

An expression for the Mott cross section of electrons and positrons on nuclei with Z up to 118

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HIGHLIGHTS

- We give an improved numerical solution of Mott differential cross section on nuclei.
- An interpolation function is provided with corresponding tabulated values.
- Electrons and positrons with kinetic energies from 1 keV up to 900 MeV are discussed.
- All nuclear targets up to $Z = 118$ are treated for electron and positron scattering.

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ABSTRACT

In the present work, an improved numerical solution for determining the ratio, $\mathcal{R}^{\text{Mott}}$, of the unscreened Mott differential cross section (MDCS) with respect to Rutherford's formula is proposed for the scattering of electrons and positrons on nuclei with $1 \leq Z \leq 118$. It accounts for incoming lepton energies between 1 keV and 900 MeV. For both electrons and positrons, a fitting formula and a set of fitting coefficients for the ratio $\mathcal{R}^{\text{Mott}}$ on nuclei are also presented. The found average error of the latter practical interpolated expression is typically lower than 1% also at low energy for electrons and lower than 0.05% for positrons for all nuclei over the entire energy range.

Both the improved numerical solution and the interpolated practical expression were found in good agreement with the partially available previous calculations.

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1. Introduction

Mott (1929, 1932) (in addition, see the discussion available in Mott and Massey, 1965, Sections 4–4.5 of Chapter IX) treated the scattering of electrons by unscreened and infinitely heavy nuclei with negligible spin effects, by extending a method of Wentzel (1927) (see also Born, 1926) and including effects related to the spin of electrons. Wentzel's method was dealing with incident and scattered waves on point-like nuclei. The differential cross section (DCS) – the so-called Mott (unscreened) differential cross section (MDCS) – was expressed by Mott (1929, 1932) as two conditionally convergent infinite series in terms of Legendre expansions (see also Bartlett and Watson, 1940 and Mott and Massey, 1965, Eq. 46

in Chapter IX). In Mott–Wentzel treatment, the scattering occurs on a field of force generating a radially dependent Coulomb – unscreened (Mott, 1929, 1932) [screened] Wentzel, 1927 – potential. Mott equation – computed using Darwin's solution to the Dirac equation – is also referred to as an *exact* formula for the differential cross section, because no Born approximation of any order is used in its determination.

It has to be remarked that Mott's treatment of collisions of fast electrons with atoms – accounting for screening effects – involves the knowledge of the wave function of the atom and uses the first Born approximation (e.g., see Mott and Massey, 1965, Sections 2–5 of Chapter XVI), thus, as discussed by many authors (for instance, see Idoeta and Legarda, 1992; Lijian et al., 1995; Boschini et al., 2012, see also references therein), in most cases the computation of the cross section depends on the application of numerical methods. Particularly in calculations for electron transport in materials or in the determination of induced radiation damage

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due to atomic displacements resulting from Coulomb interaction on nuclei, this treatment may require an excessive time-consuming procedure for accounting the effect of nuclear screening by atomic electrons.

In practice for the above mentioned calculations (e.g., see Cahn, 1959; Seitz and Koehler, 1956; Fernandez-Varea et al., 1993a; Butkevick et al., 2002; Agostinelli et al., 2003; Sempau et al., 2003; Leroy and Rancoita, 2007; Jun et al., 2009; Boschini et al., 2012 and references therein, see Leroy and Rancoita, 2011, Chapter 4), a factorization of the elastic screened cross section is often employed (e.g., see Zeitler and Olsen, 1956; Berger, 1963; Idoeta and Legarda, 1992; Fernandez-Varea et al., 1993b; Lijian et al., 1995; Boschini et al., 2012, Leroy and Rancoita, 2012, Chapter 1 and references therein). It involves the unscreened differential cross section on point-like nuclei and a factor which takes into account the screening of the nuclear charge by the atomic electrons. Expressions for this term – which is also employed in the treatment of nucleus–nucleus interactions – were derived and discussed by many authors (e.g., see Wentzel, 1927; von Molière, 1947, 1948; Spencer, 1955; Bethe, 1963; Sherman, 1956; Zeitler and Olsen, 1956; Salvat, 1991; Idoeta and Legarda, 1992; Fernandez-Varea et al., 1993a, 1993b; Butkevick et al., 2002; Boschini et al., 2010, 2011, 2012 and references therein, see also Berger et al., 1988, Chapters 2 and 7, Leroy and Rancoita, 2011, Chapter 2 and Leroy and Rancoita, 2012, Chapter 1). Furthermore, in electron scattering on nuclei above 10 MeV, as discussed by Fernandez-Varea et al. (1993a) (see also Boschini et al., 2012 and references therein), the effects due to the finite nuclear size have to be taken into account and are usually expressed by a multiplicative term, the so-called *nuclear form factor* (e.g., see Helm, 1956; Hofstadter, 1956, 1957; Nagarajan and Wang, 1974; De Vries et al., 1987; Bertulani, 2007; Duda et al., 2007; Jentschura and Serbo, 2009 and references therein).

Approximated expressions for the Mott (unscreened) differential cross section were derived as early as in the 1940s and 1950s (e.g., see Bartlett and Watson, 1940; McKinley and Feshbach, 1948; Feshbach, 1952; Curr, 1955; Doggett and Spencer, 1956; Sherman, 1956). Recently, Idoeta and Legarda (1992) (as suggested, for instance, in Sherman, 1956) evaluated the MDSC exploiting recursion relationships of the gamma functions showing that the ratio – appearing in the MDSC – fulfills the condition for the application of the Stirling's formula. In addition, they applied the transformation of Yennie et al. (1954) to the infinite series of Legendre polynomials. Finally, they obtained tabulated values for electrons and positrons scattering on a few nuclei with energies from 5 keV to 10 MeV and a maximum error of less than $10^{-3}\%$. Subsequently, Lijian et al. (1995) developed a fitting procedure for the numerical values determined following the approach of Idoeta and Legarda (1992), then expressing the ratio ($\mathcal{R}^{\text{Mott}}$) of the MDSC to Rutherford differential cross section (RDSC) as an analytical formula depending on 30 parameters with a maximum error of less than 1% only for electrons with energies from 1 keV up to 900 MeV. Above 900 MeV, no further energy dependence was exhibited by the parameters. These parameters depend on the nuclear target and were tabulated for nuclei with Z up to 90.

In the current article, the results obtained adapting both the approach, in Section 3, of Idoeta and Legarda (1992) (and also Sherman, 1956) and, in Section 4, the procedure of Lijian et al. (1995) is reported for both electrons and positrons with energies from 1 keV up to 900 MeV scattered by nuclei with Z up to 118. The results from the current improved numerical approach (Section 3) are compared with what is determined by Idoeta and Legarda (1992) who, in turn, already discussed the good agreement of what they obtained with those previously found – within the sensitivity of the used approximations – in McKinley and Feshbach (1948), Curr (1955), Yadav (1955), Motz et al. (2008),

Doggett and Spencer (1956) and Sherman (1956). Those regarding the present practical interpolated expression for the unscreened MDSC (Section 4) are compared with what is found in Curr (1955), Idoeta and Legarda (1992), Lijian et al. (1995).

Finally, it has to be remarked that the described treatment of the MDSC for elastic scattering on nuclei is implemented into Geant4 distribution (e.g., see Agostinelli et al., 2003) version 9.6 (see, also, Boschini et al., 2012 and references therein).

2. The unscreened Mott cross section

As already mentioned, the scattering of electrons (or positrons) on unscreened atomic nuclei with charge number Z was obtained by Mott (1929, 1932) (see also Mott and Massey, 1965, Sections 4–4.5 of Chapter IX, Leroy and Rancoita, 2012, Section 1.3.1 and references therein), who derived the differential cross section ($d\sigma^{\text{Mott}}/d\Omega$ with $d\Omega$ the unit of solid angle) – usually termed as *Mott differential cross section* (MDSC) – following a treatment in which effects related to the spin of the incoming electron or positron were included. The MDSC was obtained in the laboratory system of reference for infinitely heavy nuclei initially at rest neglecting effects due to their spin. In addition, effects related to the recoil and finite rest mass (M) of the target nucleus were disregarded and, as a consequence, in this framework the total energy of electrons (or positrons) has to be smaller¹ than Mc^2 (where c is the speed of light).

The MDSC, or an approximated expression of it, is commonly² formulated in terms of its ratio, \mathcal{R}^{McF} , with respect to that for a Rutherford scattering, i.e., the *Rutherford differential cross section* (RDSC) – also termed as *Rutherford's formula* ($d\sigma^{\text{Rut}}/d\Omega$) (e.g., see a treatment in Leroy and Rancoita, 2011, Section 1.6.1) – given by

$$\frac{d\sigma^{\text{Rut}}}{d\Omega} = \left(\frac{zZe^2}{p\beta c} \right)^2 \frac{1}{(1 - \cos \theta)^2} \quad (1)$$

$$= (zZr_e)^2 \left(\frac{1 - \beta^2}{\beta^4} \right) \frac{1}{(1 - \cos \theta)^2}, \quad (2)$$

where p and θ are the momentum and scattering angle of the electron (or positron), respectively; $\beta = v/c$ with v the electron (positron) velocity; $z = -1$ ($z = +1$) is the charge number of the electron (positron); finally, $r_e = e^2/(mc^2)$ is the classical electron (or positron) radius with m and e the rest mass and charge of electron (or positron), respectively. The MDSC is usually expressed in terms of Rutherford's formula as

$$\frac{d\sigma^{\text{Mott}}}{d\Omega} = \frac{d\sigma^{\text{Rut}}}{d\Omega} \mathcal{R}^{\text{Mott}}, \quad (3)$$

where $\mathcal{R}^{\text{Mott}}$ (as above mentioned) is the ratio between the MDSC and RDSC.

$\mathcal{R}^{\text{Mott}}$ can be formulated (e.g., see Sherman, 1956, Eq. (2); Idoeta and Legarda, 1992, Eq. (2); Lijian et al., 1995, Eq. (1)) formulated in terms of the two conditionally convergent series – F and G , defined as an expansion in Legendre polynomials – derived by Mott (1929, 1932) for expressing the MDSC, i.e.,

$$\mathcal{R}^{\text{Mott}} = \frac{2(1 - \cos \theta)}{(\tau + 1)^2} |F|^2 + \frac{|G|^2}{(azZ)^2} \frac{2p^2(1 - \cos \theta)^2}{(\tau + 1)^2(1 + \cos \theta)} \quad (4)$$

¹ For an ultra high-energy extension of the treatment of the differential cross sections on nuclei, one may see the discussion in Boschini et al. (2012), Chapter 1 of Leroy and Rancoita (2011), Section 1.3.1 of Leroy and Rancoita (2012) and references therein.

² One can see, for instance, the discussion in Feshbach (1952), Curr (1955), Doggett and Spencer (1956), Sherman (1956), Idoeta and Legarda (1992), Lijian et al. (1995) and Boschini et al. (2012) (see, also, references therein).

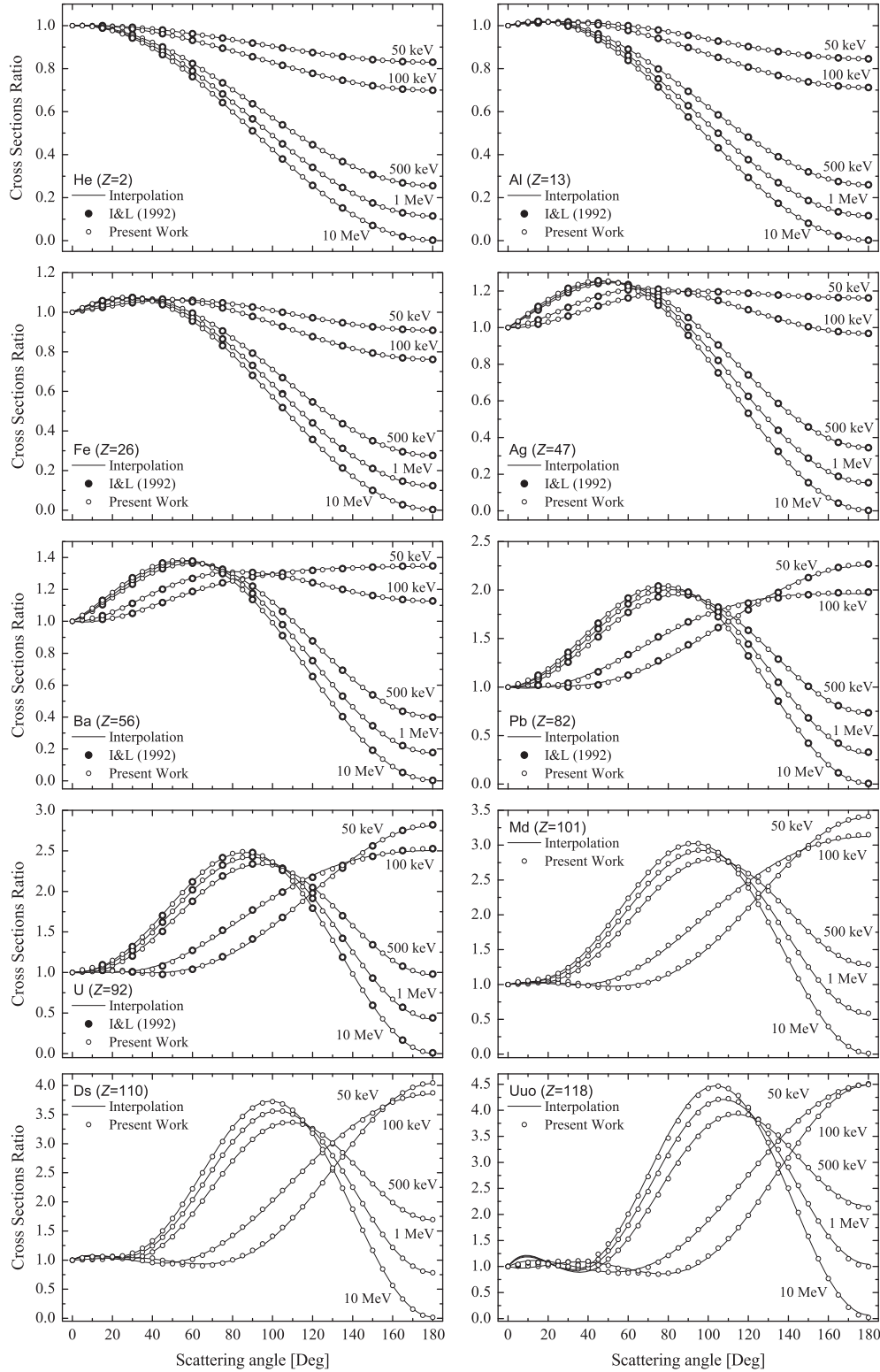


Fig. 1. Cross section ratio (indicated with $\mathcal{R}^{\text{Mott}}$ in the text) as function of scattering angle (deg.) for electrons with 50 keV, 100 keV, 500 keV, 1 MeV and 10 MeV interacting on He, Al, Fe, Ag, Ba, Pb, U, Md, Ds and Uuo: the interpolated curves (continuous lines) were obtained from Eq. (24), (\circ) from the improved numerical approach discussed in Section 3 and, finally, (\bullet) from Idoeta and Legarda (1992) indicated as I&L (1992).

with τ the kinetic energy expressed of the incoming lepton in units of its rest mass (m) (thus, $\tau = \gamma - 1$ where γ is the Lorentz factor) and α the fine structure constant. The complex functions F and G are

given by

$$F = F_0 + F_1 \quad (5)$$

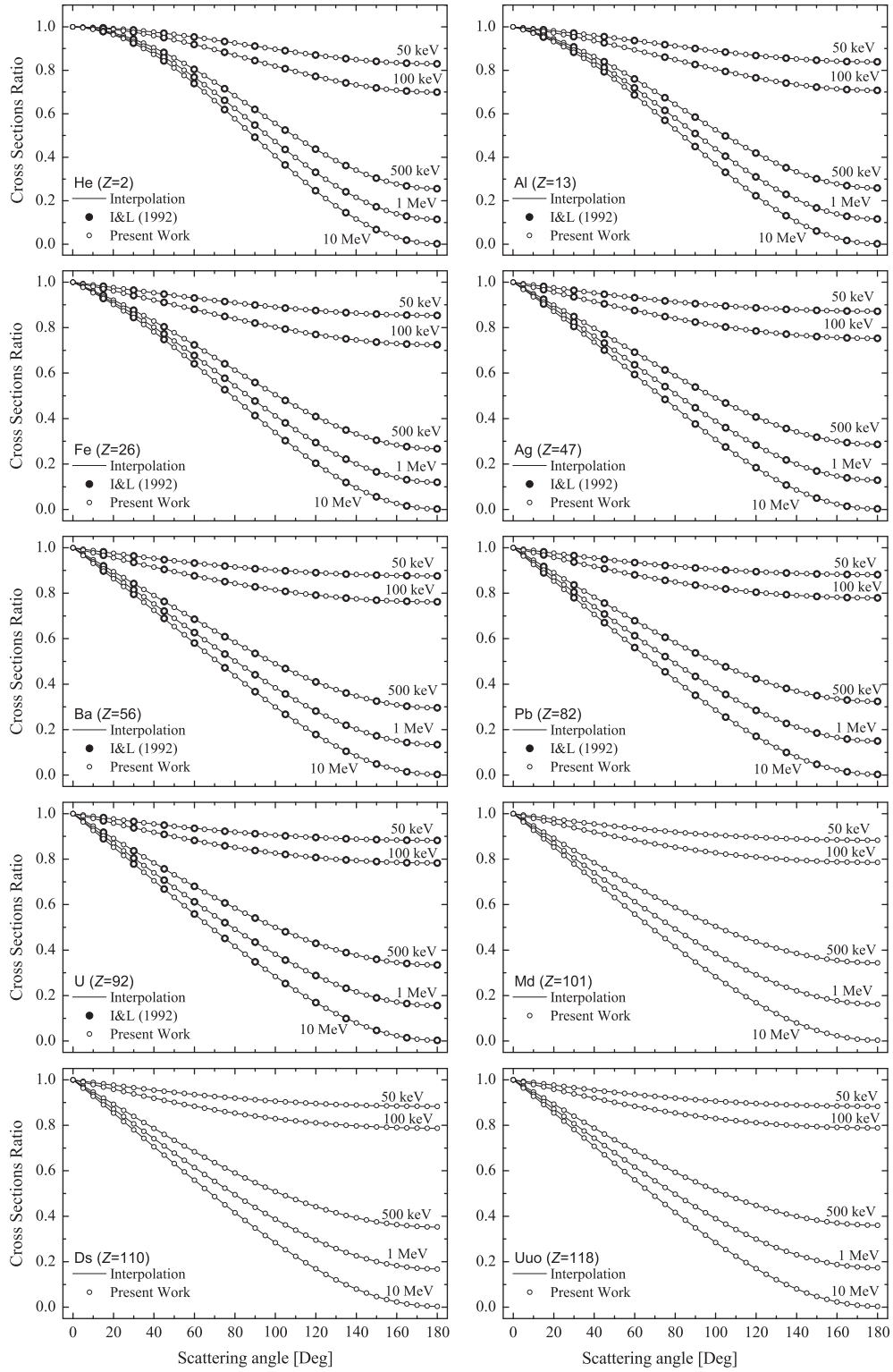


Fig. 2. Cross section ratio as function of scattering angle (deg.) for positrons with 50 keV, 100 keV, 500 keV, 1 MeV and 10 MeV interacting on He, Al, Fe, Ag, Ba, Pb, U, Md, Ds and Uuo: the interpolated curves (continuous lines) were obtained from Eq. (24), (○) from the improved numerical approach discussed in Section 3 and, finally, (●) from Idoeta and Legarda (1992) indicated as I&L (1992).

$$G = G_0 + G_1$$

with

$$F_0 = -\frac{R}{iq},$$

(6)

$$G_0 = R \cot^2 \frac{\theta}{2}, \quad (8)$$

(7)

$$F_1 = \frac{i}{2} \sum_{k=0}^{+\infty} [kD_k + (k+1)D_{k+1}] (-)^k P_k(\cos \theta), \quad (9)$$

Table 1

MDCS (i) calculated following the approach discussed in Section 3 and (ii) from Idoeta and Legarda (1992) – indicated as I&L (1992) – for electrons at 5 keV, 500 keV and 10 MeV on He, Ag and U ($Z = 2, 47$ and 92 , respectively) as a function of the scattering angle θ (deg.).

Z	θ (deg.)	5 keV		500 keV		10 MeV	
		Present work	I&L (1992)	Present work	I&L (1992)	Present work	I&L (1992)
2	15	1.00044E+00	1.00044E+00	9.91871E-01	9.91873E-01	9.88268E-01	9.88269E-01
	30	1.00006E+00	1.00006E+00	9.57871E-01	9.57871E-01	9.42117E-01	9.42117E-01
	45	9.98883E-01	9.98883E-01	9.00541E-01	9.00541E-01	8.64954E-01	8.64953E-01
	60	9.97029E-01	9.97029E-01	8.24032E-01	8.24032E-01	7.62318E-01	7.62318E-01
	75	9.94669E-01	9.94669E-01	7.33796E-01	7.33796E-01	6.41480E-01	6.41479E-01
	90	9.92004E-01	9.92004E-01	6.36207E-01	6.36207E-01	5.10931E-01	5.10931E-01
	105	9.89254E-01	9.89254E-01	5.38120E-01	5.38120E-01	3.79805E-01	3.79805E-01
	120	9.86639E-01	9.86639E-01	4.46399E-01	4.46399E-01	2.57246E-01	2.57246E-01
	135	9.84362E-01	9.84362E-01	3.67449E-01	3.67449E-01	1.51785E-01	1.51784E-01
	150	9.82599E-01	9.82599E-01	3.06771E-01	3.06772E-01	7.07477E-02	7.07482E-02
47	15	1.00121E+00	1.00121E+00	1.09603E+00	1.09602E+00	1.11558E+00	1.11557E+00
	30	1.00638E+00	1.00638E+00	1.18990E+00	1.18989E+00	1.21467E+00	1.21466E+00
	45	9.96364E-01	9.96365E-01	1.24149E+00	1.24149E+00	1.25631E+00	1.25631E+00
	60	9.90869E-01	9.90869E-01	1.23525E+00	1.23525E+00	1.22547E+00	1.22547E+00
	75	1.00217E+00	1.00217E+00	1.16997E+00	1.16997E+00	1.12221E+00	1.12221E+00
	90	1.03381E+00	1.03381E+00	1.05458E+00	1.05458E+00	9.58058E-01	9.58058E-01
	105	1.08620E+00	1.08620E+00	9.05084E-01	9.05084E-01	7.53051E-01	7.53051E-01
	120	1.15388E+00	1.15388E+00	7.41682E-01	7.41682E-01	5.32623E-01	5.32623E-01
	135	1.22582E+00	1.22582E+00	5.85909E-01	5.85909E-01	3.24172E-01	3.24172E-01
	150	1.28896E+00	1.28896E+00	4.57908E-01	4.57909E-01	1.53572E-01	1.53572E-01
92	15	1.00302E+00	1.00310E+00	1.05841E+00	1.05837E+00	1.09636E+00	1.09636E+00
	30	1.00860E+00	1.00859E+00	1.20318E+00	1.20319E+00	1.32107E+00	1.32107E+00
	45	9.90926E-01	9.90927E-01	1.50713E+00	1.50713E+00	1.70264E+00	1.70264E+00
	60	1.02493E+00	1.02492E+00	1.87820E+00	1.87820E+00	2.11844E+00	2.11844E+00
	75	1.05048E+00	1.05048E+00	2.18903E+00	2.18903E+00	2.41683E+00	2.41683E+00
	90	9.25197E-01	9.25197E-01	2.33938E+00	2.33938E+00	2.47982E+00	2.47982E+00
	105	8.08367E-01	8.08368E-01	2.28576E+00	2.28576E+00	2.26008E+00	2.26008E+00
	120	9.44562E-01	9.44562E-01	2.04832E+00	2.04832E+00	1.79365E+00	1.79365E+00
	135	1.36440E+00	1.36440E+00	1.69988E+00	1.69988E+00	1.18892E+00	1.18892E+00
	150	1.89411E+00	1.89411E+00	1.34241E+00	1.34241E+00	5.96098E-01	5.96098E-01
92	165	2.31435E+00	2.31435E+00	1.07789E+00	1.07789E+00	1.65995E-01	1.65995E-01
	180	2.47185E+00	2.47185E+00	9.80670E-01	9.80671E-01	9.13938E-03	9.13939E-03

$$G_1 = \frac{i}{2} \sum_{k=0}^{+\infty} [k^2 D_k - (k+1)^2 D_{k+1}] (-1)^k P_k(\cos \theta), \quad (10)$$

where $P_k(\cos \theta)$ is the Legendre polynomial of order k and

$$R = \frac{q}{2} \frac{\Gamma(1-iq)}{\Gamma(1+iq)} \exp \left[2iq \ln \left(\sin \frac{\theta}{2} \right) \right], \quad (11)$$

$$D_k = -\exp(-i\pi\xi_k) \frac{\Gamma(\xi_k-iq)}{\Gamma(\xi_k+1+iq)} + (-)^k \frac{\Gamma(k-iq)}{\Gamma(k+1+iq)}, \quad (12)$$

$$D_k = -\frac{\exp(-i\pi\xi_k)}{\xi_k+iq} \frac{\Gamma(\xi_k-iq)}{\Gamma(\xi_k+iq)} + \frac{\exp(-i\pi k)}{k+iq} \frac{\Gamma(k-iq)}{\Gamma(k+iq)}, \quad (13)$$

$$\xi_k = \sqrt{k^2 - (\alpha')^2}, \quad (14)$$

$$q = \frac{\alpha'}{\beta}, \quad (15)$$

$$\alpha' = -\alpha Z, \quad (16)$$

In being the natural logarithm and $\Gamma(\mu)$ the gamma function with argument μ .

3. An improved numerical approach for the unscreened MDCS

As discussed in Section 2, the MDCS (Eq. (3)) can be obtained from the evaluation of its ratio ($\mathcal{R}^{\text{Mott}}$, see Eqs. (4)–(6)) with

respect to Rutherford's formula (Eq. (2)). Sherman (1956) and Idoeta and Legarda (1992) pointed out that the function F_1 and G_1 (Eqs. (9), (10)) are obtained from two series which are only conditionally convergent and converge very slowly (in particular G_1). Thus, in order to improve the convergence they suggested to apply to such series the transformation – which can be employed for any series of Legendre polynomials – of Yennie et al. (1954). Following this transformation, the series of Legendre polynomials (with the k -th term given by $P_k(\cos \theta)$ in Eqs. (9), (10)) is rewritten in terms of an m -th reduced series, i.e.,

$$F_1 = \frac{i}{2(1-\cos \theta)^m} \sum_{k=0}^{+\infty} A_k^{(m)} P_k(\cos \theta), \quad (17)$$

$$G_1 = \frac{i}{2(1-\cos \theta)^m} \sum_{k=0}^{+\infty} B_k^{(m)} P_k(\cos \theta), \quad (18)$$

with

$$A_k^{(0)} = (-)^k [k D_k + (k+1) D_{k+1}], \quad (19)$$

\vdots

$$A_k^{(m-1)} = A_k^{(m-2)} - \left[\frac{k+1}{2k+3} \right] A_{k+1}^{(m-2)} - \left[\frac{k}{2k-1} \right] A_{k-1}^{(m-2)},$$

$$A_k^{(m)} = A_k^{(m-1)} - \left[\frac{k+1}{2k+3} \right] A_{k+1}^{(m-1)} - \left[\frac{k}{2k-1} \right] A_{k-1}^{(m-1)} \quad (20)$$

Table 2

MDCS (i) calculated following the approach discussed in Section 3 and (ii) from Idoeta and Legarda (1992) – indicated as I&L (1992) – for positrons at 5 keV, 500 keV and 10 MeV on He, Ag and U ($Z = 2, 47$ and 92 , respectively) as a function of the scattering angle θ (deg.).

Z	θ (deg.)	5 keV		500 keV		10 MeV	
		Present work	I&L (1992)	Present work	I&L (1992)	Present work	I&L (1992)
2	15	9.99020E-01	9.99020E-01	9.82895E-01	9.82895E-01	9.77877E-01	9.77874E-01
	30	9.97635E-01	9.97634E-01	9.42692E-01	9.42693E-01	9.24546E-01	9.24546E-01
	45	9.95880E-01	9.95880E-01	8.81845E-01	8.81845E-01	8.43312E-01	8.43312E-01
	60	9.93839E-01	9.93839E-01	8.04244E-01	8.04244E-01	7.39413E-01	7.39412E-01
	75	9.91616E-01	9.91616E-01	7.14942E-01	7.14942E-01	6.19656E-01	6.19655E-01
	90	9.89333E-01	9.89333E-01	6.19810E-01	6.19810E-01	4.91952E-01	4.91952E-01
	105	9.87119E-01	9.87119E-01	5.25138E-01	5.25139E-01	3.64780E-01	3.64781E-01
	120	9.85100E-01	9.85099E-01	4.37211E-01	4.37210E-01	2.46613E-01	2.46612E-01
	135	9.83392E-01	9.83392E-01	3.61878E-01	3.61878E-01	1.45339E-01	1.45339E-01
	150	9.82096E-01	9.82096E-01	3.04162E-01	3.04163E-01	6.77310E-02	6.77317E-02
	165	9.81286E-01	9.81286E-01	2.67914E-01	2.67915E-01	1.89844E-02	1.89843E-02
	180	9.81011E-01	9.81011E-01	2.55557E-01	2.55557E-01	2.36430E-03	2.36432E-03
47	15	9.98027E-01	9.98026E-01	9.24324E-01	9.24325E-01	9.03683E-01	9.03684E-01
	30	9.96141E-01	9.96142E-01	8.48536E-01	8.48536E-01	8.05107E-01	8.05107E-01
	45	9.94405E-01	9.94405E-01	7.70920E-01	7.70920E-01	7.01517E-01	7.01517E-01
	60	9.92842E-01	9.92842E-01	6.92096E-01	6.92096E-01	5.93677E-01	5.93677E-01
	75	9.91466E-01	9.91466E-01	6.13800E-01	6.13800E-01	4.84102E-01	4.84101E-01
	90	9.90279E-01	9.90280E-01	5.38380E-01	5.38380E-01	3.76398E-01	3.76398E-01
	105	9.89283E-01	9.89283E-01	4.68481E-01	4.68481E-01	2.74816E-01	2.74816E-01
	120	9.88474E-01	9.88475E-01	4.06791E-01	4.06791E-01	1.83837E-01	1.83837E-01
	135	9.87849E-01	9.87850E-01	3.55825E-01	3.55825E-01	1.07779E-01	1.07779E-01
	150	9.87405E-01	9.87405E-01	3.17743E-01	3.17743E-01	5.04405E-02	5.04406E-02
	165	9.87140E-01	9.87140E-01	2.94200E-01	2.94200E-01	1.47809E-02	1.47809E-02
	180	9.87052E-01	9.87051E-01	2.86235E-01	2.86235E-01	2.67975E-03	2.67977E-03
92	15	9.98030E-01	9.97955E-01	9.18244E-01	9.18243E-01	8.89429E-01	8.89428E-01
	30	9.96160E-01	9.96158E-01	8.36871E-01	8.36871E-01	7.78709E-01	7.78709E-01
	45	9.94432E-01	9.94432E-01	7.57144E-01	7.57144E-01	6.68219E-01	6.68218E-01
	60	9.92877E-01	9.92877E-01	6.80232E-01	6.80232E-01	5.58530E-01	5.58530E-01
	75	9.91507E-01	9.91507E-01	6.07527E-01	6.07527E-01	4.51125E-01	4.51125E-01
	90	9.90325E-01	9.90325E-01	5.40566E-01	5.40466E-01	3.48350E-01	3.48349E-01
	105	9.89331E-01	9.89332E-01	4.80894E-01	4.80894E-01	2.53196E-01	2.53196E-01
	120	9.88524E-01	9.88524E-01	4.29951E-01	4.29951E-01	1.69019E-01	1.69018E-01
	135	9.87899E-01	9.87899E-01	3.88984E-01	3.88984E-01	9.92006E-02	9.92008E-02
	150	9.87455E-01	9.87456E-01	3.58994E-01	3.58984E-01	4.68185E-02	4.68182E-02
	165	9.87190E-01	9.87190E-01	3.40708E-01	3.40708E-01	1.43292E-02	1.43291E-02
	180	9.87102E-01	9.87102E-01	3.34563E-01	3.34564E-01	3.31703E-03	3.31705E-03

and

$$B_k^{(0)} = (-)^k [k^2 D_k - (k+1)^2 D_{k+1}], \quad (21)$$

$\vdots = \vdots$

$$B_k^{(m-1)} = B_k^{(m-2)} - \left[\frac{k+1}{2k+3} \right] B_{k+1}^{(m-2)} - \left[\frac{k}{2k-1} \right] B_{k-1}^{(m-2)},$$

$$B_k^{(m)} = B_k^{(m-1)} - \left[\frac{k+1}{2k+3} \right] B_{k+1}^{(m-1)} - \left[\frac{k}{2k-1} \right] B_{k-1}^{(m-1)} \quad (22)$$

(e.g., see Yennie et al., 1954; Sherman, 1956; Idoeta and Legarda, 1992; Lijian et al., 1995). Using a code – developed for this purpose – in the Mathematica 8.0 environment (Wolfram Research, 2012), three reductions ($m=3$) were found to be adequate for the purpose of present calculations in agreement with Sherman (1956) and Idoeta and Legarda (1992). Since the series G_1 is more slowly convergent than F_1 , in the same code the Euler transformation (e.g., see Knopp, 1951, Chapter VIII and Sherman, 1956; Idoeta and Legarda, 1992) was additionally applied to the so-found 3rd reduced series, i.e.,

$$\sum_{k=0}^{\infty} (-1)^k v_k = \frac{v_0}{2} + \frac{\Delta^1 v_0}{4} + \dots + \frac{\Delta^p v_0}{2^{p+1}} + \sum_{m=0}^{\infty} \frac{(-1)^m \Delta^{p+1} v_m}{2^{p+1}} \quad (23)$$

with

$$v_k = A_k^{(3)} P_k(\cos \theta) \left[\frac{i}{(-1)^k 2(1 - \cos \theta)^3} \right],$$

$$v_m = A_m^{(3)} P_m(\cos \theta) \left[\frac{i}{(-1)^m 2(1 - \cos \theta)^3} \right]$$

and

$$\Delta^1 v_m = v_m - v_{m+1},$$

$\vdots = \vdots$

$$\Delta^p v_m = \Delta^{p-1} v_m - \Delta^{p-1} v_{m+1},$$

$$\Delta^{p+1} v_m = \Delta^p v_m - \Delta^p v_{m+1}.$$

For the current calculations, $p=1$ was used in Eq. (23). Finally, since in the developed code no approximation was introduced to evaluate Eqs. (7) and (8), the accuracy in calculating the $\mathcal{R}^{\text{Mott}}$ ratio (as function of p , θ , Z and z , e.g., see Eq. (4)) depends on the accuracy with which Eqs. (5) and (6) are calculated. Thus, in turn, it results from the number (i.e., the value of k) of additive terms – approximated as so far discussed – summed in Eqs. (9) and (10). The result was considered accurate when the last k -th term summed was such that the obtained $\mathcal{R}^{\text{Mott}}$ value [$\equiv R^{\text{num}}(\theta, Z, E)$]

Table 3
 $b_{j,k}$ with $j = 0, 4$ and $k = 1, 6$ coefficients for electrons.

		$b_{j,k}$					
	j	k=1	k=2	k=3	k=4	k=5	k=6
H	0	1.00000E+00	2.67363E-08	7.11530E-08	-9.77030E-08	-6.69132E-07	-3.09263E-07
	1	1.17182E-02	1.62222E-02	-5.90397E-05	-1.05585E-04	4.17873E-04	9.13843E-04
	2	-2.65955E-01	-7.29531E-01	-4.99796E-01	2.83507E-04	-9.09042E-04	-2.20244E-03
	3	-1.82348E-04	-8.86355E-05	-1.90554E-04	-2.49708E-04	6.35004E-04	1.73523E-03
	4	4.70966E-05	-4.09705E-06	3.75218E-05	8.05645E-05	-1.90534E-04	-5.42847E-04
He	0	1.00000E+00	3.76476E-08	-3.05313E-07	-3.27422E-07	2.44235E-06	4.08754E-06
	1	2.35767E-02	3.24642E-02	-6.37269E-04	-7.69160E-04	5.28004E-03	9.45642E-03
	2	-2.73743E-01	-7.40767E-01	-4.98195E-01	1.74337E-03	-1.25798E-02	-2.24046E-02
	3	-7.79128E-04	-4.14495E-04	-1.62657E-03	-1.37286E-03	1.04319E-02	1.83488E-02
	4	2.02855E-04	1.94598E-06	4.30102E-04	4.32180E-04	-3.31526E-03	-5.81788E-03
Li	0	1.00000E+00	7.00357E-08	-3.15076E-07	-4.24915E-07	2.45516E-06	4.90187E-06
	1	3.55657E-02	4.87956E-02	-1.95525E-03	-2.78660E-03	1.65490E-02	3.11496E-02
	2	-2.81171E-01	-7.52015E-01	-4.95329E-01	5.83548E-03	-3.39830E-02	-6.55379E-02
	3	-1.83452E-03	-8.12746E-04	-3.84675E-03	-4.44467E-03	2.55871E-02	4.99483E-02
	4	4.79031E-04	-3.89615E-05	1.01022E-03	1.39133E-03	-7.99398E-03	-1.56366E-02
Be	0	1.00000E+00	7.58881E-08	4.70500E-08	2.48041E-07	-2.06053E-06	-1.97319E-06
	1	4.76788E-02	6.52200E-02	-4.54331E-03	-6.50318E-03	3.76564E-02	7.17176E-02
	2	-2.88203E-01	-7.63217E-01	-4.90337E-01	1.22839E-02	-6.86398E-02	-1.35769E-01
	3	-3.37733E-03	-1.36514E-03	-7.51614E-03	-8.78592E-03	4.78572E-02	9.69021E-02
	4	8.81822E-04	-1.02577E-04	1.99797E-03	2.72661E-03	-1.48296E-02	-3.01060E-02
B	0	9.99999E-01	7.91498E-08	1.84164E-06	2.68534E-06	-1.81630E-05	-2.69021E-05
	1	5.98818E-02	8.17654E-02	-7.70811E-03	-1.12378E-02	6.38329E-02	1.25339E-01
	2	-2.94716E-01	-7.74405E-01	-4.86220E-01	1.77367E-02	-9.46825E-02	-2.01789E-01
	3	-5.52375E-03	-2.05348E-03	-9.44915E-03	-1.08135E-02	5.41024E-02	1.25257E-01
	4	1.44555E-03	-1.99404E-04	2.36742E-03	3.29655E-03	-1.64122E-02	-3.83750E-02
C	0	9.99999E-01	7.68158E-08	5.18185E-06	7.34245E-06	-4.94780E-05	-7.71923E-05
	1	7.21461E-02	9.84618E-02	-1.06535E-02	-1.62358E-02	8.59238E-02	1.78727E-01
	2	-3.00622E-01	-7.85616E-01	-4.85735E-01	1.91563E-02	-8.10204E-02	-2.15386E-01
	3	-8.34809E-03	-2.85241E-03	-7.03252E-03	-7.56786E-03	1.44975E-02	8.79093E-02
	4	2.18964E-03	-3.42022E-04	1.32930E-03	2.20108E-03	-3.57927E-03	-2.59280E-02
N	0	9.99999E-01	8.36312E-08	1.09116E-05	1.47812E-05	-1.02733E-04	-1.62724E-04
	1	8.44142E-02	1.15310E-01	-1.17230E-02	-1.94732E-02	8.92604E-02	2.09303E-01
	2	-3.05743E-01	-7.96809E-01	-4.93957E-01	1.01607E-02	1.67761E-02	-1.05909E-01
	3	-1.20090E-02	-3.80678E-03	4.51195E-03	6.93472E-03	-1.12405E-01	-8.15484E-02
	4	3.16048E-03	-5.22237E-04	-2.58261E-03	-2.38303E-03	3.63393E-02	2.75127E-02
O	0	9.99998E-01	1.57323E-08	1.77595E-05	2.56082E-05	-1.67537E-04	-2.73755E-04
	1	9.66438E-02	1.32264E-01	-9.53841E-03	-1.83707E-02	6.01664E-02	1.93357E-01
	2	-3.09969E-01	-8.07790E-01	-5.14392E-01	-1.67153E-02	2.33870E-01	1.91600E-01
	3	-1.65906E-02	-5.11585E-03	2.80424E-02	3.94663E-02	-3.55720E-01	-4.39251E-01
	4	4.37866E-03	-6.81795E-04	-1.01520E-02	-1.24875E-02	1.11484E-01	1.38105E-01
F	0	9.99997E-01	-8.06132E-08	2.49797E-05	3.85120E-05	-2.37451E-04	-3.99607E-04
	1	1.08782E-01	1.49306E-01	-2.50975E-03	-1.05471E-02	-1.64831E-02	1.05733E-01
	2	-3.13165E-01	-8.18489E-01	-5.50832E-01	-6.74447E-02	6.06357E-01	7.39717E-01
	3	-2.21976E-02	-6.84023E-03	6.65411E-02	9.48702E-02	-7.43989E-01	-1.03582E+00
	4	5.87088E-03	-8.10480E-04	-2.21731E-02	-2.94422E-02	2.29540E-01	3.19669E-01
Ne	0	9.99997E-01	-1.87404E-07	3.10276E-05	5.20007E-05	-2.98132E-04	-5.19259E-04
	1	1.20783E-01	1.66407E-01	1.06608E-02	6.48772E-03	-1.53031E-01	-7.59354E-02
	2	-3.15222E-01	-8.28793E-01	-6.05740E-01	-1.47812E-01	1.15760E+00	1.58565E+00
	3	-2.89055E-02	-9.08096E-03	1.21467E-01	1.77575E-01	-1.29110E+00	-1.90333E+00
	4	7.65342E-03	-8.85417E-04	-3.89092E-02	-5.44040E-02	3.93087E-01	5.79439E-01
Na	0	9.99996E-01	-2.44548E-07	3.31019E-05	6.29483E-05	-3.24667E-04	-5.95527E-04
	1	1.32615E-01	1.83566E-01	3.04158E-02	3.40925E-02	-3.54681E-01	-3.63044E-01
	2	-3.16092E-01	-8.38704E-01	-6.78558E-01	-2.59346E-01	1.88547E+00	2.73632E+00
	3	-3.67233E-02	-1.18139E-02	1.91089E-01	2.87408E-01	-1.98397E+00	-3.03075E+00
	4	9.72033E-03	-9.26380E-04	-5.95654E-02	-8.69829E-02	5.95744E-01	9.10242E-01
Mg	0	9.99995E-01	-2.12227E-07	2.95645E-05	6.92848E-05	-3.02153E-04	-6.05145E-04
	1	1.44258E-01	2.00775E-01	5.67845E-02	7.35166E-02	-6.22861E-01	-7.62213E-01
	2	-3.15754E-01	-8.48196E-01	-7.67318E-01	-4.02984E-01	2.77477E+00	4.18114E+00
	3	-4.56307E-02	-1.50425E-02	2.72232E-01	4.23528E-01	-2.79606E+00	-4.38863E+00
	4	1.20560E-02	-9.44637E-04	-8.28738E-02	-1.26564E-01	8.26726E-01	1.29882E+00

Table 3 (continued)

		$b_{j,k}$					
	j	k=1	k=2	k=3	k=4	k=5	k=6
Al	0	9.99995E-01	-4.03407E-08	1.86047E-05	6.85201E-05	-2.14503E-04	-5.22528E-04
	1	1.55704E-01	2.18048E-01	8.88994E-02	1.24878E-01	-9.51331E-01	-1.26824E+00
	2	-3.14244E-01	-8.57322E-01	-8.67190E-01	-5.75787E-01	3.78571E+00	5.87052E+00
	3	-5.55526E-02	-1.86861E-02	3.58860E-01	5.81094E-01	-3.67623E+00	-5.90800E+00
	4	1.46269E-02	-9.79742E-04	-1.06652E-01	-1.71226E-01	1.06737E+00	1.71918E+00
Si	0	9.99994E-01	3.00267E-07	-1.11840E-06	5.88256E-05	-4.78456E-05	-3.25731E-04
	1	1.66960E-01	2.35405E-01	1.25215E-01	1.87646E-01	-1.32685E+00	-1.86549E+00
	2	-3.11630E-01	-8.66152E-01	-9.71254E-01	-7.72715E-01	4.85654E+00	7.72150E+00
	3	-6.63778E-02	-2.26481E-02	4.42898E-01	7.53182E-01	-4.55172E+00	-7.48670E+00
	4	1.73883E-02	-1.07669E-03	-1.28075E-01	-2.18389E-01	1.29217E+00	2.13475E+00
P	0	9.99994E-01	8.94829E-07	-2.98434E-05	3.82193E-05	2.00584E-04	-6.40482E-06
	1	1.78039E-01	2.52912E-01	1.63761E-01	2.60132E-01	-1.73287E+00	-2.53185E+00
	2	-3.08007E-01	-8.74905E-01	-1.07146E+00	-9.85062E-01	5.91697E+00	9.63265E+00
	3	-7.79747E-02	-2.66797E-02	5.15288E-01	9.29261E-01	-5.34252E+00	-9.00574E+00
	4	2.02892E-02	-1.33011E-03	-1.44039E-01	-2.64330E-01	1.47360E+00	2.50398E+00
S	0	9.99994E-01	1.75397E-06	-6.73310E-05	6.29524E-06	5.29623E-04	4.35288E-04
	1	1.88968E-01	2.70612E-01	2.01975E-01	3.40574E-01	-2.14737E+00	-3.23836E+00
	2	-3.03499E-01	-8.83717E-01	-1.15816E+00	-1.20414E+00	6.88176E+00	1.14841E+01
	3	-9.01806E-02	-3.06202E-02	5.65581E-01	1.09902E+00	-5.95552E+00	-1.03302E+01
	4	2.32694E-02	-1.80614E-03	-1.51041E-01	-3.05449E-01	1.58037E+00	2.78083E+00
Cl	0	9.99994E-01	3.07931E-06	-1.11876E-04	-4.10164E-05	9.17095E-04	9.80145E-04
	1	1.99765E-01	2.88611E-01	2.37501E-01	4.25803E-01	-2.55105E+00	-3.95585E+00
	2	-2.98206E-01	-8.92930E-01	-1.22279E+00	-1.41690E+00	7.67836E+00	1.31601E+01
	3	-1.02865E-01	-3.40967E-02	5.84677E-01	1.24786E+00	-6.31301E+00	-1.13328E+01
	4	2.62800E-02	-2.63995E-03	-1.46076E-01	-3.36795E-01	1.58677E+00	2.92251E+00
Ar	0	9.99993E-01	4.49776E-06	-1.65136E-04	-9.76754E-05	1.39664E-03	1.66293E-03
	1	2.10469E-01	3.06924E-01	2.66793E-01	5.13797E-01	-2.90958E+00	-4.63816E+00
	2	-2.92294E-01	-9.02560E-01	-1.25307E+00	-1.61470E+00	8.18574E+00	1.44912E+01
	3	-1.15831E-01	-3.70891E-02	5.59807E-01	1.36619E+00	-6.28824E+00	-1.18327E+01
	4	2.92513E-02	-3.84903E-03	-1.24976E-01	-3.55149E-01	1.45127E+00	2.86925E+00
K	0	9.99993E-01	6.01488E-06	-2.22125E-04	-1.61774E-04	1.92058E-03	2.41975E-03
	1	2.21091E-01	3.25648E-01	2.87732E-01	6.01632E-01	-3.20436E+00	-5.25724E+00
	2	-2.85814E-01	-9.12889E-01	-1.24213E+00	-1.78635E+00	8.34196E+00	1.53776E+01
	3	-1.29005E-01	-3.92986E-02	4.84255E-01	1.44206E+00	-5.81999E+00	-1.17275E+01
	4	3.21555E-02	-5.54272E-03	-8.56572E-02	-3.56589E-01	1.15480E+00	2.58829E+00
Ca	0	9.99993E-01	8.01467E-06	-2.79242E-04	-2.36820E-04	2.45459E-03	3.21683E-03
	1	2.31651E-01	3.44948E-01	2.97820E-01	6.85187E-01	-3.41294E+00	-5.77715E+00
	2	-2.78858E-01	-9.24428E-01	-1.18215E+00	-1.91691E+00	8.07489E+00	1.56969E+01
	3	-1.42276E-01	-4.01888E-02	3.50466E-01	1.45983E+00	-4.83806E+00	-1.08936E+01
	4	3.49529E-02	-7.90933E-03	-2.58002E-02	-3.36028E-01	6.75740E-01	2.04052E+00
Sc	0	9.99992E-01	1.04277E-05	-3.35126E-04	-3.21042E-04	2.98507E-03	4.03325E-03
	1	2.42172E-01	3.64954E-01	2.94606E-01	7.60693E-01	-3.51409E+00	-6.16460E+00
	2	-2.71512E-01	-9.37543E-01	-1.06570E+00	-1.99328E+00	7.31863E+00	1.53396E+01
	3	-1.55540E-01	-3.93862E-02	1.51477E-01	1.40614E+00	-3.28024E+00	-9.22338E+00
	4	3.76066E-02	-1.10812E-02	5.66831E-02	-2.89210E-01	-4.60274E-03	1.19273E+00
Ti	0	9.99992E-01	1.30838E-05	-3.84070E-04	-4.09294E-04	3.47025E-03	4.81071E-03
	1	2.52646E-01	3.85718E-01	2.76330E-01	8.25665E-01	-3.48888E+00	-6.39017E+00
	2	-2.63758E-01	-9.52326E-01	-8.88179E-01	-2.00720E+00	6.01960E+00	1.42157E+01
	3	-1.68806E-01	-3.68095E-02	-1.16429E-01	1.27309E+00	-1.09991E+00	-6.63409E+00
	4	4.01184E-02	-1.50938E-02	1.62740E-01	-2.13760E-01	-8.99142E-01	2.08129E-02
V	0	9.99991E-01	1.59363E-05	-4.27315E-04	-5.01461E-04	3.91365E-03	5.55096E-03
	1	2.63096E-01	4.07357E-01	2.40649E-01	8.76450E-01	-3.31641E+00	-6.42069E+00
	2	-2.55682E-01	-9.69090E-01	-6.43149E-01	-1.94678E+00	4.11915E+00	1.22255E+01
	3	-1.81974E-01	-3.21462E-02	-4.58817E-01	1.04913E+00	1.75388E+00	-3.03434E+00
	4	4.24541E-02	-2.00595E-02	2.93916E-01	-1.06138E-01	-2.02203E+00	-1.50181E+00
Cr	0	9.99990E-01	1.88950E-05	-4.59994E-04	-5.93663E-04	4.27684E-03	6.20090E-03
	1	2.73504E-01	4.29990E-01	1.86473E-01	9.09921E-01	-2.98441E+00	-6.23344E+00
	2	-2.47225E-01	-9.88118E-01	-3.28759E-01	-1.80252E+00	1.59090E+00	9.30968E+00
	3	-1.95100E-01	-2.51242E-02	-8.76244E-01	7.25925E-01	5.29650E+00	1.62177E+00
	4	4.46307E-02	-2.60754E-02	4.50054E-01	3.61638E-02	-3.37524E+00	-3.38601E+00
Mn	0	9.99989E-01	2.18906E-05	-4.79199E-04	-6.83164E-04	4.53467E-03	6.72485E-03
	1	2.83854E-01	4.53722E-01	1.12877E-01	9.23203E-01	-2.48247E+00	-5.80855E+00

Table 3 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
Fe	2	-2.38338E-01	-1.00965E+00	5.61453E-02	-1.56605E+00	-1.58353E+00	5.42138E+00
	3	-2.08226E-01	-1.55138E-02	-1.36846E+00	2.95168E-01	9.53392E+00	7.36550E+00
	4	4.66619E-02	-3.32255E-02	6.30711E-01	2.15167E-01	-4.95748E+00	-5.63744E+00
	0	9.99987E-01	2.48200E-05	-4.82895E-04	-7.67488E-04	4.66900E-03	7.09581E-03
	1	2.94123E-01	4.78653E-01	1.93256E-02	9.13569E-01	-1.80354E+00	-5.13040E+00
	2	-2.28945E-01	-1.03390E+00	5.11210E-01	-1.22996E+00	-5.40939E+00	5.31490E-01
	3	-2.21426E-01	-3.12679E-03	-1.93353E+00	-2.48179E-01	1.44576E+01	1.42077E+01
Co	4	4.85718E-02	-4.15796E-02	8.34879E-01	4.32418E-01	-6.76244E+00	-8.25464E+00
	0	9.99985E-01	2.76168E-05	-4.67522E-04	-8.43978E-04	4.65008E-03	7.27476E-03
	1	3.04280E-01	5.04856E-01	-9.42256E-02	8.78905E-01	-9.44256E-01	-4.18847E+00
	2	-2.18939E-01	-1.06098E+00	1.03431E+00	-7.89123E-01	-9.87815E+00	-5.36997E+00
	3	-2.34805E-01	1.21281E-02	-2.56765E+00	-9.08015E-01	2.00436E+01	2.21379E+01
	4	5.03942E-02	-5.11768E-02	1.06090E+00	6.88631E-01	-8.77867E+00	-1.12289E+01
	0	9.99982E-01	3.00792E-05	-4.33447E-04	-9.09366E-04	4.47786E-03	7.25072E-03
Ni	1	3.14283E-01	5.32444E-01	-2.27528E-01	8.16951E-01	9.53704E-02	-2.97730E+00
	2	-2.08186E-01	-1.09112E+00	1.62237E+00	-2.38394E-01	-1.49699E+01	-1.22743E+01
	3	-2.48493E-01	3.04543E-02	-3.26601E+00	-1.68760E+00	2.62568E+01	3.11259E+01
	4	5.21709E-02	-6.20908E-02	1.30683E+00	9.84353E-01	-1.09909E+01	-1.45449E+01
	0	9.99979E-01	3.24569E-05	-3.76717E-04	-9.64000E-04	4.11997E-03	6.98761E-03
	1	3.24082E-01	5.61534E-01	-3.79993E-01	7.25313E-01	1.31342E+00	-1.49163E+00
	2	-1.96521E-01	-1.12457E+00	2.27091E+00	4.27678E-01	-2.06558E+01	-2.01690E+01
Cu	3	-2.62655E-01	5.20812E-02	-4.02224E+00	-2.59048E+00	3.30508E+01	4.11350E+01
	4	5.39556E-02	-7.44077E-02	1.57015E+00	1.32022E+00	-1.33802E+01	-1.81848E+01
	0	9.99976E-01	3.39628E-05	-2.98845E-04	-9.99651E-04	3.58523E-03	6.47782E-03
	1	3.33647E-01	5.92068E-01	-5.51020E-01	6.03630E-01	2.70712E+00	2.67853E-01
	2	-1.83849E-01	-1.16095E+00	2.97559E+00	1.20728E+00	-2.69053E+01	-2.90214E+01
	3	-2.77375E-01	7.65838E-02	-4.83023E+00	-3.61238E+00	4.03786E+01	5.21084E+01
	4	5.57745E-02	-8.79952E-02	1.84848E+00	1.69425E+00	-1.59274E+01	-2.21242E+01
Ga	0	9.99972E-01	3.48473E-05	-1.97828E-04	-1.01659E-03	2.85509E-03	5.69725E-03
	1	3.42904E-01	6.24164E-01	-7.39023E-01	4.50306E-01	4.26553E+00	2.29299E+00
	2	-1.69940E-01	-1.20051E+00	3.72868E+00	2.10276E+00	-3.36594E+01	-3.87726E+01
	3	-2.92882E-01	1.04194E-01	-5.68033E+00	-4.75339E+00	4.81633E+01	6.39614E+01
	4	5.77008E-02	-1.02941E-01	2.13826E+00	2.10589E+00	-1.86034E+01	-2.63294E+01
	0	9.99968E-01	3.47804E-05	-7.11898E-05	-1.01028E-03	1.90919E-03	4.61426E-03
	1	3.51793E-01	6.57815E-01	-9.42175E-01	2.64940E-01	5.97606E+00	4.57222E+00
Ge	2	-1.54595E-01	-1.24305E+00	4.52170E+00	3.11205E+00	-4.08539E+01	-4.93518E+01
	3	-3.09367E-01	1.34661E-01	-6.56214E+00	-6.00882E+00	5.63228E+01	7.65965E+01
	4	5.97948E-02	-1.19174E-01	2.43570E+00	2.55300E+00	-2.13779E+01	-3.07628E+01
	0	9.99963E-01	3.37519E-05	8.13037E-05	-9.78638E-04	7.41412E-04	3.21498E-03
	1	3.60246E-01	6.93065E-01	-1.15880E+00	4.68519E-02	7.82662E+00	7.09456E+00
	2	-1.37615E-01	-1.28855E+00	5.34673E+00	4.23402E+00	-4.84263E+01	-6.06897E+01
	3	-3.27017E-01	1.67941E-01	-7.46593E+00	-7.37492E+00	6.47773E+01	8.99181E+01
As	4	6.21158E-02	-1.36692E-01	2.73726E+00	3.03374E+00	-2.42209E+01	-3.53873E+01
	0	9.99958E-01	3.14983E-05	2.59741E-04	-9.19008E-04	-6.49202E-04	1.49008E-03
	1	3.68196E-01	7.29888E-01	-1.38664E+00	-2.03807E-01	9.80062E+00	9.84155E+00
	2	-1.18788E-01	-1.33674E+00	6.19400E+00	5.46446E+00	-5.62994E+01	-7.26915E+01
	3	-3.46033E-01	2.03729E-01	-8.38012E+00	-8.84466E+00	7.34319E+01	1.03805E+02
	4	6.47255E-02	-1.55409E-01	3.03879E+00	3.54516E+00	-2.70980E+01	-4.01572E+01
	0	9.99952E-01	2.79961E-05	4.60479E-04	-8.33486E-04	-2.23214E-03	-5.16285E-04
Br	1	3.75580E-01	7.68292E-01	-1.62392E+00	-4.87674E-01	1.18854E+01	1.28025E+01
	2	-9.79355E-02	-1.38749E+00	7.05560E+00	6.80198E+00	-6.44113E+01	-8.52915E+01
	3	-3.66572E-01	2.41863E-01	-9.29524E+00	-1.04141E+01	8.22093E+01	1.18166E+02
	4	6.76714E-02	-1.75289E-01	3.33691E+00	4.08538E+00	-2.99809E+01	-4.50381E+01
	0	9.99947E-01	2.29520E-05	6.82639E-04	-7.17139E-04	-4.00522E-03	-2.81601E-03
	1	3.82332E-01	8.08194E-01	-1.86848E+00	-8.03415E-01	1.40640E+01	1.59560E+01
	2	-7.48735E-02	-1.44031E+00	7.92233E+00	8.23820E+00	-7.26858E+01	-9.83865E+01
Kr	3	-3.88797E-01	2.81837E-01	-1.02005E+01	-1.20716E+01	9.10175E+01	1.32873E+02
	4	7.10017E-02	-1.96182E-01	3.62780E+00	4.65000E+00	-3.28365E+01	-4.99823E+01
	0	9.99941E-01	1.63607E-05	9.28242E-04	-5.69257E-04	-5.98245E-03	-5.42476E-03
	1	3.88363E-01	8.49548E-01	-2.11701E+00	-1.15003E+00	1.63119E+01	1.92737E+01
	2	-4.93364E-02	-1.49491E+00	8.78129E+00	9.76596E+00	-8.10212E+01	-1.11851E+02
	3	-4.12953E-01	3.23322E-01	-1.10814E+01	-1.38073E+01	9.97386E+01	1.47775E+02
	0	9.99941E-01	1.63607E-05	9.28242E-04	-5.69257E-04	-5.98245E-03	-5.42476E-03
Rb	1	3.88363E-01	8.49548E-01	-2.11701E+00	-1.15003E+00	1.63119E+01	1.92737E+01
	2	-4.93364E-02	-1.49491E+00	8.78129E+00	9.76596E+00	-8.10212E+01	-1.11851E+02
	3	-4.12953E-01	3.23322E-01	-1.10814E+01	-1.38073E+01	9.97386E+01	1.47775E+02

Table 3 (continued)

	j	$b_{j,k}$					
		k=1	k=2	k=3	k=4	k=5	k=6
Sr	4	7.47911E-02	-2.18001E-01	3.90642E+00	5.23509E+00	-3.56231E+01	-5.49352E+01
	0	9.99935E-01	8.31520E-06	1.19244E-03	-3.95258E-04	-8.12525E-03	-8.28836E-03
	1	3.93603E-01	8.92358E-01	-2.36688E+00	-1.52786E+00	1.86071E+01	2.27314E+01
	2	-2.11345E-02	-1.55112E+00	9.62205E+00	1.13827E+01	-8.93266E+01	-1.25574E+02
	3	-4.39199E-01	3.66161E-01	-1.19262E+01	-1.56159E+01	1.08267E+02	1.62736E+02
Y	4	7.90853E-02	-2.40719E-01	4.16872E+00	5.83839E+00	-3.83040E+01	-5.98484E+01
	0	9.99929E-01	-1.65608E-06	1.47476E-03	-1.86250E-04	-1.04363E-02	-1.14318E-02
	1	3.97989E-01	9.36430E-01	-2.61569E+00	-1.93387E+00	2.09305E+01	2.63021E+01
	2	9.88744E-03	-1.60813E+00	1.04351E+01	1.30740E+01	-9.75207E+01	-1.39437E+02
	3	-4.67657E-01	4.09494E-01	-1.27240E+01	-1.74797E+01	1.16508E+02	1.77614E+02
Zr	4	8.39169E-02	-2.64077E-01	4.41092E+00	6.45344E+00	-4.08455E+01	-6.46698E+01
	0	9.99922E-01	-1.37624E-05	1.77335E-03	5.99400E-05	-1.29013E-02	-1.48443E-02
	1	4.01450E-01	9.81600E-01	-2.86053E+00	-2.36562E+00	2.32591E+01	2.99551E+01
	2	4.39150E-02	-1.66522E+00	1.12093E+01	1.48279E+01	-1.05512E+02	-1.53310E+02
	3	-4.98475E-01	4.52607E-01	-1.34628E+01	-1.93836E+01	1.24357E+02	1.92256E+02
Nb	4	8.93258E-02	-2.87869E-01	4.62891E+00	7.07473E+00	-4.32116E+01	-6.93461E+01
	0	9.99916E-01	-2.78975E-05	2.08753E-03	3.41607E-04	-1.55141E-02	-1.85156E-02
	1	4.03889E-01	1.02783E+00	-3.09762E+00	-2.82183E+00	2.55629E+01	3.36548E+01
	2	8.12122E-02	-1.72210E+00	1.19310E+01	1.66362E+01	-1.13185E+02	-1.67048E+02
	3	-5.31880E-01	4.95236E-01	-1.41275E+01	-2.13166E+01	1.31687E+02	2.06495E+02
Mo	4	9.53781E-02	-3.12041E-01	4.81765E+00	7.69813E+00	-4.53587E+01	-7.38182E+01
	0	9.99910E-01	-4.39880E-05	2.41439E-03	6.54636E-04	-1.82489E-02	-2.24062E-02
	1	4.05249E-01	1.07495E+00	-3.32445E+00	-3.30073E+00	2.78221E+01	3.73760E+01
	2	1.21896E-01	-1.77813E+00	1.25907E+01	1.84893E+01	-1.20461E+02	-1.80542E+02
	3	-5.67942E-01	5.36741E-01	-1.47080E+01	-2.32664E+01	1.38408E+02	2.20203E+02
Tc	4	1.02086E-01	-3.36419E-01	4.97373E+00	8.31905E+00	-4.72562E+01	-7.80409E+01
	0	9.99904E-01	-6.22073E-05	2.75066E-03	1.00063E-03	-2.10817E-02	-2.64933E-02
	1	4.05472E-01	1.12279E+00	-3.53825E+00	-3.79964E+00	3.00132E+01	4.10871E+01
	2	1.66089E-01	-1.83255E+00	1.31785E+01	2.03743E+01	-1.27252E+02	-1.93664E+02
	3	-6.06729E-01	5.76392E-01	-1.51936E+01	-2.52171E+01	1.44423E+02	2.33232E+02
Ru	4	1.09463E-01	-3.60803E-01	5.09358E+00	8.93178E+00	-4.88706E+01	-8.19632E+01
	0	9.99898E-01	-8.26232E-05	3.09353E-03	1.37924E-03	-2.39902E-02	-3.07502E-02
	1	4.04498E-01	1.17115E+00	-3.73628E+00	-4.31580E+00	3.21142E+01	4.47580E+01
	2	2.13904E-01	-1.88458E+00	1.36848E+01	2.22782E+01	-1.33471E+02	-2.06293E+02
	3	-6.48301E-01	6.13439E-01	-1.55742E+01	-2.71531E+01	1.49638E+02	2.45444E+02
Rh	4	1.17516E-01	-3.84990E-01	5.17383E+00	9.53070E+00	-5.01709E+01	-8.55368E+01
	0	9.99893E-01	-1.05293E-04	3.43932E-03	1.78981E-03	-2.69462E-02	-3.51436E-02
	1	4.02272E-01	1.21982E+00	-3.91575E+00	-4.84621E+00	3.41013E+01	4.83563E+01
	2	2.65438E-01	-1.93341E+00	1.40998E+01	2.41876E+01	-1.39034E+02	-2.18300E+02
	3	-6.92691E-01	6.47135E-01	-1.58398E+01	-2.90581E+01	1.53960E+02	2.56697E+02
Pd	4	1.26243E-01	-4.08783E-01	5.21125E+00	1.01100E+01	-5.11262E+01	-8.87130E+01
	0	9.99888E-01	-1.30188E-04	3.78436E-03	2.22971E-03	-2.99185E-02	-3.96315E-02
	1	3.98750E-01	1.26855E+00	-4.07427E+00	-5.38796E+00	3.59550E+01	5.18546E+01
	2	3.20748E-01	-1.97817E+00	1.44153E+01	2.60890E+01	-1.43866E+02	-2.29578E+02
	3	-7.39891E-01	6.76679E-01	-1.59819E+01	-3.09162E+01	1.57312E+02	2.66867E+02
Ag	4	1.35630E-01	-4.31972E-01	5.20310E+00	1.06642E+01	-5.17104E+01	-9.14493E+01
	0	9.99884E-01	-1.57459E-04	4.12052E-03	2.69984E-03	-3.28468E-02	-4.41512E-02
	1	3.93891E-01	1.31710E+00	-4.20944E+00	-5.93691E+00	3.76535E+01	5.52188E+01
	2	3.79857E-01	-2.01791E+00	1.46238E+01	2.79653E+01	-1.47893E+02	-2.39997E+02
	3	-7.89852E-01	7.01196E-01	-1.59929E+01	-3.27077E+01	1.59613E+02	2.75813E+02
Cd	4	1.45646E-01	-4.54328E-01	5.14701E+00	1.11863E+01	-5.18977E+01	-9.36987E+01
	0	9.99881E-01	-1.86816E-04	4.45491E-03	3.19574E-03	-3.57812E-02	-4.87457E-02
	1	3.87612E-01	1.36524E+00	-4.31686E+00	-6.49005E+00	3.91612E+01	5.84032E+01
	2	4.42940E-01	-2.05189E+00	1.47103E+01	2.98033E+01	-1.50988E+02	-2.49389E+02
	3	-8.42683E-01	7.20045E-01	-1.58579E+01	-3.44169E+01	1.60733E+02	2.83354E+02
In	4	1.56312E-01	-4.75705E-01	5.03810E+00	1.16708E+01	-5.16454E+01	-9.53999E+01
	0	9.99878E-01	-2.18480E-04	4.78376E-03	3.71897E-03	-3.86926E-02	-5.33866E-02
	1	3.79879E-01	1.41265E+00	-4.39391E+00	-7.04282E+00	4.04550E+01	6.13721E+01
	2	5.10001E-01	-2.07896E+00	1.46666E+01	3.15843E+01	-1.53072E+02	-2.57624E+02
	3	-8.98306E-01	7.32213E-01	-1.55686E+01	-3.60229E+01	1.60591E+02	2.89348E+02
	4	1.67591E-01	-4.95837E-01	4.87389E+00	1.21106E+01	-5.09274E+01	-9.65060E+01

Table 3 (continued)

	j	$b_{j,k}$					
		k=1	k=2	k=3	k=4	k=5	k=6
Sn	0	9.99876E-01	-2.52173E-04	5.09558E-03	4.26518E-03	-4.14939E-02	-5.79712E-02
	1	3.70689E-01	1.45908E+00	-4.43983E+00	-7.59192E+00	4.15261E+01	6.41080E+01
	2	5.80924E-01	-2.09831E+00	1.44911E+01	3.32945E+01	-1.54118E+02	-2.64634E+02
	3	-9.56518E-01	7.37009E-01	-1.51243E+01	-3.75098E+01	1.59159E+02	2.93723E+02
	4	1.79397E-01	-5.14573E-01	4.65426E+00	1.25003E+01	-4.97362E+01	-9.69932E+01
Sb	0	9.99874E-01	-2.87917E-04	5.39066E-03	4.83313E-03	-4.41852E-02	-6.24953E-02
	1	3.60001E-01	1.50420E+00	-4.45150E+00	-8.13270E+00	4.23476E+01	6.65709E+01
	2	6.55716E-01	-2.10882E+00	1.41741E+01	3.49157E+01	-1.54034E+02	-2.70276E+02
	3	-1.01724E+00	7.33501E-01	-1.45156E+01	-3.88572E+01	1.56348E+02	2.96328E+02
	4	1.91690E-01	-5.31690E-01	4.37639E+00	1.28328E+01	-4.80435E+01	-9.68125E+01
Te	0	9.99874E-01	-3.25847E-04	5.67083E-03	5.42945E-03	-4.67877E-02	-6.70100E-02
	1	3.47783E-01	1.54767E+00	-4.42606E+00	-8.65995E+00	4.28934E+01	6.87183E+01
	2	7.34353E-01	-2.10941E+00	1.37070E+01	3.64273E+01	-1.52736E+02	-2.74401E+02
	3	-1.08036E+00	7.20771E-01	-1.37344E+01	-4.00427E+01	1.52073E+02	2.97007E+02
	4	2.04417E-01	-5.46972E-01	4.03784E+00	1.31007E+01	-4.58224E+01	-9.59123E+01
I	0	9.99875E-01	-3.65406E-04	5.92115E-03	6.03332E-03	-4.91674E-02	-7.12951E-02
	1	3.34062E-01	1.58924E+00	-4.36361E+00	-9.17241E+00	4.31638E+01	7.05522E+01
	2	8.16604E-01	-2.09933E+00	1.30915E+01	3.78235E+01	-1.50231E+02	-2.77015E+02
	3	-1.14554E+00	6.98298E-01	-1.27840E+01	-4.10591E+01	1.46348E+02	2.95770E+02
	4	2.17451E-01	-5.60344E-01	3.63994E+00	1.33015E+01	-4.30802E+01	-9.42981E+01
Xe	0	9.99877E-01	-4.06637E-04	6.14278E-03	6.64937E-03	-5.13391E-02	-7.53881E-02
	1	3.18822E-01	1.62854E+00	-4.26169E+00	-9.66459E+00	4.31357E+01	7.20331E+01
	2	9.02373E-01	-2.07743E+00	1.23209E+01	3.90832E+01	-1.46445E+02	-2.77984E+02
	3	-1.21259E+00	6.65174E-01	-1.16583E+01	-4.18839E+01	1.39104E+02	2.92479E+02
	4	2.30710E-01	-5.71608E-01	3.18104E+00	1.34277E+01	-3.97963E+01	-9.19255E+01
Cs	0	9.99881E-01	-4.49175E-04	6.32631E-03	7.27184E-03	-5.32297E-02	-7.91972E-02
	1	3.02086E-01	1.66529E+00	-4.11996E+00	-1.01330E+01	4.28031E+01	7.31464E+01
	2	9.91429E-01	-2.04292E+00	1.13959E+01	4.01931E+01	-1.41369E+02	-2.77260E+02
	3	-1.28117E+00	6.20870E-01	-1.03596E+01	-4.25024E+01	1.30338E+02	2.87090E+02
	4	2.44065E-01	-5.80702E-01	2.66217E+00	1.34745E+01	-3.59721E+01	-8.87824E+01
Ba	0	9.99886E-01	-4.93136E-04	6.47914E-03	7.90029E-03	-5.48909E-02	-8.27736E-02
	1	2.83840E-01	1.69905E+00	-3.93534E+00	-1.05724E+01	4.21392E+01	7.38521E+01
	2	1.08366E+00	-1.99451E+00	1.03076E+01	4.11340E+01	-1.34917E+02	-2.74710E+02
	3	-1.35107E+00	5.64397E-01	-8.87993E+00	-4.28945E+01	1.19972E+02	2.79470E+02
	4	2.57431E-01	-5.87417E-01	2.08111E+00	1.34353E+01	-3.15844E+01	-8.48268E+01
La	0	9.99892E-01	-5.38122E-04	6.59206E-03	8.52848E-03	-5.62508E-02	-8.60251E-02
	1	2.64130E-01	1.72952E+00	-3.70812E+00	-1.09794E+01	4.11430E+01	7.41410E+01
	2	1.17876E+00	-1.93141E+00	9.05928E+00	4.18928E+01	-1.27099E+02	-2.70309E+02
	3	-1.42185E+00	4.95292E-01	-7.22427E+00	-4.30461E+01	1.08024E+02	2.69601E+02
	4	2.70647E-01	-5.91727E-01	1.43982E+00	1.33056E+01	-2.66423E+01	-8.00557E+01
Ce	0	9.99900E-01	-5.83896E-04	6.66373E-03	9.15389E-03	-5.72988E-02	-8.89368E-02
	1	2.42961E-01	1.75635E+00	-3.43619E+00	-1.13482E+01	3.97928E+01	7.39747E+01
	2	1.27654E+00	-1.85263E+00	7.64589E+00	4.24492E+01	-1.17853E+02	-2.63933E+02
	3	-1.49322E+00	4.12926E-01	-5.38909E+00	-4.29363E+01	9.44419E+01	2.57363E+02
	4	2.83597E-01	-5.93557E-01	7.37540E-01	1.30785E+01	-2.11316E+01	-7.44329E+01
Pr	0	9.99909E-01	-6.30100E-04	6.69295E-03	9.77077E-03	-5.80220E-02	-9.14799E-02
	1	2.20373E-01	1.77919E+00	-3.11907E+00	-1.16754E+01	3.80818E+01	7.33384E+01
	2	1.37668E+00	-1.75734E+00	6.06819E+00	4.27905E+01	-1.07169E+02	-2.55543E+02
	3	-1.56475E+00	3.16885E-01	-3.37687E+00	-4.25518E+01	7.92269E+01	2.42726E+02
	4	2.96124E-01	-5.92915E-01	-2.45072E-02	1.27501E+01	-1.50562E+01	-6.79514E+01
Nd	0	9.99920E-01	-6.77211E-04	6.67917E-03	1.03866E-02	-5.84208E-02	-9.36775E-02
	1	1.96406E-01	1.79753E+00	-2.75530E+00	-1.19533E+01	3.59929E+01	7.21943E+01
	2	1.47887E+00	-1.64416E+00	4.32381E+00	4.28906E+01	-9.50034E+01	-2.45021E+02
	3	-1.63600E+00	2.06169E-01	-1.18704E+00	-4.18661E+01	6.23476E+01	2.25579E+02
	4	3.08067E-01	-5.89622E-01	-8.46080E-01	1.23116E+01	-8.40939E+00	-6.05788E+01
Pm	0	9.99932E-01	-7.23543E-04	6.61026E-03	1.09756E-02	-5.83892E-02	-9.53462E-02
	1	1.71135E-01	1.81127E+00	-2.34665E+00	-1.21818E+01	3.35368E+01	7.05547E+01
	2	1.58269E+00	-1.51310E+00	2.42140E+00	4.27487E+01	-8.14091E+01	-2.32422E+02
	3	-1.70642E+00	8.13302E-02	1.16945E+00	-4.08790E+01	4.38728E+01	2.05995E+02
	4	3.19226E-01	-5.84023E-01	-1.72313E+00	1.17636E+01	-1.21776E+00	-5.23434E+01
Sm	0	9.99946E-01	-7.69368E-04	6.48923E-03	1.15425E-02	-5.79523E-02	-9.65284E-02
	1	1.44613E-01	1.81998E+00	-1.89196E+00	-1.23548E+01	3.06998E+01	6.83894E+01

Table 3 (continued)

		$b_{j,k}$						
		j	k=1	k=2	k=3	k=4	k=5	k=6
	2	1.68776E+00	-1.36316E+00	3.59801E-01	4.23443E+01	-6.63559E+01	-2.17658E+02	
	3	-1.77552E+00	-5.81387E-02	3.69184E+00	-3.95701E+01	2.37855E+01	1.83897E+02	
	4	3.29420E-01	-5.76119E-01	-2.65496E+00	1.10995E+01	6.52027E+00	-4.32241E+01	
Eu	0	9.99962E-01	-8.13654E-04	6.31217E-03	1.20763E-02	-5.70782E-02	-9.71683E-02	
	1	1.16915E-01	1.82343E+00	-1.39208E+00	-1.24689E+01	2.74833E+01	6.56914E+01	
	2	1.79364E+00	-1.19400E+00	-1.85513E+00	4.16665E+01	-4.98680E+01	-2.00724E+02	
	3	-1.84272E+00	-2.12012E-01	6.37189E+00	-3.79293E+01	2.12742E+00	1.59295E+02	
	4	3.38449E-01	-5.66167E-01	-3.63838E+00	1.03165E+01	1.47866E+01	-3.32296E+01	
	Gd	0	9.99980E-01	-8.57331E-04	6.07736E-03	1.25819E-02	-5.57471E-02	-9.72475E-02
		1	8.81540E-02	1.82105E+00	-8.47718E-01	-1.25186E+01	2.38891E+01	6.24510E+01
2		1.89976E+00	-1.00428E+00	-4.21799E+00	4.06970E+01	-3.19703E+01	-1.81604E+02	
3		-1.90731E+00	-3.81080E-01	9.20190E+00	-3.59386E+01	-2.10594E+01	1.32192E+02	
	4	3.46059E-01	-5.54093E-01	-4.67039E+00	9.40924E+00	2.35631E+01	-2.23653E+01	
	Tb	0	9.99999E-01	-8.99343E-04	5.78680E-03	1.30512E-02	-5.39764E-02	-9.67723E-02
		1	5.84024E-02	1.81266E+00	-2.59193E-01	-1.25002E+01	1.99139E+01	5.86545E+01
2		2.00567E+00	-7.93885E-01	-6.72461E+00	3.94244E+01	-1.26714E+01	-1.60273E+02	
3		-1.96873E+00	-5.64782E-01	1.21753E+01	-3.35880E+01	-4.57487E+01	1.02578E+02	
	4	3.52050E-01	-5.40282E-01	-5.74837E+00	8.37487E+00	3.28364E+01	-1.06341E+01	
	Dy	0	1.00002E+00	-9.39311E-04	5.43607E-03	1.34763E-02	-5.17249E-02	-9.56765E-02
		1	2.78005E-02	1.79795E+00	3.70737E-01	-1.24114E+01	1.55759E+01	5.43184E+01
2		2.11070E+00	-5.62473E-01	-9.36239E+00	3.78424E+01	7.94516E+00	-1.36806E+02	
3		-2.02617E+00	-7.62769E-01	1.52768E+01	-3.08728E+01	-7.18354E+01	7.05554E+01	
	4	3.56140E-01	-5.25061E-01	-6.86679E+00	7.21247E+00	4.25672E+01	1.92463E+00	
	Ho	0	1.00004E+00	-9.76747E-04	5.02266E-03	1.38530E-02	-4.89737E-02	-9.39340E-02
		1	-3.54744E-03	1.77664E+00	1.04132E+00	-1.22473E+01	1.08741E+01	4.94269E+01
2		2.21429E+00	-3.09743E-01	-1.21254E+01	3.59359E+01	2.98600E+01	-1.11177E+02	
3		-2.07893E+00	-9.74603E-01	1.84979E+01	-2.77795E+01	-9.92800E+01	3.61173E+01	
	4	3.58090E-01	-5.08796E-01	-8.02233E+00	5.91833E+00	5.27374E+01	1.53069E+01	
	Er	0	1.00007E+00	-1.01117E-03	4.54349E-03	1.41720E-02	-4.56907E-02	-9.14834E-02
		1	-3.54805E-02	1.74848E+00	1.74921E+00	-1.20063E+01	5.83106E+00	4.40029E+01
2		2.31570E+00	-3.56472E-02	-1.49988E+01	3.37013E+01	5.29727E+01	-8.34879E+01	
3		-2.12613E+00	-1.19953E+00	2.18208E+01	-2.43067E+01	-1.27958E+02	-6.05797E-01	
	4	3.57593E-01	-4.91966E-01	-9.20870E+00	4.49274E+00	6.33009E+01	2.94631E+01	
	Tm	0	1.00009E+00	-1.04219E-03	3.99979E-03	1.44301E-02	-4.18849E-02	-8.83308E-02
		1	-6.78832E-02	1.71323E+00	2.49363E+00	-1.16834E+01	4.45978E-01	3.80313E+01
2		2.41433E+00	2.59886E-01	-1.79765E+01	3.11249E+01	7.72617E+01	-5.37152E+01	
3		-2.16704E+00	-1.43680E+00	2.52369E+01	-2.04429E+01	-1.57828E+02	-3.96140E+01	
	4	3.54400E-01	-4.75067E-01	-1.04225E+01	2.93269E+00	7.42385E+01	4.43866E+01	
	Yb	0	1.00012E+00	-1.06927E-03	3.39091E-03	1.46208E-02	-3.75471E-02	-8.44506E-02
		1	-1.00611E-01	1.67068E+00	3.27246E+00	-1.12756E+01	-5.27058E+00	3.15152E+01
2		2.50948E+00	5.76648E-01	-2.10477E+01	2.81988E+01	1.02665E+02	-2.18989E+01	
3		-2.20084E+00	-1.68528E+00	2.87325E+01	-1.61828E+01	-1.88802E+02	-8.08394E+01	
	4	3.48226E-01	-4.58722E-01	-1.16589E+01	1.23735E+00	8.55166E+01	6.00477E+01	
	Lu	0	1.00015E+00	-1.09216E-03	2.71745E-03	1.47404E-02	-3.26779E-02	-7.98343E-02
		1	-1.33495E-01	1.62059E+00	4.08307E+00	-1.07793E+01	-1.13042E+01	2.44607E+01
2		2.60038E+00	9.14519E-01	-2.42000E+01	2.49142E+01	1.29108E+02	1.19101E+01	
3		-2.22661E+00	-1.94391E+00	3.22924E+01	-1.15206E+01	-2.20784E+02	-1.24202E+02	
	4	3.38764E-01	-4.43546E-01	-1.29122E+01	-5.94280E-01	9.70972E+01	7.64128E+01	
	Hf	0	1.00018E+00	-1.11005E-03	1.98019E-03	1.47814E-02	-2.72814E-02	-7.44728E-02
		1	-1.66392E-01	1.56288E+00	4.92359E+00	-1.01915E+01	-1.76472E+01	1.68656E+01
2		2.68631E+00	1.27279E+00	-2.74231E+01	2.12642E+01	1.56537E+02	4.76851E+01	
3		-2.24352E+00	-2.21096E+00	3.59035E+01	-6.45262E+00	-2.53694E+02	-1.69646E+02	
	4	3.25734E-01	-4.30391E-01	-1.41779E+01	-2.56236E+00	1.08949E+02	9.34555E+01	
	Ta	0	1.00021E+00	-1.12270E-03	1.18750E-03	1.47467E-02	-2.14258E-02	-6.84575E-02
		1	-1.99145E-01	1.49739E+00	5.79226E+00	-9.50812E+00	-2.42938E+01	8.72312E+00
2		2.76656E+00	1.65088E+00	-3.07077E+01	1.72391E+01	1.84905E+02	8.54178E+01	
3		-2.25073E+00	-2.48478E+00	3.95541E+01	-9.72452E-01	-2.87462E+02	-2.17133E+02	
	4	3.08850E-01	-4.20088E-01	-1.54515E+01	-4.66797E+00	1.21043E+02	1.11156E+02	
	W	0	1.00025E+00	-1.12974E-03	3.25083E-04	1.46196E-02	-1.49818E-02	-6.15916E-02
		1	-2.31499E-01	1.42403E+00	6.68301E+00	-8.72894E+00	-3.12005E+01	8.13039E-02
2		2.84004E+00	2.04799E+00	-3.40292E+01	1.28426E+01	2.14035E+02	1.24907E+02	
3		-2.24701E+00	-2.76343E+00	4.32160E+01	4.91177E+00	-3.21880E+02	-2.66423E+02	

Table 3 (continued)

		$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6	
Re	4	2.87708E-01	-4.13579E-01	-1.67235E+01	-6.90724E+00	1.33305E+02	1.29426E+02	
	0	1.00028E+00	-1.13018E-03	-5.85208E-04	1.44008E-02	-8.12721E-03	-5.40793E-02	
	1	-2.63328E-01	1.34285E+00	7.59541E+00	-7.85118E+00	-3.83723E+01	-9.07534E+00	
	2	2.90612E+00	2.46267E+00	-3.73829E+01	8.06978E+00	2.43918E+02	1.66172E+02	
	3	-2.23164E+00	-3.04426E+00	4.68824E+01	1.12007E+01	-3.56918E+02	-3.17506E+02	
Os	4	2.62068E-01	-4.12056E-01	-1.79911E+01	-9.27922E+00	1.45719E+02	1.48255E+02	
	0	1.00032E+00	-1.12442E-03	-1.55891E-03	1.40881E-02	-7.32260E-04	-4.57754E-02	
	1	-2.94323E-01	1.25374E+00	8.52167E+00	-6.87354E+00	-4.57537E+01	-1.86910E+01	
	2	2.96357E+00	2.89403E+00	-4.07385E+01	2.92128E+00	2.74335E+02	2.08986E+02	
	3	-2.20324E+00	-3.32515E+00	5.05197E+01	1.78893E+01	-3.92323E+02	-3.70113E+02	
Ir	4	2.31474E-01	-4.16536E-01	-1.92429E+01	-1.17810E+01	1.58197E+02	1.67545E+02	
	0	1.00036E+00	-1.11107E-03	-2.58076E-03	1.36692E-02	7.08911E-03	-3.67730E-02	
	1	-3.24316E-01	1.15695E+00	9.45947E+00	-5.79675E+00	-5.33328E+01	-2.87528E+01	
	2	3.01159E+00	3.33981E+00	-4.40850E+01	-2.59468E+00	3.05217E+02	2.53266E+02	
	3	-2.16093E+00	-3.60244E+00	5.41141E+01	2.49638E+01	-4.28002E+02	-4.24126E+02	
Pt	4	1.95645E-01	-4.28567E-01	-2.04742E+01	-1.44066E+01	1.70702E+02	1.87249E+02	
	0	1.00039E+00	-1.09011E-03	-3.65347E-03	1.31413E-02	1.53649E-02	-2.70335E-02	
	1	-3.53028E-01	1.05257E+00	1.04028E+01	-4.62034E+00	-6.10681E+01	-3.92186E+01	
	2	3.04907E+00	3.79831E+00	-4.73979E+01	-8.47391E+00	3.36394E+02	2.98829E+02	
	3	-2.10347E+00	-3.87306E+00	5.76385E+01	3.24147E+01	-4.63751E+02	-4.79318E+02	
Au	4	1.54174E-01	-4.49506E-01	-2.16756E+01	-1.71516E+01	1.83161E+02	2.07283E+02	
	0	1.00043E+00	-1.06114E-03	-4.77340E-03	1.25001E-02	2.40713E-02	-1.65728E-02	
	1	-3.80207E-01	9.40778E-01	1.13464E+01	-3.34423E+00	-6.89259E+01	-5.00549E+01	
	2	3.07493E+00	4.26732E+00	-5.06567E+01	-1.47102E+01	3.67721E+02	3.45521E+02	
	3	-2.02970E+00	-4.13334E+00	6.10696E+01	4.02298E+01	-4.99399E+02	-5.35495E+02	
Hg	4	1.06694E-01	-4.80932E-01	-2.28393E+01	-2.00106E+01	1.95512E+02	2.27574E+02	
	0	1.00047E+00	-1.02377E-03	-5.93877E-03	1.17393E-02	3.32021E-02	-5.38025E-03	
	1	-4.05577E-01	8.21834E-01	1.22846E+01	-1.96909E+00	-7.68675E+01	-6.12207E+01	
	2	3.08808E+00	4.74434E+00	-5.38383E+01	-2.12945E+01	3.99035E+02	3.93158E+02	
	3	-1.93842E+00	-4.37923E+00	6.43816E+01	4.83938E+01	-5.34750E+02	-5.92428E+02	
Tl	4	5.28167E-02	-5.24544E-01	-2.39565E+01	-2.29768E+01	2.07685E+02	2.48037E+02	
	0	1.00051E+00	-9.77691E-04	-7.14416E-03	1.08563E-02	4.27196E-02	6.50699E-03	
	1	-4.28882E-01	6.96049E-01	1.32126E+01	-4.94649E-01	-8.48638E+01	-7.26907E+01	
	2	3.08745E+00	5.22659E+00	-5.69235E+01	-2.82201E+01	4.30208E+02	4.41611E+02	
	3	-1.82849E+00	-4.60634E+00	6.75530E+01	5.68935E+01	-5.69648E+02	-6.49946E+02	
Pb	4	-7.81506E-03	-5.82177E-01	-2.50201E+01	-2.60444E+01	2.19621E+02	2.68607E+02	
	0	1.00055E+00	-9.22411E-04	-8.38967E-03	9.83942E-03	5.26394E-02	1.91419E-02	
	1	-4.49833E-01	5.63865E-01	1.41246E+01	1.07680E+00	-9.28737E+01	-8.44177E+01	
	2	3.07189E+00	5.71077E+00	-5.98888E+01	-3.54715E+01	4.61066E+02	4.90670E+02	
	3	-1.69869E+00	-4.80968E+00	7.05579E+01	6.57062E+01	-6.03887E+02	-7.07793E+02	
Bi	4	-7.55851E-02	-6.55871E-01	-2.60213E+01	-2.92042E+01	2.31249E+02	2.89188E+02	
	0	1.00059E+00	-8.58152E-04	-9.66020E-03	8.70229E-03	6.28328E-02	3.23376E-02	
	1	-4.68192E-01	4.25668E-01	1.50174E+01	2.74763E+00	-1.00883E+02	-9.64012E+01	
	2	3.04043E+00	6.19366E+00	-6.27207E+01	-4.30487E+01	4.91532E+02	5.40291E+02	
	3	-1.54799E+00	-4.98431E+00	7.33810E+01	7.48252E+01	-6.37365E+02	-7.65885E+02	
Po	4	-1.50810E-01	-7.47659E-01	-2.69551E+01	-3.24524E+01	2.42528E+02	3.09744E+02	
	0	1.00062E+00	-7.84582E-04	-1.09553E-02	7.43533E-03	7.33106E-02	4.61358E-02	
	1	-4.83646E-01	2.82050E-01	1.58842E+01	4.51493E+00	-1.08846E+02	-1.08589E+02	
	2	2.99185E+00	6.67128E+00	-6.53938E+01	-5.09329E+01	5.21419E+02	5.90246E+02	
	3	-1.37512E+00	-5.12439E+00	7.59949E+01	8.42238E+01	-6.69862E+02	-8.23945E+02	
At	4	-2.33878E-01	-8.59879E-01	-2.78125E+01	-3.57783E+01	2.53381E+02	3.30173E+02	
	0	1.00066E+00	-7.01484E-04	-1.22684E-02	6.03454E-03	8.40298E-02	6.05018E-02	
	1	-4.95899E-01	1.33690E-01	1.67195E+01	6.37574E+00	-1.16723E+02	-1.20936E+02	
	2	2.92499E+00	7.13921E+00	-6.78861E+01	-5.91051E+01	5.50562E+02	6.40337E+02	
	3	-1.17889E+00	-5.22361E+00	7.83760E+01	9.38748E+01	-7.01185E+02	-8.81728E+02	
Rn	4	-3.25146E-01	-9.95032E-01	-2.85858E+01	-3.91713E+01	2.63738E+02	3.50385E+02	
	0	1.00070E+00	-6.08729E-04	-1.35873E-02	4.50061E-03	9.48991E-02	7.53277E-02	
	1	-5.04647E-01	-1.86445E-02	1.75175E+01	8.32729E+00	-1.24477E+02	-1.33405E+02	
	2	2.83871E+00	7.59269E+00	-7.01766E+01	-6.75463E+01	5.78809E+02	6.90388E+02	
	3	-9.58143E-01	-5.27523E+00	8.05020E+01	1.03751E+02	-7.31155E+02	-9.39013E+02	
	4	-4.24964E-01	-1.15578E+00	-2.92679E+01	-4.26205E+01	2.73537E+02	3.70298E+02	

Table 3 (continued)

	j	$b_{j,k}$					
		k=1	k=2	k=3	k=4	k=5	k=6
Fr	0	1.00073E+00	-5.06594E-04	-1.49195E-02	2.82752E-03	1.05984E-01	9.07179E-02
	1	-5.09498E-01	-1.74114E-01	1.82691E+01	1.03640E+01	-1.32042E+02	-1.45912E+02
	2	2.73154E+00	8.02658E+00	-7.22315E+01	-7.62278E+01	6.05902E+02	7.40063E+02
	3	-7.11399E-01	-5.27209E+00	8.23375E+01	1.13815E+02	-7.59479E+02	-9.95409E+02
	4	-5.33773E-01	-1.34491E+00	-2.98474E+01	-4.61115E+01	2.82675E+02	3.89772E+02
Ra	0	1.00076E+00	-3.94938E-04	-1.62461E-02	1.01616E-03	1.17156E-01	1.06529E-01
	1	-5.10179E-01	-3.31690E-01	1.89693E+01	1.24811E+01	-1.39382E+02	-1.58412E+02
	2	2.60247E+00	8.43503E+00	-7.40330E+01	-8.51228E+01	6.31692E+02	7.89166E+02
	3	-4.37673E-01	-5.20620E+00	8.38642E+01	1.24030E+02	-7.85984E+02	-1.05067E+03
	4	-6.51850E-01	-1.56551E+00	-3.03186E+01	-4.96307E+01	2.91091E+02	4.08719E+02
Ac	0	1.00079E+00	-2.74014E-04	-1.75614E-02	-9.33046E-04	1.28369E-01	1.22714E-01
	1	-5.06317E-01	-4.90282E-01	1.96102E+01	1.46725E+01	-1.46440E+02	-1.70838E+02
	2	2.45014E+00	8.81187E+00	-7.55530E+01	-9.42005E+01	6.55963E+02	8.37419E+02
	3	-1.35635E-01	-5.06921E+00	8.50532E+01	1.34356E+02	-8.10425E+02	-1.10448E+03
	4	-7.79579E-01	-1.82077E+00	-3.06725E+01	-5.31628E+01	2.98700E+02	4.27020E+02
Th	0	1.00082E+00	-1.43895E-04	-1.88590E-02	-3.02404E-03	1.39581E-01	1.39236E-01
	1	-4.97537E-01	-6.48585E-01	2.01838E+01	1.69296E+01	-1.53157E+02	-1.83108E+02
	2	2.27321E+00	9.15011E+00	-7.67630E+01	-1.03420E+02	6.78484E+02	8.84496E+02
	3	1.95990E-01	-4.85189E+00	8.58760E+01	1.44742E+02	-8.32543E+02	-1.15645E+03
	4	-9.17319E-01	-2.11420E+00	-3.09003E+01	-5.66889E+01	3.05413E+02	4.44542E+02
Pa	0	1.00085E+00	-5.30411E-06	-2.01239E-02	-5.24780E-03	1.50683E-01	1.55963E-01
	1	-4.83526E-01	-8.05262E-01	2.06846E+01	1.92461E+01	-1.59496E+02	-1.95177E+02
	2	2.07059E+00	9.44256E+00	-7.76442E+01	-1.12749E+02	6.99103E+02	9.30193E+02
	3	5.58224E-01	-4.54471E+00	8.63141E+01	1.55146E+02	-8.52163E+02	-1.20633E+03
	4	-1.06534E+00	-2.44938E+00	-3.09967E+01	-6.01932E+01	3.11168E+02	4.61192E+02
U	0	1.00087E+00	1.42049E-04	-2.13455E-02	-7.61031E-03	1.61591E-01	1.72814E-01
	1	-4.63920E-01	-9.58725E-01	2.11056E+01	2.16134E+01	-1.65402E+02	-2.06974E+02
	2	1.84100E+00	9.68106E+00	-7.81727E+01	-1.22145E+02	7.17614E+02	9.74218E+02
	3	9.52222E-01	-4.13715E+00	8.63446E+01	1.65515E+02	-8.69054E+02	-1.25378E+03
	4	-1.22395E+00	-2.83024E+00	-3.09548E+01	-6.36564E+01	3.15887E+02	4.76849E+02
Np	0	1.00089E+00	2.96049E-04	-2.25199E-02	-1.00947E-02	1.72304E-01	1.89770E-01
	1	-4.38356E-01	-1.10758E+00	2.14388E+01	2.40250E+01	-1.70813E+02	-2.18421E+02
	2	1.58322E+00	9.85807E+00	-7.83221E+01	-1.31575E+02	7.33783E+02	1.01626E+03
	3	1.37908E+00	-3.61927E+00	8.59420E+01	1.75804E+02	-8.82957E+02	-1.29844E+03
	4	-1.39342E+00	-3.26049E+00	-3.07672E+01	-6.70618E+01	3.19480E+02	4.91383E+02
Pu	0	1.00090E+00	4.56346E-04	-2.36386E-02	-1.27003E-02	1.82771E-01	2.06789E-01
	1	-4.06465E-01	-1.24997E+00	2.16774E+01	2.64711E+01	-1.75677E+02	-2.29447E+02
	2	1.29603E+00	9.96437E+00	-7.80698E+01	-1.40992E+02	7.47404E+02	1.05603E+03
	3	1.83985E+00	-2.97940E+00	8.50852E+01	1.85958E+02	-8.93641E+02	-1.33995E+03
	4	-1.57401E+00	-3.74444E+00	-3.04281E+01	-7.03888E+01	3.21870E+02	5.04671E+02
Am	0	1.00091E+00	6.22359E-04	-2.46850E-02	-1.54269E-02	1.92829E-01	2.23669E-01
	1	-3.67940E-01	-1.38391E+00	2.18175E+01	2.89415E+01	-1.79969E+02	-2.40018E+02
	2	9.78442E-01	9.99015E+00	-7.74041E+01	-1.50349E+02	7.58380E+02	1.09335E+03
	3	2.33533E+00	-2.20518E+00	8.37655E+01	1.95915E+02	-9.00988E+02	-1.37812E+03
	4	-1.76589E+00	-4.28658E+00	-2.99358E+01	-7.36156E+01	3.23018E+02	5.16638E+02
Cm	0	1.00091E+00	7.92875E-04	-2.56477E-02	-1.82659E-02	2.02416E-01	2.40347E-01
	1	-3.22419E-01	-1.50732E+00	2.18520E+01	3.14257E+01	-1.83632E+02	-2.50054E+02
	2	6.29314E-01	9.92529E+00	-7.63035E+01	-1.59597E+02	7.66494E+02	1.12791E+03
	3	2.86640E+00	-1.28398E+00	8.19642E+01	2.05617E+02	-9.04788E+02	-1.41257E+03
	4	-1.96925E+00	-4.89150E+00	-2.92855E+01	-7.67206E+01	3.22845E+02	5.27151E+02
Bk	0	1.00091E+00	9.66485E-04	-2.65182E-02	-2.12089E-02	2.11471E-01	2.56746E-01
	1	-2.69552E-01	-1.61793E+00	2.17751E+01	3.39120E+01	-1.86616E+02	-2.59484E+02
	2	2.47591E-01	9.75896E+00	-7.47505E+01	-1.68681E+02	7.71562E+02	1.15941E+03
	3	3.43387E+00	-2.02402E-01	7.96675E+01	2.14997E+02	-9.04813E+02	-1.44297E+03
	4	-2.18422E+00	-5.56401E+00	-2.84744E+01	-7.96806E+01	3.21284E+02	5.36093E+02
Cf	0	1.00090E+00	1.14163E-03	-2.72849E-02	-2.42457E-02	2.19912E-01	2.72759E-01
	1	-2.08991E-01	-1.71333E+00	2.15806E+01	3.63880E+01	-1.88871E+02	-2.68235E+02
	2	-1.67743E-01	9.47970E+00	-7.27286E+01	-1.77547E+02	7.73399E+02	1.18758E+03
	3	4.03843E+00	1.05357E+00	7.68633E+01	2.23990E+02	-9.00876E+02	-1.46897E+03
	4	-2.41092E+00	-6.30912E+00	-2.75000E+01	-8.24716E+01	3.18270E+02	5.43346E+02
Es	0	1.00088E+00	1.31654E-03	-2.79362E-02	-2.73643E-02	2.27648E-01	2.88269E-01
	1	-1.40385E-01	-1.79089E+00	2.12627E+01	3.88400E+01	-1.90344E+02	-2.76230E+02

Table 3 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
	2	-6.17665E-01	9.07535E+00	-7.02219E+01	-1.86133E+02	7.71818E+02	1.21209E+03
	3	4.68070E+00	2.49864E+00	7.35409E+01	2.32521E+02	-8.92777E+02	-1.49023E+03
	4	-2.64940E+00	-7.13202E+00	-2.63610E+01	-8.50681E+01	3.13739E+02	5.48788E+02
Fm	0	1.00086E+00	1.48934E-03	-2.84596E-02	-3.05545E-02	2.34591E-01	3.03168E-01
	1	-6.33861E-02	-1.84775E+00	2.08152E+01	4.12512E+01	-1.90978E+02	-2.83376E+02
	2	-1.10309E+00	8.53286E+00	-6.72151E+01	-1.94369E+02	7.66617E+02	1.23259E+03
	3	5.36119E+00	4.14839E+00	6.96913E+01	2.40511E+02	-8.80309E+02	-1.50636E+03
	4	-2.89970E+00	-8.03816E+00	-2.50563E+01	-8.74417E+01	3.07622E+02	5.52280E+02
Md	0	1.00083E+00	1.65771E-03	-2.88470E-02	-3.38011E-02	2.40678E-01	3.17362E-01
	1	2.23629E-02	-1.88091E+00	2.02316E+01	4.36050E+01	-1.90711E+02	-2.89575E+02
	2	-1.62493E+00	7.83872E+00	-6.36928E+01	-2.02185E+02	7.57583E+02	1.24872E+03
	3	6.08035E+00	6.01881E+00	6.53055E+01	2.47876E+02	-8.63252E+02	-1.51693E+03
	4	-3.16179E+00	-9.03311E+00	-2.35856E+01	-8.95638E+01	2.99851E+02	5.53685E+02
No	0	1.00079E+00	1.81924E-03	-2.90832E-02	-3.70879E-02	2.45791E-01	3.30698E-01
	1	1.17187E-01	-1.88709E+00	1.95065E+01	4.58826E+01	-1.89486E+02	-2.94734E+02
	2	-2.18391E+00	6.97844E+00	-5.96443E+01	-2.09503E+02	7.44530E+02	1.26012E+03
	3	6.83839E+00	8.12682E+00	6.03812E+01	2.54528E+02	-8.41421E+02	-1.52156E+03
	4	-3.43558E+00	-1.01226E+01	-2.19506E+01	-9.14044E+01	2.90368E+02	5.52871E+02
Lr	0	1.00075E+00	1.97121E-03	-2.91599E-02	-4.03994E-02	2.49868E-01	3.43083E-01
	1	2.21414E-01	-1.86285E+00	1.86345E+01	4.80646E+01	-1.87245E+02	-2.98750E+02
	2	-2.78070E+00	5.93700E+00	-5.50600E+01	-2.16243E+02	7.27260E+02	1.26641E+03
	3	7.63543E+00	1.04897E+01	5.49176E+01	2.60377E+02	-8.14622E+02	-1.51985E+03
	4	-3.72092E+00	-1.13126E+01	-2.01538E+01	-9.29324E+01	2.79114E+02	5.49699E+02
Rf	0	1.00069E+00	2.11063E-03	-2.90649E-02	-4.37166E-02	2.52811E-01	3.54381E-01
	1	3.35343E-01	-1.80450E+00	1.76110E+01	5.01296E+01	-1.83930E+02	-3.01520E+02
	2	-3.41584E+00	4.69858E+00	-4.99338E+01	-2.22321E+02	7.05590E+02	1.26721E+03
	3	8.47134E+00	1.31256E+01	4.89188E+01	2.65326E+02	-7.82678E+02	-1.51137E+03
	4	-4.01757E+00	-1.26092E+01	-1.81997E+01	-9.41154E+01	2.66036E+02	5.44032E+02
Db	0	1.00062E+00	2.23438E-03	-2.87912E-02	-4.70251E-02	2.54570E-01	3.64523E-01
	1	4.59241E-01	-1.70813E+00	1.64324E+01	5.20553E+01	-1.79492E+02	-3.02947E+02
	2	-4.08966E+00	3.24663E+00	-4.42655E+01	-2.27646E+02	6.79364E+02	1.26217E+03
	3	9.34577E+00	1.60530E+01	4.23955E+01	2.69276E+02	-7.45446E+02	-1.49575E+03
	4	-4.32520E+00	-1.40184E+01	-1.60952E+01	-9.49201E+01	2.51093E+02	5.35741E+02
Sg	0	1.00054E+00	2.33856E-03	-2.83172E-02	-5.02884E-02	2.54953E-01	3.73216E-01
	1	5.93303E-01	-1.56969E+00	1.50988E+01	5.38223E+01	-1.73905E+02	-3.02969E+02
	2	-4.80218E+00	1.56424E+00	-3.80667E+01	-2.32140E+02	6.48516E+02	1.25106E+03
	3	1.02579E+01	1.92906E+01	3.53725E+01	2.72140E+02	-7.02882E+02	-1.47274E+03
	4	-4.64333E+00	-1.55463E+01	-1.38520E+01	-9.53176E+01	2.34279E+02	5.24749E+02
Bh	0	1.00045E+00	2.41947E-03	-2.76379E-02	-5.34904E-02	2.53921E-01	3.80403E-01
	1	7.37729E-01	-1.38486E+00	1.36088E+01	5.54064E+01	-1.67129E+02	-3.01495E+02
	2	-5.55335E+00	-3.66307E-01	-3.13473E+01	-2.35709E+02	6.12931E+02	1.23355E+03
	3	1.12069E+01	2.28579E+01	2.78734E+01	2.73815E+02	-6.54893E+02	-1.44199E+03
	4	-4.97143E+00	-1.71992E+01	-1.14816E+01	-9.52743E+01	2.15573E+02	5.10941E+02
Hs	0	1.00035E+00	2.47268E-03	-2.67441E-02	-5.66022E-02	2.51390E-01	3.85940E-01
	1	8.92647E-01	-1.14912E+00	1.19639E+01	5.67848E+01	-1.59141E+02	-2.98457E+02
	2	-6.34279E+00	-2.56322E+00	-2.41272E+01	-2.38265E+02	5.72562E+02	1.20938E+03
	3	1.21914E+01	2.67741E+01	1.99334E+01	2.74204E+02	-6.01463E+02	-1.40324E+03
	4	-5.30880E+00	-1.89832E+01	-8.99983E+00	-9.47588E+01	1.94979E+02	4.94237E+02
Mt	0	1.00024E+00	2.49375E-03	-2.56255E-02	-5.95976E-02	2.47266E-01	3.89678E-01
	1	1.05812E+00	-8.57709E-01	1.01681E+01	5.79340E+01	-1.49935E+02	-2.93803E+02
	2	-7.16980E+00	-5.04529E+00	-1.64365E+01	-2.39716E+02	5.27420E+02	1.17838E+03
	3	1.32096E+01	3.10591E+01	1.15998E+01	2.73212E+02	-5.42641E+02	-1.35631E+03
	4	-5.65461E+00	-2.09042E+01	-6.42647E+00	-9.37406E+01	1.72527E+02	4.74581E+02
Ds	0	1.00011E+00	2.47775E-03	-2.42766E-02	-6.24493E-02	2.41487E-01	3.91511E-01
	1	1.23421E+00	-5.05710E-01	8.22428E+00	5.88279E+01	-1.39487E+02	-2.87452E+02
	2	-8.03353E+00	-7.83160E+00	-8.30429E+00	-2.39965E+02	4.77471E+02	1.14028E+03
	3	1.42597E+01	3.57324E+01	2.91990E+00	2.70736E+02	-4.78440E+02	-1.30094E+03
	4	-6.00791E+00	-2.29682E+01	-3.78184E+00	-9.21874E+01	1.48234E+02	4.51893E+02
Rg	0	9.99975E-01	2.41925E-03	-2.26882E-02	-6.51219E-02	2.33958E-01	3.91263E-01
	1	1.42085E+00	-8.80256E-02	6.13985E+00	5.94426E+01	-1.27806E+02	-2.79367E+02
	2	-8.93265E+00	-1.09415E+01	2.24068E-01	-2.38922E+02	4.22794E+02	1.09495E+03
	3	1.53388E+01	4.08131E+01	-6.04035E+00	2.66685E+02	-4.08996E+02	-1.23702E+03

Table 3 (continued)

		$b_{j,k}$						
		j	k=1	k=2	k=3	k=4	k=5	k=6
Uub	4		-6.36755E+00	-2.51806E+01	-1.09260E+00	-9.00713E+01	1.22161E+02	4.26151E+02
	0		9.99822E-01	2.31254E-03	-2.08550E-02	-6.75815E-02	2.24607E-01	3.88796E-01
	1		1.61799E+00	4.00698E-01	3.92095E+00	5.97493E+01	-1.14882E+02	-2.69475E+02
	2		-9.86566E+00	-1.43946E+01	9.10466E+00	-2.36487E+02	3.63422E+02	1.04216E+03
	3		1.64443E+01	4.63204E+01	-1.52151E+01	2.60954E+02	-3.34406E+02	-1.16435E+03
Uut	4		-6.73227E+00	-2.75466E+01	1.61430E+00	-8.73612E+01	9.43594E+01	3.97300E+02
	0		9.99655E-01	2.15142E-03	-1.87711E-02	-6.97883E-02	2.13350E-01	3.83936E-01
	1		1.82545E+00	9.65942E-01	1.57686E+00	5.97207E+01	-1.00725E+02	-2.57723E+02
	2		-1.08305E+01	-1.82107E+01	1.82808E+01	-2.32560E+02	2.99460E+02	9.81786E+02
	3		1.75726E+01	5.22723E+01	-2.45237E+01	2.53451E+02	-2.54850E+02	-1.08283E+03
Uuq	4		-7.10059E+00	-3.00710E+01	4.30673E+00	-8.40296E+01	6.49087E+01	3.65326E+02
	0		9.99473E-01	1.92924E-03	-1.64318E-02	-7.17008E-02	2.00109E-01	3.76517E-01
	1		2.04302E+00	1.61334E+00	-8.82149E-01	5.93264E+01	-8.53384E+01	-2.44043E+02
	2		-1.18250E+01	-2.24092E+01	2.76900E+01	-2.27039E+02	2.31010E+02	9.13629E+02
	3		1.87198E+01	5.86859E+01	-3.38779E+01	2.44074E+02	-1.70518E+02	-9.92335E+02
Uup	4		-7.47086E+00	-3.27576E+01	6.94978E+00	-8.00487E+01	3.38953E+01	3.30205E+02
	0		9.99276E-01	1.63895E-03	-1.38361E-02	-7.32738E-02	1.84822E-01	3.66376E-01
	1		2.27037E+00	2.34860E+00	-3.44417E+00	5.85364E+01	-6.87344E+01	-2.28373E+02
	2		-1.28460E+01	-2.70092E+01	3.72616E+01	-2.19825E+02	1.58211E+02	8.37547E+02
	3		1.98811E+01	6.55768E+01	-4.31793E+01	2.32735E+02	-8.16486E+01	-8.92777E+02
Uuh	4		-7.84119E+00	-3.56097E+01	9.50496E+00	-7.53943E+01	1.42399E+00	2.91936E+02
	0		9.99064E-01	1.27324E-03	-1.09916E-02	-7.44696E-02	1.67497E-01	3.53455E-01
	1		2.50713E+00	3.17754E+00	-6.09661E+00	5.73172E+01	-5.09157E+01	-2.10626E+02
	2		-1.38905E+01	-3.20289E+01	4.69203E+01	-2.10810E+02	8.11857E+01	7.53321E+02
	3		2.10515E+01	7.29586E+01	-5.23231E+01	2.19337E+02	1.15276E+01	-7.84022E+02
Uus	4		-8.20951E+00	-3.86295E+01	1.19315E+01	-7.00414E+01	-3.23996E+01	2.50503E+02
	0		9.98836E-01	8.23950E-04	-7.89491E-03	-7.52274E-02	1.48028E-01	3.37491E-01
	1		2.75270E+00	4.10593E+00	-8.82051E+00	5.56392E+01	-3.19293E+01	-1.90772E+02
	2		-1.49543E+01	-3.74855E+01	5.65661E+01	-1.99903E+02	2.22903E-01	6.60953E+02
	3		2.22247E+01	8.08420E+01	-6.11776E+01	2.03805E+02	1.08591E+02	-6.66179E+02
Uuo	4		-8.57337E+00	-4.18175E+01	1.41794E+01	-6.39741E+01	-6.74045E+01	2.05974E+02
	0		9.98592E-01	2.82966E-04	-4.55740E-03	-7.55030E-02	1.26429E-01	3.18414E-01
	1		3.00639E+00	5.13948E+00	-1.15960E+01	5.34702E+01	-1.18151E+01	-1.68761E+02
	2		-1.60324E+01	-4.33944E+01	6.60933E+01	-1.87010E+02	-8.43973E+01	5.60386E+02
	3		2.33936E+01	8.92345E+01	-6.96034E+01	1.86068E+02	2.09119E+02	-5.39313E+02
Uuo	4		-8.93007E+00	-4.51728E+01	1.61962E+01	-5.71780E+01	-1.03415E+02	1.58410E+02

Table 4

 $b_{j,k}$ with $j = 0, 4$ and $k = 1, 6$ coefficients for positrons.

		$b_{j,k}$						
		j	k=1	k=2	k=3	k=4	k=5	k=6
H	0		1.00000E+00	-2.63961E-08	-1.05983E-07	6.98859E-08	9.77498E-07	7.22885E-07
	1		-1.15697E-02	-1.62210E-02	2.56754E-05	5.94651E-05	-1.25966E-04	-4.19100E-04
	2		-2.49475E-01	-7.06540E-01	-5.00006E-01	-1.93135E-04	3.28434E-04	1.24240E-03
	3		-2.01733E-04	-1.52457E-04	-3.45949E-05	1.75794E-04	-1.53568E-04	-9.52819E-04
	4		5.43511E-05	1.80300E-05	-9.61947E-06	-5.72438E-05	3.75348E-05	2.95392E-04
He	0		1.00000E+00	-3.71563E-08	2.54023E-07	2.73203E-07	-1.93946E-06	-3.30422E-06
	1		-2.29788E-02	-3.24498E-02	2.27671E-04	1.90496E-04	-1.58887E-03	-3.00192E-03
	2		-2.40858E-01	-6.94758E-01	-5.00597E-01	-7.88898E-04	6.37319E-03	1.15722E-02
	3		-7.54571E-04	-5.41978E-04	4.55243E-04	6.88365E-04	-5.90329E-03	-1.04595E-02
	4		2.02061E-04	5.13597E-05	-2.37821E-04	-2.22551E-04	1.92190E-03	3.39201E-03
Li	0		1.00000E+00	-6.61242E-08	3.14624E-07	3.78658E-07	-2.45678E-06	-4.73353E-06
	1		-3.42080E-02	-4.87208E-02	1.75679E-04	1.55745E-04	-6.27212E-04	-2.79906E-03
	2		-2.32061E-01	-6.82670E-01	-5.00715E-01	-1.62390E-03	9.13871E-03	2.08325E-02
	3		-1.60732E-03	-1.28113E-03	4.24244E-04	1.48822E-03	-8.54039E-03	-1.89911E-02
	4		4.28858E-04	1.40228E-04	-3.39983E-04	-4.85420E-04	2.79129E-03	6.17637E-03
Be	0		1.00000E+00	-8.54294E-08	3.60088E-07	3.06775E-07	-1.60440E-06	-3.89561E-06
	1		-4.52455E-02	-6.50181E-02	-1.35878E-04	-4.75424E-04	4.01616E-03	3.49910E-03

Table 4 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
	2	-2.23117E-01	-6.70328E-01	-5.00843E-01	-2.03032E-03	8.97348E-03	2.62014E-02
	3	-2.73626E-03	-2.31306E-03	5.37447E-04	2.12418E-03	-9.99203E-03	-2.62119E-02
	4	7.29502E-04	2.68752E-04	-5.42321E-04	-7.05686E-04	3.34604E-03	8.64321E-03
B	0	1.00000E+00	-1.34641E-07	-2.19322E-07	-8.96986E-08	3.06738E-06	9.15255E-07
	1	-5.60680E-02	-8.13384E-02	-1.25850E-03	-2.47621E-03	1.57853E-02	2.15886E-02
	2	-2.14102E-01	-6.57738E-01	-4.99411E-01	-1.62861E-05	-3.08306E-03	1.42231E-02
	3	-4.07182E-03	-3.63517E-03	-7.11399E-04	7.88606E-04	-2.22086E-03	-2.05660E-02
	4	1.08339E-03	4.39517E-04	-3.48395E-04	-2.96024E-04	9.43883E-04	7.02341E-03
C	0	9.99999E-01	-2.01536E-07	-2.43353E-07	-6.26168E-07	4.50746E-06	3.19698E-06
	1	-6.66775E-02	-9.77011E-02	-2.92288E-03	-5.72193E-03	3.38850E-02	5.16453E-02
	2	-2.05015E-01	-6.44838E-01	-4.97373E-01	3.79528E-03	-2.40521E-02	-1.38486E-02
	3	-5.62473E-03	-5.31084E-03	-2.23196E-03	-1.69424E-03	1.07593E-02	-5.15036E-03
	4	1.49631E-03	6.75768E-04	-1.21222E-04	4.73516E-04	-3.07173E-03	2.36262E-03
N	0	9.99999E-01	-3.29166E-07	-5.33244E-07	-1.11684E-06	8.57093E-06	8.69030E-06
	1	-7.70567E-02	-1.14122E-01	-5.26696E-03	-1.01861E-02	5.89303E-02	9.46008E-02
	2	-1.95925E-01	-6.31578E-01	-4.93974E-01	9.47957E-03	-5.87513E-02	-6.39687E-02
	3	-7.32710E-03	-7.39261E-03	-4.84392E-03	-5.32266E-03	3.41970E-02	2.60213E-02
	4	1.94765E-03	9.97847E-04	4.19732E-04	1.60667E-03	-1.05245E-02	-7.42775E-03
O	0	9.99999E-01	-4.66583E-07	-7.22192E-07	-1.98661E-06	1.23013E-05	1.47981E-05
	1	-8.72102E-02	-1.30583E-01	-7.85695E-03	-1.58723E-02	8.72272E-02	1.46473E-01
	2	-1.86831E-01	-6.18034E-01	-4.90257E-01	1.75633E-02	-9.87667E-02	-1.28102E-01
	3	-9.18418E-03	-9.79790E-03	-7.53141E-03	-1.06985E-02	5.99496E-02	6.51713E-02
	4	2.44097E-03	1.38055E-03	9.44623E-04	3.31625E-03	-1.87816E-02	-1.98735E-02
F	0	9.99999E-01	-6.33597E-07	-9.21708E-07	-3.04874E-06	1.68020E-05	2.25753E-05
	1	-9.71347E-02	-1.47092E-01	-1.04691E-02	-2.24563E-02	1.16763E-01	2.04465E-01
	2	-1.77760E-01	-6.04187E-01	-4.86471E-01	2.76011E-02	-1.42274E-01	-2.03878E-01
	3	-1.11684E-02	-1.25461E-02	-1.01695E-02	-1.74501E-02	8.73345E-02	1.11298E-01
	4	2.96875E-03	1.83334E-03	1.42155E-03	5.48622E-03	-2.77099E-02	-3.47727E-02
Ne	0	9.99999E-01	-8.31912E-07	-8.95264E-07	-4.13450E-06	1.94766E-05	2.85275E-05
	1	-1.06829E-01	-1.63663E-01	-1.28280E-02	-2.93936E-02	1.44582E-01	2.63884E-01
	2	-1.68734E-01	-5.90005E-01	-4.83100E-01	3.85352E-02	-1.83863E-01	-2.82527E-01
	3	-1.32601E-02	-1.56645E-02	-1.23736E-02	-2.46471E-02	1.11881E-01	1.56900E-01
	4	3.52612E-03	2.36734E-03	1.72495E-03	7.82216E-03	-3.58623E-02	-4.97178E-02
Na	0	9.99998E-01	-1.05528E-06	-6.99187E-07	-5.48613E-06	2.11682E-05	3.43426E-05
	1	-1.16292E-01	-1.80299E-01	-1.46747E-02	-3.64327E-02	1.68178E-01	3.21368E-01
	2	-1.59771E-01	-5.75495E-01	-4.80630E-01	5.03005E-02	-2.19171E-01	-3.59389E-01
	3	-1.54415E-02	-1.91445E-02	-1.37650E-02	-3.24205E-02	1.30291E-01	1.98954E-01
	4	4.10873E-03	2.98228E-03	1.73164E-03	1.03773E-02	-4.21798E-02	-6.37748E-02
Mg	0	9.99998E-01	-1.34039E-06	-1.96569E-07	-6.23873E-06	2.01170E-05	3.57585E-05
	1	-1.25521E-01	-1.97018E-01	-1.59161E-02	-4.29269E-02	1.86135E-01	3.73582E-01
	2	-1.50896E-01	-5.60600E-01	-4.79096E-01	6.14058E-02	-2.46683E-01	-4.28835E-01
	3	-1.76863E-02	-2.30408E-02	-1.44138E-02	-3.93907E-02	1.42116E-01	2.33294E-01
	4	4.70933E-03	3.69893E-03	1.46355E-03	1.26977E-02	-4.65229E-02	-7.55944E-02
Al	0	9.99998E-01	-1.66526E-06	2.86994E-07	-7.06381E-06	1.99241E-05	3.90205E-05
	1	-1.34513E-01	-2.13815E-01	-1.64697E-02	-4.87511E-02	1.97477E-01	4.19240E-01
	2	-1.42127E-01	-5.45349E-01	-4.78603E-01	7.21116E-02	-2.65433E-01	-4.91123E-01
	3	-1.99772E-02	-2.73217E-02	-1.42989E-02	-4.60473E-02	1.47300E-01	2.61800E-01
	4	5.32352E-03	4.50917E-03	9.11673E-04	1.49536E-02	-4.88699E-02	-8.58220E-02
Si	0	9.99998E-01	-2.02835E-06	1.05777E-06	-7.72567E-06	1.69130E-05	3.88243E-05
	1	-1.43268E-01	-2.30700E-01	-1.62160E-02	-5.33915E-02	2.00710E-01	4.55181E-01
	2	-1.33480E-01	-5.29716E-01	-4.79482E-01	8.12550E-02	-2.71756E-01	-5.38863E-01
	3	-2.22979E-02	-3.20101E-02	-1.31294E-02	-5.13703E-02	1.42703E-01	2.78031E-01
	4	5.94727E-03	5.42309E-03	-2.46612E-05	1.68127E-02	-4.81535E-02	-9.23173E-02
P	0	9.99997E-01	-2.45028E-06	1.90684E-06	-7.87635E-06	1.26832E-05	3.60947E-05
	1	-1.51781E-01	-2.47668E-01	-1.52167E-02	-5.66269E-02	1.95686E-01	4.80404E-01
	2	-1.24981E-01	-5.13712E-01	-4.81543E-01	8.84855E-02	-2.65878E-01	-5.70906E-01
	3	-2.46237E-02	-3.70970E-02	-1.11407E-02	-5.51224E-02	1.29134E-01	2.81832E-01
	4	6.57359E-03	6.44093E-03	-1.27284E-03	1.81886E-02	-4.46216E-02	-9.50057E-02
S	0	9.99997E-01	-2.90852E-06	2.74924E-06	-8.07366E-06	8.59057E-06	3.41872E-05
	1	-1.60050E-01	-2.64711E-01	-1.35619E-02	-5.84638E-02	1.82876E-01	4.95464E-01
	2	-1.16647E-01	-4.97365E-01	-4.84589E-01	9.42103E-02	-2.49196E-01	-5.90241E-01
	3	-2.69371E-02	-4.25516E-02	-8.53860E-03	-5.78939E-02	1.08283E-01	2.77047E-01

Table 4 (continued)

	j	$b_{j,k}$					
		k=1	k=2	k=3	k=4	k=5	k=6
Cl	4	7.19786E-03	7.55474E-03	-2.77282E-03	1.92789E-02	-3.87745E-02	-9.51075E-02
	0	9.99997E-01	-3.43342E-06	3.66943E-06	-7.57715E-06	3.33705E-06	2.94070E-05
	1	-1.68070E-01	-2.81840E-01	-1.13145E-02	-5.83113E-02	1.62350E-01	4.98702E-01
	2	-1.08498E-01	-4.80624E-01	-4.88568E-01	9.66929E-02	-2.21203E-01	-5.91460E-01
	3	-2.92193E-02	-4.84272E-02	-5.36121E-03	-5.79946E-02	7.96746E-02	2.58455E-01
Ar	4	7.81488E-03	8.78493E-03	-4.51941E-03	1.95226E-02	-3.03955E-02	-9.08335E-02
	0	9.99997E-01	-4.19813E-06	5.18039E-06	-1.81063E-06	2.61123E-06	2.14096E-05
	1	-1.75845E-01	-2.99065E-01	-8.45957E-03	-5.55301E-02	1.35545E-01	4.90797E-01
	2	-1.00533E-01	-4.63446E-01	-4.93718E-01	9.38312E-02	-1.85980E-01	-5.76684E-01
	3	-3.14706E-02	-5.47751E-02	-1.34067E-03	-5.32597E-02	4.77261E-02	2.28681E-01
K	4	8.42573E-03	1.01520E-02	-6.60649E-03	1.81850E-02	-2.09323E-02	-8.30172E-02
	0	9.99996E-01	-4.78732E-06	6.44595E-06	-8.20875E-07	-5.43702E-06	1.27126E-05
	1	-1.83367E-01	-3.16296E-01	-5.28081E-03	-5.18988E-02	1.01190E-01	4.72879E-01
	2	-9.27851E-02	-4.46119E-01	-4.99342E-01	9.18166E-02	-1.37216E-01	-5.48138E-01
	3	-3.36579E-02	-6.12952E-02	2.85727E-03	-5.02898E-02	5.32032E-03	1.89771E-01
Ca	4	9.02033E-03	1.15589E-02	-8.82479E-03	1.74522E-02	-7.90938E-03	-7.21991E-02
	0	9.99996E-01	-4.99651E-06	9.85067E-06	-3.06013E-06	-3.75834E-05	-1.99197E-05
	1	-1.90639E-01	-3.33499E-01	-1.46206E-03	-4.67782E-02	5.67814E-02	4.40289E-01
	2	-8.52545E-02	-4.28745E-01	-5.06772E-01	8.85811E-02	-6.46795E-02	-4.88733E-01
	3	-3.57823E-02	-6.78790E-02	8.68379E-03	-4.70307E-02	-5.85800E-02	1.23822E-01
Sc	4	9.59982E-03	1.29714E-02	-1.16619E-02	1.66507E-02	1.23891E-02	-5.24059E-02
	0	9.99996E-01	-5.64027E-06	1.12089E-05	-1.39130E-06	-4.81007E-05	-3.31794E-05
	1	-1.97654E-01	-3.50787E-01	2.15113E-03	-3.92435E-02	1.05595E-02	4.01060E-01
	2	-7.79716E-02	-4.10908E-01	-5.13292E-01	8.07516E-02	4.25834E-03	-4.25183E-01
	3	-3.78112E-02	-7.49813E-02	1.32882E-02	-3.98722E-02	-1.14896E-01	5.93661E-02
Ti	4	1.01540E-02	1.45455E-02	-1.41660E-02	1.45535E-02	3.02220E-02	-3.31854E-02
	0	9.99996E-01	-6.18069E-06	1.16691E-05	-1.56787E-06	-5.44130E-05	-3.81630E-05
	1	-2.04406E-01	-3.68067E-01	5.48049E-03	-3.01211E-02	-3.74218E-02	3.56766E-01
	2	-7.09656E-02	-3.92903E-01	-5.18975E-01	7.10868E-02	7.22547E-02	-3.59705E-01
	3	-3.97147E-02	-8.22933E-02	1.68611E-02	-3.17533E-02	-1.67420E-01	-2.32943E-03
V	4	1.06736E-02	1.61803E-02	-1.64165E-02	1.21314E-02	4.70242E-02	-1.47295E-02
	0	9.99996E-01	-6.90601E-06	1.09846E-05	2.41652E-07	-5.22234E-05	-3.81638E-05
	1	-2.10895E-01	-3.85368E-01	8.29726E-03	-1.88946E-02	-8.53325E-02	3.08009E-01
	2	-6.42450E-02	-3.74600E-01	-5.23304E-01	5.76144E-02	1.34881E-01	-2.92287E-01
	3	-4.14842E-02	-8.99614E-02	1.89268E-02	-2.05684E-02	-2.11877E-01	-6.16277E-02
Cr	4	1.11563E-02	1.79278E-02	-1.82607E-02	8.67045E-03	6.14040E-02	3.12672E-03
	0	9.99996E-01	-7.61454E-06	1.17901E-05	2.55920E-06	-5.99752E-05	-4.97952E-05
	1	-2.17141E-01	-4.02610E-01	1.11161E-02	-6.14320E-03	-1.37177E-01	2.51307E-01
	2	-5.77524E-02	-3.56238E-01	-5.28278E-01	4.20781E-02	2.07581E-01	-2.08928E-01
	3	-4.31798E-02	-9.77438E-02	2.16529E-02	-8.10625E-03	-2.64892E-01	-1.33648E-01
Mn	4	1.16226E-02	1.97110E-02	-2.04207E-02	4.74691E-03	7.88928E-02	2.54391E-02
	0	9.99996E-01	-8.30050E-06	1.28467E-05	4.76135E-06	-7.10175E-05	-6.53661E-05
	1	-2.23135E-01	-4.19786E-01	1.36188E-02	8.10272E-03	-1.90880E-01	1.88778E-01
	2	-5.15229E-02	-3.37823E-01	-5.33034E-01	2.44228E-02	2.85150E-01	-1.14661E-01
	3	-4.47635E-02	-1.05641E-01	2.41923E-02	5.67830E-03	-3.21525E-01	-2.13608E-01
Fe	4	1.20602E-02	2.15324E-02	-2.26173E-02	3.45116E-04	9.78965E-02	5.06733E-02
	0	9.99995E-01	-9.07299E-06	1.22647E-05	7.72193E-06	-6.89733E-05	-6.83607E-05
	1	-2.28867E-01	-4.36894E-01	1.50926E-02	2.37363E-02	-2.40614E-01	1.27076E-01
	2	-4.56095E-02	-3.19317E-01	-5.35345E-01	4.68063E-03	3.49262E-01	-3.00149E-02
	3	-4.61790E-02	-1.13706E-01	2.42606E-02	2.08436E-02	-3.62865E-01	-2.80428E-01
Co	4	1.24508E-02	2.34125E-02	-2.40936E-02	-4.57624E-03	1.12143E-01	7.18756E-02
	0	9.99995E-01	-9.78027E-06	1.22471E-05	1.00363E-05	-7.20555E-05	-7.50524E-05
	1	-2.34348E-01	-4.53885E-01	1.58318E-02	4.03231E-02	-2.88712E-01	6.47722E-02
	2	-3.99817E-02	-3.00861E-01	-5.36419E-01	-1.58753E-02	4.09540E-01	5.18828E-02
	3	-4.74575E-02	-1.21798E-01	2.31934E-02	3.60665E-02	-3.99528E-01	-3.41811E-01
Ni	4	1.28049E-02	2.53069E-02	-2.52955E-02	-9.58190E-03	1.25184E-01	9.16313E-02
	0	9.99995E-01	-1.04899E-05	1.23373E-05	1.28647E-05	-7.66918E-05	-8.52106E-05
	1	-2.39585E-01	-4.70739E-01	1.59910E-02	5.80188E-02	-3.36548E-01	-7.46874E-04
	2	-3.46232E-02	-2.82488E-01	-5.36952E-01	-3.81406E-02	4.72111E-01	1.42141E-01
	3	-4.86143E-02	-1.29896E-01	2.17785E-02	5.23996E-02	-4.38375E-01	-4.10085E-01
	4	1.31278E-02	2.72121E-02	-2.64838E-02	-1.50435E-02	1.39303E-01	1.14084E-01

Table 4 (continued)

		$b_{j,k}$					
	j	k=1	k=2	k=3	k=4	k=5	k=6
Cu	0	9.99995E-01	-1.11960E-05	1.22987E-05	1.58216E-05	-8.07622E-05	-9.52147E-05
	1	-2.44577E-01	-4.87435E-01	1.51539E-02	7.64811E-02	-3.80560E-01	-6.45690E-02
	2	-2.95563E-02	-2.64238E-01	-5.35677E-01	-6.12348E-02	5.26192E-01	2.25957E-01
	3	-4.96243E-02	-1.37968E-01	1.87361E-02	6.89830E-02	-4.68533E-01	-4.70288E-01
	4	1.34111E-02	2.91202E-02	-2.72355E-02	-2.06877E-02	1.50921E-01	1.34325E-01
Zn	0	9.99995E-01	-1.18594E-05	1.19562E-05	1.84543E-05	-8.33692E-05	-1.03387E-04
	1	-2.49326E-01	-5.03959E-01	1.34275E-02	9.56498E-02	-4.21777E-01	-1.27967E-01
	2	-2.47795E-02	-2.46127E-01	-5.33031E-01	-8.51586E-02	5.75930E-01	3.08568E-01
	3	-5.04870E-02	-1.46003E-01	1.45363E-02	8.58268E-02	-4.94391E-01	-5.27872E-01
	4	1.36549E-02	3.10289E-02	-2.76968E-02	-2.65148E-02	1.61418E-01	1.54058E-01
Ga	0	9.99995E-01	-1.25029E-05	1.03925E-05	2.03923E-05	-7.56190E-05	-9.81458E-05
	1	-2.53834E-01	-5.20282E-01	1.04736E-02	1.15144E-01	-4.57140E-01	-1.86638E-01
	2	-2.03038E-02	-2.28223E-01	-5.27977E-01	-1.08978E-01	6.11931E-01	3.77036E-01
	3	-5.11885E-02	-1.53946E-01	8.13661E-03	1.02071E-01	-5.06445E-01	-5.69832E-01
	4	1.38546E-02	3.29229E-02	-2.75224E-02	-3.22619E-02	1.67650E-01	1.69018E-01
Ge	0	9.99995E-01	-1.32957E-05	8.54079E-06	2.43056E-05	-6.73005E-05	-9.66759E-05
	1	-2.58106E-01	-5.36422E-01	6.44176E-03	1.35448E-01	-4.87849E-01	-2.43033E-01
	2	-1.61263E-02	-2.10432E-01	-5.21143E-01	-1.34601E-01	6.39567E-01	4.41608E-01
	3	-5.17296E-02	-1.61902E-01	2.50372E-04	1.19767E-01	-5.10901E-01	-6.07646E-01
	4	1.40102E-02	3.48389E-02	-2.69503E-02	-3.86117E-02	1.71722E-01	1.83077E-01
As	0	9.99995E-01	-1.40602E-05	6.76125E-06	2.82630E-05	-5.97299E-05	-9.63731E-05
	1	-2.62151E-01	-5.52312E-01	1.41196E-03	1.55882E-01	-5.14490E-01	-2.96596E-01
	2	-1.22226E-02	-1.92953E-01	-5.12829E-01	-1.60006E-01	6.61216E-01	5.01314E-01
	3	-5.21333E-02	-1.69673E-01	-8.79982E-03	1.36882E-01	-5.10330E-01	-6.40524E-01
	4	1.41294E-02	3.67137E-02	-2.60802E-02	-4.49061E-02	1.74437E-01	1.95949E-01
Se	0	9.99996E-01	-1.46234E-05	5.78798E-06	3.09303E-05	-5.94048E-05	-1.02715E-04
	1	-2.65984E-01	-5.67919E-01	-4.39481E-03	1.76363E-01	-5.38797E-01	-3.49511E-01
	2	-8.56306E-03	-1.75876E-01	-5.03813E-01	-1.85163E-01	6.83169E-01	5.64370E-01
	3	-5.24276E-02	-1.77175E-01	-1.81830E-02	1.53442E-01	-5.11442E-01	-6.77238E-01
	4	1.42214E-02	3.85217E-02	-2.51813E-02	-5.11578E-02	1.77976E-01	2.10488E-01
Br	0	9.99996E-01	-1.51841E-05	1.14760E-06	3.01648E-05	-2.57597E-05	-5.94205E-05
	1	-2.69584E-01	-5.83246E-01	-1.19601E-02	1.96030E-01	-5.51786E-01	-3.88462E-01
	2	-5.22711E-03	-1.59155E-01	-4.90729E-01	-2.07367E-01	6.74785E-01	5.85675E-01
	3	-5.25260E-02	-1.84466E-01	-3.14465E-02	1.66654E-01	-4.81979E-01	-6.70364E-01
	4	1.42571E-02	4.02834E-02	-2.30679E-02	-5.64446E-02	1.71572E-01	2.10893E-01
Kr	0	9.99996E-01	-1.56599E-05	-1.00540E-06	3.20395E-05	-1.58142E-05	-5.30333E-05
	1	-2.72984E-01	-5.98270E-01	-2.01789E-02	2.16021E-01	-5.63685E-01	-4.29326E-01
	2	-2.11870E-03	-1.42849E-01	-4.77423E-01	-2.30820E-01	6.71934E-01	6.21234E-01
	3	-5.25271E-02	-1.91491E-01	-4.44960E-02	1.81047E-01	-4.60173E-01	-6.79635E-01
	4	1.42694E-02	4.19825E-02	-2.11011E-02	-6.22845E-02	1.67959E-01	2.17083E-01
Rb	0	9.99996E-01	-1.60740E-05	-2.21886E-06	3.40021E-05	-1.44508E-05	-5.69472E-05
	1	-2.76186E-01	-6.12968E-01	-2.91285E-02	2.35616E-01	-5.73179E-01	-4.68306E-01
	2	7.56429E-04	-1.27008E-01	-4.63600E-01	-2.53305E-01	6.70130E-01	6.58462E-01
	3	-5.24212E-02	-1.98209E-01	-5.76436E-02	1.94359E-01	-4.41348E-01	-6.91960E-01
	4	1.42547E-02	4.36073E-02	-1.91709E-02	-6.79360E-02	1.65550E-01	2.24687E-01
Sr	0	9.99996E-01	-1.64436E-05	-4.31347E-06	3.54126E-05	-5.47913E-06	-5.11367E-05
	1	-2.79184E-01	-6.27336E-01	-3.93501E-02	2.54555E-01	-5.75193E-01	-4.98863E-01
	2	3.36753E-03	-1.11627E-01	-4.47403E-01	-2.74189E-01	6.52275E-01	6.75819E-01
	3	-5.21730E-02	-2.04632E-01	-7.28294E-02	2.06008E-01	-4.07720E-01	-6.85082E-01
	4	1.42012E-02	4.51633E-02	-1.66308E-02	-7.32148E-02	1.58444E-01	2.26349E-01
Y	0	9.99996E-01	-1.66505E-05	-7.18581E-06	3.41224E-05	1.15080E-05	-3.00315E-05
	1	-2.81990E-01	-6.41333E-01	-5.06942E-02	2.72474E-01	-5.70812E-01	-5.21648E-01
	2	5.73305E-03	-9.68200E-02	-4.29240E-01	-2.92343E-01	6.21436E-01	6.74903E-01
	3	-5.17977E-02	-2.10648E-01	-8.96697E-02	2.14804E-01	-3.62155E-01	-6.60187E-01
	4	1.41135E-02	4.66142E-02	-1.35922E-02	-7.77187E-02	1.47466E-01	2.22290E-01
Zr	0	9.99996E-01	-1.67956E-05	-8.97030E-06	3.29841E-05	1.95944E-05	-1.94280E-05
	1	-2.84617E-01	-6.54968E-01	-6.26662E-02	2.89739E-01	-5.64239E-01	-5.42316E-01
	2	7.88727E-03	-8.25453E-02	-4.10758E-01	-3.09242E-01	5.92020E-01	6.75568E-01
	3	-5.13278E-02	-2.16307E-01	-1.06433E-01	2.22378E-01	-3.19951E-01	-6.38486E-01
	4	1.40021E-02	4.79782E-02	-1.06256E-02	-8.19977E-02	1.37688E-01	2.19570E-01
Nb	0	9.99996E-01	-1.69109E-05	-1.08484E-05	3.25312E-05	2.50532E-05	-1.51081E-05
	1	-2.87068E-01	-6.68206E-01	-7.53768E-02	3.05977E-01	-5.55654E-01	-5.60855E-01

Table 4 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
Mo	2	9.82986E-03	-6.88940E-02	-3.91544E-01	-3.23913E-01	5.64597E-01	6.78390E-01
	3	-5.07599E-02	-2.21522E-01	-1.23543E-01	2.27827E-01	-2.81795E-01	-6.20957E-01
	4	1.38657E-02	4.92280E-02	-7.58711E-03	-8.57699E-02	1.29323E-01	2.18540E-01
	0	9.99997E-01	-1.70602E-05	-1.31470E-05	3.30741E-05	3.69378E-05	-4.74005E-06
	1	-2.89350E-01	-6.81125E-01	-8.91796E-02	3.22195E-01	-5.38594E-01	-5.70742E-01
	2	1.15641E-02	-5.55927E-02	-3.70290E-01	-3.39787E-01	5.16721E-01	6.60586E-01
	3	-5.00932E-02	-2.26583E-01	-1.42412E-01	2.34704E-01	-2.23983E-01	-5.83370E-01
Tc	4	1.37037E-02	5.04599E-02	-3.99826E-03	-9.01942E-02	1.14460E-01	2.11065E-01
	0	9.99997E-01	-1.71497E-05	-1.47293E-05	3.39505E-05	4.12114E-05	-4.67233E-06
	1	-2.91468E-01	-6.93627E-01	-1.03371E-01	3.37345E-01	-5.21461E-01	-5.80338E-01
	2	1.31012E-02	-4.29546E-02	-3.49321E-01	-3.53555E-01	4.76616E-01	6.50725E-01
	3	-4.93364E-02	-2.31171E-01	-1.60612E-01	2.39643E-01	-1.76058E-01	-5.55826E-01
	4	1.35187E-02	5.15694E-02	-6.57013E-04	-9.41718E-02	1.02838E-01	2.07094E-01
	0	9.99997E-01	-1.71505E-05	-1.68161E-05	3.37003E-05	4.99482E-05	2.81614E-06
Ru	1	-2.93422E-01	-7.05724E-01	-1.18440E-01	3.51330E-01	-4.99397E-01	-5.83705E-01
	2	1.44239E-02	-3.09324E-02	-3.26859E-01	-3.64987E-01	4.27192E-01	6.28206E-01
	3	-4.84672E-02	-2.35337E-01	-1.80043E-01	2.42424E-01	-1.19897E-01	-5.16535E-01
	4	1.33028E-02	5.25748E-02	3.07617E-03	-9.76271E-02	8.83904E-02	1.99339E-01
	0	9.99997E-01	-1.71432E-05	-1.87684E-05	3.43631E-05	5.65598E-05	5.14426E-06
	1	-2.95225E-01	-7.17422E-01	-1.34090E-01	3.64444E-01	-4.74674E-01	-5.83985E-01
	2	1.55614E-02	-1.94920E-02	-3.03857E-01	-3.75242E-01	3.76112E-01	6.04065E-01
Rh	3	-4.75129E-02	-2.39123E-01	-1.99702E-01	2.44322E-01	-6.36892E-02	-4.77415E-01
	4	1.30651E-02	5.34896E-02	6.87014E-03	-1.00987E-01	7.38466E-02	1.91787E-01
	0	9.99997E-01	-1.70410E-05	-2.02072E-05	3.43416E-05	6.00349E-05	5.10394E-06
	1	-2.96890E-01	-7.28701E-01	-1.50015E-01	3.76542E-01	-4.49253E-01	-5.83174E-01
	2	1.65464E-02	-8.69112E-03	-2.81232E-01	-3.83919E-01	3.29264E-01	5.84405E-01
	3	-4.65037E-02	-2.42471E-01	-2.18674E-01	2.44939E-01	-1.33235E-02	-4.44574E-01
	4	1.28151E-02	5.42961E-02	1.04332E-02	-1.04118E-01	6.10792E-02	1.86372E-01
Pd	0	9.99997E-01	-1.68703E-05	-2.19148E-05	3.36605E-05	6.58777E-05	9.29556E-06
	1	-2.98413E-01	-7.39556E-01	-1.66572E-01	3.87266E-01	-4.19880E-01	-5.76264E-01
	2	1.73553E-02	1.45800E-03	-2.57648E-01	-3.89849E-01	2.75001E-01	5.51655E-01
	3	-4.54112E-02	-2.45372E-01	-2.38393E-01	2.43047E-01	4.35941E-02	-3.99374E-01
	4	1.25429E-02	5.49905E-02	1.42497E-02	-1.06608E-01	4.59332E-02	1.76851E-01
	0	9.99998E-01	-1.63851E-05	-2.41130E-05	3.06863E-05	7.51386E-05	2.04334E-05
	1	-2.99804E-01	-7.49931E-01	-1.83831E-01	3.96114E-01	-3.86250E-01	-5.62334E-01
Ag	2	1.80076E-02	1.07684E-02	-2.32847E-01	-3.91521E-01	2.12426E-01	5.03397E-01
	3	-4.42535E-02	-2.47631E-01	-2.59102E-01	2.37167E-01	1.07684E-01	-3.39917E-01
	4	1.22546E-02	5.55098E-02	1.83927E-02	-1.07983E-01	2.82674E-02	1.62721E-01
	0	9.99998E-01	-1.61044E-05	-2.53291E-05	2.98967E-05	7.74839E-05	2.04178E-05
	1	-3.01071E-01	-7.59936E-01	-2.01146E-01	4.04409E-01	-3.53023E-01	-5.49009E-01
	2	1.85178E-02	1.96270E-02	-2.08871E-01	-3.93442E-01	1.56441E-01	4.64481E-01
	3	-4.30409E-02	-2.49659E-01	-2.78724E-01	2.31999E-01	1.63731E-01	-2.91708E-01
Cd	4	1.19531E-02	5.59897E-02	2.21905E-02	-1.09785E-01	1.30173E-02	1.52276E-01
	0	9.99998E-01	-1.56344E-05	-2.12485E-05	2.74332E-05	4.12295E-05	-1.77772E-05
	1	-3.02233E-01	-7.69486E-01	-2.18133E-01	4.10915E-01	-3.22343E-01	-5.35716E-01
	2	1.89406E-02	2.77392E-02	-1.87032E-01	-3.91506E-01	1.14703E-01	4.33675E-01
	3	-4.18293E-02	-2.51147E-01	-2.95835E-01	2.23293E-01	2.03236E-01	-2.54139E-01
	4	1.16569E-02	5.63284E-02	2.51602E-02	-1.10618E-01	3.10746E-03	1.45469E-01
	0	9.99998E-01	-1.52486E-05	-2.18685E-05	2.63797E-05	3.96735E-05	-2.19621E-05
Sb	1	-3.03266E-01	-7.78634E-01	-2.35957E-01	4.16585E-01	-2.86177E-01	-5.16301E-01
	2	1.91815E-02	3.52883E-02	-1.63056E-01	-3.88945E-01	5.77365E-02	3.87668E-01
	3	-4.05134E-02	-2.52287E-01	-3.15080E-01	2.14402E-01	2.58325E-01	-2.01326E-01
	4	1.13302E-02	5.65893E-02	2.88772E-02	-1.11575E-01	-1.23904E-02	1.33369E-01
	0	9.99998E-01	-1.49384E-05	-1.85668E-05	2.64379E-05	9.32927E-06	-5.90939E-05
	1	-3.04204E-01	-7.87379E-01	-2.53267E-01	4.21300E-01	-2.54104E-01	-5.00591E-01
	2	1.93435E-02	4.22782E-02	-1.41547E-01	-3.85439E-01	1.84081E-02	3.60351E-01
Te	3	-3.91987E-02	-2.53089E-01	-3.31589E-01	2.05043E-01	2.94128E-01	-1.69326E-01
	4	1.10080E-02	5.67762E-02	3.17179E-02	-1.12568E-01	-2.18340E-02	1.28031E-01
	0	9.99998E-01	-1.42427E-05	-2.49446E-05	1.53930E-05	6.24366E-05	3.34028E-05
	1	-3.05013E-01	-7.95643E-01	-2.72262E-01	4.22919E-01	-2.07694E-01	-4.61381E-01
	2	1.92976E-02	4.84288E-02	-1.14760E-01	-3.73536E-01	-6.77231E-02	2.56912E-01
	3	-3.77449E-02	-2.53251E-01	-3.53610E-01	1.87283E-01	3.79081E-01	-5.75145E-02
	4						
I	0	9.99998E-01	-1.42427E-05	-2.49446E-05	1.53930E-05	6.24366E-05	3.34028E-05
	1	-3.05013E-01	-7.95643E-01	-2.72262E-01	4.22919E-01	-2.07694E-01	-4.61381E-01
	2	1.92976E-02	4.84288E-02	-1.14760E-01	-3.73536E-01	-6.77231E-02	2.56912E-01
	3	-3.77449E-02	-2.53251E-01	-3.53610E-01	1.87283E-01	3.79081E-01	-5.75145E-02
	4						
	0	9.99998E-01	-1.42427E-05	-2.49446E-05	1.53930E-05	6.24366E-05	3.34028E-05
	1	-3.05013E-01	-7.95643E-01	-2.72262E-01	4.22919E-01	-2.07694E-01	-4.61381E-01
	2	1.92976E-02	4.84288E-02	-1.14760E-01	-3.73536E-01	-6.77231E-02	2.56912E-01
	3	-3.77449E-02	-2.53251E-01	-3.53610E-01	1.87283E-01	3.79081E-01	-5.75145E-02

Table 4 (continued)

		$b_{j,k}$						
		j	k=1	k=2	k=3	k=4	k=5	k=6
Xe	4		1.06430E-02	5.67874E-02	3.64408E-02	-1.10941E-01	-4.80690E-02	9.58647E-02
	0		9.99998E-01	-1.32027E-05	-2.33027E-05	9.14491E-06	4.56416E-05	2.27780E-05
	1		-3.05759E-01	-8.03445E-01	-2.90033E-01	4.24185E-01	-1.72116E-01	-4.37185E-01
	2		1.92652E-02	5.38043E-02	-9.27549E-02	-3.62839E-01	-1.13336E-01	2.11304E-01
	3		-3.63847E-02	-2.52841E-01	-3.70455E-01	1.71365E-01	4.20403E-01	-8.30644E-03
Cs	4		1.03130E-02	5.66457E-02	3.94761E-02	-1.10117E-01	-6.01102E-02	8.44433E-02
	0		9.99999E-01	-1.26179E-05	-2.37033E-05	6.58973E-06	4.50540E-05	2.42166E-05
	1		-3.06397E-01	-8.10913E-01	-3.08160E-01	4.24872E-01	-1.33622E-01	-4.09408E-01
	2		1.90768E-02	5.88503E-02	-6.98798E-02	-3.52526E-01	-1.67197E-01	1.57681E-01
	3		-3.49340E-02	-2.52333E-01	-3.88188E-01	1.56384E-01	4.70278E-01	4.87572E-02
Ba	4		9.95585E-03	5.65088E-02	4.28601E-02	-1.09783E-01	-7.54609E-02	7.01232E-02
	0		9.99999E-01	-1.20077E-05	-2.38736E-05	4.05730E-06	4.32277E-05	2.42538E-05
	1		-3.06948E-01	-8.17977E-01	-3.26242E-01	4.24366E-01	-9.49814E-02	-3.79922E-01
	2		1.87960E-02	6.33103E-02	-4.74766E-02	-3.40500E-01	-2.19769E-01	1.02759E-01
	3		-3.34577E-02	-2.51452E-01	-4.05385E-01	1.40143E-01	5.18458E-01	1.06260E-01
La	4		9.59321E-03	5.62848E-02	4.61175E-02	-1.09209E-01	-9.06716E-02	5.54358E-02
	0		9.99999E-01	-1.07481E-05	-1.92539E-05	-2.25080E-06	4.42593E-06	-1.23825E-05
	1		-3.07451E-01	-8.24542E-01	-3.43245E-01	4.22445E-01	-6.46015E-02	-3.58740E-01
	2		1.85472E-02	6.68500E-02	-2.90780E-02	-3.25947E-01	-2.42061E-01	8.10462E-02
	3		-3.20856E-02	-2.49840E-01	-4.18293E-01	1.21766E-01	5.34064E-01	1.27455E-01
Ce	4		9.26834E-03	5.58535E-02	4.79916E-02	-1.08095E-01	-9.54003E-02	5.26817E-02
	0		9.99999E-01	-1.00541E-05	-1.86994E-05	-4.85810E-06	-2.16427E-06	-1.77696E-05
	1		-3.07844E-01	-8.30789E-01	-3.61171E-01	4.19383E-01	-2.56881E-02	-3.25272E-01
	2		1.81087E-02	7.01009E-02	-7.58517E-03	-3.09910E-01	-2.93182E-01	2.04700E-02
	3		-3.05781E-02	-2.48171E-01	-4.34502E-01	1.02408E-01	5.80158E-01	1.89068E-01
Pr	4		8.90064E-03	5.54399E-02	5.10269E-02	-1.06835E-01	-1.10754E-01	3.62068E-02
	0		9.99999E-01	-9.79122E-06	-1.69151E-05	-3.50937E-06	-1.68765E-05	-3.82375E-05
	1		-3.08169E-01	-8.36725E-01	-3.78369E-01	4.16165E-01	8.30956E-03	-2.97683E-01
	2		1.76086E-02	7.30739E-02	1.14792E-02	-2.95652E-01	-3.27931E-01	-1.78743E-02
	3		-2.90664E-02	-2.46452E-01	-4.48258E-01	8.54517E-02	6.09592E-01	2.27377E-01
Nd	4		8.53336E-03	5.50463E-02	5.33261E-02	-1.06535E-01	-1.21188E-01	2.70114E-02
	0		9.99999E-01	-9.13937E-06	-1.80755E-05	-5.16470E-06	-1.01788E-05	-3.14865E-05
	1		-3.08424E-01	-8.42217E-01	-3.95809E-01	4.11420E-01	4.50191E-02	-2.65066E-01
	2		1.70401E-02	7.52877E-02	3.14236E-02	-2.78353E-01	-3.71788E-01	-7.05787E-02
	3		-2.75426E-02	-2.44164E-01	-4.62996E-01	6.57591E-02	6.48570E-01	2.80179E-01
Pm	4		8.16401E-03	5.44970E-02	5.60168E-02	-1.05473E-01	-1.35245E-01	1.27240E-02
	0		9.99999E-01	-8.98752E-06	-2.55104E-05	-8.43805E-06	5.28526E-05	5.37052E-05
	1		-3.08578E-01	-8.47428E-01	-4.14251E-01	4.05335E-01	9.19151E-02	-2.16792E-01
	2		1.62819E-02	7.73058E-02	5.49978E-02	-2.58700E-01	-4.51624E-01	-1.75559E-01
	3		-2.58749E-02	-2.41906E-01	-4.81676E-01	4.40975E-02	7.26016E-01	3.88156E-01
Sm	4		7.74836E-03	5.39922E-02	6.00930E-02	-1.03912E-01	-1.62654E-01	-2.03163E-02
	0		1.00000E+00	-8.26662E-06	-2.52336E-05	-1.12133E-05	5.14447E-05	5.60973E-05
	1		-3.08718E-01	-8.52175E-01	-4.30815E-01	3.98540E-01	1.24188E-01	-1.86131E-01
	2		1.56265E-02	7.84801E-02	7.23642E-02	-2.38748E-01	-4.82373E-01	-2.18764E-01
	3		-2.43703E-02	-2.38986E-01	-4.93934E-01	2.25767E-02	7.52214E-01	4.31084E-01
Eu	4		7.38841E-03	5.33001E-02	6.21117E-02	-1.02536E-01	-1.73599E-01	-3.21800E-02
	0		1.00000E+00	-8.34060E-06	-2.98627E-05	-8.01232E-06	8.76510E-05	9.03860E-05
	1		-3.08763E-01	-8.56707E-01	-4.48077E-01	3.91822E-01	1.63120E-01	-1.48303E-01
	2		1.47872E-02	7.96639E-02	9.24568E-02	-2.21201E-01	-5.37350E-01	-2.85347E-01
	3		-2.27224E-02	-2.36305E-01	-5.09218E-01	4.07278E-03	8.04499E-01	4.98644E-01
Gd	4		6.98190E-03	5.27206E-02	6.52177E-02	-1.02305E-01	-1.93777E-01	-5.26367E-02
	0		1.00000E+00	-7.64510E-06	-2.92089E-05	-1.00617E-05	8.41945E-05	8.89495E-05
	1		-3.08800E-01	-8.60757E-01	-4.63789E-01	3.83454E-01	1.91718E-01	-1.19542E-01
	2		1.40560E-02	7.99159E-02	1.07549E-01	-2.00082E-01	-5.57994E-01	-3.19260E-01
	3		-2.12387E-02	-2.32861E-01	-5.19348E-01	-1.77338E-02	8.20853E-01	5.31391E-01
Tb	4		6.63116E-03	5.19186E-02	6.66840E-02	-1.01113E-01	-2.02513E-01	-6.18592E-02
	0		1.00000E+00	-6.94044E-06	-2.89150E-05	-1.25627E-05	8.45092E-05	9.35270E-05
	1		-3.08782E-01	-8.64460E-01	-4.79407E-01	3.73899E-01	2.21408E-01	-8.71143E-02
	2		1.32660E-02	7.96962E-02	1.22757E-01	-1.76859E-01	-5.84303E-01	-3.65358E-01
	3		-1.97397E-02	-2.29136E-01	-5.29774E-01	-4.13492E-02	8.43816E-01	5.77210E-01
	4		6.27617E-03	5.10544E-02	6.83314E-02	-9.94423E-02	-2.14011E-01	-7.58764E-02

Table 4 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
Dy	0	1.00000E+00	-6.24640E-06	-2.40805E-05	-1.21487E-05	4.68365E-05	4.79931E-05
	1	-3.08744E-01	-8.67831E-01	-4.93405E-01	3.64221E-01	2.39391E-01	-6.84646E-02
	2	1.25298E-02	7.90388E-02	1.32891E-01	-1.55210E-01	-5.72399E-01	-3.63560E-01
	3	-1.83419E-02	-2.25166E-01	-5.35025E-01	-6.28541E-02	8.27047E-01	5.72471E-01
	4	5.95549E-03	5.01387E-02	6.83405E-02	-9.86030E-02	-2.12849E-01	-7.34822E-02
Ho	0	1.00000E+00	-5.50393E-06	-2.52916E-05	-1.48554E-05	5.96989E-05	6.70725E-05
	1	-3.08636E-01	-8.70881E-01	-5.08584E-01	3.53063E-01	2.70240E-01	-3.13652E-02
	2	1.16653E-02	7.79734E-02	1.47649E-01	-1.30344E-01	-6.06926E-01	-4.24928E-01
	3	-1.68508E-02	-2.20974E-01	-5.45358E-01	-8.73598E-02	8.59865E-01	6.34420E-01
	4	5.60415E-03	4.91784E-02	7.01237E-02	-9.68821E-02	-2.28707E-01	-9.36510E-02
Er	0	1.00000E+00	-4.85819E-06	-2.31489E-05	-1.50494E-05	4.56408E-05	4.90092E-05
	1	-3.08515E-01	-8.73647E-01	-5.22017E-01	3.42249E-01	2.87970E-01	-1.14362E-02
	2	1.08639E-02	7.66037E-02	1.57097E-01	-1.08398E-01	-5.99682E-01	-4.28645E-01
	3	-1.54650E-02	-2.16664E-01	-5.50347E-01	-1.08454E-01	8.49779E-01	6.36435E-01
	4	5.28790E-03	4.82073E-02	7.02259E-02	-9.63966E-02	-2.30958E-01	-9.44806E-02
Tm	0	1.00000E+00	-4.20134E-06	-2.16789E-05	-1.60894E-05	3.80435E-05	4.12939E-05
	1	-3.08352E-01	-8.76114E-01	-5.35381E-01	3.30437E-01	3.07894E-01	1.37055E-02
	2	1.00202E-02	7.48660E-02	1.66956E-01	-8.46903E-02	-6.02531E-01	-4.50663E-01
	3	-1.40726E-02	-2.12164E-01	-5.55986E-01	-1.31086E-01	8.50981E-01	6.57958E-01
	4	4.96956E-03	4.71995E-02	7.06296E-02	-9.54982E-02	-2.37492E-01	-1.02212E-01
Yb	0	1.00000E+00	-3.56688E-06	-2.00685E-05	-1.67957E-05	2.98774E-05	3.24015E-05
	1	-3.08156E-01	-8.78296E-01	-5.48324E-01	3.17992E-01	3.26759E-01	3.89863E-02
	2	9.15883E-03	7.27945E-02	1.76059E-01	-6.04885E-02	-6.04528E-01	-4.73749E-01
	3	-1.26976E-02	-2.07506E-01	-5.61052E-01	-1.53887E-01	8.52004E-01	6.80843E-01
	4	4.65698E-03	4.61659E-02	7.09273E-02	-9.46480E-02	-2.44507E-01	-1.10820E-01
Lu	0	1.00000E+00	-2.96667E-06	-1.87695E-05	-1.74281E-05	2.49741E-05	2.73867E-05
	1	-3.07933E-01	-8.80219E-01	-5.60632E-01	3.05337E-01	3.42808E-01	6.12281E-02
	2	8.29085E-03	7.04640E-02	1.83875E-01	-3.70395E-02	-6.01099E-01	-4.89035E-01
	3	-1.13475E-02	-2.02764E-01	-5.65099E-01	-1.75647E-01	8.48873E-01	6.96932E-01
	4	4.35207E-03	4.51294E-02	7.09953E-02	-9.42244E-02	-2.50865E-01	-1.17856E-01
Hf	0	1.00000E+00	-2.38117E-06	-1.71196E-05	-1.76206E-05	1.75818E-05	1.86146E-05
	1	-3.07688E-01	-8.81871E-01	-5.72312E-01	2.92226E-01	3.56380E-01	8.18537E-02
	2	7.43188E-03	6.78190E-02	1.90320E-01	-1.35192E-02	-5.92277E-01	-4.99818E-01
	3	-1.00390E-02	-1.97874E-01	-5.67945E-01	-1.97188E-01	8.40799E-01	7.08540E-01
	4	4.06067E-03	4.40685E-02	7.07499E-02	-9.39650E-02	-2.56104E-01	-1.23813E-01
Ta	0	1.00000E+00	-1.64094E-06	-1.55193E-05	-1.89774E-05	1.04852E-05	1.16829E-05
	1	-3.07422E-01	-8.83241E-01	-5.83531E-01	2.78552E-01	3.68475E-01	1.01668E-01
	2	6.57878E-03	6.47988E-02	1.95926E-01	1.05680E-02	-5.81061E-01	-5.08678E-01
	3	-8.76825E-03	-1.92764E-01	-5.70119E-01	-2.19093E-01	8.30673E-01	7.18276E-01
	4	3.78161E-03	4.29575E-02	7.03587E-02	-9.36606E-02	-2.61130E-01	-1.29544E-01
W	0	1.00000E+00	-9.06217E-07	-1.75273E-05	-2.63276E-05	3.91616E-05	7.05587E-05
	1	-3.07119E-01	-8.84377E-01	-5.94807E-01	2.63602E-01	3.84677E-01	1.31208E-01
	2	5.67301E-03	6.15609E-02	2.02707E-01	3.78304E-02	-5.88336E-01	-5.53948E-01
	3	-7.46868E-03	-1.87597E-01	-5.73876E-01	-2.44177E-01	8.41510E-01	7.67774E-01
	4	3.49199E-03	4.18500E-02	7.05980E-02	-9.23631E-02	-2.73795E-01	-1.49135E-01
Re	0	1.00000E+00	-3.58948E-07	-1.62823E-05	-2.71290E-05	3.72118E-05	7.14444E-05
	1	-3.06807E-01	-8.85301E-01	-6.05065E-01	2.49307E-01	3.94729E-01	1.51179E-01
	2	4.80860E-03	5.81619E-02	2.06801E-01	6.15127E-02	-5.77208E-01	-5.66864E-01
	3	-6.24053E-03	-1.82429E-01	-5.75024E-01	-2.65216E-01	8.33338E-01	7.82915E-01
	4	3.22560E-03	4.07640E-02	7.00473E-02	-9.24940E-02	-2.80574E-01	-1.57600E-01
Os	0	1.00000E+00	2.73211E-07	-1.17490E-05	-2.58038E-05	6.36158E-06	3.32743E-05
	1	-3.06487E-01	-8.86009E-01	-6.14422E-01	2.35359E-01	3.99566E-01	1.64284E-01
	2	3.97998E-03	5.45694E-02	2.08689E-01	8.29080E-02	-5.51489E-01	-5.58007E-01
	3	-5.07592E-03	-1.77216E-01	-5.74108E-01	-2.83686E-01	8.10490E-01	7.75556E-01
	4	2.97963E-03	3.96831E-02	6.88939E-02	-9.35395E-02	-2.82965E-01	-1.59015E-01
Ir	0	1.00000E+00	7.63461E-07	-1.03728E-05	-2.61459E-05	3.81382E-06	3.27945E-05
	1	-3.06146E-01	-8.86511E-01	-6.23541E-01	2.20869E-01	4.05684E-01	1.80618E-01
	2	3.13512E-03	5.08041E-02	2.10764E-01	1.05164E-01	-5.34247E-01	-5.62996E-01
	3	-3.91682E-03	-1.71979E-01	-5.73714E-01	-3.02939E-01	7.97766E-01	7.83848E-01
	4	2.73430E-03	3.86138E-02	6.80101E-02	-9.43784E-02	-2.89324E-01	-1.66201E-01
Pt	0	1.00000E+00	1.51657E-06	-7.09538E-06	-2.84408E-05	-1.27698E-05	2.01646E-05
	1	-3.05804E-01	-8.86765E-01	-6.31784E-01	2.05913E-01	4.07649E-01	1.93502E-01

Table 4 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
Au	2	2.34793E-03	4.67022E-02	2.10764E-01	1.28101E-01	-5.06111E-01	-5.58114E-01
	3	-2.84140E-03	-1.66534E-01	-5.71402E-01	-3.22806E-01	7.74285E-01	7.82225E-01
	4	2.51586E-03	3.74936E-02	6.65720E-02	-9.50616E-02	-2.92587E-01	-1.70530E-01
	0	1.00000E+00	1.98683E-06	-6.48918E-06	-2.96293E-05	-7.69468E-06	3.13394E-05
	1	-3.05435E-01	-8.86882E-01	-6.40039E-01	1.91062E-01	4.12813E-01	2.10658E-01
	2	1.51474E-03	4.26317E-02	2.11891E-01	1.49893E-01	-4.93374E-01	-5.71304E-01
	3	-1.73665E-03	-1.61267E-01	-5.70637E-01	-3.41415E-01	7.68388E-01	8.00987E-01
Hg	4	2.28617E-03	3.64503E-02	6.57491E-02	-9.62013E-02	-3.02313E-01	-1.82243E-01
	0	1.00000E+00	2.39732E-06	-5.11645E-06	-2.96111E-05	-9.22427E-06	3.19320E-05
	1	-3.05062E-01	-8.86831E-01	-6.47453E-01	1.76573E-01	4.13633E-01	2.22198E-01
	2	7.17189E-04	3.84725E-02	2.11135E-01	1.69653E-01	-4.69442E-01	-5.67717E-01
	3	-6.88895E-04	-1.56047E-01	-5.68178E-01	-3.57792E-01	7.51537E-01	8.02701E-01
	4	2.07418E-03	3.54391E-02	6.44469E-02	-9.81311E-02	-3.08896E-01	-1.88736E-01
	0	1.00000E+00	2.78244E-06	-3.64471E-06	-2.95014E-05	-1.12274E-05	3.20414E-05
Tl	1	-3.04686E-01	-8.86615E-01	-6.54170E-01	1.62242E-01	4.11585E-01	2.30563E-01
	2	-5.16907E-05	3.42119E-02	2.09082E-01	1.88283E-01	-4.40015E-01	-5.56825E-01
	3	3.11515E-04	-1.50852E-01	-5.64706E-01	-3.72992E-01	7.30202E-01	7.98110E-01
	4	1.87637E-03	3.44517E-02	6.29055E-02	-1.00477E-01	-3.14592E-01	-1.93758E-01
	0	1.00000E+00	3.11912E-06	-2.09434E-06	-2.88816E-05	-1.39980E-05	2.99387E-05
	1	-3.04309E-01	-8.86252E-01	-6.60070E-01	1.48310E-01	4.05729E-01	2.33997E-01
	2	-7.79204E-04	2.98994E-02	2.05239E-01	2.04916E-01	-4.00938E-01	-5.31269E-01
Pb	3	1.25147E-03	-1.45730E-01	-5.59635E-01	-3.86047E-01	6.99409E-01	7.78559E-01
	4	1.69719E-03	3.35036E-02	6.09158E-02	-1.03573E-01	-3.17614E-01	-1.94234E-01
	0	1.00000E+00	3.35749E-06	3.97719E-06	-2.34572E-05	-5.63032E-05	-3.28419E-05
	1	-3.03936E-01	-8.85747E-01	-6.65065E-01	1.34864E-01	3.95346E-01	2.31317E-01
	2	-1.45687E-02	2.55398E-02	1.99275E-01	2.19322E-01	-3.49457E-01	-4.86677E-01
	3	2.12267E-03	-1.40682E-01	-5.52596E-01	-3.96718E-01	6.56053E-01	7.39183E-01
	4	1.53950E-03	3.25940E-02	5.83474E-02	-1.07501E-01	-3.16870E-01	-1.88461E-01
Bi	0	1.00000E+00	3.37161E-06	6.41700E-06	-1.65495E-05	-7.10841E-05	-6.55183E-05
	1	-3.03544E-01	-8.85146E-01	-6.70190E-01	1.21911E-01	3.88427E-01	2.32509E-01
	2	-2.16580E-03	2.12729E-02	1.94779E-01	2.31585E-01	-3.13173E-01	-4.57701E-01
	3	3.01211E-03	-1.35849E-01	-5.47388E-01	-4.05136E-01	6.29372E-01	7.16760E-01
	4	1.37421E-03	3.17686E-02	5.64658E-02	-1.12206E-01	-3.22112E-01	-1.88731E-01
	0	1.00000E+00	3.59419E-06	8.62223E-06	-1.48197E-05	-7.92650E-05	-7.68342E-05
	1	-3.03155E-01	-8.84379E-01	-6.74772E-01	1.08333E-01	3.80917E-01	2.35349E-01
At	2	-2.83453E-03	1.68369E-02	1.89414E-01	2.45715E-01	-2.77890E-01	-4.36776E-01
	3	3.84532E-03	-1.30946E-01	-5.41534E-01	-4.15613E-01	6.04263E-01	7.03374E-01
	4	1.22604E-03	3.09317E-02	5.44454E-02	-1.16240E-01	-3.28295E-01	-1.92431E-01
	0	1.00000E+00	3.87146E-06	4.80070E-06	-1.93015E-05	-3.42929E-05	-5.92706E-06
	1	-3.02743E-01	-8.83477E-01	-6.79905E-01	9.38015E-02	3.81334E-01	2.51330E-01
	2	-3.55395E-03	1.23259E-02	1.87105E-01	2.62907E-01	-2.74237E-01	-4.65042E-01
	3	4.72067E-03	-1.26071E-01	-5.39258E-01	-4.29411E-01	6.13810E-01	7.43311E-01
Rn	4	1.06194E-03	3.01154E-02	5.37051E-02	-1.19185E-01	-3.46564E-01	-2.14447E-01
	0	1.00000E+00	4.01379E-06	5.49499E-06	-1.80611E-05	-3.07892E-05	-1.66001E-06
	1	-3.02339E-01	-8.82490E-01	-6.83951E-01	8.05148E-02	3.74652E-01	2.55883E-01
	2	-4.22029E-03	7.90066E-03	1.82095E-01	2.75606E-01	-2.49450E-01	-4.56602E-01
	3	5.52838E-03	-1.21388E-01	-5.34417E-01	-4.38535E-01	6.01732E-01	7.45118E-01
	4	9.18625E-04	2.93730E-02	5.21879E-02	-1.23704E-01	-3.58082E-01	-2.24204E-01
	0	1.00000E+00	3.92136E-06	6.47993E-06	-1.22539E-05	-3.36111E-05	-1.60510E-05
Ra	1	-3.01948E-01	-8.81444E-01	-6.86996E-01	6.86217E-02	3.62375E-01	2.51482E-01
	2	-4.81937E-03	3.63292E-03	1.74815E-01	2.83496E-01	-2.09497E-01	-4.21244E-01
	3	6.25635E-03	-1.16966E-01	-5.27541E-01	-4.42744E-01	5.74838E-01	7.19912E-01
	4	7.99621E-04	2.87267E-02	5.00857E-02	-1.29858E-01	-3.65227E-01	-2.25574E-01
	0	1.00000E+00	3.99266E-06	6.47777E-06	-1.12429E-05	-2.38328E-05	-2.96736E-06
	1	-3.01550E-01	-8.80274E-01	-6.90202E-01	5.59307E-02	3.55180E-01	2.56033E-01
	2	-5.42427E-03	-7.21339E-04	1.69071E-01	2.94138E-01	-1.89681E-01	-4.18927E-01
Ac	3	6.98019E-03	-1.12541E-01	-5.22534E-01	-4.50001E-01	5.69554E-01	7.29976E-01
	4	6.80286E-04	2.80878E-02	4.86714E-02	-1.35006E-01	-3.79924E-01	-2.39042E-01
	0	1.00000E+00	4.05101E-06	1.00604E-05	-8.55053E-06	-3.80760E-05	-1.96756E-05
	1	-3.01180E-01	-8.79037E-01	-6.92166E-01	4.44478E-02	3.41177E-01	2.50586E-01
	2	-5.91516E-03	-4.97546E-03	1.60075E-01	3.00765E-01	-1.49408E-01	-3.85113E-01
	3	7.57436E-03	-1.08305E-01	-5.14356E-01	-4.53218E-01	5.43200E-01	7.07528E-01
	4						
Th	0	1.00000E+00	4.05101E-06	1.00604E-05	-8.55053E-06	-3.80760E-05	-1.96756E-05
	1	-3.01180E-01	-8.79037E-01	-6.92166E-01	4.44478E-02	3.41177E-01	2.50586E-01
	2	-5.91516E-03	-4.97546E-03	1.60075E-01	3.00765E-01	-1.49408E-01	-3.85113E-01
	3	7.57436E-03	-1.08305E-01	-5.14356E-01	-4.53218E-01	5.43200E-01	7.07528E-01
	4						
	0	1.00000E+00	4.05101E-06	1.00604E-05	-8.55053E-06	-3.80760E-05	-1.96756E-05
	1	-3.01180E-01	-8.79037E-01	-6.92166E-01	4.44478E-02	3.41177E-01	2.50586E-01
	2	-5.91516E-03	-4.97546E-03	1.60075E-01	3.00765E-01	-1.49408E-01	-3.85113E-01
	3	7.57436E-03	-1.08305E-01	-5.14356E-01	-4.53218E-01	5.43200E-01	7.07528E-01

Table 4 (continued)

	$b_{j,k}$						
	j	k=1	k=2	k=3	k=4	k=5	k=6
Pa	4	6.02309E-04	2.75190E-02	4.62704E-02	-1.41493E-01	-3.88012E-01	-2.42136E-01
	0	1.00000E+00	4.03802E-06	1.22961E-05	-5.22107E-06	-4.92913E-05	-3.72393E-05
	1	-3.00797E-01	-8.77717E-01	-6.93950E-01	3.31074E-02	3.26970E-01	2.44923E-01
	2	-6.43446E-03	-9.20205E-03	1.51488E-01	3.06993E-01	-1.11177E-01	-3.52850E-01
	3	8.19071E-03	-1.04178E-01	-5.06875E-01	-4.56147E-01	5.19430E-01	6.87083E-01
U	4	5.14989E-04	2.69938E-02	4.41697E-02	-1.48089E-01	-3.97338E-01	-2.46248E-01
	0	1.00000E+00	3.98480E-06	1.30067E-05	-2.91293E-06	-4.64269E-05	-3.57834E-05
	1	-3.00419E-01	-8.76338E-01	-6.95427E-01	2.20192E-02	3.13702E-01	2.40846E-01
	2	-6.92027E-03	-1.33345E-02	1.42861E-01	3.12565E-01	-7.88611E-02	-3.28521E-01
	3	8.76448E-03	-1.00225E-01	-4.99621E-01	-4.58571E-01	5.02398E-01	6.75598E-01
Np	4	4.39843E-04	2.65321E-02	4.22136E-02	-1.54855E-01	-4.09309E-01	-2.53760E-01
	0	1.00000E+00	3.94823E-06	1.35143E-05	-1.28843E-06	-4.26710E-05	-3.21558E-05
	1	-3.00039E-01	-8.74873E-01	-6.96826E-01	1.08115E-02	3.02127E-01	2.39645E-01
	2	-7.40220E-03	-1.74666E-02	1.34916E-01	3.18716E-01	-5.45344E-02	-3.15813E-01
	3	9.32695E-03	-9.63453E-02	-4.93297E-01	-4.61732E-01	4.93897E-01	6.76357E-01
Pu	4	3.66650E-04	2.61010E-02	4.06208E-02	-1.61393E-01	-4.24410E-01	-2.65594E-01
	0	1.00000E+00	3.85274E-06	1.67850E-05	3.33082E-06	-6.43261E-05	-6.78587E-05
	1	-2.99678E-01	-8.73363E-01	-6.97176E-01	7.68305E-04	2.84062E-01	2.28542E-01
	2	-7.81242E-03	-2.14852E-02	1.24401E-01	3.21238E-01	-1.07947E-02	-2.72085E-01
	3	9.80818E-03	-9.26511E-02	-4.84534E-01	-4.61294E-01	4.65541E-01	6.45226E-01
Am	4	3.18398E-04	2.57363E-02	3.82849E-02	-1.69124E-01	-4.33328E-01	-2.67276E-01
	0	1.00000E+00	3.49119E-06	1.77989E-05	8.54007E-06	-5.94406E-05	-6.78762E-05
	1	-2.99325E-01	-8.71876E-01	-6.97466E-01	-8.34232E-03	2.69771E-01	2.21876E-01
	2	-8.18361E-03	-2.51618E-02	1.14723E-01	3.21013E-01	1.72141E-02	-2.46552E-01
	3	1.02437E-02	-8.93779E-02	-4.76932E-01	-4.58213E-01	4.54434E-01	6.34192E-01
Cm	4	2.83157E-04	2.55154E-02	3.64039E-02	-1.77726E-01	-4.48417E-01	-2.76123E-01
	0	1.00000E+00	3.13119E-06	2.04848E-05	1.36397E-05	-6.54463E-05	-7.62514E-05
	1	-2.98982E-01	-8.70370E-01	-6.97309E-01	-1.67516E-02	2.56138E-01	2.16214E-01
	2	-8.51482E-03	-2.86591E-02	1.04405E-01	3.18798E-01	4.13936E-02	-2.25977E-01
	3	1.06317E-02	-8.63510E-02	-4.68845E-01	-4.53229E-01	4.47295E-01	6.28363E-01
Bk	4	2.61843E-04	2.53800E-02	3.44113E-02	-1.86967E-01	-4.65095E-01	-2.86964E-01
	0	1.00000E+00	2.68238E-06	1.95022E-05	1.79662E-05	-4.64560E-05	-5.83468E-05
	1	-2.98635E-01	-8.68822E-01	-6.97267E-01	-2.50651E-02	2.43906E-01	2.11454E-01
	2	-8.85891E-03	-3.20692E-02	9.55507E-02	3.16895E-01	5.76849E-02	-2.12199E-01
	3	1.10308E-02	-8.34676E-02	-4.62600E-01	-4.48895E-01	4.49398E-01	6.31098E-01
Cf	4	2.34384E-04	2.52948E-02	3.31036E-02	-1.95975E-01	-4.85340E-01	-3.01238E-01
	0	1.00000E+00	2.19243E-06	1.83802E-05	2.25939E-05	-2.74383E-05	-4.14375E-05
	1	-2.98291E-01	-8.67262E-01	-6.97067E-01	-3.27556E-02	2.32469E-01	2.06983E-01
	2	-9.18726E-03	-3.52986E-02	8.70894E-02	3.13464E-01	6.93485E-02	-2.01573E-01
	3	1.14097E-02	-8.08214E-02	-4.56981E-01	-4.43207E-01	4.56556E-01	6.37500E-01
Es	4	2.11626E-04	2.52905E-02	3.20551E-02	-2.05432E-01	-5.07586E-01	-3.17064E-01
	0	1.00000E+00	1.90824E-06	1.75337E-05	2.40067E-05	-1.39157E-05	-2.42798E-05
	1	-2.97948E-01	-8.65640E-01	-6.96905E-01	-4.09559E-02	2.23681E-01	2.08110E-01
	2	-9.51279E-03	-3.85358E-02	7.96190E-02	3.12379E-01	7.07528E-02	-2.11292E-01
	3	1.17820E-02	-7.82100E-02	-4.52580E-01	-4.40225E-01	4.74385E-01	6.65212E-01
Fm	4	1.89125E-04	2.52991E-02	3.14559E-02	-2.13995E-01	-5.33639E-01	-3.40216E-01
	0	1.00000E+00	1.77000E-06	2.62720E-05	2.94930E-05	-1.05066E-04	-1.57983E-04
	1	-2.97652E-01	-8.63999E-01	-6.94236E-01	-4.71299E-02	1.91590E-01	1.74221E-01
	2	-9.67101E-03	-4.16520E-02	6.44187E-02	3.05069E-01	1.50955E-01	-1.02197E-01
	3	1.19749E-02	-7.57620E-02	-4.40210E-01	-4.30966E-01	4.09045E-01	5.67673E-01
Md	4	2.24241E-04	2.53622E-02	2.82552E-02	-2.24641E-01	-5.32340E-01	-3.22038E-01
	0	1.00000E+00	1.65023E-06	1.70022E-05	2.09197E-05	-1.78077E-05	-2.46650E-05
	1	-2.97304E-01	-8.62336E-01	-6.94643E-01	-5.55534E-02	1.92543E-01	1.89792E-01
	2	-1.00167E-02	-4.46503E-02	6.08485E-02	3.06312E-01	1.14504E-01	-1.67135E-01
	3	1.23657E-02	-7.34762E-02	-4.40401E-01	-4.31040E-01	4.67813E-01	6.55299E-01
No	4	1.91018E-04	2.54799E-02	2.92965E-02	-2.32178E-01	-5.72806E-01	-3.66007E-01
	0	1.00000E+00	1.34186E-06	1.69432E-05	2.26628E-05	-1.33520E-05	-2.05400E-05
	1	-2.96996E-01	-8.60705E-01	-6.93244E-01	-6.16582E-02	1.79649E-01	1.83194E-01
	2	-1.02234E-02	-4.73718E-02	5.18512E-02	3.00343E-01	1.25119E-01	-1.56522E-01
	3	1.26071E-02	-7.15120E-02	-4.34991E-01	-4.23759E-01	4.76525E-01	6.62845E-01
	4	2.05633E-04	2.57040E-02	2.85086E-02	-2.42168E-01	-5.96848E-01	-3.83555E-01

Table 4 (continued)

	j	$b_{j,k}$					
		k=1	k=2	k=3	k=4	k=5	k=6
Lr	0	1.00000E+00	9.68943E-07	1.51050E-05	2.42782E-05	4.87913E-06	-1.13536E-06
	1	-2.96688E-01	-8.59095E-01	-6.92020E-01	-6.72349E-02	1.70148E-01	1.80030E-01
	2	-1.04339E-02	-4.98599E-02	4.42687E-02	2.93348E-01	1.23251E-01	-1.58755E-01
	3	1.28507E-02	-6.98228E-02	-4.31219E-01	-4.15631E-01	4.98219E-01	6.83791E-01
	4	2.17532E-04	2.60191E-02	2.83012E-02	-2.52454E-01	-6.25465E-01	-4.05797E-01
Rf	0	1.00000E+00	6.18000E-07	1.58714E-05	2.65990E-05	9.51773E-07	-8.30010E-06
	1	-2.96402E-01	-8.57482E-01	-6.90151E-01	-7.21231E-02	1.57438E-01	1.72358E-01
	2	-1.05703E-02	-5.22097E-02	3.52232E-02	2.84934E-01	1.32021E-01	-1.46479E-01
	3	1.30147E-02	-6.83011E-02	-4.26016E-01	-4.06312E-01	5.08292E-01	6.89268E-01
	4	2.54008E-04	2.63882E-02	2.76472E-02	-2.63140E-01	-6.50438E-01	-4.23135E-01
Db	0	9.99999E-01	2.59474E-07	1.66304E-05	2.92739E-05	-4.13596E-06	-2.16221E-05
	1	-2.96127E-01	-8.55900E-01	-6.87860E-01	-7.59673E-02	1.42366E-01	1.59392E-01
	2	-1.06769E-02	-5.43151E-02	2.57506E-02	2.74014E-01	1.46148E-01	-1.20052E-01
	3	1.31494E-02	-6.70578E-02	-4.20650E-01	-3.94725E-01	5.13897E-01	6.81679E-01
	4	2.97517E-04	2.68481E-02	2.70054E-02	-2.74569E-01	-6.74499E-01	-4.36824E-01
Sg	0	9.99999E-01	-1.77820E-07	1.81066E-05	3.31456E-05	-1.69397E-05	-4.28294E-05
	1	-2.95860E-01	-8.54345E-01	-6.85493E-01	-7.93655E-02	1.28453E-01	1.48394E-01
	2	-1.07632E-02	-5.61996E-02	1.67417E-02	2.62468E-01	1.56187E-01	-1.00805E-01
	3	1.32617E-02	-6.60643E-02	-4.15868E-01	-3.82710E-01	5.23344E-01	6.81217E-01
	4	3.46640E-04	2.73888E-02	2.65816E-02	-2.86163E-01	-7.00045E-01	-4.53062E-01
Bh	0	9.99999E-01	-6.09064E-07	1.75501E-05	3.53367E-05	-1.26999E-05	-4.12248E-05
	1	-2.95596E-01	-8.52825E-01	-6.83326E-01	-8.23009E-02	1.17972E-01	1.40826E-01
	2	-1.08459E-02	-5.78446E-02	9.15935E-03	2.50321E-01	1.54102E-01	-9.42181E-02
	3	1.33702E-02	-6.53381E-02	-4.12705E-01	-3.70314E-01	5.45369E-01	6.94045E-01
	4	3.95007E-04	2.80161E-02	2.67250E-02	-2.97907E-01	-7.30050E-01	-4.73991E-01
Hs	0	9.99999E-01	-9.42759E-07	1.72958E-05	3.54784E-05	-9.69148E-06	-3.67223E-05
	1	-2.95349E-01	-8.51305E-01	-6.80689E-01	-8.49368E-02	1.04962E-01	1.29792E-01
	2	-1.08770E-02	-5.93862E-02	7.36858E-04	2.38278E-01	1.59850E-01	-7.75931E-02
	3	1.34244E-02	-6.47286E-02	-4.08794E-01	-3.58341E-01	5.59306E-01	6.96865E-01
	4	4.59416E-04	2.86787E-02	2.66533E-02	-3.09522E-01	-7.57739E-01	-4.92019E-01
Mt	0	9.99999E-01	-1.32996E-06	1.59234E-05	3.56739E-05	1.06523E-06	-2.25545E-05
	1	-2.95093E-01	-8.49826E-01	-6.78848E-01	-8.76834E-02	1.00610E-01	1.30813E-01
	2	-1.09452E-02	-6.06841E-02	-4.28195E-03	2.27644E-01	1.36241E-01	-1.02336E-01
	3	1.35182E-02	-6.43838E-02	-4.08551E-01	-3.48083E-01	6.03706E-01	7.42793E-01
	4	5.08688E-04	2.94262E-02	2.78212E-02	-3.20603E-01	-7.95775E-01	-5.24547E-01
Ds	0	9.99999E-01	-1.74682E-06	1.57522E-05	3.70429E-05	4.12689E-07	-2.56009E-05
	1	-2.94861E-01	-8.48397E-01	-6.76273E-01	-8.91408E-02	9.10447E-02	1.22779E-01
	2	-1.09426E-02	-6.17213E-02	-1.11190E-02	2.13700E-01	1.30378E-01	-9.69320E-02
	3	1.35383E-02	-6.43198E-02	-4.06479E-01	-3.34582E-01	6.29188E-01	7.56942E-01
	4	5.80460E-04	3.02636E-02	2.84016E-02	-3.32795E-01	-8.27810E-01	-5.46804E-01
Rg	0	9.99999E-01	-2.09294E-06	1.43230E-05	3.60782E-05	1.07266E-05	-1.00341E-05
	1	-2.94623E-01	-8.46987E-01	-6.74321E-01	-9.10068E-02	8.80040E-02	1.24304E-01
	2	-1.09695E-02	-6.26224E-02	-1.52018E-02	2.02357E-01	1.02583E-01	-1.24641E-01
	3	1.35892E-02	-6.43956E-02	-4.07369E-01	-3.24105E-01	6.77431E-01	8.05852E-01
	4	6.40288E-04	3.11424E-02	2.99826E-02	-3.44011E-01	-8.67690E-01	-5.80897E-01
Uub	0	9.99999E-01	-2.48040E-06	1.34856E-05	3.60818E-05	1.43319E-05	-5.39346E-06
	1	-2.94407E-01	-8.45597E-01	-6.71717E-01	-9.23030E-02	7.97576E-02	1.18247E-01
	2	-1.09308E-02	-6.33722E-02	-2.07559E-02	1.90204E-01	9.18095E-02	-1.28190E-01
	3	1.35744E-02	-6.46357E-02	-4.06846E-01	-3.12984E-01	7.08165E-01	8.30043E-01
	4	7.19579E-04	3.20730E-02	3.11270E-02	-3.55492E-01	-9.02203E-01	-6.07246E-01
Uut	0	9.99999E-01	-2.85883E-06	1.25526E-05	3.58006E-05	1.83547E-05	3.68727E-07
	1	-2.94193E-01	-8.44281E-01	-6.69393E-01	-9.28313E-02	7.52932E-02	1.15795E-01
	2	-1.08961E-02	-6.38078E-02	-2.47799E-02	1.76646E-01	6.89388E-02	-1.43931E-01
	3	1.35640E-02	-6.51987E-02	-4.07959E-01	-3.00617E-01	7.51084E-01	8.66622E-01
	4	7.95784E-04	3.31054E-02	3.28208E-02	-3.67433E-01	-9.40998E-01	-6.37918E-01
Uuq	0	9.99999E-01	-3.23089E-06	1.14643E-05	3.52274E-05	2.27972E-05	6.85460E-06
	1	-2.93995E-01	-8.43015E-01	-6.66747E-01	-9.27084E-02	6.89020E-02	1.09788E-01
	2	-1.08216E-02	-6.40252E-02	-2.91655E-02	1.62218E-01	5.20261E-02	-1.49534E-01
	3	1.35150E-02	-6.59834E-02	-4.08823E-01	-2.87623E-01	7.88225E-01	8.93534E-01
	4	8.82523E-04	3.42062E-02	3.44636E-02	-3.79623E-01	-9.78363E-01	-6.65926E-01
Uup	0	9.99999E-01	-3.59368E-06	1.03465E-05	3.44987E-05	2.66691E-05	1.28457E-05
	1	-2.93801E-01	-8.41801E-01	-6.64287E-01	-9.22542E-02	6.46779E-02	1.06102E-01

Table 4 (continued)

$b_{j,k}$							
j		k=1	k=2	k=3	k=4	k=5	k=6
Uuh	2	-1.07421E-02	-6.40140E-02	-3.23716E-02	1.47883E-01	2.86703E-02	-1.62837E-01
	3	1.34620E-02	-6.69992E-02	-4.10941E-01	-2.74897E-01	8.31710E-01	9.28176E-01
	4	9.68854E-04	3.53788E-02	3.65264E-02	-3.91796E-01	-1.01812E+00	-6.96738E-01
	0	9.99999E-01	-4.00634E-06	1.34332E-05	3.78284E-05	-7.14545E-06	-3.82071E-05
Uuh	1	-2.93636E-01	-8.40634E-01	-6.60935E-01	-9.08644E-02	5.35291E-02	9.20857E-02
	2	-1.05766E-02	-6.37990E-02	-3.80644E-02	1.31539E-01	2.97590E-02	-1.40756E-01
	3	1.33207E-02	-6.82218E-02	-4.10470E-01	-2.60169E-01	8.49243E-01	9.25370E-01
	4	1.08257E-03	3.66156E-02	3.77369E-02	-4.04722E-01	-1.04961E+00	-7.15408E-01
Uus	0	9.99999E-01	-4.45767E-06	1.33605E-05	3.96345E-05	-1.55937E-05	-5.33269E-05
	1	-2.93460E-01	-8.39537E-01	-6.58549E-01	-8.94432E-02	5.07890E-02	8.85956E-02
	2	-1.04585E-02	-6.33154E-02	-4.00660E-02	1.16361E-01	4.17181E-03	-1.53315E-01
	3	1.32292E-02	-6.97106E-02	-4.13806E-01	-2.46814E-01	8.93960E-01	9.58183E-01
Uuo	4	1.17843E-03	3.79349E-02	4.01968E-02	-4.17279E-01	-1.09035E+00	-7.46081E-01
	0	9.99999E-01	-4.73699E-06	1.33242E-05	3.73673E-05	-2.10149E-05	-5.46306E-05
	1	-2.93297E-01	-8.38473E-01	-6.56026E-01	-8.84640E-02	4.84392E-02	8.76520E-02
	2	-1.03082E-02	-6.26988E-02	-4.19114E-02	1.04068E-01	-2.26331E-02	-1.75588E-01
Uuo	3	1.31073E-02	-7.13217E-02	-4.17369E-01	-2.36640E-01	9.40258E-01	1.00169E+00
	4	1.28237E-03	3.92889E-02	4.27449E-02	-4.28876E-01	-1.13208E+00	-7.80735E-01

varies by less than 10^{-6} when seven more terms in the series – i.e., extending the sums up to $k + 7$ – were added.

Idoeta and Legarda (1992) reported their calculated MDCS for electrons and positrons from 5 keV up to 10 MeV on a few nuclei with Z from 2 up to 92 as a function of the scattering angle (θ , every 15° from 15° up to 180°). In addition, they already discussed the agreement of their results with those from (i) the Mott–Born formula obtained in the first-order Born approximation (e.g., see Motz et al., 2008), (ii) McKinley–Feshbach expression derived using the second-order Born approximation (McKinley and Feshbach, 1948; Motz et al., 2008), (iii) Curr formula derived in the $(\alpha Z)^5$ and (for $\beta \approx 1$) $(\alpha Z)^8$ approximations (e.g., see Curr, 1955) and, finally, (iv) from Yadav (1955), Doggett and Spencer (1956) and Sherman (1956).

The presently obtained values were compared with those determined by Idoeta and Legarda (1992) and found to agree at least up to the 3rd digit (occurring in the 0.1% of the cases) or more, e.g., up to the 6th digit in the 73% of the cases (see also Figs. 1 and 2). For instance, in Table 1 (Table 2) the MDCS for electrons (positrons) on three nuclei – He, Ag and U ($Z = 2, 47$ and 92 , respectively) – are shown as function of the scattering angle θ (deg.) at 5 keV (the lowest energy treated in Idoeta and Legarda, 1992), 500 keV and 10 MeV (the largest energy treated in Idoeta and Legarda, 1992).

4. A practical interpolated expression for the unscreened MDCS

Recently, Lijian et al. (1995) suggested a practical interpolated polynomial expression (Eq. (24)) to $\mathcal{R}^{\text{Mott}}$ (Eq. (4)). The expression was a function of both θ and β for electrons with energies from 1 keV up to 900 MeV interacting on nuclei with $1 \leq Z \leq 90$, i.e.,

$$\mathcal{R}^{\text{Mott}} \equiv R^{\text{int}}(\theta, Z, E) = \sum_{j=0}^4 a_j(Z, \beta) (1 - \cos \theta)^{j/2}, \quad (24)$$

where

$$a_j(Z, \beta) = \sum_{k=1}^6 b_{k,j}(Z) (\beta - \bar{\beta})^{k-1}, \quad (25)$$

and $\bar{\beta}c = 0.7181287c$ is the mean velocity of electrons within the above mentioned energy range. The coefficients $b_{k,j}(Z)$ obtained by

Lijian et al. (1995) are listed in Table 1 of their article. Furthermore, it has to be pointed out that the energy dependence of $\mathcal{R}^{\text{Mott}}$ from Eq. (24) was studied and observed to be negligible above ≈ 10 MeV (as expected from Eq. (25), because β approaches 1, and discussed in Lijian et al., 1995). It has to be remarked that at 10, 100 and 1000 MeV for Li, Si, Fe and Pb, Boschini et al. (2012) calculated values of $\mathcal{R}^{\text{Mott}}$ using both Curr (1955) and Lijian et al. (1995) methods and found them to be in a very good agreement.

In the current work, following the same procedure indicated by Lijian et al. (1995), the coefficients $b_{k,j}(Z)$ for Eqs. (24) and (25) were obtained for both electrons (Table 3) and positrons (Table 4) interacting on nuclei with $1 \leq Z \leq 118$. Thus extending the treatment to positrons (not discussed in Lijian et al., 1995) and to the interaction of electrons with higher Z nuclei. It is worthwhile to remark that the previously available coefficients for electrons, as already noted by Jun et al. (2009), exhibit many typographic errors among those listed in Table 1 of Lijian et al. (1995).

For instance, in Fig. 1 (Fig. 2) the interpolated curves, obtained from Eq. (24), are shown as a function of the scattering angle for electrons (positrons) with 50 keV, 100 keV, 500 keV, 1 MeV and 10 MeV interacting on He, Al, Fe, Ag, Ba, Pb, U, Md, Ds and Uuo. In Figs. 1 and 2, the values from (a) the improved numerical approach calculated in the present work (see discussion in Section 3) and (b), when available, from Idoeta and Legarda (1992) are also shown and found in good agreement with interpolated data.

The precision of the current procedure for interpolation can be treated following that dealt by Lijian et al. (1995) as a function of the energy, E , of incoming electrons or positrons and the atomic number Z of target nuclei, i.e., introducing the *average relative error*, $\langle \sigma_{\text{rel}} \rangle$, given by

$$\langle \sigma_{\text{rel}} \rangle = \sqrt{\frac{\sum_{i=0}^{36} [R^{\text{int}}(\theta_i, Z, E) - R^{\text{num}}(\theta_i, Z, E)]^2}{\sum_{j=0}^{36} R^{\text{num}}(\theta_j, Z, E)^2}} \quad (26)$$

where θ_i (θ_j) is the i th (j th) value of the scattering angle from 0° up to 180° with 5° step, R^{int} is the value obtained from Eq. (24) and, finally, R^{num} is that from the numerical solution – sometime referred to as *exact solution* (e.g., see Idoeta and Legarda, 1992; Lijian et al., 1995) – discussed in Section 3. For electrons, one finds that, for $1 \leq Z \leq 114$, the interpolated expression (24) can be used

with $\langle\sigma_{\text{rel}}\rangle \leq 1\%$ at energies (shown in Fig. 3) which increase with increasing Z , i.e., the atomic number of the target nucleus; for $Z > 114$, $\langle\sigma_{\text{rel}}\rangle$ is (1–2.3)% for energies larger than 50 keV. For positrons, $\langle\sigma_{\text{rel}}\rangle$ was found to be less than 0.05% for all energies (i.e., from 1 keV up to 900 MeV) and all nuclei (i.e., $1 \leq Z \leq 118$).

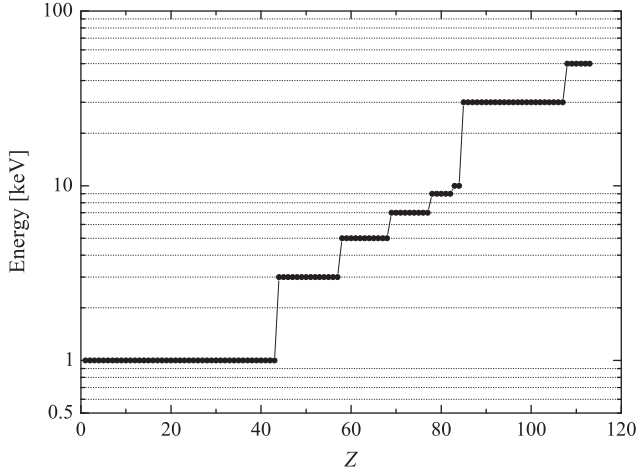


Fig. 3. Energy (in keV) of electrons above which the interpolated expression (24) provides values of $\mathcal{R}^{\text{Mott}}$ ratio with $\langle\sigma_{\text{rel}}\rangle \leq 1\%$ as a function of the atomic number Z of target nucleus with $1 \leq Z \leq 114$.

For electrons, the interpolated expression (24) $[R^{\text{int}}(\theta, Z, E)]$ obtained in the present work was also compared – when available and usable – with that from Lijian et al. (1995) $[R^{\text{L.Q.Z(1995)}}(\theta, Z, E)]$. The two expressions were found in good agreement with typical differences:

$$\Delta R = R^{\text{int}}(\theta, Z, E) - R^{\text{L.Q.Z(1995)}}(\theta, Z, E), \quad (27)$$

not exceeding 10^{-3} for low- Z nuclei and 10^{-2} for high- Z nuclei. As an example, Fig. 4 shows the values of ΔR [Eq. (27)] obtained for the scattering of electrons on He and Pb nuclei as a function of the scattering angle (in deg.) at the minimum energy for which $\langle\sigma_{\text{rel}}\rangle \leq 1\%$ – i.e., 1 keV for He and 30 keV for Pb – and at 50 keV, 100 keV, 1 MeV, 10 MeV, 100 MeV and 900 MeV.

5. Conclusion

In the present work, an improved numerical approach for determining the ratio, $\mathcal{R}^{\text{Mott}}$, of the unscreened MDCS with respect to Rutherford's formula was discussed, compared with that from Idoeta and Legarda (1992) up to 10 MeV and, finally, found to agree at least up to the 3rd digit (occurring in the 0.1% of the cases) or more, e.g., up to the 6th digit in the 73% of the cases.

For both electrons and positrons scattering on nuclei with $1 \leq Z \leq 118$ in the energy range from 1 keV up to 900 MeV, the calculated numerical values of $\mathcal{R}^{\text{Mott}}$ from the current improved numerical solution were used to provide an interpolated practical

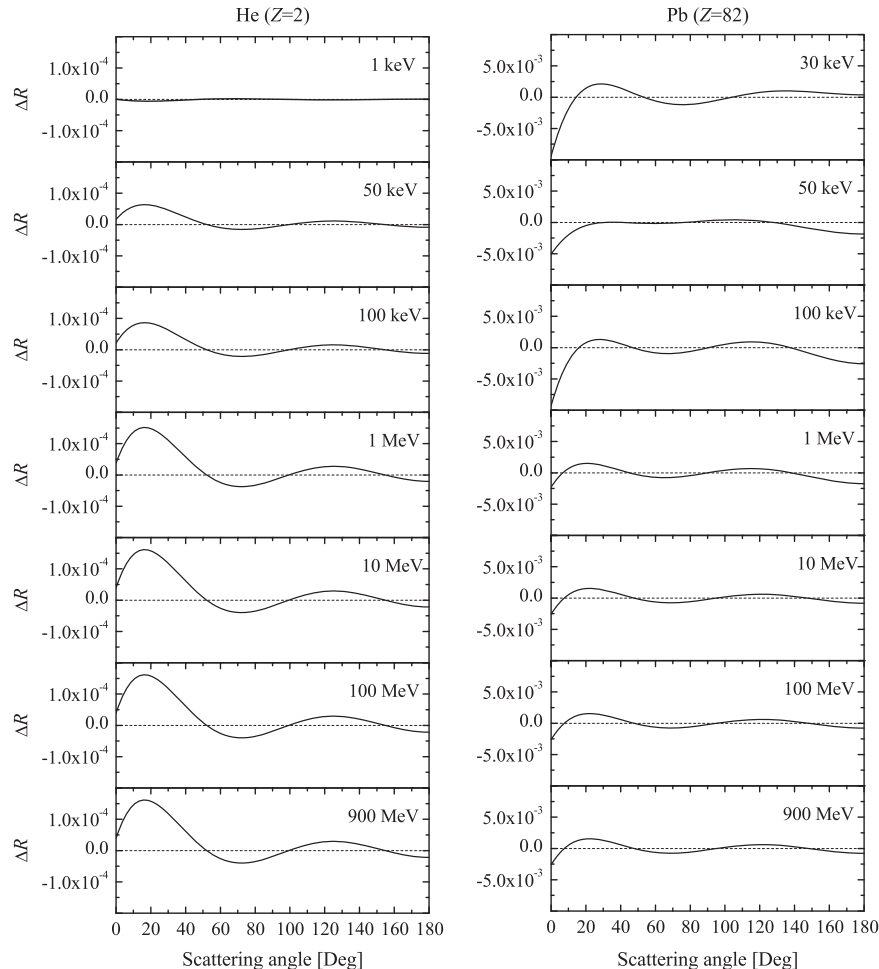


Fig. 4. Difference, ΔR , between the interpolated expression (24) obtained in the present work from that by Lijian et al. (1995) as a function of the scattering angle (deg.) for electrons at 1 keV (30 keV), 50 keV, 100 keV, 1 MeV, 10 MeV, 100 MeV and 900 MeV on He (Pb) nuclei.

expression. The latter function was shown to be in good agreement with the numerical solution. In addition, this interpolated expression was also compared with that found previously – when available and usable – only for electrons (on nuclei with $1 \leq Z \leq 90$) by Lijian et al. (1995). The two expressions exhibit differences not exceeding 10^{-3} for low- Z nuclei and 10^{-2} for high- Z nuclei.

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