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U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Washington, DC 20234

August 1982

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Department of Energy
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U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, *Secretary*
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*

STOPPING POWERS AND RANGES OF ELECTRONS AND POSITRONS*

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ABSTRACT

Tables of stopping powers and related data are given for electrons in 25 elements and 46 mixtures and compounds, and for positrons in 8 materials. The tables include: (1) collision stopping powers (ionization and excitation losses); (2) radiative stopping powers (bremsstrahlung losses); (3) total stopping powers; (4) ranges (rectified pathlengths computed in the continuous-slowing-down approximation); (5) radiation yields (fraction of initial electron energy converted to bremsstrahlung in the course of slowing down); and (6) the logarithmic derivatives of all these quantities with respect to the mean excitation energy of the medium (the key parameter of the Bethe stopping power formula). The results are tabulated at 81 energies between 1000 MeV and 10 keV. Collision stopping powers for electrons in materials of low atomic number are given also for energies down to 1 keV. The principal new ingredients in the preparation of the tables are: (1) improved values of the mean excitation energies for elements and compounds, derived from stopping-power and range measurements and from semi-empirical oscillator-strength distributions and dielectric-response functions; (2) density-effect corrections evaluated according to the method of Sternheimer, using up-to-date input parameters; and (3) use of new theoretical cross sections of Pratt and Tseng for electron-nucleus bremsstrahlung and of Haug for electron-electron bremsstrahlung.

Key words: Collision stopping power, electrons, positrons, radiation yield, radiative stopping power, range.

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*These tables were prepared as input for a report on stopping power to be written by a committee sponsored by the International Commission on Radiation Units and Measurements (ICRU). The ICRU sponsors of this committee are A. Allisy and R. S. Caswell. The committee members are H. H. Andersen, M. J. Berger (chairman), H. Bichsel, J. A. Dennis, M. Inokuti, D. Powers, and J. E. Turner. Consultants to the committee are S. M. Seltzer and R. M. Sternheimer. All of the above have made important contributions to this work. It should be emphasized that this report is a draft submitted to the ICRU, and may be revised before being included in an ICRU document.

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1. INTRODUCTION

1.1. Purpose and scope. In radiation physics, chemistry, biology, and medicine, it is often important to have accurate information about the stopping power of various media for charged particles, that is, the average rate at which the charged particles lose energy along their tracks. The purpose of this report is to supply up-to-date stopping-power information, with emphasis on the requirements of biomedical dosimetry. The contents of this report are the following: (a) In Sections 2 to 6, topics are reviewed which are pertinent to the evaluation of stopping powers for any charged particle within the framework of the Bethe theory.[1] These include shell corrections, the determination of mean excitation energies from experimental data, the use of the Bragg additivity rule for compounds, and the density-effect correction. Recommended values of mean excitation energies are given in Table 4.3 for elemental substances and in Table 5.5 for compounds and mixtures. (b) In Sections 7 to 11, topics are reviewed which are pertinent mainly or entirely to electrons. These include the radiative stopping power due to the emission of bremsstrahlung, and the information on electron collision stopping power at energies below 10 keV where the Bethe theory is no longer fully applicable. (c) In Section 12, electron stopping-power tables are presented for 25 elements and 46 compounds and mixtures, covering the energy region from 10 keV to 1000 MeV. These tables also include the range (rectified pathlength) and the radiation yield (fraction of electron kinetic energy converted to bremsstrahlung as the electrons slow down to rest), both computed in the continuous-slowing-down approximation.[2] Such data are also given for positrons in a few materials.

1.2. Background. For electrons it is customary to separate the total stopping power into two components: (a) the collision stopping power, which is the average energy loss per unit pathlength due to inelastic Coulomb collisions with bound atomic electrons of the medium resulting in ionization and excitation; (b) the radiative stopping power, which is the average energy loss per unit pathlength due to the emission of bremsstrahlung in the electric field of the atomic nucleus and of the atomic electrons.[3] The separation of the electron stopping power into two components is useful for two reasons. First, the methods used for the evaluation of the two components are quite different. Second, the energy going into the ionization and excitation of atoms is absorbed in the medium rather close to the electron track, whereas most of the energy lost in the form of bremsstrahlung travels far from the track before being absorbed. This distinction is important when attention

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[1]The results obtained will be applied to the tabulation of stopping powers for heavy charged particles in a future report.

[2]In this approximation, energy-loss fluctuations are disregarded, and the rate of energy loss at any point along the track is assumed to be equal to the stopping power.

[3]The nomenclature "collision stopping power" and "radiative stopping power" is that adopted by the International Commission on Radiation Units and Measurements (ICRU, 1980).

In the literature, the collision stopping power is often referred to as stopping power, with the adjective "collision" omitted, especially in circumstances where the radiative stopping power is negligible. The collision stopping power is sometimes also called "ionization loss." Numerically, but not conceptually, the collision stopping power is identical with the "linear energy transfer" (more precisely, the unrestricted linear energy transfer LET_∞) often used in radiobiology (see, *e.g.*, ICRU, 1970).

The excitations contributing to the collision stopping power include not only electronic excitations but also vibrational and rotational excitations of molecules; however, the latter two processes are relatively unimportant above the threshold energy for electronic excitation. Charged particles also lose some energy in elastic collisions with atoms. The transfer of recoil energy to atoms in such events is proportional to the ratio of the mass of the incident particle to the mass of the atom. This mode of energy loss is therefore unimportant for electrons except at extremely low energies where the cross sections for electronic, vibrational, and rotational energy losses become very small. For incident heavy particles, however, elastic collisions with atoms constitute a significant mode of energy loss, and give rise to a so-called "nuclear stopping power" which will be discussed in a future report on heavy charged particles.

is focussed on the energy "imparted locally" to the medium along the track rather than on the energy lost by the incident electron. Actually, even a part of the energy lost in ionizing collisions is converted to kinetic energy of secondary electrons, and is thus carried some distance away from the primary electron track. In order to estimate energy imparted locally in a crude but simple manner, it is therefore useful to introduce a restricted collision stopping power defined as the average energy loss per unit pathlength due to excitation events and due to ionization events in which the energy transferred to secondary electrons is smaller than some chosen limit. Some data on restricted stopping powers are also given in this report.

Even though electron stopping powers and ranges are widely used, they are rarely measured and must be obtained from stopping-power theory. All previous tables as well as the tables in this report contain collision stopping powers for electrons at energies above 10 keV evaluated according to the theory of Bethe (1930, 1932, 1933). The energy of 10 keV is a commonly accepted lower limit for the applicability of the theory. The principal non-trivial quantity describing the properties of the medium in Bethe's stopping-power formula is the mean excitation energy, which is a logarithmic average of the excitation energies of the medium weighted by the corresponding oscillator strengths. Except for elements with very low atomic number Z, the mean excitation energies in eV are approximately equal to $10 \cdot Z$. Accurate *ab initio* calculations of mean excitation energies are possible at present only for simple atomic gases. For most materials it is necessary to determine mean excitation energies from experimental data. Another important quantity in the stopping-power formula, not contained in Bethe's original theory, is the density-effect correction, which takes into account the reduction of the collision stopping power due to the polarization of the medium by relativistic charged particles (Fermi, 1940). All of the tabulations including the present one have relied on the method of Sternheimer (1952) for the evaluation of the density-effect correction.

The first extensive electron stopping-power and range tables were calculated by Nelms, first without and later with the density-effect correction (Nelms, 1956, 1958). The tables of Berger and Seltzer (1964, 1966) included not only the collision stopping power but also the radiative stopping power. The latter was evaluated by a combination of bremsstrahlung cross sections given by Bethe and Heitler (1934) and empirical corrections recommended by Koch and Motz (1959). Pages *et al.* (1972) in their tables used the same mean excitation energies and bremsstrahlung cross sections as those of Berger and Seltzer, but evaluated the density-effect correction with somewhat different input parameters.

1.3. New features. The principal new aspects of this work are the following:

(a) A careful review has been made of the mean excitation energies derived from the analysis of stopping-power and range measurements, and from semi-empirical dipole oscillator-strength distributions for gases or dielectric-response functions for liquids and solids.

(b) In the extraction of mean excitation energies from measured stopping powers and ranges, use has been made of empirical shell corrections recently developed by Bichsel (unpublished) as an extension of his earlier work (Bichsel, 1961, 1963, 1972).

(c) For compounds for which no direct experimental information is available, the mean excitation energies have been calculated as weighted sums of the mean excitation energies of the atomic constituents (Bragg additivity). The required mean excitation energies of the constituents have been adjusted to take into account, at least approximately, the effects of chemical binding and the physical state of aggregation.

(d) The Main Tables indicate the sensitivity of the electron collision stopping power, range, and bremsstrahlung yield to a change of the mean excitation energy. This enables the reader to make the appropriate adjustments if he prefers values of the mean excitation energy different from those adopted in this report.

(e) The density-effect correction has been re-evaluated according to the dispersion model of Sternheimer (1952). Rather than using Sternheimer's earlier results or the universal fit given by Sternheimer and Peierls (1971), we have evaluated the density effect using as input the mean excitation energies adopted in this report and values of the binding energies for atomic subshells from Carlson (1975).

(f) The radiative stopping power has been calculated with improved theoretical bremsstrahlung cross sections. For bremsstrahlung in the field of the atomic nucleus, cross sections were obtained as follows: (i) At energies up to 2 MeV, recent theoretical results were used that are based on the solution of the Dirac equation and numerical evaluation of the pertinent matrix elements (Tseng and Pratt, 1971; Pratt *et al.*, 1977). (ii) Above 50 MeV, use was made of cross sections in the high-energy approximation (Davies, Bethe, and Maximon, 1954; Olsen, 1955), evaluated with improved form-factor screening corrections derived from Hartree-Fock wave functions. (iii) In the energy region from 2 to 50 MeV, it has been found possible to construct reliable cross sections by interpolating with respect to electron energy, using the accurate low- and high-energy theoretical results as anchor points. The less important process of bremsstrahlung in the field of the atomic electrons was taken into account according to the theory of Haug (1975) augmented by a screening correction.

2. FORMULAS FOR THE COLLISION STOPPING POWER

2.1. General formulas. In this section various formulas of the Bethe theory and its elaborations will be stated briefly without derivation. For a detailed discussion of stopping-power theory the reader is referred to the many excellent reviews in the literature, *e.g.*, Bohr (1948), Bethe and Ashkin (1953), Uehling (1954), Fano (1963), Inokuti (1971), Jackson (1975), Sigmund (1975), and Ahlen (1980).

The linear collision stopping power, with dimensions of energy/length, will be denoted as $-(dE/dx)_{col}$ or S_{col}. We shall find it convenient to consider also the corresponding mass collision stopping power, S_{col}/ρ, where ρ is the density of the medium. The change from linear to mass stopping power largely removes the dependence on the density, except for a residual dependence due to the density-effect correction. With S_{col} in MeV/cm and ρ in g/cm^3, S_{col}/ρ has units of MeV/(g/cm^2).

The collision stopping power is due to energy transfers from the incident particle to bound atomic electrons. We denote by $d\sigma/dW$ the cross section (per atomic electron) for inelastic collisions resulting in an energy transfer of magnitude W. The mass collision stopping power can then be expressed as

$$\frac{1}{\rho} S_{col} = \frac{N_a Z}{A} \int W \frac{d\sigma}{dW} dW \quad . \tag{2.1}$$

The leading factor, $N_a Z/A$, represents the number of atomic electrons per gram of the medium. $N_a = 6.022045 \times 10^{23}$ mol^{-1} is Avogadro's number, and Z and A are the atomic number and atomic weight.

Following the formulation of Uehling (1954), we now discuss the results of Bethe's evaluation of the stopping-power expression (2.1). These results are applicable to electrons and positrons, mesons, protons, alpha particles and to fully-stripped heavy ions. The energy transfers W to atomic electrons in inelastic collisions are divided into two classes, depending on whether they are smaller or larger than some value W_c which must satisfy two conditions: (a) W_c must be large compared to the binding energies of the atomic electrons of the stopping medium. (b) The impact parameters associated with energy losses smaller than W_c must be large compared to atomic dimensions. The mass collision stopping power is expressed as the sum of two components,

$$\frac{1}{\rho} S_{col} = \frac{1}{\rho} S_{col}(W < W_c) + \frac{1}{\rho} S_{col}(W > W_c) \quad . \tag{2.2}$$

The main result of the Bethe theory, applicable to electrons and heavy charged particles, is that

$$\frac{1}{\rho} S_{col}(W < W_c) = \frac{2\pi N_a r_e^2 mc^2}{\beta^2} \frac{Z}{A} z^2 \left[\ln \frac{2mc^2 \beta^2 W_c}{(1 - \beta^2) I^2} - \beta^2 \right] \quad , \tag{2.3}$$

where N_a is Avogadro's number, r_e is the classical electron radius, mc^2 is the electron rest energy, β is the velocity of the incident particle (projectile) divided by the velocity of light, z is the projectile charge in units of the charge of the electron, Z and A are the atomic number and atomic weight of the target atoms, and I is the mean excitation energy. Note that (Particle Data Group, 1980)

$$2\pi N_a r_e^2 mc^2 = (2\pi)\ (6.022045 \times 10^{23} \mathrm{mol}^{-1})\ (7.940775 \times 10^{-26} \mathrm{cm}^2)\ (0.5110034\ \mathrm{MeV})$$
$$= 0.153536\ \mathrm{MeV\ cm}^2\ \mathrm{mol}^{-1} \quad .$$

Equation (2.3) is valid when the velocity of the projectile is large compared to the velocities of the atomic electrons. Applied to the electrons in the K shell this implies the requirement that $(Z/137\beta) \ll 1$. The stopping-power component due to close collisions is evaluated as if the atomic electrons were free and at rest:

$$\frac{1}{\rho} S_{col}(W > W_c) = N_a \frac{Z}{A} \int_{W_c}^{W_m} W \frac{d\sigma}{dW} dW \quad , \tag{2.4}$$

where $d\sigma/dW$ is now the differential cross section for energy transfer W in a collision with a free electron, and where

$$W_m = 2\tau(\tau + 2)mc^2/[1 + 2(\tau + 1)(m/M) + (m/M)^2] \tag{2.5}$$

is the largest possible energy transfer, with τ the kinetic energy of the projectile in units of its rest mass, and m/M the ratio of the electron mass to that of the projectile.

2.2. Stopping-power formula for heavy charged particles. Formulas for heavy charged particles are given here because they are needed for the analysis of experimental data to obtain mean excitation energies. When $m \ll M$ Eq (2.5) can be approximated by

$$W_m = 2\tau(\tau + 2)\ mc^2 = \frac{2mc^2\ \beta^2}{1 - \beta^2} \quad . \tag{2.6}$$

The differential scattering cross section is (Uehling, 1954; Fano, 1963)

$$d\sigma = \frac{2\pi\ r_e^2\ mc^2}{\beta^2} z^2 \frac{dW}{W^2} (1 - \beta^2\ W/W_m) \quad . \tag{2.7}$$

Combining Eqs (2.2) to (2.7), one obtains the result

$$\frac{1}{\rho} S_{col} = \frac{4\pi\ N_a\ r_e^2\ mc^2}{\beta^2} \frac{Z}{A} z^2 \left[\ln \frac{2\ mc^2\ \beta^2}{(1 - \beta^2) I} - \beta^2 \right] \quad . \tag{2.8}$$

As expected for a consistent treatment, the quantity W_c which separates hard and soft collisions does not appear explicitly in Eq (2.8).

The accuracy of the stopping-power formula is improved by the addition of the following corrections:

(1) A shell correction,[4] which compensates for the fact that the projectile velocity is not necessarily large compared to the velocity of the target electrons;

(2) A density-effect correction which accounts for the reduction of the stopping power due to the polarization of the medium; and

(3) Corrections which represent departures from the first Born approximation.

Following Lindhard (1976), Andersen *et al.* (1977) and Ritchie and Brandt (1978), the collision stopping-power formula is written as

$$\frac{1}{\rho} S_{col} = \frac{4\pi N_a r_e^2 mc^2}{\beta^2} \frac{Z}{A} z^2 L(\beta) \quad , \tag{2.9}$$

where $L(\beta)$, the stopping number per atomic electron, is expressed as the sum of three terms,

$$L(\beta) = L_o + zL_1 + z^2 L_2 \quad . \tag{2.10}$$

The first term,

$$L_o(\beta) = \ln\left(\frac{2mc^2 \beta^2}{1 - \beta^2}\right) - \beta^2 - \ln I - \frac{C}{Z} - \frac{\delta}{2} \quad , \tag{2.11}$$

adds to Eq (2.8) a shell correction, C/Z, and a density-effect correction $\delta/2$. These corrections will be discussed further in Sections 3.2 and 6, respectively.

The second and third terms in Eq (2.10) extend the treatment beyond the first Born approximation. The term zL_1 is often referred to as the "z^3 correction." Because of the appearance of an odd power of z, the stopping power for particles with positive and negative charge will differ, and this was in fact first observed by Barkas *et al.* (1956). For this reason, following Lindhard (1976), we shall refer to the zL_1 term as the Barkas correction. It was first calculated by Ashley, Ritchie, and Brandt (1972, 1973) in a semi-classical approximation, using a harmonic-oscillator model and assuming that only distant collisions contribute to the effect. The assumed minimum impact parameter (approximately equal to the orbital radius of the atomic electrons) is not precisely specified by the theory, and its value must be adjusted on the basis of experimental stopping-power data. Other derivations of the Barkas correction have been given by Jackson and McCarthy (1972) who used a somewhat different quantum-mechanical cut-off parameter, by Hill and Merzbacher (1974) who carried out a quantum-mechanical perturbation calculation for distant collisions, and by Lindhard (1976) on the basis of his free-electron-gas model. These theories lead to results essentially equivalent to those of Ashley, Ritchie, and Brandt, especially in view of the adjustable value of the minimum impact parameter. We shall in this report use the theoretical results of Ashley *et al.*, as given by them in terms of a numerical function F which is defined such that

$$zL_1 = \frac{zZ\alpha^3}{\beta^3} F(b\alpha\sqrt{Z}/\beta) \quad , \tag{2.12}$$

where $\alpha = 1/137.03604$ is the fine-structure constant. The multiplier b in the argument of F is related to the choice of the minimum impact parameter, and usually has a value between 1 and 2 (see, *e.g.*, Table 3.4).

---

[4]The name "shell correction" arose because the correction was calculated separately for interactions with atomic electrons in different shells, starting with the treatment of K-shell electrons by Livingston and Bethe (1937).

The correction term z^2L_2 in Eq (2.10) is contained in an extension of Bethe's stopping-power formula due to Bloch (1933), and will therefore be called the Bloch correction. Bloch's formula is based on a quantum-mechanical impact-parameter method that takes into account, approximately, the perturbation of the wave functions of the atomic electrons due to the incident particle. The correction has the form

$$z^2L_2 = \psi(1) - \mathrm{Re}\ \psi(1 + iy) \quad , \tag{2.13}$$

where $y = z\alpha/\beta$ and where ψ is the logarithmic derivative of the gamma function. Using properties of this function (see, *e.g.*, p. 259 in Abramowitz and Stegun, 1964) one can transform Eq (2.13) into

$$z^2L_2 = - y^2 \sum_{n=1}^{\infty} [n(n^2 + y^2)]^{-1} \quad . \tag{2.14}$$

For very small y, the Bloch correction is negligible. For $y \gg 1$, the value of z^2L_2 can be shown to approach $- 0.577 - \ln y$. When this asymptotic value is added to the stopping number (square brackets in Eq (2.8)), the resulting stopping formula is the same as the classical formula of Bohr (1913).

2.3. Stopping-power formulas for electrons and positrons. For electrons, large energy transfers to atomic electrons (considered as free) are governed by the Møller (1932) cross section,

$$d\sigma = \frac{2\pi\ r_e^2\ mc^2}{\beta^2} \frac{dW}{W^2} \left[1 + \frac{W^2}{(T-W)^2} + \frac{\tau^2}{(\tau+1)^2} \frac{W}{T}^2 - \frac{(2\tau+1)}{(\tau+1)^2} \frac{W}{(T-W)} \right] \tag{2.15}$$

where $\tau = T/mc^2$ is the kinetic energy of the incident electron in units of its rest mass. The Møller cross section, valid when $137\beta \gg 1$, takes into account relativity and spin effects as well as exchange effects associated with the indistinguishability of the incident and target electrons. By convention, the collision stopping-power pertains to the faster of the two electrons emerging from the collision. The maximum possible energy transfer W_m, while equal to T according to Eq (2.5), is therefore taken to be equal to $T/2$. With the Møller cross section, and using Eqs (2.1), (2.2), and (2.4), one obtains the following formulas for the electron mass collision stopping power (Rohrlich and Carlson, 1953; Uehling, 1954):

$$\frac{1}{\rho} S_{col} = \frac{2\pi\ N_a\ r_e^2\ mc^2}{\beta^2} \frac{Z}{A} [\ln(T/I)^2 + \ln(1 + \tau/2) + F^-(\tau) - \delta] \quad , \tag{2.16}$$

where

$$F^-(\tau) = (1-\beta^2)\ [1 + \tau^2/8 - (2\tau+1)\ \ln 2] \quad . \tag{2.17}$$

One half times the quantity in square brackets in Eq (2.16) is the stopping number per atomic electron, $L(\beta)$, and is analogous to the stopping number $L(\beta)$ for protons in Eq (2.9).[5] For positrons, energy transfers larger than W_c are treated by the Bhabha (1936) cross section (given by Eq (10) in Uehling, 1954). There are no exchange effects, and the maximum possible energy transfer is $W_m = T$. The mass collision stopping-power formula for positrons is similar to that for electrons, except that F^- is replaced by

[5]The factor 1/2 arises because it is conventional to use 2π for electrons and 4π for heavy charged particles in the leading factor of the stopping-power formula.

$$F^+(\tau) = 2\ln 2 - (\beta^2/12)\,[23 + 14/(\tau+2) + 10/(\tau+2)^2 + 4/(\tau+2)^3] \quad . \qquad (2.18)$$

Some remarks are necessary regarding the absence of shell corrections from the electron stopping-power formula, Eq (2.16). For heavy particles, such corrections have been developed on the basis of the assumption that the projectile particle can be considered equivalent to a perturbing potential whose center moves with constant velocity. This assumption, while satisfied for protons down to rather low velocities, is much less applicable to electrons, so that there is no sound theoretical basis for extending the available shell-correction theory to electrons.

Corrections to the Bethe theory, analogous to shell corrections for stopping power, have been discussed by Inokuti (1971) in regard to excitation cross sections. He indicates that these corrections contain an additive term proportional to the ratio of electron to projectile mass, m/M, such that the corrections can be expected to be significantly larger for electrons than for protons. It seems likely that this will also be the case for stopping-power shell corrections.

We have attempted to make a rough estimate of the possible error in the calculated electron stopping power due to the omission of a shell correction term, assuming, arbitrarily, that the error is twice as large as the reduction of the proton stopping power for protons with the same velocity. At an electron energy of 100 keV, the error is then estimated to be ~ 0.3% for H_2O, ~ 0.7% for $A\ell$, ~ 1.3% for Cu, ~ 2% for Ag, and ~ 3% for Au. At 10 keV, the corresponding error estimates are ~ 2% for H_2O, ~ 4% for $A\ell$, ~ 9% for Cu, ~ 12% for Ag, and ~ 21% for Au. The use of Eq (2.16) is questionable at energies below 10 keV. However, for low-Z materials such as water, air, or plastics, the evidence presented later in Section 8 suggests that the errors may amount to ~ 3% at 5 keV, ~ 7% at 2 keV, and 10 to 15% at 1 keV.

3. METHODS FOR ESTIMATING MEAN EXCITATION ENERGIES

In order to obtain accurate values of the mean excitation energy I, it is necessary to take into account the specific electronic structure of the atom, molecule, or solid of interest. Accurate *ab initio* calculations of I are available for some atomic gases. For other materials one must rely on semi-empirical methods for determining I, using data available from two sources: stopping-power and range measurements, usually for protons and alpha particles; and dielectric-response functions (for solids) and oscillator-strength distributions (for gases), which can often be obtained from cross sections for the interaction of photons with the medium of interest.

Only moderate accuracy of the mean excitation energy is required for the determination of the electron collision stopping power. Let ΔS_{col} be the uncertainty of S_{col} corresponding to an uncertainty ΔI of I. From Eq (2.16) it can be seen that at low energies, where the density-effect correction is negligible, $\Delta S_{col}/S_{col} = -(\Delta I/I)/L$, where the stopping number L ranges in value from $\gtrsim 3$ at 10 keV to ~ 15 at 1000 MeV. At high energies the I-dependence of the density-effect correction is such as to reduce the I-dependence of the collision stopping power further; in fact, in the limit of extremely high energies the collision stopping power becomes independent of I (see Section 6). Figure 3.1 gives the ratio of logarithmic derivatives $-(dS_{col}/S_{col})/(dI/I)$ as a function of electron kinetic energy, for a few materials. The value of this ratio decreases with increasing electron energy. The bends in the curves for water at ~ 0.5 MeV, and for air at ~ 25 MeV, are due to the sudden onset of the density-effect correction for non-conducting media.

3.1. Use of oscillator-strength and dielectric data. The use of such data is growing in importance; they are becoming more plentiful and allow the determination of I-values as accurately as from the best stopping-power measurements. The accuracy results in part from the fact that the oscillator-strength distributions are subject to various sum rules which act as constraints in the evaluation of experimental data and provide connections to other measurable physical quantities. The theory underlying the use of oscillator-strength and dielectric data has been reviewed by Fano (1963) and Inokuti and Turner (1978).

For gases, the mean excitation energy can be obtained from the expression

$$\ln I = \int_0^\infty \frac{df}{dE} \ln E \, dE \Big/ \int_0^\infty \frac{df}{dE} \, dE \quad , \tag{3.1}$$

where df/dE is the density of optical dipole oscillator strength per unit energy of excitation above the ground state.

A variety of methods has been used to evaluate Eq (3.1). For a dilute gas of free atoms, systematic calculations of oscillator-strength distributions and I-values, based on the use of Hartree-Slater central potentials and a single-electron model, have been carried out by Dehmer *et al.* (1975) for atomic numbers Z up to 18, and have been continued by Inokuti *et al.* (1981) for Z up to 38. Critical evaluations of experimental oscillator-strength distributions for atomic and molecular gases, based on the use of photo-electric cross sections and inelastic electron scattering cross sections, have been obtained by various authors, for example, Zeiss *et al.* (1975; 1977a,b; 1980). Another semi-empirical method, denoted here as $M(n)$ fit, makes use of the moments $M(n) = \int^\infty df/dE \, E^n dE$ of the oscillator-strength distribution (Dalgarno, 1960). Noting that $dE^n/dn = E^n \ln E$, one can transform Eq (3.1) into

$$\ln I = \frac{1}{M(0)} \left[\frac{dM(n)}{dn}\right]_{n=o} \quad . \tag{3.2}$$

According to the Thomas-Kuhn sum rule, $M(0) = Z$. The moments $M(2)$, $M(1)$, and $M(-1)$ are calculated theoretically, and $M(-2)$ is obtained from experimental polarizability data. By fitting these moments, an analytical function $M(n)$ is obtained which is then differentiated to get $\ln I$.

I-values for 9 gases, obtained according to Eq (3.1) by various theoretical and semi-empirical methods, are given in Table 3.1, which is an adaptation and slight extension of Table V in Dehmer *et al.* (1975). The most accurate I-values are those derived with the use of semi-empirical oscillator-strength distributions.

The values of the ratio I/Z obtained in the systematic calculations of Dehmer *et al.* (1975) and Inokuti *et al.* (1981) show a periodic variation with Z, which is interpreted as due to atomic shell structure. Quite similar variations are found when I-values are calculated on the basis of the local-plasma approximation of Lindhard and Scharff (1953). According to this model the mean excitation energy is obtained from the equation

$$\ln I = (1/Z) \int_0^\infty 4\pi \, r^2 \, n_o(r) \, \ln(\gamma \, \hbar \, \omega_o) \, dr \quad , \tag{3.3}$$

where

$$\omega_o = (4\pi \, e^2 \, n_o(r)/m)^{\frac{1}{2}} \tag{3.4}$$

is the plasma frequency corresponding to a electron density $n_o(r)$ at a distance r from the nucleus, $\hbar$ is Planck's constant divided by 2π, and γ is a free parameter for which the value $\sqrt{2}$ is recommended. As pointed out by Dehmer *et al.* (1975), the use of Eqs (3.3) and (3.4) is equivalent to assuming an approximate oscillator-strength distribution

$$\frac{df}{dE} = \langle \delta(E - \gamma \, \hbar \, \omega_o(r)) \rangle \quad , \tag{3.5}$$

where the brackets denote the ground state expectation value and δ is a delta function. Expression (3.3) was evaluated by Bichsel and Laulainer (1971), by Chu and Powers (1972), and by Ziegler (1980), with electron density distributions derived from Hartree-Slater wave functions. Ziegler has also extended the calculations to solids, using solid-state wave functions.

Figure 3.2 shows the irregular Z-dependence of I/Z as calculated by Dehmer *et al.*, and by Inokuti *et al.*, from theoretical oscillator-strength distributions, and by Chu and Powers and by Ziegler according to the local-plasma approximation. In order to make the two types of results comparable, the local-plasma results are given for $\gamma = 1$. As will be shown later in Section 4, the Z-dependence of the experimental I/Z ratios has similar irregularities. Moreover, the calculated and experimental I/Z ratios can be brought into rather good agreement with $\gamma \sim 1.3$.

The use of optical dipole oscillator-strength distributions is justified only for dilute gases for which there is only a weak correlation between the positions of the electrons in the medium. For condensed materials the mean excitation energy can be obtained from an alternative equation, in terms of the dielectric-response function $\epsilon(\omega)$ of the medium (Fano, 1956, 1963):

$$\ln I = (2/\pi\omega_p^2) \int_0^\infty d\omega\ \omega\ \mathrm{Im}[-1/\epsilon(\omega)]\ \ln(\hbar\omega) \quad , \tag{3.6}$$

where ω_p is the plasma frequency. The corresponding plasma energy[6] is

$$\hbar\omega_p = (4\pi\ \hbar^2\ e^2\ n_e/m)^{\frac{1}{2}} = 28.816(\rho Z/A)^{\frac{1}{2}}\ \mathrm{eV} \quad , \tag{3.7}$$

where n_e is the total number of electrons per unit volume, and e is the charge of the electron.

The dielectric-response function is complex-valued; for non-magnetic materials, its real and imaginary parts, $\epsilon_1(\omega)$ and $\epsilon_2(\omega)$, can be expressed in terms of the real and imaginary parts, $n(\omega)$ and $\kappa(\omega)$, of the refractive index:

$$\left.\begin{aligned} \epsilon_1(\omega) &= n^2(\omega) - \kappa^2(\omega) \\ \epsilon_2(\omega) &= 2n(\omega)\ \kappa(\omega) \end{aligned}\right\} . \tag{3.8}$$

It is therefore possible to obtain $\epsilon(\omega)$ from optical data, and just as in the case of oscillator-strength distributions there are sum rules which serve as consistency checks for experimental data.

The dielectric-response function for aluminum has been evaluated by Shiles *et al.* (1980) by a dispersion analysis involving the use of the reflectance, ellipsometric and transmission optical data from many experiments, and also the use of electron energy-loss data. These authors obtained an I-value of 165.7 ± 1.0 eV for aluminum. Mean excitation energies for various compounds, obtained in a similar manner (but usually with less abundant optical data) will be discussed in Section 5.

3.2. Use of stopping-power and range data. There is an abundant experimental literature on stopping powers and ranges for protons and alpha particles (see, *e.g.*, Andersen and Ziegler, 1977; Ziegler, 1977; Andersen, 1977). The extraction of mean excitation energies from such data would be a routine matter if it were not for the fact that the stopping-power theory contains correction terms which are not always known with the accuracy desirable. From measured stopping-power data, the mean excitation energy can be determined by inverting Eq (2.9):

$$\ln I = \ln\left(\frac{2mc^2\ \beta^2}{1-\beta^2}\right) - \beta^2 - x - \left(\frac{S_{col}}{\rho}\right)_{expt} \Bigg/ \left(\frac{4\pi\ N_a\ r_e^2\ mc^2}{\beta^2}\ \frac{Z}{A}\ z^2\right) \quad , \tag{3.9}$$

[6]The plasma energy specified in terms of Eq (3.7) is a nominal value calculated with the electron density for all atomic electrons. It is larger than the plasma energy used to describe collective excitations (plasmons) which is calculated with the density of participating electrons.

where

$$x = \frac{C}{Z} + \frac{\delta}{2} - zL_1 - z^2L_2 \tag{3.10}$$

is the total correction, combining the shell correction, density-effect correction, Barkas correction, and Bloch correction.

Let ΔS_{col} denote the uncertainty of the measured value of S_{col}, and let Δx denote the uncertainty of the correction term x. Assuming that the two uncertainties can be combined quadratically, the overall uncertainty of the estimated I-value is

$$\Delta I = I \cdot [(\Delta S_{col}/S_{col})^2 \; L_{exp}^2 + (\Delta x)^2]^{\frac{1}{2}} \tag{3.11}$$

where L_{exp} is the experimental stopping number (last term in Eq (3.9)). When range data are used to determine I-values, the error analysis is more complicated, and must take into account the uncertainty of the experimental range value as well as the uncertainties of the correction term x at all energies up to the initial projectile energy.

In the evaluation of the correction x we have followed a procedure suggested by H. Bichsel, earlier versions of which have been described by Bichsel (1961, 1963, 1972). Included in the procedure are the evaluation of the Barkas correction according to Ashley, Ritchie, and Brandt (1972,1973), the Bloch correction according to Eq (2.14), and the shell correction by the method outlined below.

3.2.1. Bichsel's shell corrections. The total shell correction C is the sum of the contributions C_K, C_L, ... from the different atomic shells. Theoretical values calculated with hydrogenic wave functions are available for C_K (Walske, 1952; Khandelwal, 1968), for C_L (Walske, 1956; Bichsel, 1967; Khandelwal, 1968), and for C_M (Khandelwal and Merzbacher, 1966). The error due to the use of hydrogenic wave functions is expected to be relatively minor for the K shell, more serious for the L shell (particularly for atomic numbers $Z \lesssim 30$) and probably even greater for the M shell.

Extension of the calculations to higher shells, with use of improved wave functions, is possible but would be very laborious. Bichsel instead adopts a semi-empirical scaling procedure with parameters that are determined by experimental stopping-power data. He assumes that the dependence of C_M on the particle velocity is similar to that of C_L, except for scale factors, and also extends this assumption to the higher shells. The Walske result for the L shell, $C_L(\theta_L,\eta_L)$, depends on the atomic number through the parameter θ_L and on the particle energy through the quantity

$$\eta_L = (\beta/\alpha Z^*)^2 \quad , \tag{3.12}$$

where $Z^* = Z - 4.15$ is the effective nuclear charge for the L shell. The M-shell correction is calculated from the scaling relation

$$C_M = V_M \; C_L \; (\theta_L, H_M\eta_L) \quad , \tag{3.13}$$

where V_M is equal to 1/8 times the number of electrons in the M shell, and where H_M is an adjustable parameter. Analogous scaling relations are used for the N shell and for a combined O-P shell.[7]

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[7]For $Z < 10$, Eq (3.13) is also applied to the incompletely filled L shell, with V_L as defined above and $H_L = 1$. For low atomic numbers, the effective charge Z^* for the L shell has in this work been set equal to $Z - d$, with values of d taken from Clementi and Raimondi (1963).

For								
$Z =$	3	4	5	6	7	8	9	10
$d =$	1.72	2.09	2.48	2.82	3.16	3.53	3.84	4.24

The scaling parameters H_n (for n = M, N, and O-P), the parameter b of the Ashley-Ritchie-Brandt theory for the Barkas correction, and the mean excitation I were determined by Bichsel in a two-stage procedure. First he chose values of I, b, and the H_n's by trial and error for a small number of key elements so as to obtain the best possible agreement between calculated and measured stopping powers and ranges for protons and alpha particles, taking into account all available data. The parameters thus chosen for C, Aℓ, Cu, Ag, and Au are given in Table 3.2. They are of course not unique, but provide a good fit to the data. Table 3.3 gives illustrative values, for the same elements, of the shell corrections, Barkas corrections, Bloch corrections, and the stopping number per electron. The relative contributions of the various corrections to the proton stopping number for gold are indicated in Fig. 3.3 where it can be seen that at energies above 500 MeV the density-effect correction is more important than the shell correction.

The second stage of Bichsel's procedure consists of interpolating the parameters H_n *vs.* Z, to obtain values for all elements. His interpolation scheme is given in Table 3.4 which also lists recommended b-values for all elements. The shell corrections thus obtained exhibit small irregularities as functions of Z, especially at low proton energies. Before being used in the present work they were smoothed graphically. The smoothed shell corrections of Bichsel, plotted *vs.* Z, are shown in Fig. 3.4 for various proton energies from 2 MeV to 100 MeV. Bichsel's shell corrections as functions of the proton energy are given in Fig. 3.5 for various elements.

3.2.2. Comparison of Bichsel's and Bonderup's shell correction. Theoretical shell corrections have been derived by Bonderup (1967) on the basis of the statistical gas model of Lindhard and Scharff (1953) and Lindhard and Winther (1964). The theoretical shell corrections, plotted against atomic number, are shown in Fig. 3.4 and can be seen to agree rather well with Bichsel's empirical shell corrections for atomic numbers Z up to ~ 50. With increasing Z the Bonderup corrections continue to increase whereas those of Bichsel reach a peak and then decrease.[8]

To investigate the influence of the adopted shell corrections we now consider the high-energy proton range measurements of Barkas and von Friesen (1961) and the low- and intermediate-energy stopping-power measurements of Burkig and MacKenzie (1957), Sørensen and Andersen (1973) and Ishiwari *et al.* (1979) for the elements Cu, Pb, and U.

The proton energy in the Barkas-von Friesen experiment had the nominal value of 750 MeV but was uncertain by one or two MeV. Using the measured proton range value of 273.29 g/cm^2 in aluminum, and using the accurate value $I_{A\ell}$ = 166 eV from Shiles *et al.* (1980), one estimates the beam energy to have been 749.0 MeV. With this energy one obtains the I-values shown in Table 3.5, which are estimated to have an uncertainty of ~ 10 eV. The use of Bonderup's rather then Bichsel's shell corrections would lower the I-values for Pb and U by a few eV but leave that for Cu unchanged. It is interesting to note that the omission of the density-effect correction would have a much greater influence on I than the change of shell corrections.

Table 3.6 compares I-values deduced from medium-energy as well as high-energy experiments. It can be seen that for copper the same I-value is obtained (within the estimated uncertainties) regardless of the type of shell correction that is used. For lead and uranium, however, the use of the Bonderup shell correction leads to estimated I-values for lead and uranium that are ~ 10 percent lower for the medium-energy experiments than for the high-energy experiment. With Bichsel's shell corrections, approximately the same I-value is obtained regardless of energy. Inasmuch as the mean excitation energy is a material constant independent of the projectile energy, we have adopted Bichsel's shell corrections as providing the better representation of the experimental situation.[9]

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[8] A similar turning over of the curve of shell correction *vs.* atomic number is also characteristic of the empirical shell corrections given by Andersen and Ziegler (1977) which lie between the Bonderup and Bichsel shell corrections.

[9] It may be noted that Andersen and Nielsen (1981) also find that the Bonderup shell correction for protons in gold at energies from 2 to 7 MeV is larger than the empirical shell correction which they deduce from their stopping-power measurements. These authors suggest that the discrepancy may be due to the non-relativistic treatment of inner-shell electrons in Bonderup's theory.

4. SELECTION OF MEAN EXCITATION ENERGIES FOR ELEMENTS

Using Eq (3.9) with shell corrections from Bichsel, the Barkas correction according to Ashley, Ritchie, and Brandt, and the Bloch correction, we have extracted I-values for a large number of elements from 22 experiments. The data are mainly for protons with energies $\gtrsim$ 5 MeV, so that the value of the correction term $x = C/Z + \delta/2 - zL_1 - z^2L_2$ is in general small compared to the stopping number (see Table 3.3). The measurements that were analyzed are listed in Table 4.1. The deduced I-values and their uncertainties are given in Table 4.2. The overall uncertainties have been calculated according to Eq (3.11), combining quadratically (a) the experimental uncertainties, and (b) an assumed 10-percent uncertainty of the correction term x.

Several of the experiments listed in Table 4.1 provide stopping-power ratios relative to a reference material. Burkig and MacKenzie (1957) and Nakano *et al.* (1963) measured stopping-power ratios relative to aluminum. We have interpreted these by assuming the stopping-power for aluminum to be that calculated with an I-value of 166 eV as obtained by Shiles *et al.* (1980) from dielectric data. The experiments of Bakker and Segrè (1951) and of Thompson (1952) give stopping-power ratios with respect to copper, which we have analyzed assuming an I-value of 322 eV for copper consistent with various other experimental results. The experiment of Nordin and Henkelman (1979) gives stopping-power ratios relative to liquid water, which have been analyzed assuming for water an I-value of 75 eV derived by Ritchie *et al.* (1978) and Ashley (1982a) from dielectric data. The measurement uncertainties entered into Eq (3.11) have been augmented to include the uncertainties of the calculated stopping powers of the reference materials.

The experimental results of Thompson were also analyzed relative to water instead of copper, and those of Nordin and Henkelman relative to aluminum instead of water. This changed the deduced I-values by only a fraction of one percent, and an average of the values with the two reference materials was taken. The I-values from the experiment of Bakker and Segrè, when analyzed with respect to aluminum instead of copper, changed significantly, and both sets of I-values are given in Table 4.2.

The final choices of mean excitation for elements were made as follows. (a) For the gases H_2, He, N_2, O_2, and Ne, the information from semi-empirical dipole oscillator-strength distributions was judged to be more accurate than that from stopping-power data, and I-values were selected from those given in Table 3.1. (b) For aluminum, the value $I = 166$ eV was used as derived by Shiles *et al.* from dielectric data; this value is also supported by the results of several stopping-power measurements. (c) For other elements, I-values were selected by taking into account the results from stopping-power and range experiments collected in Table 4.2. The available information is in most cases good enough to specify I-values accurate to a few percent.

We have also estimated I-values for elements for which no experimental information is available. Following Andersen and Ziegler (1977) we have done this by imitating the local Z-dependence as predicted by the results of calculations done in the local-plasma approximation (see Fig. 3.2). The following interpolation scheme was used. Denoting calculated I-values by $I_c(Z)$, experimental values by $I(Z)$ and interpolated values by $I_{int}(Z)$, we have assumed that

$$I_{int}(Z) = I_c(Z) \left\{ \frac{I(Z_1)}{I_c(Z_1)} \frac{Z_2 - Z}{Z_2 - Z_1} + \frac{I(Z_2)}{I_c(Z_2)} \frac{Z - Z_1}{Z_2 - Z_1} \right\} , \tag{4.1}$$

where Z_1 and Z_2 are the closest atomic numbers, with experimental I-values, that bracket the atomic number Z of interest. Either Z, Z_1, and Z_2 pertain to gases, in which case the required values of I_c are taken from the results of Chu and Powers (1972) obtained with free-atom wave functions, or Z, Z_1, and Z_2 pertain to solids in which case the values of I_c are taken from the results of Ziegler (1980) obtained with solid-state wave functions (the version indicated by Ziegler as first-order solid with continuous interstitials).

The value $I = 700$ eV listed in Table 3.1 for radon, obtained by Bell and Dalgarno (1965) by a "M(n) fit" (see Section 3.1), is expected to be inaccurate because of a numerical error in the moment $M(-1)$ and because of neglected relativistic effects. The adopted value $I = 794$ eV was estimated by extrapolating the ratios $I(Z)/I_c(Z)$ for rare gases to $Z = 86$.

Table 4.3 gives the adopted I-values, and the corresponding ratios I/Z, for all elements. The estimated uncertainties of the I-values are given only for experimentally-based I-values. These uncertainties are intended to take into account both the uncertainties of individual experimental results and the scatter of the results from different experiments.[10] The interpolated I-values are enclosed in parentheses. To indicate the irregular Z-dependence of the adopted mean excitation energies, a plot of I/Z *vs.* Z is shown in Fig. 4.1.

As a check on the acceptability of the adopted I-values and correction terms to the stopping-power formula, we demonstrate in Figs. (4.2) to (4.5) that close fits are obtained to a large body of experimental stopping-power data. Comparisons are made in terms of the ratio of the experimental to the calculated stopping power. Figure 4.2, taken from Bichsel and Porter (1982), pertains to protons and alpha particles in N_2 and O_2. Figure 4.3 pertains to proton stopping power at energies up to 20 MeV in Aℓ, Cu, Ag, Au, Pb, and U. Figures 4.4 and 4.5 pertain to the proton stopping-power measurements of Ishiwari *et al.* (1979) at 6.5 MeV, and those of Burkig and MacKenzie (1957) at 19.8 MeV, in many elements.

For a few elements, the I-values adopted in this report are compared in Table 4.4 with I-values recommended in eleven earlier papers.

5. SELECTION OF MEAN EXCITATION ENERGIES FOR COMPOUNDS

The experimental information on I-values for compounds is steadily increasing. I-values for many gases have been determined by Zeiss *et al.* (1975, 1977a,b), Thomas and Meath (1977), and Jhanwar *et al.* (1981) from semi-empirical dipole oscillator-strength distributions. For liquid water and for various plastics, I-values have been obtained by Ritchie *et al.* (1978), Ashley (1979) and Painter *et al.* (1980) from dielectric data. I-values for a large number of condensed compounds, obtained under uniform conditions, can be deduced from an experiment by Thompson (1952) who measured the pathlengths traveled by protons while slowing down from 340 MeV to 200 MeV in many organic liquids, in water, and in a few solids. Thompson showed that the ratios of these pathlengths to the pathlength in a reference material (copper) can be interpreted as reciprocals of the corresponding stopping-power ratios at an intermediate energy. We have re-analyzed Thompson's data, applying small multiple-scattering corrections according to a procedure of Bichsel (1954) and shell corrections for copper, to obtain stopping-power ratios relative to copper at 267.5 MeV.

There are many compounds of interest for which one needs to estimate I-values in the absence of direct experimental information. It has been known since the early work of Bragg and Kleeman (1905) that the collision stopping-power of a compound can be approximated by the weighted sum of the stopping powers of the atomic constituents of the compound. For the mass collision stopping power S_{col}/ρ, the additivity rule takes the form

$$\frac{1}{\rho} S_{col} = \sum_j w_j \frac{1}{\rho} S_{col\,j} \quad , \tag{5.1}$$

where w_j is the fraction by weight of the j'th atomic constituent. This additivity rule is equivalent to replacing, in the stopping-power formula Eq (2.16), the quantities Z/A, I, and δ by

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[10] The uncertainties of the I-values in Table 4.3 are figures of merit, arrived at by subjective judgements, and with a meaning that is not easily defined. One possible interpretation would be the following. If, in the future, the measurement accuracy and theoretical analysis are sufficiently improved so that I-values can be determined with an accuracy an order of magnitude better than at present, we expect that for at least 90 percent of the cases in Table 4.3 the future I-values will lie within the limits of uncertainty given in this report.

$$Z/A = \sum_j w_j (Z_j/A_j) \quad , \tag{5.2}$$

$$\ell nI = \left[\sum_j w_j (Z_j/A_j) \ell nI_j\right] \Big/ \langle Z/A \rangle \quad , \tag{5.3}$$

$$\delta = \left[\sum_j w_j (Z_j/A_j) \delta_j\right] \Big/ \langle Z/A \rangle \quad , \tag{5.4}$$

where Z_j, A_j, I_j, and δ_j pertain to the j'th constituent. It should be noted that $\langle Z/A \rangle$ is equal to the total number of electrons in the molecule divided by the molecular weight. The use of $\langle \delta \rangle$ calculated from Eq (5.4) is in general not a good approximation, and it is preferable to calculate the density-effect correction directly for the compound of interest (see Section 6.3).

The application of this additivity rule requires the choice of appropriate values for the mean excitation energies of the constituents. The simplest procedure, often used in the past, is to take the same I-values for the atomic constituents of a compound as for the corresponding elemental substances. This introduces some error because of the neglect of molecular binding effects. An additional error may be incurred when elemental I-values for gases (*e.g.*, oxygen) are applied to the constituents of solid compounds.

The accuracy of the additivity rule can be improved by assigning I-values to the constituents which are not unique but take on various values depending on the type of compound and on the physical state of aggregation of the medium. When carried to an extreme this is equivalent to abandoning additivity and treating each compound separately. However, it is possible to find simple rules for assigning I-values to atomic constituents with which the I-values for a large number of compounds can be represented satisfactorily. We have adopted such an assignment scheme which is given in Table 5.1.

A more elaborate assignment scheme was developed earlier by Thompson (1952) who interpreted his experimental stopping powers for various compounds in terms of the stopping powers (and I-values) of atomic constituents in various chemical environments. We have extracted I-values from Thompson's stopping powers for atomic constituents, and have thus obtained the up-dated Thompson assignment scheme given in Table 5.2. In this scheme, different I-values are assigned to constituents depending on the type of chemical bond involved. Thompson's conclusions as to the influence of bond types on the I-values of atomic constituents in organic liquids are quite plausible. However, the available data base is not sufficient to pin these distinctions down with great precision, and there is a need for further experiments similar to Thompson's.

Mean excitation energies for organic solids and other compounds have also been estimated by Brandt (1956, 1958, 1960) on the basis of experimental data and theoretical considerations. Brandt (1960) used as an initial approximation free-atom I-values for atomic constituents according to a formula of Jensen (1937), modified these values to take into account the valence states (aromatic, aliphatic, ...) of atomic constituents, and then assumed Bragg additivity. Brandt also applied a "low-energy density-effect" correction which raised the mean excitation energy for the compound as a whole. His valence-state corrections and density-effect corrections were obtained from theoretical polarization data for atoms and experimental molar-refractivity data for molecular compounds. As will be shown later in the comparison in Table 5.6, Brandt's theoretical I-values for low-Z compounds are not very different from those adopted in the present work. However, his I-values for compounds containing high-Z constituents tend to be too low, a fact already noted by Brandt with respect to photographic emulsion.

Table 5.3 lists the presently available experimental I-values, and their origin, for 13 gases, 27 liquids, and 14 solids. The table also gives the differences between these I-values and corresponding Bragg-additivity I-values obtained with our adopted assignment scheme and that of Thompson. In most cases these differences are smaller than the estimated experimental uncertainties. There are large discrepancies

in only two cases, for liquid dichloroethane and for paraffin wax.[11] For gases our assignment scheme works particularly well. For liquids it is slightly inferior to Thompson's scheme, but for solids it is somewhat better.

Thompson's scheme includes more chemical detail than ours but on the whole works no better and is more complicated to apply. We have therefore used our scheme (Table 5.1) for the prediction of I-values in the absence of experimental data. For compounds with the constituents H, C, N, and O (and perhaps also F and Cℓ) such predictions have a sound empirical basis. One would expect that the errors associated with such predictions will have the same order of magnitude as the differences between experimental and Bragg-additivity I-values in Table 5.3. The situation is less clear in regard to condensed materials with atomic constituents other than those listed above. Our assignment scheme uses for these other constituents I-values that are 13 percent larger than the corresponding I-values for condensed elemental substances as given in Table 4.3. This increase was found to be required to obtain a good approximation to the rather accurately known experimental I-values for $A\ell_2O_3$, SiO_2, and photographic emulsion, and is also consistent with the less certain experimental data for LiF and CaF_2. In the absence of other information we have assumed that the 13-percent increase should also be applied to the constituents of other compounds such as sodium iodide and cesium iodide.

Certain composite materials, for example tissue-equivalent gases, pyrex glass, and human tissues, have constituent molecules whose I-values are known independently from experiments. In order to take advantage of this information, we have treated such composite materials via a Bragg rule for the combination of atomic and molecular constituents. For human tissues, a prominent constituent with a known I-value is water. In Table 5.4, the water content and I-values for various types of tissue are given.

Table 5.5 lists the adopted mean excitation energies, densities and elemental compositions for the 46 compounds and mixtures for which electron stopping-power tables are given in this report. The symbol + indicates I-values derived directly from experimental data or I-values for mixtures (such as air) all of whose constituents have experimentally determined I-values. The symbol ++ indicates I-values derived by applying the additivity rule to molecular constituents one or more of which have experimentally determined I-values. In all other cases, the I-values were obtained from the additivity rule, Eq (5.3), with constituent I-values from Table 5.1.

A letter grade (A, B, or C) is given next to each I-value in Table 5.5, to indicate the relative quality of these data. The assignment of these grades was based on the information contained in Table 5.3, but also involved subjective judgements. For the most part the following guidelines were followed. Direct experimental I-values were given the grade A unless the experimental uncertainty was greater than 5 percent, in which case they were given the grade B. I-values for low-Z gas compounds were given the grade A. I-values for condensed compounds were given the grade B if the constituents consisted predominantly of the elements H, C, N, O, F, or Cℓ. The grade C was given to I-values for condensed compounds which contain mainly other constituents whose I-values were adjusted upward by the 13-percent rule. We would assign an estimated uncertainty[12] of $\lesssim$ 5 percent with grade A, 5 to 10 percent with grade B, and 10 to 15 percent with grade C. In order to indicate how the recommended I-values for compounds have changed over the years, a comparison with previously recommended values is given in Table 5.6.

For electrons, the dependence of the collision stopping power on the state of aggregation can be expressed completely through the mean excitation energy, provided the Bethe stopping-power theory (without shell corrections) is applicable. This dependence is indicated in Table 5.7 for a few elements and compounds. It should be noted that the values for molecular gases, liquids and solids are empirical, whereas those for "atomic gases" are from theoretical oscillator-strength distributions.

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[11] Because the experimental I-value for paraffin wax is inconsistent with those for other straight-chain hydrocarbons (n-pentane, n-hexane, n-heptane, and polyethylene), we have adopted the I-value of 55.9 eV, using the Bragg-additivity values according to Table 5.1. This is the only case in which the Bragg-additivity value was adopted in preference to the experimental value.

[12] Concerning the meaning that might be attached to the estimated uncertainties, see footnote 10.

6. DENSITY EFFECT

6.1. General equations. The passage of a charged particle through a medium results in the polarization of atoms in the medium, and this polarization in turn screens the electric field acting on the particle so as to reduce the stopping power. This reduction is particularly strong in dense media, and is therefore called the density effect. The greater the particle velocity, the greater is the density effect because, by virtue of the Lorentz contraction, distant collisions become more important. In fact, at very high energies the density-effect correction to the stopping power is significant even in dilute gases.

The density effect was first predicted by Swann (1938) and calculated by Fermi (1940). The results of such a calculation depend on the model used for representing the dielectric properties of the medium. Whereas Fermi used only one dispersion frequency, more realistic models were developed by Wick (1943), Halpern and Hall (1948), and Sternheimer (1952). Sternheimer introduced a procedure for making the dielectric model consistent with the (experimentally known) mean excitation energy for the medium, which is essential for obtaining accurate results.

As shown by Fano (1956, 1963), the density-effect correction can be expressed as follows in terms of the dielectric-response function $\epsilon(\omega)$ of the medium:

$$\delta = (2/\pi\omega_p^2) \int_0^\infty \omega \, d\omega \, \mathrm{Im}[-1/\epsilon(\omega)] \, \ln(1 + \ell^2/\omega^2) - (\ell/\omega_p)^2 (1 - \beta^2) \quad , \tag{6.1}$$

where ω_p is the plasma frequency, proportional to the square root of the density, given by Eq (3.7). The quantity ℓ is defined, as a function of β, as the root of the equation

$$1 - \beta^2 \epsilon(i\ell) = 0 \quad . \tag{6.2}$$

It can be shown that in the limit $\beta \to 1$

$$\delta \to \ln\left[(\hbar\omega_p)^2/(1 - \beta^2)I^2\right] - 1 \quad . \tag{6.3}$$

When this result is inserted into the stopping-power Eqs (2.9) or (2.16), the mean excitation energy I disappears from the final result. Thus in the limit of very high energies, the stopping power depends on the properties of the medium only through the plasma energy $\hbar\omega_p$, and therefore only on the density and the ratio Z/A.

In the solution of Eq (6.2), a difference arises between conducting and non-conducting media. For conductors, the dielectric-response function is such that the equation has a root for any value of β. The density effect is then present, though small, even at arbitrarily low energies. For insulators, however, a root exists only above a minimum value of $\beta_o = \epsilon(o)^{-\frac{1}{2}}$, which is a property of the material, and there is no density effect for $\beta < \beta_o$.

The most accurate method of evaluating the density-effect correction is to use semi-empirical dielectric-response functions in Eqs (6.1) and (6.2). This has recently been done by Inokuti and Smith (1982) for aluminum, and by Ashley (1982b) for water. Reliable and complete dielectric-response functions for other materials are scarce, and in general one must rely on Sternheimer's method, which -- although more approximate -- will be shown below to give results in very good agreement with those of Inokuti and Smith and of Ashley.

6.2. Sternheimer's model. As discussed by Fano (1963), Sternheimer's model can be related to Eqs (6.1) and (6.2) as follows. In Eq (6.1) one sets $\epsilon = 1/(1 - \alpha_L)$, where

$$\alpha_L(\omega) = (\hbar\omega_p)^2 \sum_{n=1}^{N} \frac{f_{nL}}{E_{nL} - (\hbar\omega)^2 - i\gamma_L \hbar\omega} \tag{6.4}$$

is the longitudinal polarizability expressed in terms of the energy levels E_{nL} of single atoms and the corresponding oscillator strengths f_{nL}. In the limit in which the damping constant $\gamma_L \to 0$, the resulting expression for δ becomes

$$\delta = \sum_{n=1}^{N} f_{nL} \, \ell n[1 + (\hbar \ell)^2/E_{nL}^2] - (\ell/\omega_p)^2 \, (1 - \beta^2) \quad . \tag{6.5}$$

In Eq (6.2), one sets $\epsilon = 1 + \alpha_T$, where α_T is the transverse polarizability and is given by an expression similar to Eq (6.4) but with different energy levels E_{nT}, oscillator strengths f_{nT}, and damping term γ_T. In the limit $\gamma_T \to 0$, Eq (6.2) is then transformed into

$$\alpha_T(i\ell) = (\hbar\omega_p)^2 \sum_{n=1}^{N} \frac{f_{nT}}{E_{nT}^2 + (\hbar\ell)^2} = \frac{1}{\beta^2} - 1 \quad . \tag{6.6}$$

The following approximations are now made:

a. The distinction between the longitudinal and transverse oscillator strengths f_{nL} and f_{nT} is disregarded, and both are approximated by f_n, the fraction of electrons in the n'th atomic shell.

b. The energy levels are assumed to be

$$E_{nT} = \mu_{St} \, E_n \quad , \tag{6.7}$$

$$E_{nL} = [\mu_{St}^2 \, E_n^2 + f_n(\hbar\omega_p)^2]^{\frac{1}{2}} \quad , \tag{6.8}$$

where the E_n's are atomic energy levels. The quantity μ_{St} is the <u>Sternheimer factor</u> and is given a value such that the equation

$$\sum_{n=1}^{N} f_n \, \ell n[\mu_{St}^2 \, E_n^2 + f_n(\hbar\omega_p)^2]^{\frac{1}{2}} = \ell n I \tag{6.9}$$

is satisfied. The dielectric model is then consistent with the mean excitation energy I (as known from experimental data), and the density-effect correction δ calculated according to Eq (6.5) goes into the correct asymptotic limit, Eq (6.3), for very high particle energies. The values of μ_{St} typically range from 1.5 to 2.5.

For conductors, the electrons in the outermost shell, $n = N$, are considered to be conduction electrons, and the corresponding binding energy E_N is set equal to zero. This has the consequence that Eq (6.6) has a solution for arbitrarily small values of β. For insulators, on the other hand, Eq (6.6) has a solution only for velocities greater than β_o given by

$$\frac{1}{\beta_o^2} - 1 = \sum_{n=1}^{N} \frac{f_n}{\mu_{St}^2 \, E_n^2/(\hbar\omega_p)^2} \quad . \tag{6.10}$$

As a final refinement, which makes little difference except for liquid H_2, a Lorentz-Lorenz correction is applied (Sternheimer, 1952), through the replacement of $f_n(\hbar\omega_p)^2$ in Eqs (6.8) and (6.9) by $\lambda_n \, f_n(\hbar\omega_p)^2$, where $\lambda_N = 1$ for conductors, and $\lambda_n = 2/3$ in all other cases.

6.3 <u>Numerical evaluation</u>. The evaluation is done by first solving Eq (6.9) for μ_{St}, then Eq (6.6) for ℓ as a function of β, and substituting the value of ℓ into Eq (6.5). Such calculations using I-values current at the time, were carried

out by Sternheimer (1952, 1956, 1966, 1967) and Sternheimer and Peierls (1971) for many materials. The results were reported in terms of a useful approximation formula for δ. In the present work we have systematically re-evaluated δ using the I-values adopted in the present report and atomic binding energies from Appendix 1 of Carlson (1975). The number of conduction electrons for metals and semi-conductors was taken to be equal to the lowest valence number. Compounds have been treated as insulators. For compounds, the sums with respect to n in the various equations were extended to include all atoms in the compound. Departures from simple Bragg additivity were taken into account by using the appropriate density and mean excitation energy for the compound. We have used the direct numerical output of the calculations rather than an analytical approximation formula when computing the stopping-power tables.[13] These values of δ are listed in the Main Tables.

Values of δ for a few media, calculated by the method of Sternheimer described above, are shown in Fig. 6.1. When expressed as functions of the particle kinetic energy in units of the rest mass, these results are applicable to any charged particle. Table 6.1 gives illustrative results regarding the percent reduction of the electron collision stopping power due to the density effect.

Figure 6.2 shows the difference between the δ-value of Inokuti and Smith (1982) and the corresponding Sternheimer value for aluminum, and Fig. 6.3 shows the difference between the δ-value of Ashley (1982b) and the corresponding Sternheimer value for water. In both cases the differences are positive at some energies and negative at others. For aluminum the absolute value of the difference is always smaller than ~ 0.04, and for water it is always smaller than ~ 0.09. Figure 6.4 shows the percent amount by which the electron collision stopping power is changed when the more exact density-effect corrections of Inokuti and Smith or of Ashley are replaced by Sternheimer's corrections. It can be seen that the absolute percent difference is smaller than 0.2 percent for aluminum and smaller than 0.5 percent for water. The very satisfactory agreement in the cases of aluminum and water gives one confidence that Sternheimer's results will be accurate in general.[14]

6.4. Complications for inhomogeneous media. The theory for the density effect is designed for media that are homogeneous and isotropic. In some cases of practical interest these conditions are not met. An important case is that of graphite, a porous material consisting of somewhat loosely packed graphite crystallites arranged in a layered structure with a dielectric-response function that is a direction-dependent tensor (Raether, 1980). The crystallite density is 2.265 g/cm^2, whereas the bulk density may range from 1.5 to 1.9 g/cm^2, depending on the method by which the graphite is manufactured. Typical densities for reactor-grade graphite are 1.7 to 1.8 g/cm^3. The porosity structure is complicated (Gmelin, 1968), including "micropores" ranging in diameter from 2 to 60 nanometers, and "macropores" ranging in diameter up to 20 micrometers. It is not clear what density value should be used in a simple theory which neglects all these complications. In the stopping-power tables we give results for densities of 1.7 and 2.265 g/cm^3. At energies above a few MeV, the use of the higher density would decrease the collision stopping power by more than one percent.

Another case of interest is photographic emulsion. The standard emulsion considered here consists of low-Z gel (17.4% by weight, average density 1.29 g/cm^3) and silver halides (82.6% by weight, average density 6.47 g/cm^3). Two extreme approaches can be considered: (a) The density effect can be calculated as if the emulsion were homogeneous, with the bulk density 3.185 g/cm^3; this is what was done to produce the tabulated results. (b) The emulsion can be considered to be inhomogeneous, and the density effect can be calculated separately for the two components, gel and silver halides, with the proper density for each. The use of method (b) instead of (a) would lower the collision stopping power by 0.2% at 1 MeV, 0.4% at 10 MeV, 0.8% at 100 MeV and 0.7% at 1000 MeV.

Similar considerations can also be applied to A-150 tissue-equivalent plastic which consists of an inhomogeneous mixture of polyethylene, nylon, carbon black and calcium fluoride (Smathers *et al.*, 1977). In this case the use of method (b) instead of (a) would lower the collision stopping power by no more than 0.1%.

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[13] Updated parameters for Sternheimer's approximation formula will be given in a forthcoming paper (Sternheimer, Seltzer, and Berger, 1982).

[14] The evidence from high-energy charged-particle penetration data also confirms the accuracy of Sternheimer's method (see, *e.g.*, Crispin and Fowler, 1970).

7. RESTRICTED COLLISION STOPPING POWER

In radiation dosimetry and in radiobiological modeling (track-structure theory) one may want to know the fraction of the energy lost by an electron that is absorbed "locally" in the medium in the vicinity of the electron track. To obtain this fraction accurately one must carry out transport calculations that take into account (a) the initial energy spectrum and angular distribution of the secondary electrons set in motion in ionization events, and (b) the penetration, diffusion and slowing down of the secondary electrons. A simple, approximate answer can be obtained in terms of the fraction $L(T,\Delta)/S_{col}(T)$, where $L(T,\Delta)$ is the <u>restricted collision stopping power</u>. (The symbol $L(T,\Delta)$ used here should not be confused with the stopping number L discussed in Sections 2 and 3.) This quantity is defined as the mean energy loss per unit pathlength due to collisions involving energy transfers W, from the incident electron to the medium, that are smaller than some chosen cut-off Δ. The kinetic energy of the secondary electrons from ionization events is then also smaller than Δ, and the range for an electron of energy Δ roughly specifies the region around the track of the incident electron within which energy is absorbed "locally". The significance of the concept of restricted stopping power, and possible extensions and generalizations, are discussed in an ICRU report on linear energy transfer (ICRU, 1970).

An application of restricted collision stopping powers occurs in the Bragg-Gray theory of cavity ionization as formulated by Spencer and Attix (1955), in which the cut-off energy Δ serves to specify the dimension of the cavity. Another application occurs in the Monte Carlo simulation of electron tracks. In such a calculation, energy-loss straggling can be taken into account approximately, with reduced computational effort, by limiting random sampling to large energy transfers, which are rare, and by treating the numerous small energy transfers in the continuous-slowing-down approximation with use of a restricted collision stopping power.

In order to obtain an expression for the restricted collision stopping power, one must replace the maximum energy transfer W_m in the integral in Eq (2.4) by Δ. The results for electrons and positrons (indicated by superscripts - and +) are:

$$\frac{1}{\rho} L^{\pm}(T,\Delta) = \frac{2\pi N_a r_e^2 mc^2}{\beta^2} \frac{Z}{A} [\ln(T/I)^2 + \ln(1 + \tau/2) + G^{\pm}(\tau,\eta) - \delta] \quad . \tag{7.1}$$

Equation (7.1) is similar to Eq (2.16), and the various symbols have the same meaning, except that the functions $F^{\pm}(\tau)$ are replaced by $G^{\pm}(\tau,\eta)$. For electrons,

$$G^{-}(\tau,\eta) = -1-\beta^2 + \ln[4(1 - \eta)\eta] + (1 - \eta)^{-1}$$

$$+ (1 - \beta^2)[\tau^2\eta^2/2 + (2\tau + 1) \ln(1 - \eta)] \tag{7.2}$$

where $\eta = \Delta/T$ is the fractional energy cut-off. For positrons

$$G^{+}(\tau,\eta) = \ln 4\eta - \beta^2[1 + (2 - u^2) \eta - (3 + u^2)(u\tau/2) \eta^2$$

$$+ (1 + u\tau)(u^2\tau^2/3) \eta^3 - (u^3\tau^3/4) \eta^4] \quad , \tag{7.3}$$

where $u = (\tau + 2)^{-1}$. We note that $G^{-}(\tau,1/2) = F^{-}(\tau)$ and that $G^{+}(\tau,1) = F^{+}(\tau)$, so that $L^{-}(T,T/2) = S^{-}_{col}(T)$ and $L^{+}(T,T) = S^{+}_{col}(T)$.

A condition for the validity of Eq (7.1) is that the cut-off energy Δ be larger than the binding energies of the atomic electrons in the target material. For the K- and L-shell electrons of high-Z materials this condition is difficult to satisfy for Δ-values of practical interest. Tables 7.1 and 7.2 give the ratios of the restricted to the total collision stopping power for electrons and positrons in seven substances, for cut-off energies Δ = 100, 10 and 1 keV. The results shown are limited to cases for which Δ is larger than the L-shell binding energy and at least

comparable with the K-shell binding energy. The results for Pb for Δ = 100 keV, for Ag and Cu for Δ = 10 keV, and for Aℓ for Δ = 1 keV have been included for completeness, but may be inaccurate.

Excluded from the definition of restricted stopping power used above is the reduction of the collision stopping power due to the escape of Auger electrons, which may occur subsequent to inner-shell ionization. For water, graphite, and air, the results in Tables 7.1 and 7.2 are not affected by this possibility, because the K-shell binding energies of these materials are ~ 1/2 keV. However, for these materials it would not be accurate to use Eq (7.1) with a cut-off energy as low as 100 eV, as is sometimes done in radiobiological calculations.

8. ELECTRON COLLISION STOPPING POWERS AT LOW ENERGIES

There is an energy below which the concept of an electron collision stopping power loses its usefulness. The lower the electron kinetic energy, the larger is the fraction of the energy lost, on the average, in a single inelastic collision. For example, it can be shown (Paretzke and Berger, 1978) that the average fractional energy loss in a collision with a water molecule in vapor is 0.5 percent at 10 keV, 3.6 percent at 1 keV, 6.4 percent at 0.5 keV, and 22 percent at 0.1 keV. The continuous-slowing-down approximation, *i.e.*, the use of a stopping power to describe the gradual energy loss along the electron track, ceases to be meaningful at energies below several hundred eV. The evaluations of low-energy electron stopping powers found in the literature have often extended down to lower energies (typically 20 eV), but such results have significance mainly as a summary description of low-energy energy-loss cross sections.

8.1. Calculations for gases. There have been considerable advances in recent years in the knowledge of electron-impact ionization and excitation cross sections at energies from 10 keV down to a few eV. The need for such data has arisen in two contexts: in the evaluation of semi-empirical oscillator-strength distributions such as those referred to in Table 3.1, and in the calculation of electron energy degradation spectra which take into account the slowing down of electrons and the buildup of successive generations of secondary electrons from ionization events. The often incomplete and sparse experimental data have been supplemented by estimated cross sections obtained by theoretical modeling, the adopted cross sections have been subjected to consistency checks in the form of sum rules, and comprehensive sets of cross sections have been assembled for a number of gases. This approach, and the results obtained, have been described by Green and Miller (1974), Fano (1975), and Inokuti, Douthat, and Rau (1976). For atmospheric gases, cross sections have been given by Jackman *et al.* (1977) where references to earlier work of Green and co-workers can also be found. From knowledge of the total cross sections for ionization and excitation, and the ionization cross section differential in the energy transferred to secondary electrons, one can readily construct collision stopping powers according to Eq (2.1).

8.2. Calculations for solids and liquids. Almost all of these calculations have been based on the approach of Lindhard (1954), Fano (1956), and Ritchie (1959). The stopping properties of the medium are expressed in terms of a complex-valued dielectric-response function $\epsilon(K,\omega)$ that depends on the momentum transfer $\hbar K$ and energy transfer $\hbar\omega$. The collision stopping power is proportional to a double integral, with respect to K and ω, over the quantity $(\omega/K)\ \mathrm{Im}[-1/\epsilon(K,\omega)]$.

In the so-called statistical model, the dielectric-response function is calculated according to the local-plasma approximation (free electron gas model) of Lindhard (1954), which has already been mentioned in Section 3 in connection with the evaluation of the mean excitation energy. The dielectric-response function has been calculated by Ashley, Ritchie and collaborators using a variety of models, adapted to conductors, semi-conductors and insulators, that take into account single-electron excitations as well as collective excitations (plasmons). Whenever possible, experimental optical data were used to obtain the dielectric-response function in the limit of zero momentum transfer, $\epsilon(o,\omega)$.[15] It was still necessary, however, to obtain $\epsilon(K,\omega)$ for non-zero K through theoretical extrapolation, guided by the requirement that very large energy transfers should be described by the Rutherford cross section, or by the Møller cross section when exchange is taken into account. Usually the

[15] $\epsilon(o,\omega)$ is sufficient for the calculation of the mean excitation energy I according to Eq (3.6).

contribution to the stopping power from inner-shell electrons has been evaluated with the use of theoretical atomic generalized oscillator strengths, which is justified on the basis that the wave functions of the inner-shell electrons are insensitive to the state of aggregation of the medium.

Tables of electron collision stopping powers have been given by Ashley *et al.* (1975) for Aℓ and $Aℓ_2O_3$; Ashley *et al.* (1976a) and Tung *et al.* (1979) for Aℓ, Si, Ni, Cu, Ag and Au; Ashley *et al.* (1976b) for Ge and GaAs; Tung *et al.* (1976) for Si and SiO_2; Ashley *et al.* (1978) for polystyrene; Ritchie *et al.* (1978) for water; Ashley *et al.* (1979) for Aℓ; Painter *et al.* (1980) for polyethylene; Ashley (1980) for various organic solids, Ashley and Anderson (1981) for SiO_2; and Ashley (1982a) for water. Other calculations based on the use of Lindhard's statistical model have been reported by Sugiyama (1976).

8.3. Comparison of stopping powers. The case of water is especially interesting because comparisons can be made between stopping powers from different authors for water vapor as well as liquid water. In the left-hand panel of Fig. 8.1, for water vapor, curve 1 is from Paretzke and Berger (1978),[16] curve 2 is from Green,[17] and curve 3 is from the Bethe theory, Eq (2.16), with I = 71.6 eV. Curves 1 and 2 both lie below the Bethe curve 3, but the differences are smaller than 10% down to ~ 400 eV. Curves 1 and 2 agree rather closely down to ~ 150 eV, but diverge at lower energies. The main reason for this divergence lies with the total ionization cross section which Green took from the experiment of Schutten *et al.* (1966) whereas Berger relied also on those of Märk and Egger (1976) below 150 eV.

In the right panel in Fig. 8.1, for liquid water, curve 4 is from Kutcher and Green (1976), curve 5 is from Ritchie *et al.* (1978), curve 6 from Ashley (1982a), and curve 7 is from the Bethe theory with I = 75 eV. The calculations leading to curves 4, 5, and 6 all take into account collective excitations (plasmons) and use the experimental optical data of Heller *et al.* (1974) on uv absorption in liquid water. Ashley constructed the dielectric function for liquid water from an insulator model fixed by the available optical data, and treated ionization from the K shell by theoretical generalized oscillator strengths. As explained by Ashley, the main difference between his calculation and the earlier work of Ritchie *et al.* consists of an improved treatment of exchange effects, which results in a lowering of the peak of the stopping-power curve at ~ 120 eV by 25 percent. The formalism for obtaining the collision stopping power in terms of the dielectric response functions is a Born-approximation theory. The uncertainties resulting from the use of this approximation could easily be 10 percent at 100 eV and even greater at lower energies. The peak of the stopping-power curve 6 of Ashley is 13 percent above the corresponding value for water vapor (curve 1). It is not clear whether this difference is significant, because it lies within the combined limits of uncertainties for the liquid and vapor results.

Figure 8.2 compares collision stopping powers in H_2 gas calculated by Green[17] and by Spencer and Pal (1978). Also shown are curves obtained with the Bethe formula for H_2 gas (I = 19.2 eV) and for liquid hydrogen (I = 21.8 eV). The results of Green and of Spencer and Pal are in good agreement down to ~ 30 eV; both of these results deviate significantly from the Bethe theory only below ~ 200 eV. Also shown in Fig. 8.2 is a stopping-power curve for air which was constructed from the results of Green[17] for N_2, O_2, Ar, and CO_2. Again there is good agreement with the Bethe formula down to 200 eV. An earlier stopping-power curve for air, calculated by Green and Peterson (1968), coincides with curve 5 in Fig. 8.2 down to 1 keV, and is 10 percent lower at 0.1 keV. Using the Green-Peterson stopping powers and taking into account multiple elastic-scattering deflections, depth-dose curves have been calculated for an air medium irradiated by 12-keV and 5-keV electrons (Berger *et al.*, 1970). These results are in good agreement with measurements in air by Grün (1957) and in nitrogen by Cohn and Caledonia (1970).

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[16] Curve 1 is the result of a calculation by Berger given in Fig. 4 of Paretzke and Berger (1978). That figure also shows stopping-power curves obtained independently by Paretzke, and by Olivero, Stagat and Green (1972). These curves are all quite similar to curves 1 and 2 in Fig. 8.2 at energies down to ~ 150 eV.

[17] Green has calculated (and communicated to us in January 1978) collision stopping powers from 15 keV down to a few eV, based on the cross sections given in Jackman *et al.* (1977) and on cross sections for other gases compiled by his group. In the case of water vapor, Green's results are an updated version of stopping powers (energy-loss functions) given earlier by Olivero, Stagat, and Green (1972).

Figure 8.3 shows stopping-power results of Ashley (1982c) for polyethylene, and results of Ashley *et al.* (1978) for polystyrene obtained from dielectric-response functions constructed with the use of optical data for the valence electrons. Similar results for silicon dioxide, from Ashley and Anderson (1981), are shown in Fig. 8.4.

Figure 8.5 compares stopping-power curves for aluminum and gold from the Bethe theory with calculations of Ashley *et al.* (1976a) obtained with a statistical model of the dielectric-response function, without differentiating between inner- and outer-shell electrons. Also shown is a stopping-power curve for aluminum calculated by Ashley *et al.* (1979) with further refinements. These refinements include the limitation of the dielectric-response function modeling to conduction electrons, consideration of damping and core polarizability, and the use of atomic generalized oscillator strengths from Hartree-Slater wave functions for inner-shell electrons. It can be seen that the differences between the simple and refined calculations for aluminum are not very great.

Other comparisons and analyses of low-energy stopping-power data can be found in Iskef *et al.* (1980), and in Waibel and Grosswendt (1980).

An experimental investigation of electron stopping power in air and collodion[18] was carried out by Cole (1969). For collodion the experiment consisted of determining the foil thicknesses for which the number transmitted was 5 percent of that in the incident beam. For air the experiment consisted of measuring characteristic depths such that only 1 percent of the ionization in air occurred at greater depths. Cole considered these foil thicknesses and characteristic depths as "ranges". With this somewhat arbitrary definition of ranges he fitted his data for collodion and air by a single polynomial curve of range *vs.* incident electron energy (with a stated accuracy of 10 percent) and obtained the stopping power by differentiating this curve with respect to energy.

Cole's results suggest that, in the case of air and collodion, gas-solid stopping-power differences, if any, are small. This is consistent with the later findings of Schou (1979) and Sørensen and Schou (1978), based on the analysis of their electron penetration measurements in liquid nitrogen at 1 to 3 keV, that the stopping powers in liquid are at most a few percent higher than the stopping powers in gas.

The results of Cole are compared in Table 8.1 with the stopping powers for cellulose nitrate from the Bethe theory, and for air from the Bethe theory and from the calculation of Green.[17] There is close agreement between experimental and theoretical results down to ~ 400 eV. Below this energy the experimental values are higher, by 19 percent at 100 eV and much more at lower energies.

The significance of Cole's results is obscured by two uncertainties. First, a considerable error must have resulted from the numerical differentiation of his range-energy curve, especially at low energies. Second, his analysis neglected the effect of multiple-scattering angular deflections which make the pathlength traveled by electrons greater than the depth of penetration. Thus multiple scattering would tend to make the apparent stopping power determined by Cole larger than the true stopping power, by an amount that is expected to increase as the electron energy decreases.

The comparisons in Figs. 8.1 to 8.5 indicate that the differences between the stopping-power values from the Bethe theory and those from more elaborate low-energy treatments are often rather small, even at energies where the conditions of applicability of the Bethe theory are no longer satisfied. We therefore give in Table 8.2 a set of stopping-power values for selected materials covering the energy region from 10 keV to 1 keV. We estimate that at 1 keV the departures of the correct stopping powers from the tabulated results will be no greater than ~ (I/7) percent, where I is the mean excitation energy in eV.

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[18] Collodion is a plastic prepared as a suspension of cellulose nitrate in ether and alcohol. The estimated mean excitation energy of cellulose nitrate is 87.0 eV, a value rather close to that for air, 85.7 eV.

9. RADIATIVE STOPPING POWER

The mass radiative stopping power can be expressed in terms of bremsstrahlung cross sections as

$$-\frac{1}{\rho}\left(\frac{dE}{dx}\right)_{rad} = \frac{1}{\rho} S_{rad}(T) =$$

$$= \frac{N_a}{A}\left[\int_o^T k \frac{d\sigma_n}{dk} dk + Z \int_o^{T'} k \frac{d\sigma_e}{dk} dk\right] , \tag{9.1}$$

where $d\sigma_n/dk$ is the differential cross section for the emission of a photon of energy k due to the interaction of the electron with the screened Coulomb field of the atomic nucleus, and $d\sigma_e/dk$ is the corresponding cross section due to the Coulomb interaction with one of the atomic electrons. The upper limit of the energy of the photons that can be emitted in electron-electron interactions is

$$T' = mc^2 \, T[T + 2mc^2 - \beta(T + mc^2)]^{-1} . \tag{9.2}$$

It is convenient to introduce dimensionless, scaled, radiative energy-loss cross sections

$$\phi_{rad}^{(n)} = (\alpha \, r_e^2 \, Z^2)^{-1} \int_o^T (k/E) \frac{d\sigma_n}{dk} dk , \tag{9.3}$$

and

$$\phi_{rad}^{(e)} = (\alpha \, r_e^2)^{-1} \int_o^{T'} (k/E) \frac{d\sigma_e}{dk} dk , \tag{9.4}$$

where α is the fine-structure constant, and $E = T + mc^2$ is the total energy of the electron. In terms of these quantities the radiative stopping power can be written as

$$\frac{1}{\rho} S_{rad}(T) = \frac{N_a}{A} \alpha \, r_e^2 \, E \, Z^2 \, \phi_{rad}^{(n)}(T) \left[1 + (1/Z) \, \phi_{rad}^{(e)}(T)/\phi_{rad}^{(n)}(T)\right] . \tag{9.5}$$

The ratio $\phi_{rad}^{(e)}/\phi_{rad}^{(n)}$ has in previous work usually been assumed to be unity. As will be shown below, this ratio is actually slightly higher than 1 at high energies, falls to ~ 0.5 at 700 keV, and tends to vanish at low energies.[19]

For compounds we assume that additivity is a good approximation, and set

$$\frac{1}{\rho} S_{rad}(T) = \sum_j w_j \frac{1}{\rho_j} S_{rad,j}(T) , \tag{9.6}$$

where w_j is the fraction by weight of the j'th constituent.

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[19] According to Joseph and Rohrlich (1958), the vanishing at very low energies is due to the lack of an electric dipole moment for the electron-electron system.

9.1. Electron-nucleus bremsstrahlung

9.1.1. High-energy region. For $T \geqslant 50$ MeV, the bremsstrahlung cross section was evaluated from the analytical expressions of Davies, Bethe, and Maximon (1954), and Olsen (1955). This formula corrects the Bethe (1934) Born-approximation result through the inclusion of a Coulomb correction $f(Z)$ derived with the use of Sommerfeld-Maue wave functions. The formula is based on the high-energy approximation, *i.e.*, the assumption that the energies of the electron both before and after the bremsstrahlung event are large compared to the electron rest energy. The cross section has the form

$$k \frac{d\sigma_n}{dk} = 4\alpha r_e^2 Z^2 \sum_{i=1}^{2} g_i(E,k) \left[e_i + \int_{q_o}^{1} h_i(q)[1-F(q,Z)]^2 \, dq - f(Z) \right] , \tag{9.7}$$

where q is the momentum transfer and

$$q_o = mc^2 \, k/[2E(E - k)] \tag{9.8}$$

the minimum momentum transfer (with both in units of mc). The Coulomb correction is given by

$$f(Z) = (\alpha Z)^2 \sum_{n=1}^{\infty} [n(n^2 + \alpha^2 Z^2)]^{-1} . \tag{9.9}$$

The other quantities in Eq (9.7) are defined as follows:

$$\left.\begin{array}{ll} g_1 = 1 + (E - k)^2/E^2 & g_2 = -2(E - k)/3E \\ e_1 = 1 & e_2 = 5/6 \\ h_1 = (q - q_o)^2/q^3 & h_2 = q^3 - 6q_o^2 \, q \, \ln(q/q_o) \\ & \quad + 3q_o^2 \, q - 4q_o^3/q^4 \end{array}\right\} . \tag{9.10}$$

$F(q,Z)$ is the atomic form factor, normalized such that $F(0,Z) = 1$. For $1 \leqslant Z \leqslant 6$ the atomic form factor was taken from the non-relativistic calculations of Hubbell *et al.* (1975) which include electron-correlation effects; for $Z > 6$ it was taken from the work of Hubbell and Øverbø (1979) which is relativistic but omits correlation effects.

9.1.2. Low-energy region. For $T \leqslant 2$ MeV, use was made of work by Pratt *et al.* (1977) which constitutes a significant advance over the Born-approximation theory of Bethe and Heitler. In this work, the bremsstrahlung process is treated as a single-electron transition in a self-consistent screened central potential. Electron wave functions are obtained in partial wave-function expansions through the numerical solution of the Dirac equation, and the matrix elements for the bremsstrahlung cross section are evaluated numerically from the wave functions. The required amount of computation is very large, especially in view of the large number of partial waves which have to be included, so that results have been obtained so far only for a limited number of materials and energies. The theory underlying the computations and initial numerical results were given by Tseng and Pratt (1971). Further numerical results for electrons with energies from 1 to 500 keV were published by Lee *et al.* (1976), and for 1- and 2-MeV electrons by Kissel and MacCallum (1977). An extensive set of data for all elements $2 \leqslant Z \leqslant 92$, including bremsstrahlung cross sections differential in photon energy as well as the total energy-weighted cross section was prepared by Pratt *et al.* (1977) through elaborate interpolation procedures. A few

exploratory calculations, for 5- and 10-MeV electrons in Aℓ and U, have recently been published by Tseng and Pratt (1979) which involve the calculation of selected terms in the partial wave expansions and interpolation between them. We have used the tables of Pratt *et al.* (1977) to obtain $\phi_{rad}^{(n)}$ and have derived values for $Z = 1$ and for $Z = 93$ to 100 by extrapolation.

9.1.3. Intermediate energy region. For T between 2 and 50 MeV, the scaled radiative energy-loss cross section has only a mild dependence on Z and on the electron energy T. Being anchored down firmly below 2 MeV and above 50 MeV, the curve of $\phi_{rad}^{(n)}(T)$ *vs.* T in the gap region can readily be obtained by interpolation. We have done this using a cubic-spline least-squares algorithm of Powell (1967). Typical results of this interpolation for $Z = 1, 6, 13, 29, 47$ and 79 are shown in Fig. 9.1. The results of the interpolation have been found to be quite insensitive to the choice of the upper cut-off energy for the gap region. A shift from 50 to 100 MeV would change the integrated cross section in the gap region by less than 1 percent, and a shift down to 20 MeV would change it less than 3 percent.

In four cases (Aℓ and U at 5 and 10 MeV) the radiative energy-loss cross sections can also be derived directly from the differential bremsstrahlung cross sections of Tseng and Pratt (1979), and are found to agree to within 1-2 percent with our interpolated results.

9.2. Electron-electron bremsstrahlung

9.2.1. High-energy region. For $T \geqslant 50$ MeV, a combination of three cross-section formulas was used. The first is the Bethe-Heitler (1934) Born-approximation result which disregards screening and was derived in the high-energy approximation:

$$k\left(\frac{d\sigma_e}{dk}\right)_{BH} = 4\alpha r_e^2 \left[g_1(E,k) + g_2(E,k)\right] [\ln(1/q_o) - 1/2] \quad , \tag{9.11}$$

where g_1, g_2, and q_o have the same meaning as in Eqs (9.7) to (9.10). The second formula used is that of Wheeler and Lamb (1939), also based on the first Born and high-energy approximations, which treats screening with use of the incoherent scattering function $S(q,Z)$:

$$k\left(\frac{d\sigma_e}{dk}\right)_{WL} = 4\alpha r_e^2 \sum_{i=1}^{2} g_i(E,k) \left[e_i + \int_{q_o}^{1} h_i(q)\, S(q,Z)\, dq\right] \quad . \tag{9.12}$$

It can be seen that this equation can be obtained from Eq (9.7) by setting $Z = 1$ and replacing $[1 - F(q,Z)]^2$ by $S(q,Z)$. In Eq (9.12), $S(q,Z)$ is normalized such that $S(\infty,Z) = 1$. We have taken the incoherent scattering function from Hubbell *et al.* (1975). The third cross section used is one derived by Haug (1975) in lowest order perturbation theory, without consideration of screening effects, but treating recoil and exchange effects accurately. Haug also considered the Coulomb correction (departure from Born approximation) but found it unimportant at high energies. Haug's calculation is expressed in complicated formulas (his Eqs 2.15, A1 and A2) which are too lengthy to be reproduced here. We have used numerical values given in Haug's paper.

Taking Haug's cross section as initial approximation, we have assumed that the electron-electron differential bremsstrahlung cross section is

$$\frac{d\sigma_e}{dk} = \left(\frac{d\sigma_e}{dk}\right)_{HG} + \left[\left(\frac{d\sigma_e}{dk}\right)_{WL} - \left(\frac{d\sigma_e}{dk}\right)_{BH}\right] \quad , \tag{9.13}$$

where the first term incorporates an exchange correction and the terms in square brackets constitute a screening correction. This treatment can be justified on the basis that the two corrections are almost independent of each other, with exchange affecting mainly large momentum transfers and screening mainly small momentum transfers.

9.2.2. Low-energy region. For $T \leqslant 2$ MeV, we have assumed that

$$\frac{\phi_{rad}^{(e)}}{\phi_{rad}^{(n)}} = \int_0^{T'} dk\ k \left(\frac{d\sigma_e}{dk}\right)_{HG} \Big/ \int_0^{T} dk\ f_E\ k \left(\frac{d\sigma_e}{dk}\right)_{BHSR} , \tag{9.14}$$

where $(d\sigma_e/dk)_{HG}$ is again Haug's cross section with exchange and no screening, and where $(d\sigma_e/dk)_{BHSR}$ is the cross section without screening derived by Bethe and Heitler (1934), Sauter (1934), and Racah (1934) in the Born approximation but without invoking the high-energy approximation. The so-called Elwert factor

$$f_E = \beta[1 - \exp(-2\pi\alpha Z/\beta)] \ / \ \beta'[1 - \exp(-2\pi\alpha Z/\beta')] , \tag{9.15}$$

which depends on the electron velocities β and β' before and after the collision, is an approximate Coulomb correction due to Elwert (1939). For the electron-electron bremsstrahlung cross section in the numerator of Eq (9.14) a Coulomb correction was not considered necessary. Equation (9.14) is valid to the extent that screening does not change the ratio of radiative energy-loss cross sections significantly.

9.2.3. Intermediate energy region. With $\phi_{rad}^{(e)}$ determined for $T \leqslant 2$ MeV and for $T \geqslant 50$ MeV, the quantity $\phi_{rad}^{(n)}(T)\left[1 + (1/Z)\phi_{rad}^{(e)}(T)/\phi_{rad}^{(n)}(T)\right]$ was obtained in the gap region, 2 to 50 MeV, by the same interpolation procedure previously used in Section 9.1.3 for $\phi_{rad}^{(n)}(T)$. This completed the evaluation of $\phi_{rad}^{(e)}(T)$ and of the total radiative stopping power according to Eq (9.5).

The ratio $\phi_{rad}^{(e)}(T)/\phi_{rad}^{(n)}(T)$ is shown in Fig. 9.2 for hydrogen, carbon and gold as a function of electron energy.

9.3. Accuracy and comparison with experiments. Pratt *et al.* (1977) estimate the uncertainty of their differential bremsstrahlung cross sections to be no greater than 10 percent. It seems plausible that the radiative stopping power, obtained as an integral over these cross sections, has a smaller uncertainty, perhaps 5 percent. Comparisons are made in Fig. 9.3 between calculated radiative stopping powers in five materials at energies up to 2.5 MeV, and corresponding results derived from bremsstrahlung measurements. There is good agreement, within the limits of experimental error, with the results of Aiginger (1966), Rester and Dance[20] (1967) and Rester and Edmonson (1972); the theoretical results are lower than those from the earlier measurements of Motz (1955) and Motz and Placious (1958).[21]

The high-energy theory of Davies, Bethe, and Maximon (1954) and Olsen (1955) provides the cross section not only for bremsstrahlung but also for the closely related process of pair production. Whereas there is a scarcity of experimental bremsstrahlung measurements above 2.5 MeV, there are sufficient data to assess the accuracy of the pair production cross section. According to Hubbell *et al.* (1980), the theoretical pair production cross sections above ~ 50 MeV are confirmed by experiments to within 1-2 percent.

In the transition region between 2 MeV and 50 MeV we expect our interpolated results to have an accuracy of 3-5 percent.

10. RANGES AND RADIATION YIELDS

The ranges and radiation yields given in this report were obtained in the continuous-slowing-down approximation (c.s.d.a.). In this approximation energy-loss fluctuations are neglected, and electrons are assumed to lose energy continuously along their track, with a mean energy loss per unit pathlength given by the stopping power. The c.s.d.a. range (in units of g cm^{-2}) is evaluated from the expression

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[20] Also private communication from D. Rester (1967).

[21] Rester and Edmonson (1972) suggest that an incomplete background correction in the experiment of Motz accounts for this discrepancy.

$$r_o(T_o \to T_f) = \rho \int_{T_f}^{T_o} [S_{col}(T) + S_{rad}(T)]^{-1} \, dT \quad , \tag{10.1}$$

and represents the average pathlength[22] traveled by an electron as it slows down from an initial energy T_o to a final energy T_f. The choice of T_f should, in principle, be adapted to the purpose for which the range is to be used. For example, if one wanted to know how far electrons can travel while they are capable of ionizing atoms of the medium, it would be appropriate to set T_f equal to the lowest atomic ionization potential.

The stopping powers needed for the evaluation of r_o from Eq (10.1) are available from the Bethe theory only down to some intermediate energy T_i, and the part of the integral from $T = T_i$ to T_f must be obtained by an approximate estimate. Fortunately this residual range is relatively small so that a simple approximation is sufficient. We have followed Nelms (1956) in assuming that the integrand $[S_{col}(T) + S_{rad}(T)]^{-1}$ is zero at $T = 0$ and can be interpolated linearly to its value at $T = T_i$. The range is then given by

$$r_o(T_o \to T_f) = r_o(T_o \to T_i) + \rho[S_{col}(T_i) + S_{rad}(T_i)]^{-1} \int_{T_f}^{T_i} (T/T_i) \, dT \quad , \tag{10.2}$$

where the first term is calculated according to Eq (10.1), and the second term is the residual range. In the range tables we give results obtained with $T_i = 1$ keV and $T_f = 0$.

For some materials it is possible to avoid the crude approximation used above for residual ranges below 1 keV, and to rely instead on estimated low-energy stopping powers. We have made such calculations for water vapor, polystyrene, aluminum and gold, using data from Figs. 8.1, 8.3, and 8.5. As shown in Table 10.1, the ranges $r_o(T_o \to 0)$ from Eq (10.2), for initial energies $T_o = 10$ keV, actually are quite close numerically to the more accurate ranges calculated with a final energy $T_f \cong 10$ eV.

The radiation yield (also called bremsstrahlung efficiency) is the fraction of the initial energy T_o of an electron that is converted to bremsstrahlung energy as the electron slows down to rest. The c.s.d.a. yield is given by

$$Y(T_o) = \frac{1}{T_o} \int_{o}^{T_o} [S_{col}(T) + S_{rad}(T)]^{-1} \, S_{rad}(T) \, dT \quad . \tag{10.3}$$

In the evaluation of this expression one is again faced with the difficulty that neither S_{col} nor S_{rad} is known accurately below an intermediate energy $T_i = 1$ keV. We have made the assumption that $S_{rad}\,(S_{col} + S_{rad})^{-1}$ is zero at $T = 0$ and increases linearly to its value at $T = T_i$.

11. MISCELLANEOUS COMPARISONS

11.1 Positron-electron differences. For the collision stopping power and range, differences arise because of the use of the Bhabha cross section instead of the Møller cross sections for large energy transfers. Table 11.1 shows ratios of positron stopping powers to electron stopping powers, and ratios of positron ranges

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[22] This is actually only an approximation, but a very close one. For example, we have determined through Monte Carlo transport calculations that in a water medium the actual mean pathlength down to a final energy $T_f = 12.6$ eV is ~ 1 percent greater than $r_o(T_o \to T_f)$ for $T_o \gtrsim 10$ keV.

to electron ranges, for a representative set of materials.[23] Table 11.2 gives the ratio of the restricted collision stopping power for positrons to that for electrons in water.

In our tabulations, the radiative stopping power for positrons has been assumed to be the same as that for electrons, which is a good approximation at energies above, say, 10 MeV. However, it should be mentioned that exploratory calculations by Feng *et al.* (1981), employing the same method as that previously used by them for electrons, indicate significant differences between positrons and electrons in regard to the differential bremsstrahlung cross sections in oxygen and uranium at 500, 50, and 10 keV.

11.2. Comparison of calculated and experimental stopping powers. There is available only a limited amount of experimental data pertaining to the total stopping power (collision plus radiative). Comparisons with measurements by Paul and Reich (1950) at 2.8 and 4.7 MeV and by Ziegler (1958) at 32 MeV are given in Table 11.3. The experimental and calculated results agree, within the limits of experimental uncertainty, at 2.8 and 32 MeV, but not at 4.7 MeV. Table 11.4 presents comparisons with stopping-power ratios (relative to Be and Aℓ) measured by Westermark (1961) and by Hereford (1948). Experimental and theoretical values agree within the limits of experimental uncertainty.

In Figs. 11.1 and 11.2 collision stopping powers measured by Kalil *et al.* (1959) and Ishigure *et al.* (1978) in aluminum and by Ziemer *et al.* (1959) in copper are compared with results from the Bethe theory. These figures show Fano plots, *i.e.*, plots of stopping power *vs.* energy in a scaled representation in which the Bethe formula gives a straight line. The experimental results of Kalil *et al.* for aluminum between 10 keV and 1 MeV, and those of Ziemer *et al.* for copper between 200 keV and 1 MeV cluster around the theoretical straight lines, but the dispersion of the experimental points is considerable.

11.3. Comparisons with previous calculations. Differences between the stopping powers, ranges, and radiation yields from this report and those from earlier tables by Berger and Seltzer (1964, 1966) and Pages *et al.* (1972) are shown in Table 11.5 for a few materials. Whereas the differences in regard to the collision stopping power amount to only a few percent, the differences in regard to the radiative stopping power and radiation yield are much larger, especially at energies below ~ 1 MeV, due to the change from Bethe-Heitler bremsstrahlung cross sections to the more accurate results of Pratt *et al.* (1977).

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[23] The positron ranges used to compute the range ratios in Table 11.1 pertain to the case in which the positron slows down to rest before being annihilated. If one included the possibility of positron annihilation in flight, the positron ranges would be slightly decreased. From results given by Heitler (1947) one can conclude that the shortening of the positron range in lead would amount to 1.7 percent at 0.511 MeV, 4.2 percent at 5.11 MeV, 4.0 percent at 51.1 MeV, and 3.1 percent at 511 MeV.

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Table 3.1 Mean excitation energies obtained from moments of dipole oscillator-strength distributions (OSD). Results are for atoms unless indicated otherwise.

	I (eV)	Reference	Remarks
H	19.5 ± 0.5	Garcia (1966)	M(n) fit for H_2
	18.6	Victor and Dalgarno (1969)	semi-empirical OSD for H_2
	18.7 ± 0.2	Langhoff and Yates (1972)	moment theory for H_2
	19.21	Ford and Browne (1973)	theoretical OSD for H_2
	19.2	Gerhart (1975)	semi-empirical OSD for H_2
	19.26 ± 0.19	Zeiss *et al.* (1977a,b)	semi-empirical OSD for H_2
He	41.8	Miller (1956)	semi-empirical OSD
	42.48	Bell and Kingston (1967)	semi-empirical OSD
	41.7	Dalgarno (1960)	M(n) fit
	42.0	Chan and Dalgarno (1965a)	variation-perturbation theory
	42.1	Chan and Dalgarno (1965b)	variation-perturbation theory
	42.19	Garcia (1966)	M(n) fit
	39	Bell and Dalgarno (1966)	M(n) fit
	42.0 ± 0.36	Yates and Langhoff (1970)	moment theory
	42.1	McGuire (1971)	theoretical OSD
	42.1 ± 1.3	Langhoff and Yates (1972)	moment theory
	38.82	Dehmer *et al.* (1975)	theoretical OSD
N	82.1	Dalgarno *et al.* (1967)	semi-empirical OSD for N_2
	77	McGuire (1971)	theoretical OSD
	76.91	Dehmer *et al.* (1975)	theoretical OSD
	81.84 ± 0.82	Zeiss *et al.* (1977a,b)	semi-empirical OSD for N_2
O	99.2	McGuire (1971)	theoretical OSD
	93.5	Dehmer *et al.* (1975)	theoretical OSD
	95.02 ± 0.95	Zeiss *et al.* (1977a,b)	semi-empirical OSD for O_2
Ne	150	Bell and Dalgarno (1965)	M(n) fit
	136.5	Bell and Dalgarno (1966)	semi-empirical OSD
	124	McGuire (1971)	theoretical OSD
	123 ± 20	Yates and Langhoff (1970)	moment theory
	129 ± 34	Langhoff and Yates (1972)	moment theory
	125	Shimamura *et al.* (1973)	variation-perturbation theory
	137	Saxon (1973)	semi-empirical OSD
	131.3	Dehmer *et al.* (1975)	theoretical OSD
Ar	220	Bell and Dalgarno (1965)	M(n) fit
	111 ± 52	Langhoff and Yates (1972)	moment theory
	177.4	Dehmer *et al.* (1975)	theoretical OSD
	179	Eggarter (1975)	semi-empirical OSD
Kr	360	Bell and Dalgarno (1965)	M(n) fit
	328.3	Dehmer *et al.* (1975)	theoretical OSD
Xe	450	Bell and Dalgarno (1965)	M(n) fit
Rn	700	Bell and Dalgarno (1965)	M(n) fit

Table 3.2 Numerical values of parameters adopted by Bichsel to fit measured stopping-power and range data for protons and alpha particles.

Parameter	C	Aℓ	Cu	Ag	Au
I, eV	78	166	322	470	790
b	1.8	1.4	1.35	1.35	1.30
V_L	0.5	1.0	1.0	1.0	1.0
H_L	1.0	1.0	1.0	1.0	1.0
V_M		0.375	2.25	2.25	2.25
H_m		12.0	6.175	4.0	3.998
V_N				2.375	4.0
H_N				21.4	15.956
V_{OP}					2.375
H_{OP}					150.0

Table 3.3 Shell correction C/Z, Barkas correction $z L_1$, Bloch correction z^2L_2, and total correction $x = (C/Z)_{tot} - z L_1 - z^2L_2$, evaluated at various proton energies* with the computer program of Bichsel. L is the stopping number per electron computed with these corrections.

Correction	C	Aℓ	Cu	Ag	Au
2 MeV					
$(C/Z)_K$	0.1255	0.0480	-0.0528	-0.0640	-0.0571
$(C/Z)_L$	0.0173	0.1278	0.1284	0.0044	-0.0751
$(C/Z)_{tot}$	0.1428	0.1796	0.2650	0.2850	0.2034
$z L_1$	0.0390	0.0734	0.1006	0.1110	0.1229
z^2L_2	-0.0149	-0.0149	-0.0149	-0.0149	-0.0149
x	0.1187	0.1211	0.1793	0.1784	0.0954
L	3.9009	3.1432	2.4225	2.0347	1.6084
6.5 MeV					
$(C/Z)_K$	0.0493	0.0716	0.0073	-0.0243	-0.0340
$(C/Z)_L$	0.0051	0.0403	0.1286	0.0972	0.0115
$(C/Z)_{tot}$	0.0543	0.1131	0.1904	0.2698	0.2681
$z L_1$	0.0109	0.0213	0.0349	0.0444	0.0564
z^2L_2	-0.0047	-0.0047	-0.0047	-0.0047	-0.0047
x	0.04B1	0.1567	0.1688	0.2301	0.2164
L	5.1431	4.3395	3.6046	3.1652	2.6596
12 MeV					
$(C/Z)_K$	0.0268	0.0526	0.0279	-0.0051	-0.0221
$(C/Z)_L$	0.0027	0.0213	0.0872	0.1009	0.0450
$(C/Z)_{tot}$	0.0295	0.0745	0.1488	0.2154	0.2374
$z L_1$	0.0053	0.0105	0.0181	0.0238	0.0326
z^2L_2	-0.0026	-0.0026	-0.0026	-0.0026	-0.0026
x	0.0268	0.0666	0.1333	0.1942	0.2074
L	5.7690	4.9741	4.2447	3.8058	3.2732
19.8 MeV					
$(C/Z)_K$	0.0160	0.0360	0.0350	0.0081	-0.0127
$(C/Z)_L$	0.0017	0.0127	0.0374	0.0844	0.0590
$(C/Z)_{tot}$	0.0177	0.0491	0.1126	0.1677	0.1985
$z L_1$	0.0029	0.0058	0.0103	0.0139	0.0194
z^2L_2	-0.0016	-0.0016	-0.0016	-0.0016	-0.0016
x	0.0164	0.0449	0.1173	0.1547	0.1807
L	6.2686	5.4848	4.7632	4.3336	3.7890

*Proton energies are pertinent to the analysis of stopping-power measurements in Figs. 4.3, 4.4, and 4.5.

Table 3.4 Bichsel's formulas for evaluating the parameters V_n and H_n in Eq (3.13). Also given is a list of values of the parameter b in the Ashley-Ritchie-Brandt theory of the Barkas correction (see Eq (2.12)).

$H_2 = 1$

$H_3 = 0$ for $Z \leq 10$
12 for $10 < Z \leq 18$
$(9/4)\ HF\ (Z - 4.15)^2/(Z - 14)^2$ for $Z > 18$

$HF = 1$ for $Z \leq 40$
1.054 for $40 < Z \leq 60$
1.34 for $Z > 60$

$H_4 = 0$ for $Z \leq 32$
$(16/4)\ HG\ (Z - 4.15)^2/(Z - 26)^2$ for $Z > 32$

$HG = 1.111$ for $Z \leq 60$
2.0 for $Z > 60$

$H_5 = 0$ for $Z \leq 60$
150 for $Z > 60$

$V_2 = 0$ for $Z \leq 2$
$(Z - 2)/8$ for $2 < Z \leq 10$
1 for $Z > 10$

$V_3 = 0$ for $Z \leq 10$
$(Z - 10)/8$ for $10 < Z \leq 28$
18/8 for $Z > 28$

$V_4 = 0$ for $Z \leq 32$
$(Z - 28)/8$ for $32 < Z \leq 60$
32/8 for $Z > 60$

$V_5 = 0$ for $Z \leq 60$
$(Z - 60)/8$ for $Z > 60$

Z	b
1	0.6 H_2 1.8 in compounds
2	0.6
3 - 10	1.8
11 - 17	1.4
18	1.8
19 - 25	1.4
26 - 50	1.35
51 - 92	1.3

Table 3.5 Analysis of range measurements of Barkas and von Friesen (1961). I-values are evaluated assuming that $I_{A\ell}$ = 166 eV, which implies a proton energy of 749.0 MeV. The experimental proton ranges were 314.9 g/cm^2 for Cu, 415.6 g/cm^2 for Pb, and 432.5 g/cm^2 for U, and have an estimated uncertainty of 0.1%. The corresponding uncertainties of the I-values are 3 eV for Cu and 6 eV for Pb and U.

Method of Analysis	I, eV		
	Cu	Pb	U
Bichsel shell correction, with density-effect correction	314.3	821.2	889.2
Bichsel shell correction, without density-effect correction	334.6	832.4	920.2
Bonderup shell correction, with density-effect correction	314.6	818.3	884.8

Table 3.6. Comparison of mean excitation energies I extracted from proton stopping-power and range measurements with the use of Bichsel's and Bonderup's shell corrections. The estimated uncertainties of the I-values are those resulting from the uncertainties of the measurements. The measurements are from the experiments listed in Table 4.1.

			I(eV), derived with use of					
			Bichsel's Shell Corrections			Bonderup's Shell Corrections		
	Reference	T (MeV)	Cu	Pb	U	Cu	Pb	U
Stopping-power Measurements	*a*	3	316±3	818± 9	910±14	310±3	745± 9	805±14
	a	6	317±3	814±12	898±18	314±3	736±12	790±18
	b	6.5	327±4	830± 7†	-	325±5	751± 7	-
	a	9	319±3	810±14	886±20	318±4	738±14	789±20
	a	12	319±5	806±16	881±22	319±5	742±16	794±22
	a	15	319±5	803±17	878±24	320±6	746±17	799±24
	a	18	318±6	800±17	877±25	320±6	747±18	806±25
	c	19.8	325±5	851±20	-	325±6	798±20	-
Range Measurements	*d*	749 → 0	314±10	821±10	889±10	315±10	818±10	885±10

[a] Sørensen and Andersen (1973)

[b] Ishiwari *et al.* (1979)

[c] Burkig and MacKenzie (1957)

[d] Barkas and von Friesen (1961)

† From preliminary results of Ishiwari, Shiomi, and Sakamoto (private communication, January 1982).

Table 4.1 List of stopping-power and range experiments from which mean excitation energies were deduced. S indicates stopping-power, R indicates range.

Abbrev.	Reference	Type of Data
Bak 51	Bakker and Segrè (1951)	S rel. to Cu, 300-MeV protons
Tho 52	Thompson (1952)	Partial proton range (rel. to Cu), 340-200 MeV
Bro 55	Brolley and Ribe (1955)	S, 4.45 MeV
Bur 57	Burkig and MacKenzie (1957)	S rel. to Aℓ, 19.8-MeV protons
Bar 61	Barkas and von Friesen (1961)	R, 750-MeV protons
Mar 62	Martin and Northcliffe (1962)	S, 4 to 40-MeV alpha particles
Nak 63	Nakano, MacKenzie, and Bichsel (1963)	S rel. to Aℓ, 28.7-MeV protons
Bic 65	Bichsel and Tschalär (1967)	R, 3- to 30-MeV protons
Tsc 68	Tschalär and Bichsel (1968)	R, 3- to 30-MeV protons
And 67	Andersen, Hanke, Sørensen, and Vajda (1967)	S, 4.5- to 12-MeV protons
And 68	Andersen, Hanke, Simonsen, Sørensen, and Vajda (1968)	S, 5- to 12-MeV protons
And 69	Andersen, Simonsen, Sørenson, and Vajda (1969)	S, 5- to 12-MeV protons
Gar 70	Garbincius and Hyman (1970)	R, 12- to 40-MeV protons
Swi 70	Swint, Prior, and Ramirez (1970)	S, 0.4- to 3.4-MeV protons
Han 70	Hanke and Bichsel (1970)	S, 1- to 9-MeV alpha particles
Sør 73	Sørensen and Andersen (1973)	S, 5- to 18-MeV protons
Zre 74	Zrelov, Kruglov, Mus, Savel'ev, and Sulek (1974)	R, 600-MeV protons
And 77	Andersen, Bak, Knudsen, and Nielsen (1977)	S, 0.8- to 7.2-MeV protons
Nor 79	Nordin and Henkelman (1979)	S, 60-MeV pions
Ish 79	Ishiwari, Shiomi, and Sakamoto (1979)	S, 6.5-MeV protons
Bes 79	Besenbacher, Andersen, Hvelplund, and Knudsen (1979)	S, 40-keV to 1-MeV protons, 100-keV to 1.2-MeV alpha particles
And 81	Andersen and Nielsen (1981)	S, 0.8- to 7.2-MeV protons

Table 4.2 Mean excitation energies, I(eV), deduced from the stopping-power and range measurements listed in Table 4.1. For the references marked (*), the I-values and their uncertainties are those given by the experimenters. In all other cases the I-values have been obtained by the method described in the text, using Bichsel's shell corrections. The quoted uncertainties were estimated according to Eq (3.9), taking into account the measurement uncertainties as well as an assumed 10-percent uncertainty of the correction term x.

GASES

Reference	H_2	He	N_2	O_2	Ne	Ar	Kr	Xe
Bro 55	19 ± 2	43 ± 5	88 ± 9	95 ± 8	129 ± 11	190 ± 15	346 ± 26	466 ± 30
* Mar 62	18.3±2.6		79 ± 7			190 ± 7		
Swi 70			76 ± 9	90 ± 10	138 ± 13		333 ± 26	
Han 70						188 ± 10		
* Bes 79	17.6	40.7	86.7	102.1	139	194	376	497

LIQUIDS AND SOLIDS

Reference	H_2 (liquid)	Li	Be	C (graphite)	N_2 (liquid)	O_2 (liquid)	Aℓ	Si
Bak 51[a]		42.1±4.2	73.5±6.0	91.7±8.6			181±16	
Bak 51[b]		38.0±3.6	67.0±6.1	83.3±7.6				
Tho 52	22.3±1.6				90.5±2.6	104.3±3.4		
Bur 57		69.0±2.3						
Nak 63			58.6±1.4					
* Bic 65				80.0±2.4				
* Tsc 68							167±1	173±1
And 67			63.3±1.1				159±3	
* Gar 70	20.4±0.9							
Sør 73							158±4	
And 77							167±4	
Nor 79				70.8±4.0			167±9	
Ish 79			63.8±1.0				166±3	

Reference	Ca	Sc	Ti	V	Cr	Mn
Bur 57	188±20		234±9	251±4		
Nak 63			229±4	259±5		
And 68	194±5	216±5	228±4	238±4	257±7	272±7
Ish 79			234±4	243±5		

Table 4.2 Continued

References	Fe	Co	Ni	Cu	Zn	Ge
Bak 51[a]	284 ± 26					
Bak 51[b]	261 ± 23			294 ± 27		
Tho 52				320 ± 8		
Bur 57	296 ± 6		317 ± 6	325 ± 6	336 ± 7	
Bar 61				314 ± 11		
Nak 63		295 ± 5	323 ± 7	339 ± 7		
* Bic 65						350 ± 11
And 67				326 ± 7		
And 68	279 ± 5	296 ± 6	301 ± 6	318 ± 6	320 ± 6	
Sør 73				318 ± 8		
* Zre 74				320 ± 4		
And 77				327 ± 10		
Nor 79	286 ± 10			310 ± 28		
Ish 79	285 ± 6	299 ± 6	316 ± 6	327 ± 7	335 ± 7	

References	Zr	Nb	Mo	Rh	Pd	Ag
Bur 57		417 ± 9	430 ± 15	448 ± 16	470 ± 17	468 ± 12
Nak 63						509 ± 11
And 67						466 ± 10
And 69	380 ± 9					
Sør 73						466 ± 12
And 77						481 ± 14
Ish 79	406 ± 10[c]		419 ± 10	452 ± 11	466 ± 12	472 ± 12

References	Cd	In	Sn	Gd	Ta	W
Bak 51[a]			541 ± 42			
Bak 51[b]			500 ± 38			
Bur 57	469 ± 11	488 ± 11	499 ± 12		701 ± 27	727 ± 18
Nak 63					783 ± 25	840 ± 23
And 69				591 ± 19	720 ± 16	
Ish 79	465 ± 12[c]	496 ± 12[c]	482 ± 12		733 ± 17	

References	Ir	Pt	Au	Pb	Th	U
Bak 51[a]				825 ± 60		931 ± 67
Bak 51[b]				766 ± 52		868 ± 58
Bur 57	757 ± 20	776 ± 21	785 ± 21	851 ± 23	786 ± 21	
Bar 61				821 ± 10		889 ± 11
Nak 63	832 ± 24		842 ± 21			
And 67		804 ± 18	798 ± 18			
Sør 73			794 ± 20	800 ± 23		877 ± 31
Ish 79			824 ± 19	830 ± 19[c]		
And 81			793 ± 20			

[a]Relative to Cu (I = 322 eV).

[b]Relative to Aℓ (I = 166 eV).

[c]From preliminary stopping-power data of Ishiwari, Shiomi, and Sakamoto (private communication, January 1982).

Table 4.3 Atomic number, weight, and mean excitation energies for elemental substances. Unless noted otherwise, the I-values are for substances in the condensed phase. The uncertainties ΔI attempt to take into account the uncertainties of the underlying measurements, the errors inherent in the analysis of the measurements, and the dispersion of the I-values derived from various sources. I-values in parentheses have been estimated by interpolation of I/Z *vs.* Z, or by extrapolation for $Z > 92$.

Z	Element	Symbol	A,[a] g/mol	I, eV	ΔI, eV	I/Z, eV
1	hydrogen	H	1.0079	19.2 molecular gas 21.8 liquid	0.4 1.6	19.2 21.8
2	helium	He	4.00260	41.8 gas	0.8	20.9
3	lithium	Li	6.941	40.0	5	13.3
4	beryllium	Be	9.01218	63.7	3	15.9
5	boron	B	10.81	76.0	8	15.2
6	carbon	C	12.011	78.0 graphite	7	13.0
7	nitrogen	N	14.0067	82.0 molecular gas	2	11.7
8	oxygen	O	15.9994	95.0 molecular gas	2	11.9
9	fluorine	F	18.998403	(115) gas		11.5.
10	neon	Ne	20.179	137 gas	4	13.7
11	sodium	Na	22.98977	(149)		13.6
12	magnesium	Mg	24.305	(156)		13.0
13	aluminum	Aℓ	26.98154	166	2	12.8
14	silicon	Si	28.0855	173	3	12.4
15	phosphorus	P	30.97376	(173)		11.5
16	sulfur	S	32.06	(180)		11.3
17	chlorine	Cℓ	35.453	(174) gas		10.2
18	argon	Ar	39.948	188 gas	10	10.4
19	potassium	K	39.0983	(190)		10.0
20	calcium	Ca	40.08	191	8	9.6
21	scandium	Sc	44.9559	216	8	10.3
22	titanium	Ti	47.88	233	5	10.6
23	vanadium	V	50.9415	245	7	10.7
24	chromium	Cr	51.996	257	10	10.7
25	manganese	Mn	54.9380	272	10	10.9
26	iron	Fe	55.847	286	9	11.0
27	cobalt	Co	58.9332	297	9	11.0
28	nickel	Ni	58.69	311	10	11.1
29	copper	Cu	63.546	322	10	11.1
30	zinc	Zn	65.38	330	10	11.0
31	gallium	Ga	69.72	(334)		10.8

Table 4.3 Continued

Z	Element	Symbol	A,[a] g/mol	I, eV	ΔI, eV	I/Z, eV
32	germanium	Ge	72.59	350	11	10.4
33	arsenic	As	74.9216	(347)		10.5
34	selenium	Se	78.96	(348)		10.2
35	bromine	Br	79.904	(343) gas (357) condensed		9.8 10.2
36	krypton	Kr	83.80	352 gas	25	9.8
37	rubidium	Rb	85.4678	(363)		9.8
38	strontium	Sr	87.62	(366)		9.6
39	yttrium	Y	88.9059	(379)		9.7
40	zirconium	Zr	91.22	393	15	9.8
41	niobium	Nb	92.9064	417	15	10.2
42	molybdenum	Mo	95.94	424	15	10.1
43	technetium	^{98}Tc	97.907	(428)		10.0
44	ruthenium	Ru	101.07	(441)		10.0
45	rhodium	Rh	102.9055	449	20	10.0
46	palladium	Pd	106.42	470	20	10.2
47	silver	Ag	107.868	470	10	10.0
48	cadmium	Cd	112.41	469	20	9.8
49	indium	In	114.82	488	20	10.0
50	tin	Sn	118.69	488	15	9.8
51	antimony	Sb	121.75	(487)		9.5
52	tellurium	Te	127.60	(485)		9.3
53	iodine	I	126.9045	(474) gas (491) condensed		8.9 9.3
54	xenon	Xe	131.29	482 gas	30	8.9
55	cesium	Cs	132.9054	(488)		8.9
56	barium	Ba	137.33	(491)		8.8
57	lanthanum	La	138.9055	(501)		8.8
58	cerium	Ce	140.12	(523)		8.8
59	praseodymium	Pr	140.9077	(535)		9.1
60	neodymium	Nd	144.24	(546)		9.1
61	promethium	^{145}Pm	144.913	(560)		9.2
62	samarium	Sm	150.36	(574)		9.3
63	europium	Eu	151.96	(580)		9.2
64	gadolinium	Gd	157.25	591	20	9.2
65	terbium	Tb	158.9254	(614)		9.4
66	dysprosium	Dy	162.50	(628)		9.5
67	holmium	Ho	164.9304	(650)		9.7

Table 4.3 Continued

Z	Element	Symbol	A,[a] g/mol	I, eV	ΔI, eV	I/Z, eV
68	erbium	Er	167.26	(658)		9.7
69	thulium	Tm	168.9342	(674)		9.8
70	ytterbium	Yb	173.04	(684)		9.8
71	lutetium	Lu	174.967	(694)		9.8
72	hafnium	Hf	178.49	(705)		9.8
73	tantalum	Ta	180.9479	718	30	9.8
74	tungsten	W	183.85	727	30	9.8
75	rhenium	Re	186.207	(736)		9.8
76	osmium	Os	190.2	(746)		9.8
77	iridium	Ir	192.22	757	30	9.8
78	platinum	Pt	195.08	790	30	10.1
79	gold	Au	196.9665	790	30	10.0
80	mercury	Hg	200.59	(800)		10.0
81	thallium	Tℓ	204.383	(810)		10.0
82	lead	Pb	207.2	823	30	10.0
83	bismuth	Bi	208.9804	(823)		9.9
84	polonium	^{209}Po	208.982	(830)		9.9
85	astatine	^{210}At	209.987	(825)		9.7
86	radon	^{222}Rn	222.018	(794) gas		9.2
87	francium	^{223}Fr	223.020	(827)		9.5
88	radium	Ra	226.0254	(826)		9.4
89	actinium	Ac	227.0278	(841)		9.4
90	thorium	Th	232.0381	(847)		9.4
91	protactinium	Pa	231.0359	(878)		9.6
92	uranium	U	238.0289	890	30	9.7
93	neptunium	Np	237.0482	(902)		9.7
94	plutonium	^{239}Pu	239.052	(921)		9.8
95	americium	^{243}Am	243.061	(934)		9.8
96	curium	^{247}Cm	247.070	(939)		9.8
97	berkelium	^{247}Bk	247.070	(952)		9.8
98	californium	^{251}Cf	251.080	(966)		9.9
99	einsteinium	^{252}Es	252.083	(980)		9.9
100	fermium	^{257}Fm	257.095	(994)		9.9

[a]The atomic weights A are those recommended by the Commission on Atomic Weights of the International Union of Pure and Applied Chemistry (Holden, 1979). The values are for naturally occurring isotopic mixtures, unless a particular isotope is indicated.

Table 4.4 Comparison of mean excitation energies for elements recommended in various publications. Values are given in units of eV.

	H_2 (gas)	C (graphite)	N_2 (gas)	O_2 (gas)	Aℓ	Cu	Ag	Pb
NCRP (1961)	-	78.4	-	-	164	306	462	812
Fano (1963)[a]	18.3	81	-	-	163	315	478	820
NAS-NRC (1964)[a]	18.7	78	85	89	163	312	480	795
Janni (1966)[a]	18.3	77.3	87.5	88.9	163	318	459	779
Bichsel (1968)	18	78	78	100	164	322	475	820
Turner *et al.* (1970)[a]	18.2	81.2	89.6	101	163	316	466	767
Bichsel (1972)	19.2	78	78	93	166	319	475	813
Andersen & Ziegler (1977)	18.8	77.3	86.7	97.7	162	322	466	759
Ahlen (1980)	18.5	79.0	82	98.5	164	317	469	793
Ziegler (1980)	19	79	86	99	162	330	470	761
Janni (1980)[a]	20.4	73.8	97.8	116	160	321	462	788
Values adopted here	19.2	78.0	82.0	95.0	166	322	470	823

[a]These references give values of I_{adj}. I-values have been obtained from the relation $\ln I = \ln I_{adj} - (C/Z)_{\beta=1}$, with $(C/Z)_{\beta=1}$ taken from Fano and Turner (1964).

Table 5.1. Mean excitation energies adopted in the present work for atomic constituents of compounds.

GASES

Constituent	I(eV)
H	19.2
C	70
N	82
O	97

LIQUIDS AND SOLIDS

Constituent	I(eV)
H	19.2
C	81
N	82
O	106
F	112
Cℓ	180

Others 1.13 x I, where I is the I-value for the element in the condensed phase given in Table 4.3.

Table 5.2. Mean excitation energies for atomic constituents of condensed organic compounds, from an analysis of stopping-power ratios relative to copper measured by Thompson (1952). The analysis assumes I_{Cu} = 322 eV, and includes multiple-scattering corrections. The uncertainties take into account Thompson's measurement uncertainties as well as the uncertainties inherent in the data analysis.

Constituent	Position in Compound	I (eV)
H	saturated	19.0 ± 0.8
	unsaturated	16.0 ± 0.8
C	saturated	81.1 ± 2.5
	unsaturated	79.8 ± 2.3
	highly chlorinated	69.0 ± 3.7
N	amines, nitrates, etc.	105.7 ±10.6
	in ring	81.9 ± 7.0
O	-O-	104.6 ± 9.2
	O=	94.4 ± 4.9
Cℓ	all	179.7 ± 11.9

Table 5.3. Mean excitation energies for compounds.

I_{expt} : value deduced from experiments.

ΔI_{expt} : percent uncertainty, estimated from the uncertainty of the measurements and from the errors inherent in the data analysis.

ΔI_{fit} : percent amount by which Bragg-rule value differs from experimental value. The heading BRAGG(1) indicates results obtained with the I-values for constituents from Table 5.1, and BRAGG(2) those obtained with the I-values according to Thompson from Table 5.2.

A. Gas Compounds

Compound	Footnote	I_{expt}* (eV)	ΔI_{expt}	ΔI_{fit} BRAGG(1)
ammonia, NH_3	*a*	53.7	± 2%	- 1.3%
butane, C_4H_{10}	*b*	48.3	± 2	- 1.0
carbon dioxide, CO_2	*c*	85.0	± 2	4.4
ethane, C_2H_6	*b*	45.4	± 2	0.2
heptane, C_7H_{16}	*b*	49.2	± 2	- 0.4
hexane, C_6H_{14}	*b*	49.1	± 2	- 0.8
methane, CH_4	*d*	41.7	± 2	0.0
nitric oxide, NO	*a*	87.8	± 2	2.2
nitrous oxide, N_2O	*a*	84.9	± 2	2.7
octane, C_8H_{18}	*b*	49.5	± 2	- 0.6
pentane, C_5H_{12}	*b*	48.2	± 2	0.4
propane, C_3H_8	*b*	47.1	± 2	- 0.2
water, H_2O	*a*	71.6	± 2	- 2.0

Footnotes for Table 5.3. A

*I_{expt} was derived from semi-empirical dipole oscillator-strength distributions, except for CO_2.

[a]From Zeiss *et al.* (1975, 1977a,b)

[b]From Jhanwar *et al.* (1981)

[c]From alpha-particle stopping-power measurements of Bichsel and Hilko (1980). Note that an analysis of the stopping-power results of Bader *et al.* (1956) for protons with energies between 300 and 400 keV leads to a value of 88.7 ± 7.1 eV.

[d]From Thomas and Meath (1977).

Table 5.3. Continued

B. Liquid Compounds*

Compound	I_{expt} (eV)	ΔI_{expt}	ΔI_{fit} BRAGG(1)	ΔI_{fit} BRAGG(2)
acetone, C_3H_6O	64.2	± 3 %	3.0 %	- 0.4 %
aniline, $C_6H_5NH_2$	66.2	± 3	0.2	0.1
benzene, C_6H_6	63.4	± 3	4.0	0.1
n-butyl alcohol, C_4H_9OH	59.9	± 3	1.0	0.6
carbon tetrachloride, $CC\ell_4$	166.3	± 3	1.5	0.1
chlorobenzene, $C_6H_5C\ell$	89.1	± 3	1.5	- 1.0
chloroform, $CHC\ell_3$	156.0	± 3	2.2	0.5
cyclohexane, C_6H_{12}	56.4	± 3	0.2	0.0
1,2-dichlorobenzene, $C_6H_4C\ell_2$	106.5	± 3	1.6	- 0.2
dichlorodiethyl ether, $C_4C\ell_2H_8O$	103.3	± 4	- 0.3	- 0.5
1,2-dichloroethane, $C_2C\ell_2H_4$	111.9	± 4	11.0	6.8
diethyl ether, $(C_2H_5)_2O$	60.0	± 3	0.9	0.4
ethyl alcohol, C_2H_5OH	62.9	± 3	0.4	- 0.3
glycerol, $C_3H_5(OH)_3$	72.6	± 3	0.8	0.1
n-heptane, C_7H_{16}	54.4	± 3	0.1	- 0.1
n-hexane, C_6H_{14}	54.0	± 3	0.2	0.0
methanol, CH_3OH	67.6	± 3	- 1.9	- 2.7
nitrobenzene, $C_6H_5NO_2$	75.8	± 3	2.2	4.8
n-pentane, C_5H_{12}	53.6	± 3	0.2	- 0.1
n-propyl alcohol, C_3H_7OH	61.1	± 3	0.7	0.2
pyridine, C_5H_5N	66.2	± 3	3.3	0.0
styrene, C_8H_8	64.0	± 3	3.0	- 0.9
tetrachloroethylene, $C_2C\ell_4$	159.2	± 3	0.3	- 2.1
toluene, C_7H_8	62.5	± 3	2.9	- 0.1
trichloroethylene, $C_2C\ell_3H$	148.1	± 3	1.0	- 0.9
water, H_2O	75.0[a]	± 3	0.4	- 0.9
xylene, C_8H_{10}	61.8	± 3	2.7	0.6

Table 5.3. Continued

Footnotes for Table 5.3. B

*Experimental I-value was obtained in our analysis of Thompson's (1952) measurement of partial proton ranges.

[a]A compromise among the following experimental results: 75.4 ± 1.9 eV from our analysis of Thompson's (1952) measurements relative to Cu, assuming I_{Cu} = 322 eV; 74.6 ± 2.7 eV from an analysis of the 61-MeV pion stopping-power measurements of Nordin and Henkelman (1979); 75 eV from Ritchie *et al.* (1978); and 75.4 eV from J. Ashley (1982a), both values derived from empirically-based models of the dielectric-response function for liquid water.

Table 5.3. Continued

C. Solid Compounds

Compound	Footnote	I_{expt}	ΔI_{expt}	ΔI_{fit} BRAGG(1)	ΔI_{fit} BRAGG(2)
adenine, $C_5H_5N_5$	*a*	71.4	± 5 %	2.9 %	4.1 %
guanine, $C_5H_5N_5O$	*a*	75.0	± 5	1.7	2.8
Nylon, type 6, $(C_6H_{11}NO)_n$	*b*	63.9	± 6	1.7	2.9
paraffin wax, $C_{25}H_{52}$	*b*	48.3	± 7	15.7	15.6
polyethylene, $(C_2H_4)_n$	*c*	57.4	± 8	- 1.6	- 1.7
polymethyl methacrylate, $(C_5H_8O_2)_n$	*d*	74.0	± 4	- 4.2	- 6.3
polystyrene, $(C_8H_8)_n$	*e*	68.7	± 4	4.1	- 6.5
A-150 tissue-equivalent plastic	*b*	65.1	±16	- 1.5	
aluminum oxide, $A\ell_2O_3$	*f*	145.2	± 3	- 1.8	
calcium fluoride, CaF_2	*g*	166	± 8	- 4.7	
lithium fluoride, LiF	*g*	94	± 8	- 5.0	
photographic emulsion	*h*	331	± 3	- 3.0	
polytetrafluoroethylene, "Teflon," $(C_2F_4)_n$	*b*	99.1	± 6	4.2	
silicon dioxide, SiO_2	*f*	139.2	± 3	1.3	

Table 5.3. Continued

Footnotes for Table 5.3. C

[a]From dielectric-response function, J. Ashley (private communication, 1981).

[b]From 61-MeV pion stopping-power measurements relative to H_2O of Nordin and Henkelman (1979) assuming I_{H_2O} = 75.0 eV.

[c]Painter *et al.* (1980) give a value 62.2 eV from their dielectric-response function measurements. Thompson's (1952) 267.5-MeV proton stopping-power measurements lead to a value of 52.5 ± 1.5 eV. The adopted value 57.4 eV is an average.

[d]Bichsel (private communication) has revised the Tschalär-Bichsel (1968) value for PMMA (see footnote *f*) from 74.2 to 73.5 eV by applying z^3 and z^4 corrections. Our analysis of the Nordin-Henkelman data (see footnote *b*) gives a value 74.4 ± 4.7 eV. The adopted value, 74.0 eV, is an average.

[e]The value 68.7 eV is from Ashley's (1979) evaluation of the dielectric-response function. This value is close to the average of 71 ± 2 eV derived by Porter *et al.* (1978) from proton stopping-power measurements at 2.2 - 5.9 MeV, and of 65.2 ± 1.9 eV derived from Thompson's measurements at 267.5 MeV.

[f]From range measurements of Tschalär and Bichsel (1968) with 3- to 30-MeV protons.

[g]From stopping-power results of Bader *et al.* (1956) for protons with energies between 300 and 400 keV.

[h]From range measurements of Barkas *et al.* (1958) using various charged particles with equivalent proton energies up to 700 MeV.

Table 5.4. Mean excitation energies, water content and other properties of selected human tissues. For the tissues labeled "ICRP" the compositions, densities and water content were taken from Tables 105 and 108 of ICRP (1975). For the tissues labeled "ICRU" the composition was taken from ICRU (1964); because this reference does not give other properties, the densities and water content were assumed to be the same as for corresponding ICRP soft or bone tissue.

Substance	I (eV)	Density (g/cm^3)	$\langle Z/A \rangle$	Water Content (% by weight)
H_2O	75.0	1.00	0.55509	
ICRP adipose tissue	63.2	0.92	0.55847	15.3
ICRP skin	72.6	1.10	0.54933	61.5
ICRP brain	73.3	1.03	0.55423	78.6
ICRP testes	75.0	1.04	0.55108	80.0
ICRP blood	75.1	1.06	0.54995	80.0
ICRP lung	75.2	1.05	0.54965	78.0
ICRP skeletal muscle	75.3	1.04	0.54938	78.6
ICRP cortical bone	106.7	1.85	0.52130	15.0
ICRU striated muscle	74.6	1.04	0.55005	78.6
ICRU compact bone	92.1	1.85	0.53010	15.0

Table 5.5. Recommended mean excitation energies I for compounds and mixtures of the indicated composition.

Material	<Z/A>	Density* (g/cm³)	I† (eV)	Gr§	Composition (constituent Z : fraction by weight)			
A-150 TISSUE-EQUIVALENT PLASTIC[a]	0.549031	1.127E+00	65.1+	B	1: 0.101327 9: 0.017422	6: 0.775501 20: 0.018378	7: 0.035057	8: 0.052316
ACETYLENE, C_2H_2	0.537680	1.097E-03	58.2	A	1: 0.077418	6: 0.922582		
ADIPOSE TISSUE (ICRP)[b]	0.558468	9.200E-01	63.2++	B	1: 0.119477 11: 0.000500 17: 0.001190 30: 0.000020	6: 0.637240 12: 0.000020 19: 0.000320	7: 0.007970 15: 0.000160 20: 0.000020	8: 0.232333 16: 0.000730 26: 0.000020
AIR, DRY (NEAR SEA LEVEL)[c]	0.499190	1.205E-03	85.7+	A	6: 0.000124	7: 0.755267	8: 0.231781	18: 0.012827
ALUMINUM OXIDE, $A\ell_2O_3$	0.490382	3.970E+00	145.2+	A	8: 0.470749	13: 0.529251		
B-100 BONE-EQUIVALENT PLASTIC[d]	0.527397	1.450E+00	85.9++	B	1: 0.065471 9: 0.167411	6: 0.536945 20: 0.176589	7: 0.021500	8: 0.032085
BONE, COMPACT (ICRU)[e]	0.530103	1.850E+00	91.9++	B	1: 0.063984 12: 0.002000	6: 0.278000 15: 0.070000	7: 0.027000 16: 0.002000	8: 0.410016 20: 0.147000
BONE, CORTICAL (ICRP)[b]	0.521299	1.850E+00	106.4++	B	1: 0.047234 12: 0.002200 30: 0.000100	6: 0.144330 15: 0.104970	7: 0.041990 16: 0.003150	8: 0.446096 20: 0.209930
C-552 AIR-EQUIVALENT PLASTIC[f]	0.499687	1.760E+00	86.8++	B	1: 0.024680 14: 0.003973	6: 0.501610	8: 0.004527	9: 0.465209
CALCIUM FLUORIDE, CaF_2	0.486700	3.180E+00	166.0+	B	9: 0.486659	20: 0.513341		
CARBON DIOXIDE, CO_2	0.499889	1.842E-03	85.0+	A	6: 0.272916	8: 0.727084		
CELLULOSE NITRATE,[μ] $C_6H_{7.7}O_{9.6}N_{2.3}$	0.514237	1.490E+00	87.0	B	1: 0.029216	6: 0.271296	7: 0.121276	8: 0.578212
CERIC SULFATE DOSIMETER SOLUTION[g]	0.552785	1.030E+00	76.7++	A	1: 0.107596 58: 0.002001	7: 0.000800	8: 0.874976	16: 0.014627
CESIUM IODIDE, CsI	0.415689	4.510E+00	553.1	C	53: 0.488451	55: 0.511549		
ETHYLENE, C_2H_4	0.570337	1.175E-03	50.7	A	1: 0.143711	6: 0.856289		
FERROUS SULFATE DOSIMETER SOLUTION[h]	0.553282	1.024E+00	76.4++	A	1: 0.108259 16: 0.012968	7: 0.000027 17: 0.000034	8: 0.878636 26: 0.000054	11: 0.000022
GLASS, BOROSILICATE ("PYREX", CORNING 7740)[i]	0.497070	2.230E+00	134.0++	A	5: 0.040061 14: 0.377220	8: 0.539564 19: 0.003321	11: 0.028191	13: 0.011644
"KAPTON" POLYIMIDE FILM, $(C_{22}H_{10}N_2O_5)_n$	0.512644	1.420E+00	79.6	B	1: 0.026362	6: 0.691133	7: 0.073270	8: 0.209235
LITHIUM FLUORIDE, LiF	0.462617	2.635E+00	94.0+	B	3: 0.267585	9: 0.732415		
LITHIUM TETRABORATE, $Li_2B_4O_7$	0.484869	2.440E+00	94.6	C	3: 0.082085	5: 0.255680	8: 0.662235	
METHANE, CH_4	0.623340	6.672E-04	41.7+	A	1: 0.251306	6: 0.748694		
MUSCLE, SKELETAL (ICRP)[b]	0.549378	1.040E+00	75.3++	A	1: 0.100637 11: 0.000750 17: 0.000790 30: 0.000050	6: 0.107830 12: 0.000190 19: 0.003020	7: 0.027680 15: 0.001800 20: 0.000030	8: 0.754773 16: 0.002410 26: 0.000040
MUSCLE, STRIATED (ICRU)[e]	0.550051	1.040E+00	74.7++	A	1: 0.101997 11: 0.000800 19: 0.003000	6: 0.123000 12: 0.000200	7: 0.035000 15: 0.002000	8: 0.729003 16: 0.005000
MUSCLE-EQUIVALENT LIQUID, WITH SUCROSE[j]	0.548281	1.110E+00	74.3++	A	1: 0.098234	6: 0.156214	7: 0.035451	8: 0.710100
MUSCLE-EQUIVALENT LIQUID, WITHOUT SUCROSE[k]	0.550136	1.070E+00	74.2++	A	1: 0.101969	6: 0.120058	7: 0.035451	8: 0.742522
NYLON, TYPE 6 AND TYPE 6/6, $(C_6H_{11}ON)_n$	0.547902	1.140E+00	63.9+	A	1: 0.097976	6: 0.636856	7: 0.123779	8: 0.141389
PARAFFIN WAX, $C_{25}H_{52}$	0.572748	9.300E-01	55.9	B	1: 0.148605	6: 0.851395		
PHOTOGRAPHIC EMULSION[l]	0.454532	3.815E+00	331.0+	A	1: 0.014100 16: 0.001890	6: 0.072261 35: 0.349103	7: 0.019320 47: 0.474105	8: 0.066101 53: 0.003120
PLASTIC SCINTILLATOR (VINYLTOLUENE BASED)[m]	0.541415	1.032E+00	64.7	B	1: 0.085000	6: 0.915000		
POLYCARBONATE,[n] "MAKROLON", $(C_{16}H_{14}O_3)_n$	0.526968	1.200E+00	73.1	B	1: 0.055491	6: 0.755751	8: 0.188758	
POLYETHYLENE, $(C_2H_4)_n$	0.570337	9.400E-01	57.4+	B	1: 0.143711	6: 0.856289		
POLYETHYLENE TEREPTHALATE,[o] "MYLAR", $(C_{10}H_8O_4)_n$	0.520370	1.400E+00	78.7	B	1: 0.041959	6: 0.625017	8: 0.333025	
POLYMETHYL METHACRYLATE,[p] $(C_5H_8O_2)_n$	0.539369	1.190E+00	74.0+	A	1: 0.080538	6: 0.599848	8: 0.319614	
POLYPROPYLENE, $(C_3H_5)_n$	0.559985	9.000E-01	59.2	B	1: 0.122698	6: 0.877302		
POLYSTYRENE,[q] $(C_8H_8)_n$	0.537680	1.060E+00	68.7+	A	1: 0.077418	6: 0.922582		
POLYTETRAFLUOROETHYLENE,[r] "TEFLON", $(C_2F_4)_n$	0.479925	2.200E+00	99.1+	A	6: 0.240183	9: 0.759817		
POLYVINYL CHLORIDE, $(C_2H_3C\ell)_n$	0.512011	1.300E+00	108.2	B	1: 0.048380	6: 0.384360	17: 0.567260	
PROPANE, C_3H_8	0.589620	1.879E-03	47.1+	A	1: 0.182855	6: 0.817145		
SILICON DIOXIDE, SiO_2	0.499298	2.320E+00	139.2+	A	8: 0.532565	14: 0.467435		
SODIUM IODIDE, NaI	0.426968	3.667E+00	452.0	C	11: 0.153373	53: 0.846627		
STILBENE, $C_{14}H_{12}$	0.532597	9.707E-01	67.7	B	1: 0.067101	6: 0.932899		
TISSUE-EQUIVALENT GAS (METHANE BASED)[s]	0.549927	1.064E-03	61.2+	A	1: 0.101869	6: 0.456179	7: 0.035172	8: 0.406780
TISSUE-EQUIVALENT GAS (PROPANE BASED)[t]	0.550268	1.826E-03	59.5++	A	1: 0.102672	6: 0.568940	7: 0.035022	8: 0.293366
TOLUENE, C_7H_8	0.542651	8.669E-01	62.5+	A	1: 0.087510	6: 0.912490		
WATER, LIQUID, H_2O	0.555087	1.000E+00	75.0+	A	1: 0.111894	8: 0.888106		
WATER VAPOR, H_2O	0.555087	7.562E-04	71.6+	A	1: 0.111894	8: 0.888106		

Table 5.5 Footnotes

*Gas densities are for a pressure of 1 atm and a temperature of 20° C. Values for densities are taken from *Handbook of Chemistry and Physics* (1979), *The Condensed Chemical Dictionary* (1977), *The Reactor Handbook* (1960), manufacturers and suppliers literature, or from reports of other authors. Due to computer preparation of the tables, the densities are given to four figures, even though in some cases the values are significant to only two or three (usually indicated by the presence of terminal zeros); the number following the "E" indicates the power of 10. In some cases, the value given is nominal, representing the mid-point of a range of densities. Density enters into the calculation of the mass collision stopping power only in the evaluation of the density-effect correction.

‡Unless indicated otherwise, the adopted mean excitation energies were obtained by the application of the Bragg additivity rule, Eq (5.3), using I-values for elemental constituents given in Table 5.1. A plus (+) indicates a direct experimental mean excitation energy for the compound, taken from Table 5.3. The mean excitation energies for air and methane-based TE gas are indicated as experimental, because these mixtures consist of constituents all of which have experimentally determined I-values. A double plus (++) indicates that the material was treated as a mixture of compounds, of which some -- but not all -- have experimentally determined I-values.

§The letter grade A, B, or C following the I-value is a qualitative indication of the estimated uncertainty as discussed in the text.

[a]Smathers *et al.*(1977) and Goodman (1978): 45.14% polyethylene ($(C_2H_4)_n$), 35.32% nylon (duPont Elvamide 8062M), 16.06% carbon, and 3.85% calcium fluoride (CaF_2), by weight.

[b]From Tables 105 and 108 of ICRP (1979).

[c]*Handbook of Chemistry and Physics* (1979): 78.09% N_2, 20.95% O_2, 0.93% Ar, and 0.03% CO_2, by volume.

[d]ICRU Report 26 (1977): 30.0% polyethylene ($(C_2H_4)_n$), 21.6% nylon (duPont Elvamide 8062M), 14.0% carbon, and 34.4% calcium fluoride (CaF_2), by weight.

[e]Composition from ICRU Report 10b (1964). Water content and density taken from Table 105 of ICRP (1975).

[f]ICRU Report 26 (1977): 78.4% polyvinylidene fluoride ($(C_2H_2F_2)_n$), 20.75% carbon, and 0.85% silicon dioxide (SiO_2), by weight.

[g]0.015 molar ceric ammonium sulfate in 0.8N sulfuric acid aqueous solution: 95.183% H_2O, 3.914% H_2SO_4, and 0.903% $Ce(SO_4)_2 \cdot 2(NH_4)_2SO_4 \cdot 2H_2O$, by weight.

[h]0.001 molar ferrous ammonium sulfate in 0.8N sulfuric acid aqueous solution. According to Greene, Major, and Law (1973): 96.0% H_2O, 3.9% H_2SO_4, 0.039% $Fe(NH_4)_2(SO_4)_2 \cdot 6H_2O$, and 0.006% NaCℓ, by weight.

[i]Hubbell (1969): 80.9% SiO_2, 12.9% B_2O_3, 3.8% Na_2O, 2.2% $Aℓ_2O_3$, and 0.4% K_2O, by weight.

[j]Rossi and Failla (1956): 56.9% H_2O, 28.4% glycerol ($C_3H_8O_3$), 7.6% urea ($CO(NH_2)_2$), and 7.1% sucrose ($C_{12}H_{22}O_{11}$), by weight.

[k]Goodman (1969): 65.6% H_2O, 26.8% glycerol ($C_3H_8O_3$), and 7.6% urea ($CO(NH_2)_2$) by weight.

[l]Standard nuclear research emulsion, as given in Table 3.5.1 of Barkas (1958).

[m]Composition (based on vinyltoluene, C_9H_{10}) and density is characteristic of "NE 102", "NE 110," "NE 111," "NE 113," "NE 114," "Pilot B," "Pilot F," "Pilot U," and "Pilot Y" plastic scintillators produced by Nuclear Enterprises, Inc.

[n]Also known as "Lexan".

[o]Also known as "Melinex".

[p]Also known as "Lucite," "Plexiglas," "Perspex," PMMA resist.

[q]Also known as "Styrofoam," "Styron".

[r]Also known as "Halon".

[s]Rossi and Failla (1956): 64.4% methane (CH_4), 32.4% CO_2, and 3.2% N_2, by volume.

[t]Srdoč (1970): 55.0% propane (C_3H_8), 39.6% CO_2, and 5.4% N_2, by volume.

[u]Nitrated cellulose, with approximate composition $(C_6H_{10}O_5) - 2.3(OH) + 2.3(ONO_2)$, used in the preparation of plastics (celluloid) and lacquers; from page 728 of Streitweiser and Heathcock (1976).

Table 5.6. Comparison of mean excitation energies for compounds recommended in various publications. Values are given in eV.

Material	Formula	Adopted here	Pages *et al.* (1972)	Dalton and Turner (1968)	NAS-NRC (1964)	Brandt (1958)
propane, liquid	C_3H_8	52.0 ± 3.9	50.4	51.2	50.3	51.5
polyethylene	$(C_2H_4)_n$	57.4† ± 4.6	54.7	55.8	54.6	59.6
nylon, type 6/6	$(C_6H_{11}ON)_n$	63.9† ± 2.6	62.3	-	-	62.0
polystyrene	$(C_8H_8)_n$	68.7† ± 2.7	63.7	65.5	63.6	65.1
polymethyl methacrylate	$(C_5H_8O_2)_n$	74.0† ± 1.5	65.7	69.2	65.6	69.0
water, liquid	H_2O	75.0† ± 3.0	65.3	71.3	65.1	72.5
polyoxymethylene	$(CH_2O)_n$	77.4 ± 5.8	69.8	-	-	76.6
air		85.7† ± 1.7	86.8	92.9	86.8	-
polyvinyl chloride	$(C_2H_3C\ell)_n$	108 ± 8	112.5	-	-	112.7
saran	$(C_2H_2C\ell_2)_n$	134 ± 10	-	-	-	145.6
"Freon-13B1"	CF_3Br	210 ± 25	-	-	204.7	171.6
photographic emulsion		331† ± 10	-	-	320	263.1
sodium iodide	NaI	452 ± 50	433	411	433	-
cesium iodide	CsI	553 ± 65	523	-	-	-

†Experimental value (see Table 5.3).

Table 5.7. Dependence of the mean excitation energy on the state of aggregation of the medium.

Substance	Mean Excitation Energy I (eV)						
	Atomic gas[a] (a)	Molecular gas[b] (b)	Liquid[c] (c)	Solid[d] (d)	Ratios (b)/(a)	(c)/(b)	(d)/(a)
^{1}H	15.0	19.2	21.8		1.28	1.14	
^{6}C	62.0			78			1.26
^{7}N	76.9	82.0	90.5		1.07	1.10	
^{8}O	93.5	95.0	104.3		1.02	1.10	
$^{13}A\ell$	124			166			1.34
^{14}Si	132			173			1.32
^{22}Ti	182			233			1.28
^{26}Fe	226			286			1.26
^{29}Cu	274			322			1.18
^{32}Ge	292			350			1.20
H_2O		71.6	75.0			1.05	
C_3H_8, propane		47.1	52.0			1.10	
C_5H_{12}, pentane		48.2	53.6			1.11	
C_6H_{14}, hexane		49.1	54.0			1.10	
C_7H_{16}, heptane		49.2	54.4			1.11	

[a]Theoretical: from Brown (1950) for H; from Dehmer *et al.* (1975) for C, N, O, Aℓ, and Si; and from Inokuti *et al.* (1981) for Ti, Fe, Cu, and Ge.

[b]From Tables 3.1, 5.3, and 5.5.

[c]From Tables 4.2 and 5.3.

[d]From Table 5.5.

Table 6.1 Percent reduction of collision stopping power due to density effect calculated according to the method of Sternheimer.

T (MeV)	graphite[a] ρ=1.70 g/cm^3	graphite[b] ρ=2.265 g/cm^3	H_2O (liquid) ρ=1.0 g/cm^3	Au ρ=19.32 g/cm^3	air ρ=1.205x10^{-3} g/cm^3	Xe ρ=5.485x10^{-3} g/cm^3
1000	30.2	30.9	29.3	27.4	11.8	8.3
500	28.2	29.0	27.2	25.0	9.3	6.0
200	25.2	26.0	24.1	21.5	5.0	3.4
100	22.6	23.5	21.5	18.7	3.4	1.8
50	19.7	20.6	18.6	15.7	1.0	0.7
20	15.6	16.4	14.6	11.9		0.0
10	12.6	13.3	11.5	9.1		
5	9.7	10.4	8.2	6.5		
2	6.1	6.7	3.9	3.6		
1	3.7	4.1	1.2	2.1		
0.5	1.9	2.2		1.2		
0.2	0.6	0.8		0.5		
0.1	0.3	0.3		0.2		

[a]Typical bulk density of reactor-grade graphite
[b]Graphite crystallite density

Table 7.1. Ratio of restricted to total collision stopping power for electrons $L^-(T,\Delta)/S^-_{col}(T)$. Results were calculated using density-effect corrections obtained from Sternheimer's method.

T (MeV)	Δ (keV)	C (1.7 g/cm^3)	Aℓ	Cu	Ag	Pb	H_2O (liquid)	Air
100	100	0.7389	0.7338	0.7200	0.7184	0.7167	0.7431	0.7895
	10	0.6483	0.6415	0.6229	0.6207		0.6540	0.7164
	1	0.5578	0.5492				0.5649	0.6434
50	100	0.7597	0.7545	0.7404	0.7385	0.7358	0.7635	0.8038
	10	0.6665	0.6592	0.6397	0.6371		0.6717	0.7277
	1	0.5733	0.5640				0.5800	0.6516
20	100	0.7888	0.7833	0.7685	0.7665	0.7620	0.7917	0.8205
	10	0.6915	0.6835	0.6618	0.6588		0.6957	0.7377
	1	0.5941	0.5836				0.5998	0.6550
10	100	0.8120	0.8068	0.7914	0.7892	0.7836	0.8148	0.8344
	10	0.7106	0.7026	0.6788	0.6754		0.7149	0.7450
	1	0.6091	0.5984				0.6149	0.6557
5	100	0.8374	0.8325	0.8174	0.8142	0.8081	0.8406	0.8520
	10	0.7308	0.7228	0.6977	0.6924		0.7361	0.7550
	1	0.6241	0.6129				0.6315	0.6579
2	100	0.8772	0.8717	0.8592	0.8547	0.8483	0.8805	0.8836
	10	0.7626	0.7520	0.7277	0.7192		0.7689	0.7750
	1	0.6473	0.6316				0.6568	0.6658
1	100	0.9126	0.9070	0.8977	0.8935	0.8873	0.9150	0.9149
	10	0.7917	0.7784	0.7564	0.7462		0.7976	0.7973
	1	0.6686	0.6475				0.6780	0.6776
0.5	100	0.9501	0.9460	0.9405	0.9374	0.9329	0.9512	0.9505
	10	0.8244	0.8100	0.7907	0.7799		0.8285	0.8259
	1	0.6926	0.6672				0.6997	0.6951
0.2	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	0.8706	0.8574	0.8422	0.8322		0.8721	0.8699
	1	0.7263	0.6984				0.7294	0.7247
0.1	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	0.9068	0.8961	0.8841	0.8759		0.9076	0.9058
	1	0.7529	0.7245				0.7549	0.7503
0.05	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	0.9442	0.9370	0.9289	0.9232		0.9446	0.9435
	1	0.7818	0.7536				0.7833	0.7789
0.02	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	1.0000	1.0000	1.0000	1.0000		1.0000	1.0000
	1	0.8266	0.8000				0.8278	0.8237
0.01	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	1.0000	1.0000	1.0000	1.0000		1.0000	1.0000
	1	0.8675	0.8439				0.8686	0.8650

Table 7.2. Ratio of restricted to total collision stopping power for positrons, $L^+(T,\Delta)/S^+_{col}(T)$. Results were calculated using density-effect corrections obtained from Sternheimer's method.

T (MeV)	Δ (keV)	C (1.7 g/cm^3)	Aℓ	Cu	Ag	Pb	H_2O (liquid)	Air
100	100	0.7583	0.7535	0.7403	0.7388	0.7371	0.7623	0.8061
	10	0.6654	0.6587	0.6406	0.6384		0.6709	0.7316
	1	0.5725	0.5639				0.5795	0.6570
50	100	0.7801	0.7751	0.7619	0.7602	0.7576	0.7836	0.8213
	10	0.6845	0.6774	0.6585	0.6559		0.6896	0.7436
	1	0.5888	0.5796				0.5954	0.6659
20	100	0.8104	0.8053	0.7917	0.7897	0.7856	0.8131	0.8395
	10	0.7107	0.7030	0.6821	0.6792		0.7149	0.7552
	1	0.6107	0.6003				0.6163	0.6705
10	100	0.8344	0.8297	0.8156	0.8136	0.8085	0.8369	0.8546
	10	0.7308	0.7232	0.7003	0.6971		0.7349	0.7637
	1	0.6265	0.6160				0.6322	0.6721
5	100	0.8599	0.8556	0.8421	0.8392	0.8338	0.8627	0.8728
	10	0.7518	0.7442	0.7202	0.7152		0.7568	0.7747
	1	0.6421	0.6312				0.6494	0.6752
2	100	0.8973	0.8926	0.8818	0.8779	0.8723	0.9001	0.9028
	10	0.7830	0.7731	0.7502	0.7421		0.7890	0.7947
	1	0.6650	0.6496				0.6742	0.6830
1	100	0.9265	0.9217	0.9137	0.9100	0.9047	0.9286	0.9285
	10	0.8085	0.7960	0.7752	0.7656		0.8141	0.8139
	1	0.6833	0.6626				0.6925	0.6921
0.5	100	0.9522	0.9482	0.9429	0.9399	0.9355	0.9533	0.9526
	10	0.8320	0.8181	0.7994	0.7889		0.8360	0.8334
	1	0.6995	0.6745				0.7065	0.7020
0.2	100	0.9785	0.9764	0.9739	0.9722	0.9697	0.9787	0.9784
	10	0.8569	0.8426	0.8261	0.8152		0.8585	0.8561
	1	0.7147	0.6861				0.7179	0.7131
0.1	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	0.8757	0.8620	0.8468	0.8365		0.8766	0.8744
	1	0.7250	0.6947				0.7271	0.7222
0.05	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	0.9006	0.8886	0.8752	0.8660		0.9013	0.8994
	1	0.7387	0.7070				0.7404	0.7354
0.02	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	0.9488	0.9416	0.9334	0.9276		0.9491	0.9480
	1	0.7662	0.7335				0.7677	0.7627
0.01	100	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
	10	1.0000	1.0000	1.0000	1.0000		1.0000	1.0000
	1	0.7960	0.7636				0.7975	0.7925

Table 8.1 Comparison of experimental and calculated collision stopping powers in air and collodion. Results are given in units of MeV/(g cm^{-2}).

T (keV)	Calculated Results			Experimental Results of Cole (1969)
	cellulose nitrate[a]	air[a]	air[b]	collodion & air[c]
100	3.74	3.63		
60	5.26	5.11		5.3
40	7.04	6.85		7.1
20	11.9	11.6		12.0
10	20.3	19.8	20.4	20
6	30.0	29.2	30.1	29
4	40.6	39.5	40.5	39
2	66.8	65.0	65.8	65
1	105	103	97.9	106
0.6	141	137	139	145
0.4	170	166	170	170
0.2			216	230
0.1			218	260
0.06			170	260
0.04			104	140
0.02			26.0	110

[a]According to Bethe theory, Eq (2.16). In the comparison, cellulose nitrate is considered equivalent to collodion (see footnote 18).

[b]Green (see footnote 17).

[c]Cole's results are the same for collodion and air.

Table 8.2 Collision stopping power, in MeV/(g cm^{-2}), for low-Z materials, calculated according to the Bethe formula, Eq (2.16), at energies from 10 to 1 keV.

T (keV)	H_2	He	Be	C graphite	N_2	O_2	Ne	Aℓ	Si	Ar
10	51.3	22.7	18.6	20.1	20.0	19.4	17.7	16.5	16.9	15.0
8	61.5	27.1	22.2	23.9	23.7	23.0	20.9	19.4	19.9	17.6
6	77.8	34.0	27.7	29.8	29.5	28.6	25.9	23.9	24.5	21.6
5	90.2	39.2	31.9	34.3	33.9	32.7	29.5	27.2	27.9	24.6
4	108	46.7	37.8	40.5	40.0	38.6	34.6	31.8	32.5	28.7
3	136	58.3	46.9	50.1	49.4	47.5	42.3	38.7	39.5	34.7
2	188	79.2	63.0	66.9	66.0	63.1	55.4	50.2	51.1	44.7
1.5	235	98.0	77.2	81.6	80.3	76.5	66.2	59.6	60.5	52.7
1	321	131	102	106	104	98.6	83.4	73.8	74.8	64.7

T (keV)	A-150 plastic	acetylene	adipose tissue	Air	$Aℓ_2O_3$	B-100 plastic	bone (ICRU)	bone (ICRP)	C-552 plastic
10	22.9	23.0	23.5	19.8	17.3	20.9	20.7	19.7	19.7
8	27.3	27.3	27.9	23.5	20.4	24.8	24.5	23.3	23.4
6	34.1	34.2	34.9	29.2	25.2	30.8	30.5	29.0	29.1
5	39.2	39.4	40.2	33.5	28.8	35.4	35.0	33.2	33.4
4	46.5	46.7	47.6	39.5	33.7	41.8	41.2	39.0	39.5
3	57.6	58.0	59.1	48.8	41.1	51.5	50.8	47.9	48.7
2	77.5	78.2	79.5	65.0	53.7	68.7	67.5	63.4	64.8
1.5	94.9	96.1	97.4	79.0	64.1	83.5	81.9	76.5	78.8
1	125	127	128	103	80.3	108	106	98.0	102

T (keV)	CaF_2	CO_2	cellulose nitrate	ceric sulfate solution	ethylene	ferrous sulfate solution	glass (Pyrex)	Kapton	LiF
10	16.7	19.6	20.3	22.4	25.0	22.4	17.9	20.6	18.0
8	19.6	23.3	24.1	26.6	29.8	26.6	21.1	24.5	21.3
6	24.2	29.0	30.0	33.1	37.3	33.2	26.1	30.5	26.5
5	27.5	33.3	34.4	38.0	43.0	38.1	29.8	35.0	30.4
4	32.2	39.3	40.6	45.0	51.1	45.1	34.9	41.4	35.8
3	39.1	48.4	50.1	55.6	63.7	55.8	42.7	51.2	44.1
2	50.7	64.4	66.8	74.4	86.1	74.6	55.9	68.3	58.6
1.5	60.2	78.2	81.2	90.7	106	90.9	67.0	83.3	71.0
1	74.6	101	105	118	141	119	84.5	108	91.6

T (keV)	methane	muscle (ICRP)	muscle (ICRU)	ME liquid (with sucrose)	ME liquid (without sucrose)	nylon type 6	paraffin wax	plastic scintillator	poly-carbonate
10	28.3	22.3	22.4	22.3	22.4	23.0	25.3	22.7	21.5
8	33.8	26.5	26.6	26.5	26.6	27.4	30.2	27.0	25.6
6	42.4	33.1	33.2	33.1	33.2	34.2	37.9	33.7	31.9
5	49.0	38.0	38.1	38.0	38.2	39.3	43.7	38.7	36.7
4	58.3	44.9	45.1	45.0	45.2	46.6	51.9	45.9	43.4
3	72.8	55.6	55.8	55.7	55.9	57.8	64.6	56.9	53.7
2	98.9	74.4	74.6	74.5	74.8	77.7	87.6	76.5	71.9
1.5	122	90.7	91.1	91.0	91.3	95.2	108	93.7	87.8
1	163	118	119	119	119	125	143	123	115

T (keV)	poly-ethylene	PMMA	poly-propylene	poly-styrene	Teflon	PVC	propane
10	24.4	22.0	23.8	22.2	18.4	19.3	26.2
8	29.1	26.1	28.4	26.4	21.8	22.9	31.2
6	36.4	32.6	35.5	33.0	27.1	28.4	39.2
5	41.9	37.4	40.9	38.0	31.1	32.4	45.2
4	49.7	44.3	48.5	44.9	36.6	38.2	53.7
3	61.8	54.8	60.2	55.7	45.1	46.9	66.9
2	83.3	73.4	81.1	74.7	59.8	62.0	90.7
1.5	102	89.6	99.5	91.4	72.3	74.8	112
1	135	117	131	120	93.0	95.7	149

T (keV)	SiO_2	stilbene	TE gas (methane based)	TE gas (propane based)	toluene	water (liquid)	water vapor
10	17.8	22.1	23.2	23.3	22.9	22.6	22.8
8	21.0	26.3	27.6	27.8	27.2	26.8	27.1
6	26.0	32.8	34.5	34.7	34.0	33.4	33.8
5	29.6	37.7	39.6	40.0	39.1	38.4	38.8
4	34.7	44.7	47.0	47.4	46.4	45.4	45.9
3	42.4	55.4	58.3	58.9	57.6	56.2	56.9
2	55.5	74.3	78.5	79.3	77.4	75.2	76.2
1.5	66.3	90.9	96.2	97.2	94.9	91.8	93.1
1	83.4	119	127	128	125	120	122

Table 10.1. Dependence of the c.s.d.a. range on the assumed residual range at 1 keV. The quantity given is the ratio r_0/r_0. The value r_0 is calculated according to Eq (10.2). The more accurate value r_0 is obtained by computing the residual range using stopping powers from Figs. 8.1, 8.3, or 8.5.

Material	T_f (eV)	T_0, keV 1	2	5	10	20	50
H_2O[a]	4.5	302	84.4	17.8	5.96	2.46	1.29
H_2O[a]	12.6	1.78	1.22	1.043	1.013	1.004	1.001
polystyrene[b]	10.0	1.31	1.087	1.017	1.005	1.002	1.000
Aℓ[c]	10.0	1.71	1.20	1.044	1.014	1.004	1.001
Au[d]	10.0	0.851	0.941	0.980	0.992	0.997	0.999

[a]Curve 1, Fig. 8.1.

[b]Curve 3, Fig. 8.3.

[c]Curve 2, Fig. 8.5.

[d]Curve 4, Fig. 8.5.

Table 11.1 Positron/electron collision stopping power and range ratios. The density-effect correction was taken from Inokuti and Smith (1982) for Aℓ, from Ashley (1982b) for H_2O, and was calculated according to Sternheimer for the other materials.

	$S^+_{col}(T)/S^-_{col}(T)$						
T (MeV)	C (1.7 g/cm^3)	Aℓ	Cu	Ag	Pb	H_2O (liq.)	Air
1000	0.976	0.976	0.975	0.975	0.975	0.977	0.981
500	0.976	0.976	0.974	0.974	0.974	0.976	0.981
200	0.975	0.975	0.973	0.973	0.973	0.975	0.980
100	0.974	0.974	0.973	0.972	0.973	0.975	0.979
50	0.974	0.973	0.972	0.972	0.971	0.974	0.978
20	0.972	0.972	0.971	0.971	0.969	0.973	0.977
10	0.972	0.971	0.971	0.969	0.968	0.973	0.976
5	0.972	0.971	0.970	0.969	0.968	0.972	0.974
2	0.974	0.972	0.971	0.969	0.968	0.974	0.975
1	0.978	0.977	0.977	0.975	0.973	0.979	0.979
0.5	0.990	0.989	0.991	0.989	0.989	0.990	0.990
0.2	1.016	1.018	1.023	1.023	1.025	1.016	1.016
0.1	1.039	1.043	1.051	1.054	1.059	1.039	1.039
0.05	1.060	1.067	1.077	1.083	1.094	1.059	1.060
0.02	1.084	1.097	1.112	1.123	1.144	1.084	1.086
0.01	1.102	1.119	1.142	1.158	1.192	1.101	1.104

	$r^+_o(T)/r^-_o(T)$						
T (MeV)	C (1.7 g/cm^3)	Aℓ	Cu	Ag	Pb	H_2O (liq.)	Air
1000	1.010	1.009	1.008	1.008	1.007	1.010	1.009
500	1.013	1.011	1.009	1.009	1.008	1.012	1.011
200	1.016	1.014	1.012	1.011	1.009	1.016	1.014
100	1.020	1.017	1.014	1.013	1.012	1.019	1.017
50	1.023	1.021	1.017	1.016	1.014	1.022	1.020
20	1.025	1.024	1.021	1.020	1.017	1.025	1.022
10	1.025	1.025	1.023	1.023	1.020	1.025	1.023
5	1.024	1.024	1.023	1.022	1.021	1.023	1.022
2	1.017	1.017	1.017	1.017	1.016	1.017	1.017
1	1.007	1.007	1.005	1.006	1.005	1.007	1.007
0.5	0.991	0.991	0.987	0.987	0.985	0.992	0.991
0.2	0.966	0.962	0.955	0.953	0.948	0.967	0.966
0.1	0.947	0.940	0.932	0.926	0.917	0.948	0.947
0.05	0.931	0.921	0.909	0.900	0.882	0.931	0.930
0.02	0.910	0.895	0.876	0.862	0.824	0.911	0.908
0.01	0.894	0.873	0.846	0.822	0.756	0.895	0.892

Table 11.2 Comparison of positron/electron collision stopping-power ratios and restricted-stopping-power ratios in liquid water. Results were calculated using density-effect corrections obtained from Sternheimer's method.

T (MeV)	$S^+_{col}(T)/S^-_{col}(T)$	$L^+(T,\Delta)/L^-(T,\Delta)$		
		Δ=100 keV	Δ=10 keV	Δ=1 keV
100	0.975	1.000	1.000	1.000
10	0.973	0.999	1.000	1.000
1	0.979	0.994	0.999	1.000
0.5	0.990	0.992	0.999	1.000
0.2	1.016	0.994	1.000	1.000
0.15	1.025	1.012	1.001	1.000
0.1	1.039	1.039	1.003	1.000
0.05	1.059	1.059	1.011	1.001
0.02	1.083	1.083	1.028	1.005
0.015	1.090	1.090	1.056	1.007
0.01	1.101	1.101	1.101	1.011

Table 11.3 Comparison of experimental and calculated total stopping powers. The density-effect correction was taken from Ashley (1982b) for H_2O, and was calculated according to Sternheimer for the other materials. Results for graphite were calculated using a density of 1.7 g/cm^3.

Material	Electron Energy (MeV)	S, MeV/(g cm^{-2}) Calculated	Experimental	Ref.
Be	2.8	1.49	1.45 ± 0.06	*a*
	4.7	1.55	1.73 ± 0.12	*a*
	32	2.03	2.0 ± 0.1	*b*
graphite (1.7 g/cm^3)	2.8	1.65	1.53 ± 0.08	*a*
	4.7	1.72	1.89 ± 0.16	*a*
	32	2.44	2.4 ± 0.1	*b*
Fe	2.8	1.46	1.43 ± 0.10	*a*
	4.7	1.62	1.94 ± 0.19	*a*
Pb	2.8	1.38	1.32 ± 0.10	*a*
	4.7	1.66	2.04 ± 0.22	*a*
liquid H_2O	2.8	1.88	1.83 ± 0.10	*a*
	4.7	1.96	2.43 ± 0.20	*a*

[a]Experimental results of Paul and Reich (1950).

[b]Experimental results of Ziegler (1958).

Table 11.4 Comparison of experimental and calculated stopping-power ratios. Results pertain to total stopping power including collision and radiation losses. The density-effect correction was taken from Inokuti and Smith (1982) for Aℓ, from Ashley (1982b) for H_2O, and was calculated according to Sternheimer for the other materials.

Materials	Electron Energy (MeV)	Stopping-Power Ratio Calculated	Experimental Westermark (1961)
Li/Be	2.8	1.029	1.051 ± 0.021
graphite[a]/Be	2.8	1.104	1.090 ± 0.022
Na/Be	2.8	1.068	1.073 ± 0.022
Mg/Be	2.8	1.088	1.092 ± 0.016
Aℓ/Be	2.8	1.050	1.050 ± 0.016
Si/Be	2.8	1.085	1.059 ± 0.016
K/Be	2.8	1.079	1.066 ± 0.020
LiH[b]/Be	2.8	1.176	1.167 ± 0.018
liquid H_2O/Aℓ	2.8	1.200	1.224 ± 0.013
n-heptane[c]/Aℓ	2.8	1.272	1.263 ± 0.019
methanol[d]/Aℓ	2.8	1.224	1.216 ± 0.019
benzene[e]/Aℓ	2.8	1.168	1.178 ± 0.018
toluene[f]/Aℓ	2.8	1.180	1.187 ± 0.018

Materials	Electron Energy (MeV)	Stopping-Power Ratio Calculated	Experimental Hereford (1948)
liquid H_2O/graphite	1.4	1.145	1.17 ± 0.02
	1.6	1.143	1.16 ± 0.02
	7.4	1.134	1.16 ± 0.02
	9.0	1.133	1.14 ± 0.02

[a]Density 1.7 g/cm^3.

[b]Actual composition 96.0% LiH, 3.25% Li, and 0.75% Na by weight (Westermark, 1961). Density 0.82 g/cm^3; $\langle Z/A \rangle$ = 0.50072; I = 37.0 eV.

[c]C_7H_{16}; density 0.68376 g/cm^3; $\langle Z/A \rangle$ = 0.57882; I = 54.4 eV.

[d]CH_3OH; density 0.7914 g/cm^3; $\langle Z/A \rangle$ = 0.56176; I = 67.6 eV.

[e]C_6H_6; density 0.87865 g/cm^3; $\langle Z/A \rangle$ = 0.53768; I = 63.4 eV.

[f]$C_6H_5CH_3$; density 0.8669 g/cm^3; $\langle Z/A \rangle$ = 0.54265; I = 62.5 eV.

Table 11.5 Comparison of data given in earlier electron stopping-power and range tables with results of the present work. The comparisons are presented in terms of the percent deviations of the results given by Berger and Seltzer (1964) and of Pages *et al.* (1972) from the results calculated here, for the collision stopping power, radiative stopping power, total stopping power, csda range and radiation yield.

Percent Deviations for Water[a] (liquid)

T (MeV)	Stopping Power: Collision $\frac{1}{\rho} S_{col}(T)$		Stopping Power: Radiative $\frac{1}{\rho} S_{rad}(T)$		Stopping Power: Total $\frac{1}{\rho} S(T)$		csda Range $r_o(T)$		Radiation Yield $Y(T)$	
	B&S	Pages	B&S	Pages	B&S	Pages	B&S	Pages	B&S	Pages
0.01	2.8	2.8	30.0	29.1	2.8	2.7	-3.1	-14.3	32.3	15.3
0.1	2.0	1.9	22.6	25.6	2.0	1.9	-2.2	-2.3	18.7	20.3
1	1.7	1.6	34.9	38.1	1.9	1.9	-1.9	-1.9	35.5	39.2
10	1.2	2.7	0.8	-0.6	1.2	2.5	-1.7	-2.2	2.4	1.0
100	0.0	5.1	-1.3	2.3	-0.6	3.6	-0.2	-2.8	-0.8	-2.2
1000	0.0		-1.9		-1.7		0.8		-0.3	

[a]Density effect calculated according to Sternheimer in B&S, Pages; according to Ashley (1982b) in present work.

Percent Deviations for Air

0.01	-0.3	-0.3	28.6	27.6	-0.3	-0.3	0.3	-11.9	35.2	16.7
0.1	-0.2	-0.2	21.0	24.2	-0.1	-0.2	0.2	0.0	20.0	21.6
1	-0.1	-0.2	34.3	38.3	0.1	0.1	0.0	-0.1	37.4	41.5
10	-0.1	-0.1	0.8	-0.7	0.0	-0.2	-0.1	0.0	4.1	3.4
100	0.7	-1.3	-1.3	2.2	-0.3	0.4	0.2	0.6	-0.9	1.3
1000	0.0		-1.9		-1.8		0.8		-0.4	

Percent Deviations for Aluminum[b]

T (MeV)	Stopping Power: Collision $\frac{1}{\rho} S_{col}(T)$		Stopping Power: Radiative $\frac{1}{\rho} S_{rad}(T)$		Stopping Power: Total $\frac{1}{\rho} S(T)$		csda Range $r_o(T)$		Radiation Yield $Y(T)$	
	B&S	Pages	B&S	Pages	B&S	Pages	B&S	Pages	B&S	Pages
0.01	0.5	-0.6	31.1	30.0	0.5	-0.6	-0.6	-13.8	40.8	22.0
0.1	0.4	-0.5	21.8	24.1	0.4	-0.5	-0.4	0.2	18.4	21.0
1	0.5	-0.6	38.4	41.2	1.0	0.0	-0.9	0.1	39.6	44.2
10	-0.1	0.0	0.4	-1.2	0.0	-0.2	-0.3	-0.1	3.6	2.6
100	0.2	0.4	-0.1	2.8	0.0	2.0	0.0	-0.2	-0.2	0.2
1000	0.1		-0.3		-0.3		0.0		0.0	

[b]Density effect calculated according to Sternheimer in B&S, Pages; according to Inokuti and Smith in present work.

Percent Deviations for Gold

0.01	-0.3	-0.4	115.3	104.7	0.0	-0.1	0.3	-27.3	176.7	108.7
0.1	0.0	-0.2	32.9	35.2	0.7	0.6	-0.4	-1.1	42.2	43.4
1	1.4	0.0	27.3	31.3	4.3	3.5	-3.0	-2.5	26.9	31.0
10	1.6	0.3	5.6	1.3	3.5	0.8	-4.3	-1.2	6.2	2.1
100	0.6	0.5	1.3	2.3	1.2	2.2	-2.2	1.4	0.3	-0.5
1000	0.1		1.0		1.0		-1.7		0.0	

Fig. 3.1. Percent increase (decrease) of the collision stopping power for electrons resulting from a 1-percent decrease (increase) of the mean excitation energy.

Fig. 3.2. Theoretical mean excitation energies for elements.

Fig. 3.3. Relative contribution of the shell correction C/Z, Barkas correction zL_1, Bloch correction z^2L_2, and density-effect correction $\delta/2$ to the stopping number L for protons (z = 1) in gold.

Fig. 3.4. Shell corrections for protons as functions of the atomic number. The solid curves represent the semi-empirical shell corrections of Bichsel, and the dashed curves the theoretical shell corrections of Bonderup (1967).

Fig. 3.5. Semi-empirical shell corrections of Bichsel for selected elements, as functions of the proton energy.

Fig. 4.1. Ratio of the mean excitation energy I to the atomic number Z for elements.

Fig. 4.2. Ratio of experimental to calculated stopping powers for protons and alpha particles in nitrogen and oxygen (from Bichsel and Porter, 1982).

——— Reynolds *et al.* (1953)	• Besenbacher *et al.* (1979)
— — — Hanke and Laursen (1978)	△ Brolley and Ribe (1955)
— — — Kerr *et al.* (1966)	○ Langley (1975)
— — — Swint *et al.* (1970)	x Wolke *et al.* (1963)
- - - - - Rotondi (1968)	+ Chilton *et al.* (1954)
· · · · · Bourland *et al.* (1971)	□ Hoyer and Wäffler (1971)

Fig. 4.3. Ratio of experimental to calculated proton stopping powers.

Fig. 4.4. Ratio of experimental to calculated proton stopping powers at 6.5 MeV. Experimental data are from Ishiwari (1979).

Fig. 4.5. Ratio of experimental to calculated proton stopping powers at 19.8 MeV. Experimental data are from Burkig and MacKenzie (1957).

Fig. 6.1 Sternheimer density-effect correction δ, as function of the particle energy.

Lower scale: for electrons, as function of kinetic energy T in MeV.

Upper scale: for any particle, as function of kinetic energy τ in units of rest mass.

Fig. 6.2. Difference between the density-effect correction δ_{DRF} calculated by Inokuti and Smith (1982) using a semi-empirical dielectric function for aluminum, and the corresponding value δ_{St} obtained by Sternheimer's method. The latter was calculated with $I = 165.7$ eV, to match the I-value found by Shiles *et al.* (1980) for aluminum.

Fig. 6.3. Difference between the density-effect correction δ_{DRF} calculated by Ashley (1982b) using a semi-empirical dielectric function for water, and the corresponding value δ_{St} obtained by Sternheimer's method. The latter was calculated with I = 75.4 eV, to match the I-value for water found by Ashley.

Fig. 6.4. Percent amount by which the electron collision stopping power in aluminum and water is changed, when the density-effect corrections of Inokuti and Smith (1982) for aluminum and that of Ashley (1982b) for water are replaced by density-effect corrections calculated according to Sternheimer.

Fig. 8.1. Calculated electron collision stopping power below 10 keV in water.

Curve 1	water vapor	Berger (see footnote 16)
2	water vapor	Green (see footnote 17)
3	water vapor	Bethe formula, Eq (2.16), with I = 71.6 eV
4	liquid water	Kutcher and Green (1976)
5	liquid water	Ritchie *et al.* (1978)
6	liquid water	Ashley (1982a)
7	liquid water	Bethe formula, Eq (2.16), with I = 75.0 eV.

Fig. 8.2 Calculated electron collision stopping power below 10 keV in hydrogen and air.

Curve 1	H_2 gas	Green (see footnote 17)
2	H_2 gas	Spencer and Pal (1978), points (o)
3	H_2 gas	Bethe formula, Eq (2.16), with I = 19.0 eV
4	Liquid hydrogen	Bethe formula, Eq (2.16), with I = 21.8 eV
5	Air	Green (see footnote 17)
6	Air	Bethe formula, Eq (2.16), with I = 85.7 eV.

Fig. 8.3. Calculated electron collision stopping power below 10 keV in polyethylene and polystyrene.

Curve 1	Polyethylene	Ashley (1982c), with implied I-value of 62.2 eV
2a	Polyethylene	Bethe formula, Eq (2.16), with I = 57.4 eV
2b	Polyethylene	Bethe formula, Eq (2.16), with I = 62.2 eV
3	Polystyrene	Ashley *et al.* (1978)
4	Polystyrene	Bethe formula, Eq (2.16), with I = 68.7 eV.

Fig. 8.4. Calculated electron collision stopping power below 10 keV in silicon dioxide.

Curve 1 Ashley and Anderson (1981)
2 Bethe formula, Eq (2.16), with I = 139.2 eV.

Fig. 8.5 Theoretical estimates of collision stopping power below 10 keV in aluminum and gold.

Curve 1	Aluminum	Ashley *et al.* (1979)
2	Aluminum	Ashley *et al.* (1976a)
3	Aluminum	Bethe formula, Eq (2.16), with I = 166 eV
4	Gold	Ashley *et al.* (1976a)
5	Gold	Bethe formula, Eq (2.16), with I = 790 eV.

Fig. 9.1. Radiative energy-loss cross section $\phi^{(n)}_{rad}$ for bremsstrahlung in the field of the atomic nucleus. Points below 2 MeV are from the calculations of Pratt *et al.* (1977), and points above 50 MeV are from high-energy theory of Davies, Bethe, and Maximon (1954) and Olsen (1955). Curves are from a least-squares fit to the theoretical points.

Fig. 9.2. Ratio of the scaled cross sections $\phi^{(e)}_{rad}$ and $\phi^{(n)}_{rad}$ which represent the radiative energy losses resulting from the emission of bremsstrahlung in the field of the atomic electrons, and in the field of the atomic nucleus, respectively. The total radiative stopping power is proportional to $Z^2\phi^{(n)}_{rad} + Z\phi^{(e)}_{rad}$.

Fig. 9.3. Comparison of theoretical radiative stopping power, calculated according to Eq (9.1), with experimental results.

- ● Motz (1955) and Motz and Placious (1958), for Be, Aℓ, and Au.
- △ Aiginger (1966), for $Aℓ_2O_3$ and Au.
- ○ Rester and Dance (1967), Rester and Edmonson (1972) and Rester (private communication) for Aℓ, Cu, Sn, and Au.

Fig. 11.1 Comparison of theoretical and experimental values of the stopping power in aluminum.

Theoretical results:
1 Ashley *et al.* (1979)
2 Ashley *et al.* (1976a)
3 Ashley *et al.* (1975)
4 Bethe formula, Eq (2.16), with I = 166 eV

Experimental results:
○ Kalil *et al.* (1959)
□ Ishigure *et al.* (1978)

Fig. 11.2 Comparison of theoretical and experimental values of the stopping power in copper.

Theoretical results:
1 Ashley *et al.* (1976a)
2 Bethe formula, Eq (2.16), with I = 322 eV

Experimental results:
○ Ziemer *et al.* (1959)

MAIN STOPPING-POWER AND RANGE TABLES

Arrangement of Tables

A. Electrons in elemental substances. Data are given for electrons in the following elemental substances, in order of increasing atomic number:

H_2, He, Be, C(graphite), N_2, O_2, Ne, Aℓ, Si, Ar, Ti, Fe, Cu, Ge, Kr, Mo, Ag, Sn, Xe, Gd, W, Pt, Au, Pb, U.

B. Electrons in mixtures and compounds. Data are given for electrons in mixtures and compounds, arranged in the same sequence in which they are listed in Table 5.5.

C. Positrons in selected materials. Data are given for positrons in graphite, aluminum, copper, silver, lead, air, polymethylmethacrylate, and water.

Content of Tables

The name of the material, the mean excitation energy I (in eV) and the density ρ (in g/cm^3) are given at the head of each table. For gases, the densities are for a pressure of 1 atmosphere (101.325 kPa) and a temperature of 20 °C.

The principal information in each table includes the mass collision stopping power, $1/\rho\ S_{col}$, the mass radiative stopping power, $1/\rho\ S_{rad}$, and the total mass stopping power, $1/\rho\ S_{col} + 1/\rho\ S_{rad}$, all in units of MeV/(g cm^{-2}); the c.s.d.a. range, r_o, in units of g cm^{-2}; and the radiation yield, Y.

The auxiliary information given includes the density-effect correction δ, and the ratio d(log)/d(log I), where the blank space stands for collision stopping power, c.s.d.a. range or radiation yield. This ratio of logarithmic derivatives can be interpreted as the percent change in the respective quantities that would result from a 1 percent change of the mean excitation energy.

Stopping powers, ranges, and yields are expressed in exponential notation, with the number that follows the letter E indicating powers of 10.

Accuracy

Above 100 keV, the uncertainty of the collision stopping power is estimated to be 1 to 2 percent; between 100 keV and 10 keV, the uncertainty is expected to be 2 to 3 percent in low-Z materials, and 5 to 10 percent in high-Z materials. The uncertainty of the radiative stopping powers is estimated to be ~ 2 percent above 50 MeV, 2 to 5 percent between 50 and 2 MeV, and ~ 5 percent below 2 MeV.

Note on Treatment of Density Effect

The standard procedure used for all materials was to evaluate the density-effect correction to the collision stopping power according to the method of Sternheimer. Electron results using the density-effect correction of Inokuti and Smith (1982) for aluminum, and the density-effect of Ashley (1982b) for water are also given; these are indicated by an asterisk (*) at the head of the tables.

When comparisons are made, *e.g.*, in terms of stopping-power ratios, between the stopping power for water and that for other materials such as tissues, tissue-equivalent materials, ferrous sulfate dosimeter solution or plastics, it is recommended that water results with the Sternheimer density-effect correction be used for the sake of consistency.

For graphite two tables are given: one for a graphite crystallite density of 2.265 g/cm^3, and the other for a typical bulk density of 1.7 g/cm^3. It is recommended that these results be interpolated to the appropriate bulk density for the graphite of interest.

ELECTRONS IN HYDROGEN

I = 19.2 eV DENSITY = 8.375E-05 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	5.125E+01	9.702E-04	5.125E+01	1.076E-04	1.029E-05	0.0	-0.156	0.172	0.172
0.0125	4.271E+01	9.793E-04	4.271E+01	1.613E-04	1.242E-05	0.0	-0.151	0.166	0.166
0.0150	3.682E+01	9.881E-04	3.682E+01	2.245E-04	1.450E-05	0.0	-0.147	0.161	0.161
0.0175	3.249E+01	9.964E-04	3.249E+01	2.970E-04	1.654E-05	0.0	-0.144	0.158	0.157
0.0200	2.917E+01	1.004E-03	2.917E+01	3.783E-04	1.854E-05	0.0	-0.141	0.154	0.154
0.0250	2.439E+01	1.019E-03	2.439E+01	5.667E-04	2.246E-05	0.0	-0.137	0.149	0.149
0.0300	2.110E+01	1.034E-03	2.110E+01	7.878E-04	2.628E-05	0.0	-0.134	0.145	0.145
0.0350	1.870E+01	1.048E-03	1.870E+01	1.040E-03	3.003E-05	0.0	-0.131	0.142	0.142
0.0400	1.687E+01	1.061E-03	1.687E+01	1.322E-03	3.371E-05	0.0	-0.129	0.140	0.139
0.0450	1.542E+01	1.074E-03	1.542E+01	1.632E-03	3.733E-05	0.0	-0.127	0.138	0.137
0.0500	1.424E+01	1.088E-03	1.424E+01	1.970E-03	4.090E-05	0.0	-0.126	0.136	0.135
0.0550	1.327E+01	1.101E-03	1.327E+01	2.334E-03	4.443E-05	0.0	-0.124	0.134	0.134
0.0600	1.245E+01	1.113E-03	1.245E+01	2.724E-03	4.791E-05	0.0	-0.123	0.133	0.132
0.0700	1.114E+01	1.138E-03	1.114E+01	3.575E-03	5.475E-05	0.0	-0.121	0.130	0.130
0.0800	1.015E+01	1.164E-03	1.015E+01	4.517E-03	6.146E-05	0.0	-0.119	0.128	0.127
0.0900	9.367E+00	1.190E-03	9.368E+00	5.543E-03	6.806E-05	0.0	-0.117	0.126	0.126
0.1000	8.737E+00	1.216E-03	8.738E+00	6.650E-03	7.457E-05	0.0	-0.116	0.125	0.124
0.1250	7.590E+00	1.285E-03	7.592E+00	9.732E-03	9.050E-05	0.0	-0.113	0.121	0.121
0.1500	6.819E+00	1.357E-03	6.820E+00	1.322E-02	1.061E-04	0.0	-0.111	0.119	0.118
0.1750	6.266E+00	1.433E-03	6.267E+00	1.705E-02	1.215E-04	0.0	-0.109	0.117	0.116
0.2000	5.851E+00	1.511E-03	5.852E+00	2.118E-02	1.367E-04	0.0	-0.108	0.115	0.115
0.2500	5.275E+00	1.677E-03	5.276E+00	3.021E-02	1.670E-04	0.0	-0.105	0.113	0.112
0.3000	4.898E+00	1.852E-03	4.899E+00	4.007E-02	1.971E-04	0.0	-0.103	0.111	0.110
0.3500	4.635E+00	2.038E-03	4.637E+00	5.057E-02	2.273E-04	0.0	-0.102	0.109	0.108
0.4000	4.445E+00	2.232E-03	4.447E+00	6.159E-02	2.577E-04	0.0	-0.100	0.107	0.106
0.4500	4.302E+00	2.436E-03	4.305E+00	7.303E-02	2.884E-04	0.0	-0.099	0.106	0.105
0.5000	4.193E+00	2.648E-03	4.196E+00	8.480E-02	3.194E-04	0.0	-0.098	0.105	0.103
0.5500	4.109E+00	2.869E-03	4.111E+00	9.684E-02	3.508E-04	0.0	-0.097	0.104	0.102
0.6000	4.042E+00	3.096E-03	4.045E+00	1.091E-01	3.825E-04	0.0	-0.096	0.103	0.101
0.7000	3.945E+00	3.573E-03	3.949E+00	1.341E-01	4.471E-04	0.0	-0.094	0.102	0.100
0.8000	3.883E+00	4.076E-03	3.887E+00	1.597E-01	5.133E-04	0.0	-0.093	0.100	0.098
0.9000	3.842E+00	4.603E-03	3.847E+00	1.856E-01	5.809E-04	0.0	-0.091	0.099	0.097
1.0000	3.816E+00	5.152E-03	3.821E+00	2.117E-01	6.501E-04	0.0	-0.090	0.098	0.096
1.2500	3.787E+00	6.614E-03	3.794E+00	2.774E-01	8.289E-04	0.0	-0.088	0.096	0.093
1.5000	3.788E+00	8.190E-03	3.796E+00	3.433E-01	1.016E-03	0.0	-0.086	0.094	0.091
1.7500	3.802E+00	9.862E-03	3.812E+00	4.090E-01	1.209E-03	0.0	-0.085	0.093	0.089
2.0000	3.823E+00	1.162E-02	3.835E+00	4.744E-01	1.409E-03	0.0	-0.083	0.091	0.088
2.5000	3.873E+00	1.534E-02	3.888E+00	6.039E-01	1.824E-03	0.0	-0.081	0.089	0.086
3.0000	3.924E+00	1.931E-02	3.943E+00	7.316E-01	2.257E-03	0.0	-0.079	0.088	0.084
3.5000	3.973E+00	2.348E-02	3.997E+00	8.575E-01	2.703E-03	0.0	-0.078	0.086	0.082
4.0000	4.020E+00	2.782E-02	4.047E+00	9.818E-01	3.162E-03	0.0	-0.077	0.085	0.081
4.5000	4.063E+00	3.230E-02	4.095E+00	1.105E+00	3.631E-03	0.0	-0.076	0.084	0.080
5.0000	4.103E+00	3.693E-02	4.140E+00	1.226E+00	4.108E-03	0.0	-0.075	0.083	0.079
5.5000	4.140E+00	4.166E-02	4.182E+00	1.346E+00	4.593E-03	0.0	-0.074	0.082	0.078
6.0000	4.175E+00	4.651E-02	4.222E+00	1.465E+00	5.084E-03	0.0	-0.074	0.082	0.077
7.0000	4.239E+00	5.647E-02	4.295E+00	1.700E+00	6.083E-03	0.0	-0.072	0.080	0.076
8.0000	4.295E+00	6.675E-02	4.361E+00	1.931E+00	7.101E-03	0.0	-0.071	0.079	0.074
9.0000	4.345E+00	7.731E-02	4.422E+00	2.159E+00	8.133E-03	0.0	-0.070	0.078	0.073
10.0000	4.391E+00	8.809E-02	4.479E+00	2.383E+00	9.177E-03	0.0	-0.070	0.077	0.072
12.5000	4.488E+00	1.159E-01	4.604E+00	2.934E+00	1.183E-02	0.0	-0.068	0.075	0.070
15.0000	4.569E+00	1.448E-01	4.714E+00	3.470E+00	1.451E-02	0.0	-0.067	0.074	0.069
17.5000	4.638E+00	1.744E-01	4.813E+00	3.995E+00	1.722E-02	0.0	-0.066	0.073	0.068
20.0000	4.698E+00	2.046E-01	4.903E+00	4.510E+00	1.994E-02	0.0	-0.065	0.071	0.066
25.0000	4.799E+00	2.667E-01	5.065E+00	5.513E+00	2.540E-02	0.0	-0.064	0.070	0.064
30.0000	4.881E+00	3.305E-01	5.212E+00	6.485E+00	3.084E-02	0.0	-0.063	0.068	0.063
35.0000	4.951E+00	3.955E-01	5.347E+00	7.432E+00	3.625E-02	0.0	-0.062	0.067	0.061
40.0000	5.010E+00	4.615E-01	5.471E+00	8.357E+00	4.161E-02	1.250E-02	-0.052	0.065	0.060
45.0000	5.055E+00	5.283E-01	5.583E+00	9.261E+00	4.693E-02	6.872E-02	-0.041	0.063	0.056
50.0000	5.091E+00	5.959E-01	5.686E+00	1.015E+01	5.221E-02	1.504E-01	-0.033	0.060	0.051
55.0000	5.120E+00	6.640E-01	5.784E+00	1.102E+01	5.745E-02	2.452E-01	-0.027	0.058	0.047
60.0000	5.144E+00	7.326E-01	5.876E+00	1.188E+01	6.264E-02	3.459E-01	-0.023	0.055	0.043
70.0000	5.183E+00	8.713E-01	6.054E+00	1.355E+01	7.288E-02	5.514E-01	-0.017	0.050	0.036
80.0000	5.213E+00	1.011E+00	6.225E+00	1.518E+01	8.293E-02	7.513E-01	-0.013	0.046	0.031
90.0000	5.238E+00	1.153E+00	6.391E+00	1.677E+01	9.277E-02	9.405E-01	-0.010	0.043	0.026
100.0000	5.259E+00	1.295E+00	6.554E+00	1.831E+01	1.024E-01	1.118E+00	-0.008	0.040	0.023
125.0000	5.301E+00	1.654E+00	6.955E+00	2.202E+01	1.255E-01	1.513E+00	-0.005	0.034	0.017
150.0000	5.333E+00	2.017E+00	7.350E+00	2.551E+01	1.473E-01	1.849E+00	-0.004	0.030	0.013
175.0000	5.359E+00	2.383E+00	7.742E+00	2.882E+01	1.679E-01	2.140E+00	-0.003	0.027	0.010
200.0000	5.381E+00	2.752E+00	8.133E+00	3.198E+01	1.873E-01	2.396E+00	-0.002	0.024	0.008
250.0000	5.417E+00	3.496E+00	8.913E+00	3.785E+01	2.231E-01	2.828E+00	-0.001	0.021	0.006
300.0000	5.446E+00	4.246E+00	9.692E+00	4.322E+01	2.552E-01	3.186E+00	-0.001	0.018	0.005
350.0000	5.470E+00	5.001E+00	1.047E+01	4.819E+01	2.842E-01	3.489E+00	-0.001	0.016	0.004
400.0000	5.491E+00	5.760E+00	1.125E+01	5.279E+01	3.106E-01	3.753E+00	-0.001	0.015	0.003
450.0000	5.509E+00	6.522E+00	1.203E+01	5.709E+01	3.347E-01	3.987E+00	-0.000	0.014	0.002
500.0000	5.526E+00	7.286E+00	1.281E+01	6.111E+01	3.568E-01	4.196E+00	-0.000	0.013	0.002
550.0000	5.540E+00	8.053E+00	1.359E+01	6.490E+01	3.771E-01	4.386E+00	-0.000	0.012	0.002
600.0000	5.554E+00	8.821E+00	1.438E+01	6.848E+01	3.960E-01	4.559E+00	-0.000	0.012	0.002
700.0000	5.577E+00	1.036E+01	1.594E+01	7.508E+01	4.298E-01	4.866E+00	-0.000	0.011	0.001
800.0000	5.598E+00	1.191E+01	1.751E+01	8.107E+01	4.592E-01	5.132E+00	-0.000	0.010	0.001
900.0000	5.616E+00	1.346E+01	1.908E+01	8.654E+01	4.853E-01	5.367E+00	-0.000	0.009	0.001
1000.0000	5.632E+00	1.502E+01	2.065E+01	9.157E+01	5.084E-01	5.577E+00	-0.000	0.009	0.001

ELECTRONS IN HELIUM

I = 41.8 eV DENSITY = 1.663E-04 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.267E+01	9.885E-04	2.267E+01	2.467E-04	2.412E-05	0.0	-0.178	0.200	0.200
0.0125	1.898E+01	9.941E-04	1.898E+01	3.678E-04	2.890E-05	0.0	-0.171	0.191	0.191
0.0150	1.642E+01	9.995E-04	1.642E+01	5.098E-04	3.352E-05	0.0	-0.166	0.185	0.185
0.0175	1.453E+01	1.005E-03	1.453E+01	6.720E-04	3.802E-05	0.0	-0.162	0.180	0.180
0.0200	1.307E+01	1.010E-03	1.307E+01	8.537E-04	4.242E-05	0.0	-0.159	0.176	0.176
0.0250	1.097E+01	1.020E-03	1.097E+01	1.273E-03	5.096E-05	0.0	-0.154	0.169	0.169
0.0300	9.521E+00	1.029E-03	9.522E+00	1.764E-03	5.923E-05	0.0	-0.150	0.164	0.164
0.0350	8.457E+00	1.039E-03	8.458E+00	2.322E-03	6.727E-05	0.0	-0.146	0.160	0.160
0.0400	7.642E+00	1.048E-03	7.643E+00	2.945E-03	7.510E-05	0.0	-0.144	0.157	0.157
0.0450	6.996E+00	1.057E-03	6.997E+00	3.630E-03	8.277E-05	0.0	-0.141	0.154	0.154
0.0500	6.471E+00	1.066E-03	6.472E+00	4.374E-03	9.029E-05	0.0	-0.139	0.152	0.152
0.0550	6.035E+00	1.075E-03	6.037E+00	5.174E-03	9.766E-05	0.0	-0.138	0.150	0.150
0.0600	5.669E+00	1.084E-03	5.670E+00	6.029E-03	1.049E-04	0.0	-0.136	0.148	0.148
0.0700	5.084E+00	1.101E-03	5.085E+00	7.896E-03	1.191E-04	0.0	-0.133	0.145	0.144
0.0800	4.638E+00	1.119E-03	4.639E+00	9.958E-03	1.328E-04	0.0	-0.131	0.142	0.142
0.0900	4.287E+00	1.138E-03	4.288E+00	1.220E-02	1.462E-04	0.0	-0.129	0.140	0.140
0.1000	4.003E+00	1.157E-03	4.004E+00	1.462E-02	1.593E-04	0.0	-0.128	0.138	0.138
0.1250	3.486E+00	1.207E-03	3.487E+00	2.134E-02	1.910E-04	0.0	-0.124	0.134	0.134
0.1500	3.137E+00	1.260E-03	3.139E+00	2.891E-02	2.215E-04	0.0	-0.122	0.131	0.131
0.1750	2.887E+00	1.316E-03	2.889E+00	3.723E-02	2.511E-04	0.0	-0.119	0.129	0.128
0.2000	2.700E+00	1.375E-03	2.701E+00	4.619E-02	2.800E-04	0.0	-0.118	0.127	0.126
0.2500	2.439E+00	1.499E-03	2.441E+00	6.573E-02	3.363E-04	0.0	-0.115	0.124	0.123
0.3000	2.269E+00	1.632E-03	2.270E+00	8.702E-02	3.914E-04	0.0	-0.112	0.121	0.120
0.3500	2.150E+00	1.774E-03	2.152E+00	1.097E-01	4.457E-04	0.0	-0.110	0.119	0.118
0.4000	2.064E+00	1.924E-03	2.066E+00	1.334E-01	4.997E-04	0.0	-0.109	0.117	0.116
0.4500	2.000E+00	2.081E-03	2.002E+00	1.580E-01	5.536E-04	0.0	-0.107	0.116	0.114
0.5000	1.952E+00	2.245E-03	1.954E+00	1.833E-01	6.076E-04	0.0	-0.106	0.114	0.113
0.5500	1.914E+00	2.416E-03	1.916E+00	2.092E-01	6.619E-04	0.0	-0.104	0.113	0.112
0.6000	1.884E+00	2.592E-03	1.887E+00	2.355E-01	7.165E-04	0.0	-0.103	0.112	0.110
0.7000	1.842E+00	2.961E-03	1.845E+00	2.891E-01	8.269E-04	0.0	-0.101	0.110	0.108
0.8000	1.815E+00	3.350E-03	1.818E+00	3.437E-01	9.389E-04	0.0	-0.100	0.109	0.106
0.9000	1.798E+00	3.757E-03	1.801E+00	3.990E-01	1.053E-03	0.0	-0.098	0.107	0.105
1.0000	1.787E+00	4.180E-03	1.791E+00	4.547E-01	1.168E-03	0.0	-0.097	0.106	0.103
1.2500	1.777E+00	5.306E-03	1.782E+00	5.947E-01	1.465E-03	0.0	-0.094	0.104	0.101
1.5000	1.780E+00	6.515E-03	1.787E+00	7.349E-01	1.773E-03	0.0	-0.092	0.102	0.098
1.7500	1.789E+00	7.793E-03	1.797E+00	8.744E-01	2.089E-03	0.0	-0.090	0.100	0.096
2.0000	1.801E+00	9.132E-03	1.810E+00	1.013E+00	2.414E-03	0.0	-0.089	0.098	0.095
2.5000	1.827E+00	1.196E-02	1.839E+00	1.287E+00	3.085E-03	0.0	-0.087	0.096	0.092
3.0000	1.854E+00	1.495E-02	1.869E+00	1.557E+00	3.779E-03	0.0	-0.085	0.094	0.090
3.5000	1.880E+00	1.809E-02	1.898E+00	1.822E+00	4.491E-03	0.0	-0.083	0.093	0.088
4.0000	1.903E+00	2.134E-02	1.925E+00	2.084E+00	5.218E-03	0.0	-0.082	0.091	0.086
4.5000	1.925E+00	2.469E-02	1.950E+00	2.342E+00	5.957E-03	0.0	-0.081	0.090	0.085
5.0000	1.946E+00	2.813E-02	1.974E+00	2.597E+00	6.706E-03	0.0	-0.080	0.089	0.084
5.5000	1.965E+00	3.165E-02	1.997E+00	2.848E+00	7.465E-03	0.0	-0.079	0.088	0.083
6.0000	1.983E+00	3.523E-02	2.018E+00	3.098E+00	8.231E-03	0.0	-0.078	0.087	0.082
7.0000	2.015E+00	4.260E-02	2.057E+00	3.588E+00	9.781E-03	0.0	-0.077	0.086	0.080
8.0000	2.043E+00	5.018E-02	2.093E+00	4.070E+00	1.135E-02	0.0	-0.075	0.084	0.079
9.0000	2.069E+00	5.793E-02	2.126E+00	4.544E+00	1.293E-02	0.0	-0.074	0.083	0.077
10.0000	2.092E+00	6.584E-02	2.157E+00	5.011E+00	1.453E-02	0.0	-0.074	0.082	0.076
12.5000	2.141E+00	8.617E-02	2.227E+00	6.151E+00	1.855E-02	0.0	-0.072	0.080	0.074
15.0000	2.182E+00	1.071E-01	2.289E+00	7.258E+00	2.258E-02	0.0	-0.071	0.078	0.072
17.5000	2.216E+00	1.286E-01	2.345E+00	8.337E+00	2.662E-02	0.0	-0.069	0.077	0.071
20.0000	2.247E+00	1.505E-01	2.397E+00	9.391E+00	3.064E-02	0.0	-0.068	0.075	0.069
25.0000	2.297E+00	1.952E-01	2.493E+00	1.144E+01	3.863E-02	0.0	-0.067	0.073	0.067
30.0000	2.339E+00	2.410E-01	2.580E+00	1.341E+01	4.651E-02	0.0	-0.066	0.071	0.065
35.0000	2.374E+00	2.875E-01	2.662E+00	1.531E+01	5.426E-02	0.0	-0.065	0.070	0.063
40.0000	2.405E+00	3.346E-01	2.739E+00	1.717E+01	6.187E-02	0.0	-0.064	0.068	0.062
45.0000	2.432E+00	3.822E-01	2.814E+00	1.897E+01	6.933E-02	0.0	-0.063	0.067	0.060
50.0000	2.456E+00	4.303E-01	2.886E+00	2.072E+01	7.665E-02	0.0	-0.063	0.066	0.059
55.0000	2.478E+00	4.786E-01	2.956E+00	2.243E+01	8.382E-02	0.0	-0.062	0.065	0.058
60.0000	2.498E+00	5.272E-01	3.025E+00	2.410E+01	9.085E-02	0.0	-0.062	0.064	0.057
70.0000	2.533E+00	6.252E-01	3.158E+00	2.734E+01	1.045E-01	0.0	-0.061	0.062	0.055
80.0000	2.564E+00	7.239E-01	3.288E+00	3.044E+01	1.176E-01	0.0	-0.060	0.061	0.054
90.0000	2.589E+00	8.231E-01	3.412E+00	3.343E+01	1.301E-01	2.142E-02	-0.048	0.059	0.051
100.0000	2.609E+00	9.229E-01	3.532E+00	3.631E+01	1.423E-01	7.841E-02	-0.039	0.057	0.048
125.0000	2.644E+00	1.174E+00	3.818E+00	4.311E+01	1.708E-01	2.879E-01	-0.024	0.051	0.039
150.0000	2.668E+00	1.427E+00	4.095E+00	4.943E+01	1.970E-01	5.234E-01	-0.017	0.047	0.032
175.0000	2.686E+00	1.681E+00	4.367E+00	5.534E+01	2.213E-01	7.535E-01	-0.012	0.043	0.027
200.0000	2.700E+00	1.937E+00	4.637E+00	6.090E+01	2.439E-01	9.696E-01	-0.009	0.039	0.023
250.0000	2.722E+00	2.451E+00	5.173E+00	7.110E+01	2.844E-01	1.356E+00	-0.006	0.034	0.017
300.0000	2.738E+00	2.967E+00	5.705E+00	8.030E+01	3.200E-01	1.688E+00	-0.004	0.031	0.013
350.0000	2.752E+00	3.486E+00	6.237E+00	8.868E+01	3.514E-01	1.976E+00	-0.003	0.028	0.011
400.0000	2.763E+00	4.006E+00	6.768E+00	9.637E+01	3.794E-01	2.230E+00	-0.002	0.026	0.009
450.0000	2.773E+00	4.527E+00	7.300E+00	1.035E+02	4.047E-01	2.457E+00	-0.002	0.024	0.007
500.0000	2.781E+00	5.049E+00	7.831E+00	1.101E+02	4.275E-01	2.661E+00	-0.002	0.023	0.006
550.0000	2.789E+00	5.573E+00	8.362E+00	1.163E+02	4.482E-01	2.847E+00	-0.001	0.022	0.006
600.0000	2.796E+00	6.097E+00	8.892E+00	1.221E+02	4.672E-01	3.017E+00	-0.001	0.021	0.005
700.0000	2.808E+00	7.147E+00	9.955E+00	1.327E+02	5.008E-01	3.321E+00	-0.001	0.019	0.004
800.0000	2.818E+00	8.199E+00	1.102E+01	1.422E+02	5.297E-01	3.584E+00	-0.001	0.018	0.003
900.0000	2.828E+00	9.253E+00	1.208E+01	1.509E+02	5.547E-01	3.818E+00	-0.001	0.017	0.003
1000.0000	2.836E+00	1.031E+01	1.314E+01	1.588E+02	5.768E-01	4.027E+00	-0.000	0.016	0.003

ELECTRONS IN BERYLLIUM

I = 63.7 eV DENSITY = 1.848E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.862E+01	1.815E-03	1.863E+01	3.033E-04	5.437E-05	5.100E-04	-0.193	0.219	0.218
0.0125	1.564E+01	1.819E-03	1.564E+01	4.504E-04	6.488E-05	7.492E-04	-0.185	0.209	0.208
0.0150	1.356E+01	1.823E-03	1.356E+01	6.226E-04	7.496E-05	1.031E-03	-0.179	0.201	0.201
0.0175	1.202E+01	1.827E-03	1.202E+01	8.187E-04	8.472E-05	1.354E-03	-0.174	0.195	0.195
0.0200	1.083E+01	1.831E-03	1.084E+01	1.038E-03	9.419E-05	1.718E-03	-0.170	0.190	0.190
0.0250	9.113E+00	1.840E-03	9.115E+00	1.544E-03	1.125E-04	2.564E-03	-0.164	0.183	0.182
0.0300	7.923E+00	1.849E-03	7.925E+00	2.134E-03	1.300E-04	3.560E-03	-0.159	0.177	0.177
0.0350	7.047E+00	1.859E-03	7.049E+00	2.804E-03	1.469E-04	4.701E-03	-0.156	0.172	0.172
0.0400	6.375E+00	1.870E-03	6.376E+00	3.551E-03	1.634E-04	5.978E-03	-0.153	0.168	0.168
0.0450	5.841E+00	1.880E-03	5.843E+00	4.371E-03	1.794E-04	7.387E-03	-0.150	0.165	0.165
0.0500	5.407E+00	1.891E-03	5.409E+00	5.262E-03	1.951E-04	8.920E-03	-0.148	0.162	0.162
0.0550	5.047E+00	1.902E-03	5.049E+00	6.219E-03	2.104E-04	1.057E-02	-0.146	0.160	0.160
0.0600	4.743E+00	1.914E-03	4.745E+00	7.241E-03	2.253E-04	1.234E-02	-0.144	0.158	0.158
0.0700	4.257E+00	1.937E-03	4.259E+00	9.471E-03	2.545E-04	1.619E-02	-0.141	0.154	0.154
0.0800	3.887E+00	1.961E-03	3.889E+00	1.193E-02	2.826E-04	2.043E-02	-0.139	0.151	0.151
0.0900	3.594E+00	1.987E-03	3.596E+00	1.461E-02	3.100E-04	2.504E-02	-0.137	0.149	0.148
0.1000	3.358E+00	2.014E-03	3.360E+00	1.749E-02	3.366E-04	2.997E-02	-0.135	0.147	0.146
0.1250	2.926E+00	2.085E-03	2.928E+00	2.549E-02	4.005E-04	4.354E-02	-0.131	0.142	0.142
0.1500	2.634E+00	2.160E-03	2.636E+00	3.451E-02	4.614E-04	5.858E-02	-0.128	0.139	0.138
0.1750	2.424E+00	2.241E-03	2.426E+00	4.442E-02	5.200E-04	7.478E-02	-0.126	0.136	0.136
0.2000	2.266E+00	2.326E-03	2.269E+00	5.508E-02	5.769E-04	9.188E-02	-0.124	0.134	0.133
0.2500	2.046E+00	2.507E-03	2.049E+00	7.836E-02	6.865E-04	1.280E-01	-0.120	0.130	0.129
0.3000	1.901E+00	2.704E-03	1.904E+00	1.037E-01	7.924E-04	1.658E-01	-0.118	0.127	0.127
0.3500	1.800E+00	2.914E-03	1.803E+00	1.308E-01	8.961E-04	2.043E-01	-0.115	0.125	0.124
0.4000	1.726E+00	3.137E-03	1.729E+00	1.591E-01	9.985E-04	2.432E-01	-0.114	0.123	0.122
0.4500	1.670E+00	3.372E-03	1.673E+00	1.885E-01	1.100E-03	2.819E-01	-0.112	0.122	0.120
0.5000	1.627E+00	3.618E-03	1.631E+00	2.188E-01	1.202E-03	3.204E-01	-0.110	0.120	0.118
0.5500	1.593E+00	3.875E-03	1.597E+00	2.498E-01	1.304E-03	3.583E-01	-0.109	0.119	0.117
0.6000	1.566E+00	4.139E-03	1.571E+00	2.814E-01	1.406E-03	3.956E-01	-0.108	0.118	0.116
0.7000	1.527E+00	4.693E-03	1.532E+00	3.459E-01	1.612E-03	4.682E-01	-0.105	0.115	0.113
0.8000	1.501E+00	5.277E-03	1.506E+00	4.118E-01	1.821E-03	5.379E-01	-0.103	0.113	0.111
0.9000	1.483E+00	5.886E-03	1.489E+00	4.786E-01	2.033E-03	6.047E-01	-0.101	0.112	0.109
1.0000	1.471E+00	6.520E-03	1.477E+00	5.460E-01	2.248E-03	6.687E-01	-0.099	0.110	0.107
1.2500	1.455E+00	8.201E-03	1.463E+00	7.162E-01	2.799E-03	8.178E-01	-0.095	0.107	0.103
1.5000	1.450E+00	1.000E-02	1.460E+00	8.873E-01	3.370E-03	9.534E-01	-0.090	0.104	0.100
1.7500	1.451E+00	1.190E-02	1.463E+00	1.058E+00	3.958E-03	1.078E+00	-0.086	0.101	0.096
2.0000	1.455E+00	1.388E-02	1.469E+00	1.229E+00	4.562E-03	1.194E+00	-0.082	0.099	0.093
2.5000	1.466E+00	1.806E-02	1.484E+00	1.568E+00	5.810E-03	1.405E+00	-0.074	0.094	0.087
3.0000	1.477E+00	2.247E-02	1.500E+00	1.903E+00	7.104E-03	1.596E+00	-0.066	0.090	0.081
3.5000	1.489E+00	2.707E-02	1.516E+00	2.234E+00	8.434E-03	1.772E+00	-0.059	0.086	0.076
4.0000	1.499E+00	3.182E-02	1.531E+00	2.563E+00	9.795E-03	1.936E+00	-0.052	0.082	0.070
4.5000	1.508E+00	3.672E-02	1.545E+00	2.888E+00	1.118E-02	2.090E+00	-0.045	0.078	0.065
5.0000	1.517E+00	4.174E-02	1.559E+00	3.210E+00	1.259E-02	2.235E+00	-0.040	0.074	0.061
5.5000	1.525E+00	4.687E-02	1.572E+00	3.529E+00	1.402E-02	2.372E+00	-0.035	0.071	0.056
6.0000	1.532E+00	5.211E-02	1.584E+00	3.846E+00	1.546E-02	2.502E+00	-0.031	0.067	0.052
7.0000	1.544E+00	6.283E-02	1.607E+00	4.473E+00	1.840E-02	2.743E+00	-0.025	0.062	0.045
8.0000	1.555E+00	7.386E-02	1.628E+00	5.091E+00	2.138E-02	2.962E+00	-0.020	0.057	0.039
9.0000	1.564E+00	8.514E-02	1.649E+00	5.701E+00	2.439E-02	3.161E+00	-0.016	0.053	0.034
10.0000	1.572E+00	9.664E-02	1.669E+00	6.304E+00	2.743E-02	3.344E+00	-0.013	0.049	0.030
12.5000	1.589E+00	1.262E-01	1.715E+00	7.782E+00	3.509E-02	3.743E+00	-0.009	0.042	0.023
15.0000	1.602E+00	1.566E-01	1.759E+00	9.221E+00	4.280E-02	4.079E+00	-0.006	0.036	0.018
17.5000	1.613E+00	1.878E-01	1.801E+00	1.063E+01	5.050E-02	4.368E+00	-0.005	0.032	0.014
20.0000	1.623E+00	2.194E-01	1.842E+00	1.200E+01	5.815E-02	4.622E+00	-0.004	0.029	0.012
25.0000	1.639E+00	2.840E-01	1.923E+00	1.465E+01	7.323E-02	5.051E+00	-0.002	0.024	0.008
30.0000	1.652E+00	3.499E-01	2.002E+00	1.720E+01	8.792E-02	5.404E+00	-0.002	0.021	0.006
35.0000	1.663E+00	4.166E-01	2.079E+00	1.965E+01	1.022E-01	5.705E+00	-0.001	0.018	0.005
40.0000	1.672E+00	4.841E-01	2.156E+00	2.201E+01	1.160E-01	5.967E+00	-0.001	0.016	0.004
45.0000	1.680E+00	5.523E-01	2.232E+00	2.429E+01	1.293E-01	6.198E+00	-0.001	0.015	0.003
50.0000	1.687E+00	6.209E-01	2.308E+00	2.650E+01	1.422E-01	6.406E+00	-0.001	0.014	0.003
55.0000	1.694E+00	6.900E-01	2.384E+00	2.863E+01	1.547E-01	6.594E+00	-0.001	0.013	0.002
60.0000	1.700E+00	7.595E-01	2.460E+00	3.069E+01	1.667E-01	6.766E+00	-0.001	0.012	0.002
70.0000	1.711E+00	8.995E-01	2.610E+00	3.464E+01	1.896E-01	7.071E+00	-0.000	0.011	0.002
80.0000	1.720E+00	1.041E+00	2.761E+00	3.836E+01	2.110E-01	7.336E+00	-0.000	0.010	0.001
90.0000	1.728E+00	1.183E+00	2.911E+00	4.189E+01	2.311E-01	7.570E+00	-0.000	0.009	0.001
100.0000	1.735E+00	1.325E+00	3.061E+00	4.524E+01	2.500E-01	7.780E+00	-0.000	0.008	0.001
125.0000	1.751E+00	1.685E+00	3.436E+00	5.295E+01	2.926E-01	8.223E+00	-0.000	0.007	0.001
150.0000	1.763E+00	2.048E+00	3.811E+00	5.985E+01	3.296E-01	8.587E+00	-0.000	0.006	0.001
175.0000	1.774E+00	2.412E+00	4.186E+00	6.611E+01	3.621E-01	8.894E+00	-0.000	0.006	0.000
200.0000	1.783E+00	2.779E+00	4.561E+00	7.183E+01	3.910E-01	9.160E+00	-0.000	0.005	0.000
250.0000	1.798E+00	3.516E+00	5.314E+00	8.197E+01	4.401E-01	9.605E+00	-0.000	0.005	0.000
300.0000	1.811E+00	4.256E+00	6.067E+00	9.077E+01	4.805E-01	9.969E+00	-0.000	0.004	0.000
350.0000	1.821E+00	5.000E+00	6.821E+00	9.854E+01	5.144E-01	1.028E+01	-0.000	0.004	0.000
400.0000	1.830E+00	5.746E+00	7.576E+00	1.055E+02	5.434E-01	1.054E+01	-0.000	0.004	0.000
450.0000	1.838E+00	6.494E+00	8.332E+00	1.118E+02	5.685E-01	1.078E+01	-0.000	0.003	0.000
500.0000	1.845E+00	7.242E+00	9.088E+00	1.175E+02	5.905E-01	1.099E+01	-0.000	0.003	0.000
550.0000	1.852E+00	7.993E+00	9.845E+00	1.228E+02	6.099E-01	1.118E+01	-0.000	0.003	0.000
600.0000	1.858E+00	8.744E+00	1.060E+01	1.277E+02	6.273E-01	1.135E+01	-0.000	0.003	0.000
700.0000	1.868E+00	1.025E+01	1.212E+01	1.365E+02	6.571E-01	1.166E+01	-0.000	0.003	0.000
800.0000	1.878E+00	1.176E+01	1.364E+01	1.443E+02	6.818E-01	1.193E+01	-0.000	0.003	0.000
900.0000	1.886E+00	1.327E+01	1.515E+01	1.513E+02	7.026E-01	1.216E+01	-0.000	0.003	0.000
1000.0000	1.893E+00	1.478E+01	1.667E+01	1.575E+02	7.204E-01	1.237E+01	-0.000	0.002	0.000

ELECTRONS IN CARBON (GRAPHITE)

I = 78.0 eV DENSITY = 2.265E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.014E+01	3.150E-03	2.014E+01	2.820E-04	8.665E-05	2.766E-03	-0.200	0.229	0.228
0.0125	1.694E+01	3.161E-03	1.694E+01	4.179E-04	1.036E-04	3.543E-03	-0.191	0.218	0.217
0.0150	1.471E+01	3.168E-03	1.471E+01	5.768E-04	1.199E-04	4.353E-03	-0.185	0.210	0.209
0.0175	1.305E+01	3.172E-03	1.305E+01	7.576E-04	1.355E-04	5.195E-03	-0.179	0.203	0.202
0.0200	1.177E+01	3.176E-03	1.177E+01	9.596E-04	1.506E-04	6.068E-03	-0.175	0.198	0.197
0.0250	9.911E+00	3.184E-03	9.915E+00	1.424E-03	1.796E-04	7.907E-03	-0.168	0.189	0.189
0.0300	8.624E+00	3.194E-03	8.628E+00	1.967E-03	2.074E-04	9.864E-03	-0.163	0.183	0.182
0.0350	7.677E+00	3.204E-03	7.680E+00	2.582E-03	2.340E-04	1.194E-02	-0.159	0.177	0.177
0.0400	6.948E+00	3.215E-03	6.951E+00	3.268E-03	2.597E-04	1.412E-02	-0.156	0.173	0.173
0.0450	6.370E+00	3.228E-03	6.373E+00	4.020E-03	2.847E-04	1.640E-02	-0.153	0.170	0.169
0.0500	5.899E+00	3.241E-03	5.902E+00	4.836E-03	3.090E-04	1.879E-02	-0.150	0.166	0.166
0.0550	5.508E+00	3.255E-03	5.511E+00	5.713E-03	3.328E-04	2.127E-02	-0.148	0.164	0.163
0.0600	5.177E+00	3.270E-03	5.181E+00	6.650E-03	3.559E-04	2.384E-02	-0.145	0.161	0.161
0.0700	4.650E+00	3.303E-03	4.653E+00	8.691E-03	4.009E-04	2.926E-02	-0.142	0.157	0.157
0.0800	4.247E+00	3.337E-03	4.250E+00	1.094E-02	4.443E-04	3.500E-02	-0.139	0.154	0.153
0.0900	3.929E+00	3.375E-03	3.932E+00	1.339E-02	4.862E-04	4.105E-02	-0.136	0.151	0.150
0.1000	3.671E+00	3.414E-03	3.675E+00	1.603E-02	5.270E-04	4.738E-02	-0.133	0.148	0.148
0.1250	3.201E+00	3.523E-03	3.205E+00	2.334E-02	6.246E-04	6.429E-02	-0.128	0.142	0.142
0.1500	2.883E+00	3.640E-03	2.887E+00	3.158E-02	7.173E-04	8.253E-02	-0.124	0.138	0.137
0.1750	2.654E+00	3.764E-03	2.658E+00	4.062E-02	8.061E-04	1.019E-01	-0.120	0.134	0.134
0.2000	2.482E+00	3.896E-03	2.486E+00	5.036E-02	8.919E-04	1.221E-01	-0.116	0.131	0.130
0.2500	2.241E+00	4.179E-03	2.245E+00	7.160E-02	1.056E-03	1.644E-01	-0.110	0.126	0.125
0.3000	2.083E+00	4.489E-03	2.087E+00	9.474E-02	1.215E-03	2.086E-01	-0.105	0.121	0.120
0.3500	1.972E+00	4.820E-03	1.977E+00	1.194E-01	1.369E-03	2.537E-01	-0.100	0.117	0.116
0.4000	1.891E+00	5.173E-03	1.896E+00	1.452E-01	1.521E-03	2.992E-01	-0.096	0.114	0.112
0.4500	1.830E+00	5.545E-03	1.835E+00	1.721E-01	1.671E-03	3.447E-01	-0.092	0.111	0.108
0.5000	1.782E+00	5.935E-03	1.788E+00	1.997E-01	1.821E-03	3.899E-01	-0.089	0.108	0.105
0.5500	1.745E+00	6.340E-03	1.752E+00	2.279E-01	1.971E-03	4.347E-01	-0.086	0.105	0.102
0.6000	1.716E+00	6.759E-03	1.722E+00	2.567E-01	2.121E-03	4.788E-01	-0.084	0.103	0.100
0.7000	1.672E+00	7.637E-03	1.680E+00	3.156E-01	2.423E-03	5.648E-01	-0.079	0.099	0.095
0.8000	1.643E+00	8.559E-03	1.651E+00	3.757E-01	2.728E-03	6.476E-01	-0.076	0.095	0.091
0.9000	1.623E+00	9.523E-03	1.632E+00	4.366E-01	3.037E-03	7.272E-01	-0.073	0.092	0.088
1.0000	1.609E+00	1.053E-02	1.619E+00	4.981E-01	3.350E-03	8.034E-01	-0.070	0.090	0.085
1.2500	1.590E+00	1.318E-02	1.603E+00	6.534E-01	4.151E-03	9.803E-01	-0.065	0.084	0.078
1.5000	1.584E+00	1.602E-02	1.600E+00	8.096E-01	4.978E-03	1.140E+00	-0.062	0.080	0.074
1.7500	1.584E+00	1.901E-02	1.603E+00	9.657E-01	5.828E-03	1.285E+00	-0.059	0.077	0.070
2.0000	1.587E+00	2.213E-02	1.609E+00	1.121E+00	6.700E-03	1.417E+00	-0.057	0.074	0.067
2.5000	1.598E+00	2.870E-02	1.627E+00	1.430E+00	8.497E-03	1.651E+00	-0.054	0.070	0.062
3.0000	1.611E+00	3.561E-02	1.646E+00	1.736E+00	1.035E-02	1.854E+00	-0.051	0.067	0.059
3.5000	1.623E+00	4.281E-02	1.666E+00	2.038E+00	1.225E-02	2.033E+00	-0.049	0.064	0.056
4.0000	1.636E+00	5.026E-02	1.686E+00	2.336E+00	1.419E-02	2.194E+00	-0.047	0.062	0.054
4.5000	1.647E+00	5.792E-02	1.705E+00	2.631E+00	1.616E-02	2.340E+00	-0.045	0.060	0.052
5.0000	1.658E+00	6.576E-02	1.723E+00	2.923E+00	1.815E-02	2.474E+00	-0.043	0.058	0.050
5.5000	1.667E+00	7.378E-02	1.741E+00	3.211E+00	2.016E-02	2.598E+00	-0.042	0.057	0.048
6.0000	1.676E+00	8.193E-02	1.758E+00	3.497E+00	2.219E-02	2.713E+00	-0.040	0.055	0.047
7.0000	1.693E+00	9.865E-02	1.791E+00	4.061E+00	2.628E-02	2.924E+00	-0.037	0.053	0.044
8.0000	1.707E+00	1.158E-01	1.823E+00	4.614E+00	3.041E-02	3.114E+00	-0.033	0.050	0.041
9.0000	1.719E+00	1.334E-01	1.853E+00	5.158E+00	3.456E-02	3.287E+00	-0.030	0.048	0.039
10.0000	1.730E+00	1.513E-01	1.881E+00	5.694E+00	3.872E-02	3.446E+00	-0.028	0.046	0.036
12.5000	1.753E+00	1.971E-01	1.950E+00	6.999E+00	4.914E-02	3.798E+00	-0.022	0.042	0.031
15.0000	1.770E+00	2.444E-01	2.015E+00	8.260E+00	5.949E-02	4.101E+00	-0.017	0.038	0.027
17.5000	1.785E+00	2.927E-01	2.077E+00	9.482E+00	6.973E-02	4.367E+00	-0.014	0.035	0.023
20.0000	1.797E+00	3.417E-01	2.139E+00	1.067E+01	7.981E-02	4.604E+00	-0.011	0.032	0.020
25.0000	1.816E+00	4.417E-01	2.258E+00	1.294E+01	9.943E-02	5.012E+00	-0.008	0.028	0.016
30.0000	1.832E+00	5.435E-01	2.375E+00	1.510E+01	1.183E-01	5.353E+00	-0.005	0.024	0.012
35.0000	1.845E+00	6.466E-01	2.491E+00	1.716E+01	1.363E-01	5.646E+00	-0.004	0.022	0.010
40.0000	1.856E+00	7.508E-01	2.606E+00	1.912E+01	1.535E-01	5.902E+00	-0.003	0.020	0.008
45.0000	1.865E+00	8.559E-01	2.721E+00	2.100E+01	1.699E-01	6.130E+00	-0.003	0.018	0.007
50.0000	1.874E+00	9.617E-01	2.835E+00	2.280E+01	1.856E-01	6.335E+00	-0.002	0.017	0.006
55.0000	1.881E+00	1.068E+00	2.949E+00	2.452E+01	2.007E-01	6.521E+00	-0.002	0.016	0.005
60.0000	1.888E+00	1.175E+00	3.063E+00	2.619E+01	2.150E-01	6.691E+00	-0.002	0.015	0.005
70.0000	1.900E+00	1.391E+00	3.291E+00	2.934E+01	2.420E-01	6.994E+00	-0.001	0.013	0.004
80.0000	1.911E+00	1.608E+00	3.519E+00	3.227E+01	2.667E-01	7.258E+00	-0.001	0.012	0.003
90.0000	1.920E+00	1.826E+00	3.746E+00	3.503E+01	2.896E-01	7.491E+00	-0.001	0.011	0.003
100.0000	1.928E+00	2.046E+00	3.974E+00	3.762E+01	3.108E-01	7.699E+00	-0.001	0.011	0.002
125.0000	1.945E+00	2.598E+00	4.544E+00	4.350E+01	3.575E-01	8.142E+00	-0.000	0.009	0.002
150.0000	1.960E+00	3.155E+00	5.115E+00	4.868E+01	3.971E-01	8.505E+00	-0.000	0.008	0.001
175.0000	1.972E+00	3.714E+00	5.686E+00	5.331E+01	4.312E-01	8.811E+00	-0.000	0.008	0.001
200.0000	1.982E+00	4.276E+00	6.258E+00	5.750E+01	4.609E-01	9.077E+00	-0.000	0.007	0.001
250.0000	1.999E+00	5.405E+00	7.405E+00	6.484E+01	5.103E-01	9.522E+00	-0.000	0.006	0.001
300.0000	2.013E+00	6.540E+00	8.553E+00	7.112E+01	5.499E-01	9.886E+00	-0.000	0.006	0.001
350.0000	2.025E+00	7.678E+00	9.703E+00	7.660E+01	5.826E-01	1.019E+01	-0.000	0.005	0.000
400.0000	2.035E+00	8.820E+00	1.085E+01	8.147E+01	6.101E-01	1.046E+01	-0.000	0.005	0.000
450.0000	2.044E+00	9.964E+00	1.201E+01	8.585E+01	6.335E-01	1.070E+01	-0.000	0.005	0.000
500.0000	2.052E+00	1.111E+01	1.316E+01	8.983E+01	6.539E-01	1.091E+01	-0.000	0.005	0.000
550.0000	2.060E+00	1.226E+01	1.432E+01	9.347E+01	6.718E-01	1.110E+01	-0.000	0.004	0.000
600.0000	2.066E+00	1.340E+01	1.547E+01	9.683E+01	6.876E-01	1.127E+01	-0.000	0.004	0.000
700.0000	2.078E+00	1.570E+01	1.778E+01	1.029E+02	7.144E-01	1.158E+01	-0.000	0.004	0.000
800.0000	2.088E+00	1.801E+01	2.010E+01	1.081E+02	7.363E-01	1.185E+01	-0.000	0.004	0.000
900.0000	2.097E+00	2.031E+01	2.241E+01	1.128E+02	7.546E-01	1.208E+01	-0.000	0.004	0.000
1000.0000	2.106E+00	2.262E+01	2.473E+01	1.171E+02	7.703E-01	1.229E+01	-0.000	0.004	0.000

ELECTRONS IN CARBON (GRAPHITE)

I = 78.0 eV DENSITY = 1.700E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.014E+01	3.150E-03	2.014E+01	2.820E-04	8.665E-05	1.920E-03	-0.200	0.229	0.228
0.0125	1.694E+01	3.161E-03	1.695E+01	4.179E-04	1.036E-04	2.481E-03	-0.191	0.218	0.217
0.0150	1.471E+01	3.168E-03	1.471E+01	5.767E-04	1.199E-04	3.073E-03	-0.185	0.210	0.209
0.0175	1.305E+01	3.172E-03	1.305E+01	7.575E-04	1.355E-04	3.695E-03	-0.180	0.203	0.202
0.0200	1.177E+01	3.176E-03	1.177E+01	9.595E-04	1.506E-04	4.347E-03	-0.176	0.198	0.197
0.0250	9.913E+00	3.184E-03	9.916E+00	1.424E-03	1.796E-04	5.736E-03	-0.169	0.189	0.189
0.0300	8.626E+00	3.194E-03	8.629E+00	1.966E-03	2.073E-04	7.236E-03	-0.164	0.183	0.183
0.0350	7.679E+00	3.204E-03	7.682E+00	2.582E-03	2.340E-04	8.843E-03	-0.160	0.178	0.177
0.0400	6.950E+00	3.215E-03	6.953E+00	3.267E-03	2.597E-04	1.055E-02	-0.156	0.174	0.173
0.0450	6.372E+00	3.228E-03	6.375E+00	4.019E-03	2.847E-04	1.236E-02	-0.153	0.170	0.170
0.0500	5.901E+00	3.241E-03	5.904E+00	4.835E-03	3.090E-04	1.425E-02	-0.151	0.167	0.167
0.0550	5.510E+00	3.255E-03	5.513E+00	5.712E-03	3.327E-04	1.624E-02	-0.149	0.164	0.164
0.0600	5.179E+00	3.270E-03	5.183E+00	6.648E-03	3.558E-04	1.832E-02	-0.147	0.162	0.162
0.0700	4.652E+00	3.303E-03	4.655E+00	8.688E-03	4.008E-04	2.271E-02	-0.143	0.158	0.158
0.0800	4.249E+00	3.337E-03	4.253E+00	1.094E-02	4.441E-04	2.740E-02	-0.140	0.154	0.154
0.0900	3.931E+00	3.375E-03	3.935E+00	1.339E-02	4.860E-04	3.237E-02	-0.137	0.152	0.151
0.1000	3.674E+00	3.414E-03	3.677E+00	1.602E-02	5.268E-04	3.760E-02	-0.135	0.149	0.149
0.1250	3.204E+00	3.523E-03	3.207E+00	2.333E-02	6.243E-04	5.166E-02	-0.130	0.144	0.143
0.1500	2.886E+00	3.640E-03	2.890E+00	3.156E-02	7.168E-04	6.694E-02	-0.126	0.140	0.139
0.1750	2.657E+00	3.764E-03	2.661E+00	4.059E-02	8.055E-04	8.320E-02	-0.123	0.136	0.136
0.2000	2.485E+00	3.896E-03	2.489E+00	5.032E-02	8.911E-04	1.003E-01	-0.120	0.133	0.133
0.2500	2.245E+00	4.179E-03	2.249E+00	7.152E-02	1.055E-03	1.363E-01	-0.115	0.129	0.128
0.3000	2.087E+00	4.489E-03	2.092E+00	9.462E-02	1.213E-03	1.740E-01	-0.110	0.125	0.123
0.3500	1.977E+00	4.820E-03	1.981E+00	1.192E-01	1.367E-03	2.129E-01	-0.106	0.121	0.120
0.4000	1.896E+00	5.173E-03	1.901E+00	1.450E-01	1.518E-03	2.524E-01	-0.102	0.118	0.116
0.4500	1.835E+00	5.545E-03	1.841E+00	1.718E-01	1.668E-03	2.922E-01	-0.099	0.115	0.113
0.5000	1.788E+00	5.935E-03	1.794E+00	1.993E-01	1.817E-03	3.321E-01	-0.095	0.113	0.110
0.5500	1.752E+00	6.340E-03	1.758E+00	2.274E-01	1.966E-03	3.719E-01	-0.092	0.110	0.108
0.6000	1.722E+00	6.759E-03	1.729E+00	2.561E-01	2.115E-03	4.114E-01	-0.090	0.108	0.105
0.7000	1.679E+00	7.637E-03	1.687E+00	3.147E-01	2.416E-03	4.891E-01	-0.085	0.104	0.101
0.8000	1.650E+00	8.559E-03	1.659E+00	3.745E-01	2.719E-03	5.648E-01	-0.081	0.101	0.096
0.9000	1.631E+00	9.523E-03	1.640E+00	4.352E-01	3.026E-03	6.382E-01	-0.077	0.098	0.093
1.0000	1.617E+00	1.053E-02	1.627E+00	4.964E-01	3.337E-03	7.091E-01	-0.074	0.095	0.090
1.2500	1.599E+00	1.318E-02	1.612E+00	6.509E-01	4.133E-03	8.756E-01	-0.069	0.089	0.083
1.5000	1.593E+00	1.602E-02	1.609E+00	8.062E-01	4.954E-03	1.028E+00	-0.064	0.085	0.078
1.7500	1.594E+00	1.901E-02	1.613E+00	9.614E-01	5.799E-03	1.167E+00	-0.061	0.081	0.073
2.0000	1.597E+00	2.213E-02	1.619E+00	1.116E+00	6.665E-03	1.295E+00	-0.059	0.078	0.070
2.5000	1.608E+00	2.870E-02	1.637E+00	1.423E+00	8.450E-03	1.522E+00	-0.055	0.073	0.065
3.0000	1.621E+00	3.561E-02	1.657E+00	1.727E+00	1.029E-02	1.720E+00	-0.052	0.069	0.061
3.5000	1.634E+00	4.281E-02	1.677E+00	2.027E+00	1.218E-02	1.894E+00	-0.050	0.067	0.058
4.0000	1.647E+00	5.026E-02	1.697E+00	2.323E+00	1.410E-02	2.051E+00	-0.048	0.064	0.055
4.5000	1.658E+00	5.792E-02	1.716E+00	2.616E+00	1.606E-02	2.193E+00	-0.047	0.062	0.053
5.0000	1.669E+00	6.576E-02	1.735E+00	2.906E+00	1.803E-02	2.323E+00	-0.045	0.060	0.051
5.5000	1.679E+00	7.378E-02	1.753E+00	3.193E+00	2.003E-02	2.443E+00	-0.044	0.059	0.050
6.0000	1.689E+00	8.193E-02	1.771E+00	3.476E+00	2.204E-02	2.555E+00	-0.042	0.057	0.048
7.0000	1.706E+00	9.865E-02	1.804E+00	4.036E+00	2.610E-02	2.758E+00	-0.040	0.055	0.046
8.0000	1.720E+00	1.158E-01	1.836E+00	4.585E+00	3.020E-02	2.939E+00	-0.037	0.053	0.043
9.0000	1.733E+00	1.334E-01	1.867E+00	5.125E+00	3.432E-02	3.104E+00	-0.035	0.051	0.041
10.0000	1.745E+00	1.513E-01	1.896E+00	5.657E+00	3.845E-02	3.256E+00	-0.032	0.049	0.039
12.5000	1.769E+00	1.971E-01	1.966E+00	6.952E+00	4.877E-02	3.591E+00	-0.027	0.045	0.035
15.0000	1.787E+00	2.444E-01	2.032E+00	8.202E+00	5.903E-02	3.879E+00	-0.022	0.041	0.031
17.5000	1.803E+00	2.927E-01	2.095E+00	9.414E+00	6.918E-02	4.133E+00	-0.018	0.038	0.027
20.0000	1.816E+00	3.417E-01	2.157E+00	1.059E+01	7.917E-02	4.361E+00	-0.015	0.035	0.024
25.0000	1.836E+00	4.417E-01	2.278E+00	1.284E+01	9.861E-02	4.755E+00	-0.011	0.031	0.019
30.0000	1.852E+00	5.435E-01	2.396E+00	1.498E+01	1.173E-01	5.088E+00	-0.008	0.028	0.016
35.0000	1.865E+00	6.466E-01	2.512E+00	1.702E+01	1.351E-01	5.376E+00	-0.006	0.025	0.013
40.0000	1.877E+00	7.508E-01	2.627E+00	1.897E+01	1.522E-01	5.628E+00	-0.005	0.023	0.011
45.0000	1.886E+00	8.559E-01	2.742E+00	2.083E+01	1.685E-01	5.854E+00	-0.004	0.021	0.009
50.0000	1.895E+00	9.617E-01	2.857E+00	2.262E+01	1.841E-01	6.057E+00	-0.003	0.020	0.008
55.0000	1.903E+00	1.068E+00	2.971E+00	2.433E+01	1.991E-01	6.241E+00	-0.003	0.018	0.007
60.0000	1.910E+00	1.175E+00	3.085E+00	2.598E+01	2.133E-01	6.411E+00	-0.002	0.017	0.006
70.0000	1.922E+00	1.391E+00	3.313E+00	2.911E+01	2.401E-01	6.712E+00	-0.002	0.016	0.005
80.0000	1.932E+00	1.608E+00	3.541E+00	3.203E+01	2.648E-01	6.974E+00	-0.001	0.014	0.004
90.0000	1.942E+00	1.826E+00	3.768E+00	3.477E+01	2.875E-01	7.206E+00	-0.001	0.013	0.004
100.0000	1.950E+00	2.046E+00	3.996E+00	3.735E+01	3.087E-01	7.415E+00	-0.001	0.012	0.003
125.0000	1.967E+00	2.598E+00	4.566E+00	4.319E+01	3.553E-01	7.857E+00	-0.001	0.011	0.002
150.0000	1.982E+00	3.155E+00	5.136E+00	4.835E+01	3.948E-01	8.219E+00	-0.000	0.010	0.002
175.0000	1.993E+00	3.714E+00	5.708E+00	5.297E+01	4.288E-01	8.525E+00	-0.000	0.009	0.001
200.0000	2.004E+00	4.276E+00	6.280E+00	5.714E+01	4.585E-01	8.791E+00	-0.000	0.008	0.001
250.0000	2.021E+00	5.405E+00	7.426E+00	6.446E+01	5.080E-01	9.236E+00	-0.000	0.007	0.001
300.0000	2.035E+00	6.540E+00	8.575E+00	7.072E+01	5.476E-01	9.599E+00	-0.000	0.007	0.001
350.0000	2.047E+00	7.678E+00	9.725E+00	7.619E+01	5.804E-01	9.907E+00	-0.000	0.006	0.001
400.0000	2.057E+00	8.820E+00	1.088E+01	8.105E+01	6.079E-01	1.017E+01	-0.000	0.006	0.001
450.0000	2.066E+00	9.964E+00	1.203E+01	8.542E+01	6.314E-01	1.041E+01	-0.000	0.005	0.000
500.0000	2.074E+00	1.111E+01	1.318E+01	8.938E+01	6.519E-01	1.062E+01	-0.000	0.005	0.000
550.0000	2.082E+00	1.226E+01	1.434E+01	9.302E+01	6.698E-01	1.081E+01	-0.000	0.005	0.000
600.0000	2.088E+00	1.340E+01	1.549E+01	9.637E+01	6.856E-01	1.098E+01	-0.000	0.005	0.000
700.0000	2.100E+00	1.570E+01	1.780E+01	1.024E+02	7.125E-01	1.129E+01	-0.000	0.005	0.000
800.0000	2.110E+00	1.801E+01	2.012E+01	1.077E+02	7.346E-01	1.156E+01	-0.000	0.004	0.000
900.0000	2.120E+00	2.031E+01	2.243E+01	1.124E+02	7.530E-01	1.179E+01	-0.000	0.004	0.000
1000.0000	2.128E+00	2.262E+01	2.475E+01	1.166E+02	7.687E-01	1.200E+01	-0.000	0.004	0.000

ELECTRONS IN NITROGEN

I = 82.0 eV DENSITY = 1.165E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.995E+01	3.711E-03	1.996E+01	2.851E-04	1.023E-04	0.0	-0.202	0.232	0.230
0.0125	1.679E+01	3.729E-03	1.680E+01	4.223E-04	1.227E-04	0.0	-0.194	0.221	0.220
0.0150	1.458E+01	3.740E-03	1.459E+01	5.825E-04	1.421E-04	0.0	-0.187	0.213	0.211
0.0175	1.294E+01	3.747E-03	1.295E+01	7.648E-04	1.608E-04	0.0	-0.182	0.206	0.205
0.0200	1.168E+01	3.753E-03	1.168E+01	9.684E-04	1.789E-04	0.0	-0.178	0.200	0.200
0.0250	9.838E+00	3.762E-03	9.842E+00	1.437E-03	2.135E-04	0.0	-0.171	0.192	0.191
0.0300	8.564E+00	3.770E-03	8.568E+00	1.983E-03	2.465E-04	0.0	-0.166	0.185	0.185
0.0350	7.626E+00	3.779E-03	7.629E+00	2.603E-03	2.781E-04	0.0	-0.162	0.180	0.180
0.0400	6.904E+00	3.790E-03	6.908E+00	3.293E-03	3.086E-04	0.0	-0.159	0.176	0.176
0.0450	6.331E+00	3.803E-03	6.335E+00	4.049E-03	3.382E-04	0.0	-0.156	0.173	0.172
0.0500	5.865E+00	3.816E-03	5.868E+00	4.870E-03	3.669E-04	0.0	-0.154	0.170	0.169
0.0550	5.477E+00	3.831E-03	5.481E+00	5.753E-03	3.949E-04	0.0	-0.152	0.167	0.167
0.0600	5.150E+00	3.846E-03	5.154E+00	6.694E-03	4.222E-04	0.0	-0.150	0.165	0.164
0.0700	4.628E+00	3.881E-03	4.632E+00	8.745E-03	4.751E-04	0.0	-0.147	0.161	0.160
0.0800	4.229E+00	3.920E-03	4.233E+00	1.101E-02	5.260E-04	0.0	-0.144	0.158	0.157
0.0900	3.914E+00	3.961E-03	3.918E+00	1.347E-02	5.752E-04	0.0	-0.142	0.155	0.155
0.1000	3.660E+00	4.005E-03	3.664E+00	1.611E-02	6.229E-04	0.0	-0.140	0.152	0.152
0.1250	3.195E+00	4.127E-03	3.199E+00	2.344E-02	7.368E-04	0.0	-0.136	0.148	0.147
0.1500	2.881E+00	4.259E-03	2.885E+00	3.169E-02	8.447E-04	0.0	-0.132	0.144	0.144
0.1750	2.655E+00	4.400E-03	2.660E+00	4.073E-02	9.477E-04	0.0	-0.130	0.141	0.141
0.2000	2.486E+00	4.550E-03	2.491E+00	5.046E-02	1.047E-03	0.0	-0.128	0.139	0.138
0.2500	2.251E+00	4.874E-03	2.256E+00	7.162E-02	1.236E-03	0.0	-0.124	0.135	0.134
0.3000	2.097E+00	5.227E-03	2.103E+00	9.462E-02	1.418E-03	0.0	-0.121	0.132	0.131
0.3500	1.991E+00	5.606E-03	1.996E+00	1.191E-01	1.593E-03	0.0	-0.119	0.129	0.128
0.4000	1.914E+00	6.009E-03	1.920E+00	1.446E-01	1.765E-03	0.0	-0.117	0.127	0.126
0.4500	1.857E+00	6.436E-03	1.863E+00	1.711E-01	1.935E-03	0.0	-0.115	0.126	0.124
0.5000	1.813E+00	6.882E-03	1.820E+00	1.982E-01	2.103E-03	0.0	-0.114	0.124	0.122
0.5500	1.779E+00	7.347E-03	1.787E+00	2.260E-01	2.271E-03	0.0	-0.112	0.123	0.121
0.6000	1.753E+00	7.827E-03	1.761E+00	2.542E-01	2.438E-03	0.0	-0.111	0.121	0.119
0.7000	1.716E+00	8.831E-03	1.725E+00	3.116E-01	2.773E-03	0.0	-0.109	0.119	0.117
0.8000	1.693E+00	9.889E-03	1.703E+00	3.700E-01	3.109E-03	0.0	-0.107	0.117	0.115
0.9000	1.679E+00	1.099E-02	1.690E+00	4.289E-01	3.447E-03	0.0	-0.105	0.116	0.113
1.0000	1.670E+00	1.214E-02	1.683E+00	4.883E-01	3.788E-03	0.0	-0.104	0.114	0.111
1.2500	1.665E+00	1.518E-02	1.680E+00	6.371E-01	4.655E-03	0.0	-0.101	0.111	0.108
1.5000	1.670E+00	1.842E-02	1.688E+00	7.856E-01	5.541E-03	0.0	-0.098	0.109	0.105
1.7500	1.681E+00	2.184E-02	1.702E+00	9.331E-01	6.444E-03	0.0	-0.096	0.107	0.103
2.0000	1.693E+00	2.540E-02	1.719E+00	1.079E+00	7.364E-03	0.0	-0.095	0.105	0.101
2.5000	1.721E+00	3.290E-02	1.754E+00	1.367E+00	9.243E-03	0.0	-0.092	0.102	0.097
3.0000	1.749E+00	4.078E-02	1.790E+00	1.649E+00	1.116E-02	0.0	-0.090	0.100	0.095
3.5000	1.775E+00	4.899E-02	1.824E+00	1.926E+00	1.311E-02	0.0	-0.088	0.098	0.093
4.0000	1.799E+00	5.747E-02	1.857E+00	2.198E+00	1.509E-02	0.0	-0.087	0.096	0.091
4.5000	1.821E+00	6.620E-02	1.888E+00	2.465E+00	1.708E-02	0.0	-0.085	0.095	0.089
5.0000	1.842E+00	7.512E-02	1.917E+00	2.728E+00	1.909E-02	0.0	-0.084	0.094	0.088
5.5000	1.861E+00	8.423E-02	1.945E+00	2.987E+00	2.110E-02	0.0	-0.083	0.093	0.086
6.0000	1.879E+00	9.352E-02	1.972E+00	3.242E+00	2.312E-02	0.0	-0.082	0.091	0.085
7.0000	1.911E+00	1.125E-01	2.024E+00	3.742E+00	2.718E-02	0.0	-0.081	0.090	0.083
8.0000	1.940E+00	1.320E-01	2.072E+00	4.231E+00	3.124E-02	0.0	-0.080	0.088	0.081
9.0000	1.965E+00	1.520E-01	2.117E+00	4.708E+00	3.530E-02	0.0	-0.078	0.086	0.080
10.0000	1.988E+00	1.723E-01	2.161E+00	5.176E+00	3.934E-02	0.0	-0.077	0.085	0.078
12.5000	2.038E+00	2.244E-01	2.262E+00	6.306E+00	4.938E-02	0.0	-0.076	0.082	0.075
15.0000	2.079E+00	2.780E-01	2.356E+00	7.388E+00	5.926E-02	0.0	-0.074	0.080	0.072
17.5000	2.113E+00	3.327E-01	2.446E+00	8.430E+00	6.894E-02	0.0	-0.073	0.078	0.070
20.0000	2.144E+00	3.884E-01	2.532E+00	9.434E+00	7.842E-02	0.0	-0.072	0.076	0.068
25.0000	2.194E+00	5.016E-01	2.696E+00	1.135E+01	9.672E-02	0.0	-0.070	0.073	0.065
30.0000	2.235E+00	6.169E-01	2.852E+00	1.315E+01	1.142E-01	9.661E-03	-0.061	0.071	0.062
35.0000	2.266E+00	7.336E-01	3.000E+00	1.486E+01	1.308E-01	6.591E-02	-0.050	0.068	0.057
40.0000	2.290E+00	8.515E-01	3.142E+00	1.649E+01	1.467E-01	1.474E-01	-0.043	0.064	0.052
45.0000	2.310E+00	9.704E-01	3.281E+00	1.804E+01	1.619E-01	2.393E-01	-0.038	0.061	0.047
50.0000	2.327E+00	1.090E+00	3.417E+00	1.954E+01	1.765E-01	3.344E-01	-0.034	0.058	0.044
55.0000	2.342E+00	1.211E+00	3.552E+00	2.097E+01	1.904E-01	4.291E-01	-0.032	0.056	0.040
60.0000	2.355E+00	1.332E+00	3.686E+00	2.235E+01	2.038E-01	5.217E-01	-0.029	0.054	0.037
70.0000	2.377E+00	1.575E+00	3.952E+00	2.497E+01	2.290E-01	6.973E-01	-0.026	0.050	0.032
80.0000	2.395E+00	1.821E+00	4.216E+00	2.742E+01	2.523E-01	8.590E-01	-0.024	0.047	0.029
90.0000	2.411E+00	2.067E+00	4.478E+00	2.972E+01	2.740E-01	1.008E+00	-0.023	0.044	0.026
100.0000	2.424E+00	2.315E+00	4.740E+00	3.189E+01	2.941E-01	1.144E+00	-0.022	0.042	0.024
125.0000	2.453E+00	2.939E+00	5.392E+00	3.684E+01	3.389E-01	1.443E+00	-0.020	0.038	0.019
150.0000	2.475E+00	3.567E+00	6.042E+00	4.121E+01	3.771E-01	1.695E+00	-0.019	0.035	0.017
175.0000	2.494E+00	4.198E+00	6.693E+00	4.514E+01	4.103E-01	1.911E+00	-0.018	0.032	0.015
200.0000	2.510E+00	4.832E+00	7.343E+00	4.871E+01	4.394E-01	2.102E+00	-0.017	0.030	0.013
250.0000	2.537E+00	6.106E+00	8.643E+00	5.498E+01	4.883E-01	2.427E+00	-0.016	0.027	0.011
300.0000	2.558E+00	7.385E+00	9.943E+00	6.037E+01	5.278E-01	2.699E+00	-0.015	0.025	0.009
350.0000	2.575E+00	8.668E+00	1.124E+01	6.509E+01	5.606E-01	2.934E+00	-0.014	0.024	0.008
400.0000	2.590E+00	9.955E+00	1.254E+01	6.930E+01	5.883E-01	3.142E+00	-0.013	0.023	0.007
450.0000	2.603E+00	1.124E+01	1.385E+01	7.309E+01	6.122E-01	3.329E+00	-0.012	0.021	0.007
500.0000	2.614E+00	1.253E+01	1.515E+01	7.654E+01	6.330E-01	3.499E+00	-0.011	0.021	0.006
550.0000	2.624E+00	1.383E+01	1.645E+01	7.971E+01	6.513E-01	3.657E+00	-0.010	0.020	0.006
600.0000	2.633E+00	1.512E+01	1.775E+01	8.264E+01	6.675E-01	3.803E+00	-0.009	0.019	0.005
700.0000	2.648E+00	1.771E+01	2.036E+01	8.789E+01	6.952E-01	4.067E+00	-0.008	0.018	0.004
800.0000	2.660E+00	2.031E+01	2.297E+01	9.251E+01	7.180E-01	4.303E+00	-0.006	0.017	0.004
900.0000	2.671E+00	2.290E+01	2.558E+01	9.664E+01	7.371E-01	4.515E+00	-0.005	0.017	0.003
1000.0000	2.681E+00	2.550E+01	2.818E+01	1.004E+02	7.534E-01	4.707E+00	-0.005	0.016	0.003

ELECTRONS IN OXYGEN

I = 95.0 eV DENSITY = 1.332E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.937E+01	4.267E-03	1.937E+01	2.950E-04	1.207E-04	0.0	-0.209	0.241	0.239
0.0125	1.632E+01	4.298E-03	1.633E+01	4.362E-04	1.449E-04	0.0	-0.199	0.229	0.227
0.0150	1.419E+01	4.316E-03	1.419E+01	6.009E-04	1.681E-04	0.0	-0.193	0.220	0.218
0.0175	1.260E+01	4.328E-03	1.261E+01	7.882E-04	1.903E-04	0.0	-0.187	0.213	0.211
0.0200	1.138E+01	4.336E-03	1.138E+01	9.973E-04	2.118E-04	0.0	-0.183	0.207	0.206
0.0250	9.595E+00	4.347E-03	9.600E+00	1.478E-03	2.529E-04	0.0	-0.176	0.198	0.197
0.0300	8.359E+00	4.356E-03	8.363E+00	2.037E-03	2.919E-04	0.0	-0.170	0.191	0.190
0.0350	7.447E+00	4.365E-03	7.452E+00	2.672E-03	3.293E-04	0.0	-0.166	0.185	0.185
0.0400	6.746E+00	4.376E-03	6.750E+00	3.378E-03	3.653E-04	0.0	-0.163	0.181	0.180
0.0450	6.189E+00	4.388E-03	6.193E+00	4.153E-03	4.001E-04	0.0	-0.160	0.177	0.177
0.0500	5.735E+00	4.402E-03	5.739E+00	4.992E-03	4.339E-04	0.0	-0.157	0.174	0.174
0.0550	5.358E+00	4.417E-03	5.362E+00	5.894E-03	4.668E-04	0.0	-0.155	0.171	0.171
0.0600	5.039E+00	4.434E-03	5.044E+00	6.856E-03	4.988E-04	0.0	-0.153	0.169	0.169
0.0700	4.530E+00	4.471E-03	4.535E+00	8.951E-03	5.608E-04	0.0	-0.150	0.165	0.164
0.0800	4.142E+00	4.512E-03	4.146E+00	1.126E-02	6.204E-04	0.0	-0.147	0.161	0.161
0.0900	3.835E+00	4.558E-03	3.839E+00	1.377E-02	6.779E-04	0.0	-0.145	0.158	0.158
0.1000	3.586E+00	4.607E-03	3.591E+00	1.647E-02	7.337E-04	0.0	-0.143	0.156	0.156
0.1250	3.133E+00	4.741E-03	3.137E+00	2.394E-02	8.666E-04	0.0	-0.138	0.151	0.151
0.1500	2.826E+00	4.889E-03	2.831E+00	3.235E-02	9.921E-04	0.0	-0.135	0.147	0.147
0.1750	2.606E+00	5.048E-03	2.611E+00	4.157E-02	1.112E-03	0.0	-0.132	0.144	0.144
0.2000	2.441E+00	5.215E-03	2.446E+00	5.147E-02	1.227E-03	0.0	-0.130	0.142	0.141
0.2500	2.211E+00	5.578E-03	2.217E+00	7.302E-02	1.447E-03	0.0	-0.127	0.138	0.137
0.3000	2.061E+00	5.975E-03	2.067E+00	9.642E-02	1.656E-03	0.0	-0.124	0.134	0.134
0.3500	1.957E+00	6.402E-03	1.963E+00	1.213E-01	1.859E-03	0.0	-0.121	0.132	0.131
0.4000	1.882E+00	6.856E-03	1.889E+00	1.473E-01	2.057E-03	0.0	-0.119	0.130	0.128
0.4500	1.826E+00	7.335E-03	1.833E+00	1.742E-01	2.253E-03	0.0	-0.117	0.128	0.126
0.5000	1.784E+00	7.838E-03	1.791E+00	2.018E-01	2.446E-03	0.0	-0.116	0.126	0.125
0.5500	1.751E+00	8.362E-03	1.759E+00	2.299E-01	2.639E-03	0.0	-0.114	0.125	0.123
0.6000	1.725E+00	8.904E-03	1.734E+00	2.586E-01	2.831E-03	0.0	-0.113	0.124	0.122
0.7000	1.690E+00	1.004E-02	1.700E+00	3.169E-01	3.215E-03	0.0	-0.111	0.121	0.119
0.8000	1.667E+00	1.122E-02	1.679E+00	3.761E-01	3.600E-03	0.0	-0.109	0.119	0.117
0.9000	1.654E+00	1.247E-02	1.666E+00	4.359E-01	3.987E-03	0.0	-0.107	0.118	0.115
1.0000	1.646E+00	1.376E-02	1.659E+00	4.961E-01	4.377E-03	0.0	-0.105	0.116	0.113
1.2500	1.641E+00	1.718E-02	1.658E+00	6.469E-01	5.366E-03	0.0	-0.102	0.113	0.110
1.5000	1.647E+00	2.084E-02	1.667E+00	7.973E-01	6.376E-03	0.0	-0.100	0.111	0.107
1.7500	1.658E+00	2.468E-02	1.682E+00	9.466E-01	7.405E-03	0.0	-0.098	0.108	0.104
2.0000	1.671E+00	2.869E-02	1.699E+00	1.094E+00	8.452E-03	0.0	-0.096	0.107	0.102
2.5000	1.699E+00	3.711E-02	1.736E+00	1.386E+00	1.059E-02	0.0	-0.093	0.104	0.099
3.0000	1.727E+00	4.598E-02	1.773E+00	1.671E+00	1.276E-02	0.0	-0.091	0.101	0.096
3.5000	1.753E+00	5.519E-02	1.808E+00	1.950E+00	1.497E-02	0.0	-0.089	0.099	0.094
4.0000	1.777E+00	6.471E-02	1.842E+00	2.224E+00	1.720E-02	0.0	-0.088	0.098	0.092
4.5000	1.799E+00	7.448E-02	1.874E+00	2.493E+00	1.945E-02	0.0	-0.086	0.096	0.090
5.0000	1.820E+00	8.449E-02	1.905E+00	2.758E+00	2.171E-02	0.0	-0.085	0.095	0.088
5.5000	1.839E+00	9.470E-02	1.934E+00	3.018E+00	2.398E-02	0.0	-0.084	0.094	0.087
6.0000	1.857E+00	1.051E-01	1.962E+00	3.275E+00	2.626E-02	0.0	-0.083	0.092	0.086
7.0000	1.889E+00	1.264E-01	2.016E+00	3.777E+00	3.081E-02	0.0	-0.082	0.091	0.084
8.0000	1.918E+00	1.482E-01	2.066E+00	4.267E+00	3.536E-02	0.0	-0.080	0.089	0.082
9.0000	1.944E+00	1.705E-01	2.114E+00	4.746E+00	3.990E-02	0.0	-0.079	0.087	0.080
10.0000	1.967E+00	1.932E-01	2.160E+00	5.214E+00	4.441E-02	0.0	-0.078	0.086	0.079
12.5000	2.016E+00	2.514E-01	2.268E+00	6.343E+00	5.558E-02	0.0	-0.076	0.083	0.075
15.0000	2.057E+00	3.112E-01	2.368E+00	7.421E+00	6.652E-02	0.0	-0.075	0.081	0.073
17.5000	2.092E+00	3.723E-01	2.464E+00	8.456E+00	7.720E-02	0.0	-0.074	0.079	0.070
20.0000	2.122E+00	4.343E-01	2.556E+00	9.452E+00	8.762E-02	0.0	-0.073	0.077	0.068
25.0000	2.173E+00	5.606E-01	2.733E+00	1.134E+01	1.076E-01	0.0	-0.071	0.074	0.065
30.0000	2.214E+00	6.890E-01	2.903E+00	1.312E+01	1.266E-01	2.989E-03	-0.065	0.071	0.062
35.0000	2.246E+00	8.189E-01	3.065E+00	1.479E+01	1.446E-01	4.425E-02	-0.054	0.068	0.057
40.0000	2.272E+00	9.502E-01	3.222E+00	1.638E+01	1.617E-01	1.129E-01	-0.047	0.065	0.053
45.0000	2.292E+00	1.083E+00	3.375E+00	1.790E+01	1.779E-01	1.940E-01	-0.041	0.062	0.048
50.0000	2.310E+00	1.216E+00	3.526E+00	1.935E+01	1.934E-01	2.804E-01	-0.037	0.059	0.045
55.0000	2.325E+00	1.350E+00	3.675E+00	2.074E+01	2.082E-01	3.682E-01	-0.034	0.057	0.041
60.0000	2.338E+00	1.484E+00	3.823E+00	2.207E+01	2.224E-01	4.554E-01	-0.031	0.055	0.038
70.0000	2.361E+00	1.755E+00	4.116E+00	2.459E+01	2.488E-01	6.239E-01	-0.028	0.051	0.033
80.0000	2.379E+00	2.028E+00	4.407E+00	2.694E+01	2.732E-01	7.819E-01	-0.025	0.048	0.030
90.0000	2.395E+00	2.302E+00	4.697E+00	2.914E+01	2.957E-01	9.288E-01	-0.023	0.045	0.027
100.0000	2.409E+00	2.577E+00	4.986E+00	3.120E+01	3.165E-01	1.065E+00	-0.022	0.043	0.024
125.0000	2.437E+00	3.270E+00	5.707E+00	3.589E+01	3.624E-01	1.366E+00	-0.019	0.038	0.020
150.0000	2.460E+00	3.967E+00	6.427E+00	4.001E+01	4.013E-01	1.622E+00	-0.018	0.035	0.017
175.0000	2.478E+00	4.668E+00	7.146E+00	4.370E+01	4.348E-01	1.843E+00	-0.017	0.033	0.015
200.0000	2.494E+00	5.371E+00	7.865E+00	4.703E+01	4.640E-01	2.038E+00	-0.016	0.031	0.013
250.0000	2.520E+00	6.784E+00	9.304E+00	5.287E+01	5.127E-01	2.369E+00	-0.015	0.028	0.011
300.0000	2.541E+00	8.202E+00	1.074E+01	5.787E+01	5.517E-01	2.644E+00	-0.015	0.026	0.009
350.0000	2.558E+00	9.625E+00	1.218E+01	6.223E+01	5.840E-01	2.879E+00	-0.014	0.024	0.008
400.0000	2.573E+00	1.105E+01	1.362E+01	6.611E+01	6.111E-01	3.086E+00	-0.013	0.023	0.007
450.0000	2.586E+00	1.248E+01	1.507E+01	6.960E+01	6.343E-01	3.271E+00	-0.013	0.022	0.006
500.0000	2.597E+00	1.391E+01	1.651E+01	7.277E+01	6.544E-01	3.438E+00	-0.012	0.021	0.006
550.0000	2.608E+00	1.534E+01	1.795E+01	7.568E+01	6.721E-01	3.592E+00	-0.011	0.020	0.005
600.0000	2.617E+00	1.678E+01	1.939E+01	7.835E+01	6.878E-01	3.733E+00	-0.011	0.020	0.005
700.0000	2.633E+00	1.965E+01	2.228E+01	8.316E+01	7.144E-01	3.989E+00	-0.010	0.019	0.004
800.0000	2.646E+00	2.252E+01	2.517E+01	8.738E+01	7.361E-01	4.215E+00	-0.008	0.018	0.004
900.0000	2.658E+00	2.540E+01	2.805E+01	9.114E+01	7.544E-01	4.418E+00	-0.008	0.017	0.004
1000.0000	2.668E+00	2.827E+01	3.094E+01	9.454E+01	7.699E-01	4.603E+00	-0.007	0.017	0.003

ELECTRONS IN NEON

I = 137.0 eV DENSITY = 8.385E-04 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.773E+01	5.273E-03	1.774E+01	3.265E-04	1.622E-04	0.0	-0.226	0.266	0.262
0.0125	1.500E+01	5.340E-03	1.500E+01	4.804E-04	1.951E-04	0.0	-0.215	0.251	0.248
0.0150	1.307E+01	5.384E-03	1.308E+01	6.595E-04	2.266E-04	0.0	-0.207	0.240	0.237
0.0175	1.164E+01	5.416E-03	1.164E+01	8.625E-04	2.569E-04	0.0	-0.201	0.232	0.229
0.0200	1.052E+01	5.439E-03	1.053E+01	1.089E-03	2.862E-04	0.0	-0.196	0.225	0.223
0.0250	8.898E+00	5.470E-03	8.904E+00	1.607E-03	3.422E-04	0.0	-0.188	0.214	0.212
0.0300	7.768E+00	5.492E-03	7.773E+00	2.210E-03	3.953E-04	0.0	-0.182	0.206	0.204
0.0350	6.932E+00	5.510E-03	6.938E+00	2.892E-03	4.461E-04	0.0	-0.177	0.200	0.198
0.0400	6.288E+00	5.526E-03	6.293E+00	3.650E-03	4.949E-04	0.0	-0.173	0.194	0.193
0.0450	5.775E+00	5.543E-03	5.781E+00	4.480E-03	5.420E-04	0.0	-0.170	0.190	0.189
0.0500	5.357E+00	5.559E-03	5.362E+00	5.379E-03	5.876E-04	0.0	-0.167	0.186	0.186
0.0550	5.009E+00	5.577E-03	5.014E+00	6.344E-03	6.319E-04	0.0	-0.164	0.183	0.183
0.0600	4.715E+00	5.595E-03	4.720E+00	7.373E-03	6.750E-04	0.0	-0.162	0.180	0.180
0.0700	4.244E+00	5.634E-03	4.250E+00	9.610E-03	7.580E-04	0.0	-0.158	0.176	0.175
0.0800	3.884E+00	5.679E-03	3.890E+00	1.207E-02	8.374E-04	0.0	-0.155	0.172	0.171
0.0900	3.599E+00	5.727E-03	3.605E+00	1.475E-02	9.138E-04	0.0	-0.153	0.169	0.168
0.1000	3.369E+00	5.781E-03	3.375E+00	1.762E-02	9.875E-04	0.0	-0.150	0.166	0.165
0.1250	2.948E+00	5.934E-03	2.954E+00	2.557E-02	1.163E-03	0.0	-0.146	0.160	0.160
0.1500	2.663E+00	6.106E-03	2.669E+00	3.449E-02	1.327E-03	0.0	-0.142	0.156	0.155
0.1750	2.458E+00	6.296E-03	2.464E+00	4.426E-02	1.484E-03	0.0	-0.139	0.152	0.152
0.2000	2.304E+00	6.500E-03	2.310E+00	5.475E-02	1.634E-03	0.0	-0.137	0.150	0.149
0.2500	2.090E+00	6.945E-03	2.097E+00	7.754E-02	1.920E-03	0.0	-0.133	0.145	0.144
0.3000	1.950E+00	7.432E-03	1.958E+00	1.023E-01	2.192E-03	0.0	-0.129	0.142	0.140
0.3500	1.854E+00	7.956E-03	1.862E+00	1.285E-01	2.456E-03	0.0	-0.127	0.139	0.137
0.4000	1.784E+00	8.511E-03	1.792E+00	1.559E-01	2.713E-03	0.0	-0.125	0.136	0.135
0.4500	1.732E+00	9.096E-03	1.741E+00	1.842E-01	2.965E-03	0.0	-0.123	0.134	0.133
0.5000	1.693E+00	9.707E-03	1.703E+00	2.133E-01	3.215E-03	0.0	-0.121	0.132	0.131
0.5500	1.663E+00	1.034E-02	1.673E+00	2.429E-01	3.463E-03	0.0	-0.119	0.131	0.129
0.6000	1.639E+00	1.100E-02	1.650E+00	2.730E-01	3.709E-03	0.0	-0.118	0.129	0.127
0.7000	1.607E+00	1.236E-02	1.619E+00	3.342E-01	4.200E-03	0.0	-0.115	0.127	0.124
0.8000	1.587E+00	1.380E-02	1.601E+00	3.964E-01	4.691E-03	0.0	-0.113	0.125	0.122
0.9000	1.575E+00	1.530E-02	1.590E+00	4.591E-01	5.184E-03	0.0	-0.111	0.123	0.120
1.0000	1.568E+00	1.686E-02	1.585E+00	5.221E-01	5.678E-03	0.0	-0.110	0.121	0.118
1.2500	1.565E+00	2.100E-02	1.586E+00	6.799E-01	6.929E-03	0.0	-0.106	0.118	0.114
1.5000	1.572E+00	2.542E-02	1.598E+00	8.370E-01	8.202E-03	0.0	-0.104	0.115	0.111
1.7500	1.584E+00	3.008E-02	1.614E+00	9.927E-01	9.497E-03	0.0	-0.101	0.113	0.108
2.0000	1.598E+00	3.493E-02	1.633E+00	1.147E+00	1.081E-02	0.0	-0.099	0.111	0.106
2.5000	1.626E+00	4.513E-02	1.672E+00	1.449E+00	1.349E-02	0.0	-0.096	0.108	0.102
3.0000	1.654E+00	5.586E-02	1.710E+00	1.745E+00	1.621E-02	0.0	-0.094	0.105	0.099
3.5000	1.681E+00	6.701E-02	1.748E+00	2.034E+00	1.897E-02	0.0	-0.092	0.103	0.097
4.0000	1.705E+00	7.852E-02	1.783E+00	2.317E+00	2.174E-02	0.0	-0.091	0.101	0.094
4.5000	1.727E+00	9.033E-02	1.817E+00	2.595E+00	2.454E-02	0.0	-0.089	0.099	0.093
5.0000	1.748E+00	1.024E-01	1.850E+00	2.868E+00	2.733E-02	0.0	-0.088	0.098	0.091
5.5000	1.767E+00	1.147E-01	1.882E+00	3.136E+00	3.014E-02	0.0	-0.087	0.097	0.089
6.0000	1.785E+00	1.273E-01	1.912E+00	3.399E+00	3.294E-02	0.0	-0.086	0.095	0.088
7.0000	1.817E+00	1.529E-01	1.970E+00	3.915E+00	3.853E-02	0.0	-0.084	0.093	0.086
8.0000	1.845E+00	1.791E-01	2.024E+00	4.415E+00	4.410E-02	0.0	-0.083	0.091	0.083
9.0000	1.870E+00	2.058E-01	2.076E+00	4.903E+00	4.963E-02	0.0	-0.082	0.090	0.082
10.0000	1.893E+00	2.330E-01	2.126E+00	5.379E+00	5.510E-02	0.0	-0.081	0.088	0.080
12.5000	1.942E+00	3.026E-01	2.245E+00	6.523E+00	6.854E-02	0.0	-0.079	0.085	0.076
15.0000	1.983E+00	3.739E-01	2.357E+00	7.609E+00	8.159E-02	0.0	-0.077	0.082	0.073
17.5000	2.017E+00	4.466E-01	2.464E+00	8.646E+00	9.423E-02	0.0	-0.076	0.080	0.071
20.0000	2.047E+00	5.204E-01	2.568E+00	9.640E+00	1.065E-01	0.0	-0.074	0.078	0.068
25.0000	2.098E+00	6.703E-01	2.768E+00	1.151E+01	1.297E-01	0.0	-0.073	0.075	0.065
30.0000	2.139E+00	8.226E-01	2.962E+00	1.326E+01	1.515E-01	0.0	-0.071	0.072	0.061
35.0000	2.174E+00	9.766E-01	3.151E+00	1.490E+01	1.719E-01	0.0	-0.070	0.069	0.059
40.0000	2.204E+00	1.132E+00	3.336E+00	1.644E+01	1.910E-01	0.0	-0.069	0.067	0.056
45.0000	2.231E+00	1.289E+00	3.520E+00	1.790E+01	2.090E-01	0.0	-0.068	0.065	0.054
50.0000	2.255E+00	1.446E+00	3.701E+00	1.928E+01	2.259E-01	0.0	-0.068	0.064	0.052
55.0000	2.277E+00	1.605E+00	3.881E+00	2.060E+01	2.420E-01	0.0	-0.067	0.062	0.050
60.0000	2.297E+00	1.764E+00	4.060E+00	2.186E+01	2.571E-01	0.0	-0.066	0.061	0.049
70.0000	2.329E+00	2.084E+00	4.413E+00	2.422E+01	2.852E-01	2.873E-02	-0.054	0.058	0.045
80.0000	2.355E+00	2.406E+00	4.761E+00	2.640E+01	3.107E-01	9.312E-02	-0.045	0.055	0.041
90.0000	2.376E+00	2.729E+00	5.105E+00	2.843E+01	3.340E-01	1.741E-01	-0.039	0.053	0.037
100.0000	2.393E+00	3.054E+00	5.447E+00	3.033E+01	3.554E-01	2.624E-01	-0.035	0.051	0.034
125.0000	2.427E+00	3.871E+00	6.298E+00	3.459E+01	4.021E-01	4.888E-01	-0.028	0.046	0.028
150.0000	2.452E+00	4.693E+00	7.144E+00	3.832E+01	4.412E-01	7.045E-01	-0.023	0.042	0.023
175.0000	2.472E+00	5.518E+00	7.990E+00	4.162E+01	4.745E-01	9.031E-01	-0.021	0.040	0.020
200.0000	2.488E+00	6.347E+00	8.835E+00	4.460E+01	5.033E-01	1.085E+00	-0.019	0.037	0.018
250.0000	2.515E+00	8.010E+00	1.053E+01	4.978E+01	5.508E-01	1.403E+00	-0.016	0.034	0.014
300.0000	2.536E+00	9.680E+00	1.222E+01	5.418E+01	5.886E-01	1.674E+00	-0.015	0.032	0.012
350.0000	2.554E+00	1.135E+01	1.391E+01	5.802E+01	6.195E-01	1.908E+00	-0.014	0.030	0.010
400.0000	2.568E+00	1.303E+01	1.560E+01	6.141E+01	6.453E-01	2.114E+00	-0.013	0.028	0.009
450.0000	2.581E+00	1.471E+01	1.729E+01	6.445E+01	6.673E-01	2.298E+00	-0.013	0.027	0.008
500.0000	2.593E+00	1.639E+01	1.899E+01	6.721E+01	6.863E-01	2.464E+00	-0.012	0.026	0.007
550.0000	2.603E+00	1.808E+01	2.068E+01	6.973E+01	7.029E-01	2.616E+00	-0.012	0.025	0.007
600.0000	2.612E+00	1.976E+01	2.237E+01	7.206E+01	7.176E-01	2.755E+00	-0.012	0.024	0.006
700.0000	2.628E+00	2.313E+01	2.576E+01	7.622E+01	7.423E-01	3.003E+00	-0.011	0.023	0.005
800.0000	2.642E+00	2.651E+01	2.915E+01	7.987E+01	7.625E-01	3.220E+00	-0.011	0.022	0.005
900.0000	2.655E+00	2.989E+01	3.254E+01	8.311E+01	7.794E-01	3.413E+00	-0.010	0.021	0.004
1000.0000	2.665E+00	3.327E+01	3.594E+01	8.603E+01	7.937E-01	3.587E+00	-0.010	0.020	0.004

ELECTRONS IN ALUMINUM

I = 166.0 eV DENSITY = 2.699E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.649E+01	6.559E-03	1.650E+01	3.539E-04	2.132E-04	3.534E-04	-0.236	0.281	0.275
0.0125	1.398E+01	6.700E-03	1.398E+01	5.192E-04	2.583E-04	4.937E-04	-0.224	0.265	0.260
0.0150	1.220E+01	6.798E-03	1.221E+01	7.111E-04	3.016E-04	6.538E-04	-0.216	0.252	0.248
0.0175	1.088E+01	6.871E-03	1.088E+01	9.284E-04	3.435E-04	8.332E-04	-0.209	0.243	0.239
0.0200	9.844E+00	6.926E-03	9.851E+00	1.170E-03	3.840E-04	1.031E-03	-0.203	0.235	0.232
0.0250	8.338E+00	7.004E-03	8.345E+00	1.724E-03	4.616E-04	1.483E-03	-0.195	0.224	0.221
0.0300	7.287E+00	7.059E-03	7.294E+00	2.367E-03	5.353E-04	2.005E-03	-0.188	0.215	0.212
0.0350	6.509E+00	7.100E-03	6.516E+00	3.093E-03	6.058E-04	2.593E-03	-0.183	0.208	0.206
0.0400	5.909E+00	7.133E-03	5.916E+00	3.900E-03	6.736E-04	3.246E-03	-0.179	0.202	0.201
0.0450	5.430E+00	7.162E-03	5.437E+00	4.783E-03	7.390E-04	3.960E-03	-0.175	0.198	0.196
0.0500	5.039E+00	7.191E-03	5.046E+00	5.738E-03	8.022E-04	4.732E-03	-0.172	0.194	0.192
0.0550	4.714E+00	7.217E-03	4.721E+00	6.763E-03	8.636E-04	5.560E-03	-0.170	0.190	0.189
0.0600	4.439E+00	7.243E-03	4.446E+00	7.855E-03	9.232E-04	6.440E-03	-0.167	0.187	0.186
0.0700	3.998E+00	7.295E-03	4.005E+00	1.023E-02	1.038E-03	8.351E-03	-0.163	0.182	0.181
0.0800	3.661E+00	7.350E-03	3.668E+00	1.284E-02	1.147E-03	1.045E-02	-0.160	0.178	0.177
0.0900	3.394E+00	7.411E-03	3.401E+00	1.568E-02	1.252E-03	1.271E-02	-0.157	0.174	0.173
0.1000	3.177E+00	7.476E-03	3.185E+00	1.872E-02	1.353E-03	1.513E-02	-0.155	0.171	0.170
0.1250	2.781E+00	7.659E-03	2.789E+00	2.714E-02	1.593E-03	2.175E-02	-0.150	0.165	0.164
0.1500	2.513E+00	7.865E-03	2.521E+00	3.659E-02	1.816E-03	2.907E-02	-0.146	0.160	0.160
0.1750	2.320E+00	8.096E-03	2.328E+00	4.693E-02	2.028E-03	3.694E-02	-0.143	0.157	0.156
0.2000	2.174E+00	8.344E-03	2.183E+00	5.804E-02	2.231E-03	4.525E-02	-0.140	0.154	0.153
0.2500	1.972E+00	8.888E-03	1.981E+00	8.217E-02	2.616E-03	6.280E-02	-0.136	0.149	0.148
0.3000	1.839E+00	9.487E-03	1.849E+00	1.083E-01	2.982E-03	8.116E-02	-0.132	0.145	0.144
0.3500	1.747E+00	1.013E-02	1.757E+00	1.361E-01	3.335E-03	9.997E-02	-0.129	0.142	0.141
0.4000	1.680E+00	1.082E-02	1.691E+00	1.652E-01	3.678E-03	1.190E-01	-0.127	0.139	0.138
0.4500	1.630E+00	1.154E-02	1.642E+00	1.952E-01	4.016E-03	1.380E-01	-0.125	0.137	0.135
0.5000	1.592E+00	1.230E-02	1.604E+00	2.260E-01	4.349E-03	1.569E-01	-0.123	0.135	0.133
0.5500	1.563E+00	1.309E-02	1.576E+00	2.575E-01	4.680E-03	1.757E-01	-0.121	0.133	0.131
0.6000	1.540E+00	1.390E-02	1.554E+00	2.894E-01	5.009E-03	1.943E-01	-0.119	0.132	0.130
0.7000	1.507E+00	1.560E-02	1.522E+00	3.545E-01	5.664E-03	2.307E-01	-0.116	0.129	0.126
0.8000	1.486E+00	1.739E-02	1.503E+00	4.206E-01	6.319E-03	2.661E-01	-0.113	0.127	0.124
0.9000	1.473E+00	1.925E-02	1.492E+00	4.874E-01	6.976E-03	3.005E-01	-0.111	0.124	0.121
1.0000	1.465E+00	2.119E-02	1.486E+00	5.546E-01	7.636E-03	3.339E-01	-0.108	0.122	0.119
1.2500	1.457E+00	2.630E-02	1.484E+00	7.231E-01	9.306E-03	4.138E-01	-0.103	0.118	0.113
1.5000	1.460E+00	3.177E-02	1.491E+00	8.912E-01	1.101E-02	4.898E-01	-0.097	0.114	0.109
1.7500	1.466E+00	3.752E-02	1.504E+00	1.058E+00	1.274E-02	5.632E-01	-0.092	0.111	0.105
2.0000	1.475E+00	4.350E-02	1.518E+00	1.224E+00	1.449E-02	6.349E-01	-0.087	0.108	0.101
2.5000	1.493E+00	5.605E-02	1.549E+00	1.550E+00	1.808E-02	7.757E-01	-0.077	0.102	0.093
3.0000	1.510E+00	6.924E-02	1.580E+00	1.869E+00	2.173E-02	9.145E-01	-0.067	0.096	0.085
3.5000	1.526E+00	8.292E-02	1.609E+00	2.183E+00	2.544E-02	1.051E+00	-0.059	0.091	0.079
4.0000	1.540E+00	9.702E-02	1.637E+00	2.491E+00	2.918E-02	1.183E+00	-0.052	0.086	0.072
4.5000	1.552E+00	1.115E-01	1.664E+00	2.794E+00	3.296E-02	1.311E+00	-0.047	0.082	0.067
5.0000	1.564E+00	1.263E-01	1.690E+00	3.092E+00	3.675E-02	1.433E+00	-0.042	0.078	0.062
5.5000	1.574E+00	1.413E-01	1.715E+00	3.386E+00	4.055E-02	1.550E+00	-0.039	0.074	0.058
6.0000	1.583E+00	1.567E-01	1.739E+00	3.675E+00	4.436E-02	1.661E+00	-0.036	0.071	0.054
7.0000	1.599E+00	1.879E-01	1.787E+00	4.242E+00	5.197E-02	1.868E+00	-0.032	0.066	0.048
8.0000	1.613E+00	2.200E-01	1.833E+00	4.795E+00	5.955E-02	2.055E+00	-0.029	0.061	0.043
9.0000	1.625E+00	2.526E-01	1.877E+00	5.334E+00	6.708E-02	2.226E+00	-0.026	0.057	0.039
10.0000	1.636E+00	2.858E-01	1.921E+00	5.861E+00	7.454E-02	2.384E+00	-0.025	0.054	0.035
12.5000	1.658E+00	3.706E-01	2.029E+00	7.127E+00	9.281E-02	2.727E+00	-0.022	0.048	0.030
15.0000	1.676E+00	4.574E-01	2.134E+00	8.328E+00	1.105E-01	3.016E+00	-0.020	0.044	0.026
17.5000	1.691E+00	5.459E-01	2.237E+00	9.472E+00	1.275E-01	3.265E+00	-0.018	0.040	0.023
20.0000	1.704E+00	6.357E-01	2.340E+00	1.056E+01	1.438E-01	3.484E+00	-0.017	0.037	0.021
25.0000	1.726E+00	8.180E-01	2.544E+00	1.261E+01	1.745E-01	3.857E+00	-0.016	0.033	0.018
30.0000	1.743E+00	1.003E+00	2.746E+00	1.450E+01	2.027E-01	4.168E+00	-0.014	0.030	0.015
35.0000	1.757E+00	1.190E+00	2.947E+00	1.626E+01	2.287E-01	4.435E+00	-0.013	0.028	0.014
40.0000	1.769E+00	1.379E+00	3.148E+00	1.790E+01	2.528E-01	4.669E+00	-0.012	0.026	0.012
45.0000	1.780E+00	1.569E+00	3.349E+00	1.944E+01	2.751E-01	4.878E+00	-0.010	0.024	0.011
50.0000	1.789E+00	1.761E+00	3.550E+00	2.089E+01	2.959E-01	5.068E+00	-0.009	0.023	0.010
55.0000	1.797E+00	1.953E+00	3.751E+00	2.226E+01	3.152E-01	5.241E+00	-0.009	0.022	0.009
60.0000	1.805E+00	2.147E+00	3.951E+00	2.356E+01	3.333E-01	5.401E+00	-0.008	0.021	0.009
70.0000	1.818E+00	2.535E+00	4.353E+00	2.597E+01	3.662E-01	5.687E+00	-0.006	0.019	0.007
80.0000	1.829E+00	2.927E+00	4.755E+00	2.817E+01	3.953E-01	5.938E+00	-0.005	0.018	0.006
90.0000	1.838E+00	3.320E+00	5.158E+00	3.019E+01	4.214E-01	6.161E+00	-0.004	0.017	0.006
100.0000	1.847E+00	3.714E+00	5.561E+00	3.205E+01	4.448E-01	6.363E+00	-0.004	0.016	0.005
125.0000	1.864E+00	4.707E+00	6.571E+00	3.618E+01	4.945E-01	6.794E+00	-0.003	0.014	0.004
150.0000	1.879E+00	5.705E+00	7.583E+00	3.972E+01	5.346E-01	7.150E+00	-0.002	0.013	0.003
175.0000	1.890E+00	6.708E+00	8.598E+00	4.282E+01	5.678E-01	7.452E+00	-0.001	0.012	0.003
200.0000	1.900E+00	7.714E+00	9.614E+00	4.557E+01	5.958E-01	7.716E+00	-0.001	0.011	0.002
250.0000	1.917E+00	9.734E+00	1.165E+01	5.028E+01	6.406E-01	8.157E+00	-0.001	0.010	0.002
300.0000	1.931E+00	1.176E+01	1.369E+01	5.424E+01	6.751E-01	8.519E+00	-0.001	0.010	0.001
350.0000	1.943E+00	1.380E+01	1.574E+01	5.764E+01	7.027E-01	8.826E+00	-0.000	0.009	0.001
400.0000	1.952E+00	1.583E+01	1.778E+01	6.063E+01	7.253E-01	9.091E+00	-0.000	0.009	0.001
450.0000	1.961E+00	1.787E+01	1.983E+01	6.329E+01	7.443E-01	9.326E+00	-0.000	0.008	0.001
500.0000	1.969E+00	1.992E+01	2.189E+01	6.569E+01	7.604E-01	9.536E+00	-0.000	0.008	0.001
550.0000	1.976E+00	2.196E+01	2.394E+01	6.787E+01	7.744E-01	9.726E+00	-0.000	0.008	0.001
600.0000	1.983E+00	2.401E+01	2.599E+01	6.988E+01	7.866E-01	9.900E+00	-0.000	0.007	0.001
700.0000	1.994E+00	2.811E+01	3.010E+01	7.345E+01	8.069E-01	1.021E+01	-0.000	0.007	0.001
800.0000	2.004E+00	3.221E+01	3.421E+01	7.656E+01	8.233E-01	1.047E+01	-0.000	0.007	0.001
900.0000	2.013E+00	3.631E+01	3.833E+01	7.932E+01	8.367E-01	1.071E+01	-0.000	0.007	0.000
1000.0000	2.021E+00	4.042E+01	4.244E+01	8.180E+01	8.481E-01	1.092E+01	-0.000	0.006	0.000

ELECTRONS IN ALUMINUM (*)

I = 166.0 eV DENSITY = 2.699E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.649E+01	6.559E-03	1.650E+01	3.539E-04	2.132E-04	1.456E-04	-0.236	0.281	0.275
0.0125	1.398E+01	6.700E-03	1.398E+01	5.192E-04	2.583E-04	2.266E-04	-0.224	0.265	0.260
0.0150	1.220E+01	6.798E-03	1.221E+01	7.111E-04	3.016E-04	3.253E-04	-0.216	0.252	0.248
0.0175	1.088E+01	6.871E-03	1.088E+01	9.284E-04	3.435E-04	4.413E-04	-0.209	0.243	0.239
0.0200	9.845E+00	6.926E-03	9.851E+00	1.170E-03	3.840E-04	5.747E-04	-0.203	0.235	0.232
0.0250	8.339E+00	7.004E-03	8.346E+00	1.724E-03	4.615E-04	8.925E-04	-0.195	0.224	0.221
0.0300	7.288E+00	7.059E-03	7.295E+00	2.367E-03	5.353E-04	1.276E-03	-0.188	0.215	0.212
0.0350	6.510E+00	7.100E-03	6.517E+00	3.093E-03	6.058E-04	1.720E-03	-0.183	0.208	0.206
0.0400	5.909E+00	7.133E-03	5.916E+00	3.900E-03	6.736E-04	2.219E-03	-0.179	0.202	0.201
0.0450	5.431E+00	7.162E-03	5.438E+00	4.782E-03	7.389E-04	2.773E-03	-0.175	0.198	0.196
0.0500	5.040E+00	7.191E-03	5.047E+00	5.738E-03	8.022E-04	3.391E-03	-0.172	0.194	0.192
0.0550	4.715E+00	7.217E-03	4.722E+00	6.763E-03	8.635E-04	4.080E-03	-0.170	0.190	0.189
0.0600	4.439E+00	7.243E-03	4.447E+00	7.855E-03	9.231E-04	4.842E-03	-0.167	0.187	0.186
0.0700	3.999E+00	7.295E-03	4.006E+00	1.023E-02	1.038E-03	6.497E-03	-0.163	0.182	0.181
0.0800	3.661E+00	7.350E-03	3.669E+00	1.284E-02	1.147E-03	8.162E-03	-0.160	0.178	0.177
0.0900	3.394E+00	7.411E-03	3.402E+00	1.568E-02	1.252E-03	9.701E-03	-0.157	0.174	0.173
0.1000	3.178E+00	7.476E-03	3.186E+00	1.872E-02	1.353E-03	1.138E-02	-0.155	0.171	0.170
0.1250	2.782E+00	7.659E-03	2.790E+00	2.713E-02	1.592E-03	1.738E-02	-0.150	0.165	0.164
0.1500	2.514E+00	7.865E-03	2.521E+00	3.659E-02	1.816E-03	2.450E-02	-0.146	0.160	0.160
0.1750	2.320E+00	8.096E-03	2.329E+00	4.692E-02	2.028E-03	3.142E-02	-0.143	0.157	0.156
0.2000	2.175E+00	8.344E-03	2.184E+00	5.802E-02	2.231E-03	3.876E-02	-0.140	0.154	0.153
0.2500	1.973E+00	8.888E-03	1.982E+00	8.214E-02	2.615E-03	5.485E-02	-0.136	0.149	0.148
0.3000	1.840E+00	9.487E-03	1.850E+00	1.083E-01	2.981E-03	7.180E-02	-0.132	0.145	0.144
0.3500	1.748E+00	1.013E-02	1.758E+00	1.361E-01	3.333E-03	8.931E-02	-0.129	0.142	0.141
0.4000	1.681E+00	1.082E-02	1.692E+00	1.651E-01	3.676E-03	1.072E-01	-0.127	0.139	0.138
0.4500	1.631E+00	1.154E-02	1.643E+00	1.951E-01	4.013E-03	1.252E-01	-0.125	0.137	0.135
0.5000	1.594E+00	1.230E-02	1.606E+00	2.259E-01	4.346E-03	1.433E-01	-0.123	0.135	0.133
0.5500	1.564E+00	1.309E-02	1.577E+00	2.573E-01	4.677E-03	1.614E-01	-0.121	0.133	0.131
0.6000	1.541E+00	1.390E-02	1.555E+00	2.893E-01	5.005E-03	1.794E-01	-0.119	0.132	0.130
0.7000	1.508E+00	1.560E-02	1.524E+00	3.543E-01	5.660E-03	2.151E-01	-0.116	0.129	0.126
0.8000	1.487E+00	1.739E-02	1.505E+00	4.203E-01	6.314E-03	2.503E-01	-0.113	0.127	0.124
0.9000	1.474E+00	1.925E-02	1.493E+00	4.871E-01	6.970E-03	2.848E-01	-0.111	0.124	0.121
1.0000	1.466E+00	2.119E-02	1.487E+00	5.542E-01	7.630E-03	3.188E-01	-0.108	0.122	0.119
1.2500	1.458E+00	2.630E-02	1.485E+00	7.226E-01	9.299E-03	4.014E-01	-0.103	0.118	0.113
1.5000	1.460E+00	3.177E-02	1.492E+00	8.906E-01	1.100E-02	4.814E-01	-0.097	0.114	0.109
1.7500	1.467E+00	3.752E-02	1.504E+00	1.057E+00	1.273E-02	5.594E-01	-0.092	0.111	0.105
2.0000	1.475E+00	4.350E-02	1.518E+00	1.223E+00	1.449E-02	6.359E-01	-0.087	0.108	0.101
2.5000	1.492E+00	5.605E-02	1.548E+00	1.549E+00	1.807E-02	7.845E-01	-0.077	0.102	0.093
3.0000	1.509E+00	6.924E-02	1.579E+00	1.869E+00	2.173E-02	9.273E-01	-0.067	0.096	0.085
3.5000	1.525E+00	8.292E-02	1.608E+00	2.183E+00	2.544E-02	1.064E+00	-0.059	0.091	0.079
4.0000	1.539E+00	9.702E-02	1.636E+00	2.491E+00	2.919E-02	1.194E+00	-0.052	0.086	0.072
4.5000	1.552E+00	1.115E-01	1.663E+00	2.794E+00	3.297E-02	1.318E+00	-0.047	0.082	0.067
5.0000	1.563E+00	1.263E-01	1.690E+00	3.092E+00	3.676E-02	1.436E+00	-0.042	0.078	0.062
5.5000	1.574E+00	1.413E-01	1.715E+00	3.386E+00	4.056E-02	1.548E+00	-0.039	0.074	0.058
6.0000	1.583E+00	1.567E-01	1.740E+00	3.675E+00	4.436E-02	1.654E+00	-0.036	0.071	0.054
7.0000	1.600E+00	1.879E-01	1.788E+00	4.242E+00	5.197E-02	1.853E+00	-0.032	0.066	0.048
8.0000	1.614E+00	2.200E-01	1.834E+00	4.794E+00	5.954E-02	2.033E+00	-0.029	0.061	0.043
9.0000	1.627E+00	2.526E-01	1.879E+00	5.333E+00	6.706E-02	2.199E+00	-0.026	0.057	0.039
10.0000	1.638E+00	2.858E-01	1.924E+00	5.859E+00	7.451E-02	2.352E+00	-0.025	0.054	0.035
12.5000	1.661E+00	3.706E-01	2.031E+00	7.123E+00	9.274E-02	2.690E+00	-0.022	0.048	0.030
15.0000	1.679E+00	4.574E-01	2.136E+00	8.323E+00	1.104E-01	2.977E+00	-0.020	0.044	0.026
17.5000	1.694E+00	5.459E-01	2.240E+00	9.466E+00	1.273E-01	3.227E+00	-0.018	0.040	0.023
20.0000	1.707E+00	6.357E-01	2.343E+00	1.056E+01	1.436E-01	3.449E+00	-0.017	0.037	0.021
25.0000	1.728E+00	8.180E-01	2.546E+00	1.260E+01	1.743E-01	3.829E+00	-0.016	0.033	0.018
30.0000	1.744E+00	1.003E+00	2.747E+00	1.449E+01	2.025E-01	4.147E+00	-0.014	0.030	0.015
35.0000	1.758E+00	1.190E+00	2.948E+00	1.625E+01	2.285E-01	4.421E+00	-0.013	0.028	0.014
40.0000	1.770E+00	1.379E+00	3.149E+00	1.789E+01	2.526E-01	4.663E+00	-0.012	0.026	0.012
45.0000	1.780E+00	1.569E+00	3.349E+00	1.943E+01	2.750E-01	4.878E+00	-0.010	0.024	0.011
50.0000	1.789E+00	1.761E+00	3.550E+00	2.088E+01	2.957E-01	5.073E+00	-0.009	0.023	0.010
55.0000	1.797E+00	1.953E+00	3.750E+00	2.225E+01	3.151E-01	5.250E+00	-0.009	0.022	0.009
60.0000	1.804E+00	2.147E+00	3.950E+00	2.355E+01	3.332E-01	5.413E+00	-0.008	0.021	0.009
70.0000	1.816E+00	2.535E+00	4.352E+00	2.596E+01	3.661E-01	5.705E+00	-0.006	0.019	0.007
80.0000	1.827E+00	2.927E+00	4.754E+00	2.816E+01	3.953E-01	5.960E+00	-0.005	0.018	0.006
90.0000	1.837E+00	3.320E+00	5.156E+00	3.018E+01	4.214E-01	6.186E+00	-0.004	0.017	0.006
100.0000	1.845E+00	3.714E+00	5.559E+00	3.204E+01	4.449E-01	6.390E+00	-0.004	0.016	0.005
125.0000	1.862E+00	4.707E+00	6.569E+00	3.618E+01	4.946E-01	6.823E+00	-0.003	0.014	0.004
150.0000	1.876E+00	5.705E+00	7.581E+00	3.972E+01	5.347E-01	7.180E+00	-0.002	0.013	0.003
175.0000	1.888E+00	6.708E+00	8.596E+00	4.281E+01	5.679E-01	7.482E+00	-0.001	0.012	0.003
200.0000	1.898E+00	7.714E+00	9.612E+00	4.556E+01	5.959E-01	7.745E+00	-0.001	0.011	0.002
250.0000	1.915E+00	9.734E+00	1.165E+01	5.028E+01	6.407E-01	8.186E+00	-0.001	0.010	0.002
300.0000	1.929E+00	1.176E+01	1.369E+01	5.423E+01	6.753E-01	8.547E+00	-0.001	0.010	0.001
350.0000	1.941E+00	1.380E+01	1.574E+01	5.764E+01	7.028E-01	8.853E+00	-0.000	0.009	0.001
400.0000	1.951E+00	1.583E+01	1.778E+01	6.063E+01	7.255E-01	9.118E+00	-0.000	0.009	0.001
450.0000	1.959E+00	1.787E+01	1.983E+01	6.329E+01	7.444E-01	9.352E+00	-0.000	0.008	0.001
500.0000	1.967E+00	1.992E+01	2.188E+01	6.569E+01	7.605E-01	9.562E+00	-0.000	0.008	0.001
550.0000	1.974E+00	2.196E+01	2.394E+01	6.787E+01	7.745E-01	9.751E+00	-0.000	0.008	0.001
600.0000	1.981E+00	2.401E+01	2.599E+01	6.987E+01	7.867E-01	9.924E+00	-0.000	0.007	0.001
700.0000	1.992E+00	2.811E+01	3.010E+01	7.345E+01	8.070E-01	1.023E+01	-0.000	0.007	0.001
800.0000	2.002E+00	3.221E+01	3.421E+01	7.656E+01	8.234E-01	1.050E+01	-0.000	0.007	0.001
900.0000	2.011E+00	3.631E+01	3.833E+01	7.932E+01	8.368E-01	1.073E+01	-0.000	0.007	0.000
1000.0000	2.019E+00	4.042E+01	4.244E+01	8.180E+01	8.482E-01	1.094E+01	-0.000	0.006	0.000

*Evaluated with the density-effect correction of Inokuti and Smith (1982).

ELECTRONS IN SILICON

I = 173.0 eV DENSITY = 2.330E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.689E+01	7.255E-03	1.690E+01	3.461E-04	2.289E-04	1.037E-03	-0.238	0.284	0.278
0.0125	1.432E+01	7.431E-03	1.433E+01	5.074E-04	2.780E-04	1.332E-03	-0.226	0.268	0.262
0.0150	1.251E+01	7.555E-03	1.252E+01	6.946E-04	3.252E-04	1.641E-03	-0.217	0.255	0.251
0.0175	1.115E+01	7.648E-03	1.116E+01	9.065E-04	3.709E-04	1.963E-03	-0.210	0.245	0.241
0.0200	1.010E+01	7.720E-03	1.011E+01	1.142E-03	4.151E-04	2.298E-03	-0.205	0.238	0.234
0.0250	8.556E+00	7.822E-03	8.564E+00	1.682E-03	5.000E-04	3.007E-03	-0.196	0.225	0.223
0.0300	7.480E+00	7.892E-03	7.487E+00	2.308E-03	5.807E-04	3.766E-03	-0.189	0.216	0.214
0.0350	6.682E+00	7.946E-03	6.690E+00	3.016E-03	6.579E-04	4.572E-03	-0.184	0.209	0.207
0.0400	6.067E+00	7.988E-03	6.075E+00	3.802E-03	7.322E-04	5.424E-03	-0.180	0.204	0.202
0.0450	5.576E+00	8.026E-03	5.584E+00	4.661E-03	8.038E-04	6.320E-03	-0.176	0.199	0.197
0.0500	5.175E+00	8.061E-03	5.183E+00	5.591E-03	8.731E-04	7.257E-03	-0.173	0.195	0.193
0.0550	4.842E+00	8.092E-03	4.850E+00	6.590E-03	9.402E-04	8.235E-03	-0.170	0.191	0.190
0.0600	4.559E+00	8.123E-03	4.568E+00	7.653E-03	1.006E-03	9.251E-03	-0.168	0.188	0.187
0.0700	4.107E+00	8.185E-03	4.116E+00	9.964E-03	1.131E-03	1.139E-02	-0.163	0.183	0.182
0.0800	3.761E+00	8.248E-03	3.769E+00	1.251E-02	1.251E-03	1.368E-02	-0.160	0.178	0.177
0.0900	3.487E+00	8.317E-03	3.496E+00	1.526E-02	1.366E-03	1.608E-02	-0.157	0.175	0.174
0.1000	3.265E+00	8.389E-03	3.274E+00	1.822E-02	1.476E-03	1.861E-02	-0.154	0.171	0.171
0.1250	2.859E+00	8.591E-03	2.867E+00	2.642E-02	1.737E-03	2.538E-02	-0.149	0.165	0.164
0.1500	2.583E+00	8.821E-03	2.592E+00	3.561E-02	1.981E-03	3.271E-02	-0.145	0.160	0.159
0.1750	2.385E+00	9.076E-03	2.394E+00	4.566E-02	2.212E-03	4.050E-02	-0.141	0.156	0.155
0.2000	2.236E+00	9.349E-03	2.245E+00	5.646E-02	2.433E-03	4.868E-02	-0.138	0.153	0.152
0.2500	2.028E+00	9.951E-03	2.038E+00	7.991E-02	2.852E-03	6.592E-02	-0.133	0.148	0.147
0.3000	1.892E+00	1.062E-02	1.903E+00	1.054E-01	3.248E-03	8.402E-02	-0.129	0.143	0.142
0.3500	1.797E+00	1.133E-02	1.809E+00	1.323E-01	3.631E-03	1.027E-01	-0.125	0.140	0.138
0.4000	1.729E+00	1.209E-02	1.741E+00	1.606E-01	4.003E-03	1.216E-01	-0.122	0.137	0.135
0.4500	1.677E+00	1.290E-02	1.690E+00	1.897E-01	4.368E-03	1.407E-01	-0.119	0.134	0.132
0.5000	1.638E+00	1.374E-02	1.652E+00	2.197E-01	4.728E-03	1.599E-01	-0.116	0.132	0.129
0.5500	1.608E+00	1.461E-02	1.623E+00	2.502E-01	5.085E-03	1.790E-01	-0.114	0.130	0.127
0.6000	1.585E+00	1.551E-02	1.600E+00	2.812E-01	5.441E-03	1.980E-01	-0.112	0.128	0.125
0.7000	1.551E+00	1.740E-02	1.568E+00	3.444E-01	6.148E-03	2.355E-01	-0.108	0.124	0.121
0.8000	1.529E+00	1.938E-02	1.549E+00	4.086E-01	6.855E-03	2.721E-01	-0.105	0.121	0.118
0.9000	1.516E+00	2.145E-02	1.537E+00	4.734E-01	7.564E-03	3.077E-01	-0.102	0.119	0.115
1.0000	1.507E+00	2.360E-02	1.531E+00	5.386E-01	8.275E-03	3.424E-01	-0.100	0.116	0.112
1.2500	1.500E+00	2.927E-02	1.529E+00	7.022E-01	1.007E-02	4.248E-01	-0.094	0.111	0.106
1.5000	1.502E+00	3.533E-02	1.538E+00	8.652E-01	1.190E-02	5.020E-01	-0.090	0.107	0.101
1.7500	1.509E+00	4.171E-02	1.551E+00	1.027E+00	1.376E-02	5.747E-01	-0.086	0.104	0.097
2.0000	1.518E+00	4.833E-02	1.567E+00	1.188E+00	1.565E-02	6.439E-01	-0.082	0.101	0.094
2.5000	1.538E+00	6.223E-02	1.600E+00	1.503E+00	1.949E-02	7.743E-01	-0.075	0.096	0.087
3.0000	1.558E+00	7.682E-02	1.634E+00	1.812E+00	2.340E-02	8.976E-01	-0.069	0.091	0.082
3.5000	1.575E+00	9.197E-02	1.667E+00	2.115E+00	2.736E-02	1.016E+00	-0.062	0.087	0.076
4.0000	1.591E+00	1.076E-01	1.699E+00	2.412E+00	3.134E-02	1.131E+00	-0.057	0.083	0.071
4.5000	1.605E+00	1.236E-01	1.729E+00	2.704E+00	3.535E-02	1.243E+00	-0.051	0.080	0.067
5.0000	1.618E+00	1.399E-01	1.758E+00	2.991E+00	3.937E-02	1.351E+00	-0.047	0.076	0.063
5.5000	1.629E+00	1.566E-01	1.786E+00	3.273E+00	4.340E-02	1.456E+00	-0.043	0.073	0.059
6.0000	1.639E+00	1.735E-01	1.813E+00	3.551E+00	4.742E-02	1.557E+00	-0.040	0.070	0.056
7.0000	1.657E+00	2.081E-01	1.865E+00	4.095E+00	5.546E-02	1.748E+00	-0.034	0.065	0.049
8.0000	1.672E+00	2.435E-01	1.916E+00	4.624E+00	6.344E-02	1.925E+00	-0.030	0.061	0.045
9.0000	1.685E+00	2.795E-01	1.965E+00	5.139E+00	7.136E-02	2.088E+00	-0.027	0.058	0.040
10.0000	1.697E+00	3.161E-01	2.013E+00	5.642E+00	7.919E-02	2.239E+00	-0.025	0.054	0.037
12.5000	1.721E+00	4.098E-01	2.130E+00	6.849E+00	9.833E-02	2.574E+00	-0.021	0.048	0.031
15.0000	1.740E+00	5.057E-01	2.245E+00	7.992E+00	1.168E-01	2.858E+00	-0.019	0.044	0.026
17.5000	1.756E+00	6.033E-01	2.359E+00	9.078E+00	1.345E-01	3.105E+00	-0.017	0.040	0.023
20.0000	1.769E+00	7.023E-01	2.472E+00	1.011E+01	1.514E-01	3.323E+00	-0.016	0.037	0.021
25.0000	1.791E+00	9.035E-01	2.695E+00	1.205E+01	1.832E-01	3.694E+00	-0.015	0.033	0.017
30.0000	1.809E+00	1.108E+00	2.917E+00	1.383E+01	2.123E-01	4.003E+00	-0.013	0.030	0.015
35.0000	1.824E+00	1.314E+00	3.139E+00	1.548E+01	2.391E-01	4.268E+00	-0.012	0.027	0.013
40.0000	1.837E+00	1.523E+00	3.360E+00	1.702E+01	2.638E-01	4.501E+00	-0.011	0.026	0.012
45.0000	1.848E+00	1.733E+00	3.581E+00	1.847E+01	2.865E-01	4.709E+00	-0.010	0.024	0.011
50.0000	1.858E+00	1.944E+00	3.802E+00	1.982E+01	3.077E-01	4.897E+00	-0.009	0.023	0.010
55.0000	1.866E+00	2.156E+00	4.023E+00	2.110E+01	3.273E-01	5.068E+00	-0.009	0.022	0.009
60.0000	1.874E+00	2.369E+00	4.244E+00	2.231E+01	3.457E-01	5.226E+00	-0.008	0.021	0.008
70.0000	1.888E+00	2.798E+00	4.686E+00	2.455E+01	3.789E-01	5.509E+00	-0.007	0.019	0.007
80.0000	1.900E+00	3.230E+00	5.129E+00	2.659E+01	4.083E-01	5.757E+00	-0.006	0.018	0.006
90.0000	1.910E+00	3.663E+00	5.573E+00	2.846E+01	4.344E-01	5.979E+00	-0.005	0.017	0.006
100.0000	1.918E+00	4.099E+00	6.017E+00	3.019E+01	4.580E-01	6.179E+00	-0.004	0.016	0.005
125.0000	1.937E+00	5.193E+00	7.130E+00	3.400E+01	5.076E-01	6.606E+00	-0.003	0.014	0.004
150.0000	1.952E+00	6.294E+00	8.246E+00	3.726E+01	5.474E-01	6.960E+00	-0.002	0.013	0.003
175.0000	1.964E+00	7.401E+00	9.365E+00	4.010E+01	5.803E-01	7.261E+00	-0.002	0.012	0.003
200.0000	1.975E+00	8.511E+00	1.049E+01	4.262E+01	6.079E-01	7.524E+00	-0.001	0.011	0.002
250.0000	1.992E+00	1.074E+01	1.273E+01	4.694E+01	6.520E-01	7.964E+00	-0.001	0.010	0.002
300.0000	2.006E+00	1.298E+01	1.498E+01	5.056E+01	6.859E-01	8.325E+00	-0.001	0.010	0.001
350.0000	2.018E+00	1.522E+01	1.724E+01	5.367E+01	7.129E-01	8.631E+00	-0.001	0.009	0.001
400.0000	2.029E+00	1.747E+01	1.950E+01	5.639E+01	7.350E-01	8.897E+00	-0.000	0.009	0.001
450.0000	2.038E+00	1.972E+01	2.176E+01	5.882E+01	7.535E-01	9.131E+00	-0.000	0.008	0.001
500.0000	2.046E+00	2.197E+01	2.402E+01	6.101E+01	7.692E-01	9.341E+00	-0.000	0.008	0.001
550.0000	2.053E+00	2.423E+01	2.628E+01	6.299E+01	7.828E-01	9.531E+00	-0.000	0.008	0.001
600.0000	2.060E+00	2.648E+01	2.854E+01	6.482E+01	7.946E-01	9.705E+00	-0.000	0.008	0.001
700.0000	2.072E+00	3.100E+01	3.308E+01	6.807E+01	8.144E-01	1.001E+01	-0.000	0.007	0.001
800.0000	2.082E+00	3.553E+01	3.761E+01	7.090E+01	8.302E-01	1.028E+01	-0.000	0.007	0.001
900.0000	2.091E+00	4.006E+01	4.215E+01	7.341E+01	8.433E-01	1.051E+01	-0.000	0.007	0.000
1000.0000	2.099E+00	4.459E+01	4.669E+01	7.567E+01	8.542E-01	1.072E+01	-0.000	0.007	0.000

ELECTRONS IN ARGON

I = 188.0 eV DENSITY = 1.662E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.497E+01	8.167E-03	1.498E+01	3.921E-04	2.846E-04	0.0	-0.243	0.292	0.284
0.0125	1.271E+01	8.444E-03	1.271E+01	5.740E-04	3.487E-04	0.0	-0.231	0.274	0.268
0.0150	1.110E+01	8.647E-03	1.111E+01	7.849E-04	4.108E-04	0.0	-0.222	0.261	0.255
0.0175	9.907E+00	8.803E-03	9.916E+00	1.024E-03	4.712E-04	0.0	-0.215	0.251	0.246
0.0200	8.974E+00	8.926E-03	8.983E+00	1.289E-03	5.299E-04	0.0	-0.209	0.243	0.238
0.0250	7.610E+00	9.107E-03	7.619E+00	1.896E-03	6.430E-04	0.0	-0.200	0.230	0.226
0.0300	6.657E+00	9.237E-03	6.666E+00	2.599E-03	7.511E-04	0.0	-0.193	0.221	0.218
0.0350	5.950E+00	9.334E-03	5.959E+00	3.394E-03	8.547E-04	0.0	-0.187	0.214	0.211
0.0400	5.404E+00	9.415E-03	5.414E+00	4.276E-03	9.546E-04	0.0	-0.183	0.208	0.205
0.0450	4.969E+00	9.482E-03	4.978E+00	5.240E-03	1.051E-03	0.0	-0.179	0.203	0.200
0.0500	4.614E+00	9.540E-03	4.623E+00	6.283E-03	1.144E-03	0.0	-0.176	0.199	0.196
0.0550	4.317E+00	9.593E-03	4.327E+00	7.402E-03	1.235E-03	0.0	-0.173	0.195	0.193
0.0600	4.067E+00	9.642E-03	4.077E+00	8.593E-03	1.323E-03	0.0	-0.171	0.192	0.190
0.0700	3.666E+00	9.733E-03	3.675E+00	1.118E-02	1.492E-03	0.0	-0.167	0.186	0.185
0.0800	3.358E+00	9.821E-03	3.368E+00	1.403E-02	1.654E-03	0.0	-0.163	0.182	0.180
0.0900	3.115E+00	9.909E-03	3.125E+00	1.712E-02	1.808E-03	0.0	-0.160	0.178	0.177
0.1000	2.918E+00	1.000E-02	2.928E+00	2.042E-02	1.957E-03	0.0	-0.158	0.175	0.174
0.1250	2.557E+00	1.025E-02	2.567E+00	2.958E-02	2.307E-03	0.0	-0.153	0.169	0.168
0.1500	2.312E+00	1.052E-02	2.323E+00	3.985E-02	2.633E-03	0.0	-0.149	0.164	0.163
0.1750	2.136E+00	1.081E-02	2.147E+00	5.106E-02	2.940E-03	0.0	-0.146	0.160	0.159
0.2000	2.004E+00	1.113E-02	2.015E+00	6.309E-02	3.233E-03	0.0	-0.143	0.157	0.156
0.2500	1.821E+00	1.182E-02	1.832E+00	8.920E-02	3.784E-03	0.0	-0.139	0.152	0.151
0.3000	1.701E+00	1.258E-02	1.713E+00	1.175E-01	4.303E-03	0.0	-0.135	0.148	0.147
0.3500	1.618E+00	1.340E-02	1.631E+00	1.474E-01	4.799E-03	0.0	-0.132	0.145	0.143
0.4000	1.558E+00	1.427E-02	1.572E+00	1.787E-01	5.280E-03	0.0	-0.130	0.142	0.141
0.4500	1.514E+00	1.519E-02	1.529E+00	2.109E-01	5.749E-03	0.0	-0.128	0.140	0.138
0.5000	1.480E+00	1.616E-02	1.497E+00	2.440E-01	6.211E-03	0.0	-0.126	0.138	0.136
0.5500	1.455E+00	1.716E-02	1.472E+00	2.777E-01	6.667E-03	0.0	-0.124	0.136	0.134
0.6000	1.435E+00	1.820E-02	1.453E+00	3.119E-01	7.119E-03	0.0	-0.122	0.135	0.132
0.7000	1.408E+00	2.036E-02	1.428E+00	3.814E-01	8.015E-03	0.0	-0.120	0.132	0.129
0.8000	1.391E+00	2.264E-02	1.414E+00	4.518E-01	8.905E-03	0.0	-0.117	0.129	0.127
0.9000	1.381E+00	2.502E-02	1.406E+00	5.227E-01	9.794E-03	0.0	-0.115	0.127	0.124
1.0000	1.376E+00	2.748E-02	1.404E+00	5.939E-01	1.068E-02	0.0	-0.114	0.126	0.122
1.2500	1.375E+00	3.399E-02	1.409E+00	7.718E-01	1.291E-02	0.0	-0.110	0.122	0.118
1.5000	1.383E+00	4.094E-02	1.424E+00	9.483E-01	1.517E-02	0.0	-0.107	0.119	0.114
1.7500	1.394E+00	4.822E-02	1.442E+00	1.123E+00	1.744E-02	0.0	-0.105	0.116	0.111
2.0000	1.407E+00	5.581E-02	1.463E+00	1.295E+00	1.973E-02	0.0	-0.103	0.114	0.109
2.5000	1.434E+00	7.168E-02	1.505E+00	1.632E+00	2.436E-02	0.0	-0.099	0.111	0.104
3.0000	1.460E+00	8.831E-02	1.548E+00	1.959E+00	2.903E-02	0.0	-0.097	0.108	0.101
3.5000	1.484E+00	1.056E-01	1.589E+00	2.278E+00	3.370E-02	0.0	-0.095	0.105	0.098
4.0000	1.506E+00	1.233E-01	1.629E+00	2.589E+00	3.837E-02	0.0	-0.093	0.103	0.096
4.5000	1.526E+00	1.415E-01	1.668E+00	2.892E+00	4.303E-02	0.0	-0.092	0.101	0.093
5.0000	1.545E+00	1.600E-01	1.705E+00	3.189E+00	4.766E-02	0.0	-0.090	0.099	0.091
5.5000	1.562E+00	1.789E-01	1.741E+00	3.479E+00	5.227E-02	0.0	-0.089	0.098	0.090
6.0000	1.579E+00	1.981E-01	1.777E+00	3.763E+00	5.684E-02	0.0	-0.088	0.096	0.088
7.0000	1.608E+00	2.373E-01	1.845E+00	4.315E+00	6.588E-02	0.0	-0.087	0.094	0.085
8.0000	1.634E+00	2.773E-01	1.911E+00	4.848E+00	7.476E-02	0.0	-0.085	0.092	0.083
9.0000	1.657E+00	3.181E-01	1.975E+00	5.363E+00	8.347E-02	0.0	-0.084	0.090	0.080
10.0000	1.678E+00	3.595E-01	2.037E+00	5.861E+00	9.200E-02	0.0	-0.083	0.088	0.078
12.5000	1.722E+00	4.651E-01	2.187E+00	7.045E+00	1.126E-01	0.0	-0.081	0.084	0.074
15.0000	1.759E+00	5.733E-01	2.332E+00	8.151E+00	1.320E-01	0.0	-0.079	0.081	0.070
17.5000	1.790E+00	6.833E-01	2.474E+00	9.192E+00	1.505E-01	0.0	-0.077	0.079	0.067
20.0000	1.818E+00	7.949E-01	2.613E+00	1.018E+01	1.680E-01	0.0	-0.076	0.076	0.064
25.0000	1.864E+00	1.021E+00	2.885E+00	1.200E+01	2.004E-01	0.0	-0.074	0.072	0.060
30.0000	1.901E+00	1.251E+00	3.152E+00	1.365E+01	2.296E-01	6.376E-04	-0.071	0.069	0.056
35.0000	1.931E+00	1.484E+00	3.415E+00	1.518E+01	2.563E-01	2.311E-02	-0.063	0.066	0.052
40.0000	1.956E+00	1.718E+00	3.674E+00	1.659E+01	2.807E-01	6.443E-02	-0.057	0.063	0.048
45.0000	1.977E+00	1.954E+00	3.931E+00	1.790E+01	3.031E-01	1.144E-01	-0.053	0.061	0.045
50.0000	1.995E+00	2.192E+00	4.187E+00	1.913E+01	3.238E-01	1.680E-01	-0.050	0.059	0.042
55.0000	2.011E+00	2.430E+00	4.441E+00	2.029E+01	3.431E-01	2.226E-01	-0.048	0.056	0.039
60.0000	2.025E+00	2.670E+00	4.695E+00	2.139E+01	3.610E-01	2.769E-01	-0.046	0.055	0.037
70.0000	2.050E+00	3.152E+00	5.202E+00	2.341E+01	3.934E-01	3.820E-01	-0.043	0.052	0.033
80.0000	2.071E+00	3.637E+00	5.708E+00	2.525E+01	4.220E-01	4.807E-01	-0.041	0.049	0.030
90.0000	2.089E+00	4.125E+00	6.214E+00	2.692E+01	4.474E-01	5.729E-01	-0.040	0.047	0.027
100.0000	2.105E+00	4.614E+00	6.719E+00	2.847E+01	4.702E-01	6.588E-01	-0.038	0.045	0.025
125.0000	2.138E+00	5.845E+00	7.982E+00	3.188E+01	5.183E-01	8.510E-01	-0.036	0.041	0.021
150.0000	2.164E+00	7.083E+00	9.247E+00	3.479E+01	5.569E-01	1.018E+00	-0.034	0.039	0.018
175.0000	2.185E+00	8.326E+00	1.051E+01	3.732E+01	5.887E-01	1.166E+00	-0.032	0.036	0.016
200.0000	2.204E+00	9.573E+00	1.178E+01	3.957E+01	6.155E-01	1.301E+00	-0.030	0.035	0.015
250.0000	2.234E+00	1.208E+01	1.431E+01	4.341E+01	6.583E-01	1.541E+00	-0.027	0.032	0.012
300.0000	2.257E+00	1.459E+01	1.685E+01	4.663E+01	6.911E-01	1.754E+00	-0.024	0.030	0.010
350.0000	2.275E+00	1.711E+01	1.938E+01	4.940E+01	7.174E-01	1.947E+00	-0.021	0.029	0.009
400.0000	2.291E+00	1.963E+01	2.192E+01	5.182E+01	7.389E-01	2.125E+00	-0.019	0.027	0.008
450.0000	2.304E+00	2.216E+01	2.446E+01	5.398E+01	7.569E-01	2.290E+00	-0.017	0.026	0.007
500.0000	2.315E+00	2.469E+01	2.700E+01	5.592E+01	7.722E-01	2.444E+00	-0.016	0.026	0.007
550.0000	2.325E+00	2.722E+01	2.954E+01	5.769E+01	7.854E-01	2.587E+00	-0.014	0.025	0.006
600.0000	2.334E+00	2.975E+01	3.209E+01	5.932E+01	7.970E-01	2.721E+00	-0.013	0.024	0.006
700.0000	2.349E+00	3.483E+01	3.718E+01	6.221E+01	8.163E-01	2.966E+00	-0.011	0.023	0.005
800.0000	2.361E+00	3.990E+01	4.227E+01	6.473E+01	8.319E-01	3.184E+00	-0.010	0.022	0.004
900.0000	2.372E+00	4.499E+01	4.736E+01	6.696E+01	8.447E-01	3.380E+00	-0.009	0.021	0.004
1000.0000	2.382E+00	5.007E+01	5.245E+01	6.897E+01	8.554E-01	3.558E+00	-0.009	0.021	0.003

ELECTRONS IN TITANIUM

I = 233.0 eV DENSITY = 4.540E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.447E+01	9.835E-03	1.447E+01	4.104E-04	3.509E-04	2.037E-03	-0.256	0.313	0.303
0.0125	1.231E+01	1.025E-02	1.232E+01	5.983E-04	4.319E-04	2.585E-03	-0.242	0.293	0.284
0.0150	1.078E+01	1.056E-02	1.079E+01	8.157E-04	5.109E-04	3.148E-03	-0.232	0.278	0.270
0.0175	9.634E+00	1.080E-02	9.644E+00	1.061E-03	5.878E-04	3.727E-03	-0.224	0.266	0.259
0.0200	8.737E+00	1.099E-02	8.748E+00	1.334E-03	6.629E-04	4.320E-03	-0.218	0.257	0.250
0.0250	7.424E+00	1.129E-02	7.435E+00	1.956E-03	8.081E-04	5.551E-03	-0.208	0.243	0.237
0.0300	6.503E+00	1.150E-02	6.514E+00	2.677E-03	9.472E-04	6.838E-03	-0.200	0.232	0.227
0.0350	5.819E+00	1.167E-02	5.831E+00	3.490E-03	1.081E-03	8.181E-03	-0.194	0.224	0.220
0.0400	5.290E+00	1.180E-02	5.301E+00	4.390E-03	1.210E-03	9.578E-03	-0.189	0.217	0.214
0.0450	4.867E+00	1.192E-02	4.879E+00	5.375E-03	1.335E-03	1.103E-02	-0.185	0.212	0.208
0.0500	4.522E+00	1.202E-02	4.534E+00	6.439E-03	1.456E-03	1.253E-02	-0.181	0.207	0.204
0.0550	4.234E+00	1.210E-02	4.246E+00	7.579E-03	1.574E-03	1.407E-02	-0.178	0.203	0.200
0.0600	3.990E+00	1.218E-02	4.002E+00	8.793E-03	1.689E-03	1.567E-02	-0.175	0.199	0.196
0.0700	3.598E+00	1.233E-02	3.611E+00	1.143E-02	1.909E-03	1.899E-02	-0.170	0.193	0.191
0.0800	3.298E+00	1.246E-02	3.311E+00	1.433E-02	2.119E-03	2.247E-02	-0.166	0.188	0.186
0.0900	3.060E+00	1.259E-02	3.073E+00	1.746E-02	2.321E-03	2.611E-02	-0.163	0.183	0.182
0.1000	2.867E+00	1.272E-02	2.880E+00	2.083E-02	2.514E-03	2.987E-02	-0.160	0.180	0.178
0.1250	2.514E+00	1.306E-02	2.527E+00	3.013E-02	2.971E-03	3.978E-02	-0.153	0.172	0.171
0.1500	2.274E+00	1.341E-02	2.287E+00	4.056E-02	3.396E-03	5.023E-02	-0.148	0.166	0.165
0.1750	2.101E+00	1.379E-02	2.115E+00	5.195E-02	3.796E-03	6.105E-02	-0.144	0.162	0.160
0.2000	1.971E+00	1.419E-02	1.985E+00	6.416E-02	4.176E-03	7.212E-02	-0.140	0.158	0.156
0.2500	1.789E+00	1.506E-02	1.804E+00	9.067E-02	4.892E-03	9.467E-02	-0.134	0.151	0.150
0.3000	1.670E+00	1.600E-02	1.686E+00	1.194E-01	5.563E-03	1.174E-01	-0.129	0.146	0.145
0.3500	1.588E+00	1.702E-02	1.605E+00	1.498E-01	6.204E-03	1.402E-01	-0.125	0.142	0.140
0.4000	1.528E+00	1.811E-02	1.546E+00	1.816E-01	6.824E-03	1.629E-01	-0.121	0.138	0.136
0.4500	1.483E+00	1.925E-02	1.502E+00	2.144E-01	7.428E-03	1.855E-01	-0.118	0.135	0.133
0.5000	1.449E+00	2.044E-02	1.470E+00	2.481E-01	8.021E-03	2.080E-01	-0.115	0.133	0.130
0.5500	1.423E+00	2.169E-02	1.445E+00	2.824E-01	8.607E-03	2.304E-01	-0.112	0.130	0.127
0.6000	1.402E+00	2.297E-02	1.425E+00	3.173E-01	9.186E-03	2.526E-01	-0.109	0.128	0.124
0.7000	1.373E+00	2.566E-02	1.399E+00	3.881E-01	1.034E-02	2.969E-01	-0.104	0.123	0.120
0.8000	1.355E+00	2.848E-02	1.383E+00	4.601E-01	1.148E-02	3.407E-01	-0.100	0.120	0.116
0.9000	1.343E+00	3.141E-02	1.374E+00	5.326E-01	1.261E-02	3.841E-01	-0.096	0.116	0.112
1.0000	1.335E+00	3.446E-02	1.370E+00	6.055E-01	1.375E-02	4.270E-01	-0.092	0.113	0.108
1.2500	1.328E+00	4.250E-02	1.371E+00	7.881E-01	1.662E-02	5.317E-01	-0.084	0.107	0.100
1.5000	1.330E+00	5.107E-02	1.381E+00	9.699E-01	1.951E-02	6.321E-01	-0.078	0.102	0.094
1.7500	1.336E+00	6.006E-02	1.396E+00	1.150E+00	2.244E-02	7.277E-01	-0.073	0.097	0.089
2.0000	1.343E+00	6.940E-02	1.412E+00	1.328E+00	2.539E-02	8.183E-01	-0.070	0.093	0.084
2.5000	1.359E+00	8.894E-02	1.448E+00	1.678E+00	3.137E-02	9.855E-01	-0.064	0.087	0.076
3.0000	1.376E+00	1.094E-01	1.485E+00	2.019E+00	3.740E-02	1.136E+00	-0.060	0.082	0.071
3.5000	1.391E+00	1.306E-01	1.521E+00	2.351E+00	4.345E-02	1.271E+00	-0.057	0.078	0.066
4.0000	1.405E+00	1.523E-01	1.557E+00	2.676E+00	4.949E-02	1.395E+00	-0.054	0.075	0.063
4.5000	1.418E+00	1.746E-01	1.593E+00	2.993E+00	5.552E-02	1.509E+00	-0.052	0.072	0.059
5.0000	1.430E+00	1.974E-01	1.627E+00	3.304E+00	6.152E-02	1.615E+00	-0.050	0.069	0.057
5.5000	1.441E+00	2.205E-01	1.661E+00	3.608E+00	6.747E-02	1.713E+00	-0.048	0.067	0.054
6.0000	1.451E+00	2.440E-01	1.695E+00	3.906E+00	7.337E-02	1.806E+00	-0.047	0.065	0.052
7.0000	1.469E+00	2.919E-01	1.761E+00	4.485E+00	8.502E-02	1.975E+00	-0.044	0.062	0.049
8.0000	1.485E+00	3.408E-01	1.825E+00	5.042E+00	9.643E-02	2.129E+00	-0.041	0.059	0.045
9.0000	1.498E+00	3.906E-01	1.889E+00	5.581E+00	1.076E-01	2.271E+00	-0.038	0.056	0.043
10.0000	1.510E+00	4.411E-01	1.952E+00	6.102E+00	1.185E-01	2.402E+00	-0.036	0.054	0.040
12.5000	1.535E+00	5.701E-01	2.105E+00	7.335E+00	1.445E-01	2.696E+00	-0.030	0.049	0.035
15.0000	1.555E+00	7.019E-01	2.257E+00	8.481E+00	1.690E-01	2.953E+00	-0.026	0.045	0.031
17.5000	1.571E+00	8.361E-01	2.407E+00	9.554E+00	1.919E-01	3.182E+00	-0.023	0.042	0.027
20.0000	1.584E+00	9.721E-01	2.556E+00	1.056E+01	2.134E-01	3.388E+00	-0.020	0.039	0.024
25.0000	1.606E+00	1.248E+00	2.854E+00	1.241E+01	2.527E-01	3.746E+00	-0.016	0.035	0.020
30.0000	1.622E+00	1.528E+00	3.150E+00	1.408E+01	2.875E-01	4.050E+00	-0.014	0.032	0.017
35.0000	1.636E+00	1.811E+00	3.447E+00	1.560E+01	3.187E-01	4.313E+00	-0.013	0.029	0.014
40.0000	1.648E+00	2.096E+00	3.744E+00	1.699E+01	3.467E-01	4.545E+00	-0.011	0.027	0.013
45.0000	1.658E+00	2.384E+00	4.042E+00	1.827E+01	3.721E-01	4.752E+00	-0.010	0.026	0.011
50.0000	1.667E+00	2.673E+00	4.340E+00	1.946E+01	3.952E-01	4.939E+00	-0.010	0.024	0.010
55.0000	1.675E+00	2.963E+00	4.639E+00	2.058E+01	4.163E-01	5.110E+00	-0.009	0.023	0.009
60.0000	1.683E+00	3.255E+00	4.938E+00	2.162E+01	4.357E-01	5.266E+00	-0.009	0.022	0.009
70.0000	1.696E+00	3.843E+00	5.538E+00	2.353E+01	4.702E-01	5.547E+00	-0.008	0.021	0.007
80.0000	1.707E+00	4.433E+00	6.140E+00	2.525E+01	5.000E-01	5.792E+00	-0.007	0.019	0.006
90.0000	1.716E+00	5.027E+00	6.743E+00	2.680E+01	5.260E-01	6.010E+00	-0.006	0.018	0.006
100.0000	1.724E+00	5.623E+00	7.348E+00	2.822E+01	5.490E-01	6.206E+00	-0.006	0.018	0.005
125.0000	1.742E+00	7.122E+00	8.864E+00	3.132E+01	5.963E-01	6.626E+00	-0.005	0.016	0.004
150.0000	1.756E+00	8.629E+00	1.039E+01	3.392E+01	6.332E-01	6.974E+00	-0.004	0.015	0.003
175.0000	1.768E+00	1.014E+01	1.191E+01	3.617E+01	6.630E-01	7.270E+00	-0.003	0.014	0.003
200.0000	1.778E+00	1.166E+01	1.344E+01	3.814E+01	6.876E-01	7.529E+00	-0.002	0.013	0.003
250.0000	1.794E+00	1.471E+01	1.651E+01	4.149E+01	7.262E-01	7.965E+00	-0.002	0.012	0.002
300.0000	1.808E+00	1.777E+01	1.958E+01	4.427E+01	7.551E-01	8.323E+00	-0.001	0.011	0.002
350.0000	1.819E+00	2.084E+01	2.266E+01	4.664E+01	7.778E-01	8.627E+00	-0.001	0.011	0.001
400.0000	1.828E+00	2.391E+01	2.574E+01	4.871E+01	7.962E-01	8.891E+00	-0.001	0.010	0.001
450.0000	1.837E+00	2.698E+01	2.882E+01	5.055E+01	8.113E-01	9.125E+00	-0.001	0.010	0.001
500.0000	1.844E+00	3.006E+01	3.191E+01	5.219E+01	8.241E-01	9.334E+00	-0.001	0.010	0.001
550.0000	1.851E+00	3.315E+01	3.500E+01	5.369E+01	8.351E-01	9.524E+00	-0.000	0.009	0.001
600.0000	1.857E+00	3.623E+01	3.809E+01	5.506E+01	8.446E-01	9.697E+00	-0.000	0.009	0.001
700.0000	1.868E+00	4.241E+01	4.428E+01	5.749E+01	8.603E-01	1.000E+01	-0.000	0.009	0.001
800.0000	1.878E+00	4.859E+01	5.047E+01	5.960E+01	8.728E-01	1.027E+01	-0.000	0.009	0.001
900.0000	1.886E+00	5.478E+01	5.666E+01	6.147E+01	8.831E-01	1.051E+01	-0.000	0.008	0.001
1000.0000	1.893E+00	6.097E+01	6.286E+01	6.315E+01	8.916E-01	1.072E+01	-0.000	0.008	0.001

ELECTRONS IN IRON

I = 286.0 eV DENSITY = 7.874E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.388E+01	1.138E-02	1.390E+01	4.329E-04	4.203E-04	2.474E-03	-0.270	0.338	0.324
0.0125	1.185E+01	1.193E-02	1.186E+01	6.284E-04	5.188E-04	3.157E-03	-0.255	0.314	0.302
0.0150	1.040E+01	1.235E-02	1.041E+01	8.539E-04	6.151E-04	3.866E-03	-0.244	0.297	0.286
0.0175	9.310E+00	1.269E-02	9.323E+00	1.108E-03	7.092E-04	4.602E-03	-0.235	0.284	0.274
0.0200	8.456E+00	1.296E-02	8.469E+00	1.390E-03	8.013E-04	5.365E-03	-0.228	0.273	0.264
0.0250	7.199E+00	1.338E-02	7.213E+00	2.032E-03	9.800E-04	6.975E-03	-0.217	0.257	0.249
0.0300	6.316E+00	1.369E-02	6.330E+00	2.774E-03	1.152E-03	8.696E-03	-0.209	0.245	0.239
0.0350	5.658E+00	1.394E-02	5.672E+00	3.610E-03	1.317E-03	1.053E-02	-0.202	0.235	0.230
0.0400	5.149E+00	1.414E-02	5.163E+00	4.536E-03	1.478E-03	1.248E-02	-0.196	0.228	0.223
0.0450	4.741E+00	1.431E-02	4.756E+00	5.546E-03	1.633E-03	1.455E-02	-0.192	0.222	0.217
0.0500	4.408E+00	1.446E-02	4.422E+00	6.637E-03	1.784E-03	1.673E-02	-0.188	0.216	0.212
0.0550	4.129E+00	1.459E-02	4.144E+00	7.806E-03	1.930E-03	1.902E-02	-0.184	0.212	0.208
0.0600	3.893E+00	1.471E-02	3.908E+00	9.050E-03	2.073E-03	2.143E-02	-0.181	0.207	0.204
0.0700	3.514E+00	1.493E-02	3.529E+00	1.175E-02	2.348E-03	2.657E-02	-0.175	0.200	0.198
0.0800	3.223E+00	1.512E-02	3.238E+00	1.471E-02	2.611E-03	3.211E-02	-0.170	0.195	0.192
0.0900	2.992E+00	1.531E-02	3.007E+00	1.792E-02	2.863E-03	3.801E-02	-0.166	0.190	0.187
0.1000	2.804E+00	1.548E-02	2.820E+00	2.136E-02	3.106E-03	4.422E-02	-0.162	0.185	0.183
0.1250	2.460E+00	1.593E-02	2.476E+00	3.085E-02	3.679E-03	6.070E-02	-0.154	0.177	0.175
0.1500	2.226E+00	1.639E-02	2.242E+00	4.149E-02	4.212E-03	7.794E-02	-0.148	0.170	0.168
0.1750	2.057E+00	1.687E-02	2.074E+00	5.310E-02	4.714E-03	9.538E-02	-0.143	0.164	0.162
0.2000	1.930E+00	1.736E-02	1.947E+00	6.556E-02	5.190E-03	1.127E-01	-0.139	0.160	0.158
0.2500	1.753E+00	1.842E-02	1.771E+00	9.257E-02	6.085E-03	1.467E-01	-0.133	0.152	0.151
0.3000	1.636E+00	1.956E-02	1.656E+00	1.218E-01	6.923E-03	1.797E-01	-0.128	0.147	0.145
0.3500	1.556E+00	2.079E-02	1.576E+00	1.528E-01	7.720E-03	2.116E-01	-0.124	0.142	0.140
0.4000	1.497E+00	2.209E-02	1.519E+00	1.851E-01	8.489E-03	2.427E-01	-0.120	0.138	0.136
0.4500	1.453E+00	2.346E-02	1.477E+00	2.186E-01	9.236E-03	2.731E-01	-0.117	0.135	0.133
0.5000	1.420E+00	2.489E-02	1.445E+00	2.528E-01	9.968E-03	3.027E-01	-0.114	0.132	0.129
0.5500	1.394E+00	2.638E-02	1.421E+00	2.877E-01	1.069E-02	3.317E-01	-0.112	0.130	0.127
0.6000	1.374E+00	2.791E-02	1.402E+00	3.231E-01	1.140E-02	3.601E-01	-0.109	0.127	0.124
0.7000	1.345E+00	3.112E-02	1.376E+00	3.952E-01	1.281E-02	4.152E-01	-0.105	0.123	0.120
0.8000	1.327E+00	3.448E-02	1.362E+00	4.683E-01	1.420E-02	4.682E-01	-0.101	0.120	0.116
0.9000	1.316E+00	3.797E-02	1.354E+00	5.420E-01	1.559E-02	5.195E-01	-0.098	0.117	0.112
1.0000	1.308E+00	4.160E-02	1.350E+00	6.159E-01	1.697E-02	5.690E-01	-0.095	0.114	0.109
1.2500	1.302E+00	5.117E-02	1.353E+00	8.011E-01	2.044E-02	6.865E-01	-0.088	0.108	0.102
1.5000	1.304E+00	6.137E-02	1.365E+00	9.851E-01	2.393E-02	7.962E-01	-0.082	0.103	0.096
1.7500	1.310E+00	7.206E-02	1.382E+00	1.167E+00	2.745E-02	8.990E-01	-0.077	0.099	0.091
2.0000	1.317E+00	8.315E-02	1.400E+00	1.347E+00	3.099E-02	9.959E-01	-0.073	0.095	0.086
2.5000	1.333E+00	1.063E-01	1.440E+00	1.699E+00	3.812E-02	1.174E+00	-0.067	0.089	0.079
3.0000	1.349E+00	1.306E-01	1.480E+00	2.042E+00	4.527E-02	1.333E+00	-0.062	0.084	0.073
3.5000	1.365E+00	1.557E-01	1.520E+00	2.375E+00	5.243E-02	1.478E+00	-0.059	0.080	0.068
4.0000	1.378E+00	1.814E-01	1.560E+00	2.700E+00	5.954E-02	1.610E+00	-0.056	0.076	0.064
4.5000	1.391E+00	2.077E-01	1.599E+00	3.016E+00	6.661E-02	1.730E+00	-0.054	0.073	0.061
5.0000	1.403E+00	2.346E-01	1.638E+00	3.325E+00	7.361E-02	1.842E+00	-0.052	0.071	0.058
5.5000	1.414E+00	2.619E-01	1.676E+00	3.627E+00	8.053E-02	1.946E+00	-0.050	0.069	0.056
6.0000	1.424E+00	2.896E-01	1.713E+00	3.922E+00	8.738E-02	2.043E+00	-0.049	0.066	0.053
7.0000	1.442E+00	3.460E-01	1.788E+00	4.493E+00	1.008E-01	2.219E+00	-0.046	0.063	0.050
8.0000	1.457E+00	4.036E-01	1.861E+00	5.042E+00	1.139E-01	2.377E+00	-0.044	0.060	0.047
9.0000	1.471E+00	4.622E-01	1.933E+00	5.569E+00	1.266E-01	2.521E+00	-0.042	0.057	0.044
10.0000	1.483E+00	5.216E-01	2.005E+00	6.077E+00	1.389E-01	2.652E+00	-0.040	0.055	0.041
12.5000	1.509E+00	6.731E-01	2.182E+00	7.272E+00	1.681E-01	2.942E+00	-0.036	0.051	0.037
15.0000	1.529E+00	8.279E-01	2.357E+00	8.374E+00	1.951E-01	3.192E+00	-0.032	0.047	0.033
17.5000	1.546E+00	9.852E-01	2.531E+00	9.397E+00	2.202E-01	3.412E+00	-0.029	0.044	0.029
20.0000	1.560E+00	1.145E+00	2.704E+00	1.035E+01	2.435E-01	3.610E+00	-0.026	0.041	0.027
25.0000	1.583E+00	1.468E+00	3.050E+00	1.209E+01	2.854E-01	3.956E+00	-0.021	0.037	0.022
30.0000	1.600E+00	1.795E+00	3.396E+00	1.365E+01	3.221E-01	4.251E+00	-0.018	0.034	0.019
35.0000	1.615E+00	2.126E+00	3.741E+00	1.505E+01	3.546E-01	4.508E+00	-0.016	0.032	0.016
40.0000	1.627E+00	2.460E+00	4.087E+00	1.633E+01	3.834E-01	4.736E+00	-0.014	0.030	0.014
45.0000	1.638E+00	2.797E+00	4.434E+00	1.750E+01	4.094E-01	4.941E+00	-0.013	0.028	0.013
50.0000	1.647E+00	3.135E+00	4.782E+00	1.859E+01	4.328E-01	5.126E+00	-0.012	0.027	0.012
55.0000	1.655E+00	3.475E+00	5.130E+00	1.959E+01	4.540E-01	5.295E+00	-0.011	0.025	0.011
60.0000	1.663E+00	3.816E+00	5.479E+00	2.054E+01	4.735E-01	5.451E+00	-0.010	0.024	0.010
70.0000	1.676E+00	4.503E+00	6.178E+00	2.226E+01	5.077E-01	5.729E+00	-0.009	0.023	0.008
80.0000	1.687E+00	5.193E+00	6.880E+00	2.379E+01	5.370E-01	5.973E+00	-0.008	0.021	0.007
90.0000	1.697E+00	5.887E+00	7.584E+00	2.517E+01	5.625E-01	6.189E+00	-0.008	0.020	0.006
100.0000	1.705E+00	6.584E+00	8.289E+00	2.643E+01	5.848E-01	6.384E+00	-0.007	0.019	0.006
125.0000	1.723E+00	8.336E+00	1.006E+01	2.917E+01	6.303E-01	6.801E+00	-0.006	0.018	0.005
150.0000	1.738E+00	1.010E+01	1.184E+01	3.146E+01	6.655E-01	7.146E+00	-0.005	0.017	0.004
175.0000	1.750E+00	1.187E+01	1.362E+01	3.342E+01	6.937E-01	7.440E+00	-0.004	0.016	0.003
200.0000	1.760E+00	1.364E+01	1.540E+01	3.515E+01	7.169E-01	7.696E+00	-0.004	0.015	0.003
250.0000	1.777E+00	1.720E+01	1.898E+01	3.807E+01	7.528E-01	8.128E+00	-0.003	0.014	0.002
300.0000	1.791E+00	2.077E+01	2.256E+01	4.048E+01	7.797E-01	8.484E+00	-0.002	0.013	0.002
350.0000	1.802E+00	2.435E+01	2.615E+01	4.254E+01	8.006E-01	8.787E+00	-0.002	0.012	0.002
400.0000	1.812E+00	2.793E+01	2.974E+01	4.433E+01	8.174E-01	9.050E+00	-0.001	0.012	0.001
450.0000	1.820E+00	3.152E+01	3.334E+01	4.592E+01	8.313E-01	9.283E+00	-0.001	0.011	0.001
500.0000	1.828E+00	3.512E+01	3.694E+01	4.734E+01	8.430E-01	9.491E+00	-0.001	0.011	0.001
550.0000	1.835E+00	3.871E+01	4.055E+01	4.863E+01	8.530E-01	9.680E+00	-0.001	0.011	0.001
600.0000	1.841E+00	4.231E+01	4.415E+01	4.981E+01	8.616E-01	9.853E+00	-0.001	0.011	0.001
700.0000	1.852E+00	4.951E+01	5.137E+01	5.191E+01	8.758E-01	1.016E+01	-0.001	0.010	0.001
800.0000	1.862E+00	5.673E+01	5.859E+01	5.373E+01	8.871E-01	1.043E+01	-0.000	0.010	0.001
900.0000	1.871E+00	6.394E+01	6.581E+01	5.534E+01	8.963E-01	1.066E+01	-0.000	0.010	0.001
1000.0000	1.878E+00	7.116E+01	7.304E+01	5.678E+01	9.040E-01	1.087E+01	-0.000	0.009	0.001

ELECTRONS IN COPPER

I = 322.0 eV DENSITY = 8.960E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.318E+01	1.213E-02	1.319E+01	4.601E-04	4.701E-04	1.244E-03	-0.280	0.354	0.337
0.0125	1.127E+01	1.277E-02	1.128E+01	6.658E-04	5.814E-04	1.585E-03	-0.263	0.328	0.314
0.0150	9.904E+00	1.327E-02	9.917E+00	9.028E-04	6.904E-04	1.938E-03	-0.251	0.310	0.297
0.0175	8.874E+00	1.366E-02	8.887E+00	1.170E-03	7.972E-04	2.304E-03	-0.242	0.295	0.284
0.0200	8.066E+00	1.399E-02	8.080E+00	1.465E-03	9.019E-04	2.683E-03	-0.235	0.284	0.273
0.0250	6.877E+00	1.449E-02	6.892E+00	2.138E-03	1.105E-03	3.481E-03	-0.223	0.266	0.257
0.0300	6.040E+00	1.488E-02	6.055E+00	2.914E-03	1.301E-03	4.334E-03	-0.214	0.253	0.246
0.0350	5.416E+00	1.518E-02	5.431E+00	3.788E-03	1.491E-03	5.247E-03	-0.208	0.243	0.237
0.0400	4.931E+00	1.543E-02	4.947E+00	4.754E-03	1.674E-03	6.220E-03	-0.202	0.235	0.230
0.0450	4.544E+00	1.564E-02	4.560E+00	5.808E-03	1.852E-03	7.259E-03	-0.197	0.229	0.224
0.0500	4.226E+00	1.583E-02	4.242E+00	6.946E-03	2.025E-03	8.365E-03	-0.193	0.223	0.218
0.0550	3.961E+00	1.600E-02	3.977E+00	8.164E-03	2.194E-03	9.542E-03	-0.189	0.218	0.214
0.0600	3.736E+00	1.615E-02	3.753E+00	9.459E-03	2.358E-03	1.080E-02	-0.186	0.214	0.210
0.0700	3.375E+00	1.641E-02	3.392E+00	1.227E-02	2.674E-03	1.354E-02	-0.180	0.207	0.203
0.0800	3.098E+00	1.665E-02	3.114E+00	1.535E-02	2.977E-03	1.664E-02	-0.175	0.201	0.198
0.0900	2.877E+00	1.688E-02	2.894E+00	1.868E-02	3.267E-03	2.013E-02	-0.171	0.196	0.193
0.1000	2.698E+00	1.710E-02	2.715E+00	2.225E-02	3.547E-03	2.404E-02	-0.167	0.191	0.189
0.1250	2.370E+00	1.763E-02	2.387E+00	3.211E-02	4.208E-03	3.583E-02	-0.157	0.182	0.180
0.1500	2.146E+00	1.816E-02	2.164E+00	4.314E-02	4.822E-03	5.053E-02	-0.149	0.174	0.172
0.1750	1.984E+00	1.870E-02	2.002E+00	5.517E-02	5.401E-03	6.758E-02	-0.141	0.168	0.165
0.2000	1.861E+00	1.926E-02	1.881E+00	6.807E-02	5.950E-03	8.595E-02	-0.135	0.162	0.159
0.2500	1.691E+00	2.045E-02	1.711E+00	9.603E-02	6.981E-03	1.236E-01	-0.127	0.152	0.150
0.3000	1.579E+00	2.172E-02	1.601E+00	1.263E-01	7.945E-03	1.603E-01	-0.121	0.145	0.143
0.3500	1.501E+00	2.307E-02	1.524E+00	1.584E-01	8.860E-03	1.958E-01	-0.116	0.139	0.137
0.4000	1.444E+00	2.450E-02	1.469E+00	1.918E-01	9.741E-03	2.302E-01	-0.112	0.135	0.132
0.4500	1.402E+00	2.600E-02	1.428E+00	2.263E-01	1.060E-02	2.635E-01	-0.109	0.131	0.127
0.5000	1.370E+00	2.757E-02	1.398E+00	2.617E-01	1.143E-02	2.958E-01	-0.106	0.127	0.124
0.5500	1.345E+00	2.919E-02	1.375E+00	2.978E-01	1.226E-02	3.273E-01	-0.104	0.124	0.121
0.6000	1.326E+00	3.087E-02	1.357E+00	3.345E-01	1.307E-02	3.581E-01	-0.101	0.122	0.118
0.7000	1.298E+00	3.437E-02	1.333E+00	4.089E-01	1.467E-02	4.173E-01	-0.097	0.117	0.113
0.8000	1.281E+00	3.803E-02	1.319E+00	4.843E-01	1.625E-02	4.739E-01	-0.094	0.113	0.109
0.9000	1.270E+00	4.185E-02	1.312E+00	5.604E-01	1.782E-02	5.280E-01	-0.091	0.110	0.105
1.0000	1.263E+00	4.580E-02	1.309E+00	6.367E-01	1.938E-02	5.799E-01	-0.088	0.107	0.102
1.2500	1.257E+00	5.623E-02	1.313E+00	8.276E-01	2.328E-02	7.011E-01	-0.083	0.101	0.095
1.5000	1.259E+00	6.733E-02	1.327E+00	1.017E+00	2.720E-02	8.121E-01	-0.078	0.097	0.090
1.7500	1.265E+00	7.896E-02	1.344E+00	1.204E+00	3.113E-02	9.149E-01	-0.074	0.093	0.085
2.0000	1.273E+00	9.103E-02	1.364E+00	1.389E+00	3.509E-02	1.011E+00	-0.071	0.090	0.081
2.5000	1.289E+00	1.162E-01	1.405E+00	1.750E+00	4.302E-02	1.186E+00	-0.065	0.084	0.075
3.0000	1.305E+00	1.425E-01	1.448E+00	2.101E+00	5.095E-02	1.343E+00	-0.060	0.079	0.069
3.5000	1.320E+00	1.697E-01	1.490E+00	2.441E+00	5.885E-02	1.486E+00	-0.056	0.076	0.065
4.0000	1.334E+00	1.976E-01	1.531E+00	2.772E+00	6.668E-02	1.617E+00	-0.053	0.072	0.061
4.5000	1.346E+00	2.261E-01	1.573E+00	3.094E+00	7.443E-02	1.738E+00	-0.051	0.069	0.058
5.0000	1.358E+00	2.552E-01	1.613E+00	3.408E+00	8.209E-02	1.850E+00	-0.049	0.067	0.055
5.5000	1.368E+00	2.847E-01	1.653E+00	3.715E+00	8.965E-02	1.954E+00	-0.047	0.065	0.052
6.0000	1.378E+00	3.146E-01	1.693E+00	4.013E+00	9.710E-02	2.052E+00	-0.046	0.063	0.050
7.0000	1.396E+00	3.756E-01	1.771E+00	4.591E+00	1.117E-01	2.229E+00	-0.043	0.059	0.046
8.0000	1.411E+00	4.378E-01	1.849E+00	5.143E+00	1.258E-01	2.388E+00	-0.041	0.056	0.043
9.0000	1.424E+00	5.009E-01	1.925E+00	5.673E+00	1.394E-01	2.532E+00	-0.040	0.054	0.041
10.0000	1.436E+00	5.650E-01	2.001E+00	6.183E+00	1.526E-01	2.664E+00	-0.038	0.052	0.039
12.5000	1.462E+00	7.282E-01	2.190E+00	7.376E+00	1.837E-01	2.951E+00	-0.035	0.048	0.034
15.0000	1.482E+00	8.949E-01	2.377E+00	8.472E+00	2.122E-01	3.194E+00	-0.033	0.044	0.031
17.5000	1.499E+00	1.064E+00	2.563E+00	9.484E+00	2.385E-01	3.407E+00	-0.030	0.042	0.028
20.0000	1.513E+00	1.236E+00	2.749E+00	1.043E+01	2.628E-01	3.597E+00	-0.028	0.039	0.026
25.0000	1.537E+00	1.583E+00	3.120E+00	1.213E+01	3.061E-01	3.927E+00	-0.024	0.036	0.022
30.0000	1.555E+00	1.936E+00	3.491E+00	1.365E+01	3.437E-01	4.209E+00	-0.021	0.033	0.019
35.0000	1.570E+00	2.291E+00	3.861E+00	1.501E+01	3.767E-01	4.456E+00	-0.018	0.031	0.017
40.0000	1.582E+00	2.650E+00	4.233E+00	1.624E+01	4.059E-01	4.676E+00	-0.016	0.029	0.015
45.0000	1.593E+00	3.012E+00	4.605E+00	1.738E+01	4.320E-01	4.874E+00	-0.015	0.027	0.013
50.0000	1.603E+00	3.375E+00	4.978E+00	1.842E+01	4.554E-01	5.054E+00	-0.013	0.026	0.012
55.0000	1.611E+00	3.740E+00	5.351E+00	1.939E+01	4.766E-01	5.219E+00	-0.012	0.025	0.011
60.0000	1.619E+00	4.107E+00	5.725E+00	2.029E+01	4.959E-01	5.372E+00	-0.011	0.024	0.010
70.0000	1.632E+00	4.844E+00	6.476E+00	2.193E+01	5.298E-01	5.646E+00	-0.010	0.022	0.009
80.0000	1.643E+00	5.586E+00	7.229E+00	2.339E+01	5.587E-01	5.886E+00	-0.009	0.021	0.008
90.0000	1.653E+00	6.330E+00	7.983E+00	2.471E+01	5.836E-01	6.100E+00	-0.008	0.020	0.007
100.0000	1.661E+00	7.079E+00	8.740E+00	2.591E+01	6.054E-01	6.292E+00	-0.008	0.019	0.006
125.0000	1.679E+00	8.958E+00	1.064E+01	2.850E+01	6.498E-01	6.705E+00	-0.006	0.018	0.005
150.0000	1.694E+00	1.085E+01	1.254E+01	3.066E+01	6.838E-01	7.046E+00	-0.006	0.016	0.004
175.0000	1.706E+00	1.275E+01	1.445E+01	3.251E+01	7.110E-01	7.336E+00	-0.005	0.016	0.003
200.0000	1.716E+00	1.465E+01	1.637E+01	3.414E+01	7.332E-01	7.590E+00	-0.004	0.015	0.003
250.0000	1.733E+00	1.847E+01	2.020E+01	3.688E+01	7.676E-01	8.017E+00	-0.003	0.014	0.002
300.0000	1.747E+00	2.230E+01	2.404E+01	3.915E+01	7.932E-01	8.370E+00	-0.003	0.013	0.002
350.0000	1.758E+00	2.613E+01	2.789E+01	4.108E+01	8.131E-01	8.670E+00	-0.002	0.012	0.002
400.0000	1.768E+00	2.998E+01	3.174E+01	4.276E+01	8.291E-01	8.931E+00	-0.002	0.012	0.002
450.0000	1.776E+00	3.382E+01	3.560E+01	4.424E+01	8.422E-01	9.162E+00	-0.002	0.012	0.001
500.0000	1.784E+00	3.767E+01	3.946E+01	4.558E+01	8.532E-01	9.369E+00	-0.001	0.011	0.001
550.0000	1.791E+00	4.153E+01	4.332E+01	4.679E+01	8.626E-01	9.558E+00	-0.001	0.011	0.001
600.0000	1.797E+00	4.539E+01	4.718E+01	4.789E+01	8.708E-01	9.730E+00	-0.001	0.011	0.001
700.0000	1.808E+00	5.311E+01	5.491E+01	4.985E+01	8.842E-01	1.004E+01	-0.001	0.010	0.001
800.0000	1.818E+00	6.083E+01	6.265E+01	5.156E+01	8.948E-01	1.030E+01	-0.001	0.010	0.001
900.0000	1.826E+00	6.856E+01	7.039E+01	5.306E+01	9.034E-01	1.053E+01	-0.001	0.010	0.001
1000.0000	1.833E+00	7.629E+01	7.813E+01	5.441E+01	9.106E-01	1.074E+01	-0.000	0.009	0.001

ELECTRONS IN GERMANIUM

I = 350.0 eV DENSITY = 5.323E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.243E+01	1.267E-02	1.244E+01	4.908E-04	5.171E-04	5.175E-04	-0.286	0.367	0.347
0.0125	1.065E+01	1.339E-02	1.066E+01	7.087E-04	6.413E-04	6.632E-04	-0.269	0.340	0.322
0.0150	9.367E+00	1.395E-02	9.381E+00	9.593E-04	7.631E-04	8.152E-04	-0.257	0.319	0.304
0.0175	8.400E+00	1.439E-02	8.414E+00	1.241E-03	8.825E-04	9.734E-04	-0.247	0.304	0.291
0.0200	7.641E+00	1.475E-02	7.655E+00	1.553E-03	9.996E-04	1.138E-03	-0.240	0.292	0.280
0.0250	6.521E+00	1.532E-02	6.536E+00	2.263E-03	1.227E-03	1.484E-03	-0.228	0.273	0.263
0.0300	5.731E+00	1.575E-02	5.747E+00	3.081E-03	1.447E-03	1.853E-03	-0.219	0.260	0.251
0.0350	5.142E+00	1.609E-02	5.158E+00	4.001E-03	1.659E-03	2.244E-03	-0.212	0.249	0.242
0.0400	4.685E+00	1.638E-02	4.701E+00	5.018E-03	1.864E-03	2.656E-03	-0.206	0.241	0.235
0.0450	4.318E+00	1.663E-02	4.335E+00	6.127E-03	2.064E-03	3.089E-03	-0.201	0.234	0.228
0.0500	4.018E+00	1.684E-02	4.035E+00	7.323E-03	2.258E-03	3.541E-03	-0.197	0.228	0.223
0.0550	3.768E+00	1.704E-02	3.785E+00	8.604E-03	2.447E-03	4.013E-03	-0.194	0.223	0.218
0.0600	3.555E+00	1.722E-02	3.572E+00	9.964E-03	2.632E-03	4.502E-03	-0.191	0.219	0.214
0.0700	3.213E+00	1.755E-02	3.231E+00	1.291E-02	2.989E-03	5.535E-03	-0.185	0.212	0.208
0.0800	2.950E+00	1.784E-02	2.968E+00	1.615E-02	3.330E-03	6.634E-03	-0.181	0.206	0.202
0.0900	2.742E+00	1.811E-02	2.760E+00	1.965E-02	3.659E-03	7.795E-03	-0.177	0.201	0.198
0.1000	2.572E+00	1.837E-02	2.591E+00	2.339E-02	3.976E-03	9.014E-03	-0.174	0.197	0.194
0.1250	2.262E+00	1.900E-02	2.281E+00	3.371E-02	4.725E-03	1.230E-02	-0.168	0.188	0.186
0.1500	2.050E+00	1.960E-02	2.070E+00	4.525E-02	5.422E-03	1.588E-02	-0.163	0.182	0.180
0.1750	1.898E+00	2.020E-02	1.918E+00	5.782E-02	6.077E-03	1.973E-02	-0.158	0.177	0.175
0.2000	1.783E+00	2.081E-02	1.804E+00	7.127E-02	6.697E-03	2.381E-02	-0.155	0.173	0.171
0.2500	1.624E+00	2.208E-02	1.646E+00	1.004E-01	7.854E-03	3.258E-02	-0.149	0.166	0.164
0.3000	1.520E+00	2.344E-02	1.543E+00	1.318E-01	8.930E-03	4.209E-02	-0.144	0.161	0.159
0.3500	1.447E+00	2.488E-02	1.472E+00	1.650E-01	9.947E-03	5.225E-02	-0.139	0.156	0.154
0.4000	1.395E+00	2.641E-02	1.422E+00	1.996E-01	1.092E-02	6.300E-02	-0.135	0.153	0.150
0.4500	1.357E+00	2.802E-02	1.385E+00	2.353E-01	1.186E-02	7.432E-02	-0.132	0.149	0.147
0.5000	1.328E+00	2.971E-02	1.357E+00	2.718E-01	1.278E-02	8.619E-02	-0.128	0.146	0.144
0.5500	1.305E+00	3.146E-02	1.337E+00	3.089E-01	1.369E-02	9.857E-02	-0.125	0.144	0.141
0.6000	1.288E+00	3.326E-02	1.321E+00	3.465E-01	1.458E-02	1.114E-01	-0.122	0.141	0.138
0.7000	1.263E+00	3.702E-02	1.300E+00	4.229E-01	1.633E-02	1.386E-01	-0.116	0.137	0.133
0.8000	1.248E+00	4.095E-02	1.289E+00	5.001E-01	1.805E-02	1.673E-01	-0.111	0.133	0.128
0.9000	1.239E+00	4.504E-02	1.284E+00	5.779E-01	1.976E-02	1.973E-01	-0.106	0.129	0.124
1.0000	1.234E+00	4.926E-02	1.283E+00	6.558E-01	2.145E-02	2.282E-01	-0.102	0.125	0.120
1.2500	1.231E+00	6.036E-02	1.291E+00	8.501E-01	2.567E-02	3.083E-01	-0.092	0.118	0.111
1.5000	1.235E+00	7.213E-02	1.307E+00	1.043E+00	2.989E-02	3.894E-01	-0.085	0.112	0.103
1.7500	1.242E+00	8.442E-02	1.326E+00	1.233E+00	3.411E-02	4.695E-01	-0.080	0.106	0.097
2.0000	1.250E+00	9.714E-02	1.347E+00	1.420E+00	3.833E-02	5.474E-01	-0.075	0.102	0.091
2.5000	1.268E+00	1.236E-01	1.391E+00	1.785E+00	4.676E-02	6.953E-01	-0.068	0.094	0.082
3.0000	1.284E+00	1.512E-01	1.436E+00	2.139E+00	5.516E-02	8.323E-01	-0.063	0.089	0.075
3.5000	1.300E+00	1.797E-01	1.480E+00	2.482E+00	6.348E-02	9.593E-01	-0.058	0.084	0.070
4.0000	1.314E+00	2.089E-01	1.523E+00	2.815E+00	7.171E-02	1.077E+00	-0.055	0.080	0.065
4.5000	1.327E+00	2.387E-01	1.566E+00	3.138E+00	7.984E-02	1.188E+00	-0.052	0.076	0.061
5.0000	1.338E+00	2.691E-01	1.608E+00	3.454E+00	8.786E-02	1.292E+00	-0.049	0.073	0.058
5.5000	1.349E+00	2.999E-01	1.649E+00	3.761E+00	9.575E-02	1.389E+00	-0.047	0.070	0.055
6.0000	1.359E+00	3.312E-01	1.690E+00	4.060E+00	1.035E-01	1.481E+00	-0.045	0.068	0.052
7.0000	1.376E+00	3.949E-01	1.771E+00	4.638E+00	1.187E-01	1.651E+00	-0.042	0.064	0.048
8.0000	1.391E+00	4.598E-01	1.851E+00	5.190E+00	1.333E-01	1.805E+00	-0.040	0.060	0.044
9.0000	1.404E+00	5.257E-01	1.930E+00	5.719E+00	1.474E-01	1.945E+00	-0.038	0.057	0.041
10.0000	1.416E+00	5.926E-01	2.009E+00	6.227E+00	1.611E-01	2.074E+00	-0.036	0.055	0.039
12.5000	1.441E+00	7.631E-01	2.204E+00	7.415E+00	1.931E-01	2.357E+00	-0.033	0.050	0.034
15.0000	1.461E+00	9.373E-01	2.398E+00	8.502E+00	2.224E-01	2.597E+00	-0.031	0.046	0.030
17.5000	1.477E+00	1.114E+00	2.592E+00	9.504E+00	2.493E-01	2.806E+00	-0.029	0.043	0.027
20.0000	1.492E+00	1.294E+00	2.786E+00	1.043E+01	2.741E-01	2.991E+00	-0.028	0.041	0.025
25.0000	1.515E+00	1.659E+00	3.173E+00	1.212E+01	3.182E-01	3.311E+00	-0.025	0.037	0.021
30.0000	1.533E+00	2.029E+00	3.562E+00	1.360E+01	3.564E-01	3.583E+00	-0.022	0.034	0.018
35.0000	1.548E+00	2.403E+00	3.952E+00	1.493E+01	3.897E-01	3.820E+00	-0.020	0.032	0.016
40.0000	1.561E+00	2.781E+00	4.342E+00	1.614E+01	4.191E-01	4.031E+00	-0.018	0.030	0.015
45.0000	1.572E+00	3.162E+00	4.734E+00	1.724E+01	4.452E-01	4.222E+00	-0.016	0.028	0.013
50.0000	1.581E+00	3.545E+00	5.127E+00	1.826E+01	4.687E-01	4.396E+00	-0.015	0.027	0.012
55.0000	1.590E+00	3.930E+00	5.520E+00	1.920E+01	4.899E-01	4.556E+00	-0.014	0.026	0.011
60.0000	1.598E+00	4.316E+00	5.914E+00	2.007E+01	5.092E-01	4.704E+00	-0.013	0.025	0.010
70.0000	1.611E+00	5.093E+00	6.704E+00	2.166E+01	5.429E-01	4.971E+00	-0.011	0.023	0.009
80.0000	1.622E+00	5.874E+00	7.495E+00	2.307E+01	5.716E-01	5.206E+00	-0.010	0.022	0.008
90.0000	1.631E+00	6.658E+00	8.289E+00	2.434E+01	5.963E-01	5.417E+00	-0.009	0.021	0.007
100.0000	1.640E+00	7.445E+00	9.085E+00	2.549E+01	6.178E-01	5.607E+00	-0.008	0.020	0.006
125.0000	1.658E+00	9.420E+00	1.108E+01	2.798E+01	6.614E-01	6.015E+00	-0.007	0.019	0.005
150.0000	1.672E+00	1.141E+01	1.308E+01	3.005E+01	6.948E-01	6.352E+00	-0.006	0.017	0.004
175.0000	1.684E+00	1.340E+01	1.508E+01	3.183E+01	7.214E-01	6.640E+00	-0.005	0.016	0.004
200.0000	1.694E+00	1.540E+01	1.709E+01	3.339E+01	7.430E-01	6.891E+00	-0.005	0.016	0.003
250.0000	1.710E+00	1.940E+01	2.111E+01	3.601E+01	7.765E-01	7.315E+00	-0.004	0.015	0.002
300.0000	1.724E+00	2.342E+01	2.514E+01	3.818E+01	8.014E-01	7.664E+00	-0.003	0.014	0.002
350.0000	1.735E+00	2.744E+01	2.918E+01	4.003E+01	8.206E-01	7.961E+00	-0.003	0.013	0.002
400.0000	1.744E+00	3.148E+01	3.322E+01	4.163E+01	8.361E-01	8.220E+00	-0.002	0.013	0.002
450.0000	1.753E+00	3.552E+01	3.727E+01	4.305E+01	8.488E-01	8.449E+00	-0.002	0.012	0.001
500.0000	1.760E+00	3.956E+01	4.132E+01	4.433E+01	8.594E-01	8.655E+00	-0.002	0.012	0.001
550.0000	1.767E+00	4.360E+01	4.537E+01	4.548E+01	8.685E-01	8.842E+00	-0.001	0.012	0.001
600.0000	1.773E+00	4.765E+01	4.943E+01	4.654E+01	8.763E-01	9.014E+00	-0.001	0.011	0.001
700.0000	1.784E+00	5.576E+01	5.754E+01	4.841E+01	8.893E-01	9.318E+00	-0.001	0.011	0.001
800.0000	1.793E+00	6.387E+01	6.566E+01	5.003E+01	8.995E-01	9.582E+00	-0.001	0.011	0.001
900.0000	1.801E+00	7.199E+01	7.379E+01	5.147E+01	9.078E-01	9.815E+00	-0.001	0.010	0.001
1000.0000	1.808E+00	8.011E+01	8.192E+01	5.276E+01	9.147E-01	1.002E+01	-0.001	0.010	0.001

ELECTRONS IN KRYPTON

I = 352.0 eV DENSITY = 3.478E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.210E+01	1.344E-02	1.211E+01	5.046E-04	5.575E-04	0.0	-0.287	0.368	0.347
0.0125	1.036E+01	1.427E-02	1.038E+01	7.285E-04	6.946E-04	0.0	-0.270	0.340	0.322
0.0150	9.116E+00	1.491E-02	9.131E+00	9.860E-04	8.296E-04	0.0	-0.257	0.320	0.304
0.0175	8.175E+00	1.543E-02	8.191E+00	1.276E-03	9.624E-04	0.0	-0.248	0.305	0.291
0.0200	7.437E+00	1.586E-02	7.452E+00	1.596E-03	1.093E-03	0.0	-0.240	0.292	0.280
0.0250	6.347E+00	1.654E-02	6.364E+00	2.325E-03	1.348E-03	0.0	-0.228	0.274	0.263
0.0300	5.579E+00	1.707E-02	5.596E+00	3.165E-03	1.594E-03	0.0	-0.219	0.260	0.251
0.0350	5.006E+00	1.750E-02	5.024E+00	4.110E-03	1.833E-03	0.0	-0.212	0.250	0.242
0.0400	4.561E+00	1.785E-02	4.579E+00	5.154E-03	2.065E-03	0.0	-0.207	0.242	0.235
0.0450	4.205E+00	1.816E-02	4.223E+00	6.292E-03	2.292E-03	0.0	-0.202	0.235	0.228
0.0500	3.913E+00	1.844E-02	3.931E+00	7.521E-03	2.512E-03	0.0	-0.198	0.229	0.223
0.0550	3.669E+00	1.869E-02	3.688E+00	8.835E-03	2.727E-03	0.0	-0.195	0.224	0.219
0.0600	3.462E+00	1.891E-02	3.481E+00	1.023E-02	2.938E-03	0.0	-0.191	0.219	0.215
0.0700	3.129E+00	1.932E-02	3.149E+00	1.326E-02	3.345E-03	0.0	-0.186	0.212	0.208
0.0800	2.874E+00	1.969E-02	2.893E+00	1.658E-02	3.736E-03	0.0	-0.182	0.206	0.203
0.0900	2.671E+00	2.003E-02	2.691E+00	2.016E-02	4.113E-03	0.0	-0.178	0.201	0.198
0.1000	2.506E+00	2.035E-02	2.527E+00	2.400E-02	4.476E-03	0.0	-0.175	0.197	0.194
0.1250	2.204E+00	2.111E-02	2.225E+00	3.459E-02	5.337E-03	0.0	-0.169	0.189	0.186
0.1500	1.999E+00	2.182E-02	2.021E+00	4.640E-02	6.139E-03	0.0	-0.164	0.183	0.180
0.1750	1.851E+00	2.252E-02	1.873E+00	5.928E-02	6.893E-03	0.0	-0.160	0.178	0.176
0.2000	1.740E+00	2.322E-02	1.763E+00	7.305E-02	7.606E-03	0.0	-0.157	0.174	0.172
0.2500	1.585E+00	2.465E-02	1.610E+00	1.028E-01	8.936E-03	0.0	-0.152	0.168	0.165
0.3000	1.484E+00	2.617E-02	1.510E+00	1.350E-01	1.017E-02	0.0	-0.147	0.163	0.160
0.3500	1.415E+00	2.777E-02	1.442E+00	1.689E-01	1.133E-02	0.0	-0.144	0.159	0.156
0.4000	1.365E+00	2.947E-02	1.394E+00	2.042E-01	1.244E-02	0.0	-0.141	0.155	0.153
0.4500	1.328E+00	3.125E-02	1.359E+00	2.405E-01	1.351E-02	0.0	-0.139	0.153	0.150
0.5000	1.300E+00	3.311E-02	1.333E+00	2.777E-01	1.455E-02	0.0	-0.136	0.150	0.147
0.5500	1.279E+00	3.504E-02	1.314E+00	3.154E-01	1.557E-02	0.0	-0.134	0.148	0.145
0.6000	1.263E+00	3.703E-02	1.300E+00	3.537E-01	1.657E-02	0.0	-0.133	0.146	0.143
0.7000	1.241E+00	4.116E-02	1.283E+00	4.312E-01	1.853E-02	0.0	-0.129	0.143	0.139
0.8000	1.229E+00	4.547E-02	1.274E+00	5.094E-01	2.045E-02	0.0	-0.127	0.140	0.136
0.9000	1.222E+00	4.996E-02	1.272E+00	5.880E-01	2.234E-02	0.0	-0.124	0.137	0.133
1.0000	1.219E+00	5.459E-02	1.273E+00	6.666E-01	2.421E-02	0.0	-0.122	0.135	0.131
1.2500	1.221E+00	6.673E-02	1.288E+00	8.620E-01	2.884E-02	0.0	-0.118	0.130	0.125
1.5000	1.230E+00	7.957E-02	1.310E+00	1.055E+00	3.342E-02	0.0	-0.115	0.127	0.121
1.7500	1.242E+00	9.297E-02	1.335E+00	1.244E+00	3.796E-02	0.0	-0.112	0.123	0.117
2.0000	1.255E+00	1.068E-01	1.362E+00	1.429E+00	4.247E-02	0.0	-0.110	0.121	0.114
2.5000	1.282E+00	1.356E-01	1.417E+00	1.789E+00	5.139E-02	0.0	-0.106	0.116	0.109
3.0000	1.307E+00	1.656E-01	1.473E+00	2.135E+00	6.018E-02	0.0	-0.103	0.113	0.104
3.5000	1.330E+00	1.965E-01	1.527E+00	2.468E+00	6.882E-02	0.0	-0.101	0.110	0.101
4.0000	1.352E+00	2.282E-01	1.580E+00	2.790E+00	7.729E-02	0.0	-0.099	0.107	0.098
4.5000	1.371E+00	2.605E-01	1.632E+00	3.102E+00	8.560E-02	0.0	-0.097	0.104	0.095
5.0000	1.389E+00	2.933E-01	1.683E+00	3.403E+00	9.374E-02	0.0	-0.096	0.102	0.092
5.5000	1.406E+00	3.267E-01	1.733E+00	3.696E+00	1.017E-01	0.0	-0.095	0.100	0.090
6.0000	1.422E+00	3.605E-01	1.782E+00	3.981E+00	1.095E-01	0.0	-0.093	0.099	0.088
7.0000	1.450E+00	4.293E-01	1.879E+00	4.527E+00	1.247E-01	0.0	-0.092	0.095	0.084
8.0000	1.474E+00	4.995E-01	1.974E+00	5.046E+00	1.392E-01	0.0	-0.090	0.093	0.081
9.0000	1.497E+00	5.708E-01	2.067E+00	5.541E+00	1.531E-01	0.0	-0.089	0.090	0.078
10.0000	1.516E+00	6.430E-01	2.159E+00	6.014E+00	1.665E-01	0.0	-0.087	0.088	0.075
12.5000	1.559E+00	8.269E-01	2.386E+00	7.115E+00	1.978E-01	0.0	-0.085	0.084	0.070
15.0000	1.594E+00	1.015E+00	2.609E+00	8.116E+00	2.262E-01	0.0	-0.083	0.080	0.065
17.5000	1.624E+00	1.206E+00	2.830E+00	9.036E+00	2.521E-01	0.0	-0.081	0.077	0.061
20.0000	1.650E+00	1.399E+00	3.050E+00	9.887E+00	2.760E-01	0.0	-0.080	0.074	0.058
25.0000	1.694E+00	1.792E+00	3.486E+00	1.142E+01	3.183E-01	0.0	-0.078	0.069	0.053
30.0000	1.729E+00	2.191E+00	3.921E+00	1.277E+01	3.548E-01	7.431E-03	-0.072	0.066	0.048
35.0000	1.758E+00	2.595E+00	4.353E+00	1.398E+01	3.867E-01	3.031E-02	-0.068	0.063	0.044
40.0000	1.782E+00	3.002E+00	4.785E+00	1.508E+01	4.149E-01	6.047E-02	-0.064	0.060	0.041
45.0000	1.803E+00	3.413E+00	5.216E+00	1.608E+01	4.400E-01	9.396E-02	-0.062	0.058	0.038
50.0000	1.822E+00	3.825E+00	5.647E+00	1.700E+01	4.626E-01	1.289E-01	-0.060	0.056	0.035
55.0000	1.838E+00	4.240E+00	6.078E+00	1.785E+01	4.831E-01	1.643E-01	-0.058	0.054	0.033
60.0000	1.853E+00	4.656E+00	6.509E+00	1.865E+01	5.017E-01	1.998E-01	-0.056	0.052	0.031
70.0000	1.879E+00	5.493E+00	7.372E+00	2.009E+01	5.344E-01	2.700E-01	-0.053	0.050	0.028
80.0000	1.901E+00	6.334E+00	8.235E+00	2.137E+01	5.623E-01	3.388E-01	-0.050	0.047	0.025
90.0000	1.920E+00	7.179E+00	9.098E+00	2.253E+01	5.864E-01	4.061E-01	-0.048	0.046	0.023
100.0000	1.936E+00	8.027E+00	9.963E+00	2.358E+01	6.076E-01	4.721E-01	-0.046	0.044	0.021
125.0000	1.970E+00	1.015E+01	1.212E+01	2.585E+01	6.506E-01	6.316E-01	-0.041	0.041	0.018
150.0000	1.996E+00	1.229E+01	1.429E+01	2.774E+01	6.837E-01	7.830E-01	-0.037	0.038	0.016
175.0000	2.017E+00	1.444E+01	1.646E+01	2.937E+01	7.102E-01	9.258E-01	-0.034	0.036	0.014
200.0000	2.034E+00	1.659E+01	1.863E+01	3.080E+01	7.320E-01	1.060E+00	-0.031	0.035	0.012
250.0000	2.062E+00	2.091E+01	2.297E+01	3.321E+01	7.658E-01	1.304E+00	-0.027	0.033	0.010
300.0000	2.084E+00	2.524E+01	2.732E+01	3.521E+01	7.911E-01	1.521E+00	-0.025	0.031	0.008
350.0000	2.102E+00	2.958E+01	3.168E+01	3.690E+01	8.108E-01	1.714E+00	-0.023	0.030	0.007
400.0000	2.117E+00	3.392E+01	3.604E+01	3.838E+01	8.266E-01	1.887E+00	-0.021	0.029	0.007
450.0000	2.130E+00	3.827E+01	4.040E+01	3.969E+01	8.397E-01	2.045E+00	-0.020	0.028	0.006
500.0000	2.141E+00	4.262E+01	4.476E+01	4.087E+01	8.507E-01	2.189E+00	-0.019	0.027	0.005
550.0000	2.151E+00	4.698E+01	4.913E+01	4.193E+01	8.601E-01	2.322E+00	-0.018	0.026	0.005
600.0000	2.160E+00	5.134E+01	5.350E+01	4.291E+01	8.683E-01	2.445E+00	-0.018	0.026	0.005
700.0000	2.176E+00	6.007E+01	6.225E+01	4.464E+01	8.817E-01	2.667E+00	-0.016	0.025	0.004
800.0000	2.190E+00	6.881E+01	7.100E+01	4.614E+01	8.924E-01	2.864E+00	-0.015	0.024	0.003
900.0000	2.201E+00	7.755E+01	7.975E+01	4.747E+01	9.011E-01	3.042E+00	-0.015	0.023	0.003
1000.0000	2.211E+00	8.630E+01	8.851E+01	4.866E+01	9.084E-01	3.203E+00	-0.014	0.023	0.003

ELECTRONS IN MOLYBDENUM

I = 424.0 eV DENSITY = 1.022E+01 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.167E+01	1.524E-02	1.168E+01	5.319E-04	6.528E-04	7.953E-04	-0.303	0.402	0.373
0.0125	1.003E+01	1.627E-02	1.004E+01	7.636E-04	8.148E-04	1.029E-03	-0.284	0.369	0.344
0.0150	8.843E+00	1.709E-02	8.860E+00	1.029E-03	9.749E-04	1.275E-03	-0.270	0.345	0.323
0.0175	7.945E+00	1.776E-02	7.963E+00	1.327E-03	1.133E-03	1.535E-03	-0.260	0.327	0.308
0.0200	7.238E+00	1.832E-02	7.256E+00	1.657E-03	1.288E-03	1.807E-03	-0.251	0.312	0.295
0.0250	6.192E+00	1.922E-02	6.211E+00	2.404E-03	1.593E-03	2.389E-03	-0.238	0.291	0.277
0.0300	5.452E+00	1.992E-02	5.472E+00	3.264E-03	1.889E-03	3.017E-03	-0.228	0.275	0.264
0.0350	4.898E+00	2.050E-02	4.918E+00	4.230E-03	2.177E-03	3.692E-03	-0.221	0.263	0.253
0.0400	4.467E+00	2.099E-02	4.488E+00	5.296E-03	2.458E-03	4.410E-03	-0.214	0.254	0.245
0.0450	4.122E+00	2.142E-02	4.143E+00	6.457E-03	2.732E-03	5.169E-03	-0.209	0.246	0.238
0.0500	3.838E+00	2.181E-02	3.860E+00	7.708E-03	3.000E-03	5.969E-03	-0.205	0.240	0.232
0.0550	3.601E+00	2.216E-02	3.623E+00	9.046E-03	3.262E-03	6.807E-03	-0.201	0.234	0.227
0.0600	3.400E+00	2.247E-02	3.422E+00	1.047E-02	3.519E-03	7.681E-03	-0.198	0.229	0.223
0.0700	3.076E+00	2.305E-02	3.099E+00	1.354E-02	4.017E-03	9.535E-03	-0.192	0.221	0.216
0.0800	2.826E+00	2.357E-02	2.850E+00	1.691E-02	4.497E-03	1.152E-02	-0.187	0.214	0.210
0.0900	2.628E+00	2.404E-02	2.652E+00	2.055E-02	4.961E-03	1.362E-02	-0.183	0.209	0.204
0.1000	2.467E+00	2.449E-02	2.492E+00	2.445E-02	5.409E-03	1.584E-02	-0.180	0.204	0.200
0.1250	2.171E+00	2.551E-02	2.197E+00	3.517E-02	6.474E-03	2.180E-02	-0.173	0.195	0.192
0.1500	1.970E+00	2.646E-02	1.996E+00	4.714E-02	7.469E-03	2.830E-02	-0.167	0.188	0.185
0.1750	1.825E+00	2.737E-02	1.852E+00	6.016E-02	8.406E-03	3.523E-02	-0.163	0.183	0.180
0.2000	1.715E+00	2.826E-02	1.743E+00	7.409E-02	9.292E-03	4.252E-02	-0.159	0.178	0.175
0.2500	1.563E+00	3.005E-02	1.593E+00	1.042E-01	1.095E-02	5.795E-02	-0.153	0.171	0.168
0.3000	1.463E+00	3.192E-02	1.495E+00	1.367E-01	1.248E-02	7.422E-02	-0.147	0.165	0.162
0.3500	1.394E+00	3.388E-02	1.427E+00	1.709E-01	1.391E-02	9.109E-02	-0.143	0.160	0.157
0.4000	1.344E+00	3.593E-02	1.380E+00	2.066E-01	1.529E-02	1.084E-01	-0.139	0.156	0.153
0.4500	1.307E+00	3.808E-02	1.345E+00	2.433E-01	1.661E-02	1.259E-01	-0.135	0.153	0.150
0.5000	1.279E+00	4.032E-02	1.319E+00	2.809E-01	1.789E-02	1.437E-01	-0.132	0.150	0.146
0.5500	1.257E+00	4.264E-02	1.300E+00	3.191E-01	1.915E-02	1.615E-01	-0.129	0.147	0.143
0.6000	1.240E+00	4.502E-02	1.285E+00	3.578E-01	2.038E-02	1.794E-01	-0.126	0.144	0.141
0.7000	1.217E+00	4.996E-02	1.267E+00	4.362E-01	2.279E-02	2.151E-01	-0.122	0.140	0.136
0.8000	1.203E+00	5.510E-02	1.258E+00	5.155E-01	2.514E-02	2.505E-01	-0.117	0.136	0.131
0.9000	1.194E+00	6.043E-02	1.255E+00	5.951E-01	2.746E-02	2.854E-01	-0.113	0.133	0.127
1.0000	1.190E+00	6.592E-02	1.255E+00	6.748E-01	2.974E-02	3.198E-01	-0.110	0.129	0.124
1.2500	1.187E+00	8.032E-02	1.268E+00	8.731E-01	3.538E-02	4.028E-01	-0.103	0.123	0.116
1.5000	1.192E+00	9.550E-02	1.288E+00	1.069E+00	4.095E-02	4.816E-01	-0.097	0.117	0.110
1.7500	1.200E+00	1.113E-01	1.311E+00	1.261E+00	4.646E-02	5.563E-01	-0.093	0.113	0.104
2.0000	1.209E+00	1.276E-01	1.337E+00	1.450E+00	5.193E-02	6.275E-01	-0.088	0.109	0.099
2.5000	1.228E+00	1.615E-01	1.389E+00	1.817E+00	6.272E-02	7.606E-01	-0.081	0.102	0.091
3.0000	1.246E+00	1.967E-01	1.442E+00	2.170E+00	7.333E-02	8.838E-01	-0.075	0.097	0.085
3.5000	1.262E+00	2.329E-01	1.495E+00	2.511E+00	8.373E-02	9.994E-01	-0.070	0.092	0.079
4.0000	1.277E+00	2.699E-01	1.547E+00	2.840E+00	9.392E-02	1.109E+00	-0.065	0.088	0.074
4.5000	1.290E+00	3.077E-01	1.598E+00	3.158E+00	1.039E-01	1.212E+00	-0.061	0.084	0.070
5.0000	1.302E+00	3.461E-01	1.648E+00	3.466E+00	1.136E-01	1.311E+00	-0.057	0.081	0.066
5.5000	1.313E+00	3.851E-01	1.698E+00	3.765E+00	1.232E-01	1.406E+00	-0.054	0.078	0.062
6.0000	1.322E+00	4.246E-01	1.747E+00	4.055E+00	1.325E-01	1.496E+00	-0.051	0.075	0.059
7.0000	1.340E+00	5.049E-01	1.845E+00	4.612E+00	1.505E-01	1.666E+00	-0.046	0.070	0.053
8.0000	1.355E+00	5.867E-01	1.941E+00	5.140E+00	1.677E-01	1.822E+00	-0.042	0.066	0.049
9.0000	1.367E+00	6.697E-01	2.037E+00	5.643E+00	1.841E-01	1.966E+00	-0.039	0.063	0.045
10.0000	1.379E+00	7.538E-01	2.133E+00	6.123E+00	1.999E-01	2.100E+00	-0.037	0.060	0.041
12.5000	1.402E+00	9.680E-01	2.370E+00	7.234E+00	2.362E-01	2.398E+00	-0.032	0.054	0.035
15.0000	1.421E+00	1.187E+00	2.608E+00	8.239E+00	2.689E-01	2.653E+00	-0.029	0.050	0.030
17.5000	1.437E+00	1.409E+00	2.845E+00	9.157E+00	2.984E-01	2.877E+00	-0.027	0.046	0.027
20.0000	1.450E+00	1.634E+00	3.084E+00	1.000E+01	3.252E-01	3.075E+00	-0.025	0.043	0.024
25.0000	1.471E+00	2.091E+00	3.562E+00	1.151E+01	3.721E-01	3.418E+00	-0.022	0.039	0.020
30.0000	1.488E+00	2.555E+00	4.043E+00	1.282E+01	4.118E-01	3.707E+00	-0.019	0.036	0.017
35.0000	1.502E+00	3.024E+00	4.526E+00	1.399E+01	4.459E-01	3.959E+00	-0.017	0.033	0.015
40.0000	1.514E+00	3.497E+00	5.011E+00	1.504E+01	4.756E-01	4.182E+00	-0.015	0.031	0.013
45.0000	1.524E+00	3.974E+00	5.498E+00	1.599E+01	5.017E-01	4.382E+00	-0.014	0.030	0.012
50.0000	1.533E+00	4.453E+00	5.987E+00	1.687E+01	5.249E-01	4.564E+00	-0.013	0.028	0.011
55.0000	1.541E+00	4.935E+00	6.477E+00	1.767E+01	5.457E-01	4.730E+00	-0.012	0.027	0.010
60.0000	1.549E+00	5.419E+00	6.968E+00	1.841E+01	5.644E-01	4.884E+00	-0.011	0.026	0.009
70.0000	1.561E+00	6.392E+00	7.953E+00	1.976E+01	5.968E-01	5.160E+00	-0.009	0.025	0.008
80.0000	1.572E+00	7.370E+00	8.942E+00	2.094E+01	6.240E-01	5.403E+00	-0.008	0.023	0.007
90.0000	1.581E+00	8.352E+00	9.933E+00	2.200E+01	6.472E-01	5.619E+00	-0.007	0.022	0.006
100.0000	1.589E+00	9.339E+00	1.093E+01	2.296E+01	6.673E-01	5.814E+00	-0.007	0.021	0.005
125.0000	1.606E+00	1.181E+01	1.342E+01	2.502E+01	7.075E-01	6.231E+00	-0.006	0.020	0.004
150.0000	1.619E+00	1.430E+01	1.592E+01	2.673E+01	7.379E-01	6.575E+00	-0.005	0.019	0.003
175.0000	1.631E+00	1.680E+01	1.843E+01	2.819E+01	7.618E-01	6.868E+00	-0.004	0.018	0.003
200.0000	1.641E+00	1.931E+01	2.095E+01	2.946E+01	7.811E-01	7.124E+00	-0.004	0.017	0.003
250.0000	1.657E+00	2.433E+01	2.598E+01	3.160E+01	8.108E-01	7.553E+00	-0.003	0.016	0.002
300.0000	1.670E+00	2.936E+01	3.103E+01	3.336E+01	8.326E-01	7.907E+00	-0.002	0.015	0.002
350.0000	1.680E+00	3.441E+01	3.609E+01	3.485E+01	8.494E-01	8.208E+00	-0.002	0.014	0.001
400.0000	1.690E+00	3.946E+01	4.115E+01	3.615E+01	8.627E-01	8.469E+00	-0.002	0.014	0.001
450.0000	1.698E+00	4.452E+01	4.622E+01	3.729E+01	8.737E-01	8.701E+00	-0.001	0.013	0.001
500.0000	1.705E+00	4.959E+01	5.129E+01	3.832E+01	8.828E-01	8.909E+00	-0.001	0.013	0.001
550.0000	1.712E+00	5.466E+01	5.637E+01	3.925E+01	8.906E-01	9.097E+00	-0.001	0.013	0.001
600.0000	1.718E+00	5.973E+01	6.145E+01	4.010E+01	8.973E-01	9.269E+00	-0.001	0.012	0.001
700.0000	1.728E+00	6.988E+01	7.161E+01	4.160E+01	9.082E-01	9.575E+00	-0.001	0.012	0.001
800.0000	1.737E+00	8.004E+01	8.178E+01	4.291E+01	9.169E-01	9.840E+00	-0.001	0.012	0.001
900.0000	1.745E+00	9.022E+01	9.196E+01	4.406E+01	9.239E-01	1.007E+01	-0.001	0.011	0.001
1000.0000	1.753E+00	1.004E+02	1.021E+02	4.509E+01	9.297E-01	1.028E+01	-0.000	0.011	0.001

ELECTRONS IN SILVER

I = 470.0 eV DENSITY = 1.050E+01 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.125E+01	1.634E-02	1.127E+01	5.577E-04	7.226E-04	1.126E-03	-0.313	0.424	0.389
0.0125	9.687E+00	1.754E-02	9.704E+00	7.976E-04	9.040E-04	1.445E-03	-0.292	0.387	0.357
0.0150	8.556E+00	1.849E-02	8.574E+00	1.072E-03	1.084E-03	1.781E-03	-0.278	0.361	0.335
0.0175	7.696E+00	1.927E-02	7.715E+00	1.380E-03	1.261E-03	2.135E-03	-0.267	0.341	0.318
0.0200	7.017E+00	1.992E-02	7.037E+00	1.720E-03	1.437E-03	2.508E-03	-0.258	0.325	0.305
0.0250	6.011E+00	2.099E-02	6.032E+00	2.490E-03	1.781E-03	3.312E-03	-0.244	0.302	0.285
0.0300	5.297E+00	2.184E-02	5.319E+00	3.375E-03	2.117E-03	4.203E-03	-0.233	0.285	0.271
0.0350	4.763E+00	2.254E-02	4.786E+00	4.368E-03	2.444E-03	5.190E-03	-0.225	0.272	0.260
0.0400	4.347E+00	2.314E-02	4.370E+00	5.463E-03	2.764E-03	6.284E-03	-0.219	0.262	0.251
0.0450	4.012E+00	2.367E-02	4.036E+00	6.655E-03	3.077E-03	7.495E-03	-0.213	0.253	0.244
0.0500	3.738E+00	2.414E-02	3.762E+00	7.939E-03	3.383E-03	8.836E-03	-0.208	0.246	0.237
0.0550	3.508E+00	2.458E-02	3.533E+00	9.312E-03	3.684E-03	1.032E-02	-0.204	0.240	0.232
0.0600	3.313E+00	2.497E-02	3.338E+00	1.077E-02	3.979E-03	1.196E-02	-0.200	0.235	0.227
0.0700	2.999E+00	2.569E-02	3.024E+00	1.392E-02	4.552E-03	1.573E-02	-0.193	0.225	0.219
0.0800	2.756E+00	2.634E-02	2.782E+00	1.737E-02	5.106E-03	2.022E-02	-0.186	0.218	0.212
0.0900	2.563E+00	2.693E-02	2.590E+00	2.110E-02	5.643E-03	2.543E-02	-0.181	0.211	0.206
0.1000	2.406E+00	2.748E-02	2.434E+00	2.509E-02	6.163E-03	3.125E-02	-0.176	0.206	0.201
0.1250	2.117E+00	2.875E-02	2.146E+00	3.607E-02	7.402E-03	4.754E-02	-0.166	0.194	0.190
0.1500	1.920E+00	2.990E-02	1.950E+00	4.832E-02	8.564E-03	6.453E-02	-0.159	0.186	0.181
0.1750	1.778E+00	3.098E-02	1.809E+00	6.165E-02	9.661E-03	8.111E-02	-0.154	0.179	0.175
0.2000	1.671E+00	3.203E-02	1.703E+00	7.591E-02	1.070E-02	9.702E-02	-0.149	0.173	0.169
0.2500	1.522E+00	3.413E-02	1.556E+00	1.067E-01	1.264E-02	1.270E-01	-0.143	0.164	0.161
0.3000	1.424E+00	3.628E-02	1.460E+00	1.400E-01	1.443E-02	1.550E-01	-0.138	0.158	0.154
0.3500	1.356E+00	3.852E-02	1.395E+00	1.750E-01	1.612E-02	1.816E-01	-0.133	0.153	0.149
0.4000	1.308E+00	4.085E-02	1.348E+00	2.115E-01	1.772E-02	2.070E-01	-0.130	0.148	0.145
0.4500	1.271E+00	4.328E-02	1.315E+00	2.491E-01	1.927E-02	2.315E-01	-0.126	0.145	0.141
0.5000	1.244E+00	4.580E-02	1.290E+00	2.875E-01	2.076E-02	2.552E-01	-0.123	0.141	0.137
0.5500	1.223E+00	4.840E-02	1.271E+00	3.266E-01	2.222E-02	2.783E-01	-0.121	0.139	0.135
0.6000	1.207E+00	5.107E-02	1.258E+00	3.661E-01	2.365E-02	3.007E-01	-0.119	0.136	0.132
0.7000	1.184E+00	5.659E-02	1.241E+00	4.462E-01	2.643E-02	3.438E-01	-0.114	0.132	0.127
0.8000	1.170E+00	6.233E-02	1.233E+00	5.271E-01	2.914E-02	3.851E-01	-0.111	0.128	0.123
0.9000	1.162E+00	6.827E-02	1.230E+00	6.084E-01	3.179E-02	4.246E-01	-0.108	0.125	0.119
1.0000	1.158E+00	7.439E-02	1.232E+00	6.896E-01	3.441E-02	4.626E-01	-0.105	0.122	0.116
1.2500	1.156E+00	9.038E-02	1.246E+00	8.915E-01	4.082E-02	5.520E-01	-0.099	0.116	0.109
1.5000	1.161E+00	1.072E-01	1.268E+00	1.090E+00	4.711E-02	6.346E-01	-0.094	0.111	0.103
1.7500	1.169E+00	1.247E-01	1.294E+00	1.286E+00	5.330E-02	7.116E-01	-0.090	0.107	0.099
2.0000	1.178E+00	1.428E-01	1.321E+00	1.477E+00	5.942E-02	7.836E-01	-0.086	0.103	0.094
2.5000	1.197E+00	1.802E-01	1.377E+00	1.848E+00	7.144E-02	9.157E-01	-0.081	0.097	0.087
3.0000	1.215E+00	2.190E-01	1.434E+00	2.203E+00	8.317E-02	1.035E+00	-0.076	0.092	0.082
3.5000	1.232E+00	2.589E-01	1.491E+00	2.545E+00	9.461E-02	1.143E+00	-0.072	0.088	0.077
4.0000	1.248E+00	2.997E-01	1.547E+00	2.874E+00	1.057E-01	1.243E+00	-0.069	0.085	0.073
4.5000	1.261E+00	3.412E-01	1.603E+00	3.192E+00	1.166E-01	1.337E+00	-0.066	0.082	0.069
5.0000	1.274E+00	3.834E-01	1.658E+00	3.499E+00	1.271E-01	1.425E+00	-0.063	0.079	0.066
5.5000	1.286E+00	4.263E-01	1.712E+00	3.795E+00	1.374E-01	1.508E+00	-0.060	0.076	0.063
6.0000	1.296E+00	4.696E-01	1.766E+00	4.083E+00	1.474E-01	1.587E+00	-0.058	0.074	0.060
7.0000	1.315E+00	5.577E-01	1.873E+00	4.633E+00	1.667E-01	1.735E+00	-0.054	0.070	0.055
8.0000	1.331E+00	6.474E-01	1.978E+00	5.152E+00	1.849E-01	1.873E+00	-0.050	0.067	0.051
9.0000	1.345E+00	7.384E-01	2.083E+00	5.645E+00	2.023E-01	2.001E+00	-0.046	0.063	0.047
10.0000	1.357E+00	8.305E-01	2.188E+00	6.113E+00	2.188E-01	2.121E+00	-0.043	0.061	0.044
12.5000	1.382E+00	1.065E+00	2.447E+00	7.193E+00	2.567E-01	2.392E+00	-0.037	0.055	0.038
15.0000	1.402E+00	1.304E+00	2.707E+00	8.164E+00	2.904E-01	2.630E+00	-0.033	0.051	0.033
17.5000	1.418E+00	1.547E+00	2.966E+00	9.046E+00	3.207E-01	2.841E+00	-0.030	0.047	0.029
20.0000	1.432E+00	1.794E+00	3.226E+00	9.854E+00	3.480E-01	3.030E+00	-0.028	0.045	0.026
25.0000	1.455E+00	2.293E+00	3.748E+00	1.129E+01	3.954E-01	3.359E+00	-0.024	0.040	0.021
30.0000	1.472E+00	2.800E+00	4.272E+00	1.254E+01	4.353E-01	3.638E+00	-0.022	0.037	0.018
35.0000	1.487E+00	3.313E+00	4.800E+00	1.364E+01	4.693E-01	3.880E+00	-0.020	0.035	0.016
40.0000	1.499E+00	3.831E+00	5.330E+00	1.463E+01	4.988E-01	4.094E+00	-0.018	0.033	0.014
45.0000	1.510E+00	4.352E+00	5.862E+00	1.553E+01	5.246E-01	4.287E+00	-0.017	0.031	0.013
50.0000	1.519E+00	4.876E+00	6.395E+00	1.634E+01	5.474E-01	4.462E+00	-0.015	0.030	0.011
55.0000	1.528E+00	5.403E+00	6.930E+00	1.709E+01	5.677E-01	4.622E+00	-0.014	0.029	0.010
60.0000	1.535E+00	5.932E+00	7.467E+00	1.779E+01	5.860E-01	4.771E+00	-0.013	0.028	0.010
70.0000	1.548E+00	6.995E+00	8.543E+00	1.904E+01	6.176E-01	5.038E+00	-0.012	0.026	0.008
80.0000	1.559E+00	8.065E+00	9.624E+00	2.014E+01	6.440E-01	5.274E+00	-0.010	0.025	0.007
90.0000	1.569E+00	9.139E+00	1.071E+01	2.113E+01	6.664E-01	5.484E+00	-0.009	0.024	0.006
100.0000	1.577E+00	1.022E+01	1.179E+01	2.202E+01	6.858E-01	5.675E+00	-0.008	0.023	0.006
125.0000	1.594E+00	1.293E+01	1.452E+01	2.392E+01	7.245E-01	6.084E+00	-0.007	0.021	0.005
150.0000	1.608E+00	1.565E+01	1.725E+01	2.550E+01	7.535E-01	6.424E+00	-0.006	0.020	0.004
175.0000	1.620E+00	1.838E+01	2.000E+01	2.684E+01	7.763E-01	6.713E+00	-0.005	0.019	0.003
200.0000	1.630E+00	2.112E+01	2.275E+01	2.802E+01	7.948E-01	6.966E+00	-0.005	0.018	0.003
250.0000	1.646E+00	2.661E+01	2.825E+01	2.998E+01	8.229E-01	7.392E+00	-0.004	0.017	0.002
300.0000	1.659E+00	3.211E+01	3.377E+01	3.160E+01	8.435E-01	7.742E+00	-0.003	0.016	0.002
350.0000	1.670E+00	3.763E+01	3.930E+01	3.297E+01	8.594E-01	8.040E+00	-0.003	0.015	0.002
400.0000	1.679E+00	4.316E+01	4.483E+01	3.416E+01	8.720E-01	8.299E+00	-0.002	0.015	0.001
450.0000	1.688E+00	4.869E+01	5.037E+01	3.521E+01	8.823E-01	8.529E+00	-0.002	0.014	0.001
500.0000	1.695E+00	5.422E+01	5.592E+01	3.616E+01	8.908E-01	8.735E+00	-0.002	0.014	0.001
550.0000	1.702E+00	5.976E+01	6.147E+01	3.701E+01	8.981E-01	8.922E+00	-0.002	0.014	0.001
600.0000	1.708E+00	6.531E+01	6.702E+01	3.779E+01	9.044E-01	9.093E+00	-0.001	0.013	0.001
700.0000	1.718E+00	7.641E+01	7.813E+01	3.917E+01	9.147E-01	9.397E+00	-0.001	0.013	0.001
800.0000	1.727E+00	8.751E+01	8.924E+01	4.036E+01	9.228E-01	9.661E+00	-0.001	0.013	0.001
900.0000	1.735E+00	9.863E+01	1.004E+02	4.142E+01	9.293E-01	9.894E+00	-0.001	0.012	0.001
1000.0000	1.743E+00	1.098E+02	1.115E+02	4.237E+01	9.347E-01	1.010E+01	-0.001	0.012	0.001

ELECTRONS IN TIN

I = 488.0 eV DENSITY = 7.310E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.075E+01	1.645E-02	1.077E+01	5.861E-04	7.576E-04	6.966E-04	-0.316	0.434	0.395
0.0125	9.263E+00	1.769E-02	9.281E+00	8.371E-04	9.496E-04	8.851E-04	-0.296	0.395	0.362
0.0150	8.186E+00	1.869E-02	8.205E+00	1.124E-03	1.140E-03	1.079E-03	-0.281	0.367	0.339
0.0175	7.366E+00	1.951E-02	7.386E+00	1.446E-03	1.329E-03	1.279E-03	-0.269	0.347	0.322
0.0200	6.719E+00	2.021E-02	6.740E+00	1.801E-03	1.515E-03	1.484E-03	-0.260	0.330	0.308
0.0250	5.759E+00	2.134E-02	5.781E+00	2.605E-03	1.882E-03	1.910E-03	-0.246	0.306	0.288
0.0300	5.078E+00	2.224E-02	5.100E+00	3.528E-03	2.239E-03	2.358E-03	-0.236	0.289	0.274
0.0350	4.567E+00	2.299E-02	4.590E+00	4.564E-03	2.589E-03	2.827E-03	-0.228	0.276	0.263
0.0400	4.169E+00	2.364E-02	4.193E+00	5.705E-03	2.931E-03	3.316E-03	-0.221	0.265	0.254
0.0450	3.850E+00	2.422E-02	3.874E+00	6.947E-03	3.266E-03	3.826E-03	-0.216	0.256	0.246
0.0500	3.587E+00	2.473E-02	3.612E+00	8.285E-03	3.595E-03	4.355E-03	-0.211	0.249	0.240
0.0550	3.367E+00	2.520E-02	3.393E+00	9.714E-03	3.917E-03	4.904E-03	-0.207	0.243	0.235
0.0600	3.181E+00	2.564E-02	3.206E+00	1.123E-02	4.233E-03	5.473E-03	-0.203	0.238	0.230
0.0700	2.880E+00	2.642E-02	2.907E+00	1.451E-02	4.849E-03	6.667E-03	-0.197	0.229	0.222
0.0800	2.649E+00	2.713E-02	2.676E+00	1.810E-02	5.445E-03	7.935E-03	-0.192	0.222	0.215
0.0900	2.465E+00	2.778E-02	2.492E+00	2.198E-02	6.023E-03	9.276E-03	-0.188	0.216	0.210
0.1000	2.315E+00	2.838E-02	2.343E+00	2.612E-02	6.584E-03	1.069E-02	-0.184	0.211	0.205
0.1250	2.039E+00	2.975E-02	2.069E+00	3.752E-02	7.920E-03	1.451E-02	-0.177	0.201	0.196
0.1500	1.852E+00	3.100E-02	1.883E+00	5.021E-02	9.172E-03	1.875E-02	-0.171	0.193	0.189
0.1750	1.717E+00	3.216E-02	1.749E+00	6.401E-02	1.035E-02	2.338E-02	-0.166	0.187	0.183
0.2000	1.615E+00	3.328E-02	1.648E+00	7.876E-02	1.147E-02	2.838E-02	-0.161	0.182	0.178
0.2500	1.473E+00	3.550E-02	1.508E+00	1.106E-01	1.356E-02	3.942E-02	-0.154	0.174	0.171
0.3000	1.380E+00	3.776E-02	1.418E+00	1.448E-01	1.548E-02	5.166E-02	-0.148	0.168	0.164
0.3500	1.316E+00	4.010E-02	1.356E+00	1.809E-01	1.729E-02	6.492E-02	-0.142	0.162	0.159
0.4000	1.269E+00	4.252E-02	1.312E+00	2.185E-01	1.900E-02	7.898E-02	-0.137	0.158	0.154
0.4500	1.235E+00	4.505E-02	1.280E+00	2.571E-01	2.065E-02	9.366E-02	-0.133	0.154	0.150
0.5000	1.209E+00	4.766E-02	1.257E+00	2.965E-01	2.224E-02	1.088E-01	-0.129	0.150	0.146
0.5500	1.189E+00	5.035E-02	1.239E+00	3.366E-01	2.379E-02	1.243E-01	-0.126	0.147	0.142
0.6000	1.174E+00	5.311E-02	1.227E+00	3.772E-01	2.530E-02	1.399E-01	-0.122	0.144	0.139
0.7000	1.152E+00	5.881E-02	1.211E+00	4.593E-01	2.825E-02	1.717E-01	-0.117	0.138	0.133
0.8000	1.140E+00	6.472E-02	1.204E+00	5.421E-01	3.111E-02	2.036E-01	-0.112	0.134	0.128
0.9000	1.132E+00	7.083E-02	1.203E+00	6.252E-01	3.391E-02	2.354E-01	-0.108	0.130	0.124
1.0000	1.128E+00	7.712E-02	1.205E+00	7.083E-01	3.666E-02	2.669E-01	-0.105	0.126	0.120
1.2500	1.127E+00	9.354E-02	1.220E+00	9.146E-01	4.340E-02	3.436E-01	-0.098	0.119	0.111
1.5000	1.132E+00	1.108E-01	1.243E+00	1.118E+00	4.998E-02	4.168E-01	-0.092	0.113	0.105
1.7500	1.140E+00	1.287E-01	1.269E+00	1.317E+00	5.646E-02	4.863E-01	-0.088	0.108	0.099
2.0000	1.149E+00	1.472E-01	1.297E+00	1.512E+00	6.284E-02	5.525E-01	-0.084	0.104	0.094
2.5000	1.168E+00	1.855E-01	1.354E+00	1.889E+00	7.534E-02	6.753E-01	-0.078	0.098	0.087
3.0000	1.186E+00	2.251E-01	1.412E+00	2.251E+00	8.750E-02	7.874E-01	-0.074	0.092	0.080
3.5000	1.203E+00	2.659E-01	1.469E+00	2.598E+00	9.933E-02	8.904E-01	-0.070	0.088	0.075
4.0000	1.218E+00	3.075E-01	1.526E+00	2.932E+00	1.108E-01	9.857E-01	-0.067	0.084	0.071
4.5000	1.232E+00	3.499E-01	1.582E+00	3.254E+00	1.220E-01	1.075E+00	-0.064	0.081	0.067
5.0000	1.244E+00	3.930E-01	1.637E+00	3.564E+00	1.329E-01	1.158E+00	-0.062	0.078	0.064
5.5000	1.256E+00	4.366E-01	1.692E+00	3.865E+00	1.434E-01	1.236E+00	-0.060	0.076	0.061
6.0000	1.266E+00	4.808E-01	1.747E+00	4.155E+00	1.537E-01	1.311E+00	-0.058	0.073	0.059
7.0000	1.285E+00	5.706E-01	1.856E+00	4.711E+00	1.734E-01	1.449E+00	-0.054	0.069	0.054
8.0000	1.301E+00	6.620E-01	1.963E+00	5.234E+00	1.920E-01	1.576E+00	-0.051	0.066	0.050
9.0000	1.315E+00	7.547E-01	2.070E+00	5.730E+00	2.097E-01	1.695E+00	-0.048	0.063	0.047
10.0000	1.328E+00	8.486E-01	2.176E+00	6.202E+00	2.265E-01	1.805E+00	-0.045	0.061	0.044
12.5000	1.353E+00	1.087E+00	2.441E+00	7.286E+00	2.649E-01	2.057E+00	-0.040	0.055	0.038
15.0000	1.374E+00	1.331E+00	2.705E+00	8.258E+00	2.990E-01	2.279E+00	-0.035	0.051	0.033
17.5000	1.390E+00	1.578E+00	2.969E+00	9.140E+00	3.295E-01	2.478E+00	-0.032	0.048	0.029
20.0000	1.404E+00	1.829E+00	3.233E+00	9.947E+00	3.570E-01	2.658E+00	-0.029	0.045	0.026
25.0000	1.426E+00	2.338E+00	3.764E+00	1.138E+01	4.045E-01	2.974E+00	-0.025	0.041	0.022
30.0000	1.444E+00	2.854E+00	4.298E+00	1.262E+01	4.443E-01	3.244E+00	-0.022	0.038	0.019
35.0000	1.459E+00	3.376E+00	4.834E+00	1.372E+01	4.782E-01	3.480E+00	-0.020	0.035	0.016
40.0000	1.471E+00	3.902E+00	5.373E+00	1.470E+01	5.075E-01	3.689E+00	-0.019	0.033	0.014
45.0000	1.481E+00	4.433E+00	5.914E+00	1.559E+01	5.332E-01	3.878E+00	-0.017	0.031	0.013
50.0000	1.491E+00	4.966E+00	6.457E+00	1.639E+01	5.558E-01	4.049E+00	-0.016	0.030	0.012
55.0000	1.499E+00	5.503E+00	7.002E+00	1.714E+01	5.760E-01	4.206E+00	-0.015	0.029	0.011
60.0000	1.506E+00	6.041E+00	7.547E+00	1.783E+01	5.941E-01	4.351E+00	-0.014	0.028	0.010
70.0000	1.519E+00	7.124E+00	8.643E+00	1.906E+01	6.253E-01	4.612E+00	-0.013	0.026	0.008
80.0000	1.530E+00	8.213E+00	9.743E+00	2.015E+01	6.514E-01	4.843E+00	-0.011	0.025	0.007
90.0000	1.540E+00	9.307E+00	1.085E+01	2.112E+01	6.736E-01	5.050E+00	-0.010	0.024	0.007
100.0000	1.548E+00	1.040E+01	1.195E+01	2.200E+01	6.927E-01	5.237E+00	-0.009	0.023	0.006
125.0000	1.565E+00	1.316E+01	1.473E+01	2.388E+01	7.307E-01	5.640E+00	-0.007	0.021	0.005
150.0000	1.579E+00	1.593E+01	1.751E+01	2.544E+01	7.593E-01	5.976E+00	-0.006	0.020	0.004
175.0000	1.590E+00	1.872E+01	2.031E+01	2.676E+01	7.817E-01	6.263E+00	-0.005	0.019	0.003
200.0000	1.600E+00	2.150E+01	2.310E+01	2.792E+01	7.998E-01	6.513E+00	-0.005	0.018	0.003
250.0000	1.616E+00	2.710E+01	2.871E+01	2.985E+01	8.274E-01	6.936E+00	-0.004	0.017	0.002
300.0000	1.629E+00	3.270E+01	3.433E+01	3.144E+01	8.475E-01	7.284E+00	-0.003	0.016	0.002
350.0000	1.639E+00	3.832E+01	3.996E+01	3.279E+01	8.630E-01	7.581E+00	-0.003	0.016	0.002
400.0000	1.649E+00	4.395E+01	4.560E+01	3.396E+01	8.753E-01	7.839E+00	-0.003	0.015	0.002
450.0000	1.657E+00	4.958E+01	5.124E+01	3.500E+01	8.854E-01	8.067E+00	-0.002	0.015	0.001
500.0000	1.664E+00	5.522E+01	5.688E+01	3.592E+01	8.938E-01	8.272E+00	-0.002	0.014	0.001
550.0000	1.670E+00	6.086E+01	6.253E+01	3.676E+01	9.009E-01	8.458E+00	-0.002	0.014	0.001
600.0000	1.676E+00	6.651E+01	6.819E+01	3.753E+01	9.070E-01	8.629E+00	-0.002	0.014	0.001
700.0000	1.687E+00	7.781E+01	7.950E+01	3.888E+01	9.170E-01	8.931E+00	-0.001	0.013	0.001
800.0000	1.695E+00	8.913E+01	9.082E+01	4.006E+01	9.249E-01	9.194E+00	-0.001	0.013	0.001
900.0000	1.703E+00	1.004E+02	1.021E+02	4.110E+01	9.313E-01	9.427E+00	-0.001	0.013	0.001
1000.0000	1.710E+00	1.118E+02	1.135E+02	4.202E+01	9.366E-01	9.635E+00	-0.001	0.012	0.001

ELECTRONS IN XENON

I = 482.0 eV DENSITY = 5.485E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.054E+01	1.686E-02	1.055E+01	5.971E-04	7.837E-04	0.0	-0.315	0.431	0.391
0.0125	9.078E+00	1.820E-02	9.097E+00	8.531E-04	9.869E-04	0.0	-0.295	0.393	0.359
0.0150	8.022E+00	1.927E-02	8.041E+00	1.146E-03	1.189E-03	0.0	-0.280	0.365	0.337
0.0175	7.218E+00	2.016E-02	7.238E+00	1.474E-03	1.389E-03	0.0	-0.269	0.345	0.320
0.0200	6.583E+00	2.092E-02	6.604E+00	1.836E-03	1.588E-03	0.0	-0.260	0.329	0.307
0.0250	5.641E+00	2.216E-02	5.664E+00	2.657E-03	1.979E-03	0.0	-0.246	0.305	0.287
0.0300	4.974E+00	2.315E-02	4.997E+00	3.600E-03	2.361E-03	0.0	-0.236	0.288	0.272
0.0350	4.473E+00	2.399E-02	4.497E+00	4.656E-03	2.736E-03	0.0	-0.228	0.275	0.261
0.0400	4.083E+00	2.471E-02	4.108E+00	5.821E-03	3.104E-03	0.0	-0.221	0.264	0.253
0.0450	3.770E+00	2.535E-02	3.796E+00	7.089E-03	3.464E-03	0.0	-0.216	0.256	0.245
0.0500	3.513E+00	2.593E-02	3.539E+00	8.454E-03	3.818E-03	0.0	-0.211	0.249	0.239
0.0550	3.298E+00	2.646E-02	3.324E+00	9.913E-03	4.166E-03	0.0	-0.207	0.243	0.234
0.0600	3.115E+00	2.695E-02	3.142E+00	1.146E-02	4.508E-03	0.0	-0.204	0.237	0.229
0.0700	2.821E+00	2.784E-02	2.849E+00	1.481E-02	5.175E-03	0.0	-0.198	0.229	0.222
0.0800	2.594E+00	2.864E-02	2.623E+00	1.847E-02	5.822E-03	0.0	-0.193	0.222	0.215
0.0900	2.414E+00	2.938E-02	2.443E+00	2.243E-02	6.450E-03	0.0	-0.189	0.216	0.210
0.1000	2.267E+00	3.006E-02	2.298E+00	2.665E-02	7.060E-03	0.0	-0.185	0.211	0.206
0.1250	1.998E+00	3.161E-02	2.030E+00	3.827E-02	8.517E-03	0.0	-0.178	0.201	0.197
0.1500	1.815E+00	3.300E-02	1.848E+00	5.121E-02	9.886E-03	0.0	-0.173	0.194	0.190
0.1750	1.683E+00	3.429E-02	1.717E+00	6.527E-02	1.118E-02	0.0	-0.169	0.188	0.184
0.2000	1.584E+00	3.554E-02	1.619E+00	8.028E-02	1.240E-02	0.0	-0.165	0.184	0.180
0.2500	1.445E+00	3.797E-02	1.483E+00	1.126E-01	1.468E-02	0.0	-0.159	0.176	0.173
0.3000	1.355E+00	4.042E-02	1.396E+00	1.475E-01	1.678E-02	0.0	-0.155	0.171	0.167
0.3500	1.293E+00	4.295E-02	1.336E+00	1.841E-01	1.875E-02	0.0	-0.151	0.166	0.163
0.4000	1.249E+00	4.555E-02	1.294E+00	2.222E-01	2.062E-02	0.0	-0.148	0.162	0.159
0.4500	1.216E+00	4.824E-02	1.264E+00	2.613E-01	2.240E-02	0.0	-0.145	0.159	0.156
0.5000	1.192E+00	5.103E-02	1.243E+00	3.012E-01	2.412E-02	0.0	-0.142	0.156	0.153
0.5500	1.173E+00	5.389E-02	1.227E+00	3.417E-01	2.579E-02	0.0	-0.140	0.154	0.150
0.6000	1.159E+00	5.681E-02	1.216E+00	3.826E-01	2.742E-02	0.0	-0.138	0.152	0.148
0.7000	1.140E+00	6.285E-02	1.203E+00	4.654E-01	3.057E-02	0.0	-0.135	0.148	0.144
0.8000	1.130E+00	6.910E-02	1.199E+00	5.487E-01	3.362E-02	0.0	-0.132	0.144	0.140
0.9000	1.124E+00	7.555E-02	1.200E+00	6.321E-01	3.659E-02	0.0	-0.129	0.142	0.137
1.0000	1.122E+00	8.217E-02	1.204E+00	7.153E-01	3.949E-02	0.0	-0.127	0.139	0.134
1.2500	1.126E+00	9.943E-02	1.225E+00	9.213E-01	4.654E-02	0.0	-0.123	0.134	0.128
1.5000	1.135E+00	1.176E-01	1.253E+00	1.123E+00	5.337E-02	0.0	-0.119	0.130	0.123
1.7500	1.147E+00	1.364E-01	1.284E+00	1.320E+00	6.004E-02	0.0	-0.116	0.126	0.119
2.0000	1.160E+00	1.557E-01	1.316E+00	1.513E+00	6.657E-02	0.0	-0.114	0.123	0.115
2.5000	1.186E+00	1.958E-01	1.382E+00	1.883E+00	7.927E-02	0.0	-0.110	0.118	0.109
3.0000	1.211E+00	2.373E-01	1.448E+00	2.237E+00	9.153E-02	0.0	-0.107	0.114	0.104
3.5000	1.233E+00	2.798E-01	1.513E+00	2.574E+00	1.034E-01	0.0	-0.104	0.110	0.100
4.0000	1.254E+00	3.233E-01	1.577E+00	2.898E+00	1.148E-01	0.0	-0.102	0.107	0.097
4.5000	1.273E+00	3.675E-01	1.640E+00	3.209E+00	1.259E-01	0.0	-0.100	0.105	0.093
5.0000	1.290E+00	4.124E-01	1.703E+00	3.508E+00	1.366E-01	0.0	-0.099	0.102	0.090
5.5000	1.306E+00	4.580E-01	1.764E+00	3.796E+00	1.470E-01	0.0	-0.097	0.100	0.088
6.0000	1.321E+00	5.040E-01	1.825E+00	4.075E+00	1.571E-01	0.0	-0.096	0.098	0.085
7.0000	1.348E+00	5.976E-01	1.946E+00	4.606E+00	1.764E-01	0.0	-0.094	0.094	0.081
8.0000	1.372E+00	6.927E-01	2.065E+00	5.104E+00	1.945E-01	0.0	-0.092	0.091	0.077
9.0000	1.393E+00	7.893E-01	2.182E+00	5.575E+00	2.117E-01	0.0	-0.091	0.089	0.074
10.0000	1.412E+00	8.870E-01	2.299E+00	6.022E+00	2.279E-01	0.0	-0.090	0.086	0.071
12.5000	1.453E+00	1.136E+00	2.589E+00	7.046E+00	2.649E-01	0.0	-0.087	0.081	0.065
15.0000	1.487E+00	1.389E+00	2.876E+00	7.962E+00	2.977E-01	0.0	-0.085	0.077	0.060
17.5000	1.515E+00	1.647E+00	3.162E+00	8.790E+00	3.269E-01	0.0	-0.084	0.074	0.056
20.0000	1.540E+00	1.907E+00	3.447E+00	9.547E+00	3.532E-01	2.396E-03	-0.080	0.071	0.053
25.0000	1.581E+00	2.436E+00	4.017E+00	1.089E+01	3.988E-01	2.422E-02	-0.074	0.066	0.047
30.0000	1.613E+00	2.973E+00	4.586E+00	1.205E+01	4.370E-01	5.614E-02	-0.070	0.063	0.042
35.0000	1.640E+00	3.517E+00	5.156E+00	1.308E+01	4.697E-01	9.173E-02	-0.067	0.059	0.038
40.0000	1.662E+00	4.064E+00	5.727E+00	1.400E+01	4.980E-01	1.286E-01	-0.065	0.057	0.035
45.0000	1.682E+00	4.616E+00	6.299E+00	1.483E+01	5.229E-01	1.660E-01	-0.062	0.055	0.032
50.0000	1.700E+00	5.171E+00	6.871E+00	1.559E+01	5.449E-01	2.033E-01	-0.060	0.053	0.030
55.0000	1.716E+00	5.730E+00	7.445E+00	1.629E+01	5.646E-01	2.405E-01	-0.059	0.051	0.028
60.0000	1.730E+00	6.290E+00	8.020E+00	1.694E+01	5.823E-01	2.775E-01	-0.057	0.050	0.026
70.0000	1.754E+00	7.417E+00	9.172E+00	1.810E+01	6.130E-01	3.504E-01	-0.054	0.047	0.024
80.0000	1.775E+00	8.551E+00	1.033E+01	1.913E+01	6.387E-01	4.215E-01	-0.051	0.045	0.021
90.0000	1.793E+00	9.689E+00	1.148E+01	2.005E+01	6.606E-01	4.905E-01	-0.049	0.044	0.020
100.0000	1.809E+00	1.083E+01	1.264E+01	2.088E+01	6.796E-01	5.571E-01	-0.047	0.042	0.018
125.0000	1.841E+00	1.370E+01	1.554E+01	2.266E+01	7.177E-01	7.131E-01	-0.043	0.039	0.015
150.0000	1.867E+00	1.659E+01	1.846E+01	2.413E+01	7.465E-01	8.546E-01	-0.040	0.037	0.013
175.0000	1.888E+00	1.949E+01	2.137E+01	2.539E+01	7.693E-01	9.836E-01	-0.038	0.035	0.011
200.0000	1.905E+00	2.239E+01	2.430E+01	2.649E+01	7.877E-01	1.102E+00	-0.036	0.034	0.010
250.0000	1.934E+00	2.821E+01	3.015E+01	2.833E+01	8.160E-01	1.313E+00	-0.033	0.032	0.009
300.0000	1.957E+00	3.405E+01	3.601E+01	2.985E+01	8.368E-01	1.499E+00	-0.031	0.031	0.007
350.0000	1.976E+00	3.990E+01	4.188E+01	3.113E+01	8.529E-01	1.665E+00	-0.029	0.029	0.006
400.0000	1.992E+00	4.576E+01	4.775E+01	3.225E+01	8.658E-01	1.816E+00	-0.027	0.028	0.006
450.0000	2.005E+00	5.163E+01	5.363E+01	3.324E+01	8.763E-01	1.956E+00	-0.025	0.028	0.005
500.0000	2.017E+00	5.750E+01	5.952E+01	3.412E+01	8.851E-01	2.086E+00	-0.023	0.027	0.005
550.0000	2.027E+00	6.337E+01	6.540E+01	3.492E+01	8.926E-01	2.208E+00	-0.022	0.026	0.004
600.0000	2.036E+00	6.926E+01	7.129E+01	3.566E+01	8.991E-01	2.322E+00	-0.021	0.026	0.004
700.0000	2.052E+00	8.102E+01	8.308E+01	3.695E+01	9.097E-01	2.532E+00	-0.019	0.025	0.003
800.0000	2.066E+00	9.280E+01	9.487E+01	3.808E+01	9.181E-01	2.722E+00	-0.017	0.024	0.003
900.0000	2.077E+00	1.046E+02	1.067E+02	3.907E+01	9.249E-01	2.894E+00	-0.016	0.024	0.003
1000.0000	2.087E+00	1.164E+02	1.185E+02	3.996E+01	9.306E-01	3.052E+00	-0.015	0.023	0.003

ELECTRONS IN GADOLINIUM

I = 591.0 eV DENSITY = 7.900E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	9.753E+00	1.847E-02	9.771E+00	6.627E-04	9.223E-04	2.078E-03	-0.337	0.491	0.430
0.0125	8.440E+00	2.008E-02	8.460E+00	9.385E-04	1.164E-03	2.671E-03	-0.313	0.442	0.391
0.0150	7.481E+00	2.140E-02	7.502E+00	1.253E-03	1.406E-03	3.295E-03	-0.297	0.407	0.364
0.0175	6.747E+00	2.250E-02	6.769E+00	1.604E-03	1.646E-03	3.950E-03	-0.284	0.381	0.344
0.0200	6.165E+00	2.345E-02	6.189E+00	1.991E-03	1.885E-03	4.637E-03	-0.273	0.361	0.328
0.0250	5.299E+00	2.501E-02	5.324E+00	2.866E-03	2.357E-03	6.106E-03	-0.258	0.331	0.305
0.0300	4.681E+00	2.628E-02	4.707E+00	3.867E-03	2.821E-03	7.705E-03	-0.246	0.310	0.288
0.0350	4.216E+00	2.736E-02	4.244E+00	4.988E-03	3.278E-03	9.430E-03	-0.237	0.295	0.276
0.0400	3.853E+00	2.831E-02	3.882E+00	6.221E-03	3.727E-03	1.128E-02	-0.230	0.282	0.266
0.0450	3.561E+00	2.916E-02	3.590E+00	7.562E-03	4.170E-03	1.324E-02	-0.223	0.272	0.257
0.0500	3.321E+00	2.993E-02	3.351E+00	9.005E-03	4.605E-03	1.530E-02	-0.218	0.263	0.250
0.0550	3.120E+00	3.064E-02	3.150E+00	1.054E-02	5.035E-03	1.746E-02	-0.213	0.256	0.244
0.0600	2.948E+00	3.130E-02	2.980E+00	1.218E-02	5.458E-03	1.970E-02	-0.209	0.250	0.239
0.0700	2.672E+00	3.251E-02	2.705E+00	1.571E-02	6.288E-03	2.439E-02	-0.202	0.239	0.230
0.0800	2.459E+00	3.360E-02	2.492E+00	1.956E-02	7.097E-03	2.926E-02	-0.197	0.231	0.222
0.0900	2.289E+00	3.461E-02	2.324E+00	2.372E-02	7.885E-03	3.424E-02	-0.192	0.224	0.216
0.1000	2.151E+00	3.554E-02	2.186E+00	2.816E-02	8.655E-03	3.927E-02	-0.187	0.218	0.211
0.1250	1.876E+00	3.765E-02	1.934E+00	4.037E-02	1.050E-02	5.187E-02	-0.179	0.207	0.200
0.1500	1.723E+00	3.952E-02	1.762E+00	5.394E-02	1.224E-02	6.425E-02	-0.173	0.198	0.192
0.1750	1.597E+00	4.124E-02	1.639E+00	6.868E-02	1.390E-02	7.632E-02	-0.168	0.191	0.186
0.2000	1.503E+00	4.287E-02	1.546E+00	8.440E-02	1.547E-02	8.808E-02	-0.163	0.185	0.180
0.2500	1.371E+00	4.601E-02	1.417E+00	1.183E-01	1.840E-02	1.108E-01	-0.156	0.177	0.172
0.3000	1.285E+00	4.912E-02	1.334E+00	1.547E-01	2.111E-02	1.327E-01	-0.151	0.170	0.165
0.3500	1.225E+00	5.225E-02	1.278E+00	1.931E-01	2.365E-02	1.538E-01	-0.146	0.164	0.160
0.4000	1.183E+00	5.547E-02	1.238E+00	2.329E-01	2.605E-02	1.743E-01	-0.142	0.160	0.155
0.4500	1.151E+00	5.875E-02	1.210E+00	2.737E-01	2.835E-02	1.943E-01	-0.138	0.156	0.151
0.5000	1.127E+00	6.211E-02	1.189E+00	3.154E-01	3.055E-02	2.138E-01	-0.135	0.152	0.148
0.5500	1.109E+00	6.553E-02	1.174E+00	3.578E-01	3.269E-02	2.328E-01	-0.132	0.149	0.145
0.6000	1.095E+00	6.903E-02	1.164E+00	4.006E-01	3.476E-02	2.514E-01	-0.130	0.147	0.142
0.7000	1.075E+00	7.619E-02	1.152E+00	4.870E-01	3.876E-02	2.876E-01	-0.125	0.142	0.137
0.8000	1.064E+00	8.356E-02	1.148E+00	5.740E-01	4.260E-02	3.223E-01	-0.121	0.138	0.132
0.9000	1.057E+00	9.112E-02	1.149E+00	6.611E-01	4.632E-02	3.556E-01	-0.118	0.134	0.128
1.0000	1.054E+00	9.888E-02	1.153E+00	7.481E-01	4.994E-02	3.878E-01	-0.115	0.131	0.125
1.2500	1.054E+00	1.190E-01	1.173E+00	9.631E-01	5.868E-02	4.637E-01	-0.109	0.124	0.117
1.5000	1.060E+00	1.399E-01	1.200E+00	1.174E+00	6.707E-02	5.337E-01	-0.104	0.119	0.111
1.7500	1.069E+00	1.616E-01	1.231E+00	1.380E+00	7.520E-02	5.989E-01	-0.100	0.114	0.106
2.0000	1.079E+00	1.839E-01	1.262E+00	1.580E+00	8.312E-02	6.600E-01	-0.096	0.111	0.101
2.5000	1.098E+00	2.299E-01	1.328E+00	1.966E+00	9.840E-02	7.725E-01	-0.090	0.104	0.094
3.0000	1.116E+00	2.773E-01	1.394E+00	2.334E+00	1.130E-01	8.746E-01	-0.085	0.099	0.087
3.5000	1.133E+00	3.259E-01	1.459E+00	2.684E+00	1.271E-01	9.689E-01	-0.081	0.095	0.082
4.0000	1.148E+00	3.754E-01	1.524E+00	3.020E+00	1.406E-01	1.057E+00	-0.077	0.091	0.078
4.5000	1.162E+00	4.258E-01	1.588E+00	3.341E+00	1.535E-01	1.139E+00	-0.074	0.087	0.074
5.0000	1.174E+00	4.770E-01	1.651E+00	3.650E+00	1.661E-01	1.217E+00	-0.071	0.084	0.070
5.5000	1.186E+00	5.288E-01	1.715E+00	3.947E+00	1.781E-01	1.291E+00	-0.068	0.082	0.067
6.0000	1.196E+00	5.811E-01	1.777E+00	4.234E+00	1.898E-01	1.361E+00	-0.066	0.079	0.064
7.0000	1.215E+00	6.874E-01	1.902E+00	4.777E+00	2.119E-01	1.492E+00	-0.062	0.075	0.059
8.0000	1.231E+00	7.954E-01	2.026E+00	5.287E+00	2.325E-01	1.612E+00	-0.059	0.072	0.054
9.0000	1.245E+00	9.049E-01	2.150E+00	5.766E+00	2.519E-01	1.723E+00	-0.056	0.068	0.051
10.0000	1.257E+00	1.016E+00	2.273E+00	6.218E+00	2.701E-01	1.826E+00	-0.054	0.066	0.048
12.5000	1.284E+00	1.298E+00	2.581E+00	7.249E+00	3.112E-01	2.056E+00	-0.049	0.060	0.041
15.0000	1.304E+00	1.585E+00	2.889E+00	8.164E+00	3.471E-01	2.255E+00	-0.046	0.056	0.037
17.5000	1.322E+00	1.877E+00	3.198E+00	8.986E+00	3.787E-01	2.433E+00	-0.042	0.053	0.033
20.0000	1.337E+00	2.172E+00	3.508E+00	9.732E+00	4.068E-01	2.593E+00	-0.040	0.050	0.030
25.0000	1.360E+00	2.771E+00	4.131E+00	1.104E+01	4.546E-01	2.875E+00	-0.035	0.045	0.025
30.0000	1.379E+00	3.379E+00	4.758E+00	1.217E+01	4.941E-01	3.119E+00	-0.031	0.042	0.022
35.0000	1.394E+00	3.994E+00	5.388E+00	1.316E+01	5.272E-01	3.334E+00	-0.028	0.040	0.019
40.0000	1.407E+00	4.615E+00	6.022E+00	1.404E+01	5.556E-01	3.528E+00	-0.026	0.038	0.017
45.0000	1.418E+00	5.240E+00	6.658E+00	1.482E+01	5.802E-01	3.704E+00	-0.024	0.036	0.015
50.0000	1.428E+00	5.869E+00	7.297E+00	1.554E+01	6.018E-01	3.865E+00	-0.022	0.034	0.014
55.0000	1.436E+00	6.502E+00	7.938E+00	1.620E+01	6.209E-01	4.014E+00	-0.020	0.033	0.013
60.0000	1.444E+00	7.136E+00	8.580E+00	1.680E+01	6.379E-01	4.152E+00	-0.019	0.032	0.012
70.0000	1.457E+00	8.414E+00	9.871E+00	1.789E+01	6.672E-01	4.400E+00	-0.017	0.030	0.010
80.0000	1.468E+00	9.698E+00	1.117E+01	1.884E+01	6.914E-01	4.621E+00	-0.016	0.029	0.009
90.0000	1.478E+00	1.099E+01	1.247E+01	1.969E+01	7.118E-01	4.818E+00	-0.015	0.028	0.008
100.0000	1.487E+00	1.229E+01	1.377E+01	2.045E+01	7.293E-01	4.997E+00	-0.013	0.027	0.007
125.0000	1.504E+00	1.554E+01	1.704E+01	2.208E+01	7.640E-01	5.384E+00	-0.011	0.025	0.006
150.0000	1.518E+00	1.881E+01	2.033E+01	2.342E+01	7.898E-01	5.707E+00	-0.010	0.024	0.005
175.0000	1.530E+00	2.210E+01	2.363E+01	2.456E+01	8.099E-01	5.984E+00	-0.008	0.023	0.004
200.0000	1.540E+00	2.539E+01	2.693E+01	2.555E+01	8.260E-01	6.228E+00	-0.007	0.022	0.004
250.0000	1.556E+00	3.199E+01	3.355E+01	2.721E+01	8.506E-01	6.641E+00	-0.006	0.020	0.003
300.0000	1.568E+00	3.861E+01	4.018E+01	2.857E+01	8.684E-01	6.983E+00	-0.005	0.019	0.002
350.0000	1.579E+00	4.524E+01	4.682E+01	2.972E+01	8.820E-01	7.275E+00	-0.004	0.019	0.002
400.0000	1.588E+00	5.188E+01	5.346E+01	3.072E+01	8.928E-01	7.530E+00	-0.004	0.018	0.002
450.0000	1.596E+00	5.853E+01	6.012E+01	3.160E+01	9.016E-01	7.756E+00	-0.004	0.018	0.002
500.0000	1.603E+00	6.518E+01	6.678E+01	3.239E+01	9.089E-01	7.958E+00	-0.003	0.017	0.002
550.0000	1.610E+00	7.184E+01	7.345E+01	3.311E+01	9.151E-01	8.142E+00	-0.003	0.017	0.001
600.0000	1.615E+00	7.850E+01	8.011E+01	3.376E+01	9.204E-01	8.311E+00	-0.003	0.016	0.001
700.0000	1.626E+00	9.183E+01	9.346E+01	3.491E+01	9.291E-01	8.610E+00	-0.002	0.016	0.001
800.0000	1.634E+00	1.052E+02	1.068E+02	3.591E+01	9.359E-01	8.871E+00	-0.002	0.015	0.001
900.0000	1.642E+00	1.185E+02	1.202E+02	3.680E+01	9.415E-01	9.101E+00	-0.002	0.015	0.001
1000.0000	1.649E+00	1.319E+02	1.335E+02	3.758E+01	9.460E-01	9.308E+00	-0.002	0.015	0.001

ELECTRONS IN TUNGSTEN

I = 727.0 eV DENSITY = 1.930E+01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	8.974E+00	1.977E-02	8.993E+00	7.489E-04	1.076E-03	9.911E-04	-0.362	0.595	0.487
0.0125	7.806E+00	2.165E-02	7.828E+00	1.048E-03	1.357E-03	1.263E-03	-0.335	0.524	0.435
0.0150	6.945E+00	2.320E-02	6.968E+00	1.387E-03	1.639E-03	1.544E-03	-0.316	0.475	0.401
0.0175	6.281E+00	2.450E-02	6.306E+00	1.765E-03	1.920E-03	1.834E-03	-0.302	0.439	0.376
0.0200	5.753E+00	2.563E-02	5.779E+00	2.179E-03	2.200E-03	2.133E-03	-0.290	0.412	0.357
0.0250	4.961E+00	2.752E-02	4.989E+00	3.114E-03	2.756E-03	2.758E-03	-0.273	0.372	0.329
0.0300	4.394E+00	2.908E-02	4.423E+00	4.181E-03	3.304E-03	3.417E-03	-0.260	0.345	0.309
0.0350	3.966E+00	3.042E-02	3.996E+00	5.372E-03	3.846E-03	4.109E-03	-0.250	0.324	0.294
0.0400	3.631E+00	3.160E-02	3.662E+00	6.681E-03	4.381E-03	4.834E-03	-0.242	0.309	0.283
0.0450	3.360E+00	3.267E-02	3.393E+00	8.101E-03	4.908E-03	5.591E-03	-0.236	0.296	0.273
0.0500	3.137E+00	3.364E-02	3.171E+00	9.627E-03	5.430E-03	6.378E-03	-0.230	0.286	0.265
0.0550	2.950E+00	3.454E-02	2.985E+00	1.125E-02	5.944E-03	7.195E-03	-0.225	0.277	0.258
0.0600	2.791E+00	3.539E-02	2.826E+00	1.298E-02	6.453E-03	8.041E-03	-0.221	0.269	0.252
0.0700	2.533E+00	3.694E-02	2.570E+00	1.669E-02	7.453E-03	9.817E-03	-0.214	0.257	0.243
0.0800	2.335E+00	3.834E-02	2.373E+00	2.075E-02	8.430E-03	1.170E-02	-0.208	0.247	0.235
0.0900	2.176E+00	3.964E-02	2.216E+00	2.511E-02	9.385E-03	1.369E-02	-0.203	0.239	0.228
0.1000	2.047E+00	4.084E-02	2.088E+00	2.977E-02	1.032E-02	1.577E-02	-0.198	0.233	0.222
0.1250	1.808E+00	4.355E-02	1.852E+00	4.253E-02	1.257E-02	2.139E-02	-0.190	0.220	0.211
0.1500	1.646E+00	4.595E-02	1.692E+00	5.668E-02	1.470E-02	2.755E-02	-0.183	0.210	0.202
0.1750	1.528E+00	4.814E-02	1.576E+00	7.202E-02	1.673E-02	3.420E-02	-0.177	0.203	0.196
0.2000	1.439E+00	5.021E-02	1.490E+00	8.835E-02	1.865E-02	4.131E-02	-0.172	0.196	0.190
0.2500	1.315E+00	5.414E-02	1.370E+00	1.235E-01	2.226E-02	5.677E-02	-0.163	0.186	0.180
0.3000	1.234E+00	5.797E-02	1.292E+00	1.611E-01	2.558E-02	7.370E-02	-0.156	0.178	0.173
0.3500	1.178E+00	6.179E-02	1.240E+00	2.007E-01	2.870E-02	9.188E-02	-0.149	0.172	0.166
0.4000	1.138E+00	6.565E-02	1.203E+00	2.416E-01	3.164E-02	1.111E-01	-0.143	0.166	0.160
0.4500	1.108E+00	6.956E-02	1.177E+00	2.836E-01	3.443E-02	1.310E-01	-0.138	0.161	0.155
0.5000	1.085E+00	7.353E-02	1.159E+00	3.265E-01	3.712E-02	1.515E-01	-0.134	0.157	0.151
0.5500	1.068E+00	7.755E-02	1.146E+00	3.699E-01	3.971E-02	1.723E-01	-0.130	0.153	0.147
0.6000	1.055E+00	8.162E-02	1.136E+00	4.137E-01	4.221E-02	1.932E-01	-0.126	0.149	0.143
0.7000	1.036E+00	8.993E-02	1.126E+00	5.022E-01	4.702E-02	2.352E-01	-0.120	0.143	0.136
0.8000	1.025E+00	9.841E-02	1.124E+00	5.911E-01	5.161E-02	2.768E-01	-0.114	0.138	0.130
0.9000	1.019E+00	1.071E-01	1.126E+00	6.800E-01	5.602E-02	3.176E-01	-0.110	0.133	0.125
1.0000	1.016E+00	1.159E-01	1.132E+00	7.686E-01	6.030E-02	3.575E-01	-0.106	0.129	0.121
1.2500	1.016E+00	1.387E-01	1.154E+00	9.875E-01	7.051E-02	4.528E-01	-0.099	0.120	0.111
1.5000	1.021E+00	1.624E-01	1.183E+00	1.201E+00	8.022E-02	5.416E-01	-0.094	0.114	0.104
1.7500	1.029E+00	1.868E-01	1.215E+00	1.410E+00	8.955E-02	6.242E-01	-0.089	0.109	0.098
2.0000	1.037E+00	2.117E-01	1.249E+00	1.613E+00	9.856E-02	7.015E-01	-0.086	0.104	0.093
2.5000	1.055E+00	2.630E-01	1.318E+00	2.003E+00	1.158E-01	8.423E-01	-0.080	0.097	0.085
3.0000	1.072E+00	3.158E-01	1.388E+00	2.372E+00	1.321E-01	9.684E-01	-0.075	0.092	0.078
3.5000	1.087E+00	3.698E-01	1.457E+00	2.724E+00	1.476E-01	1.083E+00	-0.072	0.087	0.073
4.0000	1.101E+00	4.248E-01	1.526E+00	3.059E+00	1.625E-01	1.188E+00	-0.068	0.083	0.069
4.5000	1.114E+00	4.806E-01	1.595E+00	3.380E+00	1.766E-01	1.286E+00	-0.065	0.080	0.065
5.0000	1.126E+00	5.372E-01	1.663E+00	3.687E+00	1.902E-01	1.378E+00	-0.063	0.077	0.061
5.5000	1.136E+00	5.945E-01	1.731E+00	3.981E+00	2.032E-01	1.463E+00	-0.061	0.074	0.058
6.0000	1.146E+00	6.523E-01	1.798E+00	4.265E+00	2.157E-01	1.544E+00	-0.059	0.072	0.056
7.0000	1.163E+00	7.697E-01	1.933E+00	4.801E+00	2.393E-01	1.694E+00	-0.055	0.068	0.051
8.0000	1.178E+00	8.890E-01	2.067E+00	5.301E+00	2.612E-01	1.830E+00	-0.052	0.064	0.047
9.0000	1.191E+00	1.010E+00	2.201E+00	5.770E+00	2.816E-01	1.955E+00	-0.050	0.061	0.044
10.0000	1.203E+00	1.132E+00	2.335E+00	6.211E+00	3.006E-01	2.070E+00	-0.048	0.059	0.041
12.5000	1.227E+00	1.443E+00	2.670E+00	7.212E+00	3.432E-01	2.324E+00	-0.043	0.054	0.035
15.0000	1.247E+00	1.759E+00	3.006E+00	8.094E+00	3.800E-01	2.544E+00	-0.040	0.050	0.031
17.5000	1.263E+00	2.081E+00	3.343E+00	8.882E+00	4.120E-01	2.737E+00	-0.037	0.047	0.028
20.0000	1.277E+00	2.406E+00	3.682E+00	9.594E+00	4.403E-01	2.910E+00	-0.035	0.044	0.025
25.0000	1.299E+00	3.065E+00	4.364E+00	1.084E+01	4.881E-01	3.212E+00	-0.031	0.040	0.021
30.0000	1.316E+00	3.735E+00	5.051E+00	1.190E+01	5.270E-01	3.471E+00	-0.027	0.038	0.018
35.0000	1.331E+00	4.412E+00	5.743E+00	1.283E+01	5.595E-01	3.698E+00	-0.025	0.035	0.016
40.0000	1.343E+00	5.096E+00	6.439E+00	1.365E+01	5.871E-01	3.901E+00	-0.023	0.034	0.014
45.0000	1.353E+00	5.784E+00	7.138E+00	1.439E+01	6.109E-01	4.084E+00	-0.021	0.032	0.013
50.0000	1.362E+00	6.477E+00	7.840E+00	1.506E+01	6.316E-01	4.252E+00	-0.019	0.031	0.012
55.0000	1.371E+00	7.174E+00	8.544E+00	1.567E+01	6.500E-01	4.405E+00	-0.018	0.030	0.011
60.0000	1.378E+00	7.873E+00	9.251E+00	1.623E+01	6.662E-01	4.548E+00	-0.017	0.029	0.010
70.0000	1.391E+00	9.280E+00	1.067E+01	1.724E+01	6.940E-01	4.804E+00	-0.015	0.027	0.008
80.0000	1.401E+00	1.070E+01	1.210E+01	1.812E+01	7.169E-01	5.031E+00	-0.014	0.026	0.007
90.0000	1.411E+00	1.212E+01	1.353E+01	1.890E+01	7.362E-01	5.233E+00	-0.013	0.025	0.007
100.0000	1.419E+00	1.355E+01	1.496E+01	1.960E+01	7.526E-01	5.417E+00	-0.012	0.024	0.006
125.0000	1.436E+00	1.713E+01	1.857E+01	2.110E+01	7.850E-01	5.812E+00	-0.010	0.022	0.005
150.0000	1.449E+00	2.074E+01	2.219E+01	2.233E+01	8.090E-01	6.141E+00	-0.008	0.021	0.004
175.0000	1.460E+00	2.436E+01	2.582E+01	2.337E+01	8.276E-01	6.423E+00	-0.007	0.020	0.003
200.0000	1.470E+00	2.798E+01	2.945E+01	2.428E+01	8.425E-01	6.670E+00	-0.006	0.020	0.003
250.0000	1.485E+00	3.525E+01	3.674E+01	2.579E+01	8.651E-01	7.088E+00	-0.005	0.018	0.002
300.0000	1.498E+00	4.254E+01	4.404E+01	2.704E+01	8.814E-01	7.433E+00	-0.004	0.018	0.002
350.0000	1.508E+00	4.984E+01	5.135E+01	2.809E+01	8.938E-01	7.728E+00	-0.004	0.017	0.002
400.0000	1.517E+00	5.715E+01	5.866E+01	2.900E+01	9.036E-01	7.984E+00	-0.003	0.016	0.002
450.0000	1.525E+00	6.446E+01	6.599E+01	2.980E+01	9.116E-01	8.212E+00	-0.003	0.016	0.001
500.0000	1.532E+00	7.178E+01	7.331E+01	3.052E+01	9.183E-01	8.416E+00	-0.003	0.016	0.001
550.0000	1.538E+00	7.911E+01	8.065E+01	3.117E+01	9.239E-01	8.601E+00	-0.003	0.015	0.001
600.0000	1.544E+00	8.645E+01	8.799E+01	3.176E+01	9.287E-01	8.770E+00	-0.002	0.015	0.001
700.0000	1.554E+00	1.011E+02	1.027E+02	3.281E+01	9.366E-01	9.071E+00	-0.002	0.015	0.001
800.0000	1.562E+00	1.158E+02	1.174E+02	3.372E+01	9.427E-01	9.333E+00	-0.002	0.014	0.001
900.0000	1.570E+00	1.305E+02	1.321E+02	3.453E+01	9.477E-01	9.564E+00	-0.002	0.014	0.001
1000.0000	1.576E+00	1.452E+02	1.468E+02	3.524E+01	9.518E-01	9.771E+00	-0.001	0.014	0.001

ELECTRONS IN PLATINUM

I = 790.0 eV DENSITY = 2.145E+01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	8.646E+00	2.017E-02	8.666E+00	7.943E-04	1.144E-03	1.084E-03	-0.373	0.665	0.520
0.0125	7.538E+00	2.215E-02	7.560E+00	1.104E-03	1.441E-03	1.393E-03	-0.345	0.579	0.460
0.0150	6.717E+00	2.377E-02	6.741E+00	1.455E-03	1.739E-03	1.717E-03	-0.325	0.520	0.421
0.0175	6.083E+00	2.515E-02	6.108E+00	1.845E-03	2.037E-03	2.059E-03	-0.310	0.476	0.393
0.0200	5.577E+00	2.635E-02	5.603E+00	2.273E-03	2.334E-03	2.418E-03	-0.297	0.444	0.371
0.0250	4.816E+00	2.838E-02	4.845E+00	3.236E-03	2.923E-03	3.190E-03	-0.279	0.397	0.340
0.0300	4.270E+00	3.005E-02	4.300E+00	4.334E-03	3.507E-03	4.039E-03	-0.266	0.365	0.319
0.0350	3.857E+00	3.149E-02	3.889E+00	5.559E-03	4.084E-03	4.967E-03	-0.256	0.341	0.303
0.0400	3.533E+00	3.277E-02	3.566E+00	6.904E-03	4.654E-03	5.979E-03	-0.247	0.323	0.290
0.0450	3.272E+00	3.392E-02	3.306E+00	8.361E-03	5.218E-03	7.076E-03	-0.240	0.309	0.280
0.0500	3.056E+00	3.497E-02	3.091E+00	9.927E-03	5.775E-03	8.259E-03	-0.234	0.297	0.272
0.0550	2.875E+00	3.595E-02	2.911E+00	1.160E-02	6.326E-03	9.528E-03	-0.229	0.287	0.264
0.0600	2.720E+00	3.687E-02	2.757E+00	1.336E-02	6.870E-03	1.088E-02	-0.224	0.279	0.258
0.0700	2.471E+00	3.856E-02	2.509E+00	1.717E-02	7.943E-03	1.382E-02	-0.216	0.265	0.247
0.0800	2.277E+00	4.008E-02	2.317E+00	2.132E-02	8.992E-03	1.702E-02	-0.210	0.254	0.239
0.0900	2.123E+00	4.149E-02	2.165E+00	2.579E-02	1.002E-02	2.043E-02	-0.204	0.246	0.232
0.1000	1.998E+00	4.279E-02	2.040E+00	3.055E-02	1.102E-02	2.399E-02	-0.200	0.238	0.225
0.1250	1.766E+00	4.575E-02	1.811E+00	4.360E-02	1.345E-02	3.320E-02	-0.190	0.224	0.213
0.1500	1.607E+00	4.836E-02	1.656E+00	5.807E-02	1.575E-02	4.250E-02	-0.183	0.213	0.204
0.1750	1.493E+00	5.075E-02	1.543E+00	7.374E-02	1.794E-02	5.170E-02	-0.177	0.205	0.197
0.2000	1.406E+00	5.300E-02	1.459E+00	9.042E-02	2.002E-02	6.076E-02	-0.173	0.198	0.191
0.2500	1.286E+00	5.727E-02	1.343E+00	1.262E-01	2.393E-02	7.850E-02	-0.165	0.188	0.181
0.3000	1.207E+00	6.141E-02	1.268E+00	1.646E-01	2.753E-02	9.586E-02	-0.159	0.180	0.174
0.3500	1.153E+00	6.552E-02	1.218E+00	2.049E-01	3.090E-02	1.130E-01	-0.153	0.174	0.168
0.4000	1.114E+00	6.965E-02	1.183E+00	2.466E-01	3.408E-02	1.300E-01	-0.149	0.169	0.162
0.4500	1.085E+00	7.381E-02	1.159E+00	2.893E-01	3.711E-02	1.468E-01	-0.145	0.164	0.158
0.5000	1.063E+00	7.803E-02	1.142E+00	3.328E-01	4.000E-02	1.636E-01	-0.141	0.160	0.154
0.5500	1.047E+00	8.230E-02	1.129E+00	3.768E-01	4.278E-02	1.803E-01	-0.137	0.156	0.150
0.6000	1.035E+00	8.662E-02	1.121E+00	4.213E-01	4.547E-02	1.971E-01	-0.134	0.153	0.147
0.7000	1.017E+00	9.538E-02	1.113E+00	5.109E-01	5.062E-02	2.304E-01	-0.128	0.147	0.141
0.8000	1.008E+00	1.043E-01	1.112E+00	6.008E-01	5.552E-02	2.637E-01	-0.123	0.142	0.135
0.9000	1.002E+00	1.134E-01	1.115E+00	6.906E-01	6.021E-02	2.970E-01	-0.118	0.138	0.131
1.0000	9.995E-01	1.226E-01	1.122E+00	7.800E-01	6.474E-02	3.300E-01	-0.114	0.134	0.126
1.2500	1.000E+00	1.465E-01	1.147E+00	1.001E+00	7.551E-02	4.116E-01	-0.105	0.126	0.117
1.5000	1.007E+00	1.711E-01	1.178E+00	1.216E+00	8.568E-02	4.907E-01	-0.098	0.119	0.109
1.7500	1.015E+00	1.964E-01	1.211E+00	1.425E+00	9.541E-02	5.668E-01	-0.093	0.113	0.103
2.0000	1.024E+00	2.223E-01	1.246E+00	1.629E+00	1.048E-01	6.395E-01	-0.088	0.109	0.097
2.5000	1.042E+00	2.754E-01	1.317E+00	2.019E+00	1.226E-01	7.751E-01	-0.081	0.101	0.088
3.0000	1.059E+00	3.299E-01	1.389E+00	2.389E+00	1.394E-01	8.987E-01	-0.076	0.095	0.081
3.5000	1.074E+00	3.857E-01	1.460E+00	2.740E+00	1.554E-01	1.012E+00	-0.072	0.090	0.075
4.0000	1.088E+00	4.425E-01	1.531E+00	3.074E+00	1.705E-01	1.117E+00	-0.068	0.085	0.070
4.5000	1.101E+00	5.001E-01	1.601E+00	3.393E+00	1.850E-01	1.214E+00	-0.065	0.082	0.066
5.0000	1.112E+00	5.586E-01	1.671E+00	3.699E+00	1.989E-01	1.305E+00	-0.063	0.079	0.062
5.5000	1.123E+00	6.177E-01	1.740E+00	3.992E+00	2.121E-01	1.391E+00	-0.060	0.076	0.059
6.0000	1.132E+00	6.774E-01	1.810E+00	4.274E+00	2.248E-01	1.472E+00	-0.058	0.073	0.056
7.0000	1.150E+00	7.985E-01	1.948E+00	4.806E+00	2.488E-01	1.622E+00	-0.055	0.069	0.051
8.0000	1.164E+00	9.215E-01	2.086E+00	5.302E+00	2.710E-01	1.759E+00	-0.052	0.065	0.047
9.0000	1.177E+00	1.046E+00	2.224E+00	5.767E+00	2.916E-01	1.884E+00	-0.049	0.062	0.044
10.0000	1.189E+00	1.172E+00	2.361E+00	6.203E+00	3.108E-01	2.000E+00	-0.047	0.060	0.041
12.5000	1.213E+00	1.493E+00	2.706E+00	7.191E+00	3.536E-01	2.256E+00	-0.043	0.054	0.035
15.0000	1.232E+00	1.819E+00	3.051E+00	8.061E+00	3.905E-01	2.477E+00	-0.040	0.051	0.031
17.5000	1.248E+00	2.151E+00	3.399E+00	8.837E+00	4.226E-01	2.671E+00	-0.037	0.047	0.027
20.0000	1.262E+00	2.486E+00	3.748E+00	9.537E+00	4.508E-01	2.845E+00	-0.034	0.045	0.025
25.0000	1.284E+00	3.167E+00	4.451E+00	1.076E+01	4.984E-01	3.148E+00	-0.031	0.041	0.021
30.0000	1.301E+00	3.858E+00	5.160E+00	1.180E+01	5.371E-01	3.407E+00	-0.027	0.038	0.018
35.0000	1.316E+00	4.557E+00	5.873E+00	1.271E+01	5.692E-01	3.634E+00	-0.025	0.036	0.016
40.0000	1.328E+00	5.263E+00	6.590E+00	1.351E+01	5.965E-01	3.837E+00	-0.023	0.034	0.014
45.0000	1.338E+00	5.973E+00	7.312E+00	1.423E+01	6.200E-01	4.020E+00	-0.021	0.032	0.012
50.0000	1.347E+00	6.689E+00	8.036E+00	1.489E+01	6.405E-01	4.187E+00	-0.019	0.031	0.011
55.0000	1.355E+00	7.408E+00	8.763E+00	1.548E+01	6.586E-01	4.341E+00	-0.018	0.030	0.010
60.0000	1.363E+00	8.130E+00	9.493E+00	1.603E+01	6.746E-01	4.483E+00	-0.017	0.029	0.010
70.0000	1.375E+00	9.583E+00	1.096E+01	1.701E+01	7.019E-01	4.740E+00	-0.015	0.028	0.008
80.0000	1.386E+00	1.104E+01	1.243E+01	1.787E+01	7.244E-01	4.966E+00	-0.014	0.026	0.007
90.0000	1.395E+00	1.251E+01	1.391E+01	1.863E+01	7.433E-01	5.169E+00	-0.013	0.025	0.007
100.0000	1.403E+00	1.399E+01	1.539E+01	1.931E+01	7.594E-01	5.352E+00	-0.012	0.024	0.006
125.0000	1.420E+00	1.769E+01	1.911E+01	2.076E+01	7.911E-01	5.747E+00	-0.010	0.023	0.005
150.0000	1.433E+00	2.141E+01	2.285E+01	2.196E+01	8.145E-01	6.076E+00	-0.008	0.022	0.004
175.0000	1.444E+00	2.515E+01	2.659E+01	2.297E+01	8.327E-01	6.357E+00	-0.007	0.021	0.003
200.0000	1.454E+00	2.889E+01	3.035E+01	2.385E+01	8.472E-01	6.604E+00	-0.006	0.020	0.003
250.0000	1.469E+00	3.640E+01	3.787E+01	2.532E+01	8.692E-01	7.022E+00	-0.005	0.019	0.002
300.0000	1.482E+00	4.393E+01	4.541E+01	2.653E+01	8.851E-01	7.367E+00	-0.004	0.018	0.002
350.0000	1.492E+00	5.146E+01	5.295E+01	2.755E+01	8.972E-01	7.662E+00	-0.004	0.017	0.002
400.0000	1.501E+00	5.901E+01	6.051E+01	2.843E+01	9.067E-01	7.918E+00	-0.003	0.017	0.002
450.0000	1.509E+00	6.656E+01	6.807E+01	2.921E+01	9.145E-01	8.145E+00	-0.003	0.016	0.001
500.0000	1.515E+00	7.412E+01	7.563E+01	2.990E+01	9.209E-01	8.349E+00	-0.003	0.016	0.001
550.0000	1.522E+00	8.168E+01	8.320E+01	3.053E+01	9.264E-01	8.534E+00	-0.003	0.016	0.001
600.0000	1.527E+00	8.925E+01	9.078E+01	3.111E+01	9.310E-01	8.704E+00	-0.002	0.015	0.001
700.0000	1.537E+00	1.044E+02	1.059E+02	3.213E+01	9.387E-01	9.005E+00	-0.002	0.015	0.001
800.0000	1.546E+00	1.196E+02	1.211E+02	3.301E+01	9.446E-01	9.266E+00	-0.002	0.014	0.001
900.0000	1.553E+00	1.347E+02	1.363E+02	3.379E+01	9.494E-01	9.497E+00	-0.002	0.014	0.001
1000.0000	1.560E+00	1.499E+02	1.515E+02	3.448E+01	9.534E-01	9.705E+00	-0.001	0.014	0.001

ELECTRONS IN GOLD

I = 790.0 eV DENSITY = 1.932E+01 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	8.673E+00	2.036E-02	8.694E+00	7.917E-04	1.150E-03	6.025E-04	-0.373	0.665	0.519
0.0125	7.562E+00	2.237E-02	7.585E+00	1.101E-03	1.449E-03	7.709E-04	-0.345	0.579	0.460
0.0150	6.739E+00	2.402E-02	6.763E+00	1.450E-03	1.749E-03	9.470E-04	-0.325	0.520	0.421
0.0175	6.103E+00	2.543E-02	6.128E+00	1.839E-03	2.050E-03	1.131E-03	-0.310	0.476	0.392
0.0200	5.595E+00	2.666E-02	5.622E+00	2.266E-03	2.349E-03	1.323E-03	-0.298	0.444	0.371
0.0250	4.832E+00	2.872E-02	4.861E+00	3.226E-03	2.945E-03	1.735E-03	-0.279	0.397	0.340
0.0300	4.284E+00	3.043E-02	4.315E+00	4.320E-03	3.534E-03	2.183E-03	-0.266	0.365	0.319
0.0350	3.870E+00	3.190E-02	3.902E+00	5.541E-03	4.117E-03	2.673E-03	-0.256	0.341	0.303
0.0400	3.545E+00	3.321E-02	3.579E+00	6.880E-03	4.694E-03	3.208E-03	-0.248	0.324	0.291
0.0450	3.283E+00	3.439E-02	3.318E+00	8.333E-03	5.264E-03	3.791E-03	-0.241	0.309	0.280
0.0500	3.067E+00	3.547E-02	3.102E+00	9.893E-03	5.828E-03	4.427E-03	-0.235	0.298	0.272
0.0550	2.885E+00	3.647E-02	2.922E+00	1.155E-02	6.385E-03	5.121E-03	-0.230	0.288	0.265
0.0600	2.730E+00	3.741E-02	2.768E+00	1.331E-02	6.936E-03	5.877E-03	-0.225	0.279	0.258
0.0700	2.480E+00	3.914E-02	2.519E+00	1.711E-02	8.022E-03	7.597E-03	-0.217	0.266	0.248
0.0800	2.286E+00	4.070E-02	2.327E+00	2.124E-02	9.084E-03	9.624E-03	-0.211	0.255	0.239
0.0900	2.132E+00	4.214E-02	2.174E+00	2.569E-02	1.012E-02	1.199E-02	-0.205	0.246	0.232
0.1000	2.006E+00	4.348E-02	2.049E+00	3.044E-02	1.114E-02	1.471E-02	-0.200	0.239	0.226
0.1250	1.773E+00	4.651E-02	1.819E+00	4.343E-02	1.360E-02	2.288E-02	-0.189	0.224	0.213
0.1500	1.614E+00	4.920E-02	1.663E+00	5.784E-02	1.593E-02	3.231E-02	-0.181	0.213	0.203
0.1750	1.499E+00	5.164E-02	1.550E+00	7.343E-02	1.815E-02	4.212E-02	-0.174	0.204	0.196
0.2000	1.412E+00	5.395E-02	1.466E+00	9.004E-02	2.027E-02	5.187E-02	-0.169	0.197	0.189
0.2500	1.291E+00	5.833E-02	1.349E+00	1.257E-01	2.423E-02	7.074E-02	-0.161	0.186	0.179
0.3000	1.212E+00	6.256E-02	1.274E+00	1.639E-01	2.789E-02	8.883E-02	-0.155	0.178	0.171
0.3500	1.157E+00	6.677E-02	1.224E+00	2.040E-01	3.132E-02	1.063E-01	-0.150	0.171	0.165
0.4000	1.118E+00	7.099E-02	1.189E+00	2.455E-01	3.455E-02	1.234E-01	-0.145	0.166	0.160
0.4500	1.089E+00	7.524E-02	1.164E+00	2.880E-01	3.762E-02	1.401E-01	-0.142	0.161	0.155
0.5000	1.067E+00	7.954E-02	1.147E+00	3.313E-01	4.056E-02	1.566E-01	-0.138	0.157	0.151
0.5500	1.051E+00	8.389E-02	1.135E+00	3.751E-01	4.338E-02	1.729E-01	-0.135	0.154	0.147
0.6000	1.038E+00	8.828E-02	1.127E+00	4.194E-01	4.612E-02	1.891E-01	-0.132	0.150	0.144
0.7000	1.021E+00	9.720E-02	1.119E+00	5.085E-01	5.134E-02	2.209E-01	-0.126	0.145	0.138
0.8000	1.011E+00	1.063E-01	1.118E+00	5.980E-01	5.630E-02	2.524E-01	-0.122	0.140	0.133
0.9000	1.006E+00	1.155E-01	1.122E+00	6.873E-01	6.105E-02	2.835E-01	-0.117	0.136	0.128
1.0000	1.004E+00	1.249E-01	1.129E+00	7.762E-01	6.563E-02	3.143E-01	-0.113	0.132	0.124
1.2500	1.005E+00	1.491E-01	1.154E+00	9.954E-01	7.651E-02	3.903E-01	-0.105	0.124	0.115
1.5000	1.011E+00	1.741E-01	1.186E+00	1.209E+00	8.678E-02	4.643E-01	-0.098	0.118	0.108
1.7500	1.020E+00	1.998E-01	1.220E+00	1.417E+00	9.658E-02	5.361E-01	-0.092	0.112	0.101
2.0000	1.029E+00	2.260E-01	1.255E+00	1.619E+00	1.060E-01	6.052E-01	-0.088	0.107	0.096
2.5000	1.048E+00	2.799E-01	1.327E+00	2.006E+00	1.239E-01	7.354E-01	-0.081	0.100	0.087
3.0000	1.065E+00	3.352E-01	1.400E+00	2.373E+00	1.408E-01	8.551E-01	-0.075	0.094	0.080
3.5000	1.080E+00	3.917E-01	1.472E+00	2.721E+00	1.568E-01	9.655E-01	-0.071	0.089	0.074
4.0000	1.095E+00	4.492E-01	1.544E+00	3.053E+00	1.721E-01	1.068E+00	-0.067	0.084	0.069
4.5000	1.107E+00	5.077E-01	1.615E+00	3.370E+00	1.866E-01	1.163E+00	-0.064	0.081	0.065
5.0000	1.119E+00	5.668E-01	1.686E+00	3.673E+00	2.005E-01	1.253E+00	-0.062	0.078	0.061
5.5000	1.130E+00	6.267E-01	1.756E+00	3.963E+00	2.138E-01	1.337E+00	-0.059	0.075	0.058
6.0000	1.139E+00	6.872E-01	1.827E+00	4.242E+00	2.265E-01	1.417E+00	-0.057	0.072	0.055
7.0000	1.157E+00	8.098E-01	1.967E+00	4.770E+00	2.505E-01	1.565E+00	-0.054	0.068	0.050
8.0000	1.172E+00	9.343E-01	2.106E+00	5.261E+00	2.727E-01	1.699E+00	-0.051	0.065	0.046
9.0000	1.185E+00	1.061E+00	2.245E+00	5.721E+00	2.933E-01	1.823E+00	-0.048	0.062	0.043
10.0000	1.196E+00	1.188E+00	2.385E+00	6.153E+00	3.125E-01	1.937E+00	-0.046	0.059	0.040
12.5000	1.221E+00	1.513E+00	2.733E+00	7.132E+00	3.554E-01	2.191E+00	-0.042	0.054	0.034
15.0000	1.240E+00	1.843E+00	3.083E+00	7.992E+00	3.922E-01	2.409E+00	-0.039	0.050	0.030
17.5000	1.256E+00	2.179E+00	3.435E+00	8.760E+00	4.243E-01	2.602E+00	-0.036	0.047	0.027
20.0000	1.270E+00	2.518E+00	3.788E+00	9.453E+00	4.525E-01	2.775E+00	-0.034	0.044	0.024
25.0000	1.292E+00	3.207E+00	4.500E+00	1.066E+01	5.000E-01	3.075E+00	-0.030	0.040	0.020
30.0000	1.310E+00	3.907E+00	5.217E+00	1.169E+01	5.386E-01	3.331E+00	-0.027	0.037	0.018
35.0000	1.325E+00	4.615E+00	5.939E+00	1.259E+01	5.707E-01	3.556E+00	-0.025	0.035	0.015
40.0000	1.337E+00	5.329E+00	6.666E+00	1.339E+01	5.979E-01	3.757E+00	-0.022	0.033	0.014
45.0000	1.347E+00	6.049E+00	7.396E+00	1.410E+01	6.214E-01	3.939E+00	-0.021	0.032	0.012
50.0000	1.356E+00	6.772E+00	8.129E+00	1.474E+01	6.418E-01	4.105E+00	-0.019	0.031	0.011
55.0000	1.365E+00	7.500E+00	8.865E+00	1.533E+01	6.598E-01	4.257E+00	-0.018	0.030	0.010
60.0000	1.372E+00	8.232E+00	9.604E+00	1.587E+01	6.758E-01	4.399E+00	-0.017	0.029	0.009
70.0000	1.385E+00	9.702E+00	1.109E+01	1.684E+01	7.031E-01	4.653E+00	-0.015	0.027	0.008
80.0000	1.395E+00	1.118E+01	1.258E+01	1.769E+01	7.255E-01	4.878E+00	-0.014	0.026	0.007
90.0000	1.405E+00	1.267E+01	1.407E+01	1.844E+01	7.443E-01	5.080E+00	-0.013	0.025	0.006
100.0000	1.413E+00	1.416E+01	1.557E+01	1.911E+01	7.603E-01	5.262E+00	-0.012	0.024	0.006
125.0000	1.430E+00	1.791E+01	1.934E+01	2.055E+01	7.919E-01	5.656E+00	-0.010	0.023	0.005
150.0000	1.443E+00	2.168E+01	2.312E+01	2.173E+01	8.153E-01	5.983E+00	-0.008	0.021	0.004
175.0000	1.455E+00	2.546E+01	2.692E+01	2.273E+01	8.334E-01	6.264E+00	-0.007	0.020	0.003
200.0000	1.464E+00	2.925E+01	3.072E+01	2.360E+01	8.479E-01	6.510E+00	-0.007	0.020	0.003
250.0000	1.480E+00	3.685E+01	3.833E+01	2.506E+01	8.697E-01	6.926E+00	-0.005	0.019	0.002
300.0000	1.492E+00	4.447E+01	4.596E+01	2.625E+01	8.856E-01	7.271E+00	-0.004	0.018	0.002
350.0000	1.503E+00	5.210E+01	5.360E+01	2.725E+01	8.976E-01	7.564E+00	-0.004	0.017	0.002
400.0000	1.511E+00	5.974E+01	6.125E+01	2.812E+01	9.071E-01	7.820E+00	-0.003	0.017	0.002
450.0000	1.519E+00	6.739E+01	6.891E+01	2.889E+01	9.148E-01	8.047E+00	-0.003	0.016	0.001
500.0000	1.526E+00	7.504E+01	7.656E+01	2.958E+01	9.213E-01	8.251E+00	-0.003	0.016	0.001
550.0000	1.532E+00	8.270E+01	8.423E+01	3.020E+01	9.267E-01	8.436E+00	-0.003	0.015	0.001
600.0000	1.538E+00	9.036E+01	9.190E+01	3.077E+01	9.313E-01	8.605E+00	-0.002	0.015	0.001
700.0000	1.548E+00	1.057E+02	1.072E+02	3.178E+01	9.389E-01	8.905E+00	-0.002	0.015	0.001
800.0000	1.557E+00	1.210E+02	1.226E+02	3.265E+01	9.449E-01	9.167E+00	-0.002	0.014	0.001
900.0000	1.564E+00	1.364E+02	1.380E+02	3.342E+01	9.497E-01	9.398E+00	-0.002	0.014	0.001
1000.0000	1.571E+00	1.518E+02	1.533E+02	3.410E+01	9.536E-01	9.605E+00	-0.001	0.014	0.001

ELECTRONS IN LEAD

I = 823.0 eV DENSITY = 1.135E+01 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	8.428E+00	2.045E-02	8.448E+00	8.253E-04	1.191E-03	4.841E-04	-0.379	0.713	0.539
0.0125	7.357E+00	2.251E-02	7.379E+00	1.143E-03	1.500E-03	6.147E-04	-0.350	0.615	0.475
0.0150	6.561E+00	2.421E-02	6.585E+00	1.502E-03	1.810E-03	7.491E-04	-0.329	0.549	0.432
0.0175	5.946E+00	2.566E-02	5.971E+00	1.901E-03	2.121E-03	8.872E-04	-0.314	0.501	0.402
0.0200	5.453E+00	2.693E-02	5.480E+00	2.339E-03	2.432E-03	1.029E-03	-0.301	0.464	0.379
0.0250	4.714E+00	2.908E-02	4.743E+00	3.323E-03	3.051E-03	1.324E-03	-0.283	0.413	0.347
0.0300	4.182E+00	3.086E-02	4.213E+00	4.444E-03	3.664E-03	1.633E-03	-0.269	0.378	0.324
0.0350	3.779E+00	3.240E-02	3.812E+00	5.694E-03	4.271E-03	1.956E-03	-0.259	0.352	0.308
0.0400	3.463E+00	3.376E-02	3.497E+00	7.066E-03	4.872E-03	2.294E-03	-0.250	0.333	0.295
0.0450	3.208E+00	3.500E-02	3.243E+00	8.552E-03	5.467E-03	2.646E-03	-0.243	0.317	0.284
0.0500	2.997E+00	3.613E-02	3.034E+00	1.015E-02	6.055E-03	3.011E-03	-0.238	0.305	0.276
0.0550	2.821E+00	3.718E-02	2.858E+00	1.185E-02	6.638E-03	3.390E-03	-0.232	0.294	0.268
0.0600	2.670E+00	3.817E-02	2.708E+00	1.365E-02	7.214E-03	3.783E-03	-0.228	0.285	0.262
0.0700	2.426E+00	3.998E-02	2.466E+00	1.752E-02	8.349E-03	4.608E-03	-0.220	0.271	0.251
0.0800	2.237E+00	4.162E-02	2.279E+00	2.175E-02	9.461E-03	5.485E-03	-0.214	0.260	0.242
0.0900	2.087E+00	4.313E-02	2.130E+00	2.629E-02	1.055E-02	6.413E-03	-0.209	0.251	0.235
0.1000	1.964E+00	4.454E-02	2.008E+00	3.113E-02	1.162E-02	7.392E-03	-0.205	0.243	0.229
0.1250	1.738E+00	4.772E-02	1.785E+00	4.438E-02	1.419E-02	1.005E-02	-0.196	0.229	0.217
0.1500	1.583E+00	5.054E-02	1.633E+00	5.905E-02	1.664E-02	1.300E-02	-0.189	0.218	0.208
0.1750	1.471E+00	5.312E-02	1.524E+00	7.492E-02	1.896E-02	1.623E-02	-0.183	0.210	0.201
0.2000	1.387E+00	5.555E-02	1.442E+00	9.180E-02	2.118E-02	1.971E-02	-0.178	0.203	0.195
0.2500	1.269E+00	6.015E-02	1.329E+00	1.280E-01	2.533E-02	2.736E-02	-0.170	0.193	0.186
0.3000	1.193E+00	6.460E-02	1.257E+00	1.668E-01	2.917E-02	3.579E-02	-0.163	0.185	0.178
0.3500	1.140E+00	6.900E-02	1.209E+00	2.074E-01	3.276E-02	4.484E-02	-0.157	0.178	0.172
0.4000	1.102E+00	7.340E-02	1.175E+00	2.494E-01	3.614E-02	5.437E-02	-0.153	0.173	0.166
0.4500	1.074E+00	7.781E-02	1.152E+00	2.924E-01	3.935E-02	6.426E-02	-0.148	0.168	0.162
0.5000	1.053E+00	8.228E-02	1.135E+00	3.361E-01	4.241E-02	7.442E-02	-0.144	0.164	0.157
0.5500	1.037E+00	8.677E-02	1.124E+00	3.804E-01	4.536E-02	8.479E-02	-0.141	0.160	0.154
0.6000	1.026E+00	9.132E-02	1.117E+00	4.250E-01	4.820E-02	9.529E-02	-0.138	0.157	0.150
0.7000	1.009E+00	1.005E-01	1.110E+00	5.149E-01	5.363E-02	1.166E-01	-0.132	0.151	0.144
0.8000	1.000E+00	1.098E-01	1.110E+00	6.050E-01	5.877E-02	1.380E-01	-0.128	0.146	0.139
0.9000	9.957E-01	1.193E-01	1.115E+00	6.949E-01	6.369E-02	1.595E-01	-0.124	0.142	0.134
1.0000	9.939E-01	1.290E-01	1.123E+00	7.843E-01	6.842E-02	1.809E-01	-0.120	0.138	0.130
1.2500	9.966E-01	1.537E-01	1.150E+00	1.004E+00	7.960E-02	2.337E-01	-0.113	0.130	0.121
1.5000	1.004E+00	1.792E-01	1.183E+00	1.219E+00	9.009E-02	2.854E-01	-0.107	0.124	0.114
1.7500	1.014E+00	2.053E-01	1.219E+00	1.427E+00	1.001E-01	3.360E-01	-0.102	0.118	0.108
2.0000	1.024E+00	2.319E-01	1.256E+00	1.629E+00	1.096E-01	3.855E-01	-0.097	0.114	0.103
2.5000	1.044E+00	2.866E-01	1.331E+00	2.016E+00	1.277E-01	4.817E-01	-0.089	0.106	0.094
3.0000	1.063E+00	3.427E-01	1.406E+00	2.381E+00	1.447E-01	5.743E-01	-0.083	0.100	0.086
3.5000	1.080E+00	3.999E-01	1.480E+00	2.728E+00	1.608E-01	6.631E-01	-0.078	0.095	0.080
4.0000	1.095E+00	4.582E-01	1.553E+00	3.057E+00	1.761E-01	7.479E-01	-0.073	0.091	0.075
4.5000	1.108E+00	5.174E-01	1.626E+00	3.372E+00	1.906E-01	8.289E-01	-0.070	0.087	0.070
5.0000	1.120E+00	5.773E-01	1.698E+00	3.673E+00	2.045E-01	9.061E-01	-0.067	0.083	0.066
5.5000	1.132E+00	6.379E-01	1.769E+00	3.962E+00	2.177E-01	9.798E-01	-0.064	0.080	0.063
6.0000	1.142E+00	6.991E-01	1.841E+00	4.239E+00	2.304E-01	1.050E+00	-0.061	0.078	0.060
7.0000	1.160E+00	8.233E-01	1.983E+00	4.762E+00	2.543E-01	1.182E+00	-0.057	0.073	0.054
8.0000	1.175E+00	9.495E-01	2.125E+00	5.249E+00	2.765E-01	1.304E+00	-0.054	0.069	0.050
9.0000	1.189E+00	1.077E+00	2.266E+00	5.705E+00	2.970E-01	1.417E+00	-0.051	0.066	0.046
10.0000	1.201E+00	1.206E+00	2.407E+00	6.133E+00	3.162E-01	1.523E+00	-0.049	0.063	0.043
12.5000	1.226E+00	1.535E+00	2.761E+00	7.102E+00	3.589E-01	1.759E+00	-0.044	0.058	0.037
15.0000	1.246E+00	1.870E+00	3.116E+00	7.954E+00	3.955E-01	1.964E+00	-0.041	0.053	0.032
17.5000	1.262E+00	2.210E+00	3.472E+00	8.713E+00	4.274E-01	2.147E+00	-0.038	0.050	0.029
20.0000	1.277E+00	2.554E+00	3.830E+00	9.399E+00	4.555E-01	2.310E+00	-0.036	0.047	0.026
25.0000	1.299E+00	3.252E+00	4.551E+00	1.059E+01	5.028E-01	2.596E+00	-0.032	0.043	0.022
30.0000	1.318E+00	3.961E+00	5.278E+00	1.161E+01	5.412E-01	2.841E+00	-0.029	0.040	0.019
35.0000	1.332E+00	4.678E+00	6.011E+00	1.250E+01	5.731E-01	3.055E+00	-0.027	0.038	0.016
40.0000	1.345E+00	5.402E+00	6.747E+00	1.329E+01	6.002E-01	3.247E+00	-0.025	0.036	0.015
45.0000	1.356E+00	6.132E+00	7.488E+00	1.399E+01	6.235E-01	3.420E+00	-0.023	0.034	0.013
50.0000	1.365E+00	6.865E+00	8.231E+00	1.463E+01	6.439E-01	3.579E+00	-0.021	0.033	0.012
55.0000	1.374E+00	7.603E+00	8.977E+00	1.521E+01	6.618E-01	3.725E+00	-0.020	0.032	0.011
60.0000	1.381E+00	8.345E+00	9.726E+00	1.574E+01	6.777E-01	3.861E+00	-0.019	0.031	0.010
70.0000	1.395E+00	9.836E+00	1.123E+01	1.670E+01	7.048E-01	4.107E+00	-0.017	0.029	0.009
80.0000	1.406E+00	1.134E+01	1.274E+01	1.753E+01	7.270E-01	4.326E+00	-0.015	0.028	0.008
90.0000	1.415E+00	1.284E+01	1.426E+01	1.828E+01	7.457E-01	4.521E+00	-0.014	0.027	0.007
100.0000	1.423E+00	1.436E+01	1.578E+01	1.894E+01	7.617E-01	4.699E+00	-0.013	0.026	0.006
125.0000	1.441E+00	1.816E+01	1.960E+01	2.036E+01	7.931E-01	5.083E+00	-0.011	0.024	0.005
150.0000	1.455E+00	2.198E+01	2.344E+01	2.153E+01	8.164E-01	5.404E+00	-0.010	0.023	0.004
175.0000	1.466E+00	2.582E+01	2.729E+01	2.251E+01	8.343E-01	5.679E+00	-0.009	0.022	0.004
200.0000	1.476E+00	2.966E+01	3.114E+01	2.337E+01	8.488E-01	5.921E+00	-0.008	0.021	0.003
250.0000	1.491E+00	3.737E+01	3.886E+01	2.480E+01	8.705E-01	6.330E+00	-0.006	0.020	0.003
300.0000	1.504E+00	4.509E+01	4.660E+01	2.598E+01	8.862E-01	6.670E+00	-0.005	0.019	0.002
350.0000	1.514E+00	5.283E+01	5.435E+01	2.697E+01	8.982E-01	6.960E+00	-0.005	0.018	0.002
400.0000	1.523E+00	6.058E+01	6.210E+01	2.783E+01	9.077E-01	7.213E+00	-0.004	0.018	0.002
450.0000	1.531E+00	6.833E+01	6.986E+01	2.859E+01	9.153E-01	7.438E+00	-0.004	0.017	0.001
500.0000	1.538E+00	7.609E+01	7.763E+01	2.927E+01	9.217E-01	7.640E+00	-0.003	0.017	0.001
550.0000	1.544E+00	8.386E+01	8.540E+01	2.988E+01	9.271E-01	7.824E+00	-0.003	0.017	0.001
600.0000	1.550E+00	9.163E+01	9.318E+01	3.044E+01	9.317E-01	7.992E+00	-0.003	0.016	0.001
700.0000	1.560E+00	1.072E+02	1.087E+02	3.143E+01	9.393E-01	8.290E+00	-0.002	0.016	0.001
800.0000	1.568E+00	1.227E+02	1.243E+02	3.229E+01	9.452E-01	8.550E+00	-0.002	0.015	0.001
900.0000	1.576E+00	1.383E+02	1.399E+02	3.305E+01	9.500E-01	8.780E+00	-0.002	0.015	0.001
1000.0000	1.583E+00	1.539E+02	1.555E+02	3.373E+01	9.539E-01	8.986E+00	-0.002	0.015	0.001

ELECTRONS IN URANIUM

I = 890.0 eV DENSITY = 1.895E+01 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	7.984E+00	2.101E-02	8.005E+00	8.979E-04	1.292E-03	1.810E-03	-0.391	0.848	0.589
0.0125	6.986E+00	2.327E-02	7.009E+00	1.233E-03	1.628E-03	2.324E-03	-0.360	0.719	0.510
0.0150	6.241E+00	2.516E-02	6.266E+00	1.611E-03	1.968E-03	2.863E-03	-0.338	0.631	0.459
0.0175	5.662E+00	2.679E-02	5.688E+00	2.030E-03	2.310E-03	3.423E-03	-0.321	0.569	0.424
0.0200	5.198E+00	2.822E-02	5.226E+00	2.489E-03	2.653E-03	4.006E-03	-0.308	0.521	0.397
0.0250	4.499E+00	3.067E-02	4.530E+00	3.520E-03	3.340E-03	5.231E-03	-0.289	0.455	0.360
0.0300	3.995E+00	3.273E-02	4.028E+00	4.694E-03	4.025E-03	6.526E-03	-0.274	0.411	0.335
0.0350	3.613E+00	3.452E-02	3.648E+00	6.000E-03	4.707E-03	7.882E-03	-0.263	0.380	0.317
0.0400	3.313E+00	3.612E-02	3.349E+00	7.433E-03	5.384E-03	9.289E-03	-0.254	0.356	0.302
0.0450	3.070E+00	3.756E-02	3.108E+00	8.984E-03	6.056E-03	1.074E-02	-0.247	0.337	0.291
0.0500	2.870E+00	3.888E-02	2.909E+00	1.065E-02	6.724E-03	1.222E-02	-0.241	0.322	0.281
0.0550	2.701E+00	4.011E-02	2.741E+00	1.242E-02	7.385E-03	1.372E-02	-0.235	0.310	0.273
0.0600	2.557E+00	4.127E-02	2.598E+00	1.429E-02	8.041E-03	1.525E-02	-0.231	0.299	0.266
0.0700	2.325E+00	4.339E-02	2.368E+00	1.833E-02	9.337E-03	1.834E-02	-0.223	0.282	0.255
0.0800	2.144E+00	4.531E-02	2.190E+00	2.273E-02	1.061E-02	2.147E-02	-0.216	0.269	0.246
0.0900	2.001E+00	4.709E-02	2.048E+00	2.746E-02	1.186E-02	2.462E-02	-0.211	0.259	0.238
0.1000	1.883E+00	4.875E-02	1.932E+00	3.249E-02	1.308E-02	2.776E-02	-0.206	0.250	0.232
0.1250	1.666E+00	5.249E-02	1.719E+00	4.626E-02	1.605E-02	3.560E-02	-0.196	0.234	0.219
0.1500	1.518E+00	5.585E-02	1.574E+00	6.149E-02	1.888E-02	4.336E-02	-0.189	0.222	0.209
0.1750	1.411E+00	5.894E-02	1.470E+00	7.795E-02	2.159E-02	5.103E-02	-0.183	0.213	0.202
0.2000	1.330E+00	6.184E-02	1.392E+00	9.544E-02	2.417E-02	5.860E-02	-0.178	0.206	0.195
0.2500	1.218E+00	6.735E-02	1.285E+00	1.329E-01	2.903E-02	7.344E-02	-0.170	0.194	0.185
0.3000	1.144E+00	7.263E-02	1.217E+00	1.730E-01	3.355E-02	8.794E-02	-0.164	0.186	0.178
0.3500	1.093E+00	7.781E-02	1.171E+00	2.149E-01	3.777E-02	1.021E-01	-0.158	0.179	0.171
0.4000	1.057E+00	8.294E-02	1.140E+00	2.582E-01	4.175E-02	1.160E-01	-0.154	0.173	0.166
0.4500	1.031E+00	8.805E-02	1.119E+00	3.025E-01	4.553E-02	1.296E-01	-0.150	0.168	0.161
0.5000	1.011E+00	9.316E-02	1.104E+00	3.475E-01	4.913E-02	1.430E-01	-0.146	0.164	0.157
0.5500	9.956E-01	9.828E-02	1.094E+00	3.931E-01	5.259E-02	1.561E-01	-0.143	0.160	0.153
0.6000	9.842E-01	1.034E-01	1.088E+00	4.389E-01	5.591E-02	1.691E-01	-0.140	0.157	0.150
0.7000	9.690E-01	1.137E-01	1.083E+00	5.311E-01	6.223E-02	1.945E-01	-0.135	0.151	0.144
0.8000	9.604E-01	1.241E-01	1.084E+00	6.234E-01	6.817E-02	2.192E-01	-0.130	0.146	0.138
0.9000	9.560E-01	1.346E-01	1.091E+00	7.154E-01	7.382E-02	2.434E-01	-0.127	0.142	0.134
1.0000	9.544E-01	1.452E-01	1.100E+00	8.068E-01	7.921E-02	2.672E-01	-0.123	0.138	0.130
1.2500	9.572E-01	1.721E-01	1.129E+00	1.031E+00	9.184E-02	3.246E-01	-0.116	0.130	0.121
1.5000	9.649E-01	1.995E-01	1.164E+00	1.249E+00	1.035E-01	3.799E-01	-0.110	0.124	0.114
1.7500	9.744E-01	2.275E-01	1.202E+00	1.461E+00	1.145E-01	4.332E-01	-0.104	0.119	0.108
2.0000	9.844E-01	2.559E-01	1.240E+00	1.665E+00	1.249E-01	4.847E-01	-0.100	0.114	0.103
2.5000	1.004E+00	3.139E-01	1.318E+00	2.056E+00	1.444E-01	5.832E-01	-0.092	0.107	0.094
3.0000	1.022E+00	3.732E-01	1.396E+00	2.425E+00	1.625E-01	6.762E-01	-0.086	0.101	0.087
3.5000	1.039E+00	4.338E-01	1.473E+00	2.774E+00	1.795E-01	7.645E-01	-0.081	0.096	0.081
4.0000	1.054E+00	4.955E-01	1.549E+00	3.105E+00	1.955E-01	8.488E-01	-0.076	0.091	0.076
4.5000	1.067E+00	5.580E-01	1.625E+00	3.420E+00	2.106E-01	9.294E-01	-0.073	0.087	0.071
5.0000	1.079E+00	6.214E-01	1.700E+00	3.721E+00	2.250E-01	1.007E+00	-0.069	0.084	0.067
5.5000	1.090E+00	6.856E-01	1.775E+00	4.008E+00	2.387E-01	1.081E+00	-0.066	0.081	0.064
6.0000	1.100E+00	7.504E-01	1.850E+00	4.284E+00	2.518E-01	1.152E+00	-0.063	0.078	0.060
7.0000	1.117E+00	8.818E-01	1.999E+00	4.804E+00	2.764E-01	1.287E+00	-0.058	0.074	0.055
8.0000	1.132E+00	1.015E+00	2.147E+00	5.287E+00	2.990E-01	1.412E+00	-0.054	0.070	0.050
9.0000	1.145E+00	1.151E+00	2.296E+00	5.737E+00	3.199E-01	1.529E+00	-0.051	0.066	0.046
10.0000	1.157E+00	1.288E+00	2.444E+00	6.159E+00	3.394E-01	1.639E+00	-0.048	0.063	0.043
12.5000	1.180E+00	1.636E+00	2.816E+00	7.111E+00	3.825E-01	1.886E+00	-0.043	0.058	0.036
15.0000	1.199E+00	1.991E+00	3.191E+00	7.945E+00	4.193E-01	2.102E+00	-0.039	0.053	0.032
17.5000	1.215E+00	2.352E+00	3.567E+00	8.685E+00	4.511E-01	2.294E+00	-0.036	0.050	0.028
20.0000	1.228E+00	2.717E+00	3.945E+00	9.352E+00	4.790E-01	2.467E+00	-0.034	0.047	0.025
25.0000	1.250E+00	3.457E+00	4.706E+00	1.051E+01	5.258E-01	2.768E+00	-0.030	0.043	0.021
30.0000	1.266E+00	4.208E+00	5.474E+00	1.149E+01	5.636E-01	3.026E+00	-0.027	0.040	0.018
35.0000	1.280E+00	4.967E+00	6.248E+00	1.235E+01	5.948E-01	3.252E+00	-0.024	0.038	0.015
40.0000	1.292E+00	5.733E+00	7.025E+00	1.310E+01	6.212E-01	3.453E+00	-0.022	0.036	0.014
45.0000	1.302E+00	6.505E+00	7.807E+00	1.378E+01	6.438E-01	3.635E+00	-0.021	0.034	0.012
50.0000	1.311E+00	7.282E+00	8.593E+00	1.439E+01	6.635E-01	3.802E+00	-0.019	0.033	0.011
55.0000	1.319E+00	8.063E+00	9.382E+00	1.495E+01	6.808E-01	3.954E+00	-0.018	0.032	0.010
60.0000	1.326E+00	8.847E+00	1.017E+01	1.546E+01	6.961E-01	4.096E+00	-0.017	0.031	0.009
70.0000	1.338E+00	1.043E+01	1.176E+01	1.637E+01	7.221E-01	4.351E+00	-0.015	0.029	0.008
80.0000	1.349E+00	1.201E+01	1.336E+01	1.717E+01	7.435E-01	4.577E+00	-0.013	0.028	0.007
90.0000	1.357E+00	1.361E+01	1.497E+01	1.787E+01	7.614E-01	4.779E+00	-0.012	0.027	0.006
100.0000	1.365E+00	1.521E+01	1.658E+01	1.851E+01	7.766E-01	4.962E+00	-0.011	0.026	0.006
125.0000	1.382E+00	1.924E+01	2.062E+01	1.986E+01	8.064E-01	5.357E+00	-0.010	0.024	0.005
150.0000	1.395E+00	2.329E+01	2.469E+01	2.096E+01	8.285E-01	5.685E+00	-0.008	0.023	0.004
175.0000	1.405E+00	2.736E+01	2.877E+01	2.190E+01	8.455E-01	5.966E+00	-0.007	0.022	0.003
200.0000	1.414E+00	3.144E+01	3.286E+01	2.271E+01	8.591E-01	6.213E+00	-0.006	0.021	0.003
250.0000	1.429E+00	3.962E+01	4.105E+01	2.407E+01	8.795E-01	6.630E+00	-0.005	0.020	0.002
300.0000	1.441E+00	4.782E+01	4.926E+01	2.518E+01	8.943E-01	6.975E+00	-0.004	0.019	0.002
350.0000	1.451E+00	5.604E+01	5.749E+01	2.612E+01	9.055E-01	7.268E+00	-0.004	0.019	0.002
400.0000	1.460E+00	6.426E+01	6.572E+01	2.693E+01	9.144E-01	7.525E+00	-0.003	0.018	0.001
450.0000	1.467E+00	7.250E+01	7.397E+01	2.765E+01	9.215E-01	7.752E+00	-0.003	0.017	0.001
500.0000	1.474E+00	8.074E+01	8.221E+01	2.829E+01	9.275E-01	7.956E+00	-0.003	0.017	0.001
550.0000	1.480E+00	8.899E+01	9.047E+01	2.887E+01	9.325E-01	8.141E+00	-0.002	0.017	0.001
600.0000	1.486E+00	9.724E+01	9.872E+01	2.940E+01	9.369E-01	8.310E+00	-0.002	0.016	0.001
700.0000	1.495E+00	1.137E+02	1.152E+02	3.034E+01	9.439E-01	8.611E+00	-0.002	0.016	0.001
800.0000	1.503E+00	1.303E+02	1.318E+02	3.115E+01	9.494E-01	8.872E+00	-0.002	0.016	0.001
900.0000	1.511E+00	1.468E+02	1.483E+02	3.186E+01	9.538E-01	9.103E+00	-0.002	0.015	0.001
1000.0000	1.517E+00	1.633E+02	1.648E+02	3.250E+01	9.575E-01	9.310E+00	-0.001	0.015	0.001

ELECTRONS IN A-150 TISSUE-EQUIVALENT PLASTIC

I = 65.1 eV DENSITY = 1.127E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.294E+01	3.156E-03	2.295E+01	2.463E-04	7.529E-05	0.0	-0.193	0.220	0.219
0.0125	1.927E+01	3.174E-03	1.927E+01	3.657E-04	9.048E-05	0.0	-0.186	0.210	0.209
0.0150	1.671E+01	3.188E-03	1.671E+01	5.054E-04	1.050E-04	0.0	-0.180	0.202	0.201
0.0175	1.482E+01	3.197E-03	1.482E+01	6.646E-04	1.191E-04	0.0	-0.175	0.196	0.195
0.0200	1.335E+01	3.205E-03	1.336E+01	8.426E-04	1.327E-04	0.0	-0.171	0.191	0.190
0.0250	1.124E+01	3.219E-03	1.124E+01	1.253E-03	1.588E-04	0.0	-0.165	0.183	0.183
0.0300	9.769E+00	3.232E-03	9.772E+00	1.731E-03	1.838E-04	0.0	-0.160	0.178	0.177
0.0350	8.691E+00	3.245E-03	8.694E+00	2.275E-03	2.079E-04	0.0	-0.156	0.173	0.173
0.0400	7.863E+00	3.258E-03	7.866E+00	2.880E-03	2.311E-04	0.0	-0.153	0.169	0.169
0.0450	7.206E+00	3.273E-03	7.209E+00	3.545E-03	2.537E-04	0.0	-0.151	0.166	0.166
0.0500	6.671E+00	3.287E-03	6.675E+00	4.267E-03	2.756E-04	0.0	-0.148	0.163	0.163
0.0550	6.228E+00	3.302E-03	6.231E+00	5.043E-03	2.971E-04	0.0	-0.147	0.161	0.160
0.0600	5.853E+00	3.319E-03	5.857E+00	5.871E-03	3.180E-04	0.0	-0.145	0.159	0.158
0.0700	5.256E+00	3.352E-03	5.259E+00	7.677E-03	3.586E-04	0.0	-0.142	0.155	0.155
0.0800	4.800E+00	3.388E-03	4.803E+00	9.669E-03	3.977E-04	0.0	-0.139	0.152	0.152
0.0900	4.441E+00	3.427E-03	4.444E+00	1.184E-02	4.356E-04	0.0	-0.137	0.149	0.149
0.1000	4.150E+00	3.467E-03	4.153E+00	1.417E-02	4.723E-04	0.0	-0.135	0.147	0.147
0.1250	3.620E+00	3.578E-03	3.623E+00	2.064E-02	5.602E-04	0.0	-0.132	0.143	0.142
0.1500	3.262E+00	3.697E-03	3.265E+00	2.792E-02	6.436E-04	0.0	-0.129	0.139	0.139
0.1750	3.005E+00	3.824E-03	3.009E+00	3.592E-02	7.234E-04	0.0	-0.126	0.137	0.136
0.2000	2.812E+00	3.959E-03	2.816E+00	4.452E-02	8.003E-04	0.0	-0.124	0.134	0.134
0.2500	2.544E+00	4.247E-03	2.548E+00	6.325E-02	9.476E-04	0.0	-0.121	0.131	0.130
0.3000	2.369E+00	4.563E-03	2.373E+00	8.362E-02	1.089E-03	0.0	-0.118	0.128	0.127
0.3500	2.247E+00	4.901E-03	2.252E+00	1.053E-01	1.226E-03	0.0	-0.106	0.125	0.124
0.4000	2.156E+00	5.260E-03	2.161E+00	1.280E-01	1.361E-03	2.969E-02	-0.088	0.120	0.118
0.4500	2.086E+00	5.639E-03	2.092E+00	1.515E-01	1.495E-03	6.264E-02	-0.082	0.114	0.111
0.5000	2.033E+00	6.036E-03	2.039E+00	1.757E-01	1.628E-03	9.751E-02	-0.077	0.109	0.106
0.5500	1.991E+00	6.448E-03	1.997E+00	2.005E-01	1.761E-03	1.337E-01	-0.072	0.105	0.101
0.6000	1.957E+00	6.875E-03	1.964E+00	2.258E-01	1.895E-03	1.708E-01	-0.068	0.101	0.096
0.7000	1.908E+00	7.768E-03	1.915E+00	2.774E-01	2.164E-03	2.464E-01	-0.061	0.094	0.088
0.8000	1.874E+00	8.706E-03	1.883E+00	3.300E-01	2.436E-03	3.223E-01	-0.056	0.089	0.082
0.9000	1.851E+00	9.687E-03	1.860E+00	3.835E-01	2.711E-03	3.975E-01	-0.052	0.084	0.076
1.0000	1.834E+00	1.071E-02	1.845E+00	4.375E-01	2.990E-03	4.712E-01	-0.049	0.080	0.071
1.2500	1.812E+00	1.341E-02	1.825E+00	5.739E-01	3.706E-03	6.472E-01	-0.043	0.072	0.062
1.5000	1.803E+00	1.630E-02	1.819E+00	7.111E-01	4.447E-03	8.100E-01	-0.039	0.066	0.056
1.7500	1.802E+00	1.934E-02	1.821E+00	8.485E-01	5.209E-03	9.601E-01	-0.036	0.061	0.051
2.0000	1.804E+00	2.252E-02	1.827E+00	9.856E-01	5.992E-03	1.099E+00	-0.034	0.057	0.047
2.5000	1.814E+00	2.920E-02	1.843E+00	1.258E+00	7.609E-03	1.346E+00	-0.031	0.052	0.041
3.0000	1.827E+00	3.625E-02	1.863E+00	1.528E+00	9.281E-03	1.561E+00	-0.029	0.048	0.038
3.5000	1.839E+00	4.358E-02	1.883E+00	1.795E+00	1.100E-02	1.751E+00	-0.028	0.045	0.035
4.0000	1.852E+00	5.116E-02	1.903E+00	2.059E+00	1.275E-02	1.922E+00	-0.026	0.043	0.033
4.5000	1.863E+00	5.896E-02	1.922E+00	2.320E+00	1.453E-02	2.077E+00	-0.025	0.041	0.031
5.0000	1.874E+00	6.695E-02	1.941E+00	2.579E+00	1.633E-02	2.218E+00	-0.024	0.039	0.030
5.5000	1.884E+00	7.511E-02	1.959E+00	2.836E+00	1.816E-02	2.349E+00	-0.024	0.038	0.029
6.0000	1.894E+00	8.341E-02	1.977E+00	3.090E+00	2.000E-02	2.470E+00	-0.023	0.036	0.027
7.0000	1.911E+00	1.004E-01	2.011E+00	3.591E+00	2.372E-02	2.691E+00	-0.021	0.034	0.026
8.0000	1.926E+00	1.179E-01	2.044E+00	4.084E+00	2.748E-02	2.887E+00	-0.020	0.032	0.024
9.0000	1.939E+00	1.358E-01	2.075E+00	4.570E+00	3.127E-02	3.064E+00	-0.018	0.031	0.023
10.0000	1.951E+00	1.540E-01	2.105E+00	5.048E+00	3.508E-02	3.227E+00	-0.017	0.029	0.021
12.5000	1.975E+00	2.007E-01	2.176E+00	6.216E+00	4.461E-02	3.582E+00	-0.014	0.027	0.019
15.0000	1.995E+00	2.488E-01	2.243E+00	7.348E+00	5.411E-02	3.885E+00	-0.011	0.024	0.016
17.5000	2.010E+00	2.979E-01	2.308E+00	8.446E+00	6.352E-02	4.150E+00	-0.010	0.022	0.014
20.0000	2.024E+00	3.478E-01	2.372E+00	9.515E+00	7.282E-02	4.385E+00	-0.008	0.021	0.013
25.0000	2.046E+00	4.496E-01	2.495E+00	1.157E+01	9.097E-02	4.788E+00	-0.006	0.018	0.010
30.0000	2.063E+00	5.532E-01	2.616E+00	1.353E+01	1.085E-01	5.126E+00	-0.004	0.016	0.008
35.0000	2.077E+00	6.582E-01	2.735E+00	1.540E+01	1.253E-01	5.417E+00	-0.003	0.014	0.007
40.0000	2.089E+00	7.643E-01	2.854E+00	1.718E+01	1.414E-01	5.671E+00	-0.003	0.013	0.006
45.0000	2.100E+00	8.714E-01	2.971E+00	1.890E+01	1.569E-01	5.897E+00	-0.002	0.012	0.005
50.0000	2.109E+00	9.792E-01	3.089E+00	2.055E+01	1.717E-01	6.101E+00	-0.002	0.011	0.004
55.0000	2.118E+00	1.088E+00	3.205E+00	2.214E+01	1.860E-01	6.286E+00	-0.002	0.011	0.004
60.0000	2.125E+00	1.197E+00	3.322E+00	2.367E+01	1.996E-01	6.456E+00	-0.001	0.010	0.003
70.0000	2.139E+00	1.416E+00	3.555E+00	2.658E+01	2.254E-01	6.758E+00	-0.001	0.009	0.003
80.0000	2.151E+00	1.638E+00	3.788E+00	2.931E+01	2.491E-01	7.020E+00	-0.001	0.008	0.002
90.0000	2.161E+00	1.860E+00	4.021E+00	3.187E+01	2.712E-01	7.253E+00	-0.001	0.008	0.002
100.0000	2.170E+00	2.084E+00	4.254E+00	3.429E+01	2.917E-01	7.461E+00	-0.001	0.007	0.002
125.0000	2.189E+00	2.647E+00	4.836E+00	3.979E+01	3.373E-01	7.903E+00	-0.000	0.006	0.001
150.0000	2.204E+00	3.214E+00	5.418E+00	4.468E+01	3.763E-01	8.265E+00	-0.000	0.005	0.001
175.0000	2.218E+00	3.784E+00	6.002E+00	4.906E+01	4.100E-01	8.571E+00	-0.000	0.005	0.001
200.0000	2.229E+00	4.357E+00	6.586E+00	5.303E+01	4.396E-01	8.837E+00	-0.000	0.005	0.001
250.0000	2.248E+00	5.508E+00	7.756E+00	6.002E+01	4.891E-01	9.281E+00	-0.000	0.004	0.001
300.0000	2.263E+00	6.665E+00	8.928E+00	6.603E+01	5.291E-01	9.645E+00	-0.000	0.004	0.000
350.0000	2.276E+00	7.826E+00	1.010E+01	7.129E+01	5.623E-01	9.952E+00	-0.000	0.003	0.000
400.0000	2.288E+00	8.990E+00	1.128E+01	7.597E+01	5.903E-01	1.022E+01	-0.000	0.003	0.000
450.0000	2.298E+00	1.016E+01	1.245E+01	8.019E+01	6.143E-01	1.045E+01	-0.000	0.003	0.000
500.0000	2.307E+00	1.132E+01	1.363E+01	8.402E+01	6.352E-01	1.066E+01	-0.000	0.003	0.000
550.0000	2.315E+00	1.249E+01	1.481E+01	8.754E+01	6.536E-01	1.085E+01	-0.000	0.003	0.000
600.0000	2.322E+00	1.367E+01	1.599E+01	9.079E+01	6.699E-01	1.103E+01	-0.000	0.003	0.000
700.0000	2.335E+00	1.601E+01	1.835E+01	9.662E+01	6.977E-01	1.134E+01	-0.000	0.003	0.000
800.0000	2.346E+00	1.836E+01	2.071E+01	1.018E+02	7.204E-01	1.160E+01	-0.000	0.002	0.000
900.0000	2.356E+00	2.072E+01	2.307E+01	1.063E+02	7.396E-01	1.184E+01	-0.000	0.002	0.000
1000.0000	2.365E+00	2.307E+01	2.544E+01	1.104E+02	7.559E-01	1.205E+01	-0.000	0.002	0.000

ELECTRONS IN ACETYLENE

I = 58.2 eV DENSITY = 1.097E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.296E+01	2.982E-03	2.296E+01	2.455E-04	7.143E-05	0.0	-0.189	0.214	0.213
0.0125	1.927E+01	2.992E-03	1.927E+01	3.649E-04	8.568E-05	0.0	-0.182	0.205	0.204
0.0150	1.670E+01	2.999E-03	1.670E+01	5.047E-04	9.932E-05	0.0	-0.176	0.198	0.197
0.0175	1.480E+01	3.004E-03	1.480E+01	6.641E-04	1.125E-04	0.0	-0.171	0.192	0.191
0.0200	1.333E+01	3.008E-03	1.333E+01	8.423E-04	1.252E-04	0.0	-0.168	0.187	0.187
0.0250	1.121E+01	3.017E-03	1.121E+01	1.253E-03	1.497E-04	0.0	-0.162	0.180	0.179
0.0300	9.739E+00	3.027E-03	9.742E+00	1.733E-03	1.731E-04	0.0	-0.157	0.174	0.174
0.0350	8.661E+00	3.037E-03	8.664E+00	2.279E-03	1.956E-04	0.0	-0.154	0.170	0.169
0.0400	7.833E+00	3.048E-03	7.836E+00	2.886E-03	2.174E-04	0.0	-0.151	0.166	0.166
0.0450	7.176E+00	3.061E-03	7.179E+00	3.554E-03	2.385E-04	0.0	-0.148	0.163	0.163
0.0500	6.642E+00	3.074E-03	6.645E+00	4.279E-03	2.591E-04	0.0	-0.146	0.160	0.160
0.0550	6.199E+00	3.088E-03	6.202E+00	5.058E-03	2.792E-04	0.0	-0.144	0.158	0.158
0.0600	5.825E+00	3.103E-03	5.829E+00	5.890E-03	2.989E-04	0.0	-0.142	0.156	0.155
0.0700	5.229E+00	3.135E-03	5.232E+00	7.705E-03	3.371E-04	0.0	-0.140	0.152	0.152
0.0800	4.774E+00	3.169E-03	4.777E+00	9.708E-03	3.739E-04	0.0	-0.137	0.149	0.149
0.0900	4.416E+00	3.206E-03	4.419E+00	1.189E-02	4.095E-04	0.0	-0.135	0.147	0.147
0.1000	4.126E+00	3.244E-03	4.129E+00	1.423E-02	4.441E-04	0.0	-0.133	0.145	0.144
0.1250	3.597E+00	3.350E-03	3.600E+00	2.074E-02	5.270E-04	0.0	-0.130	0.141	0.140
0.1500	3.240E+00	3.463E-03	3.244E+00	2.808E-02	6.058E-04	0.0	-0.127	0.137	0.137
0.1750	2.984E+00	3.584E-03	2.988E+00	3.612E-02	6.812E-04	0.0	-0.124	0.135	0.134
0.2000	2.792E+00	3.711E-03	2.796E+00	4.478E-02	7.540E-04	0.0	-0.122	0.132	0.132
0.2500	2.525E+00	3.985E-03	2.529E+00	6.365E-02	8.937E-04	0.0	-0.119	0.129	0.128
0.3000	2.351E+00	4.284E-03	2.355E+00	8.418E-02	1.028E-03	0.0	-0.117	0.126	0.125
0.3500	2.229E+00	4.604E-03	2.234E+00	1.060E-01	1.158E-03	0.0	-0.114	0.124	0.123
0.4000	2.142E+00	4.945E-03	2.147E+00	1.289E-01	1.286E-03	0.0	-0.113	0.122	0.121
0.4500	2.076E+00	5.304E-03	2.082E+00	1.525E-01	1.413E-03	0.0	-0.111	0.120	0.119
0.5000	2.027E+00	5.680E-03	2.032E+00	1.769E-01	1.539E-03	0.0	-0.110	0.119	0.117
0.5500	1.988E+00	6.071E-03	1.994E+00	2.017E-01	1.664E-03	0.0	-0.108	0.118	0.116
0.6000	1.958E+00	6.475E-03	1.965E+00	2.270E-01	1.790E-03	0.0	-0.107	0.116	0.115
0.7000	1.915E+00	7.322E-03	1.923E+00	2.785E-01	2.041E-03	0.0	-0.105	0.114	0.112
0.8000	1.888E+00	8.212E-03	1.897E+00	3.309E-01	2.295E-03	0.0	-0.103	0.113	0.110
0.9000	1.871E+00	9.142E-03	1.881E+00	3.838E-01	2.550E-03	0.0	-0.102	0.111	0.109
1.0000	1.861E+00	1.011E-02	1.871E+00	4.372E-01	2.808E-03	0.0	-0.100	0.110	0.107
1.2500	1.853E+00	1.267E-02	1.865E+00	5.711E-01	3.466E-03	0.0	-0.097	0.107	0.104
1.5000	1.857E+00	1.541E-02	1.873E+00	7.049E-01	4.139E-03	0.0	-0.095	0.105	0.101
1.7500	1.868E+00	1.830E-02	1.886E+00	8.380E-01	4.829E-03	0.0	-0.093	0.103	0.099
2.0000	1.881E+00	2.132E-02	1.902E+00	9.699E-01	5.532E-03	0.0	-0.092	0.102	0.097
2.5000	1.910E+00	2.766E-02	1.938E+00	1.230E+00	6.973E-03	0.0	-0.089	0.099	0.094
3.0000	1.939E+00	3.435E-02	1.974E+00	1.486E+00	8.450E-03	0.0	-0.087	0.097	0.092
3.5000	1.967E+00	4.132E-02	2.008E+00	1.737E+00	9.955E-03	0.0	-0.085	0.095	0.090
4.0000	1.993E+00	4.852E-02	2.041E+00	1.984E+00	1.148E-02	0.0	-0.084	0.094	0.088
4.5000	2.017E+00	5.593E-02	2.073E+00	2.227E+00	1.303E-02	0.0	-0.083	0.092	0.087
5.0000	2.039E+00	6.353E-02	2.102E+00	2.467E+00	1.458E-02	0.0	-0.082	0.091	0.085
5.5000	2.059E+00	7.129E-02	2.131E+00	2.703E+00	1.615E-02	0.0	-0.081	0.090	0.084
6.0000	2.078E+00	7.919E-02	2.158E+00	2.936E+00	1.773E-02	0.0	-0.080	0.089	0.083
7.0000	2.113E+00	9.539E-02	2.208E+00	3.394E+00	2.090E-02	0.0	-0.079	0.087	0.081
8.0000	2.144E+00	1.120E-01	2.256E+00	3.842E+00	2.409E-02	0.0	-0.077	0.086	0.080
9.0000	2.171E+00	1.290E-01	2.300E+00	4.281E+00	2.729E-02	0.0	-0.076	0.084	0.078
10.0000	2.196E+00	1.464E-01	2.342E+00	4.712E+00	3.049E-02	0.0	-0.075	0.083	0.077
12.5000	2.249E+00	1.909E-01	2.440E+00	5.757E+00	3.847E-02	0.0	-0.074	0.081	0.074
15.0000	2.293E+00	2.367E-01	2.530E+00	6.763E+00	4.638E-02	0.0	-0.072	0.079	0.072
17.5000	2.330E+00	2.835E-01	2.614E+00	7.735E+00	5.419E-02	0.0	-0.071	0.077	0.070
20.0000	2.363E+00	3.311E-01	2.694E+00	8.677E+00	6.188E-02	2.424E-05	-0.069	0.075	0.068
25.0000	2.413E+00	4.282E-01	2.841E+00	1.048E+01	7.689E-02	5.648E-02	-0.052	0.071	0.062
30.0000	2.448E+00	5.270E-01	2.975E+00	1.220E+01	9.142E-02	1.676E-01	-0.042	0.067	0.055
35.0000	2.476E+00	6.271E-01	3.103E+00	1.385E+01	1.055E-01	2.951E-01	-0.036	0.063	0.049
40.0000	2.498E+00	7.284E-01	3.226E+00	1.543E+01	1.190E-01	4.244E-01	-0.032	0.059	0.044
45.0000	2.517E+00	8.306E-01	3.347E+00	1.695E+01	1.321E-01	5.501E-01	-0.029	0.056	0.040
50.0000	2.533E+00	9.334E-01	3.466E+00	1.842E+01	1.448E-01	6.699E-01	-0.027	0.053	0.036
55.0000	2.547E+00	1.037E+00	3.584E+00	1.984E+01	1.570E-01	7.833E-01	-0.025	0.050	0.034
60.0000	2.560E+00	1.141E+00	3.701E+00	2.121E+01	1.689E-01	8.903E-01	-0.024	0.048	0.031
70.0000	2.581E+00	1.351E+00	3.932E+00	2.383E+01	1.914E-01	1.087E+00	-0.022	0.045	0.027
80.0000	2.600E+00	1.562E+00	4.162E+00	2.630E+01	2.124E-01	1.263E+00	-0.021	0.042	0.025
90.0000	2.616E+00	1.774E+00	4.390E+00	2.864E+01	2.321E-01	1.422E+00	-0.020	0.039	0.022
100.0000	2.630E+00	1.988E+00	4.618E+00	3.086E+01	2.507E-01	1.567E+00	-0.019	0.037	0.020
125.0000	2.659E+00	2.525E+00	5.185E+00	3.597E+01	2.925E-01	1.880E+00	-0.018	0.034	0.017
150.0000	2.683E+00	3.067E+00	5.750E+00	4.054E+01	3.289E-01	2.142E+00	-0.017	0.031	0.015
175.0000	2.702E+00	3.611E+00	6.314E+00	4.469E+01	3.609E-01	2.369E+00	-0.016	0.029	0.013
200.0000	2.719E+00	4.158E+00	6.877E+00	4.848E+01	3.894E-01	2.569E+00	-0.015	0.027	0.012
250.0000	2.746E+00	5.258E+00	8.003E+00	5.522E+01	4.379E-01	2.912E+00	-0.013	0.024	0.010
300.0000	2.767E+00	6.362E+00	9.129E+00	6.106E+01	4.779E-01	3.201E+00	-0.012	0.022	0.009
350.0000	2.784E+00	7.471E+00	1.026E+01	6.623E+01	5.115E-01	3.454E+00	-0.010	0.021	0.008
400.0000	2.799E+00	8.583E+00	1.138E+01	7.085E+01	5.403E-01	3.679E+00	-0.009	0.020	0.007
450.0000	2.811E+00	9.697E+00	1.251E+01	7.504E+01	5.653E-01	3.882E+00	-0.008	0.019	0.006
500.0000	2.822E+00	1.081E+01	1.364E+01	7.887E+01	5.872E-01	4.067E+00	-0.007	0.018	0.005
550.0000	2.832E+00	1.193E+01	1.476E+01	8.239E+01	6.066E-01	4.237E+00	-0.006	0.017	0.005
600.0000	2.840E+00	1.305E+01	1.589E+01	8.566E+01	6.240E-01	4.395E+00	-0.005	0.016	0.004
700.0000	2.855E+00	1.529E+01	1.815E+01	9.154E+01	6.537E-01	4.680E+00	-0.004	0.015	0.004
800.0000	2.867E+00	1.754E+01	2.040E+01	9.674E+01	6.785E-01	4.930E+00	-0.003	0.015	0.003
900.0000	2.878E+00	1.978E+01	2.266E+01	1.014E+02	6.993E-01	5.154E+00	-0.003	0.014	0.003
1000.0000	2.887E+00	2.203E+01	2.492E+01	1.056E+02	7.173E-01	5.356E+00	-0.002	0.013	0.003

ELECTRONS IN ADIPOSE TISSUE (ICRP)

I = 63.2 eV DENSITY = 9.200E-01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.347E+01	3.168E-03	2.347E+01	2.406E-04	7.396E-05	0.0	-0.192	0.218	0.217
0.0125	1.971E+01	3.184E-03	1.971E+01	3.574E-04	8.884E-05	0.0	-0.184	0.209	0.207
0.0150	1.709E+01	3.194E-03	1.709E+01	4.940E-04	1.031E-04	0.0	-0.179	0.201	0.200
0.0175	1.515E+01	3.201E-03	1.515E+01	6.497E-04	1.168E-04	0.0	-0.174	0.195	0.194
0.0200	1.365E+01	3.207E-03	1.365E+01	8.237E-04	1.301E-04	0.0	-0.170	0.190	0.189
0.0250	1.148E+01	3.217E-03	1.149E+01	1.225E-03	1.556E-04	0.0	-0.164	0.182	0.182
0.0300	9.984E+00	3.227E-03	9.987E+00	1.693E-03	1.800E-04	0.0	-0.159	0.177	0.176
0.0350	8.881E+00	3.238E-03	8.884E+00	2.225E-03	2.034E-04	0.0	-0.156	0.172	0.172
0.0400	8.034E+00	3.249E-03	8.037E+00	2.818E-03	2.260E-04	0.0	-0.153	0.168	0.168
0.0450	7.362E+00	3.262E-03	7.365E+00	3.468E-03	2.480E-04	0.0	-0.150	0.165	0.165
0.0500	6.816E+00	3.275E-03	6.819E+00	4.175E-03	2.693E-04	0.0	-0.148	0.162	0.162
0.0550	6.362E+00	3.290E-03	6.365E+00	4.934E-03	2.902E-04	0.0	-0.146	0.160	0.160
0.0600	5.979E+00	3.305E-03	5.983E+00	5.745E-03	3.106E-04	0.0	-0.144	0.158	0.158
0.0700	5.369E+00	3.338E-03	5.372E+00	7.513E-03	3.501E-04	0.0	-0.141	0.154	0.154
0.0800	4.903E+00	3.373E-03	4.906E+00	9.464E-03	3.881E-04	0.0	-0.139	0.151	0.151
0.0900	4.535E+00	3.411E-03	4.539E+00	1.159E-02	4.250E-04	0.0	-0.137	0.149	0.148
0.1000	4.238E+00	3.452E-03	4.241E+00	1.387E-02	4.608E-04	0.0	-0.135	0.147	0.146
0.1250	3.696E+00	3.562E-03	3.700E+00	2.020E-02	5.464E-04	0.0	-0.131	0.142	0.142
0.1500	3.330E+00	3.681E-03	3.334E+00	2.734E-02	6.277E-04	0.0	-0.128	0.139	0.138
0.1750	3.068E+00	3.808E-03	3.071E+00	3.517E-02	7.055E-04	0.0	-0.126	0.136	0.136
0.2000	2.871E+00	3.943E-03	2.875E+00	4.359E-02	7.806E-04	0.0	-0.124	0.134	0.133
0.2500	2.597E+00	4.232E-03	2.601E+00	6.194E-02	9.244E-04	0.0	-0.120	0.130	0.130
0.3000	2.418E+00	4.547E-03	2.422E+00	8.190E-02	1.062E-03	0.0	-0.118	0.127	0.127
0.3500	2.294E+00	4.885E-03	2.299E+00	1.031E-01	1.196E-03	0.0	-0.116	0.125	0.124
0.4000	2.204E+00	5.244E-03	2.209E+00	1.253E-01	1.328E-03	0.0	-0.115	0.123	0.122
0.4500	2.135E+00	5.623E-03	2.141E+00	1.483E-01	1.458E-03	1.471E-02	-0.090	0.120	0.118
0.5000	2.081E+00	6.020E-03	2.087E+00	1.720E-01	1.588E-03	4.184E-02	-0.084	0.115	0.113
0.5500	2.039E+00	6.433E-03	2.045E+00	1.962E-01	1.718E-03	7.141E-02	-0.078	0.111	0.107
0.6000	2.005E+00	6.860E-03	2.011E+00	2.209E-01	1.848E-03	1.028E-01	-0.074	0.107	0.103
0.7000	1.954E+00	7.753E-03	1.962E+00	2.712E-01	2.109E-03	1.691E-01	-0.066	0.100	0.094
0.8000	1.921E+00	8.692E-03	1.929E+00	3.227E-01	2.374E-03	2.381E-01	-0.060	0.094	0.087
0.9000	1.897E+00	9.674E-03	1.907E+00	3.748E-01	2.642E-03	3.080E-01	-0.055	0.089	0.081
1.0000	1.880E+00	1.070E-02	1.891E+00	4.275E-01	2.915E-03	3.776E-01	-0.051	0.084	0.076
1.2500	1.858E+00	1.340E-02	1.871E+00	5.605E-01	3.612E-03	5.471E-01	-0.044	0.075	0.066
1.5000	1.849E+00	1.629E-02	1.865E+00	6.944E-01	4.334E-03	7.067E-01	-0.039	0.069	0.058
1.7500	1.848E+00	1.934E-02	1.867E+00	8.284E-01	5.078E-03	8.554E-01	-0.036	0.064	0.052
2.0000	1.850E+00	2.252E-02	1.873E+00	9.621E-01	5.842E-03	9.936E-01	-0.033	0.060	0.048
2.5000	1.860E+00	2.921E-02	1.889E+00	1.228E+00	7.421E-03	1.242E+00	-0.030	0.053	0.042
3.0000	1.872E+00	3.626E-02	1.908E+00	1.491E+00	9.055E-03	1.459E+00	-0.028	0.049	0.037
3.5000	1.885E+00	4.360E-02	1.928E+00	1.752E+00	1.073E-02	1.652E+00	-0.026	0.046	0.034
4.0000	1.897E+00	5.120E-02	1.948E+00	2.010E+00	1.245E-02	1.825E+00	-0.025	0.043	0.032
4.5000	1.909E+00	5.901E-02	1.968E+00	2.265E+00	1.419E-02	1.981E+00	-0.024	0.041	0.030
5.0000	1.920E+00	6.701E-02	1.987E+00	2.518E+00	1.596E-02	2.125E+00	-0.023	0.039	0.029
5.5000	1.930E+00	7.518E-02	2.005E+00	2.769E+00	1.774E-02	2.257E+00	-0.022	0.037	0.027
6.0000	1.939E+00	8.350E-02	2.023E+00	3.017E+00	1.955E-02	2.379E+00	-0.022	0.036	0.026
7.0000	1.956E+00	1.005E-01	2.057E+00	3.507E+00	2.319E-02	2.601E+00	-0.020	0.034	0.025
8.0000	1.972E+00	1.181E-01	2.090E+00	3.990E+00	2.688E-02	2.798E+00	-0.019	0.032	0.023
9.0000	1.985E+00	1.360E-01	2.121E+00	4.465E+00	3.059E-02	2.976E+00	-0.018	0.030	0.022
10.0000	1.997E+00	1.542E-01	2.151E+00	4.933E+00	3.432E-02	3.137E+00	-0.017	0.029	0.021
12.5000	2.022E+00	2.010E-01	2.223E+00	6.076E+00	4.368E-02	3.491E+00	-0.014	0.026	0.018
15.0000	2.042E+00	2.492E-01	2.291E+00	7.183E+00	5.300E-02	3.790E+00	-0.012	0.024	0.016
17.5000	2.059E+00	2.984E-01	2.357E+00	8.259E+00	6.225E-02	4.050E+00	-0.010	0.022	0.015
20.0000	2.073E+00	3.485E-01	2.421E+00	9.305E+00	7.138E-02	4.282E+00	-0.009	0.021	0.013
25.0000	2.095E+00	4.505E-01	2.546E+00	1.132E+01	8.923E-02	4.679E+00	-0.007	0.018	0.011
30.0000	2.113E+00	5.544E-01	2.668E+00	1.324E+01	1.065E-01	5.012E+00	-0.005	0.016	0.009
35.0000	2.128E+00	6.597E-01	2.788E+00	1.507E+01	1.230E-01	5.299E+00	-0.004	0.015	0.008
40.0000	2.141E+00	7.661E-01	2.907E+00	1.683E+01	1.389E-01	5.551E+00	-0.003	0.013	0.007
45.0000	2.152E+00	8.734E-01	3.025E+00	1.851E+01	1.542E-01	5.776E+00	-0.003	0.012	0.006
50.0000	2.161E+00	9.815E-01	3.143E+00	2.013E+01	1.688E-01	5.979E+00	-0.002	0.012	0.005
55.0000	2.170E+00	1.090E+00	3.260E+00	2.170E+01	1.829E-01	6.163E+00	-0.002	0.011	0.004
60.0000	2.178E+00	1.200E+00	3.377E+00	2.320E+01	1.964E-01	6.332E+00	-0.002	0.010	0.004
70.0000	2.192E+00	1.420E+00	3.611E+00	2.607E+01	2.218E-01	6.632E+00	-0.001	0.009	0.003
80.0000	2.203E+00	1.642E+00	3.845E+00	2.875E+01	2.454E-01	6.894E+00	-0.001	0.008	0.003
90.0000	2.214E+00	1.865E+00	4.079E+00	3.127E+01	2.673E-01	7.126E+00	-0.001	0.008	0.002
100.0000	2.223E+00	2.089E+00	4.312E+00	3.366E+01	2.877E-01	7.334E+00	-0.001	0.007	0.002
125.0000	2.242E+00	2.653E+00	4.896E+00	3.910E+01	3.330E-01	7.775E+00	-0.000	0.006	0.001
150.0000	2.258E+00	3.222E+00	5.480E+00	4.392E+01	3.718E-01	8.137E+00	-0.000	0.006	0.001
175.0000	2.272E+00	3.794E+00	6.065E+00	4.825E+01	4.054E-01	8.444E+00	-0.000	0.005	0.001
200.0000	2.283E+00	4.368E+00	6.651E+00	5.219E+01	4.350E-01	8.709E+00	-0.000	0.005	0.001
250.0000	2.302E+00	5.522E+00	7.824E+00	5.911E+01	4.845E-01	9.154E+00	-0.000	0.004	0.001
300.0000	2.318E+00	6.682E+00	9.000E+00	6.507E+01	5.245E-01	9.518E+00	-0.000	0.004	0.001
350.0000	2.331E+00	7.845E+00	1.018E+01	7.029E+01	5.578E-01	9.825E+00	-0.000	0.004	0.000
400.0000	2.343E+00	9.012E+00	1.136E+01	7.494E+01	5.859E-01	1.009E+01	-0.000	0.003	0.000
450.0000	2.353E+00	1.018E+01	1.253E+01	7.913E+01	6.100E-01	1.033E+01	-0.000	0.003	0.000
500.0000	2.362E+00	1.135E+01	1.371E+01	8.294E+01	6.311E-01	1.054E+01	-0.000	0.003	0.000
550.0000	2.370E+00	1.253E+01	1.490E+01	8.643E+01	6.496E-01	1.073E+01	-0.000	0.003	0.000
600.0000	2.378E+00	1.370E+01	1.608E+01	8.966E+01	6.660E-01	1.090E+01	-0.000	0.003	0.000
700.0000	2.391E+00	1.605E+01	1.844E+01	9.547E+01	6.939E-01	1.121E+01	-0.000	0.003	0.000
800.0000	2.402E+00	1.841E+01	2.081E+01	1.006E+02	7.169E-01	1.148E+01	-0.000	0.003	0.000
900.0000	2.413E+00	2.077E+01	2.318E+01	1.051E+02	7.362E-01	1.171E+01	-0.000	0.002	0.000
1000.0000	2.422E+00	2.313E+01	2.555E+01	1.092E+02	7.526E-01	1.192E+01	-0.000	0.002	0.000

ELECTRONS IN AIR, DRY (NEAR SEA LEVEL)

I = 85.7 eV DENSITY = 1.205E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.975E+01	3.897E-03	1.976E+01	2.883E-04	1.082E-04	0.0	-0.204	0.235	0.233
0.0125	1.663E+01	3.921E-03	1.663E+01	4.269E-04	1.299E-04	0.0	-0.195	0.223	0.222
0.0150	1.445E+01	3.937E-03	1.445E+01	5.886E-04	1.506E-04	0.0	-0.189	0.215	0.213
0.0175	1.283E+01	3.946E-03	1.283E+01	7.726E-04	1.706E-04	0.0	-0.184	0.208	0.207
0.0200	1.157E+01	3.954E-03	1.158E+01	9.781E-04	1.898E-04	0.0	-0.179	0.202	0.201
0.0250	9.753E+00	3.966E-03	9.757E+00	1.451E-03	2.267E-04	0.0	-0.173	0.194	0.193
0.0300	8.492E+00	3.976E-03	8.496E+00	2.001E-03	2.618E-04	0.0	-0.167	0.187	0.186
0.0350	7.563E+00	3.986E-03	7.567E+00	2.626E-03	2.955E-04	0.0	-0.163	0.182	0.181
0.0400	6.848E+00	3.998E-03	6.852E+00	3.322E-03	3.280E-04	0.0	-0.160	0.178	0.177
0.0450	6.281E+00	4.011E-03	6.285E+00	4.085E-03	3.594E-04	0.0	-0.157	0.174	0.174
0.0500	5.819E+00	4.025E-03	5.823E+00	4.912E-03	3.900E-04	0.0	-0.155	0.171	0.171
0.0550	5.435E+00	4.040E-03	5.439E+00	5.801E-03	4.197E-04	0.0	-0.153	0.168	0.168
0.0600	5.111E+00	4.057E-03	5.115E+00	6.750E-03	4.488E-04	0.0	-0.151	0.166	0.166
0.0700	4.593E+00	4.093E-03	4.597E+00	8.817E-03	5.049E-04	0.0	-0.147	0.162	0.162
0.0800	4.198E+00	4.133E-03	4.202E+00	1.110E-02	5.590E-04	0.0	-0.145	0.159	0.158
0.0900	3.886E+00	4.175E-03	3.890E+00	1.357E-02	6.112E-04	0.0	-0.142	0.156	0.156
0.1000	3.633E+00	4.222E-03	3.637E+00	1.623E-02	6.618E-04	0.0	-0.140	0.153	0.153
0.1250	3.172E+00	4.348E-03	3.177E+00	2.362E-02	7.826E-04	0.0	-0.136	0.149	0.148
0.1500	2.861E+00	4.485E-03	2.865E+00	3.193E-02	8.968E-04	0.0	-0.133	0.145	0.145
0.1750	2.637E+00	4.633E-03	2.642E+00	4.103E-02	1.006E-03	0.0	-0.131	0.142	0.142
0.2000	2.470E+00	4.789E-03	2.474E+00	5.082E-02	1.111E-03	0.0	-0.128	0.140	0.139
0.2500	2.236E+00	5.126E-03	2.242E+00	7.212E-02	1.311E-03	0.0	-0.125	0.136	0.135
0.3000	2.084E+00	5.495E-03	2.089E+00	9.527E-02	1.502E-03	0.0	-0.122	0.133	0.132
0.3500	1.978E+00	5.890E-03	1.984E+00	1.199E-01	1.688E-03	0.0	-0.120	0.130	0.129
0.4000	1.902E+00	6.311E-03	1.908E+00	1.456E-01	1.869E-03	0.0	-0.118	0.128	0.127
0.4500	1.845E+00	6.757E-03	1.852E+00	1.722E-01	2.048E-03	0.0	-0.116	0.126	0.125
0.5000	1.802E+00	7.223E-03	1.809E+00	1.995E-01	2.225E-03	0.0	-0.114	0.125	0.123
0.5500	1.769E+00	7.708E-03	1.776E+00	2.274E-01	2.401E-03	0.0	-0.113	0.123	0.122
0.6000	1.743E+00	8.210E-03	1.751E+00	2.558E-01	2.577E-03	0.0	-0.112	0.122	0.120
0.7000	1.706E+00	9.258E-03	1.715E+00	3.135E-01	2.929E-03	0.0	-0.109	0.120	0.118
0.8000	1.683E+00	1.036E-02	1.694E+00	3.722E-01	3.283E-03	0.0	-0.107	0.118	0.115
0.9000	1.669E+00	1.151E-02	1.681E+00	4.315E-01	3.638E-03	0.0	-0.106	0.116	0.114
1.0000	1.661E+00	1.271E-02	1.674E+00	4.912E-01	3.997E-03	0.0	-0.104	0.115	0.112
1.2500	1.655E+00	1.588E-02	1.671E+00	6.408E-01	4.906E-03	0.0	-0.101	0.112	0.108
1.5000	1.661E+00	1.927E-02	1.680E+00	7.900E-01	5.836E-03	0.0	-0.099	0.109	0.106
1.7500	1.672E+00	2.284E-02	1.694E+00	9.382E-01	6.784E-03	0.0	-0.097	0.107	0.103
2.0000	1.684E+00	2.656E-02	1.711E+00	1.085E+00	7.748E-03	0.0	-0.095	0.106	0.101
2.5000	1.712E+00	3.437E-02	1.747E+00	1.374E+00	9.716E-03	0.0	-0.092	0.103	0.098
3.0000	1.740E+00	4.260E-02	1.783E+00	1.658E+00	1.173E-02	0.0	-0.090	0.100	0.095
3.5000	1.766E+00	5.115E-02	1.817E+00	1.935E+00	1.377E-02	0.0	-0.088	0.098	0.093
4.0000	1.790E+00	5.999E-02	1.850E+00	2.208E+00	1.583E-02	0.0	-0.087	0.097	0.091
4.5000	1.812E+00	6.908E-02	1.882E+00	2.476E+00	1.792E-02	0.0	-0.086	0.095	0.089
5.0000	1.833E+00	7.838E-02	1.911E+00	2.740E+00	2.001E-02	0.0	-0.084	0.094	0.088
5.5000	1.852E+00	8.787E-02	1.940E+00	2.999E+00	2.211E-02	0.0	-0.083	0.093	0.086
6.0000	1.870E+00	9.754E-02	1.968E+00	3.255E+00	2.422E-02	0.0	-0.083	0.092	0.085
7.0000	1.902E+00	1.173E-01	2.020E+00	3.757E+00	2.845E-02	0.0	-0.081	0.090	0.083
8.0000	1.931E+00	1.376E-01	2.068E+00	4.246E+00	3.269E-02	0.0	-0.080	0.088	0.081
9.0000	1.956E+00	1.584E-01	2.115E+00	4.724E+00	3.692E-02	0.0	-0.079	0.087	0.080
10.0000	1.979E+00	1.795E-01	2.159E+00	5.192E+00	4.113E-02	0.0	-0.078	0.085	0.078
12.5000	2.029E+00	2.337E-01	2.262E+00	6.323E+00	5.156E-02	0.0	-0.076	0.083	0.075
15.0000	2.069E+00	2.895E-01	2.359E+00	7.405E+00	6.181E-02	0.0	-0.074	0.080	0.072
17.5000	2.104E+00	3.464E-01	2.451E+00	8.444E+00	7.185E-02	0.0	-0.073	0.078	0.070
20.0000	2.134E+00	4.042E-01	2.539E+00	9.446E+00	8.167E-02	0.0	-0.072	0.076	0.068
25.0000	2.185E+00	5.219E-01	2.707E+00	1.135E+01	1.006E-01	0.0	-0.070	0.073	0.065
30.0000	2.226E+00	6.417E-01	2.868E+00	1.315E+01	1.186E-01	7.636E-03	-0.062	0.071	0.062
35.0000	2.257E+00	7.630E-01	3.020E+00	1.485E+01	1.357E-01	5.984E-02	-0.052	0.068	0.057
40.0000	2.282E+00	8.855E-01	3.167E+00	1.646E+01	1.520E-01	1.378E-01	-0.044	0.064	0.052
45.0000	2.302E+00	1.009E+00	3.311E+00	1.801E+01	1.676E-01	2.266E-01	-0.039	0.061	0.048
50.0000	2.319E+00	1.133E+00	3.452E+00	1.948E+01	1.825E-01	3.192E-01	-0.035	0.059	0.044
55.0000	2.334E+00	1.258E+00	3.592E+00	2.090E+01	1.968E-01	4.120E-01	-0.032	0.056	0.040
60.0000	2.347E+00	1.384E+00	3.731E+00	2.227E+01	2.104E-01	5.029E-01	-0.030	0.054	0.037
70.0000	2.369E+00	1.637E+00	4.006E+00	2.486E+01	2.361E-01	6.762E-01	-0.027	0.050	0.033
80.0000	2.387E+00	1.892E+00	4.279E+00	2.727E+01	2.598E-01	8.365E-01	-0.025	0.047	0.029
90.0000	2.403E+00	2.148E+00	4.551E+00	2.954E+01	2.818E-01	9.842E-01	-0.023	0.044	0.026
100.0000	2.417E+00	2.405E+00	4.822E+00	3.167E+01	3.022E-01	1.120E+00	-0.022	0.042	0.024
125.0000	2.445E+00	3.053E+00	5.498E+00	3.652E+01	3.474E-01	1.419E+00	-0.020	0.038	0.020
150.0000	2.468E+00	3.705E+00	6.173E+00	4.081E+01	3.859E-01	1.670E+00	-0.019	0.035	0.017
175.0000	2.486E+00	4.360E+00	6.847E+00	4.465E+01	4.192E-01	1.887E+00	-0.018	0.032	0.015
200.0000	2.502E+00	5.018E+00	7.520E+00	4.814E+01	4.484E-01	2.078E+00	-0.017	0.030	0.013
250.0000	2.529E+00	6.340E+00	8.868E+00	5.425E+01	4.972E-01	2.403E+00	-0.016	0.028	0.011
300.0000	2.550E+00	7.667E+00	1.022E+01	5.950E+01	5.365E-01	2.675E+00	-0.015	0.026	0.009
350.0000	2.567E+00	8.998E+00	1.157E+01	6.410E+01	5.691E-01	2.909E+00	-0.014	0.024	0.008
400.0000	2.582E+00	1.033E+01	1.292E+01	6.819E+01	5.967E-01	3.116E+00	-0.013	0.023	0.007
450.0000	2.595E+00	1.167E+01	1.427E+01	7.187E+01	6.203E-01	3.302E+00	-0.012	0.022	0.007
500.0000	2.606E+00	1.301E+01	1.562E+01	7.522E+01	6.409E-01	3.472E+00	-0.011	0.021	0.006
550.0000	2.616E+00	1.435E+01	1.697E+01	7.829E+01	6.589E-01	3.628E+00	-0.010	0.020	0.006
600.0000	2.625E+00	1.569E+01	1.832E+01	8.112E+01	6.750E-01	3.772E+00	-0.010	0.019	0.005
700.0000	2.641E+00	1.838E+01	2.102E+01	8.622E+01	7.022E-01	4.034E+00	-0.008	0.018	0.004
800.0000	2.653E+00	2.107E+01	2.372E+01	9.069E+01	7.247E-01	4.267E+00	-0.007	0.017	0.004
900.0000	2.664E+00	2.376E+01	2.643E+01	9.468E+01	7.435E-01	4.477E+00	-0.006	0.017	0.004
1000.0000	2.674E+00	2.646E+01	2.913E+01	9.829E+01	7.595E-01	4.668E+00	-0.005	0.016	0.003

ELECTRONS IN ALUMINUM OXIDE

I = 145.2 eV DENSITY = 3.970E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.731E+01	5.480E-03	1.732E+01	3.351E-04	1.714E-04	0.0	-0.229	0.270	0.266
0.0125	1.465E+01	5.569E-03	1.466E+01	4.927E-04	2.068E-04	0.0	-0.218	0.255	0.251
0.0150	1.278E+01	5.629E-03	1.278E+01	6.758E-04	2.407E-04	0.0	-0.210	0.244	0.241
0.0175	1.138E+01	5.674E-03	1.138E+01	8.835E-04	2.734E-04	0.0	-0.203	0.235	0.232
0.0200	1.029E+01	5.707E-03	1.030E+01	1.115E-03	3.050E-04	0.0	-0.198	0.228	0.225
0.0250	8.709E+00	5.753E-03	8.715E+00	1.645E-03	3.656E-04	0.0	-0.190	0.217	0.215
0.0300	7.605E+00	5.786E-03	7.611E+00	2.261E-03	4.231E-04	0.0	-0.184	0.208	0.207
0.0350	6.789E+00	5.812E-03	6.795E+00	2.957E-03	4.781E-04	0.0	-0.179	0.202	0.201
0.0400	6.160E+00	5.835E-03	6.165E+00	3.731E-03	5.310E-04	0.0	-0.175	0.197	0.195
0.0450	5.658E+00	5.856E-03	5.664E+00	4.578E-03	5.820E-04	0.0	-0.171	0.192	0.191
0.0500	5.249E+00	5.878E-03	5.255E+00	5.495E-03	6.315E-04	0.0	-0.169	0.189	0.188
0.0550	4.909E+00	5.899E-03	4.915E+00	6.480E-03	6.795E-04	0.0	-0.166	0.185	0.184
0.0600	4.621E+00	5.921E-03	4.627E+00	7.529E-03	7.262E-04	0.0	-0.164	0.182	0.182
0.0700	4.161E+00	5.965E-03	4.167E+00	9.811E-03	8.162E-04	0.0	-0.160	0.178	0.177
0.0800	3.809E+00	6.014E-03	3.815E+00	1.232E-02	9.023E-04	0.0	-0.157	0.174	0.173
0.0900	3.530E+00	6.068E-03	3.536E+00	1.505E-02	9.850E-04	0.0	-0.154	0.170	0.170
0.1000	3.305E+00	6.126E-03	3.311E+00	1.797E-02	1.065E-03	0.0	-0.152	0.167	0.167
0.1250	2.892E+00	6.285E-03	2.898E+00	2.608E-02	1.254E-03	0.0	-0.147	0.162	0.161
0.1500	2.613E+00	6.464E-03	2.619E+00	3.517E-02	1.432E-03	0.0	-0.143	0.157	0.157
0.1750	2.412E+00	6.661E-03	2.419E+00	4.512E-02	1.600E-03	0.0	-0.140	0.154	0.153
0.2000	2.262E+00	6.871E-03	2.269E+00	5.581E-02	1.762E-03	0.0	-0.138	0.151	0.150
0.2500	2.052E+00	7.330E-03	2.059E+00	7.902E-02	2.068E-03	1.094E-03	-0.125	0.146	0.145
0.3000	1.912E+00	7.834E-03	1.920E+00	1.042E-01	2.360E-03	2.440E-02	-0.113	0.139	0.137
0.3500	1.815E+00	8.376E-03	1.823E+00	1.310E-01	2.643E-03	4.961E-02	-0.107	0.133	0.131
0.4000	1.744E+00	8.954E-03	1.753E+00	1.590E-01	2.919E-03	7.609E-02	-0.102	0.128	0.125
0.4500	1.691E+00	9.563E-03	1.700E+00	1.879E-01	3.191E-03	1.034E-01	-0.097	0.123	0.120
0.5000	1.650E+00	1.020E-02	1.660E+00	2.177E-01	3.460E-03	1.314E-01	-0.094	0.119	0.116
0.5500	1.618E+00	1.086E-02	1.629E+00	2.481E-01	3.728E-03	1.597E-01	-0.090	0.116	0.112
0.6000	1.593E+00	1.155E-02	1.605E+00	2.791E-01	3.995E-03	1.883E-01	-0.087	0.113	0.109
0.7000	1.557E+00	1.298E-02	1.570E+00	3.421E-01	4.529E-03	2.455E-01	-0.082	0.108	0.103
0.8000	1.533E+00	1.449E-02	1.547E+00	4.063E-01	5.064E-03	3.026E-01	-0.078	0.103	0.097
0.9000	1.517E+00	1.606E-02	1.533E+00	4.712E-01	5.603E-03	3.589E-01	-0.074	0.099	0.093
1.0000	1.507E+00	1.769E-02	1.524E+00	5.367E-01	6.147E-03	4.143E-01	-0.071	0.096	0.089
1.2500	1.494E+00	2.201E-02	1.516E+00	7.013E-01	7.528E-03	5.479E-01	-0.064	0.089	0.081
1.5000	1.492E+00	2.662E-02	1.519E+00	8.661E-01	8.942E-03	6.744E-01	-0.059	0.083	0.075
1.7500	1.495E+00	3.148E-02	1.527E+00	1.030E+00	1.039E-02	7.938E-01	-0.054	0.079	0.070
2.0000	1.501E+00	3.653E-02	1.537E+00	1.193E+00	1.186E-02	9.069E-01	-0.050	0.075	0.065
2.5000	1.514E+00	4.714E-02	1.561E+00	1.516E+00	1.488E-02	1.116E+00	-0.044	0.069	0.058
3.0000	1.528E+00	5.829E-02	1.586E+00	1.834E+00	1.798E-02	1.306E+00	-0.040	0.064	0.053
3.5000	1.541E+00	6.987E-02	1.611E+00	2.147E+00	2.113E-02	1.479E+00	-0.036	0.060	0.048
4.0000	1.553E+00	8.181E-02	1.635E+00	2.455E+00	2.433E-02	1.638E+00	-0.033	0.057	0.045
4.5000	1.564E+00	9.407E-02	1.658E+00	2.759E+00	2.756E-02	1.785E+00	-0.031	0.054	0.041
5.0000	1.575E+00	1.066E-01	1.681E+00	3.058E+00	3.081E-02	1.921E+00	-0.029	0.051	0.039
5.5000	1.584E+00	1.194E-01	1.704E+00	3.353E+00	3.408E-02	2.048E+00	-0.027	0.049	0.037
6.0000	1.593E+00	1.324E-01	1.725E+00	3.645E+00	3.735E-02	2.167E+00	-0.026	0.047	0.035
7.0000	1.609E+00	1.590E-01	1.767E+00	4.218E+00	4.392E-02	2.384E+00	-0.024	0.044	0.031
8.0000	1.622E+00	1.862E-01	1.808E+00	4.777E+00	5.049E-02	2.578E+00	-0.022	0.041	0.029
9.0000	1.634E+00	2.140E-01	1.848E+00	5.324E+00	5.704E-02	2.754E+00	-0.020	0.039	0.027
10.0000	1.645E+00	2.422E-01	1.887E+00	5.859E+00	6.354E-02	2.914E+00	-0.019	0.037	0.025
12.5000	1.667E+00	3.145E-01	1.982E+00	7.152E+00	7.956E-02	3.263E+00	-0.017	0.033	0.021
15.0000	1.685E+00	3.886E-01	2.074E+00	8.385E+00	9.516E-02	3.557E+00	-0.015	0.030	0.019
17.5000	1.700E+00	4.642E-01	2.164E+00	9.565E+00	1.103E-01	3.812E+00	-0.013	0.028	0.017
20.0000	1.713E+00	5.409E-01	2.254E+00	1.070E+01	1.249E-01	4.038E+00	-0.012	0.026	0.015
25.0000	1.734E+00	6.968E-01	2.431E+00	1.283E+01	1.527E-01	4.424E+00	-0.010	0.023	0.013
30.0000	1.750E+00	8.552E-01	2.606E+00	1.482E+01	1.786E-01	4.747E+00	-0.008	0.021	0.011
35.0000	1.764E+00	1.015E+00	2.780E+00	1.668E+01	2.026E-01	5.025E+00	-0.007	0.019	0.010
40.0000	1.776E+00	1.177E+00	2.953E+00	1.842E+01	2.251E-01	5.269E+00	-0.006	0.018	0.008
45.0000	1.786E+00	1.340E+00	3.126E+00	2.007E+01	2.461E-01	5.487E+00	-0.005	0.016	0.008
50.0000	1.795E+00	1.504E+00	3.299E+00	2.162E+01	2.657E-01	5.684E+00	-0.005	0.015	0.007
55.0000	1.803E+00	1.669E+00	3.472E+00	2.310E+01	2.842E-01	5.864E+00	-0.004	0.015	0.006
60.0000	1.810E+00	1.835E+00	3.645E+00	2.451E+01	3.015E-01	6.029E+00	-0.004	0.014	0.006
70.0000	1.822E+00	2.168E+00	3.990E+00	2.713E+01	3.333E-01	6.323E+00	-0.003	0.013	0.005
80.0000	1.833E+00	2.503E+00	4.337E+00	2.953E+01	3.617E-01	6.581E+00	-0.002	0.012	0.004
90.0000	1.842E+00	2.841E+00	4.683E+00	3.175E+01	3.873E-01	6.809E+00	-0.002	0.011	0.003
100.0000	1.851E+00	3.179E+00	5.030E+00	3.381E+01	4.106E-01	7.015E+00	-0.002	0.010	0.003
125.0000	1.868E+00	4.030E+00	5.898E+00	3.839E+01	4.602E-01	7.452E+00	-0.001	0.009	0.002
150.0000	1.882E+00	4.887E+00	6.769E+00	4.235E+01	5.008E-01	7.812E+00	-0.001	0.008	0.002
175.0000	1.894E+00	5.747E+00	7.641E+00	4.582E+01	5.346E-01	8.117E+00	-0.001	0.008	0.002
200.0000	1.904E+00	6.611E+00	8.515E+00	4.892E+01	5.634E-01	8.382E+00	-0.001	0.007	0.001
250.0000	1.921E+00	8.345E+00	1.027E+01	5.426E+01	6.098E-01	8.825E+00	-0.000	0.007	0.001
300.0000	1.935E+00	1.009E+01	1.202E+01	5.876E+01	6.460E-01	9.188E+00	-0.000	0.006	0.001
350.0000	1.947E+00	1.183E+01	1.378E+01	6.264E+01	6.750E-01	9.495E+00	-0.000	0.006	0.001
400.0000	1.957E+00	1.358E+01	1.554E+01	6.605E+01	6.990E-01	9.761E+00	-0.000	0.005	0.001
450.0000	1.966E+00	1.533E+01	1.730E+01	6.910E+01	7.191E-01	9.996E+00	-0.000	0.005	0.001
500.0000	1.974E+00	1.709E+01	1.906E+01	7.185E+01	7.364E-01	1.021E+01	-0.000	0.005	0.001
550.0000	1.981E+00	1.885E+01	2.083E+01	7.436E+01	7.513E-01	1.040E+01	-0.000	0.005	0.000
600.0000	1.988E+00	2.060E+01	2.259E+01	7.667E+01	7.644E-01	1.057E+01	-0.000	0.005	0.000
700.0000	1.999E+00	2.412E+01	2.612E+01	8.078E+01	7.864E-01	1.088E+01	-0.000	0.004	0.000
800.0000	2.009E+00	2.765E+01	2.966E+01	8.437E+01	8.041E-01	1.115E+01	-0.000	0.004	0.000
900.0000	2.018E+00	3.117E+01	3.319E+01	8.756E+01	8.187E-01	1.138E+01	-0.000	0.004	0.000
1000.0000	2.026E+00	3.470E+01	3.673E+01	9.042E+01	8.311E-01	1.159E+01	-0.000	0.004	0.000

ELECTRONS IN B-100 BONE-EQUIVALENT PLASTIC

I = 85.9 eV DENSITY = 1.450E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.086E+01	4.477E-03	2.086E+01	2.731E-04	1.143E-04	0.0	-0.204	0.235	0.232
0.0125	1.756E+01	4.559E-03	1.756E+01	4.043E-04	1.389E-04	0.0	-0.196	0.223	0.221
0.0150	1.525E+01	4.618E-03	1.526E+01	5.574E-04	1.626E-04	0.0	-0.189	0.215	0.213
0.0175	1.354E+01	4.664E-03	1.355E+01	7.317E-04	1.856E-04	0.0	-0.184	0.208	0.206
0.0200	1.222E+01	4.700E-03	1.222E+01	9.263E-04	2.080E-04	0.0	-0.179	0.202	0.201
0.0250	1.030E+01	4.754E-03	1.030E+01	1.374E-03	2.511E-04	0.0	-0.173	0.194	0.192
0.0300	8.967E+00	4.796E-03	8.972E+00	1.895E-03	2.923E-04	0.0	-0.168	0.187	0.186
0.0350	7.986E+00	4.830E-03	7.991E+00	2.487E-03	3.319E-04	0.0	-0.164	0.182	0.181
0.0400	7.232E+00	4.860E-03	7.237E+00	3.146E-03	3.702E-04	0.0	-0.160	0.178	0.177
0.0450	6.633E+00	4.888E-03	6.637E+00	3.868E-03	4.073E-04	0.0	-0.157	0.174	0.173
0.0500	6.145E+00	4.914E-03	6.150E+00	4.651E-03	4.434E-04	0.0	-0.155	0.171	0.170
0.0550	5.739E+00	4.939E-03	5.744E+00	5.493E-03	4.785E-04	0.0	-0.153	0.168	0.168
0.0600	5.397E+00	4.963E-03	5.402E+00	6.392E-03	5.127E-04	0.0	-0.151	0.166	0.165
0.0700	4.850E+00	5.013E-03	4.855E+00	8.348E-03	5.789E-04	0.0	-0.148	0.162	0.161
0.0800	4.433E+00	5.063E-03	4.438E+00	1.051E-02	6.424E-04	0.0	-0.145	0.159	0.158
0.0900	4.103E+00	5.116E-03	4.109E+00	1.285E-02	7.036E-04	0.0	-0.143	0.156	0.155
0.1000	3.837E+00	5.170E-03	3.842E+00	1.537E-02	7.628E-04	0.0	-0.141	0.154	0.153
0.1250	3.350E+00	5.318E-03	3.355E+00	2.236E-02	9.036E-04	0.0	-0.136	0.149	0.148
0.1500	3.021E+00	5.479E-03	3.027E+00	3.023E-02	1.036E-03	0.0	-0.133	0.145	0.144
0.1750	2.785E+00	5.651E-03	2.791E+00	3.884E-02	1.162E-03	0.0	-0.131	0.142	0.141
0.2000	2.608E+00	5.835E-03	2.614E+00	4.811E-02	1.283E-03	0.0	-0.129	0.140	0.139
0.2500	2.362E+00	6.231E-03	2.368E+00	6.827E-02	1.513E-03	0.0	-0.125	0.136	0.135
0.3000	2.201E+00	6.665E-03	2.208E+00	9.019E-02	1.732E-03	0.0	-0.122	0.133	0.132
0.3500	2.089E+00	7.131E-03	2.096E+00	1.135E-01	1.943E-03	4.066E-03	-0.105	0.130	0.128
0.4000	2.005E+00	7.626E-03	2.013E+00	1.378E-01	2.150E-03	2.983E-02	-0.095	0.124	0.122
0.4500	1.942E+00	8.149E-03	1.950E+00	1.631E-01	2.353E-03	5.881E-02	-0.089	0.119	0.116
0.5000	1.893E+00	8.695E-03	1.902E+00	1.891E-01	2.555E-03	8.971E-02	-0.083	0.114	0.111
0.5500	1.855E+00	9.263E-03	1.864E+00	2.156E-01	2.757E-03	1.219E-01	-0.079	0.110	0.106
0.6000	1.825E+00	9.852E-03	1.835E+00	2.427E-01	2.958E-03	1.548E-01	-0.075	0.107	0.102
0.7000	1.780E+00	1.108E-02	1.791E+00	2.979E-01	3.360E-03	2.222E-01	-0.069	0.100	0.094
0.8000	1.750E+00	1.237E-02	1.762E+00	3.542E-01	3.766E-03	2.901E-01	-0.063	0.094	0.088
0.9000	1.730E+00	1.372E-02	1.743E+00	4.113E-01	4.174E-03	3.577E-01	-0.059	0.090	0.083
1.0000	1.715E+00	1.512E-02	1.731E+00	4.688E-01	4.587E-03	4.242E-01	-0.056	0.086	0.078
1.2500	1.697E+00	1.882E-02	1.715E+00	6.141E-01	5.639E-03	5.840E-01	-0.049	0.078	0.069
1.5000	1.691E+00	2.279E-02	1.714E+00	7.599E-01	6.721E-03	7.331E-01	-0.045	0.072	0.062
1.7500	1.691E+00	2.695E-02	1.718E+00	9.057E-01	7.830E-03	8.714E-01	-0.042	0.067	0.057
2.0000	1.695E+00	3.129E-02	1.726E+00	1.051E+00	8.964E-03	9.997E-01	-0.039	0.063	0.053
2.5000	1.706E+00	4.041E-02	1.747E+00	1.339E+00	1.130E-02	1.230E+00	-0.036	0.058	0.047
3.0000	1.719E+00	4.999E-02	1.769E+00	1.623E+00	1.369E-02	1.432E+00	-0.033	0.053	0.043
3.5000	1.733E+00	5.995E-02	1.793E+00	1.904E+00	1.614E-02	1.612E+00	-0.032	0.050	0.040
4.0000	1.745E+00	7.022E-02	1.816E+00	2.181E+00	1.863E-02	1.773E+00	-0.030	0.048	0.037
4.5000	1.757E+00	8.077E-02	1.838E+00	2.455E+00	2.115E-02	1.920E+00	-0.029	0.045	0.035
5.0000	1.768E+00	9.156E-02	1.860E+00	2.725E+00	2.370E-02	2.054E+00	-0.028	0.044	0.034
5.5000	1.779E+00	1.026E-01	1.881E+00	2.993E+00	2.626E-02	2.179E+00	-0.027	0.042	0.032
6.0000	1.788E+00	1.138E-01	1.902E+00	3.257E+00	2.883E-02	2.294E+00	-0.026	0.041	0.031
7.0000	1.806E+00	1.367E-01	1.942E+00	3.777E+00	3.401E-02	2.504E+00	-0.024	0.038	0.029
8.0000	1.821E+00	1.601E-01	1.981E+00	4.287E+00	3.921E-02	2.692E+00	-0.023	0.036	0.027
9.0000	1.834E+00	1.841E-01	2.018E+00	4.787E+00	4.442E-02	2.862E+00	-0.021	0.035	0.026
10.0000	1.846E+00	2.084E-01	2.054E+00	5.278E+00	4.961E-02	3.017E+00	-0.020	0.033	0.024
12.5000	1.870E+00	2.708E-01	2.141E+00	6.470E+00	6.250E-02	3.359E+00	-0.017	0.030	0.021
15.0000	1.890E+00	3.348E-01	2.225E+00	7.615E+00	7.518E-02	3.650E+00	-0.014	0.028	0.019
17.5000	1.906E+00	4.002E-01	2.306E+00	8.719E+00	8.759E-02	3.905E+00	-0.012	0.025	0.017
20.0000	1.920E+00	4.665E-01	2.386E+00	9.784E+00	9.972E-02	4.131E+00	-0.011	0.024	0.015
25.0000	1.942E+00	6.014E-01	2.543E+00	1.181E+01	1.230E-01	4.522E+00	-0.008	0.021	0.012
30.0000	1.959E+00	7.385E-01	2.698E+00	1.372E+01	1.451E-01	4.850E+00	-0.007	0.019	0.010
35.0000	1.973E+00	8.774E-01	2.851E+00	1.552E+01	1.659E-01	5.133E+00	-0.005	0.017	0.009
40.0000	1.986E+00	1.018E+00	3.003E+00	1.723E+01	1.856E-01	5.381E+00	-0.005	0.016	0.008
45.0000	1.996E+00	1.159E+00	3.155E+00	1.886E+01	2.043E-01	5.602E+00	-0.004	0.015	0.007
50.0000	2.006E+00	1.301E+00	3.307E+00	2.040E+01	2.219E-01	5.802E+00	-0.004	0.014	0.006
55.0000	2.014E+00	1.444E+00	3.458E+00	2.188E+01	2.386E-01	5.983E+00	-0.003	0.013	0.005
60.0000	2.022E+00	1.588E+00	3.610E+00	2.330E+01	2.545E-01	6.150E+00	-0.003	0.012	0.005
70.0000	2.035E+00	1.878E+00	3.913E+00	2.596E+01	2.839E-01	6.447E+00	-0.002	0.011	0.004
80.0000	2.046E+00	2.169E+00	4.216E+00	2.842E+01	3.106E-01	6.705E+00	-0.002	0.010	0.003
90.0000	2.056E+00	2.462E+00	4.519E+00	3.071E+01	3.350E-01	6.934E+00	-0.002	0.010	0.003
100.0000	2.065E+00	2.757E+00	4.822E+00	3.285E+01	3.574E-01	7.139E+00	-0.002	0.009	0.003
125.0000	2.084E+00	3.497E+00	5.582E+00	3.767E+01	4.060E-01	7.576E+00	-0.001	0.008	0.002
150.0000	2.099E+00	4.243E+00	6.343E+00	4.187E+01	4.464E-01	7.934E+00	-0.001	0.007	0.002
175.0000	2.112E+00	4.993E+00	7.105E+00	4.559E+01	4.807E-01	8.238E+00	-0.001	0.007	0.001
200.0000	2.123E+00	5.745E+00	7.868E+00	4.893E+01	5.102E-01	8.502E+00	-0.001	0.006	0.001
250.0000	2.142E+00	7.256E+00	9.398E+00	5.474E+01	5.586E-01	8.944E+00	-0.001	0.006	0.001
300.0000	2.157E+00	8.774E+00	1.093E+01	5.967E+01	5.969E-01	9.306E+00	-0.000	0.005	0.001
350.0000	2.169E+00	1.030E+01	1.247E+01	6.395E+01	6.280E-01	9.612E+00	-0.000	0.005	0.001
400.0000	2.180E+00	1.182E+01	1.400E+01	6.773E+01	6.540E-01	9.878E+00	-0.000	0.005	0.001
450.0000	2.19[illegible]E+00	1.335E+01	1.554E+01	7.112E+01	6.760E-01	1.011E+01	-0.000	0.004	0.001
500.0000	2.198E+00	1.488E+01	1.708E+01	7.418E+01	6.949E-01	1.032E+01	-0.000	0.004	0.000
550.0000	2.206E+00	1.642E+01	1.862E+01	7.699E+01	7.114E-01	1.051E+01	-0.000	0.004	0.000
600.0000	2.213E+00	1.795E+01	2.016E+01	7.957E+01	7.260E-01	1.069E+01	-0.000	0.004	0.000
700.0000	2.226E+00	2.102E+01	2.325E+01	8.418E+01	7.505E-01	1.099E+01	-0.000	0.004	0.000
800.0000	2.237E+00	2.410E+01	2.634E+01	8.822E+01	7.704E-01	1.126E+01	-0.000	0.003	0.000
900.0000	2.246E+00	2.718E+01	2.943E+01	9.181E+01	7.870E-01	1.150E+01	-0.000	0.003	0.000
1000.0000	2.255E+00	3.026E+01	3.252E+01	9.504E+01	8.010E-01	1.171E+01	-0.000	0.003	0.000

ELECTRONS IN BONE, COMPACT (ICRU)

I = 91.9 eV DENSITY = 1.850E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.068E+01	4.793E-03	2.068E+01	2.761E-04	1.236E-04	0.0	-0.207	0.239	0.236
0.0125	1.742E+01	4.880E-03	1.742E+01	4.084E-04	1.501E-04	0.0	-0.198	0.227	0.224
0.0150	1.514E+01	4.942E-03	1.514E+01	5.628E-04	1.756E-04	0.0	-0.191	0.218	0.216
0.0175	1.344E+01	4.989E-03	1.345E+01	7.383E-04	2.004E-04	0.0	-0.186	0.211	0.209
0.0200	1.213E+01	5.026E-03	1.214E+01	9.343E-04	2.244E-04	0.0	-0.182	0.205	0.203
0.0250	1.023E+01	5.080E-03	1.024E+01	1.385E-03	2.706E-04	0.0	-0.175	0.196	0.195
0.0300	8.912E+00	5.121E-03	8.917E+00	1.910E-03	3.148E-04	0.0	-0.169	0.190	0.188
0.0350	7.939E+00	5.155E-03	7.944E+00	2.505E-03	3.572E-04	0.0	-0.165	0.184	0.183
0.0400	7.190E+00	5.184E-03	7.196E+00	3.168E-03	3.982E-04	0.0	-0.162	0.180	0.179
0.0450	6.596E+00	5.211E-03	6.601E+00	3.894E-03	4.379E-04	0.0	-0.159	0.176	0.175
0.0500	6.112E+00	5.237E-03	6.117E+00	4.682E-03	4.764E-04	0.0	-0.156	0.173	0.172
0.0550	5.709E+00	5.263E-03	5.715E+00	5.528E-03	5.139E-04	0.0	-0.154	0.170	0.170
0.0600	5.370E+00	5.288E-03	5.375E+00	6.431E-03	5.504E-04	0.0	-0.152	0.168	0.167
0.0700	4.827E+00	5.338E-03	4.832E+00	8.397E-03	6.210E-04	0.0	-0.149	0.164	0.163
0.0800	4.412E+00	5.390E-03	4.417E+00	1.056E-02	6.887E-04	0.0	-0.146	0.160	0.160
0.0900	4.085E+00	5.445E-03	4.090E+00	1.292E-02	7.540E-04	0.0	-0.144	0.158	0.157
0.1000	3.820E+00	5.502E-03	3.825E+00	1.545E-02	8.171E-04	0.0	-0.142	0.155	0.155
0.1250	3.336E+00	5.657E-03	3.342E+00	2.247E-02	9.670E-04	0.0	-0.138	0.150	0.150
0.1500	3.010E+00	5.826E-03	3.015E+00	3.037E-02	1.108E-03	0.0	-0.135	0.147	0.146
0.1750	2.775E+00	6.007E-03	2.781E+00	3.901E-02	1.242E-03	0.0	-0.132	0.143	0.143
0.2000	2.599E+00	6.200E-03	2.605E+00	4.832E-02	1.371E-03	0.0	-0.130	0.141	0.140
0.2500	2.354E+00	6.618E-03	2.361E+00	6.855E-02	1.615E-03	0.0	-0.126	0.137	0.136
0.3000	2.134E+00	7.075E-03	2.201E+00	9.053E-02	1.848E-03	0.0	-0.118	0.134	0.133
0.3500	2.079E+00	7.567E-03	2.087E+00	1.139E-01	2.072E-03	2.843E-02	-0.096	0.127	0.126
0.4000	1.996E+00	8.090E-03	2.004E+00	1.384E-01	2.292E-03	6.250E-02	-0.089	0.121	0.119
0.4500	1.932E+00	8.643E-03	1.941E+00	1.637E-01	2.509E-03	9.798E-02	-0.084	0.116	0.112
0.5000	1.883E+00	9.221E-03	1.893E+00	1.898E-01	2.724E-03	1.342E-01	-0.079	0.111	0.107
0.5500	1.845E+00	9.823E-03	1.855E+00	2.165E-01	2.939E-03	1.710E-01	-0.075	0.107	0.102
0.6000	1.815E+00	1.045E-02	1.825E+00	2.437E-01	3.153E-03	2.079E-01	-0.071	0.103	0.098
0.7000	1.770E+00	1.175E-02	1.782E+00	2.992E-01	3.582E-03	2.817E-01	-0.066	0.096	0.091
0.8000	1.740E+00	1.311E-02	1.753E+00	3.558E-01	4.014E-03	3.548E-01	-0.061	0.091	0.084
0.9000	1.719E+00	1.454E-02	1.734E+00	4.132E-01	4.449E-03	4.265E-01	-0.057	0.086	0.079
1.0000	1.705E+00	1.602E-02	1.721E+00	4.711E-01	4.889E-03	4.964E-01	-0.054	0.083	0.075
1.2500	1.686E+00	1.995E-02	1.706E+00	6.171E-01	6.009E-03	6.626E-01	-0.048	0.075	0.066
1.5000	1.680E+00	2.414E-02	1.705E+00	7.638E-01	7.161E-03	8.160E-01	-0.044	0.069	0.060
1.7500	1.681E+00	2.854E-02	1.709E+00	9.103E-01	8.341E-03	9.575E-01	-0.041	0.065	0.055
2.0000	1.684E+00	3.313E-02	1.718E+00	1.056E+00	9.547E-03	1.088E+00	-0.039	0.061	0.051
2.5000	1.695E+00	4.277E-02	1.739E+00	1.346E+00	1.202E-02	1.323E+00	-0.035	0.056	0.046
3.0000	1.709E+00	5.289E-02	1.762E+00	1.631E+00	1.457E-02	1.527E+00	-0.033	0.052	0.042
3.5000	1.722E+00	6.341E-02	1.786E+00	1.913E+00	1.717E-02	1.709E+00	-0.031	0.049	0.039
4.0000	1.735E+00	7.427E-02	1.809E+00	2.191E+00	1.981E-02	1.872E+00	-0.030	0.046	0.037
4.5000	1.747E+00	8.541E-02	1.832E+00	2.466E+00	2.248E-02	2.020E+00	-0.029	0.044	0.035
5.0000	1.758E+00	9.680E-02	1.855E+00	2.737E+00	2.517E-02	2.156E+00	-0.027	0.043	0.033
5.5000	1.768E+00	1.084E-01	1.877E+00	3.005E+00	2.788E-02	2.282E+00	-0.026	0.041	0.032
6.0000	1.778E+00	1.202E-01	1.898E+00	3.270E+00	3.060E-02	2.399E+00	-0.025	0.040	0.031
7.0000	1.795E+00	1.444E-01	1.939E+00	3.791E+00	3.607E-02	2.611E+00	-0.024	0.037	0.028
8.0000	1.810E+00	1.692E-01	1.979E+00	4.301E+00	4.156E-02	2.801E+00	-0.022	0.035	0.027
9.0000	1.823E+00	1.945E-01	2.018E+00	4.802E+00	4.705E-02	2.972E+00	-0.021	0.034	0.025
10.0000	1.835E+00	2.202E-01	2.055E+00	5.293E+00	5.252E-02	3.129E+00	-0.019	0.032	0.024
12.5000	1.860E+00	2.860E-01	2.146E+00	6.483E+00	6.608E-02	3.473E+00	-0.017	0.029	0.021
15.0000	1.879E+00	3.537E-01	2.233E+00	7.625E+00	7.939E-02	3.765E+00	-0.014	0.027	0.019
17.5000	1.896E+00	4.226E-01	2.318E+00	8.724E+00	9.240E-02	4.021E+00	-0.012	0.025	0.017
20.0000	1.909E+00	4.926E-01	2.402E+00	9.783E+00	1.051E-01	4.247E+00	-0.011	0.023	0.015
25.0000	1.931E+00	6.351E-01	2.566E+00	1.180E+01	1.294E-01	4.637E+00	-0.008	0.021	0.012
30.0000	1.949E+00	7.799E-01	2.729E+00	1.369E+01	1.523E-01	4.965E+00	-0.007	0.018	0.010
35.0000	1.963E+00	9.264E-01	2.890E+00	1.547E+01	1.739E-01	5.247E+00	-0.006	0.017	0.009
40.0000	1.976E+00	1.074E+00	3.050E+00	1.715E+01	1.943E-01	5.495E+00	-0.005	0.016	0.008
45.0000	1.986E+00	1.224E+00	3.210E+00	1.875E+01	2.134E-01	5.716E+00	-0.004	0.014	0.007
50.0000	1.996E+00	1.374E+00	3.369E+00	2.027E+01	2.316E-01	5.915E+00	-0.004	0.014	0.006
55.0000	2.004E+00	1.525E+00	3.529E+00	2.172E+01	2.487E-01	6.097E+00	-0.003	0.013	0.005
60.0000	2.012E+00	1.676E+00	3.688E+00	2.310E+01	2.649E-01	6.263E+00	-0.003	0.012	0.005
70.0000	2.025E+00	1.982E+00	4.007E+00	2.570E+01	2.949E-01	6.559E+00	-0.003	0.011	0.004
80.0000	2.037E+00	2.289E+00	4.326E+00	2.811E+01	3.221E-01	6.817E+00	-0.002	0.010	0.004
90.0000	2.047E+00	2.598E+00	4.645E+00	3.034E+01	3.468E-01	7.046E+00	-0.002	0.010	0.003
100.0000	2.056E+00	2.909E+00	4.965E+00	3.242E+01	3.694E-01	7.251E+00	-0.002	0.009	0.003
125.0000	2.075E+00	3.690E+00	5.765E+00	3.709E+01	4.184E-01	7.688E+00	-0.001	0.008	0.002
150.0000	2.090E+00	4.476E+00	6.566E+00	4.115E+01	4.590E-01	8.046E+00	-0.001	0.007	0.002
175.0000	2.103E+00	5.266E+00	7.369E+00	4.474E+01	4.932E-01	8.350E+00	-0.001	0.007	0.001
200.0000	2.114E+00	6.059E+00	8.173E+00	4.796E+01	5.226E-01	8.614E+00	-0.001	0.006	0.001
250.0000	2.133E+00	7.652E+00	9.784E+00	5.354E+01	5.707E-01	9.057E+00	-0.001	0.006	0.001
300.0000	2.148E+00	9.251E+00	1.140E+01	5.827E+01	6.085E-01	9.419E+00	-0.000	0.005	0.001
350.0000	2.160E+00	1.086E+01	1.302E+01	6.238E+01	6.392E-01	9.726E+00	-0.000	0.005	0.001
400.0000	2.171E+00	1.246E+01	1.464E+01	6.600E+01	6.647E-01	9.991E+00	-0.000	0.005	0.001
450.0000	2.181E+00	1.407E+01	1.626E+01	6.924E+01	6.863E-01	1.023E+01	-0.000	0.004	0.001
500.0000	2.189E+00	1.569E+01	1.788E+01	7.217E+01	7.048E-01	1.044E+01	-0.000	0.004	0.000
550.0000	2.197E+00	1.730E+01	1.950E+01	7.485E+01	7.210E-01	1.063E+01	-0.000	0.004	0.000
600.0000	2.204E+00	1.892E+01	2.112E+01	7.731E+01	7.352E-01	1.080E+01	-0.000	0.004	0.000
700.0000	2.217E+00	2.216E+01	2.437E+01	8.171E+01	7.591E-01	1.111E+01	-0.000	0.004	0.000
800.0000	2.228E+00	2.540E+01	2.763E+01	8.556E+01	7.785E-01	1.137E+01	-0.000	0.004	0.000
900.0000	2.237E+00	2.864E+01	3.088E+01	8.898E+01	7.947E-01	1.161E+01	-0.000	0.003	0.000
1000.0000	2.246E+00	3.189E+01	3.414E+01	9.206E+01	8.083E-01	1.182E+01	-0.000	0.003	0.000

ELECTRONS IN BONE, CORTICAL (ICRP)

I = 106.4 eV DENSITY = 1.850E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.971E+01	5.461E-03	1.972E+01	2.909E-04	1.468E-04	0.0	-0.214	0.248	0.244
0.0125	1.663E+01	5.579E-03	1.664E+01	4.295E-04	1.787E-04	0.0	-0.204	0.235	0.232
0.0150	1.447E+01	5.664E-03	1.447E+01	5.911E-04	2.095E-04	0.0	-0.197	0.226	0.223
0.0175	1.286E+01	5.728E-03	1.287E+01	7.747E-04	2.393E-04	0.0	-0.191	0.218	0.216
0.0200	1.161E+01	5.778E-03	1.162E+01	9.795E-04	2.683E-04	0.0	-0.187	0.212	0.210
0.0250	9.804E+00	5.853E-03	9.810E+00	1.450E-03	3.242E-04	0.0	-0.179	0.202	0.200
0.0300	8.546E+00	5.907E-03	8.552E+00	1.997E-03	3.775E-04	0.0	-0.174	0.195	0.194
0.0350	7.618E+00	5.951E-03	7.624E+00	2.618E-03	4.287E-04	0.0	-0.169	0.190	0.188
0.0400	6.903E+00	5.989E-03	6.909E+00	3.308E-03	4.781E-04	0.0	-0.166	0.185	0.184
0.0450	6.335E+00	6.022E-03	6.341E+00	4.064E-03	5.259E-04	0.0	-0.163	0.181	0.180
0.0500	5.872E+00	6.054E-03	5.879E+00	4.884E-03	5.723E-04	0.0	-0.160	0.178	0.177
0.0550	5.488E+00	6.084E-03	5.494E+00	5.764E-03	6.175E-04	0.0	-0.158	0.175	0.174
0.0600	5.163E+00	6.113E-03	5.169E+00	6.703E-03	6.614E-04	0.0	-0.156	0.172	0.171
0.0700	4.643E+00	6.171E-03	4.649E+00	8.748E-03	7.463E-04	0.0	-0.152	0.168	0.167
0.0800	4.246E+00	6.230E-03	4.252E+00	1.100E-02	8.276E-04	0.0	-0.149	0.164	0.164
0.0900	3.932E+00	6.292E-03	3.939E+00	1.345E-02	9.059E-04	0.0	-0.147	0.161	0.161
0.1000	3.678E+00	6.356E-03	3.685E+00	1.607E-02	9.814E-04	0.0	-0.145	0.159	0.158
0.1250	3.215E+00	6.530E-03	3.221E+00	2.336E-02	1.161E-03	0.0	-0.141	0.154	0.153
0.1500	2.901E+00	6.719E-03	2.908E+00	3.155E-02	1.329E-03	0.0	-0.137	0.150	0.149
0.1750	2.676E+00	6.923E-03	2.683E+00	4.051E-02	1.489E-03	0.0	-0.134	0.147	0.146
0.2000	2.507E+00	7.140E-03	2.514E+00	5.015E-02	1.641E-03	0.0	-0.132	0.144	0.143
0.2500	2.272E+00	7.612E-03	2.280E+00	7.111E-02	1.931E-03	0.0	-0.128	0.140	0.139
0.3000	2.119E+00	8.129E-03	2.127E+00	9.386E-02	2.206E-03	0.0	-0.125	0.137	0.136
0.3500	2.011E+00	8.685E-03	2.020E+00	1.180E-01	2.471E-03	8.920E-03	-0.105	0.133	0.131
0.4000	1.931E+00	9.276E-03	1.941E+00	1.433E-01	2.730E-03	3.411E-02	-0.098	0.127	0.125
0.4500	1.871E+00	9.901E-03	1.881E+00	1.695E-01	2.984E-03	6.200E-02	-0.092	0.122	0.119
0.5000	1.825E+00	1.055E-02	1.836E+00	1.964E-01	3.236E-03	9.146E-02	-0.087	0.118	0.114
0.5500	1.789E+00	1.124E-02	1.800E+00	2.239E-01	3.487E-03	1.219E-01	-0.083	0.113	0.109
0.6000	1.760E+00	1.194E-02	1.772E+00	2.519E-01	3.737E-03	1.531E-01	-0.079	0.110	0.105
0.7000	1.718E+00	1.341E-02	1.732E+00	3.090E-01	4.237E-03	2.166E-01	-0.073	0.103	0.098
0.8000	1.690E+00	1.495E-02	1.705E+00	3.673E-01	4.740E-03	2.806E-01	-0.068	0.098	0.092
0.9000	1.671E+00	1.657E-02	1.688E+00	4.262E-01	5.245E-03	3.442E-01	-0.063	0.093	0.086
1.0000	1.658E+00	1.824E-02	1.677E+00	4.857E-01	5.755E-03	4.069E-01	-0.060	0.089	0.082
1.2500	1.642E+00	2.267E-02	1.665E+00	6.354E-01	7.052E-03	5.580E-01	-0.053	0.082	0.073
1.5000	1.637E+00	2.740E-02	1.665E+00	7.857E-01	8.382E-03	6.994E-01	-0.049	0.076	0.066
1.7500	1.639E+00	3.237E-02	1.671E+00	9.356E-01	9.743E-03	8.310E-01	-0.045	0.071	0.061
2.0000	1.643E+00	3.755E-02	1.681E+00	1.085E+00	1.113E-02	9.534E-01	-0.043	0.067	0.057
2.5000	1.656E+00	4.840E-02	1.704E+00	1.380E+00	1.398E-02	1.174E+00	-0.039	0.061	0.051
3.0000	1.670E+00	5.981E-02	1.730E+00	1.671E+00	1.689E-02	1.368E+00	-0.036	0.057	0.046
3.5000	1.684E+00	7.165E-02	1.755E+00	1.958E+00	1.987E-02	1.541E+00	-0.034	0.054	0.043
4.0000	1.697E+00	8.386E-02	1.781E+00	2.241E+00	2.288E-02	1.697E+00	-0.033	0.051	0.040
4.5000	1.709E+00	9.638E-02	1.805E+00	2.520E+00	2.592E-02	1.839E+00	-0.031	0.049	0.038
5.0000	1.720E+00	1.092E-01	1.829E+00	2.795E+00	2.898E-02	1.970E+00	-0.030	0.047	0.036
5.5000	1.731E+00	1.222E-01	1.853E+00	3.067E+00	3.206E-02	2.091E+00	-0.029	0.045	0.035
6.0000	1.740E+00	1.355E-01	1.876E+00	3.335E+00	3.514E-02	2.203E+00	-0.028	0.044	0.033
7.0000	1.758E+00	1.626E-01	1.921E+00	3.862E+00	4.133E-02	2.408E+00	-0.026	0.041	0.031
8.0000	1.773E+00	1.904E-01	1.964E+00	4.377E+00	4.752E-02	2.591E+00	-0.025	0.039	0.029
9.0000	1.787E+00	2.188E-01	2.006E+00	4.880E+00	5.369E-02	2.757E+00	-0.023	0.037	0.028
10.0000	1.799E+00	2.476E-01	2.046E+00	5.374E+00	5.983E-02	2.908E+00	-0.022	0.036	0.026
12.5000	1.824E+00	3.214E-01	2.145E+00	6.567E+00	7.497E-02	3.241E+00	-0.019	0.032	0.023
15.0000	1.844E+00	3.971E-01	2.241E+00	7.707E+00	8.974E-02	3.525E+00	-0.016	0.030	0.020
17.5000	1.860E+00	4.742E-01	2.335E+00	8.800E+00	1.041E-01	3.773E+00	-0.014	0.028	0.018
20.0000	1.874E+00	5.525E-01	2.427E+00	9.850E+00	1.180E-01	3.994E+00	-0.013	0.026	0.017
25.0000	1.897E+00	7.117E-01	2.609E+00	1.184E+01	1.446E-01	4.375E+00	-0.010	0.023	0.014
30.0000	1.915E+00	8.735E-01	2.788E+00	1.369E+01	1.694E-01	4.696E+00	-0.008	0.021	0.012
35.0000	1.929E+00	1.037E+00	2.966E+00	1.543E+01	1.926E-01	4.973E+00	-0.007	0.019	0.010
40.0000	1.942E+00	1.202E+00	3.144E+00	1.707E+01	2.143E-01	5.217E+00	-0.006	0.017	0.009
45.0000	1.952E+00	1.369E+00	3.321E+00	1.861E+01	2.347E-01	5.434E+00	-0.005	0.016	0.008
50.0000	1.962E+00	1.537E+00	3.498E+00	2.008E+01	2.538E-01	5.631E+00	-0.005	0.015	0.007
55.0000	1.970E+00	1.705E+00	3.676E+00	2.147E+01	2.718E-01	5.810E+00	-0.004	0.014	0.006
60.0000	1.978E+00	1.875E+00	3.853E+00	2.280E+01	2.888E-01	5.974E+00	-0.004	0.014	0.006
70.0000	1.992E+00	2.215E+00	4.207E+00	2.529E+01	3.199E-01	6.267E+00	-0.003	0.013	0.005
80.0000	2.003E+00	2.558E+00	4.561E+00	2.757E+01	3.480E-01	6.523E+00	-0.003	0.012	0.004
90.0000	2.013E+00	2.903E+00	4.916E+00	2.968E+01	3.733E-01	6.749E+00	-0.003	0.011	0.004
100.0000	2.022E+00	3.249E+00	5.272E+00	3.164E+01	3.964E-01	6.953E+00	-0.002	0.010	0.003
125.0000	2.041E+00	4.120E+00	6.161E+00	3.602E+01	4.459E-01	7.387E+00	-0.002	0.009	0.003
150.0000	2.056E+00	4.997E+00	7.053E+00	3.981E+01	4.865E-01	7.743E+00	-0.001	0.008	0.002
175.0000	2.069E+00	5.878E+00	7.947E+00	4.315E+01	5.205E-01	8.046E+00	-0.001	0.008	0.002
200.0000	2.080E+00	6.762E+00	8.842E+00	4.613E+01	5.495E-01	8.309E+00	-0.001	0.007	0.002
250.0000	2.098E+00	8.537E+00	1.064E+01	5.128E+01	5.966E-01	8.750E+00	-0.001	0.007	0.001
300.0000	2.113E+00	1.032E+01	1.243E+01	5.563E+01	6.333E-01	9.111E+00	-0.001	0.006	0.001
350.0000	2.126E+00	1.211E+01	1.423E+01	5.938E+01	6.630E-01	9.417E+00	-0.000	0.006	0.001
400.0000	2.136E+00	1.390E+01	1.604E+01	6.269E+01	6.875E-01	9.683E+00	-0.000	0.005	0.001
450.0000	2.146E+00	1.569E+01	1.784E+01	6.564E+01	7.081E-01	9.917E+00	-0.000	0.005	0.001
500.0000	2.154E+00	1.749E+01	1.964E+01	6.831E+01	7.258E-01	1.013E+01	-0.000	0.005	0.001
550.0000	2.162E+00	1.929E+01	2.145E+01	7.075E+01	7.412E-01	1.032E+01	-0.000	0.005	0.001
600.0000	2.169E+00	2.109E+01	2.326E+01	7.299E+01	7.547E-01	1.049E+01	-0.000	0.005	0.000
700.0000	2.181E+00	2.470E+01	2.688E+01	7.698E+01	7.773E-01	1.080E+01	-0.000	0.004	0.000
800.0000	2.192E+00	2.831E+01	3.050E+01	8.047E+01	7.956E-01	1.107E+01	-0.000	0.004	0.000
900.0000	2.202E+00	3.192E+01	3.412E+01	8.357E+01	8.108E-01	1.130E+01	-0.000	0.004	0.000
1000.0000	2.210E+00	3.553E+01	3.774E+01	8.636E+01	8.235E-01	1.151E+01	-0.000	0.004	0.000

ELECTRONS IN C-552 AIR-EQUIVALENT PLASTIC

I = 86.8 eV DENSITY = 1.760E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.972E+01	3.767E-03	1.972E+01	2.890E-04	1.046E-04	0.0	-0.205	0.235	0.233
0.0125	1.660E+01	3.794E-03	1.661E+01	4.277E-04	1.257E-04	0.0	-0.196	0.224	0.222
0.0150	1.442E+01	3.812E-03	1.443E+01	5.897E-04	1.458E-04	0.0	-0.189	0.215	0.214
0.0175	1.281E+01	3.824E-03	1.281E+01	7.739E-04	1.652E-04	0.0	-0.184	0.208	0.207
0.0200	1.156E+01	3.834E-03	1.156E+01	9.797E-04	1.839E-04	0.0	-0.180	0.203	0.202
0.0250	9.741E+00	3.848E-03	9.745E+00	1.453E-03	2.199E-04	0.0	-0.173	0.194	0.193
0.0300	8.482E+00	3.860E-03	8.486E+00	2.004E-03	2.541E-04	0.0	-0.168	0.188	0.187
0.0350	7.554E+00	3.871E-03	7.558E+00	2.630E-03	2.869E-04	0.0	-0.164	0.182	0.182
0.0400	6.841E+00	3.883E-03	6.845E+00	3.326E-03	3.185E-04	0.0	-0.160	0.178	0.178
0.0450	6.274E+00	3.896E-03	6.278E+00	4.090E-03	3.491E-04	0.0	-0.158	0.174	0.174
0.0500	5.813E+00	3.909E-03	5.816E+00	4.918E-03	3.789E-04	0.0	-0.155	0.171	0.171
0.0550	5.429E+00	3.924E-03	5.433E+00	5.809E-03	4.078E-04	0.0	-0.153	0.169	0.168
0.0600	5.106E+00	3.939E-03	5.110E+00	6.758E-03	4.360E-04	0.0	-0.151	0.166	0.166
0.0700	4.589E+00	3.973E-03	4.593E+00	8.827E-03	4.907E-04	0.0	-0.148	0.162	0.162
0.0800	4.194E+00	4.010E-03	4.198E+00	1.111E-02	5.431E-04	0.0	-0.145	0.159	0.159
0.0900	3.882E+00	4.050E-03	3.886E+00	1.359E-02	5.938E-04	0.0	-0.143	0.156	0.156
0.1000	3.630E+00	4.093E-03	3.634E+00	1.625E-02	6.429E-04	0.0	-0.141	0.154	0.153
0.1250	3.170E+00	4.214E-03	3.174E+00	2.364E-02	7.599E-04	0.0	-0.137	0.149	0.149
0.1500	2.859E+00	4.347E-03	2.863E+00	3.196E-02	8.705E-04	0.0	-0.133	0.145	0.145
0.1750	2.635E+00	4.490E-03	2.640E+00	4.107E-02	9.762E-04	0.0	-0.131	0.142	0.142
0.2000	2.468E+00	4.643E-03	2.473E+00	5.086E-02	1.078E-03	0.0	-0.129	0.140	0.139
0.2500	2.235E+00	4.974E-03	2.240E+00	7.218E-02	1.272E-03	0.0	-0.125	0.136	0.135
0.3000	2.083E+00	5.336E-03	2.088E+00	9.535E-02	1.458E-03	0.0	-0.122	0.133	0.132
0.3500	1.977E+00	5.723E-03	1.983E+00	1.200E-01	1.639E-03	0.0	-0.121	0.130	0.129
0.4000	1.899E+00	6.134E-03	1.906E+00	1.457E-01	1.815E-03	1.229E-02	-0.097	0.127	0.125
0.4500	1.840E+00	6.567E-03	1.847E+00	1.724E-01	1.990E-03	3.896E-02	-0.091	0.122	0.119
0.5000	1.794E+00	7.020E-03	1.801E+00	1.998E-01	2.164E-03	6.802E-02	-0.085	0.117	0.114
0.5500	1.758E+00	7.491E-03	1.765E+00	2.279E-01	2.337E-03	9.881E-02	-0.080	0.113	0.109
0.6000	1.729E+00	7.977E-03	1.737E+00	2.564E-01	2.510E-03	1.308E-01	-0.076	0.109	0.104
0.7000	1.687E+00	8.995E-03	1.696E+00	3.147E-01	2.858E-03	1.972E-01	-0.069	0.102	0.096
0.8000	1.659E+00	1.006E-02	1.669E+00	3.742E-01	3.209E-03	2.651E-01	-0.063	0.096	0.089
0.9000	1.639E+00	1.118E-02	1.650E+00	4.345E-01	3.564E-03	3.331E-01	-0.059	0.091	0.084
1.0000	1.626E+00	1.234E-02	1.638E+00	4.953E-01	3.923E-03	4.005E-01	-0.055	0.087	0.079
1.2500	1.608E+00	1.542E-02	1.623E+00	6.488E-01	4.840E-03	5.636E-01	-0.048	0.078	0.069
1.5000	1.602E+00	1.871E-02	1.620E+00	8.030E-01	5.787E-03	7.168E-01	-0.043	0.072	0.062
1.7500	1.602E+00	2.218E-02	1.624E+00	9.572E-01	6.760E-03	8.594E-01	-0.040	0.067	0.056
2.0000	1.605E+00	2.581E-02	1.630E+00	1.111E+00	7.758E-03	9.920E-01	-0.037	0.063	0.052
2.5000	1.615E+00	3.342E-02	1.648E+00	1.416E+00	9.814E-03	1.231E+00	-0.034	0.057	0.045
3.0000	1.627E+00	4.144E-02	1.668E+00	1.717E+00	1.194E-02	1.441E+00	-0.031	0.052	0.041
3.5000	1.639E+00	4.978E-02	1.689E+00	2.015E+00	1.411E-02	1.627E+00	-0.029	0.049	0.038
4.0000	1.650E+00	5.840E-02	1.709E+00	2.310E+00	1.632E-02	1.794E+00	-0.028	0.046	0.035
4.5000	1.661E+00	6.726E-02	1.729E+00	2.601E+00	1.857E-02	1.947E+00	-0.027	0.044	0.033
5.0000	1.671E+00	7.633E-02	1.748E+00	2.888E+00	2.084E-02	2.086E+00	-0.026	0.042	0.032
5.5000	1.681E+00	8.559E-02	1.766E+00	3.173E+00	2.314E-02	2.215E+00	-0.025	0.041	0.030
6.0000	1.690E+00	9.501E-02	1.785E+00	3.454E+00	2.544E-02	2.335E+00	-0.024	0.039	0.029
7.0000	1.705E+00	1.143E-01	1.820E+00	4.009E+00	3.010E-02	2.552E+00	-0.022	0.037	0.027
8.0000	1.719E+00	1.341E-01	1.853E+00	4.554E+00	3.478E-02	2.745E+00	-0.021	0.035	0.025
9.0000	1.731E+00	1.543E-01	1.886E+00	5.089E+00	3.948E-02	2.920E+00	-0.020	0.033	0.024
10.0000	1.742E+00	1.748E-01	1.917E+00	5.614E+00	4.419E-02	3.080E+00	-0.018	0.032	0.023
12.5000	1.765E+00	2.275E-01	1.993E+00	6.893E+00	5.590E-02	3.428E+00	-0.016	0.029	0.020
15.0000	1.783E+00	2.817E-01	2.065E+00	8.125E+00	6.748E-02	3.724E+00	-0.014	0.026	0.018
17.5000	1.799E+00	3.370E-01	2.135E+00	9.316E+00	7.886E-02	3.981E+00	-0.012	0.024	0.016
20.0000	1.811E+00	3.931E-01	2.204E+00	1.047E+01	9.002E-02	4.210E+00	-0.010	0.023	0.014
25.0000	1.832E+00	5.073E-01	2.339E+00	1.267E+01	1.116E-01	4.602E+00	-0.008	0.020	0.012
30.0000	1.848E+00	6.235E-01	2.472E+00	1.475E+01	1.321E-01	4.932E+00	-0.006	0.018	0.010
35.0000	1.862E+00	7.412E-01	2.603E+00	1.672E+01	1.516E-01	5.216E+00	-0.005	0.016	0.008
40.0000	1.873E+00	8.601E-01	2.733E+00	1.859E+01	1.702E-01	5.466E+00	-0.004	0.015	0.007
45.0000	1.883E+00	9.799E-01	2.863E+00	2.038E+01	1.878E-01	5.689E+00	-0.003	0.014	0.006
50.0000	1.892E+00	1.101E+00	2.992E+00	2.209E+01	2.045E-01	5.890E+00	-0.003	0.013	0.006
55.0000	1.900E+00	1.222E+00	3.122E+00	2.372E+01	2.204E-01	6.073E+00	-0.002	0.012	0.005
60.0000	1.907E+00	1.344E+00	3.251E+00	2.529E+01	2.356E-01	6.241E+00	-0.002	0.011	0.005
70.0000	1.919E+00	1.589E+00	3.509E+00	2.825E+01	2.639E-01	6.540E+00	-0.002	0.010	0.004
80.0000	1.930E+00	1.836E+00	3.766E+00	3.100E+01	2.898E-01	6.801E+00	-0.001	0.010	0.003
90.0000	1.939E+00	2.085E+00	4.024E+00	3.357E+01	3.135E-01	7.032E+00	-0.001	0.009	0.003
100.0000	1.948E+00	2.335E+00	4.282E+00	3.598E+01	3.353E-01	7.239E+00	-0.001	0.008	0.002
125.0000	1.965E+00	2.962E+00	4.928E+00	4.142E+01	3.831E-01	7.680E+00	-0.001	0.007	0.002
150.0000	1.979E+00	3.595E+00	5.574E+00	4.619E+01	4.233E-01	8.042E+00	-0.000	0.007	0.001
175.0000	1.991E+00	4.230E+00	6.222E+00	5.043E+01	4.575E-01	8.348E+00	-0.000	0.006	0.001
200.0000	2.002E+00	4.869E+00	6.870E+00	5.425E+01	4.872E-01	8.613E+00	-0.000	0.006	0.001
250.0000	2.019E+00	6.151E+00	8.169E+00	6.092E+01	5.361E-01	9.058E+00	-0.000	0.005	0.001
300.0000	2.033E+00	7.438E+00	9.471E+00	6.660E+01	5.751E-01	9.421E+00	-0.000	0.005	0.001
350.0000	2.045E+00	8.730E+00	1.077E+01	7.154E+01	6.070E-01	9.729E+00	-0.000	0.004	0.001
400.0000	2.055E+00	1.002E+01	1.208E+01	7.592E+01	6.337E-01	9.995E+00	-0.000	0.004	0.000
450.0000	2.064E+00	1.132E+01	1.339E+01	7.985E+01	6.564E-01	1.023E+01	-0.000	0.004	0.000
500.0000	2.072E+00	1.262E+01	1.469E+01	8.342E+01	6.760E-01	1.044E+01	-0.000	0.004	0.000
550.0000	2.080E+00	1.392E+01	1.600E+01	8.668E+01	6.931E-01	1.063E+01	-0.000	0.004	0.000
600.0000	2.086E+00	1.522E+01	1.731E+01	8.968E+01	7.083E-01	1.080E+01	-0.000	0.003	0.000
700.0000	2.098E+00	1.783E+01	1.993E+01	9.506E+01	7.339E-01	1.111E+01	-0.000	0.003	0.000
800.0000	2.108E+00	2.044E+01	2.255E+01	9.978E+01	7.548E-01	1.138E+01	-0.000	0.003	0.000
900.0000	2.117E+00	2.305E+01	2.517E+01	1.040E+02	7.722E-01	1.161E+01	-0.000	0.003	0.000
1000.0000	2.126E+00	2.567E+01	2.779E+01	1.078E+02	7.869E-01	1.183E+01	-0.000	0.003	0.000

ELECTRONS IN CALCIUM FLUORIDE

I = 166.0 eV DENSITY = 3.180E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.666E+01	7.284E-03	1.667E+01	3.503E-04	2.300E-04	0.0	-0.236	0.281	0.275
0.0125	1.412E+01	7.499E-03	1.413E+01	5.139E-04	2.809E-04	0.0	-0.224	0.265	0.259
0.0150	1.233E+01	7.657E-03	1.233E+01	7.039E-04	3.301E-04	0.0	-0.216	0.253	0.248
0.0175	1.099E+01	7.778E-03	1.099E+01	9.190E-04	3.778E-04	0.0	-0.209	0.243	0.239
0.0200	9.945E+00	7.874E-03	9.953E+00	1.158E-03	4.243E-04	0.0	-0.203	0.235	0.231
0.0250	8.424E+00	8.016E-03	8.432E+00	1.706E-03	5.138E-04	0.0	-0.195	0.224	0.220
0.0300	7.363E+00	8.118E-03	7.371E+00	2.343E-03	5.993E-04	0.0	-0.188	0.215	0.212
0.0350	6.577E+00	8.197E-03	6.585E+00	3.062E-03	6.813E-04	0.0	-0.183	0.208	0.205
0.0400	5.970E+00	8.263E-03	5.979E+00	3.860E-03	7.604E-04	0.0	-0.179	0.202	0.200
0.0450	5.487E+00	8.319E-03	5.495E+00	4.733E-03	8.368E-04	0.0	-0.175	0.198	0.196
0.0500	5.093E+00	8.370E-03	5.101E+00	5.678E-03	9.109E-04	0.0	-0.172	0.194	0.192
0.0550	4.764E+00	8.416E-03	4.773E+00	6.693E-03	9.829E-04	0.0	-0.170	0.190	0.189
0.0600	4.486E+00	8.453E-03	4.495E+00	7.773E-03	1.053E-03	0.0	-0.167	0.187	0.186
0.0700	4.041E+00	8.541E-03	4.050E+00	1.012E-02	1.188E-03	0.0	-0.163	0.182	0.181
0.0800	3.701E+00	8.621E-03	3.709E+00	1.271E-02	1.316E-03	0.0	-0.160	0.178	0.177
0.0900	3.432E+00	8.704E-03	3.440E+00	1.551E-02	1.440E-03	0.0	-0.157	0.174	0.173
0.1000	3.213E+00	8.788E-03	3.222E+00	1.851E-02	1.559E-03	0.0	-0.155	0.171	0.170
0.1250	2.814E+00	9.016E-03	2.823E+00	2.684E-02	1.840E-03	0.0	-0.150	0.165	0.164
0.1500	2.544E+00	9.265E-03	2.553E+00	3.617E-02	2.102E-03	0.0	-0.146	0.161	0.160
0.1750	2.349E+00	9.534E-03	2.359E+00	4.638E-02	2.350E-03	0.0	-0.143	0.157	0.156
0.2000	2.203E+00	9.821E-03	2.213E+00	5.733E-02	2.586E-03	0.0	-0.140	0.154	0.153
0.2500	2.000E+00	1.045E-02	2.011E+00	8.111E-02	3.033E-03	0.0	-0.136	0.149	0.148
0.3000	1.867E+00	1.113E-02	1.878E+00	1.069E-01	3.455E-03	5.037E-03	-0.125	0.145	0.143
0.3500	1.774E+00	1.187E-02	1.786E+00	1.342E-01	3.859E-03	1.737E-02	-0.119	0.140	0.138
0.4000	1.706E+00	1.266E-02	1.719E+00	1.628E-01	4.252E-03	3.256E-02	-0.113	0.135	0.133
0.4500	1.656E+00	1.348E-02	1.669E+00	1.923E-01	4.638E-03	5.026E-02	-0.107	0.131	0.129
0.5000	1.617E+00	1.435E-02	1.631E+00	2.226E-01	5.017E-03	7.003E-02	-0.103	0.128	0.125
0.5500	1.587E+00	1.525E-02	1.602E+00	2.536E-01	5.394E-03	9.144E-02	-0.098	0.124	0.121
0.6000	1.563E+00	1.618E-02	1.579E+00	2.850E-01	5.768E-03	1.141E-01	-0.094	0.121	0.117
0.7000	1.528E+00	1.812E-02	1.547E+00	3.491E-01	6.512E-03	1.623E-01	-0.087	0.115	0.110
0.8000	1.506E+00	2.016E-02	1.526E+00	4.142E-01	7.256E-03	2.128E-01	-0.081	0.110	0.104
0.9000	1.491E+00	2.229E-02	1.513E+00	4.800E-01	8.002E-03	2.645E-01	-0.076	0.106	0.099
1.0000	1.481E+00	2.450E-02	1.505E+00	5.463E-01	8.752E-03	3.167E-01	-0.072	0.102	0.095
1.2500	1.470E+00	3.034E-02	1.500E+00	7.128E-01	1.065E-02	4.459E-01	-0.064	0.093	0.085
1.5000	1.468E+00	3.658E-02	1.505E+00	8.793E-01	1.258E-02	5.700E-01	-0.059	0.087	0.078
1.7500	1.471E+00	4.313E-02	1.515E+00	1.045E+00	1.456E-02	6.875E-01	-0.054	0.082	0.072
2.0000	1.477E+00	4.995E-02	1.527E+00	1.209E+00	1.656E-02	7.980E-01	-0.051	0.078	0.067
2.5000	1.491E+00	6.423E-02	1.555E+00	1.534E+00	2.065E-02	9.994E-01	-0.047	0.071	0.060
3.0000	1.506E+00	7.922E-02	1.585E+00	1.852E+00	2.481E-02	1.178E+00	-0.044	0.066	0.055
3.5000	1.520E+00	9.476E-02	1.615E+00	2.165E+00	2.903E-02	1.338E+00	-0.041	0.063	0.051
4.0000	1.533E+00	1.108E-01	1.644E+00	2.472E+00	3.328E-02	1.482E+00	-0.039	0.060	0.048
4.5000	1.545E+00	1.272E-01	1.673E+00	2.773E+00	3.755E-02	1.614E+00	-0.038	0.057	0.045
5.0000	1.557E+00	1.439E-01	1.701E+00	3.070E+00	4.183E-02	1.735E+00	-0.037	0.055	0.043
5.5000	1.567E+00	1.610E-01	1.728E+00	3.361E+00	4.611E-02	1.848E+00	-0.035	0.053	0.041
6.0000	1.577E+00	1.783E-01	1.755E+00	3.649E+00	5.038E-02	1.953E+00	-0.034	0.051	0.040
7.0000	1.594E+00	2.137E-01	1.808E+00	4.210E+00	5.889E-02	2.144E+00	-0.032	0.048	0.037
8.0000	1.610E+00	2.499E-01	1.859E+00	4.755E+00	6.732E-02	2.316E+00	-0.030	0.046	0.035
9.0000	1.623E+00	2.868E-01	1.910E+00	5.286E+00	7.566E-02	2.472E+00	-0.028	0.044	0.033
10.0000	1.635E+00	3.243E-01	1.959E+00	5.803E+00	8.388E-02	2.615E+00	-0.027	0.042	0.031
12.5000	1.660E+00	4.199E-01	2.079E+00	7.041E+00	1.039E-01	2.931E+00	-0.023	0.038	0.027
15.0000	1.679E+00	5.180E-01	2.197E+00	8.210E+00	1.231E-01	3.203E+00	-0.020	0.035	0.024
17.5000	1.695E+00	6.177E-01	2.313E+00	9.319E+00	1.415E-01	3.442E+00	-0.018	0.033	0.022
20.0000	1.709E+00	7.189E-01	2.428E+00	1.037E+01	1.590E-01	3.656E+00	-0.016	0.031	0.019
25.0000	1.731E+00	9.243E-01	2.655E+00	1.234E+01	1.917E-01	4.026E+00	-0.013	0.027	0.016
30.0000	1.748E+00	1.133E+00	2.881E+00	1.415E+01	2.217E-01	4.338E+00	-0.011	0.025	0.014
35.0000	1.762E+00	1.344E+00	3.106E+00	1.582E+01	2.491E-01	4.609E+00	-0.009	0.023	0.012
40.0000	1.774E+00	1.557E+00	3.331E+00	1.738E+01	2.742E-01	4.848E+00	-0.008	0.021	0.010
45.0000	1.784E+00	1.771E+00	3.555E+00	1.883E+01	2.974E-01	5.061E+00	-0.007	0.020	0.009
50.0000	1.793E+00	1.987E+00	3.780E+00	2.019E+01	3.189E-01	5.253E+00	-0.007	0.019	0.008
55.0000	1.802E+00	2.204E+00	4.005E+00	2.148E+01	3.388E-01	5.429E+00	-0.006	0.018	0.007
60.0000	1.809E+00	2.422E+00	4.231E+00	2.269E+01	3.574E-01	5.590E+00	-0.006	0.017	0.007
70.0000	1.822E+00	2.860E+00	4.682E+00	2.494E+01	3.909E-01	5.878E+00	-0.005	0.016	0.006
80.0000	1.833E+00	3.301E+00	5.134E+00	2.698E+01	4.205E-01	6.130E+00	-0.004	0.015	0.005
90.0000	1.843E+00	3.744E+00	5.587E+00	2.884E+01	4.468E-01	6.353E+00	-0.004	0.014	0.004
100.0000	1.851E+00	4.189E+00	6.040E+00	3.056E+01	4.703E-01	6.554E+00	-0.003	0.013	0.004
125.0000	1.869E+00	5.308E+00	7.177E+00	3.436E+01	5.198E-01	6.983E+00	-0.003	0.012	0.003
150.0000	1.884E+00	6.434E+00	8.317E+00	3.759E+01	5.594E-01	7.336E+00	-0.002	0.011	0.003
175.0000	1.896E+00	7.565E+00	9.460E+00	4.041E+01	5.919E-01	7.636E+00	-0.002	0.010	0.002
200.0000	1.906E+00	8.699E+00	1.061E+01	4.290E+01	6.192E-01	7.898E+00	-0.001	0.009	0.002
250.0000	1.923E+00	1.098E+01	1.290E+01	4.717E+01	6.627E-01	8.337E+00	-0.001	0.009	0.001
300.0000	1.937E+00	1.326E+01	1.520E+01	5.074E+01	6.959E-01	8.697E+00	-0.001	0.008	0.001
350.0000	1.949E+00	1.556E+01	1.750E+01	5.380E+01	7.224E-01	9.003E+00	-0.001	0.008	0.001
400.0000	1.959E+00	1.785E+01	1.981E+01	5.648E+01	7.440E-01	9.268E+00	-0.001	0.007	0.001
450.0000	1.968E+00	2.015E+01	2.212E+01	5.887E+01	7.620E-01	9.502E+00	-0.000	0.007	0.001
500.0000	1.976E+00	2.246E+01	2.443E+01	6.102E+01	7.773E-01	9.712E+00	-0.000	0.007	0.001
550.0000	1.983E+00	2.476E+01	2.675E+01	6.297E+01	7.905E-01	9.902E+00	-0.000	0.006	0.001
600.0000	1.990E+00	2.707E+01	2.906E+01	6.477E+01	8.021E-01	1.008E+01	-0.000	0.006	0.001
700.0000	2.001E+00	3.169E+01	3.369E+01	6.796E+01	8.212E-01	1.038E+01	-0.000	0.006	0.001
800.0000	2.011E+00	3.631E+01	3.832E+01	7.074E+01	8.366E-01	1.065E+01	-0.000	0.006	0.000
900.0000	2.020E+00	4.094E+01	4.296E+01	7.320E+01	8.492E-01	1.088E+01	-0.000	0.006	0.000
1000.0000	2.028E+00	4.557E+01	4.760E+01	7.542E+01	8.598E-01	1.109E+01	-0.000	0.005	0.000

ELECTRONS IN CARBON DIOXIDE

I = 85.0 eV DENSITY = 1.842E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.981E+01	3.962E-03	1.982E+01	2.874E-04	1.096E-04	0.0	-0.204	0.234	0.232
0.0125	1.668E+01	3.988E-03	1.668E+01	4.255E-04	1.316E-04	0.0	-0.195	0.223	0.221
0.0150	1.449E+01	4.003E-03	1.449E+01	5.868E-04	1.526E-04	0.0	-0.189	0.214	0.213
0.0175	1.286E+01	4.012E-03	1.287E+01	7.703E-04	1.728E-04	0.0	-0.183	0.207	0.206
0.0200	1.160E+01	4.019E-03	1.161E+01	9.752E-04	1.924E-04	0.0	-0.179	0.202	0.201
0.0250	9.780E+00	4.029E-03	9.784E+00	1.446E-03	2.298E-04	0.0	-0.172	0.193	0.192
0.0300	8.515E+00	4.039E-03	8.519E+00	1.996E-03	2.654E-04	0.0	-0.167	0.187	0.186
0.0350	7.583E+00	4.048E-03	7.587E+00	2.619E-03	2.994E-04	0.0	-0.163	0.182	0.181
0.0400	6.866E+00	4.059E-03	6.870E+00	3.313E-03	3.323E-04	0.0	-0.160	0.177	0.177
0.0450	6.297E+00	4.072E-03	6.301E+00	4.074E-03	3.641E-04	0.0	-0.157	0.174	0.173
0.0500	5.834E+00	4.085E-03	5.838E+00	4.899E-03	3.950E-04	0.0	-0.155	0.171	0.170
0.0550	5.449E+00	4.100E-03	5.453E+00	5.786E-03	4.251E-04	0.0	-0.152	0.168	0.168
0.0600	5.124E+00	4.116E-03	5.128E+00	6.732E-03	4.545E-04	0.0	-0.151	0.166	0.165
0.0700	4.605E+00	4.152E-03	4.609E+00	8.793E-03	5.113E-04	0.0	-0.147	0.162	0.161
0.0800	4.208E+00	4.192E-03	4.212E+00	1.107E-02	5.659E-04	0.0	-0.145	0.158	0.158
0.0900	3.895E+00	4.235E-03	3.900E+00	1.354E-02	6.187E-04	0.0	-0.142	0.156	0.155
0.1000	3.642E+00	4.282E-03	3.646E+00	1.619E-02	6.698E-04	0.0	-0.140	0.153	0.153
0.1250	3.180E+00	4.409E-03	3.184E+00	2.356E-02	7.920E-04	0.0	-0.136	0.149	0.148
0.1500	2.868E+00	4.548E-03	2.873E+00	3.184E-02	9.074E-04	0.0	-0.133	0.145	0.144
0.1750	2.644E+00	4.697E-03	2.648E+00	4.092E-02	1.018E-03	0.0	-0.131	0.142	0.141
0.2000	2.476E+00	4.855E-03	2.480E+00	5.069E-02	1.124E-03	0.0	-0.128	0.139	0.139
0.2500	2.242E+00	5.196E-03	2.247E+00	7.194E-02	1.326E-03	0.0	-0.125	0.136	0.135
0.3000	2.089E+00	5.570E-03	2.094E+00	9.504E-02	1.520E-03	0.0	-0.122	0.132	0.132
0.3500	1.983E+00	5.970E-03	1.989E+00	1.196E-01	1.707E-03	0.0	-0.120	0.130	0.129
0.4000	1.906E+00	6.397E-03	1.913E+00	1.452E-01	1.890E-03	0.0	-0.118	0.128	0.127
0.4500	1.849E+00	6.847E-03	1.856E+00	1.718E-01	2.071E-03	0.0	-0.116	0.126	0.125
0.5000	1.806E+00	7.319E-03	1.813E+00	1.991E-01	2.250E-03	0.0	-0.114	0.125	0.123
0.5500	1.773E+00	7.810E-03	1.781E+00	2.269E-01	2.428E-03	0.0	-0.113	0.123	0.121
0.6000	1.747E+00	8.318E-03	1.755E+00	2.552E-01	2.606E-03	0.0	-0.112	0.122	0.120
0.7000	1.710E+00	9.381E-03	1.719E+00	3.128E-01	2.962E-03	0.0	-0.109	0.120	0.117
0.8000	1.687E+00	1.050E-02	1.698E+00	3.714E-01	3.319E-03	0.0	-0.107	0.118	0.115
0.9000	1.673E+00	1.167E-02	1.685E+00	4.305E-01	3.678E-03	0.0	-0.106	0.116	0.113
1.0000	1.665E+00	1.288E-02	1.677E+00	4.900E-01	4.041E-03	0.0	-0.104	0.115	0.112
1.2500	1.659E+00	1.609E-02	1.675E+00	6.393E-01	4.960E-03	0.0	-0.101	0.112	0.108
1.5000	1.664E+00	1.952E-02	1.684E+00	7.882E-01	5.899E-03	0.0	-0.099	0.109	0.105
1.7500	1.675E+00	2.314E-02	1.698E+00	9.361E-01	6.857E-03	0.0	-0.097	0.107	0.103
2.0000	1.688E+00	2.690E-02	1.715E+00	1.083E+00	7.831E-03	0.0	-0.095	0.105	0.101
2.5000	1.716E+00	3.482E-02	1.751E+00	1.371E+00	9.821E-03	0.0	-0.092	0.103	0.098
3.0000	1.744E+00	4.315E-02	1.787E+00	1.654E+00	1.185E-02	0.0	-0.090	0.100	0.095
3.5000	1.770E+00	5.181E-02	1.822E+00	1.931E+00	1.392E-02	0.0	-0.088	0.098	0.093
4.0000	1.794E+00	6.077E-02	1.855E+00	2.203E+00	1.600E-02	0.0	-0.087	0.097	0.091
4.5000	1.816E+00	6.996E-02	1.886E+00	2.470E+00	1.810E-02	0.0	-0.086	0.095	0.089
5.0000	1.837E+00	7.938E-02	1.916E+00	2.733E+00	2.022E-02	0.0	-0.084	0.094	0.088
5.5000	1.856E+00	8.899E-02	1.945E+00	2.992E+00	2.234E-02	0.0	-0.083	0.093	0.086
6.0000	1.874E+00	9.877E-02	1.973E+00	3.247E+00	2.448E-02	0.0	-0.083	0.092	0.085
7.0000	1.906E+00	1.188E-01	2.025E+00	3.748E+00	2.875E-02	0.0	-0.081	0.090	0.083
8.0000	1.935E+00	1.394E-01	2.074E+00	4.236E+00	3.302E-02	0.0	-0.080	0.088	0.081
9.0000	1.960E+00	1.604E-01	2.121E+00	4.712E+00	3.729E-02	0.0	-0.079	0.087	0.080
10.0000	1.983E+00	1.817E-01	2.165E+00	5.179E+00	4.154E-02	0.0	-0.078	0.085	0.078
12.5000	2.033E+00	2.366E-01	2.269E+00	6.306E+00	5.206E-02	0.0	-0.076	0.082	0.075
15.0000	2.074E+00	2.930E-01	2.367E+00	7.385E+00	6.240E-02	0.0	-0.074	0.080	0.072
17.5000	2.108E+00	3.506E-01	2.459E+00	8.421E+00	7.252E-02	0.0	-0.073	0.078	0.070
20.0000	2.139E+00	4.091E-01	2.548E+00	9.420E+00	8.241E-02	0.0	-0.072	0.076	0.068
25.0000	2.187E+00	5.281E-01	2.715E+00	1.132E+01	1.015E-01	2.736E-02	-0.059	0.073	0.063
30.0000	2.222E+00	6.493E-01	2.872E+00	1.311E+01	1.196E-01	1.133E-01	-0.048	0.068	0.057
35.0000	2.249E+00	7.719E-01	3.021E+00	1.481E+01	1.370E-01	2.215E-01	-0.041	0.065	0.051
40.0000	2.271E+00	8.958E-01	3.167E+00	1.642E+01	1.535E-01	3.361E-01	-0.036	0.061	0.046
45.0000	2.289E+00	1.021E+00	3.310E+00	1.797E+01	1.693E-01	4.504E-01	-0.033	0.058	0.042
50.0000	2.305E+00	1.146E+00	3.451E+00	1.945E+01	1.844E-01	5.614E-01	-0.030	0.055	0.038
55.0000	2.319E+00	1.273E+00	3.591E+00	2.087E+01	1.989E-01	6.680E-01	-0.028	0.053	0.035
60.0000	2.331E+00	1.400E+00	3.731E+00	2.223E+01	2.127E-01	7.697E-01	-0.026	0.050	0.033
70.0000	2.352E+00	1.656E+00	4.007E+00	2.482E+01	2.387E-01	9.585E-01	-0.024	0.047	0.029
80.0000	2.369E+00	1.913E+00	4.282E+00	2.723E+01	2.627E-01	1.130E+00	-0.022	0.044	0.025
90.0000	2.384E+00	2.172E+00	4.557E+00	2.949E+01	2.848E-01	1.285E+00	-0.021	0.041	0.023
100.0000	2.398E+00	2.432E+00	4.830E+00	3.163E+01	3.054E-01	1.427E+00	-0.020	0.039	0.021
125.0000	2.425E+00	3.087E+00	5.512E+00	3.647E+01	3.509E-01	1.737E+00	-0.019	0.035	0.017
150.0000	2.447E+00	3.745E+00	6.193E+00	4.074E+01	3.896E-01	1.996E+00	-0.018	0.032	0.015
175.0000	2.466E+00	4.408E+00	6.873E+00	4.457E+01	4.230E-01	2.220E+00	-0.017	0.030	0.013
200.0000	2.481E+00	5.072E+00	7.554E+00	4.804E+01	4.523E-01	2.417E+00	-0.016	0.028	0.012
250.0000	2.507E+00	6.408E+00	8.914E+00	5.413E+01	5.011E-01	2.752E+00	-0.015	0.026	0.010
300.0000	2.527E+00	7.749E+00	1.028E+01	5.935E+01	5.404E-01	3.032E+00	-0.014	0.024	0.008
350.0000	2.544E+00	9.094E+00	1.164E+01	6.392E+01	5.730E-01	3.274E+00	-0.012	0.022	0.007
400.0000	2.559E+00	1.044E+01	1.300E+01	6.798E+01	6.004E-01	3.489E+00	-0.011	0.021	0.007
450.0000	2.571E+00	1.179E+01	1.436E+01	7.164E+01	6.240E-01	3.681E+00	-0.010	0.020	0.006
500.0000	2.582E+00	1.315E+01	1.573E+01	7.496E+01	6.445E-01	3.857E+00	-0.010	0.019	0.005
550.0000	2.591E+00	1.450E+01	1.709E+01	7.801E+01	6.624E-01	4.018E+00	-0.009	0.019	0.005
600.0000	2.600E+00	1.586E+01	1.846E+01	8.083E+01	6.784E-01	4.168E+00	-0.008	0.018	0.005
700.0000	2.615E+00	1.857E+01	2.118E+01	8.588E+01	7.055E-01	4.438E+00	-0.007	0.017	0.004
800.0000	2.627E+00	2.129E+01	2.392E+01	9.032E+01	7.278E-01	4.677E+00	-0.006	0.016	0.003
900.0000	2.638E+00	2.401E+01	2.665E+01	9.428E+01	7.465E-01	4.891E+00	-0.005	0.016	0.003
1000.0000	2.647E+00	2.673E+01	2.938E+01	9.785E+01	7.624E-01	5.086E+00	-0.004	0.015	0.003

ELECTRONS IN CELLULOSE NITRATE

I = 87.0 eV DENSITY = 1.490E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.028E+01	3.800E-03	2.029E+01	2.809E-04	1.029E-04	0.0	-0.205	0.236	0.234
0.0125	1.708E+01	3.824E-03	1.708E+01	4.158E-04	1.234E-04	0.0	-0.196	0.224	0.222
0.0150	1.484E+01	3.837E-03	1.484E+01	5.733E-04	1.431E-04	0.0	-0.189	0.215	0.214
0.0175	1.317E+01	3.847E-03	1.318E+01	7.524E-04	1.620E-04	0.0	-0.184	0.209	0.207
0.0200	1.189E+01	3.853E-03	1.189E+01	9.524E-04	1.802E-04	0.0	-0.180	0.203	0.202
0.0250	1.002E+01	3.863E-03	1.002E+01	1.412E-03	2.152E-04	0.0	-0.173	0.194	0.193
0.0300	8.725E+00	3.872E-03	8.729E+00	1.949E-03	2.485E-04	0.0	-0.168	0.188	0.187
0.0350	7.771E+00	3.882E-03	7.775E+00	2.557E-03	2.803E-04	0.0	-0.164	0.182	0.182
0.0400	7.037E+00	3.893E-03	7.041E+00	3.234E-03	3.111E-04	0.0	-0.160	0.178	0.178
0.0450	6.454E+00	3.906E-03	6.458E+00	3.976E-03	3.409E-04	0.0	-0.158	0.175	0.174
0.0500	5.980E+00	3.919E-03	5.984E+00	4.781E-03	3.698E-04	0.0	-0.155	0.171	0.171
0.0550	5.585E+00	3.934E-03	5.589E+00	5.647E-03	3.979E-04	0.0	-0.153	0.169	0.168
0.0600	5.252E+00	3.950E-03	5.256E+00	6.570E-03	4.254E-04	0.0	-0.151	0.166	0.166
0.0700	4.721E+00	3.985E-03	4.725E+00	8.580E-03	4.786E-04	0.0	-0.148	0.162	0.162
0.0800	4.314E+00	4.024E-03	4.318E+00	1.080E-02	5.298E-04	0.0	-0.145	0.159	0.159
0.0900	3.994E+00	4.066E-03	3.998E+00	1.321E-02	5.792E-04	0.0	-0.143	0.156	0.156
0.1000	3.734E+00	4.111E-03	3.739E+00	1.580E-02	6.271E-04	0.0	-0.141	0.154	0.154
0.1250	3.261E+00	4.235E-03	3.265E+00	2.298E-02	7.416E-04	0.0	-0.137	0.149	0.149
0.1500	2.941E+00	4.370E-03	2.945E+00	3.106E-02	8.499E-04	0.0	-0.134	0.145	0.145
0.1750	2.711E+00	4.515E-03	2.716E+00	3.992E-02	9.533E-04	0.0	-0.131	0.142	0.142
0.2000	2.539E+00	4.669E-03	2.544E+00	4.944E-02	1.053E-03	0.0	-0.129	0.140	0.139
0.2500	2.299E+00	4.999E-03	2.304E+00	7.016E-02	1.243E-03	0.0	-0.125	0.136	0.135
0.3000	2.143E+00	5.361E-03	2.148E+00	9.268E-02	1.425E-03	0.0	-0.122	0.133	0.132
0.3500	2.034E+00	5.749E-03	2.040E+00	1.166E-01	1.601E-03	0.0	-0.120	0.130	0.129
0.4000	1.956E+00	6.162E-03	1.962E+00	1.416E-01	1.773E-03	0.0	-0.118	0.128	0.127
0.4500	1.896E+00	6.597E-03	1.903E+00	1.675E-01	1.943E-03	8.343E-03	-0.096	0.125	0.124
0.5000	1.850E+00	7.054E-03	1.857E+00	1.941E-01	2.112E-03	3.198E-02	-0.091	0.121	0.118
0.5500	1.813E+00	7.530E-03	1.820E+00	2.213E-01	2.281E-03	5.810E-02	-0.085	0.117	0.114
0.6000	1.783E+00	8.022E-03	1.792E+00	2.490E-01	2.449E-03	8.611E-02	-0.080	0.113	0.109
0.7000	1.741E+00	9.050E-03	1.750E+00	3.056E-01	2.789E-03	1.460E-01	-0.072	0.106	0.101
0.8000	1.712E+00	1.013E-02	1.722E+00	3.632E-01	3.131E-03	2.090E-01	-0.066	0.100	0.093
0.9000	1.692E+00	1.126E-02	1.703E+00	4.216E-01	3.477E-03	2.734E-01	-0.061	0.095	0.087
1.0000	1.678E+00	1.244E-02	1.691E+00	4.806E-01	3.828E-03	3.380E-01	-0.056	0.090	0.082
1.2500	1.660E+00	1.554E-02	1.675E+00	6.293E-01	4.724E-03	4.966E-01	-0.049	0.081	0.071
1.5000	1.654E+00	1.887E-02	1.673E+00	7.787E-01	5.649E-03	6.473E-01	-0.044	0.074	0.064
1.7500	1.654E+00	2.237E-02	1.676E+00	9.280E-01	6.600E-03	7.886E-01	-0.040	0.069	0.058
2.0000	1.657E+00	2.602E-02	1.683E+00	1.077E+00	7.575E-03	9.206E-01	-0.037	0.065	0.053
2.5000	1.667E+00	3.368E-02	1.701E+00	1.372E+00	9.584E-03	1.159E+00	-0.033	0.058	0.046
3.0000	1.680E+00	4.176E-02	1.721E+00	1.665E+00	1.166E-02	1.368E+00	-0.031	0.054	0.041
3.5000	1.692E+00	5.016E-02	1.742E+00	1.953E+00	1.378E-02	1.554E+00	-0.029	0.050	0.038
4.0000	1.704E+00	5.883E-02	1.763E+00	2.239E+00	1.594E-02	1.721E+00	-0.028	0.047	0.035
4.5000	1.715E+00	6.775E-02	1.783E+00	2.521E+00	1.814E-02	1.873E+00	-0.027	0.045	0.033
5.0000	1.726E+00	7.688E-02	1.803E+00	2.800E+00	2.035E-02	2.012E+00	-0.026	0.043	0.032
5.5000	1.735E+00	8.620E-02	1.822E+00	3.076E+00	2.259E-02	2.140E+00	-0.025	0.041	0.030
6.0000	1.745E+00	9.569E-02	1.840E+00	3.349E+00	2.485E-02	2.258E+00	-0.024	0.040	0.029
7.0000	1.761E+00	1.151E-01	1.876E+00	3.887E+00	2.940E-02	2.473E+00	-0.023	0.037	0.027
8.0000	1.775E+00	1.351E-01	1.910E+00	4.415E+00	3.398E-02	2.663E+00	-0.022	0.035	0.026
9.0000	1.788E+00	1.554E-01	1.944E+00	4.934E+00	3.857E-02	2.835E+00	-0.021	0.034	0.024
10.0000	1.800E+00	1.762E-01	1.976E+00	5.444E+00	4.317E-02	2.991E+00	-0.020	0.032	0.023
12.5000	1.824E+00	2.294E-01	2.053E+00	6.685E+00	5.464E-02	3.331E+00	-0.017	0.029	0.021
15.0000	1.843E+00	2.842E-01	2.127E+00	7.881E+00	6.599E-02	3.619E+00	-0.015	0.027	0.019
17.5000	1.859E+00	3.401E-01	2.199E+00	9.036E+00	7.716E-02	3.870E+00	-0.013	0.025	0.017
20.0000	1.873E+00	3.969E-01	2.270E+00	1.016E+01	8.812E-02	4.093E+00	-0.012	0.024	0.016
25.0000	1.895E+00	5.126E-01	2.407E+00	1.229E+01	1.093E-01	4.478E+00	-0.009	0.021	0.013
30.0000	1.912E+00	6.303E-01	2.542E+00	1.431E+01	1.295E-01	4.802E+00	-0.007	0.019	0.011
35.0000	1.926E+00	7.495E-01	2.676E+00	1.623E+01	1.488E-01	5.083E+00	-0.006	0.017	0.009
40.0000	1.938E+00	8.699E-01	2.808E+00	1.805E+01	1.671E-01	5.330E+00	-0.005	0.016	0.008
45.0000	1.948E+00	9.913E-01	2.940E+00	1.980E+01	1.845E-01	5.552E+00	-0.004	0.015	0.007
50.0000	1.958E+00	1.113E+00	3.071E+00	2.146E+01	2.010E-01	5.751E+00	-0.003	0.014	0.006
55.0000	1.966E+00	1.236E+00	3.202E+00	2.305E+01	2.168E-01	5.934E+00	-0.003	0.013	0.006
60.0000	1.973E+00	1.360E+00	3.333E+00	2.458E+01	2.318E-01	6.101E+00	-0.002	0.012	0.005
70.0000	1.986E+00	1.609E+00	3.595E+00	2.747E+01	2.599E-01	6.399E+00	-0.002	0.011	0.004
80.0000	1.997E+00	1.859E+00	3.856E+00	3.016E+01	2.856E-01	6.660E+00	-0.001	0.010	0.004
90.0000	2.007E+00	2.111E+00	4.118E+00	3.267E+01	3.091E-01	6.891E+00	-0.001	0.009	0.003
100.0000	2.015E+00	2.364E+00	4.379E+00	3.502E+01	3.309E-01	7.098E+00	-0.001	0.009	0.003
125.0000	2.033E+00	3.000E+00	5.034E+00	4.034E+01	3.785E-01	7.538E+00	-0.001	0.008	0.002
150.0000	2.048E+00	3.641E+00	5.689E+00	4.501E+01	4.186E-01	7.899E+00	-0.000	0.007	0.002
175.0000	2.060E+00	4.285E+00	6.346E+00	4.917E+01	4.528E-01	8.205E+00	-0.000	0.006	0.001
200.0000	2.071E+00	4.932E+00	7.003E+00	5.292E+01	4.825E-01	8.471E+00	-0.000	0.006	0.001
250.0000	2.089E+00	6.232E+00	8.320E+00	5.946E+01	5.316E-01	8.915E+00	-0.000	0.005	0.001
300.0000	2.103E+00	7.537E+00	9.640E+00	6.504E+01	5.707E-01	9.279E+00	-0.000	0.005	0.001
350.0000	2.115E+00	8.846E+00	1.096E+01	6.990E+01	6.027E-01	9.586E+00	-0.000	0.005	0.001
400.0000	2.126E+00	1.016E+01	1.228E+01	7.421E+01	6.296E-01	9.853E+00	-0.000	0.004	0.000
450.0000	2.135E+00	1.147E+01	1.361E+01	7.807E+01	6.524E-01	1.009E+01	-0.000	0.004	0.000
500.0000	2.143E+00	1.279E+01	1.493E+01	8.158E+01	6.722E-01	1.030E+01	-0.000	0.004	0.000
550.0000	2.151E+00	1.411E+01	1.626E+01	8.479E+01	6.895E-01	1.049E+01	-0.000	0.004	0.000
600.0000	2.158E+00	1.543E+01	1.759E+01	8.774E+01	7.047E-01	1.066E+01	-0.000	0.004	0.000
700.0000	2.170E+00	1.807E+01	2.024E+01	9.304E+01	7.305E-01	1.097E+01	-0.000	0.003	0.000
800.0000	2.181E+00	2.072E+01	2.290E+01	9.768E+01	7.516E-01	1.124E+01	-0.000	0.003	0.000
900.0000	2.190E+00	2.337E+01	2.556E+01	1.018E+02	7.692E-01	1.147E+01	-0.000	0.003	0.000
1000.0000	2.198E+00	2.602E+01	2.822E+01	1.055E+02	7.841E-01	1.168E+01	-0.000	0.003	0.000

ELECTRONS IN CERIC SULFATE DOSIMETER SOLUTION

I = 76.7 eV DENSITY = 1.030E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.237E+01	3.996E-03	2.237E+01	2.538E-04	9.703E-05	0.0	-0.200	0.229	0.226
0.0125	1.881E+01	4.031E-03	1.882E+01	3.762E-04	1.169E-04	0.0	-0.191	0.218	0.216
0.0150	1.633E+01	4.052E-03	1.633E+01	5.193E-04	1.360E-04	0.0	-0.185	0.209	0.208
0.0175	1.449E+01	4.067E-03	1.449E+01	6.821E-04	1.543E-04	0.0	-0.180	0.203	0.202
0.0200	1.307E+01	4.078E-03	1.307E+01	8.640E-04	1.721E-04	0.0	-0.176	0.198	0.197
0.0250	1.101E+01	4.094E-03	1.101E+01	1.283E-03	2.061E-04	0.0	-0.169	0.189	0.189
0.0300	9.577E+00	4.108E-03	9.581E+00	1.771E-03	2.385E-04	0.0	-0.164	0.183	0.182
0.0350	8.525E+00	4.120E-03	8.529E+00	2.325E-03	2.696E-04	0.0	-0.161	0.178	0.178
0.0400	7.717E+00	4.134E-03	7.721E+00	2.942E-03	2.996E-04	0.0	-0.157	0.174	0.174
0.0450	7.075E+00	4.148E-03	7.079E+00	3.620E-03	3.286E-04	0.0	-0.155	0.171	0.170
0.0500	6.553E+00	4.164E-03	6.557E+00	4.354E-03	3.568E-04	0.0	-0.152	0.168	0.167
0.0550	6.119E+00	4.180E-03	6.123E+00	5.144E-03	3.843E-04	0.0	-0.150	0.165	0.165
0.0600	5.753E+00	4.198E-03	5.757E+00	5.987E-03	4.111E-04	0.0	-0.148	0.163	0.163
0.0700	5.169E+00	4.236E-03	5.173E+00	7.823E-03	4.630E-04	0.0	-0.145	0.159	0.159
0.0800	4.722E+00	4.278E-03	4.727E+00	9.848E-03	5.129E-04	0.0	-0.143	0.156	0.156
0.0900	4.370E+00	4.324E-03	4.374E+00	1.205E-02	5.611E-04	0.0	-0.140	0.153	0.153
0.1000	4.085E+00	4.373E-03	4.090E+00	1.442E-02	6.079E-04	0.0	-0.138	0.151	0.151
0.1250	3.566E+00	4.505E-03	3.570E+00	2.099E-02	7.196E-04	0.0	-0.134	0.146	0.146
0.1500	3.215E+00	4.649E-03	3.219E+00	2.838E-02	8.253E-04	0.0	-0.131	0.143	0.142
0.1750	2.963E+00	4.803E-03	2.967E+00	3.648E-02	9.263E-04	0.0	-0.129	0.140	0.139
0.2000	2.773E+00	4.966E-03	2.778E+00	4.520E-02	1.023E-03	0.0	-0.127	0.137	0.137
0.2500	2.511E+00	5.316E-03	2.516E+00	6.418E-02	1.209E-03	0.0	-0.123	0.134	0.133
0.3000	2.339E+00	5.700E-03	2.344E+00	8.481E-02	1.386E-03	0.0	-0.120	0.131	0.130
0.3500	2.219E+00	6.111E-03	2.226E+00	1.067E-01	1.558E-03	0.0	-0.118	0.128	0.127
0.4000	2.133E+00	6.548E-03	2.140E+00	1.297E-01	1.726E-03	0.0	-0.116	0.126	0.125
0.4500	2.069E+00	7.009E-03	2.076E+00	1.534E-01	1.892E-03	0.0	-0.114	0.125	0.123
0.5000	2.021E+00	7.492E-03	2.028E+00	1.778E-01	2.056E-03	0.0	-0.109	0.123	0.121
0.5500	1.981E+00	7.995E-03	1.989E+00	2.027E-01	2.220E-03	1.324E-02	-0.094	0.120	0.118
0.6000	1.950E+00	8.515E-03	1.959E+00	2.280E-01	2.383E-03	3.214E-02	-0.088	0.117	0.114
0.7000	1.904E+00	9.602E-03	1.914E+00	2.797E-01	2.712E-03	7.786E-02	-0.078	0.110	0.106
0.8000	1.873E+00	1.074E-02	1.884E+00	3.324E-01	3.043E-03	1.307E-01	-0.070	0.105	0.099
0.9000	1.852E+00	1.194E-02	1.863E+00	3.858E-01	3.377E-03	1.876E-01	-0.064	0.099	0.093
1.0000	1.837E+00	1.318E-02	1.850E+00	4.397E-01	3.716E-03	2.470E-01	-0.059	0.095	0.087
1.2500	1.816E+00	1.646E-02	1.833E+00	5.756E-01	4.582E-03	3.983E-01	-0.050	0.085	0.075
1.5000	1.810E+00	1.997E-02	1.830E+00	7.121E-01	5.476E-03	5.470E-01	-0.043	0.077	0.066
1.7500	1.809E+00	2.367E-02	1.833E+00	8.487E-01	6.395E-03	6.891E-01	-0.039	0.071	0.059
2.0000	1.812E+00	2.752E-02	1.839E+00	9.849E-01	7.337E-03	8.234E-01	-0.035	0.067	0.054
2.5000	1.822E+00	3.561E-02	1.858E+00	1.255E+00	9.281E-03	1.069E+00	-0.031	0.059	0.046
3.0000	1.834E+00	4.413E-02	1.879E+00	1.523E+00	1.129E-02	1.287E+00	-0.028	0.054	0.040
3.5000	1.847E+00	5.299E-02	1.900E+00	1.788E+00	1.334E-02	1.481E+00	-0.026	0.050	0.036
4.0000	1.859E+00	6.214E-02	1.921E+00	2.049E+00	1.544E-02	1.656E+00	-0.024	0.046	0.034
4.5000	1.870E+00	7.154E-02	1.942E+00	2.308E+00	1.757E-02	1.815E+00	-0.023	0.044	0.031
5.0000	1.881E+00	8.117E-02	1.962E+00	2.564E+00	1.972E-02	1.961E+00	-0.022	0.042	0.029
5.5000	1.891E+00	9.099E-02	1.982E+00	2.818E+00	2.190E-02	2.095E+00	-0.022	0.040	0.028
6.0000	1.900E+00	1.010E-01	2.001E+00	3.069E+00	2.409E-02	2.219E+00	-0.021	0.038	0.027
7.0000	1.917E+00	1.215E-01	2.038E+00	3.564E+00	2.851E-02	2.444E+00	-0.020	0.036	0.025
8.0000	1.932E+00	1.425E-01	2.074E+00	4.050E+00	3.296E-02	2.642E+00	-0.019	0.034	0.023
9.0000	1.945E+00	1.639E-01	2.109E+00	4.529E+00	3.743E-02	2.819E+00	-0.019	0.032	0.022
10.0000	1.957E+00	1.858E-01	2.143E+00	4.999E+00	4.191E-02	2.980E+00	-0.018	0.030	0.021
12.5000	1.982E+00	2.418E-01	2.224E+00	6.144E+00	5.308E-02	3.328E+00	-0.016	0.028	0.019
15.0000	2.003E+00	2.994E-01	2.302E+00	7.249E+00	6.415E-02	3.619E+00	-0.015	0.026	0.017
17.5000	2.020E+00	3.583E-01	2.378E+00	8.317E+00	7.504E-02	3.870E+00	-0.014	0.024	0.016
20.0000	2.035E+00	4.180E-01	2.453E+00	9.352E+00	8.573E-02	4.092E+00	-0.013	0.022	0.015
25.0000	2.059E+00	5.397E-01	2.598E+00	1.133E+01	1.065E-01	4.471E+00	-0.011	0.020	0.013
30.0000	2.078E+00	6.635E-01	2.741E+00	1.320E+01	1.262E-01	4.790E+00	-0.009	0.018	0.011
35.0000	2.093E+00	7.889E-01	2.882E+00	1.498E+01	1.451E-01	5.066E+00	-0.007	0.017	0.010
40.0000	2.106E+00	9.155E-01	3.022E+00	1.668E+01	1.630E-01	5.309E+00	-0.006	0.016	0.009
45.0000	2.118E+00	1.043E+00	3.161E+00	1.830E+01	1.801E-01	5.527E+00	-0.005	0.015	0.008
50.0000	2.128E+00	1.172E+00	3.300E+00	1.984E+01	1.963E-01	5.724E+00	-0.004	0.014	0.007
55.0000	2.137E+00	1.301E+00	3.438E+00	2.133E+01	2.118E-01	5.904E+00	-0.004	0.013	0.006
60.0000	2.145E+00	1.431E+00	3.576E+00	2.275E+01	2.266E-01	6.070E+00	-0.003	0.012	0.006
70.0000	2.159E+00	1.693E+00	3.852E+00	2.545E+01	2.543E-01	6.365E+00	-0.003	0.011	0.005
80.0000	2.171E+00	1.956E+00	4.127E+00	2.796E+01	2.796E-01	6.623E+00	-0.002	0.010	0.004
90.0000	2.181E+00	2.221E+00	4.402E+00	3.030E+01	3.030E-01	6.853E+00	-0.002	0.010	0.004
100.0000	2.191E+00	2.487E+00	4.678E+00	3.250E+01	3.245E-01	7.059E+00	-0.001	0.009	0.003
125.0000	2.210E+00	3.156E+00	5.367E+00	3.749E+01	3.718E-01	7.497E+00	-0.001	0.008	0.002
150.0000	2.226E+00	3.830E+00	6.056E+00	4.187E+01	4.117E-01	7.857E+00	-0.001	0.007	0.002
175.0000	2.240E+00	4.507E+00	6.747E+00	4.578E+01	4.459E-01	8.162E+00	-0.001	0.006	0.002
200.0000	2.251E+00	5.187E+00	7.438E+00	4.931E+01	4.755E-01	8.427E+00	-0.000	0.006	0.001
250.0000	2.270E+00	6.553E+00	8.824E+00	5.547E+01	5.247E-01	8.871E+00	-0.000	0.005	0.001
300.0000	2.286E+00	7.926E+00	1.021E+01	6.074E+01	5.639E-01	9.234E+00	-0.000	0.005	0.001
350.0000	2.299E+00	9.302E+00	1.160E+01	6.533E+01	5.962E-01	9.541E+00	-0.000	0.005	0.001
400.0000	2.310E+00	1.068E+01	1.299E+01	6.940E+01	6.232E-01	9.807E+00	-0.000	0.004	0.001
450.0000	2.320E+00	1.206E+01	1.438E+01	7.305E+01	6.462E-01	1.004E+01	-0.000	0.004	0.001
500.0000	2.329E+00	1.345E+01	1.578E+01	7.637E+01	6.662E-01	1.025E+01	-0.000	0.004	0.000
550.0000	2.337E+00	1.484E+01	1.717E+01	7.941E+01	6.837E-01	1.044E+01	-0.000	0.004	0.000
600.0000	2.345E+00	1.622E+01	1.857E+01	8.221E+01	6.991E-01	1.062E+01	-0.000	0.004	0.000
700.0000	2.358E+00	1.900E+01	2.136E+01	8.723E+01	7.252E-01	1.092E+01	-0.000	0.003	0.000
800.0000	2.369E+00	2.178E+01	2.415E+01	9.162E+01	7.466E-01	1.119E+01	-0.000	0.003	0.000
900.0000	2.379E+00	2.457E+01	2.695E+01	9.554E+01	7.644E-01	1.143E+01	-0.000	0.003	0.000
1000.0000	2.388E+00	2.736E+01	2.975E+01	9.907E+01	7.795E-01	1.164E+01	-0.000	0.003	0.000

ELECTRONS IN CESIUM IODIDE

I = 553.1 eV DENSITY = 4.510E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.019E+01	1.704E-02	1.020E+01	6.284E-04	8.286E-04	0.0	-0.330	0.469	0.419
0.0125	8.803E+00	1.839E-02	8.821E+00	8.928E-04	1.039E-03	0.0	-0.307	0.424	0.382
0.0150	7.795E+00	1.948E-02	7.814E+00	1.195E-03	1.247E-03	0.0	-0.291	0.392	0.356
0.0175	7.025E+00	2.038E-02	7.045E+00	1.532E-03	1.454E-03	0.0	-0.279	0.368	0.337
0.0200	6.415E+00	2.114E-02	6.437E+00	1.904E-03	1.658E-03	0.0	-0.269	0.350	0.322
0.0250	5.509E+00	2.240E-02	5.531E+00	2.745E-03	2.060E-03	0.0	-0.254	0.322	0.300
0.0300	4.864E+00	2.340E-02	4.887E+00	3.709E-03	2.454E-03	0.0	-0.243	0.303	0.284
0.0350	4.379E+00	2.425E-02	4.404E+00	4.789E-03	2.839E-03	0.0	-0.235	0.288	0.272
0.0400	4.001E+00	2.498E-02	4.026E+00	5.978E-03	3.216E-03	0.0	-0.228	0.277	0.263
0.0450	3.697E+00	2.563E-02	3.723E+00	7.271E-03	3.586E-03	0.0	-0.222	0.267	0.255
0.0500	3.447E+00	2.621E-02	3.474E+00	8.662E-03	3.949E-03	0.0	-0.218	0.259	0.248
0.0550	3.238E+00	2.675E-02	3.265E+00	1.015E-02	4.306E-03	0.0	-0.213	0.253	0.242
0.0600	3.060E+00	2.724E-02	3.087E+00	1.172E-02	4.656E-03	0.0	-0.210	0.247	0.237
0.0700	2.773E+00	2.814E-02	2.802E+00	1.513E-02	5.339E-03	0.0	-0.203	0.237	0.229
0.0800	2.552E+00	2.896E-02	2.581E+00	1.885E-02	6.001E-03	0.0	-0.198	0.230	0.222
0.0900	2.376E+00	2.970E-02	2.406E+00	2.287E-02	6.644E-03	0.0	-0.194	0.223	0.217
0.1000	2.233E+00	3.039E-02	2.264E+00	2.716E-02	7.268E-03	0.0	-0.190	0.218	0.212
0.1250	1.970E+00	3.196E-02	2.002E+00	3.895E-02	8.757E-03	0.0	-0.183	0.208	0.202
0.1500	1.791E+00	3.337E-02	1.824E+00	5.206E-02	1.015E-02	0.0	-0.177	0.200	0.195
0.1750	1.661E+00	3.467E-02	1.696E+00	6.630E-02	1.147E-02	0.0	-0.173	0.194	0.189
0.2000	1.564E+00	3.593E-02	1.600E+00	8.149E-02	1.272E-02	0.0	-0.169	0.189	0.185
0.2500	1.429E+00	3.839E-02	1.467E+00	1.142E-01	1.505E-02	2.448E-04	-0.161	0.181	0.177
0.3000	1.340E+00	4.087E-02	1.381E+00	1.494E-01	1.719E-02	4.939E-03	-0.154	0.174	0.170
0.3500	1.279E+00	4.342E-02	1.322E+00	1.865E-01	1.919E-02	1.113E-02	-0.148	0.169	0.165
0.4000	1.235E+00	4.606E-02	1.281E+00	2.249E-01	2.110E-02	1.844E-02	-0.143	0.164	0.160
0.4500	1.202E+00	4.879E-02	1.251E+00	2.645E-01	2.292E-02	2.646E-02	-0.139	0.160	0.155
0.5000	1.178E+00	5.161E-02	1.229E+00	3.048E-01	2.468E-02	3.493E-02	-0.135	0.156	0.151
0.5500	1.159E+00	5.449E-02	1.214E+00	3.457E-01	2.638E-02	4.373E-02	-0.132	0.152	0.148
0.6000	1.145E+00	5.745E-02	1.202E+00	3.871E-01	2.804E-02	5.275E-02	-0.129	0.149	0.145
0.7000	1.126E+00	6.355E-02	1.189E+00	4.708E-01	3.127E-02	7.128E-02	-0.124	0.144	0.139
0.8000	1.114E+00	6.987E-02	1.184E+00	5.551E-01	3.439E-02	9.021E-02	-0.120	0.140	0.134
0.9000	1.108E+00	7.639E-02	1.184E+00	6.396E-01	3.743E-02	1.094E-01	-0.116	0.136	0.130
1.0000	1.105E+00	8.308E-02	1.188E+00	7.239E-01	4.041E-02	1.286E-01	-0.113	0.133	0.126
1.2500	1.106E+00	1.005E-01	1.207E+00	9.329E-01	4.766E-02	1.767E-01	-0.106	0.126	0.118
1.5000	1.113E+00	1.189E-01	1.232E+00	1.138E+00	5.470E-02	2.245E-01	-0.101	0.120	0.111
1.7500	1.123E+00	1.379E-01	1.261E+00	1.339E+00	6.159E-02	2.717E-01	-0.096	0.115	0.106
2.0000	1.133E+00	1.574E-01	1.291E+00	1.535E+00	6.835E-02	3.183E-01	-0.091	0.111	0.101
2.5000	1.154E+00	1.979E-01	1.352E+00	1.913E+00	8.154E-02	4.090E-01	-0.084	0.104	0.093
3.0000	1.173E+00	2.399E-01	1.413E+00	2.275E+00	9.431E-02	4.962E-01	-0.079	0.098	0.086
3.5000	1.191E+00	2.829E-01	1.474E+00	2.621E+00	1.067E-01	5.797E-01	-0.074	0.094	0.080
4.0000	1.207E+00	3.268E-01	1.534E+00	2.954E+00	1.187E-01	6.592E-01	-0.071	0.090	0.076
4.5000	1.221E+00	3.715E-01	1.593E+00	3.274E+00	1.303E-01	7.349E-01	-0.067	0.086	0.071
5.0000	1.234E+00	4.169E-01	1.651E+00	3.582E+00	1.416E-01	8.070E-01	-0.065	0.083	0.068
5.5000	1.246E+00	4.630E-01	1.709E+00	3.879E+00	1.525E-01	8.758E-01	-0.062	0.080	0.064
6.0000	1.257E+00	5.095E-01	1.767E+00	4.167E+00	1.631E-01	9.414E-01	-0.060	0.078	0.062
7.0000	1.277E+00	6.041E-01	1.881E+00	4.716E+00	1.834E-01	1.064E+00	-0.057	0.073	0.057
8.0000	1.293E+00	7.003E-01	1.994E+00	5.232E+00	2.025E-01	1.178E+00	-0.054	0.070	0.052
9.0000	1.308E+00	7.979E-01	2.106E+00	5.720E+00	2.206E-01	1.283E+00	-0.051	0.067	0.049
10.0000	1.321E+00	8.967E-01	2.218E+00	6.182E+00	2.377E-01	1.381E+00	-0.049	0.064	0.046
12.5000	1.348E+00	1.148E+00	2.497E+00	7.244E+00	2.768E-01	1.602E+00	-0.044	0.059	0.040
15.0000	1.370E+00	1.404E+00	2.774E+00	8.194E+00	3.112E-01	1.798E+00	-0.040	0.054	0.035
17.5000	1.388E+00	1.665E+00	3.053E+00	9.052E+00	3.420E-01	1.973E+00	-0.037	0.051	0.032
20.0000	1.403E+00	1.928E+00	3.331E+00	9.836E+00	3.695E-01	2.134E+00	-0.034	0.048	0.028
25.0000	1.427E+00	2.463E+00	3.890E+00	1.122E+01	4.171E-01	2.420E+00	-0.029	0.044	0.024
30.0000	1.446E+00	3.006E+00	4.451E+00	1.242E+01	4.567E-01	2.668E+00	-0.026	0.040	0.020
35.0000	1.461E+00	3.555E+00	5.016E+00	1.348E+01	4.904E-01	2.888E+00	-0.023	0.038	0.018
40.0000	1.474E+00	4.109E+00	5.583E+00	1.443E+01	5.195E-01	3.085E+00	-0.021	0.036	0.016
45.0000	1.485E+00	4.667E+00	6.152E+00	1.528E+01	5.448E-01	3.264E+00	-0.020	0.034	0.014
50.0000	1.495E+00	5.228E+00	6.723E+00	1.606E+01	5.672E-01	3.427E+00	-0.018	0.033	0.013
55.0000	1.503E+00	5.792E+00	7.296E+00	1.677E+01	5.871E-01	3.577E+00	-0.017	0.031	0.012
60.0000	1.511E+00	6.359E+00	7.870E+00	1.743E+01	6.049E-01	3.716E+00	-0.016	0.030	0.011
70.0000	1.524E+00	7.498E+00	9.023E+00	1.862E+01	6.356E-01	3.967E+00	-0.015	0.029	0.009
80.0000	1.536E+00	8.644E+00	1.018E+01	1.966E+01	6.612E-01	4.188E+00	-0.013	0.027	0.008
90.0000	1.546E+00	9.795E+00	1.134E+01	2.059E+01	6.830E-01	4.387E+00	-0.012	0.026	0.007
100.0000	1.554E+00	1.095E+01	1.251E+01	2.143E+01	7.016E-01	4.567E+00	-0.011	0.025	0.007
125.0000	1.572E+00	1.385E+01	1.543E+01	2.323E+01	7.388E-01	4.957E+00	-0.009	0.023	0.005
150.0000	1.586E+00	1.677E+01	1.836E+01	2.471E+01	7.668E-01	5.283E+00	-0.008	0.022	0.004
175.0000	1.598E+00	1.970E+01	2.130E+01	2.597E+01	7.886E-01	5.562E+00	-0.007	0.021	0.004
200.0000	1.608E+00	2.264E+01	2.424E+01	2.707E+01	8.062E-01	5.808E+00	-0.006	0.020	0.003
250.0000	1.624E+00	2.852E+01	3.015E+01	2.892E+01	8.330E-01	6.223E+00	-0.005	0.019	0.003
300.0000	1.637E+00	3.443E+01	3.607E+01	3.043E+01	8.526E-01	6.567E+00	-0.004	0.018	0.002
350.0000	1.648E+00	4.034E+01	4.199E+01	3.172E+01	8.677E-01	6.860E+00	-0.004	0.017	0.002
400.0000	1.657E+00	4.627E+01	4.792E+01	3.283E+01	8.796E-01	7.115E+00	-0.003	0.017	0.002
450.0000	1.665E+00	5.220E+01	5.386E+01	3.381E+01	8.893E-01	7.342E+00	-0.003	0.016	0.002
500.0000	1.672E+00	5.813E+01	5.981E+01	3.469E+01	8.975E-01	7.545E+00	-0.003	0.016	0.001
550.0000	1.679E+00	6.407E+01	6.575E+01	3.549E+01	9.044E-01	7.729E+00	-0.002	0.015	0.001
600.0000	1.685E+00	7.002E+01	7.171E+01	3.622E+01	9.103E-01	7.898E+00	-0.002	0.015	0.001
700.0000	1.695E+00	8.192E+01	8.361E+01	3.751E+01	9.200E-01	8.198E+00	-0.002	0.015	0.001
800.0000	1.704E+00	9.383E+01	9.553E+01	3.863E+01	9.276E-01	8.459E+00	-0.002	0.014	0.001
900.0000	1.712E+00	1.057E+02	1.075E+02	3.961E+01	9.338E-01	8.690E+00	-0.001	0.014	0.001
1000.0000	1.719E+00	1.177E+02	1.194E+02	4.050E+01	9.389E-01	8.897E+00	-0.001	0.013	0.001

ELECTRONS IN ETHYLENE

I = 50.7 eV DENSITY = 1.175E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.499E+01	2.837E-03	2.499E+01	2.248E-04	6.226E-05	0.0	-0.184	0.208	0.207
0.0125	2.095E+01	2.847E-03	2.095E+01	3.345E-04	7.476E-05	0.0	-0.177	0.199	0.198
0.0150	1.814E+01	2.854E-03	1.814E+01	4.631E-04	8.675E-05	0.0	-0.172	0.192	0.191
0.0175	1.607E+01	2.860E-03	1.607E+01	6.098E-04	9.831E-05	0.0	-0.167	0.187	0.186
0.0200	1.447E+01	2.864E-03	1.447E+01	7.741E-04	1.095E-04	0.0	-0.164	0.182	0.182
0.0250	1.215E+01	2.873E-03	1.216E+01	1.153E-03	1.311E-04	0.0	-0.158	0.175	0.175
0.0300	1.056E+01	2.883E-03	1.056E+01	1.596E-03	1.517E-04	0.0	-0.154	0.170	0.170
0.0350	9.382E+00	2.894E-03	9.385E+00	2.099E-03	1.716E-04	0.0	-0.151	0.166	0.165
0.0400	8.482E+00	2.905E-03	8.485E+00	2.660E-03	1.908E-04	0.0	-0.148	0.162	0.162
0.0450	7.768E+00	2.918E-03	7.771E+00	3.277E-03	2.095E-04	0.0	-0.145	0.159	0.159
0.0500	7.188E+00	2.931E-03	7.191E+00	3.946E-03	2.277E-04	0.0	-0.143	0.157	0.156
0.0550	6.707E+00	2.945E-03	6.710E+00	4.667E-03	2.455E-04	0.0	-0.141	0.154	0.154
0.0600	6.301E+00	2.960E-03	6.304E+00	5.436E-03	2.629E-04	0.0	-0.140	0.152	0.152
0.0700	5.654E+00	2.992E-03	5.657E+00	7.114E-03	2.967E-04	0.0	-0.137	0.149	0.149
0.0800	5.160E+00	3.025E-03	5.163E+00	8.967E-03	3.293E-04	0.0	-0.135	0.146	0.146
0.0900	4.771E+00	3.061E-03	4.774E+00	1.098E-02	3.609E-04	0.0	-0.133	0.144	0.144
0.1000	4.457E+00	3.099E-03	4.460E+00	1.315E-02	3.916E-04	0.0	-0.131	0.142	0.142
0.1250	3.884E+00	3.201E-03	3.887E+00	1.918E-02	4.652E-04	0.0	-0.127	0.138	0.137
0.1500	3.497E+00	3.312E-03	3.501E+00	2.598E-02	5.352E-04	0.0	-0.125	0.135	0.134
0.1750	3.220E+00	3.429E-03	3.223E+00	3.343E-02	6.024E-04	0.0	-0.122	0.132	0.132
0.2000	3.012E+00	3.553E-03	3.015E+00	4.146E-02	6.672E-04	0.0	-0.120	0.130	0.129
0.2500	2.723E+00	3.820E-03	2.727E+00	5.896E-02	7.918E-04	0.0	-0.117	0.127	0.126
0.3000	2.534E+00	4.110E-03	2.538E+00	7.801E-02	9.116E-04	0.0	-0.115	0.124	0.123
0.3500	2.402E+00	4.420E-03	2.407E+00	9.827E-02	1.028E-03	0.0	-0.113	0.122	0.121
0.4000	2.307E+00	4.750E-03	2.312E+00	1.195E-01	1.143E-03	0.0	-0.111	0.120	0.119
0.4500	2.236E+00	5.098E-03	2.241E+00	1.415E-01	1.256E-03	0.0	-0.109	0.118	0.117
0.5000	2.182E+00	5.462E-03	2.188E+00	1.641E-01	1.369E-03	0.0	-0.108	0.117	0.116
0.5500	2.141E+00	5.841E-03	2.146E+00	1.871E-01	1.482E-03	0.0	-0.107	0.116	0.114
0.6000	2.108E+00	6.233E-03	2.114E+00	2.106E-01	1.595E-03	0.0	-0.105	0.115	0.113
0.7000	2.061E+00	7.053E-03	2.068E+00	2.585E-01	1.821E-03	0.0	-0.103	0.113	0.111
0.8000	2.032E+00	7.915E-03	2.040E+00	3.072E-01	2.049E-03	0.0	-0.102	0.111	0.109
0.9000	2.013E+00	8.816E-03	2.022E+00	3.565E-01	2.279E-03	0.0	-0.100	0.110	0.107
1.0000	2.002E+00	9.754E-03	2.011E+00	4.061E-01	2.511E-03	0.0	-0.099	0.108	0.106
1.2500	1.992E+00	1.224E-02	2.004E+00	5.307E-01	3.104E-03	0.0	-0.096	0.106	0.103
1.5000	1.996E+00	1.490E-02	2.011E+00	6.553E-01	3.712E-03	0.0	-0.094	0.103	0.100
1.7500	2.007E+00	1.770E-02	2.024E+00	7.792E-01	4.335E-03	0.0	-0.092	0.102	0.098
2.0000	2.021E+00	2.062E-02	2.041E+00	9.022E-01	4.971E-03	0.0	-0.091	0.100	0.096
2.5000	2.051E+00	2.678E-02	2.078E+00	1.145E+00	6.275E-03	0.0	-0.088	0.098	0.093
3.0000	2.082E+00	3.327E-02	2.115E+00	1.383E+00	7.613E-03	0.0	-0.086	0.096	0.091
3.5000	2.111E+00	4.004E-02	2.151E+00	1.618E+00	8.977E-03	0.0	-0.084	0.094	0.089
4.0000	2.139E+00	4.704E-02	2.186E+00	1.848E+00	1.036E-02	0.0	-0.083	0.092	0.087
4.5000	2.164E+00	5.424E-02	2.218E+00	2.075E+00	1.177E-02	0.0	-0.082	0.091	0.086
5.0000	2.187E+00	6.162E-02	2.249E+00	2.299E+00	1.318E-02	0.0	-0.081	0.090	0.085
5.5000	2.209E+00	6.916E-02	2.278E+00	2.520E+00	1.461E-02	0.0	-0.080	0.089	0.083
6.0000	2.229E+00	7.684E-02	2.306E+00	2.738E+00	1.604E-02	0.0	-0.079	0.088	0.082
7.0000	2.266E+00	9.259E-02	2.358E+00	3.167E+00	1.894E-02	0.0	-0.078	0.086	0.080
8.0000	2.298E+00	1.088E-01	2.407E+00	3.587E+00	2.185E-02	0.0	-0.077	0.085	0.079
9.0000	2.327E+00	1.253E-01	2.453E+00	3.998E+00	2.477E-02	0.0	-0.076	0.084	0.077
10.0000	2.354E+00	1.422E-01	2.496E+00	4.402E+00	2.770E-02	0.0	-0.075	0.082	0.076
12.5000	2.410E+00	1.855E-01	2.595E+00	5.384E+00	3.500E-02	0.0	-0.073	0.080	0.074
15.0000	2.456E+00	2.301E-01	2.687E+00	6.331E+00	4.227E-02	0.0	-0.071	0.078	0.071
17.5000	2.496E+00	2.757E-01	2.772E+00	7.247E+00	4.945E-02	0.0	-0.070	0.076	0.069
20.0000	2.529E+00	3.220E-01	2.851E+00	8.136E+00	5.655E-02	1.778E-02	-0.059	0.074	0.067
25.0000	2.577E+00	4.166E-01	2.994E+00	9.846E+00	7.047E-02	1.288E-01	-0.044	0.069	0.059
30.0000	2.612E+00	5.129E-01	3.125E+00	1.148E+01	8.401E-02	2.760E-01	-0.036	0.064	0.051
35.0000	2.639E+00	6.105E-01	3.249E+00	1.305E+01	9.717E-02	4.292E-01	-0.031	0.060	0.045
40.0000	2.660E+00	7.092E-01	3.370E+00	1.456E+01	1.099E-01	5.780E-01	-0.027	0.056	0.040
45.0000	2.679E+00	8.088E-01	3.488E+00	1.602E+01	1.223E-01	7.191E-01	-0.025	0.053	0.036
50.0000	2.695E+00	9.092E-01	3.604E+00	1.743E+01	1.343E-01	8.516E-01	-0.023	0.050	0.033
55.0000	2.709E+00	1.010E+00	3.719E+00	1.879E+01	1.459E-01	9.757E-01	-0.022	0.047	0.030
60.0000	2.722E+00	1.112E+00	3.833E+00	2.012E+01	1.572E-01	1.092E+00	-0.021	0.045	0.028
70.0000	2.743E+00	1.316E+00	4.060E+00	2.265E+01	1.786E-01	1.304E+00	-0.019	0.042	0.024
80.0000	2.762E+00	1.522E+00	4.284E+00	2.505E+01	1.988E-01	1.492E+00	-0.018	0.039	0.022
90.0000	2.778E+00	1.730E+00	4.508E+00	2.733E+01	2.178E-01	1.662E+00	-0.017	0.037	0.020
100.0000	2.792E+00	1.938E+00	4.730E+00	2.949E+01	2.357E-01	1.816E+00	-0.017	0.035	0.018
125.0000	2.822E+00	2.463E+00	5.284E+00	3.449E+01	2.763E-01	2.148E+00	-0.015	0.031	0.015
150.0000	2.845E+00	2.991E+00	5.837E+00	3.899E+01	3.119E-01	2.425E+00	-0.014	0.028	0.013
175.0000	2.865E+00	3.523E+00	6.388E+00	4.308E+01	3.434E-01	2.664E+00	-0.013	0.026	0.012
200.0000	2.881E+00	4.057E+00	6.939E+00	4.684E+01	3.716E-01	2.875E+00	-0.012	0.025	0.011
250.0000	2.908E+00	5.131E+00	8.040E+00	5.352E+01	4.198E-01	3.235E+00	-0.011	0.022	0.009
300.0000	2.930E+00	6.210E+00	9.140E+00	5.935E+01	4.598E-01	3.539E+00	-0.009	0.020	0.008
350.0000	2.947E+00	7.294E+00	1.024E+01	6.452E+01	4.936E-01	3.802E+00	-0.008	0.019	0.007
400.0000	2.962E+00	8.380E+00	1.134E+01	6.915E+01	5.226E-01	4.036E+00	-0.007	0.018	0.006
450.0000	2.974E+00	9.469E+00	1.244E+01	7.336E+01	5.479E-01	4.246E+00	-0.006	0.017	0.005
500.0000	2.985E+00	1.056E+01	1.354E+01	7.721E+01	5.702E-01	4.438E+00	-0.005	0.016	0.005
550.0000	2.995E+00	1.165E+01	1.465E+01	8.076E+01	5.900E-01	4.613E+00	-0.004	0.015	0.004
600.0000	3.004E+00	1.275E+01	1.575E+01	8.405E+01	6.077E-01	4.775E+00	-0.004	0.015	0.004
700.0000	3.019E+00	1.494E+01	1.796E+01	9.000E+01	6.382E-01	5.065E+00	-0.003	0.014	0.003
800.0000	3.031E+00	1.713E+01	2.016E+01	9.525E+01	6.635E-01	5.320E+00	-0.002	0.013	0.003
900.0000	3.042E+00	1.933E+01	2.237E+01	9.995E+01	6.850E-01	5.547E+00	-0.002	0.013	0.002
1000.0000	3.052E+00	2.153E+01	2.458E+01	1.042E+02	7.035E-01	5.751E+00	-0.002	0.012	0.002

ELECTRONS IN FERROUS SULFATE DOSIMETER SOLUTION

I = 76.4 eV DENSITY = 1.024E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.241E+01	3.961E-03	2.241E+01	2.533E-04	9.615E-05	0.0	-0.200	0.228	0.226
0.0125	1.885E+01	3.993E-03	1.885E+01	3.755E-04	1.158E-04	0.0	-0.191	0.217	0.216
0.0150	1.636E+01	4.012E-03	1.636E+01	5.183E-04	1.346E-04	0.0	-0.185	0.209	0.208
0.0175	1.452E+01	4.025E-03	1.452E+01	6.808E-04	1.527E-04	0.0	-0.180	0.203	0.202
0.0200	1.309E+01	4.034E-03	1.309E+01	8.624E-04	1.702E-04	0.0	-0.176	0.197	0.196
0.0250	1.102E+01	4.047E-03	1.103E+01	1.280E-03	2.037E-04	0.0	-0.169	0.189	0.188
0.0300	9.594E+00	4.058E-03	9.598E+00	1.768E-03	2.356E-04	0.0	-0.164	0.183	0.182
0.0350	8.540E+00	4.069E-03	8.544E+00	2.321E-03	2.662E-04	0.0	-0.160	0.178	0.177
0.0400	7.730E+00	4.081E-03	7.734E+00	2.937E-03	2.957E-04	0.0	-0.157	0.174	0.173
0.0450	7.087E+00	4.094E-03	7.091E+00	3.613E-03	3.242E-04	0.0	-0.154	0.171	0.170
0.0500	6.564E+00	4.108E-03	6.568E+00	4.347E-03	3.520E-04	0.0	-0.152	0.168	0.167
0.0550	6.129E+00	4.123E-03	6.134E+00	5.135E-03	3.790E-04	0.0	-0.150	0.165	0.165
0.0600	5.763E+00	4.140E-03	5.767E+00	5.976E-03	4.053E-04	0.0	-0.148	0.163	0.162
0.0700	5.177E+00	4.176E-03	5.181E+00	7.810E-03	4.563E-04	0.0	-0.145	0.159	0.159
0.0800	4.730E+00	4.216E-03	4.734E+00	9.832E-03	5.053E-04	0.0	-0.142	0.156	0.155
0.0900	4.377E+00	4.260E-03	4.381E+00	1.203E-02	5.527E-04	0.0	-0.140	0.153	0.153
0.1000	4.092E+00	4.307E-03	4.096E+00	1.439E-02	5.986E-04	0.0	-0.138	0.151	0.150
0.1250	3.571E+00	4.436E-03	3.576E+00	2.095E-02	7.083E-04	0.0	-0.134	0.146	0.146
0.1500	3.220E+00	4.577E-03	3.224E+00	2.833E-02	8.120E-04	0.0	-0.131	0.143	0.142
0.1750	2.967E+00	4.728E-03	2.972E+00	3.643E-02	9.111E-04	0.0	-0.129	0.140	0.139
0.2000	2.778E+00	4.888E-03	2.783E+00	4.513E-02	1.007E-03	0.0	-0.127	0.137	0.137
0.2500	2.514E+00	5.233E-03	2.520E+00	6.408E-02	1.189E-03	0.0	-0.123	0.134	0.133
0.3000	2.342E+00	5.611E-03	2.348E+00	8.468E-02	1.363E-03	0.0	-0.120	0.131	0.130
0.3500	2.223E+00	6.017E-03	2.229E+00	1.066E-01	1.532E-03	0.0	-0.118	0.128	0.127
0.4000	2.137E+00	6.448E-03	2.143E+00	1.295E-01	1.697E-03	0.0	-0.116	0.126	0.125
0.4500	2.072E+00	6.904E-03	2.079E+00	1.532E-01	1.860E-03	0.0	-0.114	0.124	0.123
0.5000	2.023E+00	7.381E-03	2.031E+00	1.775E-01	2.022E-03	0.0	-0.110	0.123	0.121
0.5500	1.984E+00	7.878E-03	1.992E+00	2.024E-01	2.183E-03	1.262E-02	-0.094	0.120	0.118
0.6000	1.953E+00	8.392E-03	1.961E+00	2.277E-01	2.344E-03	3.136E-02	-0.088	0.117	0.114
0.7000	1.907E+00	9.466E-03	1.916E+00	2.793E-01	2.667E-03	7.687E-02	-0.078	0.110	0.106
0.8000	1.876E+00	1.060E-02	1.886E+00	3.319E-01	2.994E-03	1.295E-01	-0.070	0.105	0.099
0.9000	1.854E+00	1.178E-02	1.866E+00	3.852E-01	3.324E-03	1.864E-01	-0.064	0.099	0.093
1.0000	1.839E+00	1.300E-02	1.852E+00	4.390E-01	3.658E-03	2.457E-01	-0.059	0.095	0.087
1.2500	1.819E+00	1.625E-02	1.835E+00	5.747E-01	4.512E-03	3.970E-01	-0.050	0.085	0.075
1.5000	1.812E+00	1.972E-02	1.832E+00	7.111E-01	5.394E-03	5.458E-01	-0.043	0.077	0.066
1.7500	1.812E+00	2.338E-02	1.835E+00	8.475E-01	6.302E-03	6.880E-01	-0.039	0.071	0.059
2.0000	1.815E+00	2.719E-02	1.842E+00	9.835E-01	7.233E-03	8.225E-01	-0.035	0.067	0.054
2.5000	1.825E+00	3.520E-02	1.860E+00	1.254E+00	9.153E-03	1.068E+00	-0.031	0.059	0.046
3.0000	1.837E+00	4.363E-02	1.881E+00	1.521E+00	1.114E-02	1.286E+00	-0.028	0.054	0.040
3.5000	1.849E+00	5.240E-02	1.902E+00	1.785E+00	1.317E-02	1.481E+00	-0.026	0.050	0.036
4.0000	1.861E+00	6.147E-02	1.923E+00	2.047E+00	1.524E-02	1.657E+00	-0.024	0.046	0.033
4.5000	1.873E+00	7.078E-02	1.944E+00	2.306E+00	1.735E-02	1.816E+00	-0.023	0.044	0.031
5.0000	1.883E+00	8.032E-02	1.964E+00	2.561E+00	1.948E-02	1.962E+00	-0.022	0.042	0.029
5.5000	1.893E+00	9.004E-02	1.983E+00	2.815E+00	2.163E-02	2.096E+00	-0.022	0.040	0.028
6.0000	1.903E+00	9.995E-02	2.002E+00	3.066E+00	2.380E-02	2.220E+00	-0.021	0.038	0.026
7.0000	1.919E+00	1.202E-01	2.040E+00	3.561E+00	2.818E-02	2.445E+00	-0.020	0.036	0.025
8.0000	1.934E+00	1.410E-01	2.075E+00	4.047E+00	3.259E-02	2.643E+00	-0.019	0.033	0.023
9.0000	1.947E+00	1.623E-01	2.110E+00	4.524E+00	3.702E-02	2.821E+00	-0.018	0.032	0.022
10.0000	1.959E+00	1.840E-01	2.143E+00	4.995E+00	4.145E-02	2.982E+00	-0.018	0.030	0.021
12.5000	1.985E+00	2.395E-01	2.224E+00	6.139E+00	5.252E-02	3.330E+00	-0.016	0.028	0.019
15.0000	2.005E+00	2.966E-01	2.302E+00	7.244E+00	6.349E-02	3.621E+00	-0.015	0.025	0.017
17.5000	2.022E+00	3.549E-01	2.377E+00	8.313E+00	7.430E-02	3.873E+00	-0.014	0.024	0.016
20.0000	2.037E+00	4.142E-01	2.451E+00	9.348E+00	8.491E-02	4.095E+00	-0.013	0.022	0.015
25.0000	2.061E+00	5.348E-01	2.596E+00	1.133E+01	1.055E-01	4.474E+00	-0.010	0.020	0.013
30.0000	2.080E+00	6.575E-01	2.738E+00	1.320E+01	1.251E-01	4.793E+00	-0.009	0.018	0.011
35.0000	2.096E+00	7.818E-01	2.878E+00	1.499E+01	1.438E-01	5.070E+00	-0.007	0.017	0.010
40.0000	2.109E+00	9.073E-01	3.016E+00	1.668E+01	1.617E-01	5.313E+00	-0.006	0.016	0.009
45.0000	2.120E+00	1.034E+00	3.154E+00	1.830E+01	1.786E-01	5.531E+00	-0.005	0.015	0.008
50.0000	2.130E+00	1.161E+00	3.292E+00	1.986E+01	1.948E-01	5.728E+00	-0.004	0.014	0.007
55.0000	2.139E+00	1.290E+00	3.429E+00	2.134E+01	2.103E-01	5.908E+00	-0.004	0.013	0.006
60.0000	2.147E+00	1.418E+00	3.566E+00	2.277E+01	2.250E-01	6.073E+00	-0.003	0.012	0.006
70.0000	2.161E+00	1.678E+00	3.839E+00	2.548E+01	2.525E-01	6.369E+00	-0.003	0.011	0.005
80.0000	2.173E+00	1.939E+00	4.112E+00	2.799E+01	2.778E-01	6.627E+00	-0.002	0.010	0.004
90.0000	2.184E+00	2.201E+00	4.385E+00	3.035E+01	3.010E-01	6.857E+00	-0.002	0.010	0.004
100.0000	2.193E+00	2.465E+00	4.658E+00	3.256E+01	3.225E-01	7.063E+00	-0.001	0.009	0.003
125.0000	2.213E+00	3.129E+00	5.342E+00	3.757E+01	3.698E-01	7.501E+00	-0.001	0.008	0.002
150.0000	2.229E+00	3.797E+00	6.026E+00	4.197E+01	4.096E-01	7.861E+00	-0.001	0.007	0.002
175.0000	2.242E+00	4.468E+00	6.710E+00	4.590E+01	4.437E-01	8.167E+00	-0.001	0.006	0.002
200.0000	2.253E+00	5.143E+00	7.396E+00	4.945E+01	4.734E-01	8.432E+00	-0.000	0.006	0.001
250.0000	2.273E+00	6.497E+00	8.770E+00	5.565E+01	5.226E-01	8.876E+00	-0.000	0.005	0.001
300.0000	2.288E+00	7.858E+00	1.015E+01	6.094E+01	5.619E-01	9.239E+00	-0.000	0.005	0.001
350.0000	2.301E+00	9.222E+00	1.152E+01	6.557E+01	5.942E-01	9.546E+00	-0.000	0.005	0.001
400.0000	2.313E+00	1.059E+01	1.290E+01	6.966E+01	6.213E-01	9.812E+00	-0.000	0.004	0.001
450.0000	2.323E+00	1.196E+01	1.428E+01	7.334E+01	6.444E-01	1.005E+01	-0.000	0.004	0.001
500.0000	2.332E+00	1.333E+01	1.567E+01	7.669E+01	6.644E-01	1.026E+01	-0.000	0.004	0.000
550.0000	2.340E+00	1.471E+01	1.705E+01	7.974E+01	6.819E-01	1.045E+01	-0.000	0.004	0.000
600.0000	2.347E+00	1.608E+01	1.843E+01	8.256E+01	6.974E-01	1.062E+01	-0.000	0.004	0.000
700.0000	2.361E+00	1.884E+01	2.120E+01	8.762E+01	7.236E-01	1.093E+01	-0.000	0.003	0.000
800.0000	2.372E+00	2.160E+01	2.397E+01	9.205E+01	7.451E-01	1.120E+01	-0.000	0.003	0.000
900.0000	2.382E+00	2.436E+01	2.674E+01	9.600E+01	7.630E-01	1.143E+01	-0.000	0.003	0.000
1000.0000	2.391E+00	2.713E+01	2.952E+01	9.956E+01	7.782E-01	1.164E+01	-0.000	0.003	0.000

ELECTRONS IN GLASS, BOROSILICATE ("PYREX", CORNING 7740)

I = 134.0 eV DENSITY = 2.230E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.787E+01	5.400E-03	1.788E+01	3.237E-04	1.632E-04	0.0	-0.225	0.264	0.260
0.0125	1.511E+01	5.488E-03	1.512E+01	4.764E-04	1.971E-04	0.0	-0.214	0.250	0.246
0.0150	1.317E+01	5.548E-03	1.317E+01	6.540E-04	2.296E-04	0.0	-0.206	0.239	0.236
0.0175	1.172E+01	5.593E-03	1.173E+01	8.556E-04	2.610E-04	0.0	-0.200	0.230	0.228
0.0200	1.060E+01	5.626E-03	1.060E+01	1.080E-03	2.914E-04	0.0	-0.195	0.223	0.221
0.0250	8.962E+00	5.674E-03	8.968E+00	1.595E-03	3.495E-04	0.0	-0.187	0.213	0.211
0.0300	7.822E+00	5.707E-03	7.828E+00	2.194E-03	4.048E-04	0.0	-0.181	0.205	0.203
0.0350	6.980E+00	5.735E-03	6.986E+00	2.871E-03	4.578E-04	0.0	-0.176	0.199	0.197
0.0400	6.331E+00	5.759E-03	6.336E+00	3.624E-03	5.087E-04	0.0	-0.172	0.194	0.192
0.0450	5.814E+00	5.781E-03	5.820E+00	4.448E-03	5.579E-04	0.0	-0.169	0.189	0.188
0.0500	5.393E+00	5.803E-03	5.398E+00	5.341E-03	6.055E-04	0.0	-0.166	0.186	0.185
0.0550	5.042E+00	5.824E-03	5.048E+00	6.300E-03	6.518E-04	0.0	-0.164	0.182	0.182
0.0600	4.746E+00	5.847E-03	4.752E+00	7.321E-03	6.968E-04	0.0	-0.162	0.180	0.179
0.0700	4.272E+00	5.893E-03	4.278E+00	9.544E-03	7.837E-04	0.0	-0.158	0.175	0.174
0.0800	3.909E+00	5.943E-03	3.915E+00	1.199E-02	8.668E-04	0.0	-0.155	0.171	0.170
0.0900	3.622E+00	5.997E-03	3.628E+00	1.465E-02	9.467E-04	0.0	-0.152	0.168	0.167
0.1000	3.390E+00	6.055E-03	3.396E+00	1.750E-02	1.024E-03	0.0	-0.150	0.165	0.164
0.1250	2.966E+00	6.215E-03	2.972E+00	2.540E-02	1.207E-03	0.0	-0.145	0.159	0.159
0.1500	2.679E+00	6.393E-03	2.685E+00	3.427E-02	1.379E-03	0.0	-0.142	0.155	0.155
0.1750	2.473E+00	6.588E-03	2.479E+00	4.398E-02	1.542E-03	0.0	-0.139	0.152	0.151
0.2000	2.318E+00	6.796E-03	2.325E+00	5.440E-02	1.698E-03	0.0	-0.136	0.149	0.148
0.2500	2.102E+00	7.250E-03	2.110E+00	7.706E-02	1.995E-03	0.0	-0.132	0.145	0.144
0.3000	1.962E+00	7.749E-03	1.970E+00	1.016E-01	2.277E-03	0.0	-0.129	0.141	0.140
0.3500	1.864E+00	8.286E-03	1.873E+00	1.277E-01	2.549E-03	0.0	-0.127	0.138	0.137
0.4000	1.793E+00	8.857E-03	1.802E+00	1.549E-01	2.814E-03	8.985E-03	-0.110	0.135	0.133
0.4500	1.739E+00	9.461E-03	1.749E+00	1.831E-01	3.075E-03	2.665E-02	-0.105	0.130	0.128
0.5000	1.698E+00	1.009E-02	1.708E+00	2.121E-01	3.333E-03	4.637E-02	-0.100	0.126	0.124
0.5500	1.665E+00	1.075E-02	1.676E+00	2.416E-01	3.590E-03	6.760E-02	-0.095	0.123	0.119
0.6000	1.640E+00	1.143E-02	1.651E+00	2.717E-01	3.846E-03	8.997E-02	-0.091	0.119	0.115
0.7000	1.603E+00	1.285E-02	1.616E+00	3.330E-01	4.359E-03	1.371E-01	-0.085	0.114	0.109
0.8000	1.579E+00	1.434E-02	1.593E+00	3.953E-01	4.873E-03	1.860E-01	-0.080	0.108	0.103
0.9000	1.563E+00	1.590E-02	1.579E+00	4.584E-01	5.391E-03	2.359E-01	-0.075	0.104	0.098
1.0000	1.552E+00	1.751E-02	1.570E+00	5.220E-01	5.913E-03	2.859E-01	-0.072	0.100	0.093
1.2500	1.540E+00	2.179E-02	1.561E+00	6.818E-01	7.240E-03	4.090E-01	-0.064	0.092	0.084
1.5000	1.538E+00	2.636E-02	1.564E+00	8.418E-01	8.599E-03	5.271E-01	-0.059	0.086	0.077
1.7500	1.541E+00	3.117E-02	1.572E+00	1.001E+00	9.990E-03	6.390E-01	-0.055	0.082	0.072
2.0000	1.547E+00	3.617E-02	1.583E+00	1.160E+00	1.141E-02	7.448E-01	-0.052	0.078	0.067
2.5000	1.561E+00	4.668E-02	1.608E+00	1.473E+00	1.431E-02	9.392E-01	-0.047	0.071	0.060
3.0000	1.576E+00	5.771E-02	1.634E+00	1.782E+00	1.729E-02	1.114E+00	-0.043	0.066	0.055
3.5000	1.590E+00	6.918E-02	1.660E+00	2.085E+00	2.032E-02	1.273E+00	-0.040	0.063	0.051
4.0000	1.604E+00	8.102E-02	1.685E+00	2.384E+00	2.339E-02	1.419E+00	-0.037	0.059	0.047
4.5000	1.616E+00	9.315E-02	1.709E+00	2.679E+00	2.649E-02	1.554E+00	-0.035	0.057	0.045
5.0000	1.627E+00	1.056E-01	1.733E+00	2.970E+00	2.961E-02	1.679E+00	-0.033	0.054	0.042
5.5000	1.637E+00	1.182E-01	1.756E+00	3.256E+00	3.275E-02	1.797E+00	-0.031	0.052	0.040
6.0000	1.647E+00	1.311E-01	1.778E+00	3.539E+00	3.590E-02	1.907E+00	-0.030	0.050	0.038
7.0000	1.664E+00	1.574E-01	1.821E+00	4.095E+00	4.222E-02	2.110E+00	-0.027	0.047	0.035
8.0000	1.678E+00	1.844E-01	1.863E+00	4.638E+00	4.853E-02	2.292E+00	-0.025	0.044	0.032
9.0000	1.691E+00	2.119E-01	1.903E+00	5.169E+00	5.483E-02	2.458E+00	-0.023	0.042	0.030
10.0000	1.703E+00	2.399E-01	1.943E+00	5.689E+00	6.109E-02	2.611E+00	-0.022	0.040	0.028
12.5000	1.726E+00	3.115E-01	2.038E+00	6.945E+00	7.653E-02	2.945E+00	-0.019	0.036	0.024
15.0000	1.746E+00	3.850E-01	2.131E+00	8.145E+00	9.159E-02	3.229E+00	-0.017	0.033	0.021
17.5000	1.761E+00	4.599E-01	2.221E+00	9.294E+00	1.062E-01	3.476E+00	-0.015	0.030	0.019
20.0000	1.775E+00	5.360E-01	2.311E+00	1.040E+01	1.204E-01	3.695E+00	-0.014	0.028	0.017
25.0000	1.797E+00	6.906E-01	2.487E+00	1.248E+01	1.474E-01	4.071E+00	-0.011	0.025	0.014
30.0000	1.814E+00	8.477E-01	2.662E+00	1.442E+01	1.725E-01	4.388E+00	-0.010	0.023	0.012
35.0000	1.828E+00	1.007E+00	2.835E+00	1.624E+01	1.961E-01	4.661E+00	-0.008	0.021	0.011
40.0000	1.840E+00	1.167E+00	3.007E+00	1.796E+01	2.180E-01	4.901E+00	-0.007	0.019	0.010
45.0000	1.851E+00	1.329E+00	3.179E+00	1.957E+01	2.386E-01	5.115E+00	-0.006	0.018	0.009
50.0000	1.860E+00	1.491E+00	3.351E+00	2.111E+01	2.579E-01	5.309E+00	-0.006	0.017	0.008
55.0000	1.868E+00	1.655E+00	3.523E+00	2.256E+01	2.761E-01	5.486E+00	-0.005	0.016	0.007
60.0000	1.876E+00	1.819E+00	3.695E+00	2.395E+01	2.932E-01	5.649E+00	-0.005	0.015	0.006
70.0000	1.889E+00	2.150E+00	4.039E+00	2.653E+01	3.246E-01	5.940E+00	-0.004	0.014	0.005
80.0000	1.900E+00	2.483E+00	4.383E+00	2.891E+01	3.527E-01	6.194E+00	-0.003	0.013	0.005
90.0000	1.909E+00	2.817E+00	4.727E+00	3.111E+01	3.782E-01	6.420E+00	-0.003	0.012	0.004
100.0000	1.918E+00	3.153E+00	5.071E+00	3.315E+01	4.013E-01	6.624E+00	-0.002	0.011	0.004
125.0000	1.936E+00	3.998E+00	5.934E+00	3.770E+01	4.508E-01	7.058E+00	-0.002	0.010	0.003
150.0000	1.950E+00	4.848E+00	6.798E+00	4.163E+01	4.914E-01	7.415E+00	-0.001	0.009	0.002
175.0000	1.963E+00	5.702E+00	7.665E+00	4.510E+01	5.254E-01	7.718E+00	-0.001	0.009	0.002
200.0000	1.973E+00	6.559E+00	8.532E+00	4.819E+01	5.543E-01	7.982E+00	-0.001	0.008	0.002
250.0000	1.990E+00	8.280E+00	1.027E+01	5.352E+01	6.011E-01	8.424E+00	-0.001	0.007	0.001
300.0000	2.004E+00	1.001E+01	1.201E+01	5.802E+01	6.377E-01	8.786E+00	-0.000	0.007	0.001
350.0000	2.016E+00	1.174E+01	1.376E+01	6.190E+01	6.671E-01	9.093E+00	-0.000	0.006	0.001
400.0000	2.027E+00	1.348E+01	1.550E+01	6.532E+01	6.914E-01	9.359E+00	-0.000	0.006	0.001
450.0000	2.036E+00	1.522E+01	1.725E+01	6.838E+01	7.119E-01	9.594E+00	-0.000	0.006	0.001
500.0000	2.044E+00	1.696E+01	1.900E+01	7.114E+01	7.295E-01	9.804E+00	-0.000	0.006	0.001
550.0000	2.051E+00	1.870E+01	2.075E+01	7.366E+01	7.447E-01	9.994E+00	-0.000	0.005	0.001
600.0000	2.058E+00	2.045E+01	2.251E+01	7.597E+01	7.581E-01	1.017E+01	-0.000	0.005	0.001
700.0000	2.069E+00	2.394E+01	2.601E+01	8.010E+01	7.804E-01	1.048E+01	-0.000	0.005	0.000
800.0000	2.080E+00	2.744E+01	2.952E+01	8.371E+01	7.985E-01	1.074E+01	-0.000	0.005	0.000
900.0000	2.089E+00	3.094E+01	3.303E+01	8.691E+01	8.135E-01	1.098E+01	-0.000	0.005	0.000
1000.0000	2.097E+00	3.445E+01	3.654E+01	8.978E+01	8.261E-01	1.119E+01	-0.000	0.004	0.000

ELECTRONS IN "KAPTON" POLYIMIDE FILM

I = 79.6 eV DENSITY = 1.420E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.059E+01	3.368E-03	2.059E+01	2.760E-04	9.020E-05	0.0	-0.201	0.231	0.229
0.0125	1.732E+01	3.383E-03	1.733E+01	4.089E-04	1.081E-04	0.0	-0.193	0.219	0.218
0.0150	1.504E+01	3.392E-03	1.504E+01	5.642E-04	1.251E-04	0.0	-0.186	0.211	0.210
0.0175	1.335E+01	3.399E-03	1.335E+01	7.410E-04	1.416E-04	0.0	-0.181	0.205	0.204
0.0200	1.204E+01	3.404E-03	1.204E+01	9.385E-04	1.574E-04	0.0	-0.177	0.199	0.198
0.0250	1.014E+01	3.413E-03	1.015E+01	1.393E-03	1.879E-04	0.0	-0.170	0.191	0.190
0.0300	8.828E+00	3.422E-03	8.832E+00	1.923E-03	2.169E-04	0.0	-0.165	0.184	0.184
0.0350	7.860E+00	3.432E-03	7.864E+00	2.524E-03	2.448E-04	0.0	-0.161	0.179	0.179
0.0400	7.116E+00	3.443E-03	7.119E+00	3.193E-03	2.717E-04	0.0	-0.158	0.175	0.175
0.0450	6.525E+00	3.456E-03	6.528E+00	3.928E-03	2.978E-04	0.0	-0.155	0.172	0.171
0.0500	6.044E+00	3.469E-03	6.047E+00	4.724E-03	3.232E-04	0.0	-0.153	0.169	0.168
0.0550	5.644E+00	3.484E-03	5.647E+00	5.580E-03	3.480E-04	0.0	-0.151	0.166	0.166
0.0600	5.307E+00	3.499E-03	5.310E+00	6.494E-03	3.721E-04	0.0	-0.149	0.164	0.164
0.0700	4.768E+00	3.532E-03	4.772E+00	8.485E-03	4.190E-04	0.0	-0.146	0.160	0.160
0.0800	4.357E+00	3.569E-03	4.360E+00	1.068E-02	4.640E-04	0.0	-0.143	0.157	0.157
0.0900	4.032E+00	3.608E-03	4.036E+00	1.307E-02	5.076E-04	0.0	-0.141	0.154	0.154
0.1000	3.770E+00	3.649E-03	3.773E+00	1.563E-02	5.499E-04	0.0	-0.139	0.152	0.151
0.1250	3.290E+00	3.763E-03	3.294E+00	2.275E-02	6.511E-04	0.0	-0.135	0.147	0.147
0.1500	2.967E+00	3.886E-03	2.971E+00	3.076E-02	7.469E-04	0.0	-0.132	0.143	0.143
0.1750	2.735E+00	4.018E-03	2.739E+00	3.955E-02	8.385E-04	0.0	-0.129	0.141	0.140
0.2000	2.560E+00	4.157E-03	2.564E+00	4.899E-02	9.267E-04	0.0	-0.127	0.138	0.138
0.2500	2.318E+00	4.457E-03	2.322E+00	6.955E-02	1.096E-03	0.0	-0.124	0.134	0.134
0.3000	2.159E+00	4.784E-03	2.164E+00	9.190E-02	1.257E-03	0.0	-0.121	0.131	0.130
0.3500	2.049E+00	5.135E-03	2.055E+00	1.156E-01	1.414E-03	0.0	-0.119	0.129	0.128
0.4000	1.969E+00	5.509E-03	1.974E+00	1.405E-01	1.568E-03	1.309E-02	-0.095	0.125	0.123
0.4500	1.906E+00	5.903E-03	1.912E+00	1.662E-01	1.720E-03	4.101E-02	-0.089	0.120	0.117
0.5000	1.859E+00	6.316E-03	1.865E+00	1.927E-01	1.872E-03	7.122E-02	-0.083	0.115	0.112
0.5500	1.821E+00	6.745E-03	1.828E+00	2.198E-01	2.023E-03	1.031E-01	-0.078	0.111	0.107
0.6000	1.791E+00	7.189E-03	1.798E+00	2.474E-01	2.175E-03	1.361E-01	-0.074	0.107	0.102
0.7000	1.747E+00	8.119E-03	1.755E+00	3.038E-01	2.480E-03	2.042E-01	-0.067	0.100	0.094
0.8000	1.717E+00	9.096E-03	1.726E+00	3.613E-01	2.789E-03	2.735E-01	-0.062	0.094	0.088
0.9000	1.696E+00	1.012E-02	1.707E+00	4.195E-01	3.101E-03	3.426E-01	-0.057	0.090	0.082
1.0000	1.682E+00	1.118E-02	1.693E+00	4.784E-01	3.417E-03	4.109E-01	-0.054	0.085	0.077
1.2500	1.663E+00	1.399E-02	1.677E+00	6.269E-01	4.227E-03	5.751E-01	-0.048	0.077	0.067
1.5000	1.657E+00	1.700E-02	1.674E+00	7.761E-01	5.063E-03	7.282E-01	-0.043	0.071	0.061
1.7500	1.657E+00	2.017E-02	1.677E+00	9.254E-01	5.923E-03	8.700E-01	-0.040	0.066	0.055
2.0000	1.660E+00	2.347E-02	1.683E+00	1.074E+00	6.806E-03	1.001E+00	-0.038	0.062	0.051
2.5000	1.670E+00	3.041E-02	1.701E+00	1.370E+00	8.625E-03	1.237E+00	-0.035	0.056	0.046
3.0000	1.683E+00	3.773E-02	1.721E+00	1.662E+00	1.050E-02	1.442E+00	-0.032	0.052	0.041
3.5000	1.696E+00	4.535E-02	1.741E+00	1.951E+00	1.243E-02	1.624E+00	-0.031	0.049	0.039
4.0000	1.708E+00	5.322E-02	1.761E+00	2.237E+00	1.439E-02	1.788E+00	-0.029	0.047	0.036
4.5000	1.719E+00	6.132E-02	1.780E+00	2.519E+00	1.639E-02	1.936E+00	-0.028	0.045	0.034
5.0000	1.730E+00	6.961E-02	1.799E+00	2.798E+00	1.840E-02	2.072E+00	-0.027	0.043	0.033
5.5000	1.740E+00	7.807E-02	1.818E+00	3.075E+00	2.044E-02	2.197E+00	-0.026	0.041	0.032
6.0000	1.749E+00	8.669E-02	1.836E+00	3.348E+00	2.249E-02	2.314E+00	-0.025	0.040	0.030
7.0000	1.765E+00	1.044E-01	1.870E+00	3.888E+00	2.664E-02	2.526E+00	-0.024	0.038	0.029
8.0000	1.780E+00	1.225E-01	1.902E+00	4.418E+00	3.082E-02	2.715E+00	-0.022	0.036	0.027
9.0000	1.793E+00	1.410E-01	1.934E+00	4.940E+00	3.503E-02	2.886E+00	-0.021	0.034	0.025
10.0000	1.804E+00	1.599E-01	1.964E+00	5.453E+00	3.924E-02	3.043E+00	-0.019	0.033	0.024
12.5000	1.828E+00	2.084E-01	2.036E+00	6.703E+00	4.978E-02	3.387E+00	-0.016	0.030	0.021
15.0000	1.847E+00	2.582E-01	2.105E+00	7.910E+00	6.024E-02	3.681E+00	-0.014	0.027	0.019
17.5000	1.862E+00	3.091E-01	2.171E+00	9.079E+00	7.057E-02	3.939E+00	-0.011	0.025	0.017
20.0000	1.875E+00	3.609E-01	2.236E+00	1.021E+01	8.074E-02	4.168E+00	-0.010	0.023	0.015
25.0000	1.896E+00	4.664E-01	2.363E+00	1.239E+01	1.005E-01	4.564E+00	-0.007	0.020	0.012
30.0000	1.913E+00	5.737E-01	2.486E+00	1.445E+01	1.195E-01	4.897E+00	-0.005	0.018	0.010
35.0000	1.926E+00	6.824E-01	2.609E+00	1.641E+01	1.376E-01	5.184E+00	-0.004	0.016	0.008
40.0000	1.938E+00	7.923E-01	2.730E+00	1.829E+01	1.549E-01	5.437E+00	-0.003	0.015	0.007
45.0000	1.948E+00	9.031E-01	2.851E+00	2.008E+01	1.714E-01	5.662E+00	-0.003	0.014	0.006
50.0000	1.957E+00	1.015E+00	2.971E+00	2.180E+01	1.872E-01	5.864E+00	-0.002	0.013	0.005
55.0000	1.965E+00	1.127E+00	3.091E+00	2.345E+01	2.023E-01	6.049E+00	-0.002	0.012	0.005
60.0000	1.972E+00	1.240E+00	3.212E+00	2.503E+01	2.167E-01	6.218E+00	-0.002	0.011	0.004
70.0000	1.984E+00	1.467E+00	3.451E+00	2.804E+01	2.438E-01	6.519E+00	-0.001	0.010	0.003
80.0000	1.995E+00	1.696E+00	3.691E+00	3.084E+01	2.686E-01	6.781E+00	-0.001	0.009	0.003
90.0000	2.005E+00	1.926E+00	3.931E+00	3.346E+01	2.915E-01	7.013E+00	-0.001	0.009	0.002
100.0000	2.013E+00	2.157E+00	4.170E+00	3.593E+01	3.128E-01	7.221E+00	-0.001	0.008	0.002
125.0000	2.031E+00	2.739E+00	4.770E+00	4.153E+01	3.596E-01	7.663E+00	-0.000	0.007	0.002
150.0000	2.046E+00	3.325E+00	5.371E+00	4.647E+01	3.993E-01	8.025E+00	-0.000	0.006	0.001
175.0000	2.058E+00	3.914E+00	5.972E+00	5.088E+01	4.333E-01	8.331E+00	-0.000	0.006	0.001
200.0000	2.068E+00	4.506E+00	6.574E+00	5.487E+01	4.630E-01	8.597E+00	-0.000	0.005	0.001
250.0000	2.086E+00	5.695E+00	7.781E+00	6.185E+01	5.124E-01	9.042E+00	-0.000	0.005	0.001
300.0000	2.101E+00	6.889E+00	8.990E+00	6.783E+01	5.520E-01	9.405E+00	-0.000	0.004	0.001
350.0000	2.113E+00	8.088E+00	1.020E+01	7.304E+01	5.846E-01	9.713E+00	-0.000	0.004	0.000
400.0000	2.123E+00	9.289E+00	1.141E+01	7.768E+01	6.120E-01	9.979E+00	-0.000	0.004	0.000
450.0000	2.133E+00	1.049E+01	1.263E+01	8.184E+01	6.354E-01	1.021E+01	-0.000	0.004	0.000
500.0000	2.141E+00	1.170E+01	1.384E+01	8.562E+01	6.557E-01	1.043E+01	-0.000	0.003	0.000
550.0000	2.148E+00	1.291E+01	1.505E+01	8.908E+01	6.735E-01	1.062E+01	-0.000	0.003	0.000
600.0000	2.155E+00	1.411E+01	1.627E+01	9.228E+01	6.893E-01	1.079E+01	-0.000	0.003	0.000
700.0000	2.167E+00	1.654E+01	1.870E+01	9.801E+01	7.160E-01	1.110E+01	-0.000	0.003	0.000
800.0000	2.178E+00	1.896E+01	2.114E+01	1.030E+02	7.378E-01	1.136E+01	-0.000	0.003	0.000
900.0000	2.187E+00	2.139E+01	2.357E+01	1.075E+02	7.561E-01	1.160E+01	-0.000	0.003	0.000
1000.0000	2.196E+00	2.382E+01	2.601E+01	1.115E+02	7.716E-01	1.181E+01	-0.000	0.003	0.000

ELECTRONS IN LITHIUM FLUORIDE

I = 94.0 eV DENSITY = 2.635E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.796E+01	3.678E-03	1.796E+01	3.181E-04	1.117E-04	0.0	-0.208	0.240	0.238
0.0125	1.513E+01	3.712E-03	1.514E+01	4.704E-04	1.344E-04	0.0	-0.199	0.228	0.226
0.0150	1.315E+01	3.735E-03	1.316E+01	6.480E-04	1.561E-04	0.0	-0.192	0.219	0.217
0.0175	1.168E+01	3.750E-03	1.169E+01	8.501E-04	1.770E-04	0.0	-0.187	0.212	0.211
0.0200	1.055E+01	3.762E-03	1.055E+01	1.076E-03	1.973E-04	0.0	-0.182	0.206	0.205
0.0250	8.894E+00	3.779E-03	8.898E+00	1.594E-03	2.360E-04	0.0	-0.175	0.197	0.196
0.0300	7.748E+00	3.792E-03	7.751E+00	2.198E-03	2.729E-04	0.0	-0.170	0.190	0.190
0.0350	6.902E+00	3.804E-03	6.906E+00	2.883E-03	3.082E-04	0.0	-0.166	0.185	0.184
0.0400	6.252E+00	3.815E-03	6.256E+00	3.645E-03	3.423E-04	0.0	-0.162	0.181	0.180
0.0450	5.736E+00	3.827E-03	5.739E+00	4.480E-03	3.752E-04	0.0	-0.160	0.177	0.176
0.0500	5.315E+00	3.840E-03	5.319E+00	5.386E-03	4.071E-04	0.0	-0.157	0.174	0.173
0.0550	4.965E+00	3.853E-03	4.969E+00	6.359E-03	4.382E-04	0.0	-0.155	0.171	0.171
0.0600	4.670E+00	3.867E-03	4.674E+00	7.397E-03	4.684E-04	0.0	-0.153	0.169	0.168
0.0700	4.198E+00	3.898E-03	4.202E+00	9.659E-03	5.269E-04	0.0	-0.150	0.164	0.164
0.0800	3.838E+00	3.932E-03	3.842E+00	1.215E-02	5.831E-04	0.0	-0.147	0.161	0.161
0.0900	3.553E+00	3.970E-03	3.557E+00	1.486E-02	6.372E-04	0.0	-0.144	0.158	0.158
0.1000	3.323E+00	4.011E-03	3.327E+00	1.777E-02	6.896E-04	0.0	-0.142	0.156	0.155
0.1250	2.903E+00	4.125E-03	2.907E+00	2.584E-02	8.143E-04	0.0	-0.138	0.151	0.150
0.1500	2.619E+00	4.253E-03	2.623E+00	3.492E-02	9.321E-04	0.0	-0.135	0.147	0.147
0.1750	2.415E+00	4.392E-03	2.419E+00	4.486E-02	1.045E-03	0.0	-0.132	0.144	0.143
0.2000	2.261E+00	4.540E-03	2.266E+00	5.555E-02	1.153E-03	0.0	-0.130	0.141	0.141
0.2500	2.048E+00	4.863E-03	2.053E+00	7.881E-02	1.360E-03	6.058E-03	-0.118	0.136	0.135
0.3000	1.907E+00	5.215E-03	1.912E+00	1.041E-01	1.558E-03	2.136E-02	-0.112	0.131	0.130
0.3500	1.809E+00	5.592E-03	1.814E+00	1.310E-01	1.750E-03	3.978E-02	-0.106	0.126	0.125
0.4000	1.737E+00	5.992E-03	1.743E+00	1.591E-01	1.939E-03	6.095E-02	-0.100	0.122	0.120
0.4500	1.683E+00	6.412E-03	1.690E+00	1.883E-01	2.125E-03	8.445E-02	-0.095	0.118	0.116
0.5000	1.642E+00	6.852E-03	1.649E+00	2.183E-01	2.310E-03	1.098E-01	-0.090	0.115	0.112
0.5500	1.609E+00	7.308E-03	1.617E+00	2.489E-01	2.495E-03	1.367E-01	-0.086	0.112	0.108
0.6000	1.583E+00	7.779E-03	1.591E+00	2.801E-01	2.679E-03	1.648E-01	-0.082	0.108	0.104
0.7000	1.546E+00	8.765E-03	1.555E+00	3.437E-01	3.048E-03	2.236E-01	-0.075	0.103	0.098
0.8000	1.521E+00	9.800E-03	1.530E+00	4.086E-01	3.419E-03	2.846E-01	-0.070	0.098	0.092
0.9000	1.503E+00	1.088E-02	1.514E+00	4.743E-01	3.794E-03	3.467E-01	-0.065	0.094	0.087
1.0000	1.491E+00	1.200E-02	1.504E+00	5.406E-01	4.173E-03	4.093E-01	-0.060	0.090	0.083
1.2500	1.476E+00	1.499E-02	1.491E+00	7.077E-01	5.141E-03	5.644E-01	-0.052	0.082	0.073
1.5000	1.471E+00	1.818E-02	1.489E+00	8.756E-01	6.138E-03	7.142E-01	-0.046	0.075	0.066
1.7500	1.471E+00	2.154E-02	1.493E+00	1.043E+00	7.163E-03	8.568E-01	-0.041	0.070	0.059
2.0000	1.474E+00	2.505E-02	1.499E+00	1.210E+00	8.214E-03	9.917E-01	-0.037	0.066	0.054
2.5000	1.483E+00	3.244E-02	1.515E+00	1.542E+00	1.038E-02	1.240E+00	-0.032	0.059	0.047
3.0000	1.493E+00	4.021E-02	1.533E+00	1.870E+00	1.262E-02	1.461E+00	-0.028	0.054	0.041
3.5000	1.503E+00	4.830E-02	1.552E+00	2.194E+00	1.491E-02	1.660E+00	-0.026	0.049	0.037
4.0000	1.513E+00	5.666E-02	1.570E+00	2.515E+00	1.725E-02	1.839E+00	-0.024	0.046	0.034
4.5000	1.523E+00	6.524E-02	1.588E+00	2.832E+00	1.962E-02	2.003E+00	-0.022	0.044	0.031
5.0000	1.531E+00	7.402E-02	1.605E+00	3.145E+00	2.202E-02	2.154E+00	-0.021	0.041	0.029
5.5000	1.539E+00	8.298E-02	1.622E+00	3.455E+00	2.444E-02	2.293E+00	-0.020	0.039	0.027
6.0000	1.547E+00	9.211E-02	1.639E+00	3.761E+00	2.687E-02	2.422E+00	-0.019	0.038	0.026
7.0000	1.560E+00	1.108E-01	1.671E+00	4.365E+00	3.178E-02	2.655E+00	-0.018	0.035	0.024
8.0000	1.572E+00	1.299E-01	1.702E+00	4.958E+00	3.672E-02	2.861E+00	-0.017	0.033	0.022
9.0000	1.583E+00	1.494E-01	1.732E+00	5.541E+00	4.168E-02	3.046E+00	-0.016	0.031	0.020
10.0000	1.592E+00	1.693E-01	1.761E+00	6.113E+00	4.663E-02	3.214E+00	-0.016	0.029	0.019
12.5000	1.612E+00	2.201E-01	1.832E+00	7.504E+00	5.894E-02	3.577E+00	-0.014	0.026	0.017
15.0000	1.629E+00	2.723E-01	1.901E+00	8.844E+00	7.108E-02	3.881E+00	-0.013	0.024	0.015
17.5000	1.642E+00	3.256E-01	1.968E+00	1.014E+01	8.299E-02	4.143E+00	-0.011	0.022	0.014
20.0000	1.654E+00	3.797E-01	2.034E+00	1.139E+01	9.463E-02	4.374E+00	-0.010	0.021	0.013
25.0000	1.673E+00	4.896E-01	2.163E+00	1.377E+01	1.171E-01	4.769E+00	-0.008	0.018	0.011
30.0000	1.688E+00	6.014E-01	2.289E+00	1.602E+01	1.384E-01	5.099E+00	-0.007	0.017	0.009
35.0000	1.700E+00	7.146E-01	2.415E+00	1.814E+01	1.585E-01	5.383E+00	-0.005	0.015	0.008
40.0000	1.711E+00	8.289E-01	2.540E+00	2.016E+01	1.776E-01	5.633E+00	-0.004	0.014	0.007
45.0000	1.720E+00	9.441E-01	2.664E+00	2.208E+01	1.957E-01	5.856E+00	-0.004	0.013	0.006
50.0000	1.728E+00	1.060E+00	2.788E+00	2.392E+01	2.129E-01	6.057E+00	-0.003	0.012	0.005
55.0000	1.736E+00	1.177E+00	2.912E+00	2.567E+01	2.292E-01	6.240E+00	-0.003	0.011	0.005
60.0000	1.742E+00	1.294E+00	3.036E+00	2.735E+01	2.447E-01	6.408E+00	-0.002	0.011	0.004
70.0000	1.754E+00	1.530E+00	3.283E+00	3.052E+01	2.735E-01	6.707E+00	-0.002	0.010	0.004
80.0000	1.764E+00	1.767E+00	3.531E+00	3.346E+01	2.998E-01	6.968E+00	-0.001	0.009	0.003
90.0000	1.772E+00	2.006E+00	3.778E+00	3.619E+01	3.238E-01	7.199E+00	-0.001	0.008	0.003
100.0000	1.780E+00	2.245E+00	4.025E+00	3.876E+01	3.459E-01	7.406E+00	-0.001	0.008	0.002
125.0000	1.796E+00	2.848E+00	4.644E+00	4.453E+01	3.941E-01	7.847E+00	-0.001	0.007	0.002
150.0000	1.809E+00	3.455E+00	5.264E+00	4.959E+01	4.343E-01	8.209E+00	-0.000	0.006	0.001
175.0000	1.820E+00	4.065E+00	5.885E+00	5.408E+01	4.686E-01	8.515E+00	-0.000	0.006	0.001
200.0000	1.830E+00	4.677E+00	6.507E+00	5.811E+01	4.982E-01	8.780E+00	-0.000	0.005	0.001
250.0000	1.846E+00	5.907E+00	7.753E+00	6.514E+01	5.468E-01	9.225E+00	-0.000	0.005	0.001
300.0000	1.859E+00	7.142E+00	9.001E+00	7.112E+01	5.854E-01	9.588E+00	-0.000	0.004	0.001
350.0000	1.870E+00	8.381E+00	1.025E+01	7.633E+01	6.170E-01	9.896E+00	-0.000	0.004	0.001
400.0000	1.879E+00	9.622E+00	1.150E+01	8.093E+01	6.433E-01	1.016E+01	-0.000	0.004	0.000
450.0000	1.888E+00	1.087E+01	1.275E+01	8.505E+01	6.656E-01	1.040E+01	-0.000	0.004	0.000
500.0000	1.895E+00	1.211E+01	1.401E+01	8.879E+01	6.849E-01	1.061E+01	-0.000	0.004	0.000
550.0000	1.902E+00	1.336E+01	1.526E+01	9.221E+01	7.018E-01	1.080E+01	-0.000	0.003	0.000
600.0000	1.908E+00	1.461E+01	1.651E+01	9.536E+01	7.166E-01	1.097E+01	-0.000	0.003	0.000
700.0000	1.919E+00	1.711E+01	1.902E+01	1.010E+02	7.417E-01	1.128E+01	-0.000	0.003	0.000
800.0000	1.929E+00	1.961E+01	2.154E+01	1.059E+02	7.621E-01	1.155E+01	-0.000	0.003	0.000
900.0000	1.937E+00	2.211E+01	2.405E+01	1.103E+02	7.791E-01	1.178E+01	-0.000	0.003	0.000
1000.0000	1.945E+00	2.462E+01	2.656E+01	1.143E+02	7.935E-01	1.199E+01	-0.000	0.003	0.000

ELECTRONS IN LITHIUM TETRABORATE

I = 94.6 eV DENSITY = 2.440E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.880E+01	3.547E-03	1.880E+01	3.040E-04	1.039E-04	0.0	-0.208	0.241	0.239
0.0125	1.584E+01	3.569E-03	1.584E+01	4.494E-04	1.245E-04	0.0	-0.199	0.229	0.227
0.0150	1.377E+01	3.582E-03	1.377E+01	6.192E-04	1.442E-04	0.0	-0.192	0.220	0.218
0.0175	1.223E+01	3.591E-03	1.223E+01	8.122E-04	1.632E-04	0.0	-0.187	0.212	0.211
0.0200	1.104E+01	3.598E-03	1.104E+01	1.028E-03	1.815E-04	0.0	-0.183	0.207	0.206
0.0250	9.311E+00	3.608E-03	9.315E+00	1.523E-03	2.166E-04	0.0	-0.176	0.198	0.197
0.0300	8.111E+00	3.617E-03	8.115E+00	2.100E-03	2.499E-04	0.0	-0.170	0.191	0.190
0.0350	7.227E+00	3.627E-03	7.230E+00	2.754E-03	2.819E-04	0.0	-0.166	0.185	0.185
0.0400	6.546E+00	3.638E-03	6.550E+00	3.482E-03	3.128E-04	0.0	-0.163	0.181	0.180
0.0450	6.005E+00	3.649E-03	6.009E+00	4.280E-03	3.426E-04	0.0	-0.160	0.177	0.177
0.0500	5.565E+00	3.662E-03	5.569E+00	5.145E-03	3.716E-04	0.0	-0.157	0.174	0.174
0.0550	5.199E+00	3.676E-03	5.203E+00	6.074E-03	3.999E-04	0.0	-0.155	0.171	0.171
0.0600	4.890E+00	3.692E-03	4.893E+00	7.066E-03	4.274E-04	0.0	-0.153	0.169	0.168
0.0700	4.396E+00	3.725E-03	4.400E+00	9.226E-03	4.808E-04	0.0	-0.150	0.165	0.164
0.0800	4.019E+00	3.761E-03	4.022E+00	1.161E-02	5.321E-04	0.0	-0.147	0.161	0.161
0.0900	3.721E+00	3.801E-03	3.725E+00	1.419E-02	5.816E-04	0.0	-0.145	0.158	0.158
0.1000	3.480E+00	3.843E-03	3.484E+00	1.697E-02	6.297E-04	0.0	-0.142	0.156	0.156
0.1250	3.040E+00	3.959E-03	3.043E+00	2.468E-02	7.444E-04	0.0	-0.138	0.151	0.151
0.1500	2.742E+00	4.086E-03	2.746E+00	3.335E-02	8.528E-04	0.0	-0.135	0.147	0.147
0.1750	2.528E+00	4.222E-03	2.533E+00	4.285E-02	9.564E-04	0.0	-0.132	0.144	0.144
0.2000	2.368E+00	4.365E-03	2.373E+00	5.306E-02	1.056E-03	0.0	-0.130	0.142	0.141
0.2500	2.145E+00	4.675E-03	2.150E+00	7.527E-02	1.246E-03	0.0	-0.126	0.138	0.137
0.3000	1.999E+00	5.013E-03	2.004E+00	9.941E-02	1.428E-03	8.258E-03	-0.107	0.133	0.132
0.3500	1.895E+00	5.376E-03	1.900E+00	1.251E-01	1.605E-03	3.457E-02	-0.099	0.127	0.125
0.4000	1.819E+00	5.763E-03	1.825E+00	1.519E-01	1.779E-03	6.442E-02	-0.092	0.121	0.119
0.4500	1.762E+00	6.171E-03	1.768E+00	1.798E-01	1.951E-03	9.625E-02	-0.087	0.116	0.113
0.5000	1.717E+00	6.598E-03	1.724E+00	2.085E-01	2.121E-03	1.294E-01	-0.082	0.112	0.108
0.5500	1.683E+00	7.044E-03	1.690E+00	2.378E-01	2.292E-03	1.633E-01	-0.078	0.108	0.104
0.6000	1.655E+00	7.504E-03	1.663E+00	2.676E-01	2.463E-03	1.979E-01	-0.075	0.104	0.100
0.7000	1.615E+00	8.467E-03	1.623E+00	3.285E-01	2.806E-03	2.679E-01	-0.069	0.098	0.092
0.8000	1.588E+00	9.479E-03	1.597E+00	3.907E-01	3.152E-03	3.381E-01	-0.064	0.093	0.087
0.9000	1.569E+00	1.054E-02	1.580E+00	4.536E-01	3.501E-03	4.076E-01	-0.060	0.089	0.081
1.0000	1.557E+00	1.164E-02	1.568E+00	5.172E-01	3.856E-03	4.759E-01	-0.056	0.085	0.077
1.2500	1.540E+00	1.455E-02	1.554E+00	6.775E-01	4.761E-03	6.398E-01	-0.050	0.077	0.068
1.5000	1.534E+00	1.766E-02	1.552E+00	8.385E-01	5.695E-03	7.928E-01	-0.045	0.071	0.062
1.7500	1.535E+00	2.094E-02	1.556E+00	9.994E-01	6.655E-03	9.349E-01	-0.042	0.067	0.057
2.0000	1.538E+00	2.435E-02	1.562E+00	1.160E+00	7.638E-03	1.067E+00	-0.039	0.063	0.053
2.5000	1.548E+00	3.153E-02	1.580E+00	1.478E+00	9.663E-03	1.305E+00	-0.035	0.057	0.047
3.0000	1.560E+00	3.909E-02	1.599E+00	1.793E+00	1.175E-02	1.514E+00	-0.033	0.053	0.042
3.5000	1.572E+00	4.695E-02	1.619E+00	2.104E+00	1.389E-02	1.701E+00	-0.030	0.050	0.039
4.0000	1.583E+00	5.508E-02	1.638E+00	2.411E+00	1.607E-02	1.869E+00	-0.029	0.047	0.037
4.5000	1.593E+00	6.342E-02	1.657E+00	2.714E+00	1.828E-02	2.023E+00	-0.027	0.045	0.035
5.0000	1.603E+00	7.197E-02	1.675E+00	3.014E+00	2.051E-02	2.163E+00	-0.026	0.043	0.033
5.5000	1.612E+00	8.069E-02	1.693E+00	3.311E+00	2.277E-02	2.293E+00	-0.025	0.041	0.031
6.0000	1.621E+00	8.958E-02	1.710E+00	3.605E+00	2.504E-02	2.415E+00	-0.024	0.040	0.030
7.0000	1.636E+00	1.078E-01	1.744E+00	4.184E+00	2.962E-02	2.635E+00	-0.022	0.037	0.028
8.0000	1.649E+00	1.264E-01	1.775E+00	4.752E+00	3.423E-02	2.831E+00	-0.021	0.035	0.026
9.0000	1.661E+00	1.455E-01	1.806E+00	5.311E+00	3.886E-02	3.008E+00	-0.019	0.033	0.024
10.0000	1.671E+00	1.649E-01	1.836E+00	5.860E+00	4.349E-02	3.170E+00	-0.018	0.032	0.023
12.5000	1.693E+00	2.148E-01	1.908E+00	7.195E+00	5.505E-02	3.524E+00	-0.015	0.029	0.020
15.0000	1.710E+00	2.660E-01	1.976E+00	8.483E+00	6.648E-02	3.823E+00	-0.013	0.026	0.018
17.5000	1.725E+00	3.184E-01	2.043E+00	9.727E+00	7.774E-02	4.083E+00	-0.011	0.024	0.016
20.0000	1.737E+00	3.716E-01	2.109E+00	1.093E+01	8.878E-02	4.314E+00	-0.010	0.023	0.014
25.0000	1.757E+00	4.798E-01	2.237E+00	1.323E+01	1.102E-01	4.710E+00	-0.008	0.020	0.012
30.0000	1.772E+00	5.900E-01	2.362E+00	1.541E+01	1.305E-01	5.042E+00	-0.006	0.018	0.010
35.0000	1.785E+00	7.015E-01	2.487E+00	1.747E+01	1.499E-01	5.329E+00	-0.005	0.016	0.008
40.0000	1.796E+00	8.142E-01	2.611E+00	1.943E+01	1.683E-01	5.580E+00	-0.004	0.015	0.007
45.0000	1.806E+00	9.278E-01	2.734E+00	2.130E+01	1.858E-01	5.805E+00	-0.003	0.014	0.006
50.0000	1.814E+00	1.042E+00	2.856E+00	2.309E+01	2.025E-01	6.007E+00	-0.003	0.013	0.005
55.0000	1.822E+00	1.157E+00	2.979E+00	2.481E+01	2.183E-01	6.191E+00	-0.002	0.012	0.005
60.0000	1.829E+00	1.273E+00	3.102E+00	2.645E+01	2.334E-01	6.360E+00	-0.002	0.011	0.004
70.0000	1.841E+00	1.506E+00	3.346E+00	2.955E+01	2.616E-01	6.660E+00	-0.001	0.010	0.003
80.0000	1.851E+00	1.740E+00	3.591E+00	3.244E+01	2.873E-01	6.922E+00	-0.001	0.009	0.003
90.0000	1.860E+00	1.976E+00	3.836E+00	3.513E+01	3.110E-01	7.154E+00	-0.001	0.009	0.002
100.0000	1.868E+00	2.212E+00	4.080E+00	3.766E+01	3.328E-01	7.361E+00	-0.001	0.008	0.002
125.0000	1.885E+00	2.808E+00	4.693E+00	4.337E+01	3.805E-01	7.803E+00	-0.001	0.007	0.002
150.0000	1.899E+00	3.408E+00	5.306E+00	4.838E+01	4.206E-01	8.165E+00	-0.000	0.006	0.001
175.0000	1.910E+00	4.011E+00	5.921E+00	5.283E+01	4.549E-01	8.471E+00	-0.000	0.006	0.001
200.0000	1.920E+00	4.616E+00	6.536E+00	5.685E+01	4.846E-01	8.737E+00	-0.000	0.005	0.001
250.0000	1.937E+00	5.832E+00	7.769E+00	6.386E+01	5.336E-01	9.181E+00	-0.000	0.005	0.001
300.0000	1.951E+00	7.053E+00	9.004E+00	6.983E+01	5.726E-01	9.545E+00	-0.000	0.005	0.001
350.0000	1.962E+00	8.279E+00	1.024E+01	7.503E+01	6.046E-01	9.853E+00	-0.000	0.004	0.000
400.0000	1.972E+00	9.507E+00	1.148E+01	7.964E+01	6.313E-01	1.012E+01	-0.000	0.004	0.000
450.0000	1.981E+00	1.074E+01	1.272E+01	8.378E+01	6.541E-01	1.035E+01	-0.000	0.004	0.000
500.0000	1.989E+00	1.197E+01	1.396E+01	8.753E+01	6.738E-01	1.056E+01	-0.000	0.004	0.000
550.0000	1.996E+00	1.320E+01	1.520E+01	9.096E+01	6.911E-01	1.076E+01	-0.000	0.003	0.000
600.0000	2.002E+00	1.444E+01	1.644E+01	9.413E+01	7.063E-01	1.093E+01	-0.000	0.003	0.000
700.0000	2.014E+00	1.691E+01	1.893E+01	9.979E+01	7.320E-01	1.124E+01	-0.000	0.003	0.000
800.0000	2.024E+00	1.939E+01	2.141E+01	1.048E+02	7.530E-01	1.150E+01	-0.000	0.003	0.000
900.0000	2.033E+00	2.187E+01	2.390E+01	1.092E+02	7.704E-01	1.174E+01	-0.000	0.003	0.000
1000.0000	2.040E+00	2.435E+01	2.639E+01	1.132E+02	7.853E-01	1.195E+01	-0.000	0.003	0.000

ELECTRONS IN METHANE

I = 41.7 eV DENSITY = 6.672E-04 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.829E+01	2.603E-03	2.829E+01	1.977E-04	5.026E-05	0.0	-0.178	0.200	0.199
0.0125	2.369E+01	2.612E-03	2.369E+01	2.947E-04	6.045E-05	0.0	-0.171	0.191	0.191
0.0150	2.049E+01	2.620E-03	2.049E+01	4.085E-04	7.022E-05	0.0	-0.166	0.185	0.184
0.0175	1.813E+01	2.625E-03	1.813E+01	5.385E-04	7.967E-05	0.0	-0.162	0.180	0.179
0.0200	1.631E+01	2.630E-03	1.632E+01	6.840E-04	8.884E-05	0.0	-0.159	0.176	0.175
0.0250	1.369E+01	2.640E-03	1.369E+01	1.020E-03	1.065E-04	0.0	-0.154	0.169	0.169
0.0300	1.188E+01	2.651E-03	1.188E+01	1.413E-03	1.234E-04	0.0	-0.149	0.164	0.164
0.0350	1.055E+01	2.662E-03	1.056E+01	1.861E-03	1.397E-04	0.0	-0.146	0.160	0.160
0.0400	9.536E+00	2.674E-03	9.539E+00	2.360E-03	1.556E-04	0.0	-0.144	0.157	0.157
0.0450	8.730E+00	2.687E-03	8.733E+00	2.908E-03	1.710E-04	0.0	-0.141	0.154	0.154
0.0500	8.075E+00	2.700E-03	8.078E+00	3.504E-03	1.860E-04	0.0	-0.139	0.152	0.152
0.0550	7.532E+00	2.714E-03	7.534E+00	4.146E-03	2.006E-04	0.0	-0.138	0.150	0.150
0.0600	7.074E+00	2.728E-03	7.077E+00	4.831E-03	2.150E-04	0.0	-0.136	0.148	0.148
0.0700	6.344E+00	2.759E-03	6.347E+00	6.326E-03	2.429E-04	0.0	-0.133	0.145	0.145
0.0800	5.788E+00	2.791E-03	5.790E+00	7.978E-03	2.698E-04	0.0	-0.131	0.142	0.142
0.0900	5.349E+00	2.826E-03	5.352E+00	9.777E-03	2.960E-04	0.0	-0.129	0.140	0.140
0.1000	4.995E+00	2.862E-03	4.998E+00	1.171E-02	3.214E-04	0.0	-0.128	0.138	0.138
0.1250	4.350E+00	2.960E-03	4.353E+00	1.709E-02	3.825E-04	0.0	-0.124	0.134	0.134
0.1500	3.915E+00	3.066E-03	3.918E+00	2.316E-02	4.407E-04	0.0	-0.122	0.131	0.131
0.1750	3.603E+00	3.178E-03	3.606E+00	2.983E-02	4.966E-04	0.0	-0.119	0.129	0.128
0.2000	3.369E+00	3.297E-03	3.372E+00	3.701E-02	5.508E-04	0.0	-0.118	0.127	0.126
0.2500	3.044E+00	3.550E-03	3.047E+00	5.266E-02	6.550E-04	0.0	-0.115	0.124	0.123
0.3000	2.831E+00	3.826E-03	2.835E+00	6.971E-02	7.554E-04	0.0	-0.112	0.121	0.120
0.3500	2.683E+00	4.121E-03	2.687E+00	8.785E-02	8.534E-04	0.0	-0.110	0.119	0.118
0.4000	2.576E+00	4.434E-03	2.580E+00	1.069E-01	9.500E-04	0.0	-0.109	0.117	0.116
0.4500	2.496E+00	4.764E-03	2.501E+00	1.266E-01	1.046E-03	0.0	-0.107	0.116	0.114
0.5000	2.435E+00	5.109E-03	2.440E+00	1.468E-01	1.141E-03	0.0	-0.106	0.114	0.113
0.5500	2.388E+00	5.467E-03	2.393E+00	1.675E-01	1.236E-03	0.0	-0.104	0.113	0.112
0.6000	2.351E+00	5.839E-03	2.357E+00	1.886E-01	1.332E-03	0.0	-0.103	0.112	0.110
0.7000	2.298E+00	6.616E-03	2.305E+00	2.315E-01	1.523E-03	0.0	-0.101	0.110	0.108
0.8000	2.264E+00	7.432E-03	2.272E+00	2.752E-01	1.717E-03	0.0	-0.100	0.109	0.107
0.9000	2.243E+00	8.287E-03	2.251E+00	3.195E-01	1.912E-03	0.0	-0.098	0.107	0.105
1.0000	2.230E+00	9.176E-03	2.239E+00	3.640E-01	2.110E-03	0.0	-0.097	0.106	0.104
1.2500	2.217E+00	1.153E-02	2.229E+00	4.760E-01	2.614E-03	0.0	-0.094	0.104	0.101
1.5000	2.221E+00	1.405E-02	2.235E+00	5.881E-01	3.133E-03	0.0	-0.092	0.101	0.098
1.7500	2.232E+00	1.671E-02	2.249E+00	6.996E-01	3.665E-03	0.0	-0.090	0.100	0.096
2.0000	2.247E+00	1.949E-02	2.267E+00	8.103E-01	4.208E-03	0.0	-0.089	0.098	0.094
2.5000	2.280E+00	2.534E-02	2.306E+00	1.029E+00	5.325E-03	0.0	-0.087	0.096	0.092
3.0000	2.314E+00	3.152E-02	2.345E+00	1.244E+00	6.473E-03	0.0	-0.085	0.094	0.089
3.5000	2.345E+00	3.795E-02	2.383E+00	1.456E+00	7.645E-03	0.0	-0.083	0.092	0.088
4.0000	2.375E+00	4.462E-02	2.420E+00	1.664E+00	8.837E-03	0.0	-0.082	0.091	0.086
4.5000	2.403E+00	5.148E-02	2.454E+00	1.869E+00	1.004E-02	0.0	-0.081	0.090	0.085
5.0000	2.428E+00	5.852E-02	2.487E+00	2.071E+00	1.127E-02	0.0	-0.080	0.088	0.083
5.5000	2.452E+00	6.571E-02	2.517E+00	2.271E+00	1.250E-02	0.0	-0.079	0.087	0.082
6.0000	2.474E+00	7.303E-02	2.547E+00	2.469E+00	1.374E-02	0.0	-0.078	0.087	0.081
7.0000	2.514E+00	8.805E-02	2.602E+00	2.857E+00	1.624E-02	0.0	-0.077	0.085	0.079
8.0000	2.549E+00	1.035E-01	2.653E+00	3.238E+00	1.876E-02	0.0	-0.075	0.084	0.078
9.0000	2.581E+00	1.193E-01	2.700E+00	3.611E+00	2.130E-02	0.0	-0.074	0.082	0.077
10.0000	2.610E+00	1.354E-01	2.745E+00	3.978E+00	2.385E-02	0.0	-0.074	0.081	0.075
12.5000	2.671E+00	1.767E-01	2.848E+00	4.872E+00	3.022E-02	0.0	-0.072	0.079	0.073
15.0000	2.722E+00	2.194E-01	2.941E+00	5.736E+00	3.657E-02	0.0	-0.070	0.077	0.071
17.5000	2.765E+00	2.629E-01	3.028E+00	6.573E+00	4.288E-02	0.0	-0.069	0.075	0.069
20.0000	2.803E+00	3.073E-01	3.110E+00	7.388E+00	4.912E-02	0.0	-0.068	0.074	0.068
25.0000	2.863E+00	3.977E-01	3.261E+00	8.957E+00	6.139E-02	3.726E-02	-0.053	0.071	0.063
30.0000	2.904E+00	4.899E-01	3.394E+00	1.046E+01	7.336E-02	1.461E-01	-0.041	0.066	0.056
35.0000	2.935E+00	5.835E-01	3.519E+00	1.191E+01	8.505E-02	2.797E-01	-0.033	0.062	0.049
40.0000	2.960E+00	6.781E-01	3.638E+00	1.330E+01	9.644E-02	4.187E-01	-0.028	0.058	0.044
45.0000	2.981E+00	7.736E-01	3.754E+00	1.466E+01	1.075E-01	5.553E-01	-0.025	0.055	0.039
50.0000	2.998E+00	8.698E-01	3.868E+00	1.597E+01	1.183E-01	6.865E-01	-0.023	0.052	0.036
55.0000	3.014E+00	9.667E-01	3.980E+00	1.724E+01	1.288E-01	8.112E-01	-0.021	0.049	0.032
60.0000	3.027E+00	1.064E+00	4.091E+00	1.848E+01	1.391E-01	9.293E-01	-0.019	0.047	0.030
70.0000	3.051E+00	1.260E+00	4.311E+00	2.086E+01	1.587E-01	1.146E+00	-0.017	0.043	0.026
80.0000	3.070E+00	1.458E+00	4.528E+00	2.312E+01	1.773E-01	1.341E+00	-0.016	0.040	0.023
90.0000	3.087E+00	1.657E+00	4.744E+00	2.528E+01	1.949E-01	1.517E+00	-0.015	0.037	0.020
100.0000	3.102E+00	1.857E+00	4.959E+00	2.734E+01	2.116E-01	1.677E+00	-0.014	0.035	0.018
125.0000	3.133E+00	2.361E+00	5.494E+00	3.213E+01	2.499E-01	2.023E+00	-0.013	0.031	0.015
150.0000	3.158E+00	2.869E+00	6.027E+00	3.647E+01	2.838E-01	2.312E+00	-0.012	0.028	0.013
175.0000	3.178E+00	3.380E+00	6.558E+00	4.045E+01	3.142E-01	2.560E+00	-0.011	0.026	0.011
200.0000	3.196E+00	3.893E+00	7.089E+00	4.411E+01	3.415E-01	2.778E+00	-0.011	0.024	0.010
250.0000	3.224E+00	4.926E+00	8.150E+00	5.069E+01	3.888E-01	3.148E+00	-0.010	0.022	0.008
300.0000	3.247E+00	5.964E+00	9.211E+00	5.645E+01	4.284E-01	3.457E+00	-0.008	0.020	0.007
350.0000	3.266E+00	7.005E+00	1.027E+01	6.159E+01	4.623E-01	3.724E+00	-0.008	0.019	0.006
400.0000	3.282E+00	8.051E+00	1.133E+01	6.622E+01	4.916E-01	3.959E+00	-0.007	0.017	0.006
450.0000	3.295E+00	9.099E+00	1.239E+01	7.044E+01	5.173E-01	4.169E+00	-0.006	0.016	0.005
500.0000	3.307E+00	1.015E+01	1.346E+01	7.431E+01	5.400E-01	4.360E+00	-0.005	0.016	0.005
550.0000	3.318E+00	1.120E+01	1.452E+01	7.789E+01	5.603E-01	4.535E+00	-0.005	0.015	0.004
600.0000	3.328E+00	1.225E+01	1.558E+01	8.121E+01	5.785E-01	4.696E+00	-0.004	0.014	0.004
700.0000	3.344E+00	1.436E+01	1.771E+01	8.723E+01	6.100E-01	4.985E+00	-0.003	0.014	0.003
800.0000	3.358E+00	1.648E+01	1.983E+01	9.256E+01	6.364E-01	5.238E+00	-0.003	0.013	0.003
900.0000	3.370E+00	1.859E+01	2.196E+01	9.735E+01	6.589E-01	5.464E+00	-0.002	0.012	0.002
1000.0000	3.381E+00	2.071E+01	2.409E+01	1.017E+02	6.784E-01	5.668E+00	-0.002	0.012	0.002

ELECTRONS IN MUSCLE, SKELETAL (ICRP)

I = 75.3 eV DENSITY = 1.040E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.231E+01	3.835E-03	2.231E+01	2.543E-04	9.366E-05	0.0	-0.199	0.228	0.226
0.0125	1.876E+01	3.863E-03	1.877E+01	3.771E-04	1.127E-04	0.0	-0.191	0.217	0.215
0.0150	1.628E+01	3.880E-03	1.629E+01	5.205E-04	1.310E-04	0.0	-0.184	0.209	0.207
0.0175	1.445E+01	3.892E-03	1.445E+01	6.838E-04	1.485E-04	0.0	-0.179	0.202	0.201
0.0200	1.303E+01	3.901E-03	1.303E+01	8.662E-04	1.655E-04	0.0	-0.175	0.197	0.196
0.0250	1.097E+01	3.913E-03	1.098E+01	1.286E-03	1.980E-04	0.0	-0.169	0.189	0.188
0.0300	9.547E+00	3.924E-03	9.551E+00	1.776E-03	2.290E-04	0.0	-0.164	0.183	0.182
0.0350	8.498E+00	3.934E-03	8.502E+00	2.332E-03	2.587E-04	0.0	-0.160	0.178	0.177
0.0400	7.692E+00	3.946E-03	7.696E+00	2.951E-03	2.874E-04	0.0	-0.157	0.174	0.173
0.0450	7.052E+00	3.959E-03	7.056E+00	3.631E-03	3.151E-04	0.0	-0.154	0.170	0.170
0.0500	6.531E+00	3.973E-03	6.535E+00	4.368E-03	3.421E-04	0.0	-0.152	0.167	0.167
0.0550	6.099E+00	3.988E-03	6.102E+00	5.160E-03	3.683E-04	0.0	-0.150	0.165	0.164
0.0600	5.733E+00	4.004E-03	5.737E+00	6.006E-03	3.939E-04	0.0	-0.148	0.162	0.162
0.0700	5.151E+00	4.040E-03	5.155E+00	7.848E-03	4.435E-04	0.0	-0.145	0.159	0.158
0.0800	4.706E+00	4.079E-03	4.710E+00	9.881E-03	4.912E-04	0.0	-0.142	0.155	0.155
0.0900	4.355E+00	4.122E-03	4.359E+00	1.209E-02	5.373E-04	0.0	-0.140	0.153	0.152
0.1000	4.071E+00	4.168E-03	4.075E+00	1.447E-02	5.821E-04	0.0	-0.138	0.150	0.150
0.1250	3.552E+00	4.294E-03	3.557E+00	2.106E-02	6.889E-04	0.0	-0.134	0.146	0.145
0.1500	3.203E+00	4.431E-03	3.207E+00	2.848E-02	7.899E-04	0.0	-0.131	0.142	0.142
0.1750	2.951E+00	4.579E-03	2.956E+00	3.662E-02	8.865E-04	0.0	-0.129	0.139	0.139
0.2000	2.763E+00	4.734E-03	2.768E+00	4.537E-02	9.795E-04	0.0	-0.126	0.137	0.137
0.2500	2.501E+00	5.070E-03	2.506E+00	6.442E-02	1.157E-03	0.0	-0.123	0.133	0.133
0.3000	2.329E+00	5.438E-03	2.335E+00	8.513E-02	1.327E-03	0.0	-0.120	0.130	0.129
0.3500	2.211E+00	5.832E-03	2.216E+00	1.071E-01	1.492E-03	0.0	-0.118	0.128	0.127
0.4000	2.125E+00	6.252E-03	2.131E+00	1.302E-01	1.653E-03	0.0	-0.116	0.126	0.125
0.4500	2.061E+00	6.694E-03	2.068E+00	1.540E-01	1.812E-03	0.0	-0.114	0.124	0.123
0.5000	2.012E+00	7.158E-03	2.019E+00	1.785E-01	1.970E-03	2.181E-03	-0.102	0.122	0.121
0.5500	1.972E+00	7.642E-03	1.980E+00	2.035E-01	2.128E-03	2.071E-02	-0.091	0.119	0.117
0.6000	1.941E+00	8.141E-03	1.949E+00	2.290E-01	2.285E-03	4.241E-02	-0.085	0.115	0.112
0.7000	1.895E+00	9.186E-03	1.904E+00	2.809E-01	2.602E-03	9.262E-02	-0.076	0.109	0.104
0.8000	1.863E+00	1.028E-02	1.874E+00	3.339E-01	2.921E-03	1.488E-01	-0.068	0.103	0.097
0.9000	1.842E+00	1.143E-02	1.853E+00	3.876E-01	3.244E-03	2.084E-01	-0.062	0.098	0.091
1.0000	1.827E+00	1.262E-02	1.839E+00	4.418E-01	3.571E-03	2.697E-01	-0.057	0.093	0.085
1.2500	1.806E+00	1.578E-02	1.822E+00	5.784E-01	4.408E-03	4.245E-01	-0.048	0.083	0.073
1.5000	1.799E+00	1.916E-02	1.818E+00	7.158E-01	5.272E-03	5.750E-01	-0.042	0.076	0.065
1.7500	1.799E+00	2.271E-02	1.821E+00	8.532E-01	6.162E-03	7.181E-01	-0.038	0.070	0.058
2.0000	1.801E+00	2.642E-02	1.828E+00	9.903E-01	7.074E-03	8.529E-01	-0.035	0.065	0.053
2.5000	1.812E+00	3.421E-02	1.846E+00	1.263E+00	8.956E-03	1.098E+00	-0.031	0.058	0.045
3.0000	1.824E+00	4.241E-02	1.866E+00	1.532E+00	1.090E-02	1.316E+00	-0.028	0.053	0.040
3.5000	1.836E+00	5.095E-02	1.887E+00	1.798E+00	1.289E-02	1.509E+00	-0.026	0.049	0.036
4.0000	1.848E+00	5.977E-02	1.908E+00	2.062E+00	1.493E-02	1.683E+00	-0.025	0.046	0.033
4.5000	1.860E+00	6.883E-02	1.928E+00	2.323E+00	1.699E-02	1.842E+00	-0.023	0.043	0.031
5.0000	1.870E+00	7.811E-02	1.948E+00	2.580E+00	1.908E-02	1.986E+00	-0.023	0.041	0.029
5.5000	1.880E+00	8.758E-02	1.968E+00	2.836E+00	2.119E-02	2.120E+00	-0.022	0.039	0.028
6.0000	1.889E+00	9.722E-02	1.987E+00	3.089E+00	2.332E-02	2.243E+00	-0.021	0.038	0.027
7.0000	1.906E+00	1.170E-01	2.023E+00	3.587E+00	2.761E-02	2.466E+00	-0.020	0.035	0.025
8.0000	1.921E+00	1.372E-01	2.058E+00	4.077E+00	3.194E-02	2.664E+00	-0.019	0.033	0.023
9.0000	1.934E+00	1.579E-01	2.092E+00	4.559E+00	3.629E-02	2.840E+00	-0.019	0.032	0.022
10.0000	1.946E+00	1.790E-01	2.125E+00	5.033E+00	4.065E-02	3.001E+00	-0.018	0.030	0.021
12.5000	1.971E+00	2.331E-01	2.205E+00	6.188E+00	5.152E-02	3.348E+00	-0.016	0.027	0.019
15.0000	1.992E+00	2.887E-01	2.281E+00	7.303E+00	6.231E-02	3.640E+00	-0.015	0.025	0.017
17.5000	2.009E+00	3.455E-01	2.354E+00	8.382E+00	7.294E-02	3.892E+00	-0.013	0.024	0.016
20.0000	2.023E+00	4.032E-01	2.427E+00	9.428E+00	8.339E-02	4.115E+00	-0.012	0.022	0.015
25.0000	2.047E+00	5.208E-01	2.568E+00	1.143E+01	1.037E-01	4.497E+00	-0.010	0.020	0.013
30.0000	2.066E+00	6.403E-01	2.706E+00	1.333E+01	1.230E-01	4.818E+00	-0.008	0.018	0.011
35.0000	2.081E+00	7.615E-01	2.842E+00	1.513E+01	1.415E-01	5.096E+00	-0.007	0.017	0.010
40.0000	2.094E+00	8.838E-01	2.978E+00	1.685E+01	1.592E-01	5.341E+00	-0.006	0.015	0.008
45.0000	2.105E+00	1.007E+00	3.112E+00	1.849E+01	1.760E-01	5.560E+00	-0.005	0.014	0.007
50.0000	2.115E+00	1.131E+00	3.247E+00	2.006E+01	1.920E-01	5.758E+00	-0.004	0.013	0.007
55.0000	2.124E+00	1.256E+00	3.380E+00	2.157E+01	2.073E-01	5.938E+00	-0.003	0.013	0.006
60.0000	2.132E+00	1.382E+00	3.514E+00	2.302E+01	2.219E-01	6.105E+00	-0.003	0.012	0.005
70.0000	2.146E+00	1.635E+00	3.780E+00	2.577E+01	2.492E-01	6.401E+00	-0.002	0.011	0.004
80.0000	2.158E+00	1.889E+00	4.047E+00	2.832E+01	2.743E-01	6.660E+00	-0.002	0.010	0.004
90.0000	2.168E+00	2.145E+00	4.313E+00	3.071E+01	2.974E-01	6.890E+00	-0.001	0.009	0.003
100.0000	2.177E+00	2.402E+00	4.580E+00	3.296E+01	3.188E-01	7.096E+00	-0.001	0.009	0.003
125.0000	2.197E+00	3.049E+00	5.246E+00	3.806E+01	3.659E-01	7.536E+00	-0.001	0.008	0.002
150.0000	2.212E+00	3.701E+00	5.913E+00	4.255E+01	4.056E-01	7.896E+00	-0.001	0.007	0.002
175.0000	2.226E+00	4.356E+00	6.581E+00	4.655E+01	4.398E-01	8.202E+00	-0.000	0.006	0.001
200.0000	2.237E+00	5.013E+00	7.250E+00	5.017E+01	4.694E-01	8.467E+00	-0.000	0.006	0.001
250.0000	2.256E+00	6.334E+00	8.590E+00	5.650E+01	5.187E-01	8.911E+00	-0.000	0.005	0.001
300.0000	2.271E+00	7.661E+00	9.932E+00	6.191E+01	5.581E-01	9.274E+00	-0.000	0.005	0.001
350.0000	2.284E+00	8.992E+00	1.128E+01	6.663E+01	5.905E-01	9.581E+00	-0.000	0.004	0.001
400.0000	2.296E+00	1.033E+01	1.262E+01	7.082E+01	6.177E-01	9.848E+00	-0.000	0.004	0.001
450.0000	2.306E+00	1.166E+01	1.397E+01	7.458E+01	6.409E-01	1.008E+01	-0.000	0.004	0.000
500.0000	2.315E+00	1.300E+01	1.532E+01	7.800E+01	6.610E-01	1.029E+01	-0.000	0.004	0.000
550.0000	2.323E+00	1.434E+01	1.667E+01	8.113E+01	6.787E-01	1.048E+01	-0.000	0.004	0.000
600.0000	2.330E+00	1.568E+01	1.801E+01	8.401E+01	6.943E-01	1.066E+01	-0.000	0.004	0.000
700.0000	2.343E+00	1.837E+01	2.072E+01	8.918E+01	7.207E-01	1.097E+01	-0.000	0.003	0.000
800.0000	2.354E+00	2.106E+01	2.342E+01	9.372E+01	7.423E-01	1.123E+01	-0.000	0.003	0.000
900.0000	2.364E+00	2.376E+01	2.612E+01	9.776E+01	7.603E-01	1.147E+01	-0.000	0.003	0.000
1000.0000	2.373E+00	2.645E+01	2.883E+01	1.014E+02	7.756E-01	1.168E+01	-0.000	0.003	0.000

ELECTRONS IN MUSCLE, STRIATED (ICRU)

I = 74.7 eV DENSITY = 1.040E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.237E+01	3.816E-03	2.238E+01	2.536E-04	9.293E-05	0.0	-0.199	0.227	0.225
0.0125	1.881E+01	3.844E-03	1.882E+01	3.759E-04	1.119E-04	0.0	-0.190	0.216	0.215
0.0150	1.633E+01	3.862E-03	1.633E+01	5.190E-04	1.300E-04	0.0	-0.184	0.208	0.207
0.0175	1.449E+01	3.873E-03	1.449E+01	6.818E-04	1.474E-04	0.0	-0.179	0.202	0.201
0.0200	1.306E+01	3.882E-03	1.307E+01	8.638E-04	1.642E-04	0.0	-0.175	0.197	0.196
0.0250	1.100E+01	3.894E-03	1.100E+01	1.283E-03	1.965E-04	0.0	-0.169	0.188	0.188
0.0300	9.571E+00	3.905E-03	9.575E+00	1.771E-03	2.273E-04	0.0	-0.164	0.182	0.182
0.0350	8.519E+00	3.916E-03	8.523E+00	2.326E-03	2.568E-04	0.0	-0.160	0.177	0.177
0.0400	7.711E+00	3.928E-03	7.715E+00	2.944E-03	2.853E-04	0.0	-0.157	0.173	0.173
0.0450	7.069E+00	3.941E-03	7.073E+00	3.621E-03	3.128E-04	0.0	-0.154	0.170	0.169
0.0500	6.547E+00	3.955E-03	6.551E+00	4.356E-03	3.396E-04	0.0	-0.152	0.167	0.167
0.0550	6.113E+00	3.970E-03	6.117E+00	5.147E-03	3.657E-04	0.0	-0.150	0.164	0.164
0.0600	5.747E+00	3.986E-03	5.751E+00	5.991E-03	3.911E-04	0.0	-0.148	0.162	0.162
0.0700	5.163E+00	4.022E-03	5.167E+00	7.829E-03	4.404E-04	0.0	-0.145	0.158	0.158
0.0800	4.717E+00	4.061E-03	4.721E+00	9.857E-03	4.878E-04	0.0	-0.142	0.155	0.155
0.0900	4.365E+00	4.104E-03	4.369E+00	1.206E-02	5.336E-04	0.0	-0.140	0.153	0.152
0.1000	4.080E+00	4.150E-03	4.084E+00	1.443E-02	5.780E-04	0.0	-0.138	0.150	0.150
0.1250	3.561E+00	4.275E-03	3.565E+00	2.101E-02	6.841E-04	0.0	-0.134	0.146	0.145
0.1500	3.210E+00	4.412E-03	3.214E+00	2.841E-02	7.845E-04	0.0	-0.131	0.142	0.142
0.1750	2.958E+00	4.558E-03	2.962E+00	3.653E-02	8.805E-04	0.0	-0.128	0.139	0.139
0.2000	2.769E+00	4.714E-03	2.774E+00	4.526E-02	9.728E-04	0.0	-0.126	0.137	0.136
0.2500	2.506E+00	5.048E-03	2.511E+00	6.427E-02	1.149E-03	0.0	-0.123	0.133	0.132
0.3000	2.335E+00	5.415E-03	2.340E+00	8.494E-02	1.318E-03	0.0	-0.120	0.130	0.129
0.3500	2.215E+00	5.808E-03	2.221E+00	1.069E-01	1.482E-03	0.0	-0.118	0.128	0.127
0.4000	2.129E+00	6.226E-03	2.136E+00	1.299E-01	1.642E-03	0.0	-0.116	0.126	0.125
0.4500	2.065E+00	6.666E-03	2.072E+00	1.537E-01	1.801E-03	0.0	-0.114	0.124	0.123
0.5000	2.016E+00	7.129E-03	2.023E+00	1.781E-01	1.957E-03	4.240E-03	-0.098	0.122	0.120
0.5500	1.976E+00	7.610E-03	1.984E+00	2.031E-01	2.114E-03	2.378E-02	-0.090	0.118	0.116
0.6000	1.945E+00	8.108E-03	1.953E+00	2.285E-01	2.271E-03	4.634E-02	-0.084	0.115	0.112
0.7000	1.898E+00	9.148E-03	1.907E+00	2.803E-01	2.585E-03	9.798E-02	-0.075	0.108	0.104
0.8000	1.866E+00	1.024E-02	1.877E+00	3.332E-01	2.903E-03	1.553E-01	-0.068	0.102	0.096
0.9000	1.845E+00	1.139E-02	1.856E+00	3.868E-01	3.224E-03	2.158E-01	-0.062	0.097	0.090
1.0000	1.830E+00	1.257E-02	1.842E+00	4.409E-01	3.550E-03	2.778E-01	-0.057	0.092	0.084
1.2500	1.809E+00	1.572E-02	1.825E+00	5.774E-01	4.382E-03	4.339E-01	-0.048	0.083	0.073
1.5000	1.802E+00	1.908E-02	1.821E+00	7.146E-01	5.242E-03	5.852E-01	-0.042	0.075	0.064
1.7500	1.801E+00	2.263E-02	1.824E+00	8.518E-01	6.127E-03	7.289E-01	-0.038	0.070	0.057
2.0000	1.804E+00	2.632E-02	1.830E+00	9.886E-01	7.035E-03	8.641E-01	-0.035	0.065	0.052
2.5000	1.814E+00	3.408E-02	1.848E+00	1.261E+00	8.907E-03	1.110E+00	-0.031	0.058	0.045
3.0000	1.826E+00	4.225E-02	1.869E+00	1.530E+00	1.084E-02	1.327E+00	-0.028	0.053	0.040
3.5000	1.839E+00	5.076E-02	1.890E+00	1.796E+00	1.283E-02	1.521E+00	-0.026	0.049	0.036
4.0000	1.851E+00	5.954E-02	1.910E+00	2.059E+00	1.485E-02	1.695E+00	-0.024	0.046	0.033
4.5000	1.862E+00	6.857E-02	1.931E+00	2.319E+00	1.690E-02	1.853E+00	-0.023	0.043	0.031
5.0000	1.873E+00	7.782E-02	1.951E+00	2.577E+00	1.898E-02	1.998E+00	-0.023	0.041	0.029
5.5000	1.883E+00	8.725E-02	1.970E+00	2.832E+00	2.108E-02	2.131E+00	-0.022	0.039	0.028
6.0000	1.892E+00	9.686E-02	1.989E+00	3.084E+00	2.320E-02	2.255E+00	-0.021	0.038	0.027
7.0000	1.909E+00	1.165E-01	2.026E+00	3.583E+00	2.747E-02	2.478E+00	-0.020	0.035	0.025
8.0000	1.924E+00	1.367E-01	2.061E+00	4.072E+00	3.178E-02	2.675E+00	-0.019	0.033	0.023
9.0000	1.937E+00	1.574E-01	2.094E+00	4.553E+00	3.611E-02	2.852E+00	-0.018	0.032	0.022
10.0000	1.949E+00	1.784E-01	2.127E+00	5.027E+00	4.045E-02	3.013E+00	-0.018	0.030	0.021
12.5000	1.974E+00	2.323E-01	2.206E+00	6.181E+00	5.128E-02	3.361E+00	-0.016	0.027	0.019
15.0000	1.995E+00	2.877E-01	2.282E+00	7.295E+00	6.202E-02	3.652E+00	-0.015	0.025	0.017
17.5000	2.012E+00	3.443E-01	2.356E+00	8.373E+00	7.261E-02	3.905E+00	-0.013	0.024	0.016
20.0000	2.026E+00	4.018E-01	2.428E+00	9.418E+00	8.302E-02	4.128E+00	-0.012	0.022	0.015
25.0000	2.050E+00	5.189E-01	2.569E+00	1.142E+01	1.032E-01	4.511E+00	-0.010	0.020	0.012
30.0000	2.068E+00	6.381E-01	2.706E+00	1.332E+01	1.225E-01	4.833E+00	-0.008	0.018	0.011
35.0000	2.084E+00	7.588E-01	2.842E+00	1.512E+01	1.410E-01	5.111E+00	-0.007	0.016	0.009
40.0000	2.097E+00	8.807E-01	2.977E+00	1.684E+01	1.585E-01	5.356E+00	-0.005	0.015	0.008
45.0000	2.108E+00	1.004E+00	3.111E+00	1.848E+01	1.753E-01	5.576E+00	-0.005	0.014	0.007
50.0000	2.118E+00	1.127E+00	3.245E+00	2.005E+01	1.913E-01	5.774E+00	-0.004	0.013	0.007
55.0000	2.126E+00	1.252E+00	3.378E+00	2.156E+01	2.065E-01	5.955E+00	-0.003	0.013	0.006
60.0000	2.134E+00	1.377E+00	3.512E+00	2.301E+01	2.211E-01	6.121E+00	-0.003	0.012	0.005
70.0000	2.148E+00	1.629E+00	3.777E+00	2.576E+01	2.484E-01	6.418E+00	-0.002	0.011	0.004
80.0000	2.160E+00	1.883E+00	4.043E+00	2.832E+01	2.735E-01	6.677E+00	-0.002	0.010	0.004
90.0000	2.171E+00	2.138E+00	4.308E+00	3.071E+01	2.965E-01	6.907E+00	-0.001	0.009	0.003
100.0000	2.180E+00	2.394E+00	4.574E+00	3.297E+01	3.179E-01	7.113E+00	-0.001	0.009	0.003
125.0000	2.199E+00	3.039E+00	5.238E+00	3.807E+01	3.649E-01	7.553E+00	-0.001	0.008	0.002
150.0000	2.215E+00	3.688E+00	5.903E+00	4.256E+01	4.046E-01	7.913E+00	-0.001	0.007	0.002
175.0000	2.228E+00	4.341E+00	6.569E+00	4.658E+01	4.388E-01	8.219E+00	-0.000	0.006	0.001
200.0000	2.240E+00	4.996E+00	7.236E+00	5.020E+01	4.684E-01	8.484E+00	-0.000	0.006	0.001
250.0000	2.259E+00	6.313E+00	8.571E+00	5.654E+01	5.177E-01	8.928E+00	-0.000	0.005	0.001
300.0000	2.274E+00	7.635E+00	9.909E+00	6.196E+01	5.571E-01	9.291E+00	-0.000	0.005	0.001
350.0000	2.287E+00	8.962E+00	1.125E+01	6.670E+01	5.895E-01	9.598E+00	-0.000	0.004	0.001
400.0000	2.299E+00	1.029E+01	1.259E+01	7.089E+01	6.168E-01	9.865E+00	-0.000	0.004	0.001
450.0000	2.309E+00	1.162E+01	1.393E+01	7.467E+01	6.400E-01	1.010E+01	-0.000	0.004	0.000
500.0000	2.317E+00	1.296E+01	1.528E+01	7.809E+01	6.602E-01	1.031E+01	-0.000	0.004	0.000
550.0000	2.325E+00	1.430E+01	1.662E+01	8.123E+01	6.778E-01	1.050E+01	-0.000	0.004	0.000
600.0000	2.333E+00	1.563E+01	1.797E+01	8.412E+01	6.935E-01	1.067E+01	-0.000	0.003	0.000
700.0000	2.346E+00	1.831E+01	2.066E+01	8.931E+01	7.199E-01	1.098E+01	-0.000	0.003	0.000
800.0000	2.357E+00	2.099E+01	2.335E+01	9.386E+01	7.416E-01	1.125E+01	-0.000	0.003	0.000
900.0000	2.367E+00	2.368E+01	2.605E+01	9.791E+01	7.596E-01	1.148E+01	-0.000	0.003	0.000
1000.0000	2.376E+00	2.637E+01	2.874E+01	1.016E+02	7.750E-01	1.170E+01	-0.000	0.003	0.000

ELECTRONS IN MUSCLE-EQUIVALENT LIQUID, WITH SUCROSE

I = 74.3 eV DENSITY = 1.110E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.233E+01	3.749E-03	2.233E+01	2.541E-04	9.164E-05	0.0	-0.198	0.227	0.225
0.0125	1.877E+01	3.774E-03	1.878E+01	3.767E-04	1.102E-04	0.0	-0.190	0.216	0.215
0.0150	1.629E+01	3.789E-03	1.630E+01	5.201E-04	1.280E-04	0.0	-0.184	0.208	0.207
0.0175	1.445E+01	3.799E-03	1.446E+01	6.833E-04	1.451E-04	0.0	-0.179	0.202	0.201
0.0200	1.303E+01	3.807E-03	1.304E+01	8.657E-04	1.617E-04	0.0	-0.175	0.196	0.195
0.0250	1.098E+01	3.818E-03	1.098E+01	1.285E-03	1.934E-04	0.0	-0.168	0.188	0.187
0.0300	9.549E+00	3.827E-03	9.553E+00	1.775E-03	2.235E-04	0.0	-0.164	0.182	0.181
0.0350	8.499E+00	3.837E-03	8.503E+00	2.331E-03	2.525E-04	0.0	-0.160	0.177	0.177
0.0400	7.693E+00	3.848E-03	7.696E+00	2.950E-03	2.804E-04	0.0	-0.157	0.173	0.173
0.0450	7.052E+00	3.861E-03	7.056E+00	3.630E-03	3.074E-04	0.0	-0.154	0.170	0.169
0.0500	6.531E+00	3.874E-03	6.535E+00	4.367E-03	3.337E-04	0.0	-0.151	0.167	0.166
0.0550	6.099E+00	3.889E-03	6.102E+00	5.159E-03	3.593E-04	0.0	-0.149	0.164	0.164
0.0600	5.733E+00	3.905E-03	5.737E+00	6.005E-03	3.843E-04	0.0	-0.148	0.162	0.162
0.0700	5.150E+00	3.940E-03	5.154E+00	7.847E-03	4.326E-04	0.0	-0.144	0.158	0.158
0.0800	4.705E+00	3.979E-03	4.709E+00	9.880E-03	4.792E-04	0.0	-0.142	0.155	0.155
0.0900	4.354E+00	4.021E-03	4.358E+00	1.209E-02	5.241E-04	0.0	-0.140	0.152	0.152
0.1000	4.070E+00	4.066E-03	4.074E+00	1.447E-02	5.678E-04	0.0	-0.138	0.150	0.150
0.1250	3.552E+00	4.190E-03	3.556E+00	2.106E-02	6.720E-04	0.0	-0.134	0.146	0.145
0.1500	3.202E+00	4.325E-03	3.206E+00	2.848E-02	7.707E-04	0.0	-0.131	0.142	0.142
0.1750	2.950E+00	4.469E-03	2.955E+00	3.662E-02	8.651E-04	0.0	-0.128	0.139	0.139
0.2000	2.762E+00	4.622E-03	2.767E+00	4.538E-02	9.559E-04	0.0	-0.126	0.137	0.136
0.2500	2.500E+00	4.951E-03	2.505E+00	6.444E-02	1.130E-03	0.0	-0.123	0.133	0.132
0.3000	2.329E+00	5.311E-03	2.334E+00	8.516E-02	1.296E-03	0.0	-0.120	0.130	0.129
0.3500	2.210E+00	5.698E-03	2.215E+00	1.072E-01	1.457E-03	0.0	-0.118	0.128	0.127
0.4000	2.124E+00	6.109E-03	2.130E+00	1.302E-01	1.615E-03	0.0	-0.116	0.126	0.125
0.4500	2.060E+00	6.543E-03	2.066E+00	1.541E-01	1.771E-03	0.0	-0.113	0.124	0.123
0.5000	2.010E+00	6.997E-03	2.017E+00	1.786E-01	1.925E-03	1.519E-02	-0.092	0.121	0.119
0.5500	1.970E+00	7.470E-03	1.977E+00	2.036E-01	2.080E-03	3.828E-02	-0.086	0.117	0.114
0.6000	1.938E+00	7.960E-03	1.946E+00	2.291E-01	2.234E-03	6.393E-02	-0.081	0.113	0.109
0.7000	1.891E+00	8.983E-03	1.900E+00	2.812E-01	2.545E-03	1.207E-01	-0.072	0.106	0.101
0.8000	1.859E+00	1.006E-02	1.869E+00	3.343E-01	2.859E-03	1.821E-01	-0.065	0.100	0.094
0.9000	1.837E+00	1.118E-02	1.848E+00	3.881E-01	3.176E-03	2.460E-01	-0.060	0.095	0.087
1.0000	1.822E+00	1.235E-02	1.834E+00	4.424E-01	3.498E-03	3.108E-01	-0.055	0.090	0.082
1.2500	1.801E+00	1.545E-02	1.816E+00	5.795E-01	4.321E-03	4.720E-01	-0.047	0.081	0.071
1.5000	1.793E+00	1.876E-02	1.812E+00	7.174E-01	5.171E-03	6.269E-01	-0.041	0.073	0.062
1.7500	1.793E+00	2.224E-02	1.815E+00	8.553E-01	6.046E-03	7.730E-01	-0.037	0.068	0.056
2.0000	1.795E+00	2.587E-02	1.821E+00	9.928E-01	6.944E-03	9.100E-01	-0.034	0.063	0.051
2.5000	1.805E+00	3.351E-02	1.839E+00	1.266E+00	8.797E-03	1.158E+00	-0.030	0.056	0.044
3.0000	1.817E+00	4.155E-02	1.859E+00	1.537E+00	1.071E-02	1.377E+00	-0.027	0.051	0.039
3.5000	1.830E+00	4.992E-02	1.880E+00	1.804E+00	1.267E-02	1.572E+00	-0.026	0.048	0.035
4.0000	1.842E+00	5.857E-02	1.900E+00	2.069E+00	1.468E-02	1.747E+00	-0.024	0.045	0.033
4.5000	1.853E+00	6.746E-02	1.920E+00	2.330E+00	1.671E-02	1.905E+00	-0.023	0.042	0.030
5.0000	1.863E+00	7.656E-02	1.940E+00	2.589E+00	1.877E-02	2.050E+00	-0.022	0.040	0.029
5.5000	1.873E+00	8.585E-02	1.959E+00	2.846E+00	2.085E-02	2.184E+00	-0.022	0.038	0.027
6.0000	1.883E+00	9.531E-02	1.978E+00	3.100E+00	2.294E-02	2.308E+00	-0.021	0.037	0.026
7.0000	1.899E+00	1.147E-01	2.014E+00	3.601E+00	2.718E-02	2.531E+00	-0.020	0.035	0.024
8.0000	1.914E+00	1.346E-01	2.049E+00	4.093E+00	3.144E-02	2.729E+00	-0.019	0.033	0.023
9.0000	1.927E+00	1.549E-01	2.082E+00	4.577E+00	3.573E-02	2.906E+00	-0.018	0.031	0.022
10.0000	1.939E+00	1.756E-01	2.115E+00	5.054E+00	4.003E-02	3.067E+00	-0.018	0.030	0.021
12.5000	1.964E+00	2.287E-01	2.193E+00	6.215E+00	5.076E-02	3.416E+00	-0.016	0.027	0.019
15.0000	1.984E+00	2.832E-01	2.268E+00	7.336E+00	6.141E-02	3.709E+00	-0.014	0.025	0.017
17.5000	2.001E+00	3.390E-01	2.340E+00	8.421E+00	7.192E-02	3.963E+00	-0.013	0.023	0.016
20.0000	2.016E+00	3.957E-01	2.411E+00	9.473E+00	8.224E-02	4.187E+00	-0.012	0.022	0.014
25.0000	2.039E+00	5.111E-01	2.550E+00	1.149E+01	1.023E-01	4.572E+00	-0.009	0.019	0.012
30.0000	2.057E+00	6.285E-01	2.686E+00	1.340E+01	1.215E-01	4.895E+00	-0.008	0.018	0.011
35.0000	2.072E+00	7.474E-01	2.820E+00	1.522E+01	1.398E-01	5.175E+00	-0.006	0.016	0.009
40.0000	2.085E+00	8.676E-01	2.953E+00	1.695E+01	1.573E-01	5.422E+00	-0.005	0.015	0.008
45.0000	2.096E+00	9.887E-01	3.085E+00	1.860E+01	1.740E-01	5.642E+00	-0.004	0.014	0.007
50.0000	2.106E+00	1.111E+00	3.217E+00	2.019E+01	1.899E-01	5.841E+00	-0.004	0.013	0.006
55.0000	2.115E+00	1.233E+00	3.348E+00	2.172E+01	2.050E-01	6.023E+00	-0.003	0.012	0.006
60.0000	2.123E+00	1.357E+00	3.479E+00	2.318E+01	2.196E-01	6.189E+00	-0.003	0.012	0.005
70.0000	2.137E+00	1.605E+00	3.742E+00	2.595E+01	2.468E-01	6.487E+00	-0.002	0.010	0.004
80.0000	2.148E+00	1.855E+00	4.003E+00	2.853E+01	2.717E-01	6.747E+00	-0.002	0.010	0.004
90.0000	2.159E+00	2.107E+00	4.265E+00	3.095E+01	2.948E-01	6.977E+00	-0.001	0.009	0.003
100.0000	2.168E+00	2.359E+00	4.527E+00	3.323E+01	3.161E-01	7.184E+00	-0.001	0.008	0.003
125.0000	2.187E+00	2.995E+00	5.182E+00	3.839E+01	3.630E-01	7.624E+00	-0.001	0.007	0.002
150.0000	2.203E+00	3.635E+00	5.837E+00	4.293E+01	4.027E-01	7.985E+00	-0.001	0.007	0.002
175.0000	2.216E+00	4.278E+00	6.494E+00	4.699E+01	4.368E-01	8.291E+00	-0.000	0.006	0.001
200.0000	2.227E+00	4.924E+00	7.151E+00	5.066E+01	4.664E-01	8.556E+00	-0.000	0.006	0.001
250.0000	2.246E+00	6.221E+00	8.468E+00	5.707E+01	5.157E-01	9.000E+00	-0.000	0.005	0.001
300.0000	2.262E+00	7.525E+00	9.787E+00	6.256E+01	5.552E-01	9.364E+00	-0.000	0.005	0.001
350.0000	2.275E+00	8.833E+00	1.111E+01	6.736E+01	5.877E-01	9.671E+00	-0.000	0.004	0.001
400.0000	2.286E+00	1.014E+01	1.243E+01	7.161E+01	6.150E-01	9.938E+00	-0.000	0.004	0.000
450.0000	2.296E+00	1.146E+01	1.375E+01	7.543E+01	6.383E-01	1.017E+01	-0.000	0.004	0.000
500.0000	2.305E+00	1.277E+01	1.508E+01	7.890E+01	6.585E-01	1.038E+01	-0.000	0.004	0.000
550.0000	2.313E+00	1.409E+01	1.640E+01	8.208E+01	6.762E-01	1.057E+01	-0.000	0.003	0.000
600.0000	2.320E+00	1.541E+01	1.773E+01	8.501E+01	6.919E-01	1.075E+01	-0.000	0.003	0.000
700.0000	2.333E+00	1.805E+01	2.038E+01	9.027E+01	7.184E-01	1.106E+01	-0.000	0.003	0.000
800.0000	2.344E+00	2.069E+01	2.304E+01	9.488E+01	7.401E-01	1.132E+01	-0.000	0.003	0.000
900.0000	2.354E+00	2.334E+01	2.570E+01	9.899E+01	7.583E-01	1.156E+01	-0.000	0.003	0.000
1000.0000	2.363E+00	2.599E+01	2.835E+01	1.027E+02	7.737E-01	1.177E+01	-0.000	0.003	0.000

ELECTRONS IN MUSCLE-EQUIVALENT LIQUID, WITHOUT SUCROSE

I = 74.2 eV DENSITY = 1.070E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.241E+01	3.777E-03	2.241E+01	2.531E-04	9.194E-05	0.0	-0.198	0.227	0.225
0.0125	1.884E+01	3.803E-03	1.885E+01	3.753E-04	1.106E-04	0.0	-0.190	0.216	0.214
0.0150	1.635E+01	3.818E-03	1.636E+01	5.181E-04	1.285E-04	0.0	-0.184	0.208	0.207
0.0175	1.451E+01	3.829E-03	1.451E+01	6.807E-04	1.456E-04	0.0	-0.179	0.202	0.200
0.0200	1.308E+01	3.836E-03	1.309E+01	8.625E-04	1.623E-04	0.0	-0.175	0.196	0.195
0.0250	1.102E+01	3.847E-03	1.102E+01	1.281E-03	1.941E-04	0.0	-0.168	0.188	0.187
0.0300	9.584E+00	3.857E-03	9.588E+00	1.769E-03	2.244E-04	0.0	-0.164	0.182	0.181
0.0350	8.530E+00	3.867E-03	8.534E+00	2.323E-03	2.535E-04	0.0	-0.160	0.177	0.177
0.0400	7.721E+00	3.878E-03	7.725E+00	2.939E-03	2.815E-04	0.0	-0.156	0.173	0.173
0.0450	7.078E+00	3.890E-03	7.082E+00	3.616E-03	3.086E-04	0.0	-0.154	0.170	0.169
0.0500	6.555E+00	3.904E-03	6.559E+00	4.351E-03	3.350E-04	0.0	-0.151	0.167	0.166
0.0550	6.121E+00	3.919E-03	6.125E+00	5.140E-03	3.607E-04	0.0	-0.149	0.164	0.164
0.0600	5.754E+00	3.935E-03	5.758E+00	5.983E-03	3.858E-04	0.0	-0.148	0.162	0.162
0.0700	5.169E+00	3.970E-03	5.173E+00	7.819E-03	4.343E-04	0.0	-0.144	0.158	0.158
0.0800	4.722E+00	4.009E-03	4.726E+00	9.844E-03	4.811E-04	0.0	-0.142	0.155	0.155
0.0900	4.370E+00	4.051E-03	4.374E+00	1.205E-02	5.262E-04	0.0	-0.140	0.152	0.152
0.1000	4.085E+00	4.097E-03	4.089E+00	1.441E-02	5.700E-04	0.0	-0.138	0.150	0.150
0.1250	3.565E+00	4.221E-03	3.569E+00	2.098E-02	6.747E-04	0.0	-0.134	0.146	0.145
0.1500	3.213E+00	4.357E-03	3.218E+00	2.838E-02	7.737E-04	0.0	-0.131	0.142	0.142
0.1750	2.961E+00	4.502E-03	2.966E+00	3.649E-02	8.684E-04	0.0	-0.128	0.139	0.139
0.2000	2.772E+00	4.656E-03	2.777E+00	4.521E-02	9.596E-04	0.0	-0.126	0.137	0.136
0.2500	2.509E+00	4.987E-03	2.514E+00	6.420E-02	1.134E-03	0.0	-0.123	0.133	0.132
0.3000	2.337E+00	5.350E-03	2.342E+00	8.485E-02	1.301E-03	0.0	-0.120	0.130	0.129
0.3500	2.218E+00	5.739E-03	2.223E+00	1.068E-01	1.462E-03	0.0	-0.118	0.128	0.127
0.4000	2.131E+00	6.152E-03	2.138E+00	1.297E-01	1.621E-03	0.0	-0.116	0.126	0.124
0.4500	2.067E+00	6.589E-03	2.074E+00	1.535E-01	1.777E-03	0.0	-0.115	0.124	0.123
0.5000	2.018E+00	7.047E-03	2.025E+00	1.779E-01	1.932E-03	8.567E-03	-0.094	0.121	0.120
0.5500	1.978E+00	7.523E-03	1.985E+00	2.029E-01	2.087E-03	2.960E-02	-0.088	0.118	0.115
0.6000	1.946E+00	8.016E-03	1.954E+00	2.283E-01	2.242E-03	5.348E-02	-0.083	0.114	0.111
0.7000	1.899E+00	9.046E-03	1.908E+00	2.801E-01	2.553E-03	1.074E-01	-0.074	0.107	0.102
0.8000	1.867E+00	1.013E-02	1.877E+00	3.330E-01	2.867E-03	1.666E-01	-0.066	0.101	0.095
0.9000	1.845E+00	1.126E-02	1.857E+00	3.866E-01	3.185E-03	2.287E-01	-0.061	0.096	0.089
1.0000	1.830E+00	1.244E-02	1.842E+00	4.406E-01	3.508E-03	2.922E-01	-0.056	0.091	0.083
1.2500	1.809E+00	1.555E-02	1.825E+00	5.771E-01	4.332E-03	4.510E-01	-0.047	0.082	0.072
1.5000	1.802E+00	1.888E-02	1.821E+00	7.143E-01	5.184E-03	6.045E-01	-0.041	0.074	0.063
1.7500	1.801E+00	2.239E-02	1.823E+00	8.516E-01	6.061E-03	7.498E-01	-0.037	0.069	0.057
2.0000	1.804E+00	2.605E-02	1.830E+00	9.885E-01	6.960E-03	8.863E-01	-0.034	0.064	0.052
2.5000	1.814E+00	3.373E-02	1.847E+00	1.260E+00	8.815E-03	1.134E+00	-0.030	0.057	0.044
3.0000	1.826E+00	4.183E-02	1.868E+00	1.530E+00	1.073E-02	1.353E+00	-0.027	0.052	0.039
3.5000	1.838E+00	5.025E-02	1.888E+00	1.796E+00	1.270E-02	1.548E+00	-0.026	0.048	0.035
4.0000	1.850E+00	5.896E-02	1.909E+00	2.059E+00	1.471E-02	1.723E+00	-0.024	0.045	0.033
4.5000	1.861E+00	6.790E-02	1.929E+00	2.320E+00	1.674E-02	1.882E+00	-0.023	0.042	0.030
5.0000	1.872E+00	7.706E-02	1.949E+00	2.578E+00	1.880E-02	2.028E+00	-0.022	0.040	0.029
5.5000	1.882E+00	8.641E-02	1.968E+00	2.833E+00	2.089E-02	2.162E+00	-0.022	0.039	0.027
6.0000	1.891E+00	9.593E-02	1.987E+00	3.086E+00	2.299E-02	2.286E+00	-0.021	0.037	0.026
7.0000	1.908E+00	1.154E-01	2.023E+00	3.584E+00	2.723E-02	2.510E+00	-0.020	0.035	0.024
8.0000	1.923E+00	1.354E-01	2.058E+00	4.074E+00	3.150E-02	2.708E+00	-0.019	0.033	0.023
9.0000	1.936E+00	1.559E-01	2.092E+00	4.556E+00	3.580E-02	2.885E+00	-0.018	0.031	0.022
10.0000	1.948E+00	1.767E-01	2.124E+00	5.031E+00	4.010E-02	3.046E+00	-0.018	0.030	0.021
12.5000	1.973E+00	2.301E-01	2.203E+00	6.186E+00	5.085E-02	3.395E+00	-0.016	0.027	0.019
15.0000	1.993E+00	2.850E-01	2.278E+00	7.302E+00	6.152E-02	3.687E+00	-0.014	0.025	0.017
17.5000	2.010E+00	3.411E-01	2.351E+00	8.382E+00	7.204E-02	3.940E+00	-0.013	0.023	0.016
20.0000	2.025E+00	3.982E-01	2.423E+00	9.429E+00	8.238E-02	4.164E+00	-0.012	0.022	0.014
25.0000	2.048E+00	5.143E-01	2.562E+00	1.144E+01	1.025E-01	4.548E+00	-0.010	0.020	0.012
30.0000	2.067E+00	6.324E-01	2.699E+00	1.334E+01	1.217E-01	4.871E+00	-0.008	0.018	0.011
35.0000	2.082E+00	7.520E-01	2.834E+00	1.514E+01	1.400E-01	5.149E+00	-0.006	0.016	0.009
40.0000	2.095E+00	8.729E-01	2.968E+00	1.687E+01	1.575E-01	5.395E+00	-0.005	0.015	0.008
45.0000	2.106E+00	9.949E-01	3.101E+00	1.852E+01	1.742E-01	5.615E+00	-0.004	0.014	0.007
50.0000	2.116E+00	1.118E+00	3.233E+00	2.010E+01	1.901E-01	5.814E+00	-0.004	0.013	0.006
55.0000	2.125E+00	1.241E+00	3.366E+00	2.161E+01	2.053E-01	5.995E+00	-0.003	0.012	0.006
60.0000	2.133E+00	1.365E+00	3.498E+00	2.307E+01	2.198E-01	6.161E+00	-0.003	0.012	0.005
70.0000	2.146E+00	1.615E+00	3.761E+00	2.582E+01	2.470E-01	6.459E+00	-0.002	0.011	0.004
80.0000	2.158E+00	1.866E+00	4.025E+00	2.839E+01	2.720E-01	6.718E+00	-0.002	0.010	0.004
90.0000	2.169E+00	2.119E+00	4.288E+00	3.080E+01	2.950E-01	6.948E+00	-0.001	0.009	0.003
100.0000	2.178E+00	2.373E+00	4.551E+00	3.306E+01	3.164E-01	7.155E+00	-0.001	0.008	0.003
125.0000	2.197E+00	3.013E+00	5.210E+00	3.819E+01	3.633E-01	7.595E+00	-0.001	0.007	0.002
150.0000	2.213E+00	3.657E+00	5.870E+00	4.271E+01	4.030E-01	7.955E+00	-0.001	0.007	0.002
175.0000	2.226E+00	4.304E+00	6.530E+00	4.675E+01	4.371E-01	8.261E+00	-0.000	0.006	0.001
200.0000	2.238E+00	4.954E+00	7.191E+00	5.040E+01	4.668E-01	8.526E+00	-0.000	0.006	0.001
250.0000	2.257E+00	6.259E+00	8.515E+00	5.678E+01	5.160E-01	8.971E+00	-0.000	0.005	0.001
300.0000	2.272E+00	7.570E+00	9.842E+00	6.223E+01	5.555E-01	9.334E+00	-0.000	0.005	0.001
350.0000	2.285E+00	8.886E+00	1.117E+01	6.700E+01	5.880E-01	9.641E+00	-0.000	0.004	0.001
400.0000	2.296E+00	1.020E+01	1.250E+01	7.123E+01	6.153E-01	9.908E+00	-0.000	0.004	0.001
450.0000	2.306E+00	1.153E+01	1.383E+01	7.503E+01	6.386E-01	1.014E+01	-0.000	0.004	0.000
500.0000	2.315E+00	1.285E+01	1.516E+01	7.848E+01	6.588E-01	1.035E+01	-0.000	0.004	0.000
550.0000	2.323E+00	1.417E+01	1.650E+01	8.164E+01	6.765E-01	1.054E+01	-0.000	0.004	0.000
600.0000	2.331E+00	1.550E+01	1.783E+01	8.455E+01	6.921E-01	1.072E+01	-0.000	0.003	0.000
700.0000	2.344E+00	1.816E+01	2.050E+01	8.978E+01	7.187E-01	1.103E+01	-0.000	0.003	0.000
800.0000	2.355E+00	2.082E+01	2.317E+01	9.437E+01	7.404E-01	1.129E+01	-0.000	0.003	0.000
900.0000	2.365E+00	2.348E+01	2.585E+01	9.845E+01	7.585E-01	1.153E+01	-0.000	0.003	0.000
1000.0000	2.374E+00	2.615E+01	2.852E+01	1.021E+02	7.739E-01	1.174E+01	-0.000	0.003	0.000

ELECTRONS IN NYLON, TYPE 6 AND TYPE 6/6

I = 63.9 eV DENSITY = 1.140E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.298E+01	3.164E-03	2.298E+01	2.458E-04	7.558E-05	0.0	-0.193	0.219	0.218
0.0125	1.930E+01	3.178E-03	1.930E+01	3.651E-04	9.072E-05	0.0	-0.185	0.209	0.208
0.0150	1.673E+01	3.187E-03	1.674E+01	5.046E-04	1.052E-04	0.0	-0.179	0.201	0.201
0.0175	1.483E+01	3.194E-03	1.484E+01	6.636E-04	1.192E-04	0.0	-0.174	0.195	0.195
0.0200	1.337E+01	3.199E-03	1.337E+01	8.414E-04	1.327E-04	0.0	-0.170	0.191	0.190
0.0250	1.125E+01	3.208E-03	1.125E+01	1.251E-03	1.586E-04	0.0	-0.164	0.183	0.182
0.0300	9.778E+00	3.218E-03	9.781E+00	1.729E-03	1.834E-04	0.0	-0.160	0.177	0.177
0.0350	8.698E+00	3.228E-03	8.701E+00	2.272E-03	2.072E-04	0.0	-0.156	0.172	0.172
0.0400	7.869E+00	3.239E-03	7.872E+00	2.877E-03	2.302E-04	0.0	-0.153	0.169	0.168
0.0450	7.211E+00	3.252E-03	7.214E+00	3.542E-03	2.526E-04	0.0	-0.150	0.165	0.165
0.0500	6.676E+00	3.265E-03	6.679E+00	4.263E-03	2.743E-04	0.0	-0.148	0.163	0.162
0.0550	6.232E+00	3.279E-03	6.235E+00	5.038E-03	2.955E-04	0.0	-0.146	0.160	0.160
0.0600	5.857E+00	3.295E-03	5.860E+00	5.866E-03	3.162E-04	0.0	-0.144	0.158	0.158
0.0700	5.259E+00	3.327E-03	5.262E+00	7.670E-03	3.564E-04	0.0	-0.141	0.154	0.154
0.0800	4.803E+00	3.363E-03	4.806E+00	9.662E-03	3.951E-04	0.0	-0.139	0.151	0.151
0.0900	4.443E+00	3.401E-03	4.446E+00	1.183E-02	4.326E-04	0.0	-0.137	0.149	0.149
0.1000	4.152E+00	3.441E-03	4.155E+00	1.416E-02	4.690E-04	0.0	-0.135	0.147	0.146
0.1250	3.621E+00	3.551E-03	3.625E+00	2.063E-02	5.561E-04	0.0	-0.131	0.142	0.142
0.1500	3.263E+00	3.669E-03	3.266E+00	2.791E-02	6.388E-04	0.0	-0.128	0.139	0.139
0.1750	3.006E+00	3.796E-03	3.009E+00	3.590E-02	7.179E-04	0.0	-0.126	0.136	0.136
0.2000	2.813E+00	3.930E-03	2.817E+00	4.450E-02	7.943E-04	0.0	-0.124	0.134	0.133
0.2500	2.544E+00	4.218E-03	2.549E+00	6.322E-02	9.406E-04	0.0	-0.121	0.130	0.130
0.3000	2.369E+00	4.532E-03	2.374E+00	8.359E-02	1.081E-03	0.0	-0.118	0.128	0.127
0.3500	2.247E+00	4.868E-03	2.252E+00	1.052E-01	1.217E-03	0.0	-0.106	0.125	0.124
0.4000	2.156E+00	5.226E-03	2.161E+00	1.279E-01	1.351E-03	3.157E-02	-0.087	0.119	0.117
0.4500	2.086E+00	5.604E-03	2.092E+00	1.515E-01	1.484E-03	6.655E-02	-0.080	0.114	0.111
0.5000	2.032E+00	5.999E-03	2.038E+00	1.757E-01	1.617E-03	1.032E-01	-0.075	0.109	0.105
0.5500	1.990E+00	6.410E-03	1.996E+00	2.005E-01	1.750E-03	1.409E-01	-0.070	0.104	0.100
0.6000	1.956E+00	6.836E-03	1.963E+00	2.258E-01	1.883E-03	1.793E-01	-0.066	0.100	0.095
0.7000	1.906E+00	7.726E-03	1.914E+00	2.774E-01	2.151E-03	2.572E-01	-0.060	0.093	0.087
0.8000	1.872E+00	8.661E-03	1.881E+00	3.301E-01	2.422E-03	3.350E-01	-0.055	0.087	0.080
0.9000	1.849E+00	9.639E-03	1.859E+00	3.836E-01	2.696E-03	4.119E-01	-0.051	0.083	0.075
1.0000	1.832E+00	1.066E-02	1.843E+00	4.377E-01	2.975E-03	4.872E-01	-0.048	0.078	0.070
1.2500	1.809E+00	1.335E-02	1.823E+00	5.742E-01	3.689E-03	6.664E-01	-0.042	0.070	0.061
1.5000	1.801E+00	1.623E-02	1.817E+00	7.116E-01	4.428E-03	8.319E-01	-0.038	0.064	0.054
1.7500	1.799E+00	1.927E-02	1.819E+00	8.492E-01	5.190E-03	9.843E-01	-0.035	0.060	0.049
2.0000	1.802E+00	2.244E-02	1.824E+00	9.865E-01	5.972E-03	1.125E+00	-0.033	0.056	0.046
2.5000	1.811E+00	2.910E-02	1.840E+00	1.259E+00	7.587E-03	1.375E+00	-0.030	0.051	0.040
3.0000	1.823E+00	3.612E-02	1.859E+00	1.530E+00	9.258E-03	1.594E+00	-0.028	0.047	0.036
3.5000	1.836E+00	4.343E-02	1.879E+00	1.797E+00	1.097E-02	1.786E+00	-0.027	0.044	0.034
4.0000	1.848E+00	5.100E-02	1.899E+00	2.062E+00	1.272E-02	1.959E+00	-0.025	0.041	0.032
4.5000	1.859E+00	5.878E-02	1.918E+00	2.324E+00	1.450E-02	2.115E+00	-0.024	0.039	0.030
5.0000	1.870E+00	6.674E-02	1.937E+00	2.583E+00	1.631E-02	2.258E+00	-0.023	0.038	0.029
5.5000	1.880E+00	7.488E-02	1.955E+00	2.840E+00	1.813E-02	2.390E+00	-0.023	0.036	0.027
6.0000	1.889E+00	8.317E-02	1.973E+00	3.095E+00	1.997E-02	2.513E+00	-0.022	0.035	0.026
7.0000	1.906E+00	1.002E-01	2.006E+00	3.597E+00	2.370E-02	2.735E+00	-0.020	0.033	0.025
8.0000	1.921E+00	1.176E-01	2.039E+00	4.092E+00	2.746E-02	2.932E+00	-0.019	0.031	0.023
9.0000	1.934E+00	1.354E-01	2.070E+00	4.579E+00	3.125E-02	3.110E+00	-0.018	0.030	0.022
10.0000	1.946E+00	1.536E-01	2.099E+00	5.058E+00	3.505E-02	3.273E+00	-0.016	0.028	0.021
12.5000	1.970E+00	2.002E-01	2.170E+00	6.229E+00	4.459E-02	3.630E+00	-0.014	0.026	0.018
15.0000	1.990E+00	2.482E-01	2.238E+00	7.363E+00	5.410E-02	3.933E+00	-0.011	0.023	0.016
17.5000	2.006E+00	2.973E-01	2.303E+00	8.465E+00	6.352E-02	4.197E+00	-0.010	0.022	0.014
20.0000	2.019E+00	3.472E-01	2.366E+00	9.536E+00	7.283E-02	4.431E+00	-0.008	0.020	0.013
25.0000	2.041E+00	4.488E-01	2.490E+00	1.160E+01	9.100E-02	4.834E+00	-0.006	0.018	0.010
30.0000	2.058E+00	5.523E-01	2.610E+00	1.356E+01	1.085E-01	5.171E+00	-0.004	0.016	0.008
35.0000	2.072E+00	6.571E-01	2.729E+00	1.543E+01	1.253E-01	5.461E+00	-0.003	0.014	0.007
40.0000	2.085E+00	7.631E-01	2.848E+00	1.722E+01	1.415E-01	5.715E+00	-0.003	0.013	0.006
45.0000	2.095E+00	8.700E-01	2.965E+00	1.894E+01	1.570E-01	5.942E+00	-0.002	0.012	0.005
50.0000	2.104E+00	9.777E-01	3.082E+00	2.060E+01	1.718E-01	6.145E+00	-0.002	0.011	0.004
55.0000	2.113E+00	1.086E+00	3.199E+00	2.219E+01	1.861E-01	6.331E+00	-0.002	0.010	0.004
60.0000	2.121E+00	1.195E+00	3.316E+00	2.372E+01	1.997E-01	6.500E+00	-0.001	0.010	0.003
70.0000	2.134E+00	1.414E+00	3.548E+00	2.664E+01	2.255E-01	6.802E+00	-0.001	0.009	0.003
80.0000	2.145E+00	1.635E+00	3.781E+00	2.937E+01	2.493E-01	7.065E+00	-0.001	0.008	0.002
90.0000	2.156E+00	1.858E+00	4.013E+00	3.194E+01	2.713E-01	7.297E+00	-0.001	0.007	0.002
100.0000	2.165E+00	2.081E+00	4.245E+00	3.436E+01	2.919E-01	7.506E+00	-0.001	0.007	0.002
125.0000	2.184E+00	2.643E+00	4.827E+00	3.988E+01	3.375E-01	7.948E+00	-0.000	0.006	0.001
150.0000	2.199E+00	3.209E+00	5.409E+00	4.477E+01	3.765E-01	8.310E+00	-0.000	0.005	0.001
175.0000	2.212E+00	3.779E+00	5.991E+00	4.916E+01	4.102E-01	8.617E+00	-0.000	0.005	0.001
200.0000	2.224E+00	4.351E+00	6.574E+00	5.314E+01	4.398E-01	8.883E+00	-0.000	0.005	0.001
250.0000	2.243E+00	5.500E+00	7.742E+00	6.014E+01	4.893E-01	9.327E+00	-0.000	0.004	0.001
300.0000	2.258E+00	6.655E+00	8.913E+00	6.615E+01	5.293E-01	9.691E+00	-0.000	0.004	0.000
350.0000	2.271E+00	7.814E+00	1.008E+01	7.143E+01	5.624E-01	9.999E+00	-0.000	0.003	0.000
400.0000	2.282E+00	8.976E+00	1.126E+01	7.612E+01	5.904E-01	1.027E+01	-0.000	0.003	0.000
450.0000	2.292E+00	1.014E+01	1.243E+01	8.034E+01	6.145E-01	1.050E+01	-0.000	0.003	0.000
500.0000	2.301E+00	1.131E+01	1.361E+01	8.418E+01	6.354E-01	1.071E+01	-0.000	0.003	0.000
550.0000	2.309E+00	1.248E+01	1.478E+01	8.771E+01	6.538E-01	1.090E+01	-0.000	0.003	0.000
600.0000	2.316E+00	1.364E+01	1.596E+01	9.096E+01	6.701E-01	1.108E+01	-0.000	0.003	0.000
700.0000	2.329E+00	1.599E+01	1.832E+01	9.680E+01	6.978E-01	1.138E+01	-0.000	0.003	0.000
800.0000	2.341E+00	1.833E+01	2.067E+01	1.019E+02	7.206E-01	1.165E+01	-0.000	0.002	0.000
900.0000	2.351E+00	2.068E+01	2.303E+01	1.065E+02	7.397E-01	1.189E+01	-0.000	0.002	0.000
1000.0000	2.359E+00	2.303E+01	2.539E+01	1.107E+02	7.560E-01	1.210E+01	-0.000	0.002	0.000

ELECTRONS IN PARAFFIN WAX

I = 55.9 eV DENSITY = 9.300E-01 g/cm^3

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	2.464E+01	2.826E-03	2.464E+01	2.285E-04	6.305E-05	0.0	-0.188	0.213	0.212
0.0125	2.067E+01	2.837E-03	2.067E+01	3.398E-04	7.565E-05	0.0	-0.180	0.203	0.202
0.0150	1.791E+01	2.844E-03	1.791E+01	4.701E-04	8.772E-05	0.0	-0.175	0.196	0.195
0.0175	1.587E+01	2.849E-03	1.587E+01	6.187E-04	9.936E-05	0.0	-0.170	0.190	0.190
0.0200	1.429E+01	2.854E-03	1.430E+01	7.849E-04	1.106E-04	0.0	-0.167	0.186	0.185
0.0250	1.201E+01	2.863E-03	1.202E+01	1.168E-03	1.323E-04	0.0	-0.161	0.178	0.178
0.0300	1.044E+01	2.873E-03	1.044E+01	1.616E-03	1.531E-04	0.0	-0.156	0.173	0.172
0.0350	9.282E+00	2.884E-03	9.285E+00	2.125E-03	1.731E-04	0.0	-0.153	0.168	0.168
0.0400	8.394E+00	2.895E-03	8.396E+00	2.692E-03	1.924E-04	0.0	-0.150	0.165	0.165
0.0450	7.689E+00	2.908E-03	7.692E+00	3.315E-03	2.112E-04	0.0	-0.147	0.162	0.161
0.0500	7.117E+00	2.921E-03	7.119E+00	3.991E-03	2.295E-04	0.0	-0.145	0.159	0.159
0.0550	6.641E+00	2.935E-03	6.644E+00	4.719E-03	2.473E-04	0.0	-0.143	0.157	0.157
0.0600	6.241E+00	2.950E-03	6.243E+00	5.496E-03	2.648E-04	0.0	-0.142	0.155	0.155
0.0700	5.601E+00	2.981E-03	5.604E+00	7.190E-03	2.988E-04	0.0	-0.139	0.151	0.151
0.0800	5.113E+00	3.014E-03	5.116E+00	9.060E-03	3.315E-04	0.0	-0.136	0.148	0.148
0.0900	4.729E+00	3.050E-03	4.732E+00	1.110E-02	3.632E-04	0.0	-0.134	0.146	0.146
0.1000	4.418E+00	3.088E-03	4.421E+00	1.328E-02	3.941E-04	0.0	-0.133	0.144	0.144
0.1250	3.851E+00	3.190E-03	3.855E+00	1.936E-02	4.680E-04	0.0	-0.129	0.140	0.139
0.1500	3.469E+00	3.300E-03	3.472E+00	2.622E-02	5.382E-04	0.0	-0.126	0.136	0.136
0.1750	3.195E+00	3.418E-03	3.198E+00	3.373E-02	6.056E-04	0.0	-0.124	0.134	0.133
0.2000	2.989E+00	3.542E-03	2.992E+00	4.182E-02	6.707E-04	0.0	-0.122	0.132	0.131
0.2500	2.703E+00	3.807E-03	2.706E+00	5.945E-02	7.957E-04	0.0	-0.119	0.128	0.127
0.3000	2.515E+00	4.097E-03	2.520E+00	7.864E-02	9.159E-04	0.0	-0.116	0.126	0.125
0.3500	2.385E+00	4.406E-03	2.390E+00	9.905E-02	1.033E-03	2.449E-03	-0.100	0.123	0.122
0.4000	2.287E+00	4.736E-03	2.292E+00	1.204E-01	1.148E-03	3.426E-02	-0.085	0.117	0.115
0.4500	2.213E+00	5.083E-03	2.218E+00	1.426E-01	1.263E-03	6.887E-02	-0.079	0.111	0.108
0.5000	2.156E+00	5.446E-03	2.161E+00	1.655E-01	1.377E-03	1.055E-01	-0.073	0.106	0.103
0.5500	2.111E+00	5.824E-03	2.116E+00	1.889E-01	1.491E-03	1.434E-01	-0.069	0.102	0.098
0.6000	2.074E+00	6.215E-03	2.081E+00	2.127E-01	1.606E-03	1.823E-01	-0.065	0.098	0.093
0.7000	2.021E+00	7.033E-03	2.028E+00	2.614E-01	1.838E-03	2.614E-01	-0.058	0.091	0.085
0.8000	1.984E+00	7.893E-03	1.992E+00	3.112E-01	2.072E-03	3.408E-01	-0.053	0.086	0.078
0.9000	1.959E+00	8.792E-03	1.968E+00	3.617E-01	2.310E-03	4.193E-01	-0.049	0.081	0.073
1.0000	1.941E+00	9.728E-03	1.951E+00	4.128E-01	2.552E-03	4.962E-01	-0.046	0.077	0.068
1.2500	1.916E+00	1.221E-02	1.928E+00	5.418E-01	3.172E-03	6.794E-01	-0.040	0.069	0.059
1.5000	1.906E+00	1.486E-02	1.921E+00	6.718E-01	3.815E-03	8.485E-01	-0.037	0.063	0.053
1.7500	1.904E+00	1.765E-02	1.922E+00	8.019E-01	4.478E-03	1.004E+00	-0.034	0.058	0.048
2.0000	1.906E+00	2.057E-02	1.926E+00	9.319E-01	5.159E-03	1.147E+00	-0.032	0.055	0.044
2.5000	1.915E+00	2.671E-02	1.942E+00	1.190E+00	6.569E-03	1.403E+00	-0.029	0.049	0.039
3.0000	1.927E+00	3.319E-02	1.960E+00	1.447E+00	8.031E-03	1.625E+00	-0.027	0.045	0.035
3.5000	1.940E+00	3.994E-02	1.980E+00	1.701E+00	9.533E-03	1.821E+00	-0.026	0.042	0.033
4.0000	1.952E+00	4.693E-02	1.999E+00	1.952E+00	1.107E-02	1.997E+00	-0.024	0.040	0.031
4.5000	1.964E+00	5.411E-02	2.018E+00	2.201E+00	1.263E-02	2.156E+00	-0.023	0.038	0.029
5.0000	1.975E+00	6.148E-02	2.036E+00	2.448E+00	1.422E-02	2.302E+00	-0.023	0.037	0.028
5.5000	1.985E+00	6.900E-02	2.054E+00	2.692E+00	1.583E-02	2.436E+00	-0.022	0.035	0.027
6.0000	1.995E+00	7.667E-02	2.071E+00	2.934E+00	1.745E-02	2.561E+00	-0.021	0.034	0.026
7.0000	2.012E+00	9.238E-02	2.104E+00	3.413E+00	2.074E-02	2.787E+00	-0.019	0.032	0.024
8.0000	2.027E+00	1.085E-01	2.135E+00	3.885E+00	2.406E-02	2.988E+00	-0.018	0.030	0.022
9.0000	2.040E+00	1.250E-01	2.165E+00	4.350E+00	2.742E-02	3.169E+00	-0.017	0.029	0.021
10.0000	2.052E+00	1.419E-01	2.194E+00	4.809E+00	3.080E-02	3.336E+00	-0.015	0.027	0.020
12.5000	2.077E+00	1.851E-01	2.262E+00	5.931E+00	3.929E-02	3.699E+00	-0.012	0.025	0.017
15.0000	2.097E+00	2.296E-01	2.326E+00	7.021E+00	4.779E-02	4.008E+00	-0.010	0.022	0.015
17.5000	2.113E+00	2.751E-01	2.388E+00	8.081E+00	5.625E-02	4.277E+00	-0.008	0.021	0.013
20.0000	2.127E+00	3.214E-01	2.448E+00	9.115E+00	6.462E-02	4.515E+00	-0.007	0.019	0.012
25.0000	2.149E+00	4.157E-01	2.565E+00	1.111E+01	8.107E-02	4.924E+00	-0.005	0.016	0.009
30.0000	2.167E+00	5.118E-01	2.678E+00	1.302E+01	9.701E-02	5.265E+00	-0.004	0.015	0.007
35.0000	2.181E+00	6.093E-01	2.791E+00	1.485E+01	1.124E-01	5.558E+00	-0.003	0.013	0.006
40.0000	2.194E+00	7.078E-01	2.902E+00	1.660E+01	1.273E-01	5.815E+00	-0.002	0.012	0.005
45.0000	2.205E+00	8.072E-01	3.012E+00	1.829E+01	1.416E-01	6.042E+00	-0.002	0.011	0.004
50.0000	2.214E+00	9.074E-01	3.122E+00	1.992E+01	1.554E-01	6.247E+00	-0.001	0.010	0.004
55.0000	2.223E+00	1.008E+00	3.231E+00	2.150E+01	1.686E-01	6.433E+00	-0.001	0.009	0.003
60.0000	2.231E+00	1.110E+00	3.341E+00	2.302E+01	1.814E-01	6.604E+00	-0.001	0.009	0.003
70.0000	2.245E+00	1.314E+00	3.559E+00	2.592E+01	2.057E-01	6.907E+00	-0.001	0.008	0.002
80.0000	2.257E+00	1.519E+00	3.776E+00	2.865E+01	2.282E-01	7.170E+00	-0.001	0.007	0.002
90.0000	2.268E+00	1.726E+00	3.994E+00	3.122E+01	2.492E-01	7.403E+00	-0.001	0.007	0.002
100.0000	2.277E+00	1.934E+00	4.211E+00	3.366E+01	2.689E-01	7.612E+00	-0.000	0.006	0.001
125.0000	2.297E+00	2.458E+00	4.755E+00	3.924E+01	3.130E-01	8.054E+00	-0.000	0.005	0.001
150.0000	2.313E+00	2.986E+00	5.299E+00	4.422E+01	3.510E-01	8.417E+00	-0.000	0.005	0.001
175.0000	2.327E+00	3.517E+00	5.843E+00	4.871E+01	3.842E-01	8.724E+00	-0.000	0.004	0.001
200.0000	2.339E+00	4.050E+00	6.388E+00	5.280E+01	4.134E-01	8.990E+00	-0.000	0.004	0.001
250.0000	2.358E+00	5.122E+00	7.480E+00	6.003E+01	4.629E-01	9.435E+00	-0.000	0.004	0.000
300.0000	2.374E+00	6.199E+00	8.573E+00	6.627E+01	5.032E-01	9.798E+00	-0.000	0.003	0.000
350.0000	2.388E+00	7.280E+00	9.668E+00	7.176E+01	5.368E-01	1.011E+01	-0.000	0.003	0.000
400.0000	2.400E+00	8.365E+00	1.076E+01	7.666E+01	5.654E-01	1.037E+01	-0.000	0.003	0.000
450.0000	2.410E+00	9.452E+00	1.186E+01	8.108E+01	5.900E-01	1.061E+01	-0.000	0.003	0.000
500.0000	2.419E+00	1.054E+01	1.296E+01	8.511E+01	6.116E-01	1.082E+01	-0.000	0.003	0.000
550.0000	2.428E+00	1.163E+01	1.406E+01	8.881E+01	6.306E-01	1.101E+01	-0.000	0.002	0.000
600.0000	2.435E+00	1.272E+01	1.516E+01	9.224E+01	6.475E-01	1.118E+01	-0.000	0.002	0.000
700.0000	2.449E+00	1.491E+01	1.736E+01	9.840E+01	6.763E-01	1.149E+01	-0.000	0.002	0.000
800.0000	2.461E+00	1.710E+01	1.956E+01	1.038E+02	7.002E-01	1.176E+01	-0.000	0.002	0.000
900.0000	2.471E+00	1.930E+01	2.177E+01	1.087E+02	7.202E-01	1.199E+01	-0.000	0.002	0.000
1000.0000	2.480E+00	2.149E+01	2.397E+01	1.130E+02	7.374E-01	1.220E+01	-0.000	0.002	0.000

ELECTRONS IN PHOTOGRAPHIC EMULSION

I = 331.0 eV DENSITY = 3.815E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.302E+01	1.310E-02	1.304E+01	4.664E-04	4.991E-04	0.0	-0.282	0.359	0.338
0.0125	1.114E+01	1.396E-02	1.116E+01	6.745E-04	6.250E-04	0.0	-0.266	0.332	0.315
0.0150	9.798E+00	1.463E-02	9.813E+00	9.140E-04	7.494E-04	0.0	-0.253	0.313	0.298
0.0175	8.782E+00	1.518E-02	8.797E+00	1.184E-03	8.722E-04	0.0	-0.244	0.298	0.285
0.0200	7.984E+00	1.565E-02	8.000E+00	1.482E-03	9.934E-04	0.0	-0.237	0.286	0.274
0.0250	6.810E+00	1.639E-02	6.827E+00	2.161E-03	1.231E-03	0.0	-0.225	0.269	0.258
0.0300	5.983E+00	1.697E-02	6.000E+00	2.945E-03	1.462E-03	0.0	-0.216	0.256	0.247
0.0350	5.366E+00	1.745E-02	5.383E+00	3.826E-03	1.687E-03	0.0	-0.210	0.246	0.238
0.0400	4.887E+00	1.786E-02	4.905E+00	4.801E-03	1.906E-03	0.0	-0.204	0.238	0.231
0.0450	4.504E+00	1.822E-02	4.522E+00	5.863E-03	2.121E-03	0.0	-0.200	0.231	0.225
0.0500	4.190E+00	1.854E-02	4.209E+00	7.011E-03	2.330E-03	0.0	-0.196	0.225	0.220
0.0550	3.928E+00	1.884E-02	3.947E+00	8.238E-03	2.536E-03	0.0	-0.192	0.221	0.215
0.0600	3.706E+00	1.910E-02	3.725E+00	9.543E-03	2.737E-03	0.0	-0.189	0.216	0.211
0.0700	3.349E+00	1.959E-02	3.369E+00	1.237E-02	3.128E-03	0.0	-0.184	0.209	0.205
0.0800	3.075E+00	2.003E-02	3.095E+00	1.547E-02	3.506E-03	0.0	-0.180	0.204	0.200
0.0900	2.857E+00	2.044E-02	2.878E+00	1.883E-02	3.870E-03	0.0	-0.176	0.199	0.195
0.1000	2.680E+00	2.081E-02	2.701E+00	2.242E-02	4.224E-03	0.0	-0.173	0.195	0.191
0.1250	2.356E+00	2.169E-02	2.378E+00	3.232E-02	5.064E-03	0.0	-0.167	0.187	0.184
0.1500	2.136E+00	2.251E-02	2.159E+00	4.338E-02	5.850E-03	0.0	-0.162	0.181	0.178
0.1750	1.978E+00	2.329E-02	2.001E+00	5.543E-02	6.592E-03	0.0	-0.159	0.176	0.173
0.2000	1.858E+00	2.405E-02	1.883E+00	6.833E-02	7.294E-03	0.0	-0.155	0.172	0.170
0.2500	1.693E+00	2.560E-02	1.718E+00	9.622E-02	8.606E-03	0.0	-0.150	0.166	0.163
0.3000	1.585E+00	2.721E-02	1.612E+00	1.263E-01	9.822E-03	0.0	-0.147	0.161	0.159
0.3500	1.509E+00	2.890E-02	1.537E+00	1.581E-01	1.097E-02	1.408E-02	-0.127	0.155	0.152
0.4000	1.453E+00	3.066E-02	1.484E+00	1.913E-01	1.206E-02	3.297E-02	-0.121	0.149	0.146
0.4500	1.412E+00	3.251E-02	1.444E+00	2.254E-01	1.312E-02	5.225E-02	-0.117	0.144	0.141
0.5000	1.381E+00	3.443E-02	1.415E+00	2.604E-01	1.415E-02	7.178E-02	-0.113	0.140	0.136
0.5500	1.356E+00	3.642E-02	1.393E+00	2.960E-01	1.516E-02	9.146E-02	-0.109	0.136	0.132
0.6000	1.338E+00	3.846E-02	1.376E+00	3.322E-01	1.615E-02	1.112E-01	-0.106	0.133	0.128
0.7000	1.311E+00	4.269E-02	1.354E+00	4.055E-01	1.809E-02	1.505E-01	-0.101	0.127	0.122
0.8000	1.295E+00	4.711E-02	1.342E+00	4.797E-01	2.000E-02	1.895E-01	-0.097	0.122	0.116
0.9000	1.284E+00	5.168E-02	1.336E+00	5.544E-01	2.187E-02	2.278E-01	-0.094	0.118	0.112
1.0000	1.278E+00	5.640E-02	1.335E+00	6.293E-01	2.373E-02	2.652E-01	-0.090	0.114	0.108
1.2500	1.274E+00	6.874E-02	1.343E+00	8.162E-01	2.833E-02	3.551E-01	-0.084	0.107	0.100
1.5000	1.278E+00	8.177E-02	1.360E+00	1.001E+00	3.289E-02	4.394E-01	-0.080	0.102	0.093
1.7500	1.285E+00	9.534E-02	1.380E+00	1.184E+00	3.742E-02	5.186E-01	-0.076	0.097	0.088
2.0000	1.294E+00	1.094E-01	1.403E+00	1.363E+00	4.193E-02	5.933E-01	-0.073	0.094	0.084
2.5000	1.312E+00	1.385E-01	1.451E+00	1.714E+00	5.089E-02	7.310E-01	-0.067	0.087	0.077
3.0000	1.331E+00	1.687E-01	1.499E+00	2.053E+00	5.974E-02	8.560E-01	-0.063	0.083	0.072
3.5000	1.347E+00	1.999E-01	1.547E+00	2.381E+00	6.848E-02	9.707E-01	-0.060	0.079	0.067
4.0000	1.363E+00	2.317E-01	1.595E+00	2.699E+00	7.708E-02	1.077E+00	-0.057	0.075	0.063
4.5000	1.377E+00	2.642E-01	1.641E+00	3.008E+00	8.554E-02	1.175E+00	-0.054	0.072	0.060
5.0000	1.390E+00	2.973E-01	1.687E+00	3.309E+00	9.385E-02	1.268E+00	-0.052	0.070	0.057
5.5000	1.401E+00	3.309E-01	1.732E+00	3.601E+00	1.020E-01	1.355E+00	-0.050	0.068	0.055
6.0000	1.412E+00	3.649E-01	1.777E+00	3.886E+00	1.100E-01	1.437E+00	-0.048	0.066	0.052
7.0000	1.431E+00	4.340E-01	1.865E+00	4.436E+00	1.256E-01	1.590E+00	-0.045	0.062	0.049
8.0000	1.448E+00	5.045E-01	1.952E+00	4.960E+00	1.406E-01	1.729E+00	-0.043	0.059	0.045
9.0000	1.462E+00	5.760E-01	2.038E+00	5.461E+00	1.551E-01	1.856E+00	-0.040	0.056	0.042
10.0000	1.475E+00	6.485E-01	2.123E+00	5.942E+00	1.690E-01	1.975E+00	-0.038	0.054	0.040
12.5000	1.502E+00	8.331E-01	2.335E+00	7.064E+00	2.015E-01	2.240E+00	-0.034	0.049	0.035
15.0000	1.523E+00	1.022E+00	2.545E+00	8.089E+00	2.312E-01	2.471E+00	-0.031	0.046	0.031
17.5000	1.540E+00	1.213E+00	2.754E+00	9.033E+00	2.584E-01	2.675E+00	-0.028	0.043	0.027
20.0000	1.555E+00	1.407E+00	2.963E+00	9.909E+00	2.834E-01	2.858E+00	-0.026	0.040	0.025
25.0000	1.579E+00	1.802E+00	3.381E+00	1.149E+01	3.277E-01	3.178E+00	-0.023	0.036	0.021
30.0000	1.598E+00	2.202E+00	3.800E+00	1.288E+01	3.659E-01	3.451E+00	-0.020	0.033	0.018
35.0000	1.613E+00	2.606E+00	4.220E+00	1.413E+01	3.993E-01	3.689E+00	-0.018	0.031	0.016
40.0000	1.626E+00	3.015E+00	4.641E+00	1.526E+01	4.286E-01	3.899E+00	-0.017	0.029	0.014
45.0000	1.638E+00	3.426E+00	5.064E+00	1.629E+01	4.547E-01	4.089E+00	-0.016	0.028	0.013
50.0000	1.648E+00	3.840E+00	5.488E+00	1.724E+01	4.781E-01	4.261E+00	-0.015	0.027	0.012
55.0000	1.657E+00	4.256E+00	5.913E+00	1.812E+01	4.992E-01	4.419E+00	-0.014	0.025	0.011
60.0000	1.665E+00	4.674E+00	6.338E+00	1.893E+01	5.183E-01	4.565E+00	-0.013	0.025	0.010
70.0000	1.678E+00	5.513E+00	7.192E+00	2.041E+01	5.518E-01	4.828E+00	-0.011	0.023	0.008
80.0000	1.690E+00	6.358E+00	8.048E+00	2.173E+01	5.801E-01	5.059E+00	-0.010	0.022	0.007
90.0000	1.700E+00	7.206E+00	8.906E+00	2.291E+01	6.045E-01	5.266E+00	-0.009	0.021	0.007
100.0000	1.709E+00	8.056E+00	9.766E+00	2.398E+01	6.258E-01	5.453E+00	-0.009	0.020	0.006
125.0000	1.728E+00	1.019E+01	1.192E+01	2.629E+01	6.688E-01	5.855E+00	-0.007	0.018	0.005
150.0000	1.743E+00	1.234E+01	1.409E+01	2.822E+01	7.017E-01	6.190E+00	-0.006	0.017	0.004
175.0000	1.755E+00	1.450E+01	1.625E+01	2.987E+01	7.279E-01	6.476E+00	-0.005	0.016	0.003
200.0000	1.766E+00	1.666E+01	1.843E+01	3.131E+01	7.492E-01	6.726E+00	-0.005	0.015	0.003
250.0000	1.783E+00	2.100E+01	2.278E+01	3.375E+01	7.820E-01	7.147E+00	-0.004	0.014	0.002
300.0000	1.797E+00	2.535E+01	2.714E+01	3.576E+01	8.064E-01	7.495E+00	-0.003	0.014	0.002
350.0000	1.808E+00	2.970E+01	3.151E+01	3.747E+01	8.252E-01	7.791E+00	-0.003	0.013	0.002
400.0000	1.818E+00	3.407E+01	3.589E+01	3.895E+01	8.404E-01	8.048E+00	-0.003	0.012	0.002
450.0000	1.827E+00	3.844E+01	4.027E+01	4.027E+01	8.528E-01	8.276E+00	-0.002	0.012	0.001
500.0000	1.835E+00	4.281E+01	4.465E+01	4.145E+01	8.632E-01	8.481E+00	-0.002	0.012	0.001
550.0000	1.842E+00	4.719E+01	4.903E+01	4.251E+01	8.720E-01	8.666E+00	-0.002	0.011	0.001
600.0000	1.848E+00	5.157E+01	5.342E+01	4.349E+01	8.797E-01	8.836E+00	-0.002	0.011	0.001
700.0000	1.859E+00	6.034E+01	6.220E+01	4.522E+01	8.923E-01	9.138E+00	-0.001	0.011	0.001
800.0000	1.869E+00	6.912E+01	7.099E+01	4.673E+01	9.023E-01	9.401E+00	-0.001	0.010	0.001
900.0000	1.878E+00	7.790E+01	7.978E+01	4.806E+01	9.104E-01	9.633E+00	-0.001	0.010	0.001
1000.0000	1.885E+00	8.669E+01	8.858E+01	4.924E+01	9.171E-01	9.841E+00	-0.001	0.010	0.001

ELECTRONS IN PLASTIC SCINTILLATOR (VINYLTOLUENE BASED)

I = 64.7 eV DENSITY = 1.032E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.265E+01	2.965E-03	2.265E+01	2.495E-04	7.219E-05	0.0	-0.193	0.220	0.218
0.0125	1.902E+01	2.975E-03	1.903E+01	3.704E-04	8.650E-05	0.0	-0.185	0.210	0.209
0.0150	1.650E+01	2.982E-03	1.650E+01	5.120E-04	1.002E-04	0.0	-0.179	0.202	0.201
0.0175	1.463E+01	2.987E-03	1.463E+01	6.732E-04	1.134E-04	0.0	-0.175	0.196	0.195
0.0200	1.318E+01	2.992E-03	1.318E+01	8.535E-04	1.262E-04	0.0	-0.171	0.191	0.190
0.0250	1.109E+01	3.000E-03	1.109E+01	1.269E-03	1.507E-04	0.0	-0.165	0.183	0.183
0.0300	9.642E+00	3.010E-03	9.645E+00	1.754E-03	1.742E-04	0.0	-0.160	0.177	0.177
0.0350	8.578E+00	3.021E-03	8.581E+00	2.305E-03	1.967E-04	0.0	-0.156	0.173	0.172
0.0400	7.760E+00	3.032E-03	7.763E+00	2.918E-03	2.186E-04	0.0	-0.153	0.169	0.169
0.0450	7.112E+00	3.045E-03	7.115E+00	3.592E-03	2.398E-04	0.0	-0.151	0.166	0.165
0.0500	6.584E+00	3.058E-03	6.587E+00	4.323E-03	2.604E-04	0.0	-0.148	0.163	0.163
0.0550	6.146E+00	3.072E-03	6.150E+00	5.109E-03	2.805E-04	0.0	-0.146	0.161	0.160
0.0600	5.777E+00	3.087E-03	5.780E+00	5.948E-03	3.002E-04	0.0	-0.145	0.158	0.158
0.0700	5.187E+00	3.119E-03	5.190E+00	7.778E-03	3.384E-04	0.0	-0.142	0.155	0.155
0.0800	4.737E+00	3.153E-03	4.740E+00	9.797E-03	3.753E-04	0.0	-0.139	0.152	0.152
0.0900	4.382E+00	3.189E-03	4.386E+00	1.199E-02	4.109E-04	0.0	-0.137	0.149	0.149
0.1000	4.095E+00	3.228E-03	4.099E+00	1.435E-02	4.456E-04	0.0	-0.135	0.147	0.147
0.1250	3.572E+00	3.333E-03	3.575E+00	2.091E-02	5.286E-04	0.0	-0.131	0.143	0.142
0.1500	3.219E+00	3.446E-03	3.222E+00	2.830E-02	6.074E-04	0.0	-0.128	0.139	0.139
0.1750	2.965E+00	3.566E-03	2.969E+00	3.639E-02	6.828E-04	0.0	-0.126	0.137	0.136
0.2000	2.775E+00	3.693E-03	2.779E+00	4.511E-02	7.557E-04	0.0	-0.124	0.134	0.134
0.2500	2.510E+00	3.966E-03	2.514E+00	6.409E-02	8.953E-04	0.0	-0.121	0.131	0.130
0.3000	2.337E+00	4.264E-03	2.342E+00	8.474E-02	1.029E-03	0.0	-0.118	0.128	0.127
0.3500	2.217E+00	4.583E-03	2.222E+00	1.067E-01	1.160E-03	0.0	-0.117	0.126	0.125
0.4000	2.129E+00	4.923E-03	2.134E+00	1.297E-01	1.288E-03	1.600E-02	-0.092	0.121	0.120
0.4500	2.061E+00	5.281E-03	2.066E+00	1.535E-01	1.415E-03	4.447E-02	-0.086	0.116	0.114
0.5000	2.009E+00	5.655E-03	2.014E+00	1.780E-01	1.541E-03	7.551E-02	-0.080	0.112	0.108
0.5500	1.967E+00	6.045E-03	1.973E+00	2.031E-01	1.668E-03	1.084E-01	-0.075	0.107	0.103
0.6000	1.934E+00	6.448E-03	1.941E+00	2.287E-01	1.795E-03	1.426E-01	-0.071	0.104	0.099
0.7000	1.886E+00	7.291E-03	1.893E+00	2.809E-01	2.051E-03	2.134E-01	-0.064	0.097	0.091
0.8000	1.853E+00	8.178E-03	1.861E+00	3.342E-01	2.310E-03	2.854E-01	-0.059	0.091	0.084
0.9000	1.830E+00	9.105E-03	1.839E+00	3.883E-01	2.572E-03	3.574E-01	-0.055	0.086	0.079
1.0000	1.814E+00	1.007E-02	1.824E+00	4.429E-01	2.839E-03	4.284E-01	-0.051	0.082	0.074
1.2500	1.792E+00	1.262E-02	1.804E+00	5.808E-01	3.521E-03	5.989E-01	-0.045	0.074	0.064
1.5000	1.784E+00	1.535E-02	1.799E+00	7.196E-01	4.228E-03	7.575E-01	-0.041	0.068	0.058
1.7500	1.783E+00	1.823E-02	1.801E+00	8.586E-01	4.956E-03	9.041E-01	-0.038	0.063	0.053
2.0000	1.785E+00	2.124E-02	1.807E+00	9.972E-01	5.704E-03	1.040E+00	-0.036	0.059	0.049
2.5000	1.796E+00	2.756E-02	1.823E+00	1.273E+00	7.249E-03	1.282E+00	-0.033	0.054	0.043
3.0000	1.808E+00	3.423E-02	1.842E+00	1.546E+00	8.848E-03	1.493E+00	-0.031	0.050	0.039
3.5000	1.821E+00	4.117E-02	1.862E+00	1.816E+00	1.049E-02	1.680E+00	-0.029	0.047	0.037
4.0000	1.833E+00	4.835E-02	1.882E+00	2.083E+00	1.217E-02	1.848E+00	-0.028	0.044	0.034
4.5000	1.845E+00	5.574E-02	1.901E+00	2.347E+00	1.387E-02	2.000E+00	-0.027	0.042	0.033
5.0000	1.856E+00	6.331E-02	1.919E+00	2.609E+00	1.560E-02	2.139E+00	-0.026	0.041	0.031
5.5000	1.866E+00	7.105E-02	1.937E+00	2.868E+00	1.735E-02	2.268E+00	-0.025	0.039	0.030
6.0000	1.875E+00	7.892E-02	1.954E+00	3.125E+00	1.911E-02	2.387E+00	-0.024	0.038	0.029
7.0000	1.892E+00	9.507E-02	1.988E+00	3.632E+00	2.268E-02	2.604E+00	-0.022	0.036	0.027
8.0000	1.907E+00	1.116E-01	2.019E+00	4.132E+00	2.629E-02	2.798E+00	-0.021	0.034	0.025
9.0000	1.921E+00	1.286E-01	2.049E+00	4.623E+00	2.993E-02	2.973E+00	-0.019	0.032	0.024
10.0000	1.932E+00	1.459E-01	2.078E+00	5.108E+00	3.359E-02	3.134E+00	-0.018	0.031	0.023
12.5000	1.957E+00	1.902E-01	2.147E+00	6.291E+00	4.275E-02	3.487E+00	-0.015	0.028	0.020
15.0000	1.976E+00	2.359E-01	2.212E+00	7.438E+00	5.191E-02	3.788E+00	-0.012	0.025	0.017
17.5000	1.992E+00	2.826E-01	2.274E+00	8.553E+00	6.099E-02	4.051E+00	-0.010	0.023	0.015
20.0000	2.005E+00	3.301E-01	2.335E+00	9.637E+00	6.998E-02	4.286E+00	-0.008	0.022	0.013
25.0000	2.027E+00	4.268E-01	2.453E+00	1.173E+01	8.755E-02	4.689E+00	-0.006	0.019	0.011
30.0000	2.043E+00	5.254E-01	2.569E+00	1.372E+01	1.045E-01	5.028E+00	-0.004	0.017	0.009
35.0000	2.058E+00	6.252E-01	2.683E+00	1.562E+01	1.209E-01	5.319E+00	-0.003	0.015	0.007
40.0000	2.069E+00	7.262E-01	2.796E+00	1.745E+01	1.366E-01	5.574E+00	-0.003	0.014	0.006
45.0000	2.080E+00	8.281E-01	2.908E+00	1.920E+01	1.517E-01	5.801E+00	-0.002	0.012	0.005
50.0000	2.089E+00	9.306E-01	3.020E+00	2.089E+01	1.662E-01	6.005E+00	-0.002	0.012	0.004
55.0000	2.097E+00	1.034E+00	3.131E+00	2.251E+01	1.801E-01	6.191E+00	-0.001	0.011	0.004
60.0000	2.105E+00	1.138E+00	3.243E+00	2.408E+01	1.935E-01	6.361E+00	-0.001	0.010	0.003
70.0000	2.118E+00	1.347E+00	3.465E+00	2.707E+01	2.187E-01	6.663E+00	-0.001	0.009	0.003
80.0000	2.129E+00	1.557E+00	3.687E+00	2.986E+01	2.421E-01	6.926E+00	-0.001	0.008	0.002
90.0000	2.139E+00	1.769E+00	3.909E+00	3.250E+01	2.638E-01	7.159E+00	-0.001	0.008	0.002
100.0000	2.148E+00	1.982E+00	4.130E+00	3.499E+01	2.841E-01	7.367E+00	-0.001	0.007	0.002
125.0000	2.167E+00	2.518E+00	4.685E+00	4.066E+01	3.292E-01	7.810E+00	-0.000	0.006	0.001
150.0000	2.182E+00	3.058E+00	5.241E+00	4.571E+01	3.679E-01	8.172E+00	-0.000	0.006	0.001
175.0000	2.195E+00	3.601E+00	5.797E+00	5.024E+01	4.015E-01	8.479E+00	-0.000	0.005	0.001
200.0000	2.207E+00	4.147E+00	6.353E+00	5.436E+01	4.310E-01	8.745E+00	-0.000	0.005	0.001
250.0000	2.225E+00	5.243E+00	7.468E+00	6.161E+01	4.805E-01	9.190E+00	-0.000	0.004	0.001
300.0000	2.240E+00	6.345E+00	8.585E+00	6.785E+01	5.207E-01	9.554E+00	-0.000	0.004	0.000
350.0000	2.253E+00	7.451E+00	9.704E+00	7.332E+01	5.540E-01	9.861E+00	-0.000	0.004	0.000
400.0000	2.264E+00	8.560E+00	1.082E+01	7.820E+01	5.822E-01	1.013E+01	-0.000	0.003	0.000
450.0000	2.274E+00	9.671E+00	1.195E+01	8.260E+01	6.065E-01	1.036E+01	-0.000	0.003	0.000
500.0000	2.283E+00	1.078E+01	1.307E+01	8.660E+01	6.276E-01	1.057E+01	-0.000	0.003	0.000
550.0000	2.291E+00	1.190E+01	1.419E+01	9.027E+01	6.462E-01	1.076E+01	-0.000	0.003	0.000
600.0000	2.298E+00	1.302E+01	1.531E+01	9.366E+01	6.627E-01	1.094E+01	-0.000	0.003	0.000
700.0000	2.311E+00	1.525E+01	1.756E+01	9.975E+01	6.908E-01	1.125E+01	-0.000	0.003	0.000
800.0000	2.322E+00	1.749E+01	1.981E+01	1.051E+02	7.140E-01	1.151E+01	-0.000	0.002	0.000
900.0000	2.332E+00	1.973E+01	2.206E+01	1.099E+02	7.334E-01	1.175E+01	-0.000	0.002	0.000
1000.0000	2.341E+00	2.198E+01	2.432E+01	1.142E+02	7.500E-01	1.196E+01	-0.000	0.002	0.000

ELECTRONS IN POLYCARBONATE, "MAKROLON", "LEXAN"

I = 73.1 eV DENSITY = 1.200E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.153E+01	3.240E-03	2.153E+01	2.634E-04	8.291E-05	0.0	-0.198	0.226	0.225
0.0125	1.810E+01	3.254E-03	1.810E+01	3.906E-04	9.938E-05	0.0	-0.190	0.215	0.214
0.0150	1.571E+01	3.263E-03	1.571E+01	5.393E-04	1.151E-04	0.0	-0.183	0.207	0.206
0.0175	1.393E+01	3.270E-03	1.394E+01	7.086E-04	1.303E-04	0.0	-0.178	0.201	0.200
0.0200	1.256E+01	3.275E-03	1.257E+01	8.978E-04	1.450E-04	0.0	-0.174	0.196	0.195
0.0250	1.058E+01	3.284E-03	1.058E+01	1.333E-03	1.731E-04	0.0	-0.168	0.188	0.187
0.0300	9.202E+00	3.293E-03	9.205E+00	1.842E-03	2.000E-04	0.0	-0.163	0.181	0.181
0.0350	8.190E+00	3.304E-03	8.193E+00	2.419E-03	2.258E-04	0.0	-0.159	0.177	0.176
0.0400	7.412E+00	3.315E-03	7.416E+00	3.061E-03	2.507E-04	0.0	-0.156	0.173	0.172
0.0450	6.795E+00	3.327E-03	6.798E+00	3.766E-03	2.749E-04	0.0	-0.153	0.169	0.169
0.0500	6.293E+00	3.340E-03	6.296E+00	4.531E-03	2.984E-04	0.0	-0.151	0.166	0.166
0.0550	5.876E+00	3.355E-03	5.879E+00	5.354E-03	3.213E-04	0.0	-0.149	0.164	0.164
0.0600	5.524E+00	3.370E-03	5.527E+00	6.231E-03	3.437E-04	0.0	-0.147	0.162	0.161
0.0700	4.962E+00	3.403E-03	4.965E+00	8.144E-03	3.872E-04	0.0	-0.144	0.158	0.158
0.0800	4.533E+00	3.439E-03	4.536E+00	1.025E-02	4.290E-04	0.0	-0.142	0.155	0.154
0.0900	4.194E+00	3.477E-03	4.198E+00	1.255E-02	4.695E-04	0.0	-0.139	0.152	0.152
0.1000	3.920E+00	3.518E-03	3.924E+00	1.502E-02	5.088E-04	0.0	-0.137	0.150	0.149
0.1250	3.421E+00	3.629E-03	3.425E+00	2.186E-02	6.028E-04	0.0	-0.134	0.145	0.145
0.1500	3.084E+00	3.749E-03	3.088E+00	2.957E-02	6.919E-04	0.0	-0.131	0.142	0.141
0.1750	2.842E+00	3.877E-03	2.846E+00	3.802E-02	7.772E-04	0.0	-0.128	0.139	0.138
0.2000	2.660E+00	4.013E-03	2.664E+00	4.711E-02	8.594E-04	0.0	-0.126	0.137	0.136
0.2500	2.407E+00	4.304E-03	2.412E+00	6.691E-02	1.017E-03	0.0	-0.123	0.133	0.132
0.3000	2.242E+00	4.623E-03	2.247E+00	8.843E-02	1.168E-03	0.0	-0.120	0.130	0.129
0.3500	2.128E+00	4.964E-03	2.133E+00	1.113E-01	1.314E-03	0.0	-0.118	0.128	0.126
0.4000	2.044E+00	5.327E-03	2.050E+00	1.352E-01	1.458E-03	5.680E-03	-0.098	0.125	0.123
0.4500	1.980E+00	5.710E-03	1.986E+00	1.600E-01	1.600E-03	3.196E-02	-0.089	0.120	0.117
0.5000	1.930E+00	6.112E-03	1.936E+00	1.855E-01	1.741E-03	6.091E-02	-0.083	0.115	0.112
0.5500	1.891E+00	6.529E-03	1.897E+00	2.116E-01	1.883E-03	9.181E-02	-0.078	0.111	0.107
0.6000	1.859E+00	6.961E-03	1.866E+00	2.382E-01	2.025E-03	1.241E-01	-0.074	0.107	0.102
0.7000	1.813E+00	7.864E-03	1.821E+00	2.925E-01	2.310E-03	1.913E-01	-0.067	0.100	0.094
0.8000	1.782E+00	8.813E-03	1.791E+00	3.479E-01	2.599E-03	2.602E-01	-0.061	0.094	0.087
0.9000	1.761E+00	9.806E-03	1.771E+00	4.041E-01	2.891E-03	3.293E-01	-0.057	0.089	0.082
1.0000	1.746E+00	1.084E-02	1.757E+00	4.608E-01	3.187E-03	3.978E-01	-0.053	0.085	0.077
1.2500	1.726E+00	1.357E-02	1.739E+00	6.039E-01	3.946E-03	5.631E-01	-0.047	0.077	0.067
1.5000	1.719E+00	1.650E-02	1.735E+00	7.479E-01	4.730E-03	7.177E-01	-0.042	0.070	0.060
1.7500	1.718E+00	1.958E-02	1.738E+00	8.919E-01	5.537E-03	8.611E-01	-0.039	0.065	0.055
2.0000	1.721E+00	2.279E-02	1.744E+00	1.036E+00	6.365E-03	9.941E-01	-0.037	0.062	0.050
2.5000	1.731E+00	2.955E-02	1.761E+00	1.321E+00	8.075E-03	1.233E+00	-0.033	0.056	0.045
3.0000	1.744E+00	3.667E-02	1.781E+00	1.603E+00	9.842E-03	1.441E+00	-0.031	0.051	0.040
3.5000	1.757E+00	4.408E-02	1.801E+00	1.883E+00	1.165E-02	1.626E+00	-0.030	0.048	0.038
4.0000	1.769E+00	5.174E-02	1.821E+00	2.159E+00	1.350E-02	1.792E+00	-0.028	0.046	0.035
4.5000	1.780E+00	5.962E-02	1.840E+00	2.432E+00	1.538E-02	1.942E+00	-0.027	0.044	0.033
5.0000	1.791E+00	6.770E-02	1.859E+00	2.702E+00	1.728E-02	2.080E+00	-0.026	0.042	0.032
5.5000	1.801E+00	7.594E-02	1.877E+00	2.970E+00	1.921E-02	2.207E+00	-0.025	0.040	0.031
6.0000	1.811E+00	8.434E-02	1.895E+00	3.235E+00	2.115E-02	2.325E+00	-0.024	0.039	0.029
7.0000	1.827E+00	1.015E-01	1.929E+00	3.758E+00	2.506E-02	2.539E+00	-0.023	0.037	0.028
8.0000	1.842E+00	1.192E-01	1.961E+00	4.272E+00	2.902E-02	2.730E+00	-0.021	0.035	0.026
9.0000	1.855E+00	1.373E-01	1.992E+00	4.778E+00	3.300E-02	2.903E+00	-0.020	0.033	0.024
10.0000	1.867E+00	1.557E-01	2.022E+00	5.276E+00	3.699E-02	3.061E+00	-0.019	0.032	0.023
12.5000	1.891E+00	2.029E-01	2.094E+00	6.491E+00	4.699E-02	3.408E+00	-0.016	0.029	0.020
15.0000	1.910E+00	2.515E-01	2.162E+00	7.665E+00	5.693E-02	3.704E+00	-0.013	0.026	0.018
17.5000	1.926E+00	3.011E-01	2.227E+00	8.805E+00	6.677E-02	3.963E+00	-0.011	0.024	0.016
20.0000	1.939E+00	3.516E-01	2.291E+00	9.911E+00	7.648E-02	4.193E+00	-0.009	0.023	0.014
25.0000	1.961E+00	4.544E-01	2.415E+00	1.204E+01	9.539E-02	4.590E+00	-0.007	0.020	0.012
30.0000	1.978E+00	5.591E-01	2.537E+00	1.406E+01	1.136E-01	4.924E+00	-0.005	0.018	0.009
35.0000	1.992E+00	6.652E-01	2.657E+00	1.598E+01	1.310E-01	5.212E+00	-0.004	0.016	0.008
40.0000	2.003E+00	7.724E-01	2.776E+00	1.782E+01	1.477E-01	5.464E+00	-0.003	0.015	0.007
45.0000	2.014E+00	8.805E-01	2.894E+00	1.959E+01	1.637E-01	5.689E+00	-0.003	0.013	0.006
50.0000	2.023E+00	9.894E-01	3.012E+00	2.128E+01	1.789E-01	5.892E+00	-0.002	0.012	0.005
55.0000	2.031E+00	1.099E+00	3.130E+00	2.291E+01	1.936E-01	6.077E+00	-0.002	0.012	0.005
60.0000	2.038E+00	1.209E+00	3.247E+00	2.448E+01	2.076E-01	6.246E+00	-0.002	0.011	0.004
70.0000	2.051E+00	1.431E+00	3.482E+00	2.745E+01	2.339E-01	6.547E+00	-0.001	0.010	0.003
80.0000	2.062E+00	1.654E+00	3.717E+00	3.023E+01	2.582E-01	6.809E+00	-0.001	0.009	0.003
90.0000	2.072E+00	1.879E+00	3.951E+00	3.284E+01	2.807E-01	7.041E+00	-0.001	0.008	0.002
100.0000	2.081E+00	2.105E+00	4.185E+00	3.530E+01	3.016E-01	7.249E+00	-0.001	0.008	0.002
125.0000	2.099E+00	2.673E+00	4.772E+00	4.089E+01	3.478E-01	7.691E+00	-0.000	0.007	0.001
150.0000	2.114E+00	3.245E+00	5.359E+00	4.583E+01	3.871E-01	8.053E+00	-0.000	0.006	0.001
175.0000	2.127E+00	3.820E+00	5.947E+00	5.025E+01	4.210E-01	8.360E+00	-0.000	0.006	0.001
200.0000	2.138E+00	4.398E+00	6.536E+00	5.426E+01	4.507E-01	8.625E+00	-0.000	0.005	0.001
250.0000	2.156E+00	5.560E+00	7.715E+00	6.130E+01	5.001E-01	9.070E+00	-0.000	0.005	0.001
300.0000	2.171E+00	6.726E+00	8.897E+00	6.733E+01	5.400E-01	9.434E+00	-0.000	0.004	0.001
350.0000	2.183E+00	7.897E+00	1.008E+01	7.260E+01	5.729E-01	9.741E+00	-0.000	0.004	0.000
400.0000	2.194E+00	9.071E+00	1.127E+01	7.729E+01	6.006E-01	1.001E+01	-0.000	0.004	0.000
450.0000	2.204E+00	1.025E+01	1.245E+01	8.151E+01	6.244E-01	1.024E+01	-0.000	0.003	0.000
500.0000	2.212E+00	1.143E+01	1.364E+01	8.535E+01	6.450E-01	1.045E+01	-0.000	0.003	0.000
550.0000	2.220E+00	1.261E+01	1.483E+01	8.886E+01	6.631E-01	1.064E+01	-0.000	0.003	0.000
600.0000	2.227E+00	1.379E+01	1.601E+01	9.211E+01	6.791E-01	1.082E+01	-0.000	0.003	0.000
700.0000	2.239E+00	1.615E+01	1.839E+01	9.793E+01	7.064E-01	1.113E+01	-0.000	0.003	0.000
800.0000	2.250E+00	1.852E+01	2.077E+01	1.030E+02	7.288E-01	1.139E+01	-0.000	0.003	0.000
900.0000	2.260E+00	2.089E+01	2.315E+01	1.076E+02	7.475E-01	1.163E+01	-0.000	0.003	0.000
1000.0000	2.268E+00	2.327E+01	2.554E+01	1.117E+02	7.634E-01	1.184E+01	-0.000	0.003	0.000

ELECTRONS IN POLYETHYLENE

I = 57.4 eV DENSITY = 9.400E-01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.441E+01	2.837E-03	2.442E+01	2.308E-04	6.391E-05	0.0	-0.189	0.214	0.213
0.0125	2.049E+01	2.847E-03	2.049E+01	3.430E-04	7.666E-05	0.0	-0.181	0.204	0.203
0.0150	1.775E+01	2.854E-03	1.776E+01	4.745E-04	8.887E-05	0.0	-0.176	0.197	0.196
0.0175	1.573E+01	2.860E-03	1.573E+01	6.244E-04	1.007E-04	0.0	-0.171	0.191	0.191
0.0200	1.417E+01	2.864E-03	1.417E+01	7.921E-04	1.121E-04	0.0	-0.167	0.187	0.186
0.0250	1.191E+01	2.873E-03	1.192E+01	1.179E-03	1.340E-04	0.0	-0.161	0.179	0.179
0.0300	1.035E+01	2.883E-03	1.036E+01	1.630E-03	1.550E-04	0.0	-0.157	0.174	0.173
0.0350	9.206E+00	2.894E-03	9.209E+00	2.143E-03	1.752E-04	0.0	-0.153	0.169	0.169
0.0400	8.325E+00	2.905E-03	8.328E+00	2.715E-03	1.948E-04	0.0	-0.150	0.166	0.165
0.0450	7.627E+00	2.918E-03	7.630E+00	3.343E-03	2.138E-04	0.0	-0.148	0.162	0.162
0.0500	7.060E+00	2.931E-03	7.063E+00	4.025E-03	2.323E-04	0.0	-0.146	0.160	0.160
0.0550	6.589E+00	2.945E-03	6.592E+00	4.758E-03	2.503E-04	0.0	-0.144	0.157	0.157
0.0600	6.191E+00	2.960E-03	6.194E+00	5.541E-03	2.680E-04	0.0	-0.142	0.155	0.155
0.0700	5.557E+00	2.992E-03	5.560E+00	7.249E-03	3.023E-04	0.0	-0.139	0.152	0.152
0.0800	5.074E+00	3.025E-03	5.077E+00	9.134E-03	3.354E-04	0.0	-0.137	0.149	0.149
0.0900	4.692E+00	3.061E-03	4.696E+00	1.118E-02	3.675E-04	0.0	-0.135	0.147	0.146
0.1000	4.384E+00	3.099E-03	4.387E+00	1.339E-02	3.987E-04	0.0	-0.133	0.144	0.144
0.1250	3.822E+00	3.201E-03	3.825E+00	1.952E-02	4.733E-04	0.0	-0.129	0.140	0.140
0.1500	3.443E+00	3.312E-03	3.446E+00	2.642E-02	5.443E-04	0.0	-0.127	0.137	0.137
0.1750	3.171E+00	3.429E-03	3.174E+00	3.399E-02	6.124E-04	0.0	-0.124	0.134	0.134
0.2000	2.967E+00	3.553E-03	2.970E+00	4.215E-02	6.782E-04	0.0	-0.122	0.132	0.132
0.2500	2.683E+00	3.820E-03	2.687E+00	5.991E-02	8.045E-04	0.0	-0.119	0.129	0.128
0.3000	2.497E+00	4.110E-03	2.501E+00	7.923E-02	9.258E-04	0.0	-0.116	0.126	0.125
0.3500	2.368E+00	4.420E-03	2.373E+00	9.979E-02	1.044E-03	0.0	-0.109	0.124	0.123
0.4000	2.272E+00	4.750E-03	2.277E+00	1.213E-01	1.160E-03	2.626E-02	-0.087	0.118	0.116
0.4500	2.199E+00	5.098E-03	2.204E+00	1.437E-01	1.276E-03	5.906E-02	-0.081	0.113	0.110
0.5000	2.142E+00	5.462E-03	2.147E+00	1.667E-01	1.391E-03	9.409E-02	-0.075	0.108	0.104
0.5500	2.097E+00	5.841E-03	2.103E+00	1.902E-01	1.506E-03	1.307E-01	-0.070	0.104	0.099
0.6000	2.061E+00	6.233E-03	2.068E+00	2.142E-01	1.622E-03	1.683E-01	-0.066	0.100	0.095
0.7000	2.008E+00	7.053E-03	2.016E+00	2.632E-01	1.856E-03	2.453E-01	-0.060	0.093	0.087
0.8000	1.972E+00	7.915E-03	1.980E+00	3.133E-01	2.092E-03	3.231E-01	-0.054	0.087	0.080
0.9000	1.947E+00	8.816E-03	1.956E+00	3.641E-01	2.332E-03	4.002E-01	-0.050	0.082	0.074
1.0000	1.930E+00	9.754E-03	1.940E+00	4.155E-01	2.575E-03	4.759E-01	-0.047	0.078	0.069
1.2500	1.905E+00	1.224E-02	1.917E+00	5.452E-01	3.200E-03	6.568E-01	-0.041	0.070	0.060
1.5000	1.895E+00	1.490E-02	1.910E+00	6.759E-01	3.848E-03	8.243E-01	-0.037	0.064	0.054
1.7500	1.893E+00	1.770E-02	1.911E+00	8.068E-01	4.516E-03	9.785E-01	-0.034	0.059	0.049
2.0000	1.895E+00	2.062E-02	1.916E+00	9.375E-01	5.203E-03	1.121E+00	-0.032	0.055	0.045
2.5000	1.905E+00	2.678E-02	1.932E+00	1.197E+00	6.623E-03	1.375E+00	-0.029	0.050	0.039
3.0000	1.917E+00	3.327E-02	1.950E+00	1.455E+00	8.095E-03	1.596E+00	-0.027	0.046	0.036
3.5000	1.930E+00	4.004E-02	1.970E+00	1.710E+00	9.608E-03	1.791E+00	-0.026	0.043	0.033
4.0000	1.942E+00	4.704E-02	1.989E+00	1.963E+00	1.116E-02	1.966E+00	-0.025	0.041	0.031
4.5000	1.954E+00	5.424E-02	2.008E+00	2.213E+00	1.273E-02	2.124E+00	-0.024	0.039	0.029
5.0000	1.965E+00	6.162E-02	2.026E+00	2.461E+00	1.433E-02	2.269E+00	-0.023	0.037	0.028
5.5000	1.975E+00	6.916E-02	2.044E+00	2.706E+00	1.594E-02	2.402E+00	-0.022	0.036	0.027
6.0000	1.984E+00	7.684E-02	2.061E+00	2.950E+00	1.758E-02	2.527E+00	-0.021	0.035	0.026
7.0000	2.002E+00	9.259E-02	2.094E+00	3.431E+00	2.089E-02	2.751E+00	-0.020	0.032	0.024
8.0000	2.017E+00	1.088E-01	2.126E+00	3.905E+00	2.424E-02	2.952E+00	-0.018	0.031	0.023
9.0000	2.030E+00	1.253E-01	2.156E+00	4.372E+00	2.762E-02	3.132E+00	-0.017	0.029	0.021
10.0000	2.042E+00	1.422E-01	2.184E+00	4.833E+00	3.102E-02	3.298E+00	-0.016	0.028	0.020
12.5000	2.067E+00	1.855E-01	2.253E+00	5.960E+00	3.956E-02	3.660E+00	-0.013	0.025	0.017
15.0000	2.087E+00	2.301E-01	2.317E+00	7.054E+00	4.811E-02	3.967E+00	-0.010	0.023	0.015
17.5000	2.103E+00	2.757E-01	2.379E+00	8.119E+00	5.661E-02	4.235E+00	-0.009	0.021	0.013
20.0000	2.117E+00	3.220E-01	2.439E+00	9.157E+00	6.503E-02	4.473E+00	-0.007	0.019	0.012
25.0000	2.139E+00	4.166E-01	2.556E+00	1.116E+01	8.156E-02	4.880E+00	-0.005	0.017	0.009
30.0000	2.157E+00	5.129E-01	2.670E+00	1.307E+01	9.759E-02	5.221E+00	-0.004	0.015	0.008
35.0000	2.171E+00	6.105E-01	2.782E+00	1.491E+01	1.131E-01	5.514E+00	-0.003	0.013	0.006
40.0000	2.184E+00	7.092E-01	2.893E+00	1.667E+01	1.280E-01	5.770E+00	-0.002	0.012	0.005
45.0000	2.195E+00	8.088E-01	3.004E+00	1.837E+01	1.424E-01	5.997E+00	-0.002	0.011	0.005
50.0000	2.204E+00	9.092E-01	3.114E+00	2.000E+01	1.562E-01	6.202E+00	-0.001	0.010	0.004
55.0000	2.213E+00	1.010E+00	3.223E+00	2.158E+01	1.695E-01	6.388E+00	-0.001	0.010	0.003
60.0000	2.221E+00	1.112E+00	3.333E+00	2.310E+01	1.824E-01	6.558E+00	-0.001	0.009	0.003
70.0000	2.235E+00	1.316E+00	3.551E+00	2.601E+01	2.067E-01	6.861E+00	-0.001	0.008	0.002
80.0000	2.247E+00	1.522E+00	3.769E+00	2.874E+01	2.293E-01	7.125E+00	-0.001	0.007	0.002
90.0000	2.257E+00	1.730E+00	3.987E+00	3.132E+01	2.504E-01	7.357E+00	-0.001	0.007	0.002
100.0000	2.267E+00	1.938E+00	4.205E+00	3.376E+01	2.701E-01	7.566E+00	-0.000	0.006	0.002
125.0000	2.287E+00	2.463E+00	4.749E+00	3.936E+01	3.142E-01	8.009E+00	-0.000	0.005	0.001
150.0000	2.303E+00	2.991E+00	5.294E+00	4.434E+01	3.523E-01	8.371E+00	-0.000	0.005	0.001
175.0000	2.316E+00	3.523E+00	5.839E+00	4.883E+01	3.855E-01	8.678E+00	-0.000	0.004	0.001
200.0000	2.328E+00	4.057E+00	6.385E+00	5.293E+01	4.148E-01	8.944E+00	-0.000	0.004	0.001
250.0000	2.348E+00	5.131E+00	7.479E+00	6.015E+01	4.642E-01	9.389E+00	-0.000	0.004	0.000
300.0000	2.364E+00	6.210E+00	8.574E+00	6.639E+01	5.045E-01	9.753E+00	-0.000	0.003	0.000
350.0000	2.377E+00	7.294E+00	9.671E+00	7.188E+01	5.381E-01	1.006E+01	-0.000	0.003	0.000
400.0000	2.389E+00	8.380E+00	1.077E+01	7.678E+01	5.667E-01	1.033E+01	-0.000	0.003	0.000
450.0000	2.399E+00	9.469E+00	1.187E+01	8.120E+01	5.913E-01	1.056E+01	-0.000	0.003	0.000
500.0000	2.409E+00	1.056E+01	1.297E+01	8.523E+01	6.128E-01	1.077E+01	-0.000	0.003	0.000
550.0000	2.417E+00	1.165E+01	1.407E+01	8.893E+01	6.318E-01	1.096E+01	-0.000	0.002	0.000
600.0000	2.425E+00	1.275E+01	1.517E+01	9.235E+01	6.487E-01	1.114E+01	-0.000	0.002	0.000
700.0000	2.438E+00	1.494E+01	1.738E+01	9.851E+01	6.775E-01	1.144E+01	-0.000	0.002	0.000
800.0000	2.450E+00	1.713E+01	1.958E+01	1.039E+02	7.012E-01	1.171E+01	-0.000	0.002	0.000
900.0000	2.460E+00	1.933E+01	2.179E+01	1.088E+02	7.212E-01	1.195E+01	-0.000	0.002	0.000
1000.0000	2.469E+00	2.153E+01	2.400E+01	1.131E+02	7.383E-01	1.216E+01	-0.000	0.002	0.000

ELECTRONS IN POLYETHYLENE TEREPTHALATE, "MYLAR"

I = 78.7 eV DENSITY = 1.400E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.095E+01	3.431E-03	2.095E+01	2.712E-04	9.013E-05	0.0	-0.201	0.230	0.228
0.0125	1.762E+01	3.448E-03	1.763E+01	4.019E-04	1.081E-04	0.0	-0.192	0.219	0.218
0.0150	1.530E+01	3.459E-03	1.530E+01	5.545E-04	1.252E-04	0.0	-0.186	0.211	0.210
0.0175	1.358E+01	3.466E-03	1.358E+01	7.283E-04	1.417E-04	0.0	-0.181	0.204	0.203
0.0200	1.225E+01	3.471E-03	1.225E+01	9.224E-04	1.577E-04	0.0	-0.177	0.199	0.198
0.0250	1.032E+01	3.481E-03	1.032E+01	1.369E-03	1.882E-04	0.0	-0.170	0.190	0.190
0.0300	8.978E+00	3.490E-03	8.982E+00	1.890E-03	2.174E-04	0.0	-0.165	0.184	0.183
0.0350	7.993E+00	3.500E-03	7.997E+00	2.481E-03	2.454E-04	0.0	-0.161	0.179	0.179
0.0400	7.236E+00	3.511E-03	7.239E+00	3.139E-03	2.724E-04	0.0	-0.158	0.175	0.174
0.0450	6.635E+00	3.524E-03	6.638E+00	3.862E-03	2.986E-04	0.0	-0.155	0.171	0.171
0.0500	6.145E+00	3.537E-03	6.149E+00	4.645E-03	3.240E-04	0.0	-0.153	0.168	0.168
0.0550	5.739E+00	3.552E-03	5.742E+00	5.487E-03	3.488E-04	0.0	-0.151	0.166	0.166
0.0600	5.396E+00	3.567E-03	5.399E+00	6.386E-03	3.731E-04	0.0	-0.149	0.164	0.163
0.0700	4.848E+00	3.601E-03	4.852E+00	8.344E-03	4.200E-04	0.0	-0.146	0.160	0.159
0.0800	4.430E+00	3.637E-03	4.433E+00	1.050E-02	4.652E-04	0.0	-0.143	0.157	0.156
0.0900	4.100E+00	3.677E-03	4.103E+00	1.285E-02	5.089E-04	0.0	-0.141	0.154	0.153
0.1000	3.832E+00	3.719E-03	3.836E+00	1.537E-02	5.513E-04	0.0	-0.139	0.151	0.151
0.1250	3.345E+00	3.835E-03	3.349E+00	2.238E-02	6.527E-04	0.0	-0.135	0.147	0.146
0.1500	3.016E+00	3.960E-03	3.020E+00	3.026E-02	7.487E-04	0.0	-0.132	0.143	0.143
0.1750	2.780E+00	4.094E-03	2.784E+00	3.890E-02	8.405E-04	0.0	-0.129	0.140	0.140
0.2000	2.603E+00	4.235E-03	2.607E+00	4.819E-02	9.290E-04	0.0	-0.127	0.138	0.137
0.2500	2.356E+00	4.540E-03	2.361E+00	6.841E-02	1.098E-03	0.0	-0.124	0.134	0.133
0.3000	2.195E+00	4.873E-03	2.200E+00	9.040E-02	1.260E-03	0.0	-0.121	0.131	0.130
0.3500	2.083E+00	5.230E-03	2.088E+00	1.138E-01	1.417E-03	0.0	-0.119	0.129	0.128
0.4000	2.001E+00	5.610E-03	2.007E+00	1.382E-01	1.571E-03	9.379E-03	-0.094	0.125	0.124
0.4500	1.938E+00	6.011E-03	1.944E+00	1.635E-01	1.724E-03	3.706E-02	-0.089	0.120	0.118
0.5000	1.889E+00	6.431E-03	1.896E+00	1.896E-01	1.875E-03	6.709E-02	-0.083	0.116	0.112
0.5500	1.851E+00	6.868E-03	1.858E+00	2.162E-01	2.027E-03	9.882E-02	-0.078	0.111	0.107
0.6000	1.821E+00	7.320E-03	1.828E+00	2.434E-01	2.179E-03	1.318E-01	-0.074	0.107	0.103
0.7000	1.776E+00	8.265E-03	1.784E+00	2.988E-01	2.484E-03	1.999E-01	-0.067	0.100	0.094
0.8000	1.745E+00	9.259E-03	1.755E+00	3.554E-01	2.793E-03	2.694E-01	-0.061	0.094	0.088
0.9000	1.724E+00	1.030E-02	1.735E+00	4.127E-01	3.106E-03	3.390E-01	-0.057	0.090	0.082
1.0000	1.710E+00	1.138E-02	1.721E+00	4.706E-01	3.422E-03	4.077E-01	-0.053	0.085	0.077
1.2500	1.690E+00	1.424E-02	1.705E+00	6.167E-01	4.233E-03	5.734E-01	-0.047	0.077	0.067
1.5000	1.684E+00	1.730E-02	1.701E+00	7.635E-01	5.070E-03	7.283E-01	-0.042	0.070	0.060
1.7500	1.683E+00	2.052E-02	1.704E+00	9.104E-01	5.931E-03	8.719E-01	-0.039	0.066	0.055
2.0000	1.686E+00	2.388E-02	1.710E+00	1.057E+00	6.815E-03	1.005E+00	-0.037	0.062	0.051
2.5000	1.697E+00	3.094E-02	1.728E+00	1.348E+00	8.637E-03	1.244E+00	-0.033	0.056	0.045
3.0000	1.709E+00	3.838E-02	1.748E+00	1.636E+00	1.052E-02	1.453E+00	-0.031	0.052	0.041
3.5000	1.722E+00	4.612E-02	1.768E+00	1.920E+00	1.245E-02	1.638E+00	-0.030	0.048	0.038
4.0000	1.734E+00	5.413E-02	1.788E+00	2.201E+00	1.441E-02	1.804E+00	-0.028	0.046	0.035
4.5000	1.745E+00	6.236E-02	1.808E+00	2.479E+00	1.641E-02	1.955E+00	-0.027	0.044	0.033
5.0000	1.756E+00	7.079E-02	1.827E+00	2.755E+00	1.843E-02	2.093E+00	-0.026	0.042	0.032
5.5000	1.766E+00	7.940E-02	1.845E+00	3.027E+00	2.047E-02	2.220E+00	-0.025	0.040	0.031
6.0000	1.775E+00	8.816E-02	1.863E+00	3.296E+00	2.253E-02	2.339E+00	-0.024	0.039	0.029
7.0000	1.792E+00	1.061E-01	1.898E+00	3.828E+00	2.669E-02	2.553E+00	-0.023	0.037	0.027
8.0000	1.806E+00	1.245E-01	1.931E+00	4.351E+00	3.088E-02	2.744E+00	-0.022	0.035	0.026
9.0000	1.819E+00	1.434E-01	1.963E+00	4.864E+00	3.509E-02	2.917E+00	-0.020	0.033	0.024
10.0000	1.831E+00	1.626E-01	1.993E+00	5.370E+00	3.931E-02	3.075E+00	-0.019	0.032	0.023
12.5000	1.855E+00	2.118E-01	2.066E+00	6.601E+00	4.986E-02	3.420E+00	-0.016	0.029	0.020
15.0000	1.874E+00	2.625E-01	2.136E+00	7.791E+00	6.034E-02	3.715E+00	-0.014	0.026	0.018
17.5000	1.889E+00	3.142E-01	2.204E+00	8.943E+00	7.069E-02	3.972E+00	-0.012	0.024	0.016
20.0000	1.903E+00	3.668E-01	2.270E+00	1.006E+01	8.087E-02	4.201E+00	-0.010	0.023	0.015
25.0000	1.924E+00	4.740E-01	2.398E+00	1.220E+01	1.007E-01	4.595E+00	-0.007	0.020	0.012
30.0000	1.941E+00	5.830E-01	2.524E+00	1.424E+01	1.196E-01	4.927E+00	-0.006	0.018	0.010
35.0000	1.955E+00	6.934E-01	2.648E+00	1.617E+01	1.378E-01	5.213E+00	-0.004	0.016	0.008
40.0000	1.967E+00	8.051E-01	2.772E+00	1.801E+01	1.551E-01	5.464E+00	-0.004	0.015	0.007
45.0000	1.977E+00	9.177E-01	2.894E+00	1.978E+01	1.716E-01	5.689E+00	-0.003	0.014	0.006
50.0000	1.986E+00	1.031E+00	3.017E+00	2.147E+01	1.874E-01	5.891E+00	-0.002	0.013	0.005
55.0000	1.994E+00	1.145E+00	3.139E+00	2.310E+01	2.025E-01	6.075E+00	-0.002	0.012	0.005
60.0000	2.001E+00	1.260E+00	3.261E+00	2.466E+01	2.169E-01	6.244E+00	-0.002	0.011	0.004
70.0000	2.014E+00	1.490E+00	3.504E+00	2.762E+01	2.440E-01	6.544E+00	-0.001	0.010	0.003
80.0000	2.025E+00	1.723E+00	3.748E+00	3.038E+01	2.688E-01	6.806E+00	-0.001	0.009	0.003
90.0000	2.035E+00	1.957E+00	3.991E+00	3.296E+01	2.918E-01	7.038E+00	-0.001	0.009	0.002
100.0000	2.043E+00	2.191E+00	4.235E+00	3.539E+01	3.130E-01	7.245E+00	-0.001	0.008	0.002
125.0000	2.062E+00	2.782E+00	4.844E+00	4.091E+01	3.598E-01	7.687E+00	-0.001	0.007	0.002
150.0000	2.076E+00	3.378E+00	5.454E+00	4.577E+01	3.995E-01	8.049E+00	-0.000	0.006	0.001
175.0000	2.089E+00	3.976E+00	6.065E+00	5.011E+01	4.336E-01	8.355E+00	-0.000	0.006	0.001
200.0000	2.100E+00	4.577E+00	6.676E+00	5.404E+01	4.632E-01	8.621E+00	-0.000	0.005	0.001
250.0000	2.118E+00	5.784E+00	7.902E+00	6.092E+01	5.126E-01	9.065E+00	-0.000	0.005	0.001
300.0000	2.132E+00	6.997E+00	9.129E+00	6.680E+01	5.522E-01	9.429E+00	-0.000	0.004	0.001
350.0000	2.145E+00	8.214E+00	1.036E+01	7.194E+01	5.848E-01	9.737E+00	-0.000	0.004	0.000
400.0000	2.155E+00	9.434E+00	1.159E+01	7.650E+01	6.121E-01	1.000E+01	-0.000	0.004	0.000
450.0000	2.165E+00	1.066E+01	1.282E+01	8.060E+01	6.356E-01	1.024E+01	-0.000	0.004	0.000
500.0000	2.173E+00	1.188E+01	1.405E+01	8.432E+01	6.559E-01	1.045E+01	-0.000	0.003	0.000
550.0000	2.181E+00	1.311E+01	1.529E+01	8.773E+01	6.736E-01	1.064E+01	-0.000	0.003	0.000
600.0000	2.188E+00	1.433E+01	1.652E+01	9.088E+01	6.894E-01	1.081E+01	-0.000	0.003	0.000
700.0000	2.200E+00	1.679E+01	1.899E+01	9.652E+01	7.161E-01	1.112E+01	-0.000	0.003	0.000
800.0000	2.211E+00	1.926E+01	2.147E+01	1.015E+02	7.379E-01	1.139E+01	-0.000	0.003	0.000
900.0000	2.220E+00	2.172E+01	2.394E+01	1.059E+02	7.562E-01	1.162E+01	-0.000	0.003	0.000
1000.0000	2.229E+00	2.419E+01	2.641E+01	1.099E+02	7.717E-01	1.183E+01	-0.000	0.003	0.000

ELECTRONS IN POLYMETHYL METHACRYLATE, "LUCITE", "PERSPEX", "PLEXIGLAS"

I = 74.0 eV DENSITY = 1.190E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.198E+01	3.332E-03	2.198E+01	2.580E-04	8.329E-05	0.0	-0.198	0.227	0.225
0.0125	1.848E+01	3.349E-03	1.849E+01	3.826E-04	9.993E-05	0.0	-0.190	0.216	0.215
0.0150	1.604E+01	3.359E-03	1.604E+01	5.282E-04	1.158E-04	0.0	-0.184	0.208	0.207
0.0175	1.423E+01	3.366E-03	1.423E+01	6.940E-04	1.311E-04	0.0	-0.179	0.201	0.201
0.0200	1.283E+01	3.372E-03	1.284E+01	8.792E-04	1.460E-04	0.0	-0.175	0.196	0.195
0.0250	1.080E+01	3.382E-03	1.081E+01	1.306E-03	1.744E-04	0.0	-0.168	0.188	0.187
0.0300	9.400E+00	3.391E-03	9.404E+00	1.803E-03	2.015E-04	0.0	-0.163	0.182	0.181
0.0350	8.367E+00	3.401E-03	8.370E+00	2.368E-03	2.275E-04	0.0	-0.160	0.177	0.177
0.0400	7.573E+00	3.413E-03	7.576E+00	2.997E-03	2.526E-04	0.0	-0.156	0.173	0.173
0.0450	6.942E+00	3.425E-03	6.946E+00	3.687E-03	2.770E-04	0.0	-0.154	0.170	0.169
0.0500	6.429E+00	3.438E-03	6.433E+00	4.436E-03	3.007E-04	0.0	-0.151	0.167	0.166
0.0550	6.003E+00	3.453E-03	6.007E+00	5.241E-03	3.238E-04	0.0	-0.149	0.164	0.164
0.0600	5.644E+00	3.468E-03	5.647E+00	6.100E-03	3.464E-04	0.0	-0.147	0.162	0.162
0.0700	5.070E+00	3.502E-03	5.073E+00	7.972E-03	3.901E-04	0.0	-0.144	0.158	0.158
0.0800	4.631E+00	3.538E-03	4.635E+00	1.004E-02	4.322E-04	0.0	-0.142	0.155	0.155
0.0900	4.286E+00	3.577E-03	4.289E+00	1.228E-02	4.729E-04	0.0	-0.140	0.152	0.152
0.1000	4.006E+00	3.619E-03	4.010E+00	1.470E-02	5.125E-04	0.0	-0.138	0.150	0.150
0.1250	3.496E+00	3.732E-03	3.500E+00	2.140E-02	6.070E-04	0.0	-0.134	0.145	0.145
0.1500	3.152E+00	3.855E-03	3.155E+00	2.894E-02	6.966E-04	0.0	-0.131	0.142	0.142
0.1750	2.904E+00	3.987E-03	2.908E+00	3.721E-02	7.824E-04	0.0	-0.128	0.139	0.139
0.2000	2.719E+00	4.126E-03	2.723E+00	4.610E-02	8.650E-04	0.0	-0.126	0.137	0.136
0.2500	2.461E+00	4.425E-03	2.465E+00	6.547E-02	1.023E-03	0.0	-0.123	0.133	0.132
0.3000	2.292E+00	4.751E-03	2.297E+00	8.653E-02	1.175E-03	0.0	-0.120	0.130	0.129
0.3500	2.175E+00	5.101E-03	2.180E+00	1.089E-01	1.322E-03	0.0	-0.118	0.128	0.127
0.4000	2.090E+00	5.474E-03	2.096E+00	1.323E-01	1.466E-03	0.0	-0.117	0.126	0.125
0.4500	2.026E+00	5.867E-03	2.032E+00	1.566E-01	1.609E-03	1.466E-02	-0.092	0.122	0.120
0.5000	1.975E+00	6.278E-03	1.981E+00	1.815E-01	1.751E-03	4.112E-02	-0.086	0.118	0.115
0.5500	1.935E+00	6.707E-03	1.942E+00	2.070E-01	1.892E-03	6.992E-02	-0.081	0.113	0.110
0.6000	1.903E+00	7.149E-03	1.910E+00	2.330E-01	2.035E-03	1.005E-01	-0.076	0.109	0.105
0.7000	1.856E+00	8.076E-03	1.864E+00	2.860E-01	2.320E-03	1.650E-01	-0.068	0.102	0.097
0.8000	1.825E+00	9.050E-03	1.834E+00	3.401E-01	2.609E-03	2.321E-01	-0.062	0.096	0.090
0.9000	1.803E+00	1.007E-02	1.813E+00	3.950E-01	2.902E-03	3.001E-01	-0.057	0.091	0.083
1.0000	1.788E+00	1.113E-02	1.799E+00	4.504E-01	3.199E-03	3.679E-01	-0.053	0.087	0.078
1.2500	1.767E+00	1.393E-02	1.781E+00	5.902E-01	3.959E-03	5.330E-01	-0.046	0.078	0.068
1.5000	1.760E+00	1.693E-02	1.776E+00	7.308E-01	4.744E-03	6.887E-01	-0.041	0.071	0.060
1.7500	1.759E+00	2.009E-02	1.779E+00	8.715E-01	5.553E-03	8.339E-01	-0.038	0.066	0.055
2.0000	1.762E+00	2.338E-02	1.785E+00	1.012E+00	6.383E-03	9.689E-01	-0.035	0.062	0.050
2.5000	1.772E+00	3.031E-02	1.802E+00	1.291E+00	8.096E-03	1.212E+00	-0.032	0.056	0.044
3.0000	1.784E+00	3.761E-02	1.822E+00	1.567E+00	9.868E-03	1.425E+00	-0.029	0.051	0.039
3.5000	1.797E+00	4.521E-02	1.842E+00	1.839E+00	1.168E-02	1.613E+00	-0.028	0.048	0.036
4.0000	1.809E+00	5.307E-02	1.862E+00	2.109E+00	1.354E-02	1.783E+00	-0.027	0.045	0.034
4.5000	1.821E+00	6.115E-02	1.882E+00	2.376E+00	1.542E-02	1.936E+00	-0.025	0.043	0.032
5.0000	1.832E+00	6.943E-02	1.901E+00	2.641E+00	1.733E-02	2.077E+00	-0.025	0.041	0.030
5.5000	1.842E+00	7.788E-02	1.920E+00	2.903E+00	1.926E-02	2.207E+00	-0.024	0.039	0.029
6.0000	1.851E+00	8.648E-02	1.938E+00	3.162E+00	2.120E-02	2.327E+00	-0.023	0.038	0.028
7.0000	1.868E+00	1.041E-01	1.972E+00	3.673E+00	2.513E-02	2.545E+00	-0.022	0.036	0.026
8.0000	1.883E+00	1.222E-01	2.005E+00	4.176E+00	2.910E-02	2.739E+00	-0.020	0.034	0.025
9.0000	1.896E+00	1.407E-01	2.037E+00	4.671E+00	3.309E-02	2.914E+00	-0.019	0.032	0.023
10.0000	1.908E+00	1.596E-01	2.067E+00	5.158E+00	3.710E-02	3.073E+00	-0.018	0.031	0.022
12.5000	1.932E+00	2.079E-01	2.140E+00	6.346E+00	4.712E-02	3.421E+00	-0.015	0.028	0.020
15.0000	1.952E+00	2.577E-01	2.210E+00	7.496E+00	5.709E-02	3.716E+00	-0.013	0.025	0.017
17.5000	1.968E+00	3.086E-01	2.277E+00	8.610E+00	6.695E-02	3.974E+00	-0.011	0.024	0.016
20.0000	1.982E+00	3.603E-01	2.342E+00	9.693E+00	7.667E-02	4.202E+00	-0.010	0.022	0.014
25.0000	2.004E+00	4.656E-01	2.470E+00	1.177E+01	9.561E-02	4.596E+00	-0.007	0.019	0.012
30.0000	2.022E+00	5.728E-01	2.595E+00	1.375E+01	1.138E-01	4.927E+00	-0.006	0.017	0.010
35.0000	2.036E+00	6.815E-01	2.718E+00	1.563E+01	1.313E-01	5.212E+00	-0.005	0.016	0.008
40.0000	2.049E+00	7.912E-01	2.840E+00	1.743E+01	1.480E-01	5.463E+00	-0.004	0.014	0.007
45.0000	2.059E+00	9.020E-01	2.961E+00	1.915E+01	1.639E-01	5.687E+00	-0.003	0.013	0.006
50.0000	2.069E+00	1.013E+00	3.082E+00	2.081E+01	1.792E-01	5.889E+00	-0.003	0.012	0.005
55.0000	2.077E+00	1.126E+00	3.203E+00	2.240E+01	1.939E-01	6.072E+00	-0.002	0.012	0.005
60.0000	2.085E+00	1.238E+00	3.323E+00	2.393E+01	2.079E-01	6.241E+00	-0.002	0.011	0.004
70.0000	2.098E+00	1.465E+00	3.563E+00	2.684E+01	2.342E-01	6.541E+00	-0.001	0.010	0.004
80.0000	2.109E+00	1.694E+00	3.804E+00	2.955E+01	2.585E-01	6.803E+00	-0.001	0.009	0.003
90.0000	2.120E+00	1.924E+00	4.044E+00	3.210E+01	2.810E-01	7.034E+00	-0.001	0.008	0.003
100.0000	2.128E+00	2.155E+00	4.284E+00	3.450E+01	3.019E-01	7.242E+00	-0.001	0.008	0.002
125.0000	2.147E+00	2.737E+00	4.884E+00	3.996E+01	3.481E-01	7.683E+00	-0.001	0.007	0.002
150.0000	2.163E+00	3.323E+00	5.486E+00	4.479E+01	3.874E-01	8.045E+00	-0.000	0.006	0.001
175.0000	2.176E+00	3.912E+00	6.087E+00	4.912E+01	4.213E-01	8.351E+00	-0.000	0.006	0.001
200.0000	2.187E+00	4.503E+00	6.690E+00	5.303E+01	4.509E-01	8.617E+00	-0.000	0.005	0.001
250.0000	2.205E+00	5.692E+00	7.897E+00	5.990E+01	5.004E-01	9.061E+00	-0.000	0.005	0.001
300.0000	2.220E+00	6.887E+00	9.107E+00	6.579E+01	5.402E-01	9.425E+00	-0.000	0.004	0.001
350.0000	2.233E+00	8.085E+00	1.032E+01	7.095E+01	5.731E-01	9.733E+00	-0.000	0.004	0.000
400.0000	2.244E+00	9.286E+00	1.153E+01	7.553E+01	6.008E-01	9.999E+00	-0.000	0.004	0.000
450.0000	2.254E+00	1.049E+01	1.274E+01	7.965E+01	6.246E-01	1.023E+01	-0.000	0.003	0.000
500.0000	2.263E+00	1.170E+01	1.396E+01	8.340E+01	6.452E-01	1.044E+01	-0.000	0.003	0.000
550.0000	2.271E+00	1.290E+01	1.518E+01	8.684E+01	6.633E-01	1.064E+01	-0.000	0.003	0.000
600.0000	2.278E+00	1.411E+01	1.639E+01	9.000E+01	6.793E-01	1.081E+01	-0.000	0.003	0.000
700.0000	2.291E+00	1.653E+01	1.882E+01	9.569E+01	7.066E-01	1.112E+01	-0.000	0.003	0.000
800.0000	2.302E+00	1.896E+01	2.126E+01	1.007E+02	7.289E-01	1.138E+01	-0.000	0.003	0.000
900.0000	2.312E+00	2.139E+01	2.370E+01	1.051E+02	7.476E-01	1.162E+01	-0.000	0.003	0.000
1000.0000	2.320E+00	2.382E+01	2.614E+01	1.092E+02	7.636E-01	1.183E+01	-0.000	0.003	0.000

ELECTRONS IN POLYPROPYLENE

I = 59.2 eV DENSITY = 9.000E-01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.383E+01	2.883E-03	2.383E+01	2.366E-04	6.658E-05	0.0	-0.190	0.215	0.214
0.0125	2.000E+01	2.893E-03	2.000E+01	3.516E-04	7.985E-05	0.0	-0.182	0.206	0.205
0.0150	1.733E+01	2.900E-03	1.734E+01	4.863E-04	9.254E-05	0.0	-0.177	0.198	0.198
0.0175	1.536E+01	2.905E-03	1.536E+01	6.398E-04	1.048E-04	0.0	-0.172	0.193	0.192
0.0200	1.384E+01	2.910E-03	1.384E+01	8.115E-04	1.167E-04	0.0	-0.168	0.188	0.187
0.0250	1.164E+01	2.919E-03	1.164E+01	1.207E-03	1.394E-04	0.0	-0.162	0.180	0.180
0.0300	1.011E+01	2.929E-03	1.012E+01	1.669E-03	1.612E-04	0.0	-0.158	0.175	0.174
0.0350	8.995E+00	2.939E-03	8.998E+00	2.195E-03	1.822E-04	0.0	-0.154	0.170	0.170
0.0400	8.136E+00	2.951E-03	8.139E+00	2.780E-03	2.025E-04	0.0	-0.151	0.166	0.166
0.0450	7.454E+00	2.963E-03	7.457E+00	3.422E-03	2.223E-04	0.0	-0.149	0.163	0.163
0.0500	6.900E+00	2.976E-03	6.903E+00	4.120E-03	2.415E-04	0.0	-0.146	0.161	0.160
0.0550	6.440E+00	2.991E-03	6.443E+00	4.870E-03	2.602E-04	0.0	-0.145	0.158	0.158
0.0600	6.052E+00	3.006E-03	6.055E+00	5.671E-03	2.786E-04	0.0	-0.143	0.156	0.156
0.0700	5.433E+00	3.037E-03	5.436E+00	7.418E-03	3.142E-04	0.0	-0.140	0.153	0.152
0.0800	4.960E+00	3.071E-03	4.963E+00	9.347E-03	3.485E-04	0.0	-0.137	0.150	0.149
0.0900	4.588E+00	3.107E-03	4.591E+00	1.144E-02	3.818E-04	0.0	-0.135	0.147	0.147
0.1000	4.287E+00	3.145E-03	4.290E+00	1.370E-02	4.141E-04	0.0	-0.134	0.145	0.145
0.1250	3.738E+00	3.248E-03	3.741E+00	1.997E-02	4.915E-04	0.0	-0.130	0.141	0.140
0.1500	3.367E+00	3.360E-03	3.370E+00	2.703E-02	5.651E-04	0.0	-0.127	0.138	0.137
0.1750	3.101E+00	3.478E-03	3.105E+00	3.477E-02	6.357E-04	0.0	-0.125	0.135	0.134
0.2000	2.902E+00	3.603E-03	2.905E+00	4.310E-02	7.038E-04	0.0	-0.123	0.133	0.132
0.2500	2.624E+00	3.872E-03	2.628E+00	6.126E-02	8.345E-04	0.0	-0.119	0.129	0.128
0.3000	2.443E+00	4.165E-03	2.447E+00	8.102E-02	9.601E-04	0.0	-0.117	0.126	0.126
0.3500	2.317E+00	4.478E-03	2.322E+00	1.020E-01	1.082E-03	0.0	-0.115	0.124	0.123
0.4000	2.225E+00	4.812E-03	2.229E+00	1.240E-01	1.202E-03	1.122E-02	-0.091	0.121	0.119
0.4500	2.153E+00	5.163E-03	2.159E+00	1.468E-01	1.322E-03	3.973E-02	-0.085	0.116	0.113
0.5000	2.098E+00	5.531E-03	2.104E+00	1.703E-01	1.440E-03	7.098E-02	-0.079	0.111	0.108
0.5500	2.055E+00	5.914E-03	2.061E+00	1.943E-01	1.559E-03	1.042E-01	-0.074	0.107	0.103
0.6000	2.020E+00	6.310E-03	2.027E+00	2.188E-01	1.679E-03	1.388E-01	-0.070	0.103	0.098
0.7000	1.969E+00	7.138E-03	1.976E+00	2.688E-01	1.919E-03	2.107E-01	-0.063	0.096	0.090
0.8000	1.934E+00	8.009E-03	1.942E+00	3.199E-01	2.163E-03	2.841E-01	-0.057	0.090	0.083
0.9000	1.910E+00	8.919E-03	1.919E+00	3.717E-01	2.409E-03	3.575E-01	-0.053	0.085	0.077
1.0000	1.893E+00	9.867E-03	1.903E+00	4.240E-01	2.660E-03	4.300E-01	-0.049	0.081	0.072
1.2500	1.869E+00	1.238E-02	1.882E+00	5.563E-01	3.303E-03	6.045E-01	-0.043	0.072	0.063
1.5000	1.860E+00	1.506E-02	1.876E+00	6.894E-01	3.969E-03	7.670E-01	-0.039	0.066	0.056
1.7500	1.859E+00	1.789E-02	1.877E+00	8.227E-01	4.656E-03	9.173E-01	-0.036	0.062	0.051
2.0000	1.861E+00	2.084E-02	1.882E+00	9.557E-01	5.361E-03	1.056E+00	-0.034	0.058	0.047
2.5000	1.871E+00	2.706E-02	1.898E+00	1.220E+00	6.821E-03	1.305E+00	-0.031	0.052	0.041
3.0000	1.883E+00	3.361E-02	1.917E+00	1.483E+00	8.332E-03	1.521E+00	-0.029	0.048	0.037
3.5000	1.896E+00	4.044E-02	1.936E+00	1.742E+00	9.886E-03	1.713E+00	-0.027	0.045	0.035
4.0000	1.908E+00	4.751E-02	1.956E+00	1.999E+00	1.147E-02	1.885E+00	-0.026	0.042	0.032
4.5000	1.920E+00	5.477E-02	1.975E+00	2.253E+00	1.309E-02	2.040E+00	-0.025	0.040	0.031
5.0000	1.931E+00	6.222E-02	1.993E+00	2.505E+00	1.473E-02	2.183E+00	-0.024	0.039	0.029
5.5000	1.941E+00	6.984E-02	2.011E+00	2.755E+00	1.639E-02	2.314E+00	-0.023	0.037	0.028
6.0000	1.951E+00	7.759E-02	2.028E+00	3.003E+00	1.806E-02	2.436E+00	-0.022	0.036	0.027
7.0000	1.968E+00	9.348E-02	2.062E+00	3.492E+00	2.145E-02	2.658E+00	-0.021	0.034	0.025
8.0000	1.983E+00	1.098E-01	2.093E+00	3.973E+00	2.488E-02	2.855E+00	-0.019	0.032	0.024
9.0000	1.997E+00	1.265E-01	2.123E+00	4.447E+00	2.834E-02	3.033E+00	-0.018	0.031	0.022
10.0000	2.008E+00	1.435E-01	2.152E+00	4.915E+00	3.182E-02	3.196E+00	-0.017	0.029	0.021
12.5000	2.033E+00	1.872E-01	2.221E+00	6.059E+00	4.056E-02	3.553E+00	-0.014	0.026	0.018
15.0000	2.053E+00	2.322E-01	2.285E+00	7.168E+00	4.930E-02	3.856E+00	-0.011	0.024	0.016
17.5000	2.069E+00	2.782E-01	2.347E+00	8.248E+00	5.798E-02	4.122E+00	-0.009	0.022	0.014
20.0000	2.083E+00	3.249E-01	2.408E+00	9.299E+00	6.658E-02	4.357E+00	-0.008	0.020	0.013
25.0000	2.105E+00	4.202E-01	2.525E+00	1.133E+01	8.343E-02	4.762E+00	-0.005	0.018	0.010
30.0000	2.123E+00	5.173E-01	2.640E+00	1.326E+01	9.975E-02	5.101E+00	-0.004	0.016	0.008
35.0000	2.137E+00	6.158E-01	2.753E+00	1.512E+01	1.155E-01	5.392E+00	-0.003	0.014	0.007
40.0000	2.149E+00	7.153E-01	2.865E+00	1.690E+01	1.307E-01	5.648E+00	-0.002	0.013	0.006
45.0000	2.160E+00	8.157E-01	2.976E+00	1.861E+01	1.453E-01	5.875E+00	-0.002	0.012	0.005
50.0000	2.170E+00	9.169E-01	3.086E+00	2.026E+01	1.593E-01	6.079E+00	-0.002	0.011	0.004
55.0000	2.178E+00	1.019E+00	3.197E+00	2.185E+01	1.728E-01	6.265E+00	-0.001	0.010	0.004
60.0000	2.186E+00	1.121E+00	3.307E+00	2.339E+01	1.858E-01	6.435E+00	-0.001	0.010	0.003
70.0000	2.200E+00	1.327E+00	3.527E+00	2.632E+01	2.104E-01	6.738E+00	-0.001	0.009	0.003
80.0000	2.211E+00	1.535E+00	3.746E+00	2.907E+01	2.333E-01	7.001E+00	-0.001	0.008	0.002
90.0000	2.222E+00	1.744E+00	3.966E+00	3.166E+01	2.546E-01	7.233E+00	-0.001	0.007	0.002
100.0000	2.231E+00	1.954E+00	4.185E+00	3.412E+01	2.745E-01	7.442E+00	-0.000	0.007	0.002
125.0000	2.250E+00	2.483E+00	4.733E+00	3.973E+01	3.189E-01	7.884E+00	-0.000	0.006	0.001
150.0000	2.266E+00	3.015E+00	5.282E+00	4.473E+01	3.572E-01	8.247E+00	-0.000	0.005	0.001
175.0000	2.280E+00	3.551E+00	5.831E+00	4.923E+01	3.905E-01	8.553E+00	-0.000	0.005	0.001
200.0000	2.291E+00	4.089E+00	6.380E+00	5.333E+01	4.199E-01	8.819E+00	-0.000	0.004	0.001
250.0000	2.310E+00	5.171E+00	7.482E+00	6.056E+01	4.694E-01	9.264E+00	-0.000	0.004	0.001
300.0000	2.326E+00	6.259E+00	8.585E+00	6.679E+01	5.096E-01	9.628E+00	-0.000	0.004	0.000
350.0000	2.339E+00	7.350E+00	9.689E+00	7.227E+01	5.432E-01	9.936E+00	-0.000	0.003	0.000
400.0000	2.351E+00	8.444E+00	1.080E+01	7.716E+01	5.716E-01	1.020E+01	-0.000	0.003	0.000
450.0000	2.361E+00	9.541E+00	1.190E+01	8.157E+01	5.961E-01	1.044E+01	-0.000	0.003	0.000
500.0000	2.370E+00	1.064E+01	1.301E+01	8.558E+01	6.175E-01	1.065E+01	-0.000	0.003	0.000
550.0000	2.378E+00	1.174E+01	1.412E+01	8.927E+01	6.364E-01	1.084E+01	-0.000	0.003	0.000
600.0000	2.386E+00	1.284E+01	1.523E+01	9.268E+01	6.531E-01	1.101E+01	-0.000	0.003	0.000
700.0000	2.399E+00	1.505E+01	1.745E+01	9.881E+01	6.817E-01	1.132E+01	-0.000	0.002	0.000
800.0000	2.411E+00	1.726E+01	1.967E+01	1.042E+02	7.053E-01	1.159E+01	-0.000	0.002	0.000
900.0000	2.421E+00	1.947E+01	2.189E+01	1.090E+02	7.251E-01	1.182E+01	-0.000	0.002	0.000
1000.0000	2.430E+00	2.169E+01	2.412E+01	1.134E+02	7.421E-01	1.203E+01	-0.000	0.002	0.000

ELECTRONS IN POLYSTYRENE

I = 68.7 eV DENSITY = 1.060E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.223E+01	2.982E-03	2.224E+01	2.546E-04	7.406E-05	0.0	-0.195	0.223	0.221
0.0125	1.868E+01	2.992E-03	1.869E+01	3.777E-04	8.869E-05	0.0	-0.187	0.212	0.211
0.0150	1.621E+01	2.999E-03	1.621E+01	5.218E-04	1.027E-04	0.0	-0.181	0.205	0.204
0.0175	1.437E+01	3.004E-03	1.438E+01	6.859E-04	1.162E-04	0.0	-0.176	0.198	0.198
0.0200	1.296E+01	3.008E-03	1.296E+01	8.694E-04	1.292E-04	0.0	-0.172	0.193	0.193
0.0250	1.091E+01	3.017E-03	1.091E+01	1.292E-03	1.543E-04	0.0	-0.166	0.185	0.185
0.0300	9.485E+00	3.027E-03	9.488E+00	1.785E-03	1.782E-04	0.0	-0.162	0.179	0.179
0.0350	8.440E+00	3.037E-03	8.443E+00	2.345E-03	2.013E-04	0.0	-0.158	0.175	0.174
0.0400	7.637E+00	3.048E-03	7.640E+00	2.968E-03	2.235E-04	0.0	-0.155	0.171	0.170
0.0450	7.000E+00	3.061E-03	7.003E+00	3.653E-03	2.452E-04	0.0	-0.152	0.167	0.167
0.0500	6.481E+00	3.074E-03	6.484E+00	4.395E-03	2.662E-04	0.0	-0.150	0.165	0.164
0.0550	6.051E+00	3.088E-03	6.054E+00	5.194E-03	2.867E-04	0.0	-0.148	0.162	0.162
0.0600	5.688E+00	3.103E-03	5.691E+00	6.047E-03	3.068E-04	0.0	-0.146	0.160	0.160
0.0700	5.108E+00	3.135E-03	5.111E+00	7.905E-03	3.458E-04	0.0	-0.143	0.156	0.156
0.0800	4.666E+00	3.169E-03	4.669E+00	9.955E-03	3.834E-04	0.0	-0.140	0.153	0.153
0.0900	4.317E+00	3.206E-03	4.320E+00	1.218E-02	4.197E-04	0.0	-0.138	0.151	0.150
0.1000	4.034E+00	3.244E-03	4.038E+00	1.458E-02	4.550E-04	0.0	-0.136	0.148	0.148
0.1250	3.520E+00	3.350E-03	3.523E+00	2.124E-02	5.396E-04	0.0	-0.132	0.144	0.144
0.1500	3.172E+00	3.463E-03	3.176E+00	2.873E-02	6.199E-04	0.0	-0.129	0.140	0.140
0.1750	2.923E+00	3.584E-03	2.926E+00	3.695E-02	6.967E-04	0.0	-0.127	0.138	0.137
0.2000	2.735E+00	3.711E-03	2.739E+00	4.579E-02	7.709E-04	0.0	-0.125	0.135	0.135
0.2500	2.475E+00	3.985E-03	2.479E+00	6.504E-02	9.131E-04	0.0	-0.122	0.132	0.131
0.3000	2.305E+00	4.284E-03	2.309E+00	8.598E-02	1.050E-03	0.0	-0.119	0.129	0.128
0.3500	2.187E+00	4.604E-03	2.192E+00	1.082E-01	1.182E-03	0.0	-0.117	0.127	0.125
0.4000	2.101E+00	4.945E-03	2.106E+00	1.315E-01	1.312E-03	2.729E-03	-0.102	0.124	0.123
0.4500	2.035E+00	5.304E-03	2.040E+00	1.557E-01	1.441E-03	2.688E-02	-0.090	0.119	0.117
0.5000	1.984E+00	5.680E-03	1.990E+00	1.805E-01	1.570E-03	5.420E-02	-0.084	0.115	0.112
0.5500	1.943E+00	6.071E-03	1.950E+00	2.059E-01	1.699E-03	8.383E-02	-0.079	0.111	0.107
0.6000	1.911E+00	6.475E-03	1.918E+00	2.318E-01	1.827E-03	1.152E-01	-0.074	0.107	0.102
0.7000	1.864E+00	7.322E-03	1.871E+00	2.846E-01	2.087E-03	1.810E-01	-0.067	0.100	0.094
0.8000	1.832E+00	8.212E-03	1.840E+00	3.385E-01	2.349E-03	2.492E-01	-0.061	0.094	0.088
0.9000	1.810E+00	9.142E-03	1.819E+00	3.932E-01	2.615E-03	3.179E-01	-0.057	0.089	0.082
1.0000	1.794E+00	1.011E-02	1.804E+00	4.484E-01	2.885E-03	3.862E-01	-0.053	0.085	0.077
1.2500	1.773E+00	1.267E-02	1.786E+00	5.878E-01	3.577E-03	5.515E-01	-0.046	0.077	0.067
1.5000	1.766E+00	1.541E-02	1.781E+00	7.281E-01	4.293E-03	7.064E-01	-0.042	0.070	0.060
1.7500	1.765E+00	1.830E-02	1.783E+00	8.684E-01	5.030E-03	8.501E-01	-0.039	0.065	0.055
2.0000	1.768E+00	2.132E-02	1.789E+00	1.008E+00	5.788E-03	9.834E-01	-0.037	0.062	0.050
2.5000	1.778E+00	2.766E-02	1.806E+00	1.287E+00	7.352E-03	1.222E+00	-0.034	0.056	0.045
3.0000	1.791E+00	3.435E-02	1.825E+00	1.562E+00	8.970E-03	1.431E+00	-0.031	0.051	0.041
3.5000	1.804E+00	4.132E-02	1.845E+00	1.835E+00	1.063E-02	1.616E+00	-0.030	0.048	0.038
4.0000	1.816E+00	4.852E-02	1.865E+00	2.104E+00	1.233E-02	1.782E+00	-0.029	0.046	0.035
4.5000	1.828E+00	5.593E-02	1.884E+00	2.371E+00	1.405E-02	1.932E+00	-0.027	0.044	0.034
5.0000	1.839E+00	6.353E-02	1.902E+00	2.635E+00	1.580E-02	2.070E+00	-0.026	0.042	0.032
5.5000	1.849E+00	7.129E-02	1.920E+00	2.897E+00	1.757E-02	2.197E+00	-0.025	0.040	0.031
6.0000	1.859E+00	7.919E-02	1.938E+00	3.156E+00	1.936E-02	2.316E+00	-0.025	0.039	0.030
7.0000	1.876E+00	9.539E-02	1.971E+00	3.667E+00	2.297E-02	2.531E+00	-0.023	0.037	0.028
8.0000	1.891E+00	1.120E-01	2.003E+00	4.171E+00	2.662E-02	2.722E+00	-0.021	0.035	0.026
9.0000	1.904E+00	1.290E-01	2.033E+00	4.666E+00	3.029E-02	2.896E+00	-0.020	0.033	0.025
10.0000	1.916E+00	1.464E-01	2.062E+00	5.155E+00	3.399E-02	3.054E+00	-0.019	0.032	0.023
12.5000	1.940E+00	1.909E-01	2.131E+00	6.347E+00	4.325E-02	3.403E+00	-0.015	0.029	0.020
15.0000	1.960E+00	2.367E-01	2.196E+00	7.502E+00	5.249E-02	3.702E+00	-0.013	0.026	0.018
17.5000	1.975E+00	2.835E-01	2.259E+00	8.625E+00	6.166E-02	3.963E+00	-0.010	0.024	0.016
20.0000	1.989E+00	3.311E-01	2.320E+00	9.717E+00	7.072E-02	4.196E+00	-0.009	0.022	0.014
25.0000	2.010E+00	4.282E-01	2.439E+00	1.182E+01	8.844E-02	4.596E+00	-0.006	0.019	0.011
30.0000	2.027E+00	5.270E-01	2.554E+00	1.382E+01	1.056E-01	4.933E+00	-0.005	0.017	0.009
35.0000	2.041E+00	6.271E-01	2.669E+00	1.574E+01	1.220E-01	5.223E+00	-0.003	0.016	0.008
40.0000	2.053E+00	7.284E-01	2.782E+00	1.757E+01	1.378E-01	5.478E+00	-0.003	0.014	0.006
45.0000	2.064E+00	8.306E-01	2.894E+00	1.933E+01	1.530E-01	5.704E+00	-0.002	0.013	0.005
50.0000	2.073E+00	9.334E-01	3.006E+00	2.103E+01	1.676E-01	5.908E+00	-0.002	0.012	0.005
55.0000	2.081E+00	1.037E+00	3.118E+00	2.266E+01	1.816E-01	6.093E+00	-0.002	0.011	0.004
60.0000	2.089E+00	1.141E+00	3.230E+00	2.424E+01	1.951E-01	6.263E+00	-0.001	0.011	0.004
70.0000	2.102E+00	1.351E+00	3.452E+00	2.723E+01	2.204E-01	6.565E+00	-0.001	0.010	0.003
80.0000	2.113E+00	1.562E+00	3.675E+00	3.004E+01	2.439E-01	6.828E+00	-0.001	0.009	0.002
90.0000	2.123E+00	1.774E+00	3.897E+00	3.268E+01	2.658E-01	7.060E+00	-0.001	0.008	0.002
100.0000	2.132E+00	1.988E+00	4.120E+00	3.518E+01	2.861E-01	7.269E+00	-0.001	0.008	0.002
125.0000	2.151E+00	2.525E+00	4.676E+00	4.087E+01	3.314E-01	7.711E+00	-0.000	0.006	0.001
150.0000	2.166E+00	3.067E+00	5.233E+00	4.592E+01	3.701E-01	8.073E+00	-0.000	0.006	0.001
175.0000	2.179E+00	3.611E+00	5.790E+00	5.046E+01	4.037E-01	8.380E+00	-0.000	0.005	0.001
200.0000	2.190E+00	4.158E+00	6.348E+00	5.458E+01	4.333E-01	8.646E+00	-0.000	0.005	0.001
250.0000	2.208E+00	5.258E+00	7.466E+00	6.184E+01	4.828E-01	9.091E+00	-0.000	0.004	0.001
300.0000	2.223E+00	6.362E+00	8.586E+00	6.808E+01	5.229E-01	9.454E+00	-0.000	0.004	0.000
350.0000	2.236E+00	7.471E+00	9.707E+00	7.355E+01	5.562E-01	9.762E+00	-0.000	0.004	0.000
400.0000	2.247E+00	8.583E+00	1.083E+01	7.842E+01	5.843E-01	1.003E+01	-0.000	0.003	0.000
450.0000	2.257E+00	9.697E+00	1.195E+01	8.282E+01	6.085E-01	1.026E+01	-0.000	0.003	0.000
500.0000	2.266E+00	1.081E+01	1.308E+01	8.681E+01	6.296E-01	1.047E+01	-0.000	0.003	0.000
550.0000	2.274E+00	1.193E+01	1.420E+01	9.048E+01	6.482E-01	1.066E+01	-0.000	0.003	0.000
600.0000	2.281E+00	1.305E+01	1.533E+01	9.387E+01	6.646E-01	1.084E+01	-0.000	0.003	0.000
700.0000	2.293E+00	1.529E+01	1.758E+01	9.996E+01	6.926E-01	1.115E+01	-0.000	0.003	0.000
800.0000	2.304E+00	1.754E+01	1.984E+01	1.053E+02	7.157E-01	1.141E+01	-0.000	0.003	0.000
900.0000	2.314E+00	1.978E+01	2.210E+01	1.101E+02	7.350E-01	1.165E+01	-0.000	0.002	0.000
1000.0000	2.323E+00	2.203E+01	2.436E+01	1.144E+02	7.515E-01	1.186E+01	-0.000	0.002	0.000

ELECTRONS IN POLYTETRAFLUOROETHYLENE, "TEFLON"

I = 99.1 eV DENSITY = 2.200E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.843E+01	4.211E-03	1.843E+01	3.105E-04	1.249E-04	0.0	-0.210	0.243	0.241
0.0125	1.553E+01	4.247E-03	1.554E+01	4.589E-04	1.502E-04	0.0	-0.201	0.231	0.229
0.0150	1.351E+01	4.271E-03	1.351E+01	6.320E-04	1.743E-04	0.0	-0.194	0.222	0.220
0.0175	1.200E+01	4.287E-03	1.201E+01	8.287E-04	1.975E-04	0.0	-0.189	0.215	0.213
0.0200	1.084E+01	4.300E-03	1.084E+01	1.048E-03	2.199E-04	0.0	-0.184	0.209	0.207
0.0250	9.141E+00	4.316E-03	9.146E+00	1.553E-03	2.629E-04	0.0	-0.177	0.199	0.198
0.0300	7.965E+00	4.329E-03	7.970E+00	2.140E-03	3.037E-04	0.0	-0.172	0.192	0.192
0.0350	7.098E+00	4.341E-03	7.102E+00	2.806E-03	3.428E-04	0.0	-0.167	0.187	0.186
0.0400	6.430E+00	4.353E-03	6.435E+00	3.547E-03	3.805E-04	0.0	-0.164	0.182	0.182
0.0450	5.900E+00	4.366E-03	5.904E+00	4.359E-03	4.169E-04	0.0	-0.161	0.179	0.178
0.0500	5.468E+00	4.380E-03	5.472E+00	5.239E-03	4.522E-04	0.0	-0.158	0.175	0.175
0.0550	5.109E+00	4.395E-03	5.113E+00	6.185E-03	4.865E-04	0.0	-0.156	0.173	0.172
0.0600	4.806E+00	4.410E-03	4.810E+00	7.194E-03	5.200E-04	0.0	-0.154	0.170	0.170
0.0700	4.321E+00	4.444E-03	4.325E+00	9.391E-03	5.847E-04	0.0	-0.151	0.166	0.166
0.0800	3.951E+00	4.483E-03	3.955E+00	1.181E-02	6.467E-04	0.0	-0.148	0.163	0.162
0.0900	3.658E+00	4.525E-03	3.663E+00	1.444E-02	7.065E-04	0.0	-0.145	0.160	0.159
0.1000	3.421E+00	4.571E-03	3.426E+00	1.727E-02	7.643E-04	0.0	-0.143	0.157	0.157
0.1250	2.989E+00	4.700E-03	2.994E+00	2.511E-02	9.021E-04	0.0	-0.139	0.152	0.152
0.1500	2.697E+00	4.844E-03	2.702E+00	3.392E-02	1.032E-03	0.0	-0.136	0.148	0.148
0.1750	2.487E+00	5.000E-03	2.492E+00	4.357E-02	1.156E-03	0.0	-0.133	0.145	0.145
0.2000	2.330E+00	5.167E-03	2.335E+00	5.395E-02	1.275E-03	0.0	-0.131	0.143	0.142
0.2500	2.111E+00	5.530E-03	2.117E+00	7.651E-02	1.503E-03	0.0	-0.127	0.138	0.138
0.3000	1.968E+00	5.928E-03	1.974E+00	1.010E-01	1.721E-03	0.0	-0.124	0.135	0.134
0.3500	1.869E+00	6.353E-03	1.875E+00	1.271E-01	1.931E-03	0.0	-0.122	0.133	0.132
0.4000	1.797E+00	6.805E-03	1.804E+00	1.543E-01	2.137E-03	2.294E-03	-0.108	0.130	0.129
0.4500	1.742E+00	7.279E-03	1.749E+00	1.824E-01	2.341E-03	2.338E-02	-0.097	0.126	0.123
0.5000	1.699E+00	7.775E-03	1.707E+00	2.114E-01	2.543E-03	4.753E-02	-0.091	0.121	0.118
0.5500	1.665E+00	8.291E-03	1.674E+00	2.410E-01	2.744E-03	7.398E-02	-0.085	0.117	0.113
0.6000	1.639E+00	8.823E-03	1.647E+00	2.711E-01	2.945E-03	1.022E-01	-0.081	0.113	0.109
0.7000	1.600E+00	9.937E-03	1.610E+00	3.326E-01	3.347E-03	1.623E-01	-0.073	0.106	0.101
0.8000	1.573E+00	1.111E-02	1.585E+00	3.952E-01	3.753E-03	2.253E-01	-0.067	0.101	0.094
0.9000	1.555E+00	1.233E-02	1.568E+00	4.587E-01	4.162E-03	2.896E-01	-0.062	0.095	0.088
1.0000	1.543E+00	1.360E-02	1.557E+00	5.227E-01	4.575E-03	3.541E-01	-0.058	0.091	0.083
1.2500	1.527E+00	1.697E-02	1.544E+00	6.841E-01	5.631E-03	5.127E-01	-0.050	0.082	0.072
1.5000	1.522E+00	2.057E-02	1.542E+00	8.462E-01	6.719E-03	6.637E-01	-0.045	0.075	0.065
1.7500	1.522E+00	2.437E-02	1.546E+00	1.008E+00	7.837E-03	8.056E-01	-0.041	0.070	0.059
2.0000	1.525E+00	2.834E-02	1.553E+00	1.169E+00	8.983E-03	9.382E-01	-0.038	0.066	0.054
2.5000	1.535E+00	3.667E-02	1.572E+00	1.490E+00	1.134E-02	1.178E+00	-0.034	0.059	0.047
3.0000	1.546E+00	4.544E-02	1.592E+00	1.806E+00	1.377E-02	1.390E+00	-0.031	0.054	0.042
3.5000	1.558E+00	5.456E-02	1.612E+00	2.118E+00	1.626E-02	1.578E+00	-0.029	0.051	0.039
4.0000	1.569E+00	6.399E-02	1.633E+00	2.426E+00	1.879E-02	1.748E+00	-0.028	0.048	0.036
4.5000	1.579E+00	7.367E-02	1.653E+00	2.730E+00	2.136E-02	1.902E+00	-0.027	0.045	0.034
5.0000	1.589E+00	8.357E-02	1.672E+00	3.031E+00	2.395E-02	2.043E+00	-0.026	0.043	0.032
5.5000	1.598E+00	9.367E-02	1.692E+00	3.328E+00	2.656E-02	2.173E+00	-0.025	0.042	0.031
6.0000	1.606E+00	1.040E-01	1.710E+00	3.622E+00	2.919E-02	2.294E+00	-0.024	0.040	0.029
7.0000	1.621E+00	1.250E-01	1.746E+00	4.201E+00	3.447E-02	2.512E+00	-0.023	0.038	0.027
8.0000	1.635E+00	1.466E-01	1.781E+00	4.768E+00	3.978E-02	2.706E+00	-0.021	0.036	0.026
9.0000	1.646E+00	1.686E-01	1.815E+00	5.324E+00	4.509E-02	2.880E+00	-0.020	0.034	0.024
10.0000	1.657E+00	1.910E-01	1.848E+00	5.870E+00	5.040E-02	3.039E+00	-0.019	0.032	0.023
12.5000	1.679E+00	2.483E-01	1.927E+00	7.194E+00	6.355E-02	3.385E+00	-0.017	0.029	0.020
15.0000	1.697E+00	3.071E-01	2.004E+00	8.466E+00	7.648E-02	3.677E+00	-0.015	0.027	0.018
17.5000	1.712E+00	3.672E-01	2.079E+00	9.691E+00	8.913E-02	3.930E+00	-0.013	0.025	0.017
20.0000	1.724E+00	4.281E-01	2.152E+00	1.087E+01	1.015E-01	4.155E+00	-0.012	0.023	0.015
25.0000	1.745E+00	5.521E-01	2.297E+00	1.312E+01	1.252E-01	4.541E+00	-0.009	0.021	0.013
30.0000	1.761E+00	6.781E-01	2.439E+00	1.523E+01	1.476E-01	4.866E+00	-0.008	0.019	0.011
35.0000	1.774E+00	8.056E-01	2.579E+00	1.723E+01	1.687E-01	5.146E+00	-0.006	0.017	0.009
40.0000	1.785E+00	9.344E-01	2.719E+00	1.911E+01	1.886E-01	5.394E+00	-0.005	0.016	0.008
45.0000	1.795E+00	1.064E+00	2.859E+00	2.091E+01	2.075E-01	5.614E+00	-0.004	0.015	0.007
50.0000	1.803E+00	1.195E+00	2.998E+00	2.262E+01	2.253E-01	5.814E+00	-0.004	0.014	0.006
55.0000	1.811E+00	1.326E+00	3.137E+00	2.425E+01	2.421E-01	5.996E+00	-0.003	0.013	0.006
60.0000	1.818E+00	1.458E+00	3.276E+00	2.580E+01	2.581E-01	6.163E+00	-0.003	0.012	0.005
70.0000	1.830E+00	1.724E+00	3.554E+00	2.874E+01	2.878E-01	6.461E+00	-0.002	0.011	0.004
80.0000	1.840E+00	1.991E+00	3.831E+00	3.144E+01	3.147E-01	6.721E+00	-0.002	0.010	0.004
90.0000	1.849E+00	2.260E+00	4.109E+00	3.396E+01	3.392E-01	6.952E+00	-0.001	0.010	0.003
100.0000	1.857E+00	2.530E+00	4.387E+00	3.632E+01	3.616E-01	7.159E+00	-0.001	0.009	0.003
125.0000	1.874E+00	3.209E+00	5.083E+00	4.161E+01	4.104E-01	7.599E+00	-0.001	0.008	0.002
150.0000	1.887E+00	3.893E+00	5.780E+00	4.622E+01	4.508E-01	7.960E+00	-0.001	0.007	0.002
175.0000	1.899E+00	4.580E+00	6.479E+00	5.030E+01	4.851E-01	8.266E+00	-0.000	0.007	0.001
200.0000	1.909E+00	5.269E+00	7.178E+00	5.396E+01	5.146E-01	8.531E+00	-0.000	0.006	0.001
250.0000	1.926E+00	6.655E+00	8.580E+00	6.033E+01	5.629E-01	8.976E+00	-0.000	0.006	0.001
300.0000	1.939E+00	8.045E+00	9.984E+00	6.572E+01	6.010E-01	9.339E+00	-0.000	0.005	0.001
350.0000	1.950E+00	9.440E+00	1.139E+01	7.041E+01	6.319E-01	9.646E+00	-0.000	0.005	0.001
400.0000	1.960E+00	1.084E+01	1.280E+01	7.455E+01	6.577E-01	9.913E+00	-0.000	0.005	0.001
450.0000	1.969E+00	1.224E+01	1.421E+01	7.825E+01	6.796E-01	1.015E+01	-0.000	0.004	0.000
500.0000	1.977E+00	1.364E+01	1.562E+01	8.161E+01	6.984E-01	1.036E+01	-0.000	0.004	0.000
550.0000	1.984E+00	1.504E+01	1.703E+01	8.468E+01	7.148E-01	1.055E+01	-0.000	0.004	0.000
600.0000	1.990E+00	1.645E+01	1.844E+01	8.750E+01	7.292E-01	1.072E+01	-0.000	0.004	0.000
700.0000	2.002E+00	1.926E+01	2.126E+01	9.254E+01	7.535E-01	1.103E+01	-0.000	0.004	0.000
800.0000	2.012E+00	2.208E+01	2.409E+01	9.696E+01	7.732E-01	1.130E+01	-0.000	0.003	0.000
900.0000	2.020E+00	2.490E+01	2.692E+01	1.009E+02	7.896E-01	1.153E+01	-0.000	0.003	0.000
1000.0000	2.028E+00	2.772E+01	2.975E+01	1.044E+02	8.035E-01	1.174E+01	-0.000	0.003	0.000

ELECTRONS IN POLYVINYL CHLORIDE

I = 108.2 eV DENSITY = 1.300E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.930E+01	5.953E-03	1.930E+01	2.974E-04	1.617E-04	0.0	-0.214	0.249	0.245
0.0125	1.628E+01	6.106E-03	1.629E+01	4.390E-04	1.977E-04	0.0	-0.205	0.236	0.232
0.0150	1.416E+01	6.218E-03	1.417E+01	6.041E-04	2.326E-04	0.0	-0.198	0.227	0.223
0.0175	1.259E+01	6.302E-03	1.260E+01	7.916E-04	2.665E-04	0.0	-0.192	0.219	0.216
0.0200	1.137E+01	6.369E-03	1.138E+01	1.001E-03	2.995E-04	0.0	-0.187	0.213	0.210
0.0250	9.601E+00	6.468E-03	9.608E+00	1.481E-03	3.630E-04	0.0	-0.180	0.203	0.201
0.0300	8.370E+00	6.539E-03	8.377E+00	2.040E-03	4.237E-04	0.0	-0.174	0.196	0.194
0.0350	7.462E+00	6.595E-03	7.468E+00	2.673E-03	4.821E-04	0.0	-0.170	0.190	0.189
0.0400	6.762E+00	6.641E-03	6.769E+00	3.378E-03	5.384E-04	0.0	-0.166	0.186	0.184
0.0450	6.206E+00	6.681E-03	6.213E+00	4.150E-03	5.928E-04	0.0	-0.163	0.182	0.180
0.0500	5.753E+00	6.717E-03	5.759E+00	4.987E-03	6.457E-04	0.0	-0.161	0.178	0.177
0.0550	5.376E+00	6.751E-03	5.383E+00	5.885E-03	6.970E-04	0.0	-0.158	0.175	0.174
0.0600	5.058E+00	6.783E-03	5.065E+00	6.844E-03	7.470E-04	0.0	-0.156	0.173	0.172
0.0700	4.549E+00	6.846E-03	4.556E+00	8.930E-03	8.434E-04	0.0	-0.153	0.168	0.168
0.0800	4.160E+00	6.908E-03	4.167E+00	1.123E-02	9.356E-04	0.0	-0.150	0.165	0.164
0.0900	3.853E+00	6.972E-03	3.860E+00	1.372E-02	1.024E-03	0.0	-0.147	0.162	0.161
0.1000	3.604E+00	7.040E-03	3.611E+00	1.641E-02	1.110E-03	0.0	-0.145	0.159	0.159
0.1250	3.150E+00	7.222E-03	3.157E+00	2.384E-02	1.312E-03	0.0	-0.141	0.154	0.153
0.1500	2.843E+00	7.424E-03	2.851E+00	3.219E-02	1.501E-03	0.0	-0.138	0.150	0.149
0.1750	2.623E+00	7.642E-03	2.630E+00	4.134E-02	1.680E-03	0.0	-0.135	0.147	0.146
0.2000	2.457E+00	7.877E-03	2.465E+00	5.117E-02	1.852E-03	0.0	-0.132	0.144	0.144
0.2500	2.227E+00	8.387E-03	2.235E+00	7.254E-02	2.176E-03	0.0	-0.129	0.140	0.139
0.3000	2.077E+00	8.949E-03	2.086E+00	9.575E-02	2.484E-03	0.0	-0.126	0.137	0.136
0.3500	1.972E+00	9.554E-03	1.982E+00	1.204E-01	2.780E-03	0.0	-0.123	0.134	0.133
0.4000	1.896E+00	1.020E-02	1.907E+00	1.461E-01	3.068E-03	7.976E-03	-0.102	0.131	0.129
0.4500	1.838E+00	1.088E-02	1.849E+00	1.728E-01	3.351E-03	3.082E-02	-0.097	0.126	0.124
0.5000	1.793E+00	1.159E-02	1.805E+00	2.001E-01	3.631E-03	5.539E-02	-0.092	0.122	0.119
0.5500	1.758E+00	1.233E-02	1.770E+00	2.281E-01	3.910E-03	8.121E-02	-0.088	0.118	0.114
0.6000	1.730E+00	1.310E-02	1.743E+00	2.566E-01	4.187E-03	1.079E-01	-0.084	0.114	0.110
0.7000	1.690E+00	1.469E-02	1.704E+00	3.147E-01	4.741E-03	1.629E-01	-0.078	0.108	0.103
0.8000	1.663E+00	1.637E-02	1.679E+00	3.738E-01	5.296E-03	2.189E-01	-0.073	0.103	0.097
0.9000	1.645E+00	1.813E-02	1.663E+00	4.337E-01	5.855E-03	2.747E-01	-0.069	0.098	0.092
1.0000	1.633E+00	1.995E-02	1.653E+00	4.940E-01	6.418E-03	3.299E-01	-0.066	0.094	0.087
1.2500	1.618E+00	2.476E-02	1.643E+00	6.458E-01	7.846E-03	4.627E-01	-0.060	0.087	0.078
1.5000	1.615E+00	2.990E-02	1.645E+00	7.980E-01	9.308E-03	5.867E-01	-0.056	0.081	0.072
1.7500	1.618E+00	3.530E-02	1.653E+00	9.496E-01	1.080E-02	7.018E-01	-0.053	0.077	0.067
2.0000	1.623E+00	4.092E-02	1.664E+00	1.100E+00	1.232E-02	8.087E-01	-0.051	0.073	0.063
2.5000	1.638E+00	5.270E-02	1.690E+00	1.399E+00	1.543E-02	1.001E+00	-0.047	0.068	0.057
3.0000	1.653E+00	6.507E-02	1.718E+00	1.692E+00	1.861E-02	1.170E+00	-0.044	0.064	0.053
3.5000	1.669E+00	7.791E-02	1.747E+00	1.981E+00	2.184E-02	1.321E+00	-0.042	0.060	0.050
4.0000	1.683E+00	9.114E-02	1.774E+00	2.265E+00	2.511E-02	1.458E+00	-0.040	0.058	0.048
4.5000	1.696E+00	1.047E-01	1.801E+00	2.544E+00	2.841E-02	1.583E+00	-0.039	0.055	0.045
5.0000	1.708E+00	1.186E-01	1.827E+00	2.820E+00	3.172E-02	1.699E+00	-0.037	0.054	0.044
5.5000	1.720E+00	1.327E-01	1.853E+00	3.092E+00	3.504E-02	1.807E+00	-0.036	0.052	0.042
6.0000	1.730E+00	1.471E-01	1.877E+00	3.360E+00	3.837E-02	1.908E+00	-0.034	0.050	0.040
7.0000	1.749E+00	1.764E-01	1.925E+00	3.886E+00	4.503E-02	2.095E+00	-0.031	0.048	0.037
8.0000	1.765E+00	2.065E-01	1.971E+00	4.399E+00	5.168E-02	2.264E+00	-0.029	0.045	0.035
9.0000	1.779E+00	2.371E-01	2.016E+00	4.901E+00	5.830E-02	2.420E+00	-0.027	0.043	0.033
10.0000	1.791E+00	2.683E-01	2.060E+00	5.391E+00	6.486E-02	2.564E+00	-0.024	0.041	0.031
12.5000	1.817E+00	3.479E-01	2.165E+00	6.575E+00	8.101E-02	2.888E+00	-0.020	0.037	0.026
15.0000	1.837E+00	4.295E-01	2.266E+00	7.704E+00	9.672E-02	3.168E+00	-0.017	0.034	0.023
17.5000	1.853E+00	5.127E-01	2.366E+00	8.783E+00	1.119E-01	3.415E+00	-0.014	0.031	0.020
20.0000	1.866E+00	5.971E-01	2.464E+00	9.819E+00	1.267E-01	3.636E+00	-0.012	0.029	0.018
25.0000	1.889E+00	7.686E-01	2.657E+00	1.177E+01	1.546E-01	4.017E+00	-0.010	0.026	0.015
30.0000	1.906E+00	9.428E-01	2.849E+00	1.359E+01	1.806E-01	4.337E+00	-0.009	0.023	0.012
35.0000	1.921E+00	1.119E+00	3.040E+00	1.529E+01	2.048E-01	4.613E+00	-0.007	0.021	0.011
40.0000	1.933E+00	1.297E+00	3.230E+00	1.688E+01	2.273E-01	4.854E+00	-0.007	0.019	0.009
45.0000	1.944E+00	1.476E+00	3.420E+00	1.839E+01	2.484E-01	5.069E+00	-0.006	0.018	0.008
50.0000	1.953E+00	1.657E+00	3.610E+00	1.981E+01	2.681E-01	5.263E+00	-0.006	0.017	0.007
55.0000	1.962E+00	1.838E+00	3.800E+00	2.116E+01	2.866E-01	5.440E+00	-0.005	0.016	0.007
60.0000	1.969E+00	2.020E+00	3.990E+00	2.244E+01	3.040E-01	5.602E+00	-0.005	0.015	0.006
70.0000	1.983E+00	2.387E+00	4.370E+00	2.484E+01	3.358E-01	5.890E+00	-0.005	0.014	0.005
80.0000	1.995E+00	2.756E+00	4.750E+00	2.703E+01	3.643E-01	6.142E+00	-0.004	0.013	0.005
90.0000	2.005E+00	3.127E+00	5.132E+00	2.906E+01	3.899E-01	6.365E+00	-0.004	0.012	0.004
100.0000	2.014E+00	3.499E+00	5.513E+00	3.094E+01	4.132E-01	6.566E+00	-0.003	0.012	0.004
125.0000	2.033E+00	4.436E+00	6.469E+00	3.512E+01	4.628E-01	6.995E+00	-0.003	0.010	0.003
150.0000	2.048E+00	5.379E+00	7.427E+00	3.872E+01	5.033E-01	7.348E+00	-0.002	0.010	0.002
175.0000	2.061E+00	6.326E+00	8.386E+00	4.189E+01	5.371E-01	7.649E+00	-0.002	0.009	0.002
200.0000	2.072E+00	7.276E+00	9.347E+00	4.471E+01	5.658E-01	7.910E+00	-0.001	0.008	0.002
250.0000	2.090E+00	9.185E+00	1.127E+01	4.958E+01	6.122E-01	8.349E+00	-0.001	0.008	0.001
300.0000	2.104E+00	1.110E+01	1.321E+01	5.367E+01	6.482E-01	8.710E+00	-0.001	0.007	0.001
350.0000	2.117E+00	1.302E+01	1.514E+01	5.720E+01	6.771E-01	9.015E+00	-0.001	0.007	0.001
400.0000	2.127E+00	1.495E+01	1.708E+01	6.031E+01	7.010E-01	9.281E+00	-0.000	0.006	0.001
450.0000	2.137E+00	1.688E+01	1.901E+01	6.308E+01	7.211E-01	9.515E+00	-0.000	0.006	0.001
500.0000	2.145E+00	1.881E+01	2.095E+01	6.559E+01	7.383E-01	9.725E+00	-0.000	0.006	0.001
550.0000	2.153E+00	2.074E+01	2.289E+01	6.787E+01	7.531E-01	9.915E+00	-0.000	0.006	0.001
600.0000	2.159E+00	2.268E+01	2.484E+01	6.997E+01	7.662E-01	1.009E+01	-0.000	0.005	0.001
700.0000	2.172E+00	2.655E+01	2.872E+01	7.371E+01	7.880E-01	1.040E+01	-0.000	0.005	0.000
800.0000	2.182E+00	3.043E+01	3.261E+01	7.697E+01	8.056E-01	1.066E+01	-0.000	0.005	0.000
900.0000	2.191E+00	3.431E+01	3.650E+01	7.987E+01	8.202E-01	1.090E+01	-0.000	0.005	0.000
1000.0000	2.200E+00	3.820E+01	4.040E+01	8.247E+01	8.324E-01	1.111E+01	-0.000	0.005	0.000

ELECTRONS IN PROPANE

I = 47.1 eV DENSITY = 1.879E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.618E+01	2.752E-03	2.618E+01	2.142E-04	5.755E-05	0.0	-0.182	0.205	0.204
0.0125	2.194E+01	2.762E-03	2.194E+01	3.189E-04	6.916E-05	0.0	-0.175	0.196	0.195
0.0150	1.899E+01	2.769E-03	1.899E+01	4.418E-04	8.028E-05	0.0	-0.170	0.189	0.189
0.0175	1.681E+01	2.774E-03	1.681E+01	5.820E-04	9.102E-05	0.0	-0.165	0.184	0.184
0.0200	1.513E+01	2.779E-03	1.514E+01	7.390E-04	1.014E-04	0.0	-0.162	0.180	0.179
0.0250	1.271E+01	2.789E-03	1.271E+01	1.101E-03	1.215E-04	0.0	-0.156	0.173	0.173
0.0300	1.103E+01	2.799E-03	1.104E+01	1.525E-03	1.407E-04	0.0	-0.152	0.168	0.167
0.0350	9.806E+00	2.810E-03	9.808E+00	2.006E-03	1.592E-04	0.0	-0.149	0.164	0.163
0.0400	8.863E+00	2.821E-03	8.866E+00	2.543E-03	1.771E-04	0.0	-0.146	0.160	0.160
0.0450	8.116E+00	2.834E-03	8.119E+00	3.133E-03	1.945E-04	0.0	-0.144	0.157	0.157
0.0500	7.509E+00	2.847E-03	7.511E+00	3.774E-03	2.114E-04	0.0	-0.142	0.155	0.155
0.0550	7.005E+00	2.861E-03	7.008E+00	4.464E-03	2.280E-04	0.0	-0.140	0.153	0.152
0.0600	6.580E+00	2.876E-03	6.583E+00	5.201E-03	2.442E-04	0.0	-0.138	0.151	0.150
0.0700	5.903E+00	2.907E-03	5.906E+00	6.808E-03	2.757E-04	0.0	-0.136	0.147	0.147
0.0800	5.387E+00	2.940E-03	5.390E+00	8.583E-03	3.061E-04	0.0	-0.133	0.145	0.144
0.0900	4.980E+00	2.975E-03	4.983E+00	1.051E-02	3.356E-04	0.0	-0.131	0.142	0.142
0.1000	4.652E+00	3.013E-03	4.655E+00	1.259E-02	3.643E-04	0.0	-0.130	0.140	0.140
0.1250	4.052E+00	3.114E-03	4.056E+00	1.837E-02	4.330E-04	0.0	-0.126	0.136	0.136
0.1500	3.648E+00	3.222E-03	3.652E+00	2.488E-02	4.984E-04	0.0	-0.123	0.133	0.133
0.1750	3.358E+00	3.338E-03	3.362E+00	3.203E-02	5.612E-04	0.0	-0.121	0.131	0.130
0.2000	3.141E+00	3.460E-03	3.144E+00	3.973E-02	6.219E-04	0.0	-0.119	0.129	0.128
0.2500	2.839E+00	3.722E-03	2.842E+00	5.651E-02	7.386E-04	0.0	-0.116	0.125	0.125
0.3000	2.641E+00	4.007E-03	2.645E+00	7.479E-02	8.509E-04	0.0	-0.114	0.123	0.122
0.3500	2.504E+00	4.311E-03	2.508E+00	9.423E-02	9.603E-04	0.0	-0.112	0.121	0.120
0.4000	2.404E+00	4.635E-03	2.409E+00	1.146E-01	1.068E-03	0.0	-0.110	0.119	0.118
0.4500	2.330E+00	4.976E-03	2.335E+00	1.357E-01	1.174E-03	0.0	-0.108	0.117	0.116
0.5000	2.274E+00	5.334E-03	2.279E+00	1.574E-01	1.281E-03	0.0	-0.107	0.116	0.115
0.5500	2.230E+00	5.705E-03	2.236E+00	1.795E-01	1.386E-03	0.0	-0.106	0.115	0.113
0.6000	2.196E+00	6.089E-03	2.202E+00	2.021E-01	1.492E-03	0.0	-0.105	0.114	0.112
0.7000	2.147E+00	6.894E-03	2.154E+00	2.480E-01	1.705E-03	0.0	-0.103	0.112	0.110
0.8000	2.116E+00	7.739E-03	2.124E+00	2.948E-01	1.920E-03	0.0	-0.101	0.110	0.108
0.9000	2.096E+00	8.623E-03	2.105E+00	3.421E-01	2.137E-03	0.0	-0.100	0.109	0.106
1.0000	2.084E+00	9.544E-03	2.094E+00	3.898E-01	2.356E-03	0.0	-0.098	0.107	0.105
1.2500	2.073E+00	1.198E-02	2.085E+00	5.095E-01	2.914E-03	0.0	-0.095	0.105	0.102
1.5000	2.078E+00	1.459E-02	2.092E+00	6.293E-01	3.488E-03	0.0	-0.093	0.103	0.099
1.7500	2.088E+00	1.734E-02	2.106E+00	7.484E-01	4.075E-03	0.0	-0.091	0.101	0.097
2.0000	2.103E+00	2.021E-02	2.123E+00	8.666E-01	4.675E-03	0.0	-0.090	0.099	0.096
2.5000	2.134E+00	2.626E-02	2.160E+00	1.100E+00	5.907E-03	0.0	-0.087	0.097	0.093
3.0000	2.166E+00	3.263E-02	2.199E+00	1.330E+00	7.171E-03	0.0	-0.086	0.095	0.090
3.5000	2.196E+00	3.928E-02	2.235E+00	1.555E+00	8.462E-03	0.0	-0.084	0.093	0.088
4.0000	2.224E+00	4.616E-02	2.270E+00	1.777E+00	9.772E-03	0.0	-0.083	0.092	0.087
4.5000	2.250E+00	5.323E-02	2.304E+00	1.996E+00	1.110E-02	0.0	-0.081	0.091	0.085
5.0000	2.274E+00	6.049E-02	2.335E+00	2.211E+00	1.244E-02	0.0	-0.080	0.089	0.084
5.5000	2.297E+00	6.790E-02	2.365E+00	2.424E+00	1.379E-02	0.0	-0.080	0.088	0.083
6.0000	2.318E+00	7.546E-02	2.393E+00	2.634E+00	1.515E-02	0.0	-0.079	0.087	0.082
7.0000	2.356E+00	9.094E-02	2.447E+00	3.047E+00	1.790E-02	0.0	-0.077	0.086	0.080
8.0000	2.389E+00	1.068E-01	2.496E+00	3.452E+00	2.066E-02	0.0	-0.076	0.084	0.079
9.0000	2.419E+00	1.231E-01	2.542E+00	3.849E+00	2.343E-02	0.0	-0.075	0.083	0.077
10.0000	2.446E+00	1.397E-01	2.586E+00	4.239E+00	2.621E-02	0.0	-0.074	0.082	0.076
12.5000	2.505E+00	1.823E-01	2.687E+00	5.187E+00	3.316E-02	0.0	-0.073	0.080	0.073
15.0000	2.551E+00	2.262E-01	2.777E+00	6.102E+00	4.007E-02	1.733E-02	-0.061	0.077	0.070
17.5000	2.586E+00	2.710E-01	2.857E+00	6.989E+00	4.695E-02	8.510E-02	-0.049	0.074	0.065
20.0000	2.613E+00	3.167E-01	2.930E+00	7.853E+00	5.376E-02	1.770E-01	-0.041	0.070	0.059
25.0000	2.655E+00	4.097E-01	3.064E+00	9.521E+00	6.721E-02	3.825E-01	-0.032	0.063	0.049
30.0000	2.685E+00	5.045E-01	3.190E+00	1.112E+01	8.035E-02	5.859E-01	-0.027	0.058	0.042
35.0000	2.710E+00	6.007E-01	3.310E+00	1.266E+01	9.314E-02	7.756E-01	-0.024	0.053	0.036
40.0000	2.730E+00	6.979E-01	3.428E+00	1.414E+01	1.056E-01	9.500E-01	-0.022	0.050	0.032
45.0000	2.747E+00	7.960E-01	3.543E+00	1.558E+01	1.176E-01	1.110E+00	-0.020	0.047	0.029
50.0000	2.763E+00	8.948E-01	3.657E+00	1.697E+01	1.294E-01	1.257E+00	-0.019	0.044	0.026
55.0000	2.776E+00	9.944E-01	3.770E+00	1.831E+01	1.407E-01	1.393E+00	-0.018	0.042	0.024
60.0000	2.788E+00	1.094E+00	3.883E+00	1.962E+01	1.517E-01	1.519E+00	-0.017	0.040	0.023
70.0000	2.809E+00	1.296E+00	4.105E+00	2.212E+01	1.728E-01	1.746E+00	-0.016	0.037	0.020
80.0000	2.828E+00	1.499E+00	4.326E+00	2.450E+01	1.926E-01	1.946E+00	-0.015	0.034	0.018
90.0000	2.843E+00	1.703E+00	4.546E+00	2.675E+01	2.113E-01	2.125E+00	-0.015	0.032	0.016
100.0000	2.857E+00	1.909E+00	4.766E+00	2.890E+01	2.289E-01	2.287E+00	-0.014	0.030	0.015
125.0000	2.886E+00	2.426E+00	5.312E+00	3.386E+01	2.690E-01	2.637E+00	-0.013	0.027	0.013
150.0000	2.909E+00	2.947E+00	5.856E+00	3.835E+01	3.043E-01	2.928E+00	-0.012	0.025	0.011
175.0000	2.928E+00	3.471E+00	6.399E+00	4.243E+01	3.356E-01	3.180E+00	-0.011	0.023	0.010
200.0000	2.944E+00	3.998E+00	6.942E+00	4.618E+01	3.636E-01	3.402E+00	-0.010	0.021	0.009
250.0000	2.970E+00	5.056E+00	8.027E+00	5.287E+01	4.117E-01	3.783E+00	-0.008	0.019	0.007
300.0000	2.991E+00	6.121E+00	9.111E+00	5.871E+01	4.517E-01	4.103E+00	-0.007	0.017	0.006
350.0000	3.008E+00	7.189E+00	1.020E+01	6.390E+01	4.856E-01	4.381E+00	-0.005	0.016	0.005
400.0000	3.022E+00	8.260E+00	1.128E+01	6.856E+01	5.148E-01	4.626E+00	-0.005	0.015	0.005
450.0000	3.034E+00	9.334E+00	1.237E+01	7.279E+01	5.402E-01	4.845E+00	-0.004	0.014	0.004
500.0000	3.044E+00	1.041E+01	1.345E+01	7.666E+01	5.626E-01	5.044E+00	-0.003	0.014	0.004
550.0000	3.054E+00	1.149E+01	1.454E+01	8.024E+01	5.826E-01	5.225E+00	-0.003	0.013	0.003
600.0000	3.062E+00	1.257E+01	1.563E+01	8.355E+01	6.005E-01	5.392E+00	-0.002	0.013	0.003
700.0000	3.077E+00	1.473E+01	1.781E+01	8.954E+01	6.313E-01	5.689E+00	-0.002	0.012	0.003
800.0000	3.090E+00	1.689E+01	1.998E+01	9.484E+01	6.569E-01	5.949E+00	-0.001	0.011	0.002
900.0000	3.101E+00	1.906E+01	2.216E+01	9.959E+01	6.787E-01	6.180E+00	-0.001	0.011	0.002
1000.0000	3.111E+00	2.123E+01	2.434E+01	1.039E+02	6.975E-01	6.387E+00	-0.001	0.010	0.002

ELECTRONS IN SILICON DIOXIDE

I = 139.2 eV DENSITY = 2.320E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.780E+01	5.664E-03	1.781E+01	3.255E-04	1.716E-04	0.0	-0.227	0.267	0.263
0.0125	1.506E+01	5.762E-03	1.506E+01	4.788E-04	2.074E-04	0.0	-0.216	0.252	0.248
0.0150	1.313E+01	5.830E-03	1.313E+01	6.570E-04	2.417E-04	0.0	-0.208	0.241	0.238
0.0175	1.169E+01	5.880E-03	1.169E+01	8.592E-04	2.749E-04	0.0	-0.202	0.232	0.230
0.0200	1.057E+01	5.918E-03	1.057E+01	1.084E-03	3.069E-04	0.0	-0.196	0.225	0.223
0.0250	8.939E+00	5.971E-03	8.945E+00	1.601E-03	3.684E-04	0.0	-0.188	0.215	0.213
0.0300	7.804E+00	6.009E-03	7.810E+00	2.201E-03	4.268E-04	0.0	-0.182	0.207	0.205
0.0350	6.965E+00	6.039E-03	6.971E+00	2.880E-03	4.827E-04	0.0	-0.177	0.200	0.199
0.0400	6.318E+00	6.065E-03	6.324E+00	3.634E-03	5.365E-04	0.0	-0.174	0.195	0.194
0.0450	5.803E+00	6.089E-03	5.809E+00	4.460E-03	5.884E-04	0.0	-0.170	0.191	0.190
0.0500	5.383E+00	6.112E-03	5.389E+00	5.355E-03	6.387E-04	0.0	-0.167	0.187	0.186
0.0550	5.033E+00	6.135E-03	5.040E+00	6.315E-03	6.876E-04	0.0	-0.165	0.184	0.183
0.0600	4.738E+00	6.159E-03	4.744E+00	7.338E-03	7.351E-04	0.0	-0.163	0.181	0.180
0.0700	4.265E+00	6.207E-03	4.271E+00	9.564E-03	8.267E-04	0.0	-0.159	0.176	0.175
0.0800	3.904E+00	6.259E-03	3.910E+00	1.201E-02	9.143E-04	0.0	-0.156	0.172	0.172
0.0900	3.618E+00	6.315E-03	3.624E+00	1.467E-02	9.985E-04	0.0	-0.153	0.169	0.168
0.1000	3.386E+00	6.375E-03	3.393E+00	1.753E-02	1.080E-03	0.0	-0.151	0.166	0.165
0.1250	2.963E+00	6.541E-03	2.969E+00	2.544E-02	1.272E-03	0.0	-0.146	0.160	0.160
0.1500	2.677E+00	6.727E-03	2.683E+00	3.432E-02	1.453E-03	0.0	-0.142	0.156	0.156
0.1750	2.471E+00	6.930E-03	2.478E+00	4.403E-02	1.624E-03	0.0	-0.140	0.153	0.152
0.2000	2.316E+00	7.148E-03	2.323E+00	5.446E-02	1.789E-03	0.0	-0.137	0.150	0.149
0.2500	2.101E+00	7.622E-03	2.109E+00	7.713E-02	2.100E-03	0.0	-0.133	0.145	0.144
0.3000	1.961E+00	8.144E-03	1.969E+00	1.017E-01	2.396E-03	0.0	-0.130	0.142	0.141
0.3500	1.864E+00	8.706E-03	1.872E+00	1.278E-01	2.682E-03	0.0	-0.125	0.139	0.138
0.4000	1.792E+00	9.304E-03	1.801E+00	1.550E-01	2.960E-03	1.344E-02	-0.110	0.135	0.133
0.4500	1.738E+00	9.935E-03	1.748E+00	1.832E-01	3.233E-03	3.175E-02	-0.104	0.130	0.128
0.5000	1.697E+00	1.060E-02	1.708E+00	2.122E-01	3.504E-03	5.190E-02	-0.100	0.126	0.123
0.5500	1.665E+00	1.128E-02	1.676E+00	2.417E-01	3.774E-03	7.343E-02	-0.096	0.123	0.119
0.6000	1.639E+00	1.199E-02	1.651E+00	2.718E-01	4.042E-03	9.597E-02	-0.092	0.119	0.116
0.7000	1.603E+00	1.348E-02	1.616E+00	3.331E-01	4.579E-03	1.431E-01	-0.086	0.114	0.109
0.8000	1.579E+00	1.504E-02	1.594E+00	3.954E-01	5.118E-03	1.919E-01	-0.081	0.109	0.103
0.9000	1.563E+00	1.667E-02	1.579E+00	4.585E-01	5.659E-03	2.413E-01	-0.076	0.104	0.098
1.0000	1.552E+00	1.836E-02	1.570E+00	5.220E-01	6.206E-03	2.907E-01	-0.073	0.101	0.094
1.2500	1.540E+00	2.283E-02	1.563E+00	6.817E-01	7.593E-03	4.118E-01	-0.066	0.093	0.085
1.5000	1.538E+00	2.761E-02	1.566E+00	8.416E-01	9.013E-03	5.276E-01	-0.061	0.087	0.078
1.7500	1.542E+00	3.264E-02	1.575E+00	1.001E+00	1.046E-02	6.371E-01	-0.057	0.083	0.073
2.0000	1.548E+00	3.787E-02	1.586E+00	1.159E+00	1.194E-02	7.405E-01	-0.054	0.079	0.068
2.5000	1.563E+00	4.886E-02	1.612E+00	1.472E+00	1.497E-02	9.306E-01	-0.049	0.072	0.061
3.0000	1.578E+00	6.039E-02	1.639E+00	1.780E+00	1.807E-02	1.102E+00	-0.045	0.068	0.056
3.5000	1.593E+00	7.238E-02	1.665E+00	2.082E+00	2.123E-02	1.258E+00	-0.041	0.064	0.052
4.0000	1.606E+00	8.475E-02	1.691E+00	2.380E+00	2.442E-02	1.402E+00	-0.038	0.061	0.049
4.5000	1.619E+00	9.743E-02	1.716E+00	2.674E+00	2.765E-02	1.535E+00	-0.036	0.058	0.046
5.0000	1.630E+00	1.104E-01	1.741E+00	2.963E+00	3.089E-02	1.659E+00	-0.034	0.055	0.043
5.5000	1.641E+00	1.236E-01	1.764E+00	3.248E+00	3.415E-02	1.776E+00	-0.032	0.053	0.041
6.0000	1.650E+00	1.371E-01	1.787E+00	3.530E+00	3.742E-02	1.885E+00	-0.030	0.051	0.039
7.0000	1.667E+00	1.646E-01	1.832E+00	4.082E+00	4.397E-02	2.087E+00	-0.028	0.048	0.036
8.0000	1.682E+00	1.927E-01	1.875E+00	4.622E+00	5.052E-02	2.269E+00	-0.025	0.045	0.033
9.0000	1.695E+00	2.214E-01	1.916E+00	5.150E+00	5.704E-02	2.435E+00	-0.024	0.043	0.030
10.0000	1.706E+00	2.507E-01	1.957E+00	5.666E+00	6.352E-02	2.587E+00	-0.022	0.041	0.028
12.5000	1.730E+00	3.254E-01	2.056E+00	6.912E+00	7.948E-02	2.921E+00	-0.019	0.036	0.025
15.0000	1.749E+00	4.021E-01	2.152E+00	8.101E+00	9.502E-02	3.205E+00	-0.017	0.033	0.022
17.5000	1.765E+00	4.803E-01	2.246E+00	9.238E+00	1.101E-01	3.452E+00	-0.015	0.031	0.019
20.0000	1.779E+00	5.596E-01	2.338E+00	1.033E+01	1.247E-01	3.671E+00	-0.014	0.029	0.017
25.0000	1.801E+00	7.209E-01	2.522E+00	1.239E+01	1.523E-01	4.047E+00	-0.012	0.025	0.015
30.0000	1.818E+00	8.847E-01	2.703E+00	1.430E+01	1.781E-01	4.362E+00	-0.010	0.023	0.013
35.0000	1.833E+00	1.050E+00	2.883E+00	1.609E+01	2.021E-01	4.635E+00	-0.009	0.021	0.011
40.0000	1.845E+00	1.218E+00	3.063E+00	1.778E+01	2.245E-01	4.874E+00	-0.008	0.020	0.010
45.0000	1.855E+00	1.386E+00	3.242E+00	1.936E+01	2.455E-01	5.089E+00	-0.007	0.018	0.009
50.0000	1.865E+00	1.556E+00	3.421E+00	2.086E+01	2.651E-01	5.282E+00	-0.006	0.017	0.008
55.0000	1.873E+00	1.727E+00	3.600E+00	2.229E+01	2.835E-01	5.459E+00	-0.005	0.016	0.007
60.0000	1.880E+00	1.898E+00	3.778E+00	2.364E+01	3.008E-01	5.621E+00	-0.005	0.016	0.007
70.0000	1.894E+00	2.243E+00	4.136E+00	2.617E+01	3.325E-01	5.911E+00	-0.004	0.014	0.006
80.0000	1.905E+00	2.590E+00	4.494E+00	2.849E+01	3.609E-01	6.165E+00	-0.003	0.013	0.005
90.0000	1.915E+00	2.938E+00	4.853E+00	3.063E+01	3.865E-01	6.391E+00	-0.003	0.012	0.004
100.0000	1.923E+00	3.288E+00	5.212E+00	3.262E+01	4.097E-01	6.594E+00	-0.003	0.012	0.004
125.0000	1.941E+00	4.169E+00	6.110E+00	3.705E+01	4.593E-01	7.027E+00	-0.002	0.010	0.003
150.0000	1.956E+00	5.055E+00	7.011E+00	4.086E+01	4.999E-01	7.384E+00	-0.001	0.010	0.002
175.0000	1.968E+00	5.945E+00	7.913E+00	4.422E+01	5.337E-01	7.687E+00	-0.001	0.009	0.002
200.0000	1.978E+00	6.839E+00	8.817E+00	4.721E+01	5.625E-01	7.951E+00	-0.001	0.008	0.002
250.0000	1.996E+00	8.633E+00	1.063E+01	5.237E+01	6.090E-01	8.393E+00	-0.001	0.008	0.001
300.0000	2.010E+00	1.043E+01	1.244E+01	5.671E+01	6.452E-01	8.755E+00	-0.000	0.007	0.001
350.0000	2.022E+00	1.224E+01	1.426E+01	6.046E+01	6.742E-01	9.062E+00	-0.000	0.007	0.001
400.0000	2.032E+00	1.405E+01	1.608E+01	6.376E+01	6.982E-01	9.328E+00	-0.000	0.006	0.001
450.0000	2.041E+00	1.586E+01	1.790E+01	6.670E+01	7.184E-01	9.563E+00	-0.000	0.006	0.001
500.0000	2.049E+00	1.768E+01	1.973E+01	6.936E+01	7.357E-01	9.773E+00	-0.000	0.006	0.001
550.0000	2.057E+00	1.950E+01	2.155E+01	7.179E+01	7.507E-01	9.963E+00	-0.000	0.006	0.001
600.0000	2.063E+00	2.131E+01	2.338E+01	7.401E+01	7.638E-01	1.014E+01	-0.000	0.005	0.001
700.0000	2.075E+00	2.496E+01	2.703E+01	7.799E+01	7.858E-01	1.044E+01	-0.000	0.005	0.000
800.0000	2.086E+00	2.860E+01	3.069E+01	8.146E+01	8.036E-01	1.071E+01	-0.000	0.005	0.000
900.0000	2.095E+00	3.225E+01	3.434E+01	8.454E+01	8.182E-01	1.095E+01	-0.000	0.005	0.000
1000.0000	2.103E+00	3.590E+01	3.800E+01	8.730E+01	8.306E-01	1.116E+01	-0.000	0.005	0.000

ELECTRONS IN SODIUM IODIDE

I = 452.0 eV DENSITY = 3.667E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.116E+01	1.518E-02	1.117E+01	5.598E-04	6.717E-04	0.0	-0.309	0.416	0.382
0.0125	9.603E+00	1.632E-02	9.619E+00	8.018E-04	8.429E-04	0.0	-0.289	0.380	0.351
0.0150	8.477E+00	1.723E-02	8.494E+00	1.079E-03	1.013E-03	0.0	-0.275	0.355	0.330
0.0175	7.622E+00	1.798E-02	7.640E+00	1.390E-03	1.181E-03	0.0	-0.264	0.336	0.314
0.0200	6.948E+00	1.862E-02	6.966E+00	1.733E-03	1.348E-03	0.0	-0.255	0.320	0.301
0.0250	5.949E+00	1.967E-02	5.968E+00	2.511E-03	1.675E-03	0.0	-0.242	0.298	0.282
0.0300	5.241E+00	2.050E-02	5.262E+00	3.406E-03	1.996E-03	0.0	-0.232	0.281	0.268
0.0350	4.711E+00	2.120E-02	4.733E+00	4.410E-03	2.309E-03	0.0	-0.224	0.269	0.257
0.0400	4.299E+00	2.180E-02	4.321E+00	5.517E-03	2.616E-03	0.0	-0.218	0.259	0.249
0.0450	3.968E+00	2.234E-02	3.990E+00	6.723E-03	2.917E-03	0.0	-0.213	0.251	0.242
0.0500	3.696E+00	2.282E-02	3.719E+00	8.022E-03	3.212E-03	0.0	-0.208	0.244	0.236
0.0550	3.469E+00	2.326E-02	3.492E+00	9.410E-03	3.502E-03	0.0	-0.204	0.239	0.231
0.0600	3.276E+00	2.367E-02	3.300E+00	1.088E-02	3.786E-03	0.0	-0.201	0.234	0.226
0.0700	2.965E+00	2.442E-02	2.990E+00	1.407E-02	4.342E-03	0.0	-0.195	0.225	0.219
0.0800	2.726E+00	2.509E-02	2.751E+00	1.757E-02	4.880E-03	0.0	-0.191	0.218	0.213
0.0900	2.536E+00	2.571E-02	2.562E+00	2.134E-02	5.402E-03	0.0	-0.187	0.213	0.208
0.1000	2.382E+00	2.628E-02	2.408E+00	2.536E-02	5.910E-03	0.0	-0.183	0.208	0.203
0.1250	2.098E+00	2.760E-02	2.126E+00	3.646E-02	7.120E-03	0.0	-0.176	0.199	0.195
0.1500	1.905E+00	2.878E-02	1.934E+00	4.882E-02	8.258E-03	0.0	-0.171	0.192	0.188
0.1750	1.766E+00	2.989E-02	1.796E+00	6.225E-02	9.332E-03	0.0	-0.167	0.186	0.183
0.2000	1.661E+00	3.096E-02	1.692E+00	7.661E-02	1.035E-02	0.0	-0.163	0.182	0.178
0.2500	1.516E+00	3.306E-02	1.549E+00	1.076E-01	1.225E-02	0.0	-0.158	0.175	0.171
0.3000	1.421E+00	3.519E-02	1.456E+00	1.410E-01	1.400E-02	0.0	-0.153	0.169	0.166
0.3500	1.355E+00	3.739E-02	1.393E+00	1.761E-01	1.565E-02	1.129E-03	-0.146	0.165	0.162
0.4000	1.308E+00	3.967E-02	1.348E+00	2.126E-01	1.721E-02	5.582E-03	-0.141	0.160	0.157
0.4500	1.273E+00	4.204E-02	1.315E+00	2.502E-01	1.871E-02	1.097E-02	-0.137	0.157	0.153
0.5000	1.247E+00	4.448E-02	1.291E+00	2.886E-01	2.016E-02	1.711E-02	-0.134	0.153	0.149
0.5500	1.227E+00	4.698E-02	1.274E+00	3.276E-01	2.157E-02	2.388E-02	-0.131	0.150	0.146
0.6000	1.211E+00	4.956E-02	1.261E+00	3.671E-01	2.295E-02	3.119E-02	-0.128	0.147	0.143
0.7000	1.190E+00	5.486E-02	1.245E+00	4.469E-01	2.562E-02	4.711E-02	-0.122	0.142	0.138
0.8000	1.178E+00	6.037E-02	1.238E+00	5.275E-01	2.822E-02	6.443E-02	-0.118	0.138	0.133
0.9000	1.170E+00	6.605E-02	1.236E+00	6.084E-01	3.076E-02	8.284E-02	-0.113	0.134	0.129
1.0000	1.167E+00	7.189E-02	1.239E+00	6.892E-01	3.326E-02	1.021E-01	-0.110	0.131	0.125
1.2500	1.167E+00	8.714E-02	1.254E+00	8.899E-01	3.936E-02	1.530E-01	-0.102	0.124	0.116
1.5000	1.173E+00	1.031E-01	1.276E+00	1.088E+00	4.533E-02	2.065E-01	-0.095	0.118	0.109
1.7500	1.182E+00	1.198E-01	1.302E+00	1.282E+00	5.120E-02	2.610E-01	-0.089	0.113	0.103
2.0000	1.192E+00	1.369E-01	1.329E+00	1.472E+00	5.700E-02	3.159E-01	-0.085	0.108	0.098
2.5000	1.212E+00	1.725E-01	1.384E+00	1.840E+00	6.838E-02	4.239E-01	-0.077	0.101	0.089
3.0000	1.230E+00	2.093E-01	1.439E+00	2.195E+00	7.949E-02	5.275E-01	-0.071	0.095	0.082
3.5000	1.247E+00	2.471E-01	1.494E+00	2.536E+00	9.034E-02	6.258E-01	-0.067	0.090	0.076
4.0000	1.263E+00	2.857E-01	1.548E+00	2.864E+00	1.009E-01	7.184E-01	-0.064	0.086	0.071
4.5000	1.277E+00	3.250E-01	1.601E+00	3.182E+00	1.112E-01	8.057E-01	-0.061	0.082	0.067
5.0000	1.289E+00	3.649E-01	1.654E+00	3.489E+00	1.213E-01	8.881E-01	-0.058	0.079	0.064
5.5000	1.301E+00	4.055E-01	1.706E+00	3.787E+00	1.311E-01	9.660E-01	-0.056	0.076	0.061
6.0000	1.311E+00	4.464E-01	1.758E+00	4.075E+00	1.407E-01	1.040E+00	-0.054	0.074	0.058
7.0000	1.330E+00	5.297E-01	1.860E+00	4.628E+00	1.591E-01	1.177E+00	-0.051	0.070	0.053
8.0000	1.347E+00	6.145E-01	1.961E+00	5.152E+00	1.766E-01	1.301E+00	-0.049	0.066	0.049
9.0000	1.361E+00	7.005E-01	2.062E+00	5.649E+00	1.933E-01	1.416E+00	-0.047	0.063	0.046
10.0000	1.374E+00	7.876E-01	2.162E+00	6.122E+00	2.092E-01	1.522E+00	-0.045	0.061	0.043
12.5000	1.401E+00	1.009E+00	2.410E+00	7.217E+00	2.458E-01	1.759E+00	-0.041	0.055	0.038
15.0000	1.423E+00	1.235E+00	2.658E+00	8.204E+00	2.785E-01	1.964E+00	-0.038	0.051	0.034
17.5000	1.441E+00	1.465E+00	2.906E+00	9.103E+00	3.080E-01	2.147E+00	-0.035	0.048	0.030
20.0000	1.456E+00	1.697E+00	3.153E+00	9.929E+00	3.347E-01	2.312E+00	-0.032	0.046	0.028
25.0000	1.480E+00	2.169E+00	3.649E+00	1.140E+01	3.813E-01	2.605E+00	-0.028	0.041	0.023
30.0000	1.499E+00	2.648E+00	4.147E+00	1.269E+01	4.206E-01	2.858E+00	-0.025	0.038	0.020
35.0000	1.514E+00	3.133E+00	4.647E+00	1.382E+01	4.544E-01	3.081E+00	-0.022	0.036	0.018
40.0000	1.527E+00	3.622E+00	5.149E+00	1.485E+01	4.837E-01	3.281E+00	-0.020	0.034	0.016
45.0000	1.539E+00	4.114E+00	5.652E+00	1.577E+01	5.095E-01	3.463E+00	-0.019	0.032	0.014
50.0000	1.548E+00	4.609E+00	6.158E+00	1.662E+01	5.324E-01	3.628E+00	-0.017	0.031	0.013
55.0000	1.557E+00	5.107E+00	6.664E+00	1.740E+01	5.529E-01	3.780E+00	-0.016	0.029	0.012
60.0000	1.565E+00	5.607E+00	7.172E+00	1.812E+01	5.713E-01	3.921E+00	-0.015	0.028	0.011
70.0000	1.579E+00	6.612E+00	8.191E+00	1.943E+01	6.033E-01	4.175E+00	-0.014	0.027	0.009
80.0000	1.590E+00	7.623E+00	9.213E+00	2.058E+01	6.301E-01	4.399E+00	-0.013	0.025	0.008
90.0000	1.600E+00	8.639E+00	1.024E+01	2.161E+01	6.530E-01	4.600E+00	-0.012	0.024	0.007
100.0000	1.609E+00	9.659E+00	1.127E+01	2.254E+01	6.727E-01	4.782E+00	-0.011	0.023	0.007
125.0000	1.627E+00	1.222E+01	1.385E+01	2.454E+01	7.123E-01	5.174E+00	-0.009	0.022	0.005
150.0000	1.641E+00	1.479E+01	1.644E+01	2.619E+01	7.422E-01	5.502E+00	-0.008	0.020	0.004
175.0000	1.653E+00	1.738E+01	1.903E+01	2.760E+01	7.658E-01	5.783E+00	-0.007	0.019	0.004
200.0000	1.663E+00	1.997E+01	2.163E+01	2.883E+01	7.848E-01	6.029E+00	-0.006	0.018	0.003
250.0000	1.680E+00	2.516E+01	2.684E+01	3.091E+01	8.140E-01	6.445E+00	-0.005	0.017	0.003
300.0000	1.693E+00	3.037E+01	3.207E+01	3.261E+01	8.354E-01	6.790E+00	-0.004	0.016	0.002
350.0000	1.704E+00	3.560E+01	3.730E+01	3.405E+01	8.519E-01	7.083E+00	-0.003	0.016	0.002
400.0000	1.714E+00	4.082E+01	4.254E+01	3.531E+01	8.651E-01	7.339E+00	-0.003	0.015	0.002
450.0000	1.722E+00	4.606E+01	4.778E+01	3.641E+01	8.759E-01	7.566E+00	-0.003	0.015	0.002
500.0000	1.729E+00	5.130E+01	5.303E+01	3.741E+01	8.848E-01	7.769E+00	-0.003	0.014	0.001
550.0000	1.736E+00	5.654E+01	5.827E+01	3.831E+01	8.925E-01	7.954E+00	-0.002	0.014	0.001
600.0000	1.742E+00	6.178E+01	6.353E+01	3.913E+01	8.991E-01	8.123E+00	-0.002	0.014	0.001
700.0000	1.753E+00	7.229E+01	7.404E+01	4.058E+01	9.098E-01	8.423E+00	-0.002	0.013	0.001
800.0000	1.762E+00	8.280E+01	8.456E+01	4.185E+01	9.183E-01	8.684E+00	-0.002	0.013	0.001
900.0000	1.770E+00	9.332E+01	9.509E+01	4.296E+01	9.252E-01	8.915E+00	-0.001	0.012	0.001
1000.0000	1.777E+00	1.038E+02	1.056E+02	4.396E+01	9.309E-01	9.122E+00	-0.001	0.012	0.001

ELECTRONS IN STILBENE

I = 67.7 eV DENSITY = 9.707E-01 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.209E+01	3.004E-03	2.209E+01	2.561E-04	7.507E-05	0.0	-0.195	0.222	0.221
0.0125	1.856E+01	3.014E-03	1.856E+01	3.801E-04	8.992E-05	0.0	-0.187	0.212	0.211
0.0150	1.610E+01	3.021E-03	1.610E+01	5.251E-04	1.041E-04	0.0	-0.181	0.204	0.203
0.0175	1.428E+01	3.026E-03	1.428E+01	6.904E-04	1.178E-04	0.0	-0.176	0.198	0.197
0.0200	1.287E+01	3.031E-03	1.287E+01	8.751E-04	1.310E-04	0.0	-0.172	0.193	0.192
0.0250	1.083E+01	3.039E-03	1.083E+01	1.300E-03	1.565E-04	0.0	-0.166	0.185	0.184
0.0300	9.418E+00	3.049E-03	9.421E+00	1.797E-03	1.808E-04	0.0	-0.161	0.179	0.178
0.0350	8.380E+00	3.059E-03	8.383E+00	2.361E-03	2.041E-04	0.0	-0.157	0.174	0.174
0.0400	7.582E+00	3.070E-03	7.585E+00	2.989E-03	2.267E-04	0.0	-0.154	0.170	0.170
0.0450	6.949E+00	3.083E-03	6.953E+00	3.678E-03	2.487E-04	0.0	-0.152	0.167	0.167
0.0500	6.435E+00	3.096E-03	6.438E+00	4.426E-03	2.700E-04	0.0	-0.149	0.164	0.164
0.0550	6.007E+00	3.110E-03	6.010E+00	5.231E-03	2.909E-04	0.0	-0.147	0.162	0.161
0.0600	5.646E+00	3.126E-03	5.650E+00	6.089E-03	3.113E-04	0.0	-0.146	0.160	0.159
0.0700	5.071E+00	3.157E-03	5.074E+00	7.961E-03	3.508E-04	0.0	-0.143	0.156	0.156
0.0800	4.631E+00	3.191E-03	4.635E+00	1.003E-02	3.889E-04	0.0	-0.140	0.153	0.153
0.0900	4.285E+00	3.228E-03	4.288E+00	1.227E-02	4.258E-04	0.0	-0.138	0.150	0.150
0.1000	4.005E+00	3.267E-03	4.008E+00	1.469E-02	4.616E-04	0.0	-0.136	0.148	0.148
0.1250	3.493E+00	3.373E-03	3.497E+00	2.139E-02	5.474E-04	0.0	-0.132	0.144	0.143
0.1500	3.148E+00	3.487E-03	3.152E+00	2.894E-02	6.288E-04	0.0	-0.129	0.140	0.140
0.1750	2.901E+00	3.608E-03	2.904E+00	3.722E-02	7.068E-04	0.0	-0.127	0.137	0.137
0.2000	2.715E+00	3.736E-03	2.718E+00	4.613E-02	7.820E-04	0.0	-0.125	0.135	0.135
0.2500	2.456E+00	4.011E-03	2.460E+00	6.553E-02	9.262E-04	0.0	-0.121	0.131	0.131
0.3000	2.287E+00	4.312E-03	2.292E+00	8.663E-02	1.065E-03	0.0	-0.119	0.129	0.128
0.3500	2.170E+00	4.633E-03	2.175E+00	1.091E-01	1.199E-03	0.0	-0.116	0.126	0.125
0.4000	2.085E+00	4.975E-03	2.090E+00	1.325E-01	1.331E-03	0.0	-0.110	0.124	0.123
0.4500	2.020E+00	5.336E-03	2.026E+00	1.568E-01	1.462E-03	1.936E-02	-0.092	0.120	0.118
0.5000	1.969E+00	5.714E-03	1.975E+00	1.819E-01	1.592E-03	4.453E-02	-0.086	0.116	0.113
0.5500	1.930E+00	6.107E-03	1.936E+00	2.074E-01	1.722E-03	7.225E-02	-0.081	0.112	0.108
0.6000	1.898E+00	6.513E-03	1.904E+00	2.335E-01	1.852E-03	1.019E-01	-0.076	0.108	0.104
0.7000	1.851E+00	7.364E-03	1.858E+00	2.867E-01	2.115E-03	1.648E-01	-0.068	0.101	0.096
0.8000	1.819E+00	8.258E-03	1.827E+00	3.410E-01	2.381E-03	2.305E-01	-0.063	0.096	0.089
0.9000	1.797E+00	9.193E-03	1.807E+00	3.960E-01	2.650E-03	2.971E-01	-0.058	0.091	0.083
1.0000	1.782E+00	1.017E-02	1.792E+00	4.516E-01	2.923E-03	3.636E-01	-0.054	0.086	0.078
1.2500	1.761E+00	1.274E-02	1.774E+00	5.920E-01	3.622E-03	5.253E-01	-0.047	0.078	0.068
1.5000	1.754E+00	1.550E-02	1.770E+00	7.331E-01	4.346E-03	6.774E-01	-0.043	0.071	0.061
1.7500	1.753E+00	1.840E-02	1.772E+00	8.743E-01	5.092E-03	8.190E-01	-0.040	0.066	0.056
2.0000	1.756E+00	2.143E-02	1.778E+00	1.015E+00	5.857E-03	9.504E-01	-0.037	0.063	0.051
2.5000	1.767E+00	2.780E-02	1.795E+00	1.295E+00	7.438E-03	1.186E+00	-0.034	0.057	0.045
3.0000	1.780E+00	3.452E-02	1.814E+00	1.572E+00	9.074E-03	1.393E+00	-0.032	0.052	0.041
3.5000	1.793E+00	4.152E-02	1.834E+00	1.846E+00	1.075E-02	1.576E+00	-0.030	0.049	0.038
4.0000	1.805E+00	4.875E-02	1.854E+00	2.118E+00	1.247E-02	1.740E+00	-0.029	0.047	0.036
4.5000	1.817E+00	5.620E-02	1.873E+00	2.386E+00	1.421E-02	1.889E+00	-0.028	0.044	0.034
5.0000	1.828E+00	6.383E-02	1.891E+00	2.652E+00	1.598E-02	2.025E+00	-0.027	0.043	0.033
5.5000	1.838E+00	7.162E-02	1.909E+00	2.915E+00	1.776E-02	2.151E+00	-0.026	0.041	0.031
6.0000	1.847E+00	7.956E-02	1.927E+00	3.175E+00	1.957E-02	2.269E+00	-0.025	0.040	0.030
7.0000	1.864E+00	9.582E-02	1.960E+00	3.690E+00	2.321E-02	2.481E+00	-0.024	0.037	0.028
8.0000	1.879E+00	1.125E-01	1.992E+00	4.196E+00	2.689E-02	2.671E+00	-0.022	0.036	0.027
9.0000	1.893E+00	1.296E-01	2.022E+00	4.694E+00	3.061E-02	2.843E+00	-0.020	0.034	0.025
10.0000	1.904E+00	1.470E-01	2.051E+00	5.185E+00	3.433E-02	3.001E+00	-0.019	0.032	0.024
12.5000	1.929E+00	1.917E-01	2.121E+00	6.383E+00	4.368E-02	3.347E+00	-0.016	0.029	0.021
15.0000	1.948E+00	2.377E-01	2.186E+00	7.544E+00	5.300E-02	3.643E+00	-0.013	0.027	0.018
17.5000	1.964E+00	2.847E-01	2.249E+00	8.672E+00	6.224E-02	3.903E+00	-0.011	0.025	0.016
20.0000	1.978E+00	3.325E-01	2.310E+00	9.768E+00	7.138E-02	4.134E+00	-0.009	0.023	0.014
25.0000	1.999E+00	4.300E-01	2.429E+00	1.188E+01	8.924E-02	4.533E+00	-0.006	0.020	0.012
30.0000	2.016E+00	5.292E-01	2.545E+00	1.389E+01	1.065E-01	4.869E+00	-0.005	0.018	0.009
35.0000	2.030E+00	6.297E-01	2.660E+00	1.581E+01	1.230E-01	5.158E+00	-0.004	0.016	0.008
40.0000	2.042E+00	7.314E-01	2.773E+00	1.765E+01	1.390E-01	5.412E+00	-0.003	0.015	0.007
45.0000	2.052E+00	8.339E-01	2.886E+00	1.942E+01	1.542E-01	5.638E+00	-0.002	0.013	0.006
50.0000	2.061E+00	9.372E-01	2.998E+00	2.112E+01	1.689E-01	5.842E+00	-0.002	0.012	0.005
55.0000	2.069E+00	1.041E+00	3.110E+00	2.276E+01	1.830E-01	6.027E+00	-0.002	0.012	0.004
60.0000	2.077E+00	1.146E+00	3.222E+00	2.434E+01	1.965E-01	6.197E+00	-0.001	0.011	0.004
70.0000	2.090E+00	1.356E+00	3.446E+00	2.734E+01	2.220E-01	6.499E+00	-0.001	0.010	0.003
80.0000	2.101E+00	1.568E+00	3.669E+00	3.015E+01	2.456E-01	6.761E+00	-0.001	0.009	0.003
90.0000	2.111E+00	1.781E+00	3.892E+00	3.279E+01	2.675E-01	6.994E+00	-0.001	0.008	0.002
100.0000	2.120E+00	1.996E+00	4.115E+00	3.529E+01	2.879E-01	7.202E+00	-0.001	0.008	0.002
125.0000	2.138E+00	2.535E+00	4.673E+00	4.099E+01	3.333E-01	7.644E+00	-0.000	0.007	0.001
150.0000	2.153E+00	3.079E+00	5.232E+00	4.604E+01	3.721E-01	8.006E+00	-0.000	0.006	0.001
175.0000	2.166E+00	3.625E+00	5.791E+00	5.058E+01	4.058E-01	8.313E+00	-0.000	0.005	0.001
200.0000	2.177E+00	4.174E+00	6.351E+00	5.470E+01	4.353E-01	8.579E+00	-0.000	0.005	0.001
250.0000	2.195E+00	5.277E+00	7.473E+00	6.195E+01	4.849E-01	9.024E+00	-0.000	0.004	0.001
300.0000	2.210E+00	6.386E+00	8.596E+00	6.819E+01	5.249E-01	9.387E+00	-0.000	0.004	0.000
350.0000	2.223E+00	7.499E+00	9.722E+00	7.365E+01	5.582E-01	9.695E+00	-0.000	0.004	0.000
400.0000	2.234E+00	8.614E+00	1.085E+01	7.852E+01	5.863E-01	9.962E+00	-0.000	0.004	0.000
450.0000	2.244E+00	9.733E+00	1.198E+01	8.290E+01	6.105E-01	1.020E+01	-0.000	0.003	0.000
500.0000	2.252E+00	1.085E+01	1.310E+01	8.689E+01	6.315E-01	1.041E+01	-0.000	0.003	0.000
550.0000	2.260E+00	1.197E+01	1.423E+01	9.055E+01	6.500E-01	1.060E+01	-0.000	0.003	0.000
600.0000	2.267E+00	1.310E+01	1.536E+01	9.393E+01	6.664E-01	1.077E+01	-0.000	0.003	0.000
700.0000	2.280E+00	1.535E+01	1.763E+01	1.000E+02	6.943E-01	1.108E+01	-0.000	0.003	0.000
800.0000	2.291E+00	1.760E+01	1.989E+01	1.053E+02	7.173E-01	1.135E+01	-0.000	0.003	0.000
900.0000	2.300E+00	1.985E+01	2.216E+01	1.101E+02	7.365E-01	1.158E+01	-0.000	0.003	0.000
1000.0000	2.309E+00	2.211E+01	2.442E+01	1.144E+02	7.530E-01	1.179E+01	-0.000	0.002	0.000

ELECTRONS IN TISSUE-EQUIVALENT GAS (METHANE BASED)

I = 61.2 eV DENSITY = 1.064E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.325E+01	3.402E-03	2.326E+01	2.426E-04	7.986E-05	0.0	-0.191	0.217	0.215
0.0125	1.952E+01	3.421E-03	1.953E+01	3.605E-04	9.606E-05	0.0	-0.183	0.207	0.206
0.0150	1.692E+01	3.433E-03	1.693E+01	4.984E-04	1.116E-04	0.0	-0.178	0.200	0.199
0.0175	1.500E+01	3.441E-03	1.500E+01	6.556E-04	1.265E-04	0.0	-0.173	0.194	0.193
0.0200	1.352E+01	3.447E-03	1.352E+01	8.314E-04	1.410E-04	0.0	-0.169	0.189	0.188
0.0250	1.137E+01	3.457E-03	1.137E+01	1.237E-03	1.687E-04	0.0	-0.163	0.181	0.181
0.0300	9.882E+00	3.467E-03	9.885E+00	1.710E-03	1.952E-04	0.0	-0.159	0.176	0.175
0.0350	8.789E+00	3.477E-03	8.792E+00	2.247E-03	2.206E-04	0.0	-0.155	0.171	0.171
0.0400	7.950E+00	3.488E-03	7.953E+00	2.846E-03	2.452E-04	0.0	-0.152	0.167	0.167
0.0450	7.285E+00	3.501E-03	7.288E+00	3.504E-03	2.690E-04	0.0	-0.149	0.164	0.164
0.0500	6.743E+00	3.514E-03	6.747E+00	4.217E-03	2.922E-04	0.0	-0.147	0.161	0.161
0.0550	6.294E+00	3.529E-03	6.298E+00	4.985E-03	3.148E-04	0.0	-0.145	0.159	0.159
0.0600	5.915E+00	3.544E-03	5.919E+00	5.805E-03	3.368E-04	0.0	-0.143	0.157	0.157
0.0700	5.310E+00	3.578E-03	5.314E+00	7.591E-03	3.796E-04	0.0	-0.141	0.153	0.153
0.0800	4.849E+00	3.614E-03	4.853E+00	9.564E-03	4.208E-04	0.0	-0.138	0.150	0.150
0.0900	4.485E+00	3.654E-03	4.489E+00	1.171E-02	4.607E-04	0.0	-0.136	0.148	0.148
0.1000	4.191E+00	3.696E-03	4.195E+00	1.402E-02	4.994E-04	0.0	-0.134	0.146	0.146
0.1250	3.655E+00	3.812E-03	3.659E+00	2.042E-02	5.920E-04	0.0	-0.130	0.142	0.141
0.1500	3.293E+00	3.937E-03	3.297E+00	2.764E-02	6.797E-04	0.0	-0.128	0.138	0.138
0.1750	3.033E+00	4.071E-03	3.037E+00	3.556E-02	7.638E-04	0.0	-0.125	0.136	0.135
0.2000	2.838E+00	4.213E-03	2.842E+00	4.408E-02	8.447E-04	0.0	-0.123	0.133	0.133
0.2500	2.567E+00	4.518E-03	2.572E+00	6.263E-02	9.998E-04	0.0	-0.120	0.130	0.129
0.3000	2.390E+00	4.851E-03	2.395E+00	8.282E-02	1.148E-03	0.0	-0.117	0.127	0.126
0.3500	2.267E+00	5.208E-03	2.272E+00	1.043E-01	1.293E-03	0.0	-0.115	0.125	0.124
0.4000	2.178E+00	5.587E-03	2.184E+00	1.268E-01	1.434E-03	0.0	-0.113	0.123	0.122
0.4500	2.112E+00	5.988E-03	2.118E+00	1.500E-01	1.574E-03	0.0	-0.112	0.121	0.120
0.5000	2.061E+00	6.407E-03	2.068E+00	1.739E-01	1.713E-03	0.0	-0.110	0.120	0.118
0.5500	2.022E+00	6.844E-03	2.029E+00	1.983E-01	1.851E-03	0.0	-0.109	0.118	0.117
0.6000	1.992E+00	7.296E-03	1.999E+00	2.232E-01	1.990E-03	0.0	-0.108	0.117	0.115
0.7000	1.949E+00	8.241E-03	1.957E+00	2.738E-01	2.267E-03	0.0	-0.106	0.115	0.113
0.8000	1.921E+00	9.233E-03	1.931E+00	3.253E-01	2.546E-03	0.0	-0.104	0.113	0.111
0.9000	1.904E+00	1.027E-02	1.914E+00	3.773E-01	2.826E-03	0.0	-0.102	0.112	0.109
1.0000	1.894E+00	1.135E-02	1.905E+00	4.297E-01	3.110E-03	0.0	-0.101	0.111	0.108
1.2500	1.886E+00	1.421E-02	1.900E+00	5.612E-01	3.831E-03	0.0	-0.098	0.108	0.105
1.5000	1.890E+00	1.727E-02	1.908E+00	6.926E-01	4.569E-03	0.0	-0.096	0.105	0.102
1.7500	1.901E+00	2.049E-02	1.922E+00	8.232E-01	5.324E-03	0.0	-0.094	0.104	0.100
2.0000	1.915E+00	2.385E-02	1.939E+00	9.527E-01	6.093E-03	0.0	-0.092	0.102	0.098
2.5000	1.945E+00	3.091E-02	1.976E+00	1.208E+00	7.668E-03	0.0	-0.089	0.099	0.095
3.0000	1.975E+00	3.835E-02	2.013E+00	1.459E+00	9.280E-03	0.0	-0.087	0.097	0.092
3.5000	2.003E+00	4.610E-02	2.049E+00	1.705E+00	1.092E-02	0.0	-0.086	0.095	0.090
4.0000	2.030E+00	5.411E-02	2.084E+00	1.947E+00	1.258E-02	0.0	-0.084	0.094	0.089
4.5000	2.054E+00	6.234E-02	2.116E+00	2.185E+00	1.426E-02	0.0	-0.083	0.093	0.087
5.0000	2.077E+00	7.077E-02	2.147E+00	2.420E+00	1.596E-02	0.0	-0.082	0.091	0.086
5.5000	2.098E+00	7.938E-02	2.177E+00	2.651E+00	1.766E-02	0.0	-0.081	0.090	0.084
6.0000	2.117E+00	8.815E-02	2.205E+00	2.879E+00	1.938E-02	0.0	-0.080	0.089	0.083
7.0000	2.153E+00	1.061E-01	2.259E+00	3.327E+00	2.282E-02	0.0	-0.079	0.087	0.081
8.0000	2.184E+00	1.246E-01	2.308E+00	3.765E+00	2.628E-02	0.0	-0.078	0.086	0.080
9.0000	2.212E+00	1.434E-01	2.355E+00	4.194E+00	2.974E-02	0.0	-0.077	0.085	0.078
10.0000	2.237E+00	1.626E-01	2.400E+00	4.614E+00	3.320E-02	0.0	-0.076	0.083	0.077
12.5000	2.292E+00	2.119E-01	2.504E+00	5.634E+00	4.180E-02	0.0	-0.074	0.081	0.074
15.0000	2.337E+00	2.626E-01	2.599E+00	6.613E+00	5.032E-02	0.0	-0.072	0.079	0.072
17.5000	2.375E+00	3.144E-01	2.689E+00	7.559E+00	5.870E-02	0.0	-0.071	0.077	0.070
20.0000	2.408E+00	3.671E-01	2.775E+00	8.474E+00	6.694E-02	0.0	-0.070	0.075	0.068
25.0000	2.462E+00	4.743E-01	2.937E+00	1.022E+01	8.296E-02	1.908E-02	-0.059	0.072	0.064
30.0000	2.501E+00	5.835E-01	3.085E+00	1.188E+01	9.838E-02	1.033E-01	-0.046	0.068	0.058
35.0000	2.530E+00	6.942E-01	3.225E+00	1.347E+01	1.132E-01	2.153E-01	-0.039	0.064	0.051
40.0000	2.554E+00	8.060E-01	3.360E+00	1.499E+01	1.275E-01	3.356E-01	-0.034	0.060	0.046
45.0000	2.573E+00	9.188E-01	3.492E+00	1.645E+01	1.413E-01	4.562E-01	-0.030	0.057	0.042
50.0000	2.590E+00	1.032E+00	3.622E+00	1.785E+01	1.546E-01	5.735E-01	-0.027	0.054	0.038
55.0000	2.605E+00	1.147E+00	3.751E+00	1.921E+01	1.674E-01	6.861E-01	-0.025	0.052	0.035
60.0000	2.618E+00	1.261E+00	3.879E+00	2.052E+01	1.798E-01	7.934E-01	-0.024	0.049	0.032
70.0000	2.640E+00	1.493E+00	4.132E+00	2.302E+01	2.032E-01	9.924E-01	-0.021	0.046	0.028
80.0000	2.658E+00	1.725E+00	4.384E+00	2.537E+01	2.250E-01	1.172E+00	-0.020	0.043	0.025
90.0000	2.674E+00	1.960E+00	4.634E+00	2.759E+01	2.454E-01	1.336E+00	-0.019	0.040	0.022
100.0000	2.688E+00	2.195E+00	4.883E+00	2.969E+01	2.645E-01	1.485E+00	-0.018	0.038	0.020
125.0000	2.717E+00	2.787E+00	5.505E+00	3.451E+01	3.074E-01	1.809E+00	-0.016	0.034	0.017
150.0000	2.741E+00	3.384E+00	6.124E+00	3.881E+01	3.445E-01	2.081E+00	-0.015	0.031	0.014
175.0000	2.760E+00	3.984E+00	6.743E+00	4.270E+01	3.770E-01	2.315E+00	-0.014	0.029	0.013
200.0000	2.776E+00	4.586E+00	7.362E+00	4.625E+01	4.058E-01	2.520E+00	-0.014	0.027	0.011
250.0000	2.803E+00	5.796E+00	8.599E+00	5.252E+01	4.546E-01	2.870E+00	-0.012	0.024	0.009
300.0000	2.825E+00	7.012E+00	9.837E+00	5.796E+01	4.945E-01	3.162E+00	-0.011	0.022	0.008
350.0000	2.843E+00	8.232E+00	1.107E+01	6.274E+01	5.280E-01	3.414E+00	-0.010	0.021	0.007
400.0000	2.858E+00	9.456E+00	1.231E+01	6.702E+01	5.565E-01	3.636E+00	-0.009	0.020	0.006
450.0000	2.871E+00	1.068E+01	1.355E+01	7.089E+01	5.811E-01	3.836E+00	-0.009	0.019	0.006
500.0000	2.882E+00	1.191E+01	1.479E+01	7.442E+01	6.027E-01	4.017E+00	-0.008	0.018	0.005
550.0000	2.892E+00	1.314E+01	1.603E+01	7.767E+01	6.218E-01	4.184E+00	-0.007	0.017	0.005
600.0000	2.901E+00	1.437E+01	1.727E+01	8.067E+01	6.388E-01	4.338E+00	-0.007	0.017	0.004
700.0000	2.917E+00	1.683E+01	1.975E+01	8.608E+01	6.679E-01	4.614E+00	-0.005	0.016	0.004
800.0000	2.930E+00	1.930E+01	2.223E+01	9.085E+01	6.920E-01	4.859E+00	-0.005	0.015	0.003
900.0000	2.941E+00	2.177E+01	2.472E+01	9.512E+01	7.123E-01	5.077E+00	-0.004	0.014	0.003
1000.0000	2.951E+00	2.425E+01	2.720E+01	9.897E+01	7.297E-01	5.275E+00	-0.003	0.014	0.003

ELECTRONS IN TISSUE-EQUIVALENT GAS (PROPANE BASED)

I = 59.5 eV DENSITY = 1.826E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.340E+01	3.274E-03	2.340E+01	2.410E-04	7.648E-05	0.0	-0.190	0.215	0.214
0.0125	1.964E+01	3.290E-03	1.964E+01	3.581E-04	9.195E-05	0.0	-0.182	0.206	0.205
0.0150	1.702E+01	3.301E-03	1.703E+01	4.952E-04	1.068E-04	0.0	-0.177	0.198	0.198
0.0175	1.509E+01	3.308E-03	1.509E+01	6.516E-04	1.210E-04	0.0	-0.172	0.193	0.192
0.0200	1.359E+01	3.314E-03	1.359E+01	8.264E-04	1.348E-04	0.0	-0.168	0.188	0.187
0.0250	1.143E+01	3.323E-03	1.143E+01	1.229E-03	1.614E-04	0.0	-0.162	0.180	0.180
0.0300	9.933E+00	3.333E-03	9.937E+00	1.700E-03	1.867E-04	0.0	-0.158	0.175	0.174
0.0350	8.834E+00	3.343E-03	8.837E+00	2.235E-03	2.110E-04	0.0	-0.154	0.170	0.170
0.0400	7.990E+00	3.355E-03	7.993E+00	2.830E-03	2.345E-04	0.0	-0.151	0.167	0.166
0.0450	7.321E+00	3.367E-03	7.324E+00	3.485E-03	2.573E-04	0.0	-0.149	0.163	0.163
0.0500	6.776E+00	3.381E-03	6.780E+00	4.195E-03	2.795E-04	0.0	-0.147	0.161	0.160
0.0550	6.325E+00	3.395E-03	6.328E+00	4.959E-03	3.012E-04	0.0	-0.145	0.158	0.158
0.0600	5.944E+00	3.410E-03	5.947E+00	5.775E-03	3.223E-04	0.0	-0.143	0.156	0.156
0.0700	5.335E+00	3.443E-03	5.339E+00	7.553E-03	3.633E-04	0.0	-0.140	0.153	0.152
0.0800	4.872E+00	3.479E-03	4.875E+00	9.516E-03	4.029E-04	0.0	-0.138	0.150	0.150
0.0900	4.506E+00	3.518E-03	4.509E+00	1.165E-02	4.411E-04	0.0	-0.135	0.147	0.147
0.1000	4.210E+00	3.559E-03	4.214E+00	1.395E-02	4.783E-04	0.0	-0.134	0.145	0.145
0.1250	3.671E+00	3.672E-03	3.675E+00	2.033E-02	5.672E-04	0.0	-0.130	0.141	0.141
0.1500	3.307E+00	3.794E-03	3.311E+00	2.751E-02	6.515E-04	0.0	-0.127	0.138	0.137
0.1750	3.046E+00	3.924E-03	3.050E+00	3.540E-02	7.322E-04	0.0	-0.125	0.135	0.134
0.2000	2.850E+00	4.061E-03	2.854E+00	4.388E-02	8.100E-04	0.0	-0.123	0.133	0.132
0.2500	2.578E+00	4.357E-03	2.582E+00	6.236E-02	9.592E-04	0.0	-0.119	0.129	0.128
0.3000	2.400E+00	4.680E-03	2.404E+00	8.247E-02	1.102E-03	0.0	-0.117	0.126	0.126
0.3500	2.276E+00	5.026E-03	2.281E+00	1.039E-01	1.241E-03	0.0	-0.115	0.124	0.123
0.4000	2.187E+00	5.394E-03	2.192E+00	1.262E-01	1.378E-03	0.0	-0.113	0.122	0.121
0.4500	2.120E+00	5.782E-03	2.126E+00	1.494E-01	1.512E-03	0.0	-0.111	0.121	0.119
0.5000	2.069E+00	6.189E-03	2.075E+00	1.732E-01	1.646E-03	0.0	-0.110	0.119	0.118
0.5500	2.030E+00	6.612E-03	2.037E+00	1.976E-01	1.780E-03	0.0	-0.108	0.118	0.116
0.6000	1.999E+00	7.050E-03	2.006E+00	2.223E-01	1.913E-03	0.0	-0.107	0.117	0.115
0.7000	1.956E+00	7.965E-03	1.964E+00	2.727E-01	2.180E-03	0.0	-0.105	0.115	0.113
0.8000	1.928E+00	8.927E-03	1.937E+00	3.240E-01	2.449E-03	0.0	-0.103	0.113	0.111
0.9000	1.911E+00	9.934E-03	1.921E+00	3.759E-01	2.720E-03	0.0	-0.102	0.112	0.109
1.0000	1.901E+00	1.098E-02	1.912E+00	4.281E-01	2.994E-03	0.0	-0.100	0.110	0.107
1.2500	1.892E+00	1.375E-02	1.906E+00	5.592E-01	3.690E-03	0.0	-0.098	0.107	0.104
1.5000	1.897E+00	1.671E-02	1.914E+00	6.901E-01	4.404E-03	0.0	-0.095	0.105	0.102
1.7500	1.908E+00	1.984E-02	1.927E+00	8.203E-01	5.133E-03	0.0	-0.093	0.103	0.099
2.0000	1.921E+00	2.309E-02	1.944E+00	9.495E-01	5.877E-03	0.0	-0.092	0.102	0.098
2.5000	1.951E+00	2.994E-02	1.981E+00	1.204E+00	7.399E-03	0.0	-0.089	0.099	0.095
3.0000	1.981E+00	3.716E-02	2.018E+00	1.454E+00	8.959E-03	0.0	-0.087	0.097	0.092
3.5000	2.010E+00	4.468E-02	2.054E+00	1.700E+00	1.055E-02	0.0	-0.086	0.095	0.090
4.0000	2.036E+00	5.245E-02	2.088E+00	1.941E+00	1.216E-02	0.0	-0.084	0.094	0.088
4.5000	2.060E+00	6.044E-02	2.121E+00	2.179E+00	1.379E-02	0.0	-0.083	0.092	0.087
5.0000	2.083E+00	6.862E-02	2.152E+00	2.413E+00	1.543E-02	0.0	-0.082	0.091	0.085
5.5000	2.104E+00	7.698E-02	2.181E+00	2.644E+00	1.708E-02	0.0	-0.081	0.090	0.084
6.0000	2.123E+00	8.550E-02	2.209E+00	2.871E+00	1.874E-02	0.0	-0.080	0.089	0.083
7.0000	2.159E+00	1.029E-01	2.262E+00	3.319E+00	2.208E-02	0.0	-0.079	0.087	0.081
8.0000	2.190E+00	1.208E-01	2.311E+00	3.756E+00	2.543E-02	0.0	-0.078	0.086	0.080
9.0000	2.218E+00	1.392E-01	2.357E+00	4.184E+00	2.879E-02	0.0	-0.076	0.084	0.078
10.0000	2.244E+00	1.578E-01	2.401E+00	4.605E+00	3.215E-02	0.0	-0.076	0.083	0.077
12.5000	2.298E+00	2.057E-01	2.504E+00	5.624E+00	4.051E-02	0.0	-0.074	0.081	0.074
15.0000	2.343E+00	2.549E-01	2.598E+00	6.604E+00	4.879E-02	0.0	-0.072	0.079	0.072
17.5000	2.381E+00	3.053E-01	2.686E+00	7.550E+00	5.695E-02	7.537E-03	-0.064	0.077	0.069
20.0000	2.410E+00	3.565E-01	2.767E+00	8.467E+00	6.499E-02	5.064E-02	-0.054	0.074	0.065
25.0000	2.454E+00	4.607E-01	2.915E+00	1.023E+01	8.071E-02	1.907E-01	-0.041	0.068	0.056
30.0000	2.486E+00	5.669E-01	3.053E+00	1.190E+01	9.592E-02	3.525E-01	-0.034	0.063	0.049
35.0000	2.512E+00	6.744E-01	3.186E+00	1.350E+01	1.106E-01	5.139E-01	-0.030	0.058	0.043
40.0000	2.532E+00	7.831E-01	3.315E+00	1.504E+01	1.248E-01	6.676E-01	-0.027	0.055	0.038
45.0000	2.550E+00	8.928E-01	3.443E+00	1.652E+01	1.385E-01	8.118E-01	-0.024	0.052	0.034
50.0000	2.565E+00	1.003E+00	3.568E+00	1.795E+01	1.517E-01	9.464E-01	-0.023	0.049	0.031
55.0000	2.578E+00	1.114E+00	3.693E+00	1.933E+01	1.644E-01	1.072E+00	-0.021	0.046	0.029
60.0000	2.591E+00	1.226E+00	3.817E+00	2.066E+01	1.766E-01	1.189E+00	-0.020	0.044	0.027
70.0000	2.612E+00	1.451E+00	4.062E+00	2.320E+01	1.999E-01	1.403E+00	-0.019	0.041	0.023
80.0000	2.629E+00	1.677E+00	4.307E+00	2.559E+01	2.216E-01	1.593E+00	-0.018	0.038	0.021
90.0000	2.645E+00	1.905E+00	4.550E+00	2.785E+01	2.419E-01	1.763E+00	-0.017	0.036	0.019
100.0000	2.658E+00	2.134E+00	4.792E+00	2.999E+01	2.610E-01	1.917E+00	-0.017	0.034	0.017
125.0000	2.687E+00	2.710E+00	5.397E+00	3.490E+01	3.037E-01	2.251E+00	-0.015	0.030	0.015
150.0000	2.709E+00	3.291E+00	6.000E+00	3.929E+01	3.408E-01	2.529E+00	-0.014	0.028	0.013
175.0000	2.728E+00	3.874E+00	6.602E+00	4.326E+01	3.733E-01	2.769E+00	-0.013	0.026	0.011
200.0000	2.744E+00	4.460E+00	7.205E+00	4.689E+01	4.020E-01	2.980E+00	-0.012	0.024	0.010
250.0000	2.770E+00	5.638E+00	8.408E+00	5.330E+01	4.508E-01	3.341E+00	-0.011	0.022	0.008
300.0000	2.791E+00	6.822E+00	9.612E+00	5.886E+01	4.909E-01	3.644E+00	-0.010	0.020	0.007
350.0000	2.808E+00	8.009E+00	1.082E+01	6.376E+01	5.244E-01	3.907E+00	-0.008	0.019	0.006
400.0000	2.822E+00	9.200E+00	1.202E+01	6.814E+01	5.530E-01	4.140E+00	-0.007	0.018	0.006
450.0000	2.834E+00	1.039E+01	1.323E+01	7.211E+01	5.778E-01	4.349E+00	-0.006	0.017	0.005
500.0000	2.845E+00	1.159E+01	1.443E+01	7.573E+01	5.994E-01	4.539E+00	-0.006	0.016	0.004
550.0000	2.854E+00	1.279E+01	1.564E+01	7.905E+01	6.186E-01	4.713E+00	-0.005	0.015	0.004
600.0000	2.863E+00	1.398E+01	1.685E+01	8.213E+01	6.357E-01	4.873E+00	-0.004	0.015	0.004
700.0000	2.877E+00	1.638E+01	1.926E+01	8.768E+01	6.650E-01	5.161E+00	-0.003	0.014	0.003
800.0000	2.890E+00	1.879E+01	2.168E+01	9.257E+01	6.893E-01	5.414E+00	-0.003	0.013	0.003
900.0000	2.901E+00	2.119E+01	2.409E+01	9.695E+01	7.097E-01	5.640E+00	-0.002	0.013	0.002
1000.0000	2.910E+00	2.360E+01	2.651E+01	1.009E+02	7.273E-01	5.843E+00	-0.002	0.012	0.002

ELECTRONS IN TOLUENE

I = 62.5 eV DENSITY = 8.669E-01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.285E+01	2.960E-03	2.286E+01	2.470E-04	7.135E-05	0.0	-0.192	0.218	0.217
0.0125	1.919E+01	2.970E-03	1.919E+01	3.669E-04	8.552E-05	0.0	-0.184	0.208	0.207
0.0150	1.664E+01	2.977E-03	1.664E+01	5.072E-04	9.908E-05	0.0	-0.178	0.201	0.200
0.0175	1.475E+01	2.982E-03	1.475E+01	6.671E-04	1.122E-04	0.0	-0.174	0.195	0.194
0.0200	1.329E+01	2.986E-03	1.329E+01	8.459E-04	1.248E-04	0.0	-0.170	0.190	0.189
0.0250	1.118E+01	2.995E-03	1.118E+01	1.258E-03	1.491E-04	0.0	-0.164	0.182	0.182
0.0300	9.719E+00	3.005E-03	9.722E+00	1.739E-03	1.724E-04	0.0	-0.159	0.176	0.176
0.0350	8.645E+00	3.015E-03	8.648E+00	2.285E-03	1.948E-04	0.0	-0.155	0.172	0.171
0.0400	7.820E+00	3.026E-03	7.823E+00	2.894E-03	2.164E-04	0.0	-0.152	0.168	0.168
0.0450	7.166E+00	3.039E-03	7.169E+00	3.563E-03	2.374E-04	0.0	-0.150	0.165	0.164
0.0500	6.634E+00	3.052E-03	6.637E+00	4.288E-03	2.579E-04	0.0	-0.148	0.162	0.162
0.0550	6.192E+00	3.067E-03	6.195E+00	5.069E-03	2.778E-04	0.0	-0.146	0.160	0.159
0.0600	5.819E+00	3.082E-03	5.823E+00	5.902E-03	2.974E-04	0.0	-0.144	0.158	0.157
0.0700	5.225E+00	3.113E-03	5.228E+00	7.718E-03	3.353E-04	0.0	-0.141	0.154	0.154
0.0800	4.771E+00	3.147E-03	4.774E+00	9.723E-03	3.718E-04	0.0	-0.138	0.151	0.151
0.0900	4.413E+00	3.184E-03	4.417E+00	1.190E-02	4.072E-04	0.0	-0.136	0.148	0.148
0.1000	4.124E+00	3.222E-03	4.127E+00	1.425E-02	4.415E-04	0.0	-0.135	0.146	0.146
0.1250	3.597E+00	3.327E-03	3.600E+00	2.076E-02	5.238E-04	0.0	-0.131	0.142	0.142
0.1500	3.241E+00	3.440E-03	3.244E+00	2.809E-02	6.020E-04	0.0	-0.128	0.139	0.138
0.1750	2.985E+00	3.560E-03	2.989E+00	3.614E-02	6.769E-04	0.0	-0.126	0.136	0.135
0.2000	2.793E+00	3.687E-03	2.797E+00	4.480E-02	7.492E-04	0.0	-0.123	0.134	0.133
0.2500	2.527E+00	3.960E-03	2.531E+00	6.365E-02	8.878E-04	0.0	-0.120	0.130	0.129
0.3000	2.353E+00	4.258E-03	2.357E+00	8.417E-02	1.021E-03	0.0	-0.118	0.127	0.126
0.3500	2.232E+00	4.576E-03	2.236E+00	1.060E-01	1.150E-03	0.0	-0.115	0.125	0.124
0.4000	2.144E+00	4.915E-03	2.149E+00	1.288E-01	1.277E-03	0.0	-0.108	0.123	0.122
0.4500	2.077E+00	5.273E-03	2.082E+00	1.525E-01	1.403E-03	2.097E-02	-0.090	0.119	0.117
0.5000	2.024E+00	5.647E-03	2.030E+00	1.768E-01	1.528E-03	4.725E-02	-0.084	0.114	0.112
0.5500	1.983E+00	6.036E-03	1.989E+00	2.017E-01	1.654E-03	7.602E-02	-0.079	0.110	0.107
0.6000	1.950E+00	6.438E-03	1.956E+00	2.271E-01	1.780E-03	1.066E-01	-0.074	0.106	0.102
0.7000	1.901E+00	7.281E-03	1.908E+00	2.788E-01	2.033E-03	1.715E-01	-0.067	0.100	0.094
0.8000	1.868E+00	8.167E-03	1.876E+00	3.317E-01	2.289E-03	2.389E-01	-0.061	0.094	0.087
0.9000	1.845E+00	9.092E-03	1.855E+00	3.853E-01	2.549E-03	3.071E-01	-0.056	0.089	0.081
1.0000	1.830E+00	1.006E-02	1.840E+00	4.395E-01	2.812E-03	3.751E-01	-0.053	0.085	0.076
1.2500	1.808E+00	1.261E-02	1.820E+00	5.762E-01	3.488E-03	5.402E-01	-0.046	0.076	0.067
1.5000	1.800E+00	1.534E-02	1.815E+00	7.138E-01	4.187E-03	6.953E-01	-0.041	0.070	0.059
1.7500	1.799E+00	1.821E-02	1.817E+00	8.515E-01	4.908E-03	8.395E-01	-0.038	0.065	0.054
2.0000	1.801E+00	2.121E-02	1.823E+00	9.889E-01	5.648E-03	9.733E-01	-0.036	0.061	0.050
2.5000	1.812E+00	2.753E-02	1.839E+00	1.262E+00	7.177E-03	1.213E+00	-0.033	0.055	0.044
3.0000	1.824E+00	3.419E-02	1.858E+00	1.533E+00	8.760E-03	1.423E+00	-0.031	0.051	0.040
3.5000	1.837E+00	4.112E-02	1.878E+00	1.800E+00	1.039E-02	1.609E+00	-0.029	0.048	0.037
4.0000	1.849E+00	4.830E-02	1.898E+00	2.065E+00	1.205E-02	1.776E+00	-0.028	0.045	0.035
4.5000	1.861E+00	5.568E-02	1.917E+00	2.327E+00	1.374E-02	1.927E+00	-0.027	0.043	0.033
5.0000	1.872E+00	6.324E-02	1.935E+00	2.587E+00	1.545E-02	2.066E+00	-0.026	0.041	0.031
5.5000	1.882E+00	7.097E-02	1.953E+00	2.844E+00	1.718E-02	2.193E+00	-0.025	0.040	0.030
6.0000	1.892E+00	7.883E-02	1.971E+00	3.099E+00	1.893E-02	2.312E+00	-0.024	0.038	0.029
7.0000	1.909E+00	9.496E-02	2.004E+00	3.602E+00	2.247E-02	2.528E+00	-0.022	0.036	0.027
8.0000	1.924E+00	1.115E-01	2.036E+00	4.097E+00	2.604E-02	2.720E+00	-0.021	0.034	0.025
9.0000	1.937E+00	1.285E-01	2.066E+00	4.585E+00	2.965E-02	2.894E+00	-0.020	0.033	0.024
10.0000	1.949E+00	1.457E-01	2.095E+00	5.065E+00	3.327E-02	3.053E+00	-0.018	0.031	0.023
12.5000	1.974E+00	1.900E-01	2.164E+00	6.239E+00	4.236E-02	3.403E+00	-0.015	0.028	0.020
15.0000	1.994E+00	2.357E-01	2.229E+00	7.377E+00	5.143E-02	3.701E+00	-0.012	0.026	0.018
17.5000	2.010E+00	2.823E-01	2.292E+00	8.483E+00	6.044E-02	3.962E+00	-0.010	0.024	0.016
20.0000	2.023E+00	3.297E-01	2.353E+00	9.560E+00	6.935E-02	4.195E+00	-0.009	0.022	0.014
25.0000	2.045E+00	4.264E-01	2.471E+00	1.163E+01	8.678E-02	4.595E+00	-0.006	0.019	0.011
30.0000	2.062E+00	5.248E-01	2.587E+00	1.361E+01	1.036E-01	4.932E+00	-0.005	0.017	0.009
35.0000	2.076E+00	6.246E-01	2.701E+00	1.550E+01	1.199E-01	5.221E+00	-0.003	0.015	0.007
40.0000	2.088E+00	7.254E-01	2.814E+00	1.732E+01	1.355E-01	5.476E+00	-0.003	0.014	0.006
45.0000	2.099E+00	8.273E-01	2.926E+00	1.906E+01	1.505E-01	5.702E+00	-0.002	0.013	0.005
50.0000	2.108E+00	9.297E-01	3.038E+00	2.073E+01	1.649E-01	5.906E+00	-0.002	0.012	0.005
55.0000	2.116E+00	1.033E+00	3.149E+00	2.235E+01	1.787E-01	6.091E+00	-0.002	0.011	0.004
60.0000	2.124E+00	1.137E+00	3.260E+00	2.391E+01	1.920E-01	6.261E+00	-0.001	0.010	0.004
70.0000	2.137E+00	1.345E+00	3.483E+00	2.688E+01	2.171E-01	6.563E+00	-0.001	0.009	0.003
80.0000	2.149E+00	1.556E+00	3.704E+00	2.966E+01	2.404E-01	6.825E+00	-0.001	0.009	0.002
90.0000	2.159E+00	1.768E+00	3.926E+00	3.228E+01	2.621E-01	7.058E+00	-0.001	0.008	0.002
100.0000	2.168E+00	1.980E+00	4.148E+00	3.476E+01	2.823E-01	7.266E+00	-0.001	0.007	0.002
125.0000	2.186E+00	2.516E+00	4.702E+00	4.042E+01	3.273E-01	7.708E+00	-0.000	0.006	0.001
150.0000	2.202E+00	3.055E+00	5.257E+00	4.544E+01	3.659E-01	8.071E+00	-0.000	0.006	0.001
175.0000	2.215E+00	3.598E+00	5.813E+00	4.996E+01	3.994E-01	8.377E+00	-0.000	0.005	0.001
200.0000	2.226E+00	4.143E+00	6.369E+00	5.407E+01	4.289E-01	8.643E+00	-0.000	0.005	0.001
250.0000	2.245E+00	5.238E+00	7.483E+00	6.131E+01	4.784E-01	9.088E+00	-0.000	0.004	0.001
300.0000	2.260E+00	6.339E+00	8.599E+00	6.754E+01	5.186E-01	9.452E+00	-0.000	0.004	0.000
350.0000	2.273E+00	7.444E+00	9.717E+00	7.300E+01	5.520E-01	9.759E+00	-0.000	0.004	0.000
400.0000	2.284E+00	8.552E+00	1.084E+01	7.787E+01	5.802E-01	1.003E+01	-0.000	0.003	0.000
450.0000	2.294E+00	9.662E+00	1.196E+01	8.226E+01	6.045E-01	1.026E+01	-0.000	0.003	0.000
500.0000	2.303E+00	1.077E+01	1.308E+01	8.626E+01	6.257E-01	1.047E+01	-0.000	0.003	0.000
550.0000	2.311E+00	1.189E+01	1.420E+01	8.993E+01	6.444E-01	1.066E+01	-0.000	0.003	0.000
600.0000	2.318E+00	1.300E+01	1.532E+01	9.332E+01	6.609E-01	1.084E+01	-0.000	0.003	0.000
700.0000	2.331E+00	1.524E+01	1.757E+01	9.941E+01	6.891E-01	1.114E+01	-0.000	0.003	0.000
800.0000	2.342E+00	1.747E+01	1.982E+01	1.048E+02	7.124E-01	1.141E+01	-0.000	0.003	0.000
900.0000	2.352E+00	1.972E+01	2.207E+01	1.095E+02	7.319E-01	1.165E+01	-0.000	0.002	0.000
1000.0000	2.360E+00	2.196E+01	2.432E+01	1.139E+02	7.485E-01	1.186E+01	-0.000	0.002	0.000

ELECTRONS IN WATER, LIQUID

I = 75.0 eV DENSITY = 1.000E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.256E+01	3.898E-03	2.257E+01	2.515E-04	9.408E-05	0.0	-0.199	0.227	0.225
0.0125	1.897E+01	3.927E-03	1.898E+01	3.728E-04	1.133E-04	0.0	-0.190	0.217	0.215
0.0150	1.647E+01	3.944E-03	1.647E+01	5.147E-04	1.316E-04	0.0	-0.184	0.208	0.207
0.0175	1.461E+01	3.955E-03	1.461E+01	6.761E-04	1.492E-04	0.0	-0.179	0.202	0.201
0.0200	1.317E+01	3.963E-03	1.318E+01	8.566E-04	1.663E-04	0.0	-0.175	0.197	0.196
0.0250	1.109E+01	3.974E-03	1.110E+01	1.272E-03	1.990E-04	0.0	-0.169	0.189	0.188
0.0300	9.653E+00	3.984E-03	9.657E+00	1.756E-03	2.301E-04	0.0	-0.164	0.182	0.182
0.0350	8.592E+00	3.994E-03	8.596E+00	2.306E-03	2.599E-04	0.0	-0.160	0.177	0.177
0.0400	7.777E+00	4.005E-03	7.781E+00	2.919E-03	2.886E-04	0.0	-0.157	0.173	0.173
0.0450	7.130E+00	4.018E-03	7.134E+00	3.591E-03	3.165E-04	0.0	-0.154	0.170	0.170
0.0500	6.603E+00	4.031E-03	6.607E+00	4.320E-03	3.435E-04	0.0	-0.152	0.167	0.167
0.0550	6.166E+00	4.046E-03	6.170E+00	5.103E-03	3.698E-04	0.0	-0.150	0.165	0.164
0.0600	5.797E+00	4.062E-03	5.801E+00	5.940E-03	3.955E-04	0.0	-0.148	0.162	0.162
0.0700	5.207E+00	4.098E-03	5.211E+00	7.762E-03	4.452E-04	0.0	-0.145	0.158	0.158
0.0800	4.757E+00	4.138E-03	4.762E+00	9.773E-03	4.931E-04	0.0	-0.142	0.155	0.155
0.0900	4.402E+00	4.181E-03	4.407E+00	1.196E-02	5.393E-04	0.0	-0.140	0.153	0.152
0.1000	4.115E+00	4.228E-03	4.120E+00	1.431E-02	5.841E-04	0.0	-0.138	0.150	0.150
0.1250	3.591E+00	4.355E-03	3.596E+00	2.083E-02	6.912E-04	0.0	-0.134	0.146	0.145
0.1500	3.238E+00	4.494E-03	3.242E+00	2.817E-02	7.926E-04	0.0	-0.131	0.142	0.142
0.1750	2.984E+00	4.643E-03	2.988E+00	3.622E-02	8.894E-04	0.0	-0.128	0.139	0.139
0.2000	2.793E+00	4.801E-03	2.798E+00	4.487E-02	9.826E-04	0.0	-0.126	0.137	0.136
0.2500	2.528E+00	5.141E-03	2.533E+00	6.372E-02	1.161E-03	0.0	-0.123	0.133	0.132
0.3000	2.355E+00	5.514E-03	2.360E+00	8.421E-02	1.331E-03	0.0	-0.120	0.130	0.129
0.3500	2.235E+00	5.913E-03	2.241E+00	1.060E-01	1.496E-03	0.0	-0.118	0.128	0.127
0.4000	2.148E+00	6.339E-03	2.154E+00	1.288E-01	1.658E-03	0.0	-0.116	0.126	0.125
0.4500	2.083E+00	6.787E-03	2.090E+00	1.523E-01	1.818E-03	0.0	-0.114	0.124	0.123
0.5000	2.034E+00	7.257E-03	2.041E+00	1.766E-01	1.976E-03	0.0	-0.111	0.123	0.121
0.5500	1.995E+00	7.747E-03	2.003E+00	2.013E-01	2.134E-03	1.103E-02	-0.094	0.120	0.118
0.6000	1.963E+00	8.254E-03	1.972E+00	2.265E-01	2.292E-03	2.938E-02	-0.088	0.117	0.114
0.7000	1.917E+00	9.312E-03	1.926E+00	2.778E-01	2.608E-03	7.435E-02	-0.078	0.110	0.106
0.8000	1.886E+00	1.043E-02	1.896E+00	3.302E-01	2.928E-03	1.267E-01	-0.070	0.105	0.099
0.9000	1.864E+00	1.159E-02	1.876E+00	3.832E-01	3.251E-03	1.835E-01	-0.064	0.099	0.093
1.0000	1.849E+00	1.280E-02	1.862E+00	4.367E-01	3.579E-03	2.428E-01	-0.059	0.095	0.087
1.2500	1.829E+00	1.600E-02	1.845E+00	5.717E-01	4.416E-03	3.944E-01	-0.049	0.085	0.075
1.5000	1.822E+00	1.942E-02	1.841E+00	7.075E-01	5.281E-03	5.437E-01	-0.043	0.077	0.066
1.7500	1.821E+00	2.303E-02	1.844E+00	8.432E-01	6.171E-03	6.866E-01	-0.038	0.071	0.059
2.0000	1.824E+00	2.678E-02	1.850E+00	9.785E-01	7.085E-03	8.218E-01	-0.035	0.066	0.053
2.5000	1.834E+00	3.468E-02	1.868E+00	1.247E+00	8.969E-03	1.069E+00	-0.030	0.059	0.045
3.0000	1.846E+00	4.299E-02	1.889E+00	1.514E+00	1.092E-02	1.288E+00	-0.027	0.054	0.040
3.5000	1.858E+00	5.164E-02	1.910E+00	1.777E+00	1.291E-02	1.484E+00	-0.025	0.049	0.036
4.0000	1.870E+00	6.058E-02	1.931E+00	2.037E+00	1.495E-02	1.660E+00	-0.024	0.046	0.033
4.5000	1.882E+00	6.976E-02	1.951E+00	2.295E+00	1.702E-02	1.821E+00	-0.023	0.043	0.031
5.0000	1.892E+00	7.917E-02	1.971E+00	2.550E+00	1.911E-02	1.967E+00	-0.022	0.041	0.029
5.5000	1.902E+00	8.876E-02	1.991E+00	2.802E+00	2.123E-02	2.102E+00	-0.021	0.039	0.027
6.0000	1.911E+00	9.854E-02	2.010E+00	3.052E+00	2.336E-02	2.227E+00	-0.021	0.038	0.026
7.0000	1.928E+00	1.185E-01	2.047E+00	3.545E+00	2.766E-02	2.453E+00	-0.020	0.035	0.024
8.0000	1.943E+00	1.391E-01	2.082E+00	4.030E+00	3.200E-02	2.652E+00	-0.019	0.033	0.023
9.0000	1.956E+00	1.601E-01	2.116E+00	4.506E+00	3.636E-02	2.831E+00	-0.018	0.031	0.021
10.0000	1.968E+00	1.814E-01	2.149E+00	4.975E+00	4.072E-02	2.992E+00	-0.018	0.030	0.020
12.5000	1.993E+00	2.362E-01	2.230E+00	6.117E+00	5.163E-02	3.341E+00	-0.016	0.027	0.019
15.0000	2.014E+00	2.926E-01	2.306E+00	7.219E+00	6.243E-02	3.633E+00	-0.015	0.025	0.017
17.5000	2.031E+00	3.501E-01	2.381E+00	8.286E+00	7.309E-02	3.885E+00	-0.014	0.024	0.016
20.0000	2.046E+00	4.086E-01	2.454E+00	9.320E+00	8.355E-02	4.107E+00	-0.013	0.022	0.015
25.0000	2.070E+00	5.277E-01	2.598E+00	1.130E+01	1.039E-01	4.487E+00	-0.010	0.020	0.013
30.0000	2.089E+00	6.489E-01	2.738E+00	1.317E+01	1.233E-01	4.806E+00	-0.009	0.018	0.011
35.0000	2.105E+00	7.716E-01	2.876E+00	1.496E+01	1.418E-01	5.082E+00	-0.007	0.017	0.010
40.0000	2.118E+00	8.955E-01	3.013E+00	1.665E+01	1.594E-01	5.326E+00	-0.006	0.015	0.009
45.0000	2.129E+00	1.021E+00	3.150E+00	1.828E+01	1.762E-01	5.544E+00	-0.005	0.014	0.008
50.0000	2.139E+00	1.146E+00	3.286E+00	1.983E+01	1.923E-01	5.741E+00	-0.004	0.014	0.007
55.0000	2.148E+00	1.273E+00	3.421E+00	2.132E+01	2.076E-01	5.921E+00	-0.004	0.013	0.006
60.0000	2.156E+00	1.400E+00	3.556E+00	2.276E+01	2.222E-01	6.087E+00	-0.003	0.012	0.006
70.0000	2.170E+00	1.656E+00	3.827E+00	2.547E+01	2.496E-01	6.383E+00	-0.002	0.011	0.005
80.0000	2.182E+00	1.914E+00	4.096E+00	2.799E+01	2.747E-01	6.641E+00	-0.002	0.010	0.004
90.0000	2.193E+00	2.173E+00	4.366E+00	3.035E+01	2.978E-01	6.871E+00	-0.002	0.009	0.003
100.0000	2.202E+00	2.434E+00	4.636E+00	3.258E+01	3.192E-01	7.077E+00	-0.001	0.009	0.003
125.0000	2.222E+00	3.089E+00	5.311E+00	3.761E+01	3.662E-01	7.516E+00	-0.001	0.008	0.002
150.0000	2.238E+00	3.749E+00	5.987E+00	4.204E+01	4.060E-01	7.876E+00	-0.001	0.007	0.002
175.0000	2.251E+00	4.412E+00	6.663E+00	4.600E+01	4.401E-01	8.182E+00	-0.001	0.006	0.001
200.0000	2.263E+00	5.078E+00	7.341E+00	4.957E+01	4.698E-01	8.447E+00	-0.000	0.006	0.001
250.0000	2.282E+00	6.416E+00	8.698E+00	5.582E+01	5.190E-01	8.891E+00	-0.000	0.005	0.001
300.0000	2.297E+00	7.760E+00	1.006E+01	6.116E+01	5.584E-01	9.254E+00	-0.000	0.005	0.001
350.0000	2.311E+00	9.107E+00	1.142E+01	6.583E+01	5.908E-01	9.561E+00	-0.000	0.005	0.001
400.0000	2.322E+00	1.046E+01	1.278E+01	6.996E+01	6.180E-01	9.827E+00	-0.000	0.004	0.001
450.0000	2.332E+00	1.181E+01	1.414E+01	7.368E+01	6.412E-01	1.006E+01	-0.000	0.004	0.000
500.0000	2.341E+00	1.317E+01	1.551E+01	7.705E+01	6.613E-01	1.027E+01	-0.000	0.004	0.000
550.0000	2.349E+00	1.453E+01	1.688E+01	8.014E+01	6.789E-01	1.046E+01	-0.000	0.004	0.000
600.0000	2.357E+00	1.589E+01	1.824E+01	8.299E+01	6.945E-01	1.064E+01	-0.000	0.004	0.000
700.0000	2.370E+00	1.861E+01	2.098E+01	8.810E+01	7.209E-01	1.094E+01	-0.000	0.003	0.000
800.0000	2.381E+00	2.133E+01	2.371E+01	9.258E+01	7.425E-01	1.121E+01	-0.000	0.003	0.000
900.0000	2.391E+00	2.406E+01	2.645E+01	9.657E+01	7.605E-01	1.145E+01	-0.000	0.003	0.000
1000.0000	2.400E+00	2.679E+01	2.919E+01	1.002E+02	7.759E-01	1.166E+01	-0.000	0.003	0.000

ELECTRONS IN WATER, LIQUID (*)

I = 75.0 eV DENSITY = 1.000E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.256E+01	3.898E-03	2.257E+01	2.515E-04	9.408E-05	0.0	-0.199	0.227	0.225
0.0125	1.897E+01	3.927E-03	1.898E+01	3.728E-04	1.133E-04	0.0	-0.190	0.217	0.215
0.0150	1.647E+01	3.944E-03	1.647E+01	5.147E-04	1.316E-04	0.0	-0.184	0.208	0.207
0.0175	1.461E+01	3.955E-03	1.461E+01	6.761E-04	1.492E-04	0.0	-0.179	0.202	0.201
0.0200	1.317E+01	3.963E-03	1.318E+01	8.566E-04	1.663E-04	0.0	-0.175	0.197	0.196
0.0250	1.109E+01	3.974E-03	1.110E+01	1.272E-03	1.990E-04	0.0	-0.169	0.189	0.188
0.0300	9.653E+00	3.984E-03	9.657E+00	1.756E-03	2.301E-04	0.0	-0.164	0.182	0.182
0.0350	8.592E+00	3.994E-03	8.596E+00	2.306E-03	2.599E-04	0.0	-0.160	0.177	0.177
0.0400	7.777E+00	4.005E-03	7.781E+00	2.919E-03	2.886E-04	0.0	-0.157	0.173	0.173
0.0450	7.130E+00	4.018E-03	7.134E+00	3.591E-03	3.165E-04	0.0	-0.154	0.170	0.170
0.0500	6.603E+00	4.031E-03	6.607E+00	4.320E-03	3.435E-04	0.0	-0.152	0.167	0.167
0.0550	6.166E+00	4.046E-03	6.170E+00	5.103E-03	3.698E-04	0.0	-0.150	0.165	0.164
0.0600	5.797E+00	4.062E-03	5.801E+00	5.940E-03	3.955E-04	0.0	-0.148	0.162	0.162
0.0700	5.207E+00	4.098E-03	5.211E+00	7.762E-03	4.452E-04	0.0	-0.145	0.158	0.158
0.0800	4.757E+00	4.138E-03	4.762E+00	9.773E-03	4.931E-04	0.0	-0.142	0.155	0.155
0.0900	4.402E+00	4.181E-03	4.407E+00	1.196E-02	5.393E-04	0.0	-0.140	0.153	0.152
0.1000	4.115E+00	4.228E-03	4.120E+00	1.431E-02	5.841E-04	0.0	-0.138	0.150	0.150
0.1250	3.591E+00	4.355E-03	3.596E+00	2.083E-02	6.912E-04	0.0	-0.134	0.146	0.145
0.1500	3.238E+00	4.494E-03	3.242E+00	2.817E-02	7.926E-04	0.0	-0.131	0.142	0.142
0.1750	2.984E+00	4.643E-03	2.988E+00	3.622E-02	8.894E-04	0.0	-0.128	0.139	0.139
0.2000	2.793E+00	4.801E-03	2.798E+00	4.487E-02	9.826E-04	0.0	-0.126	0.137	0.136
0.2500	2.528E+00	5.141E-03	2.533E+00	6.372E-02	1.161E-03	0.0	-0.123	0.133	0.132
0.3000	2.355E+00	5.514E-03	2.360E+00	8.421E-02	1.331E-03	2.187E-03	-0.120	0.130	0.129
0.3500	2.233E+00	5.913E-03	2.239E+00	1.060E-01	1.497E-03	1.051E-02	-0.118	0.128	0.127
0.4000	2.145E+00	6.339E-03	2.152E+00	1.288E-01	1.659E-03	2.188E-02	-0.116	0.126	0.125
0.4500	2.079E+00	6.787E-03	2.086E+00	1.524E-01	1.819E-03	3.663E-02	-0.114	0.124	0.123
0.5000	2.028E+00	7.257E-03	2.035E+00	1.767E-01	1.978E-03	5.424E-02	-0.111	0.123	0.121
0.5500	1.988E+00	7.747E-03	1.996E+00	2.015E-01	2.137E-03	7.393E-02	-0.094	0.120	0.118
0.6000	1.956E+00	8.254E-03	1.965E+00	2.268E-01	2.295E-03	9.538E-02	-0.088	0.117	0.114
0.7000	1.910E+00	9.312E-03	1.919E+00	2.783E-01	2.614E-03	1.422E-01	-0.078	0.110	0.106
0.8000	1.879E+00	1.043E-02	1.890E+00	3.308E-01	2.935E-03	1.925E-01	-0.070	0.105	0.099
0.9000	1.858E+00	1.159E-02	1.870E+00	3.841E-01	3.260E-03	2.448E-01	-0.064	0.099	0.093
1.0000	1.844E+00	1.280E-02	1.857E+00	4.378E-01	3.588E-03	2.983E-01	-0.059	0.095	0.087
1.2500	1.825E+00	1.600E-02	1.841E+00	5.731E-01	4.428E-03	4.331E-01	-0.049	0.085	0.075
1.5000	1.820E+00	1.942E-02	1.839E+00	7.090E-01	5.293E-03	5.648E-01	-0.043	0.077	0.066
1.7500	1.821E+00	2.303E-02	1.844E+00	8.448E-01	6.183E-03	6.911E-01	-0.038	0.071	0.059
2.0000	1.825E+00	2.678E-02	1.851E+00	9.801E-01	7.094E-03	8.119E-01	-0.035	0.066	0.053
2.5000	1.837E+00	3.468E-02	1.871E+00	1.249E+00	8.973E-03	1.036E+00	-0.030	0.059	0.045
3.0000	1.850E+00	4.299E-02	1.893E+00	1.514E+00	1.091E-02	1.238E+00	-0.027	0.054	0.040
3.5000	1.864E+00	5.164E-02	1.916E+00	1.777E+00	1.290E-02	1.419E+00	-0.025	0.049	0.036
4.0000	1.877E+00	6.058E-02	1.937E+00	2.037E+00	1.493E-02	1.585E+00	-0.024	0.046	0.033
4.5000	1.889E+00	6.976E-02	1.958E+00	2.293E+00	1.698E-02	1.738E+00	-0.023	0.043	0.031
5.0000	1.900E+00	7.917E-02	1.979E+00	2.547E+00	1.907E-02	1.880E+00	-0.022	0.041	0.029
5.5000	1.910E+00	8.876E-02	1.999E+00	2.799E+00	2.117E-02	2.011E+00	-0.021	0.039	0.027
6.0000	1.919E+00	9.854E-02	2.018E+00	3.048E+00	2.329E-02	2.133E+00	-0.021	0.038	0.026
7.0000	1.936E+00	1.185E-01	2.055E+00	3.539E+00	2.757E-02	2.359E+00	-0.020	0.035	0.024
8.0000	1.951E+00	1.391E-01	2.090E+00	4.021E+00	3.189E-02	2.555E+00	-0.019	0.033	0.023
9.0000	1.964E+00	1.601E-01	2.124E+00	4.496E+00	3.623E-02	2.736E+00	-0.018	0.031	0.021
10.0000	1.976E+00	1.814E-01	2.157E+00	4.963E+00	4.058E-02	2.900E+00	-0.018	0.030	0.020
12.5000	2.000E+00	2.362E-01	2.237E+00	6.101E+00	5.145E-02	3.257E+00	-0.016	0.027	0.019
15.0000	2.020E+00	2.926E-01	2.313E+00	7.200E+00	6.222E-02	3.558E+00	-0.015	0.025	0.017
17.5000	2.037E+00	3.501E-01	2.387E+00	8.264E+00	7.286E-02	3.819E+00	-0.014	0.024	0.016
20.0000	2.051E+00	4.086E-01	2.459E+00	9.295E+00	8.331E-02	4.050E+00	-0.013	0.022	0.015
25.0000	2.074E+00	5.277E-01	2.601E+00	1.127E+01	1.036E-01	4.444E+00	-0.010	0.020	0.013
30.0000	2.092E+00	6.489E-01	2.741E+00	1.314E+01	1.230E-01	4.773E+00	-0.009	0.018	0.011
35.0000	2.107E+00	7.716E-01	2.878E+00	1.492E+01	1.415E-01	5.056E+00	-0.007	0.017	0.010
40.0000	2.120E+00	8.955E-01	3.015E+00	1.662E+01	1.592E-01	5.305E+00	-0.006	0.015	0.009
45.0000	2.131E+00	1.021E+00	3.151E+00	1.824E+01	1.760E-01	5.527E+00	-0.005	0.014	0.008
50.0000	2.141E+00	1.146E+00	3.287E+00	1.980E+01	1.920E-01	5.726E+00	-0.004	0.014	0.007
55.0000	2.149E+00	1.273E+00	3.422E+00	2.129E+01	2.074E-01	5.908E+00	-0.004	0.013	0.006
60.0000	2.157E+00	1.400E+00	3.558E+00	2.272E+01	2.220E-01	6.074E+00	-0.003	0.012	0.006
70.0000	2.171E+00	1.656E+00	3.828E+00	2.543E+01	2.494E-01	6.372E+00	-0.002	0.011	0.005
80.0000	2.183E+00	1.914E+00	4.097E+00	2.795E+01	2.745E-01	6.631E+00	-0.002	0.010	0.004
90.0000	2.194E+00	2.173E+00	4.367E+00	3.032E+01	2.976E-01	6.861E+00	-0.002	0.009	0.003
100.0000	2.203E+00	2.434E+00	4.637E+00	3.254E+01	3.190E-01	7.067E+00	-0.001	0.009	0.003
125.0000	2.223E+00	3.089E+00	5.312E+00	3.757E+01	3.661E-01	7.505E+00	-0.001	0.008	0.002
150.0000	2.239E+00	3.749E+00	5.988E+00	4.200E+01	4.058E-01	7.864E+00	-0.001	0.007	0.002
175.0000	2.252E+00	4.412E+00	6.664E+00	4.596E+01	4.400E-01	8.170E+00	-0.001	0.006	0.001
200.0000	2.264E+00	5.078E+00	7.342E+00	4.953E+01	4.696E-01	8.434E+00	-0.000	0.006	0.001
250.0000	2.283E+00	6.416E+00	8.699E+00	5.578E+01	5.189E-01	8.878E+00	-0.000	0.005	0.001
300.0000	2.298E+00	7.760E+00	1.006E+01	6.112E+01	5.583E-01	9.243E+00	-0.000	0.005	0.001
350.0000	2.312E+00	9.107E+00	1.142E+01	6.578E+01	5.907E-01	9.551E+00	-0.000	0.005	0.001
400.0000	2.323E+00	1.046E+01	1.278E+01	6.992E+01	6.179E-01	9.818E+00	-0.000	0.004	0.001
450.0000	2.333E+00	1.181E+01	1.415E+01	7.364E+01	6.411E-01	1.005E+01	-0.000	0.004	0.000
500.0000	2.342E+00	1.317E+01	1.551E+01	7.701E+01	6.612E-01	1.027E+01	-0.000	0.004	0.000
550.0000	2.350E+00	1.453E+01	1.688E+01	8.010E+01	6.788E-01	1.046E+01	-0.000	0.004	0.000
600.0000	2.357E+00	1.589E+01	1.824E+01	8.295E+01	6.944E-01	1.063E+01	-0.000	0.004	0.000
700.0000	2.370E+00	1.861E+01	2.098E+01	8.806E+01	7.208E-01	1.094E+01	-0.000	0.003	0.000
800.0000	2.382E+00	2.133E+01	2.371E+01	9.254E+01	7.424E-01	1.121E+01	-0.000	0.003	0.000
900.0000	2.392E+00	2.406E+01	2.645E+01	9.653E+01	7.605E-01	1.145E+01	-0.000	0.003	0.000
1000.0000	2.400E+00	2.679E+01	2.919E+01	1.001E+02	7.758E-01	1.166E+01	-0.000	0.003	0.000

*Evaluated with the density-effect correction of Ashley (1982b).

ELECTRONS IN WATER VAPOR

I = 71.6 eV DENSITY = 7.562E-04 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.277E+01	3.898E-03	2.277E+01	2.489E-04	9.311E-05	0.0	-0.197	0.225	0.223
0.0125	1.914E+01	3.927E-03	1.914E+01	3.691E-04	1.121E-04	0.0	-0.189	0.214	0.213
0.0150	1.661E+01	3.944E-03	1.661E+01	5.097E-04	1.303E-04	0.0	-0.183	0.206	0.205
0.0175	1.473E+01	3.955E-03	1.474E+01	6.699E-04	1.479E-04	0.0	-0.178	0.200	0.199
0.0200	1.328E+01	3.963E-03	1.329E+01	8.488E-04	1.648E-04	0.0	-0.174	0.195	0.194
0.0250	1.118E+01	3.974E-03	1.119E+01	1.261E-03	1.973E-04	0.0	-0.167	0.187	0.186
0.0300	9.726E+00	3.984E-03	9.730E+00	1.742E-03	2.282E-04	0.0	-0.163	0.181	0.180
0.0350	8.656E+00	3.994E-03	8.660E+00	2.287E-03	2.578E-04	0.0	-0.159	0.176	0.175
0.0400	7.834E+00	4.005E-03	7.838E+00	2.895E-03	2.863E-04	0.0	-0.156	0.172	0.172
0.0450	7.181E+00	4.018E-03	7.185E+00	3.563E-03	3.140E-04	0.0	-0.153	0.169	0.168
0.0500	6.650E+00	4.031E-03	6.654E+00	4.286E-03	3.409E-04	0.0	-0.151	0.166	0.165
0.0550	6.209E+00	4.046E-03	6.213E+00	5.065E-03	3.670E-04	0.0	-0.149	0.163	0.163
0.0600	5.836E+00	4.062E-03	5.841E+00	5.895E-03	3.926E-04	0.0	-0.147	0.161	0.161
0.0700	5.242E+00	4.098E-03	5.246E+00	7.706E-03	4.420E-04	0.0	-0.144	0.157	0.157
0.0800	4.789E+00	4.138E-03	4.793E+00	9.703E-03	4.896E-04	0.0	-0.141	0.154	0.154
0.0900	4.431E+00	4.181E-03	4.435E+00	1.187E-02	5.355E-04	0.0	-0.139	0.152	0.151
0.1000	4.142E+00	4.228E-03	4.146E+00	1.421E-02	5.801E-04	0.0	-0.137	0.149	0.149
0.1250	3.614E+00	4.355E-03	3.618E+00	2.069E-02	6.866E-04	0.0	-0.133	0.145	0.144
0.1500	3.257E+00	4.494E-03	3.262E+00	2.799E-02	7.874E-04	0.0	-0.130	0.141	0.141
0.1750	3.001E+00	4.643E-03	3.006E+00	3.598E-02	8.837E-04	0.0	-0.128	0.138	0.138
0.2000	2.809E+00	4.801E-03	2.814E+00	4.459E-02	9.765E-04	0.0	-0.126	0.136	0.136
0.2500	2.542E+00	5.141E-03	2.548E+00	6.333E-02	1.154E-03	0.0	-0.122	0.132	0.132
0.3000	2.368E+00	5.514E-03	2.374E+00	8.370E-02	1.323E-03	0.0	-0.119	0.130	0.129
0.3500	2.247E+00	5.913E-03	2.253E+00	1.054E-01	1.488E-03	0.0	-0.117	0.127	0.126
0.4000	2.159E+00	6.339E-03	2.166E+00	1.280E-01	1.649E-03	0.0	-0.115	0.125	0.124
0.4500	2.094E+00	6.787E-03	2.101E+00	1.515E-01	1.808E-03	0.0	-0.114	0.123	0.122
0.5000	2.045E+00	7.257E-03	2.052E+00	1.756E-01	1.965E-03	0.0	-0.112	0.122	0.120
0.5500	2.007E+00	7.747E-03	2.014E+00	2.002E-01	2.122E-03	0.0	-0.111	0.121	0.119
0.6000	1.977E+00	8.254E-03	1.985E+00	2.252E-01	2.279E-03	0.0	-0.109	0.119	0.118
0.7000	1.934E+00	9.312E-03	1.944E+00	2.761E-01	2.592E-03	0.0	-0.107	0.117	0.115
0.8000	1.908E+00	1.043E-02	1.918E+00	3.279E-01	2.907E-03	0.0	-0.105	0.115	0.113
0.9000	1.891E+00	1.159E-02	1.903E+00	3.803E-01	3.224E-03	0.0	-0.104	0.114	0.111
1.0000	1.881E+00	1.280E-02	1.894E+00	4.330E-01	3.544E-03	0.0	-0.102	0.112	0.110
1.2500	1.874E+00	1.600E-02	1.890E+00	5.652E-01	4.356E-03	0.0	-0.099	0.110	0.106
1.5000	1.880E+00	1.942E-02	1.899E+00	6.972E-01	5.187E-03	0.0	-0.097	0.107	0.104
1.7500	1.891E+00	2.303E-02	1.914E+00	8.284E-01	6.036E-03	0.0	-0.095	0.105	0.101
2.0000	1.905E+00	2.678E-02	1.932E+00	9.584E-01	6.899E-03	0.0	-0.093	0.104	0.099
2.5000	1.936E+00	3.468E-02	1.970E+00	1.215E+00	8.665E-03	0.0	-0.091	0.101	0.096
3.0000	1.966E+00	4.299E-02	2.009E+00	1.466E+00	1.047E-02	0.0	-0.089	0.099	0.094
3.5000	1.995E+00	5.164E-02	2.047E+00	1.713E+00	1.230E-02	0.0	-0.087	0.097	0.091
4.0000	2.022E+00	6.058E-02	2.082E+00	1.955E+00	1.416E-02	0.0	-0.086	0.095	0.090
4.5000	2.046E+00	6.976E-02	2.116E+00	2.193E+00	1.604E-02	0.0	-0.084	0.094	0.088
5.0000	2.069E+00	7.917E-02	2.148E+00	2.427E+00	1.792E-02	0.0	-0.083	0.093	0.087
5.5000	2.090E+00	8.876E-02	2.179E+00	2.658E+00	1.982E-02	0.0	-0.082	0.091	0.085
6.0000	2.110E+00	9.854E-02	2.209E+00	2.886E+00	2.172E-02	0.0	-0.081	0.090	0.084
7.0000	2.146E+00	1.185E-01	2.265E+00	3.333E+00	2.555E-02	0.0	-0.080	0.089	0.082
8.0000	2.178E+00	1.391E-01	2.317E+00	3.770E+00	2.938E-02	0.0	-0.079	0.087	0.080
9.0000	2.206E+00	1.601E-01	2.366E+00	4.197E+00	3.321E-02	0.0	-0.078	0.086	0.079
10.0000	2.232E+00	1.814E-01	2.413E+00	4.616E+00	3.703E-02	0.0	-0.077	0.084	0.077
12.5000	2.286E+00	2.362E-01	2.523E+00	5.628E+00	4.652E-02	0.0	-0.075	0.082	0.074
15.0000	2.332E+00	2.926E-01	2.624E+00	6.600E+00	5.587E-02	0.0	-0.073	0.079	0.072
17.5000	2.370E+00	3.501E-01	2.721E+00	7.535E+00	6.505E-02	0.0	-0.072	0.077	0.070
20.0000	2.404E+00	4.086E-01	2.813E+00	8.439E+00	7.405E-02	0.0	-0.071	0.076	0.068
25.0000	2.460E+00	5.277E-01	2.988E+00	1.016E+01	9.147E-02	0.0	-0.069	0.073	0.065
30.0000	2.507E+00	6.489E-01	3.155E+00	1.179E+01	1.081E-01	0.0	-0.068	0.071	0.062
35.0000	2.544E+00	7.716E-01	3.316E+00	1.334E+01	1.240E-01	1.481E-02	-0.058	0.068	0.059
40.0000	2.574E+00	8.955E-01	3.469E+00	1.481E+01	1.392E-01	6.811E-02	-0.049	0.065	0.055
45.0000	2.598E+00	1.021E+00	3.618E+00	1.622E+01	1.537E-01	1.414E-01	-0.042	0.063	0.051
50.0000	2.617E+00	1.146E+00	3.764E+00	1.758E+01	1.677E-01	2.242E-01	-0.037	0.060	0.047
55.0000	2.634E+00	1.273E+00	3.907E+00	1.888E+01	1.811E-01	3.108E-01	-0.033	0.057	0.043
60.0000	2.649E+00	1.400E+00	4.049E+00	2.014E+01	1.940E-01	3.984E-01	-0.030	0.055	0.040
70.0000	2.674E+00	1.656E+00	4.330E+00	2.252E+01	2.184E-01	5.703E-01	-0.026	0.051	0.035
80.0000	2.694E+00	1.914E+00	4.608E+00	2.476E+01	2.410E-01	7.335E-01	-0.023	0.048	0.031
90.0000	2.711E+00	2.173E+00	4.884E+00	2.687E+01	2.620E-01	8.863E-01	-0.021	0.045	0.027
100.0000	2.726E+00	2.434E+00	5.159E+00	2.886E+01	2.817E-01	1.029E+00	-0.019	0.043	0.025
125.0000	2.756E+00	3.089E+00	5.845E+00	3.341E+01	3.256E-01	1.345E+00	-0.017	0.038	0.020
150.0000	2.779E+00	3.749E+00	6.528E+00	3.746E+01	3.634E-01	1.614E+00	-0.015	0.035	0.017
175.0000	2.799E+00	4.412E+00	7.211E+00	4.110E+01	3.963E-01	1.848E+00	-0.014	0.032	0.014
200.0000	2.815E+00	5.078E+00	7.894E+00	4.441E+01	4.252E-01	2.053E+00	-0.014	0.030	0.013
250.0000	2.843E+00	6.416E+00	9.258E+00	5.025E+01	4.741E-01	2.402E+00	-0.013	0.027	0.010
300.0000	2.865E+00	7.760E+00	1.062E+01	5.529E+01	5.138E-01	2.692E+00	-0.012	0.025	0.009
350.0000	2.883E+00	9.107E+00	1.199E+01	5.972E+01	5.469E-01	2.939E+00	-0.011	0.023	0.008
400.0000	2.899E+00	1.046E+01	1.336E+01	6.367E+01	5.750E-01	3.156E+00	-0.011	0.022	0.007
450.0000	2.912E+00	1.181E+01	1.473E+01	6.723E+01	5.992E-01	3.348E+00	-0.011	0.021	0.006
500.0000	2.924E+00	1.317E+01	1.609E+01	7.048E+01	6.203E-01	3.522E+00	-0.010	0.020	0.006
550.0000	2.935E+00	1.453E+01	1.746E+01	7.346E+01	6.390E-01	3.681E+00	-0.010	0.020	0.005
600.0000	2.945E+00	1.589E+01	1.883E+01	7.622E+01	6.555E-01	3.827E+00	-0.009	0.019	0.005
700.0000	2.962E+00	1.861E+01	2.157E+01	8.117E+01	6.838E-01	4.088E+00	-0.008	0.018	0.004
800.0000	2.977E+00	2.133E+01	2.431E+01	8.554E+01	7.072E-01	4.318E+00	-0.008	0.017	0.004
900.0000	2.989E+00	2.406E+01	2.705E+01	8.944E+01	7.268E-01	4.524E+00	-0.007	0.016	0.003
1000.0000	3.000E+00	2.679E+01	2.979E+01	9.296E+01	7.435E-01	4.711E+00	-0.006	0.016	0.003

POSITRONS IN CARBON (GRAPHITE)

I = 78.0 eV DENSITY = 2.265E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.219E+01	3.150E-03	2.219E+01	2.520E-04	7.749E-05	0.0	-0.182	0.204	0.203
0.0125	1.857E+01	3.161E-03	1.857E+01	3.757E-04	9.323E-05	0.0	-0.175	0.196	0.195
0.0150	1.605E+01	3.168E-03	1.605E+01	5.210E-04	1.083E-04	0.0	-0.170	0.189	0.188
0.0175	1.419E+01	3.172E-03	1.420E+01	6.869E-04	1.229E-04	0.0	-0.166	0.184	0.183
0.0200	1.276E+01	3.176E-03	1.276E+01	8.730E-04	1.371E-04	0.0	-0.163	0.180	0.179
0.0250	1.069E+01	3.184E-03	1.070E+01	1.303E-03	1.644E-04	0.0	-0.158	0.173	0.173
0.0300	9.266E+00	3.194E-03	9.269E+00	1.807E-03	1.905E-04	0.0	-0.154	0.168	0.168
0.0350	8.218E+00	3.204E-03	8.221E+00	2.381E-03	2.158E-04	0.0	-0.151	0.164	0.164
0.0400	7.414E+00	3.215E-03	7.417E+00	3.022E-03	2.403E-04	0.0	-0.148	0.161	0.161
0.0450	6.777E+00	3.228E-03	6.781E+00	3.728E-03	2.641E-04	0.0	-0.146	0.158	0.158
0.0500	6.260E+00	3.241E-03	6.263E+00	4.496E-03	2.874E-04	0.0	-0.144	0.156	0.156
0.0550	5.831E+00	3.255E-03	5.834E+00	5.324E-03	3.101E-04	0.0	-0.142	0.154	0.154
0.0600	5.469E+00	3.270E-03	5.473E+00	6.209E-03	3.324E-04	0.0	-0.141	0.152	0.152
0.0700	4.893E+00	3.303E-03	4.896E+00	8.146E-03	3.758E-04	0.0	-0.139	0.149	0.149
0.0800	4.453E+00	3.337E-03	4.456E+00	1.029E-02	4.179E-04	0.0	-0.137	0.147	0.147
0.0900	4.107E+00	3.375E-03	4.110E+00	1.263E-02	4.587E-04	0.0	-0.135	0.145	0.144
0.1000	3.827E+00	3.414E-03	3.830E+00	1.515E-02	4.985E-04	0.0	-0.133	0.143	0.143
0.1250	3.317E+00	3.523E-03	3.320E+00	2.219E-02	5.942E-04	0.0	-0.131	0.139	0.139
0.1500	2.973E+00	3.640E-03	2.977E+00	3.017E-02	6.855E-04	0.0	-0.128	0.137	0.136
0.1750	2.726E+00	3.764E-03	2.730E+00	3.895E-02	7.735E-04	0.0	-0.127	0.135	0.134
0.2000	2.541E+00	3.896E-03	2.545E+00	4.845E-02	8.587E-04	0.0	-0.123	0.133	0.132
0.2500	2.280E+00	4.179E-03	2.284E+00	6.926E-02	1.023E-03	3.446E-02	-0.097	0.124	0.123
0.3000	2.107E+00	4.489E-03	2.111E+00	9.209E-02	1.182E-03	7.681E-02	-0.089	0.116	0.114
0.3500	1.986E+00	4.820E-03	1.990E+00	1.165E-01	1.338E-03	1.205E-01	-0.084	0.110	0.108
0.4000	1.897E+00	5.173E-03	1.902E+00	1.422E-01	1.492E-03	1.650E-01	-0.079	0.105	0.102
0.4500	1.830E+00	5.545E-03	1.836E+00	1.690E-01	1.645E-03	2.097E-01	-0.075	0.100	0.097
0.5000	1.778E+00	5.935E-03	1.784E+00	1.967E-01	1.798E-03	2.543E-01	-0.072	0.096	0.093
0.5500	1.738E+00	6.340E-03	1.744E+00	2.250E-01	1.951E-03	2.986E-01	-0.069	0.093	0.089
0.6000	1.705E+00	6.759E-03	1.712E+00	2.540E-01	2.104E-03	3.424E-01	-0.066	0.090	0.086
0.7000	1.657E+00	7.637E-03	1.665E+00	3.133E-01	2.413E-03	4.282E-01	-0.062	0.085	0.080
0.8000	1.624E+00	8.559E-03	1.633E+00	3.740E-01	2.726E-03	5.111E-01	-0.059	0.081	0.076
0.9000	1.602E+00	9.523E-03	1.611E+00	4.356E-01	3.042E-03	5.909E-01	-0.056	0.078	0.072
1.0000	1.586E+00	1.053E-02	1.596E+00	4.980E-01	3.363E-03	6.675E-01	-0.054	0.075	0.069
1.2500	1.563E+00	1.318E-02	1.576E+00	6.558E-01	4.185E-03	8.458E-01	-0.050	0.069	0.063
1.5000	1.555E+00	1.602E-02	1.571E+00	8.147E-01	5.033E-03	1.007E+00	-0.047	0.065	0.058
1.7500	1.553E+00	1.901E-02	1.572E+00	9.739E-01	5.906E-03	1.153E+00	-0.045	0.062	0.055
2.0000	1.555E+00	2.213E-02	1.577E+00	1.133E+00	6.800E-03	1.287E+00	-0.043	0.059	0.052
2.5000	1.564E+00	2.870E-02	1.593E+00	1.448E+00	8.643E-03	1.524E+00	-0.040	0.055	0.048
3.0000	1.575E+00	3.561E-02	1.611E+00	1.760E+00	1.055E-02	1.730E+00	-0.038	0.052	0.045
3.5000	1.587E+00	4.281E-02	1.630E+00	2.069E+00	1.249E-02	1.913E+00	-0.036	0.050	0.042
4.0000	1.598E+00	5.026E-02	1.649E+00	2.374E+00	1.448E-02	2.077E+00	-0.034	0.048	0.040
4.5000	1.609E+00	5.792E-02	1.667E+00	2.675E+00	1.649E-02	2.226E+00	-0.032	0.046	0.038
5.0000	1.619E+00	6.576E-02	1.685E+00	2.974E+00	1.853E-02	2.364E+00	-0.031	0.044	0.037
5.5000	1.628E+00	7.378E-02	1.702E+00	3.269E+00	2.059E-02	2.492E+00	-0.029	0.043	0.035
6.0000	1.637E+00	8.193E-02	1.719E+00	3.561E+00	2.267E-02	2.612E+00	-0.028	0.042	0.034
7.0000	1.652E+00	9.865E-02	1.751E+00	4.138E+00	2.686E-02	2.831E+00	-0.025	0.039	0.031
8.0000	1.665E+00	1.158E-01	1.781E+00	4.704E+00	3.109E-02	3.029E+00	-0.022	0.037	0.029
9.0000	1.677E+00	1.334E-01	1.810E+00	5.261E+00	3.534E-02	3.210E+00	-0.019	0.035	0.027
10.0000	1.687E+00	1.513E-01	1.838E+00	5.809E+00	3.960E-02	3.377E+00	-0.017	0.034	0.025
12.5000	1.708E+00	1.971E-01	1.905E+00	7.145E+00	5.027E-02	3.745E+00	-0.013	0.030	0.021
15.0000	1.725E+00	2.444E-01	1.969E+00	8.435E+00	6.087E-02	4.059E+00	-0.010	0.027	0.017
17.5000	1.738E+00	2.927E-01	2.031E+00	9.686E+00	7.134E-02	4.334E+00	-0.008	0.024	0.015
20.0000	1.750E+00	3.417E-01	2.091E+00	1.090E+01	8.165E-02	4.577E+00	-0.006	0.022	0.013
25.0000	1.768E+00	4.417E-01	2.210E+00	1.322E+01	1.017E-01	4.993E+00	-0.004	0.019	0.010
30.0000	1.783E+00	5.435E-01	2.327E+00	1.543E+01	1.209E-01	5.339E+00	-0.003	0.017	0.008
35.0000	1.796E+00	6.466E-01	2.442E+00	1.753E+01	1.393E-01	5.636E+00	-0.002	0.015	0.006
40.0000	1.806E+00	7.508E-01	2.557E+00	1.953E+01	1.568E-01	5.894E+00	-0.002	0.014	0.005
45.0000	1.816E+00	8.559E-01	2.672E+00	2.144E+01	1.735E-01	6.124E+00	-0.001	0.012	0.004
50.0000	1.824E+00	9.617E-01	2.786E+00	2.327E+01	1.894E-01	6.330E+00	-0.001	0.012	0.004
55.0000	1.832E+00	1.068E+00	2.900E+00	2.503E+01	2.046E-01	6.517E+00	-0.001	0.011	0.003
60.0000	1.838E+00	1.175E+00	3.014E+00	2.672E+01	2.192E-01	6.688E+00	-0.001	0.010	0.003
70.0000	1.850E+00	1.391E+00	3.241E+00	2.992E+01	2.465E-01	6.992E+00	-0.001	0.009	0.002
80.0000	1.861E+00	1.608E+00	3.469E+00	3.290E+01	2.715E-01	7.256E+00	-0.001	0.008	0.002
90.0000	1.870E+00	1.826E+00	3.696E+00	3.569E+01	2.946E-01	7.489E+00	-0.000	0.008	0.002
100.0000	1.878E+00	2.046E+00	3.924E+00	3.832E+01	3.159E-01	7.698E+00	-0.000	0.007	0.001
125.0000	1.895E+00	2.598E+00	4.494E+00	4.427E+01	3.629E-01	8.141E+00	-0.000	0.006	0.001
150.0000	1.910E+00	3.155E+00	5.064E+00	4.951E+01	4.027E-01	8.504E+00	-0.000	0.006	0.001
175.0000	1.921E+00	3.714E+00	5.636E+00	5.418E+01	4.368E-01	8.811E+00	-0.000	0.005	0.001
200.0000	1.932E+00	4.276E+00	6.208E+00	5.841E+01	4.665E-01	9.077E+00	-0.000	0.005	0.001
250.0000	1.949E+00	5.405E+00	7.354E+00	6.580E+01	5.158E-01	9.522E+00	-0.000	0.004	0.000
300.0000	1.963E+00	6.540E+00	8.503E+00	7.212E+01	5.553E-01	9.886E+00	-0.000	0.004	0.000
350.0000	1.975E+00	7.678E+00	9.653E+00	7.763E+01	5.878E-01	1.019E+01	-0.000	0.004	0.000
400.0000	1.985E+00	8.820E+00	1.080E+01	8.253E+01	6.151E-01	1.046E+01	-0.000	0.003	0.000
450.0000	1.994E+00	9.964E+00	1.196E+01	8.692E+01	6.385E-01	1.070E+01	-0.000	0.003	0.000
500.0000	2.002E+00	1.111E+01	1.311E+01	9.091E+01	6.587E-01	1.091E+01	-0.000	0.003	0.000
550.0000	2.009E+00	1.226E+01	1.427E+01	9.457E+01	6.764E-01	1.110E+01	-0.000	0.003	0.000
600.0000	2.016E+00	1.340E+01	1.542E+01	9.794E+01	6.920E-01	1.127E+01	-0.000	0.003	0.000
700.0000	2.028E+00	1.570E+01	1.773E+01	1.040E+02	7.186E-01	1.158E+01	-0.000	0.003	0.000
800.0000	2.038E+00	1.801E+01	2.005E+01	1.093E+02	7.403E-01	1.185E+01	-0.000	0.003	0.000
900.0000	2.047E+00	2.031E+01	2.236E+01	1.140E+02	7.584E-01	1.208E+01	-0.000	0.002	0.000
1000.0000	2.055E+00	2.262E+01	2.468E+01	1.183E+02	7.739E-01	1.229E+01	-0.000	0.002	0.000

POSITRONS IN CARBON (GRAPHITE)

I = 78.0 eV DENSITY = 1.700E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.219E+01	3.150E-03	2.219E+01	2.520E-04	7.750E-05	1.920E-03	-0.182	0.204	0.203
0.0125	1.856E+01	3.161E-03	1.857E+01	3.758E-04	9.324E-05	2.481E-03	-0.175	0.195	0.194
0.0150	1.605E+01	3.168E-03	1.605E+01	5.211E-04	1.083E-04	3.073E-03	-0.170	0.189	0.188
0.0175	1.419E+01	3.172E-03	1.419E+01	6.871E-04	1.229E-04	3.695E-03	-0.165	0.184	0.183
0.0200	1.276E+01	3.176E-03	1.276E+01	8.732E-04	1.371E-04	4.347E-03	-0.162	0.179	0.179
0.0250	1.069E+01	3.184E-03	1.069E+01	1.303E-03	1.644E-04	5.736E-03	-0.157	0.173	0.172
0.0300	9.260E+00	3.194E-03	9.264E+00	1.807E-03	1.906E-04	7.236E-03	-0.153	0.168	0.167
0.0350	8.212E+00	3.204E-03	8.215E+00	2.382E-03	2.159E-04	8.843E-03	-0.149	0.164	0.163
0.0400	7.408E+00	3.215E-03	7.412E+00	3.024E-03	2.404E-04	1.055E-02	-0.147	0.160	0.160
0.0450	6.771E+00	3.228E-03	6.775E+00	3.730E-03	2.642E-04	1.236E-02	-0.144	0.157	0.157
0.0500	6.254E+00	3.241E-03	6.257E+00	4.499E-03	2.875E-04	1.425E-02	-0.142	0.155	0.155
0.0550	5.824E+00	3.255E-03	5.828E+00	5.328E-03	3.103E-04	1.624E-02	-0.141	0.153	0.153
0.0600	5.462E+00	3.270E-03	5.465E+00	6.214E-03	3.327E-04	1.832E-02	-0.139	0.151	0.151
0.0700	4.885E+00	3.303E-03	4.888E+00	8.153E-03	3.762E-04	2.271E-02	-0.136	0.148	0.148
0.0800	4.445E+00	3.337E-03	4.448E+00	1.030E-02	4.183E-04	2.740E-02	-0.134	0.145	0.145
0.0900	4.098E+00	3.375E-03	4.101E+00	1.265E-02	4.593E-04	3.237E-02	-0.132	0.143	0.143
0.1000	3.817E+00	3.414E-03	3.820E+00	1.517E-02	4.992E-04	3.760E-02	-0.130	0.141	0.141
0.1250	3.306E+00	3.523E-03	3.309E+00	2.224E-02	5.953E-04	5.166E-02	-0.126	0.137	0.136
0.1500	2.960E+00	3.640E-03	2.964E+00	3.024E-02	6.872E-04	6.694E-02	-0.123	0.134	0.133
0.1750	2.712E+00	3.764E-03	2.716E+00	3.907E-02	7.758E-04	8.320E-02	-0.121	0.131	0.130
0.2000	2.525E+00	3.896E-03	2.529E+00	4.862E-02	8.618E-04	1.003E-01	-0.118	0.129	0.128
0.2500	2.265E+00	4.179E-03	2.270E+00	6.957E-02	1.028E-03	1.363E-01	-0.114	0.125	0.124
0.3000	2.094E+00	4.489E-03	2.099E+00	9.253E-02	1.188E-03	1.740E-01	-0.110	0.121	0.120
0.3500	1.975E+00	4.820E-03	1.979E+00	1.171E-01	1.345E-03	2.129E-01	-0.106	0.118	0.117
0.4000	1.887E+00	5.173E-03	1.892E+00	1.430E-01	1.500E-03	2.524E-01	-0.102	0.116	0.114
0.4500	1.821E+00	5.545E-03	1.827E+00	1.699E-01	1.654E-03	2.922E-01	-0.099	0.113	0.112
0.5000	1.770E+00	5.935E-03	1.776E+00	1.976E-01	1.807E-03	3.321E-01	-0.096	0.111	0.109
0.5500	1.730E+00	6.340E-03	1.737E+00	2.261E-01	1.961E-03	3.719E-01	-0.094	0.109	0.107
0.6000	1.698E+00	6.759E-03	1.705E+00	2.552E-01	2.114E-03	4.114E-01	-0.091	0.107	0.105
0.7000	1.651E+00	7.637E-03	1.659E+00	3.147E-01	2.424E-03	4.891E-01	-0.086	0.104	0.100
0.8000	1.619E+00	8.559E-03	1.628E+00	3.756E-01	2.737E-03	5.648E-01	-0.082	0.100	0.097
0.9000	1.597E+00	9.523E-03	1.607E+00	4.374E-01	3.054E-03	6.382E-01	-0.079	0.098	0.093
1.0000	1.582E+00	1.053E-02	1.592E+00	5.000E-01	3.376E-03	7.091E-01	-0.076	0.095	0.090
1.2500	1.561E+00	1.318E-02	1.574E+00	6.580E-01	4.198E-03	8.756E-01	-0.070	0.090	0.084
1.5000	1.553E+00	1.602E-02	1.569E+00	8.172E-01	5.046E-03	1.028E+00	-0.066	0.085	0.079
1.7500	1.552E+00	1.901E-02	1.571E+00	9.765E-01	5.918E-03	1.167E+00	-0.063	0.082	0.075
2.0000	1.555E+00	2.213E-02	1.577E+00	1.135E+00	6.812E-03	1.295E+00	-0.060	0.079	0.071
2.5000	1.564E+00	2.870E-02	1.593E+00	1.451E+00	8.653E-03	1.522E+00	-0.056	0.074	0.066
3.0000	1.576E+00	3.561E-02	1.612E+00	1.763E+00	1.055E-02	1.720E+00	-0.054	0.070	0.062
3.5000	1.589E+00	4.281E-02	1.631E+00	2.071E+00	1.250E-02	1.894E+00	-0.051	0.068	0.059
4.0000	1.600E+00	5.026E-02	1.651E+00	2.376E+00	1.448E-02	2.051E+00	-0.050	0.065	0.057
4.5000	1.612E+00	5.792E-02	1.670E+00	2.677E+00	1.649E-02	2.193E+00	-0.048	0.063	0.055
5.0000	1.622E+00	6.576E-02	1.688E+00	2.975E+00	1.852E-02	2.323E+00	-0.046	0.061	0.053
5.5000	1.632E+00	7.378E-02	1.706E+00	3.270E+00	2.057E-02	2.443E+00	-0.045	0.060	0.051
6.0000	1.641E+00	8.193E-02	1.723E+00	3.561E+00	2.264E-02	2.555E+00	-0.044	0.058	0.050
7.0000	1.658E+00	9.865E-02	1.756E+00	4.136E+00	2.682E-02	2.758E+00	-0.041	0.056	0.047
8.0000	1.672E+00	1.158E-01	1.788E+00	4.700E+00	3.102E-02	2.939E+00	-0.038	0.054	0.045
9.0000	1.685E+00	1.334E-01	1.818E+00	5.255E+00	3.525E-02	3.104E+00	-0.036	0.052	0.042
10.0000	1.696E+00	1.513E-01	1.847E+00	5.800E+00	3.949E-02	3.256E+00	-0.033	0.050	0.040
12.5000	1.720E+00	1.971E-01	1.917E+00	7.129E+00	5.007E-02	3.591E+00	-0.028	0.046	0.036
15.0000	1.738E+00	2.444E-01	1.983E+00	8.411E+00	6.058E-02	3.879E+00	-0.023	0.042	0.031
17.5000	1.754E+00	2.927E-01	2.046E+00	9.652E+00	7.095E-02	4.133E+00	-0.019	0.039	0.028
20.0000	1.766E+00	3.417E-01	2.108E+00	1.086E+01	8.116E-02	4.361E+00	-0.016	0.036	0.025
25.0000	1.787E+00	4.417E-01	2.228E+00	1.316E+01	1.010E-01	4.755E+00	-0.011	0.032	0.020
30.0000	1.803E+00	5.435E-01	2.346E+00	1.535E+01	1.200E-01	5.088E+00	-0.008	0.028	0.016
35.0000	1.816E+00	6.466E-01	2.462E+00	1.743E+01	1.382E-01	5.376E+00	-0.006	0.026	0.013
40.0000	1.827E+00	7.508E-01	2.578E+00	1.941E+01	1.556E-01	5.628E+00	-0.005	0.023	0.011
45.0000	1.837E+00	8.559E-01	2.692E+00	2.131E+01	1.722E-01	5.854E+00	-0.004	0.022	0.010
50.0000	1.845E+00	9.617E-01	2.807E+00	2.313E+01	1.880E-01	6.057E+00	-0.003	0.020	0.008
55.0000	1.853E+00	1.068E+00	2.921E+00	2.488E+01	2.031E-01	6.241E+00	-0.003	0.019	0.007
60.0000	1.860E+00	1.175E+00	3.035E+00	2.655E+01	2.176E-01	6.411E+00	-0.002	0.018	0.006
70.0000	1.872E+00	1.391E+00	3.263E+00	2.973E+01	2.447E-01	6.712E+00	-0.002	0.016	0.005
80.0000	1.882E+00	1.608E+00	3.490E+00	3.269E+01	2.696E-01	6.974E+00	-0.001	0.015	0.004
90.0000	1.892E+00	1.826E+00	3.718E+00	3.547E+01	2.925E-01	7.206E+00	-0.001	0.013	0.004
100.0000	1.900E+00	2.046E+00	3.946E+00	3.808E+01	3.138E-01	7.415E+00	-0.001	0.013	0.003
125.0000	1.917E+00	2.598E+00	4.516E+00	4.400E+01	3.607E-01	7.857E+00	-0.001	0.011	0.002
150.0000	1.931E+00	3.155E+00	5.086E+00	4.921E+01	4.003E-01	8.219E+00	-0.000	0.010	0.002
175.0000	1.943E+00	3.714E+00	5.658E+00	5.387E+01	4.344E-01	8.525E+00	-0.000	0.009	0.001
200.0000	1.954E+00	4.276E+00	6.230E+00	5.808E+01	4.641E-01	8.791E+00	-0.000	0.008	0.001
250.0000	1.971E+00	5.405E+00	7.376E+00	6.545E+01	5.135E-01	9.236E+00	-0.000	0.007	0.001
300.0000	1.985E+00	6.540E+00	8.525E+00	7.175E+01	5.530E-01	9.599E+00	-0.000	0.007	0.001
350.0000	1.997E+00	7.678E+00	9.675E+00	7.725E+01	5.856E-01	9.907E+00	-0.000	0.006	0.001
400.0000	2.007E+00	8.820E+00	1.083E+01	8.213E+01	6.129E-01	1.017E+01	-0.000	0.006	0.001
450.0000	2.016E+00	9.964E+00	1.198E+01	8.652E+01	6.363E-01	1.041E+01	-0.000	0.006	0.000
500.0000	2.024E+00	1.111E+01	1.313E+01	9.050E+01	6.566E-01	1.062E+01	-0.000	0.005	0.000
550.0000	2.031E+00	1.226E+01	1.429E+01	9.415E+01	6.744E-01	1.081E+01	-0.000	0.005	0.000
600.0000	2.038E+00	1.340E+01	1.544E+01	9.752E+01	6.901E-01	1.098E+01	-0.000	0.005	0.000
700.0000	2.050E+00	1.570E+01	1.775E+01	1.036E+02	7.167E-01	1.129E+01	-0.000	0.005	0.000
800.0000	2.060E+00	1.801E+01	2.007E+01	1.088E+02	7.385E-01	1.156E+01	-0.000	0.005	0.000
900.0000	2.069E+00	2.031E+01	2.238E+01	1.136E+02	7.568E-01	1.179E+01	-0.000	0.004	0.000
1000.0000	2.077E+00	2.262E+01	2.470E+01	1.178E+02	7.723E-01	1.200E+01	-0.000	0.004	0.000

POSITRONS IN ALUMINUM

I = 166.0 eV DENSITY = 2.699E+00 g/cm^3

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm^2/g	MeV cm^2/g	MeV cm^2/g	g/cm^2					
0.0100	1.846E+01	6.559E-03	1.847E+01	3.090E-04	1.867E-04	0.0	-0.211	0.243	0.239
0.0125	1.554E+01	6.700E-03	1.555E+01	4.572E-04	2.280E-04	0.0	-0.202	0.231	0.228
0.0150	1.349E+01	6.798E-03	1.350E+01	6.303E-04	2.679E-04	0.0	-0.195	0.222	0.219
0.0175	1.197E+01	6.871E-03	1.198E+01	8.273E-04	3.066E-04	0.0	-0.190	0.215	0.212
0.0200	1.080E+01	6.926E-03	1.080E+01	1.047E-03	3.442E-04	0.0	-0.186	0.209	0.207
0.0250	9.087E+00	7.004E-03	9.094E+00	1.554E-03	4.166E-04	0.0	-0.179	0.200	0.198
0.0300	7.900E+00	7.059E-03	7.907E+00	2.145E-03	4.858E-04	0.0	-0.174	0.194	0.192
0.0350	7.026E+00	7.100E-03	7.033E+00	2.817E-03	5.524E-04	0.0	-0.170	0.188	0.187
0.0400	6.352E+00	7.133E-03	6.359E+00	3.566E-03	6.166E-04	0.0	-0.167	0.184	0.183
0.0450	5.817E+00	7.162E-03	5.825E+00	4.389E-03	6.787E-04	0.0	-0.164	0.180	0.179
0.0500	5.382E+00	7.191E-03	5.389E+00	5.282E-03	7.391E-04	0.0	-0.162	0.177	0.176
0.0550	5.020E+00	7.217E-03	5.027E+00	6.244E-03	7.978E-04	0.0	-0.160	0.175	0.174
0.0600	4.714E+00	7.243E-03	4.721E+00	7.271E-03	8.551E-04	0.0	-0.158	0.172	0.172
0.0700	4.225E+00	7.295E-03	4.233E+00	9.512E-03	9.657E-04	0.0	-0.155	0.169	0.168
0.0800	3.852E+00	7.350E-03	3.859E+00	1.199E-02	1.072E-03	0.0	-0.152	0.165	0.165
0.0900	3.557E+00	7.411E-03	3.565E+00	1.469E-02	1.174E-03	0.0	-0.150	0.163	0.162
0.1000	3.319E+00	7.476E-03	3.326E+00	1.760E-02	1.273E-03	0.0	-0.148	0.160	0.160
0.1250	2.884E+00	7.659E-03	2.891E+00	2.569E-02	1.509E-03	0.0	-0.145	0.156	0.155
0.1500	2.590E+00	7.865E-03	2.598E+00	3.484E-02	1.730E-03	0.0	-0.142	0.153	0.152
0.1750	2.378E+00	8.096E-03	2.387E+00	4.490E-02	1.942E-03	0.0	-0.140	0.150	0.149
0.2000	2.220E+00	8.344E-03	2.228E+00	5.575E-02	2.145E-03	0.0	-0.138	0.148	0.147
0.2500	2.000E+00	8.888E-03	2.009E+00	7.947E-02	2.534E-03	0.0	-0.134	0.144	0.143
0.3000	1.855E+00	9.487E-03	1.865E+00	1.054E-01	2.904E-03	7.102E-03	-0.126	0.140	0.139
0.3500	1.754E+00	1.013E-02	1.765E+00	1.330E-01	3.263E-03	1.706E-02	-0.122	0.137	0.135
0.4000	1.681E+00	1.082E-02	1.692E+00	1.619E-01	3.614E-03	2.867E-02	-0.118	0.134	0.132
0.4500	1.627E+00	1.154E-02	1.638E+00	1.920E-01	3.959E-03	4.148E-02	-0.115	0.131	0.129
0.5000	1.585E+00	1.230E-02	1.597E+00	2.229E-01	4.300E-03	5.517E-02	-0.112	0.128	0.126
0.5500	1.553E+00	1.309E-02	1.566E+00	2.545E-01	4.639E-03	6.950E-02	-0.110	0.126	0.124
0.6000	1.527E+00	1.390E-02	1.541E+00	2.867E-01	4.977E-03	8.429E-02	-0.108	0.124	0.121
0.7000	1.490E+00	1.560E-02	1.506E+00	3.524E-01	5.650E-03	1.147E-01	-0.104	0.120	0.117
0.8000	1.467E+00	1.739E-02	1.484E+00	4.194E-01	6.323E-03	1.458E-01	-0.100	0.117	0.114
0.9000	1.451E+00	1.925E-02	1.471E+00	4.871E-01	6.999E-03	1.771E-01	-0.097	0.115	0.111
1.0000	1.441E+00	2.119E-02	1.463E+00	5.553E-01	7.678E-03	2.084E-01	-0.095	0.112	0.108
1.2500	1.431E+00	2.630E-02	1.457E+00	7.267E-01	9.394E-03	2.867E-01	-0.088	0.107	0.101
1.5000	1.431E+00	3.177E-02	1.463E+00	8.980E-01	1.114E-02	3.630E-01	-0.082	0.102	0.096
1.7500	1.436E+00	3.752E-02	1.473E+00	1.068E+00	1.292E-02	4.393E-01	-0.077	0.098	0.091
2.0000	1.443E+00	4.350E-02	1.486E+00	1.237E+00	1.472E-02	5.153E-01	-0.072	0.095	0.087
2.5000	1.459E+00	5.605E-02	1.515E+00	1.570E+00	1.840E-02	6.671E-01	-0.062	0.088	0.079
3.0000	1.474E+00	6.924E-02	1.544E+00	1.897E+00	2.216E-02	8.175E-01	-0.053	0.083	0.071
3.5000	1.489E+00	8.292E-02	1.571E+00	2.218E+00	2.596E-02	9.643E-01	-0.046	0.077	0.065
4.0000	1.501E+00	9.702E-02	1.598E+00	2.534E+00	2.981E-02	1.106E+00	-0.041	0.073	0.059
4.5000	1.513E+00	1.115E-01	1.624E+00	2.844E+00	3.368E-02	1.240E+00	-0.037	0.069	0.054
5.0000	1.523E+00	1.263E-01	1.649E+00	3.150E+00	3.758E-02	1.368E+00	-0.033	0.065	0.050
5.5000	1.533E+00	1.413E-01	1.674E+00	3.451E+00	4.148E-02	1.490E+00	-0.031	0.062	0.046
6.0000	1.541E+00	1.567E-01	1.698E+00	3.747E+00	4.538E-02	1.605E+00	-0.029	0.059	0.043
7.0000	1.556E+00	1.879E-01	1.744E+00	4.328E+00	5.319E-02	1.817E+00	-0.025	0.055	0.038
8.0000	1.570E+00	2.200E-01	1.790E+00	4.894E+00	6.096E-02	2.009E+00	-0.023	0.051	0.034
9.0000	1.581E+00	2.526E-01	1.834E+00	5.446E+00	6.867E-02	2.184E+00	-0.021	0.048	0.031
10.0000	1.592E+00	2.858E-01	1.877E+00	5.985E+00	7.631E-02	2.343E+00	-0.020	0.045	0.028
12.5000	1.614E+00	3.706E-01	1.984E+00	7.280E+00	9.498E-02	2.690E+00	-0.018	0.040	0.024
15.0000	1.631E+00	4.574E-01	2.089E+00	8.508E+00	1.130E-01	2.982E+00	-0.016	0.036	0.021
17.5000	1.646E+00	5.459E-01	2.192E+00	9.676E+00	1.303E-01	3.233E+00	-0.015	0.033	0.019
20.0000	1.659E+00	6.357E-01	2.295E+00	1.079E+01	1.469E-01	3.454E+00	-0.014	0.031	0.017
25.0000	1.680E+00	8.180E-01	2.498E+00	1.288E+01	1.781E-01	3.830E+00	-0.013	0.027	0.014
30.0000	1.697E+00	1.003E+00	2.700E+00	1.480E+01	2.068E-01	4.143E+00	-0.011	0.025	0.012
35.0000	1.711E+00	1.190E+00	2.901E+00	1.659E+01	2.331E-01	4.412E+00	-0.010	0.023	0.011
40.0000	1.723E+00	1.379E+00	3.102E+00	1.826E+01	2.575E-01	4.649E+00	-0.009	0.021	0.010
45.0000	1.733E+00	1.569E+00	3.303E+00	1.982E+01	2.800E-01	4.860E+00	-0.008	0.020	0.009
50.0000	1.742E+00	1.761E+00	3.503E+00	2.129E+01	3.009E-01	5.051E+00	-0.007	0.019	0.008
55.0000	1.750E+00	1.953E+00	3.704E+00	2.268E+01	3.204E-01	5.226E+00	-0.007	0.018	0.007
60.0000	1.758E+00	2.147E+00	3.904E+00	2.399E+01	3.386E-01	5.387E+00	-0.006	0.017	0.007
70.0000	1.770E+00	2.535E+00	4.306E+00	2.643E+01	3.716E-01	5.676E+00	-0.005	0.016	0.006
80.0000	1.781E+00	2.927E+00	4.708E+00	2.865E+01	4.009E-01	5.928E+00	-0.004	0.015	0.005
90.0000	1.791E+00	3.320E+00	5.110E+00	3.069E+01	4.270E-01	6.153E+00	-0.003	0.014	0.004
100.0000	1.799E+00	3.714E+00	5.513E+00	3.257E+01	4.505E-01	6.356E+00	-0.003	0.013	0.004
125.0000	1.816E+00	4.707E+00	6.523E+00	3.673E+01	5.002E-01	6.790E+00	-0.002	0.012	0.003
150.0000	1.830E+00	5.705E+00	7.535E+00	4.030E+01	5.402E-01	7.147E+00	-0.001	0.011	0.002
175.0000	1.842E+00	6.708E+00	8.550E+00	4.341E+01	5.732E-01	7.450E+00	-0.001	0.010	0.002
200.0000	1.852E+00	7.714E+00	9.566E+00	4.617E+01	6.010E-01	7.714E+00	-0.001	0.009	0.002
250.0000	1.869E+00	9.734E+00	1.160E+01	5.091E+01	6.456E-01	8.156E+00	-0.001	0.008	0.001
300.0000	1.883E+00	1.176E+01	1.364E+01	5.488E+01	6.798E-01	8.518E+00	-0.000	0.008	0.001
350.0000	1.894E+00	1.380E+01	1.569E+01	5.830E+01	7.071E-01	8.825E+00	-0.000	0.007	0.001
400.0000	1.904E+00	1.583E+01	1.774E+01	6.129E+01	7.295E-01	9.091E+00	-0.000	0.007	0.001
450.0000	1.913E+00	1.787E+01	1.979E+01	6.396E+01	7.483E-01	9.326E+00	-0.000	0.007	0.001
500.0000	1.921E+00	1.992E+01	2.184E+01	6.636E+01	7.642E-01	9.536E+00	-0.000	0.007	0.001
550.0000	1.928E+00	2.196E+01	2.389E+01	6.855E+01	7.780E-01	9.726E+00	-0.000	0.006	0.001
600.0000	1.934E+00	2.401E+01	2.594E+01	7.056E+01	7.900E-01	9.900E+00	-0.000	0.006	0.001
700.0000	1.946E+00	2.811E+01	3.005E+01	7.414E+01	8.101E-01	1.021E+01	-0.000	0.006	0.000
800.0000	1.956E+00	3.221E+01	3.416E+01	7.726E+01	8.262E-01	1.047E+01	-0.000	0.006	0.000
900.0000	1.964E+00	3.631E+01	3.828E+01	8.002E+01	8.395E-01	1.071E+01	-0.000	0.005	0.000
1000.0000	1.972E+00	4.042E+01	4.239E+01	8.250E+01	8.507E-01	1.092E+01	-0.000	0.005	0.000

POSITRONS IN COPPER

I = 322.0 eV DENSITY = 8.960E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.505E+01	1.213E-02	1.506E+01	3.891E-04	4.006E-04	0.0	-0.245	0.293	0.283
0.0125	1.275E+01	1.277E-02	1.276E+01	5.702E-04	5.011E-04	0.0	-0.233	0.276	0.267
0.0150	1.113E+01	1.327E-02	1.114E+01	7.804E-04	6.003E-04	0.0	-0.224	0.263	0.255
0.0175	9.915E+00	1.366E-02	9.929E+00	1.019E-03	6.979E-04	0.0	-0.217	0.253	0.246
0.0200	8.970E+00	1.399E-02	8.984E+00	1.284E-03	7.940E-04	0.0	-0.211	0.245	0.239
0.0250	7.588E+00	1.449E-02	7.603E+00	1.891E-03	9.819E-04	0.0	-0.203	0.233	0.227
0.0300	6.622E+00	1.488E-02	6.637E+00	2.597E-03	1.164E-03	0.0	-0.196	0.223	0.219
0.0350	5.906E+00	1.518E-02	5.921E+00	3.396E-03	1.341E-03	0.0	-0.191	0.216	0.212
0.0400	5.353E+00	1.543E-02	5.369E+00	4.285E-03	1.513E-03	0.0	-0.187	0.211	0.207
0.0450	4.912E+00	1.564E-02	4.928E+00	5.258E-03	1.681E-03	0.0	-0.184	0.206	0.203
0.0500	4.552E+00	1.583E-02	4.568E+00	6.313E-03	1.845E-03	0.0	-0.181	0.202	0.199
0.0550	4.252E+00	1.600E-02	4.268E+00	7.446E-03	2.005E-03	0.0	-0.178	0.198	0.196
0.0600	3.999E+00	1.615E-02	4.015E+00	8.655E-03	2.162E-03	0.0	-0.176	0.195	0.193
0.0700	3.592E+00	1.641E-02	3.609E+00	1.129E-02	2.466E-03	0.0	-0.172	0.190	0.188
0.0800	3.281E+00	1.665E-02	3.297E+00	1.419E-02	2.758E-03	0.0	-0.169	0.186	0.184
0.0900	3.034E+00	1.688E-02	3.051E+00	1.735E-02	3.039E-03	0.0	-0.167	0.183	0.181
0.1000	2.835E+00	1.710E-02	2.852E+00	2.074E-02	3.312E-03	0.0	-0.165	0.180	0.178
0.1250	2.469E+00	1.763E-02	2.487E+00	3.017E-02	3.960E-03	0.0	-0.160	0.174	0.172
0.1500	2.222E+00	1.816E-02	2.240E+00	4.078E-02	4.567E-03	2.607E-03	-0.141	0.169	0.167
0.1750	2.040E+00	1.870E-02	2.059E+00	5.245E-02	5.143E-03	2.460E-02	-0.131	0.161	0.159
0.2000	1.904E+00	1.926E-02	1.923E+00	6.503E-02	5.694E-03	4.545E-02	-0.128	0.154	0.153
0.2500	1.714E+00	2.045E-02	1.735E+00	9.250E-02	6.737E-03	8.470E-02	-0.122	0.145	0.143
0.3000	1.590E+00	2.172E-02	1.612E+00	1.225E-01	7.721E-03	1.217E-01	-0.117	0.138	0.136
0.3500	1.503E+00	2.307E-02	1.526E+00	1.544E-01	8.660E-03	1.572E-01	-0.113	0.133	0.131
0.4000	1.440E+00	2.450E-02	1.465E+00	1.879E-01	9.567E-03	1.916E-01	-0.110	0.129	0.126
0.4500	1.393E+00	2.600E-02	1.419E+00	2.226E-01	1.045E-02	2.249E-01	-0.107	0.125	0.123
0.5000	1.358E+00	2.757E-02	1.385E+00	2.582E-01	1.132E-02	2.573E-01	-0.104	0.122	0.119
0.5500	1.330E+00	2.919E-02	1.359E+00	2.947E-01	1.217E-02	2.889E-01	-0.102	0.120	0.116
0.6000	1.308E+00	3.087E-02	1.339E+00	3.318E-01	1.301E-02	3.198E-01	-0.100	0.117	0.114
0.7000	1.276E+00	3.437E-02	1.310E+00	4.074E-01	1.467E-02	3.794E-01	-0.096	0.113	0.109
0.8000	1.256E+00	3.803E-02	1.294E+00	4.842E-01	1.631E-02	4.363E-01	-0.093	0.110	0.106
0.9000	1.243E+00	4.185E-02	1.284E+00	5.618E-01	1.795E-02	4.907E-01	-0.090	0.107	0.102
1.0000	1.234E+00	4.580E-02	1.280E+00	6.398E-01	1.957E-02	5.430E-01	-0.087	0.104	0.099
1.2500	1.225E+00	5.623E-02	1.281E+00	8.352E-01	2.362E-02	6.652E-01	-0.082	0.099	0.093
1.5000	1.225E+00	6.733E-02	1.293E+00	1.030E+00	2.768E-02	7.772E-01	-0.077	0.094	0.088
1.7500	1.230E+00	7.896E-02	1.309E+00	1.222E+00	3.176E-02	8.810E-01	-0.073	0.091	0.084
2.0000	1.236E+00	9.103E-02	1.327E+00	1.412E+00	3.585E-02	9.779E-01	-0.070	0.088	0.080
2.5000	1.251E+00	1.162E-01	1.367E+00	1.783E+00	4.404E-02	1.155E+00	-0.064	0.082	0.074
3.0000	1.266E+00	1.425E-01	1.409E+00	2.143E+00	5.222E-02	1.314E+00	-0.060	0.078	0.068
3.5000	1.280E+00	1.697E-01	1.450E+00	2.493E+00	6.035E-02	1.458E+00	-0.056	0.074	0.064
4.0000	1.294E+00	1.976E-01	1.491E+00	2.833E+00	6.841E-02	1.590E+00	-0.053	0.071	0.060
4.5000	1.306E+00	2.261E-01	1.532E+00	3.164E+00	7.638E-02	1.712E+00	-0.050	0.068	0.057
5.0000	1.317E+00	2.552E-01	1.572E+00	3.486E+00	8.424E-02	1.825E+00	-0.048	0.066	0.054
5.5000	1.327E+00	2.847E-01	1.612E+00	3.800E+00	9.199E-02	1.929E+00	-0.047	0.064	0.052
6.0000	1.337E+00	3.146E-01	1.651E+00	4.107E+00	9.962E-02	2.027E+00	-0.045	0.062	0.050
7.0000	1.354E+00	3.756E-01	1.729E+00	4.698E+00	1.145E-01	2.206E+00	-0.043	0.058	0.046
8.0000	1.369E+00	4.378E-01	1.806E+00	5.264E+00	1.290E-01	2.366E+00	-0.041	0.055	0.043
9.0000	1.382E+00	5.009E-01	1.883E+00	5.806E+00	1.429E-01	2.510E+00	-0.039	0.053	0.040
10.0000	1.394E+00	5.650E-01	1.959E+00	6.327E+00	1.563E-01	2.642E+00	-0.038	0.051	0.038
12.5000	1.418E+00	7.282E-01	2.147E+00	7.546E+00	1.880E-01	2.931E+00	-0.035	0.047	0.034
15.0000	1.439E+00	8.949E-01	2.333E+00	8.662E+00	2.169E-01	3.176E+00	-0.032	0.044	0.030
17.5000	1.455E+00	1.064E+00	2.519E+00	9.693E+00	2.436E-01	3.390E+00	-0.030	0.041	0.028
20.0000	1.469E+00	1.236E+00	2.705E+00	1.065E+01	2.681E-01	3.581E+00	-0.027	0.039	0.025
25.0000	1.492E+00	1.583E+00	3.076E+00	1.238E+01	3.119E-01	3.913E+00	-0.024	0.035	0.021
30.0000	1.510E+00	1.936E+00	3.446E+00	1.392E+01	3.497E-01	4.197E+00	-0.020	0.032	0.018
35.0000	1.525E+00	2.291E+00	3.817E+00	1.530E+01	3.829E-01	4.445E+00	-0.018	0.030	0.016
40.0000	1.538E+00	2.650E+00	4.188E+00	1.655E+01	4.121E-01	4.666E+00	-0.016	0.028	0.014
45.0000	1.548E+00	3.012E+00	4.560E+00	1.769E+01	4.382E-01	4.865E+00	-0.014	0.027	0.013
50.0000	1.558E+00	3.375E+00	4.933E+00	1.874E+01	4.617E-01	5.046E+00	-0.013	0.026	0.012
55.0000	1.566E+00	3.740E+00	5.306E+00	1.972E+01	4.829E-01	5.212E+00	-0.012	0.025	0.011
60.0000	1.573E+00	4.107E+00	5.680E+00	2.063E+01	5.021E-01	5.365E+00	-0.011	0.024	0.010
70.0000	1.587E+00	4.844E+00	6.430E+00	2.229E+01	5.359E-01	5.639E+00	-0.010	0.022	0.008
80.0000	1.598E+00	5.586E+00	7.183E+00	2.376E+01	5.647E-01	5.880E+00	-0.009	0.021	0.007
90.0000	1.607E+00	6.330E+00	7.938E+00	2.508E+01	5.895E-01	6.094E+00	-0.008	0.020	0.007
100.0000	1.616E+00	7.079E+00	8.695E+00	2.628E+01	6.111E-01	6.288E+00	-0.007	0.019	0.006
125.0000	1.634E+00	8.958E+00	1.059E+01	2.888E+01	6.551E-01	6.701E+00	-0.006	0.017	0.005
150.0000	1.648E+00	1.085E+01	1.250E+01	3.105E+01	6.888E-01	7.042E+00	-0.005	0.016	0.004
175.0000	1.660E+00	1.275E+01	1.441E+01	3.292E+01	7.157E-01	7.333E+00	-0.005	0.015	0.003
200.0000	1.670E+00	1.465E+01	1.632E+01	3.455E+01	7.377E-01	7.587E+00	-0.004	0.015	0.003
250.0000	1.687E+00	1.847E+01	2.015E+01	3.730E+01	7.716E-01	8.015E+00	-0.003	0.014	0.002
300.0000	1.701E+00	2.230E+01	2.400E+01	3.957E+01	7.969E-01	8.368E+00	-0.003	0.013	0.002
350.0000	1.712E+00	2.613E+01	2.784E+01	4.150E+01	8.165E-01	8.668E+00	-0.002	0.012	0.002
400.0000	1.722E+00	2.998E+01	3.170E+01	4.318E+01	8.322E-01	8.930E+00	-0.002	0.012	0.001
450.0000	1.731E+00	3.382E+01	3.555E+01	4.467E+01	8.451E-01	9.161E+00	-0.001	0.011	0.001
500.0000	1.738E+00	3.767E+01	3.941E+01	4.601E+01	8.560E-01	9.369E+00	-0.001	0.011	0.001
550.0000	1.745E+00	4.153E+01	4.327E+01	4.722E+01	8.652E-01	9.557E+00	-0.001	0.011	0.001
600.0000	1.751E+00	4.539E+01	4.714E+01	4.832E+01	8.733E-01	9.729E+00	-0.001	0.011	0.001
700.0000	1.762E+00	5.311E+01	5.487E+01	5.029E+01	8.864E-01	1.003E+01	-0.001	0.010	0.001
800.0000	1.772E+00	6.083E+01	6.260E+01	5.199E+01	8.969E-01	1.030E+01	-0.001	0.010	0.001
900.0000	1.780E+00	6.856E+01	7.034E+01	5.350E+01	9.053E-01	1.053E+01	-0.000	0.010	0.001
1000.0000	1.787E+00	7.629E+01	7.808E+01	5.485E+01	9.124E-01	1.074E+01	-0.000	0.009	0.001

POSITRONS IN SILVER

I = 470.0 eV DENSITY = 1.050E+01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.303E+01	1.634E-02	1.305E+01	4.587E-04	6.026E-04	0.0	-0.270	0.334	0.317
0.0125	1.110E+01	1.754E-02	1.112E+01	6.670E-04	7.651E-04	0.0	-0.256	0.312	0.296
0.0150	9.726E+00	1.849E-02	9.744E+00	9.078E-04	9.272E-04	0.0	-0.245	0.295	0.282
0.0175	8.690E+00	1.927E-02	8.709E+00	1.180E-03	1.088E-03	0.0	-0.237	0.282	0.270
0.0200	7.880E+00	1.992E-02	7.900E+00	1.482E-03	1.248E-03	0.0	-0.230	0.272	0.261
0.0250	6.689E+00	2.099E-02	6.710E+00	2.171E-03	1.564E-03	0.0	-0.220	0.257	0.248
0.0300	5.853E+00	2.184E-02	5.875E+00	2.970E-03	1.874E-03	0.0	-0.212	0.246	0.238
0.0350	5.231E+00	2.254E-02	5.254E+00	3.871E-03	2.178E-03	0.0	-0.206	0.237	0.230
0.0400	4.749E+00	2.314E-02	4.773E+00	4.872E-03	2.477E-03	0.0	-0.201	0.230	0.224
0.0450	4.364E+00	2.367E-02	4.388E+00	5.965E-03	2.771E-03	0.0	-0.197	0.224	0.218
0.0500	4.049E+00	2.414E-02	4.073E+00	7.149E-03	3.060E-03	0.0	-0.194	0.219	0.214
0.0550	3.786E+00	2.458E-02	3.811E+00	8.419E-03	3.345E-03	0.0	-0.191	0.215	0.210
0.0600	3.564E+00	2.497E-02	3.589E+00	9.772E-03	3.625E-03	0.0	-0.189	0.211	0.207
0.0700	3.206E+00	2.569E-02	3.232E+00	1.271E-02	4.172E-03	0.0	-0.184	0.205	0.201
0.0800	2.932E+00	2.634E-02	2.958E+00	1.595E-02	4.704E-03	0.0	-0.181	0.200	0.197
0.0900	2.715E+00	2.693E-02	2.742E+00	1.947E-02	5.222E-03	0.0	-0.178	0.196	0.193
0.1000	2.537E+00	2.748E-02	2.564E+00	2.324E-02	5.727E-03	5.406E-03	-0.159	0.191	0.188
0.1250	2.210E+00	2.875E-02	2.239E+00	3.372E-02	6.940E-03	2.558E-02	-0.155	0.180	0.177
0.1500	1.989E+00	2.990E-02	2.018E+00	4.551E-02	8.090E-03	4.392E-02	-0.151	0.172	0.169
0.1750	1.829E+00	3.098E-02	1.860E+00	5.844E-02	9.183E-03	6.093E-02	-0.147	0.167	0.164
0.2000	1.709E+00	3.203E-02	1.741E+00	7.235E-02	1.023E-02	7.694E-02	-0.144	0.162	0.159
0.2500	1.542E+00	3.413E-02	1.576E+00	1.026E-01	1.219E-02	1.068E-01	-0.139	0.155	0.152
0.3000	1.433E+00	3.628E-02	1.469E+00	1.356E-01	1.403E-02	1.348E-01	-0.135	0.150	0.147
0.3500	1.357E+00	3.852E-02	1.395E+00	1.705E-01	1.576E-02	1.613E-01	-0.131	0.146	0.143
0.4000	1.302E+00	4.085E-02	1.343E+00	2.071E-01	1.742E-02	1.867E-01	-0.128	0.142	0.139
0.4500	1.261E+00	4.328E-02	1.304E+00	2.449E-01	1.902E-02	2.112E-01	-0.125	0.139	0.136
0.5000	1.230E+00	4.580E-02	1.276E+00	2.837E-01	2.057E-02	2.349E-01	-0.123	0.136	0.133
0.5500	1.206E+00	4.840E-02	1.255E+00	3.232E-01	2.208E-02	2.580E-01	-0.120	0.134	0.131
0.6000	1.188E+00	5.107E-02	1.239E+00	3.633E-01	2.357E-02	2.804E-01	-0.118	0.132	0.129
0.7000	1.161E+00	5.659E-02	1.218E+00	4.448E-01	2.647E-02	3.237E-01	-0.115	0.128	0.125
0.8000	1.145E+00	6.233E-02	1.207E+00	5.273E-01	2.929E-02	3.651E-01	-0.111	0.125	0.121
0.9000	1.135E+00	6.827E-02	1.203E+00	6.104E-01	3.206E-02	4.048E-01	-0.108	0.122	0.118
1.0000	1.129E+00	7.439E-02	1.203E+00	6.935E-01	3.478E-02	4.429E-01	-0.105	0.119	0.115
1.2500	1.124E+00	9.038E-02	1.214E+00	9.005E-01	4.145E-02	5.328E-01	-0.100	0.114	0.108
1.5000	1.127E+00	1.072E-01	1.234E+00	1.105E+00	4.799E-02	6.158E-01	-0.095	0.109	0.103
1.7500	1.134E+00	1.247E-01	1.259E+00	1.305E+00	5.442E-02	6.931E-01	-0.091	0.105	0.098
2.0000	1.142E+00	1.428E-01	1.285E+00	1.502E+00	6.075E-02	7.656E-01	-0.087	0.102	0.094
2.5000	1.160E+00	1.802E-01	1.340E+00	1.883E+00	7.317E-02	8.983E-01	-0.081	0.096	0.087
3.0000	1.177E+00	2.190E-01	1.396E+00	2.249E+00	8.526E-02	1.018E+00	-0.077	0.092	0.082
3.5000	1.194E+00	2.589E-01	1.452E+00	2.600E+00	9.703E-02	1.127E+00	-0.073	0.088	0.077
4.0000	1.208E+00	2.997E-01	1.508E+00	2.937E+00	1.085E-01	1.228E+00	-0.070	0.084	0.073
4.5000	1.222E+00	3.412E-01	1.563E+00	3.263E+00	1.196E-01	1.322E+00	-0.066	0.081	0.069
5.0000	1.234E+00	3.834E-01	1.618E+00	3.577E+00	1.304E-01	1.410E+00	-0.064	0.079	0.066
5.5000	1.245E+00	4.263E-01	1.672E+00	3.882E+00	1.409E-01	1.494E+00	-0.061	0.076	0.063
6.0000	1.256E+00	4.696E-01	1.725E+00	4.176E+00	1.511E-01	1.573E+00	-0.058	0.074	0.060
7.0000	1.274E+00	5.577E-01	1.832E+00	4.738E+00	1.708E-01	1.722E+00	-0.054	0.070	0.055
8.0000	1.290E+00	6.474E-01	1.937E+00	5.269E+00	1.894E-01	1.860E+00	-0.050	0.066	0.051
9.0000	1.303E+00	7.384E-01	2.042E+00	5.772E+00	2.070E-01	1.989E+00	-0.046	0.063	0.047
10.0000	1.315E+00	8.305E-01	2.146E+00	6.250E+00	2.237E-01	2.110E+00	-0.043	0.061	0.044
12.5000	1.340E+00	1.065E+00	2.405E+00	7.349E+00	2.621E-01	2.383E+00	-0.037	0.055	0.038
15.0000	1.360E+00	1.304E+00	2.664E+00	8.336E+00	2.963E-01	2.621E+00	-0.033	0.051	0.033
17.5000	1.376E+00	1.547E+00	2.923E+00	9.232E+00	3.268E-01	2.833E+00	-0.030	0.047	0.029
20.0000	1.390E+00	1.794E+00	3.183E+00	1.005E+01	3.543E-01	3.023E+00	-0.028	0.045	0.026
25.0000	1.412E+00	2.293E+00	3.705E+00	1.151E+01	4.019E-01	3.352E+00	-0.024	0.040	0.021
30.0000	1.429E+00	2.800E+00	4.230E+00	1.277E+01	4.418E-01	3.632E+00	-0.022	0.037	0.018
35.0000	1.444E+00	3.313E+00	4.757E+00	1.388E+01	4.758E-01	3.874E+00	-0.020	0.035	0.016
40.0000	1.456E+00	3.831E+00	5.287E+00	1.488E+01	5.052E-01	4.089E+00	-0.018	0.033	0.014
45.0000	1.467E+00	4.352E+00	5.818E+00	1.578E+01	5.309E-01	4.282E+00	-0.017	0.031	0.013
50.0000	1.476E+00	4.876E+00	6.352E+00	1.660E+01	5.536E-01	4.457E+00	-0.015	0.030	0.011
55.0000	1.484E+00	5.403E+00	6.887E+00	1.736E+01	5.739E-01	4.618E+00	-0.014	0.029	0.010
60.0000	1.492E+00	5.932E+00	7.424E+00	1.806E+01	5.921E-01	4.767E+00	-0.013	0.028	0.010
70.0000	1.505E+00	6.995E+00	8.500E+00	1.932E+01	6.234E-01	5.035E+00	-0.012	0.026	0.008
80.0000	1.516E+00	8.065E+00	9.580E+00	2.042E+01	6.496E-01	5.271E+00	-0.010	0.025	0.007
90.0000	1.525E+00	9.139E+00	1.066E+01	2.141E+01	6.718E-01	5.482E+00	-0.009	0.024	0.006
100.0000	1.533E+00	1.022E+01	1.175E+01	2.230E+01	6.910E-01	5.672E+00	-0.008	0.023	0.006
125.0000	1.551E+00	1.293E+01	1.448E+01	2.422E+01	7.292E-01	6.082E+00	-0.007	0.021	0.005
150.0000	1.565E+00	1.565E+01	1.721E+01	2.580E+01	7.579E-01	6.422E+00	-0.006	0.020	0.004
175.0000	1.576E+00	1.838E+01	1.995E+01	2.715E+01	7.804E-01	6.712E+00	-0.005	0.019	0.003
200.0000	1.586E+00	2.112E+01	2.270E+01	2.832E+01	7.985E-01	6.965E+00	-0.005	0.018	0.003
250.0000	1.602E+00	2.661E+01	2.821E+01	3.029E+01	8.263E-01	7.391E+00	-0.004	0.017	0.002
300.0000	1.615E+00	3.211E+01	3.373E+01	3.191E+01	8.465E-01	7.741E+00	-0.003	0.016	0.002
350.0000	1.626E+00	3.763E+01	3.926E+01	3.329E+01	8.621E-01	8.039E+00	-0.003	0.015	0.002
400.0000	1.636E+00	4.316E+01	4.479E+01	3.448E+01	8.745E-01	8.299E+00	-0.002	0.015	0.001
450.0000	1.644E+00	4.869E+01	5.033E+01	3.553E+01	8.846E-01	8.528E+00	-0.002	0.014	0.001
500.0000	1.651E+00	5.422E+01	5.588E+01	3.647E+01	8.930E-01	8.735E+00	-0.002	0.014	0.001
550.0000	1.658E+00	5.976E+01	6.142E+01	3.732E+01	9.002E-01	8.922E+00	-0.002	0.014	0.001
600.0000	1.664E+00	6.531E+01	6.697E+01	3.810E+01	9.063E-01	9.093E+00	-0.001	0.013	0.001
700.0000	1.675E+00	7.641E+01	7.808E+01	3.949E+01	9.164E-01	9.397E+00	-0.001	0.013	0.001
800.0000	1.684E+00	8.751E+01	8.920E+01	4.068E+01	9.244E-01	9.661E+00	-0.001	0.013	0.001
900.0000	1.692E+00	9.863E+01	1.003E+02	4.174E+01	9.308E-01	9.894E+00	-0.001	0.012	0.001
1000.0000	1.699E+00	1.098E+02	1.114E+02	4.269E+01	9.361E-01	1.010E+01	-0.001	0.012	0.001

POSITRONS IN LEAD

I = 823.0 eV DENSITY = 1.135E+01 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	1.005E+01	2.045E-02	1.007E+01	6.238E-04	9.433E-04	0.0	-0.318	0.432	0.387
0.0125	8.641E+00	2.251E-02	8.664E+00	8.925E-04	1.217E-03	0.0	-0.298	0.394	0.356
0.0150	7.623E+00	2.421E-02	7.647E+00	1.200E-03	1.495E-03	0.0	-0.284	0.367	0.335
0.0175	6.847E+00	2.566E-02	6.873E+00	1.546E-03	1.774E-03	0.0	-0.273	0.347	0.319
0.0200	6.236E+00	2.693E-02	6.263E+00	1.927E-03	2.055E-03	0.0	-0.264	0.331	0.306
0.0250	5.329E+00	2.908E-02	5.358E+00	2.794E-03	2.617E-03	0.0	-0.250	0.308	0.287
0.0300	4.685E+00	3.086E-02	4.716E+00	3.791E-03	3.178E-03	0.0	-0.241	0.291	0.273
0.0350	4.203E+00	3.240E-02	4.235E+00	4.912E-03	3.738E-03	0.0	-0.233	0.278	0.263
0.0400	3.827E+00	3.376E-02	3.861E+00	6.150E-03	4.296E-03	0.0	-0.227	0.268	0.255
0.0450	3.526E+00	3.500E-02	3.561E+00	7.500E-03	4.850E-03	0.0	-0.222	0.260	0.248
0.0500	3.278E+00	3.613E-02	3.314E+00	8.957E-03	5.402E-03	0.0	-0.218	0.253	0.242
0.0550	3.071E+00	3.718E-02	3.108E+00	1.052E-02	5.950E-03	0.0	-0.214	0.247	0.237
0.0600	2.895E+00	3.817E-02	2.933E+00	1.217E-02	6.495E-03	0.0	-0.211	0.242	0.233
0.0700	2.611E+00	3.998E-02	2.651E+00	1.577E-02	7.574E-03	0.0	-0.206	0.234	0.225
0.0800	2.393E+00	4.162E-02	2.435E+00	1.971E-02	8.639E-03	0.0	-0.201	0.227	0.219
0.0900	2.220E+00	4.313E-02	2.263E+00	2.397E-02	9.688E-03	0.0	-0.198	0.221	0.215
0.1000	2.079E+00	4.454E-02	2.123E+00	2.854E-02	1.072E-02	0.0	-0.195	0.217	0.210
0.1250	1.820E+00	4.772E-02	1.867E+00	4.114E-02	1.324E-02	0.0	-0.189	0.208	0.202
0.1500	1.644E+00	5.054E-02	1.694E+00	5.523E-02	1.565E-02	0.0	-0.184	0.201	0.196
0.1750	1.517E+00	5.312E-02	1.570E+00	7.059E-02	1.796E-02	0.0	-0.180	0.195	0.191
0.2000	1.421E+00	5.555E-02	1.476E+00	8.703E-02	2.019E-02	7.387E-04	-0.173	0.191	0.186
0.2500	1.287E+00	6.015E-02	1.347E+00	1.226E-01	2.439E-02	8.466E-03	-0.166	0.182	0.178
0.3000	1.200E+00	6.460E-02	1.265E+00	1.610E-01	2.831E-02	1.693E-02	-0.160	0.176	0.172
0.3500	1.140E+00	6.900E-02	1.209E+00	2.015E-01	3.199E-02	2.596E-02	-0.155	0.171	0.166
0.4000	1.097E+00	7.340E-02	1.170E+00	2.435E-01	3.549E-02	3.545E-02	-0.151	0.166	0.161
0.4500	1.065E+00	7.781E-02	1.142E+00	2.868E-01	3.881E-02	4.530E-02	-0.147	0.162	0.157
0.5000	1.041E+00	8.228E-02	1.123E+00	3.310E-01	4.200E-02	5.543E-02	-0.144	0.158	0.154
0.5500	1.022E+00	8.677E-02	1.109E+00	3.758E-01	4.507E-02	6.577E-02	-0.141	0.155	0.150
0.6000	1.008E+00	9.132E-02	1.099E+00	4.211E-01	4.804E-02	7.627E-02	-0.138	0.152	0.147
0.7000	9.887E-01	1.005E-01	1.089E+00	5.126E-01	5.371E-02	9.756E-02	-0.133	0.147	0.142
0.8000	9.772E-01	1.098E-01	1.087E+00	6.045E-01	5.908E-02	1.191E-01	-0.128	0.143	0.137
0.9000	9.707E-01	1.193E-01	1.090E+00	6.964E-01	6.421E-02	1.406E-01	-0.125	0.139	0.132
1.0000	9.675E-01	1.290E-01	1.096E+00	7.879E-01	6.915E-02	1.621E-01	-0.121	0.135	0.129
1.2500	9.676E-01	1.537E-01	1.121E+00	1.014E+00	8.081E-02	2.153E-01	-0.114	0.128	0.120
1.5000	9.737E-01	1.792E-01	1.153E+00	1.233E+00	9.173E-02	2.673E-01	-0.108	0.122	0.113
1.7500	9.822E-01	2.053E-01	1.187E+00	1.447E+00	1.021E-01	3.183E-01	-0.103	0.117	0.108
2.0000	9.916E-01	2.319E-01	1.224E+00	1.655E+00	1.120E-01	3.683E-01	-0.098	0.113	0.102
2.5000	1.011E+00	2.866E-01	1.297E+00	2.051E+00	1.307E-01	4.653E-01	-0.090	0.105	0.094
3.0000	1.028E+00	3.427E-01	1.371E+00	2.426E+00	1.482E-01	5.586E-01	-0.084	0.099	0.086
3.5000	1.044E+00	3.999E-01	1.444E+00	2.782E+00	1.647E-01	6.481E-01	-0.078	0.094	0.080
4.0000	1.059E+00	4.582E-01	1.517E+00	3.119E+00	1.803E-01	7.335E-01	-0.074	0.090	0.075
4.5000	1.072E+00	5.174E-01	1.589E+00	3.441E+00	1.951E-01	8.149E-01	-0.070	0.086	0.070
5.0000	1.084E+00	5.773E-01	1.661E+00	3.749E+00	2.093E-01	8.926E-01	-0.067	0.083	0.067
5.5000	1.095E+00	6.379E-01	1.733E+00	4.044E+00	2.228E-01	9.667E-01	-0.065	0.080	0.063
6.0000	1.105E+00	6.991E-01	1.804E+00	4.326E+00	2.357E-01	1.038E+00	-0.062	0.077	0.060
7.0000	1.123E+00	8.233E-01	1.946E+00	4.860E+00	2.600E-01	1.170E+00	-0.058	0.073	0.054
8.0000	1.138E+00	9.495E-01	2.087E+00	5.356E+00	2.824E-01	1.293E+00	-0.055	0.069	0.050
9.0000	1.151E+00	1.077E+00	2.228E+00	5.820E+00	3.032E-01	1.406E+00	-0.052	0.066	0.046
10.0000	1.163E+00	1.206E+00	2.369E+00	6.255E+00	3.225E-01	1.512E+00	-0.050	0.063	0.043
12.5000	1.188E+00	1.535E+00	2.723E+00	7.238E+00	3.655E-01	1.749E+00	-0.045	0.057	0.037
15.0000	1.208E+00	1.870E+00	3.077E+00	8.101E+00	4.023E-01	1.955E+00	-0.041	0.053	0.032
17.5000	1.224E+00	2.210E+00	3.434E+00	8.870E+00	4.343E-01	2.138E+00	-0.038	0.050	0.029
20.0000	1.238E+00	2.554E+00	3.792E+00	9.563E+00	4.624E-01	2.302E+00	-0.036	0.047	0.026
25.0000	1.261E+00	3.252E+00	4.513E+00	1.077E+01	5.096E-01	2.589E+00	-0.032	0.043	0.022
30.0000	1.279E+00	3.961E+00	5.240E+00	1.180E+01	5.478E-01	2.834E+00	-0.029	0.040	0.019
35.0000	1.293E+00	4.678E+00	5.972E+00	1.269E+01	5.796E-01	3.048E+00	-0.027	0.038	0.016
40.0000	1.306E+00	5.402E+00	6.708E+00	1.348E+01	6.065E-01	3.241E+00	-0.025	0.036	0.015
45.0000	1.317E+00	6.132E+00	7.448E+00	1.419E+01	6.296E-01	3.414E+00	-0.023	0.034	0.013
50.0000	1.326E+00	6.865E+00	8.192E+00	1.483E+01	6.497E-01	3.574E+00	-0.022	0.033	0.012
55.0000	1.335E+00	7.603E+00	8.938E+00	1.541E+01	6.674E-01	3.720E+00	-0.020	0.032	0.011
60.0000	1.342E+00	8.345E+00	9.687E+00	1.595E+01	6.832E-01	3.857E+00	-0.019	0.031	0.010
70.0000	1.355E+00	9.836E+00	1.119E+01	1.691E+01	7.099E-01	4.103E+00	-0.017	0.029	0.009
80.0000	1.366E+00	1.134E+01	1.270E+01	1.775E+01	7.319E-01	4.322E+00	-0.015	0.028	0.008
90.0000	1.376E+00	1.284E+01	1.422E+01	1.849E+01	7.504E-01	4.518E+00	-0.014	0.027	0.007
100.0000	1.384E+00	1.436E+01	1.574E+01	1.916E+01	7.661E-01	4.696E+00	-0.013	0.026	0.006
125.0000	1.401E+00	1.816E+01	1.956E+01	2.058E+01	7.971E-01	5.080E+00	-0.011	0.024	0.005
150.0000	1.415E+00	2.198E+01	2.340E+01	2.175E+01	8.199E-01	5.401E+00	-0.010	0.023	0.004
175.0000	1.426E+00	2.582E+01	2.725E+01	2.274E+01	8.376E-01	5.677E+00	-0.009	0.022	0.004
200.0000	1.436E+00	2.966E+01	3.110E+01	2.359E+01	8.518E-01	5.919E+00	-0.008	0.021	0.003
250.0000	1.452E+00	3.737E+01	3.882E+01	2.503E+01	8.731E-01	6.329E+00	-0.006	0.020	0.003
300.0000	1.464E+00	4.509E+01	4.656E+01	2.621E+01	8.886E-01	6.668E+00	-0.005	0.019	0.002
350.0000	1.475E+00	5.283E+01	5.431E+01	2.720E+01	9.003E-01	6.959E+00	-0.005	0.018	0.002
400.0000	1.484E+00	6.058E+01	6.206E+01	2.806E+01	9.096E-01	7.212E+00	-0.004	0.018	0.002
450.0000	1.491E+00	6.833E+01	6.982E+01	2.882E+01	9.171E-01	7.437E+00	-0.004	0.017	0.001
500.0000	1.498E+00	7.609E+01	7.759E+01	2.950E+01	9.234E-01	7.639E+00	-0.003	0.017	0.001
550.0000	1.505E+00	8.386E+01	8.536E+01	3.011E+01	9.287E-01	7.823E+00	-0.003	0.017	0.001
600.0000	1.510E+00	9.163E+01	9.314E+01	3.067E+01	9.332E-01	7.991E+00	-0.003	0.016	0.001
700.0000	1.520E+00	1.072E+02	1.087E+02	3.167E+01	9.406E-01	8.290E+00	-0.002	0.016	0.001
800.0000	1.529E+00	1.227E+02	1.243E+02	3.253E+01	9.464E-01	8.550E+00	-0.002	0.015	0.001
900.0000	1.536E+00	1.383E+02	1.398E+02	3.328E+01	9.511E-01	8.780E+00	-0.002	0.015	0.001
1000.0000	1.543E+00	1.539E+02	1.554E+02	3.396E+01	9.549E-01	8.986E+00	-0.002	0.015	0.001

POSITRONS IN AIR, DRY (NEAR SEA LEVEL)

I = 85.7 eV DENSITY = 1.205E-03 g/cm³ (20° C)

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.180E+01	3.897E-03	2.180E+01	2.571E-04	9.658E-05	0.0	-0.185	0.208	0.207
0.0125	1.825E+01	3.921E-03	1.825E+01	3.830E-04	1.167E-04	0.0	-0.178	0.199	0.198
0.0150	1.578E+01	3.937E-03	1.579E+01	5.307E-04	1.359E-04	0.0	-0.173	0.193	0.192
0.0175	1.396E+01	3.946E-03	1.397E+01	6.995E-04	1.545E-04	0.0	-0.169	0.187	0.186
0.0200	1.256E+01	3.954E-03	1.256E+01	8.885E-04	1.725E-04	0.0	-0.165	0.183	0.182
0.0250	1.053E+01	3.966E-03	1.053E+01	1.325E-03	2.072E-04	0.0	-0.160	0.176	0.176
0.0300	9.126E+00	3.976E-03	9.130E+00	1.837E-03	2.404E-04	0.0	-0.156	0.171	0.171
0.0350	8.096E+00	3.986E-03	8.100E+00	2.419E-03	2.723E-04	0.0	-0.153	0.167	0.167
0.0400	7.306E+00	3.998E-03	7.310E+00	3.070E-03	3.032E-04	0.0	-0.150	0.164	0.163
0.0450	6.680E+00	4.011E-03	6.684E+00	3.787E-03	3.333E-04	0.0	-0.148	0.161	0.160
0.0500	6.171E+00	4.025E-03	6.175E+00	4.566E-03	3.626E-04	0.0	-0.146	0.158	0.158
0.0550	5.749E+00	4.040E-03	5.753E+00	5.405E-03	3.912E-04	0.0	-0.144	0.156	0.156
0.0600	5.393E+00	4.057E-03	5.397E+00	6.303E-03	4.192E-04	0.0	-0.143	0.154	0.154
0.0700	4.826E+00	4.093E-03	4.830E+00	8.266E-03	4.735E-04	0.0	-0.140	0.151	0.151
0.0800	4.393E+00	4.133E-03	4.397E+00	1.044E-02	5.261E-04	0.0	-0.138	0.149	0.149
0.0900	4.052E+00	4.175E-03	4.056E+00	1.281E-02	5.771E-04	0.0	-0.137	0.147	0.146
0.1000	3.776E+00	4.222E-03	3.780E+00	1.537E-02	6.267E-04	0.0	-0.135	0.145	0.145
0.1250	3.274E+00	4.348E-03	3.278E+00	2.250E-02	7.458E-04	0.0	-0.132	0.141	0.141
0.1500	2.935E+00	4.485E-03	2.940E+00	3.057E-02	8.593E-04	0.0	-0.130	0.138	0.138
0.1750	2.692E+00	4.633E-03	2.697E+00	3.947E-02	9.683E-04	0.0	-0.128	0.136	0.136
0.2000	2.510E+00	4.789E-03	2.515E+00	4.908E-02	1.074E-03	0.0	-0.126	0.134	0.134
0.2500	2.257E+00	5.126E-03	2.262E+00	7.013E-02	1.276E-03	0.0	-0.124	0.132	0.131
0.3000	2.091E+00	5.495E-03	2.097E+00	9.314E-02	1.471E-03	0.0	-0.122	0.129	0.129
0.3500	1.976E+00	5.890E-03	1.982E+00	1.177E-01	1.660E-03	0.0	-0.120	0.127	0.127
0.4000	1.893E+00	6.311E-03	1.899E+00	1.435E-01	1.846E-03	0.0	-0.118	0.126	0.125
0.4500	1.831E+00	6.757E-03	1.838E+00	1.703E-01	2.030E-03	0.0	-0.117	0.124	0.123
0.5000	1.784E+00	7.223E-03	1.791E+00	1.978E-01	2.212E-03	0.0	-0.116	0.123	0.122
0.5500	1.748E+00	7.708E-03	1.755E+00	2.261E-01	2.394E-03	0.0	-0.114	0.122	0.121
0.6000	1.719E+00	8.210E-03	1.727E+00	2.548E-01	2.575E-03	0.0	-0.113	0.121	0.120
0.7000	1.678E+00	9.258E-03	1.687E+00	3.134E-01	2.939E-03	0.0	-0.111	0.119	0.118
0.8000	1.652E+00	1.036E-02	1.663E+00	3.731E-01	3.304E-03	0.0	-0.109	0.118	0.116
0.9000	1.636E+00	1.151E-02	1.648E+00	4.336E-01	3.671E-03	0.0	-0.108	0.116	0.114
1.0000	1.626E+00	1.271E-02	1.639E+00	4.945E-01	4.041E-03	0.0	-0.107	0.115	0.113
1.2500	1.617E+00	1.588E-02	1.633E+00	6.474E-01	4.980E-03	0.0	-0.104	0.113	0.110
1.5000	1.621E+00	1.927E-02	1.640E+00	8.002E-01	5.939E-03	0.0	-0.101	0.110	0.107
1.7500	1.630E+00	2.284E-02	1.653E+00	9.521E-01	6.916E-03	0.0	-0.099	0.109	0.105
2.0000	1.642E+00	2.656E-02	1.669E+00	1.103E+00	7.910E-03	0.0	-0.097	0.107	0.103
2.5000	1.668E+00	3.437E-02	1.703E+00	1.399E+00	9.936E-03	0.0	-0.095	0.104	0.100
3.0000	1.695E+00	4.260E-02	1.738E+00	1.690E+00	1.200E-02	0.0	-0.092	0.102	0.097
3.5000	1.720E+00	5.115E-02	1.772E+00	1.975E+00	1.410E-02	0.0	-0.091	0.100	0.095
4.0000	1.744E+00	5.999E-02	1.804E+00	2.255E+00	1.622E-02	0.0	-0.089	0.099	0.093
4.5000	1.766E+00	6.908E-02	1.835E+00	2.529E+00	1.836E-02	0.0	-0.088	0.097	0.091
5.0000	1.786E+00	7.838E-02	1.865E+00	2.800E+00	2.051E-02	0.0	-0.087	0.096	0.090
5.5000	1.805E+00	8.787E-02	1.893E+00	3.066E+00	2.266E-02	0.0	-0.086	0.095	0.089
6.0000	1.823E+00	9.754E-02	1.920E+00	3.328E+00	2.483E-02	0.0	-0.085	0.094	0.087
7.0000	1.854E+00	1.173E-01	1.972E+00	3.842E+00	2.916E-02	0.0	-0.083	0.092	0.085
8.0000	1.883E+00	1.376E-01	2.020E+00	4.343E+00	3.349E-02	0.0	-0.082	0.090	0.083
9.0000	1.908E+00	1.584E-01	2.066E+00	4.832E+00	3.782E-02	0.0	-0.081	0.089	0.082
10.0000	1.931E+00	1.795E-01	2.110E+00	5.311E+00	4.212E-02	0.0	-0.080	0.087	0.080
12.5000	1.980E+00	2.337E-01	2.214E+00	6.467E+00	5.278E-02	0.0	-0.078	0.084	0.077
15.0000	2.020E+00	2.895E-01	2.310E+00	7.573E+00	6.323E-02	0.0	-0.076	0.082	0.074
17.5000	2.055E+00	3.464E-01	2.401E+00	8.634E+00	7.346E-02	0.0	-0.075	0.080	0.072
20.0000	2.085E+00	4.042E-01	2.489E+00	9.656E+00	8.345E-02	0.0	-0.074	0.078	0.070
25.0000	2.136E+00	5.219E-01	2.657E+00	1.160E+01	1.027E-01	0.0	-0.072	0.075	0.066
30.0000	2.176E+00	6.417E-01	2.818E+00	1.343E+01	1.210E-01	7.636E-03	-0.064	0.072	0.063
35.0000	2.208E+00	7.630E-01	2.971E+00	1.515E+01	1.383E-01	5.984E-02	-0.053	0.069	0.058
40.0000	2.232E+00	8.855E-01	3.118E+00	1.680E+01	1.548E-01	1.378E-01	-0.045	0.066	0.053
45.0000	2.252E+00	1.009E+00	3.261E+00	1.836E+01	1.706E-01	2.266E-01	-0.040	0.063	0.049
50.0000	2.269E+00	1.133E+00	3.403E+00	1.986E+01	1.857E-01	3.192E-01	-0.036	0.060	0.045
55.0000	2.284E+00	1.258E+00	3.542E+00	2.130E+01	2.001E-01	4.120E-01	-0.033	0.057	0.041
60.0000	2.297E+00	1.384E+00	3.681E+00	2.269E+01	2.139E-01	5.029E-01	-0.031	0.055	0.038
70.0000	2.319E+00	1.637E+00	3.956E+00	2.531E+01	2.398E-01	6.762E-01	-0.027	0.051	0.033
80.0000	2.337E+00	1.892E+00	4.229E+00	2.775E+01	2.637E-01	8.365E-01	-0.025	0.048	0.030
90.0000	2.353E+00	2.148E+00	4.501E+00	3.005E+01	2.858E-01	9.842E-01	-0.023	0.045	0.027
100.0000	2.367E+00	2.405E+00	4.772E+00	3.220E+01	3.063E-01	1.120E+00	-0.022	0.043	0.024
125.0000	2.395E+00	3.053E+00	5.448E+00	3.710E+01	3.517E-01	1.419E+00	-0.020	0.039	0.020
150.0000	2.418E+00	3.705E+00	6.122E+00	4.143E+01	3.904E-01	1.670E+00	-0.019	0.036	0.017
175.0000	2.436E+00	4.360E+00	6.796E+00	4.530E+01	4.237E-01	1.887E+00	-0.018	0.033	0.015
200.0000	2.452E+00	5.018E+00	7.470E+00	4.881E+01	4.529E-01	2.078E+00	-0.017	0.031	0.013
250.0000	2.479E+00	6.340E+00	8.818E+00	5.496E+01	5.016E-01	2.403E+00	-0.016	0.028	0.011
300.0000	2.500E+00	7.667E+00	1.017E+01	6.024E+01	5.409E-01	2.675E+00	-0.015	0.026	0.009
350.0000	2.517E+00	8.998E+00	1.152E+01	6.486E+01	5.734E-01	2.909E+00	-0.014	0.025	0.008
400.0000	2.532E+00	1.033E+01	1.286E+01	6.896E+01	6.008E-01	3.116E+00	-0.013	0.023	0.007
450.0000	2.545E+00	1.167E+01	1.422E+01	7.266E+01	6.243E-01	3.302E+00	-0.012	0.022	0.007
500.0000	2.556E+00	1.301E+01	1.557E+01	7.602E+01	6.447E-01	3.472E+00	-0.011	0.021	0.006
550.0000	2.566E+00	1.435E+01	1.692E+01	7.910E+01	6.627E-01	3.628E+00	-0.011	0.021	0.006
600.0000	2.575E+00	1.569E+01	1.827E+01	8.194E+01	6.786E-01	3.772E+00	-0.010	0.020	0.005
700.0000	2.590E+00	1.838E+01	2.097E+01	8.705E+01	7.057E-01	4.034E+00	-0.008	0.019	0.005
800.0000	2.603E+00	2.107E+01	2.367E+01	9.153E+01	7.279E-01	4.267E+00	-0.007	0.018	0.004
900.0000	2.614E+00	2.376E+01	2.638E+01	9.553E+01	7.466E-01	4.477E+00	-0.006	0.017	0.004
1000.0000	2.624E+00	2.646E+01	2.908E+01	9.914E+01	7.625E-01	4.668E+00	-0.005	0.017	0.003

POSITRONS IN POLYMETHYL METHACRYLATE, "LUCITE", "PERSPEX", "PLEXIGLAS"

I = 74.0 eV DENSITY = 1.190E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	RADIATIVE	TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	CSDA RANGE	RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.419E+01	3.332E-03	2.419E+01	2.309E-04	7.461E-05	0.0	-0.180	0.202	0.201
0.0125	2.023E+01	3.349E-03	2.024E+01	3.444E-04	9.003E-05	0.0	-0.174	0.194	0.193
0.0150	1.749E+01	3.359E-03	1.749E+01	4.777E-04	1.048E-04	0.0	-0.169	0.187	0.186
0.0175	1.546E+01	3.366E-03	1.546E+01	6.301E-04	1.191E-04	0.0	-0.165	0.182	0.182
0.0200	1.390E+01	3.372E-03	1.390E+01	8.009E-04	1.330E-04	0.0	-0.161	0.178	0.177
0.0250	1.164E+01	3.382E-03	1.164E+01	1.196E-03	1.598E-04	0.0	-0.156	0.172	0.171
0.0300	1.009E+01	3.391E-03	1.009E+01	1.659E-03	1.854E-04	0.0	-0.152	0.167	0.166
0.0350	8.943E+00	3.401E-03	8.947E+00	2.186E-03	2.101E-04	0.0	-0.149	0.163	0.163
0.0400	8.068E+00	3.413E-03	8.071E+00	2.775E-03	2.340E-04	0.0	-0.147	0.160	0.159
0.0450	7.374E+00	3.425E-03	7.377E+00	3.424E-03	2.573E-04	0.0	-0.145	0.157	0.157
0.0500	6.810E+00	3.438E-03	6.814E+00	4.130E-03	2.800E-04	0.0	-0.143	0.155	0.155
0.0550	6.343E+00	3.453E-03	6.347E+00	4.891E-03	3.022E-04	0.0	-0.141	0.153	0.153
0.0600	5.949E+00	3.468E-03	5.953E+00	5.705E-03	3.240E-04	0.0	-0.140	0.151	0.151
0.0700	5.321E+00	3.502E-03	5.325E+00	7.485E-03	3.664E-04	0.0	-0.138	0.148	0.148
0.0800	4.842E+00	3.538E-03	4.846E+00	9.457E-03	4.073E-04	0.0	-0.136	0.146	0.145
0.0900	4.465E+00	3.577E-03	4.469E+00	1.161E-02	4.471E-04	0.0	-0.134	0.144	0.143
0.1000	4.161E+00	3.619E-03	4.164E+00	1.393E-02	4.859E-04	0.0	-0.133	0.142	0.142
0.1250	3.606E+00	3.732E-03	3.609E+00	2.040E-02	5.791E-04	0.0	-0.130	0.138	0.138
0.1500	3.232E+00	3.855E-03	3.235E+00	2.774E-02	6.682E-04	0.0	-0.127	0.136	0.135
0.1750	2.963E+00	3.987E-03	2.967E+00	3.582E-02	7.538E-04	0.0	-0.126	0.134	0.133
0.2000	2.762E+00	4.126E-03	2.766E+00	4.456E-02	8.368E-04	0.0	-0.124	0.132	0.131
0.2500	2.482E+00	4.425E-03	2.487E+00	6.370E-02	9.967E-04	0.0	-0.122	0.129	0.129
0.3000	2.300E+00	4.751E-03	2.304E+00	8.463E-02	1.151E-03	0.0	-0.120	0.127	0.126
0.3500	2.173E+00	5.101E-03	2.178E+00	1.070E-01	1.301E-03	0.0	-0.118	0.125	0.124
0.4000	2.081E+00	5.474E-03	2.086E+00	1.305E-01	1.449E-03	0.0	-0.118	0.124	0.123
0.4500	2.011E+00	5.867E-03	2.017E+00	1.549E-01	1.595E-03	1.466E-02	-0.093	0.120	0.119
0.5000	1.956E+00	6.278E-03	1.962E+00	1.800E-01	1.741E-03	4.112E-02	-0.087	0.116	0.114
0.5500	1.912E+00	6.707E-03	1.919E+00	2.058E-01	1.887E-03	6.992E-02	-0.082	0.112	0.109
0.6000	1.877E+00	7.149E-03	1.885E+00	2.321E-01	2.033E-03	1.005E-01	-0.077	0.108	0.104
0.7000	1.826E+00	8.076E-03	1.834E+00	2.859E-01	2.328E-03	1.650E-01	-0.069	0.102	0.096
0.8000	1.791E+00	9.050E-03	1.800E+00	3.410E-01	2.626E-03	2.321E-01	-0.063	0.096	0.090
0.9000	1.767E+00	1.007E-02	1.777E+00	3.969E-01	2.928E-03	3.001E-01	-0.058	0.091	0.084
1.0000	1.750E+00	1.113E-02	1.761E+00	4.535E-01	3.235E-03	3.679E-01	-0.054	0.086	0.078
1.2500	1.726E+00	1.393E-02	1.740E+00	5.964E-01	4.019E-03	5.330E-01	-0.047	0.078	0.068
1.5000	1.716E+00	1.693E-02	1.733E+00	7.405E-01	4.830E-03	6.887E-01	-0.042	0.071	0.061
1.7500	1.714E+00	2.009E-02	1.734E+00	8.847E-01	5.664E-03	8.339E-01	-0.039	0.066	0.055
2.0000	1.716E+00	2.338E-02	1.739E+00	1.029E+00	6.520E-03	9.689E-01	-0.036	0.062	0.051
2.5000	1.724E+00	3.031E-02	1.755E+00	1.315E+00	8.286E-03	1.212E+00	-0.033	0.056	0.045
3.0000	1.736E+00	3.761E-02	1.773E+00	1.598E+00	1.011E-02	1.425E+00	-0.030	0.051	0.040
3.5000	1.748E+00	4.521E-02	1.793E+00	1.879E+00	1.198E-02	1.613E+00	-0.029	0.048	0.037
4.0000	1.759E+00	5.307E-02	1.812E+00	2.156E+00	1.389E-02	1.783E+00	-0.027	0.045	0.035
4.5000	1.770E+00	6.115E-02	1.832E+00	2.431E+00	1.583E-02	1.936E+00	-0.026	0.043	0.033
5.0000	1.781E+00	6.943E-02	1.850E+00	2.702E+00	1.779E-02	2.077E+00	-0.025	0.041	0.031
5.5000	1.791E+00	7.788E-02	1.869E+00	2.971E+00	1.977E-02	2.207E+00	-0.024	0.040	0.030
6.0000	1.800E+00	8.648E-02	1.886E+00	3.237E+00	2.177E-02	2.327E+00	-0.024	0.038	0.029
7.0000	1.816E+00	1.041E-01	1.920E+00	3.763E+00	2.581E-02	2.545E+00	-0.022	0.036	0.027
8.0000	1.831E+00	1.222E-01	1.953E+00	4.279E+00	2.988E-02	2.739E+00	-0.021	0.034	0.025
9.0000	1.844E+00	1.407E-01	1.985E+00	4.787E+00	3.398E-02	2.914E+00	-0.020	0.033	0.024
10.0000	1.855E+00	1.596E-01	2.015E+00	5.287E+00	3.809E-02	3.073E+00	-0.019	0.031	0.023
12.5000	1.880E+00	2.079E-01	2.088E+00	6.506E+00	4.836E-02	3.421E+00	-0.016	0.028	0.020
15.0000	1.899E+00	2.577E-01	2.157E+00	7.684E+00	5.856E-02	3.716E+00	-0.014	0.026	0.018
17.5000	1.915E+00	3.086E-01	2.224E+00	8.825E+00	6.865E-02	3.974E+00	-0.012	0.024	0.016
20.0000	1.929E+00	3.603E-01	2.289E+00	9.933E+00	7.859E-02	4.202E+00	-0.010	0.022	0.014
25.0000	1.951E+00	4.656E-01	2.417E+00	1.206E+01	9.792E-02	4.596E+00	-0.008	0.020	0.012
30.0000	1.968E+00	5.728E-01	2.541E+00	1.408E+01	1.165E-01	4.927E+00	-0.006	0.018	0.010
35.0000	1.983E+00	6.815E-01	2.664E+00	1.600E+01	1.342E-01	5.212E+00	-0.005	0.016	0.008
40.0000	1.995E+00	7.912E-01	2.786E+00	1.783E+01	1.512E-01	5.463E+00	-0.004	0.015	0.007
45.0000	2.005E+00	9.020E-01	2.907E+00	1.959E+01	1.674E-01	5.687E+00	-0.003	0.014	0.006
50.0000	2.015E+00	1.013E+00	3.028E+00	2.127E+01	1.830E-01	5.889E+00	-0.003	0.013	0.006
55.0000	2.023E+00	1.126E+00	3.149E+00	2.289E+01	1.978E-01	6.072E+00	-0.002	0.012	0.005
60.0000	2.031E+00	1.238E+00	3.269E+00	2.445E+01	2.120E-01	6.241E+00	-0.002	0.011	0.004
70.0000	2.044E+00	1.465E+00	3.509E+00	2.740E+01	2.387E-01	6.541E+00	-0.001	0.010	0.004
80.0000	2.055E+00	1.694E+00	3.750E+00	3.016E+01	2.632E-01	6.803E+00	-0.001	0.009	0.003
90.0000	2.065E+00	1.924E+00	3.990E+00	3.274E+01	2.859E-01	7.034E+00	-0.001	0.009	0.003
100.0000	2.074E+00	2.155E+00	4.230E+00	3.518E+01	3.069E-01	7.242E+00	-0.001	0.008	0.002
125.0000	2.093E+00	2.737E+00	4.830E+00	4.070E+01	3.534E-01	7.683E+00	-0.001	0.007	0.002
150.0000	2.108E+00	3.323E+00	5.431E+00	4.558E+01	3.928E-01	8.045E+00	-0.000	0.006	0.001
175.0000	2.121E+00	3.912E+00	6.033E+00	4.995E+01	4.268E-01	8.351E+00	-0.000	0.006	0.001
200.0000	2.133E+00	4.503E+00	6.636E+00	5.390E+01	4.565E-01	8.617E+00	-0.000	0.005	0.001
250.0000	2.151E+00	5.692E+00	7.843E+00	6.082E+01	5.059E-01	9.061E+00	-0.000	0.005	0.001
300.0000	2.166E+00	6.887E+00	9.053E+00	6.675E+01	5.456E-01	9.425E+00	-0.000	0.004	0.001
350.0000	2.179E+00	8.085E+00	1.026E+01	7.193E+01	5.783E-01	9.733E+00	-0.000	0.004	0.000
400.0000	2.190E+00	9.286E+00	1.148E+01	7.654E+01	6.059E-01	9.999E+00	-0.000	0.004	0.000
450.0000	2.200E+00	1.049E+01	1.269E+01	8.068E+01	6.295E-01	1.023E+01	-0.000	0.004	0.000
500.0000	2.209E+00	1.170E+01	1.391E+01	8.444E+01	6.499E-01	1.044E+01	-0.000	0.003	0.000
550.0000	2.217E+00	1.290E+01	1.512E+01	8.789E+01	6.679E-01	1.064E+01	-0.000	0.003	0.000
600.0000	2.224E+00	1.411E+01	1.634E+01	9.107E+01	6.838E-01	1.081E+01	-0.000	0.003	0.000
700.0000	2.237E+00	1.653E+01	1.877E+01	9.678E+01	7.108E-01	1.112E+01	-0.000	0.003	0.000
800.0000	2.248E+00	1.896E+01	2.121E+01	1.018E+02	7.329E-01	1.138E+01	-0.000	0.003	0.000
900.0000	2.257E+00	2.139E+01	2.364E+01	1.062E+02	7.514E-01	1.162E+01	-0.000	0.003	0.000
1000.0000	2.266E+00	2.382E+01	2.608E+01	1.103E+02	7.672E-01	1.183E+01	-0.000	0.003	0.000

POSITRONS IN WATER, LIQUID

I = 75.0 eV DENSITY = 1.000E+00 g/cm³

ENERGY	STOPPING POWER COLLISION	STOPPING POWER RADIATIVE	STOPPING POWER TOTAL	CSDA RANGE	RADIATION YIELD	DENS.EFF. CORR. (DELTA)	d(log)/d(logI) COLL LOSS	d(log)/d(logI) CSDA RANGE	d(log)/d(logI) RAD YIELD
MeV	MeV cm²/g	MeV cm²/g	MeV cm²/g	g/cm²					
0.0100	2.483E+01	3.893E-03	2.484E+01	2.250E-04	8.425E-05	0.0	-0.181	0.202	0.201
0.0125	2.077E+01	3.927E-03	2.078E+01	3.356E-04	1.020E-04	0.0	-0.174	0.194	0.193
0.0150	1.795E+01	3.944E-03	1.796E+01	4.654E-04	1.191E-04	0.0	-0.169	0.188	0.187
0.0175	1.587E+01	3.955E-03	1.588E+01	6.138E-04	1.356E-04	0.0	-0.165	0.183	0.182
0.0200	1.427E+01	3.963E-03	1.427E+01	7.801E-04	1.515E-04	0.0	-0.162	0.179	0.178
0.0250	1.196E+01	3.974E-03	1.196E+01	1.165E-03	1.823E-04	0.0	-0.157	0.172	0.171
0.0300	1.036E+01	3.984E-03	1.036E+01	1.615E-03	2.117E-04	0.0	-0.153	0.167	0.167
0.0350	9.185E+00	3.994E-03	9.189E+00	2.129E-03	2.400E-04	0.0	-0.150	0.163	0.163
0.0400	8.286E+00	4.005E-03	8.290E+00	2.703E-03	2.673E-04	0.0	-0.147	0.160	0.160
0.0450	7.574E+00	4.018E-03	7.578E+00	3.334E-03	2.939E-04	0.0	-0.145	0.157	0.157
0.0500	6.995E+00	4.031E-03	6.999E+00	4.021E-03	3.199E-04	0.0	-0.143	0.155	0.155
0.0550	6.516E+00	4.046E-03	6.520E+00	4.762E-03	3.452E-04	0.0	-0.142	0.153	0.153
0.0600	6.111E+00	4.062E-03	6.115E+00	5.555E-03	3.700E-04	0.0	-0.140	0.151	0.151
0.0700	5.466E+00	4.098E-03	5.470E+00	7.287E-03	4.181E-04	0.0	-0.138	0.148	0.148
0.0800	4.974E+00	4.138E-03	4.979E+00	9.207E-03	4.646E-04	0.0	-0.136	0.146	0.146
0.0900	4.587E+00	4.181E-03	4.591E+00	1.130E-02	5.098E-04	0.0	-0.134	0.144	0.144
0.1000	4.274E+00	4.228E-03	4.279E+00	1.356E-02	5.538E-04	0.0	-0.133	0.142	0.142
0.1250	3.704E+00	4.355E-03	3.709E+00	1.986E-02	6.594E-04	0.0	-0.130	0.139	0.138
0.1500	3.320E+00	4.494E-03	3.325E+00	2.700E-02	7.601E-04	0.0	-0.128	0.136	0.136
0.1750	3.044E+00	4.643E-03	3.049E+00	3.487E-02	8.569E-04	0.0	-0.126	0.134	0.133
0.2000	2.838E+00	4.801E-03	2.843E+00	4.337E-02	9.506E-04	0.0	-0.124	0.132	0.132
0.2500	2.551E+00	5.141E-03	2.556E+00	6.199E-02	1.131E-03	0.0	-0.122	0.129	0.129
0.3000	2.363E+00	5.514E-03	2.368E+00	8.236E-02	1.304E-03	0.0	-0.120	0.127	0.126
0.3500	2.233E+00	5.913E-03	2.238E+00	1.041E-01	1.473E-03	0.0	-0.118	0.125	0.125
0.4000	2.138E+00	6.339E-03	2.145E+00	1.270E-01	1.638E-03	0.0	-0.116	0.124	0.123
0.4500	2.068E+00	6.787E-03	2.075E+00	1.507E-01	1.802E-03	0.0	-0.115	0.122	0.121
0.5000	2.014E+00	7.257E-03	2.021E+00	1.751E-01	1.965E-03	0.0	-0.113	0.121	0.120
0.5500	1.971E+00	7.747E-03	1.979E+00	2.001E-01	2.128E-03	1.103E-02	-0.095	0.119	0.117
0.6000	1.937E+00	8.254E-03	1.945E+00	2.256E-01	2.290E-03	2.938E-02	-0.090	0.116	0.113
0.7000	1.886E+00	9.312E-03	1.895E+00	2.777E-01	2.617E-03	7.435E-02	-0.080	0.110	0.106
0.8000	1.851E+00	1.043E-02	1.862E+00	3.310E-01	2.947E-03	1.267E-01	-0.072	0.104	0.099
0.9000	1.827E+00	1.159E-02	1.839E+00	3.851E-01	3.280E-03	1.835E-01	-0.065	0.099	0.093
1.0000	1.810E+00	1.280E-02	1.823E+00	4.397E-01	3.618E-03	2.428E-01	-0.060	0.095	0.087
1.2500	1.786E+00	1.600E-02	1.802E+00	5.777E-01	4.483E-03	3.944E-01	-0.050	0.085	0.076
1.5000	1.777E+00	1.942E-02	1.796E+00	7.167E-01	5.375E-03	5.437E-01	-0.044	0.078	0.067
1.7500	1.775E+00	2.303E-02	1.798E+00	8.559E-01	6.294E-03	6.866E-01	-0.039	0.072	0.060
2.0000	1.776E+00	2.678E-02	1.803E+00	9.947E-01	7.235E-03	8.218E-01	-0.036	0.067	0.054
2.5000	1.785E+00	3.468E-02	1.820E+00	1.271E+00	9.177E-03	1.069E+00	-0.031	0.059	0.046
3.0000	1.796E+00	4.299E-02	1.839E+00	1.544E+00	1.118E-02	1.288E+00	-0.028	0.054	0.041
3.5000	1.808E+00	5.164E-02	1.859E+00	1.815E+00	1.324E-02	1.484E+00	-0.026	0.050	0.037
4.0000	1.819E+00	6.058E-02	1.879E+00	2.082E+00	1.533E-02	1.660E+00	-0.024	0.047	0.034
4.5000	1.830E+00	6.976E-02	1.899E+00	2.347E+00	1.746E-02	1.821E+00	-0.023	0.044	0.031
5.0000	1.840E+00	7.917E-02	1.919E+00	2.609E+00	1.961E-02	1.967E+00	-0.022	0.042	0.030
5.5000	1.849E+00	8.876E-02	1.938E+00	2.868E+00	2.179E-02	2.102E+00	-0.022	0.040	0.028
6.0000	1.858E+00	9.854E-02	1.957E+00	3.125E+00	2.398E-02	2.227E+00	-0.021	0.038	0.027
7.0000	1.875E+00	1.185E-01	1.993E+00	3.631E+00	2.840E-02	2.453E+00	-0.020	0.036	0.025
8.0000	1.889E+00	1.391E-01	2.028E+00	4.128E+00	3.285E-02	2.652E+00	-0.019	0.034	0.023
9.0000	1.902E+00	1.601E-01	2.062E+00	4.617E+00	3.732E-02	2.831E+00	-0.019	0.032	0.022
10.0000	1.914E+00	1.814E-01	2.095E+00	5.098E+00	4.180E-02	2.992E+00	-0.018	0.030	0.021
12.5000	1.939E+00	2.362E-01	2.175E+00	6.269E+00	5.297E-02	3.341E+00	-0.017	0.028	0.019
15.0000	1.959E+00	2.926E-01	2.252E+00	7.398E+00	6.403E-02	3.633E+00	-0.015	0.026	0.017
17.5000	1.976E+00	3.501E-01	2.327E+00	8.490E+00	7.492E-02	3.885E+00	-0.014	0.024	0.016
20.0000	1.991E+00	4.086E-01	2.400E+00	9.548E+00	8.561E-02	4.107E+00	-0.013	0.023	0.015
25.0000	2.015E+00	5.277E-01	2.542E+00	1.157E+01	1.063E-01	4.487E+00	-0.011	0.020	0.013
30.0000	2.034E+00	6.489E-01	2.683E+00	1.349E+01	1.261E-01	4.806E+00	-0.009	0.018	0.011
35.0000	2.049E+00	7.716E-01	2.821E+00	1.530E+01	1.449E-01	5.082E+00	-0.007	0.017	0.010
40.0000	2.062E+00	8.955E-01	2.958E+00	1.703E+01	1.629E-01	5.326E+00	-0.006	0.016	0.009
45.0000	2.074E+00	1.021E+00	3.094E+00	1.869E+01	1.799E-01	5.544E+00	-0.005	0.015	0.008
50.0000	2.084E+00	1.146E+00	3.230E+00	2.027E+01	1.962E-01	5.741E+00	-0.004	0.014	0.007
55.0000	2.093E+00	1.273E+00	3.366E+00	2.178E+01	2.117E-01	5.921E+00	-0.004	0.013	0.006
60.0000	2.101E+00	1.400E+00	3.501E+00	2.324E+01	2.265E-01	6.087E+00	-0.003	0.012	0.006
70.0000	2.115E+00	1.656E+00	3.771E+00	2.599E+01	2.541E-01	6.383E+00	-0.003	0.011	0.005
80.0000	2.127E+00	1.914E+00	4.041E+00	2.855E+01	2.795E-01	6.641E+00	-0.002	0.010	0.004
90.0000	2.137E+00	2.173E+00	4.311E+00	3.095E+01	3.028E-01	6.871E+00	-0.002	0.010	0.004
100.0000	2.147E+00	2.434E+00	4.580E+00	3.320E+01	3.243E-01	7.077E+00	-0.001	0.009	0.003
125.0000	2.166E+00	3.089E+00	5.255E+00	3.829E+01	3.716E-01	7.516E+00	-0.001	0.008	0.002
150.0000	2.182E+00	3.749E+00	5.931E+00	4.277E+01	4.115E-01	7.876E+00	-0.001	0.007	0.002
175.0000	2.195E+00	4.412E+00	6.608E+00	4.676E+01	4.456E-01	8.182E+00	-0.001	0.007	0.002
200.0000	2.207E+00	5.078E+00	7.285E+00	5.036E+01	4.753E-01	8.447E+00	-0.000	0.006	0.001
250.0000	2.226E+00	6.416E+00	8.642E+00	5.665E+01	5.244E-01	8.891E+00	-0.000	0.005	0.001
300.0000	2.242E+00	7.760E+00	1.000E+01	6.203E+01	5.637E-01	9.254E+00	-0.000	0.005	0.001
350.0000	2.255E+00	9.107E+00	1.136E+01	6.671E+01	5.959E-01	9.561E+00	-0.000	0.005	0.001
400.0000	2.266E+00	1.046E+01	1.273E+01	7.087E+01	6.229E-01	9.827E+00	-0.000	0.004	0.001
450.0000	2.276E+00	1.181E+01	1.409E+01	7.460E+01	6.460E-01	1.006E+01	-0.000	0.004	0.001
500.0000	2.285E+00	1.317E+01	1.545E+01	7.799E+01	6.659E-01	1.027E+01	-0.000	0.004	0.000
550.0000	2.294E+00	1.453E+01	1.682E+01	8.109E+01	6.834E-01	1.046E+01	-0.000	0.004	0.000
600.0000	2.301E+00	1.589E+01	1.819E+01	8.395E+01	6.988E-01	1.064E+01	-0.000	0.004	0.000
700.0000	2.314E+00	1.861E+01	2.092E+01	8.907E+01	7.250E-01	1.094E+01	-0.000	0.003	0.000
800.0000	2.326E+00	2.133E+01	2.366E+01	9.356E+01	7.463E-01	1.121E+01	-0.000	0.003	0.000
900.0000	2.336E+00	2.406E+01	2.640E+01	9.756E+01	7.641E-01	1.145E+01	-0.000	0.003	0.000
1000.0000	2.345E+00	2.679E+01	2.914E+01	1.012E+02	7.793E-01	1.166E+01	-0.000	0.003	0.000

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16. ABSTRACT *(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here.)*

Tables of stopping powers and related data are given for electrons in 37 elements and 60 compounds, and for positrons in 8 materials. The tables include (1) collision stopping powers (2) radiative stopping powers, (3) total stopping powers, (4) ranges (computed in the continuous-slowing-down approximation), (5) radiation yields (fraction of electron energy converted into bremsstrahlung), and (6) the logarithmic derivatives of all these quantities with respect to the mean excitation energy of the medium. These results are given at 81 energies between 1000 MeV and 10 keV. Restricted collision stopping powers are tabulated for selected materials, with cut-off energies of 1, 10 and 100 keV. The principal new ingredients in the preparation of these tables were: (1) a revision and updating of the mean excitation energies which enter into the Bethe stopping-power formula, on the basis of the best available data from stopping-power measurements and analyses of experimental oscillator-strength distributions and dielectric-response functions; (2) use of the general formulation of Sternheimer and Peierls for the density-effect correction to the collision stopping power; and (3) use of theoretical bremsstrahlung cross sections of Tseng and Pratt.

17. KEY WORDS *(six to twelve entries; alphabetical order; capitalize only the first letter of the first key word unless a proper name; separated by semicolons)*

Collision stopping power, electrons, positrons, radiation yield, radiative stopping power, range.

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