Technical University of Denmark

DTU

A compilation of X-ray interaction data for X-ray fluorescence analysis of geological samples

Gwozdz, R.; Kunzendorf, Helmar; Rose-Hansen, J.

Publication date:
1973

Document Version
Publisher's PDF, also known as Version of record

[Link back to DTU Orbit](#)

DTU Library
Technical Information Center of Denmark

Danish Atomic Energy Commission

Research Establishment Risø

A Compilation of X-Ray Interaction Data for X-Ray Fluorescence Analysis of Geological Samples

by R. Gwozdz, H. Kunzendorf and J. Rose-Hansen

December 1973

UDC 550.4 : 543.426

A Compilation of
X-Ray Interaction Data for X-Ray Fluorescence
Analysis of Geological Samples

by

R. Gwozdz[*], H. Kunzendorf and J. Rose-Hansen[*]

Danish Atomic Energy Commission
Research Establishment Risø
Electronics Department

Abstract

X-ray interaction data useful in X-ray fluorescence analysis of geological samples were compiled on a Univac 1110 computer by means of a Fortran IV program. Based on fit coefficients the tabulations include values for the photoelectric absorption coefficient, the coherent and incoherent scattering coefficients, the ratio of the total scattering coefficient to the total X-ray attenuation coefficient, the ratio of the coherent to the incoherent scattering coefficient, and the half-range of characteristic Kα X-rays for 14 oxides, international geochemical reference samples, selected minerals, and selected fluxing agents. A graphical representation of some of these data is also included. For the geological samples are also tabulated X-ray interaction data for the radiation of 9 radioisotopes commonly used in energy-dispersive X-ray fluorescence analysis.

[*] Institute of Petrology, University of Copenhagen, Østervoldgade 5,
DK-1350 København K.

Contents

1. Introduction

Accurate and easily accessible X-ray attenuation coefficients are great-
needed for X-ray intensity corrections in X-ray fluorescence analysis.
is not within the scope of this paper to discuss these correction methods
detail because a great variety of papers describing physical phenomena
volved with the production and measurement of secondary X-rays (e. g.
n Hamos 1945, Klug et al. 1948, Sherman 1958) and papers presenting
-ray intensity correction methods can be found in the literature. In short,
wever, correction methods are based on three assumptions:

The investigated sample is infinitely thick for the primary radiation
(source).

Attenuation of primary radiation and generated characteristic X-rays
is exclusively determined by the photoelectric effect, i. e. scattering
contributions are negligible.

The analysed sample is homogeneous.

With these considerations, X-ray intensity corrections given in the
rature are more or less based on the simple formula for the intensity
secondary X-rays

$$I_s(N) = K \cdot \frac{w(N)}{w(N) + a_Z(N) \cdot w(i)} , \tag{1}$$

re w(N) is the weight fraction of element N in the sample, w(i) are the
ght fractions of all other elements in the sample not to be analysed for,
N) is the characteristic X-ray intensity of element N, K is a constant
ending on instrumental conditions, the primary X-ray intencity and the
ment under investigation, and $a_Z(N)$ is an X-ray absorption parameter,
ned by Beattie and Brissey (1954), characterizing the influence of the
ment with atomic number Z upon $I_s(N)$. $a_Z(N)$ is exclusively a function
he total X-ray attenuation coefficients for both the primary and the
ted radiation and of the geometry of the analytical system. If the en-
ement effect is negligible, this parameter can be expressed as

$$a_Z(N) = \frac{\mu_p(i) + G \cdot \mu_s(i)}{\mu_p(N) + G \cdot \mu_s(N)} , \tag{2}$$

where $\mu_p(i)$ and $\mu_s(i)$ are the total X-ray attenuation coefficients for the primary and the secondary radiation of element i respectively, $\mu_p(N)$ and $\mu_s(N)$ the respective values of element N, and $G = \sin\Theta/\sin\phi$, where Θ is the angle between sample and incident primary radiation and ϕ the emerging angle of the secondary radiation. Introducing

$$a_M(N) \cdot w(M) = \sum_{i=1}^{N-1} a_i(N) \cdot w(i), \qquad (3)$$

where M is an index ascribed to the matrix, (1) can be rewritten in the form of

$$I_s(N) = K \frac{w(N)}{w(N) + a_M(N)(1 - w(N))}. \qquad (4)$$

which is the one commonly used in X-ray fluorescence analysis. The equation is difficult to solve because only $I_s(N)$ is determined experimentally. Without going into a detailed discussion of various methods applied to solve (4), four cases of approximate problem solutions can be mentioned:

1) Methods involving external standards,

2) Methods in which chemical compounds in known quantities are added to, mixed with, or diluted in the sample,

3) Mathematical methods for solving of (1), and

4) Use of scattered radiation.

The methods of external standards are widely used in X-ray fluorescence analysis. These methods assume that the X-ray attenuation parameters of the standards are equal to $a_M(N)$. In this case by measurement of the X-ray intensities of both the standards and the sample under identical physical conditions, (4) can be solved graphically or algebraically.

In addition-mixing-dilution methods measurement of both the sample and one or two samples where the original sample composition is changed by addition, mixing or dilution of known chemical compounds, is carried out. It is then possible to eliminate two unknowns in (4) and determine w(N) (e. g. Sherman 1958, Tertian 1968, Gwozdz 1974).

Methods employing mathematical corrections make use of theoretical or experimental evaluation of the $a_i(N)$ incorporated in $a_M(N)$ according to (3). After transformations in (4) a system of linear equations can be

established and a solution vector in the form of unknown concentrations in the sample can be computed (Beattie and Brissey 1954, Lucas-Tooth and Pyne 1964, Holland and Brindle 1966, Kodama et al. 1967).

Additional information for solving of (4) is obtained by analysing the scattered radiation also recorded by an X-ray fluorescence apparatus. The ratio of fluorescent to scattered or of incoherently to coherently scattered X-rays gives information about the matrix of the sample (Andermann and Kemp 1958, Reynolds 1963, Champion et al. 1966, Kunzendorf 1972).

Tabulations of X-ray attenuation coefficients exist for most elements of the Periodic Table (Victoreen 1949, Leroux 1962, Heinrich 1966, Theisen and Vollath 1967, Champion et al. 1968, Mc Master et al. 1969). Outside the absorption edges agreement of the published values is normally within $\pm$ 5%, but worse inside the L-, M- and N-absorption edges. Table 1 illustrates this with comparison of data given by Heinrich (1966), Theisen and Vollath (1967), and McMaster et al. (1969) for forty elements. The following definitions were used in this table:

$$DEV 1 = \sum_{Z=3}^{42} \frac{\mu_{Z, \text{TH or H}} - \mu_{Z, \text{McM}}}{\mu_{Z, \text{McM}}} \times 100/40 ,$$

$$DEV 2 = \sum_{Z=3}^{42} \left| \frac{\mu_{Z, \text{TH or H}} - \mu_{Z, \text{McM}}}{\mu_{Z, \text{McM}}} \right| \times 100/40$$

where $\mu_{Z, \text{TH or H}}$ are the given total attenuation coefficients for the characteristic average $K\alpha$ X-ray energy of element Z presented by Theisen and Vollath, and Heinrich respectively, and $\mu_{Z, \text{McM}}$ is the value presented in this report. Under the heading Maximum Deviations four extreme DEV 2 values are given for each characteristic $K\alpha$ X-ray energy.

In some of the published tabulations X-ray attenuation coefficients are given up to 15.7 keV, the $K\alpha$ X-ray energy of Mo $K\alpha$ X-rays partly for experimental reasons. Since the introduction of energy-dispersive X-ray fluorescence (EDX-) analysis incorporating semiconductor detectors, the high-energy region of X-rays has become of more interest. Sufficient excitation of $K\alpha$ X-rays of heavy elements is achieved in this case by both low-power X-ray tubes and radioisotopic sources.

The first compilation of total attenuation, coherent scattering, and incoherent scattering cross sections has been given for a variety of X-ray energies for all elements of the Periodic Table by McMaster et al. (1969). These data are also stored on magnetic tape in barns/atom and include

Table 1 a

Comparison between total X-ray attenuation coefficients
given by Heinrich (1966) and in this report

HEINRICH/MC   MASTER

K-ALFA	KEV	DEV1	DEV2			MAXIMAL DEVIATIONS					
NA	1.041	6.8	13.9	KR	34.7	BR	34.5	SE	32.2	AS	31.5
MG	1.254	4.9	12.4	BR	28.8	SE	27.1	AS	26.8	KR	26.3
AL	1.487	2.9	10.5	BR	23.8	C	-23.5	N	-22.4	RB	20.9
SI	1.740	1.4	9.4	C	-22.8	N	-22.4	KR	19.6	SE	17.3
P	2.013	0.6	8.4	N	-21.9	C	-21.8	SR	19.3	KR	16.9
S	2.307	0.4	7.9	N	-20.9	C	-20.3	SR	16.3	RB	14.4
CL	2.622	0.3	7.3	N	-19.6	C	-18.5	NB	13.7	F	-13.2
AR	2.957	0.2	6.8	N	-18.0	C	-16.5	F	-12.8	CL	11.7
K	3.313	-0.1	6.3	N	-16.3	C	-14.2	F	-12.1	NE	-11.1
CA	3.690	0.0	5.7	N	-14.3	LI	13.3	C	-12.0	F	-11.1
SC	4.089	0.2	5.1	LI	16.4	N	-12.2	MG	-10.5	NA	-10.0
TI	4.509	0.4	4.9	LI	18.5	BE	11.5	MG	-10.4	N	-10.3
V	4.950	0.5	4.7	LI	18.5	BE	13.8	MG	- 9.8	SI	- 9.7
CR	5.412	1.0	4.8	LI	20.7	BE	15.7	SI	- 9.5	MG	- 9.1
MN	5.895	1.1	4.4	BE	17.8	LI	11.9	B	11.8	SI	- 9.1
FE	6.400	1.4	4.4	BE	19.5	B	14.1	LI	13.4	O	10.1
CO	6.925	1.8	4.4	BE	24.5	B	15.8	O	12.3	SI	- 7.8
NI	7.472	2.1	4.5	BE	22.0	B	16.0	O	14.2	LI	9.5
CU	8.041	2.4	4.4	BE	19.4	O	16.8	B	16.5	C	8.8
ZN	8.631	2.6	4.5	B	20.5	BE	19.8	O	18.2	C	11.5
GA	9.243	2.5	4.9	O	20.7	B	18.6	LI	-16.9	BE	13.8
GE	9.876	3.3	5.0	O	22.1	B	17.4	BE	16.5	C	13.9
AS	10.532	3.2	5.9	LI	-32.3	O	23.6	B	19.6	BE	15.2
SE	11.209	3.7	6.0	LI	-26.6	O	24.1	B	17.1	C	13.4
BR	11.909	3.9	6.0	O	27.8	LI	-21.3	F	13.8	N	13.8
KR	12.632	2.8	7.5	LI	-58.2	O	27.2	BE	-18.1	F	13.6
RB	13.375	3.8	7.8	LI	-56.0	O	29.2	F	17.0	SE	16.0
SR	14.143	3.1	8.3	LI	-53.9	BE	-34.9	O	27.1	F	17.2
Y	14.933	3.6	8.7	LI	-52.1	BE	-29.9	O	25.2	F	17.1
ZR	15.747	4.4	8.6	LI	-50.5	BE	-25.2	O	25.1	NE	17.7
NB	16.584	4.3	9.1	LI	-49.0	O	28.7	BE	-20.7	F	19.7
MO	17.444	3.6	10.2	BE	-58.3	LI	-47.7	O	21.0	F	19.0

Table 1 b

Comparison between total X-ray attenuation coefficients
given by Theisen and Vollath (1967) and in this report

THEISEN/MC   MASTER

K-ALFA	KEV	DEV1	DEV2			MAXIMAL DEVIATIONS					
NA	1.041	8.2	9.4	ZN	75.5	NE	27.1	F	23.1	LI	20.7
MG	1.254	4.1	5.9	LI	19.6	NE	17.8	NA	14.2	F	13.8
AL	1.487	2.9	5.5	LI	20.1	SE	12.9	MG	12.2	C	-11.3
SI	1.740	1.9	5.3	LI	21.7	C	-11.8	KR	11.4	N	-11.3
P	2.013	-0.3	6.1	RB	-30.7	SR	-28.9	LI	24.1	N	-11.9
S	2.307	-0.5	6.4	ZR	-32.5	Y	-31.7	LI	27.1	P	14.3
CL	2.622	0.1	5.2	NB	-30.8	LI	30.2	BE	13.1	N	-11.6
AR	2.957	1.3	4.8	LI	33.5	BE	16.2	CL	14.6	N	-10.9
K	3.313	1.4	4.9	LI	36.5	BE	19.4	AR	13.7	N	- 9.9
CA	3.690	1.3	4.9	LI	39.3	BE	22.6	AR	10.3	N	- 8.7
SC	4.089	1.1	4.8	LI	41.5	BE	25.8	B	9.5	MG	- 8.5
TI	4.509	1.3	4.9	LI	42.7	BE	28.8	B	12.0	SI	- 8.5
V	4.950	1.5	5.0	LI	43.5	BE	31.3	B	14.5	SI	- 8.8
CR	5.412	1.6	5.1	LI	42.4	BE	33.5	B	16.7	SI	- 8.8
MN	5.895	1.9	5.1	LI	40.4	BE	35.3	B	18.9	SI	- 8.6
FE	6.400	1.9	4.9	BE	36.2	LI	36.1	B	20.6	SI	- 8.2
CO	6.925	2.1	4.8	BE	36.3	LI	31.7	B	22.4	SI	- 7.6
NI	7.472	2.4	4.7	BE	35.0	LI	25.9	B	23.5	C	8.8
CU	8.041	2.6	4.5	BE	33.3	B	24.0	LI	19.5	C	10.0
ZN	8.631	2.5	4.5	BE	30.6	B	23.9	C	10.9	LI	10.3
GA	9.243	2.8	4.2	BE	26.6	B	23.5	C	11.7	NA	8.4
GE	9.876	3.1	4.4	BE	23.2	B	22.5	C	11.7	NA	10.1
AS	10.532	3.3	4.8	B	20.6	BE	17.1	LI	-15.4	GA	12.0
SE	11.209	2.0	6.6	CU	-59.0	LI	-22.9	B	18.3	NA	13.6
BR	11.909	3.7	5.5	LI	-29.2	NA	15.2	B	14.3	AS	12.1
KR	12.632	4.0	5.6	LI	-24.7	NA	16.8	B	11.0	AS	10.7
RB	13.375	3.9	6.7	LI	-42.8	NA	18.4	SE	16.0	MG	10.2
SR	14.143	4.0	7.4	LI	-49.3	NA	19.7	BE	-15.4	SE	14.5
Y	14.933	3.9	8.4	LI	-56.9	BE	-22.9	NA	21.1	SE	13.0
ZR	15.747	3.9	9.1	LI	-60.4	BE	-28.9	NA	17.2	RB	14.9
NB	16.584	4.0	10.1	LI	-64.3	BE	-36.6	NA	23.1	MG	15.3
MO	17.444	3.9	11.0	LI	-68.6	BE	-41.6	NA	24.2	B	-18.7

values for the energies just before and just after the K absorption edge. For other X-ray energies than those compiled linear interpolation between the given values is recommended by the authors. In X-ray fluorescence analysis of geological samples total X-ray attenuation coefficients in cm^2/g for the characteristic X-rays of all elements of the Periodic Table, in particular geological compounds (e.g. rocks), are required rather than cross sections in the form mentioned before.

We calculated X-ray attenuation data in the form especially suitable for the user in the field of geoscience. In this report we present therefore photoelectric absorption, coherent scattering, and incoherent scattering coefficients for X-rays based on the work of Mc Master et al. (1969) in the form of tables for:

1) 14 oxides,

2) international geochemical reference samples,

3) 9 selected minerals and 3 selected fluxing agents,

for the characteristic K X-rays of the elements Na through U. These data are given in cm^2/g. The tables include also the ratios of total scattering (incoherent + coherent scattering) to total attenuation, the half-range of characteristic X-rays in the sample materials, and the ratio of coherent to incoherent scattering. For the US Geological Survey standard rocks, H_2O, SiO_2, $Li_2B_4O_7$, $Na_2B_4O_7$, and Norrish flux these data are also given in the form of plots. Under a special heading we tabulated X-ray interaction data for the radiation emitted by 9 radioisotopes which are primarily applied in EDX-analysis.

To compute all the data a Fortran IV program was used together with a Univac 1110 computer. With the computer program used the same kind of data for any other geological sample may be calculated.

2. Method of Compilation and Tabulation

In the following tables with the compiled X-ray interaction data the succession of the data is:

1) the element symbol,

2) the average Kα X-ray energy (K-ALFA(1+2)) for the elements Na through Sn or the $K\alpha_1$ X-ray energy (K-ALFA(1)) for the elements Sb through U,

3) the photoelectric absorption coefficient,

4) **the coherent scattering coefficient,**

5) **the incoherent scattering coefficient,**

6) **the half-range of X-rays of given energy in the sample,**

7) **the ratio of the total scattering to total X-ray attenuation, and**

8) **the ratio of the coherent scattering to the incoherent scattering coefficient.**

The most prominent contribution to the attenuation of X-rays in the low-energy range comes from the photoelectric effect. The _photoelectric absorption coefficients_ $\mathcal{T}(Z)$ for elements with atomic number Z were compiled by means of the expression

$$\mathcal{T}(Z) = \exp\left\{ \sum_{i=1}^{3} A_{F,i}(Z)(\ln E_i)^i - \ln C \right\} / r_J , \tag{5}$$

where $A_{F,i}(Z)$ is the fit coefficient for element Z given by McMaster et al. (1969), E_i the energy of the characteristic X-rays in keV, C a constant for the conversion of data given in barns/atom into cm^2/g, and r_J are the absorption-edge jump-values.

Similar to expression (1) the _coherent scattering_ coefficient $\sigma_{coh}(Z)$ is calculated from

$$\sigma_{coh}(Z) = \exp\left\{ \sum_{i=0}^{1} A_{coh,i}(Z)(\ln E_i)^i - \ln C \right\} , \tag{6}$$

while the _incoherent scattering_ X-ray mass absorption coefficient is calculated using the formula

$$\sigma_{incoh}(Z) = \exp\left\{ \sum_{i=0}^{1} A_{incoh,i}(Z)(\ln E_i)^i - \ln C \right\} . \tag{7}$$

The _total X-ray attenuation_ coefficient $\mu(Z)$ is not tabulated, but may be calculated from

$$\mu(Z) = \mathcal{T}(Z) + \sigma_{coh}(Z) + \sigma_{incoh}(Z) . \tag{8}$$

The _half-range_ is calculated using the following expression

$$R_{1/2} \,(mg/cm^2) = \frac{693.15}{\mu(Z)} . \tag{9}$$

From these values an approximation for the thickness of an infinitely thick sample can be obtained by the simple formula

$$R_{inf}(mg/cm^2) \approx 7 \cdot R_{1/2} \cdot \sin\theta, \tag{10}$$

where θ is the angle under which the radiation penetrates the sample.

The <u>ratio of the scattering to the total</u> X-ray attenuation coefficient was calculated using the formula

$$R_1 = \frac{\sigma_{coh}(Z) + \sigma_{incoh}(Z)}{\mu(Z)} \times 100 \; (\%), \tag{11}$$

whereas <u>the ratio of coherent to incoherent</u> scattering was calculated from

$$R_2 = \frac{\sigma_{coh}(Z)}{\sigma_{incoh}(Z)}. \tag{12}$$

The X-ray energy values used were taken from Bearden and Burr (1967), whereas energy data on radioisotopes used in our tabulations are based on the work of Lederer et al. (1967).

<u>X-Ray Interaction Data of Selected Oxides</u>

X-ray interaction data for 14 oxides are given in the following. The tabulations include data on the major oxides SiO_2, Al_2O_3, Fe_2O_3, FeO, MgO, CaO, Na_2O, K_2O, H_2O, TiO_2, P_2O_5, and MnO, which are the most commonly reported components in quantitative analysis of geological samples. Data are given for the average $K\alpha$ X-ray energies for the elements Na through Sn and for the characteristic $K\alpha_1$ X-ray energies for the elements Sb through U. For SiO_2 and H_2O a plot of interaction data vs. X-ray energy is also given. In addition to data for the major oxides X-ray interaction data for ZrO_2 and Cr_2O_3 are given for the same X-ray energies. Table 2 is a guide to the tabulations of X-ray interaction data of oxides.

<u>Table 2</u>

Guidance table for X-ray interaction data of selected oxides

Oxide	X-ray interaction data on page	Plot on page
SiO_2	20	59
Al_2O_3	20	-
Fe_2O_3	21	-
FeO	21	-
MgO	22	-
CaO	22	-
Na_2O	23	-
K_2O	23	-
H_2O	24	-
TiO_2	24	-
P_2O_5	25	-
MnO	25	-
ZrO_2	26	-
Cr_2O_3	26	-

X-Ray Interaction Data of International Geochemical Reference Samples

Chemical analyses of international geochemical reference rock and mineral samples have been compiled by Flanagan (1972). The contents of the major oxides in these rocks are given in table 3. The tabulations of X-ray interaction data for these samples are based on these analyses. They include data for 8 US Geological Survey (USGS) rock standards and 11 other internationally known standards for the average Kα X-ray energies for the elements Na through Sn and for the characteristic $K\alpha_1$ X-ray energies of elements Sb through U. X-ray interaction data for the remaining 10 rock standards, also reported by Flanagan (1972), can be evaluated from the given data according to the guidance table, table 4. X-ray interaction data in the form of plots are given for the USGS samples.

X-Ray Interaction Data for Selected Minerals and Selected Fluxing Agents

X-ray interaction data for selected minerals and selected fluxing agents for the same X-ray energies as for rocks and oxides are given in the following. The guiding data can be found in table 5.

Table 3

Chemical analyses of international geochemical reference samples

used in the tabulations of Flanagan (1972)

Rock type		SiO_2	Al_2O_3	Fe_2O_3	FeO	MgO	CaO	Na_2O	K_2O	H_2O	TiO_2	P_2O_5	MnO	CO_2	Sum
Andesite	USGS-AGV-1	59.00	17.25	4.51	2.05	1.53	4.90	4.26	2.89	0.97	1.04	0.49	0.097	0.06	99.91
Basalt	USGS-BCR-1	54.50	13.61	3.68	8.80	3.46	6.92	3.27	1.70	1.57	2.20	0.36	0.18	0.03	100.28
	CRPG-BR	38.20	10.20	5.58	6.57	13.28	13.80	3.05	1.40	2.80	2.60	1.04	0.20	0.86	99.64
	GSJ-JB-1	52.09	14.53	2.30	6.06	7.70	9.21	2.79	1.42	1.98	1.34	0.26	0.16	0.19	100.03
	ZGI-BM	49.60	16.20	1.60	7.28	7.46	6.44	4.64	0.20	3.62	1.14	0.11	0.15	1.34	99.87
Biotite	CRPG-Mica-Fe	34.40	19.40	4.45	19.17	4.60	0.45	0.30	8.80	3.10	2.55	0.45	0.35	0.20	99.12
Diabase	USGS-W-1	52.64	15.00	1.40	8.72	6.62	10.96	2.15	0.64	0.69	1.07	0.14	0.17	0.06	100.26
Diorite	ANRT-DR-N	52.65	17.42	3.89	5.42	4.50	7.08	3.00	1.70	2.32	1.11	0.27	0.21	0.13	99.70
Dunite	USGS-DTS-1	40.50	0.24	1.21	7.23	49.80	0.15	0.007	0.0012	0.52	0.013	0.002	0.11	0.08	99.86
	NIM-D	38.86	0.44	1.30	14.27	43.30	0.31	0.10	0.04	0.4	0.04	0.03	0.20	0.4	100.47
Granite	USGS-G-2	69.11	15.40	1.08	1.45	0.76	1.94	4.07	4.51	0.66	0.50	0.14	0.034	0.08	99.73
	CRPG-GR	65.90	14.75	1.65	2.16	2.40	2.50	3.80	4.50	0.80	0.65	0.28	0.06	0.26	99.77
	USGS-G-1	72.64	14.04	0.87	0.90	0.38	1.39	3.32	5.48	0.40	0.26	0.09	0.03	0.07	99.93
	CRPG-GA	69.90	14.50	1.36	1.32	0.95	2.45	3.55	4.03	0.96	0.38	0.12	0.09	0.11	99.75
	CRPG-GH	75.80	12.50	0.41	0.84	0.03	0.69	3.85	4.76	0.50	0.08	0.01	0.05	0.14	99.86
	NIM-G	75.59	12.08	0.72	1.29	0.10	0.80	3.32	4.98	0.6	0.09	0.02	0.02	0.10	100.30
	ZGI-GM	73.55	13.50	0.75	1.14	0.38	1.02	3.76	4.74	0.35	0.21	0.06	0.04	0.28	99.86
Granodiorite	USGS-GSP-1	67.38	15.25	1.77	2.31	0.96	2.02	2.80	5.53	0.69	0.66	0.28	0.042	0.15	99.84
	GSJ-JG-1	72.24	14.21	0.36	1.66	0.73	2.18	3.39	3.96	0.62	0.26	0.10	0.06	0.09	99.86
Limestone	ZGI-KH	8.61	2.41	0.55	0.34	0.72	47.76	0.11	0.41	1.00	0.13	0.12	0.09	37.60	100.00
Lujavrite	NIM-L	52.52	13.93	8.76	1.12	0.36	3.30	8.27	5.54	2.4	0.51	0.07	0.71	0.2	100.81
Norite	NIM-N	52.43	16.64	1.05	7.24	7.43	11.55	2.44	0.26	0.4	0.19	0.04	0.17	0.1	100.09
Peridotite	USGS-PCC-1	41.90	0.74	2.85	5.24	43.18	0.51	0.006	0.004	5.20	0.015	0.002	0.12	0.12	99.89
Pyroxenite	NIM-P	50.88	4.38	2.58	9.20	25.19	2.68	0.37	0.10	0.3	0.20	0.04	0.21	0.1	99.60
Shale	ZGI-TS	62.80	16.05	6.50	0.72	1.79	0.16	0.10	4.87	4.06	0.73	0.28	0.04	0.04	99.51
Slate	ZGI-TB	60.30	20.55	0.91	5.43	1.94	0.30	1.31	3.85	3.82	0.93	0.10	0.05	0.13	99.75
Syenite	NIM-S	63.72	17.33	1.19	0.29	0.48	0.70	0.43	15.34	0.3	0.05	0.13	0.01	0.1	100.47
	SSC-SY-1	59.5	9.6	2.15	5.45	4.2	10.2	3.3	2.67	0.69	0.49	0.22	0.40	0.37	99.28

Table 4

Guidance table for X-ray interaction data of international
geochemical reference samples

Rock type	Standard	X-ray interaction data on page	Plot on page	Within 5% similar to
Andesite	USGS-AGV-1	27 ·	54	
Basalt	USGS-BCR-1	27	54	
	CRPG-BR	30	-	
	GSJ-JB-1			USGS-W-1
	ZGI-BM	31	-	
Bauxite	ANRT-BX-N	31	-	
Diabase	USGS-W-1	28	55	
Diorite	ANRT-DR-N	32	-	
Diabase	ANRT-DT-N	32	-	
Dunite	USGS-DTS-1	28	ˆ5	
	NIM-D	33	-	
Granite	USGS-G-1			USGS-G-2
	USGS-G-2	29	56	
	CREPG-GA			USGS-G-2
	CRPG-GH			USGS-G-2
	CRPG-GR	33	-	
	NIM-G			USGS-G-2
	ZGI-GM			USGS-G-2
Granodiorite	USGS-GSP-1	29	56	
	GSJ-JG-1			USGS-G-2
Limestone	ZGI-KH	34	-	
Lujavrite	NIM-L			ZGI-BM
Norite	NIM-N			USGS-W-1
Peridotite	USGS-PCC-1	30	57	
Pyroxenite	NUM-P	34	-	
Shale	ZGI-TS			ZGI-TB
Slate	ZGI-TB	35	-	
Syenite	NIM-S	35	-	
	SSC-SY-1	36	-	

Table 5

Guidance table for X-ray interaction data of selected minerals
and selected fluxing agents

Mineral or fluxing agent	Chemical formula used	X-ray interaction data on page	Plot on page
Anhydrite	$CaSO_4$	38	-
Barite	$BaSO_4$	36	-
Biotite *	CRPG Mica-Fe	37	-
Chalcocite	Cu_2S	38	-
Calcite	$CaCO_3$	37	-
Galena	PbS	40	-
Magnesite	$MgCO_3$	39	-
Sphalerite	ZnS	40	-
Troilite	FeS	39	-
Lithium tetraborate	$Li_2B_4O_7$	41	58
Norrish flux **		42	57
Sodium tetraborate	$Na_2B_4O_7$	41	58

* after Flanagan (1972)

** after Norrish and Chappell (1967)

X-Ray Interaction Data for Selected Radioisotopes

In EDX-systems both X-ray tube excitation and excitation by means of radioisotopes are used. Frequently used radioisotopic sources include encapsulated radioisotopes and radioisotope-target configurations. For X-ray interaction data for radioisotope-target sources the tabulations given under the headings oxides, international geochemical reference samples, and minerals may be used. For example, for the radioisotope-target configuration ^{241}Am/Mo interaction data for Mo are valid. In our tabulations X-ray interaction data for the radioisotopes ^{55}Fe, ^{238}Pu, ^{109}Cd, ^{241}Am, ^{125}I, ^{210}Pb, ^{130}Tm, ^{153}Gd, and ^{57}Co are presented. Some pertinent data on these radioisotopes are given in table 6. Contrary to the previous tabulations for oxides, rocks, minerals, and fluxing agents the first column of our tables contains the kind of the radiation emitted (e.g. Np L X-rays) and the second column the energy used under the heading of each radioisotope. A guide to the tabulated X-ray interaction data of radioisotopic sources for selected oxides, rocks, minerals, and fluxing agents is given in table 7.

Table 6

**Half-life, source strength used, and range of application
of selected radioisotopes**

Radioisotope	Half-life (years)	Recommended source strength* (mCi)	Range of application for K X-ray excitation
^{55}Fe	2.7	⟩ 5	P - Cr
^{238}Pu	86	30	K - As
^{109}Cd	1.3	⟩ 3	Rb - Mo
^{241}Am	458	30	Rb - Tm
^{57}Co	.74	⟩ 3	Hf - Pb, U, Th
^{125}I	.16	25	Rb - Sn
^{210}Pb	22	19	Rb - Gd
^{170}Tm	.35	⟩ 3	Rb - Dy
^{153}Gd	.66	10	Hf - Pb, U, Th

* estimates for small-area semiconductor detectors

Table 7

Guidance table for X-ray interaction data of selected oxides,
geochemical reference samples, selected minerals,
and selected fluxing agents of selected radioisotopes

Geological sample	X-ray interact. data on page
SiO_2, Al_2O_3, Fe_2O_3, FeO	43
MgO, CaO, Na_2O, K_2O	44
H_2O, TiO_2, P_2O_5, MnO	45
USGS-AGV-1, USGS-BCR-1, USGS-W-1, USGS-DTS-1	46
USGS-G-2, USGS-GSP-1, USGS-PCC-1, CRPG-GR	47
ANRT-DRN, ZGI-BM, SSC-SY-1, NIM-S	48
ZGI-TB, ANRT-DT-N, NIM-D, NIM-P	49
CRPG-Mica-Fe, CRPG-BR, ZGI-KH, ANRT-BX-N	50
$MgCO_2$, $CaCO_3$, $CaSO_4$, Cr_2O_3	51
FeS, Cu_2S, ZnS, $BaSO_4$	52
ZrO_2, PbS, $Li_2B_4O_7$, $Na_2B_4O_7$	53
Norrish flux	42

Acknowledgement

References

1) Andermann, G. and Kemp, J.W., Scattered X-Rays as Internal Standards in X-ray Emission Spectroscopy. Anal. Chem. 30 (1958) 1306-1309.

2) Bearden, J.A. and Burr, A.F., Reevaluation of X-Ray Atomic Energy Levels. Rev. Mod. Phys. 39 (1967) 125-142.

3) Beattie, H.J. and Brissey, R.M., Calibration Method for X-Ray Fluorescence Spectrometry. Anal. Chem. 26 (1954) 980-983.

4) Champion, K.P., Taylor, J.C., and Whittem, R.N., Rapid X-Ray Fluorescence Determination of Traces of Strontium in Samples of Biological and Geological Origin. Anal. Chem. 38 (1966) 109-112.

5) Champion, K.P., Hurst, H.J., and Whittem, R.N., Tables of Mass Absorption Coefficients for Use in X-Ray Spectrochemical Analysis. AAEC/TM 454 (1968) 96 pp.

6) Flanagan, F.J., 1972 Values for International Geochemical Reference Samples. Geochim. Cosmochim. Acta 37 (1973) 1189-1200.

7) Gwozdz, R., A Critical Survey of Mixing, Dilution and Addition Methods and Possible Extensions of the Theory. X-Ray Spectrometry (1974). In Press.

8) Von Hamos, L., On the Determination of Very Small Quantities of Substances by the X-Ray Micro-Analyser. Arkiv f. Matematik, Atronomi och Fysik 31A (1945) 1-11.

9) Heinrich, K.F.J., X-Ray Absorption Uncertainty. In: The Electron Microprobe. Proceedings of a conference held in Washington, D.C., 12-15 October, 1964. Edited by T.D. McKinley, K.F.J. Heinrich, and D.B. Witting. (Wiley, New York, 1966) 296-377.

10) Holland, J.G. and Brindle, D.W., A Self-consistent Mass Absorption Correction for Silicate Analysis by X-Ray Fluorescence. Spectrochim. Acta, 22 (1966) 2083-2093.

11) Klug, H.P., Alexander, L.A., and Kummer, E., Quantitative Analysis with the X-Ray Spectrometer. Anal. Chem. 20 (1948) 607-609.

12) Kodama, H., Brydon, J.E., and Stone, B.C., X-Ray Spectrochemical Analysis of Silicates using Synthetic Standards with a Correction for Interelement Effects by a Computer Method. Geochim. Cosmochim. Acta, 31 (1967) 649-659.

13) Kunzendorf, H., Quick Determination of the Average Atomic Number Z by X-Ray Scattering. Nucl. Instrum. Methods 99 (1972) 611-612.

14) Lederer, C. M., Hollander, J. M., and Perlman, I., Table of Isotopes. 6th edition (Wiley, New York, 1967) 594 pp.

15) Leroux, J., Method for Finding Mass-Absorption Coefficients by Empirical Equations and Graphs. Advan. X-Ray Anal. 5 (1962) 153-160.

16) Lucas-Tooth, J. and Pyne, C., The Accurate Determination of Major Constituents by X-Ray Fluorescence Analysis in the Presence of Large Interelement Effects. Advan. X-Ray Anal. 7 (1964) 523-541.

17) McMaster, W. H., Del Grande, N. Keer, Mallett, J. H., and Hubbell, J. H., Compilation of X-Ray Cross Sections. UCRL-50174 (1969) 350 pp.

18) Norrish, K. and Chappell, B., X-Ray Fluorescence Spectrography. In: Physical Methods in Determinative Mineralogy. Edited by J. Zussman. (Academic Press New York 1967).

19) Sherman, J., Theoretical Derivation of the Composition of Mixable Specimens from Fluorescent X-ray Intensities. Advan. X-Ray Anal. 1 (1958) 231-252.

20) Reynolds, R. C., Matrix Corrections in Trace Element Analysis by X-Ray Fluorescence: Estimation of the Mass-Absorption Coefficient by Compton Scattering. Amer. Mineral. 48 (1963) 1133-1143.

21) Tertian, R., Controle de l'effet de Matrice en Fluorescence X et Principe d'une Methode Quasi-absolue d'analyse Quantitative en Solution Solide ou Liqide. Spectrochim. Acta 23B (1968) 305-321.

22) Theisen, R and Vollath, D., Tabellen der Massenschwächungs-koeffizienten von Röntgenstrahlen (Verlag Stahl und Eisen, Düsseldorf, 1967) 44 pp.

23) Victoreen, J. A, The Calculation of X-Ray Mass Absorption Coefficients. J. Appl. Phys. 20 (1949) 1141-1147.

SILICON DIOXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	2070.	1.017	.011	.241	.0669	176.9
MG	1.254	1761.	1.044	.015	.303	.1082	130.4
AL	1.487	1114.	1.039	.019	.621	.1044	90.18
SI	1.740	726.4	1.740	.023	.952	.2450	75.30
P	2.013	1020.	1.669	.028	.427	.1044	58.73
S	2.307	1149.	1.570	.034	.602	.1392	44.51
CL	2.622	827.8	1.468	.039	.836	.1817	37.33
AR	2.957	683.7	.167	.065	1.195	.2555	30.34
K	3.313	445.7	1.268	.051	1.550	.2951	26.94
CA	3.690	332.5	1.171	.057	2.076	.3687	20.69
SC	4.089	250.8	1.085	.063	2.751	.4954	17.33
TI	4.509	190.9	1.081	.068	3.609	.5567	14.63
V	4.950	146.8	.923	.074	4.690	.6744	12.45
CR	5.412	113.8	.850	.080	6.040	.8103	10.67
MN	5.895	88.97	.783	.085	7.715	.9665	9.208
FE	6.400	70.09	.722	.090	9.775	1.145	7.991
CO	6.925	55.62	.665	.095	12.29	1.368	6.974
NI	7.472	44.44	.613	.100	15.35	1.578	6.117
CU	8.041	35.73	.565	.105	19.03	1.839	5.391
ZN	8.631	28.91	.521	.109	23.45	2.133	4.773
GA	9.243	23.53	.481	.113	28.72	2.444	4.243
GE	9.876	19.26	.445	.117	34.94	2.834	3.784
AS	10.532	15.84	.411	.121	42.33	3.249	3.391
SE	11.209	13.09	.380	.125	50.96	3.711	3.047
BR	11.909	10.87	.352	.128	61.04	4.225	2.747
KR	12.632	9.069	.326	.131	72.76	4.797	2.483
RB	13.375	7.599	.302	.134	86.25	5.424	2.252
SR	14.143	6.392	.280	.137	101.7	6.125	2.047
Y	14.933	5.397	.260	.139	119.5	6.893	1.846
ZR	15.747	4.573	.242	.142	139.8	7.737	1.704
NB	16.584	3.889	.225	.144	162.7	8.660	1.560
MO	17.444	3.318	.209	.146	188.6	9.668	1.431
TC	18.328	2.840	.195	.148	217.7	10.76	1.316
RU	19.236	2.438	.181	.150	250.2	11.95	1.212
RH	20.169	2.100	.169	.151	286.3	13.23	1.118
PD	21.125	1.813	.158	.153	326.2	14.62	1.033
AG	22.105	1.570	.147	.154	370.1	16.10	.9571
CD	23.110	1.364	.138	.155	418.2	17.68	.8875
IN	24.141	1.187	.129	.156	470.6	19.36	.8242
SN	25.195	1.036	.121	.157	527.4	21.14	.7665

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	.8973	.112	.158	503.5	23.16	.7100
TE	27.472	.7844	.105	.159	654.0	25.16	.6620
J	28.612	.6906	.099	.160	730.9	27.21	.6180
XE	29.779	.6077	.093	.160	805.6	29.36	.5775
CS	30.973	.5359	.087	.161	884.8	31.58	.5404
BA	32.194	.4735	.082	.161	968.8	33.87	.5062
LA	33.442	.4191	.077	.161	1056.	36.21	.4744
CE	34.720	.3716	.072	.162	1145.	38.59	.4498
PR	36.026	.3301	.068	.162	1238.	41.00	.4185
ND	37.361	.2937	.064	.162	1334.	43.43	.3936
PM	38.725	.2618	.060	.162	1433.	45.87	.3705
SM	40.118	.2337	.056	.162	1533.	48.30	.3490
EU	41.542	.2089	.053	.162	1636.	50.71	.3291
GD	42.996	.1871	.050	.162	1737.	53.10	.3106
TB	44.482	.1677	.047	.161	1840.	55.49	.2933
DY	45.998	.1506	.045	.161	1944.	57.75	.2772
HO	47.547	.1354	.042	.161	2047.	60.04	.2621
ER	49.128	.1219	.040	.161	2149.	62.16	.2481
TM	50.742	.1099	.038	.160	2251.	64.30	.2349
YB	52.389	.0992	.036	.160	2352.	66.36	.2224
LU	54.070	.0896	.034	.159	2451.	68.38	.2111
HF	55.790	.0810	.032	.159	2540.	70.19	.2003
TA	57.532	.0734	.030	.159	2644.	71.98	.1902
W	59.318	.0666	.029	.158	2738.	73.70	.1807
RE	61.140	.0604	.027	.157	2830.	75.33	.1717
OS	63.001	.0549	.026	.157	2920.	76.80	.1633
IR	64.896	.0499	.024	.156	3008.	78.34	.1554
PT	66.832	.0454	.023	.156	3093.	79.72	.1479
AU	68.804	.0414	.022	.155	3176.	81.03	.1408
HG	70.819	.0377	.021	.154	3247.	82.26	.1342
TL	72.872	.0344	.020	.154	3336.	83.41	.1279
PB	74.969	.0315	.019	.153	3414.	84.50	.1219
BI	77.108	.0288	.018	.152	3489.	85.52	.1163
PO	79.290	.0263	.017	.151	3562.	86.48	.1110
RN	83.780	.0221	.015	.150	3702.	88.20	.1012
RA	88.470	.0186	.014	.148	3837.	89.72	.0920
AC	90.804	.0170	.013	.148	3902.	90.40	.0883
TH	93.350	.0157	.012	.147	3965.	91.04	.0845
PA	95.868	.0144	.012	.146	4027.	91.64	.0808
U	98.439	.0132	.011	.145	4088.	92.19	.0773

ALUMINIUM OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	2507.	1.056	.011	.276	.0744	162.6
MG	1.254	1532.	1.034	.015	.452	.1205	121.3
AL	1.487	969.0	1.780	.019	.714	.1853	92.28
SI	1.740	2213.	1.704	.024	.313	.0780	71.39
P	2.013	1524.	1.615	.029	.454	.1077	56.09
S	2.307	1068.	1.519	.034	.648	.1451	44.69
CL	2.622	761.3	1.421	.039	.900	.1914	36.06
AR	2.957	550.2	1.323	.045	1.256	.2480	29.43
K	3.313	403.0	1.228	.051	1.714	.3161	24.28
CA	3.690	298.7	1.137	.056	2.311	.3977	20.21
SC	4.089	223.9	1.050	.062	3.080	.4941	16.97
TI	4.509	169.6	.969	.067	4.061	.6072	14.37
V	4.950	129.8	.894	.073	5.299	.7388	12.25
CR	5.412	100.3	.824	.078	6.849	.8911	10.52
MN	5.895	78.16	.759	.083	8.775	1.066	9.093
FE	6.400	61.39	.699	.088	11.16	1.266	7.903
CO	6.925	48.60	.644	.093	14.06	1.495	6.906
NI	7.472	38.75	.598	.098	17.57	1.754	6.064
CU	8.041	31.11	.548	.102	21.82	2.047	5.350
ZN	8.631	25.13	.506	.107	26.91	2.377	4.741
GA	9.243	20.43	.467	.111	32.98	2.748	4.218
GE	9.876	16.70	.431	.115	40.17	3.164	3.767
AS	10.532	13.73	.399	.118	48.65	3.628	3.376
SE	11.209	11.34	.369	.122	58.56	4.145	3.035
BR	11.909	9.416	.342	.125	70.13	4.720	2.738
KR	12.632	7.850	.317	.128	83.56	5.358	2.476
RB	13.375	6.576	.294	.131	99.01	6.060	2.246
SR	14.143	5.531	.272	.133	116.7	6.834	2.043
Y	14.933	4.689	.253	.136	137.0	7.686	1.862
ZR	15.747	3.957	.235	.138	160.0	8.619	1.702
NB	16.584	3.365	.219	.149	186.0	9.638	1.558
MO	17.444	2.872	.204	.142	215.3	10.74	1.430
TC	18.328	2.459	.190	.144	248.1	11.94	1.315
RU	19.236	2.112	.177	.146	284.6	13.24	1.211
RH	20.169	1.819	.165	.147	325.1	14.64	1.118
PD	21.125	1.572	.154	.149	369.6	16.16	1.033
AG	22.105	1.362	.144	.150	418.5	17.74	.9572
CD	23.110	1.183	.134	.151	471.8	19.44	.8877
IN	24.141	1.030	.126	.152	529.6	21.25	.8245
SN	25.195	.8999	.118	.153	591.9	23.14	.7669

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	.7797	.110	.154	664.1	25.29	.7105
TE	27.472	.6836	.103	.155	736.2	27.38	.6625
J	28.612	.6007	.096	.156	812.7	29.54	.6185
XE	29.779	.5289	.090	.156	893.6	31.80	.5780
CS	30.973	.4667	.085	.157	978.5	34.11	.5409
BA	32.194	.4126	.080	.157	1067.	36.48	.5067
LA	33.442	.3654	.075	.158	1159.	38.88	.4752
CE	34.720	.3242	.070	.158	1254.	41.31	.4460
PR	36.026	.2881	.066	.158	1352.	43.77	.4191
ND	37.361	.2565	.062	.158	1452.	46.22	.3941
PM	38.725	.2288	.059	.158	1554.	48.67	.3710
SM	40.118	.2043	.055	.158	1658.	51.11	.3495
EU	41.542	.1828	.052	.158	1762.	53.51	.3294
GD	42.996	.1638	.049	.158	1867.	55.87	.3110
TB	44.482	.1469	.046	.158	1972.	58.18	.2937
DY	45.998	.1320	.044	.158	2077.	60.44	.2776
HO	47.547	.1187	.041	.158	2181.	62.63	.2626
ER	49.128	.1069	.039	.157	2284.	64.75	.2485
TM	50.742	.0964	.037	.157	2386.	66.79	.2353
YB	52.389	.0871	.035	.157	2486.	68.75	.2230
LU	54.070	.0787	.033	.156	2585.	70.63	.2115
HF	55.790	.0712	.031	.156	2682.	72.43	.2007
TA	57.532	.0646	.030	.155	2776.	74.13	.1906
W	59.318	.0586	.028	.155	2869.	75.75	.1810
RE	61.140	.0532	.027	.154	2959.	77.29	.1721
OS	63.001	.0483	.025	.154	3047.	78.75	.1636
IR	64.896	.0440	.024	.153	3132.	80.12	.1557
PT	66.832	.0400	.023	.153	3216.	81.42	.1482
AU	68.804	.0365	.021	.152	3297.	82.63	.1411
HG	70.819	.0333	.020	.152	3376.	83.78	.1345
TL	72.872	.0304	.019	.151	3453.	84.85	.1282
PB	74.969	.0278	.018	.150	3528.	85.84	.1222
BI	77.108	.0254	.017	.150	3601.	86.80	.1166
PO	79.290	.0232	.017	.149	3672.	87.68	.1113
RN	83.780	.0195	.015	.148	3808.	89.27	.1015
RA	88.470	.0164	.014	.146	3939.	90.64	.0926
AC	90.804	.0151	.013	.145	4001.	91.29	.0886
TH	93.350	.0139	.012	.144	4063.	91.87	.0847
PA	95.868	.0127	.012	.144	4124.	92.42	.0810
U	98.439	.0117	.011	.143	4183.	92.93	.0775

FERRIC OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	7144.	3.948	.008	.097	.0075	426.4
MG	1.254	4535.	3.447	.011	.153	.0753	317.6
AL	1.487	2963.	3.306	.014	.234	.1149	241.5
SI	1.740	1974.	3.307	.018	.350	.1461	187.9
P	2.013	1394.	3.191	.022	.512	.2374	147.3
S	2.307	942.0	3.051	.026	.733	.3256	117.6
CL	2.622	669.0	2.896	.030	1.031	.4352	95.23
AR	2.957	482.9	2.730	.035	1.427	.5644	77.96
K	3.313	345.6	2.564	.040	1.946	.7318	64.50
CA	3.690	262.1	2.399	.045	2.619	.9235	53.04
SC	4.089	198.7	2.238	.050	3.463	1.149	45.33
TI	4.509	149.2	2.085	.054	4.578	1.412	38.46
V	4.950	116.4	1.938	.058	5.954	1.715	32.88
CR	5.412	88.52	1.800	.066	7.668	2.062	28.28
MN	5.895	69.08	1.671	.068	9.787	2.458	24.48
FE	6.400	54.35	1.550	.073	12.38	2.897	21.31
CO	6.925	43.09	1.437	.077	15.53	3.393	18.66
NI	7.472	290.2	1.332	.081	2.650	.5623	16.39
CU	8.041	214.9	1.235	.085	3.285	.6104	14.48
ZN	8.631	178.9	1.146	.089	3.866	.6852	12.84
GA	9.243	149.6	1.063	.093	4.504	.7463	11.43
GE	9.876	125.6	.986	.097	5.471	.8565	10.21
AS	10.532	105.0	.916	.100	6.487	.9564	9.161
SE	11.209	89.50	.850	.103	7.663	1.056	8.261
BR	11.909	75.93	.790	.106	9.021	1.166	7.430
KR	12.632	64.63	.735	.109	10.58	1.284	6.725
RB	13.375	55.21	.683	.112	12.37	1.420	6.101
SR	14.143	47.30	.636	.115	14.42	1.562	5.540
Y	14.933	40.64	.593	.117	16.74	1.716	5.058
ZR	15.747	35.01	.552	.119	19.42	1.842	4.620
NB	16.584	30.25	.515	.122	22.43	2.060	4.230
MO	17.444	26.71	.480	.124	25.85	2.253	3.881
TC	18.328	22.76	.449	.126	29.70	2.460	3.567
RU	19.236	19.81	.419	.128	34.03	2.683	3.284
RH	20.169	17.24	.392	.129	38.90	2.923	3.039
PD	21.125	15.12	.366	.131	44.35	3.181	2.799
AG	22.105	13.26	.343	.132	50.45	3.450	2.591
CD	23.110	11.65	.321	.134	57.25	3.756	2.401
IN	24.141	10.25	.301	.135	64.81	4.074	2.229
SN	25.195	9.069	.282	.136	73.21	4.414	2.072

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	7.924	.263	.137	83.24	4.811	1.910
TE	27.472	7.016	.247	.138	93.67	5.207	1.787
J	28.612	6.219	.232	.139	105.1	5.631	1.667
XE	29.779	5.524	.218	.140	117.8	6.084	1.557
CS	30.973	4.915	.205	.141	131.7	6.567	1.456
BA	32.194	4.380	.193	.141	147.0	7.083	1.363
LA	33.442	3.910	.181	.142	163.7	7.633	1.277
CE	34.720	3.495	.171	.142	181.9	8.219	1.197
PR	36.026	3.129	.161	.143	201.9	8.843	1.124
ND	37.361	2.805	.151	.143	223.5	9.506	1.056
PM	38.725	2.510	.163	.144	247.0	10.20	.9930
SM	40.118	2.264	.135	.144	272.5	10.95	.9355
EU	41.542	2.030	.127	.144	300.1	11.73	.8813
GD	42.996	1.837	.120	.144	329.0	12.54	.8309
TB	44.482	1.657	.113	.144	361.8	13.44	.7846
DY	45.998	1.497	.107	.144	394.2	14.37	.7403
HO	47.547	1.354	.101	.144	435.1	15.34	.6986
ER	49.128	1.226	.096	.144	472.5	16.36	.6615
TM	50.742	1.112	.091	.144	516.4	17.42	.4259
YB	52.389	1.099	.086	.144	559.3	18.54	.5986
LU	54.070	.9160	.081	.144	606.9	19.71	.5615
HF	55.790	.8335	.077	.144	657.5	20.92	.5322
TA	57.532	.7590	.073	.144	710.6	22.18	.5050
W	59.318	.6915	.069	.144	766.8	23.49	.4792
RE	61.140	.6364	.065	.143	824.1	24.84	.4551
OS	63.001	.5735	.062	.143	888.5	26.24	.4304
IR	64.894	.5250	.059	.143	953.3	27.68	.4110
PT	66.832	.4807	.056	.142	1021.	29.16	.3909
AU	68.804	.4390	.053	.142	1092.	30.68	.3719
HG	70.819	.4027	.050	.142	1166.	32.23	.3540
TL	72.872	.3691	.048	.141	1242.	33.82	.3372
PB	74.969	.3385	.045	.141	1322.	35.44	.3212
BI	77.100	.3106	.043	.140	1404.	37.08	.3062
PO	79.290	.2852	.041	.140	1488.	38.75	.2919
RN	83.700	.2611	.037	.139	1463.	42.12	.2657
RA	86.070	.2042	.033	.138	1844.	45.54	.2442
AC	90.884	.1801	.032	.137	1943.	47.28	.2313
TH	93.350	.1733	.030	.136	2039.	49.00	.2210
PA	95.848	.1598	.029	.134	2137.	50.71	.2112
U	98.439	.1474	.027	.135	2234.	52.42	.2019

FERROUS OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	7498.	3.550	.008	.097	.0074	446.9
MG	1.254	4754.	3.413	.011	.146	.0742	336.4
AL	1.487	3102.	3.597	.014	.223	.1162	250.1
SI	1.740	2077.	3.422	.017	.355	.1784	201.6
P	2.013	1423.	3.404	.021	.484	.2001	159.6
S	2.307	994.5	3.259	.025	.675	.3291	128.2
CL	2.622	707.6	3.096	.030	.976	.0390	106.2
AR	2.957	511.2	2.929	.034	1.348	.5732	85.05
K	3.313	376.8	2.748	.039	1.836	.7380	71.09
CA	3.690	278.2	2.579	.043	2.448	.0918	59.40
SC	4.089	209.0	2.404	.048	3.278	1.159	50.21
TI	4.509	158.7	2.240	.052	4.305	1.093	42.69
V	4.950	121.7	2.004	.057	5.594	1.727	36.55
CR	5.412	94.30	1.936	.061	7.190	2.074	31.44
MN	5.895	73.44	1.700	.066	9.180	2.448	27.28
FE	6.400	57.99	1.660	.070	11.68	2.918	23.77
CO	6.925	46.00	1.548	.074	14.55	3.000	20.81
NI	7.472	290.0	1.436	.078	2.606	.5255	18.31
CU	8.041	237.7	1.332	.082	2.899	.5913	16.18
ZN	8.631	197.9	1.235	.086	3.078	.6631	14.35
GA	9.243	165.5	1.146	.090	4.156	.7011	12.78
GE	9.876	138.9	1.064	.093	4.946	.8554	11.42
AS	10.532	117.1	.988	.098	5.846	.9177	10.26
SE	11.209	99.06	.918	.100	6.980	1.017	9.216
BR	11.909	84.08	.853	.103	8.193	1.126	8.313
KR	12.632	71.58	.795	.106	9.567	1.241	7.519
RB	13.375	61.13	.739	.108	11.18	1.366	6.821
SR	14.143	52.38	.688	.111	13.03	1.491	6.202
Y	14.933	45.01	.648	.113	15.16	1.607	5.652
ZR	15.747	38.78	.597	.116	17.57	1.804	5.162
NB	16.584	33.51	.557	.118	20.27	1.973	4.720
MO	17.444	29.03	.520	.120	23.34	2.155	4.333
TC	18.328	25.21	.484	.122	26.84	2.350	3.981
RU	19.236	21.95	.453	.124	30.76	2.560	3.664
RH	20.169	19.16	.424	.125	35.16	2.784	3.379
PD	21.125	16.76	.396	.127	40.19	3.070	3.121
AG	22.105	14.69	.371	.128	45.61	3.287	2.887
CD	23.110	12.91	.347	.130	51.71	3.545	2.675
IN	24.141	11.36	.326	.131	58.62	3.843	2.482
SN	25.195	10.02	.305	.132	66.2	4.182	2.304

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	8.781	.285	.134	75.33	4.550	2.134
TE	27.472	7.773	.268	.135	84.78	4.919	1.987
J	28.612	6.893	.251	.136	95.21	5.313	1.853
XE	29.779	6.123	.236	.136	106.7	5.734	1.736
CS	30.973	5.448	.222	.137	119.3	6.185	1.617
BA	32.194	4.855	.209	.138	133.2	6.662	1.512
LA	33.442	4.334	.196	.139	148.4	7.172	1.417
CE	34.720	3.874	.185	.139	165.0	7.716	1.328
PR	36.026	3.468	.174	.140	183.2	8.296	1.246
ND	37.361	3.110	.164	.140	203.0	8.907	1.171
PM	38.725	2.792	.155	.140	224.5	9.559	1.100
SM	40.118	2.510	.146	.141	247.8	10.28	1.035
EU	41.542	2.259	.138	.141	273.0	11.04	.9753
GD	42.996	2.036	.130	.141	300.3	11.75	.9191
TB	44.482	1.838	.123	.142	329.7	12.54	.8669
DY	45.998	1.660	.116	.142	361.3	13.62	.8182
HO	47.547	1.502	.110	.142	395.3	14.33	.7729
ER	49.128	1.360	.104	.142	431.6	15.20	.7305
TM	50.742	1.233	.098	.142	470.5	16.27	.6909
YB	52.389	1.119	.093	.142	512.1	17.32	.6539
LU	54.070	1.016	.088	.142	556.2	18.41	.6193
HF	55.790	.9242	.083	.142	603.3	19.55	.5868
TA	57.532	.8410	.079	.141	662.8	20.73	.5565
W	59.318	.7648	.075	.141	706.6	21.96	.5279
RE	61.140	.6979	.071	.141	760.8	23.28	.5011
OS	63.001	.6382	.067	.141	819.2	24.56	.4759
IR	64.894	.5830	.064	.141	880.5	25.93	.4523
PT	66.832	.5336	.060	.140	944.8	27.34	.4309
AU	68.804	.4877	.057	.140	1011.	28.79	.4094
HG	70.819	.4466	.054	.140	1082.	30.27	.3891
TL	72.872	.4093	.052	.139	1156.	31.80	.3705
PB	74.969	.3753	.049	.139	1230.	33.39	.3538
BI	77.100	.3444	.047	.138	1309.	34.94	.3382
PO	79.290	.3163	.044	.138	1390.	36.55	.3206
RN	83.700	.2673	.041	.137	1559.	39.93	.2915
RA	86.070	.2264	.036	.136	1730.	43.29	.2665
AC	90.884	.2084	.034	.135	1831.	44.94	.2535
TH	93.350	.1927	.033	.135	1925.	46.60	.2421
PA	95.848	.1772	.031	.134	2021.	48.30	.2313
U	98.439	.1635	.030	.134	2119.	50.00	.2210

MAGNESIUM OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	2177.	1.060	.012	.318	.0859	158.0
MG	1.254	1323.	1.043	.016	.523	.1402	118.6
AL	1.487	3046.	1.793	.020	.227	.0594	60.71
SI	1.740	2067.	1.719	.026	.335	.0843	70.48
P	2.013	1427.	1.631	.029	.485	.1162	55.57
S	2.307	1001.	1.535	.035	.691	.1564	44.41
CL	2.622	713.7	1.436	.040	.964	.2044	35.93
AR	2.957	515.6	1.330	.046	1.341	.2676	29.40
K	3.313	377.2	1.242	.051	1.831	.3415	24.20
CA	3.690	279.1	1.169	.057	2.473	.4502	20.26
SC	4.089	208.0	1.062	.062	3.301	.5354	17.02
TI	4.509	157.8	.979	.068	4.342	.6591	14.42
V	4.950	120.5	.903	.073	5.706	.8035	12.31
CR	5.412	92.84	.832	.079	7.393	.9710	10.57
MN	5.895	72.12	.766	.084	9.494	1.164	9.139
FE	6.408	56.49	.705	.089	12.09	1.386	7.944
CO	6.925	44.59	.650	.094	15.29	1.639	6.941
NI	7.472	35.44	.599	.098	19.17	1.928	6.094
CU	8.041	28.36	.552	.103	23.68	2.255	5.375
ZN	8.631	22.84	.509	.107	29.54	2.624	4.761
GA	9.243	18.51	.470	.111	36.29	3.041	4.234
GE	9.876	15.08	.434	.115	44.32	3.500	3.779
AS	10.532	12.36	.401	.118	53.86	4.029	3.385
SE	11.209	10.18	.371	.122	64.93	4.611	3.042
BR	11.909	8.426	.343	.125	77.93	5.260	2.742
KR	12.632	7.003	.317	.128	93.05	5.980	2.478
RB	13.375	5.849	.294	.131	110.4	6.775	2.247
SR	14.145	4.905	.273	.134	130.4	7.651	2.042
Y	14.933	4.129	.253	.136	153.4	8.610	1.860
ZR	15.747	3.489	.235	.138	179.6	9.672	1.698
NB	16.584	2.959	.219	.141	208.8	10.82	1.554
MO	17.444	2.518	.203	.143	242.0	12.08	1.425
TC	18.328	2.150	.189	.145	279.0	13.43	1.309
RU	19.236	1.841	.176	.146	320.2	14.90	1.205
RH	20.169	1.582	.164	.148	365.8	16.48	1.111
PD	21.125	1.363	.153	.149	415.9	18.16	1.026
AG	22.105	1.178	.143	.151	470.7	19.95	.9508
CD	23.110	1.021	.134	.152	530.3	21.85	.8802
IN	24.141	.8874	.125	.153	594.7	23.86	.8160
SN	25.195	.7729	.117	.154	663.9	25.96	.7592

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	.6680	.109	.155	743.6	28.32	.7008
TE	27.472	.5844	.102	.156	822.9	30.62	.6540
J	28.612	.5123	.096	.157	906.6	32.90	.6100
XE	29.779	.4501	.090	.157	996.6	35.62	.5700
CS	30.973	.3963	.084	.158	1086.	37.98	.5330
BA	32.194	.3496	.079	.158	1181.	40.42	.4983
LA	33.442	.3090	.074	.159	1279.	42.90	.4670
CE	34.720	.2736	.070	.159	1380.	45.52	.4380
PR	36.026	.2427	.066	.159	1482.	48.07	.4120
ND	37.361	.2157	.062	.159	1587.	50.61	.3872
PM	38.725	.1920	.058	.159	1692.	53.12	.3642
SM	40.118	.1712	.055	.160	1798.	55.50	.3439
EU	41.542	.1520	.052	.160	1904.	58.00	.3231
GD	42.996	.1367	.049	.159	2010.	60.35	.3067
TB	44.482	.1229	.046	.159	2115.	62.63	.2876
DY	45.998	.1098	.043	.159	2219.	64.84	.2716
HO	47.547	.0986	.041	.159	2322.	66.96	.2567
ER	49.128	.0847	.039	.159	2423.	68.99	.2420
TM	50.742	.0754	.036	.159	2522.	70.99	.2290
YB	52.389	.0720	.034	.158	2618.	72.79	.2177
LU	54.070	.0650	.033	.158	2713.	74.55	.2065
HF	55.790	.0587	.031	.158	2805.	76.22	.1954
TA	57.532	.0532	.029	.157	2895.	77.79	.1854
W	59.318	.0482	.028	.157	2982.	79.28	.1762
RE	61.140	.0437	.026	.156	3067.	80.67	.1670
OS	63.001	.0396	.025	.156	3149.	81.99	.1591
IR	64.896	.0360	.023	.155	3229.	83.22	.1513
PT	66.832	.0328	.022	.155	3306.	84.37	.1440
AU	68.808	.0298	.021	.154	3381.	85.45	.1378
HG	70.819	.0272	.020	.153	3454.	86.45	.1305
TL	72.872	.0248	.019	.153	3525.	87.39	.1243
HB	74.969	.0226	.018	.152	3594.	88.27	.1185
BI	77.108	.0207	.017	.152	3661.	89.08	.1130
PO	79.290	.0189	.016	.151	3726.	89.84	.1078
RN	83.760	.0158	.015	.149	3851.	91.20	.0982
RA	88.470	.0133	.013	.148	3976.	92.38	.0898
AC	90.884	.0122	.013	.147	4028.	92.91	.0854
TH	93.350	.0112	.012	.147	4084.	93.40	.0818
PA	95.868	.0103	.011	.146	4139.	93.85	.0782
U	98.439	.0095	.011	.145	4194.	94.27	.0748

CALCIUM OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	4572.	2.684	.012	.158	.0616	217.7
MG	1.254	2702.	2.711	.016	.256	.1008	169.1
AL	1.487	1725.	2.682	.020	.401	.1563	133.2
SI	1.740	1135.	2.611	.025	.610	.2315	106.2
P	2.013	763.8	2.511	.029	.908	.3314	85.71
S	2.307	526.1	2.393	.034	1.311	.4591	69.40
CL	2.622	369.6	2.264	.039	1.846	.6192	57.58
AR	2.957	266.2	2.130	.044	2.602	.8161	47.86
K	3.313	191.0	1.995	.050	3.576	1.054	40.12
CA	3.690	141.5	1.862	.055	4.859	1.338	33.88
SC	4.089	763.4	1.734	.060	.906	.2345	28.81
TI	4.509	593.0	1.611	.065	1.166	.2820	24.66
V	4.950	464.5	1.495	.070	1.487	.3359	21.24
CR	5.412	366.7	1.386	.075	1.882	.3969	18.40
MN	5.895	291.6	1.284	.080	2.365	.4656	16.03
FE	6.408	233.6	1.189	.085	2.951	.5429	14.03
CO	6.925	188.3	1.101	.089	3.658	.6288	12.34
NI	7.472	152.7	1.019	.094	4.506	.7251	10.89
CU	8.041	124.6	.944	.098	5.515	.8285	9.665
ZN	8.631	102.2	.874	.102	6.713	.9440	8.601
GA	9.243	84.36	.810	.105	8.128	1.073	7.683
GE	9.876	69.98	.750	.109	9.790	1.213	6.886
AS	10.532	58.24	.696	.112	11.73	1.368	6.191
SE	11.209	48.73	.646	.116	14.01	1.537	5.583
BR	11.909	41.09	.599	.119	16.63	1.723	5.048
KR	12.632	34.53	.556	.122	19.68	1.925	4.576
RB	13.375	29.25	.517	.124	23.18	2.145	4.159
SR	14.145	24.86	.481	.127	27.21	2.386	3.789
Y	14.933	21.20	.447	.129	31.81	2.647	3.459
ZR	15.747	18.16	.417	.132	37.07	2.931	3.165
NB	16.584	15.58	.388	.134	43.06	3.240	2.902
MO	17.444	13.41	.362	.136	49.81	3.574	2.665
TC	18.328	11.59	.337	.138	57.45	3.937	2.452
RU	19.236	10.03	.315	.139	66.05	4.329	2.261
RH	20.169	8.716	.294	.141	75.72	4.752	2.087
PD	21.125	7.592	.275	.142	86.54	5.210	1.930
AG	22.105	6.627	.257	.144	98.61	5.702	1.788
CD	23.110	5.800	.241	.145	112.0	6.233	1.658
IN	24.141	5.087	.225	.146	126.9	6.803	1.540
SN	25.195	4.472	.211	.147	143.4	7.416	1.433

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	3.902	.197	.148	163.1	8.124	1.327
TE	27.472	3.444	.185	.149	183.4	8.834	1.237
J	28.612	3.045	.173	.150	205.7	9.593	1.154
XE	29.779	2.697	.163	.151	230.2	10.40	1.079
CS	30.973	2.394	.153	.151	256.8	11.26	1.009
BA	32.194	2.128	.144	.152	286.9	12.18	.9451
LA	33.442	1.896	.135	.152	317.4	13.15	.8859
CE	34.720	1.691	.127	.153	351.6	14.19	.8311
PR	36.026	1.511	.119	.153	388.5	15.28	.7804
ND	37.361	1.352	.113	.153	428.3	16.43	.7335
PM	38.725	1.212	.106	.154	471.0	17.64	.6900
SM	40.118	1.087	.100	.154	516.6	18.91	.6498
EU	41.542	.9777	.094	.154	565.6	20.24	.6121
GD	42.996	.8800	.089	.154	617.3	21.62	.5771
TB	44.482	.7930	.084	.154	672.3	23.07	.5446
DY	45.998	.7155	.079	.154	730.6	24.57	.5143
HO	47.547	.6466	.075	.154	792.0	26.13	.4860
ER	49.128	.5847	.071	.154	856.5	27.74	.4596
TM	50.742	.5295	.067	.154	924.2	29.40	.4349
YB	52.389	.4800	.063	.153	994.9	31.10	.4110
LU	54.070	.4356	.060	.153	1068.	32.84	.3905
HF	55.790	.3956	.057	.153	1145.	34.62	.3697
TA	57.532	.3600	.054	.153	1224.	36.42	.3508
W	59.318	.3277	.051	.152	1305.	38.26	.3329
RE	61.140	.2986	.048	.152	1389.	40.12	.3161
OS	63.001	.2723	.046	.152	1476.	42.01	.3003
IR	64.896	.2486	.043	.151	1564.	43.88	.2856
PT	66.832	.2271	.041	.151	1654.	45.78	.2714
AU	68.808	.2077	.039	.150	1746.	47.67	.2582
HG	70.819	.1901	.037	.150	1839.	49.56	.2450
TL	72.872	.1741	.035	.149	1933.	51.43	.2341
HB	74.969	.1595	.033	.149	2028.	53.30	.2230
BI	77.108	.1463	.032	.148	2124.	55.16	.2125
PO	79.290	.1343	.030	.148	2221.	56.95	.2026
RN	83.760	.1136	.027	.147	2418.	60.49	.1843
RA	88.470	.0960	.024	.145	2607.	63.89	.1679
AC	90.884	.0884	.023	.145	2703.	65.53	.1603
TH	93.350	.0816	.022	.144	2799.	67.12	.1532
PA	95.868	.0750	.021	.143	2896.	68.67	.1463
U	98.439	.0692	.020	.143	2988.	70.17	.1399

SODIUM OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC

POTASSIUM OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC

..

WATER

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3801.	1.508	.015	.100	.0013	183.5
MG	1.254	2859.	1.437	.020	.307	.0044	73.09
AL	1.487	1927.	1.351	.025	.405	.0044	52.99
SI	1.740	985.5	1.256	.032	.748	.1393	39.44
P	2.013	610.2	1.165	.039	1.126	.1955	30.08
S	2.307	416.3	1.072	.046	1.660	.2679	23.26
CL	2.622	287.6	.984	.054	2.401	.3593	18.34
AR	2.957	202.1	.900	.061	3.412	.4732	14.67
K	3.313	144.3	.822	.069	4.772	.613%	11.90
CA	3.690	104.6	.750	.077	6.582	.7853	9.761
SC	4.089	76.66	.684	.085	8.956	.9920	8.091
TI	4.509	56.91	.624	.092	12.02	1.241	6.772
V	4.950	42.75	.569	.099	15.94	1.530	5.718
CR	5.412	32.65	.519	.107	20.95	1.809	4.867
MN	5.895	25.09	.473	.113	27.21	2.301	4.173
FE	6.400	19.25	.432	.120	34.99	2.708	3.603
CO	6.925	15.02	.395	.124	44.57	3.352	3.129
NI	7.472	11.82	.361	.132	56.26	4.007	2.734
CU	8.041	9.376	.331	.138	70.44	4.741	2.401
ZN	8.631	7.487	.303	.143	87.34	5.627	2.119
GA	9.243	6.019	.278	.148	107.5	6.615	1.879
GE	9.876	4.870	.256	.153	131.3	7.736	1.673
AS	10.532	3.963	.235	.157	159.1	9.003	1.495
SE	11.209	3.244	.216	.161	191.4	10.42	1.341
BR	11.909	2.668	.199	.165	228.5	12.08	1.207
KR	12.632	2.208	.184	.168	270.9	13.76	1.091
RB	13.375	1.833	.176	.172	318.7	15.68	.9982
SR	14.163	1.530	.157	.175	372.3	17.79	.897P
Y	14.933	1.282	.165	.177	431.9	20.07	.8177
ZR	15.767	1.079	.154	.180	497.5	22.52	.7447
NB	16.584	.9120	.124	.182	569.0	25.13	.6835
MO	17.444	.7733	.115	.184	648.3	27.89	.6270
TC	18.328	.6581	.107	.186	729.8	30.77	.5765
RU	19.236	.5620	.099	.187	816.7	33.77	.5310
RH	20.169	.4815	.092	.189	909.0	36.85	.4901
PD	21.125	.4138	.086	.190	1005.	40.40	.4532
AG	22.105	.3567	.084	.191	1104.	43.17	.4190
CD	23.110	.3083	.075	.192	1205.	44.36	.3895
IN	24.141	.2673	.070	.193	1309.	49.52	.3620
SN	25.195	.2323	.065	.193	1413.	52.64	.3369

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	.2003	.060	.194	1525.	55.92	.3123
TE	27.472	.1749	.057	.194	1628.	58.89	.2916
J	28.612	.1531	.053	.194	1731.	61.75	.2723
XE	29.779	.1343	.050	.194	1832.	64.49	.2547
CS	30.973	.1180	.046	.194	1931.	67.11	.2386
BA	32.194	.1040	.043	.194	2027.	69.58	.2237
LA	33.442	.0918	.041	.194	2121.	71.92	.2100
CE	34.720	.0811	.038	.194	2211.	74.11	.1973
PR	36.026	.0719	.036	.194	2299.	76.16	.1854
ND	37.361	.0638	.034	.193	2383.	78.04	.1747
PM	38.725	.0567	.032	.193	2464.	79.83	.1647
SM	40.118	.0505	.030	.192	2541.	81.47	.1553
EU	41.542	.0451	.028	.192	2616.	82.99	.1466
GD	42.996	.0402	.026	.191	2688.	84.38	.1385
TB	44.482	.0369	.025	.190	2757.	85.67	.1310
DY	45.998	.0323	.024	.190	2823.	86.85	.1239
HO	47.547	.0290	.022	.189	2887.	87.93	.1174
ER	49.128	.0260	.021	.188	2948.	88.93	.1112
TM	50.742	.0234	.020	.187	3008.	89.84	.1054
YB	52.389	.0211	.019	.186	3065.	90.67	.1001
LU	54.070	.0190	.018	.185	3120.	91.43	.0950
HF	55.790	.0172	.017	.185	3174.	92.13	.0902
TA	57.532	.0155	.016	.184	3226.	92.76	.0858
W	59.318	.0141	.015	.183	3277.	93.35	.0816
RE	61.140	.0127	.014	.182	3326.	93.88	.0777
OS	63.001	.0116	.013	.180	3374.	94.37	.0739
IR	64.896	.0105	.013	.179	3422.	94.81	.0704
PT	66.832	.0095	.012	.178	3468.	95.22	.0671
AU	68.804	.0087	.011	.177	3513.	95.59	.0640
HG	70.819	.0079	.011	.176	3558.	95.94	.0611
TL	72.872	.0072	.010	.175	3602.	96.25	.0583
PB	74.969	.0066	.010	.174	3645.	96.54	.0556
BI	77.108	.0060	.009	.173	3688.	96.80	.0531
PO	79.290	.0055	.009	.172	3730.	97.06	.0508
RN	83.780	.0046	.008	.169	3814.	97.47	.0466
RA	88.470	.0039	.007	.167	3897.	97.83	.0426
AC	90.884	.0035	.007	.166	3938.	97.99	.0406
TH	93.350	.0032	.006	.165	3979.	98.13	.0389
PA	95.868	.0030	.006	.163	4020.	98.27	.0372
U	98.439	.0027	.006	.162	4061.	98.39	.0357

TITANIUM OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	5012.	2.605	.009	.138	.0521	281.9
MG	1.254	3101.	2.616	.012	.223	.0847	209.8
AL	1.487	1981.	2.575	.016	.349	.1306	159.3
SI	1.740	1382.	2.494	.020	.531	.1928	123.2
P	2.013	877.6	2.393	.025	.788	.2747	96.96
S	2.307	606.6	2.273	.029	1.142	.3795	77.35
CL	2.622	424.5	2.146	.034	1.624	.5108	62.53
AR	2.957	303.4	2.018	.039	2.209	.6722	51.16
K	3.313	220.3	1.893	.045	3.119	.8675	42.28
CA	3.690	162.1	1.755	.050	4.227	1.100	35.27
SC	4.089	120.9	1.632	.055	5.653	1.375	29.68
TI	4.509	91.26	1.515	.060	7.446	1.698	25.18
V	4.950	69.64	1.406	.065	9.747	2.046	21.52
CR	5.412	356.7	1.301	.070	1.935	.382n	18.51
MN	5.895	285.6	1.204	.075	2.416	.4457	16.02
FE	6.400	230.2	1.116	.080	2.995	.5158	13.99
CO	6.925	186.6	1.031	.084	3.691	.5937	12.21
NI	7.472	152.2	.956	.089	4.522	.6800	10.73
CU	8.041	124.8	.882	.093	5.511	.7755	9.487
ZN	8.631	102.8	.817	.097	6.679	.8807	8.418
GA	9.243	85.19	.757	.101	8.055	.9946	7.498
AS	10.532	59.24	.650	.108	11.55	1.282	6.014
SE	11.209	49.73	.603	.111	13.74	1.415	5.413
BR	11.909	41.90	.560	.114	16.27	1.582	4.886
KR	12.632	35.63	.519	.117	19.21	1.768	4.423
RB	13.375	30.09	.482	.120	22.58	1.963	4.015
SR	14.163	25.66	.449	.123	26.44	2.179	3.656
Y	14.933	21.91	.417	.125	30.86	2.415	3.333
ZR	15.767	18.79	.388	.127	35.89	2.671	3.047
NB	16.584	16.16	.362	.130	41.60	2.950	2.792
MO	17.444	13.94	.337	.132	48.08	3.252	2.565
TC	18.328	12.06	.315	.135	55.38	3.580	2.358
RU	19.236	10.46	.294	.135	63.61	3.934	2.173
RH	20.169	9.114	.274	.137	72.86	4.318	2.006
PD	21.125	7.938	.256	.138	83.17	4.733	1.855
AG	22.105	6.939	.240	.140	94.71	5.181	1.718
CD	23.110	6.079	.224	.141	107.5	5.663	1.595
IN	24.141	5.336	.210	.142	121.8	6.183	1.480
SN	25.195	4.698	.197	.143	137.5	6.741	1.377

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	4.104	.184	.144	156.4	7.387	1.275
TE	27.472	3.625	.172	.145	175.8	8.036	1.189
J	28.612	3.208	.162	.145	197.1	8.731	1.110
XE	29.779	2.844	.152	.146	220.6	9.474	1.038
CS	30.973	2.526	.142	.147	246.1	10.26	.9713
BA	32.194	2.247	.134	.147	274.0	11.11	.9098
LA	33.442	2.003	.126	.148	304.4	12.00	.8531
CE	34.720	1.780	.118	.148	337.3	12.96	.8007
PR	36.026	1.590	.111	.148	372.9	13.97	.7522
ND	37.361	1.431	.105	.148	411.3	15.03	.7073
PM	38.725	1.283	.099	.148	452.6	16.16	.6657
SM	40.118	1.152	.093	.148	496.0	17.36	.6270
EU	41.542	1.036	.088	.148	544.3	18.54	.5911
GD	42.996	.9334	.083	.148	596.0	19.88	.5577
TB	44.482	.8416	.078	.148	648.6	21.24	.5265
DY	45.998	.7607	.074	.148	705.6	22.65	.4975
HO	47.547	.6886	.070	.148	765.0	24.12	.4704
ER	49.128	.6213	.066	.148	829.5	25.66	.4451
TM	50.742	.5628	.062	.148	896.1	27.21	.4214
YB	52.389	.5104	.059	.148	966.3	28.83	.3992
LU	54.070	.4634	.056	.148	1039.	30.56	.3784
HF	55.790	.4210	.053	.147	1116.	32.21	.3580
TA	57.532	.3832	.050	.147	1196.	33.96	.3407
W	59.318	.3489	.047	.147	1276.	35.71	.3235
RE	61.140	.3180	.045	.146	1361.	37.52	.3074
OS	63.001	.2901	.043	.146	1449.	39.36	.2922
IR	64.896	.2649	.060	.145	1538.	41.18	.2770
PT	66.832	.2421	.038	.145	1630.	43.04	.2644
AU	68.804	.2215	.036	.144	1724.	44.90	.2517
HG	70.819	.2027	.034	.144	1819.	46.77	.2397
TL	72.872	.1857	.033	.143	1916.	48.63	.2284
PB	74.969	.1703	.031	.143	2015.	50.48	.2177
BI	77.108	.1562	.029	.142	2115.	52.33	.2076
PO	79.290	.1434	.028	.141	2215.	54.15	.1980
RN	83.780	.1212	.025	.140	2418.	57.72	.1806
RA	88.470	.1026	.023	.139	2622.	61.10	.1665
AC	90.884	.0945	.022	.138	2724.	62.80	.1572
TH	93.350	.0875	.021	.137	2827.	64.50	.1502
PA	95.868	.0812	.020	.137	2928.	66.10	.1436
U	98.439	.0740	.019	.136	3020.	67.69	.1373

PHOSPHORUS PENTOXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3119.	1.939	.010	.222	.0626	206.7
MG	1.254	1894.	1.916	.013	.385	.1016	144.9
AL	1.487	1193.	1.857	.017	.500	.1568	107.3
SI	1.740	776.1	1.777	.022	.691	.2313	81.23
P	2.013	518.9	1.684	.027	1.331	.3206	62.68
S	2.307	1185.	1.583	.032	.584	.1361	49.20
CL	2.622	859.9	1.488	.036	.805	.1762	39.21
AR	2.957	631.7	1.378	.043	1.095	.2265	31.68
K	3.313	449.4	1.278	.049	1.472	.2820	25.94
CA	3.690	362.4	1.183	.055	1.966	.3501	21.60
SC	4.089	267.2	1.092	.061	2.583	.4299	17.84
TI	4.509	204.5	1.008	.067	3.372	.4227	15.03
V	4.950	157.9	.929	.073	4.361	.6302	12.75
CR	5.412	122.9	.856	.078	5.594	.7937	10.94
MN	5.895	96.50	.788	.084	7.118	.9953	9.389
FE	6.400	76.30	.726	.089	8.988	1.056	8.133
CO	6.925	60.75	.669	.094	11.26	1.240	7.006
NI	7.472	48.60	.616	.099	14.02	1.447	6.207
CU	8.041	39.27	.568	.104	17.35	1.681	5.444
ZN	8.631	31.86	.524	.108	21.33	1.945	4.832
GA	9.243	25.99	.483	.113	26.04	2.241	4.291
GE	9.876	21.32	.446	.117	31.67	2.572	3.827
AS	10.532	17.57	.413	.120	38.27	2.943	3.424
SE	11.209	14.56	.382	.124	46.00	3.355	3.075
BR	11.909	12.11	.353	.127	56.03	3.814	2.771
KR	12.632	10.12	.327	.131	65.52	4.324	2.503
RB	13.375	8.494	.303	.134	77.60	4.847	2.269
SR	14.143	7.156	.281	.136	91.51	5.510	2.062
Y	14.933	6.051	.261	.139	107.4	6.194	1.878
ZR	15.767	5.134	.242	.141	125.6	6.950	1.715
NB	16.584	4.372	.225	.143	146.2	7.776	1.570
MO	17.444	3.735	.210	.145	169.6	8.680	1.440
TC	18.328	3.201	.195	.147	195.6	9.664	1.323
RU	19.236	2.751	.182	.149	224.8	10.73	1.219
RH	20.169	2.371	.169	.151	257.6	11.89	1.129
PD	21.125	2.050	.158	.152	293.6	13.13	1.039
AG	22.105	1.777	.148	.153	333.4	14.44	.9623
CD	23.110	1.544	.130	.155	377.2	15.91	.8922
IN	24.141	1.345	.129	.156	425.1	17.45	.8286
SN	25.95	1.175	.121	.157	477.1	19.07	.7706

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	24.359	1.018	.112	.157	537.9	20.03	.7130
TE	27.472	.893	.105	.156	569.2	22.74	.6646
J	28.612	.7851	.099	.156	666.8	24.68	.6212
XE	29.779	.0916	.092	.156	734.9	26.68	.5864
CS	30.973	.0160	.087	.160	800.2	28.77	.5632
BA	32.194	.5393	.081	.160	807.7	30.03	.5000
LA	33.442	.0777	.077	.160	876.0	33.16	.4772
CE	34.720	.0230	.072	.161	1956.	35.62	.4670
PR	36.026	.3766	.060	.161	1145.	37.73	.4200
ND	37.361	.3353	.064	.161	1290.	40.40	.3900
PM	38.725	.2996	.060	.161	1334.	42.45	.3720
SM	40.118	.2670	.056	.161	1432.	44.43	.3510
EU	41.542	.2360	.053	.161	1531.	47.22	.3310
GD	42.996	.2130	.050	.160	1632.	49.50	.3120
TB	44.482	.1919	.067	.160	1736.	51.44	.2950
DY	45.998	.1723	.045	.160	1830.	54.25	.2700
HO	47.547	.1550	.042	.160	1943.	56.53	.2637
ER	49.128	.1396	.040	.159	2047.	58.76	.2496
TM	50.742	.1259	.038	.159	2151.	60.03	.2344
YB	52.389	.1136	.035	.159	2254.	63.06	.2281
LU	54.070	.1027	.034	.159	2354.	65.06	.2125
HF	55.790	.0929	.032	.157	2457.	67.05	.2016
TA	57.532	.0842	.030	.157	2556.	68.94	.1915
W	59.318	.0764	.028	.156	2606.	70.75	.1819
RE	61.140	.0693	.027	.156	2751.	72.44	.1739
OS	63.001	.0630	.025	.155	2845.	74.14	.1666
IR	64.896	.0573	.024	.154	2930.	75.71	.1564
PT	66.832	.0522	.023	.154	3020.	77.21	.1482
AU	68.806	.0475	.022	.153	3117.	78.62	.1418
HG	70.819	.0433	.021	.152	3205.	79.94	.1351
TL	72.872	.0394	.020	.152	3207.	81.22	.1280
PB	74.969	.0362	.019	.151	3376.	82.62	.1228
BI	77.108	.0331	.018	.150	3646.	83.56	.1172
PO	79.298	.0302	.017	.160	3629.	84.60	.1110
AT	83.700	.0254	.015	.160	3686.	84.52	.1026
RA	88.670	.0216	.016	.164	3624.	88.21	.0931
AC	90.606	.0196	.013	.165	3696.	88.54	.0086
TH	93.350	.0160	.012	.165	3862.	89.70	.0051
PA	95.868	.0166	.012	.166	3929.	90.37	.0016
U	98.030	.0152	.011	.163	3995.	91.00	.0770

MANGANEOUS OXIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	6977.	3.326	.009	.099	.0078	303.6
MG	1.254	4392.	3.377	.012	.159	.0778	291.6
AL	1.487	2803.	3.354	.015	.247	.1201	225.5
SI	1.740	1857.	3.280	.019	.373	.1773	177.1
P	2.013	1260.	3.106	.022	.548	.2523	131.1
S	2.307	874.4	3.026	.027	.790	.3479	113.9
CL	2.628	618.2	2.872	.031	1.116	.4673	92.44
AR	2.957	449.6	2.709	.035	1.549	.0134	76.65
K	3.313	324.7	2.544	.040	2.117	.7093	63.81
CA	3.690	240.3	2.380	.044	2.855	.9900	53.05
SC	4.089	180.1	2.221	.049	3.800	1.244	45.29
TI	4.509	136.6	2.068	.054	4.997	1.549	38.50
V	4.950	104.6	1.923	.058	6.497	1.857	33.09
CR	5.412	81.06	1.786	.063	8.362	2.230	28.45
MN	5.895	63.29	1.657	.067	10.66	2.651	24.78
FE	6.400	49.05	1.537	.071	13.46	3.126	21.62
CO	6.925	316.5	1.425	.075	2.180	.0718	18.95
NI	7.472	250.4	1.321	.079	2.667	.5390	16.49
CU	8.041	212.2	1.225	.083	3.246	.612	14.76
ZN	8.631	175.2	1.136	.087	3.929	.6931	13.11
GA	9.243	145.3	1.056	.090	4.731	.7809	11.68
GE	9.876	121.2	.978	.094	5.669	.8766	10.45
AS	10.532	101.4	.908	.097	6.763	.9803	9.378
SE	11.209	85.36	.843	.100	8.031	1.092	8.442
BR	11.909	72.08	.780	.103	9.489	1.214	7.620
KR	12.632	61.09	.728	.106	11.19	1.347	6.890
RB	13.375	51.99	.678	.108	13.13	1.489	6.249
SR	14.143	44.39	.631	.111	15.35	1.642	5.690
Y	14.933	38.03	.587	.113	17.89	1.808	5.191
ZR	15.767	32.69	.547	.115	20.78	1.987	4.743
NB	16.584	28.18	.510	.118	24.05	2.179	4.343
MO	17.444	24.37	.476	.120	27.76	2.384	3.986
TC	18.328	21.13	.445	.121	31.94	2.608	3.662
RU	19.236	18.37	.415	.123	36.64	2.847	3.372
RH	20.169	16.01	.388	.125	41.93	3.103	3.118
PD	21.125	13.99	.363	.126	47.84	3.378	2.876
AG	22.105	12.26	.340	.128	54.44	3.672	2.659
CD	23.110	10.76	.318	.129	61.79	3.987	2.464
IN	24.141	9.478	.298	.130	69.94	4.325	2.287
SN	25.105	8.360	.280	.131	79.02	4.666	2.124

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	24.359	7.320	.261	.133	88.85	5.102	1.967
TE	27.472	6.088	.245	.136	101.6	5.517	1.853
J	28.612	5.707	.236	.136	113.6	5.521	1.768
XE	29.779	5.107	.216	.135	126.9	6.035	1.596
CS	30.973	4.548	.203	.134	141.6	6.522	1.496
BA	32.194	4.053	.191	.137	158.2	7.077	1.396
LA	33.442	3.628	.180	.137	176.0	7.644	1.307
CE	34.720	3.238	.169	.138	195.5	8.095	1.226
PR	36.026	2.901	.159	.138	216.0	9.300	1.150
ND	37.361	2.603	.150	.139	239.6	9.082	1.081
PM	38.725	2.339	.141	.139	266.5	10.78	1.016
SM	40.118	2.105	.133	.139	291.5	11.44	.959
EU	41.542	1.896	.126	.140	320.5	12.27	.909
GD	42.996	1.711	.119	.140	351.0	13.12	.0091
TB	44.482	1.545	.112	.140	385.5	14.02	.840
DY	45.998	1.390	.106	.140	421.5	14.94	.7540
HO	47.547	1.240	.100	.140	440.1	15.90	.7161
ER	49.128	1.147	.095	.140	501.3	16.94	.6750
TM	50.742	1.041	.089	.140	509.1	18.04	.6305
YB	52.389	.9905	.085	.140	501.7	19.19	.6003
LU	54.070	.8809	.080	.140	603.1	20.36	.5772
HF	55.790	.7836	.076	.140	603.6	21.59	.5653
TA	57.532	.7164	.072	.140	760.5	22.05	.5144
W	59.318	.6517	.068	.140	800.5	24.16	.4909
RE	61.140	.5951	.065	.139	867.5	25.51	.4633
OS	63.001	.5438	.061	.139	931.5	26.91	.4449
IR	64.896	.4973	.058	.139	998.6	28.35	.4181
PT	66.832	.4533	.055	.139	1068.	29.83	.3973
AU	68.806	.4172	.052	.138	1108.	31.53	.3781
HG	70.819	.3825	.050	.138	1210.	32.08	.3590
TL	72.872	.3515	.047	.137	1296.	34.05	.3423
PB	74.969	.3223	.045	.137	1375.	36.00	.3200
BI	77.108	.2961	.042	.137	1450.	37.60	.3100
PO	79.298	.2723	.040	.136	1500.	39.33	.3003
AT	83.700	.2300	.036	.135	1722.	42.00	.2699
RA	88.670	.1960	.033	.134	1600.	40.05	.2493
AC	90.606	.1807	.031	.134	2000.	47.74	.2334
TH	93.350	.1567	.035	.133	2101.	44.03	.2734
PA	95.868	.1539	.028	.133	2200.	51.12	.2170
U	98.030	.1422	.027	.132	2300.	52.00	.2000

ZIRCONIUM OXIDE

K - ALFA(1+2) LINES

K - ALFA(1) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

CHROMIUM OXIDE

K - ALFA(1+2) LINES

K - ALFA(1) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

ANDESITE USGS-AGV-1

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3143.	2.047	.011	.220	.0654	191.4
MG	1.254	2080.	2.035	.014	.333	.0984	142.4
AL	1.487	1382.	1.984	.018	.540	.1448	100.0
SI	1.740	1188.	1.909	.023	.542	.1650	83.43
P	2.013	1043.	1.816	.020	.473	.1250	65.47
S	2.307	1036.	1.714	.035	.660	.1603	52.12
CL	2.622	742.7	1.608	.030	.931	.2212	42.04
AR	2.957	539.6	1.502	.044	1.201	.2004	34.31
K	3.313	397.0	1.397	.049	1.730	.3630	20.30
CA	3.690	319.1	1.296	.055	2.163	.4217	23.56
SC	4.090	273.0	1.200	.061	2.527	.4597	19.79
TI	4.509	200.6	1.110	.064	3.303	.5600	16.76
V	4.950	168.9	1.025	.072	4.277	.6767	14.38
CR	5.412	128.6	.946	.077	5.355	.7905	12.20
MN	5.895	100.7	.873	.082	6.813	.9300	10.61
FE	6.400	79.71	.805	.087	8.600	1.107	9.229
CO	6.925	63.77	.743	.092	10.72	1.292	8.064
NI	7.472	66.41	.686	.097	10.31	1.164	7.006
CU	8.041	54.00	.633	.101	12.64	1.361	6.253
ZN	8.631	44.16	.585	.106	15.45	1.539	5.542
GA	9.243	36.30	.540	.110	18.75	1.750	4.932
GE	9.876	30.00	.500	.113	22.64	2.002	4.406
AS	10.532	24.98	.462	.117	27.19	2.273	3.949
SE	11.209	20.77	.429	.121	32.49	2.572	3.552
BR	11.909	17.48	.397	.124	38.64	2.902	3.204
KR	12.632	14.63	.368	.127	45.81	3.267	2.890
RB	13.375	12.36	.341	.130	54.01	3.668	2.630
SR	14.143	10.47	.317	.132	63.42	4.108	2.398
Y	14.933	8.913	.294	.135	74.19	4.592	2.191
ZR	15.747	7.607	.274	.137	86.45	5.122	1.993
NB	16.584	6.513	.254	.139	100.3	5.701	1.825
MO	17.444	5.590	.237	.141	116.0	6.333	1.675
TC	18.326	4.820	.221	.143	133.7	7.021	1.540
RU	19.236	4.164	.206	.145	153.5	7.760	1.419
RH	20.169	3.607	.192	.147	175.6	8.579	1.310
PD	21.125	3.134	.179	.148	200.2	9.455	1.211
AG	22.105	2.729	.167	.149	227.5	10.40	1.121
CD	23.110	2.382	.157	.151	257.6	11.41	1.040
IN	24.141	2.085	.146	.152	290.8	12.50	.9642
SN	25.195	1.829	.137	.153	327.1	13.67	.8907

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SM	26.359	1.592	.128	.154	369.0	15.01	.6320
TE	27.472	1.482	.126	.154	413.5	16.35	.7763
J	28.612	1.237	.112	.155	440.7	17.76	.7897
XE	29.779	1.093	.105	.156	511.7	19.26	.6773
CS	30.973	.9685	.099	.156	540.5	20.86	.6338
BA	32.194	.8593	.093	.157	625.1	22.49	.5937
LA	33.442	.7638	.087	.157	687.6	24.22	.5567
CE	34.720	.6800	.082	.157	754.0	26.02	.5026
PR	36.026	.6064	.077	.157	824.2	27.89	.4990
ND	37.361	.5416	.073	.157	898.1	29.82	.4617
PM	38.725	.4845	.068	.156	975.1	31.81	.4344
SM	40.118	.4340	.065	.156	1056.	33.84	.4094
EU	41.542	.3894	.061	.156	1140.	35.92	.3860
GD	42.996	.3498	.057	.157	1227.	38.04	.3642
TB	44.482	.3147	.054	.157	1317.	40.18	.3439
DY	45.998	.2835	.051	.157	1409.	42.36	.3250
HO	47.547	.2557	.048	.157	1504.	44.52	.3075
ER	49.128	.2309	.046	.157	1600.	46.69	.2908
TM	50.742	.2087	.043	.156	1698.	48.86	.2755
YB	52.389	.1889	.041	.156	1797.	51.01	.2610
LU	54.070	.1712	.039	.156	1897.	53.14	.2475
HF	55.790	.1552	.036	.155	1998.	55.25	.2340
TA	57.532	.1410	.035	.155	2098.	57.38	.2229
W	59.318	.1282	.033	.154	2199.	59.33	.2117
RE	61.140	.1166	.031	.154	2299.	61.30	.2012
OS	63.001	.1062	.029	.153	2399.	63.22	.1915
IR	64.896	.0968	.027	.153	2498.	65.09	.1820
PT	66.832	.0883	.026	.152	2597.	66.89	.1732
AU	68.804	.0807	.025	.152	2694.	68.63	.1650
HG	70.819	.0737	.024	.151	2790.	70.31	.1571
TL	72.872	.0674	.023	.150	2884.	71.93	.1498
PB	74.969	.0617	.021	.150	2977.	73.47	.1428
BI	77.108	.0566	.020	.149	3069.	74.95	.1362
PO	79.290	.0518	.019	.148	3159.	76.37	.1300
RN	83.580	.0437	.017	.147	3333.	78.99	.1185
RA	80.470	.0360	.016	.145	3500.	81.37	.1081
AC	90.004	.0338	.015	.145	3582.	82.47	.1033
TH	93.350	.0312	.014	.144	3661.	83.51	.0988
PA	95.868	.0287	.014	.143	3739.	84.49	.0945
U	98.439	.0265	.013	.142	3816.	85.42	.0906

BASALT USGS-BCR-1

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3520.	2.184	.011	.197	.0623	204.1
MG	1.254	2286.	2.176	.014	.303	.0957	152.3
AL	1.487	1540.	2.120	.018	.449	.1391	115.8
SI	1.740	1232.	2.051	.023	.562	.1681	89.66
P	2.013	1455.	1.956	.028	.676	.1361	70.50
	2.307	1089.	1.850	.033	.872	.1826	56.20
A	2.622	730.8	1.738	.038	.930	.2005	45.04
K	2.957	535.0	1.625	.044	1.291	.3110	37.14
CA	3.313	393.5	1.514	.049	1.754	.3058	30.68
SC	3.690	300.6	1.407	.055	2.250	.4766	25.57
TI	4.089	276.5	1.304	.061	2.694	.4910	21.50
V	4.509	211.4	1.207	.064	3.259	.5086	18.23
CR	4.950	163.1	1.116	.072	4.219	.7829	15.56
MN	5.412	133.6	1.031	.077	5.165	.8826	13.38
FE	5.895	104.9	.952	.082	6.540	.9761	11.57
CO	6.400	83.07	.879	.087	8.260	1.150	10.07
NI	6.925	66.73	.812	.092	10.24	1.336	8.808
CU	7.472	53.83	.750	.097	8.185	.9998	7.702
ZN	8.041	44.25	.693	.101	10.00	1.166	6.836
GA	8.631	56.25	.640	.106	17.16	1.308	6.062
GE	9.243	46.44	.592	.110	18.70	1.484	5.397
AS	9.876	38.53	.548	.114	17.68	1.647	4.823
SE	10.532	32.11	.507	.117	21.17	1.906	4.325
BR	11.209	26.88	.470	.121	25.22	2.164	3.891
KR	11.909	22.59	.435	.124	29.93	2.415	3.511
RB	12.632	19.06	.404	.127	35.30	2.700	3.177
SR	13.375	16.14	.375	.130	41.62	3.029	2.880
Y	14.143	13.72	.348	.133	48.78	3.382	2.620
ZR	14.933	11.70	.323	.135	56.96	3.760	2.393
NB	15.747	10.01	.301	.138	66.27	4.191	2.187
MO	16.584	8.601	.280	.140	76.83	4.652	2.003
TC	17.444	7.409	.261	.142	88.77	5.154	1.838
RU	18.326	6.395	.243	.144	102.2	5.701	1.691
RH	19.236	5.537	.227	.145	117.2	6.295	1.558
PD	20.169	4.807	.212	.147	134.1	6.940	1.438
AG	21.125	4.184	.198	.148	152.9	7.637	1.330
CD	22.105	3.651	.185	.150	173.9	8.390	1.232
IN	23.110	3.193	.173	.151	197.0	9.202	1.142
SN	24.141	2.794	.162	.152	222.6	10.07	1.061
	25.195	2.460	.151	.153	250.7	11.03	.9876

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SM	26.359	2.164	.141	.154	284.0	12.00	.9150
TE	27.472	1.892	.132	.155	318.0	13.17	.8532
J	28.612	1.672	.124	.154	345.1	14.32	.7946
XE	29.779	1.480	.116	.154	395.4	15.55	.7445
CS	30.973	1.312	.109	.157	439.0	16.84	.6967
BA	32.194	1.166	.103	.157	485.9	18.21	.6527
LA	33.442	1.038	.096	.154	536.3	19.65	.6121
CE	34.720	.9255	.091	.154	590.3	21.17	.5745
PR	36.026	.8263	.085	.154	647.9	22.75	.5398
ND	37.361	.7389	.081	.154	709.0	24.41	.5074
PM	38.725	.6618	.076	.154	773.7	26.12	.4778
SM	40.118	.5934	.071	.154	841.9	27.90	.4501
EU	41.542	.5331	.067	.154	913.4	29.74	.4244
GD	42.996	.4794	.063	.154	988.5	31.62	.4005
TB	44.482	.4317	.060	.154	1066.	33.54	.3782
DY	45.998	.3895	.056	.154	1147.	35.53	.3574
HO	47.547	.3516	.053	.154	1231.	37.54	.3380
ER	49.128	.3176	.050	.154	1318.	39.57	.3199
TM	50.742	.2876	.048	.157	1407.	41.63	.3029
YB	52.389	.2606	.045	.157	1498.	43.69	.2870
LU	54.070	.2361	.043	.156	1591.	45.77	.2721
HF	55.790	.2143	.040	.156	1686.	47.86	.2581
TA	57.532	.1948	.038	.156	1782.	49.80	.2451
W	59.318	.1772	.036	.155	1879.	51.93	.2324
RE	61.140	.1616	.034	.155	1977.	53.96	.2212
OS	63.001	.1471	.032	.154	2075.	55.95	.2103
IR	64.896	.1342	.031	.154	2174.	57.97	.2001
PT	66.832	.1225	.029	.153	2272.	60.03	.1904
AU	68.804	.1120	.028	.153	2370.	61.70	.1813
HG	70.819	.1024	.026	.152	2468.	63.53	.1727
TL	72.872	.0937	.025	.151	2566.	65.30	.1646
PB	74.969	.0858	.024	.151	2662.	67.02	.1569
BI	77.108	.0787	.022	.150	2757.	68.69	.1497
PO	79.290	.0722	.021	.149	2852.	70.29	.1428
RN	83.780	.0600	.019	.148	3037.	73.32	.1302
RA	88.470	.0516	.017	.147	3216.	76.12	.1188
AC	90.004	.0473	.017	.146	3304.	77.43	.1134
TH	93.350	.0430	.016	.145	3390.	78.67	.1086
PA	95.868	.0402	.015	.144	3475.	79.86	.1036
U	98.439	.0370	.014	.144	3558.	81.00	.0993

DUNASE USGS-W-1

R - ALFA(1+2) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

R - ALFA(1) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

DUNITE USGS-DTS-1

R - ALFA(1+2) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

R - ALFA(1) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

GRANITE USGS-G-2

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	2955.	1.990	.011	.234	.0676	103.7
MG	1.254	1982.	1.973	.014	.355	.1017	136.3
AL	1.487	1260.	1.921	.019	.549	.1537	103.1
SI	1.740	1009.	1.844	.023	.647	.1743	79.44
P	2.013	1509.	1.732	.028	.450	.1170	62.20
S	2.307	1087.	1.652	.033	.648	.1576	49.48
CL	2.622	744.0	1.548	.039	.903	.2047	34.86
AR	2.957	557.1	1.444	.044	1.241	.2044	32.48
K	3.313	410.2	1.342	.050	1.604	.3301	26.76
CA	3.690	342.6	1.244	.056	2.017	.3781	22.26
SC	4.089	271.6	1.150	.062	2.541	.4442	18.68
TI	4.509	207.5	1.063	.067	3.321	.5415	15.80
V	4.950	160.0	.981	.073	4.301	.6550	13.47
CR	5.412	126.0	.905	.078	5.056	.7730	11.56
MN	5.895	98.06	.834	.084	6.946	.9190	9.904
FE	6.400	78.14	.769	.089	8.773	1.005	8.676
CO	6.925	62.29	.709	.094	10.90	1.272	7.579
NI	7.472	55.97	.654	.098	12.21	1.326	6.654
CU	8.041	45.30	.604	.103	15.06	1.535	5.869
ZN	8.631	36.88	.557	.107	18.45	1.749	5.200
GA	9.243	30.20	.515	.111	22.48	2.030	4.626
GE	9.876	29.05	.476	.115	27.23	2.322	4.131
AS	10.532	20.56	.448	.119	32.62	2.646	3.701
SE	11.209	17.08	.407	.122	39.34	3.006	3.328
BR	11.909	14.26	.377	.126	46.94	3.405	3.001
KR	12.632	11.95	.349	.129	55.75	3.846	2.714
MO	13.375	10.06	.324	.132	65.89	4.332	2.462
SR	14.163	8.503	.301	.134	77.54	4.860	2.239
Y	14.933	7.211	.279	.137	90.87	5.457	2.041
ZR	15.747	6.136	.260	.139	106.4	6.103	1.865
NB	16.584	5.240	.242	.141	123.2	6.810	1.707
MO	17.444	4.488	.225	.143	142.7	7.582	1.567
TC	18.328	3.857	.209	.145	164.5	8.432	1.448
RU	19.236	3.324	.195	.147	188.8	9.335	1.327
RH	20.169	2.872	.182	.149	216.3	10.32	1.220
PD	21.125	2.489	.170	.150	246.6	11.39	1.132
AG	22.105	2.163	.159	.151	280.2	12.53	1.048
CD	23.118	1.884	.148	.153	317.1	13.77	.9722
IN	24.101	1.645	.139	.154	357.6	15.09	.9029
SN	25.195	1.440	.130	.155	401.7	16.49	.8397

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	1.251	.121	.156	453.5	18.10	.7779
TE	27.472	1.090	.113	.156	504.0	19.70	.7253
J	28.612	.9686	.106	.157	562.6	21.38	.6778
XE	29.779	.8546	.100	.158	623.3	23.10	.6327
CS	30.973	.7556	.094	.158	690.0	24.99	.5920
BA	32.194	.6693	.088	.159	756.6	26.91	.5546
LA	33.442	.5940	.083	.159	829.6	28.90	.5200
CE	34.720	.5279	.078	.159	906.3	30.86	.4881
MN	36.026	.4708	.073	.159	986.7	33.00	.4585
ND	37.361	.4192	.069	.159	1070.	35.25	.4312
PM	38.725	.3744	.065	.160	1157.	37.46	.4059
SM	40.118	.3350	.061	.160	1247.	39.70	.3823
EU	41.542	.3001	.058	.160	1340.	41.94	.3605
GD	42.996	.2693	.054	.159	1435.	44.24	.3401
TH	44.482	.2419	.051	.159	1532.	46.52	.3212
DY	45.998	.2176	.048	.159	1631.	48.79	.3035
HO	47.547	.1960	.046	.159	1730.	51.04	.2870
ER	49.128	.1768	.043	.159	1831.	53.27	.2716
TM	50.742	.1596	.041	.158	1933.	55.47	.2572
YB	52.389	.1443	.038	.158	2036.	57.63	.2438
LU	54.070	.1306	.036	.157	2136.	59.74	.2311
HF	55.790	.1183	.034	.157	2237.	61.80	.2192
TA	57.532	.1074	.033	.157	2337.	63.78	.2082
W	59.318	.0975	.031	.156	2436.	65.71	.1977
HE	61.140	.0886	.029	.156	2536.	67.58	.1879
OS	63.001	.0806	.028	.155	2631.	69.38	.1787
IR	64.896	.0734	.026	.154	2727.	71.10	.1708
PT	66.832	.0669	.025	.154	2821.	72.75	.1618
AU	68.804	.0611	.024	.153	2913.	74.32	.1541
HG	70.819	.0558	.022	.153	3003.	75.83	.1468
TL	72.872	.0510	.021	.152	3091.	77.26	.1399
PB	74.969	.0466	.020	.151	3178.	78.62	.1334
BI	77.108	.0427	.019	.151	3263.	79.91	.1272
PO	79.290	.0391	.018	.150	3346.	81.13	.1214
AN	83.760	.0329	.016	.148	3505.	83.37	.1107
NA	88.070	.0277	.015	.147	3658.	85.37	.1010
AC	90.884	.0255	.014	.146	3732.	86.28	.0965
TH	93.350	.0234	.013	.145	3806.	87.16	.0923
PA	95.868	.0215	.013	.145	3875.	87.95	.0883
U	98.439	.0198	.012	.144	3945.	88.71	.0845

GRANODIORITE USGS-GSP-1

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3059.	2.097	.011	.226	.0666	107.5
MG	1.254	1975.	2.012	.014	.350	.1025	139.3
AL	1.487	1279.	1.961	.019	.541	.1565	105.5
SI	1.740	1080.	1.884	.023	.641	.1762	81.38
P	2.013	1498.	1.791	.028	.463	.1214	63.79
S	2.307	1059.	1.690	.033	.653	.1623	50.74
CL	2.622	748.3	1.584	.039	.910	.2130	40.89
AR	2.957	552.0	1.478	.044	1.250	.2700	33.35
K	3.313	407.1	1.375	.050	1.697	.3407	27.44
CA	3.690	348.3	1.275	.056	1.982	.3804	22.07
SC	4.089	276.9	1.180	.061	2.492	.4442	19.78
TI	4.509	211.7	1.090	.067	3.255	.5435	16.25
V	4.950	163.0	1.007	.073	4.213	.6550	13.86
CR	5.412	129.2	.929	.078	5.301	.7729	11.90
MN	5.895	101.0	.857	.083	6.770	.9181	10.28
FE	6.400	80.20	.790	.088	8.545	1.003	8.935
CO	6.925	64.63	.729	.093	10.60	1.267	7.807
NI	7.472	61.18	.672	.098	11.20	1.245	6.854
CU	8.041	49.50	.621	.103	13.78	1.438	6.069
ZN	8.631	40.03	.573	.107	16.85	1.653	5.360
GA	9.243	33.17	.530	.111	20.49	1.894	4.764
GE	9.876	27.38	.490	.115	24.79	2.161	4.260
AS	10.532	22.66	.453	.119	29.83	2.459	3.817
SE	11.209	18.86	.419	.122	35.71	2.784	3.433
BR	11.909	15.77	.389	.125	42.55	3.153	3.096
KR	12.632	13.26	.360	.128	50.49	3.546	2.801
MO	13.375	11.16	.334	.131	59.60	3.949	2.541
SR	14.163	9.446	.310	.134	70.00	4.448	2.311
Y	14.933	8.020	.288	.137	82.07	5.009	2.107
ZR	15.747	6.834	.268	.139	95.72	5.613	1.925
NB	16.584	5.843	.249	.141	111.2	6.256	1.763
MO	17.444	5.010	.232	.143	128.7	6.939	1.618
TC	18.328	4.310	.216	.145	148.3	7.724	1.487
RU	19.236	3.719	.201	.147	170.4	8.595	1.370
RH	20.169	3.217	.188	.148	195.0	9.556	1.265
PD	21.125	2.791	.175	.150	222.4	10.59	1.169
AG	22.105	2.427	.164	.151	252.7	11.67	1.082
CD	23.118	2.116	.153	.152	286.1	12.60	1.006
IN	24.101	1.850	.143	.153	322.8	13.81	.9327
SN	25.195	1.620	.134	.154	363.0	15.10	.8676

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	1.409	.125	.155	410.2	16.58	.8037
TE	27.472	1.239	.117	.156	458.2	18.05	.7494
J	28.612	1.092	.110	.157	510.0	19.61	.6996
XE	29.779	.9647	.103	.157	565.8	21.25	.6538
CS	30.973	.8535	.097	.158	625.5	22.97	.6118
BA	32.194	.7565	.091	.158	689.2	24.76	.5731
LA	33.442	.6718	.085	.159	756.9	26.63	.5376
CE	34.720	.5979	.080	.159	828.5	28.58	.5044
PR	36.026	.5323	.075	.159	903.8	30.58	.4739
ND	37.361	.4750	.071	.159	982.8	32.64	.4454
PM	38.725	.4246	.067	.159	1065.	34.75	.4195
SM	40.118	.3800	.063	.159	1150.	36.91	.3952
EU	41.542	.3404	.059	.159	1239.	39.09	.3728
GD	42.996	.3058	.056	.159	1330.	41.30	.3516
TH	44.482	.2749	.053	.159	1423.	43.53	.3320
DY	45.998	.2476	.050	.159	1519.	45.76	.3137
HO	47.547	.2230	.047	.159	1616.	47.99	.2967
ER	49.128	.2012	.044	.158	1715.	50.20	.2808
TM	50.742	.1818	.042	.158	1815.	52.40	.2659
YB	52.389	.1646	.040	.158	1915.	54.56	.2520
LU	54.070	.1489	.038	.157	2016.	56.69	.2389
HF	55.790	.1349	.036	.157	2117.	58.79	.2276
TA	57.532	.1225	.034	.156	2217.	60.81	.2152
W	59.318	.1113	.032	.156	2317.	62.80	.2044
HE	61.140	.1012	.031	.156	2416.	64.72	.1942
OS	63.001	.0921	.029	.155	2515.	66.59	.1847
IR	64.896	.0839	.027	.154	2612.	68.36	.1757
PT	66.832	.0765	.026	.154	2708.	70.13	.1672
AU	68.804	.0698	.024	.153	2802.	71.77	.1592
HG	70.819	.0638	.023	.153	2895.	73.36	.1517
TL	72.872	.0583	.022	.152	2986.	74.88	.1446
PB	74.969	.0533	.021	.151	3075.	76.33	.1379
BI	77.108	.0488	.020	.151	3163.	77.71	.1315
PO	79.290	.0447	.019	.150	3248.	79.02	.1255
AN	83.760	.0377	.017	.148	3414.	81.44	.1144
NA	88.070	.0318	.015	.147	3574.	83.62	.1048
AC	90.884	.0292	.015	.146	3726.	84.62	.0998
TH	93.350	.0264	.014	.145	3726.	85.54	.0954
PA	95.868	.0247	.013	.144	3800.	86.44	.0912
U	98.439	.0228	.013	.144	3872.	87.28	.0873

PERIDOTITE   USGS-PCC-1

K - ALFA(1+2) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	2940.	2.003	.011	.232	.0672	178.7
MG	1.254	1839.	1.985	.015	.376	.1086	133.1
AL	1.487	2125.	1.933	.019	.326	.0918	101.0
SI	1.740	1636.	1.856	.024	.442	.1307	78.10
P	2.013	1458.	1.764	.024	.475	.1228	61.32
S	2.307	1027.	1.643	.034	.674	.1649	48.85
CL	2.622	734.9	1.559	.040	.941	.2170	39.42
AR	2.957	533.0	1.454	.045	1.297	.2804	32.18
K	3.313	391.5	1.351	.051	1.764	.3549	26.55
CA	3.690	290.7	1.253	.057	2.373	.4482	22.11
SC	4.089	221.7	1.159	.062	3.109	.5478	18.57
TI	4.509	168.2	1.071	.068	4.091	.6721	15.75
V	4.950	128.9	.988	.074	5.331	.8167	13.41
CR	5.412	99.77	.912	.079	6.879	.9831	11.52
MN	5.895	77.78	.840	.084	8.806	1.175	9.961
FE	6.400	61.13	.775	.089	11.17	1.394	8.660
CO	6.925	48.74	.715	.094	13.98	1.632	7.568
NI	7.472	58.37	.659	.099	11.72	1.282	6.868
CU	8.041	67.65	.608	.104	14.39	1.478	5.866
ZN	8.631	38.79	.562	.108	17.56	1.696	5.199
GA	9.243	31.89	.519	.112	21.31	1.939	4.626
GE	9.876	26.35	.479	.116	25.72	2.209	4.132
AS	10.532	21.87	.443	.120	30.84	2.509	3.703
SE	11.209	18.24	.410	.123	36.91	2.841	3.330
BR	11.909	15.28	.380	.126	43.90	3.207	3.004
KR	12.632	12.84	.352	.130	51.99	3.613	2.717
RB	13.375	10.85	.327	.132	61.27	4.058	2.465
SR	14.143	9.198	.303	.135	71.93	4.548	2.242
Y	14.933	7.823	.281	.138	84.09	5.046	2.044
ZR	15.747	6.676	.262	.140	97.93	5.675	1.867
NB	16.584	5.716	.243	.142	113.5	6.319	1.710
MO	17.444	4.909	.226	.144	131.2	7.022	1.569
TC	18.328	4.229	.211	.146	151.1	7.787	1.443
RU	19.236	3.653	.197	.148	173.3	8.617	1.329
RH	20.169	3.165	.183	.150	198.1	9.517	1.226
PD	21.125	2.749	.171	.151	225.6	10.48	1.134
AG	22.105	2.394	.160	.152	256.0	11.53	1.050
CD	23.110	2.090	.149	.154	289.6	12.65	.9737
IN	24.141	1.829	.140	.155	326.3	13.86	.9043
SN	25.195	1.604	.131	.156	366.5	15.15	.8411

K - ALFA(1) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SR	26.359	1.396	.122	.157	613.8	16.42	.7791
TE	27.472	1.279	.114	.157	661.7	18.49	.7244
J	28.612	1.984	.107	.158	513.4	19.60	.6781
XE	29.779	.9589	.101	.159	569.0	21.87	.6337
CS	30.973	.8492	.095	.159	620.6	22.98	.5920
BA	32.194	.7535	.089	.160	642.0	24.77	.5584
LA	33.442	.6697	.083	.160	759.3	26.63	.5207
CE	34.720	.5962	.078	.160	630.5	28.56	.4887
PR	36.024	.5316	.073	.160	905.6	30.56	.4591
ND	37.361	.4748	.069	.160	983.8	32.61	.4318
PM	38.725	.4247	.065	.161	1045.	34.71	.4070
SM	40.118	.3809	.061	.161	1150.	36.85	.3838
EU	41.542	.3413	.058	.161	1230.	39.02	.3627
GD	42.996	.3066	.055	.160	1320.	41.27	.3405
TB	44.482	.2754	.052	.160	1421.	43.40	.3216
DY	45.998	.2484	.049	.160	1516.	45.60	.3010
HO	47.547	.2240	.046	.160	1612.	47.87	.2876
ER	49.128	.2023	.043	.160	1718.	50.08	.2719
TM	50.742	.1829	.041	.159	1800.	52.27	.2573
YB	52.389	.1655	.039	.159	1908.	54.43	.2440
LU	54.078	.1500	.037	.159	2000.	56.55	.2313
HF	55.790	.1360	.035	.158	2100.	58.63	.2190
TA	57.532	.1235	.033	.158	2207.	60.60	.2080
W	59.310	.1123	.031	.157	2300.	62.60	.1970
RE	61.140	.1022	.029	.157	2400.	64.56	.1881
OS	63.001	.0930	.028	.156	2501.	66.42	.1788
IR	64.890	.0848	.026	.156	2597.	68.21	.1701
PT	66.832	.0774	.025	.155	2692.	69.94	.1619
AU	68.804	.0707	.024	.154	2784.	71.66	.1542
HG	70.819	.0646	.023	.154	2877.	73.19	.1469
TL	72.872	.0591	.021	.153	2967.	74.71	.1400
PB	74.960	.0541	.020	.152	3056.	76.16	.1334
BI	77.10	.0495	.019	.152	3142.	77.54	.1273
PO	79.240	.0454	.018	.151	3227.	78.84	.1215
AT	83.760	.0382	.017	.150	3392.	81.28	.1107
RA	88.070	.0323	.015	.148	3560.	83.47	.1015
AC	90.804	.0297	.014	.147	3625.	85.47	.0966
TH	93.350	.0273	.014	.146	3700.	85.61	.0920
PA	95.868	.0251	.013	.146	3773.	86.30	.0883
U	98.434	.0232	.012	.145	3845.	87.18	.0845

BASALT   CAPE-GR

K - ALFA(1+2) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3553.	2.203	.011	.195	.0623	203.2
MG	1.254	2300.	2.198	.014	.301	.0961	152.2
AL	1.487	1765.	2.152	.019	.392	.1227	116.2
SI	1.740	1332.	2.076	.023	.519	.1572	90.24
P	2.013	1340.	1.981	.028	.516	.1409	71.15
S	2.307	951.2	1.874	.033	.727	.2005	56.84
CL	2.622	679.4	1.762	.038	1.017	.2643	46.05
AR	2.957	492.6	1.649	.044	1.403	.3426	37.71
K	3.313	361.5	1.537	.049	1.909	.4369	31.20
CA	3.690	279.9	1.429	.055	2.463	.5271	26.04
SC	4.089	301.4	1.325	.060	2.289	.4574	21.42
TI	4.509	230.9	1.227	.066	2.994	.5466	18.60
V	4.950	178.6	1.134	.071	3.854	.6704	15.90
CR	5.412	147.2	1.048	.077	4.672	.7583	13.68
MN	5.895	115.9	.968	.082	5.927	.8980	11.84
FE	6.400	91.95	.898	.087	7.459	1.055	10.31
CO	6.925	74.01	.826	.092	9.250	1.224	9.022
NI	7.472	84.50	.763	.096	7.757	.9617	7.934
CU	8.041	72.31	.705	.101	9.479	1.101	7.009
ZN	8.631	59.41	.652	.105	11.51	1.257	6.218
GA	9.243	49.06	.603	.109	13.92	1.429	5.538
GE	9.876	40.71	.558	.113	16.76	1.619	4.951
AS	10.532	33.94	.516	.116	20.04	1.830	4.441
SE	11.209	28.42	.478	.120	23.84	2.063	3.996
BR	11.909	23.89	.443	.123	28.33	2.315	3.607
KR	12.632	20.16	.411	.126	33.68	2.594	3.265
RB	13.375	17.08	.382	.129	39.34	2.901	2.966
SR	14.143	14.52	.355	.132	46.16	3.237	2.697
Y	14.933	12.39	.330	.134	53.90	3.605	2.460
ZR	15.747	10.60	.307	.136	62.71	4.007	2.248
NB	16.584	9.109	.285	.139	72.70	4.444	2.040
MO	17.444	7.845	.266	.141	84.04	4.924	1.891
TC	18.328	6.776	.248	.142	96.72	5.444	1.739
RU	19.236	5.868	.231	.144	111.0	6.009	1.603
RH	20.169	5.096	.216	.146	127.0	6.621	1.479
PD	21.125	4.437	.201	.147	144.8	7.284	1.368
AG	22.105	3.872	.189	.149	164.6	8.003	1.267
CD	23.110	3.388	.176	.150	186.6	8.772	1.175
IN	24.141	2.971	.165	.151	210.8	9.602	1.091
SN	25.195	2.611	.154	.152	237.5	10.49	1.015

K - ALFA(1) LINES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SR	26.359	2.277	.144	.153	269.2	11.52	.9411
TE	27.472	2.009	.135	.154	301.6	12.55	.8775
J	28.612	1.774	.126	.154	337.0	13.65	.8195
XE	29.779	1.572	.119	.155	375.0	16.82	.7657
CS	30.973	1.395	.111	.155	417.0	16.05	.7165
BA	32.194	1.239	.105	.156	461.9	17.36	.6712
LA	33.442	1.103	.098	.156	510.2	18.76	.6290
CE	34.720	.9861	.093	.157	562.0	20.20	.5990
PR	36.024	.8769	.087	.157	617.3	21.72	.5556
ND	37.361	.7841	.082	.157	676.1	23.31	.5219
PM	38.725	.7042	.077	.157	730.5	24.97	.4913
SM	40.118	.6317	.073	.157	804.6	26.48	.4628
EU	41.542	.5674	.069	.157	873.8	28.44	.4363
GD	42.996	.5104	.065	.157	944.5	30.29	.4117
TH	44.482	.4597	.061	.157	1022.	32.17	.3887
DY	45.998	.4146	.058	.157	1101.	34.09	.3676
HO	47.547	.3746	.056	.157	1183.	36.01	.3476
FM	49.128	.3386	.051	.156	1296.	38.05	.3287
TM	50.742	.3063	.049	.156	1356.	40.07	.3113
YB	52.389	.2775	.046	.156	1445.	42.18	.2949
LU	54.076	.2517	.043	.156	1537.	44.15	.2793
HF	55.790	.2285	.041	.155	1631.	46.20	.2652
TA	57.532	.2078	.039	.155	1726.	48.26	.2518
W	59.310	.1891	.037	.154	1822.	50.27	.2392
RE	61.140	.1722	.035	.154	1920.	52.29	.2273
OS	63.001	.1569	.033	.153	2018.	54.25	.2161
IR	64.890	.1432	.031	.153	2117.	56.05	.2055
PT	66.832	.1308	.030	.152	2216.	58.19	.1956
AU	68.804	.1195	.028	.152	2316.	60.08	.1862
HG	70.819	.1093	.027	.151	2413.	61.93	.1774
TL	72.872	.1003	.025	.150	2511.	63.73	.1691
PB	74.960	.0917	.024	.150	2609.	65.49	.1612
BI	77.106	.0840	.023	.149	2705.	67.18	.1537
PO	79.240	.0771	.022	.148	2801.	68.83	.1466
AT	83.760	.0650	.020	.147	2989.	71.94	.1337
RA	88.070	.0550	.018	.144	3172.	76.82	.1219
AC	90.804	.0500	.017	.145	3262.	76.17	.1165
TH	93.350	.0460	.016	.144	3350.	77.67	.1115
PA	95.868	.0424	.015	.143	3437.	78.76	.1065
U	98.434	.0390	.015	.143	3522.	79.84	.1010

DIORITE   ANRT-DR-N

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3385.	2.109	.011	.208	.0637	195.0
MG	1.254	2153.	2.098	.014	.321	.0980	145.4
AL	1.487	1475.	2.048	.019	.469	.1390	110.5
SI	1.740	1248.	1.972	.023	.554	.1595	85.49
P	2.013	1446.	1.878	.028	.479	.1316	67.18
S	2.307	1021.	1.774	.033	.677	.1764	53.56
CL	2.622	731.5	1.666	.039	.945	.2324	43.25
AR	2.957	531.0	1.556	.044	1.301	.3005	35.34
K	3.313	270.5	1.449	.050	1.768	.3823	29.18
CA	3.690	304.3	1.345	.055	2.267	.4581	24.31
SC	4.089	275.8	1.246	.061	2.501	.4716	20.44
TI	4.509	210.8	1.153	.067	3.269	.5750	17.32
V	4.950	162.6	1.065	.072	4.232	.6943	14.78
CR	5.412	129.9	.984	.077	5.291	.8099	12.70
MN	5.895	102.0	.908	.085	6.730	.9618	10.98
FE	6.400	80.69	.838	.088	8.492	1.134	9.557
CO	6.925	64.88	.774	.093	10.54	1.317	8.357
NI	7.472	74.34	.714	.097	9.222	1.079	7.364
CU	8.041	60.60	.660	.102	11.29	1.240	6.484
ZN	8.631	49.67	.609	.106	13.75	1.419	5.749
GA	9.243	40.93	.563	.110	16.65	1.618	5.118
GE	9.876	33.89	.521	.114	20.07	1.838	4.573
AS	10.532	28.20	.482	.118	24.06	2.082	4.100
SE	11.204	23.57	.447	.121	28.71	2.351	3.689
BR	11.909	19.78	.414	.124	34.11	2.648	3.328
KR	12.632	16.64	.384	.127	40.36	2.975	3.011
HB	13.375	14.09	.356	.130	47.52	3.333	2.733
SR	14.143	11.96	.331	.133	55.75	3.728	2.486
Y	14.933	10.19	.307	.135	65.15	4.160	2.267
ZR	15.747	8.715	.286	.138	75.84	4.633	2.072
NB	16.584	7.473	.266	.140	87.97	5.149	1.898
MO	17.444	6.427	.247	.142	101.6	5.713	1.742
TC	18.328	5.544	.231	.144	117.0	6.326	1.602
RU	19.236	4.796	.215	.146	134.3	6.993	1.476
RH	20.169	4.160	.201	.147	153.7	7.716	1.363
PD	21.125	3.618	.187	.149	175.2	8.498	1.260
AG	22.105	3.154	.175	.150	199.1	9.342	1.167
CD	23.110	2.757	.164	.151	225.6	10.25	1.082
IN	24.141	2.415	.153	.152	254.7	11.22	1.035
SN	25.195	2.120	.143	.153	286.7	12.27	.9355

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SR	26.359	1.868	.134	.154	324.4	13.47	.8668
TE	27.472	1.629	.125	.155	363.0	14.68	.8083
J	28.612	1.438	.118	.156	404.9	15.96	.7546
XE	29.779	1.272	.110	.156	450.2	17.31	.7053
CS	30.973	1.128	.104	.157	499.1	18.75	.6600
BA	32.194	1.001	.097	.157	551.7	20.25	.6183
LA	33.442	.8913	.091	.158	607.8	21.83	.5798
CE	34.720	.7941	.086	.158	667.8	23.49	.5443
PR	36.026	.7086	.081	.158	731.4	25.22	.5114
ND	37.361	.6334	.076	.158	798.7	27.01	.4800
PM	38.725	.5670	.072	.158	869.6	28.86	.4527
SM	40.118	.5083	.068	.158	944.0	30.77	.4265
EU	41.542	.4563	.064	.158	1021.	32.73	.4021
GD	42.996	.4102	.060	.158	1102.	34.73	.3794
TH	44.482	.3692	.057	.157	1186.	36.78	.3583
DY	45.998	.3328	.053	.158	1273.	38.85	.3384
HG	47.547	.3003	.051	.158	1362.	40.95	.3202
ER	49.128	.2714	.048	.158	1454.	43.06	.3031
TM	50.742	.2455	.045	.157	1547.	45.18	.2870
YB	52.389	.2223	.043	.157	1643.	47.36	.2720
LU	54.070	.2015	.040	.157	1739.	49.61	.2574
HF	55.790	.1828	.038	.156	1837.	51.51	.2446
TA	57.532	.1662	.036	.156	1936.	53.57	.2323
W	59.318	.1511	.034	.155	2035.	55.62	.2206
HE	61.140	.1376	.032	.155	2134.	57.62	.2097
OS	63.001	.1253	.031	.154	2234.	59.59	.1994
IR	64.896	.1143	.029	.154	2333.	61.51	.1897
PT	66.832	.1043	.028	.153	2431.	63.39	.1805
AU	68.808	.0953	.026	.152	2529.	65.20	.1719
HG	70.819	.0872	.025	.152	2626.	66.96	.1637
TL	72.872	.0798	.024	.151	2722.	68.66	.1561
SH	74.969	.0735	.022	.151	2817.	70.30	.1488
BI	77.108	.0669	.021	.150	2911.	71.88	.1419
PO	79.290	.0614	.021	.149	3003.	73.40	.1354
HN	83.780	.0516	.018	.148	3182.	76.23	.1235
RA	88.470	.0437	.016	.146	3356.	78.42	.1127
AC	90.884	.0402	.016	.146	3441.	80.03	.1077
TH	93.350	.0370	.015	.145	3525.	81.17	.1030
PA	95.868	.0341	.014	.144	3605.	82.26	.0985
U	98.439	.0314	.013	.143	3684.	83.29	.0942

DISTHENE   ANRT-DT-N

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	1843.	1.307	.008	.376	.0713	166.5
MG	1.254	1129.	1.292	.010	.613	.1151	124.1
AL	1.487	717.6	1.254	.013	.964	.1766	94.33
SI	1.740	1401.	1.202	.016	.494	.0888	72.91
P	2.013	1036.	1.140	.020	.668	.1118	57.25
S	2.307	727.8	1.072	.024	.951	.1503	45.59
CL	2.622	518.7	1.003	.027	1.333	.1983	36.77
AR	2.957	375.1	.935	.031	1.843	.2567	30.01
K	3.313	274.9	.868	.035	2.513	.3272	24.75
CA	3.690	206.8	.803	.039	3.370	.4095	20.60
SC	4.089	156.7	.743	.043	4.457	.5051	17.30
TI	4.509	117.3	.685	.047	5.872	.6203	14.64
V	4.950	89.85	.632	.051	7.656	.7542	12.49
CR	5.412	73.69	.583	.054	9.325	.8573	10.72
MN	5.895	57.55	.537	.058	11.92	1.023	9.268
FE	6.400	45.32	.495	.061	15.10	1.212	8.055
CO	6.925	35.98	.456	.065	18.98	1.427	7.039
NI	7.472	30.26	.421	.068	22.53	1.589	6.182
CU	8.041	24.38	.386	.071	27.89	1.848	5.454
ZN	8.631	19.77	.358	.074	34.30	2.139	4.833
GA	9.243	16.13	.331	.077	41.91	2.465	4.300
GE	9.876	13.23	.306	.080	50.90	2.829	3.841
AS	10.532	10.90	.283	.082	61.49	3.235	3.442
SE	11.204	9.038	.262	.084	73.86	3.687	3.096
BR	11.909	7.523	.242	.087	88.27	4.188	2.792
KR	12.632	6.289	.224	.089	104.9	4.744	2.526
RB	13.375	5.282	.208	.091	124.1	5.355	2.291
SR	14.143	4.454	.193	.093	146.2	6.029	2.084
Y	14.933	3.769	.179	.094	171.4	6.770	1.900
ZR	15.747	3.201	.167	.096	200.0	7.583	1.736
NB	16.584	2.729	.155	.097	232.4	8.470	1.590
MO	17.444	2.333	.144	.099	268.9	9.437	1.459
TC	18.328	2.002	.134	.100	309.8	10.48	1.342
RU	19.236	1.723	.125	.101	355.4	11.62	1.236
RH	20.169	1.487	.117	.102	406.1	12.85	1.141
PD	21.125	1.287	.109	.103	462.1	14.16	1.055
AG	22.105	1.117	.102	.104	523.6	15.58	.9771
CD	23.110	.9724	.095	.105	591.0	17.09	.9063
IN	24.141	.8483	.089	.106	664.3	18.69	.8418
SN	25.195	.7418	.083	.107	743.8	20.39	.7831

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SM	26.359	.6438	.078	.107	836.3	22.31	.7255
TE	27.472	.5453	.073	.108	920.2	24.21	.6765
J	28.612	.4974	.068	.108	1028.	26.18	.6316
XE	29.779	.4386	.064	.109	1133.	28.24	.5900
CS	30.973	.3875	.060	.109	1245.	30.37	.5525
BA	32.194	.3430	.057	.109	1362.	32.57	.5176
LA	33.442	.3042	.053	.109	1485.	34.82	.4854
CE	34.720	.2702	.050	.110	1612.	37.12	.4556
PR	36.026	.2405	.047	.110	1745.	39.44	.4281
ND	37.361	.2143	.044	.110	1881.	41.81	.4027
PM	38.725	.1914	.042	.110	2021.	44.19	.3790
SM	40.118	.1711	.039	.110	2164.	46.56	.3571
EU	41.542	.1532	.037	.110	2300.	48.93	.3368
GD	42.996	.1374	.035	.110	2457.	51.28	.3178
TB	44.482	.1234	.033	.110	2605.	53.61	.3001
DY	45.998	.1110	.031	.110	2754.	55.89	.2837
MO	47.547	.0999	.024	.109	2904.	58.13	.2683
ER	49.128	.0901	.028	.109	3053.	60.31	.2539
TM	50.742	.0813	.026	.109	3201.	62.44	.2405
YB	52.389	.0735	.025	.104	3348.	64.40	.2279
LU	54.070	.0665	.023	.108	3495.	66.48	.2162
HF	55.790	.0602	.022	.108	3637.	68.40	.2051
TA	57.532	.0546	.021	.108	3777.	70.22	.1948
W	59.318	.0496	.020	.108	3915.	71.94	.1850
HE	61.140	.0451	.019	.107	4051.	73.66	.1759
OS	63.001	.0410	.018	.107	4184.	75.25	.1672
IR	64.896	.0373	.017	.106	4314.	76.77	.1591
PT	66.832	.0340	.016	.106	4441.	78.21	.1515
AU	68.808	.0310	.015	.106	4568.	79.57	.1443
HG	70.819	.0283	.014	.105	4685.	80.35	.1370
TL	72.872	.0259	.014	.105	4803.	82.07	.1310
PH	74.969	.0237	.013	.104	4918.	83.21	.1249
BI	77.108	.0216	.012	.104	5030.	84.28	.1192
PO	79.290	.0198	.012	.103	5139.	85.30	.1138
RN	83.780	.0167	.011	.102	5349.	87.13	.1037
RA	88.470	.0140	.010	.101	5550.	88.75	.0947
AC	90.884	.0129	.009	.101	5647.	89.48	.0905
TH	93.350	.0119	.009	.100	5742.	90.17	.0866
PA	95.868	.0109	.008	.100	5835.	90.81	.0828
U	98.439	.0100	.008	.099	5926.	91.41	.0792

DUNITE-CHRYSOTILE NIN-D

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3298.	2.141	.011	.210	.0652	198.7
MG	1.254	2904.	2.134	.014	.334	.1050	148.7
AL	1.487	2264.	2.086	.018	.306	.0928	113.3
SI	1.740	1527.	2.011	.023	.453	.1338	87.94
P	2.013	1487.	1.917	.028	.444	.1306	69.27
S	2.307	1847.	1.812	.033	.640	.1757	55.32
CL	2.622	749.6	1.703	.038	.922	.2316	44.75
AR	2.957	543.7	1.592	.043	1.271	.2990	36.61
K	3.313	389.6	1.483	.049	1.729	.3820	30.26
CA	3.698	297.0	1.377	.055	2.322	.4705	25.24
SC	4.089	225.2	1.276	.060	3.060	.5800	21.23
TI	4.509	170.9	1.181	.066	4.025	.7230	18.06
V	4.950	131.0	1.091	.071	5.244	.8799	15.37
CR	5.412	101.4	1.008	.076	6.760	1.057	13.22
MN	5.895	79.11	.931	.081	8.651	1.263	11.63
FE	6.400	62.19	.859	.086	10.97	1.447	9.950
CO	6.925	49.08	.793	.091	13.67	1.744	8.772
NI	7.472	78.31	.733	.096	8.758	1.046	7.669
CU	8.041	64.04	.677	.100	10.69	1.198	6.753
ZN	8.631	52.66	.625	.104	12.98	1.366	5.968
GA	9.243	43.51	.578	.108	15.68	1.552	5.330
GE	9.876	36.13	.535	.112	18.84	1.758	4.763
AS	10.532	30.13	.495	.116	22.54	1.984	4.270
SE	11.209	25.25	.458	.119	26.83	2.236	3.841
BR	11.909	21.23	.425	.123	31.82	2.512	3.465
KR	12.632	17.92	.394	.126	37.57	2.815	3.135
RB	13.375	15.19	.365	.128	44.17	3.147	2.845
SR	14.143	12.92	.339	.131	51.73	3.511	2.588
Y	14.935	11.03	.317	.134	60.37	3.911	2.359
ZR	15.747	9.444	.293	.136	70.19	4.347	2.156
NB	16.584	8.111	.273	.138	81.32	4.823	1.975
MO	17.444	6.987	.254	.140	93.90	5.342	1.812
TC	18.328	6.036	.237	.142	108.0	5.907	1.669
RU	19.236	5.228	.221	.144	125.9	6.520	1.535
RH	20.169	4.540	.206	.145	141.6	7.185	1.416
PD	21.125	3.953	.192	.147	161.4	7.905	1.309
AG	22.105	3.451	.180	.148	183.4	8.682	1.212
CD	23.110	3.019	.168	.150	207.6	9.519	1.124
IN	24.141	2.648	.157	.151	234.4	10.41	1.044
SN	25.195	2.327	.147	.152	263.9	11.38	.9713

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SI	26.359	2.030	.137	.153	294.7	12.39	.8947
TF	27.472	1.790	.129	.153	334.5	13.41	.8388
J	28.612	1.582	.121	.154	375.1	14.70	.7479
KE	29.779	1.401	.113	.155	415.1	16.05	.7316
CS	30.973	1.243	.104	.154	496.5	17.39	.6845
HA	32.194	1.106	.104	.156	590.4	18.79	.6411
LA	33.442	.9835	.094	.154	641.8	20.27	.6011
CE	34.720	.8768	.088	.157	617.9	21.82	.5641
PR	36.026	.7830	.085	.167	677.1	23.45	.5299
ND	37.361	.7003	.078	.157	746.9	25.16	.4982
PM	38.725	.6272	.074	.157	807.8	26.89	.4680
SM	40.118	.5620	.060	.157	878.2	28.71	.4416
EU	41.542	.5053	.065	.157	952.1	30.56	.4163
GD	42.996	.4545	.062	.157	1029.	32.53	.3928
TB	44.482	.4143	.058	.152	1109.	34.46	.3708
DY	45.998	.3691	.055	.157	1193.	36.47	.3508
HO	47.547	.3332	.052	.157	1279.	38.50	.3313
EN	49.128	.3012	.049	.157	1367.	41.56	.3135
TM	50.742	.2724	.046	.154	1458.	42.63	.2998
YB	52.389	.2469	.044	.154	1551.	44.72	.2812
LU	54.070	.2240	.041	.156	1646.	46.89	.2666
HF	55.790	.2033	.039	.155	1742.	48.84	.2528
TA	57.532	.1848	.037	.155	1839.	50.75	.2400
W	59.318	.1681	.035	.154	1937.	52.99	.2280
RE	61.140	.1531	.033	.154	2036.	55.01	.2166
OS	63.001	.1395	.032	.152	2135.	57.10	.2059
IR	64.896	.1273	.030	.153	2234.	58.95	.1959
PT	66.832	.1162	.028	.152	2535.	60.86	.1868
AU	68.804	.1062	.027	.152	2452.	62.72	.1775
HG	70.819	.0971	.026	.151	2530.	64.53	.1690
TL	72.872	.0889	.024	.151	2627.	66.29	.1611
PB	74.969	.0818	.023	.150	2723.	67.99	.1536
BI	77.108	.0747	.022	.149	2818.	69.63	.1465
PO	79.290	.0685	.021	.149	2912.	71.21	.1397
AT	83.780	.0578	.019	.167	3095.	74.19	.1273
RA	88.470	.0498	.017	.166	3274.	76.93	.1162
AC	90.484	.0449	.016	.165	3561.	78.21	.1116
TH	93.350	.0414	.015	.164	3669.	79.43	.1062
PA	95.860	.0381	.015	.164	3830.	80.59	.1015
U	98.630	.0351	.014	.163	3912.	81.69	.0971

GRANITE   CRPG-OR

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3022.	2.014	.011	.229	.0669	186.2
MG	1.254	1986.	1.948	.014	.369	.1012	130.2
AL	1.487	1318.	1.946	.019	.525	.1408	104.7
SI	1.740	1099.	1.870	.023	.629	.1719	80.76
P	2.013	1493.	1.778	.028	.444	.1207	63.24
S	2.307	1057.	1.676	.033	.654	.1616	50.36
CL	2.622	758.3	1.571	.034	.912	.2119	40.56
AR	2.957	551.3	1.466	.044	1.254	.2732	33.09
K	3.313	405.9	1.363	.050	1.702	.3470	27.26
CA	3.698	338.9	1.264	.056	2.037	.3874	22.68
SC	4.089	272.6	1.170	.061	2.530	.4494	19.04
TI	4.509	208.4	1.081	.067	3.307	.5477	16.11
V	4.950	160.7	.998	.073	4.282	.6613	13.74
CR	5.412	127.0	.921	.078	5.412	.7797	11.79
MN	5.895	99.69	.849	.083	6.800	.9205	10.19
FE	6.400	78.82	.783	.088	8.697	1.093	8.856
CO	6.925	62.93	.722	.093	10.87	1.279	7.738
NI	7.472	59.56	.646	.098	11.44	1.266	6.795
CU	8.041	48.29	.615	.103	14.14	1.463	5.946
ZN	8.631	39.38	.560	.107	17.30	1.684	5.312
GA	9.243	32.29	.520	.111	21.00	1.929	4.726
GE	9.876	26.62	.485	.115	25.46	2.203	4.220
AS	10.532	22.06	.448	.119	30.65	2.507	3.782
SE	11.209	18.34	.415	.122	36.78	2.843	3.401
BR	11.909	15.33	.384	.125	43.74	3.216	3.067
KR	12.632	12.86	.356	.128	51.90	3.629	2.777
RB	13.375	10.84	.330	.131	61.29	4.083	2.517
SR	14.143	9.176	.307	.134	72.07	4.582	2.289
Y	14.935	7.790	.285	.137	84.08	5.132	2.087
ZR	15.747	6.636	.265	.139	98.05	5.734	1.907
NB	16.584	5.672	.246	.141	110.3	6.392	1.746
MO	17.444	4.864	.229	.143	132.3	7.111	1.602
TC	18.328	4.183	.214	.145	150.4	7.894	1.473
RU	19.236	3.608	.199	.147	175.2	8.744	1.357
RH	20.169	3.121	.186	.148	200.5	9.664	1.252
PD	21.125	2.707	.173	.150	228.6	10.64	1.158
AG	22.105	2.360	.162	.151	259.8	11.73	1.072
CD	23.110	2.053	.151	.152	294.1	12.84	.9944
IN	24.141	1.794	.142	.153	331.7	14.12	.9235
SN	25.195	1.571	.135	.154	372.0	15.43	.8590

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SI	26.359	1.366	.125	.155	421.3	16.04	.7997
TF	27.472	1.201	.116	.156	470.4	18.44	.7414
J	28.612	1.059	.109	.157	529.4	20.03	.6926
KE	29.779	.9351	.102	.157	580.6	21.70	.6473
CS	30.973	.8272	.096	.158	641.4	23.44	.6057
HA	32.194	.7532	.090	.158	700.4	25.27	.5673
LA	33.442	.6510	.086	.158	775.3	27.17	.5320
CE	34.720	.5790	.079	.159	849.2	29.16	.4993
PR	36.026	.5158	.078	.159	924.8	31.17	.4693
ND	37.361	.4603	.071	.159	1005.	33.26	.4411
PM	38.725	.4113	.066	.159	1088.	34.59	.4152
SM	40.118	.3682	.062	.159	1175.	37.56	.3912
EU	41.542	.3300	.059	.159	1266.	39.77	.3688
GD	42.996	.2962	.055	.159	1347.	41.99	.3480
TB	44.482	.2663	.052	.159	1451.	44.23	.3286
DY	45.998	.2396	.060	.156	1568.	46.47	.3105
HO	47.547	.2160	.047	.159	1666.	48.71	.2937
EN	49.128	.1960	.044	.159	1765.	50.93	.2779
TM	50.742	.1760	.042	.159	1865.	53.12	.2632
YB	52.389	.1592	.039	.158	1966.	55.29	.2498
LU	54.070	.1442	.037	.157	2067.	57.41	.2365
HF	55.790	.1306	.035	.157	2198.	59.50	.2243
TA	57.532	.1189	.033	.156	2298.	61.52	.2130
W	59.318	.1077	.032	.156	2368.	63.49	.2023
RE	61.140	.0980	.031	.155	2467.	65.60	.1923
OS	63.001	.0892	.028	.155	2566.	67.24	.1828
IR	64.896	.0812	.027	.154	2662.	69.02	.1739
PT	66.832	.0741	.026	.154	2758.	70.74	.1655
AU	68.804	.0676	.024	.153	2832.	72.30	.1576
HG	70.819	.0617	.023	.158	2928.	73.99	.1501
TL	72.872	.0566	.022	.152	3014.	75.44	.1431
PB	74.969	.0518	.021	.151	3103.	76.87	.1366
BI	77.108	.0473	.020	.150	3190.	78.23	.1305
PO	79.290	.0433	.019	.150	3275.	79.52	.1242
AT	83.780	.0365	.017	.148	3480.	81.90	.1132
RA	88.470	.0307	.015	.147	3590.	84.03	.1033
AC	90.484	.0283	.014	.146	3679.	85.01	.0998
TH	93.350	.0260	.014	.145	3769.	85.93	.0944
PA	95.860	.0234	.013	.144	3822.	86.80	.0903
U	98.630	.0221	.012	.144	3893.	87.62	.0866

LIMESTONE   201-KM

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3083.	2.131	.012	.170	.0551	185.3
MG	1.254	2303.	2.116	.015	.289	.0890	138.0
AL	1.487	1536.	2.043	.020	.051	.1354	104.9
SI	1.740	1042.	1.904	.024	.064	.1903	81.20
P	2.013	796.8	1.888	.030	.068	.2401	63.07
S	2.307	550.6	1.703	.035	1.255	.3290	50.97
CL	2.622	384.9	1.673	.041	1.704	.4409	41.21
AR	2.957	276.4	1.563	.046	2.092	.5707	33.72
K	3.313	200.5	1.455	.052	3.030	.7958	27.08
CA	3.690	158.7	1.350	.050	4.555	.9255	23.26
SC	4.089	426.6	1.251	.064	1.620	.3073	19.58
TI	4.509	329.9	1.157	.070	2.093	.3705	16.61
V	4.950	257.4	1.069	.075	2.681	.4427	14.20
CR	5.412	202.8	.988	.081	3.390	.5230	12.22
MN	5.895	160.8	.912	.088	4.284	.6167	10.58
FE	6.400	128.3	.842	.091	5.360	.7213	9.216
CO	6.925	103.4	.777	.096	6.643	.8369	8.069
NI	7.472	85.79	.717	.101	8.003	.9448	7.099
CU	8.041	69.87	.663	.106	9.812	1.087	6.275
ZN	8.631	57.23	.612	.110	11.96	1.245	5.569
GA	9.243	47.13	.566	.114	14.49	1.422	4.963
GE	9.876	39.01	.523	.118	17.47	1.617	4.440
AS	10.532	32.44	.484	.122	20.97	1.833	3.985
SE	11.209	27.11	.449	.125	25.03	2.072	3.584
BR	11.909	22.75	.416	.128	29.73	2.335	3.241
KR	12.632	19.16	.386	.131	35.21	2.626	2.935
RB	13.375	16.21	.358	.134	41.48	2.945	2.666
SR	14.103	13.76	.332	.137	48.68	3.295	2.427
Y	14.933	11.73	.309	.139	56.90	3.679	2.215
ZR	15.747	10.03	.287	.142	66.27	4.100	2.026
NB	16.584	8.603	.267	.144	76.89	4.559	1.858
MO	17.444	7.402	.249	.146	88.90	5.061	1.704
TC	18.328	6.388	.232	.148	102.4	5.607	1.570
RU	19.236	5.520	.216	.149	117.5	6.201	1.448
RH	20.169	4.797	.202	.151	134.5	6.846	1.337
PD	21.125	4.174	.188	.152	153.5	7.544	1.237
AG	22.105	3.641	.176	.154	174.5	8.298	1.147
CD	23.110	3.164	.165	.155	197.8	9.111	1.064
IN	24.141	2.791	.154	.156	223.4	9.900	.9994
SN	25.195	2.452	.144	.157	251.7	10.92	.9269

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	2.138	.134	.157	285.1	12.00	.0538
TE	27.472	1.884	.126	.158	319.3	13.09	.7905
J	28.612	1.667	.118	.159	354.5	14.24	.7440
XE	29.779	1.475	.111	.159	390.0	15.47	.6950
CS	30.973	1.309	.104	.160	440.6	16.77	.0514
BA	32.194	1.163	.098	.160	487.7	18.14	.6105
LA	33.442	1.035	.092	.160	538.1	19.58	.5720
CE	34.720	.9234	.086	.161	592.2	21.10	.5379
PR	36.026	.8266	.081	.161	645.8	22.69	.5056
ND	37.361	.7376	.077	.161	710.9	24.34	.4757
PM	38.725	.6608	.072	.161	775.6	26.06	.4479
SM	40.118	.5920	.068	.161	843.7	27.89	.4221
EU	41.542	.5324	.064	.161	915.2	29.67	.3981
GD	42.996	.4791	.060	.162	990.1	31.56	.3758
TB	44.482	.4316	.057	.160	1040.	33.49	.3550
DY	45.998	.3893	.054	.160	1149.	35.44	.3356
HO	47.547	.3516	.051	.160	1232.	37.44	.3175
ER	49.128	.3179	.048	.160	1319.	39.49	.3005
TM	50.742	.2877	.045	.159	1408.	41.54	.2847
YB	52.389	.2608	.043	.159	1499.	43.60	.2690
LU	54.070	.2366	.041	.159	1591.	45.67	.2539
HF	55.790	.2148	.038	.158	1686.	47.78	.2420
TA	57.532	.1954	.036	.157	1781.	49.78	.2304
W	59.318	.1778	.034	.157	1878.	51.82	.2191
RE	61.140	.1620	.033	.156	1975.	53.83	.2083
OS	63.001	.1477	.031	.156	2073.	55.82	.1981
IR	64.896	.1348	.029	.155	2171.	57.77	.1885
PT	66.832	.1231	.028	.155	2270.	59.68	.1794
AU	68.804	.1125	.026	.154	2368.	61.55	.1708
HG	70.819	.1029	.025	.153	2465.	63.37	.1628
TL	72.872	.0943	.024	.153	2562.	65.14	.1552
HI	74.969	.0866	.022	.152	2659.	66.86	.1479
NI	77.108	.0792	.021	.151	2754.	68.52	.1411
PO	79.240	.0727	.020	.150	2848.	70.13	.1347
HN	83.760	.0613	.018	.149	3033.	73.15	.1227
RA	88.470	.0519	.017	.147	3213.	75.94	.1121
AC	90.884	.0478	.016	.147	3301.	77.25	.1071
TH	93.350	.0440	.015	.146	3387.	78.58	.1024
PA	95.868	.0405	.014	.145	3472.	79.69	.0980
U	98.439	.0374	.014	.144	3555.	80.83	.0937

PYROXENITE   NI-P

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3165.	2.039	.010	.219	.0447	196.3
MG	1.254	1987.	2.030	.014	.352	.1038	146.5
AL	1.487	1813.	1.985	.018	.382	.1102	111.5
SI	1.740	1270.	1.909	.022	.541	.1500	80.31
P	2.013	1049.	1.819	.027	.677	.1271	67.87
S	2.307	1023.	1.719	.032	.676	.1700	54.13
CL	2.622	733.8	1.610	.037	.943	.2297	43.73
AR	2.957	532.3	1.508	.042	1.290	.2903	35.74
K	3.313	391.5	1.400	.046	1.704	.3603	29.51
CA	3.690	292.0	1.303	.053	2.362	.4423	24.60
SC	4.089	237.2	1.200	.050	2.906	.5307	20.60
TI	4.509	188.6	1.117	.064	3.813	.6495	17.52
V	4.950	130.7	1.032	.069	4.956	.7872	14.96
CR	5.412	100.2	.953	.070	6.345	.9404	12.75
MN	5.895	80.50	.880	.079	8.101	1.120	11.11
FE	6.400	66.07	.812	.086	10.25	1.326	9.649
CO	6.925	53.51	.750	.089	12.75	1.542	8.454
NI	7.472	71.57	.692	.093	9.570	1.005	7.620
CU	8.041	58.01	.639	.097	11.71	1.245	6.557
ZN	8.631	47.93	.590	.102	14.25	1.423	5.813
GA	9.243	39.54	.546	.105	17.24	1.620	5.176
GE	9.876	32.78	.505	.109	20.75	1.838	4.623
AS	10.532	27.29	.467	.113	24.86	2.088	4.164
SE	11.209	22.83	.433	.116	29.64	2.346	3.728
BR	11.909	19.17	.401	.119	35.18	2.640	3.363
KR	12.632	16.16	.372	.122	41.60	2.963	3.043
RB	13.375	13.68	.345	.125	48.95	3.317	2.761
SR	14.103	11.63	.320	.128	57.30	3.707	2.511
Y	14.933	9.916	.298	.130	67.02	4.133	2.290
ZR	15.747	8.479	.277	.132	77.98	4.600	2.092
NB	16.584	7.275	.257	.134	90.40	5.110	1.916
MO	17.444	6.260	.240	.136	104.4	5.666	1.759
TC	18.328	5.403	.223	.138	120.2	6.271	1.617
RU	19.236	4.674	.208	.140	137.9	6.928	1.490
RH	20.169	4.056	.194	.141	157.7	7.640	1.375
PD	21.125	3.530	.182	.143	179.7	8.411	1.271
AG	22.105	3.079	.170	.144	204.2	9.243	1.177
CD	23.110	2.692	.159	.145	231.3	10.13	1.091
IN	24.141	2.359	.148	.146	261.1	11.10	1.014
SN	25.195	2.072	.139	.147	293.8	12.13	.9432

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	1.844	.130	.148	332.5	13.52	.073T
TE	27.472	1.592	.121	.149	372.0	14.51	.8166
J	28.612	1.407	.114	.150	414.9	15.77	.7605
XE	29.779	1.245	.107	.150	461.3	17.11	.7107
CS	30.973	1.104	.100	.151	511.5	18.42	.6649
BA	32.194	.9807	.094	.151	565.3	20.01	.6220
LA	33.442	.872n	.089	.152	622.9	21.57	.5846
CE	34.720	.7776	.083	.152	684.6	23.21	.5481
PR	36.026	.6941	.078	.152	749.7	24.92	.5149
ND	37.361	.6205	.074	.152	818.0	26.69	.4802
PM	38.725	.5564	.069	.152	891.6	24.53	.4567
SM	40.118	.4991	.065	.152	968.1	30.42	.4293
EU	41.542	.4473	.062	.152	1048.	32.37	.4047
GD	42.996	.4021	.058	.152	1131.	34.36	.3819
TB	44.482	.3620	.055	.152	1217.	36.36	.3606
DY	45.998	.3264	.052	.152	1307.	38.45	.3407
HO	47.547	.2944	.049	.152	1399.	40.53	.3222
ER	49.128	.2662	.046	.152	1493.	42.66	.3049
TM	50.742	.2408	.044	.151	1590.	44.75	.2887
YB	52.389	.2181	.041	.151	1680.	46.87	.2735
LU	54.070	.1977	.039	.151	1780.	48.97	.2593
HF	55.790	.1794	.037	.150	1809.	51.07	.2460
TA	57.532	.1631	.035	.150	1991.	53.10	.2336
W	59.318	.1483	.033	.150	2094.	55.18	.2210
RE	61.140	.1350	.031	.149	2196.	57.19	.2100
OS	63.001	.1231	.030	.149	2299.	59.17	.2004
IR	64.896	.1122	.028	.148	2402.	61.09	.1900
PT	66.832	.1025	.027	.148	2504.	62.97	.1818
AU	68.804	.093n	.025	.147	2606.	64.79	.1727
HG	70.819	.085n	.024	.146	2707.	66.57	.1665
TL	72.872	.0783	.023	.146	2806.	68.2n	.1588
PB	74.969	.0717	.022	.145	2905.	69.93	.1495
BI	77.108	.0657	.021	.145	3012.	71.52	.1429
PO	79.290	.0603	.020	.144	3098.	73.nn	.1344
RN	83.760	.0508	.018	.143	3204.	75.90	.1200
RA	88.470	.0430	.016	.141	3405.	78.52	.1132
AC	90.884	.0395	.015	.140	3553.	79.74	.1082
TH	93.350	.0364	.014	.140	3639.	80.69	.1034
PA	95.868	.0335	.014	.139	3723.	81.9n	.0989
U	98.439	.0309	.013	.138	3806.	83.0n	.0946

SLATE   281-TB

R - ALFA(1+2) LINES   **R - ALFA(1) LINES**

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3143.	2.022	.011	.220	.0644	100.0
MG	1.254	1979.	2.006	.015	.350	.1019	130.0
AL	1.487	1303.	1.953	.019	.531	.1511	104.5
SI	1.740	1100.	1.876	.023	.586	.1606	80.50
P	2.013	1406.	1.703	.028	.644	.1217	63.16
S	2.307	1050.	1.601	.033	.659	.1630	50.21
CL	2.622	752.5	1.576	.039	.919	.2142	40.65
AR	2.957	546.7	1.471	.045	1.264	.2763	32.99
K	3.313	402.3	1.367	.050	1.717	.3511	27.19
CA	3.690	330.9	1.260	.056	2.006	.3904	22.62
SC	4.089	251.9	1.173	.062	2.730	.4879	18.94
TI	4.509	192.1	1.004	.067	3.585	.5957	16.07
V	4.950	147.9	1.001	.073	4.650	.7205	13.71
CR	5.412	117.7	.924	.078	5.035	.6637	11.77
MN	5.895	92.20	.852	.084	7.035	1.003	10.17
FE	6.400	72.07	.786	.089	9.390	1.105	8.001
CO	6.925	56.10	.725	.094	11.76	1.309	7.726
NI	7.472	62.16	.669	.099	13.01	1.219	6.705
CU	8.041	50.51	.617	.103	13.52	1.406	5.907
ZN	8.631	41.20	.570	.107	16.51	1.616	5.306
GA	9.243	33.93	.527	.112	20.05	1.846	4.722
GE	9.876	28.02	.487	.115	24.20	2.103	4.218
AS	10.532	23.26	.450	.119	24.08	2.309	3.780
SE	11.209	19.39	.417	.123	34.76	2.706	3.400
BR	11.909	16.24	.386	.126	41.57	3.054	3.067
KR	12.632	13.65	.358	.129	44.02	3.043	2.775
RB	13.375	11.52	.332	.132	57.00	3.868	2.518
SR	14.143	9.767	.308	.135	67.09	4.317	2.290
Y	14.933	8.304	.286	.137	79.61	4.951	2.088
ZR	15.747	7.000	.266	.139	92.54	5.415	1.900
NB	16.584	6.004	.248	.142	107.4	6.031	1.748
MO	17.444	5.200	.231	.144	124.1	6.780	1.600
TC	18.328	4.484	.215	.146	143.0	7.637	1.475
RU	19.236	3.872	.200	.147	164.2	8.233	1.359
RH	20.169	3.354	.187	.149	187.0	9.096	1.256
PD	21.125	2.912	.174	.150	210.1	10.02	1.168
AG	22.105	2.535	.163	.152	243.1	11.03	1.079
CD	23.110	2.213	.152	.153	275.2	12.11	.9987
IN	24.101	1.936	.142	.154	310.5	13.27	.9250
SN	25.195	1.697	.133	.155	349.0	14.51	.8613

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SN	26.359	1.477	.124	.156	394.6	15.93	.7980
TE	27.472	1.300	.116	.157	440.5	17.35	.7461
J	28.612	1.167	.109	.157	490.6	18.85	.6960
XE	29.779	1.035	.102	.158	546.1	20.43	.6465
CS	30.973	.9074	.094	.158	601.7	22.09	.6070
BA	32.194	.7940	.086	.158	663.2	23.92	.5694
LA	33.442	.7074	.084	.158	728.6	25.66	.5340
CE	34.720	.6295	.088	.158	797.4	27.52	.5013
PR	36.026	.5612	.075	.158	871.0	29.47	.4710
ND	37.361	.5011	.071	.158	947.7	31.48	.4430
PM	38.725	.4491	.067	.158	1027.	33.56	.4170
SM	40.118	.4016	.063	.158	1111.	35.65	.3920
EU	41.542	.3608	.059	.158	1197.	37.79	.3705
GD	42.996	.3233	.056	.159	1287.	39.96	.3444
TB	44.482	.2908	.053	.159	1378.	42.15	.3362
DY	45.998	.2619	.050	.159	1472.	44.36	.3121
HO	47.547	.2361	.047	.159	1568.	46.56	.2952
ER	49.128	.2132	.044	.159	1666.	48.76	.2794
TM	50.742	.1927	.042	.158	1766.	50.94	.2644
YB	52.389	.1743	.040	.158	1866.	53.11	.2500
LU	54.070	.1579	.037	.157	1966.	55.24	.2370
HF	55.790	.1432	.035	.157	2064.	57.36	.2254
TA	57.532	.1304	.036	.157	2166.	59.38	.2147
W	59.318	.1182	.032	.156	2264.	61.38	.2036
RE	61.140	.1075	.030	.156	2364.	63.33	.1936
OS	63.001	.0979	.029	.155	2462.	65.22	.1839
IR	64.899	.0892	.027	.154	2560.	67.08	.1750
PT	66.832	.0814	.026	.154	2657.	68.80	.1664
AU	68.804	.0743	.026	.153	2752.	71.45	.1589
HG	70.819	.0679	.025	.153	2865.	72.12	.1511
TL	72.872	.0621	.022	.152	2930.	73.60	.1441
PB	74.960	.0568	.021	.151	3028.	75.17	.1374
BI	77.108	.0525	.020	.151	3117.	76.54	.1314
PO	79.290	.0477	.019	.150	3204.	77.00	.1254
AT	83.780	.0402	.017	.148	3373.	80.65	.1160
RA	88.470	.0338	.015	.147	3534.	82.71	.1001
AC	90.804	.0312	.015	.146	3613.	83.76	.0990
TH	93.350	.0287	.014	.145	3600.	86.74	.0951
PA	95.908	.0264	.013	.145	3766.	85.45	.0910
U	98.430	.0243	.013	.144	3640.	86.54	.0947

SYENITE   NIM-S

R - ALFA(1+2) LINES   **R - ALFA(1) LINES**

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3023.	2.060	.011	.229	.0640	100.6
MG	1.254	1871.	2.047	.015	.378	.1101	140.6
AL	1.487	1198.	1.997	.019	.577	.1679	100.6
SI	1.740	1050.	1.920	.023	.654	.1833	82.65
P	2.013	1446.	1.827	.028	.601	.1206	64.75
S	2.307	1018.	1.720	.033	.679	.1723	51.50
CL	2.622	730.1	1.610	.039	.907	.2200	41.60
AR	2.957	530.0	1.510	.040	1.302	.2920	34.00
K	3.313	390.0	1.405	.050	1.707	.3710	28.06
CA	3.690	416.5	1.300	.056	1.659	.3853	23.37
SC	4.089	321.9	1.207	.061	2.105	.3805	19.63
TI	4.509	207.5	1.116	.067	2.707	.4750	16.63
V	4.950	192.0	1.030	.073	3.500	.5712	14.19
CR	5.412	150.3	.951	.070	4.500	.6800	12.19
MN	5.895	118.0	.870	.083	5.000	.0000	10.54
FE	6.400	93.99	.010	.080	7.305	.0042	9.165
CO	6.925	75.10	.747	.093	9.123	1.105	8.011
NI	7.472	63.03	.689	.090	10.72	1.210	7.030
CU	8.041	51.73	.636	.102	13.20	1.407	6.212
ZN	8.631	42.10	.500	.107	16.17	1.620	5.500
GA	9.243	34.56	.543	.111	19.60	1.050	4.900
GE	9.876	28.60	.502	.115	23.03	2.120	4.378
AS	10.532	23.56	.460	.110	26.70	2.013	3.900
SE	11.209	19.59	.430	.122	30.40	2.730	3.540
BR	11.909	16.36	.390	.125	41.00	3.099	3.100
KR	12.632	13.72	.369	.128	46.76	3.490	2.840
RB	13.375	11.55	.343	.131	57.01	3.930	2.613
SR	14.143	9.769	.310	.134	67.01	4.420	2.377
Y	14.933	8.200	.298	.136	79.50	4.952	2.167
ZR	15.747	7.053	.275	.139	92.03	5.535	1.980
NB	16.584	6.023	.250	.141	107.9	6.173	1.814
MO	17.444	5.160	.238	.143	125.0	6.078	1.665
TC	18.328	4.430	.222	.145	144.3	7.630	1.531
RU	19.236	3.822	.207	.146	166.0	8.050	1.410
RH	20.169	3.303	.193	.148	190.2	9.352	1.301
PD	21.125	2.862	.180	.150	217.1	10.32	1.203
AG	22.105	2.497	.169	.151	246.9	11.36	1.116
CD	23.110	2.169	.157	.152	279.9	12.48	1.033
IN	24.101	1.892	.147	.153	316.3	13.60	.9597
SN	25.195	1.650	.130	.154	356.8	14.07	.8928

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SN	26.359	1.530	.124	.155	402.5	16.45	.8271
TE	27.472	1.344	.120	.156	439.	17.92	.7711
J	28.612	1.113	.113	.157	501.6	19.68	.7199
XE	29.779	.982	.106	.157	554.6	21.11	.6720
CS	30.973	.8840	.099	.158	610.1	22.65	.6295
BA	32.194	.7940	.093	.158	670.6	24.63	.5007
LA	33.442	.7121	.088	.158	744.7	26.51	.5520
CE	34.720	.6442	.082	.158	810.5	28.45	.5180
PR	36.026	.5390	.077	.158	883.2	30.60	.4875
ND	37.361	.4811	.073	.158	971.0	32.54	.4605
PM	38.725	.4297	.069	.158	1050.	34.65	.4315
SM	40.118	.3863	.065	.159	1134.	36.81	.4005
EU	41.542	.3442	.061	.159	1220.	39.00	.3832
GD	42.996	.3008	.058	.159	1310.	41.22	.3618
TB	44.482	.2770	.056	.159	1412.	43.60	.3418
DY	45.998	.2695	.051	.159	1500.	45.70	.3227
HO	47.547	.2267	.048	.159	1600.	47.96	.3051
ER	49.128	.2026	.046	.150	1796.	50.17	.2887
TM	50.742	.1829	.043	.158	1800.	52.37	.2736
YB	52.389	.1653	.041	.158	1905.	54.55	.2591
LU	54.070	.1494	.039	.157	2000.	56.69	.2456
HF	55.790	.1355	.037	.157	2107.	58.86	.2350
TA	57.532	.1229	.035	.156	2200.	60.83	.2212
W	59.318	.1116	.033	.156	2300.	62.83	.2101
RE	61.140	.1019	.031	.155	2607.	64.76	.1997
OS	63.001	.0923	.029	.155	2500.	66.00	.1898
IR	64.899	.0840	.028	.154	2603.	68.00	.1809
PT	66.832	.0760	.026	.154	2699.	70.18	.1719
AU	68.804	.0698	.025	.153	2790.	71.86	.1636
HG	70.819	.0650	.024	.153	2887.	73.40	.1559
TL	72.872	.0603	.023	.152	2970.	74.90	.1486
PB	74.960	.0553	.021	.151	3060.	76.52	.1416
BI	77.108	.0497	.020	.151	3155.	77.80	.1351
PO	79.290	.0460	.019	.150	3261.	79.12	.1299
NA	98.470	.0375	.017	.148	3607.	81.90	.1175
MA	98.470	.0316	.016	.147	3567.	83.72	.1072
AC	100.804	.0201	.015	.146	3660.	84.71	.1025
TH	103.350	.0267	.014	.145	3719.	86.65	.0980
PA	105.908	.0244	.014	.145	3793.	86.56	.0937
U	108.450	.0206	.013	.144	3855.	87.36	.0890

SYENITE   SSC-SY-1

K - ALFA(1+2) LINES   K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	3304.	2.116	.011	.210	.0643	196.8
MG	1.254	2149.	2.187	.014	.322	.0906	146.9
AL	1.487	1465.	2.056	.018	.472	.1415	111.7
SI	1.748	1117.	1.982	.023	.619	.1791	86.52
P	2.013	1433.	1.849	.028	.683	.1336	68.04
S	2.307	1013.	1.785	.033	.683	.1791	54.27
CL	2.622	725.8	1.677	.038	.955	.2357	43.45
AR	2.957	527.2	1.567	.044	1.311	.3045	35.84
K	3.313	307.9	1.459	.049	1.780	.3873	29.61
CA	3.690	310.5	1.355	.055	2.222	.4519	24.68
SC	4.089	301.4	1.255	.060	2.290	.4347	20.75
TI	4.509	230.9	1.162	.066	2.906	.5204	17.54
V	4.950	178.5	1.074	.071	3.858	.6372	15.01
CR	5.412	148.7	.991	.077	4.889	.7435	12.90
MN	5.895	110.6	.915	.082	6.210	.8935	11.16
FE	6.400	87.63	.845	.087	7.826	1.052	9.710
CO	6.925	71.02	.780	.092	9.640	1.212	8.492
NI	7.472	75.52	.720	.096	9.880	1.069	7.463
CU	8.041	61.51	.665	.101	11.13	1.230	6.569
ZN	8.631	50.30	.615	.105	13.56	1.408	5.842
GA	9.243	61.48	.568	.109	16.44	1.606	5.201
GE	9.876	36.33	.525	.113	19.82	1.825	4.647
AS	10.532	28.54	.486	.117	23.78	2.068	4.167
SE	11.209	23.84	.450	.120	28.39	2.336	3.749
BR	11.909	19.99	.417	.123	33.75	2.632	3.382
KR	12.632	16.83	.387	.126	39.95	2.959	3.060
RB	13.375	14.23	.359	.129	47.87	3.318	2.777
SR	14.165	12.08	.333	.132	55.25	3.789	2.527
Y	14.933	10.28	.310	.134	64.59	4.108	2.304
ZR	15.757	8.787	.288	.137	75.26	4.612	2.106
NB	16.584	7.532	.268	.139	87.30	5.127	1.929
MO	17.444	6.475	.250	.141	100.9	5.689	1.770
TC	18.320	5.583	.233	.143	116.3	6.301	1.620
RU	19.236	4.828	.217	.145	133.5	6.965	1.500
RH	20.169	4.186	.202	.146	152.8	7.686	1.384
PD	21.125	3.639	.189	.148	174.3	8.466	1.280
AG	22.105	3.172	.177	.149	198.1	9.307	1.185
CD	23.110	2.771	.165	.150	224.5	10.21	1.099
IN	24.141	2.427	.155	.151	253.5	11.18	1.021
SN	25.195	2.130	.145	.152	285.5	12.23	.9501

		KEV	PHOTO	COHER	INCOH.	H-1/2	SC/TOT	COH/INC
SM		26.359	1.856	.135	.153	323.2	13.43	.8803
TE		27.472	1.635	.126	.154	361.7	14.63	.8208
J		28.612	1.444	.119	.155	403.6	15.90	.7662
XE		29.779	1.277	.111	.155	448.9	17.26	.7161
CS		30.973	1.132	.104	.156	497.8	18.69	.6701
BA		32.194	1.005	.098	.156	556.3	20.19	.6277
LA		33.442	.8039	.092	.157	606.5	21.77	.5886
CE		34.720	.7963	.087	.157	666.5	23.42	.5525
PR		36.026	.7105	.082	.157	730.3	25.14	.5190
ND		37.361	.6340	.077	.157	797.6	26.93	.4881
PM		38.725	.5663	.072	.157	868.6	28.78	.4594
SM		40.118	.5064	.068	.157	943.1	30.68	.4328
EU		41.542	.4572	.064	.157	1021.	32.64	.4080
GD		42.996	.4109	.061	.157	1102.	34.65	.3850
TB		44.482	.3649	.057	.157	1186.	36.69	.3635
DY		45.998	.3333	.054	.157	1273.	38.76	.3435
HO		47.547	.3008	.051	.157	1363.	40.85	.3249
ER		49.128	.2717	.048	.157	1454.	42.97	.3074
TM		50.742	.2457	.045	.156	1548.	45.08	.2911
YB		52.389	.2225	.043	.156	1644.	47.20	.2758
LU		54.070	.2017	.041	.156	1741.	49.31	.2615
HF		55.790	.1830	.038	.155	1840.	51.42	.2481
TA		57.532	.1663	.036	.155	1938.	53.48	.2355
W		59.318	.1512	.035	.154	2038.	55.52	.2237
RE		61.140	.1377	.033	.154	2138.	57.53	.2126
OS		63.001	.1254	.031	.153	2238.	59.50	.2021
IR		64.896	.1148	.029	.153	2337.	61.43	.1923
PT		66.832	.1044	* .028	.152	2434.	63.30	.1830
AU		68.808	.0956	.026	.152	2535.	65.12	.1742
HG		70.819	.0872	.025	.151	2632.	66.88	.1660
TL		72.872	.0798	.024	.150	2729.	68.59	.1582
PB		74.969	.0730	.023	.150	2824.	70.23	.1508
BI		77.108	.0669	.021	.149	2918.	71.81	.1438
PO		79.290	.0614	.020	.148	3011.	73.33	.1372
RN		83.780	.0517	.018	.147	3192.	76.17	.1251
RA		88.470	.0437	.017	.146	3367.	78.77	.1141
AC		90.884	.0402	.016	.145	3451.	79.97	.1091
TH		93.350	.0370	.015	.144	3535.	81.12	.1043
PA		95.868	.0341	.014	.143	3617.	82.21	.0997
U		98.439	.0314	.014	.142	3697.	83.24	.0954

BARIUM SULPHATE

K - ALFA(1+2) LINES   K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	4796.	6.883	.006	.104	.1634	1130.
MG	1.254	3090.	7.247	.008	.224	.2342	940.7
AL	1.487	2044.	7.449	.010	.335	.3407	733.2
SI	1.748	1416.	7.513	.013	.407	.5207	541.3
P	2.013	958.9	7.469	.016	.489	.7637	447.9
S	2.307	721.1	7.340	.019	.951	1.010	381.7
CL	2.622	1078.	7.167	.023	.368	.3842	315.1
AR	2.957	1371.	6.909	.026	.503	.5033	262.9
K	3.313	1299.	6.640	.030	.531	.5106	221.5
CA	3.690	1065.	6.350	.034	.635	.5695	188.1
SC	4.089	885.0	6.049	.038	.777	.690	161.0
TI	4.509	664.7	5.745	.041	1.044	.8340	138.8
V	4.950	535.4	5.443	.045	1.281	1.018	120.6
CR	5.412	423.0	5.144	.049	1.419	1.213	105.1
MN	5.895	337.4	4.857	.053	2.025	1.434	92.25
FE	6.400	271.5	4.579	.056	2.509	1.677	81.36
CO	6.925	220.3	4.312	.060	3.084	1.945	72.09
NI	7.472	180.1	4.058	.063	3.741	2.239	64.15
CU	8.041	148.3	3.816	.067	4.552	2.450	57.31
ZN	8.631	122.9	3.588	.070	5.473	2.480	51.39
GA	9.243	102.5	3.372	.073	6.537	3.249	46.26
GE	9.876	86.05	3.169	.076	7.762	3.636	41.75
AS	10.532	72.56	2.978	.079	9.166	4.002	37.79
SE	11.209	61.51	2.799	.082	10.76	4.472	34.31
BR	11.909	52.38	2.630	.084	12.58	4.926	31.23
KR	12.632	44.88	2.472	.087	14.63	5.402	28.50
RB	13.375	89.99	2.326	.089	7.501	2.611	26.07
SR	14.165	77.71	2.185	.091	8.665	2.806	23.90
Y	14.933	67.33	2.055	.094	9.976	3.093	21.49
ZR	15.757	81.70	1.934	.096	8.278	2.623	20.20
NB	16.584	82.38	1.828	.098	6.223	2.274	18.63
MO	17.444	72.06	1.713	.100	9.343	2.453	17.20
TC	18.320	63.21	1.613	.101	10.67	2.660	15.92
RU	19.236	55.68	1.520	.103	12.11	2.835	14.75
RH	20.169	49.03	1.432	.105	13.70	3.036	13.69
PD	21.125	43.34	1.350	.106	15.47	3.249	12.72
AG	22.105	38.41	1.273	.107	17.42	3.469	11.84
CD	23.110	34.11	1.201	.109	19.56	3.697	11.03
IN	24.141	30.35	1.134	.110	21.93	3.935	10.30
SN	25.195	27.07	1.070	.111	24.53	4.181	9.624

		KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SM		26.359	23.98	1.006	.112	27.61	4.456	8.957
TE		27.472	21.46	.951	.113	30.76	4.723	8.386
J		28.612	10.26	.808	.114	34.22	5.000	7.859
XE		29.770	17.27	.869	.115	37.99	5.286	7.372
CS		30.973	15.54	.803	.116	42.10	5.584	6.923
BA		32.194	14.01	.760	.117	46.58	5.891	6.507
LA		33.442	12.63	.719	.117	51.45	6.210	6.122
CE		34.720	11.41	.681	.118	56.76	6.560	5.764
PR		36.026	10.32	.645	.119	62.49	6.881	5.431
ND		37.361	9.358	.611	.119	68.70	7.235	5.122
PM		38.725	8.490	.579	.120	75.43	7.604	4.834
SM		40.118	7.712	.549	.120	82.70	7.978	4.566
EU		41.542	7.018	.520	.121	90.55	8.370	4.316
GD		42.996	6.386	.493	.121	99.00	8.774	4.082
TB		44.482	5.821	.468	.121	108.1	9.192	3.865
DY		45.998	5.312	.444	.121	117.9	9.625	3.659
HO		47.547	4.852	.422	.122	128.6	10.07	3.467
ER		49.128	4.437	.401	.122	139.7	10.53	3.288
TM		50.742	4.061	.381	.122	151.8	11.01	3.119
YB		52.389	3.720	.362	.122	164.8	11.50	2.961
LU		54.070	3.411	.344	.122	178.7	12.01	2.813
HF		55.790	3.130	.327	.122	193.6	12.54	2.672
TA		57.532	2.876	.311	.122	200.4	13.08	2.542
W		59.318	2.646	.296	.122	226.3	13.64	2.418
RE		61.140	2.433	.281	.122	14.22	2.301	
OS		63.001	2.240	.268	.122	243.3	14.62	2.191
IR		64.896	2.064	.25%	.122	283.0	15.43	2.087
PT		66.832	1.902	.243	.122	305.7	16.07	1.988
AU		68.808	1.755	.231	.122	328.7	16.72	1.896
HG		70.819	1.621	.220	.122	353.1	17.40	1.808
TL		72.872	1.497	.210	.121	379.0	18.10	1.725
PB		74.969	1.384	.200	.121	406.4	18.81	1.646
BI		77.108	1.280	.190	.121	435.5	19.55	1.572
PO		79.290	1.186	.181	.121	466.1	20.31	1.501
RN		83.780	1.016	.165	.120	532.5	21.90	1.371
RA		88.470	.153	.150	.119	156.7	6.092	1.253
AC		90.884	3.881	.143	.119	167.2	6.328	1.198
TH		93.350	3.627	.136	.119	178.5	6.575	1.146
PA		95.868	5.300	.130	.119	190.4	6.832	1.097
U		98.439	3.170	.124	.118	203.1	7.10	1.050

BIOTITE   **CARD-MICA-FE**

K - ALFA(1+2) LINES   K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CON/INC
NA	1.041	3976.	2.331	.010	.174	.0500	220.9
MG	1.254	2685.	2.333	.014	.279	.0943	171.4
AL	1.487	1690.	2.290	.010	.400	.1357	130.0
SI	1.740	1431.	2.215	.022	.483	.1540	101.5
P	2.013	1367.	2.118	.026	.566	.1544	80.00
S	2.307	964.5	2.000	.031	.717	.2110	64.05
CL	2.622	680.9	1.892	.036	1.003	.2791	51.07
AR	2.957	499.3	1.773	.042	1.383	.3621	42.49
K	3.313	366.7	1.655	.047	1.801	.4021	35.17
CA	3.690	304.5	1.541	.052	2.003	.4603	29.37
SC	4.089	264.1	1.431	.050	2.610	.5600	25.74
TI	4.509	202.2	1.326	.063	3.605	.6825	21.00
V	4.950	156.2	1.228	.068	4.400	.8230	17.95
CR	5.412	129.6	1.136	.074	5.304	.9856	15.45
MN	5.895	101.6	1.051	.079	6.731	1.196	13.30
FE	6.400	80.72	.971	.083	8.076	1.200	11.65
CO	6.925	65.39	.898	.088	10.04	1.405	10.20
NI	7.472	118.4	.830	.093	8.223	.8803	8.974
CU	8.041	90.73	.768	.097	7.567	.9537	7.930
ZN	8.631	76.90	.710	.101	9.154	1.071	7.037
GA	9.243	62.13	.657	.105	11.02	1.211	6.264
GE	9.876	51.77	.609	.109	13.26	1.366	5.606
AS	10.532	43.32	.564	.112	15.75	1.536	5.029
SE	11.209	36.40	.523	.115	18.71	1.722	4.527
BR	11.909	30.70	.485	.119	22.14	1.927	4.007
KR	12.632	25.90	.450	.122	26.18	2.151	3.700
RB	13.375	22.00	.418	.124	30.63	2.376	3.350
SR	14.163	18.82	.388	.127	35.83	2.644	3.057
Y	14.933	16.18	.361	.129	41.77	2.957	2.709
ZR	15.747	13.61	.336	.132	48.54	3.270	2.550
NB	16.584	11.08	.313	.134	56.20	3.623	2.336
MO	17.444	10.25	.292	.136	64.08	4.001	2.145
TC	18.328	8.074	.272	.138	74.65	4.412	1.973
RU	19.236	7.699	.254	.139	85.65	4.858	1.818
RH	20.169	6.696	.237	.141	97.97	5.342	1.679
PD	21.125	5.839	.221	.143	111.7	5.865	1.552
AG	22.105	5.104	.207	.144	127.0	6.430	1.438
CD	23.110	4.471	.194	.145	144.0	7.040	1.334
IN	24.141	3.926	.181	.146	162.9	7.697	1.239
SN	25.195	3.454	.170	.147	183.7	8.404	1.153

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CON/INC
SH	26.359	3.017	.158	.148	210.5	9.22	1.068
TE	27.472	2.648	.148	.148	236.8	10.09	.9966
J	28.612	2.357	.134	.150	70.16	10.42	.9311
XE	29.774	2.004	.131	.150	79.10	11.05	.8699
CS	30.973	1.855	.122	.151	325.6	12.05	.8137
BA	32.194	1.669	.115	.151	381.6	13.01	.7623
LA	33.442	1.476	.108	.152	449.6	15.06	.7160
CE	34.720	1.311	.102	.152	482.6	16.23	.6710
PR	36.026	1.172	.098	.152	487.9	17.40	.6306
ND	37.361	1.049	.094	.153	516.8	18.02	.5924
PM	38.725	.9403	.093	.153	560.2	20.19	.5581
SM	40.118	.8441	.090	.153	663.5	21.63	.5257
EU	41.542	.7966	.074	.153	702.1	23.16	.4957
GD	42.996	.6920	.071	.153	760.2	24.72	.4677
TB	44.482	.6153	.067	.153	827.7	26.36	.4416
DY	45.998	.5551	.064	.153	848.5	28.03	.4173
HO	47.547	.5015	.061	.152	673.7	29.76	.3942
ER	49.128	.4536	.057	.152	1040.	71.56	.3735
TM	50.742	.4107	.054	.152	1126.	33.17	.3537
YB	52.389	.3722	.051	.152	1246.	35.23	.3351
LU	54.070	.3378	.069	.151	1276.	37.12	.3177
HF	55.790	.3067	.066	.151	1377.	39.05	.3016
TA	57.532	.2790	.063	.151	1466.	40.00	.2861
W	59.318	.2539	.061	.150	1557.	42.03	.2717
RE	61.140	.2313	.059	.150	1651.	44.00	.2582
OS	63.001	.2109	.057	.149	1766.	46.05	.2455
IR	64.896	.1925	.055	.149	1862.	48.11	.2335
PT	66.832	.1758	.053	.148	1967.	50.76	.2222
AU	68.804	.1608	.051	.148	2050.	52.00	.2114
HG	70.819	.1471	.049	.147	2150.	54.00	.2016
TL	72.872	.1347	.028	.147	2235.	56.49	.1921
PB	74.969	.1235	.027	.146	2344.	58.93	.1831
BI	77.100	.1132	.025	.145	2460.	60.15	.1747
PO	79.290	.1030	.024	.145	2761.	62.00	.1668
RN	83.700	.0876	.022	.143	2766.	65.35	.1510
RA	88.701	.0761	.021	.142	2930.	68.50	.1390
AC	90.000	.0682	.019	.141	3135.	70.17	.1326
TH	93.350	.0620	.018	.141	3131.	71.00	.1266
PA	95.000	.0579	.017	.140	3326.	73.00	.1211
U	98.430	.0536	.016	.139	3430.	76.42	.1154

CALCIUM CARBONATE

K - ALFA(1+2) LINES   K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CON/INC
NA	1.041	4011.	2.157	.012	.173	.0540	185.4
MG	1.254	2669.	2.103	.015	.280	.0873	138.4
AL	1.487	1567.	2.090	.020	.441	.1343	105.4
SI	1.740	1023.	2.010	.025	.676	.1903	81.08
P	2.013	685.1	1.914	.030	1.009	.2880	64.30
S	2.307	468.6	1.807	.035	1.473	.3916	51.35
CL	2.622	326.9	1.697	.041	2.109	.5206	41.55
AR	2.957	232.1	1.585	.047	2.945	.6982	34.01
K	3.313	167.4	1.476	.052	4.102	.9047	28.14
CA	3.690	122.4	1.371	.058	5.895	1.153	23.49
SC	4.089	459.3	1.270	.064	1.500	.2096	19.78
TI	4.509	366.7	1.175	.070	1.942	.3407	16.79
V	4.950	277.9	1.084	.076	2.484	.4163	14.36
CR	5.412	218.8	1.003	.081	3.151	.4930	12.36
MN	5.895	173.6	.926	.086	3.949	.5790	10.71
FE	6.400	138.7	.855	.092	4.940	.6776	9.332
CO	6.925	111.6	.790	.097	6.150	.7872	8.173
NI	7.472	90.43	.729	.101	7.598	.9099	7.193
CU	8.041	73.67	.673	.105	9.310	1.046	6.359
ZN	8.631	60.36	.622	.110	11.36	1.199	5.646
GA	9.243	49.72	.575	.114	13.76	1.360	5.033
GE	9.876	41.17	.532	.118	16.57	1.535	4.503
AS	10.532	34.25	.493	.122	19.88	1.702	4.042
SE	11.209	28.62	.454	.125	23.72	1.899	3.641
BR	11.909	24.02	.423	.129	28.10	2.244	3.289
KR	12.632	20.24	.392	.132	33.37	2.522	2.979
RB	13.375	17.13	.364	.135	39.30	2.827	2.708
SR	14.163	14.55	.338	.137	46.12	3.162	2.465
Y	14.933	12.40	.314	.140	53.91	3.530	2.250
ZR	15.747	10.60	.292	.142	62.78	3.932	2.058
NB	16.584	9.100	.272	.144	72.03	4.372	1.887
MO	17.444	7.831	.253	.146	84.21	4.851	1.734
TC	18.328	6.760	.236	.148	97.02	5.373	1.596
RU	19.236	5.862	.220	.150	111.4	5.941	1.471
RH	20.169	5.079	.205	.151	127.5	6.557	1.359
PD	21.125	4.421	.192	.152	145.4	7.224	1.258
AG	22.105	3.857	.179	.154	165.4	7.945	1.165
CD	23.110	3.374	.166	.155	187.5	8.723	1.082
IN	24.141	2.958	.157	.156	213.9	9.560	1.005
SN	25.195	2.599	.147	.157	238.7	10.45	.9364

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CON/INC
SH	26.359	2.267	.137	.158	270.5	11.40	.8681
TE	27.472	2.000	.128	.158	303.6	12.53	.8100
J	28.612	1.768	.120	.159	338.5	13.66	.7567
XE	29.779	1.565	.113	.160	377.1	14.82	.7076
CS	30.973	1.389	.106	.160	410.8	16.00	.6625
BA	32.194	1.234	.100	.160	443.7	17.38	.6214
LA	33.442	1.099	.094	.161	512.1	18.77	.5826
CE	34.720	.9803	.088	.161	543.9	20.26	.5471
PR	36.026	.8756	.083	.161	619.2	21.77	.5143
ND	37.361	.7836	.078	.161	678.0	23.37	.4830
PM	38.725	.7019	.073	.161	760.2	25.03	.4557
SM	40.118	.6298	.069	.161	806.8	26.76	.4295
EU	41.542	.5659	.064	.161	875.1	28.56	.4051
GD	42.996	.5092	.061	.161	947.6	30.38	.3829
TB	44.482	.4568	.056	.161	1023.	32.27	.3612
DY	45.998	.4139	.055	.160	1107.	34.19	.3415
HO	47.547	.3738	.052	.160	1183.	36.15	.3230
ER	49.128	.3381	.049	.160	1266.	38.15	.3058
TM	50.742	.3061	.046	.159	1355.	40.17	.2897
YB	52.389	.2775	.044	.159	1446.	42.20	.2744
LU	54.070	.2517	.041	.158	1535.	44.26	.2600
HF	55.790	.2286	.039	.158	1628.	46.30	.2471
TA	57.532	.2079	.037	.158	1722.	48.33	.2347
W	59.318	.1892	.035	.157	1818.	50.36	.2229
RE	61.140	.1724	.031	.156	1916.	52.37	.2119
OS	63.001	.1572	.031	.156	2012.	54.36	.2015
IR	64.896	.1435	.030	.155	2109.	56.32	.1918
PT	66.832	.1311	.028	.155	2207.	58.26	.1825
AU	68.804	.1199	.027	.154	2305.	60.13	.1738
HG	70.819	.1097	.025	.153	2405.	61.97	.1656
TL	72.872	.1000	.024	.153	2500.	63.76	.1575
PB	74.969	.0921	.023	.152	2597.	65.51	.1505
BI	77.100	.0848	.022	.151	2693.	67.20	.1436
PO	79.290	.0775	.021	.151	2788.	68.86	.1370
RN	83.780	.0656	.019	.149	2976.	71.93	.1249
RA	88.070	.0453	.017	.147	3157.	76.80	.1146
AC	90.000	.0509	.016	.147	3269.	76.15	.1091
TH	93.350	.0462	.015	.146	311.	77.44	.1042
PA	95.848	.0432	.014	.145	3419.	78.67	.0997
U	98.430	.0379	.014	.144	3500.	79.85	.0953

CALCIUM SULPHATE

K - ALFA(1+2) LINES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

K - ALFA(1) LINES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

CUPRIC SULPHIDE

K - ALFA(1+2) LINES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

K - ALFA(1) LINES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC

FERROUS BROMIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	4185.	2.055	.007	.169	.0502	206.2
MG	1.254	2562.	2.039	.010	.270	.0799	200.3
AL	1.487	1643.	1.984	.014	.421	.1214	144.4
SI	1.740	1080.	1.983	.018	.640	.1775	106.0
P	2.013	726.2	1.887	.022	.952	.2512	80.00
S	2.307	497.9	1.701	.027	1.387	.3454	62.42
CL	2.622	979.5	1.542	.032	.706	.1855	49.01
AR	2.957	714.3	1.482	.038	.968	.2124	39.07
K	3.313	527.5	1.376	.044	1.310	.2603	31.57
CA	3.690	393.9	1.273	.049	1.756	.3346	25.81
SC	4.090	297.0	1.176	.055	2.321	.4122	21.33
TI	4.509	228.0	1.085	.061	3.000	.5025	17.00
V	4.950	174.7	1.000	.067	3.943	.6067	14.99
CR	5.012	194.7	.921	.072	5.009	.7262	12.73
MN	5.895	184.3	.848	.078	6.461	.8629	10.88
FE	6.400	83.90	.781	.083	8.149	1.018	9.378
CO	6.925	64.81	.719	.088	10.25	1.193	8.128
NI	7.472	53.52	.662	.093	12.76	1.392	7.085
CU	8.041	43.16	.610	.098	15.79	1.614	6.209
ZN	8.631	35.02	.563	.103	19.42	1.864	5.468
GA	9.243	28.58	.519	.107	23.72	2.144	4.838
GE	9.876	23.46	.479	.111	28.82	2.455	4.299
AS	10.532	19.35	.443	.115	34.81	2.802	3.835
SE	11.209	16.04	.409	.119	41.82	3.187	3.434
BR	11.909	13.34	.378	.123	49.99	3.614	3.085
KR	12.632	11.17	.350	.126	59.48	4.087	2.780
RB	13.375	9.393	.325	.129	70.39	4.606	2.514
SR	14.143	7.923	.301	.132	82.94	5.180	2.280
Y	14.933	6.709	.279	.135	97.31	5.810	2.072
ZR	15.747	5.701	.259	.137	113.6	6.500	1.889
NB	16.584	4.842	.241	.140	132.2	7.255	1.726
MO	17.444	4.160	.224	.142	153.1	8.078	1.580
TC	18.328	3.571	.208	.144	176.6	8.974	1.450
RU	19.236	3.074	.194	.146	202.9	9.945	1.334
RH	20.169	2.655	.181	.147	232.3	10.99	1.289
PD	21.125	2.299	.169	.149	264.0	12.12	1.134
AG	22.105	1.984	.157	.150	300.8	13.34	1.049
CD	23.110	1.738	.147	.151	340.3	14.64	.9717
IN	24.141	1.517	.137	.152	383.5	16.04	.9015
SN	25.195	1.327	.129	.153	430.4	17.52	.8376

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.350	1.152	.120	.154	485.8	19.21	.7752
TE	27.472	1.012	.112	.155	541.6	20.87	.7222
J	28.612	.8916	.105	.156	601.5	22.63	.6736
XE	29.779	.7844	.098	.156	665.7	24.47	.6292
CS	30.973	.6951	.092	.157	734.1	26.38	.5885
BA	32.194	.6156	.087	.157	806.5	28.37	.5508
LA	33.442	.5462	.081	.158	842.9	30.42	.5162
CE	34.720	.4854	.076	.158	963.2	32.56	.4803
PR	36.026	.4321	.072	.158	1047.	34.70	.4548
ND	37.361	.3854	.068	.158	1134.	36.91	.4276
PM	38.725	.3442	.064	.158	1225.	39.16	.4024
SM	40.118	.3079	.060	.158	1310.	41.42	.3790
EU	41.542	.2759	.056	.158	1414.	43.70	.3572
GD	42.996	.2475	.053	.158	1512.	45.99	.3370
TB	44.482	.2224	.050	.157	1612.	48.27	.3182
DY	45.998	.2001	.047	.157	1713.	50.53	.3007
HO	47.547	.1802	.045	.157	1816.	52.77	.2843
ER	49.128	.1626	.042	.156	1919.	54.98	.2691
TM	50.742	.1468	.040	.156	2023.	57.15	.2548
YB	52.389	.1327	.038	.156	2126.	59.27	.2414
LU	54.070	.1202	.036	.155	2230.	61.34	.2289
HF	55.790	.1089	.034	.155	2333.	63.35	.2172
TA	57.532	.0988	.032	.154	2435.	65.29	.2062
W	59.318	.0897	.030	.154	2536.	67.16	.1959
RE	61.140	.0816	.028	.153	2636.	68.97	.1862
OS	63.001	.0742	.027	.152	2734.	70.71	.1771
IR	64.896	.0676	.026	.152	2831.	72.37	.1685
PT	66.832	.0616	.024	.151	2927.	73.97	.1604
AU	68.804	.0562	.023	.150	3021.	75.48	.1527
HG	70.819	.0514	.022	.150	3113.	76.93	.1455
TL	72.872	.0470	.021	.149	3203.	78.30	.1387
PB	74.969	.0429	.020	.148	3291.	79.60	.1323
BI	77.108	.0393	.019	.147	3378.	80.83	.1262
PO	79.290	.0360	.018	.146	3463.	82.00	.1205
AN	83.780	.0303	.016	.145	3627.	84.18	.1099
RA	88.470	.0256	.014	.143	3784.	86.06	.1003
AC	90.844	.0235	.014	.142	3841.	86.91	.0960
TH	93.350	.0216	.013	.142	3936.	87.73	.0917
PA	95.868	.0197	.012	.141	4009.	88.49	.0877
U	98.439	.0183	.012	.140	4081.	89.21	.0839

MAGNESIUM CARBONATE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	2893.	1.665	.011	.239	.0579	148.6
MG	1.254	1765.	1.622	.015	.392	.0926	107.2
AL	1.487	2171.	1.554	.020	.319	.0729	79.36
SI	1.740	1450.	1.472	.025	.477	.1031	60.00
P	2.013	984.2	1.382	.030	.700	.1426	46.25
S	2.307	685.7	1.280	.036	1.009	.1927	36.26
CL	2.622	483.7	1.196	.041	1.429	.2550	28.86
AR	2.957	346.5	1.105	.047	1.996	.3316	23.28
K	3.313	251.6	1.019	.054	2.743	.4246	19.01
CA	3.690	184.9	.930	.060	3.720	.5360	15.68
SC	4.090	137.5	.862	.066	5.005	.6701	13.07
TI	4.509	103.6	.792	.072	6.645	.8279	10.98
V	4.950	78.59	.727	.078	8.730	1.013	9.316
CR	5.412	60.29	.667	.084	11.35	1.229	7.957
MN	5.895	46.66	.612	.089	14.63	1.480	6.862
FE	6.400	36.42	.562	.095	18.69	1.770	5.921
CO	6.925	28.60	.516	.100	23.67	2.103	5.154
NI	7.472	22.71	.476	.105	29.75	2.485	4.511
CU	8.041	18.13	.436	.110	37.10	2.921	3.968
ZN	8.631	14.57	.401	.114	45.94	3.415	3.504
GA	9.243	11.70	.369	.119	56.49	3.976	3.112
GE	9.876	9.562	.340	.123	68.99	4.600	2.773
AS	10.532	7.838	.314	.127	83.74	5.319	2.480
SE	11.209	6.443	.291	.130	100.9	6.116	2.226
BR	11.909	5.323	.268	.133	121.0	7.005	2.005
KR	12.632	4.418	.247	.137	144.3	7.972	1.810
RB	13.375	3.685	.229	.140	170.9	9.090	1.640
SR	14.143	3.084	.212	.142	201.4	10.29	1.490
Y	14.933	2.598	.197	.145	236.0	11.62	1.357
ZR	15.747	2.190	.182	.147	275.0	13.07	1.239
NB	16.584	1.855	.169	.149	318.7	14.65	1.133
MO	17.444	1.577	.157	.151	367.4	16.38	1.039
TC	18.328	1.344	.146	.153	421.2	18.19	.9554
RU	19.236	1.152	.136	.155	480.3	20.16	.8797
RH	20.169	.9890	.127	.156	544.9	22.25	.8116
PD	21.125	.8514	.118	.158	615.7	24.47	.7498
AG	22.105	.7385	.110	.159	689.9	26.79	.6940
CD	23.110	.6369	.103	.160	770.2	29.22	.6434
IN	24.141	.5530	.096	.161	855.5	31.79	.5975
SN	25.195	.4814	.090	.162	945.3	34.34	.5556

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.350	.4150	.084	.163	1046.	37.20	.5166
TE	27.472	.3636	.078	.163	1145.	39.92	.4798
J	28.612	.3186	.073	.164	1247.	42.68	.4479
XE	29.779	.2798	.069	.164	1351.	45.40	.4184
CS	30.973	.2462	.064	.165	1458.	48.20	.3917
BA	32.194	.2171	.061	.165	1566.	50.94	.3669
LA	33.442	.1918	.057	.165	1675.	53.63	.3441
CE	34.720	.1698	.053	.165	1784.	56.28	.3230
PR	36.026	.1506	.050	.165	1893.	58.86	.3035
ND	37.361	.1337	.047	.165	2002.	61.34	.2854
PM	38.725	.1190	.044	.165	2109.	63.78	.2687
SM	40.118	.1061	.042	.165	2216.	64.10	.2532
EU	41.542	.0947	.039	.165	2318.	68.32	.2388
GD	42.996	.0847	.037	.165	2420.	70.44	.2254
TB	44.482	.0758	.035	.164	2519.	72.44	.2129
DY	45.998	.0680	.033	.164	2616.	74.34	.2012
HO	47.547	.0610	.031	.164	2709.	76.16	.1906
ER	49.128	.0549	.029	.163	2801.	77.82	.1802
TM	50.742	.0494	.028	.163	2889.	79.40	.1707
YB	52.389	.0445	.026	.162	2975.	80.88	.1618
LU	54.070	.0402	.025	.162	3057.	82.27	.1535
HF	55.790	.0363	.023	.161	3138.	83.56	.1456
TA	57.532	.0329	.022	.161	3215.	84.76	.1383
W	59.318	.0298	.021	.160	3290.	85.87	.1319
RE	61.140	.0270	.020	.159	3362.	86.91	.1250
OS	63.001	.0245	.019	.159	3433.	87.87	.1189
IR	64.896	.0222	.018	.158	3501.	88.76	.1131
PT	66.832	.0202	.017	.157	3567.	89.59	.1077
AU	68.804	.0184	.016	.156	3631.	90.35	.1026
HG	70.819	.0168	.015	.156	3693.	91.06	.0978
TL	72.872	.0153	.014	.155	3754.	91.71	.0932
PB	74.969	.0140	.014	.154	3813.	92.32	.0889
BI	77.108	.0127	.013	.153	3871.	92.88	.0849
PO	79.290	.0117	.012	.152	3928.	93.39	.0810
AN	83.780	.0098	.011	.151	4037.	94.31	.0759
RA	88.470	.0082	.010	.149	4142.	95.10	.0675
AC	90.844	.0075	.010	.148	4194.	95.46	.0644
TH	93.350	.0069	.009	.147	4244.	95.77	.0617
PA	95.868	.0063	.009	.146	4295.	96.07	.0591
U	98.439	.0058	.008	.145	4344.	96.34	.0566

LEAD SULPHIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	4172.	3.060	.014	.166	.0731	219.7
MG	1.254	2482.	3.101	.018	.268	.1206	175.9
AL	1.487	1653.	3.092	.022	.418	.1880	142.3
SI	1.740	1090.	3.030	.026	.636	.2795	116.2
P	2.013	737.7	2.931	.031	.936	.3940	95.80
S	2.307	510.6	2.804	.035	1.356	.5535	79.62
CL	2.622	592.5	2.666	.040	1.165	.4544	46.69
AR	2.957	430.6	2.517	.045	1.600	.5916	56.26
K	3.313	317.6	2.365	.050	2.167	.7550	47.78
CA	3.690	236.8	2.214	.054	2.899	.9488	40.82
SC	4.089	976.1	2.067	.059	.709	.2173	35.07
TI	4.509	758.6	1.925	.064	.911	.2615	30.29
V	4.950	594.6	1.790	.068	1.162	.3116	26.30
CR	5.412	469.6	1.662	.072	1.471	.3681	22.94
MN	5.895	373.6	1.542	.077	1.848	.4317	20.10
FE	6.400	299.1	1.430	.081	2.306	.5026	17.68
CO	6.925	241.1	1.326	.085	2.857	.5816	15.62
NI	7.472	195.6	1.229	.089	3.519	.6690	13.85
CU	8.041	159.6	1.139	.092	4.308	.7655	12.32
ZN	8.631	131.0	1.056	.096	5.244	.8718	11.00
GA	9.243	108.0	.979	.099	6.350	.9884	9.853
GE	9.876	89.59	.909	.103	7.650	1.116	8.850
AS	10.532	74.61	.843	.106	9.172	1.255	7.970
SE	11.209	62.43	.783	.109	10.94	1.407	7.197
BR	11.909	52.65	.727	.112	13.00	1.573	6.515
KR	12.632	44.23	.676	.114	15.39	1.754	5.911
RB	13.375	37.67	.628	.117	18.13	1.949	5.376
SR	14.143	31.85	.585	.119	21.29	2.162	4.900
Y	14.933	27.16	.544	.122	24.90	2.392	4.475
ZR	15.747	23.24	.507	.124	29.03	2.641	4.095
NB	16.584	19.95	.472	.126	33.72	2.910	3.754
MO	17.444	17.18	.441	.128	39.04	3.201	3.447
TC	18.328	14.84	.411	.130	45.05	3.515	3.171
RU	19.236	12.85	.384	.131	51.83	3.853	2.922
RH	20.169	11.16	.359	.133	59.46	4.217	2.697
PD	21.125	9.721	.335	.134	68.01	4.609	2.493
AG	22.105	8.486	.314	.136	77.57	5.031	2.307
CD	23.110	7.426	.294	.137	88.22	5.483	2.139
IN	24.141	6.513	.275	.138	100.0	5.969	1.985
SN	25.195	5.725	.258	.140	113.2	6.489	1.845

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	4.994	.240	.141	128.9	7.089	1.707
TE	27.472	4.408	.226	.142	145.1	7.691	1.590
J	28.612	3.898	.212	.143	163.0	8.333	1.485
XE	29.779	3.452	.199	.144	182.6	9.018	1.384
CS	30.973	3.064	.187	.144	204.1	9.749	1.243
BA	32.194	2.724	.176	.145	227.6	10.52	1.210
LA	33.442	2.426	.165	.146	253.2	11.35	1.133
CE	34.720	2.164	.155	.146	281.0	12.22	1.062
PR	36.026	1.931	.146	.147	311.3	13.15	.9963
ND	37.361	1.730	.138	.147	343.0	14.13	.9354
PM	38.725	1.550	.130	.148	379.1	15.16	.8740
SM	40.118	1.391	.122	.148	417.0	16.25	.8267
EU	41.542	1.250	.115	.148	457.7	17.40	.7781
GD	42.996	1.125	.109	.148	501.1	18.66	.7330
TB	44.482	1.018	.103	.149	547.5	19.85	.6909
DY	45.998	.9153	.097	.149	596.0	21.17	.6518
HO	47.547	.8269	.092	.149	649.3	22.53	.6152
ER	49.128	.7479	.087	.149	706.7	23.95	.5812
TM	50.742	.6772	.082	.149	763.2	25.42	.5493
YB	52.389	.6139	.077	.149	829.8	26.94	.5196
LU	54.070	.5571	.073	.149	889.3	28.51	.4917
HF	55.790	.5060	.069	.149	957.1	30.13	.4656
TA	57.532	.4604	.066	.149	1027.	31.77	.4413
W	59.318	.4190	.062	.149	1100.	33.47	.4184
RE	61.140	.3818	.059	.149	1176.	35.19	.3968
OS	63.001	.3482	.056	.148	1255.	36.95	.3766
IR	64.896	.3179	.053	.148	1336.	38.73	.3576
PT	66.832	.2904	.050	.148	1419.	40.53	.3397
AU	68.804	.2656	.048	.147	1506.	42.35	.3229
HG	70.819	.2430	.045	.147	1592.	44.18	.3071
TL	72.872	.2226	.043	.147	1681.	46.01	.2921
PB	74.969	.2040	.041	.146	1772.	47.85	.2780
BI	77.108	.1871	.039	.146	1864.	49.68	.2647
PO	79.290	.1717	.037	.146	1957.	51.50	.2521
RN	83.780	.1450	.033	.145	2146.	55.10	.2200
RA	88.470	.1227	.030	.144	2338.	58.62	.2082
AC	90.884	.1129	.028	.143	2434.	60.35	.1987
TH	93.350	.1046	.027	.143	2530.	62.02	.1896
PA	95.868	.0950	.026	.142	2626.	63.66	.1810
U	98.439	.0884	.04	.142	2722.	65.27	.1720

ZINC SULPHIDE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
NA	1.041	8318.	3.935	.007	.083	.0473	566.3
MG	1.254	5868.	4.046	.010	.118	.0691	415.3
AL	1.487	3785.	4.065	.013	.185	.1087	321.4
SI	1.740	2466.	4.010	.018	.281	.1630	252.8
P	2.013	1607.	3.901	.019	.415	.2345	201.7
S	2.307	1194.	3.754	.023	.598	.3260	163.0
CL	2.622	1372.	3.583	.027	.504	.2423	135.2
AR	2.957	999.5	3.398	.031	.691	.3418	109.9
K	3.313	738.1	3.205	.035	.935	.4370	91.57
CA	3.690	551.8	3.011	.039	1.249	.5496	76.87
SC	4.089	617.5	2.819	.043	1.049	.4808	65.02
TI	4.509	319.4	2.633	.048	2.152	.6323	55.38
V	4.950	246.8	2.455	.052	2.780	1.005	47.47
CR	5.412	192.5	2.286	.056	3.557	1.201	40.94
MN	5.895	151.4	2.126	.060	4.511	1.422	35.69
FE	6.400	120.1	1.976	.064	5.673	1.669	30.94
CO	6.925	96.02	1.835	.068	7.078	1.949	27.89
NI	7.472	77.29	1.705	.072	8.766	2.246	25.83
CU	8.041	62.62	1.583	.075	10.78	2.579	21.05
ZN	8.631	51.06	1.470	.079	13.17	2.943	18.66
GA	9.243	198.5	1.365	.082	3.466	.7238	16.61
GE	9.876	167.0	1.268	.086	4.117	.8042	14.83
AS	10.532	161.0	1.179	.089	4.672	.8909	13.29
SE	11.209	119.6	1.096	.092	5.744	.9842	11.94
BR	11.909	101.5	1.019	.095	6.748	1.084	10.76
KR	12.632	86.65	.948	.098	7.904	1.192	9.725
RB	13.375	74.17	.883	.100	9.222	1.308	8.811
SR	14.143	63.68	.823	.103	10.72	1.432	8.002
Y	14.933	54.82	.767	.105	12.44	1.565	7.284
ZR	15.747	47.33	.715	.108	14.39	1.707	6.644
NB	16.584	40.97	.667	.110	16.60	1.860	6.074
MO	17.444	35.36	.622	.112	19.09	2.023	5.563
TC	18.328	30.94	.581	.114	21.90	2.197	5.105
RU	19.236	26.99	.543	.116	25.06	2.383	4.693
RH	20.169	23.60	.508	.118	28.61	2.582	4.322
PD	21.125	20.68	.475	.119	32.57	2.795	3.987
AG	22.105	18.16	.445	.121	37.00	3.021	3.684
CD	23.110	15.98	.417	.122	41.94	3.263	3.409
IN	24.141	14.09	.391	.124	47.43	3.521	3.159
SN	25.195	12.45	.367	.125	53.52	3.796	2.931

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
SB	26.359	10.92	.342	.126	60.81	4.112	2.709
TE	27.472	9.689	.321	.128	68.36	4.426	2.520
J	28.612	8.606	.302	.129	76.70	4.762	2.347
XE	29.779	7.656	.284	.130	85.89	5.119	2.188
CS	30.973	6.823	.267	.130	96.00	5.494	2.043
BA	32.194	6.090	.251	.131	107.0	5.902	1.909
LA	33.442	5.444	.236	.132	119.2	6.331	1.786
CE	34.720	4.874	.222	.133	132.5	6.787	1.672
PR	36.026	4.369	.209	.133	147.0	7.272	1.568
ND	37.361	3.923	.197	.134	162.9	7.785	1.471
PM	38.725	3.527	.186	.135	180.1	8.328	1.381
SM	40.118	3.175	.175	.135	198.8	8.906	1.298
EU	41.542	2.862	.165	.135	219.1	9.513	1.221
GD	42.996	2.583	.156	.134	241.0	10.15	1.150
TB	44.482	2.334	.148	.134	264.7	10.83	1.083
DY	45.998	2.111	.139	.136	290.3	11.55	1.022
HO	47.547	1.912	.132	.137	317.8	12.30	.9646
ER	49.128	1.734	.125	.137	347.3	13.09	.9109
TM	50.742	1.573	.118	.137	379.0	13.93	.8608
YB	52.389	1.429	.112	.137	412.9	14.80	.8140
LU	54.070	1.300	.106	.137	449.1	15.72	.7702
HF	55.790	1.183	.100	.137	487.9	16.64	.7292
TA	57.532	1.079	.095	.137	528.7	17.67	.6910
W	59.318	.9842	.090	.137	572.3	18.72	.6551
RE	61.140	.8985	.085	.137	618.6	19.81	.6213
OS	63.001	.8209	.081	.137	667.5	20.94	.5897
IR	64.896	.7508	.077	.137	719.1	22.11	.5560
PT	66.832	.6871	.073	.136	773.5	23.32	.5319
AU	68.804	.6294	.069	.136	830.6	24.58	.5086
HG	70.819	.5768	.065	.136	890.6	25.87	.4868
TL	72.872	.5292	.062	.136	953.4	27.21	.4574
PB	74.969	.4857	.059	.135	1019.	28.58	.4354
BI	77.108	.4462	.056	.135	1087.	29.99	.4146
PO	79.290	.4101	.053	.135	1158.	31.43	.3949
RN	83.780	.3473	.048	.134	1309.	34.41	.3589
RA	88.470	.2946	.044	.133	1470.	37.50	.3265
AC	90.884	.2716	.041	.133	1554.	39.07	.3116
TH	93.350	.2506	.039	.132	1641.	40.67	.2976
PA	95.868	.2312	.037	.132	1730.	42.28	.2840
U	98.439	.2135	.036	.131	1821.	43.90	.2713

SODIUM TETRABORATE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOM	R-1/2	SC/TOT	COM/INC
NA	1.041	2684.	1.494	.012	.258	.0561	12?.9
MG	1.254	2684.	1.451	.016	.258	.0544	89.61
AL	1.487	1729.	1.387	.021	.401	.0813	66.76
SI	1.740	1140.	1.310	.026	.607	.1170	50.74
P	2.013	768.3	1.226	.031	.901	.1634	39.26
S	2.307	527.8	1.141	.037	1.310	.2286	30.87
CL	2.622	349.0	1.056	.043	1.873	.2969	24.63
AR	2.957	262.1	.974	.049	2.636	.3887	19.90
K	3.313	188.9	.896	.055	3.650	.5009	16.27
CA	3.690	137.0	.823	.061	4.902	.6368	13.43
SC	4.089	101.9	.755	.067	6.741	.7945	11.20
TI	4.509	76.27	.692	.073	8.997	.9930	9.422
V	4.950	57.66	.634	.079	11.87	1.221	7.989
CR	5.412	44.03	.580	.085	15.50	1.48?	6.823
MN	5.895	33.93	.532	.091	20.05	1.800	5.867
FE	6.400	26.38	.487	.096	25.69	2.162	5.077
CO	6.925	20.68	.447	.101	32.66	2.579	4.418
NI	7.472	16.34	.410	.106	41.10	3.059	3.866
CU	8.041	13.00	.376	.111	51.36	3.608	3.399
ZN	8.631	10.42	.346	.115	63.68	4.234	3.002
GA	9.243	8.406	.318	.119	78.38	4.946	2.664
GE	9.876	6.820	.293	.123	95.78	5.766	2.377
AS	10.532	5.565	.269	.127	116.2	6.850	2.121
SE	11.209	4.566	.248	.130	140.1	7.461	1.903
BR	11.909	3.765	.229	.134	167.8	8.791	1.713
KR	12.632	3.119	.212	.137	198.8	10.06	1.547
RB	13.375	2.597	.196	.140	236.3	11.43	1.401
SR	14.143	2.172	.181	.142	277.7	12.95	1.272
Y	14.933	1.823	.168	.145	324.4	14.62	1.158
ZR	15.747	1.537	.155	.147	376.8	16.43	1.056
NB	16.584	1.300	.144	.149	434.8	18.34	.9667
MO	17.444	1.104	.134	.151	498.9	20.49	.8861
TC	18.326	.9413	.124	.153	569.0	22.73	.8140
RU	19.236	.8068	.116	.154	645.0	25.10	.7491
RH	20.169	.6902	.108	.156	727.0	27.60	.6907
PD	21.125	.5938	.100	.157	814.6	30.21	.6381
AG	22.105	.5123	.093	.158	907.5	32.91	.5906
CD	23.110	.4433	.087	.159	1005.	35.70	.5472
IN	24.141	.3846	.081	.160	1107.	38.54	.5080
SN	25.195	.3346	.076	.161	1213.	41.43	.4722

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COM/INC
SA	26.350	.2488	.071	.161	1330.	44.5?	.4373
TE	27.472	.2523	.066	.162	14?2.	47.47	.4075
J	28.612	.2210	.062	.163	1556.	50.37	.3803
XE	29.770	.1939	.058	.163	1671.	53.23	.3553
CS	30.973	.1706	.054	.163	1786.	56.03	.3324
HA	32.194	.1503	.051	.163	1901.	58.76	.3113
LA	33.442	.1328	.048	.164	2015.	61.40	.2910
CE	34.720	.1175	.045	.164	2127.	63.95	.2730
PR	36.026	.1041	.042	.164	2237.	66.38	.2574
ND	37.361	.0924	.040	.163	2346.	68.71	.2419
PM	38.725	.0822	.037	.163	2451.	70.92	.2277
SM	40.118	.0733	.035	.163	2554.	73.00	.2145
EU	41.542	.0654	.033	.163	2653.	74.97	.2023
GD	42.996	.0584	.031	.163	2750.	76.81	.1900
TB	44.482	.0523	.029	.162	2843.	78.54	.1802
DY	45.998	.0469	.028	.162	2933.	80.16	.1703
HO	47.547	.0421	.026	.161	3020.	81.66	.1611
ER	49.128	.0378	.025	.161	3104.	83.06	.1525
TM	50.742	.0340	.023	.160	3185.	84.35	.1444
YB	52.389	.0307	.022	.160	3263.	85.56	.1369
LU	54.070	.0277	.021	.150	3338.	86.67	.1298
HF	55.790	.0250	.020	.159	3411.	87.70	.1231
TA	57.532	.0226	.018	.158	3481.	88.66	.1170
W	59.318	.0205	.017	.157	3548.	89.51	.1111
RE	61.140	.0186	.017	.157	3616.	90.32	.1056
OS	63.001	.0168	.016	.156	3677.	91.06	.1018
IR	64.896	.0153	.015	.155	3739.	91.74	.0956
PT	66.832	.0139	.014	.154	3799.	92.37	.0911
AU	68.804	.0127	.013	.154	3857.	92.95	.0867
HG	70.819	.0115	.013	.153	3914.	93.49	.0826
TL	72.872	.0105	.012	.152	3969.	93.98	.0787
HH	74.960	.0095	.011	.151	4024.	94.43	.0751
BI	77.108	.0086	.011	.150	4077.	94.85	.0716
PO	79.290	.0080	.010	.149	4120.	95.24	.0684
RN	83.760	.0067	.009	.148	4231.	95.96	.0624
RA	88.470	.0056	.008	.147	4350.	96.48	.0570
AC	90.884	.0052	.008	.145	4378.	96.73	.0545
TH	93.350	.0047	.008	.144	4426.	96.97	.0521
PA	95.868	.0043	.007	.143	4474.	97.17	.0498
U	98.439	.0040	.007	.142	4522.	97.39	.0477

LITHIUM TETRABORATE

K - ALFA(1+2) LINES

	KEV	PHOTO	COHER	INCOM	R-1/2	SC/TOT	COM/INC
NA	1.041	3026.	1.298	.014	.229	.0433	92.26
MG	1.254	1852.	1.243	.018	.376	.0681	67.50
AL	1.487	1166.	1.174	.023	.593	.1025	50.39
SI	1.740	754.8	1.098	.029	.917	.1490	38.32
P	2.013	494.8	1.018	.034	1.384	.2101	29.65
S	2.307	338.0	.939	.040	2.044	.2889	23.29
CL	2.622	233.1	.863	.047	2.962	.3888	18.56
AR	2.957	163.5	.791	.053	4.216	.5134	14.98
K	3.313	116.0	.724	.059	5.905	.6670	12.23
CA	3.690	84.27	.661	.066	8.155	.8589	10.08
SC	4.089	61.73	.603	.072	11.10	1.082	8.390
TI	4.509	45.78	.551	.078	14.95	1.354	7.055
V	4.950	34.34	.502	.084	19.86	1.678	5.975
CR	5.412	26.04	.459	.090	26.06	2.062	5.098
MN	5.895	19.94	.419	.096	33.88	2.516	4.379
FE	6.400	15.41	.383	.101	43.58	3.041	3.786
CO	6.925	12.02	.350	.106	55.54	3.655	3.293
NI	7.472	9.452	.320	.111	70.13	4.364	2.879
CU	8.041	7.487	.293	.116	87.77	5.181	2.530
ZN	8.631	5.974	.269	.120	108.9	6.116	2.234
GA	9.243	4.790	.247	.125	134.0	7.180	1.981
GE	9.876	3.880	.227	.128	163.6	8.385	1.766
AS	10.532	3.159	.208	.132	198.2	9.742	1.577
SE	11.209	2.580	.192	.136	238.3	11.25	1.415
BR	11.909	2.121	.177	.139	284.3	12.94	1.273
KR	12.632	1.752	.163	.142	336.8	14.81	1.148
RB	13.375	1.456	.151	.145	395.8	16.84	1.041
SR	14.143	1.214	.139	.147	461.8	19.06	.9457
Y	14.933	1.017	.129	.149	535.0	21.46	.8610
ZR	15.747	.8548	.119	.152	615.3	24.02	.7858
NB	16.584	.7227	.110	.154	702.5	26.76	.7189
MO	17.444	.6126	.102	.155	790.4	29.61	.6591
TC	18.326	.5211	.095	.157	894.6	32.59	.6055
RU	19.236	.4448	.088	.158	1002.	35.67	.5575
RH	20.169	.3809	.082	.160	1113.	38.83	.5142
PD	21.125	.3272	.076	.161	1227.	42.03	.4751
AG	22.105	.2819	.071	.162	1345.	45.25	.4398
CD	23.110	.2436	.066	.163	1466.	48.46	.4077
IN	24.141	.2111	.062	.164	1587.	51.66	.3786
SN	25.195	.1834	.058	.164	1709.	54.75	.3521

K - ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COM/INC
SA	26.350	.1581	.054	.165	1840.	58.01	.326?
TE	27.472	.1380	.050	.165	1961.	60.05	.3041
J	28.612	.1207	.047	.166	2070.	63.76	.2840
XE	29.770	.1059	.044	.166	2195.	66.65	.2664
CS	30.973	.0930	.041	.166	2309.	69.50	.2481
HA	32.194	.0819	.039	.166	2418.	71.41	.2327
LA	33.442	.0723	.036	.166	2526.	73.66	.2182
CE	34.720	.0630	.034	.166	2626.	75.78	.2049
PR	36.026	.0566	.032	.166	2725.	77.76	.1926
ND	37.361	.0502	.031	.166	2819.	79.57	.1812
PM	38.725	.0446	.028	.165	2909.	81.25	.1700
SM	40.118	.0397	.027	.165	2996.	82.81	.1608
EU	41.542	.0354	.025	.165	3079.	84.25	.1516
GD	42.996	.0317	.024	.164	3158.	85.57	.1432
TB	44.482	.0283	.022	.164	3234.	86.78	.1352
DY	45.998	.0254	.021	.163	3307.	87.80	.1279
HO	47.547	.0228	.020	.163	3377.	88.90	.1210
ER	49.128	.0204	.019	.162	3445.	89.83	.1148
TM	50.742	.0184	.018	.162	3509.	90.68	.1085
YB	52.389	.0166	.017	.161	3572.	91.46	.1029
LU	54.070	.0149	.016	.160	3632.	92.16	.0976
HF	55.790	.0135	.015	.160	3690.	92.81	.0927
TA	57.532	.0122	.014	.159	3747.	93.40	.0881
W	59.318	.0110	.013	.158	3801.	93.94	.0837
RE	61.140	.0100	.013	.157	3845.	94.43	.0790
OS	63.001	.0091	.012	.156	3907.	94.86	.0757
IR	64.896	.0082	.011	.156	3956.	95.29	.0721
PT	66.832	.0075	.011	.155	4007.	95.67	.0686
AU	68.804	.0068	.010	.154	4055.	96.01	.0654
HG	70.819	.0062	.010	.153	4106.	96.32	.0623
TL	72.872	.0057	.009	.152	4151.	96.61	.0595
PB	74.960	.0052	.009	.151	4198.	96.87	.0567
BI	77.108	.0047	.008	.150	4244.	97.11	.0541
PO	79.290	.0043	.008	.150	4289.	97.35	.0517
RN	83.760	.0036	.007	.148	4370.	97.72	.0472
RA	88.470	.0030	.006	.146	4464.	98.05	.0431
AC	90.884	.0028	.006	.145	4512.	98.19	.0412
TH	93.350	.0025	.006	.144	4554.	98.32	.0394
PA	95.868	.0023	.005	.143	4601.	98.45	.0377
U	98.439	.0021	.005	.142	4644.	98.56	.0361

NORRISH FLUX

H = ALFA(1)21 LINES   K = ALFA(1) LINES

	KEV	PHOTO	COHER	INCOH	h-1/2	SC/TOT	COH/INC
NA	1.041	4566.	2.019	.012	.152	.0576	215.6
MG	1.254	3350.	2.066	.016	.247	.0790	167.6
AL	1.487	2212.	2.056	.020	.313	.1206	132.1
SI	1.740	1656.	2.610	.025	.576	.1662	106.7
P	2.013	969.6	2.536	.030	.690	.2507	85.62
S	2.307	665.7	2.630	.035	1.007	.3592	70.16
CL	2.622	466.0	2.329	.060	1.519	.0456	58.09
AN	2.957	351.0	2.212	.064	1.962	.6389	48.57
K	3.313	257.9	2.092	.051	2.665	.0239	40.98
CA	3.690	192.3	1.971	.057	3.565	1.062	34.06
SC	4.089	149.5	1.052	.062	4.701	1.290	29.06
TI	4.509	111.5	1.737	.067	6.117	1.590	25.7h
V	4.950	86.67	1.625	.073	7.061	1.906	22.34
CR	5.412	150.6	1.526	.078	6.633	1.821	19.5C
MN	5.895	166.8	1.419	.083	6.117	.0022	17.12
FE	6.400	153.1	1.325	.060	6.686	.9136	15.16
CO	6.925	123.7	1.236	.042	5.560	1.061	13.36
NI	7.472	100.7	1.152	.097	6.796	1.226	11.91
CU	8.041	82.61	1.075	.101	8.273	1.603	10.66
ZN	8.631	68.15	1.002	.105	10.00	1.590	9.951
GA	9.243	56.57	.935	.109	12.03	1.811	8.590
GE	9.876	47.22	.872	.112	16.37	2.061	7.705
AS	10.532	39.61	.816	.116	17.69	2.291	7.033
SE	11.209	33.61	.760	.119	20.21	2.561	6.590
BR	11.909	28.29	.709	.122	23.79	2.862	5.820
KR	12.632	24.07	.662	.125	27.60	3.105	5.314
RB	13.375	20.56	.619	.127	32.52	3.501	6.665
SR	14.143	17.63	.579	.130	37.77	3.860	5.663
Y	14.933	15.18	.541	.132	43.71	4.245	6.103
ZR	15.747	13.11	.506	.136	50.60	6.657	3.700
NB	16.504	11.36	.474	.136	57.69	5.095	3.60h
MO	17.666	9.876	.444	.136	66.27	5.563	3.225
TC	18.320	8.618	.416	.139	75.61	6.860	2.987
RU	19.236	7.520	.390	.101	88.07	6.509	2.771
RH	20.169	6.660	.366	.162	97.51	7.150	2.576
PD	21.125	5.861	.366	.163	110.2	7.766	2.595
AG	27.105	5.111	.323	.165	126.2	8.373	2.232
CD	23.110	6.515	.303	.166	130.6	9.039	2.082
IN	24.141	3.996	.205	.166	156.5	9.701	1.966
SN	25.195	3.565	.266	.167	176.0	10.60	1.820

	KEV	PHOTO	COHER	INCOH	h-1/2	SC/TOT	COH/INC
SR	26.356	3.124	.251	.160	196.7	11.32	1.646
TE	27.472	2.782	.236	.160	216.2	12.15	1.500
J	28.612	2.662	.222	.166	242.0	13.01	1.692
XE	29.779	2.218	.216	.159	268.0	13.93	1.661
CS	30.973	1.969	.197	.159	297.6	16.60	1.317
BA	32.194	1.700	.166	.159	327.3	15.60	1.266
LA	33.662	1.596	.176	.156	360.0	16.92	1.160
CE	34.726	1.630	.166	.150	366.9	18.01	1.191
PR	36.026	1.276	.156	.151	632.3	19.15	1.653
ND	37.361	1.169	.166	.151	672.2	20.32	.9816
PM	38.725	6.626	.160	.151	106.7	6.596	.9776
SM	40.118	5.516	.137	.150	119.5	6.073	.9772
EU	41.542	5.067	.125	.150	130.2	5.160	.6342
GD	42.996	6.622	.116	.150	161.7	5.606	.7663
TB	44.482	6.236	.112	.150	156.1	5.817	.7642
DY	45.998	3.666	.106	.150	167.6	6.176	.7666
HO	47.547	3.563	.166	.169	181.0	6.566	.6706
ER	49.126	3.274	.099	.169	197.2	6.966	.6566
TM	50.762	3.003	.090	.169	213.0	7.350	.6690
YB	52.309	2.759	.005	.166	231.5	7.806	.5760
LU	54.074	2.536	.001	.166	250.6	8.267	.5667
HF	55.790	2.332	.077	.167	271.1	8.760	.5796
TA	57.532	2.167	.073	.167	792.0	9.276	.5663
W	59.318	1.977	.060	.166	316.1	9.822	.5710
RE	61.160	1.821	.066	.166	361.0	10.39	.6695
OS	63.001	1.670	.062	.165	367.5	11.50	.5663
IR	64.896	1.567	.099	.166	395.7	11.63	.6607
PT	66.832	1.627	.056	.166	657.6	12.29	.5699
AU	68.806	1.317	.053	.165	657.6	12.90	.3730
HG	70.819	1.216	.061	.163	691.5	13.72	.5760
TL	72.872	1.126	.060	.162	527.5	16.66	.3695
PB	74.969	1.030	.066	.161	566.3	15.27	.3660
BI	77.100	.9663	.066	.161	605.5	16.10	.3601
PO	79.290	.9662	.067	.166	667.6	16.97	.3695
AT	83.700	.7910	.630	.139	730.6	18.60	.3713
RN	88.070	.9636	.636	.137	661.3	20.70	.3606
FR	90.666	.9060	.037	.136	666.0	21.66	.3600
RA	93.356	.9060	.033	.136	963.2	23.96	.3670
AC	95.000	.5190	.029	.135	1013.	26.01	.3603
U	98.639	.6622	.028	.136	1075.	25.15	.3992

NORRISH FLUX

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	h-1/2	SC/TOT	COH/INC
			IRON - 55				
FE-KX	5.888	167.6	1.421	.083	9.103	.0991	17.15
FE-KX	5.899	166.5	1.418	.083	9.126	.0953	17.18
FE-KX	6.690	157.6	1.366	.069	6.656	.9365	16.78
			PLUTONIUM - 238				
U-LX	13.639	20.30	.416	.127	32.93	3.530	6.030
U-LX	13.619	19.50	.600	.128	36.10	3.611	6.736
U-LX	16.620	11.66	.600	.136	56.65	5.013	3.536
U-LX	17.220	10.23	.052	.137	66.62	5.639	3.290
U-LX	20.167	6.661	.366	.162	77.69	7.169	2.575
			AMERICIUM - 261				
NP-LX	13.760	19.02	.390	.128	35.09	3.679	6.657
NP-LX	13.969	18.33	.369	.129	36.37	3.766	6.562
NP-LX	16.890	16.88	.665	.136	66.31	5.233	3.606
NP-LX	17.750	9.611	.636	.130	66.62	5.733	3.139
NP-LX	20.766	6.666	.351	.163	105.6	7.531	2.697
GAMMA	59.5	1.966	.069	.166	310.5	9.079	.6695
			CADMIUM - 109				
AG-KX	21.990	5.166	.325	.166	122.5	8.299	2.256
AG-KX	22.163	5.076	.321	.105	125.0	8.611	2.223
AG-KX	26.962	3.667	.272	.167	170.6	10.30	1.869
AG-KX	25.056	3.005	.266	.167	170.7	10.66	1.791
GAMMA	87.7	.9609	.035	.137	826.2	29.65	.2521
			IODINE - 125				
TE-KX	27.202	2.860	.266	.166	213.3	11.96	1.616
TE-KX	27.473	2.781	.236	.169	210.8	12.15	1.566
TE-KX	30.996	1.961	.197	.156	297.6	16.96	1.316
TE-KX	31.700	1.866	.193	.150	316.9	15.66	1.270
			LEAD - 210				
GAMMA	67.	3.672	.102	.169	176.6	6.663	.6629
			THALLIUM - 170				
YB-KX	51.326	2.613	.008	.169	220.8	7.513	.7939
YB-KX	52.360	2.763	.005	.168	231.2	7.792	.5766
YB-KX	56.552	1.976	.069	.166	316.6	9.033	.6713
YB-KX	60.696	1.836	.066	.166	356.6	10.33	.6617
GAMMA	86.	.7956	.037	.136	766.2	18.69	.2702
			GADOLINIUM - 153				
GAMMA	97.	.5628	.029	.136	1666.	26.53	.2162
GAMMA	103.	.6239	.026	.135	1160.	27.21	.1946
			COBALT - 57				
GAMMA	16.36	16.91	.568	.130	59.75	5.005	6.350
GAMMA	121.97	.2616	.019	.127	1760.	35.66	.1677
GAMMA	136.6	.1901	.015	.126	2106.	67.21	.1263

MAGNESIUM OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55							
MN-KX	5.888	72.39	.767	.088	9.463	1.161	9.159
MN-KX	5.899	71.99	.766	.088	9.516	1.196	9.130
MN-KX	6.490	54.16	.695	.090	12.61	1.428	7.754
PLUTONIUM -238							
U-LX	13.439	5.763	.292	.131	112.0	6.845	2.228
U-LX	13.615	5.531	.287	.132	116.4	7.042	2.179
U-LX	16.428	3.049	.222	.140	203.2	10.60	1.579
U-LX	17.220	2.624	.207	.142	233.0	11.74	1.457
U-LX	20.167	1.582	.164	.148	365.7	16.47	1.111
AMERICIUM -241							
NP-LX	13.760	5.349	.283	.132	120.2	7.206	2.140
NP-LX	13.944	5.129	.278	.133	125.1	7.419	2.092
NP-LX	16.840	2.818	.214	.141	218.4	11.19	1.513
NP-LX	17.750	2.582	.198	.143	254.4	12.54	1.383
NP-LX	20.785	1.636	.157	.149	397.7	17.55	1.055
GAMMA	59.5	.0477	.027	.157	2991.	79.42	.1753
CADMIUM - 109							
AG-KX	21.990	1.198	.144	.151	464.1	19.74	.9583
AG-KX	22.163	1.168	.143	.151	474.0	20.04	.9456
AG-KX	24.942	.7985	.119	.154	647.0	25.45	.7724
AG-KX	25.456	.7476	.115	.154	681.5	26.49	.7459
GAMMA	87.7	.0137	.013	.148	3951.	92.20	.0909
IODINE - 125							
TE-KX	27.202	.6034	.104	.156	803.4	30.06	.6659
TE-KX	27.473	.5843	.102	.156	823.0	30.62	.6547
TE-KX	30.996	.3953	.084	.158	1087.	37.95	.5327
TE-KX	31.700	.3676	.081	.158	1142.	39.40	.5126
LEAD - 210							
GAMMA	47.	.1024	.042	.159	2284.	66.22	.2618
THULIUM -170							
YB-KX	51.326	.0769	.036	.158	2556.	71.61	.2254
YB-KX	52.360	.0721	.034	.158	2617.	72.76	.2179
YB-XX	59.352	.0481	.028	.157	2984.	79.30	.1761
YB-KX	60.959	.0441	.026	.156	3056.	80.54	.1683
GAM-A	84.	.0157	.015	.149	3857.	91.26	.0978
GADOLINIUM -153							
GAMMA	97.	.0099	.011	.145	4164.	94.04	.0767
GAMMA	103.	.0082	.010	.144	4284.	94.93	.0693
COBALT - 57							
GAMMA	14.36	4.674	.267	.134	136.5	7.910	1.989
GAMMA	121.97	.0048	.007	.138	4618.	96.80	.0522
GAMMA	136.3	.0034	.006	.134	4833.	97.64	.0434

CALCIUM OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55							
MN-KX	5.888	292.6	1.284	.080	2.357	.4645	16.04
MN-KX	5.899	291.1	1.283	.080	2.369	.4661	16.01
MN-KX	6.490	224.8	1.173	.084	3.046	.5568	13.71
PLUTONIUM -238							
U-LX	13.439	28.85	.514	.125	23.50	2.165	4.127
U-LX	1.615	27.78	.505	.125	24.39	2.219	4.038
U-LX	16.428	16.02	.393	.133	41.88	3.181	2.948
U-LX	17.220	13.94	.568	.135	47.98	3.485	2.724
U-LX	20.167	8.720	.294	.141	75.78	4.752	2.087
AMERICIUM -241							
NP-LX	13.760	26.93	.498	.126	25.14	2.244	3.967
NP-LX	13.944	25.91	.490	.126	26.12	2.322	3.880
NP-LX	16.840	14.89	.380	.134	44.99	3.337	2.828
NP-LX	17.750	12.74	.353	.134	52.37	3.697	2.588
NP-LX	20.785	7.960	.282	.142	82.59	5.044	1.484
GAMMA	59.5	.3266	.050	.152	1314.	38.45	.3312
CADMIUM - 109							
AG-KX	21.990	6.732	.259	.144	97.15	5.643	1.804
AG-KX	22.163	6.576	.256	.144	99.36	5.732	1.780
AG-KX	24.942	4.610	.214	.147	139.4	7.246	1.457
AG-KX	25.456	4.335	.208	.147	147.7	7.572	1.408
GAMMA	87.7	.0986	.025	.146	2576.	63.35	.1706
IODINE - 125							
TE-KX	27.202	3.548	.187	.149	176.4	8.650	1.258
TE-KX	27.473	3.443	.185	.149	183.4	8.835	1.237
TE-KX	30.996	2.388	.153	.151	257.4	11.28	1.008
TE-KX	31.70	2.231	.147	.152	273.9	11.80	.9703
LEAD - 210							
GAMMA	47.	.6698	.076	.154	770.1	25.58	.4957
THULIUM -170							
YB-KX	51.326	.5112	.066	.154	949.1	30.00	.4264
YB-KX	52.360	.4808	.063	.153	993.7	31.47	.4121
YB-KX	59.352	.3271	.051	.152	1307.	38.30	.3326
YB-KX	60.959	.3013	.048	.152	1381.	39.04	.3177
GAM-A	84.	.1125	.027	.147	2423.	60.66	.1835
GADOLINIUM -153							
GAMMA	97.	.0724	.021	.143	2936.	69.34	.1436
GAMMA	103.	.0602	.018	.142	3168.	72.64	.1294
COBALT - 57							
GAMMA	14.36	23.78	.471	.128	28.63	2.454	3.694
GAMMA	121.97	.0359	.013	.137	3728.	60.66	.0970
GAMMA	136.3	.0256	.011	.133	4084.	74.87	.0802

SODIUM OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55							
NA-KX	5.888	63.60	.753	.088	10.75	1.292	9.456
NA-KX	5.899	63.24	.752	.088	10.81	1.297	9.425
NA-KX	6.490	47.62	.682	.084	14.38	1.592	7.973
PLUTONIUM -238							
U-LX	13.439	4.946	.283	.127	129.4	7.656	2.227
U-LX	13.615	4.744	.278	.128	134.5	7.876	2.177
U-LX	16.428	2.607	.214	.136	234.4	11.83	1.567
U-LX	17.220	2.242	.200	.138	268.6	13.09	1.443
U-LX	20.167	1.348	.158	.144	419.9	18.28	1.095
AMERICIUM -241							
NP-LX	13.760	4.589	.274	.128	138.8	8.059	2.137
NP-LX	13.944	4.390	.269	.129	144.6	8.296	2.088
NP-LX	16.840	2.408	.206	.137	251.9	12.48	1.501
NP-LX	17.750	2.034	.191	.139	293.1	13.97	1.369
NP-LX	20.785	1.223	.151	.145	456.1	19.46	1.039
GAMMA	59.5	.0402	.026	.153	3160.	81.85	.1676
CADMIUM - 109							
AG-KX	21.990	1.020	.138	.147	531.1	21.84	.9417
AG-KX	22.163	.9946	.137	.147	542.2	22.18	.9289
AG-KX	24.942	.6785	.116	.150	735.6	27.98	.7959
AG-KX	25.456	.6351	.110	.151	773.9	29.09	.7295
GAMMA	87.7	.0115	.013	.145	4096.	93.19	.0863
IODINE - 125							
TE-KX	27.202	.5121	.099	.152	908.4	32.88	.6499
TE-KX	27.473	.4959	.097	.152	929.9	33.47	.6388
TE-KX	30.996	.3351	.080	.154	1217.	41.12	.5178
TE-KX	31.700	.3115	.077	.155	1276.	42.63	.4980
LEAD - 210							
GAMMA	47.	.0865	.039	.156	2462.	69.27	.2516
THULIUM -170							
YB-KX	51.326	.0650	.034	.155	2732.	74.38	.2162
YB-KX	52.360	.0609	.032	.155	2792.	75.46	.2088
YB-KX	59.352	.0406	.026	.153	3153.	81.55	.1683
YB-KX	60.959	.0372	.025	.153	3226.	82.68	.1608
GAMMA	84.	.0132	.014	.146	4004.	92.35	.0926
GADOLINIUM -153							
GAMMA	97.	.0085	.010	.142	4305.	94.81	.0727
GAMMA	103.	.0069	.009	.140	4425.	95.57	.0656
COBALT - 57							
GAMMA	14.36	4.006	.258	.130	157.7	8.843	1.983
GAMMA	121.97	.0040	.007	.135	4756.	97.23	.0493
GAMMA	136.3	.0028	.005	.131	4972.	97.95	.0409

POTASSIUM OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55							
MN-KX	5.888	288.4	1.319	.074	2.391	.4814	17.33
MN-KX	5.899	287.0	1.317	.074	2.403	.4830	17.28
MN-KX	6.490	222.5	1.204	.081	3.097	.5742	14.77
PLUTONIUM -238							
U-LX	13.439	28.58	.524	.120	23.71	2.210	4.394
U-LX	13.615	27.51	.518	.120	24.62	2.266	4.299
U-LX	16.428	15.75	.402	.129	42.55	3.259	3.130
U-LX	17.220	13.68	.377	.130	48.84	3.575	2.890
U-LX	20.167	8.492	.301	.136	77.62	4.895	2.230
AMERICIUM -241							
NP-LX	13.760	26.67	.511	.121	25.38	2.312	4.223
NP-LX	13.944	25.66	.502	.122	26.38	2.372	4.129
NP-LX	16.840	14.63	.389	.130	45.75	3.622	3.001
NP-LX	17.750	12.69	.361	.132	53.38	3.796	2.745
NP-LX	20.785	7.747	.288	.137	84.81	5.201	2.100
GAMMA	59.5	.2937	.052	.148	1404.	40.50	.3070
CADMIUM - 109							
AG-KX	21.990	6.528	.265	.139	100.0	5.829	1.908
AG-KX	22.163	6.370	.262	.139	102.3	5.922	1.882
AG-KX	24.942	4.434	.219	.142	146.5	7.537	1.559
AG-KX	25.456	4.164	.212	.143	153.3	7.859	1.484
GAMMA	87.7	.0869	.025	.142	2725.	64.83	.1782
IODINE - 125							
TE-KX	27.202	3.394	.192	.144	185.8	9.007	1.327
TE-KX	27.473	3.291	.189	.145	191.2	9.193	1.305
TE-KX	30.996	2.264	.156	.147	269.9	11.78	1.062
TE-KX	31.700	2.112	.150	.147	287.6	12.34	1.022
LEAD - 210							
GAMMA	47.	.6163	.078	.150	821.2	26.98	.5202
THULIUM -170							
YB-KX	51.326	.4674	.067	.150	1013.	31.65	.4472
YB-KX	52.360	.4390	.065	.149	1061.	32.77	.4322
YB-KX	59.352	.2960	.052	.148	1396.	40.35	.3485
YB-KX	60.959	.2721	.049	.148	1475.	42.05	.3328
GAMMA	84.	.0994	.027	.143	2547.	63.15	.1910
GADOLINIUM -153							
GAMMA	97.	.0634	.021	.140	3092.	71.69	.1499
GAMMA	103.	.0526	.019	.138	3308.	74.89	.1353
COBALT - 57							
GAMMA	14.36	23.51	.483	.123	28.74	2.510	3.429
GAMMA	121.97	.0311	.014	.133	3800.	82.52	.1013
GAMMA	136.30	.0221	.011	.130	4249.	86.44	.0836

WATER

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	C/M/INC
			IRON - 55				
MN-KX	5.888	24.98	.474	.113	27.11	2.297	4.183
MN-KX	5.899	24.83	.473	.113	27.26	2.307	4.148
MN-KX	6.490	13.42	.424	.121	36.54	2.481	3.513
			PLUTONIUM -230				
U-LX	13.439	1.885	.168	.172	323.0	15.84	.9802
U-LX	13.615	1.731	.165	.173	335.0	16.33	.9585
U-LX	16.420	.9984	.126	.181	555.4	24.64	.6996
U-LX	17.220	.8867	.118	.183	625.8	27.16	.6410
U-LX	20.167	.6816	.092	.189	908.4	36.85	.4902
			AMERICIUM -241				
NP-LX	13.760	1.672	.163	.173	345.0	16.72	.9412
NP-LX	13.944	1.682	.160	.174	358.0	17.23	.9199
NP-LX	16.840	.8875	.122	.182	591.6	25.94	.6658
NP-LX	17.750	.7307	.112	.184	674.5	28.88	.6087
NP-LX	20.785	.4363	.068	.189	970.8	38.88	.4658
GAMMA	59.5	.0139	.015	.182	3282.	93.40	.0812
			CADMIUM - 109				
AG-KX	21.990	.3420	.081	.191	1092.	42.81	.4235
AG-KX	22.163	.3536	.080	.191	1110.	43.36	.4180
AG-KX	24.942	.2401	.046	.193	1388.	51.90	.3426
AG-KX	25.456	.2246	.044	.193	1438.	53.39	.3311
GAMMA	87.7	.0049	.007	.167	3884.	97.77	.0431
			IODINE - 125				
TE-KX	27.202	.1807	.057	.194	1604.	58.18	.2963
TE-KX	27.473	.1749	.053	.194	1629.	58.89	.2914
TE-KX	30.996	.1177	.046	.194	1933.	67.16	.2383
TE-KX	31.700	.1094	.045	.194	1989.	68.61	.2295
			LEAD - 210				
GAMMA	47.	.0301	.023	.189	2865.	87.56	.1196
			THULIUM -170				
YB-KX	51.326	.0226	.019	.187	3028.	90.14	.1035
YB-KX	52.360	.0211	.019	.186	3064.	90.65	.1001
YB-KX	59.352	.0140	.015	.183	3278.	93.36	.0815
YB-KX	60.959	.0129	.014	.182	3321.	93.83	.0780
GAMMA	84.	.0046	.008	.169	3818.	97.49	.0462
			GADOLINIUM -153				
GAMMA	97.	.0029	.006	.165	4030.	98.32	.0365
GAMMA	103.	.0024	.005	.168	4132.	98.58	.0331
			COBALT - 57				
GAMMA	14.36	1.436	.153	.175	388.3	18.40	.8744
GAMMA	121.97	.0014	.004	.152	4483.	99.12	.0251
GAMMA	136.3	.0010	.003	.147	4590.	99.35	.0210

TITANIUM OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	C/M/INC
			IRON - 55				
MN-KX	5.888	2H6.6	1.205	.075	2.508	.4447	16.05
MN-KX	5.899	285.2	1.203	.075	2.420	.4442	16.00
MN-KX	6.490	221.7	1.099	.081	3.109	.5289	13.62
			PLUTONIUM -218				
U-LX	13.439	29.69	.480	.120	22.88	1.980	3.983
U-LX	13.615	28.60	.471	.121	23.74	2.029	3.847
U-LX	16.420	16.61	.367	.129	46.50	2.897	2.537
U-LX	17.220	14.68	.343	.131	46.33	3.172	2.420
U-LX	20.167	9.106	.274	.137	72.83	4.318	2.006
			AMERICIUM -241				
NP-LX	13.760	27.74	.465	.121	24.46	2.069	3.828
NP-LX	13.944	26.70	.457	.122	25.40	2.122	3.763
NP-LX	16.840	15.46	.354	.130	45.47	3.058	2.721
NP-LX	17.750	13.25	.329	.132	50.53	3.363	2.489
NP-LX	20.785	8.329	.262	.138	79.40	4.583	1.906
GAMMA	59.5	.3457	.047	.166	1286.	35.90	.3218
			CADMIUM - 109				
AG-KX	21.990	7.067	.242	.139	93.31	5.127	1.733
AG-KX	22.163	6.885	.239	.140	95.42	5.208	1.710
AG-KX	24.942	4.842	.200	.143	133.6	6.608	1.408
AG-KX	25.456	4.555	.194	.143	141.5	6.883	1.353
GAMMA	87.7	.1053	.023	.154	2585.	80.64	.1670
			IODINE - 125				
TE-KX	27.202	3.736	.175	.144	170.9	7.876	1.209
TE-KX	27.473	3.628	.172	.145	175.8	8.037	1.189
TE-KX	30.996	2.520	.142	.147	246.7	10.28	.9701
TE-KX	31.700	2.355	.137	.147	262.6	10.76	.9330
			LEAD - 210				
GAMMA	47.	.7113	.071	.149	746.4	23.60	.4747
			THULIUM -170				
YB-KX	51.326	.5435	.061	.148	920.9	27.74	.4133
YB-KX	52.360	.5113	.059	.148	965.1	28.80	.3994
YB-KX	59.352	.3483	.047	.146	1276.	35.75	.3232
YB-KX	60.959	.3210	.045	.146	1353.	37.34	.3089
GAMMA	84.	.1202	.025	.148	2426.	57.84	.1794
			GADOLINIUM -153				
GAMMA	97.	.0774	.019	.134	2973.	66.79	.1408
GAMMA	103.	.0645	.017	.135	3202.	70.22	.1272
			COBALT - 57				
GAMMA	14.36	24.53	.440	.123	27.61	2.243	3.561
GAMMA	121.97	.0385	.012	.130	3833.	78.64	.0456
GAMMA	136.3	.0275	.010	.126	4230.	83.20	.0793

PHOSPHORUS PENTOXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	C/M/INC
			IRON - 55				
MN-KX	5.888	96.85	.788	.084	7.093	.8931	9.410
MN-KX	5.899	96.33	.787	.084	7.131	.8965	9.379
MN-KX	6.490	73.26	.715	.090	9.357	1.087	7.935
			PLUTONIUM -230				
U-LX	13.439	8.372	.301	.134	78.69	4.937	2.251
U-LX	13.615	8.045	.296	.134	81.78	5.077	2.201
U-LX	16.420	4.982	.228	.143	142.2	7.619	1.595
U-LX	17.220	3.888	.213	.145	163.1	8.439	1.472
U-LX	20.167	2.372	.169	.151	257.4	11.08	1.124
			AMERICIUM -241				
NP-LX	13.760	7.787	.292	.135	84.38	5.194	2.161
NP-LX	13.944	7.475	.287	.138	87.77	5.345	2.113
NP-LX	16.840	4.168	.228	.144	158.9	8.040	1.529
NP-LX	17.750	3.538	.204	.146	178.2	9.010	1.398
NP-LX	20.785	2.157	.162	.152	280.4	12.68	1.048
GAMMA	59.5	.0796	.028	.156	2464.	76.93	.1809
			CADMIUM - 109				
AG-KX	21.990	1.807	.149	.153	328.6	14.32	.9708
AG-KX	22.163	1.763	.147	.153	336.9	14.56	.9580
AG-KX	24.942	1.213	.183	.156	464.3	18.68	.7839
AG-KX	25.456	1.137	.119	.157	490.6	19.49	.7572
GAMMA	87.7	.0220	.014	.147	3881.	87.95	.0945
			IODINE - 125				
TE-KX	27.202	.9219	.107	.158	584.0	22.31	.6767
TE-KX	27.473	.0933	.105	.158	599.2	22.76	.6654
TE-KX	30.996	.0606	.087	.160	818.7	28.81	.5425
TE-KX	31.700	.5685	.084	.160	855.7	30.05	.5223
			LEAD - 210				
GAMMA	47.	.1608	.043	.160	1907.	55.74	.2689
			THULIUM -170				
YB-KX	51.326	.1213	.037	.159	2188.	61.89	.2319
YB-KX	52.360	.1138	.036	.158	2252.	63.00	.2243
YB-KX	59.352	.0762	.028	.154	2656.	70.78	.1817
YB-KX	60.959	.0708	.027	.154	2781.	72.32	.1737
GAMMA	84.	.0252	.015	.148	3687.	86.60	.1015
			GADOLINIUM -153				
GAMMA	97.	.0160	.011	.143	4059.	90.65	.0798
GAMMA	103.	.0132	.010	.141	4206.	91.98	.0722
			COBALT - 57				
GAMMA	14.36	6.828	.275	.137	95.73	5.694	2.009
GAMMA	121.97	.0078	.007	.134	4600.	94.84	.0545
GAMMA	136.3	.0055	.006	.131	4850.	96.15	.0453

MANGANEOUS OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	C/M/INC
			IRON - 55				
MN-KX	5.888	63.52	1.659	.067	10.62	2.645	24.83
MN-KX	5.899	63.17	1.656	.067	10.68	2.655	24.75
MN-KX	6.490	47.84	1.517	.072	14.02	3.213	21.11
			PLUTONIUM -230				
U-LX	13.439	51.30	.674	.108	13.30	1.501	6.204
U-LX	13.615	49.45	.663	.109	13.80	1.536	6.073
U-LX	16.420	28.95	.517	.117	23.42	2.143	4.413
U-LX	17.220	25.29	.485	.119	26.76	2.331	4.073
U-LX	20.167	16.02	.388	.125	41.92	3.103	3.111
			AMERICIUM -241				
NP-LX	13.760	47.99	.656	.110	14.21	1.565	5.965
NP-LX	13.944	46.21	.642	.110	14.75	1.602	5.832
NP-LX	16.840	26.97	.500	.118	25.12	2.290	4.231
NP-LX	17.750	23.17	.465	.120	29.16	2.542	3.864
NP-LX	20.785	14.67	.372	.126	45.68	3.279	2.995
GAMMA	59.5	.8457	.068	.140	812.5	24.29	.6855
			CADMIUM - 109				
AG-KX	21.990	12.45	.342	.128	53.64	3.637	2.683
AG-KX	22.163	12.17	.339	.128	54.84	3.690	2.647
AG-KX	24.942	8.011	.284	.131	76.78	4.598	2.163
AG-KX	25.456	8.110	.275	.132	81.37	4.777	2.068
GAMMA	87.7	.2011	.033	.134	1878.	45.40	.2492
			IODINE - 125				
TE-KX	27.202	6.672	.209	.133	98.25	5.615	1.844
TE-KX	27.473	6.479	.205	.134	101.0	5.638	1.832
TE-KX	30.996	4.535	.203	.134	142.1	6.989	1.490
TE-KX	31.700	4.243	.194	.134	151.4	7.297	1.433
			LEAD - 210				
GAMMA	47.	1.310	.102	.140	446.3	15.59	.7285
			THULIUM -170				
YB-KX	51.326	1.006	.088	.140	561.5	18.46	.6260
YB-KX	52.360	.9481	.085	.140	590.9	19.17	.6069
YB-KX	59.352	.6506	.068	.140	807.6	24.18	.4875
YB-KX	60.959	.6008	.065	.139	861.4	25.38	.4656
GAMMA	84.	.2209	.034	.134	1730.	42.83	.2683
			GADOLINIUM -153				
GAMMA	97.	.1484	.028	.132	2249.	51.87	.2096
GAMMA	103.	.1241	.025	.131	2475.	55.06	.1891
			COBALT - 57				
GAMMA	14.36	42.51	.618	.111	16.02	1.687	5.548
GAMMA	121.97	.0748	.018	.127	3155.	65.93	.1416
GAMMA	136.3	.0537	.015	.124	3600.	72.02	.1171

ANDESITE USGS-AGV-1

SELECTED RADIOISOTOPES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55						
100-KX 5.888	101.1	.074	.082	6.709	.936A	10.63
100-KX 5.899	100.5	.072	.082	6.825	.9901	10.60
100-KX 6.490	76.54	.794	.088	8.952	1.130	9.009
PLUTONIUM - 238						
U-LX 13.439	12.19	.339	.130	54.75	3.703	2.609
U-LX 13.615	11.73	.333	.131	56.84	3.882	2.552
U-LX 16.420	6.780	.258	.139	97.66	5.591	1.855
U-LX 17.220	5.817	.241	.101	111.8	6.165	1.712
U-LX 20.167	3.808	.192	.107	175.6	8.577	1.310
AMERICIUM - 241						
NP-LX 13.760	11.36	.329	.131	50.60	3.805	2.506
NP-LX 13.944	10.92	.323	.132	60.09	3.992	2.450
NP-LX 16.840	6.228	.249	.146	106.8	5.885	1.778
NP-LX 17.750	5.309	.231	.102	121.9	6.566	1.626
NP-LX 20.785	3.292	.184	.106	191.2	9.138	1.244
GAMMA 59.5	.1270	.032	.154	2209.	59.53	.2106
CADMIUM - 109						
AG-KX 21.990	2.773	.169	.149	224.2	10.28	1.151
AG-KX 22.163	2.707	.167	.149	229.2	10.45	1.116
AG-KX 24.942	1.886	.139	.152	310.2	13.58	.9142
AG-KX 25.456	1.772	.135	.153	336.4	13.97	.8631
GAMMA 87.7	.0379	.016	.146	347x.	81.01	.1097
IODINE - 125						
TE-KX 27.202	1.445	.122	.154	402.7	16.02	.7804
TE-KX 27.473	1.401	.120	.154	413.5	16.35	.7762
TE-KX 30.996	.8863	.099	.156	547.6	20.87	.6330
TE-KX 31.700	.9014	.095	.156	601.1	21.82	.6094
LEAD - 210						
GAMMA 47.	.2651	.049	.157	1470.	43.75	.3134
THULIUM - 170						
YB-KX 51.326	.2010	.042	.156	1733.	49.63	.2702
YB-KX 52.360	.1892	.041	.156	1795.	50.97	.2613
YB-KX 59.352	.1288	.033	.154	2201.	59.36	.2115
YB-KX 60.959	.1177	.031	.154	2289.	61.11	.2022
GAMMA 84.	.0433	.017	.147	3341.	79.11	.1180
GADOLINIUM - 153						
GAMMA 97.	.0277	.013	.143	3773.	84.91	.0926
GAMMA 103.	.0230	.012	.101	3944.	86.90	.0838
COBALT - 57						
GAMMA 14.36	10.01	.310	.133	68.27	4.238	2.351
GAMMA 121.97	.0136	.009	.135	4380.	91.33	.0631
GAMMA 136.3	.0097	.007	.132	4679.	93.44	.0524

BASALT USGS-BCR-1

SELECTED RADIOISOTOPES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55						
100-KX 5.888	105.3	.953	.082	6.517	.9736	11.60
100-KX 5.899	104.7	.952	.082	6.552	.9773	11.56
100-KX 6.490	79.78	.867	.088	8.500	1.185	9.032
PLUTONIUM - 238						
U-LX 13.439	15.92	.372	.130	42.18	3.058	2.861
U-LX 13.615	15.33	.366	.131	43.77	3.137	2.798
U-LX 16.420	8.84	.280	.139	74.79	4.384	2.036
U-LX 17.220	7.695	.266	.101	85.55	5.020	1.880
U-LX 20.167	4.886	.212	.107	134.1	6.938	1.430
AMERICIUM - 241						
NP-LX 13.760	14.87	.361	.131	45.11	3.203	2.744
NP-LX 13.944	14.30	.355	.132	46.85	3.289	2.687
NP-LX 16.840	8.220	.279	.100	80.27	4.708	1.982
NP-LX 17.750	7.033	.254	.102	93.20	5.340	1.706
NP-LX 20.785	4.393	.202	.100	146.1	7.388	1.367
GAMMA 59.5	.1756	.036	.155	1809.	52.14	.2316
CADMIUM - 109						
AG-KX 21.990	3.709	.186	.150	171.3	8.300	1.845
AG-KX 22.163	3.622	.184	.150	175.1	8.435	1.276
AG-KX 24.942	2.536	.154	.153	243.8	10.78	1.004
AG-KX 25.456	2.384	.149	.153	257.9	11.25	.9705
GAMMA 87.7	.0529	.018	.147	3184.	75.69	.1200
IODINE - 125						
TE-KX 27.202	1.950	.134	.155	309.5	12.98	.8670
TE-KX 27.473	1.892	.132	.155	318.0	13.17	.8532
TE-KX 30.996	1.309	.109	.157	439.8	16.87	.6980
TE-KX 31.700	1.222	.105	.157	466.7	17.65	.6699
LEAD - 210						
GAMMA 47.	.3642	.054	.158	1282.	36.83	.3444
THULIUM - 170						
YB-KX 51.326	.2776	.047	.157	1450.	42.36	.2971
YB-KX 52.360	.2600	.045	.157	1497.	43.66	.2873
YB-KX 59.352	.1760	.036	.155	1881.	51.97	.2326
YB-KX 60.959	.1609	.034	.155	1967.	53.76	.2223
GAMMA 84.	.0604	.019	.148	3045.	73.44	.1296
GADOLINIUM - 153						
GAMMA 97.	.0307	.015	.144	3512.	80.37	.1010
GAMMA 103.	.0322	.013	.142	3690.	82.82	.0920
COBALT - 57						
GAMMA 14.36	13.13	.341	.133	50.94	3.486	2.587
GAMMA 121.97	.0192	.009	.137	4193.	88.61	.0693
GAMMA 136.3	.0136	.008	.133	4490.	91.14	.0576

DIABASE USGS-W-1

SELECTED RADIOISOTOPES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55						
100-KX 5.888	109.7	.944	.082	6.295	.9862	11.46
100-KX 5.899	109.1	.942	.082	6.288	.9897	11.42
100-KX 6.490	83.19	.858	.088	8.237	1.185	9.720
PLUTONIUM - 238						
U-LX 13.439	15.20	.368	.130	44.14	3.175	2.830
U-LX 13.615	14.63	.362	.131	45.81	3.250	2.768
U-LX 16.420	8.020	.281	.139	78.40	4.730	2.010
U-LX 17.220	7.322	.263	.101	89.70	5.227	1.859
U-LX 20.167	4.568	.209	.107	140.7	7.233	1.423
AMERICIUM - 241						
NP-LX 13.760	14.19	.357	.131	47.21	3.327	2.719
NP-LX 13.944	13.66	.351	.132	49.05	3.416	2.650
NP-LX 16.840	7.824	.271	.140	84.16	4.995	1.931
NP-LX 17.750	6.601	.252	.102	97.03	5.562	1.766
NP-LX 20.785	4.172	.200	.140	153.3	7.700	1.352
GAMMA 59.5	.1657	.036	.155	1943.	53.53	.2288
CADMIUM - 109						
AG-KX 21.990	3.521	.184	.150	179.8	8.656	1.829
AG-KX 22.163	3.430	.182	.150	183.8	8.790	1.813
AG-KX 24.942	2.405	.152	.153	255.7	11.24	.9935
AG-KX 25.456	2.260	.147	.153	270.4	11.73	.9580
GAMMA 87.7	.0498	.017	.147	323x.	76.74	.1191
IODINE - 125						
TE-KX 27.202	1.847	.133	.155	324.6	13.46	.8580
TE-KX 27.473	1.792	.131	.155	333.4	13.74	.8437
TE-KX 30.996	1.240	.108	.157	460.6	17.58	.6880
TE-KX 31.700	1.157	.104	.157	488.5	18.40	.6624
LEAD - 210						
GAMMA 47.	.3441	.054	.158	1246.	38.10	.3406
THULIUM - 170						
YB-KX 51.326	.2620	.046	.157	1409.	43.71	.2936
YB-KX 52.360	.2463	.045	.157	1547.	45.02	.2839
YB-KX 59.352	.1670	.036	.155	1935.	53.37	.2298
YB-KX 60.959	.1537	.034	.155	2021.	55.15	.2196
GAMMA 84.	.0569	.019	.148	3094.	74.58	.1280
GADOLINIUM - 153						
GAMMA 97.	.0305	.015	.144	3552.	81.28	.1005
GAMMA 103.	.0303	.013	.142	3735.	83.64	.0909
COBALT - 57						
GAMMA 14.36	12.52	.337	.133	53.34	3.682	2.529
GAMMA 121.97	.0181	.009	.137	4220.	89.00	.0684
GAMMA 136.3	.0129	.008	.133	4519.	91.62	.0568

DUNITE USGS-DTS-1

SELECTED RADIOISOTOPES

KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
IRON - 55						
100-KX 5.888	79.29	.689	.083	8.639	1.173	10.37
100-KX 5.899	78.85	.687	.083	8.684	1.177	10.33
100-KX 6.490	59.54	.788	.089	11.07	1.437	8.788
PLUTONIUM - 238						
U-LX 13.439	11.05	.332	.131	60.17	4.019	2.500
U-LX 13.615	10.63	.326	.131	62.47	4.121	2.408
U-LX 16.420	6.077	.252	.140	106.0	6.038	1.806
U-LX 17.220	5.276	.236	.142	122.5	6.679	1.665
U-LX 20.167	3.273	.188	.147	198.8	9.885	1.273
AMERICIUM - 241						
NP-LX 13.760	10.30	.322	.132	64.40	4.211	2.448
NP-LX 13.944	9.930	.316	.132	66.91	4.306	2.305
NP-LX 16.840	5.642	.244	.141	115.0	6.376	1.738
NP-LX 17.750	4.815	.220	.143	135.6	7.113	1.581
NP-LX 20.785	2.986	.179	.140	209.1	9.898	1.209
GAMMA 59.5	.1151	.032	.156	2290.	61.98	.2034
CADMIUM - 109						
AG-KX 21.990	2.515	.165	.150	244.8	11.12	1.898
AG-KX 22.163	2.456	.163	.150	250.2	11.31	1.684
AG-KX 24.942	1.711	.136	.153	340.4	14.46	.8871
AG-KX 25.456	1.607	.132	.154	366.1	15.08	.8869
GAMMA 87.7	.0343	.016	.147	3814.	82.50	.1087
IODINE - 125						
TE-KX 27.202	1.311	.119	.155	437.2	17.28	.7606
TE-KX 27.473	1.271	.117	.155	446.9	17.65	.7500
TE-KX 30.996	.8765	.096	.157	613.3	22.44	.6134
TE-KX 31.700	.8177	.093	.157	648.9	23.44	.5905
LEAD - 210						
GAMMA 47.	.2404	.048	.158	1551.	46.19	.3030
THULIUM - 170						
YB-KX 51.326	.1824	.041	.158	1817.	52.12	.3610
YB-KX 52.360	.1718	.040	.157	1879.	53.47	.3504
YB-KX 59.352	.1160	.032	.156	2282.	61.79	.2042
YB-KX 60.959	.1067	.030	.155	2370.	63.50	.1952
GAMMA 84.	.0393	.017	.148	3307.	80.00	.1137
GADOLINIUM - 153						
GAMMA 97.	.7251	.015	.144	3799.	86.23	.0093
GAMMA 103.	.208	.012	.143	3962.	86.06	.0807
COBALT - 57						
GAMMA 14.36	9.087	.304	.134	72.01	4.590	2.269
GAMMA 121.97	.0124	.008	.137	4393.	92.18	.0688
GAMMA 136.3	.0088	.007	.133	4660.	94.08	.0585

DIORITE   AMRT-ORN

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.888	102.3	.909	.083	6.788	.9594	11.01
MN-KX	5.899	101.8	.907	.083	6.741	.9630	10.97
MN-KX	6.490	77.49	.086	.089	0.040	1.166	9.331
			PLUTONIUM - 238				
U-LX	13.439	13.90	.354	.130	48.17	3.365	2.711
U-LX	13.615	13.38	.348	.131	49.99	3.454	2.652
U-LX	16.428	7.685	.22?	.140	85.63	5.051	1.929
U-LX	17.220	6.480	.252	.142	97.98	5.563	1.781
U-LX	20.167	4.161	.201	.147	153.7	7.715	1.363
			AMERICIUM - 241				
NP-LX	13.760	12.97	.343	.132	51.53	3.528	2.605
NP-LX	13.944	12.47	.337	.132	53.53	3.623	2.547
NP-LX	16.840	7.144	.260	.141	91.92	5.314	1.858
NP-LX	17.750	6.182	.241	.143	106.8	5.921	1.692
NP-LX	20.785	3.800	.192	.148	167.4	8.215	1.295
GAMMA	59.5	.1497	.034	.155	2045.	55.82	.2195
			CADMIUM - 109				
AG-KX	21.990	3.205	.176	.150	196.2	9.240	1.177
AG-KX	22.163	3.130	.176	.150	200.6	9.392	1.162
AG-KX	24.942	2.187	.146	.153	278.6	12.01	.9516
AG-KX	25.456	2.055	.141	.154	294.9	12.53	.9194
GAMMA	87.7	.0049	.017	.147	3329.	78.42	.1143
			IODINE - 125				
TE-KX	27.202	1.679	.127	.155	353.4	14.38	.8219
TE-KX	27.473	1.628	.125	.155	363.0	14.68	.8082
TE-KX	30.994	1.125	.103	.157	500.1	18.77	.6592
TE-KX	31.700	1.050	.100	.157	530.1	19.64	.6346
			LEAD - 210				
GAMMA	47.	.3113	.052	.158	1331.	40.21	.3265
			THULIUM - 170				
YB-KX	51.326	.2369	.044	.157	1501.	45.94	.2815
YB-KX	52.360	.2227	.043	.157	1641.	47.26	.2772
YB-KX	59.352	.1509	.034	.155	2037.	55.65	.2204
YB-KX	60.959	.1309	.033	.155	2124.	57.43	.2107
GAMMA	84.	.0513	.018	.148	3191.	76.36	.1229
			GADOLINIUM - 153				
GAMMA	97.	.0329	.014	.144	3440.	82.72	.0945
GAMMA	103.	.0273	.012	.142	3818.	84.94	.0873
			COBALT - 57				
GAMMA	14.36	11.44	.324	.134	50.24	3.044	2.423
GAMMA	121.97	.0162	.009	.136	4292.	89.96	.0656
GAMMA	136.3	.0116	.007	.132	4584.	92.35	.0544

BASALT   ZGI-BM

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.888	95.94	.8A8	.083	7.150	1.002	10.67
MN-KX	5.899	95.44	.846	.083	7.189	1.005	10.63
MN-KX	6.490	72.53	.807	.089	9.439	1.220	9.041
			PLUTONIUM - 238				
U-LX	13.439	13.11	.345	.131	50.98	3.502	2.624
U-LX	13.615	12.62	.339	.132	52.92	3.595	2.566
U-LX	16.428	7.244	.262	.141	90.61	5.265	1.846
U-LX	17.220	6.298	.245	.142	103.6	5.801	1.723
U-LX	20.167	3.922	.195	.148	162.4	8.052	1.319
			AMERICIUM - 241				
NP-LX	13.760	12.24	.334	.133	54.54	3.672	2.521
NP-LX	13.944	11.77	.328	.133	56.64	3.772	2.464
NP-LX	16.840	6.732	.253	.142	97.25	5.540	1.790
NP-LX	17.750	5.753	.235	.144	113.0	6.176	1.637
NP-LX	20.785	3.581	.187	.144	176.9	8.576	1.253
GAMMA	59.5	.1409	.033	.156	2101.	57.26	.2125
			CADMIUM - 109				
AG-KX	21.990	3.020	.172	.151	207.3	9.648	1.139
AG-KX	22.163	2.949	.170	.151	211.9	9.887	1.124
AG-KX	24.942	2.060	.142	.154	290.1	12.55	.9207
AG-KX	25.456	1.936	.137	.154	311.0	13.09	.8895
GAMMA	87.7	.0423	.016	.147	3371.	79.43	.1107
			IODINE - 125				
TE-KX	27.202	1.581	.124	.156	372.4	15.02	.7952
TE-KX	27.473	1.534	.122	.156	382.4	15.33	.7820
TE-KX	30.994	1.060	.101	.158	525.6	19.58	.6378
TE-KX	31.700	.9845	.097	.158	556.9	20.48	.6140
			LEAD - 210				
GAMMA	47.	.2951	.050	.159	1381.	41.58	.3160
			THULIUM - 170				
YB-KX	51.326	.2230	.043	.158	1635.	47.37	.2725
YB-KX	52.360	.2097	.042	.158	1695.	48.70	.2635
YB-KX	59.352	.1420	.033	.156	2093.	57.10	.2134
YB-KX	60.959	.1307	.032	.155	2181.	58.86	.2040
GAMMA	84.	.0483	.018	.148	3236.	77.43	.1190
			GADOLINIUM - 153				
GAMMA	97.	.0310	.013	.144	3676.	83.57	.0935
GAMMA	103.	.0257	.012	.142	3851.	85.70	.0846
			COBALT - 57				
GAMMA	14.36	10.79	.316	.135	61.64	4.002	2.345
GAMMA	121.97	.0153	.009	.137	4314.	90.48	.0637
GAMMA	136.3	.0109	.007	.133	4604.	92.77	.0529

SYENITE   SSC-SY-1

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.888	111.0	.916	.082	6.188	.8912	11.18
MN-KX	5.899	110.4	.915	.082	6.220	.8946	11.15
MN-KX	6.490	84.18	.833	.088	8.145	1.082	9.480
			PLUTONIUM - 238				
U-LX	13.439	14.03	.357	.129	47.71	3.348	2.755
U-LX	13.615	13.51	.351	.130	49.53	3.434	2.695
U-LX	16.428	7.746	.272	.139	84.97	5.029	1.960
U-LX	17.220	6.731	.254	.140	97.27	5.539	1.810
U-LX	20.167	4.187	.202	.146	152.8	7.685	1.385
			AMERICIUM - 241				
NP-LX	13.760	13.09	.346	.131	51.06	3.510	2.647
NP-LX	13.944	12.59	.340	.131	53.05	3.605	2.588
NP-LX	16.840	7.195	.262	.140	91.23	5.291	1.879
NP-LX	17.750	6.197	.244	.142	106.1	5.897	1.719
NP-LX	20.785	3.822	.192	.147	166.1	8.104	1.316
GAMMA	59.5	.1998	.034	.154	2048.	55.73	.2225
			CADMIUM - 109				
AG-KX	21.990	3.223	.178	.149	195.2	9.200	1.196
AG-KX	22.163	3.147	.176	.149	199.6	9.358	1.180
AG-KX	24.942	2.197	.147	.152	277.6	11.97	.9605
AG-KX	25.456	2.064	.142	.152	293.7	12.49	.9337
GAMMA	87.7	.0049	.017	.146	3330.	78.30	.1158
			IODINE - 125				
TE-KX	27.202	1.686	.128	.154	352.1	14.33	.8346
TE-KX	27.473	1.635	.126	.154	361.7	14.63	.8207
TE-KX	30.994	1.129	.104	.156	498.7	18.71	.6693
TE-KX	31.700	1.054	.101	.156	528.8	19.58	.6443
			LEAD - 210				
GAMMA	47.	.3118	.052	.157	1331.	40.12	.3313
			THULIUM - 170				
YB-KX	51.326	.2372	.045	.156	1502.	45.04	.2855
YB-KX	52.360	.2229	.043	.156	1642.	47.17	.2761
YB-KX	59.352	.1510	.034	.154	2040.	55.56	.2235
YB-KX	60.959	.1309	.033	.154	2128.	57.34	.2136
GAMMA	84.	.0513	.018	.147	3200.	76.30	.1245
			GADOLINIUM - 153				
GAMMA	97.	.0329	.014	.143	3652.	82.67	.0978
GAMMA	103.	.0273	.012	.141	3831.	84.90	.0884
			COBALT - 57				
GAMMA	14.36	11.54	.327	.133	57.72	3.629	2.462
GAMMA	121.97	.0162	.009	.136	4307.	89.91	.0666
GAMMA	136.3	.0115	.007	.132	4601.	92.33	.0553

SYENITE   NIM-S

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.888	118.8	.879	.083	5.785	.8028	10.56
MN-KX	5.899	110.2	.877	.083	5.816	.8058	10.52
MN-KX	6.490	90.31	.798	.089	7.600	.9730	8.947
			PLUTONIUM - 238				
U-LX	13.439	11.39	.340	.131	58.41	3.97?	2.592
U-LX	13.615	11.95	.335	.132	60.67	4.084	2.536
U-LX	16.428	6.199	.259	.140	105.0	6.052	1.843
U-LX	17.220	5.304	.242	.142	120.4	6.685	1.702
U-LX	20.167	3.304	.193	.148	190.1	9.351	1.301
			AMERICIUM - 241				
NP-LX	13.760	10.61	.330	.132	62.58	4.176	2.491
NP-LX	13.944	10.19	.324	.133	65.07	4.292	2.435
NP-LX	16.840	5.798	.250	.141	112.8	6.376	1.767
NP-LX	17.750	4.892	.232	.144	131.5	7.128	1.616
NP-LX	20.785	3.010	.184	.149	207.3	9.971	1.237
GAMMA	59.5	.1105	.035	.156	2318.	63.03	.2090
			CADMIUM - 109				
AG-KX	21.990	2.528	.169	.151	243.3	11.24	1.124
AG-KX	22.163	2.467	.167	.151	248.8	11.42	1.109
AG-KX	24.942	1.709	.140	.154	346.0	14.66	.9082
AG-KX	25.456	1.603	.135	.154	366.0	15.30	.8773
GAMMA	87.7	.0325	.016	.147	3541.	83.38	.1088
			IODINE - 125				
TE-KX	27.202	1.303	.122	.156	438.2	17.56	.7842
TE-KX	27.473	1.263	.120	.156	450.1	17.92	.7711
TE-KX	30.994	.8660	.099	.158	617.3	22.87	.6287
TE-KX	31.700	.8070	.096	.158	653.5	23.90	.6093
			LEAD - 210				
GAMMA	47.	.2330	.049	.159	1571.	47.15	.3111
			THULIUM - 170				
YB-KX	51.326	.1764	.042	.158	1840.	53.15	.2682
YB-KX	52.360	.1656	.041	.158	1903.	54.51	.2593
YB-KX	59.352	.1110	.033	.156	2310.	62.87	.2094
YB-KX	60.959	.1029	.031	.155	2398.	64.58	.2007
GAMMA	84.	.0372	.017	.148	3415.	81.65	.1170
			GADOLINIUM - 153				
GAMMA	97.	.0237	.013	.144	3825.	86.92	.0919
GAMMA	103.	.0196	.012	.142	3986.	88.70	.0831
			COBALT - 57				
GAMMA	14.36	9.328	.312	.134	70.91	4.563	2.316
GAMMA	121.97	.0116	.009	.137	4414.	92.01	.0626
GAMMA	136.3	.0082	.007	.133	4680.	94.44	.0519

SLATE 261-78

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.8HH	92.62	.053	.000	7.008	1.001	10.19
MN-KX	5.899	92.12	.051	.000	7.040	1.005	10.16
MN-KX	6.490	69.96	.775	.000	9.78A	1.220	8.630
			PLUTONIUM - 238				
U-LX	13.439	11.36	.330	.132	58.50	3.900	2.400
U-LX	13.615	10.93	.324	.133	60.03	9.011	2.443
U-LX	16.420	6.230	.251	.141	106.5	5.918	1.776
U-LX	17.220	5.418	.235	.103	119.6	6.525	1.440
U-LX	20.167	3.354	.187	.109	107.8	9.095	1.254
			AMERICIUM - 241				
NP-LX	13.760	10.59	.320	.133	62.72	9.099	2.309
NP-LX	13.945	10.10	.314	.134	65.17	9.213	2.349
NP-LX	16.840	5.790	.242	.142	112.2	6.227	1.703
NP-LX	17.750	4.940	.225	.144	138.5	6.953	1.550
NP-LX	20.785	3.060	.179	.150	204.5	9.492	1.192
GAMMA	59.5	.1171	.032	.156	2270.	61.50	.2025
			CADMIUM - 109				
AG-KX	21.990	2.576	.164	.151	239.6	10.91	1.000
AG-KX	22.163	2.515	.162	.152	241.9	11.09	1.049
AG-KX	24.942	1.751	.135	.155	339.5	14.21	.07n1
AG-KX	25.456	1.644	.131	.155	350.9	14.82	.044n
GAMMA	87.7	.0348	.016	.147	3569.	82.36	.1056
			IODINE - 125				
TE-KX	27.202	1.340	.118	.156	429.0	17.00	.7567
TE-KX	27.473	1.300	.118	.157	440.5	17.35	.7441
TE-KX	30.946	.8953	.096	.154	602.8	22.12	.6070
TE-KX	31.700	.8351	.093	.159	630.1	23.12	.5844
			LEAD - 210				
GAMMA	47.	.2040	.048	.159	1534.	45.79	.3010
			THULIUM - 170				
YB-KX	51.326	.1059	.041	.150	1800.	51.72	.2595
YB-KX	52.360	.1746	.040	.154	1862.	53.07	.2510
YB-KX	59.352	.1100	.032	.156	2246.	61.42	.2033
YB-KX	60.959	.1885	.030	.156	2534.	63.16	.194n
GAMMA	84.	.0390	.017	.148	3381.	80.56	.1135
			GADOLINIUM - 153				
GAMMA	97.	.0255	.013	.144	3790.	86.00	.0092
GAMMA	103.	.0211	.011	.142	3903.	87.91	.0007
			COBALT - 57				
GAMMA	14.36	9.333	.302	.135	70.90	4.475	2.232
GAMMA	121.97	.0125	.008	.137	4401.	92.04	.0440
GAMMA	136.3	.0089	.007	.133	4073.	93.99	.050n

DISTHENE MRT-OT-N

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.800	57.76	.530	.050	11.87	1.020	9.207
MN-KX	5.899	57.45	.537	.050	11.94	1.025	9.250
MN-KX	6.490	43.48	.600	.062	15.73	1.240	7.063
			PLUTONIUM - 238				
U-LX	13.439	5.207	.207	.091	125.9	5.400	2.273
U-LX	13.615	5.000	.203	.091	130.0	5.561	2.223
U-LX	16.420	2.800	.157	.097	276.2	8.301	1.616
U-LX	17.220	2.429	.147	.099	259.1	9.179	1.092
U-LX	20.167	1.487	.117	.102	406.0	12.04	1.141
			AMERICIUM - 241				
NP-LX	13.760	4.844	.200	.092	136.9	5.607	2.186
NP-LX	13.945	4.651	.197	.092	140.3	5.861	2.135
NP-LX	16.840	2.662	.152	.098	292.9	8.732	1.569
NP-LX	17.750	2.211	.141	.099	282.7	9.703	1.017
NP-LX	20.785	1.354	.112	.103	441.7	13.09	1.004
GAMMA	59.5	.0491	.020	.107	3985.	72.15	.1043
			CADMIUM - 109				
AG-KX	21.990	1.135	.103	.104	516.2	15.41	.9030
AG-KX	22.163	1.100	.102	.104	527.4	15.66	.9720
AG-KX	24.942	.7057	.005	.106	726.4	19.07	.7765
AG-KX	25.456	.7182	.082	.107	764.1	20.41	.7605
GAMMA	87.7	.0144	.010	.101	5510.	80.50	.0461
			IODINE - 125				
TE-KX	27.202	.5432	.075	.100	906.3	23.76	.6079
TE-KX	27.473	.5652	.073	.100	929.3	24.21	.6765
TE-KX	30.946	.3864	.060	.109	1297.	30.42	.5510
TE-KX	31.700	.3601	.058	.109	1319.	31.68	.5312
			LEAD - 210				
GAMMA	47.	.1036	.03C	.109	2051.	57.35	.2734
			THULIUM - 170				
YB-KX	51.326	.0780	.026	.109	3294.	63.18	.2339
YB-KX	52.360	.0736	.025	.109	3345.	64.46	.2202
YB-KX	59.352	.0445	.020	.108	3910.	72.01	.1040
YB-KX	60.959	.0455	.019	.107	4030.	73.49	.1767
GAMMA	84.	.0165	.011	.102	5354.	87.22	.1033
			GADOLINIUM - 153				
GAMMA	97.	.0105	.000	.099	5675.	91.08	.0012
GAMMA	103.	.0087	.007	.090	6079.	92.35	.0735
			COBALT - 57				
GAMMA	14.36	4.250	.109	.093	152.9	6.270	2.031
GAMMA	121.97	.0051	.005	.090	6426.	95.00	.0594
GAMMA	136.3	.0036	.004	.092	6973.	96.33	.0401

DUNITE-CHRYSOTILE NIM-D

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.860	79.90	.932	.001	8.619	1.200	11.06
MN-KX	5.899	78.96	.930	.001	8.646	1.205	11.42
MN-KX	6.490	59.65	.907	.007	11.03	1.542	9.715
			PLUTONIUM - 238				
U-LX	13.439	14.99	.363	.129	44.76	3.170	2.422
U-LX	13.615	14.43	.357	.129	46.44	3.250	2.701
U-LX	16.420	8.339	.277	.130	77.17	4.732	2.044
U-LX	17.220	7.259	.259	.100	90.51	5.204	1.036
U-LX	20.167	6.541	.206	.105	141.6	7.100	1.017
			AMERICIUM - 241				
NP-LX	13.760	.3.760	14.00	.352	.130	47.06	3.327	2.711
NP-LX	13.945	13.46	.346	.130	49.79	3.415	2.651
NP-LX	16.840	7.753	.267	.139	86.95	6.979	1.929
NP-LX	17.750	6.637	.246	.141	98.65	5.539	1.759
NP-LX	20.785	6.150	.197	.104	150.2	7.445	1.346
GAMMA	59.5	.1066	.035	.154	1947.	53.20	.2200
			CADMIUM - 109				
AG-KX	21.990	3.505	.181	.148	180.7	8.589	1.223
AG-KX	22.163	3.424	.179	.148	184.7	8.729	1.207
AG-KX	24.942	2.399	.150	.151	256.6	11.14	.9801
AG-KX	25.456	2.255	.145	.152	271.5	11.63	.9545
GAMMA	87.7	.0502	.017	.146	3266.	76.51	.1170
			IODINE - 125				
TE-KX	27.202	1.645	.131	.153	325.5	13.33	.0530
TE-KX	27.473	1.790	.129	.153	334.6	13.61	.A3n7
TE-KX	30.946	1.240	.108	.155	441.4	17.41	.0836
TE-KX	31.700	1.150	.102	.156	409.4	10.22	.0501
			LEAD - 210				
GAMMA	47.	.3454	.063	.157	1248.	37.78	.3379
			THULIUM - 170				
YB-KX	51.326	.2031	.045	.156	1491.	43.38	.2911
YB-KX	52.360	.2070	.044	.156	1509.	44.48	.2015
YB-KX	59.352	.1078	.035	.156	1930.	53.03	.2277
YB-KX	60.959	.1545	.034	.156	2020.	50.02	.2177
GAMMA	84.	.0573	.019	.147	3100.	70.33	.1260
			GADOLINIUM - 153				
GAMMA	97.	.0368	.016	.143	3556.	81.08	.0995
GAMMA	103.	.0306	.013	.142	3790.	83.46	.090n
			COBALT - 57				
GAMMA	14.36	12.36	.333	.132	54.02	3.619	2.522
GAMMA	121.97	.0102	.009	.136	4230.	89.8n	.067A
GAMMA	136.3	.0130	.007	.132	4530.	91.51	.0543

PYROXENITE NIM-P

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	CONV/INC
			IRON - 55				
MN-KX	5.8n8	84.91	.081	.079	8.071	1.117	11.14
MN-KX	5.899	84.45	.079	.079	8.115	1.122	11.18
MN-KX	6.490	63.90	.081	.085	10.68	1.385	9.659
			PLUTONIUM - 238				
U-LX	13.439	13.50	.363	.125	49.61	3.369	2.739
U-LX	13.615	12.99	.337	.126	51.48	3.436	2.679
U-LX	16.420	7.681	.261	.136	84.00	5.013	1.937
U-LX	17.220	6.508	.244	.136	100.6	5.518	1.798
U-LX	20.167	4.059	.196	.101	157.7	7.639	1.375
			AMERICIUM - 241				
NP-LX	13.760	12.40	.352	.126	53.86	3.509	2.631
NP-LX	13.945	12.12	.320	.127	55.11	3.644	2.572
NP-LX	16.840	6.951	.252	.135	90.45	5.272	1.847
NP-LX	17.750	5.945	.234	.137	109.7	5.071	1.700
NP-LX	20.785	3.707	.186	.142	171.7	8.132	1.504
GAMMA	59.5	.1469	.033	.149	2190.	55.30	.2207
			CADMIUM - 109				
AG-KX	21.990	3.128	.171	.144	201.2	9.103	1.107
AG-KX	22.163	3.055	.169	.144	205.7	9.293	1.172
AG-KX	24.942	2.137	.141	.147	205.8	11.00	.9595
AG-KX	25.456	2.000	.137	.148	302.2	12.39	.9260
GAMMA	87.7	.0441	.016	.141	3636.	78.12	.1140
			IODINE - 125				
TE-KX	27.202	1.641	.123	.149	342.1	14.21	.0280
TE-KX	27.473	1.592	.121	.149	372.0	14.51	.A146
TE-KX	30.946	1.101	.100	.151	512.4	18.55	.0601
TE-KX	31.700	1.020	.097	.151	545.2	19.48	.6393
			LEAD - 210				
GAMMA	47.	.3053	.050	.152	136n.	39.00	.3505
			THULIUM - 170				
YB-KX	51.326	.2320	.043	.151	1625.	45.51	.2031
YB-KX	52.360	.2105	.041	.151	1686.	46.85	.2730
YB-KX	59.352	.1081	.033	.149	2095.	55.22	.2216
YB-KX	60.959	.1363	.032	.149	2186.	57.00	.2110
GAMMA	84.	.0504	.018	.142	3293.	76.03	.1235
			GADOLINIUM - 153				
GAMMA	97.	.0323	.015	.139	3760.	82.74	.0909
GAMMA	103.	.0269	.012	.137	3905.	84.71	.0077
			COBALT - 57				
GAMMA	14.36	11.12	.314	.128	59.93	3.823	2.447
GAMMA	121.97	.0160	.009	.132	4437.	89.77	.00nn
GAMMA	136.3	.0114	.007	.128	4760.	92.72	.n3n8

BIOTITE   CRPG-MICA-FE   BASALT   CRPG-BR

SELECTED RADIOISOTOPES   SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				

LIMESTONE   ECI-KH   BAUXITE   ANRT-BX-N

SELECTED RADIOISOTOPES   SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				

MAGNESIUM CARBONATE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MO-KX	5.888	44.84	.613	.000	14.57	1.476	6.857
MO-KX	5.899	44.57	.411	.009	14.46	1.482	6.834
MO-KX	6.490	34.90	.353	.096	19.49	1.825	5.776
			PLUTONIUM -238				
U-LX	13.439	3.630	.227	.140	173.3	9.187	1.627
U-LX	13.615	3.483	.223	.148	180.1	9.658	1.591
U-LX	16.428	1.912	.172	.149	310.3	14.35	1.152
U-LX	17.228	1.644	.168	.151	354.4	15.90	1.063
U-LX	20.167	.9892	.127	.156	544.7	22.25	.8115
			AMERICIUM -241				
NP-LX	13.760	3.360	.220	.141	185.8	9.485	1.542
NP-LX	13.944	3.220	.216	.142	193.2	9.978	1.527
NP-LX	16.840	1.766	.166	.159	332.8	15.15	1.104
NP-LX	17.750	1.492	.153	.152	385.6	16.98	1.009
NP-LX	20.785	.8976	.121	.157	509.5	23.67	.7708
GAMMA	59.5	.0295	.021	.160	3397.	85.98	.1388
			CADMIUM - 109				
AG-KX	21.990	.7480	.111	.159	680.9	26.52	.7082
AG-KX	22.163	.7293	.110	.159	694.6	26.93	.6989
AG-KX	24.942	.4976	.091	.162	923.6	33.71	.5652
AG-KX	25.456	.4656	.088	.162	967.9	34.98	.5468
GAMMA	87.7	.0084	.010	.149	4125.	94.98	.0685
			IODINE - 125				
TE-KX	27.202	.3754	.080	.163	1121.	39.26	.4879
TE-KX	27.473	.3633	.078	.163	1145.	39.93	.4798
TE-KX	30.994	.2456	.064	.165	1440.	46.25	.3912
TE-KX	31.700	.2283	.062	.165	1522.	49.84	.3746
			LEAD - 210				
GAMMA	47.	.0634	.032	.164	2677.	75.52	.1941
			THALLIUM -170				
YB-KX	51.326	.0476	.027	.163	2920.	79.94	.1675
YB-KX	52.360	.0446	.026	.162	2975.	80.94	.1620
YB-KX	59.352	.0297	.021	.160	3291.	85.09	.1313
YB-KX	60.959	.0272	.020	.159	3355.	86.81	.1244
GAMMA	84.	.0097	.011	.151	4042.	94.35	.0734
			GADOLINIUM -153				
GAMMA	97.	.0061	.008	.146	4317.	96.19	.0579
GAMMA	103.	.0050	.008	.146	4429.	96.77	.0526
			COBALT - 57				
GAMMA	14.36	2.930	.200	.163	210.6	10.65	1.451
GAMMA	121.97	.0030	.005	.130	4742.	97.98	.0346
GAMMA	136.3	.0021	.004	.134	4950.	98.51	.0328

CALCIUM SULPHATE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MO-KX	5.888	66.17	.949	.092	10.36	1.826	6.448
MO-KX	5.899	65.88	.939	.092	10.42	1.830	6.438
MO-KX	6.490	49.97	.930	.090	13.49	1.836	5.490
			PLUTONIUM -238				
U-LX	13.439	9.737	.224	.130	113.6	5.930	1.620
U-LX	13.615	5.514	.220	.139	118.0	6.102	1.598
U-LX	16.428	3.102	.169	.146	202.7	9.225	1.156
U-LX	17.228	2.649	.158	.148	231.4	10.23	1.060
U-LX	20.167	1.647	.125	.153	360.0	16.40	.8195
			AMERICIUM -241				
NP-LX	13.760	9.359	.217	.139	121.7	6.245	1.587
NP-LX	13.944	5.126	.213	.140	180.5	6.431	1.523
NP-LX	16.840	2.875	.163	.147	217.5	9.761	1.109
NP-LX	17.750	2.444	.151	.149	252.5	10.93	1.015
NP-LX	20.785	1.449	.120	.154	389.9	15.60	.7784
GAMMA	59.5	.0503	.021	.158	3003.	76.02	.1354
			CADMIUM - 109				
AG-KX	21.990	1.258	.110	.155	454.9	17.37	.7684
AG-KX	22.163	1.208	.108	.156	464.4	17.46	.6991
AG-KX	24.942	.8502	.090	.157	631.2	22.56	.5733
AG-KX	25.456	.7977	.087	.158	664.5	23.51	.5540
GAMMA	87.7	.0164	.010	.145	4651.	90.03	.0697
			IODINE - 125				
TE-KX	27.202	.6480	.079	.159	782.6	26.88	.4956
TE-KX	27.473	.6205	.077	.159	801.6	27.32	.4876
TE-KX	30.994	.4307	.064	.160	1059.	36.18	.3981
TE-KX	31.700	.4013	.061	.160	1112.	35.56	.3833
			LEAD - 210				
GAMMA	47.	.1163	.031	.159	2262.	62.05	.1988
			THALLIUM -170				
YB-KX	51.326	.0881	.027	.157	2543.	67.46	.1788
YB-KX	52.360	.0827	.026	.157	2607.	68.87	.1652
YB-KX	59.352	.0550	.021	.155	2990.	75.89	.1339
YB-KX	60.959	.0513	.020	.154	3076.	77.26	.1201
GAMMA	84.	.0187	.011	.146	3047.	89.33	.0749
			GADOLINIUM -153				
GAMMA	97.	.0120	.008	.141	4200.	92.60	.0549
GAMMA	103.	.0099	.007	.139	4421.	93.67	.0432
			COBALT - 57				
GAMMA	14.36	4.606	.209	.161	137.7	8.060	1.440
GAMMA	121.97	.0059	.005	.136	4789.	95.99	.0401
GAMMA	136.30	.0042	.004	.129	5025.	96.98	.0333

CALCIUM CARBONATE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MO-KX	5.888	174.2	.927	.086	3.955	.5785	10.73
MO-KX	5.899	173.3	.926	.087	3.975	.5805	10.70
MO-KX	6.490	133.5	.863	.093	5.155	.6960	9.134
			PLUTONIUM -238				
U-LX	13.439	16.90	.362	.135	39.84	2.844	2.685
U-LX	13.615	16.24	.356	.135	41.35	2.920	2.627
U-LX	16.428	9.357	.276	.144	70.89	4.248	1.917
U-LX	17.228	8.138	.248	.146	81.14	4.723	1.772
U-LX	20.167	5.080	.205	.151	127.4	6.556	1.359
			AMERICIUM -241				
NP-LX	13.760	15.77	.351	.136	42.63	2.992	2.581
NP-LX	13.944	15.16	.345	.137	44.28	3.073	2.524
NP-LX	16.840	8.695	.266	.145	76.11	4.511	1.839
NP-LX	17.750	7.637	.247	.147	88.51	5.028	1.684
NP-LX	20.785	4.661	.194	.152	138.9	6.983	1.292
GAMMA	59.5	.1875	.035	.157	1827.	56.56	.2218
			CADMIUM - 109				
AG-KX	21.990	3.918	.181	.154	162.9	7.859	1.176
AG-KX	22.163	3.827	.179	.154	166.6	7.989	1.168
AG-KX	24.942	2.680	.149	.157	232.1	10.23	.9523
AG-KX	25.456	2.519	.145	.157	245.6	10.68	.9203
GAMMA	87.7	.0568	.017	.148	3127.	74.36	.1157
			IODINE - 125				
TE-KX	27.202	2.061	.130	.158	204.9	12.27	.8235
TE-KX	27.473	2.000	.128	.158	303.1	12.53	.8108
TE-KX	30.994	1.385	.106	.166	419.6	16.09	.6617
TE-KX	31.700	1.294	.102	.160	445.3	16.85	.6373
			LEAD - 210				
GAMMA	47.	.3874	.053	.160	1154.	35.46	.3294
			THALLIUM -170				
YB-KX	51.326	.2955	.045	.159	1386.	40.89	.2862
YB-KX	52.360	.2779	.044	.159	1442.	42.16	.2748
YB-KX	59.352	.1859	.035	.157	1819.	50.40	.2227
YB-KX	60.959	.1740	.033	.157	1905.	52.17	.2139
GAMMA	84.	.0649	.019	.149	2983.	72.08	.1244
			GADOLINIUM -153				
GAMMA	97.	.0417	.016	.145	3457.	79.20	.0977
GAMMA	103.	.0347	.013	.143	3647.	81.74	.0884
			COBALT - 57				
GAMMA	14.36	13.91	.331	.138	48.18	3.261	2.492
GAMMA	121.97	.0207	.009	.137	4134.	87.59	.0665
GAMMA	136.3	.0148	.007	.133	4446.	90.49	.0552

CHROMIUM OXIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MO-KX	5.888	53.04	1.461	.070	12.51	2.040	21.10
MO-KX	5.899	53.34	1.479	.071	12.58	2.011	21.03
MO-KX	6.490	310.7	1.352	.071	2.220	.0574	17.07
			PLUTONIUM - 238				
U-LX	13.439	41.95	.594	.115	16.24	1.663	5.142
U-LX	13.615	40.43	.585	.116	16.89	1.782	5.090
U-LX	16.428	23.61	.456	.124	28.44	2.394	3.461
U-LX	17.228	20.61	.427	.126	32.74	2.611	3.370
U-LX	20.167	13.03	.341	.132	51.33	3.504	2.570
			AMERICIUM - 241				
NP-LX	13.760	39.23	.577	.116	17.36	1.735	4.950
NP-LX	13.944	37.77	.567	.117	18.02	1.777	4.844
NP-LX	16.840	21.98	.440	.125	30.73	2.506	3.518
NP-LX	17.750	18.48	.409	.127	35.69	2.701	3.297
NP-LX	20.785	11.93	.326	.133	55.94	3.704	2.448
GAMMA	59.5	.5180	.059	.146	958.7	28.35	.0831
			CADMIUM - 109				
AG-KX	21.990	10.11	.300	.135	65.68	4.127	2.223
AG-KX	22.163	9.887	.297	.135	67.16	4.189	2.103
AG-KX	24.942	6.984	.249	.139	94.02	5.255	1.791
AG-KX	25.456	6.576	.241	.139	99.63	5.447	1.730
GAMMA	87.7	.1605	.029	.148	2181.	51.39	.2070
			IODINE - 125				
TE-KX	27.202	5.455	.210	.141	120.2	6.220	1.504
TE-KX	27.473	5.269	.214	.141	123.6	6.342	1.518
TE-KX	30.994	3.668	.177	.144	173.7	8.041	1.234
TE-KX	31.700	3.431	.171	.144	185.4	8.407	1.147
			LEAD - 210				
GAMMA	47.	1.030	.089	.147	537.0	18.29	.0643
			THALLIUM - 170				
YB-KX	51.326	.8490	.076	.147	671.4	21.44	.5195
YB-KX	52.360	.7637	.074	.147	745.5	22.44	.5090
YB-KX	59.352	.5219	.059	.144	993.1	28.23	.4040
YB-KX	60.959	.4810	.056	.144	1013.	29.54	.3846
GAMMA	84.	.1820	.031	.143	1950.	48.57	.2229
			GADOLINIUM - 153				
GAMMA	97.	.1184	.024	.138	2470.	57.80	.1762
GAMMA	103.	.0988	.021	.137	2697.	61.55	.1571
			COBALT - 57				
GAMMA	14.36	34.73	.565	.118	19.57	1.874	4.649
GAMMA	121.97	.0594	.016	.132	3344.	71.33	.1176
GAMMA	136.3	.0420	.013	.129	3741.	76.80	.0972

FERROUS SULPHIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MN-KX	5.888	108.7	.849	.078	6.438	.8407	10.91
MN-KX	5.899	108.1	.847	.078	6.473	.8490	10.87
MN-KX	6.490	80.63	.769	.084	8.906	1.047	9.141
			PLUTONIUM -238				
U-LX	13.439	9.258	.322	.129	71.38	4.652	2.493
U-LX	13.615	8.099	.317	.130	74.16	4.781	2.437
U-LX	16.420	5.005	.244	.139	128.6	7.111	1.754
U-LX	17.220	4.[illegible]	.228	.141	147.5	7.859	1.616
U-LX	20.167	2.655	.181	.147	232.2	10.99	1.229
			AMERICIUM -241				
NP-LX	13.760	8.616	.312	.131	76.51	4.889	2.382
NP-LX	13.944	8.273	.307	.131	79.56	5.020	2.337
NP-LX	16.840	4.638	.236	.140	138.2	7.495	1.680
NP-LX	17.750	3.943	.218	.142	161.0	8.383	1.533
NP-LX	20.785	2.418	.173	.148	253.0	11.72	1.169
GAMMA	59.5	.0889	.030	.153	2566.	67.35	.1964
			CADMIUM - 109				
AG-KX	21.990	2.029	.159	.150	296.4	13.20	1.058
AG-KX	22.163	1.980	.157	.150	303.0	13.41	1.046
AG-KX	24.942	1.370	.131	.153	419.1	17.16	.8523
AG-KX	25.456	1.285	.126	.154	442.7	17.89	.8229
GAMMA	87.7	.0263	.015	.143	3759.	85.75	.1018
			IODINE - 125				
TE-KX	27.202	1.044	.114	.155	527.8	20.46	.7365
TE-KX	27.473	1.012	.112	.155	541.6	20.88	.7221
TE-KX	30.996	.6535	.092	.157	735.6	26.42	.5876
TE-KX	31.700	.6062	.089	.157	776.9	27.56	.5655
			LEAD - 210				
GAMMA	47.	.1869	.046	.157	1780.	51.99	.2899
			THULIUM -170				
YB-KX	51.326	.1416	.039	.156	2066.	57.91	.2499
YB-KX	52.360	.1330	.038	.156	2124.	59.23	.2417
YB-KX	59.352	.0896	.030	.153	2538.	67.20	.1957
YB-KX	60.959	.0823	.029	.153	2626.	68.80	.1871
GAMMA	84.	.0301	.016	.145	3634.	84.23	.1096
			GADOLINIUM -153				
GAMMA	97.	.0192	.012	.140	4041.	88.82	.0840
GAMMA	103.	.0154	.011	.138	4203.	90.36	.0778
			COBALT - 57				
GAMMA	14.36	7.563	.295	.133	86.74	5.349	2.219
GAMMA	121.97	.0096	.008	.132	4637.	93.79	.0587
GAMMA	136.300	.0067	.006	.128	4911.	95.27	.0468

CUPRIC SULPHIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MN-KX	5.888	132.3	1.859	.065	5.162	1.433	28.63
MN-KX	5.899	131.6	1.856	.065	5.190	1.438	28.36
MN-KX	6.490	100.2	1.701	.070	6.794	1.736	24.22
			PLUTONIUM -238				
U-LX	13.439	57.97	.759	.106	11.78	1.469	7.160
U-LX	13.615	55.90	.746	.107	12.21	1.502	6.983
U-LX	16.420	32.91	.583	.115	20.62	2.075	5.066
U-LX	17.220	28.77	.546	.117	23.54	2.252	4.671
U-LX	20.167	18.25	.438	.123	36.83	2.979	3.558
			AMERICIUM -241				
NP-LX	13.760	54.27	.736	.107	12.57	1.538	6.858
NP-LX	13.944	52.29	.724	.108	13.04	1.565	6.704
NP-LX	16.840	30.67	.563	.116	22.10	2.166	4.853
NP-LX	17.750	26.38	.524	.118	25.64	2.379	4.438
NP-LX	20.785	16.72	.419	.124	40.14	3.144	3.378
GAMMA	59.5	.7144	.076	.141	743.8	23.30	.5424
			CADMIUM - 109				
AG-KX	21.990	14.19	.386	.126	47.14	3.481	3.066
AG-KX	22.163	13.87	.382	.126	48.20	3.531	3.023
AG-KX	24.942	9.806	.320	.130	67.58	4.386	2.464
AG-KX	25.456	9.233	.310	.130	71.65	4.555	2.378
GAMMA	87.7	.2183	.038	.137	1766.	44.43	.2762
			IODINE - 125				
TE-KX	27.202	7.588	.280	.132	86.62	5.154	2.120
TE-KX	27.473	7.308	.276	.132	89.12	5.253	2.086
TE-KX	30.996	5.165	.229	.135	125.8	6.604	1.689
TE-KX	31.700	4.811	.221	.136	134.1	6.905	1.625
			LEAD - 210				
GAMMA	47.	1.446	.115	.141	482.5	14.95	.8183
			THULIUM -170				
YB-KX	51.326	1.121	.099	.141	509.0	17.62	.7018
YB-KX	52.360	1.055	.096	.141	536.4	18.30	.6778
YB-KX	59.352	.7201	.077	.141	739.2	23.19	.5448
YB-KX	60.959	.6637	.073	.141	788.8	24.37	.5206
GAMMA	84.	.2490	.041	.137	1622.	41.73	.2996
			GADOLINIUM -153				
GAMMA	97.	.1604	.031	.135	2122.	50.80	.2319
GAMMA	103.	.1336	.028	.134	2347.	54.75	.2090
			COBALT - 57				
GAMMA	14.36	48.15	.477	.109	10.15	1.245	4.378
GAMMA	121.97	.0794	.020	.130	3015.	65.25	.1541
GAMMA	136.300	.0570	.016	.127	3462.	71.51	.1260

ZINC SULPHIDE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MN-KX	5.888	151.9	2.120	.060	4.496	1.419	35.57
MN-KX	5.899	151.1	2.125	.060	4.519	1.424	35.46
MN-KX	6.490	115.4	1.950	.065	5.902	1.715	30.21
			PLUTONIUM -238				
U-LX	13.439	73.22	.878	.100	9.341	1.318	8.780
U-LX	13.615	70.67	.863	.101	9.676	1.346	8.544
U-LX	16.420	42.06	.675	.109	16.17	1.831	6.174
U-LX	17.220	36.87	.634	.111	18.42	1.980	5.690
U-LX	20.167	23.60	.508	.118	28.60	2.582	4.323
			AMERICIUM -241				
NP-LX	13.760	68.05	.852	.102	9.958	1.369	8.391
NP-LX	13.944	66.19	.838	.102	10.32	1.399	8.200
NP-LX	16.840	39.25	.653	.110	17.32	1.907	5.916
NP-LX	17.750	33.87	.608	.113	20.03	2.082	5.390
NP-LX	20.785	21.66	.487	.119	31.12	2.718	4.101
GAMMA	59.5	.9752	.089	.137	576.9	18.83	.6516
			CADMIUM - 109				
AG-KX	21.990	18.43	.449	.121	36.46	2.996	3.717
AG-KX	22.163	18.02	.443	.121	37.28	3.035	3.667
AG-KX	24.942	12.82	.372	.125	52.02	3.729	2.983
AG-KX	25.456	12.09	.361	.125	55.10	3.865	2.879
GAMMA	87.7	.3025	.044	.133	1443.	36.99	.3315
			IODINE - 125				
TE-KX	27.202	9.973	.326	.127	86.47	4.349	2.566
TE-KX	27.473	9.688	.321	.128	88.37	4.427	2.528
TE-KX	30.996	6.808	.266	.130	96.20	5.506	2.046
TE-KX	31.700	6.373	.257	.131	102.5	5.737	1.961
			LEAD - 210				
GAMMA	47.	1.979	.135	.137	307.9	12.03	.9843
			THULIUM - 170				
YB-KX	51.326	1.528	.116	.137	398.9	14.23	.8467
YB-KX	52.360	1.432	.112	.137	412.3	14.79	.8140
YB-KX	59.352	.9825	.090	.137	573.2	18.76	.6544
YB-KX	60.959	.9066	.086	.137	613.9	19.70	.6246
GAMMA	84.	.3405	.048	.134	1316.	34.95	.3572
			GADOLINIUM -153				
GAMMA	97.	.2232	.037	.132	1770.	42.99	.2783
GAMMA	103.	.1862	.033	.131	1903.	46.71	.2508
			COBALT - 57				
GAMMA	14.36	61.06	.807	.103	11.18	1.448	7.796
GAMMA	121.97	.1120	.024	.127	2440.	57.34	.1876
GAMMA	136.300	.0802	.019	.124	3103.	64.07	.1548

BARIUM SULPHATE

SELECTED RADIOISOTOPES

	KEV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
MN-KX	5.888	338.5	4.881	.053	2.018	1.430	92.43
MN-KX	5.899	336.0	4.855	.053	2.028	1.435	92.16
MN-KX	6.490	261.6	4.531	.057	2.604	1.723	79.62
			PLUTONIUM -238				
U-LX	13.439	88.88	2.312	.089	7.593	2.438	25.98
U-LX	13.615	85.90	2.279	.090	7.853	2.608	25.36
U-LX	16.420	86.45	1.840	.097	8.023	2.192	18.96
U-LX	17.220	76.57	1.700	.097	9.071	2.293	17.56
U-LX	20.167	49.04	1.432	.105	13.70	3.030	13.64
			AMERICIUM -241				
NP-LX	13.760	83.53	2.253	.090	8.071	2.728	24.94
NP-LX	13.944	80.66	2.226	.091	8.354	2.785	24.43
NP-LX	16.840	79.10	1.787	.098	8.550	2.327	18.18
NP-LX	17.750	68.82	1.677	.100	9.018	2.517	16.76
NP-LX	20.785	45.26	1.378	.106	14.82	3.176	13.05
GAMMA	59.5	2.622	.294	.122	270.1	13.70	2.406
			CADMIUM - 109				
AG-KX	21.990	38.94	1.282	.107	17.18	3.443	11.96
AG-KX	22.163	38.14	1.269	.108	17.53	3.482	11.79
AG-KX	24.942	27.81	1.085	.111	23.89	4.122	9.780
AG-KX	25.456	26.33	1.055	.111	25.20	4.242	9.488
GAMMA	87.7	.8949	.152	.120	544.8	23.38	1.271
			IODINE - 125				
TE-KX	27.202	22.04	.963	.113	29.90	4.648	8.519
TE-KX	27.473	21.46	.951	.113	30.77	4.723	8.385
TE-KX	30.996	15.51	.802	.116	42.18	5.589	6.915
TE-KX	31.700	14.59	.777	.116	44.76	5.788	6.670
			LEAD - 210				
GAMMA	47.	5.008	.430	.122	124.6	9.915	3.533
			THULIUM -170				
YB-KX	51.326	3.935	.376	.122	156.4	11.18	3.082
YB-KX	52.360	3.726	.362	.122	164.6	11.49	2.966
YB-KX	59.352	2.640	.295	.122	226.6	13.65	2.415
YB-KX	60.959	2.453	.283	.122	242.5	14.18	2.312
GAMMA	84.	1.004	.164	.120	435.9	21.98	1.365
			GADOLINIUM -153				
GAMMA	97.	3.291	.127	.118	195.9	6.944	1.076
GAMMA	103.	2.823	.114	.117	226.8	7.591	.9744
			COBALT - 57				
GAMMA	14.36	74.65	2.148	.092	9.014	2.913	23.35
GAMMA	121.97	1.825	.084	.115	342.4	9.861	.7361
GAMMA	136.300	1.366	.069	.112	448.0	11.69	.6119

ZIRCONIUM OXIDE

SELECTED RADIOISOTOPES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
Mn-K	5.880	240.2	2.715	.050	2.052	1.101	44.16
Mn-K	5.899	230.9	2.711	.050	2.087	1.105	44.05
Mn-K	6.490	104.0	2.507	.063	3.710	1.377	39.53
			PLUTONIUM - 239				
U-L	13.030	23.90	1.194	.090	27.51	5.127	12.70
U-L	13.615	23.02	1.176	.090	28.52	5.203	11.94
U-L	16.420	13.38	.933	.104	48.06	7.246	8.783
U-L	17.220	11.64	.870	.100	54.76	7.794	8.129
U-L	20.167	51.79	.713	.114	13.29	1.494	6.240
			AMERICIUM - 241				
Np-L	13.760	22.33	1.161	.099	20.37	5.339	11.76
Np-L	13.946	21.49	1.143	.099	30.48	5.462	11.48
Np-L	16.860	12.65	.906	.107	51.07	7.510	8.433
Np-L	17.750	10.68	.865	.109	59.56	8.198	7.733
Np-L	20.785	47.53	.685	.115	10.34	1.494	5.961
Gamma	59.5	2.603	.135	.131	261.5	9.279	1.027
			CADMIUM - 109				
Ag-K	21.990	41.16	.636	.117	10.53	1.704	5.436
Ag-K	22.163	48.36	.627	.117	10.86	1.799	5.361
Ag-K	24.942	29.67	.531	.120	22.05	2.164	4.607
Ag-K	25.454	28.12	.515	.121	24.14	2.212	4.260
Gamma	87.7	.8275	.060	.126	677.1	19.16	.5759
			IODINE - 125				
Te-K	27.202	23.54	.040	.123	28.67	2.440	3.816
Te-K	27.473	22.94	.041	.123	29.43	2.481	3.753
Te-K	30.994	16.57	.504	.126	40.56	2.991	3.270
Te-K	31.700	15.59	.575	.126	43.98	3.148	2.957
			LEAD - 210				
Gamma	47.	5.159	.260	.131	126.2	6.031	1.520
			THULIUM - 170				
Yb-K	51.324	6.082	.173	.131	160.9	7.066	1.310
Yb-K	52.360	3.778	.167	.131	170.0	7.320	1.276
Yb-K	59.352	2.622	.135	.131	239.6	9.232	1.032
Yb-K	60.959	2.629	.129	.131	250.4	9.703	.9047
Gamma	84.	.9406	.076	.128	600.5	17.44	.5763
			GADOLINIUM - 153				
Gamma	97.	.6129	.057	.126	870.7	23.40	.4903
Gamma	103.	.5125	.051	.125	1006.	25.57	.4049
			COBALT - 57				
Gamma	14.36	19.75	1.103	.101	33.07	5.742	10.95
Gamma	121.97	.5096	.037	.122	1679.	33.91	.3059
Gamma	136.3	.2275	.030	.119	1866.	46.16	.2530

LEAD SULPHIDE

SELECTED RADIOISOTOPES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
Mn-K	5.880	370.6	1.544	.077	1.062	.4767	26.16
Mn-K	5.899	372.4	1.541	.077	1.051	.5322	20.60
Mn-K	6.490	287.8	1.411	.082	2.394	.5159	17.30
			PLUTONIUM - 239				
U-L	13.030	36.04	.425	.117	10.36	1.467	5.336
U-L	13.615	35.50	.416	.118	10.08	2.416	5.224
U-L	16.420	20.51	.379	.125	32.01	2.099	3.816
U-L	17.220	17.04	.340	.127	37.04	3.126	3.523
U-L	20.167	11.16	.350	.135	49.04	4.217	2.697
			AMERICIUM - 241				
Np-L	13.760	34.56	.404	.118	10.67	2.056	5.129
Np-L	13.946	33.10	.595	.119	20.44	2.106	5.017
Np-L	16.860	19.47	.463	.126	30.23	2.995	3.636
Np-L	17.750	16.32	.430	.128	41.05	3.340	3.360
Np-L	20.785	10.26	.343	.135	40.09	4.440	2.562
Gamma	59.5	.9151	.062	.134	1167.	33.04	.0161
			CADMIUM - 109				
Ag-K	21.990	8.620	.516	.136	76.48	4.480	2.320
Ag-K	22.163	8.020	.512	.136	78.15	4.056	2.207
Ag-K	24.942	5.002	.282	.140	104.0	4.362	1.677
Ag-K	25.454	5.550	.254	.140	110.4	6.621	1.013
Gamma	87.7	.1240	.034	.146	2307.	40.00	.2116
			IODINE - 125				
Te-K	27.202	6.562	.220	.142	101.0	7.562	1.618
Te-K	27.473	6.408	.220	.142	105.1	7.401	1.590
Te-K	30.994	3.057	.104	.146	206.3	9.703	1.292
Te-K	31.700	2.855	.104	.145	217.9	10.20	1.243
			LEAD - 210				
Gamma	47.	.4940	.043	.149	630.4	22.05	.0278
			THULIUM - 170				
Yb-K	51.324	.6530	.080	.149	794.9	25.40	.5306
Yb-K	52.360	.6169	.078	.149	823.3	26.92	.5201
Yb-K	59.352	.0183	.062	.149	1101.	33.54	.0179
Yb-K	60.959	.5053	.059	.148	1104.	39.02	.3900
Gamma	84.	.1630	.038	.145	2155.	55.27	.2270
			GADOLINIUM - 153				
Gamma	97.	.5925	.025	.142	2048.	64.30	.1770
Gamma	103.	.0770	.022	.141	2006.	67.95	.1540
			COBALT - 57				
Gamma	14.36	30.44	.573	.128	22.24	2.224	6.777
Gamma	121.97	.0459	.016	.137	3607.	76.09	.1191
Gamma	136.36	.0320	.013	.133	3644.	81.73	.0942

LITHIUM TETRABORATE

SELECTED RADIOISOTOPES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
Mn-K	5.880	20.02	.019	.096	33.76	2.546	4.389
Mn-K	5.899	19.40	.018	.096	33.46	2.517	.375
Mn-K	6.490	16.76	.377	.102	45.51	3.163	3.463
			PLUTONIUM - 239				
U-L	13.030	1.033	.190	.105	441.1	17.02	1.032
U-L	13.615	1.376	.107	.105	415.8	17.52	1.016
U-L	16.420	.7053	.112	.143	26.23	.730	
U-L	17.220	.6598	.104	.155	771.6	28.06	.4730
U-L	20.167	.3010	.002	.164	1113.	30.02	.5102
			AMERICIUM - 241				
Np-L	13.760	1.320	.105	.164	420.2	17.04	.9910
Np-L	13.946	1.271	.102	.164	446.3	18.04	.9401
Np-L	16.860	.6070	.104	.154	730.1	27.50	.7002
Np-L	17.750	.5707	.104	.154	830.7	30.40	.6507
Np-L	20.785	.3651	.078	.160	1187.	44.04	.4006
Gamma	59.5	.0109	.013	.150	3007.	93.99	.0033
			CADMIUM - 109				
Ag-K	21.990	.2000	.072	.162	1332.	44.00	.0037
Ag-K	22.163	.2795	.071	.162	1342.	45.46	.0370
Ag-K	24.942	.1090	.050	.164	1400.	46.42	.3502
Ag-K	25.454	.1773	.057	.164	1739.	48.38	.3446
Gamma	87.7	.0031	.008	.164	4456.	98.04	.0037
			IODINE - 125				
Te-K	27.202	.1406	.051	.163	1938.	44.24	.3492
Te-K	27.473	.1300	.050	.164	1961.	44.95	.3441
Te-K	30.994	.0080	.041	.164	2311.	44.05	.2400
Te-K	31.700	.0060	.040	.164	2375.	70.40	.2300
			LEAD - 210				
Gamma	47.	.023	.020	.163	3343.	88.56	.123
			THULIUM - 170				
Yb-K	51.324	.0177	.017	.161	3838.	90.97	.1045
Yb-K	52.360	.0166	.017	.161	3571.	91.40	.1030
Yb-K	59.352	.0110	.013	.158	3802.	93.95	.003
Yb-K	60.959	.0101	.013	.157	3856.	94.38	.0000
Gamma	84.	.0036	.007	.148	4383.	97.70	.0070
			GADOLINIUM - 153				
Gamma	97.	.0022	.005	.163	4620.	98.50	.0370
Gamma	103.	.0019	.005	.164	4720.	98.73	.0335
			COBALT - 57				
Gamma	14.36	1.195	.136	.168	481.4	19.71	.9211
Gamma	121.97	.0011	.003	.136	5012.	99.21	.0253
Gamma	136.3	.0008	.003	.129	5213.	99.42	.0211

SODIUM TETRABORATE

SELECTED RADIOISOTOPES

	REV	PHOTO	COHER	INCOH	R-1/2	SC/TOT	COH/INC
			IRON - 55				
Mn-K	5.880	34.06	.532	.091	19.00	1.795	5.080
Mn-K	5.899	33.07	.531	.091	20.09	2.517	5.064
Mn-K	6.490	25.24	.400	.097	24.02	2.231	4.032
			PLUTONIUM - 239				
U-L	13.030	2.152	.194	.164	234.5	11.55	1.309
U-L	13.615	2.046	.191	.164	240.0	11.44	1.354
U-L	16.420	1.340	.164	.154	423.7	18.01	.9824
U-L	17.220	1.151	.130	.154	441.6	18.45	.9081
U-L	20.167	.6003	.100	.154	724.9	27.44	.6900
			AMERICIUM - 241				
Np-L	13.760	2.377	.180	.161	236.0	12.10	1.336
Np-L	13.946	2.273	.105	.162	244.0	12.95	1.303
Np-L	16.860	1.237	.161	.154	451.5	19.04	.9015
Np-L	17.750	1.046	.134	.152	522.7	21.25	.8400
Np-L	20.785	.6249	.103	.157	703.1	29.20	.6900
Gamma	59.5	.0203	.017	.157	3495.	89.40	.1105
			CADMIUM - 109				
Ag-K	21.990	.5211	.006	.150	404.5	32.00	.5957
Ag-K	22.163	.5005	.003	.160	413.0	33.07	.5070
Ag-K	24.942	.3060	.077	.161	1107.	46.76	.4800
Ag-K	25.454	.3235	.075	.161	1239.	42.13	.4460
Gamma	87.7	.0030	.006	.164	4316.	96.35	.0070
			IODINE - 125				
Te-K	27.202	.2000	.067	.162	1015.	44.77	.1015
Te-K	27.473	.2523	.006	.162	1002.	47.45	.0075
Te-K	30.994	.1702	.056	.163	1700.	54.40	.3320
Te-K	31.700	.1501	.052	.163	1855.	57.67	.3190
			LEAD - 210				
Gamma	47.	.0037	.027	.162	2970.	81.15	.1003
			THULIUM - 170				
Yb-K	51.324	.0320	.025	.164	3213.	86.79	.1017
Yb-K	52.360	.0307	.022	.160	3262.	86.51	.157
Yb-K	59.352	.0200	.017	.157	3556.	89.93	.1110
Yb-K	60.959	.0107	.017	.157	3607.	90.20	.1001
Gamma	84.	.0004	.009	.148	4235.	95.93	.0021
			GADOLINIUM - 153				
Gamma	97.	.0002	.007	.163	4495.	97.28	.0000
Gamma	103.	.0009	.006	.161	4463.	97.70	.0002
			COBALT - 57				
Gamma	14.36	2.040	.177	.163	290.7	13.40	1.230
Gamma	121.97	.0024	.006	.135	4909.	98.54	.0536
Gamma	136.3	.0010	.006	.134	5116.	98.94	.0270

Fig. 1. X-ray interaction data for andesite (USGS-AGV-1) and basalt (USGS-BCR-1) plotted vs. X-ray energy. Curve 1 is the photoelectric absorption coefficient τ, 2 the coherent scattering coefficient σ_{coh}, 3 the incoherent scattering coefficient σ_{incoh}, 4 the half-range $R_{1/2}$, 5 the ratio of scattering to total attenuation coefficient, and 6 the ratio of coherent to incoherent scattering. The dimensions of the ordinates of the different plots are given on the left-hand side of the figure.
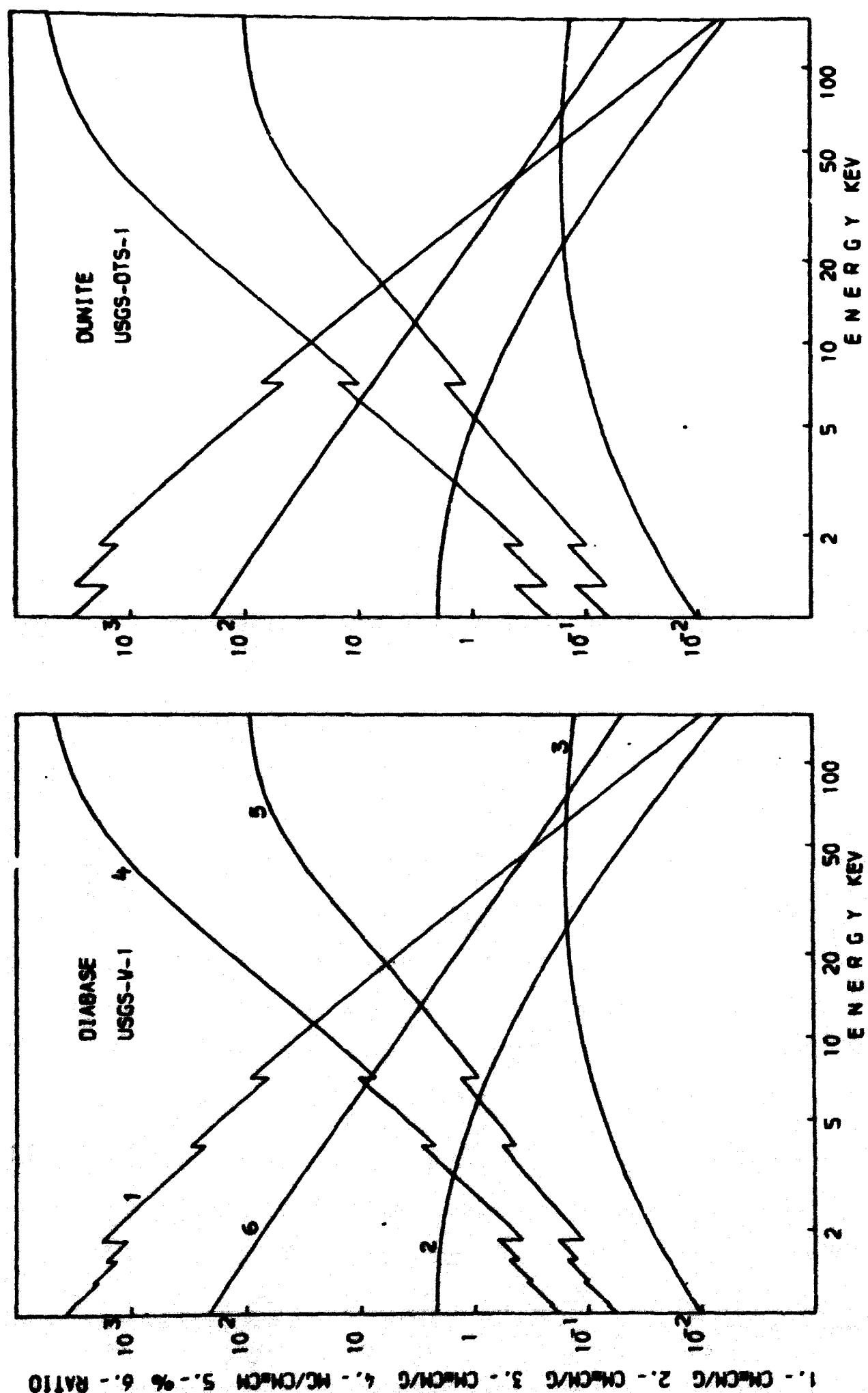
Fig. 2. X-ray interaction data for diabase (USGS-W-1) and dunite (USGS-DTS-1) plotted vs. X-ray energy. For explanations of numbers and dimensions see fig. 1.
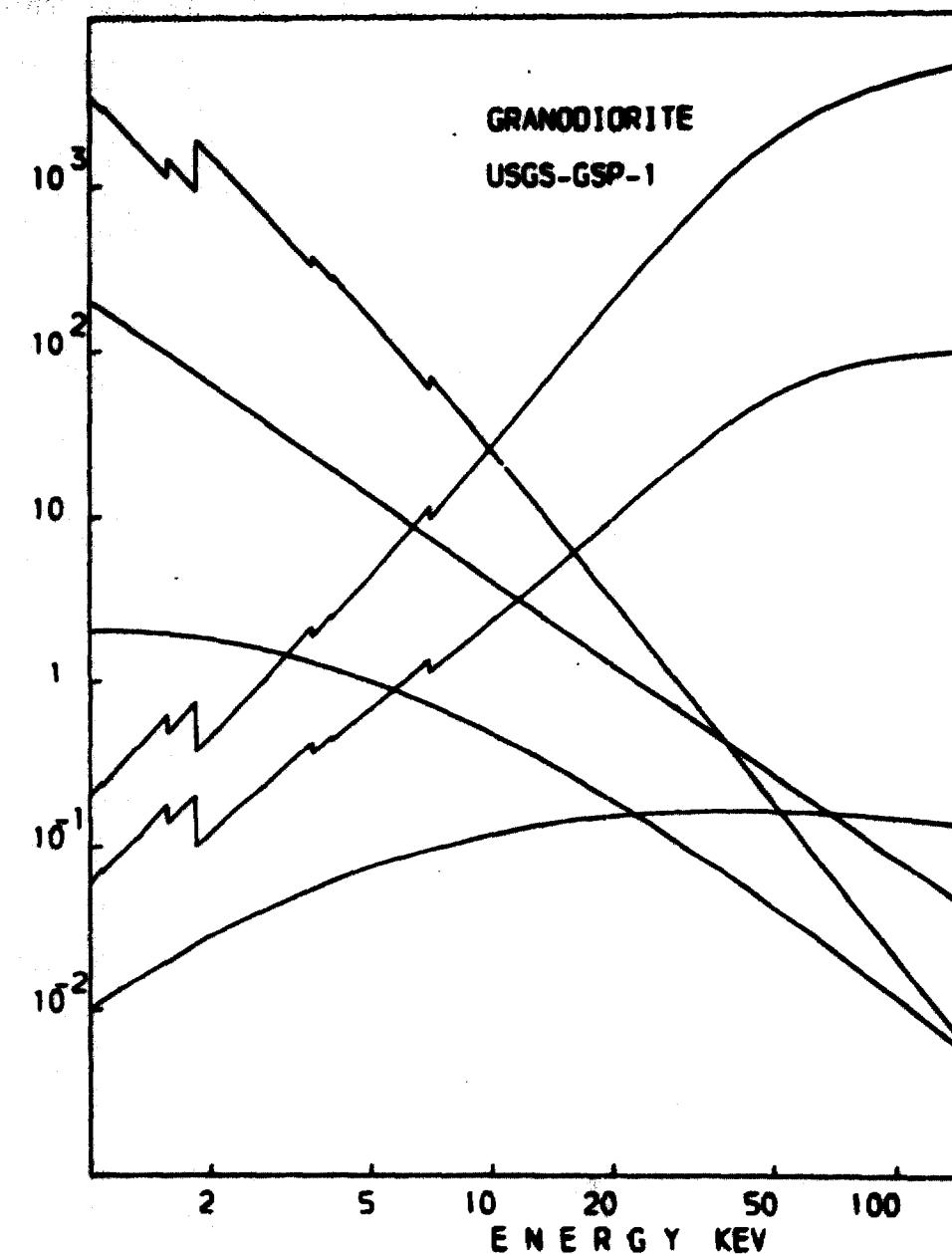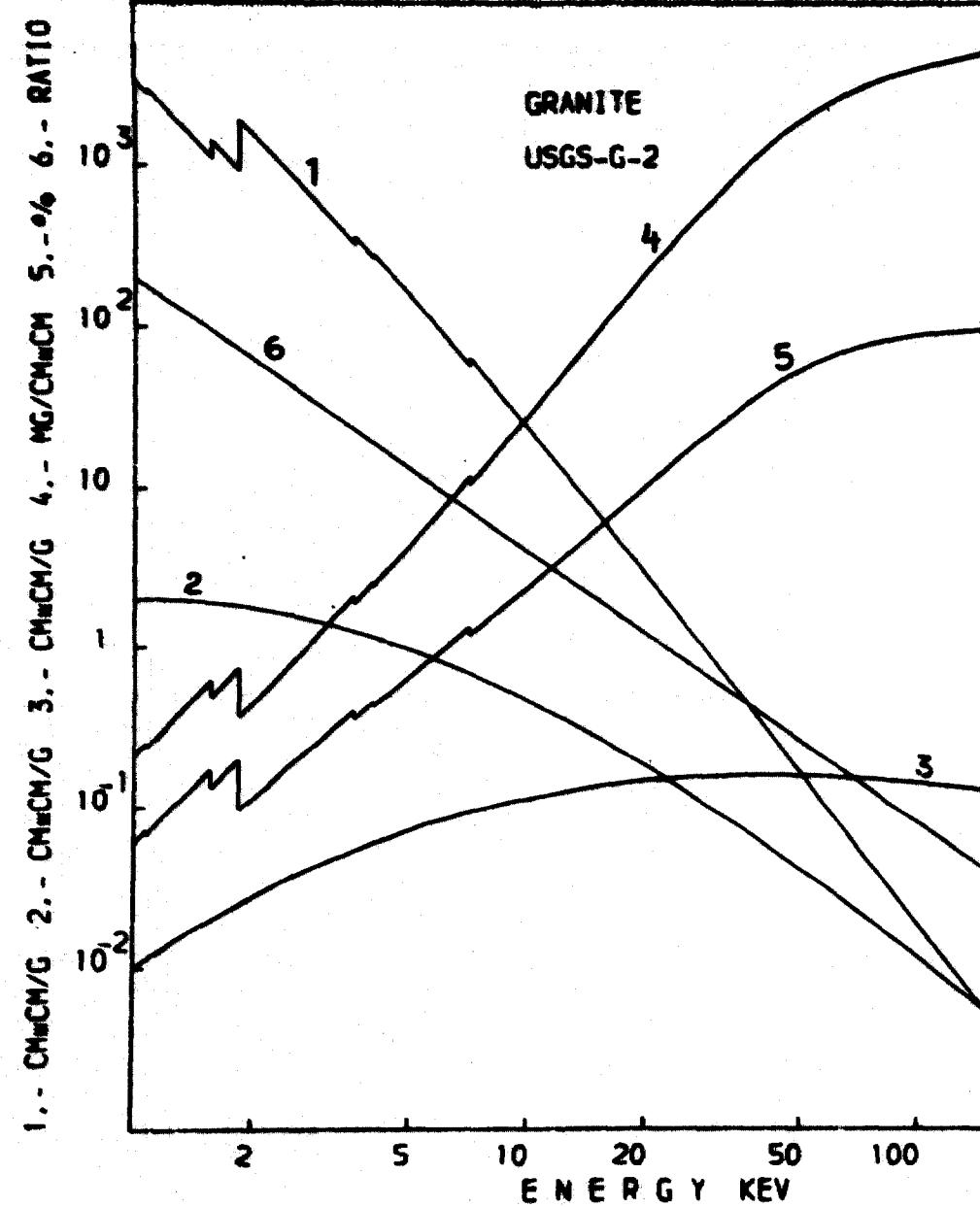
Fig. 3. X-ray interaction data for granite (USGS-G-2) and granodiorite
(USGS-GSP-1) plotted vs. X-ray energy. For explanations of numbers
and dimensions see fig. 1.
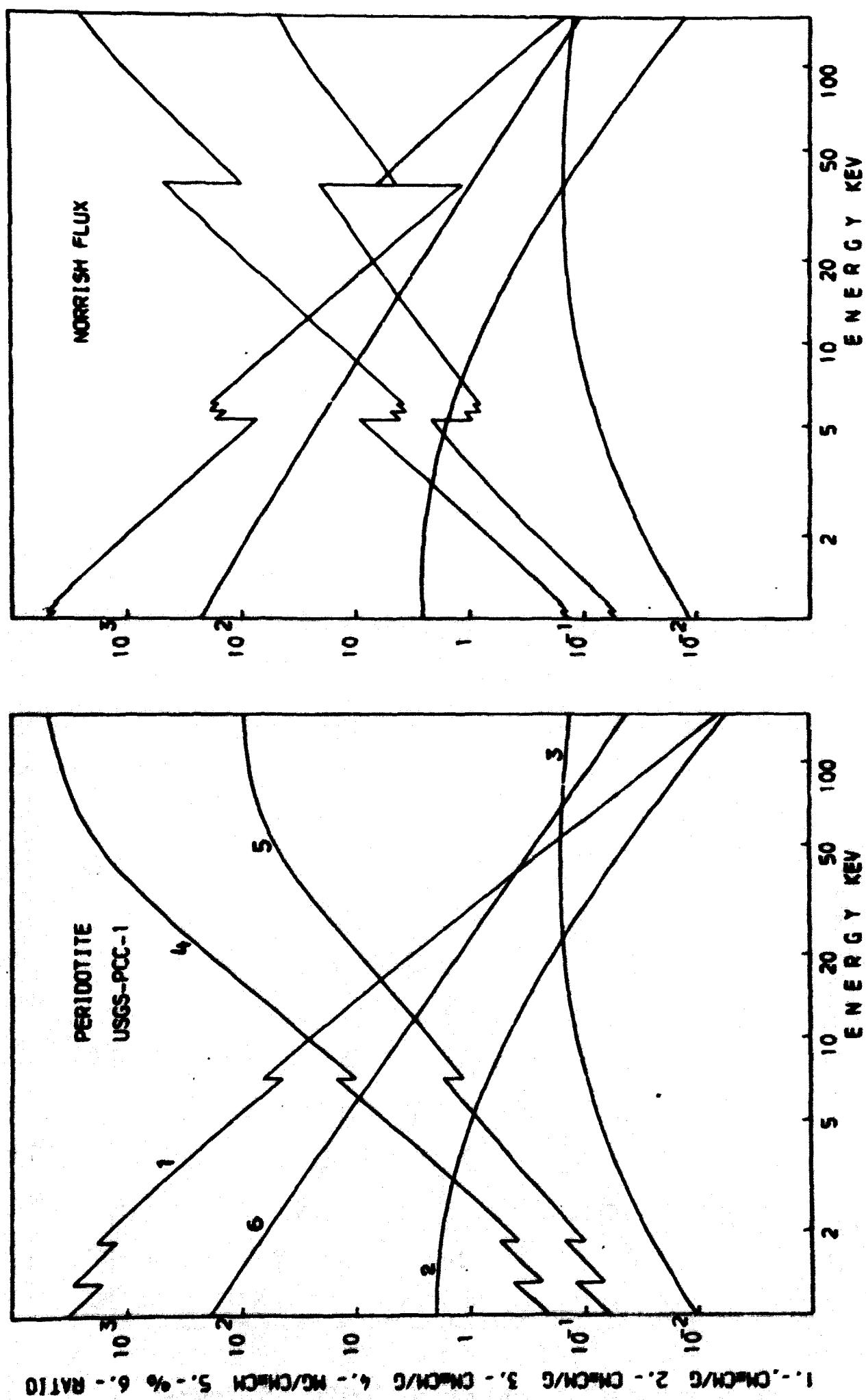
Fig. 4. X-ray interaction data for peridotite (USGS-PCC-1) and Norrish flux plotted vs. X-ray energy. For explanations of numbers and dimensions see fig. 1.
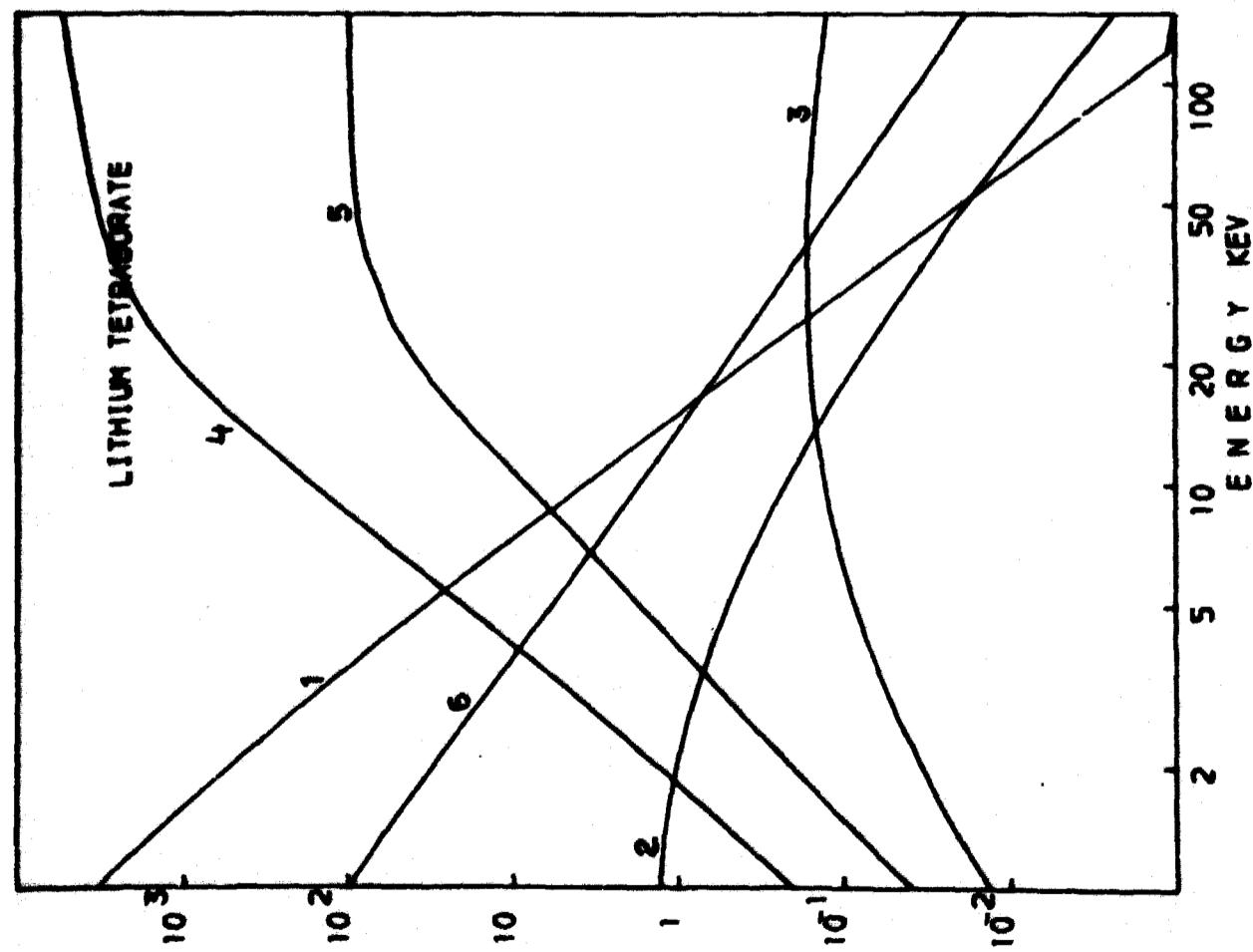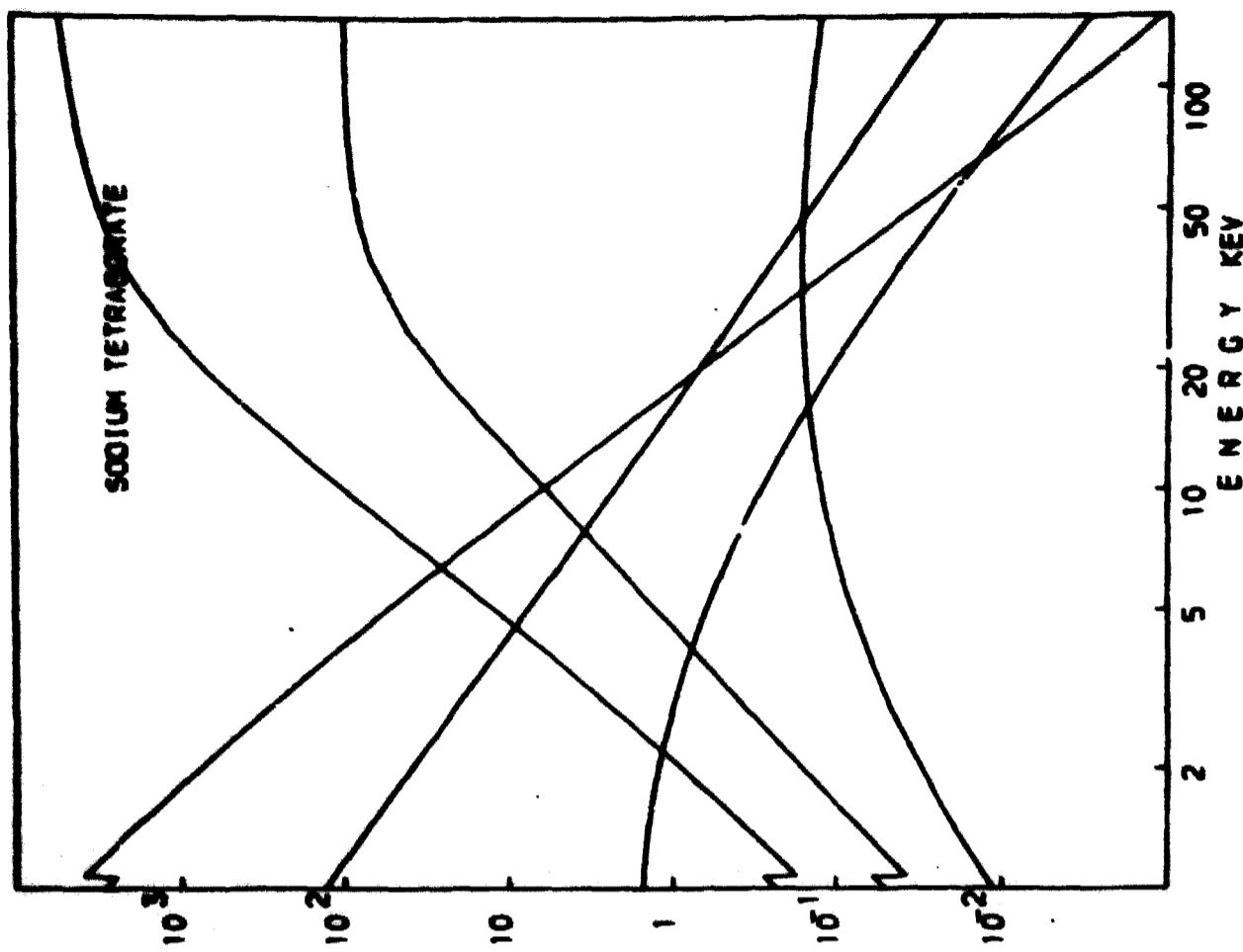
Fig. 5. X-ray interaction data for $Li_2B_4O_7$ and $Na_2B_4O_7$ plotted vs. X-ray energy. For explanations of numbers and dimensions see fig. 1.

1.- CM.CM/G   2.- CM.CM/G   3.- CM.CM/G   4.- MG/CM.CM   5.- % 6.- RATIO
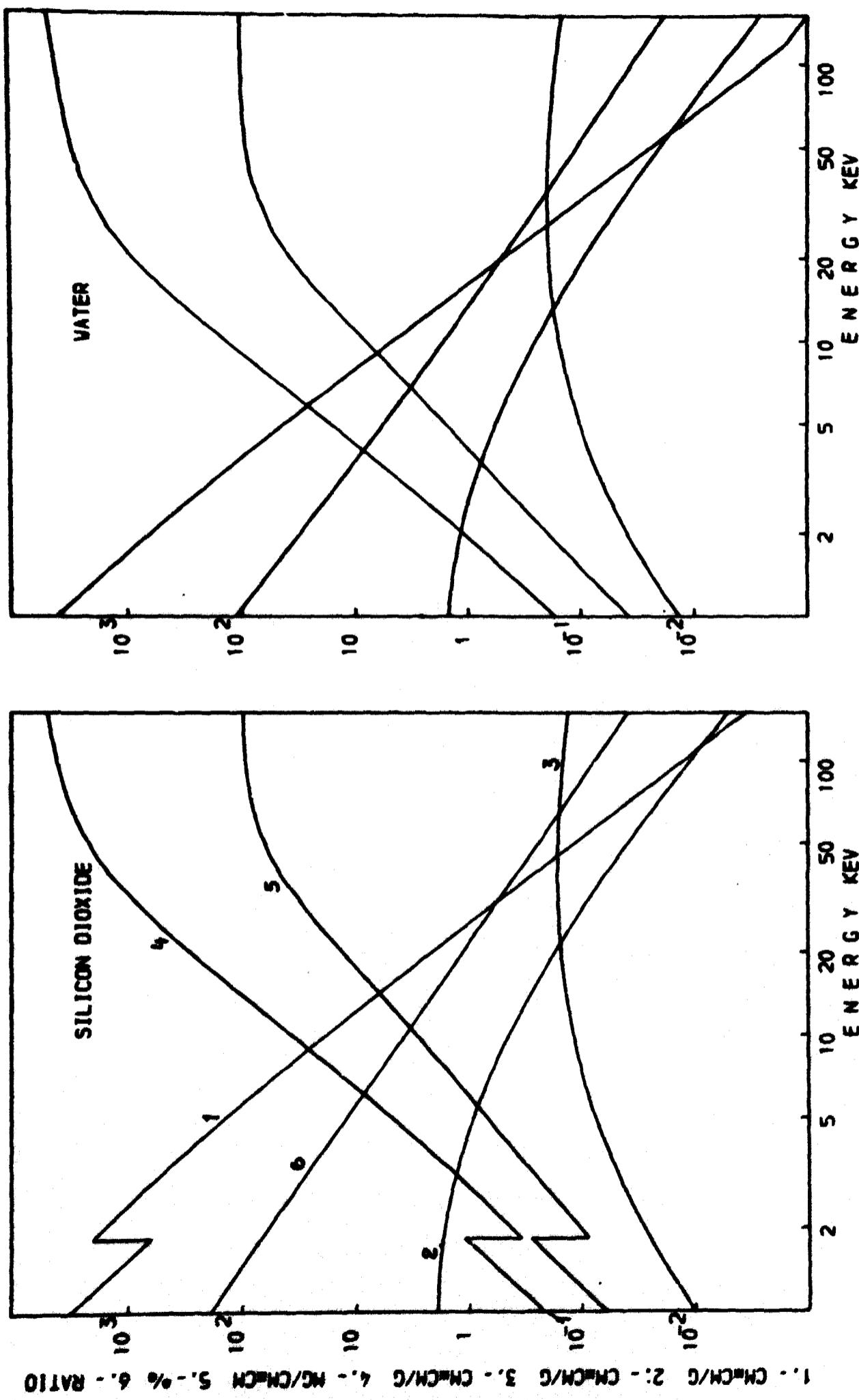
Fig. 6. X-ray interaction data for SiO_2 and water plotted vs. X-ray energy. For explanations of numbers and dimensions see fig. 1.