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Validation of physical parameters in quantitative electron probe microanalysis (EPMA) Part I–mass attenuation coefficients

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ABSTRACT

Mass attenuation coefficients (m.a.c.s) are important factors of accuracy in quantitative electron probe microanalysis (EPMA). To improve accuracy of quantitative EPMA, new mass attenuation coefficients are calculated from the latest version of two databases of atomic scattering factors and m.a.c.s for Z = 1 – 92.
Keywords. electron probe microanalysis, mass attenuation coefficients, matrix correction

INTRODUCTION

Quantitative electron probe microanalysis (EPMA) is widely used in a variety of fields of earth and planetary sciences. It provides information on the chemical compositions of rock-forming minerals and glasses in microvolumes. Accuracy of this non-destructive chemical analysis depends upon the chosen model for the depth distribution function and incorporated physical parameters. Some of physical parameters still have non-negligible uncertainty. The one of them is mass attenuation coefficients (m.a.c.s), which is defined by the following equation:

$$I/I_0 = \exp(-\mu\rho x) \tag{1}$$

where I_0 and I are incident and transmitted intensities of a narrow beam, x is the pass length, μ is m.a.c., and ρ is the density of material, respectively.

Uncertainty of m.a.c.s affects both absorption and fluorescence terms in the matrix correction of quantitative EPMA. The classical absorption correction factor is described by the following equation:

$$F_A = \frac{\int_0^\infty \varphi(\rho z)\exp(-\chi\rho z)d(\rho z)}{\int_0^\infty \varphi(\rho z)d(\rho z)} \tag{2}$$

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where $\varphi(\rho z)$ is the depth distribution fuction, and $\chi = \mu\mathrm{cosec}\psi$ (ψ is the X-ray take-off angle), respectively. The model by Reed (1969 and 1990) is widely used in the fluorescence correction of characteristic excitation, which is described as:

$$F_F = 1 + \frac{I_f}{I_A} \tag{3}$$

$$\frac{I_f}{I_A} = 0.5 C_B \left(\frac{\mu_B^A}{\mu_B}\right)\left(\frac{r_A - 1}{r_A}\right)\omega_B\left(\frac{Aw_A}{Aw_B}\right) \times \left(\frac{U_B \log_e U_B - U_B + 1}{U_A \log_e U_A - U_A + 1}\right) \times \left[\frac{\log_e (u + 1)}{u} + \frac{\log_e (\nu + 1)}{\nu}\right] \tag{4}$$

$$u = \mu_A \mathrm{cosec}\psi/\mu_B \tag{5}$$

$$\nu = \sigma/\mu_B \tag{6}$$

where

C_B : the mass concentration of element B

μ_B^A , μ_B : m.a.c.s of pure A and sample for the radiation of the element B, respectively

μ_A : m.a.c. of sample for the radiation of the element A

r_A : the absorption edge jump ratio

ω_B : the fluorescence yield

Aw_A , Aw_B : atomic weights of elements A and B, respectively

U_A , U_B : overvoltage ratios of elements A and B, respectively

σ : Lenard coefficient.

A variety of m.a.c.s and their approximations have been published. From 1990s, compilations of experimental and theoretical works covering all elements from H through U became available (Henke *et al.*, 1993 and Hubbell and Seltzer, 1995), in addition to the old experimental and empirical values of m.a.c.s. (e.g., Henke and Ebisu, 1974 and Pouchou and Pichoir, 1991). Furthermore, simple approximations by Heinrich (1987), MAC30, and Heirnch (1967), MAC26 are still used in commercial products. Updated versions of Henke *et al.* (1993) and Hubbell and Seltzer (1995) are available online from

http://henke.lbl.gov/optical_constants/asf.html

and

http://www.nist.gov/pml/data/xraycoef/index.cfm, respectively,

respectively.

This paper validates the latest databases by Henke *et al.* (1993) and Hubbell and Seltzer (1995), and proposes new combined m.a.c.s, together with those databases to minimize inconsistency (see below) in those databases.

VALIDATION OF MASS ATTENUATION COEFFICIENTS

Henke *et al.* (1993) gives atomic scattering factors for Z = 1 – 92 at E = 0.05 – 30 keV. From the atomic scattering factor (f), the mass attenuation (μ) coefficient is obtained using the following equation:

$$\mu = 2r_e \lambda N_A f/Aw \qquad (7)$$

where r_e is the classical electron radius, λ is the wavelength of X-ray, N_A is Avogadro constant, and A_w is the atomic weight, respectively. Hubbell and Seltzer (1995) provides m.a.c.s for Z = 1 – 92 at E = 1 keV – 20 MeV. That is, this databse does not give m.a.c.s at E < 1 keV. Both databases provide similar m.a.c.s to each other at E = 1 – 30 keV, but there are non-negligible differences in certain conditions.

(Problems in Henke *et al.*, 1993)

Absorption edges of L- and M-shell in soft X-ray region are unclear in this database (Fig. 1). Furthermore, obtained m.a.c.s of U shows spurious discontinuity around E = 9 keV (Fig. 2). It is not due to an absorption edge and seems that a wrong data is introduced.

(Problems in Hubbell and Seltzer, 1995)

In the log(E) – log(μ) space, m.a.c.s of light elements do not show a straight line (Fig. 3). At high-energy sides of Cr K-edge, Ru LII-edge, and Po MV-edge, m.a.c.s

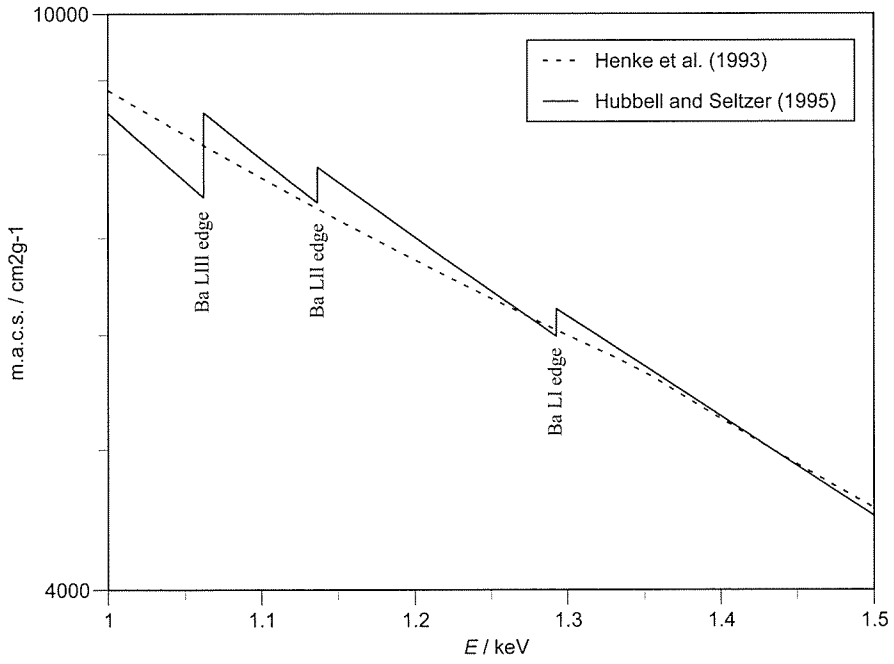

Fig. 1: Mass attenuation coefficients of Ba around Ba L edges.

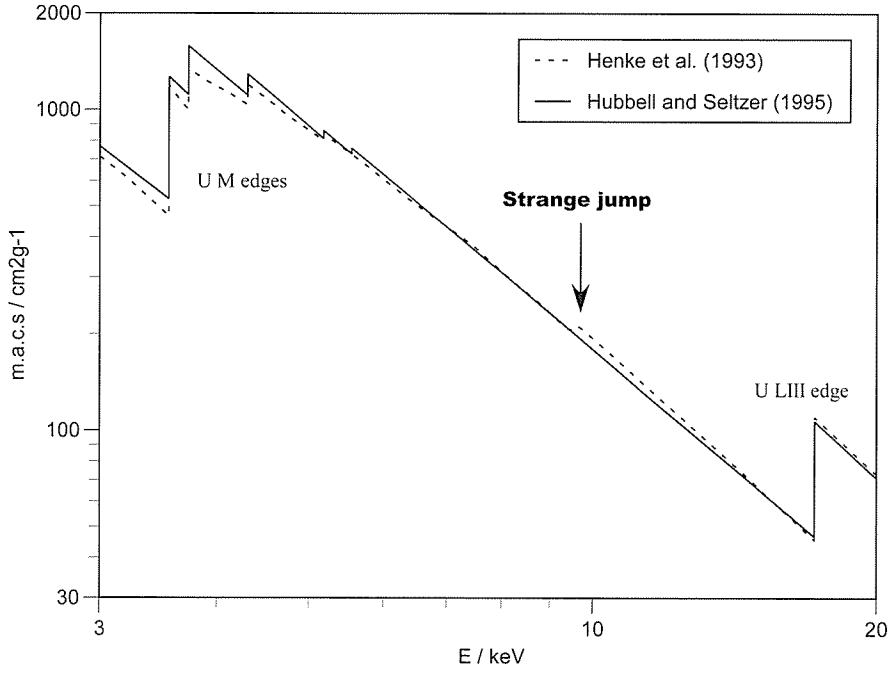

Fig. 2: Mass attenuation coefficients of U.

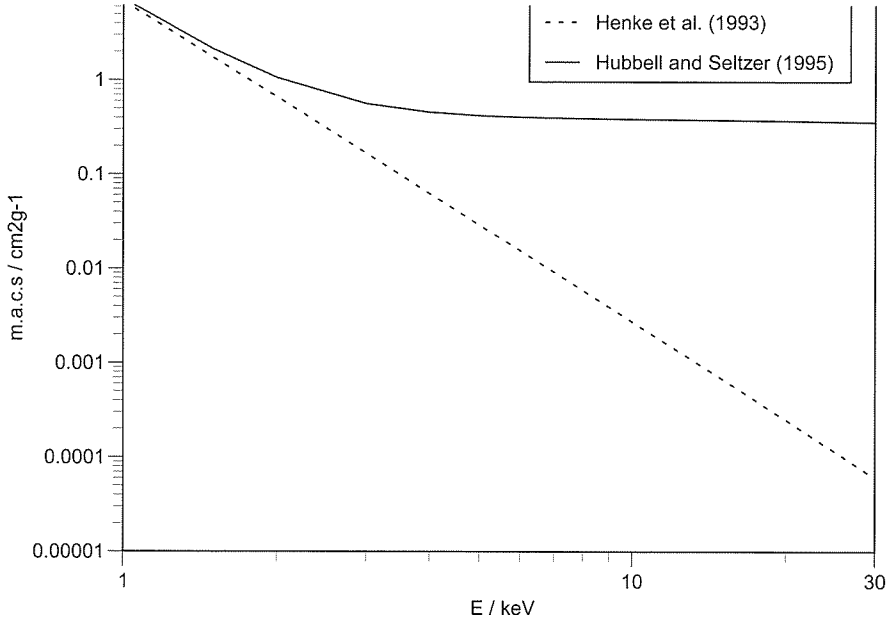

Fig. 3: Mass attenuation coefficients of H.

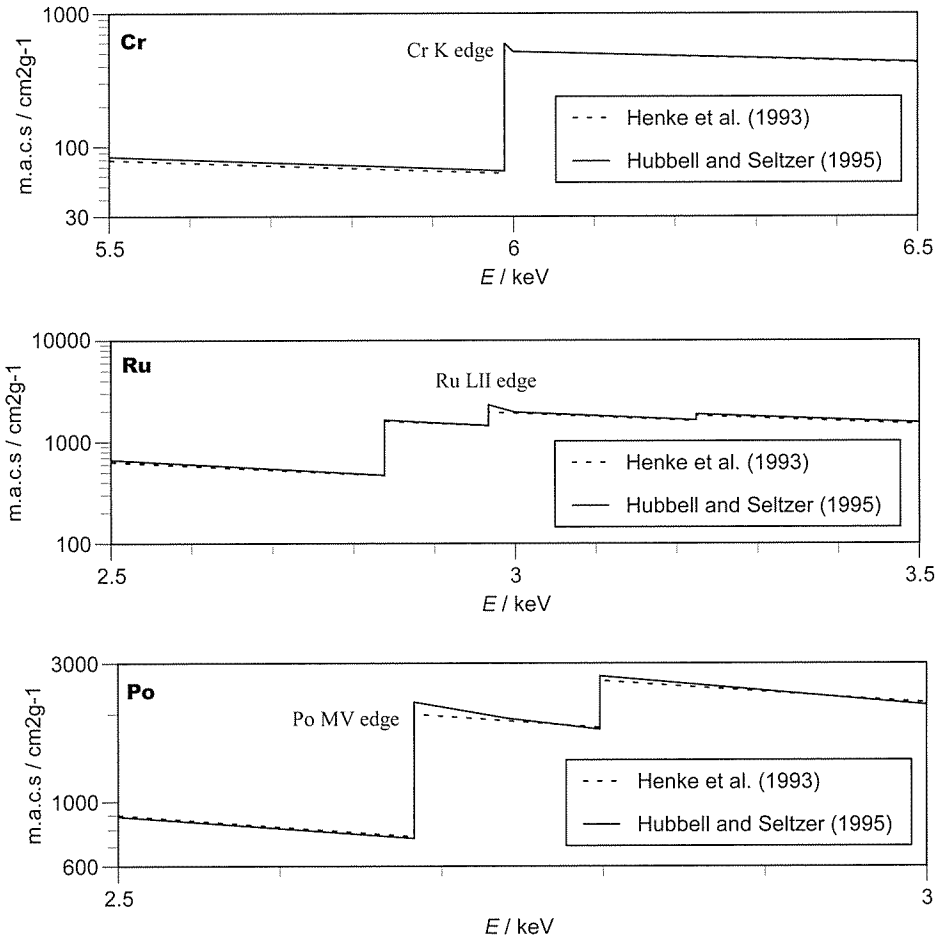

Fig. 4: Mass attenuation coefficients of Cr, Ru and Po.

of this database seem to be higher, and unnatural increases are observed (Fig. 4). In addition, the shape around M-shell edges for Z = 57 – 83 is not sharp (Fig. 5). These problems are considered to be caused by miss-interpolation process around absorption edges.

CALCULATION OF NEW MASS ATTENUATION COEFFICIENTS

From the latest version of data sets (accessed on 27 July 2013), m.a.c.s for Z = 1 – 92 were interpolated using the two data sets. Chosen models are as follows:

E < 1 keV or Z < 11 (Henke *et al.*, 1993), high-energy sides of Cr-K, Ru-LII and Po-MV edges (Henke *et al.*, 1993), between MV edge and MI edge for Z = 57 – 82 (Henke *et al.*, 1993), and others (Hubbell and Seltzer, 1995)

Calculated m.a.c.s for Kα, Kβ, Lα, Lβ, Mα, and Mβ lines of representative elements

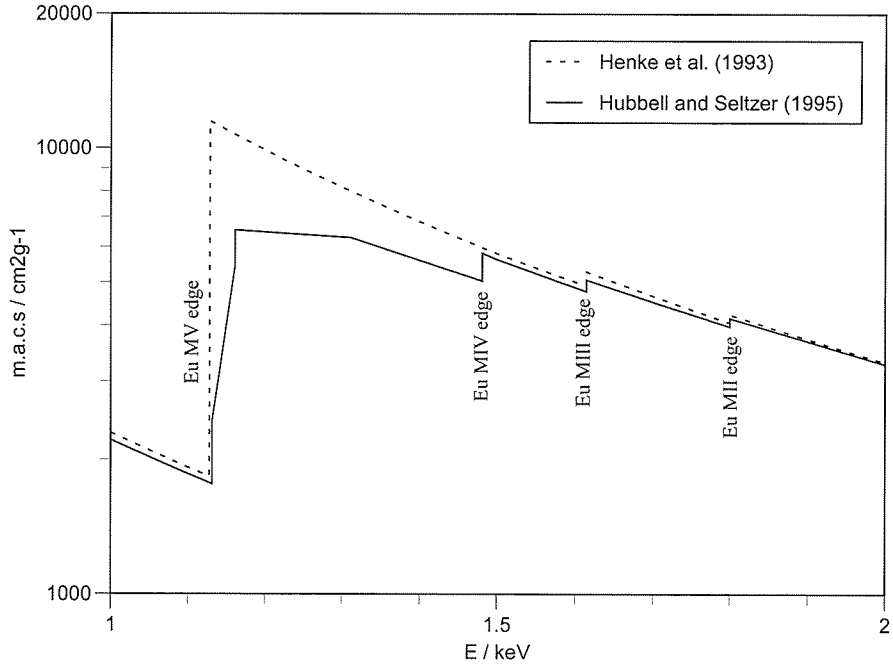

Fig. 5: Mass attenuation coefficients of Eu.

are listed in Table 1 – 6, respectively.

COMPARISON OF M.A.C.S

To understand the effect of m.a.c.s in quantitative EPMA, matrix corrections were performed using different sets of m.a.c.s for the same X-ray intensities of standards and the sample. Three matrix correction models, conventional ZAF, surface-center Gaussian by Armstrong (1991) and PAP (Pouchou and Pichori, 1984 and 1991) are also compared. Details of chosen models are listed in Table 7. Table 8 shows the result of matrix corrections of pyroxene using a variety of m.a.c.s. In all $\varphi(\rho z)$ models, the approximation by Heinrich (1966) gives significantly higher total value than 100%, while m.a.c.s by this study, Hubble and Seltzer (1995) and Henke *et al.* (1993) give about 100 % of the total (except for the conventional ZAF model). This problem results from the overestimation of the Mg concentration, which is caused by the overestimation of the absorption edge jump ratio in the approximation (c.f. Riveros and Castellano, 1993 and Kato, 2005). The approximation by Heinrich (1987) also gives higher total value than m.a.c.s by this study, but is better than his old approximation.

Table 1: Mass attenuation coefficients for Kα lines.

	Emitter							
Absorber	Be	B	C	N	O	F	Ne	Na
H	8866.9	1720.1	458.5	148.5	57.2	24.8	11.7	6.4
He	51656.7	11522.1	3324.9	1140.9	455.2	201.3	98.5	53.6
Li	112405.5	31484.3	10264.8	3808.2	1602.1	736.9	370.2	206.9
Be	6790.5	56030.9	22064.6	8862.8	3922.6	1882.1	974.0	536.6
B	11195.8	3343.1	36871.1	15817.5	7411.5	3684.9	1965.1	1094.9
C	20404.1	6395.5	1953.5	25010.6	12112.4	6376.0	3488.5	1976.1
N	36223.4	10887.5	3754.3	1321.3	17330.0	9218.3	5114.1	2968.6
O	56563.1	18437.2	6020.8	2525.0	1199.6	12411.6	7026.1	4127.9
F	73286.3	23306.3	8718.4	3604.3	1570.4	727.9	8484.2	5098.9
Ne	105749.6	35362.1	13512.5	5604.6	2581.3	1303.5	721.8	6705.0
Na	117897.5	45362.6	17824.6	7452.8	3522.1	1826.5	993.0	588.4
Mg	128765.3	60746.3	26024.7	11252.5	5271.3	2651.7	1416.9	830.2
Al	112306.7	77166.8	31784.4	13557.4	6714.3	3413.5	1864.9	1066.3
Si	67937.1	76837.5	37600.6	17979.6	8825.7	4561.9	2551.5	1413.4
P	7695.0	66794.8	41104.2	20548.1	10534.1	5536.4	3069.0	1722.8
S	12764.4	74077.2	47598.7	24895.5	13009.4	7017.9	3921.8	2188.2
Cl	16131.5	7536.6	50430.1	27571.2	14119.5	7594.6	4297.6	2552.4
Ar	18408.4	8794.4	56120.8	29621.1	16131.8	8936.1	5114.8	2871.3
K	21090.2	11360.3	5721.2	35189.6	19352.9	10702.5	5998.4	3661.9
Ca	22503.6	14369.0	6931.9	35617.7	22019.1	12388.4	7222.1	4395.3
Sc	26238.8	16488.7	8330.8	4291.4	24079.0	14399.8	8763.9	4733.7
Ti	25661.5	16768.6	8600.4	4358.0	22118.3	14549.9	8618.4	5307.4
V	33668.7	19840.0	10104.5	5064.5	24243.7	15773.0	9442.1	5879.1
Cr	41651.6	22411.5	11855.9	5851.4	3284.9	16317.6	11277.6	6708.6
Mn	35569.3	23447.4	12998.3	6512.6	3469.8	17570.7	11663.2	7341.5
Fe	54066.9	30994.8	16305.3	7870.4	4093.5	2332.1	13064.5	8253.1
Co	59296.9	30856.6	15506.3	8015.0	4407.1	2571.7	12755.1	8906.6
Ni	64910.2	39519.6	21272.3	10703.8	5637.2	3095.6	1812.2	10188.8
Cu	61873.0	42393.0	21343.1	11280.5	6230.1	3530.0	2150.1	9470.4
Zn	67746.4	47105.8	24611.1	13100.3	6653.2	3723.9	2255.4	6196.4
Ga	60641.5	43977.8	27137.1	14956.6	8223.7	4614.0	2468.9	1545.7
Ge	57127.0	49459.4	30866.2	16637.7	9044.0	4993.1	2850.5	1724.1
As	47069.2	43898.3	27794.1	15612.0	8799.6	5088.6	3090.0	1931.3
Se	39352.8	44540.3	30056.3	16984.8	9627.5	5593.1	3398.2	2110.2
Br	27870.1	42250.5	32372.1	18742.7	10703.2	6267.3	3812.4	2388.5
Kr	11308.8	36588.5	31809.7	20820.6	12287.0	7194.4	4398.6	2598.6
Rb	8905.9	36420.7	34027.9	21922.8	12808.8	7561.0	4643.6	2890.8
Sr	4846.7	28955.9	34927.7	23243.4	13749.5	8220.6	5061.7	3183.4
Y	4911.3	19239.3	30478.7	25529.5	14752.9	8928.0	5373.6	3521.3
Zr	5111.1	5546.1	28216.1	24847.8	17033.2	10364.3	6524.1	3837.6
Nb	4861.5	5470.1	24684.0	22251.2	16186.8	10537.2	6907.2	4194.0
Mo	5076.3	5256.3	20944.3	27021.6	19014.1	12111.3	7577.3	4507.2
Tc	4933.6	5666.4	12464.5	24363.0	18350.1	11974.7	7568.0	4886.1
Ru	6025.8	6024.3	4898.9	23866.1	18478.7	12465.0	7941.8	5217.8
Rh	8453.3	6328.1	5675.1	21103.7	19606.7	13935.2	8838.2	5631.5
Pd	13334.5	6324.6	6016.1	16445.7	19150.5	14625.3	9466.4	5970.1

Table 1: continued

	Emitter							
Absorber	Be	B	C	N	O	F	Ne	Na
Ag	20591.2	7280.0	6885.8	8606.3	19460.7	15086.6	10248.8	6430.6
Cd	31972.4	5406.0	6019.0	4401.1	19178.8	14500.8	10518.0	6718.7
In	40339.6	5064.0	7394.4	4978.9	17207.0	14825.8	10990.5	7142.1
Sn	56456.7	5190.6	7363.2	5019.8	13365.9	13188.4	11411.1	7466.0
Sb	50567.4	6852.0	6576.8	5007.3	3417.3	14707.4	11186.8	7860.2
Te	72928.7	5242.7	7745.3	5963.8	3926.5	15602.4	11419.3	8065.2
I	87349.8	4360.8	7329.7	6077.1	3974.7	17271.0	10357.9	8379.4
Xe	111742.3	4166.2	7579.7	6344.0	4399.0	18951.6	10847.8	8671.1
Cs	124677.8	3901.5	6510.8	6155.1	4438.0	3032.6	10931.4	8626.8
Ba	160887.7	3249.4	6807.1	6520.9	4798.0	3148.4	11210.7	7822.0
La	20577.3	4396.6	7284.4	6848.0	5290.5	3395.1	12259.3	8323.7
Ce	22615.5	8186.0	7855.5	7111.9	5256.9	3658.8	2186.7	8868.2
Pr	16782.2	11698.8	7260.6	7468.0	5504.0	3634.7	2266.3	9606.2
Nd	13470.2	17017.0	8713.7	7479.0	5707.6	4079.3	2693.8	8289.3
Pm	12748.1	23498.6	9793.4	8490.7	5955.1	4082.3	2810.0	7915.0
Sm	13963.9	26951.6	12193.3	9407.2	6298.0	4288.1	2950.4	1959.2
Eu	16053.2	27507.2	12338.3	9553.9	6621.1	4499.3	3097.1	2059.7
Gd	17197.3	25345.8	12393.8	9001.7	6572.1	4548.6	3137.2	2130.3
Tb	21866.9	28606.8	14776.4	10457.4	7413.6	5045.7	3412.3	2224.3
Dy	25924.3	30496.6	15694.3	11435.2	7855.0	5307.7	3592.7	2313.9
Ho	23923.6	28916.2	15913.9	11485.0	8371.3	5597.9	3780.1	2425.0
Er	25061.6	27844.0	17309.2	12410.0	8842.1	5956.2	4022.3	2547.1
Tm	26006.6	29834.1	17068.1	12508.1	9541.0	6389.4	4291.6	2683.8
Yb	28632.6	24848.0	18862.3	13737.8	9789.9	6688.8	4505.0	2789.1
Lu	23194.2	21875.7	17408.5	13847.5	10235.5	6903.3	4648.1	2945.8
Hf	23329.1	21793.4	18225.7	13198.9	9947.4	7229.9	4878.4	3082.4
Ta	20960.4	20815.4	18318.9	13425.4	10546.6	7591.1	5147.7	3243.9
W	16532.8	19411.9	18410.3	14174.3	10973.1	7931.2	5378.9	3403.8
Re	15599.5	17612.9	17403.1	14178.5	11250.5	8236.2	5597.7	3578.8
Os	13720.9	16693.3	17004.7	14104.3	11281.7	8398.3	5788.1	3726.8
Ir	12708.6	14664.8	17124.7	15029.3	11991.6	8652.6	6273.1	3922.4
Pt	14640.4	12676.4	16082.8	15159.0	11413.9	8899.6	6487.6	4098.6
Au	13819.9	8104.9	15094.7	14824.8	11998.2	9483.4	7117.0	4302.1
Hg	19363.3	7402.6	14356.8	15734.6	12418.2	9760.3	7182.1	4467.7
Tl	20224.2	5990.9	12607.2	14524.8	12185.7	9638.6	7307.6	4633.3
Pb	22810.4	4762.3	10424.4	13879.7	11787.8	9166.7	7156.8	4821.4
Bi	29814.6	4576.4	9305.1	12853.1	12414.8	9323.3	7421.0	5036.7
Po	32596.0	4893.4	6969.9	13200.1	14041.0	9757.0	7781.0	5300.1
At	40149.1	4158.2	4430.2	12229.4	12917.2	10329.4	8154.6	5450.8
Rn	43021.4	4660.2	3478.6	10966.7	12075.6	10248.3	8263.1	5419.7
Fr	59015.8	6809.2	2882.5	9530.6	11853.6	10899.9	7660.7	5730.7
Ra	58768.3	5859.0	2095.3	7365.1	11065.8	10491.4	7817.6	5771.8
Ac	69262.5	6724.4	1896.0	5469.6	11012.2	9910.1	7948.2	6021.5
Th	106580.0	4056.2	2234.7	4087.9	8656.6	8850.8	7223.6	6157.3
Pa	104941.5	7279.7	2128.3	3254.1	9137.3	9329.6	8191.5	6471.3
U	20067.4	9572.6	2243.3	2143.2	5258.6	6018.3	8053.5	6174.9

Table 1: continued

	Emitter							
Absorber	Mg	Al	Si	P	S	Cl	Ar	K
H	3.7	2.2	1.5	1.1	0.8	0.7	0.6	0.5
He	29.7	17.2	10.6	6.8	4.4	3.0	2.1	1.5
Li	116.2	68.5	41.9	26.6	17.2	11.5	7.9	5.6
Be	307.4	184.5	114.4	73.5	47.8	32.3	22.2	15.6
B	635.8	386.4	242.3	157.2	103.2	70.2	48.7	34.4
C	1165.0	717.8	454.9	297.9	197.0	134.9	94.3	66.8
N	1776.3	1109.5	710.4	469.6	313.0	215.8	151.8	108.2
O	2505.7	1585.8	1025.8	684.5	459.9	319.4	226.2	162.0
F	3148.7	2024.4	1323.4	891.5	603.3	421.8	300.6	216.5
Ne	4191.8	2725.6	1800.9	1225.1	835.0	587.6	421.4	305.1
Na	4644.6	3253.0	2181.1	1499.6	1030.0	730.0	527.0	383.5
Mg	504.7	4082.2	2752.8	1905.3	1318.6	941.1	683.9	500.2
Al	649.0	411.7	3097.9	2232.4	1556.3	1118.2	817.8	601.3
Si	862.2	548.1	359.4	2739.8	1917.8	1383.0	1015.0	749.6
P	1052.5	670.1	439.7	297.5	2077.2	1537.4	1156.4	860.4
S	1339.0	853.7	560.8	379.9	260.7	1812.4	1382.7	1033.8
Cl	1565.2	999.9	657.4	445.6	305.8	216.6	1509.8	1140.9
Ar	1765.5	1130.6	744.0	504.8	346.4	245.4	177.0	1177.2
K	2258.7	1450.6	956.4	649.9	446.4	316.4	228.5	167.4
Ca	2720.8	1753.1	1158.4	788.7	542.4	384.8	278.1	203.8
Sc	2940.0	1900.1	1258.3	858.4	591.0	419.7	303.6	222.7
Ti	3306.6	2143.2	1422.4	972.2	670.3	476.7	345.3	253.4
V	3679.0	2394.3	1592.5	1090.6	753.0	536.2	388.8	285.6
Cr	4215.3	2753.6	1835.3	1259.3	870.6	620.8	450.7	331.3
Mn	4641.4	3049.1	2037.7	1401.4	970.4	692.9	503.8	370.7
Fe	5252.9	3472.1	2326.6	1603.7	1112.2	795.3	579.0	426.4
Co	5691.5	3775.8	2538.2	1754.7	1218.9	872.8	636.3	469.2
Ni	6514.6	4324.1	2915.4	2021.1	1406.3	1008.6	736.4	543.4
Cu	6783.7	4511.5	3053.7	2124.8	1480.5	1063.2	777.2	574.1
Zn	7456.2	4928.7	3351.5	2343.0	1636.2	1177.5	862.4	637.8
Ga	6770.6	5195.4	3541.4	2481.3	1736.6	1252.2	918.8	680.3
Ge	6671.9	5589.1	3814.6	2674.9	1876.5	1356.0	997.0	739.2
As	1241.6	5298.5	4117.2	2892.4	2035.5	1475.1	1087.6	807.4
Se	1357.6	5253.2	4350.5	3057.4	2156.4	1566.0	1156.8	859.9
Br	1534.6	1023.1	4234.5	3362.5	2374.0	1725.6	1275.9	949.8
Kr	1671.8	1115.9	4490.7	3552.2	2511.0	1827.2	1352.4	1008.1
Rb	1862.2	1244.5	851.1	3366.6	2726.6	1984.7	1469.5	1096.9
Sr	2054.2	1375.1	939.9	3562.3	2925.1	2131.8	1580.2	1181.9
Y	2274.6	1524.0	1042.3	732.7	2771.4	2309.9	1713.6	1283.1
Zr	2482.0	1664.8	1139.2	801.1	2944.4	2467.5	1835.3	1374.9
Nb	2715.2	1822.9	1247.9	877.9	623.3	2315.1	1973.5	1479.6
Mo	2922.3	1964.7	1345.6	947.0	672.0	1755.1	2080.5	1563.0
Tc	3172.0	2135.0	1463.4	1030.5	731.1	533.7	1929.1	1661.6
Ru	3392.0	2285.9	1568.5	1105.6	784.0	572.1	1464.5	1750.0
Rh	3667.4	2475.5	1699.5	1198.3	849.6	620.0	460.1	1624.8
Pd	3893.4	2631.4	1807.7	1275.3	904.5	660.2	490.0	1229.5

Table 1: continued

	Emitter							
Absorber	Mg	Al	Si	P	S	Cl	Ar	K
Ag	4202.9	2846.4	1957.9	1383.0	981.3	716.5	532.1	399.8
Cd	4403.5	2989.9	2057.7	1454.1	1032.6	754.6	560.8	421.4
In	4692.7	3193.5	2201.4	1557.8	1106.8	809.2	601.6	452.1
Sn	4923.0	3361.3	2320.1	1643.7	1168.8	855.2	636.2	478.1
Sb	5198.9	3559.6	2459.9	1744.5	1241.5	909.1	676.9	508.9
Te	5354.1	3678.3	2546.5	1808.7	1288.3	944.0	703.3	529.0
I	5814.5	3995.3	2771.0	1971.6	1405.4	1030.5	768.3	578.2
Xe	6060.5	4164.5	2893.0	2061.5	1470.9	1079.5	805.5	606.5
Cs	6452.6	4420.1	3077.3	2197.9	1569.8	1153.2	861.2	648.9
Ba	6390.4	4587.3	3200.0	2289.8	1637.3	1204.1	900.1	678.7
La	6522.9	4864.8	3397.2	2433.1	1741.5	1281.9	959.1	723.6
Ce	7640.0	5130.6	3588.8	2574.5	1846.1	1361.1	1020.0	769.2
Pr	6149.9	5274.8	3803.1	2733.5	1960.4	1445.5	1083.4	818.2
Nd	6111.2	5432.0	3954.2	2842.2	2041.2	1507.0	1130.9	854.6
Pm	6674.4	5672.4	4187.1	3010.3	2164.7	1600.1	1202.1	908.8
Sm	7030.5	5861.1	4283.6	3081.5	2218.2	1641.2	1234.0	933.7
Eu	8903.1	5916.6	4412.2	3237.6	2332.2	1726.7	1299.1	983.5
Gd	8415.3	5627.4	4829.9	3318.8	2393.6	1774.1	1336.2	1012.3
Tb	8244.0	5433.1	4359.1	3464.2	2501.9	1856.7	1400.1	1061.4
Dy	1619.7	5662.0	4529.4	3427.3	2589.0	1923.9	1452.6	1101.6
Ho	1692.9	6338.2	4326.8	3794.8	2698.6	2005.7	1514.6	1149.4
Er	1775.9	6358.7	4344.7	3802.3	2811.0	2089.2	1577.7	1198.4
Tm	1864.2	7036.0	4749.6	3866.9	2937.0	2182.6	1648.0	1253.0
Yb	1927.4	1373.7	4827.9	3990.8	3010.0	2246.4	1695.7	1290.1
Lu	2034.3	1449.0	5071.6	3535.3	3162.4	2341.6	1768.0	1346.1
Hf	2127.9	1515.2	5344.8	3741.8	3074.2	2418.2	1827.7	1392.2
Ta	2238.7	1593.6	2729.2	3889.3	3214.7	2484.5	1899.6	1448.0
W	2348.8	1671.9	1204.0	4039.8	3355.2	2586.0	1965.5	1499.6
Re	2470.7	1759.4	1265.9	4156.2	2983.2	2522.9	2037.0	1556.2
Os	2573.3	1832.7	1317.4	2904.3	3064.1	2605.7	2055.2	1598.9
Ir	2710.1	1931.3	1387.6	1020.3	3217.8	2741.0	2160.4	1663.1
Pt	2833.9	2020.8	1452.7	1068.7	3361.0	2466.3	2122.1	1719.9
Au	2977.7	2125.5	1528.0	1124.1	2080.9	2357.5	2187.9	1802.8
Hg	3095.7	2211.9	1590.7	1170.6	2457.4	2628.9	2289.6	1845.0
Tl	3213.7	2298.2	1653.3	1217.0	899.4	2713.4	2342.9	1780.5
Pb	3348.0	2396.8	1725.1	1270.4	938.6	2820.1	2103.4	1846.5
Bi	3502.4	2510.6	1808.5	1332.6	983.9	1835.3	2114.3	1850.4
Po	3690.6	2648.7	1908.6	1406.8	1038.7	786.5	2258.7	1939.0
At	3873.6	2778.0	2003.5	1477.9	1090.6	825.5	2386.8	1754.2
Rn	3862.4	2766.0	1995.8	1473.0	1086.8	822.5	1646.2	1794.4
Fr	4049.5	2895.5	2090.6	1544.1	1138.9	861.7	661.8	1892.1
Ra	4201.5	3001.4	2167.7	1601.5	1182.0	894.8	687.6	1929.8
Ac	4303.1	3135.9	2267.1	1676.7	1237.7	937.2	720.3	1377.6
Th	4413.4	3216.6	2326.9	1722.2	1271.9	963.5	740.7	574.1
Pa	4646.7	3385.9	2449.5	1813.1	1339.0	1014.2	779.7	604.2
U	4656.3	3442.3	2490.4	1843.8	1362.0	1031.9	793.6	614.6

Table 1: continued

	Emitter							
Absorber	Ca	Sc	Ti	V	Cr	Mn	Fe	Co
H	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
He	1.2	0.9	0.7	0.6	0.5	0.4	0.4	0.4
Li	4.0	2.9	2.2	1.7	1.3	1.0	0.8	0.7
Be	11.1	8.1	6.0	4.5	3.4	2.7	2.1	1.7
B	24.6	17.9	13.3	10.0	7.6	5.8	4.6	3.6
C	48.1	35.2	26.1	19.7	15.0	11.5	9.0	7.1
N	78.3	57.5	42.8	32.4	24.7	19.0	14.8	11.7
O	117.9	86.9	65.0	49.3	37.7	29.1	22.8	17.9
F	158.3	117.3	88.1	67.0	51.4	39.9	31.2	24.6
Ne	224.2	166.8	125.8	96.1	73.9	57.5	45.1	35.6
Na	283.1	211.5	160.1	122.8	94.7	73.9	58.0	46.0
Mg	371.0	278.5	211.5	162.7	125.9	98.5	77.6	61.7
Al	448.1	337.8	257.5	198.7	154.3	121.0	95.6	76.1
Si	561.1	424.8	324.9	251.6	196.0	154.2	122.1	97.4
P	647.2	492.1	377.8	293.6	229.3	180.9	143.6	114.9
S	780.4	595.5	458.9	357.9	280.3	221.7	176.3	141.4
Cl	864.3	661.7	511.6	400.2	314.5	249.6	199.0	159.9
Ar	913.5	712.5	552.4	433.4	341.3	271.4	216.9	174.7
K	1132.6	871.4	677.0	532.1	420.3	335.2	268.6	216.8
Ca	151.6	988.7	776.9	617.3	488.6	390.1	313.3	253.5
Sc	165.7	125.0	806.3	645.3	512.9	411.0	330.6	267.9
Ti	188.7	142.3	109.0	84.5	559.6	451.2	364.0	295.4
V	212.8	160.6	123.0	95.4	74.6	488.3	395.6	322.0
Cr	247.0	186.6	143.0	110.9	86.7	68.5	438.4	359.8
Mn	276.7	209.2	160.4	124.5	97.4	77.0	61.5	391.0
Fe	318.5	240.9	184.8	143.5	112.4	88.9	70.9	57.1
Co	350.9	265.7	203.9	158.4	124.1	98.2	78.4	63.1
Ni	406.7	308.2	236.7	184.1	144.2	114.2	91.2	73.4
Cu	430.1	326.1	250.6	195.0	152.9	121.1	96.7	77.9
Zn	478.3	363.0	279.3	217.4	170.5	135.1	107.9	87.0
Ga	510.7	388.0	298.6	232.6	182.5	144.7	115.7	93.2
Ge	555.6	422.5	325.5	253.7	199.2	158.0	126.3	101.9
As	607.4	462.3	356.4	278.0	218.4	173.4	138.7	111.9
Se	647.7	493.6	380.7	297.2	233.7	185.6	148.5	119.8
Br	716.4	546.6	422.0	329.7	259.3	206.0	164.9	133.1
Kr	761.4	581.6	449.4	351.4	276.6	219.9	176.2	142.3
Rb	829.7	634.6	490.8	384.1	302.6	240.7	192.9	155.8
Sr	895.8	686.4	531.4	416.3	328.1	261.2	209.4	169.3
Y	973.5	746.7	578.7	453.8	357.9	285.1	228.7	185.0
Zr	1043.4	800.7	621.2	487.7	385.1	307.0	246.4	199.3
Nb	1123.5	862.7	670.1	526.5	415.9	331.7	266.4	215.7
Mo	1188.4	913.7	710.5	558.8	441.9	352.7	283.4	229.5
Tc	1266.6	975.9	759.8	598.4	473.6	378.4	304.3	246.6
Ru	1336.7	1031.4	802.8	632.1	500.8	400.5	322.3	261.3
Rh	1425.0	1102.0	857.9	675.6	535.5	428.6	345.1	280.0
Pd	1491.6	1155.8	899.8	708.7	562.1	450.2	362.8	294.5

Table 1: continued

	Emitter							
Absorber	Ca	Sc	Ti	V	Cr	Mn	Fe	Co
Ag	1380.8	1229.8	959.4	757.0	601.0	481.7	388.4	315.5
Cd	1037.6	1263.6	991.9	787.3	625.2	500.8	404.0	328.4
In	344.3	1161.6	1047.4	833.1	661.6	530.0	427.8	347.9
Sn	364.1	882.0	1088.3	867.4	689.7	553.1	446.7	363.5
Sb	387.6	298.7	985.4	905.7	722.6	581.4	469.9	382.4
Te	403.1	310.8	735.8	923.4	738.9	596.8	482.7	392.8
I	440.9	340.1	265.7	859.3	795.2	643.7	521.1	424.3
Xe	462.7	357.0	279.0	650.8	711.1	664.7	538.8	439.3
Cs	495.2	382.3	298.7	236.0	751.2	699.1	568.0	464.0
Ba	518.3	400.3	312.9	247.4	567.5	624.5	585.1	479.1
La	552.9	427.2	334.1	264.2	210.5	652.7	617.2	506.0
Ce	587.4	453.7	354.9	280.8	223.7	509.8	564.2	533.8
Pr	625.7	483.9	378.6	299.6	238.8	192.1	437.2	563.8
Nd	654.1	506.1	396.2	313.7	250.0	201.2	457.2	511.4
Pm	695.7	538.5	421.8	334.0	266.3	214.3	174.0	392.1
Sm	715.3	554.0	434.0	343.9	274.3	220.8	179.2	400.7
Eu	754.0	584.3	457.9	362.9	289.6	233.2	189.3	154.8
Gd	776.4	602.0	472.0	374.3	298.7	240.6	195.3	159.8
Tb	814.6	632.0	495.7	393.2	313.9	252.9	205.3	168.0
Dy	845.6	656.2	514.9	408.6	326.3	263.0	213.6	174.8
Ho	883.0	685.6	538.2	427.2	341.2	275.1	223.5	182.9
Er	921.5	716.1	562.4	446.5	356.8	287.7	233.7	191.3
Tm	964.4	750.1	589.2	468.0	374.1	301.8	245.3	200.8
Yb	993.8	773.5	608.0	483.2	386.3	311.8	253.4	207.5
Lu	1037.7	808.2	635.6	505.4	404.3	326.5	265.4	217.4
Hf	1073.7	836.6	658.3	523.7	419.1	338.4	275.3	225.5
Ta	1117.3	871.0	685.6	545.7	436.8	352.8	287.0	235.2
W	1158.0	903.4	711.6	566.7	453.7	366.6	298.3	244.6
Re	1203.0	939.3	740.2	589.7	472.4	381.8	310.8	254.9
Os	1237.0	966.6	762.3	607.8	487.1	393.8	320.7	263.1
Ir	1285.9	1004.6	792.8	632.6	507.2	410.4	334.2	274.2
Pt	1330.3	1039.7	821.0	655.5	525.9	425.8	346.8	284.6
Au	1382.7	1081.3	854.1	682.0	547.5	443.4	361.4	296.6
Hg	1423.1	1114.5	880.5	703.2	564.6	457.4	372.9	306.1
Tl	1448.5	1145.8	905.6	723.6	581.2	471.0	384.2	315.6
Pb	1504.7	1182.8	935.4	747.7	600.8	487.0	397.4	326.6
Bi	1418.8	1225.6	969.9	775.9	623.8	506.1	413.0	339.5
Po	1489.3	1228.8	1015.0	811.8	653.0	530.0	432.7	355.8
At	1552.3	1280.3	1056.1	844.6	679.9	552.2	451.0	370.9
Rn	1540.2	1194.2	1043.8	835.5	672.5	546.1	446.2	367.1
Fr	1609.2	1247.3	1043.7	868.8	699.4	568.1	464.3	382.2
Ra	1439.9	1289.7	1073.1	894.4	720.2	584.9	478.3	393.9
Ac	1497.6	1345.3	1054.0	889.6	747.1	607.3	496.8	409.2
Th	1524.4	1374.4	1079.9	909.0	762.2	619.5	506.8	417.6
Pa	1604.1	1240.5	1131.1	897.4	797.0	647.8	530.0	436.8
U	1141.3	1255.0	1147.9	910.9	772.7	654.7	535.8	441.5

Table 1: continued

	Emitter							
Absorber	Ni	Cu	Zn	Ga	Ge	As	Se	Br
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Li	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3
Be	1.4	1.1	0.9	0.8	0.7	0.6	0.5	0.5
B	2.9	2.3	1.9	1.6	1.3	1.1	1.0	0.8
C	5.6	4.5	3.6	3.0	2.5	2.1	1.7	1.5
N	9.3	7.4	6.0	4.9	4.0	3.3	2.8	2.4
O	14.3	11.4	9.2	7.5	6.2	5.1	4.3	3.6
F	19.6	15.7	12.7	10.4	8.5	7.0	5.8	4.9
Ne	28.4	22.9	18.5	15.1	12.4	10.2	8.5	7.1
Na	36.8	29.6	24.0	19.6	16.1	13.3	11.1	9.3
Mg	49.4	39.9	32.4	26.5	21.8	18.0	15.0	12.5
Al	61.1	49.5	40.2	32.9	27.1	22.4	18.7	15.6
Si	78.4	63.6	51.8	42.5	35.0	29.0	24.2	20.2
P	92.7	75.3	61.4	50.5	41.7	34.6	28.8	24.2
S	114.3	93.1	76.0	62.6	51.8	43.0	35.9	30.1
Cl	129.5	105.7	86.5	71.3	59.1	49.2	41.1	34.5
Ar	141.9	116.0	95.1	78.6	65.2	54.3	45.4	38.2
K	176.3	144.5	118.7	98.2	81.6	68.1	57.0	48.0
Ca	206.7	169.8	139.7	115.7	96.4	80.5	67.5	56.9
Sc	218.7	179.8	148.3	123.1	102.7	85.8	72.1	60.8
Ti	241.7	199.1	164.4	136.6	114.2	95.6	80.3	67.9
V	264.2	218.2	180.4	150.1	125.6	105.3	88.6	75.0
Cr	297.4	247.3	204.7	170.6	142.9	119.9	101.1	85.6
Mn	323.4	269.1	223.1	186.1	156.1	131.1	110.6	93.8
Fe	360.4	300.9	250.0	209.1	175.8	147.9	124.9	106.1
Co	51.2	319.9	267.1	224.5	189.5	159.7	135.0	114.8
Ni	59.6	48.7	301.0	253.8	215.1	181.5	153.6	130.7
Cu	63.2	51.7	42.6	259.5	221.8	187.8	159.2	135.7
Zn	70.6	57.8	47.6	39.5	239.7	203.1	172.6	147.5
Ga	75.7	62.0	51.1	42.3	35.3	212.0	180.4	154.3
Ge	82.8	67.8	55.8	46.3	38.6	32.4	192.7	165.0
As	91.0	74.5	61.4	50.9	42.5	35.6	30.0	177.0
Se	97.5	79.8	65.8	54.6	45.5	38.2	32.2	27.3
Br	108.3	88.8	73.2	60.7	50.7	42.5	35.8	30.4
Kr	115.8	95.0	78.3	65.0	54.2	45.5	38.4	32.5
Rb	126.9	104.1	85.8	71.3	59.5	49.9	42.1	35.7
Sr	137.9	113.1	93.3	77.5	64.7	54.3	45.8	38.8
Y	150.8	123.8	102.1	84.9	70.9	59.5	50.2	42.6
Zr	162.5	133.4	110.2	91.6	76.5	64.2	54.2	46.0
Nb	175.9	144.5	119.4	99.2	82.9	69.6	58.7	49.8
Mo	187.3	154.0	127.2	105.8	88.4	74.3	62.7	53.2
Tc	201.3	165.6	136.9	113.8	95.2	80.0	67.5	57.3
Ru	213.5	175.7	145.2	120.8	101.1	84.9	71.7	60.9
Rh	228.9	188.5	155.9	129.8	108.6	91.3	77.1	65.4
Pd	240.9	198.5	164.2	136.7	114.5	96.2	81.3	69.0

Table 1: continued

	Emitter							
Absorber	Ni	Cu	Zn	Ga	Ge	As	Se	Br
Ag	258.3	213.0	176.3	146.9	123.0	103.4	87.4	74.2
Cd	269.0	221.8	183.7	153.1	128.3	107.9	91.2	77.5
In	285.1	235.3	194.9	162.5	136.2	114.6	96.9	82.3
Sn	298.0	246.1	203.9	170.1	142.7	120.1	101.5	86.3
Sb	313.6	259.0	214.8	179.3	150.4	126.6	107.1	91.1
Te	322.1	266.0	220.7	184.3	154.7	130.3	110.2	93.8
I	348.1	287.6	238.8	199.5	167.6	141.2	119.5	101.7
Xe	360.9	298.5	247.9	207.3	174.1	146.8	124.3	105.8
Cs	381.9	316.4	262.9	219.8	184.8	155.8	131.9	112.3
Ba	395.3	328.2	272.7	228.0	191.7	161.7	136.9	116.6
La	418.0	347.4	288.6	241.2	202.7	171.0	144.9	123.5
Ce	441.5	367.4	305.3	255.3	214.5	181.1	153.5	130.9
Pr	466.8	388.9	323.4	270.6	227.6	192.2	163.0	139.0
Nd	483.5	403.1	335.7	281.3	236.9	200.2	169.8	144.9
Pm	509.7	424.9	354.5	297.7	251.2	212.4	180.2	153.7
Sm	455.1	433.5	362.2	304.5	257.3	217.5	184.6	157.6
Eu	346.1	392.6	379.3	319.6	270.6	228.9	194.3	165.8
Gd	354.4	400.8	387.9	327.1	277.1	234.5	199.2	170.0
Tb	138.4	308.3	351.1	341.6	289.6	245.3	208.5	178.1
Dy	144.1	321.6	361.4	352.3	298.6	253.1	215.2	184.0
Ho	150.8	125.1	275.7	317.3	309.9	262.8	223.7	191.4
Er	157.8	131.0	291.2	240.8	321.9	273.2	232.7	199.3
Tm	165.7	137.6	114.9	251.5	290.7	284.9	242.8	208.0
Yb	171.2	142.2	118.8	262.7	218.9	293.2	250.0	214.2
Lu	179.4	149.0	124.5	269.8	227.7	269.5	260.5	223.4
Hf	186.2	154.7	129.3	108.7	236.4	199.2	234.2	230.6
Ta	194.2	161.4	134.9	113.4	244.0	206.9	243.0	239.1
W	202.0	167.9	140.4	118.0	99.8	214.2	181.7	218.9
Re	210.6	175.1	146.4	123.1	104.1	223.1	196.4	161.5
Os	217.4	180.8	151.2	127.2	107.6	91.4	198.9	170.2
Ir	226.6	188.5	157.7	132.7	112.2	95.4	203.4	172.9
Pt	235.2	195.7	163.7	137.8	116.5	99.1	84.6	179.3
Au	245.2	204.1	170.7	143.7	121.6	103.3	88.2	186.8
Hg	253.2	210.8	176.4	148.5	125.7	106.8	91.2	78.3
Tl	261.1	217.5	182.0	153.3	129.7	110.3	94.2	80.9
Pb	270.3	225.3	188.6	158.8	134.4	114.3	97.7	83.9
Bi	281.1	234.3	196.2	165.3	140.0	119.1	101.7	87.4
Po	294.7	245.7	205.8	173.4	146.8	124.9	106.8	91.7
At	307.3	256.2	214.7	181.0	153.3	130.5	111.5	95.8
Rn	304.3	253.9	212.7	179.4	152.0	129.3	110.6	95.0
Fr	316.8	264.4	221.6	186.9	158.4	134.8	115.2	99.0
Ra	326.7	272.8	228.7	192.9	163.5	139.2	119.0	102.3
Ac	339.5	283.6	237.8	200.6	170.1	144.8	123.9	106.5
Th	346.6	289.6	242.9	204.9	173.8	148.0	126.6	108.9
Pa	362.5	302.9	254.1	214.5	182.0	155.1	132.7	114.1
U	366.5	306.2	257.1	217.1	184.2	157.0	134.4	115.6

Table 1: continued

	Emitter							
Absorber	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Be	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2
B	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3
C	1.3	1.1	0.9	0.8	0.7	0.7	0.6	0.5
N	2.0	1.7	1.5	1.2	1.1	1.0	0.9	0.8
O	3.0	2.5	2.2	1.9	1.6	1.4	1.2	1.1
F	4.1	3.5	2.9	2.5	2.2	1.9	1.6	1.4
Ne	6.0	5.0	4.3	3.6	3.1	2.7	2.3	2.0
Na	7.8	6.6	5.6	4.7	4.1	3.5	3.0	2.6
Mg	10.5	8.9	7.5	6.4	5.5	4.7	4.1	3.5
Al	13.1	11.1	9.4	8.0	6.9	5.9	5.1	4.4
Si	17.0	14.4	12.2	10.4	8.9	7.7	6.6	5.7
P	20.4	17.2	14.6	12.5	10.7	9.2	7.9	6.9
S	25.4	21.5	18.3	15.6	13.4	11.5	9.9	8.6
Cl	29.2	24.7	21.0	18.0	15.4	13.3	11.4	9.9
Ar	32.3	27.4	23.4	20.0	17.1	14.8	12.7	11.0
K	40.6	34.5	29.4	25.2	21.7	18.7	16.1	14.0
Ca	48.2	41.0	35.0	30.0	25.8	22.2	19.2	16.7
Sc	51.6	43.9	37.6	32.3	27.7	23.9	20.7	18.0
Ti	57.7	49.1	42.1	36.2	31.1	26.8	23.2	20.2
V	63.8	54.4	46.6	40.1	34.6	29.9	25.9	22.5
Cr	72.9	62.3	53.5	46.1	39.7	34.3	29.7	25.9
Mn	80.0	68.4	58.7	50.7	43.7	37.8	32.8	28.6
Fe	90.5	77.5	66.6	57.5	49.6	43.0	37.3	32.5
Co	98.1	84.0	72.3	62.5	54.0	46.8	40.6	35.5
Ni	111.7	95.8	82.5	71.4	61.7	53.5	46.6	40.7
Cu	116.2	99.8	86.1	74.6	64.6	56.1	48.8	42.6
Zn	126.6	109.0	94.2	81.8	70.8	61.5	53.6	46.9
Ga	132.6	114.3	99.0	86.0	74.5	64.8	56.5	49.4
Ge	141.9	122.4	106.0	92.2	79.9	69.5	60.6	53.1
As	152.4	131.5	114.1	99.3	86.1	75.0	65.4	57.3
Se	23.2	137.6	119.5	104.1	90.4	78.8	68.9	60.4
Br	25.9	22.1	129.5	112.7	98.1	85.6	74.9	65.8
Kr	27.7	23.7	20.3	117.7	102.5	89.7	78.6	69.2
Rb	30.4	26.0	22.3	19.2	109.9	96.2	84.4	74.4
Sr	33.1	28.3	24.3	21.0	18.1	102.4	89.9	79.3
Y	36.3	31.0	26.6	23.0	19.9	17.3	96.4	85.1
Zr	39.2	33.5	28.8	24.8	21.5	18.7	16.2	89.9
Nb	42.5	36.3	31.2	26.9	23.3	20.2	17.6	15.4
Mo	45.4	38.8	33.3	28.8	24.9	21.6	18.8	16.5
Tc	48.9	41.8	35.9	31.0	26.8	23.3	20.3	17.8
Ru	51.9	44.4	38.2	33.0	28.5	24.8	21.6	18.9
Rh	55.8	47.8	41.1	35.5	30.7	26.7	23.2	20.3
Pd	58.9	50.4	43.4	37.4	32.4	28.2	24.5	21.5

Table 1: continued

	Emitter							
Absorber	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc
Ag	63.4	54.2	46.7	40.3	34.9	30.3	26.4	23.1
Cd	66.1	56.6	48.7	42.1	36.5	31.7	27.6	24.2
In	70.3	60.2	51.8	44.8	38.8	33.7	29.4	25.7
Sn	73.7	63.2	54.4	47.0	40.7	35.4	30.9	27.0
Sb	77.8	66.7	57.4	49.6	43.0	37.4	32.6	28.5
Te	80.2	68.7	59.2	51.2	44.4	38.6	33.6	29.4
I	86.9	74.5	64.2	55.5	48.1	41.9	36.5	32.0
Xe	90.5	77.6	66.9	57.9	50.2	43.7	38.1	33.3
Cs	96.1	82.5	71.1	61.5	53.3	46.4	40.5	35.5
Ba	99.8	85.7	73.9	64.0	55.5	48.3	42.1	36.9
La	105.7	90.8	78.3	67.8	58.8	51.2	44.7	39.2
Ce	112.1	96.3	83.1	72.0	62.5	54.4	47.5	41.6
Pr	119.1	102.3	88.3	76.6	66.4	57.9	50.5	44.3
Nd	124.1	106.7	92.1	79.9	69.3	60.4	52.7	46.2
Pm	131.7	113.2	97.8	84.8	73.6	64.1	56.0	49.1
Sm	135.1	116.1	100.3	87.0	75.5	65.8	57.5	50.5
Eu	142.1	122.2	105.6	91.6	79.5	69.3	60.6	53.2
Gd	145.8	125.5	108.4	94.1	81.7	71.3	62.3	54.6
Tb	152.8	131.6	113.8	98.8	85.8	74.9	65.5	57.4
Dy	158.1	136.2	117.8	102.4	89.0	77.7	67.9	59.6
Ho	164.6	141.9	122.8	106.8	92.9	81.1	70.9	62.3
Er	171.4	147.8	128.1	111.4	96.9	84.6	74.1	65.1
Tm	179.0	154.5	133.9	116.6	101.4	88.6	77.5	68.1
Yb	184.4	159.2	138.1	120.2	104.6	91.4	80.0	70.3
Lu	192.4	166.2	144.2	125.6	109.3	95.5	83.6	73.5
Hf	198.7	171.8	149.1	129.9	113.1	98.8	86.5	76.0
Ta	206.1	178.3	154.8	135.0	117.5	102.7	90.0	79.1
W	213.2	184.5	160.4	139.9	121.9	106.5	93.3	82.0
Re	220.9	191.2	166.2	145.0	126.4	110.5	96.9	85.2
Os	196.6	196.3	170.6	148.9	129.8	113.6	99.6	87.7
Ir	148.0	176.9	176.7	154.1	134.5	117.8	103.3	91.0
Pt	153.3	185.1	182.5	159.0	138.8	121.6	106.8	94.1
Au	159.5	137.0	169.2	164.9	144.1	126.3	111.0	97.9
Hg	164.7	141.2	121.9	169.4	148.0	129.9	114.2	100.7
Tl	69.7	152.3	129.3	150.7	152.3	133.6	117.5	103.7
Pb	72.3	150.8	130.0	112.5	136.2	137.8	121.2	107.0
Bi	75.4	65.2	135.1	116.9	140.4	142.8	125.6	110.9
Po	79.1	68.5	141.7	122.8	106.6	129.2	131.2	115.9
At	82.6	71.5	62.2	128.8	111.5	96.9	118.6	120.3
Rn	82.0	70.9	61.7	126.8	110.1	95.9	120.1	118.7
Fr	85.5	74.0	64.3	56.1	114.6	99.8	87.2	113.8
Ra	88.3	76.5	66.5	58.0	118.4	103.0	90.0	79.0
Ac	92.0	79.6	69.3	60.5	52.9	112.5	102.5	85.5
Th	94.0	81.4	70.8	61.9	54.2	112.1	103.3	90.5
Pa	98.6	85.4	74.3	64.9	56.8	49.9	100.6	88.2
U	99.9	86.5	75.3	65.8	57.6	50.6	101.9	89.3

Table 1: continued

	Emitter							
Absorber	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Be	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
B	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
C	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3
N	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.4
O	1.0	0.8	0.8	0.7	0.6	0.6	0.5	0.5
F	1.3	1.1	1.0	0.9	0.8	0.7	0.7	0.6
Ne	1.8	1.6	1.4	1.2	1.1	1.0	0.9	0.8
Na	2.3	2.0	1.8	1.6	1.4	1.3	1.1	1.0
Mg	3.1	2.7	2.4	2.1	1.9	1.7	1.5	1.3
Al	3.8	3.3	2.9	2.6	2.3	2.0	1.8	1.6
Si	5.0	4.3	3.8	3.3	3.0	2.6	2.3	2.1
P	6.0	5.2	4.6	4.0	3.5	3.1	2.8	2.5
S	7.5	6.5	5.7	5.0	4.4	3.9	3.4	3.1
Cl	8.6	7.5	6.6	5.8	5.1	4.5	4.0	3.5
Ar	9.6	8.4	7.3	6.4	5.7	5.0	4.4	3.9
K	12.1	10.6	9.3	8.1	7.2	6.3	5.6	4.9
Ca	14.5	12.7	11.1	9.7	8.6	7.5	6.7	5.9
Sc	15.6	13.7	12.0	10.5	9.2	8.2	7.2	6.4
Ti	17.6	15.4	13.5	11.8	10.4	9.2	8.1	7.2
V	19.6	17.1	15.0	13.2	11.6	10.3	9.1	8.0
Cr	22.6	19.8	17.3	15.2	13.4	11.8	10.5	9.3
Mn	25.0	21.9	19.2	16.8	14.8	13.1	11.6	10.3
Fe	28.4	24.9	21.8	19.2	16.9	15.0	13.3	11.8
Co	31.0	27.2	23.9	21.0	18.5	16.4	14.5	12.9
Ni	35.6	31.2	27.4	24.1	21.3	18.9	16.7	14.9
Cu	37.3	32.8	28.8	25.4	22.4	19.8	17.6	15.7
Zn	41.1	36.1	31.7	28.0	24.7	21.9	19.4	17.3
Ga	43.4	38.1	33.5	29.6	26.1	23.2	20.6	18.3
Ge	46.6	41.0	36.1	31.8	28.2	25.0	22.2	19.8
As	50.4	44.3	39.0	34.5	30.5	27.1	24.1	21.5
Se	53.1	46.8	41.2	36.4	32.2	28.6	25.5	22.7
Br	58.0	51.1	45.1	39.8	35.3	31.4	27.9	24.9
Kr	61.0	53.9	47.5	42.0	37.2	33.1	29.5	26.3
Rb	65.7	58.1	51.3	45.4	40.2	35.8	31.9	28.5
Sr	70.1	62.0	54.8	48.5	43.0	38.3	34.1	30.5
Y	75.2	66.6	58.9	52.1	46.3	41.2	36.8	32.9
Zr	79.5	70.3	62.2	55.2	49.1	43.7	39.1	35.0
Nb	84.5	75.0	66.4	58.9	52.4	46.8	41.8	37.4
Mo	14.4	78.3	69.4	61.7	54.9	49.0	43.9	39.3
Tc	15.6	13.7	73.6	65.4	58.3	52.1	46.6	41.8
Ru	16.6	14.6	12.8	68.4	61.0	54.5	48.8	43.8
Rh	17.8	15.7	13.8	12.2	10.8	57.6	51.6	46.4
Pd	18.8	16.6	14.6	12.9	11.5	10.2	53.7	48.2

Table 1: continued

	Emitter							
Absorber	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb
Ag	20.3	17.8	15.7	13.9	12.3	11.0	9.8	51.0
Cd	21.2	18.7	16.5	14.6	12.9	11.5	10.2	9.1
In	22.6	19.9	17.5	15.5	13.8	12.2	10.9	9.7
Sn	23.7	20.8	18.4	16.3	14.4	12.8	11.4	10.2
Sb	25.0	22.0	19.4	17.2	15.3	13.6	12.1	10.8
Te	25.8	22.7	20.1	17.8	15.8	14.0	12.5	11.2
I	28.1	24.7	21.8	19.3	17.1	15.2	13.6	12.1
Xe	29.3	25.8	22.7	20.1	17.9	15.9	14.2	12.6
Cs	31.1	27.4	24.2	21.4	19.0	16.9	15.1	13.5
Ba	32.4	28.5	25.2	22.3	19.8	17.6	15.7	14.0
La	34.4	30.3	26.7	23.7	21.0	18.7	16.7	14.9
Ce	36.5	32.2	28.4	25.2	22.3	19.9	17.7	15.8
Pr	38.9	34.3	30.3	26.8	23.8	21.2	18.9	16.9
Nd	40.6	35.8	31.6	28.0	24.8	22.1	19.7	17.6
Pm	43.2	38.1	33.6	29.8	26.4	23.5	21.0	18.7
Sm	44.4	39.1	34.5	30.6	27.2	24.2	21.6	19.3
Eu	46.7	41.2	36.4	32.3	28.7	25.5	22.8	20.3
Gd	48.1	42.4	37.5	33.2	29.5	26.2	23.4	20.9
Tb	50.5	44.6	39.4	34.9	31.0	27.6	24.6	22.0
Dy	52.5	46.3	40.9	36.3	32.2	28.7	25.6	22.9
Ho	54.8	48.4	42.8	37.9	33.7	30.0	26.8	24.0
Er	57.3	50.6	44.7	39.7	35.2	31.4	28.0	25.1
Tm	60.0	53.0	46.9	41.6	36.9	32.9	29.4	26.3
Yb	61.9	54.7	48.4	42.9	38.2	34.0	30.4	27.2
Lu	64.7	57.2	50.6	44.9	39.9	35.6	31.8	28.4
Hf	67.0	59.2	52.4	46.5	41.3	36.9	32.9	29.5
Ta	69.7	61.6	54.5	48.4	43.0	38.4	34.3	30.7
W	72.3	63.9	56.6	50.2	44.7	39.9	35.6	31.9
Re	75.2	66.5	58.8	52.2	46.5	41.5	37.1	33.2
Os	77.4	68.4	60.6	53.8	47.9	42.8	38.2	34.2
Ir	80.4	71.2	63.0	56.0	49.9	44.5	39.8	35.7
Pt	83.2	73.7	65.3	58.0	51.6	46.1	41.2	37.0
Au	86.5	76.7	67.9	60.4	53.8	48.0	43.0	38.5
Hg	89.1	79.0	70.0	62.2	55.4	49.5	44.3	39.7
Tl	91.7	81.3	72.1	64.1	57.1	51.0	45.6	40.9
Pb	94.7	84.0	74.5	66.2	59.0	52.7	47.2	42.3
Bi	98.2	87.1	77.2	68.7	61.3	54.7	49.0	44.0
Po	102.6	91.0	80.7	71.8	64.1	57.3	51.3	46.0
At	106.4	94.4	83.8	74.6	66.6	59.5	53.4	47.9
Rn	105.0	93.0	82.7	73.6	65.7	58.8	52.7	47.4
Fr	109.0	96.7	85.9	76.5	68.3	61.2	54.9	49.3
Ra	112.2	99.6	88.5	78.9	70.4	63.1	56.6	50.8
Ac	105.8	103.4	91.9	81.9	73.2	65.5	58.8	52.9
Th	75.6	91.3	93.5	83.4	74.5	66.8	59.9	53.9
Pa	77.5	68.3	97.7	87.2	78.0	69.9	62.7	56.4
U	78.4	69.1	92.2	88.0	78.7	70.6	63.4	57.1

Table 2: Mass attenuation coefficients for Kβ lines.

	Emitter							
Absorber	Ne	Na	Mg	Al	Si	P	S	Cl
H	10.9	5.9	3.3	2.0	1.3	1.0	0.8	0.6
He	92.0	49.5	26.7	15.0	9.1	5.6	3.6	2.4
Li	346.6	191.2	104.9	59.8	35.8	22.0	14.0	9.2
Be	914.5	497.3	278.5	161.5	98.1	60.9	39.1	25.9
B	1848.3	1016.5	577.4	339.3	208.4	130.8	84.8	56.6
C	3290.0	1838.5	1060.9	632.4	392.6	248.6	162.4	109.1
N	4833.1	2767.4	1621.8	980.4	615.1	393.3	259.0	175.3
O	6657.3	3855.8	2293.6	1405.4	891.1	575.2	381.8	260.4
F	8065.8	4773.9	2891.0	1799.6	1153.4	751.4	502.7	345.3
Ne	681.6	6288.2	3857.1	2430.1	1575.0	1035.9	698.0	482.7
Na	936.9	549.6	4335.5	2918.9	1914.7	1272.2	864.1	602.1
Mg	1333.7	775.9	461.9	3665.0	2422.2	1621.9	1110.2	779.2
Al	1759.3	996.4	594.3	366.1	2765.5	1906.4	1314.9	929.4
Si	2409.5	1321.1	789.9	487.4	313.6	2343.9	1623.3	1151.8
P	2898.6	1610.6	964.5	595.9	383.8	252.3	1781.7	1299.2
S	3707.2	2046.2	1227.4	759.5	489.7	322.2	218.7	1544.4
Cl	4070.7	2387.4	1435.3	889.8	574.1	377.9	256.5	178.6
Ar	4841.3	2686.7	1619.7	1006.5	650.0	428.1	290.6	202.3
K	5690.4	3428.0	2073.4	1292.1	836.0	551.4	374.6	261.0
Ca	6852.1	4116.5	2499.1	1562.5	1013.3	669.5	455.3	317.6
Sc	8321.3	4435.4	2702.0	1694.6	1101.5	729.0	496.4	346.6
Ti	8189.1	4975.2	3040.7	1912.6	1245.9	826.2	563.3	393.9
V	8980.5	5514.3	3385.8	2138.1	1395.9	927.4	633.3	443.4
Cr	10658.5	6295.9	3882.1	2460.6	1609.8	1071.5	732.7	513.7
Mn	11097.3	6895.7	4279.3	2727.0	1788.8	1193.2	817.3	573.9
Fe	12648.2	7759.1	4848.8	3107.9	2044.0	1366.4	937.3	659.2
Co	12159.4	8378.0	5257.3	3382.8	2232.2	1496.1	1028.0	724.1
Ni	13870.4	9584.8	6018.3	3876.9	2566.5	1724.5	1187.0	837.4
Cu	2022.5	8845.9	6269.3	4049.0	2691.8	1814.1	1250.5	883.4
Zn	2144.0	8334.6	6882.6	4427.1	2959.2	2002.3	1383.5	979.4
Ga	2347.6	1455.7	6376.9	4670.0	3129.4	2122.6	1469.8	1042.8
Ge	2701.5	1623.6	6485.7	5027.2	3371.6	2290.5	1590.0	1130.5
As	2942.5	1818.4	1147.9	5418.6	3641.3	2480.2	1727.2	1231.9
Se	3236.8	1987.2	1254.6	4956.8	3848.1	2624.2	1831.7	1309.2
Br	3632.3	2248.4	1418.9	4218.0	4221.4	2887.4	2017.6	1443.5
Kr	4146.7	2446.6	1546.1	1004.1	3969.0	3051.9	2135.2	1529.4
Rb	4425.0	2722.2	1722.6	1119.8	2988.7	3313.2	2318.9	1661.6
Sr	4826.8	2998.4	1900.8	1237.2	831.1	3103.8	2489.2	1785.9
Y	5122.6	3317.2	2105.1	1371.5	921.9	2403.6	2696.1	1936.1
Zr	6205.8	3615.7	2297.5	1498.5	1007.7	689.8	2518.9	2071.3
Nb	6550.5	3952.1	2513.9	1641.0	1104.1	755.7	1936.3	2225.1
Mo	7193.1	4248.1	2706.4	1768.9	1190.7	815.0	572.5	2047.1
Tc	7232.7	4606.0	2938.2	1922.7	1295.3	886.8	622.7	2179.3
Ru	7601.7	4919.7	3142.7	2059.2	1388.7	951.2	667.6	479.7
Rh	8447.0	5311.0	3399.0	2230.4	1504.9	1030.9	723.5	519.7
Pd	9050.9	5631.4	3609.3	2371.4	1601.0	1097.3	770.3	553.5

Table 2: continued

	Emitter							
Absorber	Ne	Na	Mg	Al	Si	P	S	Cl
Ag	9858.8	6067.6	3897.9	2566.2	1734.8	1190.1	835.9	600.9
Cd	10062.6	6341.9	4085.9	2696.1	1823.5	1251.8	880.0	633.2
In	10595.0	6743.8	4356.1	2881.1	1951.8	1341.4	943.4	679.1
Sn	10983.6	7053.1	4572.9	3033.8	2057.9	1415.9	996.6	718.0
Sb	10907.4	7428.5	4831.7	3214.0	2182.7	1503.2	1059.1	763.6
Te	11075.8	7626.1	4979.2	3323.0	2260.7	1559.1	1099.4	793.2
I	10275.8	7939.3	5407.6	3611.0	2461.6	1700.1	1199.7	866.3
Xe	10309.4	8225.3	5636.4	3765.4	2571.4	1778.4	1256.2	907.9
Cs	10398.5	8647.9	5997.4	3998.0	2737.4	1896.9	1341.3	970.4
Ba	10882.3	8462.3	6225.3	4151.2	2848.4	1977.2	1399.8	1013.8
La	11575.5	7864.2	6193.9	4404.0	3024.9	2101.9	1489.6	1079.9
Ce	2081.9	8365.4	7142.7	4646.7	3197.3	2225.8	1580.3	1147.7
Pr	2167.3	9028.0	5935.9	4916.5	3390.6	2363.4	1678.3	1219.0
Nd	2595.0	7945.5	5951.9	5023.4	3525.3	2458.9	1748.6	1271.7
Pm	2706.3	7732.8	6475.7	5165.6	3733.1	2605.8	1855.5	1351.2
Sm	2841.1	1868.6	6795.0	5540.0	3819.9	2668.6	1902.3	1386.6
Eu	2982.5	1964.9	8226.5	5359.2	4009.6	2804.7	2000.7	1459.3
Gd	3022.4	2032.9	7785.2	5853.8	4286.4	2876.5	2054.5	1500.3
Tb	3284.5	2120.4	7605.5	4883.2	4143.3	3004.3	2148.9	1571.3
Dy	3455.6	2205.1	7934.3	5088.7	4031.6	3106.4	2225.2	1629.4
Ho	3636.2	2309.7	1587.4	5697.8	4454.8	3237.7	2319.6	1698.9
Er	3868.8	2425.8	1663.4	5717.7	4487.6	3281.8	2416.2	1769.6
Tm	4124.4	2553.9	1745.7	6306.1	4183.8	3555.9	2524.3	1848.6
Yb	4328.2	2651.8	1805.2	4249.5	4283.2	3421.0	2598.6	1902.2
Lu	4467.5	2800.5	1905.2	1324.3	4472.3	3102.6	2699.1	1983.2
Hf	4692.7	2930.2	1992.7	1384.5	4720.7	3737.2	2793.1	2049.3
Ta	4951.6	3083.6	2096.3	1455.4	4825.4	3352.4	2722.7	2128.3
W	5171.6	3235.5	2199.4	1526.7	3392.8	3486.2	2838.4	2164.5
Re	5386.5	3402.1	2313.7	1606.3	1177.2	3595.0	2958.1	2253.3
Os	5573.5	3542.9	2409.8	1672.8	1183.9	3692.0	3047.9	2318.5
Ir	6062.2	3729.1	2538.3	1762.7	1246.8	3887.6	2750.4	2294.7
Pt	6245.4	3897.1	2654.5	1844.6	1305.5	2743.8	2869.8	2395.3
Au	6910.7	4091.1	2789.8	1940.3	1373.2	985.0	2609.6	2399.2
Hg	6945.2	4249.3	2900.9	2019.4	1429.7	1025.6	3045.3	2223.6
Tl	7082.1	4407.4	3011.9	2098.5	1486.2	1066.2	2161.3	2279.9
Pb	6963.9	4587.0	3138.4	2188.8	1550.9	1112.8	814.8	2370.8
Bi	7167.6	4792.8	3284.0	2293.3	1626.2	1167.0	853.8	2340.1
Po	7514.3	5044.4	3461.3	2419.8	1716.5	1231.9	901.3	2655.5
At	7951.0	5298.4	3632.5	2538.3	1802.3	1293.9	946.2	1949.1
Rn	8041.5	5168.8	3620.9	2527.5	1795.7	1289.5	942.8	703.7
Fr	7533.0	5426.7	3795.2	2646.1	1881.6	1351.6	987.9	737.2
Ra	7551.3	5587.8	3937.0	2743.0	1951.1	1402.2	1025.6	765.7
Ac	7684.7	5746.2	4116.9	2866.4	2041.3	1468.1	1074.0	802.1
Th	7032.5	5880.5	4139.5	2940.4	2095.7	1508.3	1103.9	824.8
Pa	7948.5	6180.3	4359.8	3094.9	2206.2	1587.9	1162.1	868.2
U	8042.4	6272.3	4431.4	3146.2	2243.3	1614.9	1182.3	883.5

Table 2: continued

	Emitter							
Absorber	Ar	K	Ca	Sc	Ti	V	Cr	Mn
H	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
He	1.7	1.2	0.9	0.7	0.6	0.5	0.4	0.4
Li	6.2	4.3	3.1	2.3	1.7	1.3	1.0	0.8
Be	17.6	12.2	8.6	6.2	4.6	3.4	2.6	2.0
B	38.6	26.9	19.1	13.7	10.1	7.5	5.7	4.4
C	75.0	52.4	37.4	27.0	19.9	14.9	11.3	8.6
N	121.2	85.2	61.1	44.3	32.7	24.5	18.6	14.3
O	181.2	128.0	92.2	67.1	49.8	37.5	28.5	21.9
F	241.8	171.7	124.4	90.9	67.7	51.1	38.9	30.0
Ne	340.1	242.9	176.8	129.8	97.1	73.4	56.1	43.3
Na	426.7	306.3	224.0	165.1	124.0	94.1	72.1	55.8
Mg	555.7	400.9	294.7	218.0	164.4	125.2	96.2	74.6
Al	666.8	483.7	357.2	265.3	200.7	153.3	118.3	91.9
Si	830.0	604.9	448.8	334.7	254.2	194.8	150.7	117.5
P	951.0	696.8	519.6	389.0	296.5	228.0	176.9	138.3
S	1141.3	839.5	628.3	472.3	361.4	278.6	216.8	169.9
Cl	1258.0	928.9	697.6	526.3	404.1	312.7	244.2	191.8
Ar	144.0	975.7	750.8	568.1	437.5	339.3	265.6	209.1
K	185.8	134.5	917.8	696.1	537.2	417.9	328.1	259.0
Ca	226.2	163.7	120.7	797.8	622.8	485.9	381.9	302.3
Sc	247.1	178.9	132.0	98.6	651.0	510.1	402.5	319.0
Ti	281.1	203.7	150.3	112.2	85.3	556.5	442.1	351.3
V	316.7	229.7	169.7	126.7	96.4	74.2	478.9	382.0
Cr	367.3	266.6	197.0	147.2	112.0	86.2	67.0	423.9
Mn	410.9	298.6	220.9	165.1	125.7	96.8	75.3	59.2
Fe	472.5	343.6	254.4	190.3	145.0	111.7	86.9	68.4
Co	519.7	378.4	280.5	209.9	160.0	123.3	96.0	75.5
Ni	601.7	438.5	325.3	243.7	185.9	143.4	111.7	87.9
Cu	635.5	463.6	344.2	258.0	196.9	152.0	118.4	93.2
Zn	705.7	515.4	383.1	287.4	219.5	169.5	132.2	104.1
Ga	752.5	550.1	409.4	307.3	234.9	181.5	141.6	111.5
Ge	817.3	598.3	445.8	334.9	256.2	198.1	154.6	121.8
As	892.4	653.9	487.7	366.8	280.7	217.2	169.6	133.7
Se	950.1	697.2	520.6	391.8	300.1	232.3	181.6	143.2
Br	1048.8	770.8	576.5	434.2	332.9	257.8	201.6	159.1
Kr	1112.7	818.9	613.3	462.4	354.8	275.0	215.2	169.9
Rb	1210.0	892.0	669.0	504.9	387.8	300.8	235.5	186.0
Sr	1302.9	962.6	723.5	546.6	420.3	326.2	255.6	202.0
Y	1413.9	1045.8	786.8	595.2	458.1	355.9	279.0	220.6
Zr	1515.0	1120.8	843.5	638.8	492.3	382.9	300.5	237.7
Nb	1630.0	1206.7	908.7	689.0	531.5	413.6	324.7	257.0
Mo	1721.1	1276.0	962.1	730.4	564.1	439.4	345.3	273.5
Tc	1828.1	1359.0	1027.3	781.0	604.0	470.9	370.4	293.6
Ru	1682.1	1433.5	1085.8	825.2	638.0	498.0	392.2	311.0
Rh	1784.7	1527.0	1160.2	881.9	681.9	532.5	419.7	333.1
Pd	1339.8	1392.3	1216.7	925.0	715.3	559.0	440.9	350.1

Table 2: continued

	Emitter							
Absorber	Ar	K	Ca	Sc	Ti	V	Cr	Mn
Ag	440.0	1478.5	1294.2	986.0	764.0	597.7	471.7	375.0
Cd	463.8	1112.4	1160.5	1018.7	794.4	621.7	490.5	390.0
In	497.6	369.5	1221.0	1075.4	840.6	657.9	519.0	413.0
Sn	526.2	390.8	931.0	971.3	875.1	685.9	541.7	431.3
Sb	560.0	416.0	314.3	1008.2	913.7	718.6	569.6	453.8
Te	582.1	432.6	327.0	753.2	808.4	734.9	584.9	466.1
I	636.1	473.0	357.7	273.0	865.4	790.9	631.0	503.2
Xe	667.1	496.4	375.6	286.6	655.2	707.4	651.7	520.4
Cs	713.5	531.2	402.2	306.9	238.2	747.5	685.6	548.8
Ba	746.2	555.9	421.1	321.5	249.7	564.7	612.0	565.6
La	795.4	592.9	449.4	343.3	266.6	209.3	642.7	596.7
Ce	845.7	629.9	477.1	364.6	283.4	222.5	500.7	545.4
Pr	899.1	670.8	508.9	389.0	302.4	237.5	188.2	574.9
Nd	938.9	701.1	532.2	407.0	316.5	248.7	197.1	442.7
Pm	998.4	745.7	566.2	433.3	337.1	264.9	210.0	462.3
Sm	1025.4	766.5	582.5	445.9	347.0	272.8	216.3	173.1
Eu	1080.0	807.8	614.3	470.4	366.2	288.0	228.5	182.9
Gd	1111.3	831.7	632.8	484.8	377.7	297.1	235.7	188.8
Tb	1165.0	872.5	664.3	509.1	396.8	312.2	247.8	198.4
Dy	1209.0	905.7	689.7	528.8	412.3	324.5	257.7	206.4
Ho	1261.2	945.5	720.5	552.7	431.1	339.4	269.6	216.0
Er	1314.4	986.6	752.6	577.5	450.6	354.8	281.9	225.9
Tm	1373.8	1032.2	788.2	605.1	472.3	372.1	295.7	237.1
Yb	1414.1	1063.4	812.7	624.3	487.5	384.3	305.5	245.0
Lu	1475.1	1110.2	849.1	652.6	509.9	402.1	319.9	256.6
Hf	1525.4	1148.6	878.8	675.9	528.4	416.8	331.7	266.1
Ta	1586.3	1195.1	914.8	703.9	550.5	434.4	345.8	277.5
W	1642.3	1238.4	948.8	730.6	571.8	451.3	359.3	288.4
Re	1703.7	1286.1	986.4	759.9	595.0	469.8	374.2	300.5
Os	1749.9	1322.2	1014.9	782.5	613.2	484.5	386.0	310.1
Ir	1820.5	1374.7	1054.6	813.8	638.2	504.5	402.3	323.2
Pt	1873.1	1422.0	1091.3	842.7	661.2	523.1	417.4	335.4
Au	1927.2	1477.7	1135.0	876.6	688.0	544.6	434.7	349.5
Hg	1912.4	1520.2	1169.7	903.7	709.4	561.6	448.4	360.6
Tl	1951.4	1550.8	1202.5	929.4	729.9	578.1	461.8	371.5
Pb	2027.0	1610.1	1241.2	959.8	754.3	597.6	477.5	384.4
Bi	2027.7	1521.0	1285.9	995.2	782.7	620.6	496.2	399.5
Po	1846.3	1596.6	1288.9	1041.5	818.9	649.6	519.7	418.6
At	1929.4	1663.2	1341.0	1083.7	852.0	676.3	541.5	436.3
Rn	2037.3	1649.9	1255.7	1026.5	842.8	669.0	535.5	431.7
Fr	2135.9	1497.5	1311.2	1071.3	876.3	695.8	557.0	449.2
Ra	1478.9	1551.0	1355.9	1038.4	902.0	716.4	573.6	462.8
Ac	608.1	1608.6	1414.4	1082.7	897.5	743.2	595.6	480.7
Th	625.4	1632.9	1242.6	1109.3	917.0	758.2	607.5	490.4
Pa	658.2	1204.3	1304.3	1161.7	905.5	792.9	635.3	512.9
U	669.7	1230.7	1318.3	1179.0	919.1	768.7	642.1	518.5

Table 2: continued

	Emitter							
Absorber	Fe	Co	Ni	Cu	Zn	Ga	Ge	As
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
Li	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3
Be	1.6	1.3	1.0	0.9	0.7	0.6	0.5	0.5
B	3.4	2.7	2.1	1.7	1.4	1.2	1.0	0.9
C	6.7	5.2	4.2	3.3	2.7	2.2	1.8	1.6
N	11.1	8.7	6.9	5.5	4.4	3.6	3.0	2.5
O	17.0	13.3	10.5	8.4	6.8	5.5	4.5	3.8
F	23.3	18.3	14.5	11.6	9.4	7.6	6.2	5.1
Ne	33.8	26.6	21.1	16.9	13.6	11.1	9.1	7.5
Na	43.6	34.4	27.4	22.0	17.7	14.4	11.8	9.7
Mg	58.5	46.3	36.9	29.6	23.9	19.5	16.0	13.2
Al	72.2	57.3	45.8	36.8	29.8	24.3	19.9	16.4
Si	92.5	73.5	58.8	47.4	38.5	31.4	25.8	21.3
P	109.1	86.9	69.7	56.3	45.7	37.4	30.7	25.4
S	134.4	107.3	86.2	69.7	56.8	46.5	38.2	31.6
Cl	152.1	121.7	98.0	79.4	64.8	53.1	43.7	36.2
Ar	166.3	133.4	107.7	87.4	71.4	58.6	48.3	40.1
K	206.3	165.9	134.2	109.1	89.3	73.5	60.6	50.3
Ca	241.4	194.6	157.8	128.5	105.4	86.8	71.7	59.6
Sc	255.2	205.9	167.3	136.5	112.1	92.6	76.6	63.8
Ti	281.6	227.7	185.2	151.4	124.6	103.0	85.3	71.1
V	307.1	249.1	203.1	166.3	137.0	113.4	94.1	78.5
Cr	343.8	281.1	230.4	188.8	155.7	129.1	107.3	89.7
Mn	373.6	305.7	250.8	205.8	170.0	141.1	117.3	98.2
Fe	54.3	341.0	280.6	230.9	191.2	159.1	132.5	111.0
Co	60.0	48.1	298.9	247.3	205.8	171.7	143.2	120.1
Ni	69.8	56.0	45.3	279.1	233.1	195.0	162.8	136.6
Cu	74.1	59.4	48.1	39.2	239.4	201.6	168.6	141.8
Zn	82.7	66.4	53.7	43.8	35.9	217.9	182.7	154.1
Ga	88.7	71.2	57.6	47.0	38.6	31.9	190.8	161.1
Ge	96.9	77.8	63.0	51.4	42.2	34.9	29.0	172.2
As	106.5	85.5	69.3	56.5	46.4	38.3	31.8	26.6
Se	114.1	91.6	74.2	60.6	49.7	41.1	34.2	28.6
Br	126.7	101.9	82.6	67.4	55.3	45.8	38.0	31.8
Kr	135.4	108.9	88.3	72.1	59.2	49.0	40.7	34.0
Rb	148.4	119.4	96.8	79.0	64.9	53.7	44.7	37.4
Sr	161.2	129.7	105.3	86.0	70.6	58.5	48.6	40.7
Y	176.1	141.9	115.2	94.1	77.4	64.0	53.2	44.6
Zr	189.8	152.9	124.2	101.5	83.5	69.1	57.5	48.1
Nb	205.4	165.6	134.5	110.0	90.5	74.9	62.3	52.2
Mo	218.6	176.4	143.3	117.2	96.5	79.9	66.5	55.7
Tc	234.9	189.6	154.2	126.1	103.8	86.0	71.6	60.0
Ru	248.9	201.0	163.5	133.8	110.2	91.4	76.0	63.7
Rh	266.8	215.6	175.5	143.7	118.4	98.2	81.7	68.5
Pd	280.7	227.0	184.8	151.4	124.8	103.5	86.2	72.2

Table 2: continued

	Emitter							
Absorber	Fe	Co	Ni	Cu	Zn	Ga	Ge	As
Ag	300.8	243.4	198.4	162.6	134.1	111.2	92.7	77.7
Cd	313.1	253.5	206.6	169.4	139.8	116.0	96.7	81.1
In	331.7	268.8	219.2	179.8	148.4	123.2	102.7	86.1
Sn	346.6	280.9	229.3	188.2	155.4	129.1	107.6	90.3
Sb	364.7	295.6	241.4	198.2	163.8	136.1	113.5	95.2
Te	374.6	303.6	247.9	203.7	168.4	140.0	116.8	98.1
I	404.7	328.3	268.2	220.5	182.4	151.7	126.6	106.3
Xe	419.1	340.4	278.4	229.0	189.5	157.7	131.7	110.6
Cs	442.9	360.4	295.1	242.8	201.0	167.4	139.8	117.5
Ba	457.6	373.3	306.1	251.9	208.5	173.6	145.1	122.0
La	483.4	394.9	324.0	266.5	220.6	183.7	153.5	129.1
Ce	510.1	417.3	342.7	281.9	233.4	194.4	162.6	136.8
Pr	538.9	441.4	362.8	298.8	247.5	206.3	172.6	145.3
Nd	485.4	457.2	376.3	310.3	257.5	214.8	179.8	151.4
Pm	510.8	481.9	396.9	328.1	272.8	227.9	190.8	160.6
Sm	382.7	428.1	405.2	335.3	279.2	233.5	195.5	164.6
Eu	400.9	444.6	423.7	351.5	293.3	245.6	205.7	173.2
Gd	152.6	334.5	375.2	359.6	300.3	251.6	210.8	177.7
Tb	160.4	349.9	391.0	375.5	313.8	263.1	220.6	186.0
Dy	166.9	136.0	298.8	335.9	323.6	271.3	227.7	192.2
Ho	174.6	142.4	308.9	254.9	335.9	281.7	236.6	199.9
Er	182.7	149.0	122.4	270.0	302.5	292.8	246.1	208.0
Tm	191.8	156.4	128.6	277.4	230.2	305.2	256.7	217.1
Yb	198.2	161.7	132.9	110.0	241.3	271.6	264.2	223.6
Lu	207.6	169.4	139.3	115.3	247.2	206.4	275.3	233.1
Hf	215.4	175.9	144.6	119.7	255.0	214.4	252.7	240.6
Ta	224.7	183.4	150.9	124.9	104.0	222.2	185.8	249.4
W	233.6	190.8	157.0	130.0	108.3	230.0	192.4	228.3
Re	243.5	198.9	163.7	135.6	112.9	94.7	205.3	170.5
Os	251.3	205.4	169.1	140.0	116.7	97.9	207.8	179.7
Ir	262.0	214.1	176.3	146.0	121.7	102.1	86.0	180.8
Pt	271.9	222.3	183.0	151.6	126.4	106.0	89.4	187.5
Au	283.4	231.7	190.9	158.2	131.9	110.6	93.2	79.0
Hg	292.5	239.3	197.1	163.4	136.3	114.4	96.4	81.7
Tl	301.6	246.8	203.4	168.6	140.6	118.0	99.5	84.4
Pb	312.1	255.6	210.7	174.7	145.8	122.3	103.2	87.5
Bi	324.5	265.7	219.1	181.8	151.7	127.4	107.4	91.1
Po	340.1	278.6	229.9	190.7	159.2	133.7	112.8	95.7
At	354.6	290.5	239.8	199.0	166.2	139.6	117.8	99.9
Rn	351.0	287.8	237.6	197.2	164.7	138.4	116.8	99.1
Fr	365.4	299.7	247.4	205.5	171.6	144.2	121.7	103.3
Ra	376.7	309.1	255.3	212.0	177.2	148.9	125.7	106.7
Ac	391.3	321.2	265.4	220.5	184.3	154.9	130.8	111.1
Th	399.4	327.9	271.0	225.2	188.3	158.3	133.7	113.5
Pa	417.7	343.0	283.5	235.7	197.1	165.8	140.1	119.0
U	422.3	346.8	286.7	238.5	199.5	167.9	141.8	120.5

Table 2: continued

	Emitter							
Absorber	Se	Br	Kr	Rb	Sr	Y	Zr	Nb
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Be	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2
B	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.3
C	1.3	1.1	0.9	0.8	0.7	0.6	0.6	0.5
N	2.1	1.7	1.5	1.2	1.1	0.9	0.8	0.7
O	3.1	2.6	2.2	1.9	1.6	1.4	1.2	1.0
F	4.3	3.6	3.0	2.5	2.1	1.8	1.6	1.4
Ne	6.2	5.2	4.3	3.6	3.1	2.7	2.3	2.0
Na	8.1	6.7	5.6	4.7	4.0	3.4	2.9	2.5
Mg	10.9	9.1	7.6	6.4	5.4	4.6	4.0	3.4
Al	13.6	11.4	9.5	8.0	6.8	5.8	4.9	4.2
Si	17.6	14.7	12.4	10.4	8.8	7.5	6.4	5.5
P	21.1	17.6	14.8	12.5	10.6	9.0	7.7	6.6
S	26.3	22.0	18.5	15.6	13.2	11.3	9.6	8.3
Cl	30.2	25.3	21.3	18.0	15.2	13.0	11.1	9.5
Ar	33.4	28.0	23.6	20.0	17.0	14.4	12.4	10.6
K	42.0	35.3	29.8	25.2	21.4	18.3	15.6	13.4
Ca	49.8	41.9	35.4	30.0	25.5	21.8	18.6	16.0
Sc	53.4	44.9	38.0	32.3	27.4	23.4	20.1	17.3
Ti	59.6	50.2	42.5	36.1	30.8	26.3	22.5	19.4
V	65.9	55.6	47.2	40.1	34.2	29.2	25.1	21.6
Cr	75.3	63.6	54.0	46.0	39.3	33.6	28.9	24.9
Mn	82.6	69.8	59.4	50.6	43.2	37.0	31.8	27.5
Fe	93.4	79.1	67.3	57.5	49.1	42.1	36.2	31.3
Co	101.2	85.8	73.1	62.4	53.4	45.8	39.5	34.1
Ni	115.3	97.8	83.4	71.3	61.0	52.4	45.2	39.2
Cu	119.9	101.9	87.0	74.6	63.9	54.9	47.4	41.1
Zn	130.5	111.2	95.2	81.7	70.1	60.3	52.1	45.1
Ga	136.7	116.6	100.0	86.0	73.8	63.5	54.9	47.6
Ge	146.2	124.8	107.1	92.1	79.1	68.2	58.9	51.2
As	157.0	134.2	115.2	99.2	85.3	73.5	63.6	55.2
Se	24.0	140.4	120.6	104.0	89.5	77.2	66.9	58.2
Br	26.7	22.6	130.8	112.7	97.1	84.0	72.9	63.5
Kr	28.6	24.2	20.5	117.6	101.5	88.0	76.5	66.7
Rb	31.4	26.5	22.6	19.2	108.8	94.4	82.2	71.8
Sr	34.2	28.9	24.6	20.9	17.9	100.4	87.6	76.6
Y	37.5	31.7	26.9	23.0	19.7	16.9	93.9	82.1
Zr	40.5	34.2	29.1	24.8	21.3	18.3	15.8	86.8
Nb	43.9	37.1	31.6	26.9	23.1	19.8	17.1	14.8
Mo	46.8	39.6	33.7	28.7	24.6	21.2	18.3	15.9
Tc	50.5	42.7	36.3	31.0	26.6	22.9	19.7	17.1
Ru	53.6	45.4	38.6	32.9	28.2	24.3	21.0	18.2
Rh	57.6	48.8	41.5	35.4	30.4	26.1	22.6	19.6
Pd	60.8	51.5	43.8	37.4	32.1	27.6	23.8	20.7

Table 2: continued

	Emitter							
Absorber	Se	Br	Kr	Rb	Sr	Y	Zr	Nb
Ag	65.4	55.4	47.2	40.3	34.5	29.7	25.7	22.3
Cd	68.3	57.8	49.3	42.1	36.1	31.1	26.9	23.3
In	72.6	61.5	52.4	44.8	38.4	33.1	28.6	24.8
Sn	76.1	64.5	55.0	47.0	40.3	34.7	30.0	26.0
Sb	80.3	68.1	58.0	49.6	42.5	36.6	31.7	27.5
Te	82.7	70.2	59.8	51.1	43.9	37.8	32.7	28.4
I	89.7	76.1	64.9	55.5	47.7	41.0	35.5	30.8
Xe	93.4	79.2	67.6	57.8	49.7	42.8	37.0	32.1
Cs	99.2	84.2	71.8	61.5	52.8	45.5	39.4	34.2
Ba	103.0	87.5	74.7	63.9	54.9	47.3	41.0	35.6
La	109.1	92.7	79.1	67.8	58.2	50.2	43.5	37.7
Ce	115.6	98.3	83.9	71.9	61.8	53.3	46.1	40.1
Pr	122.8	104.4	89.3	76.5	65.8	56.7	49.1	42.7
Nd	128.0	108.9	93.1	79.8	68.6	59.2	51.3	44.6
Pm	135.9	115.6	98.8	84.7	72.8	62.9	54.5	47.3
Sm	139.3	118.5	101.4	86.9	74.8	64.5	55.9	48.6
Eu	146.6	124.7	106.7	91.5	78.7	68.0	58.9	51.2
Gd	150.4	128.0	109.5	94.0	80.9	69.9	60.6	52.7
Tb	157.6	134.3	114.9	98.7	85.0	73.4	63.7	55.4
Dy	163.0	138.9	119.0	102.3	88.1	76.1	66.1	57.5
Ho	169.6	144.7	124.1	106.7	92.0	79.5	69.0	60.1
Er	176.6	150.8	129.4	111.3	96.0	83.0	72.0	62.7
Tm	184.5	157.6	135.3	116.5	100.4	86.9	75.4	65.7
Yb	190.1	162.4	139.5	120.1	103.6	89.6	77.8	67.8
Lu	198.3	169.5	145.7	125.5	108.3	93.6	81.3	70.9
Hf	204.7	175.2	150.6	129.9	112.0	96.9	84.2	73.3
Ta	212.4	181.8	156.4	134.9	116.4	100.7	87.5	76.3
W	219.6	188.2	162.0	139.8	120.7	104.4	90.8	79.1
Re	197.3	195.0	167.9	145.0	125.2	108.4	94.3	82.2
Os	201.9	200.1	172.3	148.8	128.5	111.4	96.9	84.6
Ir	152.7	182.8	178.5	154.0	133.2	115.5	100.6	87.9
Pt	158.1	185.3	184.3	158.9	137.4	119.3	103.9	90.9
Au	164.7	139.8	172.4	164.8	142.7	123.9	108.0	94.5
Hg	170.0	144.1	123.1	169.2	146.6	127.4	111.2	97.3
Tl	71.8	154.6	131.1	150.6	150.8	131.1	114.4	100.1
Pb	74.5	153.9	131.3	112.4	134.9	135.2	118.0	103.4
Bi	77.6	66.5	136.5	116.8	139.1	140.1	122.3	107.1
Po	81.5	69.8	143.1	122.7	105.5	126.9	127.8	111.9
At	85.1	72.9	62.8	128.7	110.4	94.9	132.7	116.2
Rn	84.4	72.3	62.3	126.7	109.0	94.0	122.2	114.6
Fr	88.0	75.4	65.0	56.1	113.4	97.8	84.8	103.7
Ra	91.0	78.0	67.1	58.0	117.2	100.9	87.5	109.8
Ac	94.7	81.2	69.9	60.4	52.4	111.2	98.6	81.2
Th	96.8	83.0	71.5	61.8	53.7	110.8	101.5	86.0
Pa	101.5	87.1	75.0	64.8	56.3	112.9	97.8	85.0
U	102.8	88.2	76.0	65.7	57.0	49.7	99.1	86.0

Table 2: continued

	Emitter							
Absorber	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Be	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
B	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
C	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.3
N	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4
O	0.9	0.8	0.7	0.7	0.6	0.6	0.5	0.5
F	1.2	1.1	0.9	0.8	0.8	0.7	0.6	0.6
Ne	1.7	1.5	1.3	1.2	1.0	0.9	0.8	0.7
Na	2.2	1.9	1.7	1.5	1.3	1.2	1.0	0.9
Mg	2.9	2.5	2.2	2.0	1.7	1.5	1.4	1.2
Al	3.6	3.2	2.8	2.4	2.1	1.9	1.7	1.5
Si	4.7	4.1	3.6	3.1	2.7	2.4	2.1	1.9
P	5.7	4.9	4.3	3.7	3.3	2.9	2.5	2.2
S	7.1	6.2	5.3	4.7	4.1	3.6	3.1	2.8
Cl	8.2	7.1	6.2	5.4	4.7	4.1	3.6	3.2
Ar	9.1	7.9	6.9	6.0	5.2	4.6	4.0	3.5
K	11.6	10.0	8.7	7.6	6.6	5.8	5.1	4.5
Ca	13.8	12.0	10.4	9.1	7.9	6.9	6.1	5.4
Sc	14.9	12.9	11.2	9.8	8.5	7.5	6.6	5.8
Ti	16.8	14.5	12.6	11.0	9.6	8.4	7.4	6.5
V	18.7	16.2	14.1	12.3	10.7	9.4	8.3	7.3
Cr	21.5	18.7	16.3	14.2	12.4	10.9	9.6	8.4
Mn	23.8	20.7	18.0	15.7	13.7	12.0	10.6	9.4
Fe	27.1	23.6	20.5	17.9	15.7	13.8	12.1	10.7
Co	29.6	25.7	22.4	19.6	17.1	15.1	13.3	11.7
Ni	34.0	29.6	25.8	22.5	19.7	17.3	15.3	13.5
Cu	35.7	31.0	27.1	23.7	20.8	18.3	16.1	14.2
Zn	39.3	34.2	29.8	26.1	22.9	20.1	17.8	15.7
Ga	41.4	36.1	31.5	27.6	24.2	21.3	18.8	16.7
Ge	44.5	38.8	33.9	29.7	26.1	23.0	20.3	18.0
As	48.1	42.0	36.7	32.2	28.3	25.0	22.1	19.5
Se	50.8	44.3	38.8	34.0	29.9	26.4	23.3	20.7
Br	55.5	48.5	42.4	37.2	32.8	28.9	25.6	22.7
Kr	58.4	51.1	44.7	39.3	34.6	30.5	27.0	24.0
Rb	62.9	55.1	48.3	42.4	37.4	33.0	29.2	26.0
Sr	67.2	58.9	51.6	45.4	40.0	35.4	31.3	27.8
Y	72.1	63.2	55.5	48.8	43.0	38.1	33.8	30.0
Zr	76.1	66.8	58.7	51.7	45.6	40.4	35.9	31.9
Nb	81.0	71.2	62.6	55.2	48.8	43.2	38.4	34.2
Mo	13.8	74.4	65.5	57.8	51.2	45.4	40.4	36.0
Tc	14.9	13.0	69.5	61.3	54.3	48.2	42.9	38.3
Ru	15.8	13.8	12.1	64.1	56.8	50.5	44.9	40.1
Rh	17.0	14.9	13.0	11.4	60.1	53.4	47.6	42.5
Pd	18.0	15.7	13.8	12.1	10.6	55.5	49.4	44.2

Table 2: continued

	Emitter							
Absorber	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In
Ag	19.4	16.9	14.8	13.0	11.5	10.1	52.3	46.7
Cd	20.3	17.7	15.5	13.6	12.0	10.6	9.4	48.0
In	21.6	18.8	16.5	14.5	12.8	11.3	10.0	8.9
Sn	22.6	19.8	17.3	15.2	13.4	11.9	10.5	9.3
Sb	23.9	20.9	18.3	16.1	14.2	12.5	11.1	9.9
Te	24.7	21.6	18.9	16.6	14.6	12.9	11.5	10.2
I	26.8	23.4	20.5	18.0	15.9	14.1	12.4	11.1
Xe	28.0	24.4	21.4	18.8	16.6	14.7	13.0	11.5
Cs	29.8	26.0	22.8	20.0	17.7	15.6	13.8	12.3
Ba	31.0	27.1	23.7	20.9	18.4	16.2	14.4	12.8
La	32.9	28.7	25.2	22.2	19.5	17.3	15.3	13.6
Ce	34.9	30.5	26.8	23.5	20.7	18.3	16.3	14.4
Pr	37.2	32.5	28.5	25.1	22.1	19.5	17.3	15.4
Nd	38.8	34.0	29.8	26.2	23.1	20.4	18.1	16.1
Pm	41.3	36.1	31.7	27.9	24.6	21.7	19.3	17.1
Sm	42.4	37.1	32.6	28.6	25.3	22.3	19.8	17.6
Eu	44.7	39.1	34.3	30.2	26.6	23.6	20.9	18.6
Gd	46.0	40.2	35.3	31.1	27.4	24.2	21.5	19.1
Tb	48.4	42.3	37.1	32.7	28.8	25.5	22.6	20.1
Dy	50.2	43.9	38.6	34.0	30.0	26.5	23.5	20.9
Ho	52.5	45.9	40.3	35.5	31.3	27.7	24.6	21.9
Er	54.8	48.0	42.2	37.1	32.8	29.0	25.7	22.9
Tm	57.4	50.3	44.2	38.9	34.4	30.4	27.0	24.0
Yb	59.3	51.9	45.6	40.2	35.5	31.4	27.9	24.8
Lu	61.9	54.3	47.7	42.0	37.1	32.9	29.2	26.0
Hf	64.1	56.2	49.4	43.5	38.5	34.1	30.3	26.9
Ta	66.7	58.5	51.4	45.3	40.0	35.5	31.5	28.1
W	69.2	60.7	53.4	47.0	41.6	36.9	32.8	29.2
Re	72.0	63.1	55.5	48.9	43.3	38.4	34.1	30.4
Os	74.1	65.0	57.2	50.4	44.6	39.6	35.2	31.3
Ir	77.0	67.6	59.5	52.5	46.4	41.2	36.6	32.6
Pt	79.7	70.0	61.6	54.4	48.1	42.7	37.9	33.8
Au	82.9	72.8	64.1	56.6	50.1	44.4	39.5	35.2
Hg	85.4	75.1	66.1	58.4	51.6	45.8	40.8	36.4
Tl	87.9	77.3	68.1	60.1	53.2	47.2	42.0	37.5
Pb	90.8	79.8	70.3	62.1	55.0	48.8	43.5	38.8
Bi	94.1	82.8	72.9	64.4	57.1	50.7	45.1	40.3
Po	98.3	86.5	76.2	67.4	59.7	53.1	47.2	42.2
At	102.0	89.8	79.2	70.0	62.1	55.2	49.2	43.9
Rn	100.6	88.5	78.1	69.1	61.3	54.5	48.6	43.4
Fr	104.4	91.9	81.2	71.8	63.7	56.7	50.6	45.2
Ra	107.5	94.7	83.6	74.0	65.7	58.5	52.2	46.6
Ac	102.2	98.3	86.9	76.9	68.3	60.8	54.2	48.5
Th	71.0	100.0	88.4	78.3	69.5	61.9	55.3	49.5
Pa	74.1	90.9	92.4	81.9	72.8	64.8	57.9	51.8
U	74.9	65.6	83.7	82.7	73.5	65.5	58.5	52.4

Table 3: Mass attenuation coefficients for Lα lines.

	Emitter							
Absorber	Ca	Sc	Ti	V	Cr	Mn	Fe	Co
H	234.5	144.7	93.3	62.4	42.9	30.2	21.6	15.7
He	1755.3	1112.7	728.4	494.5	345.1	246.0	177.9	131.1
Li	5679.7	3720.5	2508.3	1733.8	1232.2	891.6	654.9	487.4
Be	12768.7	8673.2	5962.1	4223.3	3063.6	2254.1	1682.6	1267.2
B	22232.3	15510.7	10995.9	7948.9	5860.3	4385.8	3311.6	2529.8
C	34416.0	24523.3	17597.9	12945.8	9707.5	7412.5	5778.3	4449.3
N	2066.8	1288.2	24478.7	18418.9	14102.4	10740.1	8309.5	6489.2
O	3583.4	2474.3	1755.9	1283.0	18729.8	14476.8	11289.9	8867.8
F	5169.4	3524.2	2394.1	1691.6	1222.9	886.8	13172.8	10479.5
Ne	7997.5	5487.2	3844.4	2769.2	2042.8	1538.9	1177.5	917.0
Na	10671.5	7301.0	5161.0	3766.1	2814.8	2159.6	1645.9	1268.2
Mg	15935.8	11028.1	7810.2	5653.2	4169.2	3123.1	2371.6	1815.8
Al	18849.4	13315.2	9751.7	7181.4	5362.5	4034.8	3079.0	2377.6
Si	24575.6	17640.8	12800.1	9428.3	7085.0	5349.6	4102.3	3224.8
P	27211.3	20204.6	14960.7	11211.8	8471.0	6513.9	5005.2	3898.9
S	32399.5	24497.1	18317.9	13820.2	10596.0	8187.2	6370.7	4949.4
Cl	35386.8	27088.1	20057.0	15036.4	11429.6	8805.4	6863.0	5387.0
Ar	41272.8	29092.4	21758.9	17006.5	13263.8	10354.6	8148.5	6444.6
K	42855.9	34768.1	27022.7	20533.5	15785.5	12306.6	9692.8	7552.5
Ca	4868.0	35172.2	30140.2	23303.2	18149.6	14289.5	11337.1	8999.7
Sc	5554.9	4563.6	26789.3	26206.2	20270.8	16253.0	13147.0	10680.6
Ti	5886.8	4294.4	3315.4	23412.4	20093.0	16709.4	13346.7	10656.3
V	6763.0	4980.5	3683.7	2877.6	20050.6	18018.2	14460.8	11622.3
Cr	8017.9	5750.4	4400.3	3465.3	2708.4	17898.1	15866.4	13692.1
Mn	8629.8	6408.9	4790.5	3664.9	2895.2	2316.0	16092.2	14246.4
Fe	10867.0	7744.5	5737.5	4345.8	3355.0	2672.9	2148.8	14531.9
Co	10527.0	7889.2	6016.3	4657.3	3670.6	2935.6	2369.3	1923.3
Ni	14242.3	10523.2	7897.1	6019.4	4532.2	3524.2	2834.6	2165.5
Cu	14667.6	11112.0	8330.8	6584.3	5183.5	4073.7	3201.6	2636.1
Zn	17084.1	12873.9	9594.3	7103.6	5398.9	4273.1	3423.9	2784.5
Ga	19409.3	14726.8	11178.8	8681.5	6752.4	5306.1	4110.6	3117.7
Ge	21430.8	16391.4	12593.2	9588.0	7443.1	5765.2	4528.4	3565.3
As	19712.8	15391.2	11874.2	9280.7	7321.2	5830.1	4678.1	3785.1
Se	21401.8	16748.2	12953.5	10147.9	8031.1	6406.0	5142.4	4158.1
Br	23389.8	18490.0	14351.3	11275.4	8949.2	7162.6	5768.9	4667.2
Kr	24690.2	20597.7	16163.0	12896.1	10241.7	8168.0	6610.0	5408.1
Rb	26915.3	21650.3	17008.2	13473.5	10724.9	8615.6	6972.3	5667.3
Sr	27525.8	22971.3	18129.5	14443.4	11582.2	9348.5	7587.1	6165.8
Y	28863.7	25258.1	19663.1	15509.8	12453.1	10119.3	8149.2	6562.3
Zr	29111.2	24706.4	21365.9	17715.8	14479.1	11672.9	9560.6	7878.3
Nb	23814.6	22159.5	19525.4	16741.9	14104.4	11701.2	9813.2	8218.4
Mo	24550.5	30237.2	22420.5	19137.6	16182.1	13401.4	11184.7	9128.4
Tc	24479.1	24312.9	22171.5	18928.9	16626.5	13528.5	11102.1	9124.5
Ru	24233.7	23694.5	20774.7	19745.6	15936.9	13484.5	11419.9	9498.1
Rh	13408.0	21179.8	21377.8	20210.2	17611.4	15646.4	12928.6	10651.2
Pd	5764.6	17007.7	19610.3	19327.7	18065.2	15763.8	13734.9	11392.9

Table 3: continued

	Emitter							
Absorber	Ca	Sc	Ti	V	Cr	Mn	Fe	Co
Ag	5099.0	9489.1	19179.3	19673.7	18542.5	16270.5	14331.9	12209.3
Cd	4838.3	4404.8	11195.9	19853.0	16768.3	15336.2	13873.6	12282.5
In	6145.6	4919.4	4503.3	16772.7	15763.5	13666.9	14838.8	12371.0
Sn	6186.9	4954.5	4191.7	9120.4	16105.9	14301.7	12372.7	13145.2
Sb	5598.0	4967.8	4186.7	3542.3	21784.3	17009.4	13474.9	11151.5
Te	6986.5	5874.6	4676.1	4010.2	6524.4	17416.5	14388.0	11807.4
I	7032.1	6026.4	5039.2	4151.6	3441.2	20341.3	15635.1	12429.5
Xe	7062.9	6295.2	5522.2	4582.0	3862.1	3283.8	17111.5	13430.7
Cs	6676.9	6117.1	5365.6	4588.7	3923.0	3344.7	2852.5	13552.7
Ba	7262.3	6472.0	5669.6	4946.5	4132.5	3479.7	2922.7	2415.2
La	7159.7	6824.2	6327.1	5519.9	4589.6	3751.6	3166.1	2605.4
Ce	7790.2	7062.2	6279.8	5431.5	4673.8	4021.9	3343.0	2684.4
Pr	8082.8	7424.6	6562.3	5677.6	4923.2	4035.3	3385.5	2757.0
Nd	8289.9	7419.6	6640.0	5870.6	5165.5	4508.5	3810.3	3173.0
Pm	9210.0	8401.2	7074.9	6163.1	5259.0	4492.3	3843.5	3278.8
Sm	10469.5	9324.9	7709.7	6526.5	5549.5	4725.1	4035.0	3443.5
Eu	10439.6	9483.4	8055.8	6858.5	5831.5	4962.4	4232.2	3614.1
Gd	10366.2	8927.0	7696.4	6796.8	5870.3	5013.7	4283.7	3657.6
Tb	12058.9	10368.2	8862.4	7662.9	6600.3	5577.0	4710.0	3994.6
Dy	13067.1	11342.6	9662.1	8147.3	6950.3	5869.1	4957.2	4215.3
Ho	12937.9	11401.9	9982.6	8638.1	7370.5	6188.0	5254.7	4439.3
Er	14572.1	12305.3	10667.7	9163.4	7820.8	6608.0	5582.7	4722.8
Tm	13751.5	12436.4	11174.5	9849.4	8374.5	7079.3	5991.6	5059.2
Yb	15797.5	13620.4	11782.5	10117.1	8766.2	7417.1	6271.3	5308.2
Lu	15196.2	13747.9	11740.3	10508.3	9013.5	7638.3	6477.8	5475.4
Hf	15024.3	13103.2	11595.2	10184.1	9183.2	7994.0	6785.6	5728.2
Ta	15222.6	13346.8	12548.5	10892.4	9817.3	8386.3	7130.4	6037.1
W	15726.8	14102.6	12970.2	11320.0	9752.1	8740.3	7449.5	6321.7
Re	15649.2	14079.5	12694.8	11492.9	10035.1	9110.0	7720.1	6559.3
Os	15235.1	14018.3	12211.5	11469.1	10151.0	8813.5	7913.2	6751.8
Ir	15931.1	14967.8	13652.0	12269.2	10963.8	9421.0	8166.7	7120.0
Pt	15536.9	15096.1	13307.2	11666.4	11129.3	9751.7	8415.1	7563.5
Au	15460.4	14779.1	13555.3	12266.8	11138.9	10129.4	9015.6	8010.2
Hg	16090.2	15678.6	14300.2	12750.0	11167.5	10421.8	9273.5	7953.3
Tl	14489.2	14513.1	13682.7	12459.8	11023.6	9683.8	9309.6	8030.4
Pb	13323.0	13860.0	13107.9	12074.2	10817.6	9704.7	8832.0	8006.4
Bi	12331.6	12857.4	12974.5	12575.9	11539.2	10112.0	8851.1	8477.8
Po	11412.8	13295.1	14466.2	14254.2	12734.1	10653.7	9295.6	8899.1
At	9801.8	12301.2	12826.2	12974.0	12195.8	11142.9	9773.4	8489.5
Rn	8356.0	11074.6	11953.0	12045.2	11884.4	11071.5	9737.6	8505.3
Fr	5998.8	9662.7	11284.4	11874.0	11687.9	11789.5	10224.8	8790.9
Ra	3868.9	7602.1	10480.9	11074.5	10839.9	10742.4	10304.1	8991.0
Ac	2375.3	5740.4	9516.7	10785.8	11055.2	10469.4	9710.8	8895.3
Th	2445.2	4253.0	6885.2	8572.5	8852.1	8888.3	8805.7	8045.6
Pa	2138.8	3382.1	6417.9	8825.1	9779.8	9573.4	9711.2	9233.6
U	1932.2	2173.7	3234.9	4917.3	6358.4	6071.0	6289.4	7317.1

Table 3: continued

	Emitter							
Absorber	Ni	Cu	Zn	Ga	Ge	As	Se	Br
H	11.5	8.6	7.0	5.5	4.3	3.4	2.8	2.2
He	97.4	73.9	58.6	45.1	35.2	27.6	21.9	17.5
Li	366.3	279.5	225.6	174.9	137.3	108.4	86.4	69.4
Be	964.3	744.5	583.4	456.3	361.2	287.5	230.9	186.7
B	1946.2	1510.2	1188.0	934.7	744.1	595.6	481.0	390.9
C	3456.3	2713.4	2139.3	1694.3	1357.5	1093.3	888.3	726.1
N	5068.1	4019.1	3206.5	2556.3	2060.9	1669.9	1364.7	1121.9
O	6965.0	5594.4	4449.2	3569.5	2895.1	2359.7	1939.4	1603.1
F	8416.3	6806.9	5481.5	4431.3	3620.1	2971.4	2458.6	2045.7
Ne	715.3	9187.9	7194.9	5848.0	4802.1	3961.6	3293.8	2753.5
Na	983.8	774.4	634.1	6117.8	5197.5	4432.6	3804.7	3280.5
Mg	1403.9	1094.2	894.4	718.7	583.2	475.2	4818.0	4118.8
Al	1847.7	1452.7	1148.8	922.8	749.3	611.4	503.0	416.2
Si	2528.4	1982.4	1522.3	1224.0	994.8	812.4	669.0	554.0
P	3041.2	2404.6	1855.1	1492.5	1213.8	992.0	817.3	677.3
S	3887.1	3078.8	2355.7	1896.7	1543.5	1262.2	1040.6	862.9
Cl	4260.8	3402.8	2746.8	2213.7	1803.1	1475.8	1217.7	1010.5
Ar	5070.1	4046.8	3088.8	2492.2	2032.3	1665.2	1375.5	1142.6
K	5946.0	4908.1	3937.4	3181.4	2597.7	2131.2	1762.6	1465.9
Ca	7161.9	5769.2	4723.4	3822.5	3125.9	2568.3	2127.1	1771.5
Sc	8693.0	7016.3	5084.5	4120.7	3374.4	2776.3	2302.4	1919.9
Ti	8548.8	6921.4	5698.2	4624.4	3791.8	3123.7	2593.6	2165.3
V	9367.5	7612.9	6307.7	5129.1	4213.5	3477.4	2892.3	2418.7
Cr	11176.9	8928.8	7193.3	5859.7	4822.0	3986.2	3320.9	2781.5
Mn	11569.0	9466.5	7864.6	6424.1	5300.0	4392.5	3668.2	3079.6
Fe	13034.3	10691.0	8832.3	7235.9	5986.6	4975.2	4165.7	3506.3
Co	12662.3	11158.4	9525.9	7817.9	6479.0	5393.2	4522.8	3812.6
Ni	1800.1	11746.7	10896.4	8944.9	7414.7	6173.5	5178.4	4366.3
Cu	2133.3	1552.3	10234.4	9300.3	7716.3	6430.2	5398.3	4555.3
Zn	2237.3	1818.7	1511.4	8410.6	7445.4	7062.0	5913.2	4977.3
Ga	2449.3	1988.8	1651.1	1360.3	7240.7	6500.9	6223.5	5246.1
Ge	2826.3	2244.8	1841.8	1517.0	1260.1	6545.0	5859.0	5642.4
As	3066.2	2505.1	2063.4	1698.6	1411.4	1177.3	5952.0	5331.8
Se	3372.1	2757.5	2254.3	1856.6	1543.9	1286.8	1080.2	5215.5
Br	3783.2	3099.7	2552.5	2099.8	1744.2	1455.1	1222.8	1033.0
Kr	4357.9	3464.3	2776.5	2285.4	1899.4	1585.4	1333.1	1126.7
Rb	4608.3	3774.2	3088.0	2543.3	2114.9	1766.3	1485.9	1256.4
Sr	5023.7	4127.8	3399.8	2802.2	2331.9	1948.9	1640.6	1388.2
Y	5332.9	4364.4	3760.0	3100.6	2581.3	2158.2	1817.6	1538.6
Zr	6477.4	5236.2	4097.0	3380.3	2815.6	2355.3	1984.5	1680.6
Nb	6857.0	5500.7	4476.8	3695.3	3079.2	2576.9	2172.2	1840.2
Mo	7517.5	6134.2	4810.1	3973.0	3312.7	2774.0	2339.6	1983.2
Tc	7514.0	6225.7	5213.5	4308.6	3594.4	3011.4	2541.2	2155.1
Ru	7886.7	6628.5	5566.3	4602.9	3842.2	3220.8	2719.3	2307.3
Rh	8775.3	7272.6	6006.0	4970.4	4152.0	3483.0	2942.7	2498.6
Pd	9399.2	7808.3	6365.8	5271.5	4406.1	3698.3	3126.3	2656.0

Table 3: continued

	Emitter							
Absorber	Ni	Cu	Zn	Ga	Ge	As	Se	Br
Ag	10188.0	8315.0	6854.6	5681.7	4753.4	3993.4	3378.8	2872.8
Cd	10443.3	8716.9	7158.7	5941.1	4976.2	4185.4	3545.1	3017.4
In	10926.7	9203.8	7606.9	6320.1	5299.1	4461.6	3782.7	3222.8
Sn	11342.1	9793.3	7947.7	6613.6	5553.5	4682.6	3975.7	3391.8
Sb	11169.7	9535.1	8363.4	6968.9	5859.5	4946.8	4205.1	3591.7
Te	11414.5	9808.1	8576.8	7158.4	6028.1	5096.8	4338.8	3711.1
I	10313.2	10554.1	8880.1	7772.8	6546.0	5535.2	4712.4	4030.9
Xe	10760.4	9782.1	9188.7	7739.8	6822.8	5769.4	4911.9	4201.7
Cs	10845.0	8919.4	9142.6	8153.1	6931.3	6140.2	5220.5	4459.9
Ba	11157.9	9856.8	8325.4	7963.4	7157.3	6093.5	5418.5	4628.6
La	12148.0	9590.4	8855.8	7366.8	6919.4	6304.7	5737.1	4908.2
Ce	2169.7	14233.8	9455.5	7829.6	8527.9	7298.9	6073.9	5176.2
Pr	2249.9	10888.6	10284.2	8416.1	6983.8	5987.2	5642.3	5299.7
Nd	2678.0	2293.5	8681.0	7572.9	6647.1	5991.2	5725.5	5453.0
Pm	2793.4	2389.4	2013.0	7531.8	7011.9	6538.9	6115.1	5701.5
Sm	2932.9	2506.8	2062.5	8059.4	7433.6	6869.8	6370.1	5893.2
Eu	3078.7	2631.6	2168.9	1861.8	10133.6	8438.1	7081.6	5971.0
Gd	3118.8	2671.5	2242.6	1927.2	1688.6	7982.2	6717.8	5681.5
Tb	3391.8	2894.5	2344.2	2008.8	1730.8	7805.2	6527.0	5487.1
Dy	3570.7	3038.5	2439.7	2088.2	1797.8	1551.0	6805.9	5718.4
Ho	3756.9	3199.2	2558.4	2185.9	1880.7	1620.6	7613.9	6401.0
Er	3997.6	3402.0	2687.4	2295.6	1976.2	1698.8	1469.3	6421.7
Tm	4264.6	3618.3	2834.1	2414.6	2073.6	1782.9	1541.2	7107.7
Yb	4476.6	3790.2	2948.2	2504.6	2144.9	1843.6	1594.4	1384.8
Lu	4619.0	3920.2	3114.2	2644.8	2264.4	1945.8	1682.3	1460.7
Hf	4848.5	4127.9	3258.7	2767.2	2368.8	2035.2	1759.3	1527.4
Ta	5116.3	4352.7	3429.7	2911.9	2492.3	2141.0	1850.6	1606.5
W	5345.6	4541.1	3598.7	3055.3	2615.0	2246.4	1941.6	1685.5
Re	5563.8	4743.6	3783.5	3212.8	2750.4	2363.1	2042.9	1773.6
Os	5753.8	4914.3	3939.8	3345.8	2864.4	2461.2	2127.8	1847.5
Ir	6242.9	5225.2	4146.2	3522.1	3016.1	2592.3	2241.7	1946.9
Pt	6448.8	5505.1	4332.1	3681.1	3153.2	2710.9	2344.9	2037.0
Au	7083.9	6162.0	4546.4	3865.1	3312.3	2848.9	2465.3	2142.5
Hg	7150.3	6101.4	4720.6	4015.1	3442.4	2962.1	2564.4	2229.5
Tl	7277.6	6273.1	4894.9	4165.2	3572.6	3075.4	2663.5	2316.6
Pb	7124.9	6417.5	5092.7	4335.7	3720.6	3204.3	2776.4	2415.8
Bi	7381.2	6393.1	5319.0	4531.1	3890.6	3352.7	2906.6	2530.4
Po	7739.0	6702.0	5596.1	4770.0	4098.1	3533.4	3064.9	2669.6
At	8134.5	7071.0	5744.3	5009.6	4302.4	3708.3	3215.5	2800.0
Rn	8243.0	7062.5	5703.6	5000.5	4291.8	3696.8	3203.6	2788.0
Fr	7629.7	7297.8	6084.5	5128.3	4502.0	3875.1	3355.9	2918.6
Ra	7775.4	6774.9	6072.0	5295.8	4571.1	4020.1	3480.1	3025.4
Ac	7906.4	6913.9	6334.3	5524.9	4771.3	4204.1	3637.7	3161.0
Th	7192.4	6620.3	6476.5	5578.4	4892.0	4225.6	3734.1	3242.5
Pa	8153.2	7123.7	6806.8	5867.0	5073.5	4450.1	3857.4	3413.4
U	8054.1	7638.3	6491.8	5951.3	5152.3	4524.2	3920.2	3470.5

Table 3: continued

	Emitter							
Absorber	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc
H	1.9	1.6	1.4	1.2	1.0	0.9	0.9	0.8
He	14.1	11.5	9.4	7.7	6.4	5.4	4.5	3.8
Li	56.1	45.7	37.3	30.6	25.3	21.0	17.6	14.8
Be	152.0	124.3	102.1	84.0	69.9	58.2	48.9	41.2
B	319.8	262.8	216.7	179.2	149.6	125.0	105.6	89.1
C	596.7	492.5	407.9	338.7	283.8	237.9	201.5	170.6
N	926.2	767.7	638.5	532.4	447.8	376.5	319.9	271.7
O	1329.4	1106.7	924.3	773.9	653.3	551.2	469.8	400.3
F	1704.6	1425.1	1195.3	1005.0	851.5	720.7	616.1	526.5
Ne	2304.9	1935.7	1630.8	1377.1	1171.2	994.3	852.4	730.5
Na	2772.6	2339.8	1980.5	1680.4	1434.9	1222.1	1051.0	903.5
Mg	3484.4	2949.4	2503.9	2130.7	1824.7	1559.2	1345.1	1159.8
Al	3818.1	3293.3	2848.2	2468.2	2139.8	1834.2	1586.9	1372.4
Si	461.9	386.8	324.9	2960.8	2627.4	2256.0	1955.0	1693.5
P	564.8	473.1	397.6	334.9	284.7	2412.1	2114.3	1852.4
S	719.9	603.3	507.2	427.4	363.4	309.5	266.1	228.7
Cl	843.5	707.1	594.7	501.3	426.3	363.0	312.1	268.2
Ar	954.2	800.2	673.2	567.7	482.9	411.2	353.5	303.8
K	1225.3	1028.3	865.7	730.6	621.9	529.7	455.6	391.6
Ca	1482.1	1245.0	1049.1	886.1	754.7	643.2	553.4	476.0
Sc	1607.9	1351.9	1140.2	963.9	821.6	700.5	603.0	518.8
Ti	1815.2	1527.6	1289.5	1091.1	930.7	794.0	683.9	588.8
V	2029.8	1709.6	1444.4	1223.3	1044.2	891.3	768.2	661.7
Cr	2336.5	1969.7	1665.5	1411.7	1205.9	1030.0	888.1	765.5
Mn	2590.3	2185.9	1850.3	1569.9	1342.2	1147.2	989.8	853.7
Fe	2953.1	2494.7	2113.8	1795.3	1536.2	1313.9	1134.4	978.9
Co	3215.6	2720.1	2307.9	1962.6	1681.2	1438.8	1243.0	1073.4
Ni	3686.7	3122.6	2652.8	2258.8	1936.9	1658.8	1434.1	1239.2
Cu	3852.3	3268.5	2781.4	2372.2	2036.5	1745.3	1509.6	1305.2
Zn	4214.9	3583.9	3056.3	2612.2	2246.3	1926.8	1668.2	1443.7
Ga	4447.5	3785.5	3231.4	2764.6	2379.5	2043.0	1770.3	1533.4
Ge	4788.1	4076.9	3481.3	2979.4	2565.9	2205.2	1912.7	1658.3
As	5162.2	4398.9	3759.2	3219.7	2775.5	2388.6	2074.4	1800.8
Se	4752.5	4647.8	3972.5	3402.8	2934.6	2528.0	2197.4	1909.2
Br	3707.6	4552.1	4356.4	3738.2	3227.8	2781.8	2419.0	2102.6
Kr	956.6	3563.5	4101.4	3932.9	3410.4	2940.6	2558.4	2224.9
Rb	1066.9	909.3	3091.6	3699.8	3235.2	3192.6	2778.0	2416.2
Sr	1178.6	1004.2	858.1	734.8	3434.9	2995.4	2980.0	2593.3
Y	1306.7	1113.6	951.8	815.2	703.9	3219.2	2821.9	2808.5
Zr	1427.7	1217.0	1040.3	891.3	769.6	665.0	2159.3	2621.6
Nb	1563.6	1333.0	1139.7	976.6	843.3	728.5	634.9	2028.9
Mo	1685.6	1437.3	1229.1	1053.4	909.6	785.6	684.6	596.3
Tc	1832.3	1562.9	1336.9	1146.2	989.8	854.8	744.7	648.6
Ru	1962.6	1674.8	1433.3	1229.3	1061.8	916.8	798.6	695.4
Rh	2125.9	1814.5	1553.1	1332.3	1150.9	993.7	865.5	753.6
Pd	2260.5	1929.8	1652.3	1417.7	1224.9	1057.7	921.4	802.4

Table 3: continued

	Emitter							
Absorber	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc
Ag	2446.5	2089.8	1790.2	1536.8	1328.3	1147.2	999.6	870.6
Cd	2570.5	2196.2	1881.6	1615.6	1396.8	1206.8	1051.9	916.5
In	2747.4	2348.8	2013.7	1730.1	1496.5	1293.2	1127.4	982.4
Sn	2893.5	2475.0	2123.0	1824.9	1579.2	1365.1	1190.5	1037.8
Sb	3065.9	2623.6	2251.4	1936.2	1676.2	1449.5	1264.5	1102.7
Te	3170.5	2715.1	2331.6	2006.6	1738.0	1503.5	1312.1	1144.5
I	3446.1	2953.6	2538.4	2186.3	1894.8	1639.6	1431.3	1248.9
Xe	3594.2	3082.6	2651.2	2284.9	1981.4	1715.3	1497.9	1307.6
Cs	3817.5	3277.6	2821.8	2434.5	2112.7	1829.8	1598.5	1395.9
Ba	3964.8	3407.0	2935.7	2534.9	2201.4	1907.5	1667.2	1456.6
La	4206.8	3616.4	3117.3	2692.7	2339.4	2028.0	1773.2	1549.9
Ce	4439.6	3819.3	3294.5	2847.8	2475.9	2147.9	1879.5	1643.9
Pr	4698.6	4045.8	3493.1	3022.1	2628.8	2280.8	1995.8	1745.8
Nd	4885.2	4206.5	3631.8	3142.1	2733.9	2373.3	2077.9	1818.6
Pm	4935.6	4454.2	3845.9	3327.6	2895.9	2515.4	2203.5	1929.6
Sm	5444.4	4715.3	3935.1	3405.7	2964.8	2576.3	2257.8	1977.9
Eu	5122.6	4710.8	4130.0	3576.7	3115.3	2707.9	2373.8	2080.1
Gd	5595.0	5150.7	4421.2	3662.7	3193.8	2777.6	2436.1	2135.8
Tb	4651.2	4649.3	4275.1	3671.2	3334.3	2901.5	2546.2	2233.5
Dy	4846.8	4822.5	4155.2	3807.2	3296.8	3000.5	2634.6	2312.4
Ho	5427.6	4623.4	4596.5	4219.6	3648.5	3127.4	2746.2	2410.5
Er	5447.2	4641.8	3967.1	3959.5	3655.0	3165.7	2860.5	2510.9
Tm	5998.6	5085.5	4323.8	4323.5	3710.3	3426.1	3067.0	2623.3
Yb	4740.0	5149.5	4418.3	3799.1	3829.4	3294.5	3066.1	2700.6
Lu	1270.5	5427.5	4620.6	3942.9	3464.5	2990.3	3220.8	2809.7
Hf	1328.2	5714.5	4875.2	4167.9	3595.2	3600.8	3132.3	2908.9
Ta	1395.8	1215.9	4634.4	4330.0	3737.6	3232.7	3277.0	2840.0
W	1464.0	1274.9	1112.9	4493.8	3883.5	3362.6	3420.6	2961.5
Re	1540.2	1340.6	1169.9	3122.6	3997.8	3469.6	3037.0	3085.3
Os	1603.7	1395.4	1217.2	1063.8	4105.6	3563.3	3119.3	2730.0
Ir	1689.8	1469.9	1281.9	1120.0	2922.6	3750.1	3276.6	2862.1
Pt	1768.5	1538.7	1342.2	1173.0	1031.5	2649.5	3422.8	2987.1
Au	1860.2	1618.5	1411.8	1233.8	1085.0	953.7	1958.1	2670.3
Hg	1936.1	1684.8	1469.8	1284.7	1129.8	992.9	879.5	3166.1
Tl	2012.0	1751.1	1527.8	1335.6	1174.6	1032.2	914.2	2252.0
Pb	2098.8	1827.0	1594.3	1394.0	1226.0	1077.3	954.0	844.6
Bi	2199.1	1915.0	1671.7	1462.1	1286.0	1129.7	1000.1	885.1
Po	2320.5	2020.9	1764.4	1543.3	1357.6	1192.5	1055.8	934.4
At	2434.5	2121.0	1852.5	1621.0	1426.1	1252.5	1108.6	980.9
Rn	2424.3	2112.6	1845.6	1615.4	1421.3	1248.2	1104.7	977.4
Fr	2538.3	2212.8	1933.7	1693.1	1489.9	1308.3	1157.8	1024.2
Ra	2631.3	2294.2	2005.1	1755.8	1545.4	1357.3	1201.5	1063.2
Ac	2750.2	2398.9	2097.6	1837.7	1618.0	1421.2	1258.1	1113.4
Th	2821.4	2461.9	2153.4	1887.1	1662.0	1460.1	1292.9	1144.3
Pa	2969.8	2591.5	2266.9	1986.7	1749.7	1537.2	1361.1	1204.7
U	3019.1	2634.7	2304.9	2020.2	1779.4	1563.4	1384.4	1225.5

Table 3: continued

	Emitter							
Absorber	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb
H	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5
He	3.3	2.8	2.4	2.0	1.8	1.6	1.4	1.2
Li	12.5	10.6	9.0	7.7	6.6	5.7	4.9	4.3
Be	34.9	29.6	25.3	21.6	18.6	16.0	13.8	12.0
B	75.7	64.5	55.2	47.5	40.9	35.3	30.5	26.6
C	145.3	124.1	106.6	91.9	79.3	68.5	59.5	51.8
N	232.1	198.9	171.3	148.0	128.0	110.9	96.4	84.2
O	343.0	294.8	254.6	220.6	191.2	166.1	144.7	126.6
F	452.5	389.9	337.6	293.4	254.9	221.9	193.7	169.8
Ne	629.5	544.0	472.3	411.5	358.2	312.5	273.4	240.2
Na	780.9	676.8	589.2	514.8	449.2	392.6	344.2	303.0
Mg	1005.4	873.9	763.0	668.4	584.5	511.9	449.7	396.7
Al	1193.1	1039.9	910.4	799.7	700.8	615.1	541.5	478.6
Si	1474.5	1287.2	1128.5	992.7	871.6	766.6	676.2	598.7
P	1630.8	1439.1	1275.0	1133.1	997.9	879.5	777.4	689.8
S	1916.8	1702.1	1517.0	1356.1	1196.9	1056.6	935.3	831.1
Cl	231.7	200.8	1621.4	1487.5	1318.5	1165.7	1033.5	919.7
Ar	262.5	227.5	198.0	172.9	151.3	1200.5	1075.6	966.9
K	338.5	293.4	255.4	223.2	195.3	171.3	150.7	133.0
Ca	411.6	356.9	310.9	271.7	237.8	208.6	183.4	162.0
Sc	448.9	389.4	339.3	296.7	259.7	227.8	200.5	177.1
Ti	509.6	442.3	385.6	337.4	295.4	259.2	228.1	201.6
V	573.1	497.7	434.1	380.0	332.9	292.2	257.2	227.3
Cr	663.3	576.3	503.0	440.5	386.0	338.9	298.4	263.8
Mn	740.2	643.5	561.9	492.4	431.7	379.2	334.1	295.5
Fe	849.3	738.8	645.5	566.0	496.3	436.1	384.3	340.0
Co	931.9	811.1	709.1	622.1	545.8	479.8	423.1	374.5
Ni	1076.5	937.6	820.2	720.0	631.9	555.7	490.1	434.0
Cu	1134.5	988.6	865.3	759.9	667.3	587.1	518.0	458.8
Zn	1255.9	1095.4	959.5	843.3	740.9	652.1	575.7	510.1
Ga	1335.1	1165.4	1021.7	898.7	789.9	695.6	614.3	544.5
Ge	1445.1	1262.6	1107.8	975.3	857.8	755.7	667.7	592.2
As	1571.2	1374.4	1207.3	1064.1	936.4	825.3	729.6	647.3
Se	1667.3	1459.7	1283.3	1132.0	996.7	879.0	777.4	690.2
Br	1836.9	1608.9	1415.0	1248.6	1100.0	970.7	859.1	763.1
Kr	1944.6	1704.0	1499.3	1323.6	1166.7	1030.2	912.2	810.8
Rb	2112.2	1851.0	1628.9	1438.2	1268.5	1120.8	993.1	883.2
Sr	2268.1	1988.7	1750.9	1546.6	1365.4	1207.5	1070.8	953.1
Y	2457.2	2155.3	1898.3	1677.4	1481.5	1310.7	1162.9	1035.6
Zr	2623.4	2303.7	2031.2	1796.8	1587.3	1404.5	1246.2	1109.8
Nb	2460.0	2163.1	2182.3	1932.5	1707.7	1511.4	1341.4	1194.9
Mo	1887.2	2276.5	2007.7	2038.2	1802.7	1596.5	1417.7	1263.6
Tc	567.7	1772.2	2136.8	1888.3	1914.0	1696.9	1508.5	1345.9
Ru	608.6	533.9	1643.7	1683.6	1761.2	1786.9	1589.9	1419.8
Rh	659.5	578.5	509.6	450.4	1352.7	1658.6	1691.7	1512.5
Pd	702.2	616.1	542.7	479.7	424.3	1254.2	1539.3	1379.3

Table 3: continued

	Emitter							
Absorber	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb
Ag	762.0	668.7	589.2	520.8	460.7	408.3	1193.3	1464.7
Cd	802.5	704.4	620.9	549.0	485.6	430.4	382.5	1102.3
In	860.4	755.4	665.9	588.9	521.0	461.7	410.3	366.0
Sn	909.2	798.5	704.1	622.9	551.0	488.3	433.9	387.0
Sb	966.4	849.0	748.9	662.7	586.3	519.7	461.9	412.0
Te	1003.3	881.7	778.0	688.7	609.4	540.2	480.2	428.4
I	1095.1	962.7	849.6	752.3	665.9	590.5	525.0	468.5
Xe	1147.0	1008.6	890.5	788.8	698.4	619.4	550.8	491.6
Cs	1225.0	1077.6	951.8	843.4	746.9	662.6	589.4	526.1
Ba	1278.8	1125.5	994.5	881.6	780.9	693.0	616.6	550.6
La	1361.2	1198.4	1059.4	939.4	832.4	738.8	657.5	587.2
Ce	1444.9	1273.0	1126.0	999.1	885.1	785.4	698.8	623.9
Pr	1534.5	1352.0	1196.0	1061.3	940.8	835.3	743.7	664.4
Nd	1599.4	1409.9	1247.8	1107.8	982.4	872.5	777.0	694.4
Pm	1697.8	1497.4	1325.9	1177.7	1044.5	927.8	826.3	738.6
Sm	1741.0	1536.1	1360.7	1209.1	1072.7	953.1	849.2	759.3
Eu	1831.5	1616.4	1432.2	1272.9	1129.6	1004.0	894.7	800.2
Gd	1881.3	1661.2	1472.5	1309.3	1162.2	1033.2	921.0	823.9
Tb	1968.5	1739.0	1542.3	1372.1	1218.3	1083.4	966.0	864.3
Dy	2039.2	1802.5	1599.5	1423.7	1264.3	1124.4	1002.6	897.2
Ho	2125.9	1879.2	1667.7	1484.5	1318.7	1173.1	1046.4	936.7
Er	2214.4	1957.5	1737.1	1546.3	1374.1	1223.0	1091.4	977.3
Tm	2313.4	2044.9	1814.6	1615.2	1435.9	1278.6	1141.5	1022.6
Yb	2381.2	2104.5	1867.2	1661.8	1477.9	1316.4	1175.6	1053.6
Lu	2481.9	2193.8	1946.7	1732.7	1541.4	1373.4	1227.0	1100.0
Hf	2547.2	2266.1	2011.7	1791.4	1593.9	1420.5	1269.2	1138.0
Ta	2645.5	2315.8	2089.5	1862.2	1657.4	1477.3	1320.3	1184.0
W	2577.7	2411.6	2161.2	1926.9	1715.6	1529.8	1367.7	1227.0
Re	2688.6	2506.1	2209.7	1997.5	1779.5	1587.5	1419.9	1274.3
Os	2774.3	2429.2	2273.8	2012.3	1827.5	1630.9	1459.3	1310.1
Ir	2917.4	2556.2	2249.7	2115.6	1879.1	1696.5	1517.5	1362.1
Pt	2620.3	2664.9	2348.8	2077.6	1957.9	1743.4	1569.6	1409.0
Au	2466.4	2272.5	2363.4	2146.4	1943.6	1835.7	1630.5	1464.2
Hg	2788.0	2461.5	2182.5	2243.1	1997.3	1882.8	1680.5	1506.5
Tl	2884.4	2534.0	2236.1	2294.6	2039.4	1816.7	1716.0	1536.3
Pb	2061.4	2634.3	2325.3	2059.7	2120.1	1884.8	1680.4	1595.2
Bi	786.8	2558.3	2302.0	2077.1	1839.1	1888.0	1686.0	1506.5
Po	830.6	1987.9	2586.9	2195.5	1933.2	1713.4	1766.4	1581.4
At	871.8	776.5	1934.0	2303.2	2019.7	1791.3	1842.2	1647.5
Rn	868.6	773.6	691.6	1589.9	2173.8	1839.2	1601.5	1634.3
Fr	910.1	810.5	724.4	649.4	1462.0	1943.2	1683.6	1481.2
Ra	945.0	841.7	752.5	674.7	1630.5	1974.9	1735.2	1535.2
Ac	989.7	881.6	788.3	706.8	633.6	1416.7	1789.8	1592.7
Th	1017.4	906.4	810.6	726.9	651.6	585.0	1270.7	1617.5
Pa	1071.0	954.2	853.3	765.2	685.8	615.7	1360.4	1191.5
U	1089.6	970.9	868.3	778.8	697.9	626.3	563.5	1218.2

Table 3: continued

	Emitter							
Absorber	Te	I	Xe	Cs	Ba	La	Ce	Pr
H	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
He	1.1	1.0	0.9	0.8	0.7	0.7	0.6	0.6
Li	3.7	3.3	2.9	2.5	2.3	2.0	1.8	1.6
Be	10.5	9.1	8.0	7.0	6.2	5.5	4.8	4.3
B	23.1	20.2	17.8	15.6	13.7	12.1	10.7	9.5
C	45.3	39.6	34.9	30.6	27.0	23.9	21.1	18.7
N	73.7	64.6	57.0	50.1	44.2	39.2	34.7	30.8
O	111.0	97.6	86.2	75.9	67.0	59.6	52.8	46.9
F	149.3	131.5	116.3	102.6	90.8	80.8	71.7	63.8
Ne	211.6	186.7	165.5	146.1	129.6	115.5	102.7	91.5
Na	267.3	236.4	209.8	185.6	164.9	147.3	131.1	117.0
Mg	350.7	310.7	276.2	244.8	217.7	194.7	173.6	155.1
Al	424.0	376.4	335.2	297.4	264.9	237.3	211.8	189.6
Si	531.3	472.5	421.5	374.6	334.2	299.8	268.0	240.2
P	613.3	546.5	488.3	434.8	388.5	349.0	312.5	280.4
S	740.1	660.5	591.0	527.0	471.6	424.3	380.5	342.0
Cl	820.2	732.9	656.8	586.5	525.6	473.5	425.2	382.7
Ar	870.9	785.9	707.2	632.4	567.4	511.7	460.1	414.6
K	1075.8	963.3	865.0	774.1	695.2	627.5	564.7	509.3
Ca	143.4	127.2	981.7	883.0	796.8	722.5	653.3	591.5
Sc	156.8	139.1	124.0	110.3	98.4	751.6	681.8	619.1
Ti	178.5	158.4	141.2	125.6	112.1	100.6	90.0	671.7
V	201.3	178.7	159.4	141.8	126.5	113.6	101.6	91.1
Cr	233.7	207.5	185.1	164.7	147.0	132.0	118.1	105.9
Mn	261.9	232.7	207.6	184.7	164.9	148.0	132.5	118.9
Fe	301.5	267.9	239.1	212.8	190.1	170.7	152.8	137.1
Co	332.2	295.3	263.6	234.7	209.6	188.3	168.6	151.3
Ni	385.1	342.4	305.8	272.3	243.4	218.7	195.9	175.9
Cu	407.3	362.3	323.6	288.2	257.6	231.5	207.4	186.3
Zn	453.0	403.2	360.2	321.0	287.0	258.1	231.3	207.8
Ga	483.8	430.7	385.0	343.1	306.9	276.0	247.4	222.3
Ge	526.4	468.9	419.3	373.8	334.5	300.9	269.8	242.5
As	575.6	513.0	458.8	409.2	366.2	329.5	295.6	265.8
Se	614.0	547.5	489.9	437.0	391.2	352.1	315.9	284.1
Br	679.3	606.0	542.5	484.2	433.6	390.4	350.4	315.2
Kr	722.1	644.6	577.3	515.4	461.8	415.9	373.4	336.1
Rb	787.1	703.0	629.9	562.6	504.2	454.3	408.1	367.4
Sr	850.2	759.9	681.3	608.8	545.9	492.0	442.1	398.2
Y	924.1	826.4	741.2	662.6	594.4	536.0	481.8	434.2
Zr	990.5	885.8	794.7	710.8	638.0	575.6	517.7	466.7
Nb	1066.7	954.1	856.3	766.3	688.0	621.0	558.8	503.9
Mo	1128.6	1010.1	907.0	812.0	729.4	658.7	592.9	534.9
Tc	1203.3	1078.1	968.7	867.8	780.0	704.6	634.7	572.9
Ru	1270.4	1139.1	1023.8	917.0	824.2	744.5	670.5	605.2
Rh	1355.2	1216.6	1094.0	979.9	880.7	795.6	716.6	646.9
Pd	1419.2	1275.4	1147.3	1027.8	923.8	834.6	751.7	678.6

Table 3: continued

	Emitter							
Absorber	Te	I	Xe	Cs	Ba	La	Ce	Pr
Ag	1313.4	1354.8	1220.9	1094.6	984.7	890.3	802.6	725.1
Cd	1352.3	1215.9	1254.7	1128.0	1017.4	922.2	833.4	754.5
In	1025.7	931.8	1153.4	1189.6	1074.0	974.4	881.5	798.6
Sn	345.9	929.8	875.3	1071.9	1115.7	1013.1	917.3	831.8
Sb	368.2	329.8	296.6	817.3	1007.1	918.5	957.5	868.9
Te	383.0	343.1	308.6	276.8	752.5	929.6	848.3	885.6
I	418.9	375.3	337.6	302.9	272.7	728.2	667.5	827.8
Xe	439.7	394.0	354.4	318.0	286.3	259.0	678.9	627.0
Cs	470.6	421.9	379.5	340.5	306.5	277.3	250.1	660.3
Ba	492.6	441.7	397.5	356.7	321.1	290.6	262.2	237.1
La	525.6	471.3	424.2	380.7	342.8	310.3	279.9	253.2
Ce	558.2	500.5	450.4	404.3	364.2	329.6	297.5	269.1
Pr	594.9	533.7	480.4	431.3	388.5	351.7	317.4	287.2
Nd	621.9	558.1	502.5	451.2	406.5	368.1	332.3	300.7
Pm	661.5	593.7	534.7	480.2	432.7	391.9	353.8	320.2
Sm	680.3	610.7	550.1	494.1	445.3	403.3	364.2	329.6
Eu	717.1	643.9	580.1	521.2	469.8	425.5	384.3	347.9
Gd	738.5	663.3	597.7	537.1	484.2	438.7	396.3	358.8
Tb	774.9	696.2	627.5	563.9	508.5	460.8	416.3	377.0
Dy	804.5	722.8	651.5	585.6	528.1	478.7	432.5	391.8
Ho	840.1	755.0	680.7	612.0	552.0	500.4	452.2	409.6
Er	877.0	788.5	711.1	639.4	576.8	522.9	472.7	428.2
Tm	918.0	825.7	744.8	669.8	604.3	548.0	495.4	448.9
Yb	946.1	851.2	768.1	690.9	623.5	565.5	511.3	463.4
Lu	988.1	889.3	802.6	722.1	651.8	591.3	534.8	484.8
Hf	1022.4	920.3	830.7	747.6	675.0	612.4	554.1	502.4
Ta	1064.0	957.9	864.9	778.5	703.0	638.0	577.3	523.5
W	1102.9	993.3	897.1	807.8	729.6	662.3	599.5	543.7
Re	1146.0	1032.5	932.8	840.0	758.9	689.0	623.7	565.9
Os	1178.5	1062.2	959.9	864.8	781.5	709.8	642.7	583.3
Ir	1225.0	1103.8	997.6	899.0	812.7	738.3	668.8	607.1
Pt	1267.4	1142.2	1032.5	930.7	841.6	764.7	692.9	629.1
Au	1317.5	1187.7	1073.9	968.1	875.5	795.6	720.9	654.6
Hg	1356.5	1223.8	1106.8	997.9	902.5	820.2	743.3	675.1
Tl	1394.4	1258.0	1137.9	1026.1	928.2	843.7	764.7	694.6
Pb	1432.4	1298.5	1174.7	1059.5	958.6	871.6	790.1	717.8
Bi	1431.7	1290.4	1217.2	1098.2	994.0	904.0	819.8	745.0
Po	1415.8	1348.9	1220.4	1149.4	1040.2	946.0	857.8	779.5
At	1476.4	1325.7	1271.9	1146.7	1082.4	984.3	892.5	811.0
Rn	1465.2	1316.1	1185.7	1132.3	1025.3	973.1	882.7	802.4
Fr	1530.6	1374.5	1238.4	1112.6	1070.0	969.4	917.4	834.4
Ra	1364.2	1421.1	1280.5	1150.5	1037.1	1002.5	944.0	859.2
Ac	1422.1	1479.3	1335.7	1199.8	1081.3	979.4	940.8	890.6
Th	1450.1	1302.6	1364.7	1227.9	1107.9	1003.3	961.0	872.5
Pa	1524.9	1367.8	1231.7	1286.6	1160.2	1051.5	950.1	913.2
U	1540.0	1382.1	1246.2	1121.6	1177.5	1067.2	964.3	873.3

Table 3: continued

	Emitter							
Absorber	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
Li	1.4	1.3	1.2	1.1	1.0	0.9	0.8	0.8
Be	3.8	3.4	3.1	2.7	2.5	2.2	2.0	1.8
B	8.4	7.5	6.7	6.0	5.4	4.8	4.4	3.9
C	16.7	14.8	13.3	11.8	10.7	9.6	8.6	7.8
N	27.5	24.5	21.9	19.5	17.6	15.8	14.2	12.8
O	41.9	37.3	33.5	29.9	27.0	24.2	21.8	19.7
F	57.1	50.9	45.7	40.9	36.9	33.2	29.9	27.0
Ne	81.9	73.2	65.8	58.9	53.3	47.9	43.2	39.1
Na	104.9	93.8	84.5	75.7	68.5	61.7	55.6	50.4
Mg	139.3	124.8	112.4	100.9	91.4	82.4	74.4	67.5
Al	170.5	152.9	137.9	123.9	112.4	101.4	91.7	83.2
Si	216.3	194.2	175.5	157.9	143.3	129.5	117.1	106.4
P	252.8	227.3	205.6	185.2	168.4	152.2	137.8	125.3
S	308.7	277.8	251.6	226.9	206.4	186.9	169.3	154.1
Cl	345.9	311.8	282.7	255.3	232.6	210.8	191.2	174.2
Ar	375.0	338.4	307.1	277.6	253.1	229.6	208.5	190.2
K	461.3	416.8	378.7	342.8	312.9	284.1	258.2	235.7
Ca	536.1	484.5	440.5	398.9	364.4	331.2	301.4	275.4
Sc	561.9	508.7	463.1	420.0	384.2	349.4	318.1	290.9
Ti	611.4	555.1	506.7	460.8	422.3	384.4	350.3	320.6
V	82.2	74.0	545.8	498.3	458.1	417.5	380.9	349.0
Cr	95.6	86.0	77.8	70.2	504.7	461.7	422.8	388.7
Mn	107.3	96.5	87.4	78.8	71.7	65.0	59.1	422.3
Fe	123.8	111.4	100.9	91.0	82.8	75.1	68.2	62.2
Co	136.6	123.0	111.4	100.4	91.5	82.9	75.3	68.7
Ni	158.8	143.0	129.5	116.8	106.4	96.5	87.6	79.9
Cu	168.2	151.5	137.3	123.9	112.8	102.3	92.9	84.7
Zn	187.7	169.0	153.2	138.2	125.9	114.2	103.8	94.6
Ga	200.8	181.0	164.0	148.1	134.9	122.4	111.2	101.4
Ge	219.1	197.5	179.0	161.7	147.3	133.7	121.5	110.8
As	240.2	216.6	196.4	177.4	161.7	146.7	133.3	121.7
Se	256.9	231.7	210.1	189.9	173.1	157.1	142.8	130.3
Br	285.1	257.1	233.2	210.7	192.1	174.5	158.6	144.8
Kr	304.0	274.2	248.9	224.9	205.1	186.3	169.4	154.7
Rb	332.4	300.0	272.3	246.2	224.6	204.0	185.5	169.4
Sr	360.4	325.3	295.4	267.1	243.7	221.4	201.4	184.0
Y	393.1	354.9	322.3	291.5	266.1	241.8	220.0	201.0
Zr	422.7	381.8	346.9	313.9	286.6	260.5	237.0	216.5
Nb	456.5	412.4	374.8	339.2	309.8	281.6	256.3	234.3
Mo	484.8	438.1	398.3	360.6	329.4	299.5	272.7	249.3
Tc	519.4	469.6	427.0	386.8	353.5	321.5	292.8	267.7
Ru	549.0	496.6	451.8	409.5	374.3	340.5	310.1	283.6
Rh	586.9	531.1	483.3	438.1	400.6	364.5	332.1	303.8
Pd	615.9	557.4	507.5	460.2	420.9	383.1	349.2	319.5

Table 3: continued

	Emitter							
Absorber	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho
Ag	658.3	596.0	542.7	492.3	450.4	410.1	373.9	342.3
Cd	684.9	620.0	564.5	511.9	468.3	426.5	388.9	356.1
In	724.8	656.1	597.4	541.7	495.6	451.5	411.9	377.2
Sn	755.3	684.0	623.0	565.3	517.4	471.4	430.1	394.0
Sb	790.1	716.7	653.7	594.0	544.2	495.9	452.5	414.5
Te	806.7	733.0	669.7	609.5	559.1	509.4	464.8	425.8
I	867.4	788.9	721.4	657.3	603.3	549.9	501.8	459.8
Xe	774.0	705.5	744.6	678.7	623.2	568.4	519.0	475.8
Cs	604.1	745.7	681.4	713.4	656.1	598.9	547.3	502.2
Ba	215.5	563.3	698.9	637.9	674.6	616.5	564.0	518.1
La	230.2	208.7	541.3	493.2	617.8	650.1	595.1	546.9
Ce	244.7	221.9	202.3	519.5	478.9	593.5	543.9	576.6
Pr	261.1	236.8	216.0	196.3	503.3	460.4	573.5	528.2
Nd	273.4	248.0	226.2	205.5	188.4	478.2	441.4	401.6
Pm	291.2	264.2	241.0	219.0	200.7	183.4	461.0	424.3
Sm	299.8	272.0	248.2	225.6	206.8	188.8	172.7	432.8
Eu	316.5	287.2	262.1	238.2	218.4	199.5	182.4	167.5
Gd	326.5	296.3	270.4	245.8	225.4	205.9	188.3	172.9
Tb	343.0	311.3	284.1	258.3	236.9	216.4	197.9	181.7
Dy	356.5	323.6	295.4	268.7	246.4	225.1	205.9	189.0
Ho	372.8	338.5	309.0	281.0	257.8	235.5	215.4	197.8
Er	389.8	353.9	323.1	293.9	269.6	246.3	225.3	206.9
Tm	408.6	371.1	338.8	308.2	282.8	258.4	236.4	217.2
Yb	422.0	383.2	350.0	318.4	292.2	267.0	244.3	224.4
Lu	441.5	401.1	366.4	333.4	306.0	279.7	255.9	235.0
Hf	457.6	415.7	379.8	345.6	317.3	290.0	265.4	243.8
Ta	476.9	433.3	395.9	360.3	330.8	302.4	276.7	254.3
W	495.3	450.1	411.3	374.4	343.7	314.2	287.6	264.3
Re	515.6	468.6	428.2	389.9	358.0	327.3	299.7	275.4
Os	531.6	483.2	441.7	402.2	369.3	337.8	309.3	284.3
Ir	553.4	503.2	460.0	419.0	384.9	352.0	322.3	296.3
Pt	573.6	521.7	477.1	434.7	399.4	365.3	334.5	307.5
Au	597.0	543.1	496.8	452.8	416.0	380.5	348.5	320.4
Hg	615.7	560.2	512.4	467.0	429.1	392.6	359.6	330.7
Tl	633.7	576.6	527.6	480.9	442.0	404.5	370.5	340.8
Pb	654.9	596.0	545.4	497.2	457.1	418.3	383.4	352.6
Bi	679.9	618.9	566.5	516.6	475.0	434.8	398.4	366.5
Po	711.6	647.9	593.1	541.0	497.5	455.5	417.5	384.1
At	740.6	674.6	617.7	563.6	518.5	474.7	435.1	400.4
Rn	732.6	667.2	611.0	557.4	512.7	469.5	430.5	396.2
Fr	761.9	694.0	635.5	579.8	533.4	488.5	448.0	412.4
Ra	784.5	714.6	654.4	597.1	549.3	503.2	461.6	425.0
Ac	813.5	741.3	679.1	619.9	570.4	522.6	479.4	441.5
Th	830.1	756.3	692.7	632.2	581.8	533.1	489.1	450.5
Pa	832.9	790.8	724.4	661.2	608.4	557.6	511.5	471.1
U	842.8	766.7	731.9	668.2	615.0	563.6	517.1	476.3

Table 3: continued

	Emitter							
Absorber	Er	Tm	Yb	Lu	Hf	Ta	W	Re
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Li	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.4
Be	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.9
B	3.6	3.2	2.9	2.7	2.4	2.2	2.0	1.9
C	7.0	6.4	5.8	5.2	4.8	4.3	4.0	3.6
N	11.6	10.5	9.5	8.6	7.9	7.2	6.5	6.0
O	17.8	16.1	14.6	13.3	12.1	11.0	10.1	9.2
F	24.4	22.1	20.1	18.3	16.7	15.2	13.9	12.7
Ne	35.4	32.1	29.2	26.5	24.2	22.1	20.1	18.4
Na	45.7	41.5	37.7	34.3	31.4	28.6	26.1	23.9
Mg	61.2	55.6	50.6	46.2	42.2	38.5	35.2	32.2
Al	75.5	68.7	62.6	57.1	52.3	47.7	43.7	40.0
Si	96.7	88.1	80.3	73.3	67.1	61.4	56.2	51.5
P	114.0	103.9	94.9	86.7	79.5	72.7	66.6	61.2
S	140.4	128.1	117.0	107.0	98.2	89.9	82.4	75.7
Cl	158.8	145.0	132.6	121.4	111.4	102.1	93.7	86.2
Ar	173.5	158.6	145.2	133.1	122.3	112.2	103.0	94.7
K	215.3	196.9	180.4	165.5	152.2	139.7	128.4	118.2
Ca	251.8	230.6	211.5	194.2	178.7	164.2	151.0	139.1
Sc	266.0	243.8	223.7	205.5	189.2	174.0	160.2	147.6
Ti	293.4	269.1	247.1	227.2	209.4	192.7	177.5	163.7
V	319.9	293.7	270.1	248.6	229.3	211.2	194.6	179.6
Cr	357.5	329.3	303.8	280.5	259.6	239.5	220.8	203.9
Mn	388.5	358.0	330.3	305.1	282.4	260.6	240.4	222.1
Fe	56.7	398.2	367.9	340.4	315.5	291.5	269.2	249.0
Co	62.6	57.2	52.4	48.0	335.3	310.2	287.1	266.1
Ni	72.9	66.6	61.0	55.9	51.3	47.1	323.1	299.9
Cu	77.3	70.7	64.7	59.3	54.5	50.0	46.0	42.4
Zn	86.4	79.0	72.3	66.3	60.9	55.9	51.4	47.4
Ga	92.6	84.6	77.5	71.1	65.3	60.0	55.2	50.8
Ge	101.2	92.5	84.7	77.7	71.4	65.6	60.3	55.6
As	111.1	101.6	93.1	85.4	78.5	72.1	66.3	61.1
Se	119.0	108.9	99.7	91.5	84.1	77.3	71.1	65.5
Br	132.2	121.0	110.8	101.7	93.5	85.9	79.1	72.9
Kr	141.3	129.3	118.5	108.7	100.0	91.9	84.6	78.0
Rb	154.8	141.6	129.8	119.1	109.6	100.7	92.7	85.5
Sr	168.1	153.9	141.1	129.5	119.1	109.5	100.8	92.9
Y	183.7	168.2	154.2	141.6	130.3	119.8	110.3	101.7
Zr	197.9	181.2	166.2	152.6	140.4	129.1	118.9	109.7
Nb	214.2	196.2	179.9	165.3	152.1	139.9	128.9	118.9
Mo	228.0	208.8	191.6	176.0	162.0	149.1	137.3	126.7
Tc	244.9	224.4	205.9	189.2	174.2	160.3	147.7	136.3
Ru	259.5	237.9	218.3	200.6	184.8	170.0	156.7	144.6
Rh	278.1	254.9	234.1	215.2	198.2	182.4	168.2	155.2
Pd	292.5	268.3	246.4	226.5	208.7	192.2	177.1	163.5

Table 3: continued

	Emitter							
Absorber	Er	Tm	Yb	Lu	Hf	Ta	W	Re
Ag	313.4	287.5	264.1	242.9	223.9	206.2	190.1	175.5
Cd	326.2	299.3	275.0	253.0	233.2	214.8	198.1	182.9
In	345.6	317.2	291.5	268.2	247.4	227.9	210.2	194.1
Sn	361.0	331.4	304.7	280.4	258.6	238.3	219.8	203.1
Sb	379.9	348.7	320.6	295.1	272.2	250.8	231.5	213.9
Te	390.2	358.2	329.3	303.1	279.5	257.6	237.8	219.8
I	421.5	387.0	355.9	327.6	302.3	278.6	257.2	237.8
Xe	436.4	400.9	368.8	339.7	313.6	289.2	267.0	246.9
Cs	460.9	423.8	390.2	359.7	332.3	306.6	283.1	261.8
Ba	476.0	438.1	403.8	372.6	344.5	318.0	293.7	271.6
La	502.8	463.0	426.9	394.1	364.6	336.6	310.8	287.4
Ce	530.4	488.7	450.9	416.5	385.5	356.0	328.7	304.0
Pr	560.2	516.4	476.7	440.5	407.9	376.8	348.1	322.0
Nd	507.6	534.7	493.7	456.4	422.8	390.7	361.2	334.3
Pm	389.5	493.5	451.5	481.1	445.5	411.9	381.1	353.1
Sm	398.1	366.2	462.7	427.2	454.4	420.4	389.2	360.7
Eu	153.8	383.9	353.7	443.7	411.7	439.4	407.2	377.8
Gd	158.8	146.1	362.1	333.9	308.3	389.0	416.3	386.4
Tb	166.9	153.5	141.4	349.3	323.5	298.3	376.6	349.7
Dy	173.6	159.8	147.2	135.8	335.0	311.0	286.0	360.1
Ho	181.7	167.2	154.0	142.1	131.4	320.6	296.6	274.6
Er	190.1	174.9	161.2	148.7	137.5	127.0	309.4	290.2
Tm	199.5	183.6	169.2	156.1	144.4	133.4	123.5	298.7
Yb	206.2	189.8	174.9	161.4	149.2	137.9	127.7	118.3
Lu	216.0	198.8	183.2	169.1	156.4	144.5	133.8	124.0
Hf	224.1	206.3	190.2	175.5	162.3	150.1	138.9	128.8
Ta	233.7	215.2	198.4	183.1	169.4	156.6	144.9	134.4
W	243.0	223.7	206.3	190.4	176.2	162.9	150.8	139.8
Re	253.2	233.2	215.1	198.6	183.7	169.8	157.3	145.8
Os	261.4	240.7	222.0	205.0	189.7	175.4	162.4	150.6
Ir	272.4	250.9	231.4	213.7	197.7	182.9	169.4	157.1
Pt	282.7	260.5	240.2	221.8	205.3	189.8	175.8	163.1
Au	294.7	271.5	250.4	231.3	214.0	198.0	183.4	170.1
Hg	304.2	280.3	258.6	238.8	221.1	204.5	189.4	175.7
Tl	313.5	289.0	266.7	246.4	228.1	211.0	195.5	181.3
Pb	324.5	299.1	276.1	255.1	236.2	218.5	202.5	187.8
Bi	337.3	310.9	287.0	265.2	245.6	227.3	210.6	195.4
Po	353.5	326.0	300.9	278.1	257.6	238.4	220.9	205.0
At	368.6	339.8	313.8	290.0	268.6	248.6	230.4	213.9
Rn	364.8	336.5	310.7	287.2	266.1	246.3	228.3	211.9
Fr	379.7	350.3	323.5	299.1	277.1	256.6	237.8	220.8
Ra	391.4	361.1	333.6	308.5	285.9	264.7	245.4	227.8
Ac	406.6	375.2	346.6	320.6	297.1	275.2	255.1	236.9
Th	415.0	383.0	353.9	327.3	303.4	281.0	260.6	241.9
Pa	434.0	400.5	370.1	342.4	317.3	293.9	272.6	253.2
U	438.8	404.9	374.2	346.1	320.9	297.2	275.7	256.1

Table 3: continued

	Emitter							
Absorber	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
Li	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
Be	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6
B	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.0
C	3.3	3.1	2.8	2.6	2.4	2.2	2.1	1.9
N	5.5	5.0	4.6	4.2	3.9	3.6	3.3	3.1
O	8.4	7.7	7.1	6.5	6.0	5.5	5.1	4.7
F	11.6	10.6	9.7	9.0	8.2	7.6	7.0	6.5
Ne	16.9	15.5	14.2	13.1	12.0	11.1	10.2	9.4
Na	21.9	20.1	18.5	17.0	15.6	14.4	13.3	12.3
Mg	29.6	27.1	24.9	22.9	21.1	19.5	18.0	16.6
Al	36.7	33.7	31.0	28.5	26.3	24.3	22.4	20.7
Si	47.3	43.5	40.0	36.9	34.0	31.4	29.0	26.8
P	56.2	51.7	47.6	43.9	40.5	37.4	34.5	31.9
S	69.6	64.1	59.0	54.4	50.3	46.4	42.9	39.7
Cl	79.3	73.0	67.3	62.1	57.4	53.1	49.1	45.4
Ar	87.2	80.4	74.2	68.5	63.4	58.6	54.2	50.2
K	108.9	100.4	92.8	85.7	79.3	73.4	67.9	62.9
Ca	128.3	118.4	109.4	101.2	93.7	86.7	80.3	74.4
Sc	136.3	125.8	116.4	107.7	99.8	92.4	85.7	79.4
Ti	151.2	139.7	129.3	119.7	111.0	102.8	95.4	88.5
V	166.0	153.5	142.1	131.7	122.2	113.2	105.1	97.5
Cr	188.5	174.4	161.6	149.8	139.0	128.9	119.7	111.2
Mn	205.5	190.2	176.3	163.5	151.8	140.9	130.9	121.6
Fe	230.6	213.6	198.3	184.0	171.1	158.8	147.6	137.2
Co	246.9	229.2	213.1	198.2	184.6	171.5	159.4	148.3
Ni	278.7	259.1	241.2	224.7	209.6	194.7	181.1	168.6
Cu	39.1	264.6	247.3	231.2	216.5	201.3	187.4	174.5
Zn	43.7	40.4	37.3	250.1	233.7	217.6	202.7	189.0
Ga	46.9	43.3	40.0	37.0	34.3	31.8	211.6	197.4
Ge	51.3	47.4	43.8	40.5	37.5	34.8	32.3	30.0
As	56.4	52.1	48.2	44.5	41.3	38.3	35.5	33.0
Se	60.5	55.8	51.6	47.8	44.3	41.1	38.1	35.4
Br	67.3	62.1	57.5	53.2	49.3	45.7	42.4	39.4
Kr	72.0	66.5	61.5	56.9	52.7	48.9	45.4	42.2
Rb	78.9	72.9	67.4	62.4	57.8	53.6	49.8	46.3
Sr	85.8	79.3	73.3	67.9	62.9	58.4	54.2	50.4
Y	93.9	86.8	80.3	74.3	68.9	63.9	59.4	55.2
Zr	101.3	93.6	86.6	80.2	74.4	69.0	64.1	59.6
Nb	109.8	101.4	93.9	86.9	80.6	74.8	69.5	64.6
Mo	117.0	108.2	100.1	92.7	86.0	79.8	74.1	68.9
Tc	125.9	116.4	107.8	99.8	92.6	85.9	79.8	74.2
Ru	133.6	123.5	114.4	105.9	98.3	91.2	84.8	78.8
Rh	143.4	132.6	122.8	113.8	105.6	98.0	91.1	84.7
Pd	151.1	139.8	129.5	120.0	111.3	103.3	96.0	89.3

Table 3: continued

	Emitter							
Absorber	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi
Ag	162.3	150.1	139.1	128.9	119.7	111.1	103.2	96.0
Cd	169.1	156.5	145.0	134.4	124.8	115.8	107.7	100.2
In	179.5	166.1	153.9	142.7	132.5	123.0	114.4	106.4
Sn	187.9	173.9	161.2	149.5	138.8	128.9	119.9	111.5
Sb	197.9	183.2	169.8	157.5	146.3	135.9	126.4	117.6
Te	203.4	188.3	174.7	162.0	150.5	139.8	130.0	121.0
I	220.1	203.9	189.1	175.5	163.1	151.5	140.9	131.2
Xe	228.6	211.8	196.5	182.3	169.5	157.5	146.5	136.4
Cs	242.4	224.6	208.4	193.4	179.8	167.1	155.5	144.7
Ba	251.5	233.0	216.2	200.7	186.5	173.4	161.3	150.2
La	266.1	246.5	228.7	212.2	197.3	183.4	170.7	159.0
Ce	281.5	260.8	242.0	224.6	208.8	194.2	180.7	168.3
Pr	298.3	276.4	256.6	238.2	221.5	206.0	191.8	178.7
Nd	309.8	287.3	266.8	247.9	230.7	214.5	199.8	186.1
Pm	327.6	304.0	282.6	262.8	244.7	227.6	211.9	197.5
Sm	334.8	310.9	289.1	269.0	250.6	233.1	217.1	202.3
Eu	351.0	326.2	303.6	282.7	263.6	245.3	228.4	212.9
Gd	359.0	333.8	310.8	289.5	270.0	251.3	234.1	218.2
Tb	374.9	348.7	324.7	302.5	282.3	262.8	244.8	228.3
Dy	335.4	359.6	334.9	311.9	291.0	271.0	252.6	235.6
Ho	254.5	323.9	347.6	323.8	302.0	281.4	262.3	244.8
Er	269.5	246.8	312.9	291.4	313.8	292.4	272.7	254.5
Tm	276.9	256.9	238.5	302.9	283.7	304.8	284.4	265.5
Yb	109.8	267.3	251.4	230.8	290.0	271.2	292.7	273.2
Lu	115.1	106.9	256.1	238.1	221.7	206.1	269.3	247.6
Hf	119.5	111.0	103.2	246.3	230.7	214.1	198.8	256.3
Ta	124.7	115.8	107.7	100.2	238.5	221.9	206.5	192.3
W	129.8	120.5	112.1	104.3	97.2	229.7	213.8	199.1
Re	135.4	125.7	116.9	108.8	101.4	94.5	222.7	210.9
Os	139.8	129.9	120.8	112.4	104.8	97.7	91.2	85.2
Ir	145.8	135.5	126.0	117.3	109.3	101.9	95.2	88.9
Pt	151.4	140.7	130.9	121.8	113.5	105.9	98.9	92.4
Au	157.9	146.7	136.5	127.1	118.4	110.5	103.1	96.4
Hg	163.2	151.6	141.1	131.3	122.4	114.2	106.6	99.6
Tl	168.4	156.5	145.6	135.5	126.3	117.9	110.1	102.8
Pb	174.5	162.1	150.9	140.5	131.0	122.2	114.1	106.6
Bi	181.5	168.7	157.1	146.2	136.4	127.2	118.8	111.1
Po	190.4	177.0	164.8	153.4	143.1	133.5	124.7	116.6
At	198.7	184.7	172.0	160.2	149.4	139.4	130.2	121.7
Rn	196.9	183.1	170.5	158.8	148.1	138.2	129.1	120.7
Fr	205.1	190.8	177.6	165.4	154.3	144.0	134.5	125.8
Ra	211.7	196.9	183.3	170.8	159.3	148.7	138.9	129.9
Ac	220.2	204.7	190.7	177.7	165.8	154.7	144.6	135.2
Th	224.9	209.2	194.8	181.5	169.4	158.1	147.7	138.1
Pa	235.4	219.0	204.0	190.1	177.4	165.6	154.8	144.7
U	238.1	221.6	206.4	192.4	179.6	167.7	156.7	146.6

Table 3: continued

	Emitter							
Absorber	Po	At	Rn	Fr	Ra	Ac	Th	Pa
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Be	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
B	1.0	0.9	0.9	0.8	0.8	0.7	0.7	0.6
C	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
N	2.9	2.7	2.5	2.3	2.1	2.0	1.9	1.7
O	4.4	4.0	3.7	3.5	3.2	3.0	2.8	2.6
F	6.0	5.5	5.1	4.8	4.4	4.1	3.8	3.6
Ne	8.7	8.1	7.5	6.9	6.4	6.0	5.6	5.2
Na	11.3	10.5	9.7	9.0	8.4	7.8	7.2	6.7
Mg	15.3	14.2	13.2	12.2	11.3	10.5	9.8	9.1
Al	19.1	17.7	16.4	15.2	14.1	13.1	12.2	11.4
Si	24.8	22.9	21.3	19.7	18.3	17.0	15.8	14.7
P	29.5	27.4	25.4	23.5	21.9	20.3	18.9	17.6
S	36.8	34.1	31.6	29.3	27.3	25.4	23.6	22.0
Cl	42.1	39.0	36.2	33.6	31.3	29.1	27.1	25.3
Ar	46.5	43.1	40.1	37.2	34.6	32.3	30.1	28.0
K	58.3	54.2	50.3	46.8	43.6	40.6	37.8	35.3
Ca	69.1	64.1	59.6	55.5	51.6	48.1	44.9	41.9
Sc	73.8	68.5	63.7	59.3	55.3	51.5	48.1	44.9
Ti	82.2	76.4	71.1	66.2	61.7	57.6	53.8	50.2
V	90.7	84.3	78.5	73.2	68.2	63.7	59.5	55.6
Cr	103.4	96.2	89.6	83.6	78.0	72.8	68.1	63.6
Mn	113.1	105.3	98.2	91.6	85.5	79.9	74.7	69.8
Fe	127.7	119.0	111.0	103.5	96.7	90.4	84.6	79.1
Co	138.1	128.7	120.1	112.1	104.7	97.9	91.6	85.8
Ni	157.0	146.4	136.6	127.6	119.2	111.5	104.4	97.8
Cu	162.7	151.8	141.8	132.5	124.0	116.0	108.7	101.9
Zn	176.4	164.8	154.0	144.1	134.9	126.4	118.5	111.2
Ga	184.3	172.2	161.1	150.8	141.3	132.4	124.3	116.6
Ge	196.8	184.0	172.2	161.2	151.1	141.7	133.0	124.8
As	30.7	28.6	26.6	173.0	162.2	152.2	142.9	134.2
Se	32.9	30.7	28.6	26.6	24.9	23.2	149.4	140.4
Br	36.7	34.1	31.8	29.6	27.7	25.8	24.2	22.6
Kr	39.2	36.5	34.0	31.7	29.6	27.7	25.9	24.2
Rb	43.1	40.1	37.3	34.8	32.5	30.4	28.4	26.5
Sr	46.9	43.6	40.7	37.9	35.4	33.1	30.9	28.9
Y	51.3	47.8	44.5	41.5	38.8	36.2	33.9	31.7
Zr	55.4	51.6	48.1	44.9	41.9	39.1	36.6	34.2
Nb	60.1	56.0	52.1	48.6	45.4	42.4	39.7	37.1
Mo	64.1	59.7	55.7	51.9	48.5	45.3	42.4	39.6
Tc	69.0	64.3	59.9	55.9	52.2	48.8	45.6	42.7
Ru	73.3	68.3	63.7	59.4	55.5	51.8	48.5	45.4
Rh	78.8	73.4	68.4	63.9	59.6	55.7	52.1	48.8
Pd	83.1	77.4	72.2	67.4	62.9	58.8	55.0	51.5

Table 3: continued

	Emitter							
Absorber	Po	At	Rn	Fr	Ra	Ac	Th	Pa
Ag	89.4	83.3	77.6	72.5	67.7	63.3	59.2	55.4
Cd	93.2	86.9	81.0	75.6	70.7	66.1	61.8	57.9
In	99.1	92.3	86.1	80.4	75.1	70.2	65.7	61.5
Sn	103.8	96.8	90.3	84.3	78.7	73.6	68.9	64.5
Sb	109.5	102.1	95.2	88.9	83.1	77.7	72.7	68.1
Te	112.7	105.1	98.0	91.6	85.6	80.0	74.9	70.2
I	122.2	113.9	106.3	99.3	92.8	86.8	81.3	76.1
Xe	127.1	118.5	110.6	103.3	96.6	90.4	84.6	79.2
Cs	134.9	125.8	117.4	109.7	102.6	96.0	89.9	84.2
Ba	140.0	130.6	121.9	113.9	106.5	99.7	93.4	87.5
La	148.2	138.2	129.1	120.6	112.8	105.6	98.9	92.7
Ce	156.9	146.4	136.8	127.8	119.6	111.9	104.9	98.3
Pr	166.6	155.5	145.2	135.8	127.0	118.9	111.4	104.5
Nd	173.6	162.0	151.3	141.5	132.4	124.0	116.2	108.9
Pm	184.2	171.9	160.6	150.1	140.5	131.5	123.3	115.6
Sm	188.7	176.2	164.6	153.9	144.0	134.9	126.4	118.5
Eu	198.6	185.4	173.2	161.9	151.6	141.9	133.1	124.7
Gd	203.5	190.1	177.6	166.1	155.5	145.6	136.5	128.0
Tb	213.0	199.0	186.0	174.0	162.9	152.6	143.1	134.3
Dy	219.9	205.5	192.1	179.8	168.4	157.9	148.1	138.9
Ho	228.6	213.6	199.8	187.1	175.3	164.3	154.2	144.7
Er	237.7	222.2	207.9	194.7	182.5	171.2	160.6	150.8
Tm	248.0	231.9	217.1	203.3	190.6	178.8	167.8	157.6
Yb	255.3	238.8	223.5	209.4	196.3	184.2	172.9	162.4
Lu	266.1	248.9	233.1	218.4	204.8	192.2	180.5	169.6
Hf	241.5	256.8	240.5	225.4	211.4	198.5	186.4	175.2
Ta	179.3	237.6	249.3	233.7	219.3	205.9	193.4	181.8
W	185.7	173.5	228.2	211.2	226.8	213.0	200.2	188.2
Re	199.8	185.4	170.5	216.1	203.7	220.6	207.4	195.0
Os	202.2	191.8	179.7	165.2	152.1	196.3	212.9	200.2
Ir	83.1	193.8	180.8	168.8	157.9	147.8	194.6	182.8
Pt	86.4	80.8	187.4	175.0	163.5	153.1	143.4	185.3
Au	90.1	84.3	79.0	182.3	170.4	159.3	149.2	139.8
Hg	93.2	87.2	81.7	76.6	175.9	164.4	153.9	144.1
Tl	96.2	90.0	84.3	79.1	74.2	69.6	161.8	154.6
Pb	99.7	93.4	87.5	82.0	76.9	72.2	67.9	153.9
Bi	103.9	97.2	91.1	85.4	80.1	75.3	70.7	66.5
Po	109.0	102.1	95.6	89.7	84.1	79.0	74.3	69.8
At	113.9	106.6	99.9	93.6	87.9	82.5	77.6	72.9
Rn	112.9	105.7	99.0	92.9	87.2	81.9	76.9	72.3
Fr	117.7	110.2	103.3	96.8	90.9	85.4	80.2	75.5
Ra	121.5	113.8	106.7	100.0	93.9	88.2	82.9	78.0
Ac	126.5	118.5	111.0	104.1	97.8	91.8	86.3	81.2
Th	129.3	121.1	113.5	106.5	100.0	93.9	88.3	83.0
Pa	135.5	126.9	118.9	111.6	104.8	98.4	92.6	87.1
U	137.2	128.5	120.5	113.0	106.1	99.7	93.8	88.2

Table 3: continued

	Emitter
Absorber	U
H	0.4
He	0.2
Li	0.2
Be	0.4
B	0.6
C	1.0
N	1.6
O	2.4
F	3.3
Ne	4.8
Na	6.3
Mg	8.5
Al	10.6
Si	13.7
P	16.4
S	20.5
Cl	23.6
Ar	26.2
K	32.9
Ca	39.1
Sc	42.0
Ti	47.0
V	52.0
Cr	59.6
Mn	65.4
Fe	74.2
Co	80.4
Ni	91.7
Cu	95.6
Zn	104.4
Ga	109.6
Ge	117.4
As	126.2
Se	132.1
Br	143.3
Kr	22.6
Rb	24.9
Sr	27.1
Y	29.7
Zr	32.1
Nb	34.8
Mo	37.1
Tc	40.0
Ru	42.5
Rh	45.7
Pd	48.3

Table 3: continued

	Emitter
Absorber	U
Ag	51.9
Cd	54.2
In	57.7
Sn	60.5
Sb	63.8
Te	65.8
I	71.4
Xe	74.3
Cs	79.0
Ba	82.1
La	87.0
Ce	92.2
Pr	98.0
Nd	102.2
Pm	108.5
Sm	111.3
Eu	117.1
Gd	120.2
Tb	126.1
Dy	130.6
Ho	136.1
Er	141.8
Tm	148.2
Yb	152.8
Lu	159.5
Hf	164.8
Ta	171.1
W	177.2
Re	183.6
Os	188.4
Ir	195.2
Pt	182.2
Au	131.3
Hg	135.3
Tl	147.8
Pb	144.4
Bi	150.1
Po	65.7
At	68.7
Rn	68.1
Fr	71.0
Ra	73.4
Ac	76.5
Th	78.2
Pa	82.0
U	83.1

Table 4: Mass attenuation coefficients for Lβ lines.

	Emitter							
Absorber	Ca	Sc	Ti	V	Cr	Mn	Fe	Co
H	226.4	139.7	89.2	59.3	40.6	28.5	20.3	14.7
He	1697.8	1076.2	697.9	471.2	326.7	231.9	167.7	123.2
Li	5507.2	3606.6	2408.6	1655.6	1169.5	843.1	618.6	459.2
Be	12414.2	8426.9	5739.0	4045.0	2915.3	2136.5	1592.7	1196.8
B	21653.9	15101.6	10611.4	7631.2	5595.0	4167.6	3144.1	2395.2
C	33601.2	23888.7	17015.4	12452.3	9293.4	7089.3	5497.1	4220.6
N	1996.0	1245.5	23720.7	17774.8	13495.1	10267.3	7917.3	6163.8
O	3487.9	2408.2	1696.0	1233.6	17966.0	13837.9	10778.0	8433.4
F	5028.2	3418.2	2303.0	1619.7	1163.1	836.7	12594.5	10009.8
Ne	7781.8	5334.9	3707.7	2657.9	1951.3	1465.5	1121.9	870.9
Na	10390.2	7103.6	4982.5	3621.6	2692.4	2057.9	1565.1	1202.7
Mg	15519.4	10736.0	7538.1	5426.7	3979.4	2975.6	2251.2	1720.8
Al	18343.6	12999.2	9429.3	6904.5	5122.9	3841.0	2929.2	2255.8
Si	24028.6	17199.4	12389.2	9071.5	6782.5	5104.4	3913.0	3072.2
P	26628.3	19740.7	14497.4	10811.8	8115.7	6213.1	4769.2	3702.8
S	31749.3	23955.0	17764.8	13340.5	10163.7	7825.9	6069.8	4705.3
Cl	34732.7	26466.8	19436.0	14494.6	10959.5	8431.1	6545.6	5130.1
Ar	40118.4	28402.7	21173.9	16490.0	12742.5	9917.2	7789.4	6132.9
K	42207.1	34160.0	26255.5	19835.4	15162.9	11810.5	9229.6	7184.0
Ca	4783.2	34696.7	29413.7	22545.3	17461.7	13703.9	10847.1	8582.0
Sc	5433.8	68362.9	26620.4	24941.8	19417.6	15707.3	12619.3	10235.1
Ti	5770.9	4208.8	29641.3	22647.7	20137.4	16042.9	12783.7	10178.0
V	6619.2	4870.8	3576.3	24839.3	19647.2	17408.8	13864.5	11112.4
Cr	7839.0	5618.6	4289.3	3358.8	22924.2	17317.8	15660.6	13155.6
Mn	8444.4	6273.4	4644.2	3549.6	2792.3	19246.1	15429.0	13809.6
Fe	10591.6	7575.6	5564.3	4196.6	3226.0	2568.7	17466.7	13895.9
Co	10310.2	7724.1	5850.5	4509.3	3540.2	2823.7	2276.1	14825.7
Ni	13940.5	10287.2	7670.5	5793.1	4341.6	3392.1	2708.9	2080.5
Cu	14375.9	10891.3	8084.7	6375.0	4995.2	3909.9	3075.6	2527.5
Zn	16752.7	12578.3	9306.3	6837.0	5197.9	4103.6	3290.0	2662.4
Ga	19022.0	14409.6	10870.6	8411.1	6494.4	5098.8	3893.5	2949.7
Ge	21027.5	16068.9	12219.2	9266.4	7147.3	5526.1	4327.0	3396.3
As	19361.8	15088.0	11558.4	8997.4	7056.8	5602.2	4491.0	3623.1
Se	21023.5	16422.0	12611.7	9841.4	7743.5	6156.4	4936.3	3980.8
Br	22993.9	18137.2	13977.5	10938.5	8633.3	6887.9	5538.8	4467.8
Kr	24366.6	20263.4	15764.4	12536.8	9874.0	7868.2	6355.2	5181.3
Rb	26456.9	21261.2	16581.6	13082.9	10351.9	8292.0	6700.3	5429.2
Sr	27173.8	22572.0	17684.9	14035.5	11189.2	9003.1	7291.4	5908.6
Y	28697.7	24901.0	19122.1	15063.1	12042.3	9777.7	7810.1	6283.6
Zr	28993.6	24519.2	20909.3	17313.8	13983.4	11270.3	9207.8	7562.3
Nb	23645.4	22019.5	19240.9	16415.3	13684.9	11345.5	9493.2	7919.1
Mo	24361.5	25035.4	21671.4	19198.9	15055.6	13017.7	10704.8	8733.9
Tc	24619.7	24246.3	21856.9	18572.4	16080.0	13052.6	10692.4	8763.7
Ru	24088.0	23500.8	21250.0	19235.5	15592.2	13124.5	10965.5	9153.3
Rh	14500.6	21301.7	21243.7	19859.7	17279.2	15168.1	12457.5	10231.9
Pd	5879.6	17786.3	19668.1	19224.0	17769.9	15422.1	13302.4	10955.2

Table 4: continued

	Emitter							
Absorber	Ca	Sc	Ti	V	Cr	Mn	Fe	Co
Ag	5091.7	10737.8	19403.7	19556.9	18201.3	15912.3	13993.4	11801.6
Cd	4781.8	4409.7	12710.1	19558.6	16545.0	15085.2	13573.4	11940.0
In	6050.4	4845.6	6157.5	17102.8	15385.3	13554.4	14386.9	12099.7
Sn	6093.2	4868.9	4178.2	11472.5	15908.6	13943.4	12682.4	12779.3
Sb	5550.5	4906.8	4111.2	3468.8	20926.8	16296.3	12953.3	11083.9
Te	6915.8	5757.9	4585.1	3961.1	22144.8	16856.4	13802.4	11434.3
I	6953.1	5958.9	4946.6	4047.4	3354.4	19373.5	14942.9	11907.9
Xe	7010.7	6230.7	5426.3	4474.2	3767.7	3192.1	16316.5	12812.0
Cs	6649.4	6063.0	5259.8	4501.0	3824.1	3250.6	2769.4	12919.0
Ba	7252.2	6407.5	5584.7	4861.6	4011.7	3386.2	2815.4	12355.0
La	7154.9	6792.5	6275.9	5385.0	4441.4	3642.8	3047.3	2505.6
Ce	7756.1	6996.6	6202.9	5328.8	4561.7	3923.3	3205.3	2567.5
Pr	8039.6	7367.3	6458.1	5575.6	4766.2	3912.9	3268.4	2641.7
Nd	8245.1	7341.2	6576.4	5774.8	5061.2	4377.6	3682.1	3057.4
Pm	9180.6	8281.1	6969.6	6041.8	5127.5	4368.6	3728.7	3171.8
Sm	10395.4	9187.8	7567.0	6392.0	5407.5	4592.9	3914.6	3331.1
Eu	10379.2	9372.9	7916.5	6719.9	5682.2	4822.4	4106.1	3496.4
Gd	10253.7	8822.1	7600.4	6664.6	5724.3	4874.0	4155.3	3538.7
Tb	11935.4	10249.3	8724.1	7516.3	6450.5	5415.0	4561.2	3860.4
Dy	12948.2	11220.4	9481.6	7975.3	6784.4	5697.8	4801.9	4075.7
Ho	12819.2	11282.8	9837.8	8481.2	7164.8	6008.7	5088.5	4287.9
Er	14387.1	12167.3	10514.2	8974.3	7612.8	6411.1	5406.6	4562.3
Tm	13652.7	12341.7	11036.4	9672.4	8151.7	6870.6	5801.5	4883.4
Yb	15652.3	13465.5	11596.3	9924.7	8541.3	7197.0	6074.4	5124.9
Lu	15089.7	13590.8	11583.3	10355.7	8777.3	7416.2	6273.6	5286.1
Hf	14873.2	12976.8	11445.2	10043.3	8987.9	7762.4	6570.2	5532.9
Ta	15074.7	13270.0	12390.4	10691.5	9633.0	8144.7	6907.8	5833.3
W	15587.1	14007.5	12805.8	11119.4	9574.0	8512.6	7219.7	6106.6
Re	15534.9	13948.7	12555.9	11350.7	9869.4	8869.5	7481.8	6339.7
Os	15146.5	13878.3	12100.3	11370.1	9918.3	8680.1	7673.1	6532.3
Ir	15887.7	14886.2	13491.7	12106.3	10698.3	9187.8	7949.8	6926.9
Pt	15511.0	14972.0	13121.0	11499.3	10905.8	9501.0	8236.2	7335.2
Au	15460.3	14718.5	13412.2	12109.6	10969.2	9969.9	8805.6	7823.8
Hg	16107.6	15590.1	14127.0	12560.5	11025.0	10242.4	9006.6	7768.1
Tl	14510.4	14497.5	13557.4	12304.6	10785.1	9638.5	9057.6	7855.3
Pb	13420.5	13830.1	13035.8	11906.1	10633.2	9530.9	8680.3	7830.7
Bi	12401.7	12863.2	12945.2	12481.5	11302.6	9877.5	8753.2	8274.2
Po	11573.1	13422.7	14520.7	14129.2	12412.2	10349.4	9196.4	8683.2
At	10040.6	12356.1	12842.5	12975.2	12053.4	10913.7	9501.9	8387.7
Rn	8584.5	11219.9	11958.0	12062.9	11785.7	10850.9	9480.0	8423.7
Fr	6285.8	9841.5	11401.8	11862.1	11660.3	11594.3	9944.7	8518.7
Ra	4077.0	7925.5	10636.4	11069.4	10837.6	10667.5	10055.1	8727.3
Ac	2518.5	6104.4	9729.9	10917.5	11024.2	10272.2	9596.0	8710.9
Th	2476.9	4465.2	7153.7	8621.5	8871.7	8884.2	8705.3	7878.8
Pa	2152.5	3555.2	6810.7	9006.1	9794.0	9470.1	9839.1	9023.7
U	1929.3	2222.7	3402.3	5113.8	6487.3	6007.8	6478.3	7523.4

Table 4: continued

	Emitter							
Absorber	Ni	Cu	Zn	Ga	Ge	As	Se	Br
H	10.8	8.0	6.5	5.1	4.0	3.2	2.5	2.1
He	91.4	69.2	54.6	41.8	32.5	25.3	20.0	15.9
Li	344.3	261.5	210.5	162.5	127.0	99.7	79.2	63.2
Be	908.6	698.7	545.5	424.9	334.8	264.9	212.2	170.5
B	1836.8	1420.7	1112.6	871.9	691.0	550.0	443.0	357.8
C	3270.4	2556.9	2007.1	1583.6	1263.3	1011.8	819.9	666.0
N	4805.5	3795.0	3013.9	2393.8	1921.8	1548.8	1262.5	1031.2
O	6621.6	5289.4	4189.1	3348.7	2705.0	2193.2	1798.1	1476.6
F	8024.3	6451.6	5171.9	4166.3	3390.2	2768.7	2285.4	1888.6
Ne	677.6	8715.2	6798.5	5506.9	4504.8	3698.0	3067.5	2547.2
Na	931.4	728.8	597.1	5821.1	4929.8	4187.1	3587.1	3055.5
Mg	1325.6	1028.4	842.5	674.5	544.9	5331.6	4527.0	3833.4
Al	1748.8	1369.6	1082.0	866.0	700.3	568.4	466.5	384.0
Si	2395.5	1862.0	1434.2	1149.0	930.0	755.6	620.7	511.3
P	2881.8	2270.2	1748.0	1401.3	1135.1	922.8	758.5	625.1
S	3685.8	2908.2	2220.1	1781.1	1443.7	1174.5	966.0	796.6
Cl	4048.2	3218.9	2589.5	2079.4	1687.0	1373.7	1130.8	933.1
Ar	4814.5	3827.3	2912.8	2341.9	1902.1	1550.6	1277.8	1055.4
K	5664.3	4690.4	3714.5	2990.6	2432.4	1985.5	1638.1	1354.6
Ca	6815.6	5472.1	4457.9	3595.0	2928.4	2393.9	1978.0	1637.7
Sc	8276.6	6641.2	4800.6	3877.1	3162.7	2589.1	2142.0	1775.7
Ti	8146.6	6567.0	5382.0	4352.7	3555.4	2914.4	2414.2	2003.7
V	8934.7	7229.5	5960.9	4830.5	3953.1	3246.4	2694.0	2239.4
Cr	10597.4	8477.5	6801.1	5521.5	4526.5	3723.7	3095.1	2576.5
Mn	11042.8	9004.9	7441.4	6058.0	4979.4	4106.9	3422.0	2854.6
Fe	12582.2	10165.0	8363.8	6829.5	5629.6	4656.3	3890.1	3252.5
Co	12097.8	11004.5	9025.0	7382.6	6096.0	5050.5	4226.1	3538.9
Ni	13798.8	11169.9	10324.0	8447.4	6976.9	5781.8	4839.1	4054.4
Cu	2009.1	12444.6	9615.8	8785.5	7262.8	6024.0	5046.2	4232.4
Zn	2133.0	1736.2	5492.0	8311.8	7990.9	6609.5	5522.0	4625.0
Ga	2335.5	1890.4	1565.9	4609.5	7130.8	6949.7	5815.1	4877.4
Ge	2686.6	2122.0	1746.6	1433.6	4421.5	6393.6	6240.2	5249.9
As	2927.9	2383.0	1956.5	1605.5	1328.8	1103.3	5697.4	5001.2
Se	3220.8	2622.5	2137.8	1755.1	1453.5	1205.5	1009.7	5145.9
Br	3614.5	2951.7	2419.9	1984.3	1642.3	1363.7	1143.5	961.1
Kr	4121.8	3290.6	2632.6	2160.0	1788.7	1486.2	1246.9	1048.3
Rb	4403.2	3592.1	2928.5	2404.2	1992.0	1656.0	1390.1	1169.2
Sr	4803.5	3931.0	3224.8	2649.5	2196.9	1827.6	1535.3	1291.8
Y	5097.7	4144.0	3566.9	2932.0	2432.2	2024.3	1701.2	1431.9
Zr	6173.1	4983.7	3887.2	3197.0	2653.4	2209.5	1857.7	1564.4
Nb	6514.3	5238.9	4248.1	3495.4	2902.3	2417.8	2033.7	1713.1
Mo	7150.8	5812.8	4565.1	3758.8	3123.0	2603.3	2191.0	1846.6
Tc	7199.2	5937.7	4948.7	4076.9	3389.2	2826.6	2380.1	2006.9
Ru	7568.9	6361.6	5284.5	4356.2	3623.5	3023.7	2547.5	2149.1
Rh	8407.9	6939.2	5703.2	4705.0	3916.6	3270.8	2757.6	2327.7
Pd	9009.6	7458.5	6045.8	4990.9	4157.1	3473.6	2930.2	2474.7

Table 4: continued

	Emitter							
Absorber	Ni	Cu	Zn	Ga	Ge	As	Se	Br
Ag	9806.3	7945.4	6511.8	5380.8	4486.1	3752.1	3167.9	2677.5
Cd	10018.0	8330.3	6802.9	5628.5	4698.2	3934.0	3325.2	2813.0
In	10555.5	8797.8	7231.1	5989.4	5004.8	4195.2	3549.5	3005.4
Sn	10941.0	9480.4	7558.3	6270.4	5247.6	4405.3	3732.5	3164.3
Sb	10860.9	9228.3	7956.5	6609.9	5539.0	4656.0	3949.7	3351.9
Te	11035.5	9436.5	8163.2	6792.8	5701.2	4799.7	4077.6	3464.8
I	10288.9	10197.2	8477.2	7376.1	6191.2	5212.7	4428.9	3764.3
Xe	10256.1	9975.1	8770.4	7358.3	6453.1	5433.3	4616.4	3924.5
Cs	10345.7	8821.6	8726.8	7764.8	6874.2	5779.5	4903.9	4165.8
Ba	10849.4	9552.5	7919.4	7570.0	6789.9	5999.0	5089.7	4324.4
La	11508.1	9056.6	8425.6	7318.4	6740.7	6023.4	5392.2	4587.3
Ce	2071.5	13599.2	8980.6	7409.2	8098.2	6841.7	5786.6	4839.1
Pr	2157.5	10559.6	9735.7	7945.5	6575.7	5856.2	5514.7	5118.8
Nd	2585.0	2208.2	8365.1	7277.6	6371.9	5890.7	5626.3	5198.0
Pm	2695.9	2297.8	7954.9	7369.3	6851.1	6377.5	5959.1	5379.2
Sm	2830.1	2410.0	1979.1	7863.2	7241.2	6679.0	6187.2	5588.9
Eu	2970.9	2530.0	2080.7	1780.6	9534.9	7904.1	6618.9	5578.9
Gd	3010.9	2569.8	2151.9	1841.9	9004.0	7485.0	6285.7	5288.1
Tb	3271.6	2781.9	2247.3	1920.2	1648.9	7301.5	6092.2	5099.4
Dy	3441.9	2918.8	2338.1	1996.1	1711.7	7616.2	6351.0	5314.0
Ho	3621.8	3073.0	2450.7	2088.4	1789.9	1536.5	7106.7	5949.6
Er	3853.4	3267.0	2574.1	2193.1	1879.3	1609.3	7128.7	5969.6
Tm	4107.7	3474.2	2712.6	2305.0	1973.2	1688.6	1457.0	6592.8
Yb	4310.5	3635.7	2819.6	2388.9	2039.7	1746.4	1507.5	1303.2
Lu	4449.5	3763.6	2978.2	2522.5	2153.1	1843.0	1590.5	1374.0
Hf	4674.1	3963.4	3116.3	2639.0	2252.3	1927.6	1663.3	1436.6
Ta	4931.9	4177.5	3279.6	2776.9	2369.6	2027.7	1749.5	1510.6
W	5150.8	4360.4	3441.2	2913.7	2486.3	2127.5	1835.5	1584.7
Re	5365.4	4558.2	3618.1	3064.1	2615.1	2238.1	1931.3	1667.5
Os	5551.9	4720.9	3767.7	3191.0	2723.6	2331.1	2011.7	1736.7
Ir	6016.6	5020.9	3965.3	3359.4	2868.1	2455.5	2119.6	1830.2
Pt	6221.0	5289.8	4143.4	3511.4	2998.8	2568.1	2217.4	1915.1
Au	6889.8	5941.0	4349.0	3687.3	3150.5	2699.3	2331.7	2014.5
Hg	6917.3	5863.0	4516.3	3831.0	3274.8	2807.0	2425.7	2096.5
Tl	7055.4	6050.7	4683.6	3974.7	3399.1	2914.8	2519.8	2178.5
Pb	6947.0	6194.8	4873.5	4138.0	3540.5	3037.5	2627.1	2272.2
Bi	7141.6	6218.9	5090.9	4325.3	3703.0	3178.8	2750.9	2380.4
Po	7487.1	6521.3	5357.0	4554.2	3901.1	3350.8	2901.3	2511.7
At	7922.2	6812.7	5507.8	4782.4	4095.2	3516.2	3043.5	2634.5
Rn	8009.0	6799.2	5474.4	4772.8	4084.2	3504.6	3031.6	2623.0
Fr	7527.2	7080.0	5798.6	4899.2	4283.2	3672.7	3174.8	2745.8
Ra	7524.3	6690.3	5829.8	5065.6	4444.7	3809.5	3291.8	2846.2
Ac	7658.0	6822.7	6081.9	5284.4	4545.1	3983.2	3440.3	2974.0
Th	7016.6	6540.1	6218.7	5337.4	4661.2	4007.5	3530.4	3050.5
Pa	7920.0	6903.2	6535.8	5615.2	4838.9	4220.2	3719.0	3210.7
U	8041.0	7434.3	6236.5	5698.0	4912.8	4289.1	3708.5	3263.9

Table 4: continued

	Emitter							
Absorber	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc
H	1.7	1.5	1.2	1.1	1.0	0.9	0.8	0.7
He	12.8	10.4	8.4	6.9	5.7	4.7	4.0	3.3
Li	50.8	41.1	33.4	27.2	22.3	18.4	15.4	12.8
Be	137.9	112.1	91.6	74.9	61.8	51.2	42.8	35.8
B	290.8	237.5	194.9	160.2	132.8	110.3	92.5	77.7
C	543.7	446.0	367.7	303.6	252.3	210.3	177.0	149.0
N	845.8	696.8	576.9	478.4	399.0	333.6	281.8	238.0
O	1216.5	1006.7	837.0	697.0	583.5	489.5	414.8	351.5
F	1563.0	1299.2	1085.0	907.4	762.1	641.5	545.2	463.5
Ne	2118.1	1768.9	1483.9	1246.6	1050.3	886.9	756.0	644.5
Na	2553.9	2143.4	1806.9	1525.3	1289.6	1092.6	934.4	799.2
Mg	3214.3	2706.1	2288.1	1937.4	1643.6	1397.2	1198.7	1028.4
Al	3554.4	3051.2	2629.3	2268.6	1931.4	1647.2	1417.4	1219.8
Si	423.8	352.9	3102.2	2782.1	2374.2	2028.4	1748.4	1507.2
P	518.4	431.7	361.2	302.7	255.8	2187.2	1907.7	1664.1
S	660.9	550.7	461.0	386.4	326.6	276.6	236.5	1953.9
Cl	774.5	645.6	540.6	453.3	383.1	324.5	277.4	237.2
Ar	876.3	730.7	612.1	513.5	434.0	367.6	314.2	268.7
K	1125.6	939.4	787.5	661.1	558.9	473.6	405.0	346.4
Ca	1362.2	1137.8	954.7	802.2	678.6	575.2	492.2	421.2
Sc	1478.4	1236.1	1038.1	873.1	738.9	626.7	536.5	459.3
Ti	1669.8	1397.4	1174.6	988.8	837.4	710.6	608.7	521.4
V	1867.9	1564.6	1316.4	1109.2	939.9	798.1	684.0	586.3
Cr	2151.1	1803.4	1518.6	1280.7	1085.9	922.6	791.2	678.5
Mn	2386.0	2002.5	1688.1	1425.0	1209.1	1028.1	882.2	757.1
Fe	2721.5	2286.6	1929.6	1630.6	1384.5	1178.1	1011.6	868.6
Co	2965.4	2494.9	2108.2	1784.0	1515.9	1290.7	1109.0	953.0
Ni	3401.9	2866.1	2425.0	2054.7	1747.2	1488.8	1280.1	1100.8
Cu	3557.7	3002.6	2544.9	2159.9	1837.9	1567.0	1348.2	1159.9
Zn	3896.7	3296.1	2799.8	2381.4	2028.4	1731.2	1490.8	1283.9
Ga	4113.7	3483.3	2961.8	2521.8	2150.1	1836.8	1583.2	1364.7
Ge	4429.5	3752.1	3191.5	2718.3	2320.0	1984.1	1711.8	1476.9
As	4777.5	4050.1	3447.7	2938.9	2511.8	2151.1	1858.3	1605.5
Se	4443.4	4279.6	3643.6	3106.3	2657.5	2278.1	1969.8	1703.5
Br	4865.7	4159.1	3999.6	3416.0	2923.9	2507.6	2169.2	1876.7
Kr	885.4	4417.7	3737.4	3608.1	3090.3	2651.7	2295.1	1986.5
Rb	987.4	837.2	3926.3	3417.9	3354.9	2879.2	2492.3	2157.6
Sr	1090.7	924.5	786.9	2598.4	3141.3	3088.2	2674.7	2316.8
Y	1209.3	1025.3	872.9	744.2	2438.6	2921.2	2896.4	2509.8
Zr	1321.5	1120.6	954.3	813.7	698.3	2254.5	2701.1	2679.0
Nb	1447.4	1227.6	1045.6	891.7	765.1	657.8	2111.0	2511.8
Mo	1560.4	1323.8	1127.6	961.9	825.1	709.3	614.9	1939.3
Tc	1696.5	1439.7	1226.8	1046.8	897.8	771.6	668.8	579.8
Ru	1817.6	1543.1	1315.5	1123.0	963.0	827.5	717.1	621.6
Rh	1969.0	1672.0	1425.7	1217.2	1043.8	896.8	777.2	673.6
Pd	2093.9	1778.5	1516.9	1295.4	1111.0	954.7	827.4	717.2

Table 4: continued

	Emitter							
Absorber	Kr	Rb	Sr	Y	Zr	Nb	Mo	Tc
Ag	2266.8	1926.5	1643.9	1404.7	1205.0	1035.7	897.8	778.3
Cd	2381.9	2024.7	1728.1	1476.9	1267.4	1089.7	945.0	819.5
In	2546.7	2166.2	1850.1	1582.1	1358.0	1167.9	1013.0	878.7
Sn	2682.7	2283.2	1951.0	1669.4	1433.4	1233.2	1070.0	928.4
Sb	2843.2	2420.8	2069.6	1771.6	1521.8	1309.7	1136.8	986.8
Te	2941.2	2506.2	2144.1	1836.8	1578.3	1358.9	1179.8	1024.4
I	3198.2	2727.5	2335.3	2002.2	1721.0	1482.2	1287.3	1118.2
Xe	3336.8	2847.7	2440.0	2093.4	1800.2	1551.1	1347.7	1171.0
Cs	3545.9	3029.5	2598.5	2231.7	1920.1	1655.1	1438.6	1250.6
Ba	3684.2	3150.5	2704.7	2324.9	2001.3	1726.0	1501.0	1305.5
La	3909.8	3344.8	2872.6	2470.2	2127.4	1835.5	1596.9	1389.5
Ce	4127.6	3533.7	3037.1	2613.6	2252.6	1945.2	1693.6	1474.7
Pr	4370.4	3745.1	3221.7	2774.9	2391.9	2065.6	1798.5	1566.1
Nd	4544.0	3893.9	3349.7	2885.2	2488.5	2150.2	1873.3	1632.2
Pm	4732.6	4123.3	3547.3	3055.6	2637.0	2279.9	1987.4	1732.5
Sm	5062.8	4218.4	3630.1	3127.8	2700.5	2335.8	2037.0	1776.5
Eu	5111.8	4341.0	3811.3	3286.2	2838.1	2455.6	2142.1	1868.8
Gd	5210.0	4753.4	4064.6	3368.3	2910.6	2519.8	2199.2	1919.5
Tb	5038.6	4289.9	3926.6	3515.7	3039.8	2633.2	2299.5	2008.2
Dy	4483.9	4459.3	4073.2	3479.4	3143.0	2724.3	2380.5	2080.2
Ho	5022.2	4945.9	4221.8	3853.1	3316.6	2839.6	2481.4	2168.6
Er	5041.2	4273.9	4244.9	3608.5	3321.9	2957.8	2584.7	2258.9
Tm	5537.9	4669.6	3954.3	3929.5	3600.8	3089.2	2700.5	2359.9
Yb	5580.8	4751.1	4061.1	4055.2	3464.7	3176.6	2813.3	2429.1
Lu	4630.8	4986.9	4228.9	3591.5	3141.4	2698.7	2896.3	2531.8
Hf	1242.9	5256.7	4466.8	3800.3	3784.4	3246.7	2999.5	2601.3
Ta	1305.6	3003.2	4638.8	3949.8	3393.7	3399.6	2931.8	2703.0
W	1369.2	1187.0	3245.7	4102.1	3528.9	3041.0	3058.0	2634.9
Re	1440.1	1248.0	1120.6	4219.2	3638.2	3142.8	3184.9	2747.8
Os	1499.3	1298.7	1129.0	2946.3	3736.5	3227.9	2812.1	2834.4
Ir	1579.5	1367.8	1188.8	1034.4	3935.1	3392.4	2949.5	2565.1
Pt	1653.3	1432.1	1244.9	1083.5	2776.3	3544.6	3078.9	2675.1
Au	1739.0	1506.3	1309.4	1139.6	995.8	1723.2	2686.5	2508.6
Hg	1810.1	1568.1	1363.4	1186.8	1036.8	907.4	3260.5	2844.6
Tl	1881.2	1629.9	1417.3	1233.9	1077.9	943.2	2322.9	2945.3
Pb	1962.5	1700.7	1479.2	1288.0	1125.0	984.3	867.8	2105.1
Bi	2056.7	1782.9	1551.2	1351.1	1179.8	1032.0	909.5	801.6
Po	2170.3	1881.7	1637.3	1426.3	1245.4	1089.4	960.1	846.2
At	2277.4	1975.3	1719.4	1498.5	1308.1	1144.0	1008.0	888.2
Rn	2268.1	1967.7	1713.3	1493.4	1303.7	1140.0	1004.4	885.0
Fr	2375.1	2061.4	1795.4	1565.6	1366.5	1194.8	1052.5	927.3
Ra	2462.3	2137.3	1861.8	1623.7	1417.6	1239.8	1092.5	962.8
Ac	2574.1	2235.5	1948.2	1699.9	1484.3	1298.2	1144.1	1008.3
Th	2641.3	2294.6	2000.4	1746.0	1524.8	1334.0	1175.8	1036.5
Pa	2780.2	2415.4	2105.9	1838.2	1605.3	1404.4	1237.8	1091.1
U	2826.5	2455.8	2141.3	1869.3	1632.7	1428.4	1259.2	1110.1

Table 4: continued

	Emitter							
Absorber	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb
H	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5
He	2.8	2.4	2.0	1.8	1.5	1.3	1.2	1.0
Li	10.7	9.0	7.6	6.5	5.6	4.8	4.1	3.5
Be	30.1	25.4	21.5	18.3	15.6	13.3	11.4	9.8
B	65.5	55.5	47.2	40.2	34.3	29.4	25.3	21.8
C	126.1	107.0	91.3	77.9	66.7	57.3	49.3	42.7
N	201.9	172.0	147.1	125.9	108.0	92.9	80.2	69.5
O	299.2	255.6	219.2	188.1	161.8	139.5	120.7	104.8
F	395.7	338.9	291.6	250.8	216.3	186.9	162.1	141.0
Ne	551.8	474.1	408.9	352.6	304.8	264.0	229.4	200.1
Na	686.4	591.4	511.7	442.2	383.0	332.5	289.5	253.0
Mg	886.0	765.8	664.5	575.6	499.7	434.7	379.3	332.2
Al	1054.0	913.6	795.0	690.3	600.6	523.7	458.0	402.0
Si	1304.4	1132.5	987.0	858.8	748.8	654.2	573.3	504.2
P	1456.8	1279.1	1127.1	983.5	859.5	752.6	660.9	582.5
S	1722.0	1521.7	1349.3	1179.8	1032.8	905.9	796.8	703.4
Cl	203.6	1625.2	1481.7	1299.9	1139.8	1001.3	882.2	780.0
Ar	230.7	198.7	171.9	149.1	1176.1	1044.9	930.8	831.8
K	297.5	256.4	221.8	192.4	167.2	145.7	1155.6	1024.0
Ca	361.9	312.0	270.1	234.2	203.6	177.4	155.0	135.9
Sc	394.8	340.5	294.9	255.8	222.5	193.8	169.4	148.6
Ti	448.5	387.0	335.3	291.0	253.1	220.6	192.8	169.2
V	504.6	435.7	377.7	327.9	285.3	248.7	217.5	190.9
Cr	584.3	504.8	437.9	380.2	330.9	288.6	252.4	221.6
Mn	652.4	564.0	489.5	425.3	370.3	323.1	282.8	248.4
Fe	749.0	647.9	562.6	489.0	426.0	371.8	325.5	286.0
Co	822.2	711.7	618.4	537.8	468.7	409.3	358.5	315.2
Ni	950.4	823.2	715.7	622.6	542.8	474.2	415.5	365.4
Cu	1002.0	868.4	755.5	657.5	573.5	501.2	439.4	386.5
Zn	1110.1	962.9	838.5	730.1	637.1	557.1	488.5	430.0
Ga	1181.0	1025.3	893.5	778.4	679.6	594.5	521.6	459.3
Ge	1279.4	1111.7	969.7	845.3	738.4	646.3	567.4	499.9
As	1392.5	1211.6	1058.1	922.8	806.5	706.3	620.3	546.7
Se	1478.8	1287.8	1125.6	982.3	859.1	752.7	661.5	583.3
Br	1629.9	1419.9	1241.6	1084.2	948.8	831.9	731.5	645.5
Kr	1726.1	1504.5	1316.2	1150.1	1007.1	883.5	777.4	686.4
Rb	1875.1	1634.5	1430.1	1250.5	1095.8	962.0	847.0	748.3
Sr	2014.4	1756.9	1538.0	1346.1	1180.7	1037.5	914.3	808.6
Y	2183.1	1904.8	1668.0	1460.7	1281.8	1126.9	993.6	879.1
Zr	2333.2	2038.1	1786.9	1565.0	1373.5	1207.7	1064.9	942.2
Nb	2190.5	2189.7	1921.9	1683.8	1478.1	1300.0	1146.6	1014.8
Mo	2305.8	2014.4	2027.4	1777.6	1561.5	1374.2	1212.7	1074.0
Tc	1800.2	2144.1	1877.8	1887.6	1660.0	1462.6	1292.2	1145.6
Ru	540.8	471.9	1789.5	1736.9	1748.3	1541.9	1363.6	1209.9
Rh	586.0	511.4	447.9	1841.8	1623.2	1641.1	1453.3	1291.4
Pd	624.0	544.6	477.0	418.4	1228.3	1494.8	1521.0	1353.0

Table 4: continued

	Emitter							
Absorber	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb
Ag	677.3	591.2	517.9	454.3	399.4	1156.6	1408.2	1434.7
Cd	713.4	623.0	546.0	478.9	421.0	370.8	1059.0	1289.5
In	765.1	668.2	585.7	513.8	451.7	397.8	351.3	986.7
Sn	808.7	706.5	619.5	543.4	477.7	420.7	371.5	329.2
Sb	859.8	751.4	659.1	578.2	508.4	447.8	395.5	350.5
Te	892.9	780.6	684.9	601.0	528.5	465.6	411.3	364.6
I	974.9	852.5	748.2	656.7	577.6	509.0	449.8	398.8
Xe	1021.4	893.5	784.5	688.7	605.9	534.1	472.0	418.6
Cs	1091.2	955.0	838.8	736.6	648.2	571.5	505.2	448.2
Ba	1139.6	997.8	876.8	770.2	678.0	597.9	528.8	469.2
La	1213.5	1062.9	934.3	821.0	722.9	637.6	564.0	500.6
Ce	1288.8	1129.7	993.8	873.0	768.4	677.6	599.2	531.6
Pr	1368.8	1199.9	1055.6	927.9	817.4	721.3	638.3	566.7
Nd	1427.4	1251.9	1101.9	969.0	853.8	753.7	667.1	592.5
Pm	1515.9	1330.2	1171.5	1030.3	907.9	801.6	709.6	630.3
Sm	1555.1	1365.2	1202.7	1058.1	932.8	823.8	729.5	648.2
Eu	1636.3	1436.8	1266.2	1114.3	982.6	868.0	768.9	683.4
Gd	1681.5	1477.3	1302.4	1146.5	1011.3	893.6	791.8	703.9
Tb	1760.2	1547.3	1364.9	1201.9	1060.4	937.3	830.7	738.7
Dy	1824.4	1604.6	1416.2	1247.3	1100.6	972.9	862.3	766.9
Ho	1902.0	1673.0	1476.7	1301.0	1148.3	1015.4	900.3	801.0
Er	1981.2	1742.7	1538.2	1355.8	1197.3	1059.2	939.6	836.3
Tm	2069.7	1820.4	1606.7	1416.8	1251.8	1107.9	983.3	875.5
Yb	2130.1	1873.3	1653.1	1458.2	1288.9	1141.2	1013.2	902.4
Lu	2220.5	1953.0	1723.7	1521.0	1344.8	1191.2	1057.9	942.6
Hf	2293.5	2018.2	1782.1	1572.8	1390.9	1232.2	1094.5	975.4
Ta	2346.2	2096.2	1852.5	1635.5	1446.6	1281.9	1138.9	1015.2
W	2443.0	2168.1	1917.0	1693.1	1498.1	1328.0	1180.4	1052.5
Re	2538.2	2217.2	1987.3	1756.2	1554.8	1378.9	1226.1	1093.8
Os	2461.0	2281.5	2001.2	1803.7	1597.4	1417.2	1260.7	1125.0
Ir	2589.4	2257.4	2104.1	1854.1	1661.5	1473.7	1310.6	1169.3
Pt	2699.2	2356.8	2066.2	1931.8	1718.3	1524.3	1355.8	1209.8
Au	2294.8	2369.3	2136.2	1939.3	1801.2	1583.6	1409.1	1257.8
Hg	2491.7	2189.6	2231.1	1971.2	1843.2	1631.1	1450.2	1295.5
Tl	2566.3	2243.6	2282.2	2012.3	1778.8	1665.2	1477.0	1331.7
Pb	2667.7	2333.1	2048.5	2091.4	1844.8	1630.5	1534.0	1366.3
Bi	1851.8	2308.6	2067.5	1813.3	1848.6	1635.3	1447.2	1367.5
Po	748.4	2598.6	2179.3	1906.5	1937.2	1714.5	1519.1	1348.7
At	785.3	1936.6	2281.9	1991.9	1752.5	1787.3	1583.1	1407.0
Rn	782.5	693.6	1575.5	2131.5	1792.3	1544.3	1570.7	1396.6
Fr	819.7	726.6	646.2	2224.4	1889.8	1626.1	1415.1	1458.7
Ra	851.3	754.8	671.4	1579.3	1927.7	1677.2	1470.7	1507.8
Ac	891.7	790.6	703.3	625.8	1376.0	1734.0	1528.2	1353.2
Th	916.7	813.0	723.4	643.6	573.6	1229.9	1554.5	1382.2
Pa	965.1	855.8	761.4	677.4	603.7	1309.9	1636.2	1452.5
U	981.9	870.9	774.9	689.2	614.1	548.1	1166.6	1467.3

Table 4: continued

	Emitter							
Absorber	Te	I	Xe	Cs	Ba	La	Ce	Pr
H	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.9	0.8	0.8	0.7	0.6	0.6	0.5	0.5
Li	3.0	2.7	2.3	2.0	1.8	1.6	1.4	1.3
Be	8.5	7.4	6.4	5.6	4.9	4.3	3.7	3.3
B	18.9	16.3	14.2	12.4	10.8	9.5	8.3	7.3
C	37.0	32.1	28.0	24.4	21.3	18.7	16.4	14.3
N	60.3	52.4	45.8	39.9	34.9	30.7	26.9	23.7
O	91.2	79.3	69.4	60.7	53.2	46.8	41.1	36.1
F	123.0	107.2	94.0	82.3	72.2	63.7	56.0	49.3
Ne	174.8	152.7	134.0	117.6	103.4	91.4	80.4	70.9
Na	221.5	193.8	170.5	149.8	132.0	116.8	102.9	90.9
Mg	291.5	255.5	225.0	198.1	174.8	154.9	136.7	120.9
Al	353.4	310.2	273.7	241.3	213.2	189.3	167.3	148.2
Si	444.1	390.5	345.2	304.8	269.8	239.9	212.4	188.3
P	514.2	453.0	401.0	354.7	314.5	280.1	248.3	220.5
S	621.8	548.8	486.7	431.2	382.9	341.6	303.2	269.6
Cl	690.6	610.4	542.2	481.1	427.9	382.3	339.9	302.7
Ar	743.2	657.8	585.1	519.8	463.0	414.1	368.5	328.6
K	908.7	805.1	716.7	637.4	568.2	508.7	453.4	404.9
Ca	119.5	916.6	820.3	733.4	657.1	590.8	526.9	470.8
Sc	130.6	114.9	101.6	762.5	685.7	618.4	552.5	494.5
Ti	148.8	130.9	115.7	102.2	90.5	671.0	601.4	540.0
V	167.9	147.7	130.7	115.4	102.3	91.0	80.8	580.1
Cr	195.0	171.6	151.8	134.1	118.8	105.8	93.9	83.4
Mn	218.6	192.4	170.3	150.5	133.3	118.7	105.4	93.7
Fe	251.8	221.7	196.2	173.5	153.8	137.0	121.6	108.1
Co	277.6	244.5	216.4	191.4	169.7	151.2	134.2	119.4
Ni	321.9	283.7	251.2	222.3	197.1	175.7	156.0	138.8
Cu	340.7	300.3	266.0	235.3	208.8	186.1	165.3	147.1
Zn	379.1	334.3	296.3	262.3	232.7	207.5	184.4	164.1
Ga	405.2	357.4	316.7	280.5	249.0	222.0	197.3	175.7
Ge	441.2	389.3	345.2	305.8	271.5	242.2	215.3	191.7
As	482.7	426.1	377.9	334.9	297.5	265.5	236.0	210.3
Se	515.3	455.0	403.7	357.8	317.9	283.8	252.4	224.9
Br	570.6	504.0	447.4	396.7	352.6	314.9	280.1	249.6
Kr	607.0	536.4	476.3	422.6	375.8	335.7	298.7	266.3
Rb	662.2	585.5	520.1	461.6	410.6	367.0	326.7	291.3
Sr	716.2	633.4	563.0	499.9	444.9	397.8	354.2	316.0
Y	778.9	689.3	612.9	544.5	484.8	433.7	386.3	344.7
Zr	835.0	739.4	657.8	584.7	520.9	466.2	415.4	370.9
Nb	899.6	796.9	709.3	630.8	562.2	503.3	448.7	400.7
Mo	952.6	844.3	751.9	669.0	596.6	534.4	476.5	425.7
Tc	1017.2	902.1	803.9	715.6	638.5	572.3	510.5	456.3
Ru	1075.1	953.4	849.4	756.1	674.6	604.6	539.7	482.6
Rh	1148.7	1018.7	907.7	808.0	721.0	646.2	577.0	516.2
Pd	1204.7	1068.4	952.1	847.5	756.3	677.9	605.5	541.9

Table 4: continued

	Emitter							
Absorber	Te	I	Xe	Cs	Ba	La	Ce	Pr
Ag	1281.5	1137.6	1014.6	904.1	807.5	724.3	647.2	579.4
Cd	1315.4	1171.1	1047.5	936.1	838.4	753.7	673.4	602.7
In	1209.3	1076.4	1105.5	988.9	886.7	797.8	712.7	637.8
Sn	921.4	1107.4	998.3	1028.1	922.7	830.9	742.7	665.0
Sb	311.2	841.0	1032.7	932.2	963.1	867.9	777.1	697.1
Te	323.8	287.6	767.0	941.5	853.3	884.7	793.7	713.3
I	354.2	314.7	280.9	736.4	671.1	826.9	853.5	767.9
Xe	371.9	330.4	294.9	263.0	681.9	626.3	762.4	792.3
Cs	398.2	353.8	315.8	281.6	251.7	659.7	593.4	727.2
Ba	417.0	370.6	330.8	295.0	263.7	236.8	605.9	548.2
La	445.0	395.5	353.1	315.0	281.6	252.9	226.4	574.1
Ce	472.5	420.0	375.1	334.7	299.3	268.8	240.6	215.8
Pr	504.0	448.0	400.2	357.1	319.4	286.9	256.8	230.4
Nd	527.1	468.7	418.7	373.7	334.3	300.3	268.9	241.2
Pm	560.8	498.8	445.6	397.8	355.9	319.9	286.4	256.9
Sm	576.9	513.2	458.6	409.4	366.4	329.3	294.9	264.6
Eu	608.4	541.2	483.8	432.0	386.6	347.6	311.3	279.4
Gd	626.7	557.7	498.6	445.3	398.7	358.5	321.1	288.2
Tb	657.9	585.6	523.6	467.7	418.8	376.6	337.4	302.9
Dy	683.1	608.1	543.8	485.9	435.1	391.3	350.7	314.9
Ho	713.6	635.4	568.4	507.9	454.9	409.2	366.8	329.3
Er	745.4	663.8	593.8	530.8	475.5	427.8	383.4	344.3
Tm	780.7	695.4	622.2	556.2	498.3	448.4	402.0	361.0
Yb	805.0	717.2	641.9	573.9	514.3	462.9	415.1	372.9
Lu	841.1	749.5	671.0	600.1	537.9	484.3	434.3	390.3
Hf	870.5	775.9	694.8	621.6	557.3	501.8	450.2	404.5
Ta	906.2	807.9	723.6	647.5	580.7	522.9	469.1	421.6
W	939.8	838.2	750.9	672.1	603.0	543.2	487.3	438.0
Re	977.1	871.6	781.0	699.2	627.4	565.3	507.3	456.0
Os	1005.4	897.2	804.2	720.2	646.5	582.7	523.0	470.3
Ir	1044.7	932.6	836.3	749.2	672.7	606.5	544.5	489.8
Pt	1081.2	965.4	865.9	776.0	696.9	628.5	564.5	507.9
Au	1124.4	1004.1	900.7	807.2	725.0	653.9	587.5	528.7
Hg	1158.8	1035.0	928.5	832.2	747.6	674.4	605.9	545.3
Tl	1191.3	1064.2	954.9	856.1	769.2	693.9	623.6	561.3
Pb	1229.7	1098.8	986.2	884.3	794.7	717.1	644.5	580.3
Bi	1274.0	1138.8	1022.4	917.1	824.5	744.2	669.1	602.6
Po	1277.1	1191.9	1070.0	959.7	862.7	778.7	700.3	630.9
At	1329.1	1190.1	1113.4	998.6	897.6	810.2	728.9	656.9
Rn	1243.6	1174.3	1054.4	987.2	887.7	801.6	721.0	649.7
Fr	1298.6	1155.5	1099.9	984.2	922.6	833.6	749.9	675.8
Ra	1342.8	1194.8	1068.0	1016.6	949.4	858.3	772.2	695.9
Ac	1400.8	1246.1	1113.6	994.2	946.2	889.7	800.8	721.9
Th	1230.5	1274.5	1140.9	1018.6	911.4	871.6	817.0	736.5
Pa	1291.7	1335.9	1194.6	1067.3	955.7	912.2	819.7	770.2
U	1305.9	1164.1	1212.4	1083.2	970.1	872.3	829.3	746.4

Table 4: continued

	Emitter							
Absorber	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3
Li	1.1	1.0	0.9	0.8	0.8	0.7	0.6	0.6
Be	2.9	2.6	2.3	2.1	1.8	1.7	1.5	1.3
B	6.4	5.6	5.0	4.4	4.0	3.5	3.2	2.8
C	12.7	11.2	9.9	8.8	7.8	6.9	6.2	5.5
N	20.9	18.4	16.4	14.5	12.9	11.5	10.2	9.1
O	32.0	28.2	25.1	22.2	19.8	17.6	15.7	14.0
F	43.7	38.6	34.3	30.4	27.1	24.1	21.5	19.2
Ne	63.0	55.7	49.6	43.9	39.3	35.0	31.2	27.9
Na	80.8	71.6	63.8	56.6	50.6	45.2	40.3	36.1
Mg	107.7	95.6	85.2	75.7	67.8	60.5	54.1	48.5
Al	132.2	117.4	104.9	93.3	83.6	74.7	66.9	60.0
Si	168.2	149.7	133.8	119.1	106.9	95.7	85.7	77.0
P	197.2	175.7	157.3	140.2	125.9	112.8	101.2	91.0
S	241.4	215.4	193.0	172.2	154.9	138.9	124.7	112.3
Cl	271.5	242.6	217.6	194.4	175.0	157.2	141.3	127.3
Ar	294.9	263.8	237.0	212.0	191.1	171.7	154.6	139.5
K	363.9	326.0	293.1	262.5	236.8	213.1	192.0	173.3
Ca	423.4	379.5	341.6	306.3	276.7	249.3	224.9	203.3
Sc	445.5	399.9	360.3	323.3	292.2	263.4	237.8	215.1
Ti	487.9	439.4	396.3	355.9	322.0	290.6	262.5	237.7
V	526.3	476.1	430.2	387.0	350.6	316.8	286.6	259.9
Cr	74.7	66.6	475.2	429.2	390.3	354.1	321.7	292.7
Mn	83.9	74.8	67.1	60.0	424.1	384.9	349.7	318.3
Fe	96.8	86.4	77.5	69.3	62.4	56.1	389.1	354.8
Co	106.9	95.4	85.6	76.6	69.0	62.0	55.8	50.3
Ni	124.3	110.9	99.6	89.1	80.3	72.1	64.9	58.5
Cu	131.8	117.7	105.6	94.5	85.1	76.5	68.9	62.1
Zn	147.0	131.3	117.9	105.5	95.1	85.5	76.9	69.4
Ga	157.5	140.6	126.3	113.0	101.9	91.6	82.5	74.4
Ge	171.9	153.6	137.9	123.5	111.3	100.1	90.2	81.4
As	188.6	168.5	151.4	135.5	122.2	110.0	99.0	89.4
Se	201.8	180.4	162.1	145.2	130.9	117.8	106.1	95.8
Br	224.0	200.3	180.0	161.2	145.4	130.9	117.9	106.5
Kr	239.0	213.8	192.2	172.2	155.4	139.8	126.0	113.8
Rb	261.6	234.0	210.4	188.5	170.2	153.2	138.1	124.7
Sr	283.7	253.9	228.4	204.7	184.8	166.4	150.0	135.6
Y	309.7	277.2	249.4	223.6	201.9	181.9	164.0	148.2
Zr	333.3	298.6	268.7	240.9	217.5	195.9	176.7	159.7
Nb	360.2	322.7	290.4	260.5	235.3	212.0	191.3	173.0
Mo	382.8	343.1	308.9	277.1	250.4	225.7	203.7	184.2
Tc	410.5	368.1	331.5	297.5	268.9	242.4	218.9	198.0
Ru	434.4	389.7	351.1	315.1	284.9	256.9	232.0	209.9
Rh	464.8	417.1	375.9	337.5	305.2	275.3	248.7	225.1
Pd	488.0	438.1	395.0	354.7	320.9	289.6	261.7	236.9

Table 4: continued

	Emitter							
Absorber	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho
Ag	522.0	468.8	422.8	379.9	343.8	310.3	280.5	254.1
Cd	542.9	487.4	439.6	395.1	357.7	323.0	292.0	264.5
In	574.5	515.8	465.4	418.4	378.9	342.2	309.5	280.5
Sn	599.3	538.3	485.8	436.9	395.7	357.5	323.4	293.1
Sb	629.2	566.1	511.1	459.6	416.3	376.2	340.3	308.5
Te	645.0	581.4	525.0	472.2	427.7	386.4	349.5	316.8
I	695.1	627.2	566.6	509.7	461.8	417.4	377.7	342.4
Xe	717.6	647.8	585.6	527.1	477.9	432.1	391.3	355.0
Cs	753.5	681.6	616.9	555.8	504.4	456.5	413.8	375.7
Ba	674.1	608.3	634.7	572.7	520.3	471.5	427.9	389.0
La	522.1	639.8	580.8	604.2	549.2	498.1	452.2	411.4
Ce	194.7	497.9	610.1	552.3	579.1	525.5	477.4	434.6
Pr	207.9	187.0	473.8	581.8	530.5	555.0	504.5	459.5
Nd	217.7	195.9	177.2	448.9	403.5	502.2	522.4	476.0
Pm	231.9	208.7	188.8	170.3	426.0	385.8	482.4	501.8
Sm	238.9	215.0	194.5	175.3	159.2	394.4	357.5	449.2
Eu	252.3	227.1	205.4	185.2	168.2	152.3	375.0	340.5
Gd	260.3	234.3	212.0	191.2	173.6	157.3	383.7	348.8
Tb	273.6	246.3	222.9	201.0	182.5	165.3	149.9	364.3
Dy	284.4	256.1	231.8	209.0	189.8	172.0	156.0	141.8
Ho	297.5	267.9	242.5	218.7	198.6	180.0	163.2	148.4
Er	311.1	280.2	253.6	228.8	207.8	188.3	170.8	155.2
Tm	326.3	293.9	266.1	240.1	218.1	197.6	179.3	163.0
Yb	337.1	303.7	274.9	248.1	225.4	204.2	185.3	168.5
Lu	352.9	318.0	287.9	259.8	236.0	213.9	194.1	176.5
Hf	365.8	329.7	298.6	269.4	244.9	222.0	201.5	183.2
Ta	381.3	343.7	311.3	281.0	255.3	231.5	210.1	191.1
W	396.1	357.1	323.5	292.0	265.4	240.7	218.5	198.8
Re	412.5	371.9	337.0	304.2	276.6	250.9	227.8	207.2
Os	425.5	383.7	347.7	314.0	285.5	258.9	235.1	214.0
Ir	443.2	399.9	362.3	327.2	297.5	269.9	245.1	223.0
Pt	459.7	414.9	376.0	339.6	308.8	280.1	254.4	231.5
Au	478.7	432.1	391.7	353.8	321.8	291.9	265.2	241.4
Hg	493.8	445.7	404.1	365.1	332.1	301.3	273.8	249.2
Tl	508.4	459.0	416.2	376.1	342.2	310.6	282.3	257.0
Pb	525.7	474.7	430.5	389.1	354.1	321.5	292.2	266.1
Bi	546.1	493.2	447.4	404.4	368.1	334.2	303.8	276.7
Po	571.8	516.6	468.7	423.7	385.7	350.3	318.5	290.1
At	595.6	538.3	488.4	441.7	402.1	365.2	332.0	302.5
Rn	589.0	532.3	483.1	437.0	397.9	361.5	328.7	299.6
Fr	612.7	553.7	502.6	454.7	414.1	376.2	342.3	311.9
Ra	630.9	570.2	517.7	468.4	426.7	387.8	352.9	321.7
Ac	654.8	592.1	537.7	486.6	443.3	402.9	366.6	334.3
Th	668.0	603.9	548.4	496.4	452.3	411.2	374.3	341.3
Pa	698.5	631.5	573.5	519.1	473.1	430.1	391.4	356.9
U	705.8	638.3	579.7	524.8	478.2	434.8	395.7	360.9

Table 4: continued

	Emitter							
Absorber	Er	Tm	Yb	Lu	Hf	Ta	W	Re
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
Li	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3
Be	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.6
B	2.5	2.3	2.0	1.8	1.7	1.5	1.4	1.3
C	4.9	4.4	4.0	3.6	3.2	2.9	2.6	2.4
N	8.1	7.3	6.5	5.9	5.3	4.8	4.3	3.9
O	12.5	11.2	10.0	9.0	8.1	7.3	6.6	5.9
F	17.2	15.4	13.8	12.4	11.2	10.1	9.1	8.2
Ne	25.0	22.4	20.1	18.1	16.3	14.7	13.2	11.9
Na	32.4	29.1	26.1	23.5	21.1	19.0	17.2	15.5
Mg	43.5	39.1	35.2	31.6	28.5	25.7	23.2	21.0
Al	53.9	48.5	43.6	39.3	35.5	32.0	28.9	26.2
Si	69.2	62.3	56.1	50.6	45.7	41.3	37.3	33.8
P	82.0	73.9	66.5	60.0	54.3	49.0	44.4	40.2
S	101.2	91.3	82.3	74.3	67.3	60.8	55.1	50.0
Cl	114.9	103.7	93.6	84.6	76.6	69.4	62.9	57.1
Ar	126.0	113.9	102.9	93.0	84.3	76.4	69.3	63.0
K	156.7	141.8	128.2	116.0	105.3	95.5	86.7	78.9
Ca	184.0	166.7	150.8	136.6	124.1	112.6	102.4	93.2
Sc	194.8	176.6	159.9	145.0	131.8	119.8	109.0	99.2
Ti	215.5	195.5	177.2	160.8	146.3	133.0	121.1	110.4
V	235.9	214.3	194.4	176.5	160.7	146.2	133.2	121.5
Cr	266.8	242.9	220.5	200.4	182.5	166.1	151.5	138.2
Mn	290.2	264.4	240.1	218.3	199.0	181.3	165.4	151.0
Fe	324.0	295.6	268.9	244.8	223.4	203.7	186.1	170.1
Co	344.3	314.5	286.7	261.7	239.4	218.9	200.4	183.6
Ni	52.9	47.8	322.7	295.0	270.4	247.6	227.1	208.5
Cu	56.1	50.8	45.9	41.6	275.5	253.5	233.6	215.3
Zn	62.7	56.7	51.4	46.5	42.3	38.4	252.7	232.5
Ga	67.3	60.9	55.1	49.9	45.4	41.2	37.5	34.1
Ge	73.5	66.5	60.3	54.6	49.6	45.1	41.0	37.3
As	80.8	73.1	66.2	60.0	54.6	49.6	45.1	41.0
Se	86.6	78.4	71.0	64.4	58.5	53.1	48.3	44.0
Br	96.3	87.2	79.0	71.6	65.1	59.1	53.8	49.0
Kr	103.0	93.2	84.5	76.6	69.6	63.3	57.6	52.4
Rb	112.9	102.2	92.6	84.0	76.3	69.4	63.1	57.5
Sr	122.6	111.1	100.7	91.3	83.0	75.5	68.7	62.6
Y	134.1	121.5	110.1	99.9	90.9	82.6	75.2	68.5
Zr	144.6	131.0	118.8	107.8	98.0	89.1	81.2	74.0
Nb	156.6	141.9	128.7	116.8	106.2	96.6	88.0	80.2
Mo	166.8	151.2	137.1	124.5	113.3	103.0	93.8	85.5
Tc	179.4	162.6	147.5	133.9	121.9	110.8	101.0	92.1
Ru	190.2	172.5	156.5	142.1	129.3	117.6	107.2	97.7
Rh	204.0	185.1	167.9	152.5	138.9	126.3	115.1	105.0
Pd	214.8	195.0	176.9	160.7	146.3	133.1	121.4	110.7

Table 4: continued

	Emitter							
Absorber	Er	Tm	Yb	Lu	Hf	Ta	W	Re
Ag	230.4	209.2	189.9	172.5	157.1	143.0	130.4	119.0
Cd	240.0	217.9	197.8	179.8	163.8	149.1	135.9	124.1
In	254.5	231.2	209.9	190.8	173.8	158.3	144.3	131.8
Sn	266.1	241.7	219.5	199.6	181.9	165.7	151.2	138.0
Sb	280.0	254.4	231.1	210.2	191.6	174.6	159.3	145.5
Te	287.6	261.3	237.5	216.0	197.0	179.5	163.9	149.7
I	310.9	282.6	256.9	233.8	213.2	194.4	177.5	162.2
Xe	322.5	293.3	266.7	242.7	221.5	201.9	184.4	168.6
Cs	341.7	310.9	282.7	257.4	234.9	214.2	195.6	178.8
Ba	354.2	322.5	293.3	267.0	243.6	222.2	202.9	185.5
La	374.7	341.3	310.4	282.5	257.8	235.0	214.6	196.2
Ce	396.1	361.0	328.3	298.9	272.7	248.7	227.2	207.7
Pr	419.1	382.1	347.7	316.6	289.0	263.7	240.9	220.3
Nd	434.3	396.2	360.7	328.7	300.3	274.2	250.7	229.4
Pm	457.7	417.6	380.6	347.3	317.6	290.3	265.7	243.4
Sm	466.7	426.1	388.7	354.8	324.7	296.9	271.9	249.3
Eu	422.7	445.4	406.7	371.7	340.5	311.7	285.8	262.2
Gd	317.0	394.2	415.7	380.1	348.3	319.0	292.6	268.6
Tb	332.4	302.7	376.2	396.9	363.8	333.3	305.8	280.8
Dy	342.0	315.7	285.6	354.6	325.2	343.7	315.3	289.5
Ho	135.0	325.1	296.2	270.0	337.3	309.4	327.3	300.4
Er	141.3	128.8	309.1	286.2	259.8	320.7	294.6	312.1
Tm	148.4	135.3	123.3	293.7	268.4	245.1	306.0	282.3
Yb	153.4	139.8	127.5	116.4	277.3	257.1	233.8	288.6
Lu	160.7	146.5	133.6	122.0	111.6	263.1	240.8	220.5
Hf	166.9	152.1	138.7	126.7	115.9	106.0	248.8	229.5
Ta	174.1	158.7	144.8	132.2	121.0	110.6	101.3	237.3
W	181.1	165.1	150.6	137.5	125.8	115.1	105.4	96.7
Re	188.8	172.2	157.1	143.4	131.3	120.1	110.0	100.8
Os	194.9	177.8	162.2	148.2	135.6	124.1	113.7	104.2
Ir	203.2	185.4	169.1	154.5	141.4	129.4	118.6	108.7
Pt	211.0	192.4	175.6	160.4	146.8	134.4	123.1	112.9
Au	220.0	200.7	183.1	167.3	153.2	140.2	128.4	117.8
Hg	227.2	207.3	189.2	172.8	158.3	144.9	132.8	121.8
Tl	234.3	213.9	195.2	178.3	163.3	149.5	137.0	125.7
Pb	242.7	221.5	202.2	184.8	169.2	154.9	142.0	130.3
Bi	252.3	230.4	210.3	192.2	176.1	161.2	147.8	135.7
Po	264.6	241.6	220.6	201.7	184.7	169.2	155.1	142.3
At	275.9	252.0	230.1	210.4	192.8	176.6	161.9	148.6
Rn	273.4	249.7	228.0	208.5	191.1	175.0	160.5	147.3
Fr	284.7	260.0	237.5	217.2	199.0	182.3	167.2	153.5
Ra	293.6	268.3	245.1	224.1	205.4	188.2	172.6	158.5
Ac	305.2	278.9	254.8	233.0	213.6	195.7	179.6	164.9
Th	311.6	284.8	260.2	238.0	218.2	199.9	183.5	168.5
Pa	325.9	297.9	272.3	249.1	228.4	209.3	192.1	176.5
U	329.5	301.2	275.4	252.0	231.1	211.8	194.5	178.7

Table 4: continued

	Emitter							
Absorber	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Be	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4
B	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.7
C	2.2	2.0	1.8	1.7	1.5	1.4	1.3	1.2
N	3.5	3.2	2.9	2.7	2.4	2.2	2.0	1.8
O	5.4	4.9	4.4	4.0	3.7	3.3	3.0	2.8
F	7.4	6.7	6.1	5.5	5.0	4.6	4.1	3.8
Ne	10.8	9.8	8.9	8.0	7.3	6.6	6.0	5.5
Na	14.0	12.7	11.5	10.5	9.5	8.6	7.8	7.1
Mg	19.0	17.2	15.6	14.1	12.8	11.7	10.6	9.6
Al	23.7	21.4	19.4	17.6	16.0	14.6	13.2	12.1
Si	30.6	27.7	25.2	22.8	20.8	18.9	17.2	15.6
P	36.5	33.1	30.0	27.2	24.8	22.5	20.5	18.7
S	45.3	41.1	37.3	33.9	30.9	28.1	25.6	23.3
Cl	51.8	47.0	42.7	38.9	35.4	32.2	29.4	26.8
Ar	57.2	51.9	47.2	43.0	39.1	35.7	32.5	29.7
K	71.6	65.1	59.3	53.9	49.2	44.8	40.9	37.4
Ca	84.7	77.0	70.1	63.9	58.3	53.2	48.6	44.4
Sc	90.3	82.2	74.9	68.3	62.3	56.9	52.0	47.5
Ti	100.5	91.5	83.5	76.1	69.5	63.5	58.1	53.1
V	110.7	100.9	92.0	84.0	76.7	70.2	64.2	58.8
Cr	126.0	114.9	105.0	95.9	87.6	80.2	73.4	67.3
Mn	137.7	125.7	114.8	104.9	96.0	87.9	80.5	73.8
Fe	155.3	141.8	129.6	118.5	108.5	99.4	91.1	83.6
Co	167.7	153.2	140.1	128.2	117.4	107.7	98.7	90.6
Ni	190.5	174.1	159.3	145.8	133.6	122.6	112.5	103.3
Cu	197.0	180.2	165.1	151.3	138.8	127.4	117.0	107.5
Zn	212.9	195.1	178.9	164.1	150.7	138.6	127.4	117.2
Ga	31.1	203.7	186.9	171.6	157.7	145.1	133.5	122.9
Ge	34.0	31.0	28.3	183.3	168.6	155.1	142.8	131.5
As	37.4	34.1	31.2	28.5	26.0	166.5	153.4	141.3
Se	40.1	36.6	33.4	30.5	27.9	25.6	23.4	147.8
Br	44.7	40.8	37.2	34.0	31.1	28.5	26.1	23.9
Kr	47.8	43.6	39.8	36.4	33.3	30.5	27.9	25.6
Rb	52.4	47.9	43.7	39.9	36.5	33.4	30.6	28.1
Sr	57.1	52.1	47.6	43.5	39.8	36.4	33.3	30.6
Y	62.5	57.0	52.1	47.6	43.6	39.9	36.5	33.5
Zr	67.5	61.6	56.3	51.4	47.0	43.1	39.5	36.2
Nb	73.1	66.8	61.0	55.7	51.0	46.7	42.8	39.2
Mo	78.0	71.2	65.1	59.5	54.4	49.9	45.7	41.9
Tc	84.0	76.7	70.1	64.1	58.6	53.7	49.2	45.1
Ru	89.2	81.4	74.4	68.0	62.3	57.0	52.3	47.9
Rh	95.8	87.5	80.0	73.1	66.9	61.3	56.2	51.5
Pd	101.0	92.3	84.4	77.1	70.6	64.7	59.3	54.4

Table 4: continued

	Emitter							
Absorber	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi
Ag	108.6	99.2	90.7	82.9	75.9	69.6	63.8	58.5
Cd	113.3	103.5	94.6	86.6	79.3	72.6	66.6	61.1
In	120.3	109.9	100.5	92.0	84.2	77.2	70.8	65.0
Sn	126.1	115.2	105.4	96.4	88.3	81.0	74.2	68.1
Sb	132.9	121.5	111.1	101.7	93.1	85.4	78.3	71.9
Te	136.8	125.0	114.4	104.7	95.9	88.0	80.7	74.1
I	148.2	135.5	124.0	113.5	104.0	95.4	87.5	80.4
Xe	154.0	140.9	128.9	118.0	108.2	99.3	91.1	83.7
Cs	163.5	149.5	136.9	125.3	114.9	105.4	96.7	88.9
Ba	169.6	155.1	142.1	130.1	119.3	109.5	100.5	92.3
La	179.4	164.1	150.3	137.7	126.3	115.9	106.4	97.8
Ce	189.9	173.8	159.2	145.9	133.8	122.9	112.8	103.7
Pr	201.6	184.5	169.0	154.9	142.1	130.5	119.9	110.2
Nd	209.9	192.2	176.1	161.4	148.1	136.0	125.0	114.9
Pm	222.7	203.9	186.8	171.2	157.1	144.3	132.6	121.9
Sm	228.1	208.9	191.4	175.5	161.1	148.0	136.0	125.0
Eu	240.0	219.8	201.4	184.7	169.5	155.7	143.1	131.6
Gd	245.9	225.2	206.5	189.3	173.8	159.7	146.8	135.0
Tb	257.1	235.6	216.1	198.2	182.0	167.3	153.9	141.6
Dy	265.2	243.1	223.1	204.7	188.1	173.0	159.1	146.5
Ho	275.4	252.5	231.8	212.8	195.6	180.0	165.6	152.5
Er	286.2	262.5	241.1	221.4	203.6	187.4	172.5	158.9
Tm	298.4	273.8	251.5	231.1	212.5	195.7	180.2	166.0
Yb	265.8	281.9	258.9	237.9	218.9	201.5	185.6	171.1
Lu	275.5	258.6	269.8	248.0	228.2	210.2	193.7	178.6
Hf	209.3	190.9	246.5	255.9	235.5	217.0	200.0	184.4
Ta	217.0	198.6	181.9	236.3	244.2	225.1	207.5	191.4
W	224.7	205.6	188.4	172.8	226.4	232.7	214.6	198.0
Re	92.6	216.1	202.0	184.5	166.0	208.9	222.3	205.2
Os	95.7	87.9	204.5	191.3	174.9	157.3	197.7	210.6
Ir	99.8	91.7	84.3	193.1	176.8	162.2	149.0	194.1
Pt	103.7	95.2	87.6	80.5	183.3	168.1	154.3	141.8
Au	108.2	99.4	91.4	84.0	77.4	175.2	160.6	147.5
Hg	111.8	102.7	94.5	86.9	80.0	73.7	165.8	152.1
Tl	115.4	106.0	97.5	89.7	82.6	76.1	70.2	160.5
Pb	119.6	109.9	101.1	93.0	85.7	79.0	72.8	67.2
Bi	124.6	114.5	105.3	96.9	89.2	82.3	75.8	70.0
Po	130.8	120.2	110.5	101.7	93.7	86.4	79.6	73.5
At	136.5	125.5	115.4	106.2	97.8	90.2	83.2	76.8
Rn	135.4	124.4	114.5	105.3	97.0	89.5	82.5	76.1
Fr	141.0	129.7	119.3	109.8	101.1	93.3	86.0	79.4
Ra	145.6	133.9	123.2	113.4	104.5	96.4	88.9	82.0
Ac	151.5	139.3	128.2	118.0	108.8	100.3	92.5	85.4
Th	154.8	142.4	131.1	120.7	111.2	102.6	94.6	87.4
Pa	162.2	149.2	137.3	126.4	116.5	107.5	99.2	91.6
U	164.2	151.1	139.1	128.0	118.0	108.9	100.5	92.8

Table 4: continued

	Emitter							
Absorber	Po	At	Rn	Fr	Ra	Ac	Th	Pa
H	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
He	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Li	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Be	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
B	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4
C	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.6
N	1.7	1.5	1.4	1.3	1.2	1.1	1.0	1.0
O	2.5	2.3	2.1	1.9	1.8	1.6	1.5	1.4
F	3.4	3.1	2.9	2.6	2.4	2.2	2.0	1.9
Ne	5.0	4.5	4.1	3.8	3.5	3.2	2.9	2.7
Na	6.5	5.9	5.4	4.9	4.5	4.1	3.8	3.4
Mg	8.8	8.0	7.3	6.7	6.1	5.6	5.1	4.7
Al	11.0	10.0	9.1	8.3	7.6	6.9	6.4	5.8
Si	14.2	13.0	11.9	10.8	9.9	9.0	8.3	7.6
P	17.0	15.5	14.2	13.0	11.8	10.8	9.9	9.1
S	21.3	19.4	17.7	16.2	14.8	13.5	12.4	11.3
Cl	24.4	22.3	20.4	18.6	17.0	15.6	14.3	13.1
Ar	27.1	24.8	22.7	20.7	19.0	17.3	15.9	14.5
K	34.1	31.2	28.6	26.2	23.9	21.9	20.0	18.4
Ca	40.5	37.1	34.0	31.1	28.5	26.1	23.9	21.9
Sc	43.5	39.8	36.5	33.4	30.6	28.0	25.7	23.6
Ti	48.6	44.5	40.8	37.4	34.3	31.4	28.8	26.4
V	53.8	49.4	45.3	41.6	38.1	34.9	32.0	29.4
Cr	61.6	56.6	51.9	47.7	43.8	40.1	36.8	33.8
Mn	67.7	62.1	57.1	52.4	48.1	44.2	40.5	37.2
Fe	76.7	70.4	64.8	59.5	54.7	50.2	46.1	42.3
Co	83.2	76.4	70.3	64.6	59.4	54.6	50.1	46.1
Ni	94.8	87.2	80.2	73.8	67.8	62.4	57.3	52.7
Cu	98.8	90.9	83.8	77.1	71.0	65.2	60.0	55.2
Zn	107.9	99.4	91.7	84.5	77.8	71.6	65.8	60.6
Ga	113.2	104.4	96.3	88.8	81.8	75.3	69.3	63.9
Ge	121.2	111.8	103.2	95.2	87.8	80.8	74.4	68.5
As	130.3	120.2	111.0	102.5	94.5	87.0	80.2	73.9
Se	136.3	125.9	116.3	107.4	99.1	91.3	84.2	77.7
Br	21.9	136.5	126.0	116.4	107.4	99.1	91.4	84.4
Kr	23.4	21.5	19.7	121.5	112.2	103.6	95.7	88.4
Rb	25.7	23.6	21.7	19.9	120.1	110.9	102.6	94.9
Sr	28.0	25.7	23.6	21.7	19.9	18.3	109.1	101.0
Y	30.7	28.2	25.9	23.8	21.8	20.1	18.5	17.0
Zr	33.2	30.4	28.0	25.7	23.6	21.7	20.0	18.4
Nb	36.0	33.0	30.3	27.9	25.6	23.6	21.7	20.0
Mo	38.4	35.3	32.4	29.8	27.4	25.2	23.2	21.3
Tc	41.4	38.0	34.9	32.1	29.5	27.1	25.0	23.0
Ru	44.0	40.4	37.1	34.1	31.3	28.8	26.5	24.4
Rh	47.3	43.4	39.9	36.7	33.7	31.0	28.5	26.3
Pd	49.9	45.8	42.1	38.7	35.6	32.8	30.1	27.8

Table 4: continued

	Emitter							
Absorber	Po	At	Rn	Fr	Ra	Ac	Th	Pa
Ag	53.7	49.3	45.3	41.7	38.3	35.3	32.5	29.9
Cd	56.1	51.5	47.4	43.6	40.1	36.9	33.9	31.2
In	59.6	54.8	50.4	46.3	42.6	39.2	36.1	33.2
Sn	62.5	57.5	52.9	48.6	44.7	41.1	37.9	34.9
Sb	66.0	60.7	55.8	51.3	47.2	43.4	40.0	36.9
Te	68.0	62.5	57.5	52.9	48.7	44.8	41.3	38.0
I	73.8	67.9	62.4	57.4	52.9	48.6	44.8	41.3
Xe	76.8	70.7	65.0	59.8	55.1	50.7	46.7	43.0
Cs	81.6	75.1	69.1	63.6	58.5	53.9	49.6	45.8
Ba	84.8	78.0	71.8	66.1	60.9	56.0	51.6	47.6
La	89.9	82.7	76.2	70.1	64.6	59.5	54.8	50.5
Ce	95.3	87.7	80.8	74.4	68.5	63.1	58.1	53.6
Pr	101.3	93.3	85.9	79.1	72.9	67.1	61.8	57.0
Nd	105.6	97.2	89.6	82.5	76.0	70.0	64.5	59.5
Pm	112.1	103.2	95.1	87.6	80.7	74.3	68.5	63.2
Sm	115.0	105.9	97.6	89.9	82.8	76.3	70.4	64.9
Eu	121.0	111.4	102.7	94.6	87.2	80.4	74.1	68.4
Gd	124.2	114.4	105.5	97.2	89.6	82.6	76.1	70.3
Tb	130.3	120.0	110.7	102.0	94.1	86.7	80.0	73.8
Dy	134.8	124.3	114.7	105.7	97.5	89.9	82.9	76.6
Ho	140.5	129.5	119.5	110.3	101.7	93.8	86.6	79.9
Er	146.4	135.1	124.7	115.1	106.2	97.9	90.4	83.4
Tm	153.0	141.2	130.4	120.4	111.1	102.5	94.6	87.3
Yb	157.7	145.5	134.4	124.1	114.5	105.7	97.5	90.1
Lu	164.6	152.0	140.4	129.7	119.7	110.5	101.9	94.2
Hf	170.1	157.1	145.2	134.1	123.9	114.3	105.5	97.4
Ta	176.6	163.1	150.8	139.3	128.7	118.7	109.6	101.3
W	182.8	168.9	156.2	144.4	133.4	123.1	113.7	105.0
Re	189.4	175.0	161.9	149.7	138.3	127.7	117.9	109.0
Os	194.4	179.7	166.2	153.6	142.0	131.1	121.1	112.0
Ir	201.4	186.1	172.1	159.1	147.0	135.8	125.6	116.1
Pt	185.0	166.8	177.6	164.1	151.6	140.2	129.6	119.9
Au	135.6	176.5	160.8	170.2	157.3	145.5	134.6	124.6
Hg	139.8	128.7	166.7	153.7	161.6	149.5	138.3	128.1
Tl	151.3	138.8	124.7	155.4	144.1	153.8	142.3	131.8
Pb	149.3	137.3	126.4	116.3	147.7	137.5	146.7	135.9
Bi	155.1	142.7	131.3	120.9	111.3	141.6	131.9	140.9
Po	67.8	149.5	137.8	126.9	116.9	107.7	99.2	127.5
At	70.8	65.5	143.5	132.9	122.6	112.7	103.7	95.4
Rn	70.3	64.9	60.1	130.9	120.8	111.2	102.5	94.5
Fr	73.3	67.7	62.6	57.9	125.8	115.8	106.6	98.3
Ra	75.7	70.0	64.7	59.9	55.4	119.6	110.1	101.5
Ac	78.9	72.9	67.4	62.4	57.7	53.4	117.3	111.5
Th	80.7	74.6	69.0	63.8	59.1	54.7	50.7	111.1
Pa	84.6	78.2	72.4	66.9	62.0	57.4	53.1	49.3
U	85.7	79.2	73.3	67.8	62.8	58.1	53.9	49.9

Table 4: continued

	Emitter
Absorber	U
H	0.4
He	0.2
Li	0.2
Be	0.3
B	0.4
C	0.6
N	0.9
O	1.3
F	1.7
Ne	2.4
Na	3.2
Mg	4.3
Al	5.3
Si	6.9
P	8.3
S	10.4
Cl	12.0
Ar	13.3
K	16.8
Ca	20.1
Sc	21.6
Ti	24.2
V	27.0
Cr	31.0
Mn	34.2
Fe	38.9
Co	42.4
Ni	48.5
Cu	50.8
Zn	55.8
Ga	58.8
Ge	63.1
As	68.1
Se	71.6
Br	77.9
Kr	81.7
Rb	87.7
Sr	93.4
Y	100.2
Zr	16.9
Nb	18.4
Mo	19.6
Tc	21.2
Ru	22.5
Rh	24.2
Pd	25.6

Table 4: continued

	Emitter
Absorber	U
Ag	27.5
Cd	28.8
In	30.6
Sn	32.1
Sb	33.9
Te	35.0
I	38.0
Xe	39.6
Cs	42.2
Ba	43.9
La	46.5
Ce	49.4
Pr	52.6
Nd	54.9
Pm	58.3
Sm	59.9
Eu	63.1
Gd	64.8
Tb	68.1
Dy	70.7
Ho	73.8
Er	77.0
Tm	80.6
Yb	83.2
Lu	86.9
Hf	90.0
Ta	93.5
W	97.0
Re	100.7
Os	103.5
Ir	107.4
Pt	111.0
Au	115.3
Hg	118.6
Tl	122.0
Pb	125.9
Bi	130.5
Po	136.3
At	129.9
Rn	87.1
Fr	90.7
Ra	93.6
Ac	106.0
Th	105.8
Pa	104.7
U	106.1

Table 5: Mass attenuation coefficients for Mα lines.

	Emitter							
Absorber	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd
H	12.4	10.2	8.6	7.3	6.7	5.7	5.0	4.3
He	104.4	86.9	74.1	63.2	56.1	47.5	41.1	35.4
Li	391.7	327.5	280.0	238.9	216.0	183.8	159.7	138.2
Be	1028.0	865.9	745.7	640.8	559.5	478.7	417.8	363.3
B	2070.1	1752.1	1512.5	1308.4	1140.3	979.4	857.7	748.5
C	3667.3	3126.6	2717.3	2359.5	2055.8	1773.1	1558.5	1365.2
N	5369.8	4603.4	4024.7	3510.8	3084.9	2671.7	2357.0	2072.3
O	7367.0	6359.6	5602.0	4898.3	4285.0	3726.1	3298.6	2910.7
F	8860.0	7719.9	6815.9	6000.8	5286.1	4618.8	4106.1	3638.9
Ne	758.2	10428.7	9199.7	8114.6	6944.8	6089.0	5429.4	4826.5
Na	1044.0	891.0	775.5	670.9	610.8	6325.7	5753.2	5219.3
Mg	1490.1	1266.2	1095.8	947.2	861.6	750.0	664.5	586.4
Al	1960.3	1672.4	1454.8	1264.9	1106.7	963.0	853.1	753.3
Si	2679.9	2292.9	1985.4	1710.9	1466.7	1277.1	1131.9	1000.1
P	3223.6	2758.9	2408.0	2100.3	1787.5	1557.1	1380.7	1220.3
S	4114.1	3529.5	3083.1	2692.3	2270.1	1978.5	1754.9	1551.7
Cl	4501.8	3882.9	3407.5	2986.5	2647.5	2308.7	2049.0	1812.6
Ar	5363.2	4617.6	4052.4	3548.3	2977.7	2598.6	2307.7	2043.0
K	6288.8	5472.1	4913.5	4405.8	3796.7	3316.3	2947.4	2611.2
Ca	7555.8	6547.5	5776.7	5094.5	4555.8	3983.4	3543.3	3142.1
Sc	9137.5	7955.8	7025.8	6183.7	4905.4	4293.0	3821.8	3391.8
Ti	9002.8	7833.7	6930.3	6114.4	5498.7	4816.4	4291.0	3811.2
V	9854.5	8597.5	7622.5	6739.2	6088.9	5340.0	4762.7	4234.8
Cr	11808.6	10149.4	8940.2	7873.3	6945.9	6098.6	5444.7	4846.2
Mn	12188.7	10641.7	9478.1	8412.3	7597.6	6682.4	5974.8	5326.3
Fe	13228.3	12097.1	10704.2	9499.4	8536.8	7522.5	6737.0	6015.8
Co	13267.7	11642.3	11157.3	10274.8	9210.0	8124.7	7283.5	6510.3
Ni	1878.9	13272.4	11761.0	10501.6	10535.4	9295.5	8334.2	7450.5
Cu	2243.2	1913.1	1556.9	11446.7	9843.7	8551.6	8668.3	7753.4
Zn	2355.6	2051.9	1820.8	1633.2	4467.8	8368.2	8217.6	7475.7
Ga	2577.1	2246.8	1991.2	1765.3	1597.4	1412.6	5021.3	7249.0
Ge	2984.4	2575.4	2248.0	1980.7	1781.8	1575.4	1414.6	1266.2
As	3221.9	2820.1	2508.1	2227.0	1996.0	1764.3	1584.3	1418.1
Se	3542.3	3102.8	2760.8	2449.4	2180.8	1928.2	1731.9	1551.2
Br	3974.1	3483.3	3103.5	2762.4	2468.9	2181.2	1958.0	1752.5
Kr	4612.0	3939.7	3468.6	3070.7	2685.8	2373.8	2131.5	1908.4
Rb	4838.2	4243.0	3778.8	3359.0	2987.4	2641.4	2372.5	2124.9
Sr	5271.4	4631.6	4132.8	3678.5	3289.4	2909.8	2614.7	2342.9
Y	5598.5	4914.5	4369.9	3863.7	3638.3	3219.3	2893.6	2593.4
Zr	6781.8	5933.2	5242.9	4667.6	3964.7	3509.3	3155.2	2828.8
Nb	7174.7	6248.8	5507.5	4908.6	4332.6	3836.1	3449.8	3093.7
Mo	7900.7	6893.0	6142.3	5438.2	4655.7	4123.8	3709.9	3328.2
Tc	7865.5	6952.5	6232.9	5566.3	5046.6	4471.6	4024.1	3611.2
Ru	8245.6	7327.6	6635.3	6019.2	5388.6	4776.6	4299.9	3860.0
Rh	9185.0	8119.9	7280.9	6510.2	5815.1	5157.1	4644.5	4171.2
Pd	9836.2	8704.7	7817.1	7008.9	6164.1	5468.8	4926.9	4426.4

Table 5: continued

	Emitter							
Absorber	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd
Ag	10583.2	9415.9	8324.2	7460.0	6638.5	5893.3	5312.2	4775.2
Cd	10931.1	9689.1	8726.6	7830.6	6934.4	6160.9	5557.2	4998.9
In	11340.2	10250.0	9214.0	8278.0	7370.0	6552.4	5914.0	5323.2
Sn	11784.3	10626.2	9801.0	8936.6	7702.2	6854.6	6192.1	5578.5
Sb	11234.2	10517.9	9543.0	8858.7	8107.0	7221.0	6528.0	5885.6
Te	11417.0	10737.0	9817.4	9059.2	8316.2	7415.0	6709.4	6054.7
I	10655.4	10388.0	10561.4	9574.5	8626.3	8051.3	7285.5	6575.0
Xe	11331.4	9864.5	9777.5	9886.5	8925.2	8007.2	7271.1	6853.0
Cs	11409.8	9957.7	8928.8	8973.7	8881.2	8424.8	7675.9	6960.7
Ba	11499.9	10605.5	9864.4	9155.9	8070.2	8237.2	7480.1	7187.0
La	2258.1	11013.9	9604.0	8628.2	8584.7	7639.6	7276.0	6933.7
Ce	2280.7	1995.1	14249.7	12786.3	9156.1	8124.1	7313.4	6564.0
Pr	2357.6	2085.4	10896.8	10130.5	9938.2	8751.3	7840.1	7017.2
Nd	2780.7	2511.6	2295.6	2098.1	8482.5	7778.0	7209.7	6669.4
Pm	2900.9	2618.8	2391.7	2178.7	1962.1	7643.0	7331.4	7024.8
Sm	3046.2	2748.9	2509.2	2284.2	2010.1	1890.3	7817.6	7449.1
Eu	3197.6	2885.6	2634.1	2398.1	2113.4	1918.5	11390.9	10182.6
Gd	3238.1	2925.7	2674.0	2437.4	2185.5	1985.8	1822.3	1695.1
Tb	3524.8	3176.8	2897.3	2635.7	2283.2	2070.2	1899.7	1737.5
Dy	3713.4	3340.3	3041.5	2763.5	2375.8	2152.4	1974.9	1804.8
Ho	3907.3	3515.5	3202.4	2909.0	2490.6	2253.9	2066.0	1888.0
Er	4157.7	3739.8	3405.4	3091.6	2616.1	2367.2	2169.6	1983.8
Tm	4439.7	3984.3	3621.9	3287.9	2757.6	2491.2	2279.9	2081.7
Yb	4660.5	4179.4	3794.0	3435.5	2867.3	2585.4	2362.4	2153.5
Lu	4807.8	4316.2	3924.1	3561.0	3028.5	2730.4	2494.4	2273.4
Hf	5042.4	4536.8	4131.9	3749.5	3169.0	2856.7	2609.7	2378.2
Ta	5319.9	4786.4	4357.0	3949.4	3335.2	3006.2	2746.0	2502.3
W	5561.5	4997.3	4545.6	4126.3	3499.5	3154.3	2881.3	2625.5
Re	5783.9	5209.0	4748.3	4317.4	3679.3	3316.8	3030.0	2761.4
Os	5975.6	5392.0	4919.2	4468.5	3831.5	3454.1	3155.5	2875.8
Ir	6438.2	5726.8	5230.3	4753.9	4032.3	3635.8	3322.1	3028.2
Pt	6700.6	6041.2	5510.4	5009.6	4213.3	3799.8	3472.5	3165.8
Au	7298.6	6726.2	6167.5	5636.9	4422.1	3989.3	3646.6	3325.4
Hg	7346.9	6711.6	6107.4	5555.0	4592.0	4143.8	3788.8	3456.1
Tl	7462.7	6858.0	6278.7	5765.0	4761.9	4298.3	3931.1	3586.7
Pb	7330.7	6821.5	6422.8	5881.0	4954.7	4473.8	4092.7	3735.3
Bi	7638.3	6949.5	6397.6	6009.4	5175.4	4674.9	4278.2	3905.9
Po	8010.3	7285.4	6706.6	6304.8	5445.6	4920.8	4504.7	4114.1
At	8245.5	7709.0	7077.4	6475.2	5596.6	5168.3	4730.3	4319.2
Rn	8347.0	7768.9	7069.1	6463.4	5559.4	5046.5	4720.6	4308.7
Fr	7847.5	7483.9	7302.7	6741.8	5904.4	5288.2	4846.7	4519.8
Ra	8048.3	7324.1	6777.5	6630.9	5919.9	5456.3	5012.7	4588.5
Ac	8176.9	7460.1	6916.7	6751.4	6175.5	5692.7	5229.2	4789.7
Th	7394.3	6901.4	6622.3	6433.1	6314.3	5746.4	5282.1	4910.8
Pa	8401.6	7709.2	7129.2	6613.5	6636.3	6039.3	5556.5	5092.6
U	7998.3	8014.4	7643.2	7242.6	6332.4	6127.9	5639.9	5171.8

Table 5: continued

	Emitter							
Absorber	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf
H	3.8	3.3	3.0	2.6	2.3	2.1	1.9	1.7
He	30.7	26.9	23.6	20.6	18.2	16.0	14.2	12.6
Li	120.2	105.6	92.9	81.5	72.2	63.8	56.5	50.0
Be	317.6	280.3	247.5	218.2	194.0	172.1	152.9	135.7
B	656.4	581.0	514.7	455.1	405.8	361.0	321.7	286.2
C	1201.8	1067.2	948.7	841.7	752.9	671.8	600.2	535.4
N	1830.8	1631.2	1454.9	1295.2	1162.2	1040.0	931.5	833.1
O	2580.3	2306.6	2063.8	1843.2	1659.0	1488.9	1336.8	1198.7
F	3239.3	2906.8	2610.8	2340.9	2114.5	1903.9	1713.9	1540.7
Ne	4309.2	3877.6	3492.3	3140.0	2843.8	2567.4	2317.2	2088.7
Na	4752.0	4354.7	3993.4	3657.1	3369.2	3079.1	2786.9	2519.3
Mg	519.7	464.5	5071.1	4620.5	4236.7	3862.4	3502.2	3171.5
Al	668.2	597.7	535.1	478.2	430.6	387.1	3835.3	3512.4
Si	887.6	794.3	711.5	636.1	573.1	515.4	464.4	417.8
P	1083.4	969.9	869.0	777.3	700.6	630.1	567.9	511.1
S	1378.2	1234.2	1106.3	989.9	892.4	803.0	723.8	651.6
Cl	1610.8	1443.2	1294.2	1158.6	1045.0	940.6	848.0	763.6
Ar	1816.7	1628.6	1461.4	1309.0	1181.4	1063.8	959.3	864.0
K	2323.8	2084.7	1871.9	1678.0	1515.4	1365.4	1231.8	1109.9
Ca	2798.6	2512.7	2258.0	2025.7	1830.8	1650.7	1490.0	1343.2
Sc	3023.5	2716.6	2443.1	2193.4	1983.7	1789.7	1616.4	1458.0
Ti	3399.9	3057.0	2751.1	2471.6	2236.8	2019.4	1824.8	1646.8
V	3781.8	3403.8	3066.2	2757.5	2497.8	2256.8	2040.4	1842.3
Cr	4332.0	3902.6	3518.7	3167.4	2871.6	2596.5	2348.7	2121.8
Mn	4768.3	4301.5	3883.8	3500.9	3178.1	2876.6	2603.7	2353.7
Fe	5394.3	4873.6	4406.9	3978.4	3616.7	3277.4	2968.3	2684.9
Co	5843.3	5284.0	4782.3	4321.2	3931.7	3565.8	3232.0	2925.8
Ni	6688.2	6048.8	5475.1	4947.9	4502.4	4084.9	3705.3	3356.9
Cu	6963.6	6300.9	5706.0	5159.1	4696.7	4264.0	3871.6	3511.1
Zn	7656.9	6917.9	6255.5	5647.4	5134.0	4659.0	4235.7	3846.2
Ga	6906.5	6401.3	6580.6	5946.1	5409.9	4913.1	4469.3	4060.8
Ge	4850.9	6497.5	6156.5	5626.6	5814.7	5288.2	4811.6	4372.7
As	1274.4	1153.7	4462.4	5779.7	5438.4	5039.6	5187.4	4716.4
Se	1393.6	1260.9	1141.8	1032.3	4010.3	5178.4	4772.6	4394.1
Br	1575.0	1426.0	1292.1	1169.0	1064.8	968.0	3742.0	4817.5
Kr	1715.7	1553.8	1408.4	1274.6	1161.3	1055.9	961.3	874.1
Rb	1910.9	1731.2	1569.6	1420.8	1294.9	1177.6	1072.1	974.8
Sr	2107.8	1910.3	1732.6	1569.1	1430.6	1301.2	1184.4	1076.8
Y	2333.8	2115.6	1919.3	1738.5	1585.4	1442.3	1313.0	1193.9
Zr	2546.4	2308.9	2095.2	1898.4	1731.7	1575.7	1434.6	1304.6
Nb	2785.5	2526.3	2293.0	2078.1	1896.0	1725.5	1571.2	1429.0
Mo	2997.7	2719.7	2469.4	2238.7	2043.1	1859.9	1693.7	1540.6
Tc	3253.6	2952.6	2681.7	2431.8	2220.0	2021.4	1841.2	1675.0
Ru	3479.0	3158.1	2869.1	2602.6	2376.6	2164.6	1972.1	1794.6
Rh	3761.0	3415.5	3104.2	2817.0	2573.3	2344.4	2136.2	1944.1
Pd	3992.5	3626.8	3297.3	2993.2	2735.0	2492.4	2271.4	2067.5

Table 5: continued

	Emitter							
Absorber	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf
Ag	4309.4	3916.7	3562.6	3235.6	2957.9	2696.7	2458.3	2238.3
Cd	4514.3	4105.5	3736.6	3395.8	3106.2	2833.1	2582.9	2352.0
In	4810.0	4376.9	3985.9	3624.4	3317.0	3026.8	2760.6	2514.8
Sn	5045.1	4594.5	4187.3	3810.6	3490.1	3186.7	2907.3	2649.3
Sb	5326.8	4854.4	4427.2	4031.8	3695.0	3375.5	3080.4	2807.8
Te	5484.7	5002.4	4566.0	4161.5	3817.0	3489.2	3185.5	2904.8
I	5956.2	5432.7	4959.0	4519.9	4145.9	3790.6	3462.3	3158.8
Xe	6208.2	5662.6	5168.9	4711.3	4321.4	3951.8	3611.0	3295.9
Cs	6611.2	6025.5	5496.0	5005.6	4588.1	4194.6	3835.3	3502.7
Ba	6540.8	6254.5	5704.5	5195.3	4761.8	4354.1	3983.1	3639.6
La	6612.0	6215.7	5799.1	5503.1	5048.0	4618.7	4226.2	3862.6
Ce	7812.6	7173.5	6320.7	5879.3	5323.2	4872.1	4459.9	4078.0
Pr	6306.4	5946.1	5749.4	5556.2	5373.6	5153.5	4720.1	4318.2
Nd	6200.0	5959.7	5808.4	5658.6	5514.4	5227.8	4907.5	4489.7
Pm	6741.6	6488.2	6246.3	6009.8	5788.6	5415.9	4958.2	4719.1
Sm	7110.6	6809.8	6524.4	6246.6	5990.1	5610.1	5465.7	5000.6
Eu	9140.2	8268.1	7486.1	6767.3	6159.8	5616.6	5145.8	5047.2
Gd	8636.2	7824.0	7095.3	6424.3	5856.1	5326.1	5620.4	5163.4
Tb	1594.3	7644.7	6907.7	6231.5	5661.2	5136.6	4674.0	4975.9
Dy	1654.4	1525.7	7204.1	6496.8	5900.3	5352.8	4870.6	4426.4
Ho	1729.5	1593.9	1469.9	7269.2	6603.9	5992.9	5454.2	4957.9
Er	1814.9	1670.4	1538.5	1415.1	6625.1	6013.0	5473.7	4976.8
Tm	1905.3	1753.0	1614.0	1484.1	1372.4	6642.2	6028.8	5464.9
Yb	1969.7	1812.8	1669.5	1535.5	1420.3	1311.1	4630.2	5511.3
Lu	2079.1	1913.2	1761.7	1620.0	1498.3	1382.5	1275.8	4944.2
Hf	2174.8	2001.0	1842.5	1694.2	1566.8	1445.6	1333.7	1229.3
Ta	2288.0	2105.1	1938.1	1782.0	1647.9	1520.0	1401.7	1291.2
W	2400.6	2208.7	2033.5	1869.7	1728.9	1594.7	1470.2	1354.1
Re	2525.1	2323.5	2139.3	1967.2	1819.3	1678.0	1546.7	1424.2
Os	2629.9	2419.9	2228.3	2049.0	1895.0	1747.7	1610.5	1482.6
Ir	2769.7	2548.9	2347.4	2158.9	1996.9	1841.7	1697.0	1561.9
Pt	2896.0	2665.6	2455.2	2258.5	2089.3	1927.2	1776.0	1634.9
Au	3042.9	2801.4	2581.0	2374.7	2197.3	2027.2	1868.1	1719.7
Hg	3163.2	2912.9	2684.3	2470.4	2286.4	2109.7	1944.3	1790.0
Tl	3283.5	3024.4	2787.7	2566.1	2375.5	2192.3	2020.5	1860.3
Pb	3420.5	3151.4	2905.5	2675.2	2477.1	2286.5	2107.6	1940.7
Bi	3578.0	3297.5	3041.1	2801.0	2594.3	2395.4	2208.4	2033.9
Po	3769.9	3475.5	3206.2	2954.0	2736.8	2527.4	2330.3	2146.4
At	3957.1	3647.4	3364.2	3098.9	2870.6	2650.9	2444.7	2252.3
Rn	3946.0	3635.9	3352.4	3087.0	2858.6	2639.4	2434.5	2243.1
Fr	4137.6	3810.9	3512.4	3233.1	2992.8	2762.9	2548.9	2349.1
Ra	4293.2	3953.3	3642.9	3352.4	3102.6	2863.9	2642.3	2435.4
Ac	4394.3	4134.1	3808.4	3503.9	3242.0	2992.4	2761.6	2546.0
Th	4507.4	4156.5	3910.2	3596.0	3325.9	3069.3	2833.2	2612.5
Pa	4746.0	4377.6	4036.7	3788.6	3501.9	3230.6	2982.1	2749.9
U	4753.1	4449.6	4103.0	3776.7	3561.2	3284.0	3031.6	2795.7

Table 5: continued

	Emitter							
Absorber	Ta	W	Re	Os	Ir	Pt	Au	Hg
H	1.6	1.4	1.3	1.2	1.1	1.0	1.0	0.9
He	11.2	9.9	8.9	7.9	7.1	6.4	5.7	5.2
Li	44.3	39.3	35.0	31.1	27.9	25.0	22.4	20.2
Be	120.5	107.4	95.9	85.4	77.0	69.2	62.1	56.0
B	254.9	227.8	203.9	182.1	164.6	148.1	133.2	120.4
C	478.1	428.2	384.4	344.0	311.6	281.0	253.3	229.2
N	745.8	669.6	602.5	540.6	490.8	443.4	400.5	363.1
O	1075.8	968.3	873.3	785.5	714.7	647.1	585.5	531.9
F	1386.3	1250.8	1130.9	1019.7	929.8	843.5	764.7	695.9
Ne	1884.3	1704.6	1545.0	1396.8	1276.7	1160.4	1053.9	960.6
Na	2279.3	2067.6	1879.2	1703.7	1561.0	1421.9	1293.9	1181.6
Mg	2874.5	2612.1	2378.1	2159.7	1982.0	1808.6	1648.9	1508.6
Al	3219.1	2957.0	2720.8	2498.1	2314.8	2121.3	1937.5	1775.8
Si	376.3	339.9	3181.6	2987.2	2823.8	2604.9	2381.6	2185.0
P	460.4	415.8	376.3	339.7	310.1	282.1	256.6	2342.1
S	587.1	530.4	480.2	433.6	395.9	360.2	327.7	299.2
Cl	688.2	621.9	563.1	508.5	464.4	422.5	384.4	350.9
Ar	778.8	703.9	637.5	575.9	526.0	478.6	435.4	397.6
K	1000.9	905.1	820.1	741.1	677.1	616.3	560.8	512.1
Ca	1212.0	1096.5	994.0	898.8	821.5	748.0	680.8	621.9
Sc	1316.2	1191.4	1080.6	977.6	894.0	814.2	741.3	677.4
Ti	1487.5	1347.2	1222.5	1106.5	1012.4	922.4	840.1	767.9
V	1665.0	1508.7	1369.7	1240.4	1135.5	1034.9	942.9	862.2
Cr	1918.5	1739.3	1579.8	1431.4	1310.8	1195.2	1089.4	996.4
Mn	2129.5	1931.7	1755.7	1591.7	1458.4	1330.4	1213.0	1110.0
Fe	2430.6	2206.2	2006.3	1820.1	1668.5	1522.7	1389.0	1271.4
Co	2650.8	2407.9	2191.4	1989.5	1825.2	1666.5	1520.7	1392.5
Ni	3043.7	2766.9	2520.0	2289.5	2101.8	1920.0	1752.8	1605.7
Cu	3186.8	2899.7	2643.5	2404.1	2208.9	2018.9	1843.7	1689.6
Zn	3495.5	3184.6	2906.8	2646.9	2434.7	2226.9	2034.8	1865.8
Ga	3692.7	3366.2	3074.3	2801.0	2577.8	2359.1	2156.8	1978.6
Ge	3977.1	3626.3	3312.4	3018.6	2778.6	2544.0	2327.2	2136.2
As	4291.7	3914.9	3577.7	3261.8	3003.7	2752.0	2519.5	2314.5
Se	4534.7	4136.9	3780.8	3447.4	3174.8	2910.0	2665.6	2450.0
Br	4431.0	4007.6	4148.5	3786.6	3490.5	3200.8	2932.8	2696.2
Kr	3325.4	4270.7	3892.7	3516.5	3683.3	3382.0	3099.7	2850.5
Rb	887.1	809.3	2937.3	3741.8	3483.3	3208.8	3365.1	3094.8
Sr	979.7	893.6	816.6	744.4	2676.3	3409.3	3150.4	2907.4
Y	1086.5	991.2	905.8	825.9	760.6	698.1	2447.2	3126.5
Zr	1187.4	1083.3	990.2	902.9	831.6	763.3	700.4	644.9
Nb	1300.7	1186.8	1084.9	989.4	911.3	836.3	767.4	706.4
Mo	1402.4	1279.8	1170.0	1067.1	983.0	902.1	827.6	761.8
Tc	1525.1	1392.0	1272.8	1161.1	1069.7	981.7	900.5	828.8
Ru	1634.4	1492.1	1364.7	1245.2	1147.5	1053.1	965.9	889.0
Rh	1770.7	1616.8	1478.9	1349.6	1243.8	1141.4	1046.9	963.5
Pd	1883.4	1719.9	1573.4	1436.0	1323.7	1214.8	1114.3	1025.6

Table 5: continued

	Emitter							
Absorber	Ta	W	Re	Os	Ir	Pt	Au	Hg
Ag	2039.6	1863.1	1705.0	1556.6	1435.2	1317.4	1208.6	1112.4
Cd	2143.5	1958.2	1792.2	1636.4	1508.9	1385.3	1271.2	1170.3
In	2292.7	2095.4	1918.4	1752.3	1616.3	1484.2	1362.1	1254.1
Sn	2416.1	2208.8	2022.8	1848.3	1705.3	1566.3	1437.7	1324.0
Sb	2561.4	2342.2	2145.5	1960.9	1809.7	1662.5	1526.3	1405.9
Te	2651.0	2425.1	2222.4	2032.0	1876.0	1723.9	1583.0	1458.4
I	2884.2	2639.7	2420.1	2213.9	2044.7	1879.4	1726.1	1590.6
Xe	3010.6	2756.5	2528.2	2313.7	2137.7	1965.4	1805.6	1664.1
Cs	3201.5	2933.0	2691.8	2464.8	2278.6	2095.6	1925.7	1775.3
Ba	3328.3	3050.8	2801.2	2566.3	2373.5	2183.6	2007.2	1850.9
La	3533.1	3239.2	2974.9	2726.1	2521.7	2320.6	2133.6	1968.0
Ce	3731.7	3422.7	3144.7	2882.9	2667.8	2456.1	2259.2	2084.8
Pr	3953.6	3628.1	3335.1	3059.1	2832.1	2607.8	2398.9	2213.7
Nd	4110.6	3772.3	3467.6	3180.6	2944.7	2712.1	2495.7	2303.8
Pm	4352.7	3994.6	3672.1	3368.3	3118.6	2873.0	2644.6	2442.1
Sm	4673.5	4086.9	3757.6	3447.3	3192.1	2941.4	2708.3	2501.5
Eu	4597.3	4197.6	3944.5	3620.2	3353.4	3090.8	2846.3	2629.4
Gd	5028.8	4599.1	4213.5	3706.7	3436.4	3168.8	2919.0	2697.4
Tb	4539.0	4449.2	4072.0	3718.4	3587.0	3308.2	3048.5	2818.0
Dy	4711.1	4318.1	4224.7	3856.4	3555.1	3419.2	3151.9	2914.6
Ho	4510.6	4783.6	4378.2	3998.1	3937.6	3619.1	3326.4	3037.8
Er	4528.8	4131.3	4407.8	4012.3	3689.5	3625.5	3331.7	3071.6
Tm	4957.6	4508.8	4108.3	4382.9	4020.2	3678.9	3611.8	3320.9
Yb	5027.2	4596.6	4210.2	3847.6	4148.7	3797.0	3475.4	3412.0
Lu	5292.0	4816.5	4392.2	3995.8	3672.5	3435.8	3150.9	2899.3
Hf	5573.8	5079.4	4637.2	4223.2	3885.0	3565.8	3795.9	3490.4
Ta	1190.3	3659.3	4814.9	4387.1	4037.4	3707.1	3403.8	3661.1
W	1248.0	1152.6	3344.6	4552.6	4192.6	3852.1	3539.3	3262.4
Re	1312.3	1211.8	1158.6	3167.0	4310.6	3966.0	3648.8	3367.8
Os	1365.8	1260.9	1165.9	1075.9	3006.8	4072.9	3747.3	3458.8
Ir	1438.7	1328.0	1227.7	1132.8	1054.3	2900.4	3946.7	3638.7
Pt	1506.1	1390.4	1285.7	1186.4	1104.3	1024.0	2784.3	2573.1
Au	1584.2	1462.5	1352.3	1247.8	1161.5	1077.1	998.4	928.2
Hg	1649.1	1522.5	1407.9	1299.3	1209.5	1121.5	1039.5	966.3
Tl	1714.0	1582.6	1463.6	1350.7	1257.5	1166.0	1080.7	1004.6
Pb	1788.3	1651.4	1527.4	1409.8	1312.6	1217.1	1128.0	1048.4
Bi	1874.6	1731.4	1601.6	1478.6	1376.9	1276.6	1182.9	1099.3
Po	1978.3	1827.3	1690.5	1560.8	1453.4	1347.7	1248.8	1160.5
At	2076.4	1918.4	1775.1	1639.3	1526.9	1415.7	1311.6	1218.8
Rn	2068.3	1911.1	1768.7	1633.5	1521.7	1410.9	1307.2	1214.6
Fr	2166.4	2002.2	1853.3	1712.1	1595.2	1479.0	1370.2	1273.0
Ra	2246.2	2076.1	1921.8	1775.5	1654.4	1534.1	1421.4	1320.8
Ac	2348.9	2171.6	2010.8	1858.2	1731.9	1606.2	1488.2	1383.0
Th	2410.7	2229.2	2064.5	1908.2	1778.7	1649.9	1528.9	1420.9
Pa	2537.6	2346.6	2173.3	2008.9	1872.7	1737.0	1609.6	1495.9
U	2580.0	2385.9	2209.9	2042.7	1904.3	1766.4	1637.0	1521.5

Table 5: continued

	Emitter							
Absorber	Tl	Pb	Bi	Po	At	Rn	Fr	Ra
H	0.9	0.8	0.8	0.7	0.7	0.7	0.6	0.6
He	4.7	4.2	3.8	3.5	3.2	2.9	2.6	2.4
Li	18.1	16.4	14.8	13.4	12.1	11.0	10.0	9.1
Be	50.4	45.6	41.2	37.4	33.9	30.9	28.1	25.7
B	108.6	98.5	89.3	81.0	73.8	67.3	61.4	56.1
C	207.2	188.2	170.9	155.4	141.6	129.4	118.2	108.2
N	328.9	299.2	272.2	247.9	226.4	207.3	189.6	173.8
O	482.7	439.9	401.0	365.9	334.7	306.9	281.3	258.2
F	632.7	577.6	527.3	482.1	441.6	405.7	372.4	342.4
Ne	875.0	800.0	731.7	669.9	614.7	565.5	520.0	478.8
Na	1078.2	987.7	904.9	830.0	762.9	703.1	647.5	597.2
Mg	1379.2	1265.6	1161.6	1067.3	982.7	907.1	836.9	773.1
Al	1626.3	1494.9	1374.4	1265.0	1166.7	1078.6	996.7	922.2
Si	2003.1	1842.9	1696.0	1562.4	1442.3	1334.6	1234.3	1143.1
P	2162.0	2002.4	1855.0	1720.1	1597.9	1487.8	1384.5	1290.1
S	273.0	250.0	229.0	2016.4	1880.1	1756.7	1640.7	1534.1
Cl	320.2	293.2	268.6	246.3	226.4	208.6	192.1	1635.4
Ar	362.7	332.2	304.3	279.1	256.5	236.3	217.6	200.7
K	467.4	428.1	392.2	359.8	330.7	304.8	280.7	258.9
Ca	567.7	520.2	476.7	437.4	402.1	370.7	341.5	315.1
Sc	618.5	566.8	519.6	476.9	438.6	404.4	372.6	343.9
Ti	701.4	643.0	589.7	541.3	498.0	459.3	423.4	390.8
V	787.8	722.5	662.7	608.6	560.1	516.7	476.4	439.9
Cr	910.7	835.5	766.6	704.3	648.3	598.3	551.8	509.7
Mn	1014.9	931.4	855.0	785.7	723.5	667.9	616.3	569.4
Fe	1163.0	1067.7	980.4	901.3	830.3	766.7	707.7	654.1
Co	1274.2	1170.3	1075.0	988.6	911.0	841.6	777.0	718.4
Ni	1469.9	1350.5	1241.1	1141.8	1052.5	972.7	898.4	831.0
Cu	1547.2	1422.0	1307.2	1203.0	1109.3	1025.5	947.4	876.6
Zn	1709.5	1571.9	1445.8	1331.2	1228.2	1135.9	1050.0	972.0
Ga	1813.8	1668.8	1535.6	1414.6	1305.8	1208.3	1117.4	1034.8
Ge	1959.4	1803.7	1660.7	1530.7	1413.7	1308.7	1210.9	1122.0
As	2124.6	1957.2	1803.4	1663.4	1537.3	1424.2	1318.7	1222.7
Se	2250.2	2074.0	1912.0	1764.5	1631.6	1512.2	1400.9	1299.5
Br	2477.0	2283.5	2105.7	1943.7	1797.7	1666.6	1544.2	1432.8
Kr	2619.5	2415.6	2228.1	2057.2	1903.2	1764.9	1635.8	1518.1
Rb	2844.3	2623.1	2419.7	2234.3	2067.2	1917.1	1777.0	1649.3
Sr	3050.9	2814.5	2597.0	2398.8	2220.1	2059.4	1909.4	1772.7
Y	2887.0	2669.7	2812.5	2598.4	2405.3	2231.8	2069.7	1921.9
Zr	2219.8	2837.0	2625.2	2429.7	2568.5	2384.7	2212.9	2056.3
Nb	649.9	599.9	2032.2	2599.3	2408.7	2238.3	2375.9	2209.0
Mo	700.7	646.8	597.1	551.8	1838.0	2357.0	2186.3	2032.3
Tc	762.3	703.6	649.5	600.2	555.7	515.7	1687.8	2163.3
Ru	817.5	754.5	696.4	643.5	595.7	552.8	512.7	476.2
Rh	886.0	817.6	754.7	697.3	645.6	599.0	555.6	515.9
Pd	943.2	870.4	803.5	742.4	687.4	637.9	591.6	549.5

Table 5: continued

	Emitter							
Absorber	Tl	Pb	Bi	Po	At	Rn	Fr	Ra
Ag	1023.2	944.4	871.8	805.7	746.0	692.3	642.2	596.5
Cd	1076.7	993.9	917.8	848.3	785.6	729.2	676.6	628.5
In	1153.9	1065.4	983.8	909.5	842.4	782.0	725.6	674.1
Sn	1218.4	1125.2	1039.3	960.9	890.1	826.5	767.0	712.8
Sb	1294.1	1195.3	1104.3	1021.2	946.2	878.7	815.6	758.1
Te	1342.7	1240.4	1146.1	1060.1	982.4	912.5	847.1	787.5
I	1464.6	1353.3	1250.6	1157.0	1072.4	996.2	925.0	860.0
Xe	1532.7	1416.5	1309.4	1211.6	1123.2	1043.7	969.3	901.4
Cs	1635.6	1511.9	1397.9	1293.8	1199.7	1115.0	1035.8	963.4
Ba	1705.7	1577.2	1458.6	1350.3	1252.5	1164.4	1081.9	1006.6
La	1814.0	1677.7	1552.0	1437.1	1333.3	1239.7	1152.2	1072.2
Ce	1922.5	1778.8	1646.2	1525.0	1415.4	1316.6	1224.1	1139.5
Pr	2041.5	1889.0	1748.2	1619.5	1503.1	1398.3	1300.1	1210.3
Nd	2125.3	1967.1	1821.1	1687.6	1566.8	1458.0	1356.0	1262.7
Pm	2253.5	2086.5	1932.2	1791.1	1663.4	1548.2	1440.3	1341.7
Sm	2308.9	2138.3	1980.6	1836.4	1705.9	1588.1	1477.8	1376.9
Eu	2427.4	2248.4	2082.9	1931.6	1794.6	1671.0	1555.1	1449.1
Gd	2490.9	2307.8	2138.6	1983.8	1843.6	1717.1	1598.4	1489.9
Tb	2603.2	2412.6	2236.5	2075.2	1929.1	1797.3	1673.6	1560.4
Dy	2693.3	2497.0	2315.5	2149.3	1998.6	1862.6	1735.0	1618.2
Ho	2807.3	2602.8	2413.7	2240.5	2083.6	1941.9	1808.9	1687.2
Er	2924.2	2711.2	2514.2	2333.8	2170.3	2022.7	1884.2	1757.4
Tm	3067.9	2832.7	2626.8	2438.2	2267.4	2113.1	1968.3	1835.8
Yb	3138.4	2903.7	2704.2	2509.8	2333.7	2174.8	2025.6	1889.1
Lu	3296.1	3044.9	2813.6	2615.9	2432.5	2267.0	2111.7	1969.5
Hf	3207.2	2957.3	2913.0	2692.5	2493.7	2341.4	2181.6	2035.2
Ta	3357.2	3089.7	2844.2	2800.0	2588.7	2399.2	2264.7	2113.7
W	3005.1	3223.8	2965.9	2731.7	2693.8	2497.8	2315.0	2186.1
Re	3106.3	2874.8	3089.8	2847.8	2630.2	2435.2	2407.3	2236.9
Os	3190.4	2952.9	2733.8	2936.0	2714.8	2516.5	2331.6	2301.7
Ir	3352.5	3099.4	2866.1	2653.3	2855.2	2647.5	2454.0	2277.8
Pt	3502.6	3236.4	2991.3	2767.7	2566.0	2759.0	2559.5	2377.8
Au	1913.7	2600.0	2672.5	2562.3	2425.0	2332.5	2383.6	2385.6
Hg	897.7	2364.1	3170.4	2940.1	2731.9	2544.4	2368.7	2208.2
Tl	933.2	869.6	2255.2	3048.2	2824.1	2622.7	2434.7	2263.5
Pb	973.9	907.4	845.6	2178.9	2018.2	2726.2	2531.3	2353.7
Bi	1021.0	951.1	886.2	826.5	1777.5	1851.0	2473.5	2325.8
Po	1077.8	1004.1	935.6	872.5	815.1	763.1	1937.7	2629.7
At	1131.8	1054.2	982.1	915.8	855.5	800.7	749.2	1943.5
Rn	1127.8	1050.5	978.7	912.6	852.4	797.8	746.4	699.2
Fr	1182.0	1100.9	1025.5	956.2	893.1	835.9	782.0	732.4
Ra	1226.6	1142.6	1064.5	992.7	927.3	868.0	812.2	760.8
Ac	1284.4	1196.5	1114.8	1039.6	971.2	909.2	850.7	796.9
Th	1319.8	1229.6	1145.8	1068.6	998.4	934.7	874.7	819.4
Pa	1389.4	1294.5	1206.2	1125.0	1051.0	984.0	920.7	862.6
U	1413.3	1316.8	1227.1	1144.5	1069.3	1001.2	936.9	877.8

Table 5: continued

	Emitter			
Absorber	Ac	Th	Pa	U
H	0.6	0.6	0.6	0.5
He	2.2	2.0	1.9	1.7
Li	8.3	7.6	6.9	6.4
Be	23.4	21.4	19.5	17.9
B	51.2	46.9	42.9	39.4
C	99.0	90.7	83.2	76.4
N	159.3	146.1	134.2	123.4
O	237.2	217.9	200.4	184.4
F	315.0	289.8	267.0	246.0
Ne	441.1	406.5	374.9	345.9
Na	551.1	508.8	469.8	434.0
Mg	714.6	660.7	610.9	565.0
Al	853.8	790.6	731.9	677.8
Si	1059.1	981.6	909.7	843.5
P	1202.6	1121.4	1040.8	966.2
S	1435.1	1342.9	1247.7	1159.3
Cl	1553.6	1476.3	1373.7	1277.6
Ar	185.2	170.9	158.1	146.4
K	238.9	220.6	204.0	188.9
Ca	290.8	268.5	248.4	229.9
Sc	317.5	293.2	271.3	251.2
Ti	360.9	333.4	308.6	285.7
V	406.4	375.6	347.6	321.9
Cr	471.0	435.4	403.1	373.3
Mn	526.4	486.7	450.7	417.6
Fe	604.8	559.5	518.2	480.2
Co	664.6	615.0	569.8	528.1
Ni	768.9	711.8	659.6	611.5
Cu	811.4	751.3	696.4	645.8
Zn	900.1	833.9	773.1	717.1
Ga	958.8	888.6	824.1	764.6
Ge	1040.1	964.5	894.7	830.4
As	1134.2	1052.4	976.6	906.6
Se	1206.0	1119.6	1039.3	965.2
Br	1330.0	1235.0	1146.8	1065.4
Kr	1409.5	1309.2	1216.1	1130.2
Rb	1531.5	1422.5	1321.9	1229.0
Sr	1646.6	1529.9	1422.4	1323.1
Y	1785.5	1659.3	1543.1	1435.8
Zr	1911.6	1777.6	1653.3	1538.4
Nb	2054.8	1912.0	1778.6	1655.2
Mo	2164.0	2017.1	1877.2	1747.6
Tc	2009.9	1867.9	1992.3	1856.0
Ru	1531.5	1895.9	1833.4	1707.7
Rh	479.4	445.5	1411.6	1811.5
Pd	510.5	474.5	441.7	411.4

Table 5: continued

	Emitter			
Absorber	Ac	Th	Pa	U
Ag	554.3	515.2	479.6	446.7
Cd	584.2	543.1	505.6	470.9
In	626.6	582.6	542.4	505.2
Sn	662.6	616.2	573.7	534.3
Sb	704.9	655.7	610.4	568.5
Te	732.4	681.3	634.4	590.9
I	800.0	744.3	693.1	645.7
Xe	838.6	780.4	726.8	677.2
Cs	896.5	834.5	777.3	724.4
Ba	936.9	872.3	812.7	757.4
La	998.2	929.6	866.1	807.4
Ce	1061.3	988.7	921.1	858.5
Pr	1127.3	1050.2	978.8	912.6
Nd	1176.4	1096.3	1022.0	953.0
Pm	1250.3	1165.5	1086.5	1013.3
Sm	1283.4	1196.6	1115.7	1040.8
Eu	1351.0	1259.8	1174.8	1096.1
Gd	1389.3	1295.9	1208.7	1127.8
Tb	1455.5	1358.1	1266.9	1182.3
Dy	1509.9	1409.2	1314.7	1226.9
Ho	1574.3	1469.4	1371.1	1279.8
Er	1639.8	1530.6	1428.5	1333.8
Tm	1712.9	1598.8	1492.5	1393.9
Yb	1762.5	1644.9	1535.9	1434.8
Lu	1837.6	1715.1	1601.8	1496.6
Hf	1899.4	1773.3	1656.3	1547.6
Ta	1973.7	1843.4	1722.1	1609.3
W	2041.8	1907.6	1782.4	1666.1
Re	2079.7	1977.7	1848.5	1728.3
Os	2140.2	1990.8	1898.2	1775.1
Ir	2249.1	2093.2	1953.4	1824.0
Pt	2210.3	2055.4	2035.3	1900.6
Au	2264.5	2126.5	2002.8	1934.0
Hg	2381.5	2219.8	2074.6	1940.0
Tl	2105.3	2270.5	2119.6	1980.0
Pb	2189.7	2038.0	2204.9	2057.2
Bi	2187.7	2058.4	1915.6	1782.5
Po	2385.0	2164.1	2012.5	1874.5
At	2555.7	2261.9	2102.1	1958.7
Rn	1759.9	1562.1	2300.5	2081.2
Fr	686.2	643.2	1640.0	2177.2
Ra	712.9	668.3	626.9	1519.4
Ac	746.8	700.1	656.7	616.4
Th	768.0	720.0	675.4	633.9
Pa	808.5	757.9	711.0	667.2
U	822.7	771.4	723.5	678.8

Table 6: Mass attenuation coefficients for Mβ lines.

	Emitter							
Absorber	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd
H	11.4	9.5	8.0	6.8	6.2	5.4	4.7	4.1
He	96.3	81.4	69.3	59.5	52.0	44.9	38.7	33.3
Li	362.4	307.1	261.9	225.2	200.7	174.1	150.4	129.9
Be	954.3	814.5	699.8	605.4	521.1	454.1	394.3	342.4
B	1926.7	1649.4	1422.9	1239.3	1063.9	930.4	810.6	706.3
C	3423.2	2952.0	2560.7	2237.7	1921.7	1686.8	1475.3	1290.3
N	5021.3	4357.2	3800.5	3335.2	2889.1	2545.3	2234.6	1961.8
O	6903.6	6039.5	5296.9	4656.4	4020.4	3554.6	3132.0	2759.7
F	8346.6	7343.6	6460.3	5719.8	4970.6	4413.3	3905.7	3456.4
Ne	708.5	9906.3	8726.7	7740.4	6540.6	5824.9	5171.0	4590.5
Na	974.4	842.0	729.9	635.3	573.0	6097.8	5525.7	5007.2
Mg	1389.8	1193.2	1030.0	913.5	808.8	715.7	631.0	555.9
Al	1830.1	1579.6	1371.7	1200.3	1038.7	918.9	810.2	714.4
Si	2504.7	2165.7	1865.0	1618.0	1377.0	1218.9	1075.3	948.7
P	3012.8	2609.4	2273.5	1995.4	1678.5	1486.3	1311.8	1157.7
S	3851.3	3339.2	2912.3	2558.8	2132.1	1888.8	1667.7	1472.4
Cl	4222.9	3680.5	3223.4	2842.8	2487.3	2204.6	1947.5	1720.4
Ar	5024.5	4377.4	3832.7	3375.7	2798.4	2482.0	2194.1	1939.6
K	5894.4	5235.9	4695.7	4201.5	3569.6	3168.4	2803.1	2480.0
Ca	7100.2	6219.9	5479.4	4859.6	4285.2	3807.1	3371.2	2985.2
Sc	8620.3	7574.6	6650.1	5907.1	4616.0	4104.2	3637.4	3223.7
Ti	8477.3	7450.8	6575.7	5833.3	5176.3	4606.0	4085.3	3623.5
V	9290.6	8184.6	7238.9	6434.2	5735.2	5108.8	4536.4	4028.1
Cr	11073.6	9618.3	8488.5	7492.5	6545.8	5836.8	5188.2	4611.7
Mn	11475.0	10150.0	9016.1	8042.7	7165.7	6399.3	5697.0	5071.8
Fe	12962.0	11504.0	10177.8	9084.7	8058.3	7208.4	6428.3	5732.6
Co	12562.9	11200.6	11011.4	9796.8	8698.2	7788.4	6952.6	6206.4
Ni	14355.9	12628.3	11184.1	10422.1	9950.7	8911.2	7956.0	7103.2
Cu	2111.3	1807.7	12463.8	10833.4	9219.3	9265.5	8276.8	7393.6
Zn	2218.8	1952.8	1738.2	1568.9	8293.7	8414.8	7901.7	8136.9
Ga	2429.1	2138.3	1892.8	1687.6	1510.2	1355.3	7364.1	7166.5
Ge	2801.5	2435.8	2125.0	1893.7	1684.5	1511.4	1351.1	1207.8
As	3041.6	2687.9	2386.0	2129.8	1886.8	1692.3	1513.3	1352.7
Se	3345.2	2958.1	2625.8	2341.6	2061.7	1849.8	1654.6	1479.7
Br	3753.2	3322.4	2955.3	2644.1	2333.3	2092.0	1870.1	1671.7
Kr	4315.8	3729.2	3294.9	2936.6	2538.7	2277.0	2036.1	1820.7
Rb	4571.9	4046.5	3596.6	3213.8	2824.3	2533.9	2266.6	2027.5
Sr	4984.6	4420.7	3935.8	3521.1	3110.5	2791.9	2498.5	2235.9
Y	5291.1	4689.7	4149.4	3689.4	3440.8	3089.2	2765.2	2475.2
Zr	6427.3	5639.9	4989.7	4470.3	3750.2	3367.9	3015.6	2700.2
Nb	6796.0	5927.8	5245.2	4702.2	4098.7	3681.8	3297.5	2953.4
Mo	7456.1	6587.4	5820.6	5246.2	4405.1	3958.5	3546.7	3177.8
Tc	7458.2	6649.2	5944.7	5334.0	4775.7	4292.9	3847.6	3448.4
Ru	7830.1	7035.0	6368.1	5789.4	5100.4	4586.3	4111.9	3686.6
Rh	8710.1	7765.9	6947.4	6241.5	5505.2	4952.5	4442.2	3984.5
Pd	9330.1	8329.9	7467.0	6726.4	5836.7	5252.5	4713.0	4228.9

Table 6: continued

	Emitter							
Absorber	La	Ce	Pr	Nd	Pm	Sm	Eu	Gd
Ag	10125.4	8924.5	7954.4	7155.4	6287.7	5661.4	5082.8	4563.3
Cd	10367.7	9284.0	8339.8	7516.2	6570.3	5920.0	5318.7	4778.4
In	10861.0	9817.5	8807.7	7950.6	6985.3	6297.7	5661.6	5089.8
Sn	11271.1	10259.4	9488.1	8354.8	7303.4	6590.4	5930.1	5336.0
Sb	11121.0	10095.5	9235.7	8616.5	7690.2	6944.7	6253.8	5631.6
Te	11347.8	10359.9	9445.7	8826.5	7892.4	7133.7	6429.9	5795.6
I	10302.4	10516.6	10207.0	9178.9	8206.2	7746.0	6982.2	6293.8
Xe	10670.7	9581.7	9970.2	9533.3	8495.8	7714.1	7277.4	6559.9
Cs	10756.2	9495.8	8819.5	9078.1	8450.2	8126.9	7372.6	6675.6
Ba	11103.5	10301.6	9560.0	8903.6	7650.3	7936.9	7605.0	6897.5
La	12033.9	10412.5	9068.5	8419.3	8144.0	7340.6	7132.2	6792.8
Ce	2152.2	15189.7	13614.8	12277.2	8670.1	7801.2	6993.0	8222.6
Pr	2233.5	1996.7	10567.7	9857.3	9378.2	8383.9	7488.0	6693.4
Nd	2661.6	2420.7	2210.3	8897.9	8154.9	7553.1	6980.7	6451.8
Pm	2776.1	2523.5	2300.0	2103.5	7844.0	7521.0	7202.8	6898.1
Sm	2914.8	2648.3	2412.4	2204.8	1923.6	8046.4	7662.8	7297.4
Eu	3059.7	2780.1	2532.5	2314.7	2022.5	1856.4	10873.8	9707.6
Gd	3099.8	2820.1	2572.3	2353.8	2092.1	1921.4	1756.6	9164.9
Tb	3370.6	3059.5	2784.7	2543.3	2183.5	2002.9	1830.7	1672.6
Dy	3547.9	3214.8	2921.7	2665.5	2271.2	2082.0	1902.9	1736.7
Ho	3733.0	3384.0	3076.1	2805.5	2379.7	2179.3	1990.9	1816.2
Er	3972.1	3599.5	3270.3	2980.9	2499.5	2288.7	2090.6	1907.4
Tm	4236.9	3831.8	3477.8	3170.0	2632.7	2407.2	2195.6	2002.6
Yb	4447.3	4017.4	3639.4	3309.1	2735.1	2496.8	2273.5	2070.2
Lu	4589.0	4151.3	3767.5	3432.8	2888.7	2636.6	2400.4	2185.3
Hf	4817.6	4367.0	3967.5	3614.3	3022.6	2758.5	2511.2	2286.0
Ta	5083.7	4606.4	4181.8	3805.5	3180.9	2902.8	2642.3	2405.1
W	5311.2	4807.4	4364.8	3978.5	3337.7	3045.8	2772.4	2523.6
Re	5528.7	5015.6	4562.7	4165.1	3509.4	3202.8	2915.7	2654.3
Os	5718.2	5194.0	4725.6	4309.1	3654.5	3335.4	3036.5	2764.3
Ir	6211.9	5519.1	5025.9	4585.1	3846.4	3511.1	3197.0	2911.0
Pt	6408.5	5818.7	5295.1	4832.4	4019.4	3669.7	3342.0	3043.5
Au	7049.7	6491.3	5946.4	5440.3	4219.2	3853.1	3509.9	3197.4
Hg	7110.4	6457.2	5868.8	5359.8	4381.9	4002.7	3647.2	3323.3
Tl	7239.6	6613.4	6056.1	5582.0	4544.6	4152.3	3784.5	3449.3
Pb	7092.7	6664.0	6200.4	5680.6	4729.3	4322.4	3940.6	3592.6
Bi	7339.0	6711.3	6223.1	5871.4	4940.8	4517.3	4119.8	3757.3
Po	7694.7	7035.3	6525.6	6162.1	5199.7	4755.5	4338.6	3958.2
At	8099.7	7444.8	6819.0	6261.5	5461.9	4994.3	4555.4	4155.2
Rn	8204.9	7472.2	6805.6	6250.9	5322.3	4985.2	4545.4	4144.3
Fr	7609.5	7428.9	7085.7	6524.4	5611.1	5112.9	4769.2	4346.6
Ra	7731.1	7075.9	6692.0	6583.5	5669.2	5280.3	4832.4	4510.6
Ac	7862.6	7214.4	6824.6	6696.6	5913.5	5508.8	5043.7	4610.6
Th	7160.2	6765.9	6542.1	6324.3	6048.7	5562.2	5096.2	4728.1
Pa	8113.6	7454.7	6908.6	6428.9	6357.1	5850.4	5359.4	4906.9
U	8051.9	7890.7	7439.4	7160.2	6453.5	5934.3	5444.2	4982.2

Table 6: continued

	Emitter							
Absorber	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf
H	3.6	3.1	2.7	2.4	2.1	1.9	1.7	1.6
He	28.7	24.9	21.7	19.0	16.7	14.6	12.9	11.4
Li	112.7	97.9	85.7	75.2	66.3	58.1	51.3	45.2
Be	298.3	260.4	229.1	201.8	178.6	157.1	139.1	123.2
B	617.4	540.8	477.3	421.6	374.3	330.2	293.3	260.3
C	1132.2	995.3	881.6	781.5	696.1	615.7	548.3	488.0
N	1727.7	1524.3	1354.7	1205.0	1076.8	955.0	852.8	760.9
O	2439.1	2159.5	1925.6	1718.3	1540.3	1369.9	1226.3	1097.0
F	3067.8	2727.6	2441.7	2187.5	1968.2	1755.2	1575.4	1413.0
Ne	4086.8	3644.5	3271.8	2939.4	2651.8	2371.7	2134.5	1919.7
Na	4548.2	4136.9	3783.6	3462.7	3177.5	2850.6	2573.1	2320.9
Mg	491.2	5264.0	4789.8	4361.1	3983.6	3580.8	3238.0	2926.0
Al	631.8	559.7	499.4	445.9	400.0	3911.6	3577.6	3270.2
Si	839.5	744.1	664.3	593.4	532.6	475.5	427.2	383.5
P	1024.9	908.8	811.6	725.3	651.2	581.4	522.5	469.1
S	1304.0	1156.8	1033.4	923.9	829.7	741.0	666.1	598.2
Cl	1524.4	1353.0	1209.3	1081.6	971.8	868.2	780.5	701.2
Ar	1719.7	1527.4	1365.9	1222.5	1099.1	982.1	883.1	793.5
K	2200.5	1955.9	1750.5	1567.8	1410.4	1260.9	1134.3	1019.8
Ca	2651.2	2358.6	2112.6	1893.7	1704.9	1525.0	1372.7	1234.7
Sc	2865.3	2551.1	2286.7	2051.3	1848.2	1654.1	1489.8	1340.7
Ti	3223.2	2871.9	2576.1	2312.6	2085.0	1867.2	1682.5	1515.1
V	3587.0	3199.5	2873.0	2581.7	2329.7	2087.5	1882.1	1695.7
Cr	4110.8	3670.4	3298.9	2967.2	2680.0	2402.7	2167.4	1953.7
Mn	4527.9	4048.9	3644.2	3282.4	2968.6	2663.2	2403.9	2168.3
Fe	5126.3	4591.5	4138.9	3733.6	3381.5	3035.7	2741.8	2474.7
Co	5555.5	4980.7	4493.9	4057.6	3678.1	3304.8	2987.4	2698.5
Ni	6359.1	5702.0	5145.4	4646.4	4212.6	3788.2	3426.9	3098.0
Cu	6622.6	5941.4	5364.0	4846.2	4395.9	3957.3	3583.6	3243.0
Zn	7276.5	6517.4	5875.1	5300.0	4801.1	4328.2	3924.7	3556.4
Ga	6648.1	6853.7	6183.7	5583.3	5062.0	4566.3	4143.1	3756.6
Ge	6614.6	6361.9	5825.8	5996.8	5448.1	4915.7	4461.1	4045.8
As	1212.3	4508.1	5927.5	5550.0	5200.0	5299.1	4811.3	4365.5
Se	1325.3	1188.9	1073.4	4239.8	5313.4	4861.7	4470.8	4612.5
Br	1498.3	1345.1	1215.1	1098.5	997.1	3934.5	4892.3	4514.3
Kr	1632.4	1465.9	1324.7	1197.9	1087.7	981.9	891.6	3465.4
Rb	1818.5	1633.5	1476.6	1335.7	1213.1	1095.2	994.4	902.4
Sr	2006.2	1803.0	1630.4	1475.4	1340.4	1209.9	1098.5	996.6
Y	2221.6	1997.0	1806.3	1634.9	1485.7	1341.3	1217.9	1105.1
Zr	2424.2	2179.8	1972.2	1785.6	1623.1	1465.5	1330.8	1207.7
Nb	2652.2	2385.4	2158.7	1954.9	1777.3	1604.9	1457.6	1322.9
Mo	2854.7	2568.5	2325.2	2106.4	1915.6	1730.1	1571.4	1426.4
Tc	3098.8	2789.0	2525.5	2288.5	2081.9	1880.6	1708.5	1551.1
Ru	3314.0	2983.6	2702.6	2449.7	2229.2	2014.2	1830.4	1662.2
Rh	3583.4	3227.5	2924.7	2652.2	2414.3	2181.7	1982.8	1800.9
Pd	3804.5	3427.8	3107.3	2818.6	2566.6	2319.7	2108.5	1915.4

Table 6: continued

	Emitter							
Absorber	Tb	Dy	Ho	Er	Tm	Yb	Lu	Hf
Ag	4107.5	3702.8	3358.3	3047.8	2776.6	2510.4	2282.6	2074.2
Cd	4304.2	3882.8	3523.7	3200.0	2916.9	2637.6	2398.5	2179.7
In	4587.4	4140.8	3760.0	3416.6	3116.0	2818.8	2564.3	2331.3
Sn	4813.6	4348.7	3952.1	3594.0	3280.3	2968.4	2701.3	2456.6
Sb	5084.1	4596.6	4180.3	3804.2	3474.4	3145.0	2862.8	2604.2
Te	5237.0	4739.0	4313.4	3928.7	3590.9	3251.9	2961.4	2695.1
I	5687.4	5146.8	4684.8	4267.1	3900.6	3534.2	3220.0	2931.9
Xe	5928.0	5364.7	4883.2	4447.8	4065.9	3685.6	3359.4	3060.2
Cs	6310.3	5705.9	5189.8	4723.4	4314.8	3913.9	3569.8	3253.9
Ba	6255.3	5922.6	5386.6	4902.3	4478.2	4064.4	3709.0	3382.5
La	6434.7	5965.5	5703.6	5195.5	4750.0	4312.1	3936.0	3590.5
Ce	7484.9	6652.4	6046.2	5478.3	5009.9	4550.2	4155.1	3792.0
Pr	6063.2	5828.8	5630.1	5439.5	5234.1	4815.0	4399.3	4017.1
Nd	6048.1	5869.6	5716.1	5567.6	5346.0	4939.3	4574.1	4176.6
Pm	6613.2	6343.8	6100.2	5867.5	5562.4	5058.4	4738.5	4422.5
Sm	6957.9	6639.3	6352.6	6080.2	5745.4	5560.1	5097.2	4690.8
Eu	8691.0	7795.4	7036.6	6356.2	5773.8	5249.0	5147.6	4675.4
Gd	8217.7	7383.7	6675.8	6040.1	5484.4	5733.3	5239.3	5112.7
Tb	8043.9	7199.1	6484.7	5845.5	5291.9	4775.1	5073.4	4614.9
Dy	1588.5	7509.1	6761.6	6093.0	5514.7	4976.0	4515.9	4787.8
Ho	1660.0	1519.3	7564.5	6818.9	6173.7	5571.8	5057.8	4588.2
Er	1740.8	1590.9	1461.6	6840.4	6193.9	5591.6	5076.9	4606.6
Tm	1827.2	1669.3	1533.0	1408.7	6848.4	6162.7	5578.3	5045.6
Yb	1889.3	1726.5	1586.0	1457.8	1344.4	4178.5	5619.3	5111.4
Lu	1994.1	1821.9	1673.4	1537.9	1418.1	1299.2	4462.6	5385.2
Hf	2085.7	1905.5	1750.0	1608.2	1482.8	1358.3	1250.4	5670.6
Ta	2194.3	2004.5	1840.8	1691.5	1559.4	1427.7	1313.6	1207.9
W	2302.3	2103.1	1931.4	1774.7	1636.1	1497.5	1377.6	1266.5
Re	2421.8	2212.5	2032.1	1867.4	1721.7	1575.5	1449.0	1331.8
Os	2522.3	2304.5	2116.5	1945.1	1793.4	1640.7	1508.5	1386.2
Ir	2656.5	2427.5	2229.9	2049.6	1889.9	1728.7	1589.3	1460.2
Pt	2777.9	2538.9	2332.6	2144.3	1977.6	1809.2	1663.5	1528.6
Au	2919.2	2668.6	2452.4	2255.0	2080.1	1903.0	1749.7	1607.8
Hg	3035.0	2775.2	2551.0	2346.2	2164.8	1980.6	1821.2	1673.7
Tl	3150.8	2881.8	2649.6	2437.5	2249.4	2058.2	1892.7	1739.5
Pb	3282.7	3003.3	2762.0	2541.5	2346.0	2146.9	1974.5	1814.9
Bi	3434.3	3143.1	2891.5	2661.6	2457.6	2249.5	2069.3	1902.4
Po	3619.1	3313.3	3049.0	2807.4	2593.0	2373.6	2183.6	2007.6
At	3798.5	3476.8	3198.9	2944.9	2719.5	2490.0	2291.3	2107.1
Rn	3787.1	3465.1	3187.0	2932.9	2707.6	2479.5	2281.9	2098.8
Fr	3970.2	3631.2	3338.4	3071.0	2834.1	2595.9	2389.5	2198.3
Ra	4119.0	3766.4	3461.9	3183.9	2937.7	2691.0	2477.3	2279.2
Ac	4220.9	3937.9	3618.6	3327.1	3069.1	2812.3	2589.7	2383.3
Th	4328.0	3962.7	3714.4	3413.7	3147.9	2885.0	2657.2	2445.9
Pa	4557.3	4172.7	3837.3	3595.1	3313.2	3036.7	2797.0	2574.7
U	4569.2	4240.9	3899.7	3656.6	3367.9	3087.1	2843.5	2617.7

Table 6: continued

	Emitter							
Absorber	Ta	W	Re	Os	Ir	Pt	Au	Hg
H	1.4	1.3	1.2	1.1	1.0	1.0	0.9	0.9
He	10.1	9.0	8.0	7.1	6.3	5.7	5.1	4.6
Li	40.0	35.5	31.5	28.0	24.9	22.3	19.9	17.9
Be	109.3	97.2	86.5	77.2	68.8	61.7	55.2	49.6
B	231.7	206.5	184.3	165.0	147.4	132.4	118.8	106.9
C	435.4	389.0	348.1	312.4	279.7	251.7	226.3	204.1
N	680.6	609.7	546.8	491.9	441.5	398.1	358.7	324.0
O	983.8	883.5	794.3	716.3	644.3	582.1	525.5	475.6
F	1270.4	1143.7	1030.9	931.9	840.0	760.3	687.7	623.6
Ne	1730.6	1562.1	1411.8	1279.4	1155.7	1047.9	949.6	862.5
Na	2098.3	1899.4	1721.4	1564.3	1416.2	1286.7	1168.3	1063.2
Mg	2650.1	2403.2	2181.8	1986.0	1801.5	1639.9	1491.9	1360.4
Al	2995.2	2746.3	2520.7	2319.0	2113.1	1927.1	1756.5	1604.6
Si	345.1	311.0	3007.1	2827.5	2595.0	2369.1	2161.6	1976.6
P	422.3	380.6	343.4	310.8	281.0	255.2	2319.0	2135.7
S	538.6	485.6	438.3	396.7	358.7	325.8	295.8	269.2
Cl	631.5	569.4	514.0	465.4	420.8	382.2	347.0	315.7
Ar	714.8	644.7	582.1	527.1	476.7	433.0	393.1	357.7
K	919.0	829.2	749.1	678.6	613.8	557.7	506.4	460.8
Ca	1113.2	1005.0	908.4	823.3	745.0	677.0	614.9	559.8
Sc	1209.5	1092.5	988.0	895.9	811.0	737.2	669.8	609.9
Ti	1367.5	1235.8	1118.2	1014.5	918.7	835.5	759.3	691.7
V	1531.3	1384.6	1253.5	1137.8	1030.8	937.8	852.6	777.0
Cr	1765.2	1596.9	1446.4	1313.6	1190.5	1083.4	985.4	898.2
Mn	1960.4	1774.6	1608.2	1461.4	1325.1	1206.5	1097.7	1001.1
Fe	2238.7	2027.8	1838.8	1672.0	1516.8	1381.5	1257.5	1147.2
Co	2443.2	2214.7	2009.9	1828.9	1660.0	1512.5	1377.3	1257.0
Ni	2807.0	2546.5	2312.8	2106.0	1912.5	1743.4	1588.2	1450.1
Cu	2941.4	2671.0	2428.3	2213.3	2011.1	1833.8	1671.2	1526.5
Zn	3229.8	2936.7	2673.1	2439.5	2218.3	2024.0	1845.6	1686.7
Ga	3413.6	3105.7	2828.6	2582.9	2350.1	2145.4	1957.4	1789.8
Ge	3677.2	3346.2	3048.3	2784.0	2534.4	2315.0	2113.4	1933.6
As	3969.7	3614.0	3293.8	3009.5	2741.7	2506.4	2290.0	2096.9
Se	4194.7	3819.2	3481.1	3180.9	2899.1	2651.9	2424.3	2221.1
Br	4068.9	4190.1	3823.2	3497.1	3188.9	2917.7	2668.0	2445.0
Kr	4330.2	3936.2	3554.3	3690.0	3369.4	3083.8	2820.8	2585.8
Rb	820.6	2965.3	3773.6	3489.2	3197.1	3347.9	3062.6	2807.7
Sr	906.2	824.9	751.7	2683.4	3398.0	3134.9	2878.4	3011.8
Y	1005.0	915.0	834.0	762.1	695.5	2432.7	3095.8	2851.1
Zr	1098.4	1000.2	911.7	833.2	760.5	696.9	638.3	2186.4
Nb	1203.3	1095.8	999.0	913.1	833.3	763.5	699.2	641.6
Mo	1297.6	1181.8	1077.5	984.9	898.8	823.4	754.0	691.8
Tc	1411.3	1285.6	1172.4	1071.8	978.1	896.0	820.3	752.6
Ru	1512.8	1378.4	1257.3	1149.7	1049.2	961.0	879.8	807.1
Rh	1639.2	1493.7	1362.6	1246.2	1137.2	1041.6	953.5	874.7
Pd	1743.6	1589.1	1449.9	1326.2	1210.3	1108.7	1015.0	931.2

Table 6: continued

	Emitter							
Absorber	Ta	W	Re	Os	Ir	Pt	Au	Hg
Ag	1888.8	1722.0	1571.6	1438.0	1312.6	1202.5	1101.0	1010.2
Cd	1985.2	1810.1	1652.2	1511.8	1380.2	1264.8	1158.3	1063.0
In	2124.1	1937.4	1769.1	1619.4	1478.8	1355.2	1241.2	1139.3
Sn	2238.9	2042.8	1865.9	1708.5	1560.5	1430.4	1310.4	1203.0
Sb	2374.0	2166.7	1979.6	1813.1	1656.4	1518.7	1391.6	1277.8
Te	2458.0	2244.3	2051.3	1879.5	1717.6	1575.1	1443.5	1325.8
I	2675.3	2443.8	2234.7	2048.6	1872.6	1717.5	1574.4	1446.2
Xe	2793.4	2552.8	2335.4	2141.7	1958.2	1796.5	1647.2	1513.5
Cs	2972.1	2717.8	2487.8	2282.8	2088.1	1916.1	1757.4	1615.1
Ba	3091.2	2828.1	2590.1	2377.8	2175.8	1997.2	1832.3	1684.5
La	3282.0	3003.4	2751.3	2526.3	2312.3	2123.1	1948.2	1791.5
Ce	3467.7	3174.7	2909.4	2672.6	2447.3	2248.1	2063.9	1898.8
Pr	3675.5	3366.7	3087.0	2837.3	2598.5	2387.1	2191.6	2016.3
Nd	3821.5	3500.5	3209.7	2950.0	2702.5	2483.5	2280.9	2099.2
Pm	4046.7	3706.9	3399.1	3124.2	2862.8	2631.7	2417.9	2225.9
Sm	4140.2	3793.1	3478.7	3197.9	2931.0	2695.1	2476.7	2280.7
Eu	4255.7	3981.6	3653.0	3359.5	3079.9	2832.4	2603.5	2397.8
Gd	4661.6	4255.1	3740.0	3442.6	3157.7	2904.9	2670.9	2460.7
Tb	4206.9	4112.7	3754.2	3593.4	3296.7	3033.8	2790.4	2571.7
Dy	4375.3	4002.9	3893.6	3561.9	3407.3	3136.8	2886.2	2661.0
Ho	4849.3	4421.9	4036.6	3945.3	3606.0	3309.9	3008.2	2773.6
Er	4189.1	4453.3	4052.2	3696.8	3612.4	3315.1	3040.5	2889.0
Tm	4573.9	4151.4	4427.9	4028.4	3665.0	3593.2	3286.3	3067.4
Yb	4659.2	4251.8	3884.3	4157.2	3782.6	3457.3	3376.8	3098.5
Lu	4885.5	4437.8	4035.8	3679.8	3423.1	3134.8	2869.3	3254.6
Hf	5151.2	4684.8	4265.0	3892.7	3552.7	3776.4	3454.0	3165.9
Ta	3375.1	4831.1	4430.3	4045.3	3693.6	3386.7	3622.0	3312.9
W	1166.6	3372.1	4597.2	4200.7	3838.1	3521.7	3229.4	3458.4
Re	1226.5	1169.3	3200.7	4318.9	3951.9	3630.9	3334.2	3068.1
Os	1276.2	1176.2	1085.0	3012.2	4058.4	3729.0	3424.3	3151.2
Ir	1344.1	1238.6	1142.4	1056.0	2890.5	3927.0	3601.9	3310.6
Pt	1407.3	1297.0	1196.5	1106.1	1020.7	2770.9	3765.0	3458.6
Au	1480.2	1364.2	1258.4	1163.4	1073.6	993.9	919.7	1938.0
Hg	1541.0	1420.3	1310.3	1211.5	1117.9	1034.9	957.6	887.7
Tl	1601.8	1476.5	1362.2	1259.6	1162.2	1075.9	995.4	922.7
Pb	1671.4	1540.8	1421.8	1314.8	1213.2	1122.9	1038.9	962.9
Bi	1752.3	1615.7	1491.1	1379.2	1272.5	1177.6	1089.3	1009.5
Po	1849.4	1705.3	1573.9	1455.9	1343.3	1243.2	1149.9	1065.7
At	1941.5	1790.7	1653.1	1529.4	1411.1	1305.7	1207.6	1119.0
Rn	1934.1	1784.1	1647.3	1524.3	1406.3	1301.3	1203.5	1115.1
Fr	2026.2	1869.4	1726.4	1597.8	1474.2	1364.0	1261.4	1168.6
Ra	2100.9	1938.5	1790.4	1657.1	1529.1	1415.0	1308.8	1212.8
Ac	2197.5	2028.2	1873.7	1734.7	1600.9	1481.6	1370.4	1269.9
Th	2255.7	2082.3	1924.1	1781.7	1644.5	1522.0	1408.0	1304.9
Pa	2374.5	2192.1	2025.6	1875.8	1731.3	1602.4	1482.3	1373.8
U	2414.3	2228.9	2059.7	1907.4	1760.7	1629.7	1507.7	1397.4

Table 6: continued

	Emitter							
Absorber	Tl	Pb	Bi	Po	At	Rn	Fr	Ra
H	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6
He	4.1	3.7	3.4	3.1	2.8	2.5	2.3	2.1
Li	16.0	14.4	13.0	11.7	10.6	9.6	8.7	7.9
Be	44.6	40.2	36.3	32.7	29.7	26.9	24.3	22.1
B	96.4	87.1	78.7	71.1	64.6	58.7	53.3	48.6
C	184.3	166.7	150.9	136.7	124.4	113.2	102.9	93.9
N	293.1	265.7	240.9	218.6	199.3	181.8	165.4	151.3
O	431.1	391.6	355.7	323.4	295.4	269.8	246.0	225.4
F	566.2	515.2	468.9	427.0	390.7	357.5	326.5	299.6
Ne	784.6	715.2	652.0	594.8	545.0	499.6	457.0	420.0
Na	969.0	884.9	808.2	738.6	678.0	622.6	570.6	525.3
Mg	1242.2	1136.4	1039.9	952.1	875.5	805.3	739.3	681.8
Al	1467.8	1345.3	1233.1	1131.0	1041.7	959.8	882.7	815.3
Si	1809.9	1660.4	1523.5	1398.6	1289.4	1189.1	1094.6	1011.9
P	1969.4	1819.1	1680.6	1553.4	1441.4	1337.8	1239.6	1153.2
S	245.3	224.0	1972.4	1830.2	1704.6	1588.0	1477.0	1379.0
Cl	287.7	262.7	239.9	219.2	201.1	184.7	1588.4	1506.7
Ar	325.9	297.6	271.7	248.3	227.9	209.2	191.7	176.5
K	420.0	383.6	350.3	320.2	293.9	269.9	247.4	227.7
Ca	510.4	466.2	425.9	389.4	357.5	328.4	301.0	277.2
Sc	556.2	508.2	464.5	424.7	390.1	358.4	328.6	302.7
Ti	631.0	576.8	527.3	482.3	443.1	407.2	373.5	344.2
V	709.0	648.3	592.9	542.5	498.6	458.3	420.6	387.6
Cr	820.0	750.0	686.1	628.0	577.3	530.9	487.3	449.3
Mn	914.2	836.5	765.5	701.0	644.7	593.1	544.5	502.2
Fe	1048.1	959.3	878.3	804.5	740.1	681.1	625.6	577.2
Co	1148.9	1052.0	963.5	882.9	812.5	748.0	687.3	634.3
Ni	1325.9	1214.6	1112.8	1020.2	939.3	865.0	795.1	734.1
Cu	1396.2	1279.4	1172.6	1075.3	990.3	912.3	838.9	774.8
Zn	1543.6	1415.3	1297.8	1190.8	1097.3	1011.4	930.4	859.7
Ga	1638.9	1503.4	1379.4	1266.3	1167.4	1076.5	990.9	916.0
Ge	1771.6	1626.1	1492.8	1371.1	1264.7	1166.9	1074.7	994.0
As	1922.6	1766.1	1622.5	1491.5	1376.7	1271.2	1171.6	1084.4
Se	2037.6	1872.7	1721.4	1583.2	1462.2	1350.7	1245.5	1153.4
Br	2243.6	2062.6	1896.4	1744.6	1611.6	1489.1	1373.4	1272.1
Kr	2373.5	2182.6	2007.4	1847.2	1706.8	1577.5	1455.4	1348.4
Rb	2577.4	2370.3	2180.2	2006.4	1854.1	1713.8	1581.3	1465.1
Sr	2765.7	2544.3	2340.9	2155.0	1992.0	1841.8	1699.9	1575.5
Y	2624.8	2755.5	2535.9	2335.0	2158.9	1996.5	1843.1	1708.6
Zr	2789.6	2573.2	2372.5	2494.1	2307.5	2135.4	1972.7	1830.0
Nb	589.6	1985.2	2537.6	2339.8	2166.7	2293.3	2120.0	1967.8
Mo	635.6	585.1	1965.4	1776.9	2280.2	2110.1	2230.9	2074.6
Tc	691.4	636.4	585.8	539.5	1775.8	1621.5	2074.7	1923.4
Ru	741.4	682.3	628.0	578.3	534.8	494.6	1588.4	1459.8
Rh	803.5	739.4	680.6	626.7	579.5	536.0	494.8	458.7
Pd	855.4	787.2	724.6	667.3	617.1	570.8	527.0	488.6

Table 6: continued

	Emitter							
Absorber	Tl	Pb	Bi	Po	At	Rn	Fr	Ra
Ag	928.1	854.2	786.4	724.3	669.8	619.6	572.1	530.5
Cd	976.8	899.3	828.0	762.8	705.6	652.8	602.9	559.2
In	1047.1	964.1	887.7	817.9	756.6	700.1	646.7	599.8
Sn	1105.9	1018.4	938.0	864.4	799.8	740.2	683.8	634.4
Sb	1174.9	1082.2	996.9	918.9	850.4	787.2	727.4	674.9
Te	1219.2	1123.2	1034.9	954.1	883.1	817.6	755.7	701.3
I	1330.3	1225.7	1129.6	1041.5	964.2	892.9	825.4	766.1
Xe	1392.5	1283.4	1183.0	1091.0	1010.3	935.7	865.1	803.2
Cs	1486.3	1370.2	1263.3	1165.4	1079.4	1000.0	924.8	858.7
Ba	1550.6	1429.8	1318.7	1216.8	1127.3	1044.6	966.3	897.6
La	1649.5	1521.5	1403.5	1295.4	1200.4	1112.6	1029.5	956.4
Ce	1749.1	1614.0	1489.5	1375.4	1275.0	1182.3	1094.4	1017.1
Pr	1857.4	1714.0	1581.9	1460.7	1354.2	1255.7	1162.4	1080.4
Nd	1934.4	1785.6	1648.6	1522.8	1412.1	1309.9	1212.9	1127.7
Pm	2051.9	1894.7	1749.8	1616.8	1499.8	1391.6	1289.0	1198.7
Sm	2102.9	1942.3	1794.2	1658.2	1538.6	1427.9	1322.9	1230.6
Eu	2211.3	2042.7	1887.3	1744.6	1618.9	1502.7	1392.5	1295.5
Gd	2269.9	2097.5	1938.5	1792.4	1663.8	1544.8	1431.9	1332.5
Tb	2373.2	2193.6	2028.0	1875.8	1741.7	1617.7	1499.9	1396.2
Dy	2456.4	2271.4	2100.6	1943.6	1805.3	1677.3	1555.7	1448.6
Ho	2560.5	2367.7	2189.8	2026.3	1882.1	1748.7	1622.0	1510.5
Er	2667.1	2466.3	2280.9	2110.6	1960.5	1821.5	1689.6	1573.4
Tm	2786.6	2576.7	2383.0	2205.0	2048.1	1902.8	1764.9	1643.5
Yb	2872.3	2652.5	2452.9	2269.4	2107.8	1958.1	1816.1	1691.0
Lu	2993.0	2757.6	2556.6	2365.6	2197.2	2041.4	1893.4	1763.1
Hf	2905.8	2854.4	2628.2	2442.9	2269.6	2109.2	1956.9	1822.7
Ta	3034.5	2784.7	2731.6	2511.9	2319.7	2190.1	2033.0	1894.5
W	3165.8	2903.5	2663.4	2614.4	2415.6	2232.6	2102.9	1960.2
Re	2826.9	3025.3	2777.3	2551.1	2510.2	2323.0	2146.1	2031.5
Os	2903.7	2680.5	2864.3	2634.4	2433.3	2248.4	2208.5	2049.2
Ir	3047.1	2809.5	2591.1	2771.1	2560.5	2366.8	2184.1	2154.2
Pt	3181.4	2931.9	2702.4	2492.5	2669.3	2469.6	2281.1	2116.0
Au	2645.7	2640.6	2524.9	2372.2	2275.4	2430.6	2317.2	2182.1
Hg	2322.9	3109.2	2872.8	2656.0	2465.4	2289.4	2455.3	2283.1
Tl	856.4	2209.2	2975.6	2742.5	2538.2	2350.0	2172.2	2336.2
Pb	893.6	830.5	2126.9	2850.3	2638.6	2443.4	2259.1	2097.3
Bi	936.6	870.4	809.0	1819.7	2561.8	2400.6	2246.3	2109.2
Po	988.8	918.8	854.0	794.1	1989.9	1821.7	2487.7	2249.9
At	1038.1	964.6	896.4	833.4	777.6	725.7	1825.5	2375.1
Rn	1034.4	961.1	893.1	830.4	774.8	723.1	673.8	1638.3
Fr	1084.0	1007.1	935.8	870.0	811.7	757.5	705.8	660.0
Ra	1125.1	1045.5	971.6	903.4	843.0	786.8	733.2	685.8
Ac	1178.2	1094.9	1017.6	946.2	882.9	824.1	768.0	718.4
Th	1210.9	1125.3	1046.0	972.7	907.8	847.4	789.8	738.8
Pa	1274.7	1184.7	1101.1	1023.9	955.6	892.0	831.4	777.7
U	1296.7	1205.2	1120.2	1041.8	972.3	907.7	846.1	791.5

Table 6: continued

	Emitter			
Absorber	Ac	Th	Pa	U
H	0.6	0.5	0.5	0.5
He	1.9	1.8	1.6	1.5
Li	7.2	6.5	6.0	5.4
Be	20.1	18.3	16.7	15.3
B	44.2	40.3	36.8	33.7
C	85.7	78.2	71.6	65.5
N	138.2	126.3	115.7	106.0
O	206.2	188.8	173.2	158.8
F	274.5	251.7	231.2	212.3
Ne	385.4	353.8	325.4	299.3
Na	482.7	443.7	408.6	376.2
Mg	627.4	577.5	532.5	490.9
Al	751.4	692.5	639.4	590.2
Si	933.6	861.5	796.4	736.0
P	1067.6	986.5	913.1	845.1
S	1279.4	1183.4	1096.4	1015.7
Cl	1408.2	1303.8	1209.1	1121.1
Ar	162.3	149.6	1241.3	1158.5
K	209.5	193.0	178.1	164.3
Ca	255.1	235.0	216.8	200.1
Sc	278.6	256.6	236.9	218.6
Ti	316.8	291.9	269.5	248.7
V	356.9	328.9	303.7	280.3
Cr	413.8	381.4	352.2	325.2
Mn	462.7	426.6	394.1	363.9
Fe	531.9	490.5	453.2	418.6
Co	584.7	539.4	498.5	460.7
Ni	676.9	624.6	577.3	533.6
Cu	714.6	659.6	609.8	563.7
Zn	793.3	732.4	677.3	626.3
Ga	845.5	780.8	722.3	668.1
Ge	917.9	847.9	784.7	726.0
As	1001.8	925.7	856.9	793.0
Se	1066.0	985.3	912.4	844.7
Br	1176.1	1087.6	1007.4	933.0
Kr	1247.0	1153.6	1069.0	990.4
Rb	1355.3	1254.3	1162.8	1077.7
Sr	1458.1	1350.2	1252.3	1161.4
Y	1581.7	1465.0	1359.3	1260.9
Zr	1694.6	1569.7	1456.5	1351.1
Nb	1822.9	1688.8	1567.2	1454.1
Mo	1923.7	1782.9	1655.1	1536.2
Tc	2041.3	1893.1	1758.7	1633.4
Ru	1878.5	1742.0	1851.4	1720.5
Rh	1448.5	1337.1	1718.0	1597.7
Pd	452.6	419.6	1296.4	1656.8

Table 6: continued

	Emitter			
Absorber	Ac	Th	Pa	U
Ag	491.4	455.7	423.2	393.0
Cd	518.0	480.3	446.1	414.2
In	555.7	515.3	478.6	444.4
Sn	587.8	545.0	506.2	470.0
Sb	625.4	579.9	538.6	500.2
Te	650.0	602.8	559.9	520.0
I	710.1	658.7	611.9	568.4
Xe	744.6	690.8	641.8	596.3
Cs	796.3	738.8	686.6	637.9
Ba	832.5	772.5	718.0	667.2
La	887.2	823.4	765.4	711.4
Ce	943.6	875.6	813.8	756.2
Pr	1002.5	930.6	865.3	804.4
Nd	1046.7	971.8	903.8	840.3
Pm	1112.8	1033.3	961.0	893.6
Sm	1142.6	1061.2	987.2	918.1
Eu	1203.1	1117.5	1039.7	967.2
Gd	1237.7	1149.8	1070.0	995.5
Tb	1297.2	1205.4	1121.8	1043.8
Dy	1346.1	1250.9	1164.2	1083.4
Ho	1403.8	1304.7	1214.6	1130.5
Er	1462.4	1359.6	1266.1	1178.7
Tm	1527.9	1420.8	1323.4	1232.4
Yb	1572.2	1462.4	1362.4	1269.0
Lu	1639.5	1525.3	1421.3	1324.2
Hf	1695.2	1577.3	1469.9	1369.6
Ta	1762.4	1640.1	1528.6	1424.5
W	1824.0	1697.8	1582.8	1475.3
Re	1891.5	1761.1	1642.2	1531.1
Os	1942.2	1808.7	1687.0	1573.2
Ir	1999.8	1859.3	1754.9	1636.3
Pt	2083.5	1937.3	1804.4	1692.2
Au	2044.1	1940.2	1894.8	1776.2
Hg	2122.8	1976.7	1843.7	1814.7
Tl	2169.7	2018.0	1880.1	1751.5
Pb	1946.9	2097.5	1951.8	1815.9
Bi	1963.4	1818.7	1953.8	1820.2
Po	2062.1	1912.1	1776.0	1907.2
At	2153.5	1997.8	1856.3	1724.5
Rn	2380.8	2140.4	1928.7	1758.6
Fr	1758.1	2232.7	2033.4	1851.4
Ra	640.7	1590.0	1389.0	1893.8
Ac	671.2	627.4	1498.6	1348.6
Th	690.3	645.3	604.1	1388.6
Pa	726.6	679.1	635.7	595.0
U	739.4	691.0	646.8	605.3

Table 7: Details of chosen models in matrix correction procedures.

	Electron backscattering	Stopping power	φ(ρz) model
PAP	Pouchou and Pichoir (1984 and 1991)	Pouchou and Pichoir (1984 and 1991)	Pouchou and Pichoir (1984 and 1991)
Surface-center Gaussian	Love *et al*. (1978)	Love *et al*. (1978)	Armstrong (1991)
Conventional ZAF	Duncumb and Reed (1968)	Philibert and Tixier (1968)	Philibert (1963)

Table 8: Results of matrix corrections. Mg# = Mg / (Mg + Fe).

m.a.c.s	This study	Hubble and Seltzer (1995)	Henke *et al*. (1993)	Heinrich (1987)	Heinrich (1966)
PAP					
SiO_2	50.4	50.4	50.2	50.6	51.1
TiO_2	0.10	0.10	0.10	0.1	0.10
Al_2O_3	1.51	1.51	1.52	1.53	1.57
FeO	24.2	24.2	24.2	24.2	24.2
MnO	0.61	0.61	0.61	0.61	0.60
MgO	22.5	22.5	22.5	22.7	23.4
CaO	0.65	0.65	0.65	0.66	0.66
Total	100.0	100.0	99.8	100.4	101.6
Mg#	0.624	0.624	0.624	0.626	0.633
Surface-center Gaussian					
SiO_2	51.1	51.1	50.9	51.4	51.7
TiO_2	0.10	0.10	0.10	0.10	0.10
Al_2O_3	1.52	1.52	1.53	1.53	1.57
FeO	23.9	23.9	23.9	23.9	23.9
MnO	0.60	0.60	0.60	0.60	0.60
MgO	22.6	22.6	22.6	22.8	23.5
CaO	0.65	0.65	0.65	0.65	0.65
Total	100.5	100.5	100.3	101.0	102.0
Mg#	0.628	0.628	0.628	0.630	0.637
Conventional ZAF					
SiO_2	50.5	50.5	50.3	50.7	51.1
TiO_2	0.10	0.10	0.10	0.10	0.10
Al_2O_3	1.52	1.52	1.53	1.54	1.58
FeO	25.2	25.2	25.2	25.3	25.3
MnO	0.61	0.61	0.61	0.61	0.61
MgO	22.9	22.9	23.0	23.2	23.9
CaO	0.65	0.65	0.65	0.65	0.65
Total	101.5	101.5	101.4	102.1	103.2
Mg#	0.618	0.618	0.619	0.620	0.627

SUMMARY

New m.a.c.s are calculated from the update version of databases by Henke *et al.* (1993) and Hubbell and Seltzer (1995) for Z = 1 – 92. The combination of these databases solves the problems with them, such as spurious discontinuity and unnatural increase at high-energy sides of absorption edges. New m.a.c.s improve accuracy of quantitative EPMA, including geological applications.

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