04	4509.5	.05
425.5	.25	3219.7	.15	4535.8	.10
442.9	.30	3233.3	.07	4548.5	.03
446.7	.31	3253.9	.14	4565.4	.07
454.9	.53	3291.9	.12	4580.2	.16
478.8	1.99	3326.9	.18	4592.9	.04
602.4	.50	3348.2	.12	4617.7	.30
631.6	.56	3379.7	.08	4631.0	.04
735.6	.47	3401.1	.08	4647.5	.04
758.2	.59	3438.3	.05	4668.6	.06
835.2	.34	3508.6	.06	4674.3	.08
758.2	.59	3527.0	.12	4691.3	.22
835.2	.34	3594.4	.14	4739.0	.16
910.0	.60	3645.1	.10	4781.8	.33
933.6	.32	3677.5	.14	4793.4	.03
976.6	.34	3696.9	.08	4803.2	.07
1021.6	.31	3717.9	.06	4832.6	.10
1120.8 D	.89	3738.3	.13	4891.4	.06
1401.6	.39	3764.0	.03	4913.2	.17
1616.9	.46	3800.9	.08	4939.0	.03
1649.5	.63	3814.9	.06	4964.5	.03
1725.3	.61	3827.7	.08	4980.1	.14
1844.6	.50	3854.5	.20	5006.0	.26
1887.7	.24	3882.0	.15	5034.5	.11
2123.6	.08	3900.5	.15	5101.6	.13
2150.3	.14	3939.1	.03	5123.7	.06
2169.1	.18	3956.0	.04	5150.9	.12
2377.6	.25	3980.8	.17	5181.9	.04
2392.0	.10	4045.7	.03	5206.3	.19
2512.4	.15	4076.2	.03	5226.9	.04
2583.4	.17	4087.9	.05	5245.5	.26
2599.2	.10	4118.6	.09	5280.5	.04
2662.1	.11	4138.9	.08	5323.6	.03
2677.9	.13	4158.7	.03	5342.9	.27
2698.4	.18	4189.5	.08	5412.0	.03
2730.6	.07	4220.6	.53	5434.3	.05
2756.4	.10	4252.2	.04	5496.6	.08
2776.7	.06	4280.0	.06	5515.4	.10

TANTALUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5555.9	.06	5703.8	.06	5947.3	.03
5584.0	.06	5770.3	.08	5964.7	.71
5638.4	.03	5791.4	.15	6062.5	.43

TUNGSTEN

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
201.2	1.95	2453.0	.13	3739.3	.62
227.6	.22	2481.8	.61	3760.2	.15
245.8	.16	2510.8	.30	3775.7	.13
253.8	.50	2586.0	.19	3801.5	.31
273.4	1.60	2707.2	.38	3818.7	.14
291.4	.72	2727.2	.13	3847.3	.37
479.6 D	11.85	2739.9	.60	3866.2	.11
495.1	.20	2760.7	.22	3886.3	.06
551.5	3.49	2785.8	.10	3902.8	.17
577.5	1.01	2844.0	.63	3964.0	.29
617.9 D	3.89	2880.3	.20	4015.0	.33
657.2	.76	2909.5	.16	4064.4	.17
685.7 D	13.65	2933.6	.28	4082.3	.29
746.3	.35	2952.8	.10	4118.9	.38
772.7	1.37	2996.0	.09	4136.8	.06
792.4	.41	3030.5	.08	4160.1	.46
815.6	.65	3054.3	.47	4202.7	.05
839.9	1.17	3076.9	.08	4222.6	.08
891.5	1.23	3081.3	.10	4249.2	1.35
979.5	.29	3095.6	.14	4304.1	.26
1026.9	.76	3119.2	.08	4331.0	.29
1067.8	.48	3161.2	.16	4384.0	.43
1082.6	.52	3190.8	.26	4447.0	.34
1184.3	.32	3207.3	.26	4489.6	.12
1293.8	.30	3224.2	.11	4517.9	.30
1385.7	.40	3239.1	.10	4535.9	.04
1414.2	.40	3271.6	.13	4558.4	.19
1438.2	.46	3298.5	.06	4573.9	.54
1498.8	.49	3311.3	.21	4606.1	.04
1581.4	.65	3328.1	.06	4626.7	.99
1631.8	.82	3348.5	.06	4650.0	.34
1725.7	.74	3359.1	.06	4684.7	1.26
1790.6	.28	3376.4	.32	4719.3	.14
1870.0	.22	3409.1	.10	4747.0	.04
1964.1	.28	3422.6	.20	4925.5	.05
1997.1	.25	3446.3	.14	5017.0	.12
2038.1	.34	3470.7	.95	5090.6	.09
2060.5	.59	3494.0	.37	5164.3	1.97
2179.4	.31	3510.6	.19	5239.6	.11
2256.6	.36	3534.4	.74	5261.7	4.13
2285.3	.20	3561.9	.39	5320.5	2.87
2323.9	.52	3578.0	.18	5653.8	.05
2346.3	.59	3596.9	.08	5756.3	.08
2368.5	.14	3652.1	.10	5796.5	.11
2393.7	.27	3668.8	.14	5978.4	.07
2423.1	.40	3687.0	.07	6022.2	.26

TUNGSTEN CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
6098.5	.05	6290.4	.12	7297.7	.14
6144.3	1.53	6317.4	.04	7410.9	.49
6190.5	4.39	6407.9	.26		

RHENIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
209.8	5.54	2535.0	.08	4299.6	.04
228.2	.60	2575.8	.23	4334.8	.03
237.4	.60	2593.5	.12	4353.7	.04
255.4	6.61	2635.7	.11	4391.8	.04
274.5	1.19	2658.6	.08	4407.8	.08
291.1	3.97	2682.1	.07	4459.1	.06
300.2	.48	2724.0	.12	4564.6	.03
317.6	3.03	2788.7	.07	4609.9	.06
328.9	.18	2833.4	.09	4634.9	.09
340.0	.16	2853.3	.06	4648.7	.03
362.4	.21	2916.5	.10	4663.2	.16
391.6	1.19	2949.5	.13	4693.1	.07
406.7	.12	3055.2	.13	4714.9	.03
414.7	.32	3098.9	.07	4773.6	.10
479.0 D	.46	3113.8	.05	4790.2	.07
558.7	.16	3153.2	.24	4861.0	.35
608.8	.30	3175.2	.04	4889.2	.11
627.6 D	.54	3187.6	.05	4915.7	.07
630.2 D	.29	3215.1	.05	4936.5	.06
695.3	.26	3244.9	.04	4983.1	.09
714.3	.76	3309.2	.05	5007.9	.32
726.6	.20	3320.8	.04	5028.0	.19
753.5	.23	3357.1	.11	5049.3	.07
764.4 D	.27	3444.6	.05	5074.3	.48
795.3	.42	3461.9	.10	5108.9	.04
834.1 D	.16	3503.9	.04	5137.2	.38
867.0	.21	3554.6	.05	5176.9	.09
914.7	.16	3587.4	.08	5205.7	.08
925.2 D	.19	3591.0	.04	5224.6	.07
988.6	.17	3598.5	.04	5240.4	.03
1166.4	.17	3615.7	.08	5257.0	.05
1375.6	.20	3663.0	.09	5277.7	.23
1378.6	.27	3677.4	.04	5313.3	.16
1805.5 D	.34	3690.4	.04	5350.6	.34
1875.4	.19	3710.9	.06	5375.3	.03
1937.0 D	.30	3727.6	.05	5381.5	.03
2004.4	.37	3841.7	.04	5492.6	.14
2057.5	.13	3859.0	.03	5600.8	.08
2121.7	.15	3938.4	.08	5644.1	.09
2303.1	.13	4045.9	.06	5666.4	.03
2329.8	.10	4067.7	.05	5686.0	.03
2374.2	.08	4080.3	.05	5705.9	.14
2430.3	.12	4129.8	.03	5719.4	.04
2446.8	.12	4178.7	.08	5856.3	.07
2467.7	.09	4219.9	.05	5872.2	.20
2529.2	.07	4284.2	.14	5910.2	.66

RHENIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
6005.2	.05	6079.6	.11	6119.8	.08
6033.5	.06				

OSMIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
187.3	9.25	2261.3	.24	3956.7	.02
232.3	.19	2285.5	.13	3979.5	.02
253.8	.76	2330.4	.06	4072.4	.01
275.2	1.58	2436.7	.03	4222.5	.05
295.5	.13	2458.8	.10	4253.3	.02
306.3	.17	2505.2	.08	4295.7	.07
323.6 D	2.84	2574.4	.03	4344.0	.02
330.9	.26	2588.0	.03	4355.9	.01
335.4	.56	2605.7	.04	4407.1	.06
362.0 D	1.41	2620.9	.04	4460.7	.03
371.7	2.11	2666.5	.04	4508.0	.01
386.6 D	.17	2677.6	.02	4530.7	.10
397.0	.30	2730.9	.02	4555.7	.05
409.5	.29	2778.6	.02	4594.1	.02
412.7	.35	2791.2	.01	4615.7	.02
431.9	.32	2815.8	.04	4675.2	.07
434.9	.29	2852.9	.01	4716.3	.04
478.3 D	6.78	2861.4	.02	4751.1	.04
492.3	.60	2877.4	.02	4800.9	.02
526.2	.92	2888.0	.01	4812.8	.14
558.4 D	6.80	2903.7	.02	4845.4	.03
569.3	5.17	2929.9	.01	4920.7	.02
607.5	.37	2938.5	.03	4962.2	.02
634.0	10.25	2957.9	.02	4977.8	.02
646.7	.25	3021.9	.03	5011.8	.06
669.1	.39	3052.5	.03	5036.9	.02
689.9	.46	3095.7	.01	5079.5	.01
725.0	.69	3140.9	.01	5097.3	.03
775.9	.29	3156.4	.03	5146.9	.35
828.7	1.80	3176.8	.04	5170.9	.06
845.5	.32	3225.2	.02	5229.6	.01
886.9	.67	3239.3	.02	5249.1	.03
899.9	.54	3274.1	.02	5274.0	.23
930.2	1.10	3334.1	.04	5342.1	.06
987.7	1.03	3361.4	.02	5367.8	.05
1053.1	.44	3386.5	.02	5395.0	.01
1175.7	.73	3402.3	.02	5414.9	.07
1267.4	.63	3465.9	.04	5447.2	.01
1324.1	.81	3516.2	.02	5483.5	.04
1436.0	.23	3571.3	.01	5505.7	.01
1803.7	.09	3677.0	.02	5530.6	.05
1887.5	.11	3748.9	.02	5571.5	.03
2082.2	.04	3767.4	.01	5583.3	.03
2130.0	.08	3816.1	.04	5640.4	.02
2160.4	.05	3831.3	.01	5684.0	.16
2223.3	15.19	3900.7	.01	5702.6	.02

OSMIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5723.1	.01	6181.6	.02	6620.4	.02
5884.2	.05	6217.0	.04	6785.7	.01
5919.6	.01	6247.2	.03	6987.4	.01
5933.0	.05	6321.2	.01	7234.2	.05
5969.5	.02	6357.6	.01	7605.2	.01
6059.9	.03	6411.2	.04	7792.6	.04
6081.6	.01	6558.5	.01	7834.4	.04
6157.0	.01	6587.2	.09	7990.5	.03

IRIDIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
217.4	8.41	3325.1	.15	4982.9	.34
225.8	.34	3342.4	.19	5026.8	.17
263.4	.39	3591.9	.10	5041.4	.10
276.8 D	.54	3650.4	.08	5068.4	.14
295.2 D	1.35	3792.4	.14	5089.2	.23
316.5 D	1.44	3815.0	.09	5108.2	.09
328.8 D	4.29	3822.5	.15	5129.3	.17
351.8	3.96	3877.9	.11	5147.6	.36
372.8 D	.53	3942.6	.08	5167.1	.34
384.7	.20	3965.9	.11	5182.8	.09
403.1	.33	3979.1	.08	5195.5	.17
406.7	.28	4001.9	.11	5220.3	.25
418.3	1.40	4032.8	.15	5261.6	.41
435.1	.21	4198.2	.09	5283.4	.41
469.2 D	.76	4257.9	.14	5304.0	.18
489.6 D	.20	4317.4	.08	5329.6	.40
558.6	.58	4338.4	.08	5356.7	.40
574.1	.79	4368.6	.15	5399.6	.16
597.3	.33	4401.5	.30	5422.4	.08
691.9	.40	4424.3	.08	5430.5	.37
1174.0	.48	4475.5	.09	5448.2	.10
1591.6	1.12	4494.2	.10	5464.5	.42
1804.9 D	.79	4508.0	.10	5487.2	.08
2056.9 D	.55	4523.4	.09	5516.9	.27
2160.2	.40	4531.9	.34	5534.4	.57
2348.1	.26	4571.9	.21	5564.6	.82
2369.3	.27	4589.8	.15	5595.6	.26
2432.7	.28	4612.9	.08	5612.0	.43
2454.2	.45	4643.6	.14	5629.0	.11
2468.0	.45	4646.8	.12	5667.2	1.23
2589.6	.23	4665.4	.16	5689.0	.63
2638.6	.18	4682.7	.11	5729.0	.54
2673.8	.26	4712.6	.15	5758.6	.20
2735.1	.22	4733.3	.30	5782.6	.83
2811.3	.20	4754.9	.17	5807.1	.11
2831.8	.24	4782.5	.17	5822.1	.18
2885.1	.17	4809.1	.10	5866.1	.34
2906.3	.14	4839.2	.12	5907.0	.20
2970.3	.15	4860.2	.59	5957.7	1.39
3050.7	.16	4865.6	.49	6003.8	.10
3154.3	.20	4898.0	.34	6021.9	.13
3292.7	.15	4943.5	.63	6081.8	1.22

PLATINUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
241.2	.26	2469.6	1.40	3848.5	.04
252.1	.24	2487.6	.12	3881.6	.08
333.3	19.48	2506.5	.19	3927.9	.11
356.1	33.81	2526.9	.65	3946.9	.25
393.1	.49	2595.3	.11	3962.1	.12
430.4	.26	2614.3	.35	3980.2	.04
481.9	.29	2665.5	.12	4007.6	.12
558.4	.91	2735.3	.38	4025.2	.22
575.0	.38	2749.0	.38	4041.1	.06
596.7	.81	2767.9	.12	4084.8	.22
673.2	1.17	2798.4	.08	4121.6	.08
696.5	1.17	2824.4	.74	4152.4	.07
779.8	.47	2857.3	.07	4167.9	.15
1048.2	.68	2862.3	.11	4202.2	.04
1091.8	.85	2876.0	.33	4208.8	.12
1358.4	1.12	2896.2	.21	4223.2	.06
1804.0	1.14	2928.3	.10	4227.8	.06
1491.3	1.66	2995.9	.06	4256.3	.15
1629.8	.68	3022.6	.29	4287.5	.13
1645.1	.32	3041.5	.34	4312.2	.27
1654.1	.33	3062.2	.09	4342.7	.17
1676.8	1.25	3084.3	.06	4368.0	.58
1695.9	.45	3117.3	.09	4401.5	.18
1713.2	1.19	3133.1	.16	4416.1	.06
1737.7	.54	3145.4	.10	4431.9	.08
1803.7	1.62	3165.3	.09	4442.4	.07
1826.3	1.09	3176.2	.12	4453.8	.06
1875.6	.32	3230.0	.10	4477.3	.11
1889.3	.77	3251.5	.21	4481.7	.09
1913.5	.35	3284.1	.06	4513.3	.20
1971.2	1.16	3311.7	.16	4546.2	.11
1978.7	1.66	3369.0	.06	4557.3	.05
2041.1	.40	3387.3	.05	4584.0	.04
2067.8	1.24	3406.5	.07	4614.6	.15
2115.6	.25	3425.9	.17	4634.5	.16
2150.3	.37	3553.9	.10	4677.4	.05
2184.0	.71	3583.6	.19	4693.4	.16
2187.9	.27	3609.7	.18	4709.0	.30
2311.4	1.73	3623.2	.07	4729.5	.18
2334.8	.24	3652.5	.06	4746.7	.09
2344.1	.12	3685.9	.28	4767.9	.18
2376.0	.31	3747.6	.13	4791.8	.23
2393.2	.54	3761.6	.10	4816.4	.25
2402.0	.13	3776.5	.14	4839.6	.12
2429.1	.33	3799.7	.09	4858.6	.04
2445.3	.20	3815.9	.04	4882.4	.38

PLATINUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4899.4	.45	5432.6	.13	5910.5	.42
4947.6	.68	5451.3	.36	5935.1	.06
4970.7	.14	5468.3	.59	5952.8	.50
4989.9	.05	5499.6	.17	6003.9	.45
4995.2	.08	5521.1	.23	6033.5	1.10
5033.3	.04	5546.7	.25	6074.1	.29
5046.6	.43	5576.7	.15	6097.5	.07
5060.9	.17	5611.4	1.04	6118.1	.14
5078.1	.11	5676.7	.16	6244.2	.08
5098.8	.96	5692.8	.04	6319.1	.10
5116.8	.06	5721.1	.58	6518.8	.05
5140.0	.05	5738.5	.11	6560.4	.14
5173.4	1.77	5759.3	.38	6738.0	.06
5184.9	.81	5795.7	.32	7232.9	.57
5254.6	4.85	5829.3	.22	7565.6	.18
5307.0	1.16	5847.4	.30	7722.4	.07
5393.2	.99	5874.5	.36	7920.9	.41
5417.2	.07				

GOLD

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
193.5	4.03	2088.7	.27	3857.2	.07
203.2	.24	2262.2	.12	3894.2	.07
215.7	9.77	2287.6	.13	3909.1	.08
236.5	3.72	2299.5	.11	3925.9	.06
248.2	5.54	2311.1	.11	3941.5	.11
261.5	5.74	2346.2	.14	3968.1	.12
292.3	1.42	2412.1	.09	3985.7	.07
308.6	.36	2434.3	.09	4007.0	.43
312.5	.39	2446.2	.12	4026.3	.15
327.9	2.87	2508.5	.11	4074.4	.13
346.1	.90	2531.7	.15	4124.3	.38
350.4	1.20	2593.5	.20	4149.2	.05
364.6	.24	2659.6	.13	4189.0	.44
381.4	3.80	2693.8	.30	4210.3	.08
396.2	.22	2753.8	.12	4249.7	.07
411.3 D	1.52	2794.7	.13	4279.6	.44
418.0	1.16	2807.1	.09	4302.2	.11
440.8	2.96	2821.5	.07	4322.0	.16
456.2	.51	2907.7	.09	4338.8	.10
528.7	2.41	2947.0	.06	4369.3	.59
550.3	.29	3109.4	.08	4398.4	.13
596.9	2.58	3148.7	.06	4422.5	.06
612.1	.66	3175.6	.10	4439.2	.08
669.5 D	.32	3186.6	.08	4479.3	.08
702.0	.36	3201.7	.07	4510.1	.51
709.5	.33	3230.0	.06	4526.1	.08
719.3	.29	3265.0	.18	4544.1	.83
836.1	.44	3315.8	.05	4573.8	.36
868.8	1.24	3325.3	.07	4588.5	.39
878.2	.47	3366.5	.08	4601.1	.03
944.9	.51	3414.2	.07	4615.8	.05
1102.2	.54	3446.8	.22	4638.2	.78
1223.9	.68	3489.4	.12	4688.9	.10
1246.0	.82	3506.5	.15	4733.3	.52
1412.3	.55	3558.9	.06	4762.6	.05
1424.1	.56	3583.9	.19	4785.8	.08
1454.6	.85	3614.3	.21	4799.8	1.08
1531.0	.90	3630.6	.05	4829.5	.17
1568.3	.42	3655.0	.06	4852.2	.29
1607.9	.42	3679.6	.11	4866.6	.20
1691.6	.32	3693.0	.05	4887.5	.70
1736.9	.39	3706.0	.15	4903.4	.94
1859.3	.20	3736.8	.10	4930.3	.11
1886.1	.27	3764.9	.23	4957.8	.94
1908.3	.20	3789.0	.06	4974.0	.20
1940.2	.22	3840.6	.16	4999.0	.79

GOLD CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
5023.6	.04	5474.0	.07	5940.6	.62
5038.3	.36	5493.8	.56	5960.9	.04
5059.8	.06	5524.3	1.20	5982.8	1.37
5079.4	.37	5541.9	.06	6017.2	.06
5085.2	.48	5594.2	.63	6033.0	.06
5102.9	1.12	5619.9	.41	6058.5	.18
5115.5	.15	5643.3	.18	6106.1	.71
5148.2	1.31	5676.3	.24	6148.6	1.14
5175.5	.29	5710.4	1.31	6165.5	.13
5204.3	.12	5724.4	.10	6193.0	.05
5224.4	.55	5767.2	.17	6252.0	5.42
5279.5	.58	5786.1	.07	6276.2	.88
5308.2	.50	5808.7	.32	6319.1	3.47
5354.4	.80	5839.5	.33	6382.6	.04
5385.8	.04	5879.5	.45	6416.4	.08
5398.9	.09	5903.0	.07	6456.8	2.24
5420.1	.11	5920.9	.05	6512.1	1.66
5462.8	.09				

MERCURY

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
333.7	.37	2817.8	.66	4151.9	.23
367.8	82.56	2883.4	.35	4243.7	.29
473.5	.69	2900.8	1.20	4271.9	.23
477.5	.32	2920.6	1.31	4304.0	.18
540.1	.81	2983.9	.74	4351.4	.23
579.2	2.24	3052.4	.75	4372.9	1.01
661.1	4.82	3074.3	.30	4458.4	.29
702.7	.47	3124.9	.43	4536.5	.32
851.6	.79	3145.6	.26	4555.8	.32
886.3	2.65	3158.8	.20	4575.0	1.20
1147.2	.86	3185.9	3.49	4604.2	.29
1225.6	2.09	3216.4	1.27	4675.8	3.08
1253.5	.60	3268.6	1.00	4739.5	6.81
1262.8	2.27	3288.9	3.23	4759.4	2.64
1273.8	.97	3353.1	.72	4799.9	.14
1349.5	.85	3392.8	.16	4812.2	.74
1407.7	1.39	3415.8	.18	4842.5	5.24
1467.1	1.29	3426.4	.23	4893.3	.17
1570.3	3.95	3453.1	.15	4919.7	.19
1693.3	8.60	3500.1	.51	4954.0	1.10
1718.7	3.05	3560.2	.25	4975.3	1.25
1862.0	.81	3586.5	.36	5050.2	5.35
2002.1	7.64	3602.1	.19	5132.6	.13
2045.0	.42	3634.0	.51	5149.0	.47
2065.7	.64	3652.2	.29	5231.2	.16
2179.7	.31	3714.3	.31	5268.3	.14
2191.7	.33	3735.7	.15	5388.3	4.08
2258.0	.96	3749.0	.28	5465.4	.14
2272.0	1.81	3806.6	.13	5484.5	.15
2297.2	1.09	3826.5	.25	5566.5	.19
2324.3	.61	3840.7	.20	5658.1	6.63
2329.6	.40	3850.9	.15	5732.2	.41
2528.8	.41	3868.9	.58	5966.9	15.52
2566.6	.26	3892.3	.23	6196.9	.16
2619.6	.48	3950.9	.67	6230.0	.30
2639.9	4.33	4019.1	.29	6310.3	1.08
2704.8	.44	4072.7	.14	6397.4	.84
2728.5	.56	4115.6	.71	6457.8	5.98
2760.9	.38				

THALLIUM

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
229.7	.08	1459.6	.76	4079.2	.11
235.1	.14	1478.0	1.49	4099.4	.03
242.4	.10	1526.1	.88	4115.3	.17
253.1	.32	1583.2	.94	4197.0	.38
266.1	.20	1601.3	.40	4226.5	.70
270.0	.13	1674.7	.79	4261.6	.02
275.8	.11	1689.6	.17	4287.5	.05
292.8	1.03	1741.2	.71	4310.3	.30
304.6	.12	1755.8	.17	4344.1	.46
319.3	2.46	1779.2	.21	4404.9	.19
331.4	.53	1808.1	.31	4440.7	.17
338.2	.22	1929.9	.16	4464.6	.05
348.6	3.19	1936.7	.21	4496.0	.53
372.0	.12	1971.7	.13	4541.3	.43
395.7	.86	2013.5	.15	4570.0	.27
424.9	1.51	2082.2	.23	4602.5	.51
439.0	.39	2126.8	.08	4627.5	.03
472.3	1.49	2254.2	.08	4659.4	.07
488.8	1.56	2351.9	.07	4688.0	1.00
541.0	.37	2361.5	.07	4706.6	.65
594.6	.19	2457.2	.04	4752.8	1.99
627.5	1.73	2528.1	.07	4805.3	.18
678.1	.70	2548.7	.04	4841.6	.58
713.3	.74	2574.2	.05	4868.4	.09
737.0	2.49	2682.3	.12	4914.2	2.10
765.0	.83	2712.1	.09	4943.3	.20
803.7	.28	2858.8	.05	4981.5	.28
819.9	.35	2977.0	.03	5015.0	.82
854.9	.24	2996.2	.05	5093.6	.05
873.1	2.66	3070.3	.07	5128.9	.55
911.1	2.60	3098.2	.11	5154.8	.04
932.5	.69	3125.7	.05	5180.8	1.87
950.1	.84	3233.5	.05	5239.8	.15
1023.4	.27	3383.2	.04	5262.0	.97
1040.9	.26	3410.7	.03	5280.5	2.43
1072.7	.37	3450.7	.03	5404.6	1.68
1093.6	.85	3465.1	.06	5451.4	.93
1110.3	.52	3521.8	.04	5503.3	.09
1121.4	.61	3828.4	.02	5533.9	1.68
1154.9	.83	3847.2	.02	5603.6	3.32
1203.4	1.87	3876.8	.03	5641.9	3.85
1235.1	1.18	3932.3	.02	5853.3	.05
1293.0	.90	3942.3	.11	5867.0	.08
1307.4	.33	3959.1	.02	5890.1	.09
1360.0	.89	3975.1	.04	5917.8	1.03
1440.3	.63	4017.2	.03	6025.6	.30

THALLIUM CONT.

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
6119.6	.24	6199.4	.11	6336.1	.22
6166.9	2.10	6222.9	.85	6515.2	1.61
6183.1	.97	6285.2	.17	6654.3	.12

LEAD

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
6736.4	5.08	7367.7	94.77

BISMUTH

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
1889.4	15.41	3082.4	3.16	4054.7	26.49
2597.1	4.41	3356.4	3.62	4101.8	17.72
2623.9	3.59	3396.3	2.78	4171.1	36.93
2828.2	7.98	3632.5	2.80	4256.9	4.11

BISMUTH

ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100	ENERGY KEV	INTENSITY NO./100
4054.7	26.49	4101.8	17.72	4171.1	36.93

Security Classification

DOCUMENT CONTROL DATA - R&D

(Security classification of title, body of abstract and indexing annotation must be entered when the overall report is classified)

1. ORIGINATING ACTIVITY *(Corporate author)*
Massachusetts Institute of Technology
77 Massachusetts Avenue
Cambridge, Massachusetts 02139

2a. REPORT SECURITY CLASSIFICATION
unclassified

2b. GROUP

3. REPORT TITLE
THERMAL NEUTRON CAPTURE GAMMA-RAY SPECTRA OF THE ELEMENTS

4. DESCRIPTIVE NOTES *(Type of report and inclusive dates)*
Scientific Interim.

5. AUTHOR(S) *(Last name, first name, initial)*
Norman C. Rasmussen
Yoshiyuti Hukai
Tamon Inouye
Victor J. Orphan

6. REPORT DATE	7a. TOTAL NO. OF PAGES	7b. NO. OF REFS
January 1969	140	5

8a. CONTRACT OR GRANT NO.	9a. ORIGINATOR'S REPORT NUMBER(S)
AF19(628)5551	
b. PROJECT AND TASK NO. 5620=03-01	
c. DOD ELEMENT 6144501F	9b. OTHER REPORT NO(S) *(Any other numbers that may be assigned this report)*
d. DOD SUBELEMENT 681301	

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13. ABSTRACT

A determination of the energy and intensity of the gamma rays resulting from thermal neutron capture in 74 natural elements is reported. The measurements include energies above 200 keV and were done with a Ge(Li) detector.

DD FORM 1 JAN 64 1473

Security Classification

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14. KEY WORDS	LINK A		LINK B		LINK C	
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