



A11106 243096

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MAY 1992

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March 1992



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**Mass Energy-Transfer and Absorption Coefficients,
Including In-Flight Positron Annihilation for
Photon Energies 1 keV to 100 MeV**

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Abstract

Mass energy-transfer μ_{tx}/ρ and mass energy-absorption coefficients μ_{en}/ρ are tabulated in units of cm^2/g for photon energies between 1 keV and 100 MeV for 29 elements ($Z=1-92$), and 14 mixtures and compounds of general dosimetric interest. Cross sections for photo-effect, incoherent scattering, pair and triplet production are those compiled or generated by the National Institute of Standards and Technology (NIST), (formerly the National Bureau of Standards). Corrections are included for in-flight positron annihilation, previously not applied in NIST calculations for energies above 10 MeV. Agreement with recently published data is good for energies above 1 MeV, but we find differences in mass energy-absorption coefficients in the low energy region of as much as 4% compared with the last NIST compilation, and as much as 9% when compared with other recent compilations.

I. INTRODUCTION

Two useful quantities for describing the interaction and absorption of high-energy photons in a medium, for example in cancer radiotherapy by means of x-ray beams, are kerma (K) and absorbed dose (D), (ICRU¹). Kerma is proportional to the mass energy-transfer coefficient, μ_{tr}/ρ , which is a function of the photon energy and the atomic number of the medium. Absorbed dose is proportional (only under charged particle equilibrium conditions) to the mass energy-absorption coefficient, μ_{en}/ρ . These two coefficients include the effects of the different types of interactions (atomic photo effect², Compton or incoherent scattering^{3,4}, and pair and triplet production⁵). The coefficients are related as

$$\mu_{en}/\rho = (1-G) \mu_{tr}/\rho \quad (1)$$

where G is the mean fraction of the secondary electron (or positron) kinetic energy that is spent in bremsstrahlung production and in-flight positron annihilation. The value of G increases with atomic number and photon energy from approximately zero at 1 MeV in carbon to 0.66 at 100 MeV in uranium.

A number of prior tabulations of μ_{tr}/ρ and μ_{en}/ρ exist in the literature, including those by Hubbell^{6,7,8}, Allison⁹, Johns and Cunningham^{10,11} and R.T. Berger.¹² All suffer from one or more of the following limitations: Exclusion of in-flight positron annihilation in computing G, upper photon energy limit of only 10 or 20 MeV, few materials tabulated, old data base of interaction cross sections, incomplete data display (e.g., μ_{en}/ρ but not μ_{tr}/ρ , or vice versa).

It is the purpose of the present report to provide a comprehensive tabulation of gamma-ray attenuation, energy transfer and energy absorption coefficients for an extensive group of elements and other radiologically relevant media, over the energy range from 1 keV to 100 MeV, based on the latest NIST data base, and including the effect of positron in-flight annihilation. All data are fully displayed, from interaction cross sections through μ/ρ , μ_{tr}/ρ , and μ_{en}/ρ , to facilitate their use for tutorial as well as research applications. Values are given just below and just above each K, L, and M subshell absorption edge with binding energy above 1 keV.

A recent extensive graphical and numerical comparison by Saloman and Hubbell^{13,14} of the Scofield theoretical photo effect values, both renormalized (Z=2-54) and unrenormalized, with an

updated experimental database¹⁵ suggests that the unrenormalized Scofield values are in somewhat better overall agreement with existing measurements. Hence, the Berger-Hubbell XCOM computerized compilation¹⁶, representing the present NIST values, uses the unrenormalized Scofield photo effect values. The effect of the unmodified Scofield photoelectric cross sections on local absorption coefficients and the inclusion of electron binding effects⁷ in incoherent scattering cross sections have not been published for a large range of energies and materials.

There are several complications that arise in the dosimetry of photon beams above 1 MeV, i.e., the energy range used in radiotherapy:

a. Radiative losses, both through bremsstrahlung and positron in-flight annihilation, become progressively more significant with increasing energy, as already mentioned. It is useful to define a quantity collision kerma as $K_c = (1-G)K$. Thus since kerma is the energy transferred by photons to secondary electrons per unit mass of medium, collision kerma is the fraction of K that is imparted to matter by those electrons, rather than being spent in radiative losses. K_c is proportional to μ_{en}/ρ . Under charged-particle equilibrium conditions (i.e., every electron leaving a volume element is replaced by another electron of the same energy entering) the value of the collision kerma equals that of absorbed dose ($K_c = D$).

b. Secondary electron ranges become longer and more strongly biased along the original photon direction as photon energy increases above 1 MeV. At greater depths in an irradiated medium than the maximum range of the secondary electrons, D exceeds K_c , because of the down-stream flow of kinetic energy carried by those electrons. Charged particle equilibrium thus gradually fails as the photon energy is increased, and is replaced by transient charged particle equilibrium, characterized by the following relation:

$$D = K_c(1 + \mu'/x) \quad (2)$$

where μ' is the observed attenuation coefficient of the beam in the medium, and x is the mean distance the electrons carry their kinetic energy in the photon beam direction as they deposit it in collision interactions.

c. Inelastic processes such as photonuclear interactions can contribute significantly to the absorbed dose for photon energies above about 10 MeV. This remains an area for future investigation. It has not been treated as a contributor to the present tables, nor was it included in comparable past references.

II. Methods

The mass energy-transfer coefficient is:

$$\mu_{tr}/\rho = (\tau/\rho) f_\tau + (\sigma/\rho) f_\sigma + (\kappa/\rho) f_\kappa \quad (3)$$

where, τ, σ , and κ are the respective total macroscopic cross sections for photoelectric effect, incoherent scattering (including binding effects) and pair plus triplet production. The fractions f_τ, f_σ , and f_κ represent the average fraction of photon energy transferred to electrons and positrons in each of these energy transfer processes.

The corresponding mass energy-absorption coefficient is:

$$\mu_{en}/\rho = (\tau/\rho) f_\tau (1-G_\tau) + (\sigma/\rho) f_\sigma (1-G_\sigma) + (\kappa/\rho) f_\kappa (1-G_\kappa) \quad (4)$$

G_τ, G_σ and G_κ represent the average radiative yields for electrons set in motion by photons of energy $h\nu$ in photo-electron, Compton and pair production processes, respectively. Values for G for electrons and positrons are taken from ICRU 37¹⁷ (and Seltzer¹⁸). In the following tabulations, we have assumed the radiative loss component to be negligible in photoelectric processes.

1. Photoelectric Effect

Virtually all of the energy transferred in photoelectric interactions is restricted to K shell transitions, with a much smaller L-shell component and vanishing contribution from higher order transitions. Assuming constant values for the probability of shell vacancies as the ratio of the cross sections just above and just below the edges, we find, for photon energies $h\nu$ greater than the K-shell binding energy $(E_b)_K$,

$$f_\tau = \left[1 - \frac{P_K Y_K h\nu_K}{h\nu} - \frac{(1-P_K) P_L Y_L h\nu_L}{h\nu} \right] \quad (5)$$

and for $(E_b)_L < h\nu < (E_b)_K$:

$$f_\tau = \left[1 - \frac{P_L Y_L h\nu_L}{h\nu} \right] \quad (6)$$

$P_{K,L}$ = fraction of photoelectric interactions in the K or L shells^{19,20} (jump ratios in some nomenclature)

$Y_{K,L}$ = average fluorescence yield²¹

$h\nu_{K,L}$ = average x-ray energy²² resulting from transitions to the K and L shells, respectively.

2. Compton

The incoherent scattering cross section, including electron binding effects has been calculated by Hubbell.^{3,7} It may be written as

$$\frac{\sigma}{\rho} = (1 + \Delta_{kn}) \int_0^\pi (d\sigma_{kn}/d\Omega) S(q, z) d\theta \quad (7)$$

where Δ_{kn} is the combined double Compton and radiative correction of Mork²³, $d\sigma_{kn}/d\Omega$ the differential Klein-Nishina free electron scattering cross section, $S(q, Z)$ the incoherent scattering function³ vs. momentum transfer q and atomic number Z . The fraction of photon energy that is transferred to kinetic energy of bound electrons in Compton interactions is f_o . If each Compton recoil electron initially has kinetic energy T , then we may write the product

$$\left(\frac{\sigma}{\rho}\right) f_o = (1 + \Delta_{kn}) \int_0^\pi (d\sigma_{kn}/d\Omega) S(q, Z) \frac{T}{h\nu} d\theta \quad (8)$$

The mass energy-absorption coefficient for incoherent scattering is similarly constructed including a radiative loss correction (eqn. 4).

We have approximated the average radiative loss correction, used in eqn. (4), as:¹²

$$(1 - G_o) \approx \int_0^{T_{max}} P_o(h\nu, T) T(1 - G(T)) dT / \int_0^{T_{max}} P_o(h\nu, T) T dT \quad (9)$$

with $P_o(h\nu, T) = d\sigma_e/\sigma_e dT$. $d\sigma_e/dT$ is the differential Klein-Nishina scattering probability as a function of starting electron kinetic energy T .

3. Pair Production

The fraction of photon energy transferred to electron pairs (or triplets) in the pair production process is f_k .

$$f_k = 1 - \frac{2m_o c^2}{h\nu} \quad (10)$$

The mass energy-transfer coefficient is then

$$\frac{\mu_{tr}}{\rho}(h\nu) = \frac{K}{\rho} f_k \quad (11)$$

The mass energy-absorption coefficient for pair production has two radiative loss components, a bremsstrahlung component for electrons and positrons and an in-flight positron annihilation component. These can be folded into a single correction factor G_{κ} and the contribution to mass energy absorption can be written as $(\kappa/\rho) f_{\kappa}(1-G_{\kappa})$. Following Berger's analytical approach¹², we have calculated the product of the energy transfer fraction and radiative loss correction as

$$f_{\kappa}(1-G_{\kappa}) = \left(1 - \frac{2m_0c^2}{h\nu}\right) - 1/h\nu \int_0^{h\nu-2m_0c^2} P_{\kappa}(h\nu, T^+, T^-) [T^-G(T^-) + B(T^+)] dT^+ \quad (12)$$

$P_{\kappa}(h\nu, T^+, T^-)$ is the cross section for production of a positron with an initial kinetic energy between T^+ and T^++dT^+ , including the effect of screening for three primary photon energy ranges (0-5, 5-25, and greater than 25 MV). T^- is the initial electron kinetic energy and $G(T^-)$ is the corresponding radiation yield¹⁷ which is the fraction of T^- that is spent in bremsstrahlung production. $B(T^+)$ represents the mean fraction of a positron's initial kinetic energy that is spent in radiative energy losses, including in-flight annihilation as well as bremsstrahlung production. $W(T^+, T)$ is the probability that a positron born with kinetic energy T^+ will be annihilated when it slows to an instantaneous energy between T and $T+dT$:

$$W(T^+, T) = \exp\left[-\int_T^{T^+} w(T') dT'\right] w(T) dt \quad (13)$$

where, $w(T)$ is Bethe's differential annihilation probability.²⁵

Combined, the total charged particle energy spent in bremsstrahlung and in-flight annihilation is:

$$\int_0^{T^+} W(T^+, T) [G(T^+, T) (T^+ - T) + T] dT \quad (14)$$

Assuming a continuous slowing down approximation,

$$G(T^+, T) = G(T^+) - G(T) \text{ and,}$$

$$\left[f_{\kappa}(1-G_{\kappa}) = 1 - \frac{2m_0c^2}{h\nu} - \frac{1}{h\nu} \int_0^{h\nu-2m_0c^2} P_{\kappa}(h\nu, T^+, T) [T^-G(T^-) + T^+G(T^+) + \int_0^{T^+} W(T^+, T) [G(T^+, T) (T^+ - T) + T - T^+G(T^+)] dT] dT^+ \right] \quad (15)$$

4. Compounds

Cross sections for compounds are averaged by fractional weights. For pair production an effective value of Z is obtained from an electron density weighted average and is used in the calculation of the probability distribution of the electron and positron kinetic energies, including the effect of screening. Radiation energy loss factors were taken from ICRU 37¹⁷ or from Seltzer.¹⁸

III. Results

The following elements have been considered:

<u>Z</u>	<u>Element</u>	<u>Z</u>	<u>Element</u>
1	Hydrogen	22	Titanium
2	Helium	26	Iron
3	Lithium	29	Copper
4	Beryllium	32	Germanium
6	Carbon	36	Krypton
7	Nitrogen	42	Molybdenum
8	Oxygen	47	Silver
9	Fluorine	50	Tin
10	Neon	53	Iodine
13	Aluminum	56	Barium
14	Silicon	64	Gadolinium
16	Sulfur	74	Tungsten
18	Argon	78	Platinum
20	Calcium	82	Lead
		92	Uranium

The evaluated compounds and their fractional compositions by elements (listed by atomic number)¹⁷ are:

Al50 TE plastic	1: .101327	6: .775501	7: .035057
	8: .053216	9: .017422	20: .018378
Adipose (ICRP)	1: .119477	6: .63724	7: .00797
	8: .232333	11: .00050	12: 2.0E-5
	15: .00016	16: .00073	17: .00119
	19: .00032	20: 2.0E-5	26: 2.0E-5
Air (dry)	6: .000124	7: .75267	8: .231781
	18: .012827		
Bone (ICRP)	1: .047234	6: .144330	7: .04199
	8: .446096	12: .0022	15: .10497
	16: .00315	20: .20993	30: .0001
Calcium Fluoride	9: .486659	20: .513341	
Ferrous Sulphate	1: .108372	8: .878964	11: .000022
	16: .012552	17: 3.5E-5	26: 5.5E-5
Lithium Fluoride	3: .267585	9: .732415	
Polymethylmethacrylate	1: .080538	6: .599848	8: .319614
Muscle (ICRP)	1: .100637	6: .10783	7: .02768
	8: .754773	11: .00075	12: .00019
	15: .00180	16: .00241	17: .00079
	19: .00302	20: 3.0E-5	26: 4.0E-5
	30: 5.5E-5		
Polyethylene	1: .143711	6: .856289	
Polystyrene	1: .077418	6: .922582	
Polytetrafluoroethylene	6: .240182	9: .759817	
T.E. Gas	1: .101869	6: .456179	7: .035172
	8: .40678		
Water	1: .111894	8: .888106	

In Table 1 (where all units are in cm^2/g) we list, as a function of photon energy, cross sections for the photoelectric effect τ/ρ , coherent (Rayleigh) scattering σ_r/ρ , incoherent (Compton) scattering (with atomic binding correction) σ/ρ , and for pair production in the field of a nucleus κ_n/ρ or electron κ_e/ρ . Also tabulated are the energy-transfer coefficients for photoelectric effect τ_{tr}/ρ , Compton effect σ_{tr}/ρ and pair production (including triplet) κ_{tr}/ρ . The total attenuation coefficient μ/ρ appears in column 10 (the sum of columns 2 through 6), and is followed by the total mass energy-transfer coefficient μ_{tr}/ρ (the sum of columns 7 through 9), and finally, the mass energy-absorption coefficient μ_{en}/ρ . At characteristic energies, both upper and lower edges are tabulated. We suggest that in interpolating between photon energies a log-log quadratic approach be used.

In Table 2, for hydrogen, aluminum, copper, tin, tungsten, lead and uranium we have separated the radiative loss components into G_o , the energy that is converted into bremsstrahlung by Compton recoil electrons, G_x , that corresponding to pair and triplet processes (including kinetic energy transferred to photons by in-flight positron annihilation), and $(1-G)$ is the total mean fraction of secondary charged particle kinetic energy that is imparted to matter in collision interactions, thus depositing absorbed dose.

Table 3 provides a comparison of some of the low and high energy differences in this versus previous compilations.^{6,11} For specific elements ($Z=1,6,20,50$ and 92) we observe up to 4% differences in mass energy-absorption coefficients when compared against 1982 NIST data⁶ and -1.5 to +10% differences in comparison with other data.¹¹ Above 10 MeV, as in-flight positron annihilation becomes significant, we find increasing differences between this and the previous compilations¹¹ of the order of -1 to 6%. These differences are due, presumably, to the method whereby in-flight positron annihilation is included and by basic differences in the current NIST radiation yield probabilities.

Conclusions

We have generated tables of cross sections and dosimetrically related coefficients for a variety of elements and compounds. The methodology utilizes Berger's approach¹² toward accommodating kinetic energy lost by electron-positron pairs through bremsstrahlung production and by positron annihilation in-flight. Cross sections for various interactive processes have been extensively reviewed and published by the NIST and exhibit basic differences in the photoelectric region over the full range of Z -values, and for high energies and high Z values compared with the most recently published data.^{6,11}

References

- ¹ICRU 33, Radiation Quantities and Units, (1980).
- ²Scotfield, J.H., Theoretical photoionization cross sections from 1 - 1500 keV, Lawrence Livermore Lab. Rept. UCRL-51326, 1973).
- ³Hubbell, J.H., Veigele, W.J., Briggs, E.A., Brown, R.T., Cromer, D. and Howerton, R.J., Atomic form factors, incoherent scattering functions and photon scattering cross sections. J. Phys. Chem. Ref. Data 4, 471-538 (1975); erratum in 6, 615 (1977).
- ⁴Hubbell, J.H. and Overbo, I., Relativistic atomic form factors and photon coherent scattering cross sections, J. Phys. Chem. Ref. Data 8, 69 (1979).
- ⁵Hubbell, J.H., Gimm, H.A. and Overbo, I., Pair, triplet and total atomic cross sections (and mass attenuation coefficients) for 1 MeV - 100 GeV photons in elements Z = 1 to 100. J. Phys. Chem. Ref. Data 9, 1023-1117 (1980).
- ⁶Hubbell, J.H., Photon mass attenuation and energy absorption coefficients from 1 keV to 20 MeV, Int. J. Appl. Radiat. Isot. 33, 1269-1290 (1982).
- ⁷Hubbell, J.H., Photon mass attenuation and mass absorption coefficients for H, C, N, O, Ar and seven mixtures from 0.1 to 20 MeV, Radiat. Res. 70, 58-81 (1977).
- ⁸Hubbell, J.H., Photon cross sections, attenuation coefficients, and energy absorption coefficients from 10 keV to 100 GeV, Report NSRDS-29, National Bureau of Standards (1969).
- ⁹Allison, J.W., Gamma ray absorption coefficients of various materials allowing for bremsstrahlung and other secondary radiations, Australian J Phys. 14, 443-468 (1961).
- ¹⁰Johns, H.E. and Cunningham, J.R., The Physics of Radiology, 3rd edition (Charles C. Thomas, Springfield), 1977.
- ¹¹Johns, H.E. and Cunningham, J.R., The Physics of Radiology, 4th Edition (Charles C. Thomas, Springfield), 1983.

- ¹²Berger, R.T., The X- or Gamma-ray energy absorption or transfer coefficient: tabulations and discussion, Radiat. Res. 15, 1-29, (1961).
- ¹³Saloman, E.B. and Hubbell, J.H., X-ray attenuation coefficients (total cross sections): Comparison of the experimental data base with the recommended values of Henke and the theoretical values of Scofield for energies between 0.1-100 keV. NBSIR 86-3431, National Bureau of Standards, July, 1986.
- ¹⁴Saloman, E.B., Hubbell, J.H. and Scofield, J.H., X-ray attenuation cross-sections for energies 100 eV to 100 keV and elements Z=1 to Z=92, Atomic Data and Nucl. Data Tables 38, 1-197, 1988.
- ¹⁵Hubbell, J.H., Gerstenberg, H.M. and Saloman, E.B., Bibliography of photon total cross section (attenuation coefficient) measurements 10eV to 13.5 GeV, NBSIR 86-3461, National Bureau of Standards, July 1986.
- ¹⁶Berger, M.J. and Hubbell, J.H., XCOM: Photon cross sections on a personal computer. NBSIR 87-3597 (1987).
- ¹⁷ICRU 37, Stopping powers for electrons and positrons (1984).
- ¹⁸Seltzer, S. Private communication.
- ¹⁹Plechaty, E.F. Cullen, D.E. and Howerton, R.J., Tables and graphs of photon interaction cross sections from 1 keV to 100 MeV, derived from Lawrence Livermore Lab. evaluated nuclear data library, UCRL-50400, Vol. 6, rev. 1, Univ Cal. L.L.L., Springfield Va; Nat. Tech. Info. Service, 1975.
- ²⁰Storm, E. and Israel, H.I., Photon cross sections from 1 keV to 100 MeV for elements Z = 1 to Z = 100, Nucl. Data Tables 7, 565-667 (1970).
- ²¹Hubbell, J.H., Bibliography and current status of K, L and higher shell fluorescence yields for computations of photon energy-absorption coefficients. NISTIR 89-4144, National Institute of Standards and Technology, 1989.

- ²²McMaster, N.H. Kerr Del Grande, N., Mallett, J.H. and Hubbell, J.H., Compilation of x-ray cross sections, University of California Radiation Laboratory Rept., UCRL-50174, Sec.II, Rev. 1, Nat. Tech. Inform. Service, Springfield, VA, 1969.
- ²³Mork, K., Radiative corrections II. Compton Effect, Phys. Rev. 4, 917-927 (1971).
- ²⁴Bethe, H.A. and Heitler, W., Proc. Roy. Soc. Lond. A146 (1934), Heitler, W., The Quantum Theory of Radiation (Oxford University Press, London) 1954.
- ²⁵Bethe, H.A., On the annihilation radiation of positrons, Proc. Roy. Soc. Lond., A150, 129-141 (1935).

Table 1

Cross sections, mass energy transfer and mass energy absorption coefficients for the energy range 0.001 to 100 MeV. All units are in cm^2/g . To obtain units in m^2/kg , divide by 10.

E (MeV)	τ/p	σ_T/p	σ/p	κ_n/p	κ_e/p	τ_{tx}/p	[All Units: cm ² /g]				μ/p	μ_{tx}/p	μ_{en}/p
							σ_{Tx}/p	κ_{Tx}/p	σ_{Tx}/p	κ_{Tx}/p			
0.0010	0.682E+01	0.347E+00	0.503E-01	0.0	0.0	6.817	0.0	0.0	0.0	7.217	6.817	6.817	
0.0015	0.175E+01	0.298E+00	0.986E-01	0.0	0.0	1.752	0.0	0.0	0.0	2.147	1.752	1.752	
0.0020	0.664E+00	0.247E+00	0.148E+00	0.0	0.0	0.6638	0.0008	0.0	0.0008	1.0590	0.6646	0.6646	
0.0030	0.168E+00	0.165E+00	0.228E+00	0.0	0.0	0.1676	0.0017	0.0	0.0017	0.4539	0.1693	0.1693	
0.0040	0.629E-01	0.112E+00	0.279E+00	0.0	0.0	0.0629	0.0026	0.0	0.0026	0.4539	0.0655	0.0655	
0.0050	0.293E-01	0.801E-01	0.310E+00	0.0	0.0	0.0293	0.0035	0.0	0.0035	0.4194	0.0328	0.0328	
0.0060	0.157E-01	0.597E-01	0.329E+00	0.0	0.0	0.0157	0.0043	0.0	0.0043	0.4044	0.0200	0.0200	
0.0080	0.586E-02	0.366E-01	0.349E+00	0.0	0.0	0.0059	0.0057	0.0	0.0057	0.3915	0.0116	0.0116	
0.0100	0.272E-02	0.246E-01	0.358E+00	0.0	0.0	0.0028	0.0071	0.0	0.0071	0.3853	0.0099	0.0099	
0.0150	0.674E-03	0.116E-01	0.364E+00	0.0	0.0	0.0007	0.0103	0.0	0.0103	0.3763	0.0110	0.0110	
0.0200	0.250E-03	0.669E-02	0.363E+00	0.0	0.0	0.0003	0.0133	0.0	0.0133	0.3699	0.0136	0.0136	
0.0300	0.617E-04	0.302E-02	0.354E+00	0.0	0.0	0.0	0.0186	0.0	0.0186	0.3571	0.0186	0.0186	
0.0400	0.228E-04	0.171E-02	0.344E+00	0.0	0.0	0.0	0.0231	0.0	0.0231	0.3457	0.0232	0.0232	
0.0500	0.106E-04	0.110E-02	0.334E+00	0.0	0.0	0.0	0.0271	0.0	0.0271	0.3351	0.0271	0.0271	
0.0600	0.565E-05	0.765E-03	0.325E+00	0.0	0.0	0.0	0.0305	0.0	0.0305	0.3258	0.0305	0.0305	
0.0800	0.210E-05	0.431E-03	0.309E+00	0.0	0.0	0.0	0.0362	0.0	0.0362	0.3094	0.0362	0.0362	
0.1000	0.982E-06	0.276E-03	0.294E+00	0.0	0.0	0.0	0.0406	0.0	0.0406	0.2943	0.0406	0.0406	
0.1500	0.250E-06	0.123E-03	0.265E+00	0.0	0.0	0.0	0.0481	0.0	0.0481	0.2651	0.0481	0.0481	
0.2000	0.963E-07	0.691E-04	0.243E+00	0.0	0.0	0.0	0.0526	0.0	0.0526	0.2431	0.0525	0.0525	
0.3000	0.264E-07	0.307E-04	0.211E+00	0.0	0.0	0.0	0.0569	0.0	0.0569	0.2110	0.0570	0.0569	
0.4000	0.111E-07	0.173E-04	0.189E+00	0.0	0.0	0.0	0.0585	0.0	0.0585	0.1890	0.0586	0.0586	
0.5000	0.593E-08	0.111E-04	0.173E+00	0.0	0.0	0.0	0.0590	0.0	0.0590	0.1730	0.0590	0.0590	
0.6000	0.368E-08	0.768E-05	0.160E+00	0.0	0.0	0.0	0.0588	0.0	0.0588	0.1600	0.0587	0.0587	
0.8000	0.186E-08	0.432E-05	0.140E+00	0.0	0.0	0.0	0.0572	0.0	0.0572	0.1400	0.0574	0.0574	
1.0000	0.117E-08	0.276E-05	0.126E+00	0.0	0.0	0.0	0.0554	0.0	0.0554	0.1260	0.0556	0.0556	
1.2500	0.779E-09	0.177E-05	0.113E+00	0.466E-05	0.0	0.0	0.0532	0.0	0.0532	0.1130	0.0531	0.0531	
1.5000	0.581E-09	0.123E-05	0.103E+00	0.262E-04	0.0	0.0	0.0509	0.0	0.0509	0.1030	0.0508	0.0507	
2.0000	0.371E-09	0.691E-06	0.876E-01	0.105E-03	0.0	0.0	0.0465	0.0001	0.0465	0.0877	0.0465	0.0465	
3.0000	0.211E-09	0.307E-06	0.689E-01	0.302E-03	0.241E-04	0.0	0.0398	0.0002	0.0398	0.0692	0.0400	0.0399	
4.0000	0.146E-09	0.173E-06	0.575E-01	0.490E-03	0.984E-04	0.0	0.0349	0.0004	0.0349	0.0581	0.0353	0.0352	
5.0000	0.111E-09	0.111E-06	0.496E-01	0.658E-03	0.196E-03	0.0	0.0311	0.0007	0.0311	0.0505	0.0318	0.0317	
6.0000	0.901E-10	0.768E-07	0.439E-01	0.810E-03	0.301E-03	0.0	0.0283	0.0009	0.0283	0.0450	0.0292	0.0290	
8.0000	0.650E-10	0.432E-07	0.359E-01	0.107E-02	0.508E-03	0.0	0.0239	0.0014	0.0239	0.0375	0.0253	0.0251	
10.0000	0.508E-10	0.276E-07	0.306E-01	0.128E-02	0.699E-03	0.0	0.0209	0.0018	0.0209	0.0326	0.0227	0.0225	
15.0000	0.328E-10	0.123E-07	0.226E-01	0.167E-02	0.110E-02	0.0	0.0160	0.0026	0.0160	0.0254	0.0186	0.0184	
20.0000	0.242E-10	0.691E-08	0.182E-01	0.197E-02	0.141E-02	0.0	0.0132	0.0032	0.0132	0.0216	0.0164	0.0160	
30.0000	0.159E-10	0.307E-08	0.132E-01	0.239E-02	0.189E-02	0.0	0.0099	0.0041	0.0099	0.0175	0.0140	0.0135	
40.0000	0.118E-10	0.173E-08	0.105E-01	0.269E-02	0.222E-02	0.0	0.0080	0.0048	0.0080	0.0154	0.0122	0.0122	
50.0000	0.942E-11	0.111E-08	0.877E-02	0.293E-02	0.249E-02	0.0	0.0068	0.0053	0.0068	0.0142	0.0121	0.0114	
60.0000	0.783E-11	0.767E-09	0.755E-02	0.312E-02	0.272E-02	0.0	0.0059	0.0057	0.0059	0.0134	0.0116	0.0109	
80.0000	0.585E-11	0.432E-09	0.596E-02	0.342E-02	0.307E-02	0.0	0.0047	0.0064	0.0047	0.0125	0.0102	0.0102	
100.0000	0.467E-11	0.276E-09	0.494E-02	0.365E-02	0.334E-02	0.0	0.0039	0.0069	0.0039	0.0119	0.0098	0.0098	

HELIUM												
[All Units: cm ² /g]												
E (MeV)	τ/p	σ _T /p	σ/p	κ _T /p	κ ₀ /p	z = 2			[All Units: cm ² /g]			
						τ _T /p	σ _T /p	κ _T /p	μ/p	μ _T /p	μ _{en} /p	
0.0010	0.604E+02	0.379E+00	0.102E-01	0.0	0.0	60.44	0.0	0.0	60.79	60.44	60.44	0.0326
0.0015	0.164E+02	0.355E+00	0.213E-01	0.0	0.0	16.38	0.0	0.0	16.78	16.38	16.38	0.0125
0.0020	0.650E+01	0.325E+00	0.349E-01	0.0	0.0	6.504	0.0	0.0	6.860	6.504	6.504	0.0094
0.0030	0.168E+01	0.263E+00	0.636E-01	0.0	0.0	1.681	0.0	0.0	2.007	1.681	1.681	0.0100
0.0040	0.637E+00	0.206E+00	0.895E-01	0.0	0.0	0.6370	0.0009	0.0	0.9325	0.6379	0.6379	0.0119
0.0050	0.305E+00	0.162E+00	0.110E+00	0.0	0.0	0.3049	0.0013	0.0	0.5770	0.3062	0.3062	0.0137
0.0060	0.165E+00	0.128E+00	0.126E+00	0.0	0.0	0.1653	0.0018	0.0	0.4190	0.1671	0.1671	0.0154
0.0080	0.618E-01	0.843E-01	0.147E+00	0.0	0.0	0.0618	0.0026	0.0	0.2931	0.0645	0.0645	0.0183
0.0100	0.292E-01	0.591E-01	0.159E+00	0.0	0.0	0.0292	0.0034	0.0	0.2473	0.0326	0.0326	0.0205
0.0150	0.733E-02	0.295E-01	0.172E+00	0.0	0.0	0.0074	0.0051	0.0	0.2088	0.0125	0.0125	0.0242
0.0200	0.275E-02	0.176E-01	0.176E+00	0.0	0.0	0.0027	0.0067	0.0	0.1963	0.0094	0.0094	0.0265
0.0300	0.687E-03	0.818E-02	0.175E+00	0.0	0.0	0.0007	0.0093	0.0	0.1839	0.0100	0.0100	0.0287
0.0400	0.257E-03	0.469E-02	0.171E+00	0.0	0.0	0.0003	0.0116	0.0	0.1759	0.0119	0.0119	0.0295
0.0500	0.130E-06	0.481E-04	0.853E-01	0.0	0.0	0.0001	0.0136	0.0	0.1701	0.0137	0.0137	0.0297
0.0600	0.641E-04	0.211E-02	0.163E+00	0.0	0.0	0.0	0.0154	0.0	0.1652	0.0154	0.0154	0.0296
0.0800	0.240E-04	0.119E-02	0.155E+00	0.0	0.0	0.0	0.0183	0.0	0.1562	0.0183	0.0183	0.0289
0.1000	0.113E-04	0.766E-03	0.148E+00	0.0	0.0	0.0	0.0205	0.0	0.1488	0.0205	0.0205	0.0280
0.1500	0.288E-05	0.341E-03	0.133E+00	0.0	0.0	0.0	0.0242	0.0	0.1333	0.0242	0.0242	0.0268
0.2000	0.112E-05	0.192E-03	0.122E+00	0.0	0.0	0.0	0.0265	0.0	0.1222	0.0265	0.0265	0.0255
0.3000	0.308E-06	0.854E-04	0.106E+00	0.0	0.0	0.0	0.0287	0.0	0.1061	0.0287	0.0287	0.0234
0.4000	0.130E-06	0.481E-04	0.853E-01	0.0	0.0	0.0	0.0295	0.0	0.0953	0.0295	0.0295	0.0202
0.5000	0.697E-07	0.308E-04	0.870E-01	0.0	0.0	0.0	0.0297	0.0	0.0870	0.0297	0.0297	0.0179
0.6000	0.433E-07	0.214E-04	0.805E-01	0.0	0.0	0.0	0.0296	0.0	0.0805	0.0296	0.0296	0.0162
0.8000	0.218E-07	0.120E-04	0.707E-01	0.0	0.0	0.0	0.0289	0.0	0.0707	0.0289	0.0289	0.0149
1.0000	0.136E-07	0.769E-05	0.636E-01	0.0	0.0	0.0	0.0280	0.0	0.0636	0.0280	0.0280	0.0131
1.2500	0.852E-08	0.492E-05	0.569E-01	0.0	0.0	0.0	0.0268	0.0	0.0569	0.0268	0.0268	0.0118
1.5000	0.623E-08	0.342E-05	0.517E-01	0.264E-04	0.0	0.0	0.0256	0.0	0.0517	0.0256	0.0256	0.0099
2.0000	0.396E-08	0.192E-05	0.441E-01	0.106E-03	0.0	0.0	0.0234	0.0001	0.0442	0.0234	0.0234	0.00821
3.0000	0.224E-08	0.855E-06	0.347E-01	0.304E-03	0.121E-04	0.0	0.0200	0.0002	0.0350	0.0202	0.0202	0.00775
4.0000	0.155E-08	0.481E-06	0.289E-01	0.494E-03	0.496E-04	0.0	0.0175	0.0004	0.0294	0.0180	0.0180	0.00751
5.0000	0.119E-08	0.308E-06	0.250E-01	0.663E-03	0.988E-04	0.0	0.0157	0.0006	0.0258	0.0162	0.0162	0.00693
6.0000	0.957E-09	0.214E-06	0.221E-01	0.815E-03	0.152E-03	0.0	0.0142	0.0008	0.0231	0.0150	0.0150	0.00671
8.0000	0.690E-09	0.120E-06	0.181E-01	0.107E-02	0.256E-03	0.0	0.0121	0.0012	0.0194	0.0132	0.0132	0.00644
10.0000	0.539E-09	0.769E-07	0.154E-01	0.129E-02	0.352E-03	0.0	0.0105	0.0015	0.0170	0.0120	0.0120	0.00626
15.0000	0.348E-09	0.342E-07	0.114E-01	0.169E-02	0.552E-03	0.0	0.0081	0.0021	0.0136	0.0102	0.0102	0.00599
20.0000	0.257E-09	0.192E-07	0.914E-02	0.198E-02	0.710E-03	0.0	0.00664	0.00255	0.01183	0.00920	0.00920	0.00591
30.0000	0.168E-09	0.855E-08	0.666E-02	0.240E-02	0.946E-03	0.0	0.00498	0.00324	0.01001	0.00821	0.00821	0.00571
40.0000	0.125E-09	0.481E-08	0.529E-02	0.271E-02	0.112E-02	0.0	0.00403	0.00372	0.00912	0.00775	0.00775	0.00551
50.0000	0.997E-10	0.308E-08	0.442E-02	0.294E-02	0.126E-02	0.0	0.00341	0.00410	0.00862	0.00751	0.00751	0.00531
60.0000	0.828E-10	0.214E-08	0.380E-02	0.312E-02	0.137E-02	0.0	0.00296	0.00441	0.00829	0.00738	0.00738	0.00511
80.0000	0.619E-10	0.120E-08	0.300E-02	0.341E-02	0.154E-02	0.0	0.00237	0.00489	0.00795	0.00726	0.00726	0.00494
100.0000	0.494E-10	0.769E-09	0.249E-02	0.362E-02	0.168E-02	0.0	0.00199	0.00524	0.00779	0.00723	0.00723	0.00474

[All Units: cm²/g]

LITHIUM

Z = 3

E (MeV)	τ/p	σ_x/p	σ/p	κ_H/p	κ_0/p	τ_{tx}/p	σ_{tx}/p	κ_{tx}/p	μ/p	μ_{tx}/p	μ_{en}/p
0.0010	0.233E+03	0.411E+00	0.308E-01	0.0	0.0	233.4	0.0	0.0	233.4	233.4	233.4
0.0015	0.663E+02	0.342E+00	0.457E-01	0.0	0.0	66.29	0.0	0.0	66.69	66.29	66.29
0.0020	0.267E+02	0.292E+00	0.553E-01	0.0	0.0	26.72	0.0	0.0	27.05	26.72	26.72
0.0030	0.725E+01	0.232E+00	0.691E-01	0.0	0.0	7.248	0.0	0.0	7.551	7.248	7.248
0.0040	0.284E+01	0.194E+00	0.812E-01	0.0	0.0	2.839	0.001	0.0	3.115	2.840	2.840
0.0050	0.136E+01	0.164E+00	0.922E-01	0.0	0.0	1.363	0.001	0.0	1.616	1.364	1.364
0.0060	0.746E+00	0.139E+00	0.102E+00	0.0	0.0	0.7464	0.0014	0.0	0.9870	0.7478	0.7478
0.0080	0.287E+00	0.101E+00	0.118E+00	0.0	0.0	0.2867	0.0021	0.0	0.5060	0.2888	0.2888
0.0100	0.136E+00	0.748E-01	0.129E+00	0.0	0.0	0.1361	0.0027	0.0	0.3398	0.1388	0.1388
0.0150	0.348E-01	0.401E-01	0.143E+00	0.0	0.0	0.0348	0.0043	0.0	0.2179	0.0391	0.0391
0.0200	0.132E-01	0.247E-01	0.148E+00	0.0	0.0	0.0131	0.0057	0.0	0.1859	0.0188	0.0188
0.0300	0.333E-02	0.120E-01	0.149E+00	0.0	0.0	0.0034	0.0080	0.0	0.1643	0.0114	0.0114
0.0400	0.125E-02	0.701E-02	0.147E+00	0.0	0.0	0.0012	0.0101	0.0	0.1553	0.0113	0.0113
0.0500	0.587E-03	0.457E-02	0.144E+00	0.0	0.0	0.0006	0.0118	0.0	0.1492	0.0124	0.0124
0.0600	0.316E-03	0.321E-02	0.140E+00	0.0	0.0	0.0003	0.0133	0.0	0.1435	0.0136	0.0136
0.0800	0.119E-03	0.183E-02	0.134E+00	0.0	0.0	0.0001	0.0158	0.0	0.1359	0.0159	0.0159
0.1000	0.561E-04	0.118E-02	0.128E+00	0.0	0.0	0.0	0.0178	0.0	0.1292	0.0178	0.0178
0.1500	0.145E-04	0.526E-03	0.115E+00	0.0	0.0	0.0	0.0210	0.0	0.1155	0.0210	0.0210
0.2000	0.562E-05	0.296E-03	0.106E+00	0.0	0.0	0.0	0.0229	0.0	0.1063	0.0229	0.0229
0.3000	0.156E-05	0.132E-03	0.920E-01	0.0	0.0	0.0	0.0248	0.0	0.0921	0.0248	0.0248
0.4000	0.661E-06	0.742E-04	0.824E-01	0.0	0.0	0.0	0.0255	0.0	0.0825	0.0255	0.0255
0.5000	0.354E-06	0.475E-04	0.753E-01	0.0	0.0	0.0	0.0257	0.0	0.0753	0.0257	0.0257
0.6000	0.220E-06	0.330E-04	0.696E-01	0.0	0.0	0.0	0.0256	0.0	0.0696	0.0256	0.0256
0.8000	0.111E-06	0.186E-04	0.612E-01	0.0	0.0	0.0	0.0250	0.0	0.0612	0.0250	0.0250
1.0000	0.689E-07	0.119E-04	0.550E-01	0.0	0.0	0.0	0.0242	0.0	0.0550	0.0242	0.0242
1.2500	0.415E-07	0.760E-05	0.492E-01	0.612E-05	0.0	0.0	0.0232	0.0	0.0492	0.0232	0.0231
1.5000	0.302E-07	0.528E-05	0.447E-01	0.343E-04	0.0	0.0	0.0221	0.0	0.0447	0.0221	0.0221
2.0000	0.192E-07	0.297E-05	0.382E-01	0.137E-03	0.0	0.0	0.0203	0.0001	0.0383	0.0203	0.0203
3.0000	0.108E-07	0.132E-05	0.300E-01	0.394E-03	0.105E-04	0.0	0.0173	0.0003	0.0304	0.0176	0.0175
4.0000	0.750E-08	0.743E-06	0.250E-01	0.641E-03	0.429E-04	0.0	0.0152	0.0005	0.0257	0.0157	0.0156
5.0000	0.571E-08	0.475E-06	0.216E-01	0.860E-03	0.854E-04	0.0	0.0136	0.0008	0.0225	0.0143	0.0142
6.0000	0.461E-08	0.330E-06	0.191E-01	0.106E-02	0.131E-03	0.0	0.0123	0.0010	0.0203	0.0133	0.0132
8.0000	0.332E-08	0.186E-06	0.156E-01	0.139E-02	0.221E-03	0.0	0.0104	0.0014	0.0172	0.0118	0.0117
10.0000	0.259E-08	0.119E-06	0.133E-01	0.167E-02	0.304E-03	0.0	0.0091	0.0018	0.0153	0.0109	0.0107
15.0000	0.167E-08	0.528E-07	0.986E-02	0.219E-02	0.478E-03	0.0	0.00700	0.00249	0.01253	0.00948	0.00918
20.0000	0.123E-08	0.297E-07	0.791E-02	0.257E-02	0.614E-03	0.0	0.00575	0.00302	0.01109	0.00877	0.00838
30.0000	0.809E-09	0.132E-07	0.576E-02	0.311E-02	0.818E-03	0.0	0.00431	0.00380	0.00969	0.00810	0.00756
40.0000	0.601E-09	0.742E-08	0.458E-02	0.349E-02	0.967E-03	0.0	0.00349	0.00435	0.00904	0.00783	0.00715
50.0000	0.479E-09	0.475E-08	0.382E-02	0.378E-02	0.108E-02	0.0	0.00295	0.00476	0.00868	0.00771	0.00690
60.0000	0.398E-09	0.330E-08	0.329E-02	0.401E-02	0.118E-02	0.0	0.00257	0.00510	0.00848	0.00767	0.00672
80.0000	0.297E-09	0.186E-08	0.260E-02	0.436E-02	0.133E-02	0.0	0.00206	0.00562	0.00829	0.00768	0.00649
100.0000	0.237E-09	0.119E-08	0.215E-02	0.462E-02	0.144E-02	0.0	0.00172	0.00600	0.00821	0.00773	0.00632

BERYLLIUM												
[ALL Units: cm ² /g]												
Z = 4	Σ (MeV)	τ/ρ	σ_r/ρ	σ/ρ	κ_n/ρ	κ_o/ρ	τ_{tR}/ρ	σ_{tR}/ρ	κ_{tR}/ρ	μ/ρ	μ_{tR}/ρ	μ_{en}/ρ
0.0010	0.604E+03	0.592E+00	0.209E-01	0.0	0.0	0.0	603.5	0.0	0.0	604.6	603.5	603.5
0.0015	0.179E+03	0.495E+00	0.379E-01	0.0	0.0	0.0	179.1	0.0	0.0	179.5	179.1	179.1
0.0020	0.742E+02	0.410E+00	0.528E-01	0.0	0.0	0.0	74.24	0.0	0.0	74.66	74.24	74.24
0.0030	0.209E+02	0.296E+00	0.735E-01	0.0	0.0	0.0	20.90	0.0	0.0	21.27	20.90	20.90
0.0040	0.837E+01	0.232E+00	0.863E-01	0.0	0.0	0.0	8.366	0.001	0.0	8.688	8.367	8.367
0.0050	0.408E+01	0.193E+00	0.956E-01	0.0	0.0	0.0	4.081	0.001	0.0	4.369	4.082	4.082
0.0060	0.226E+01	0.165E+00	0.103E+00	0.0	0.0	0.0	2.260	0.001	0.0	2.528	2.261	2.261
0.0080	0.882E+00	0.125E+00	0.116E+00	0.0	0.0	0.0	0.8820	0.0020	0.0	1.1230	0.8840	0.8840
0.0100	0.423E+00	0.975E-01	0.126E+00	0.0	0.0	0.0	0.4230	0.0026	0.0	0.6465	0.4256	0.4256
0.0150	0.110E+00	0.588E-01	0.141E+00	0.0	0.0	0.0	0.1100	0.0043	0.0	0.3068	0.1143	0.1143
0.0200	0.421E-01	0.354E-01	0.148E+00	0.0	0.0	0.0	0.0421	0.0057	0.0	0.2255	0.0478	0.0478
0.0300	0.108E-01	0.177E-01	0.151E+00	0.0	0.0	0.0	0.0108	0.0082	0.0	0.1795	0.0190	0.0190
0.0400	0.408E-02	0.105E-01	0.149E+00	0.0	0.0	0.0	0.0041	0.0103	0.0	0.1636	0.0144	0.0144
0.0500	0.192E-02	0.696E-02	0.147E+00	0.0	0.0	0.0	0.0019	0.0121	0.0	0.1559	0.0140	0.0140
0.0600	0.104E-02	0.482E-02	0.143E+00	0.0	0.0	0.0	0.0010	0.0136	0.0	0.1490	0.0147	0.0147
0.0800	0.394E-03	0.282E-02	0.137E+00	0.0	0.0	0.0	0.0004	0.0162	0.0	0.1402	0.0166	0.0166
0.1000	0.186E-03	0.182E-02	0.131E+00	0.0	0.0	0.0	0.0002	0.0182	0.0	0.1330	0.0184	0.0184
0.1500	0.482E-04	0.819E-03	0.118E+00	0.0	0.0	0.0	0.0	0.0216	0.0	0.1189	0.0216	0.0216
0.2000	0.188E-04	0.462E-03	0.108E+00	0.0	0.0	0.0	0.0	0.0235	0.0	0.1085	0.0235	0.0235
0.3000	0.523E-05	0.206E-03	0.944E-01	0.0	0.0	0.0	0.0	0.0255	0.0	0.0946	0.0255	0.0255
0.4000	0.222E-05	0.116E-03	0.846E-01	0.0	0.0	0.0	0.0	0.0262	0.0	0.0847	0.0262	0.0262
0.5000	0.119E-05	0.742E-04	0.773E-01	0.0	0.0	0.0	0.0	0.0264	0.0	0.0774	0.0264	0.0264
0.6000	0.741E-06	0.516E-04	0.715E-01	0.0	0.0	0.0	0.0	0.0263	0.0	0.0716	0.0263	0.0263
0.8000	0.374E-06	0.290E-04	0.629E-01	0.0	0.0	0.0	0.0	0.0257	0.0	0.0628	0.0257	0.0257
1.0000	0.232E-06	0.186E-04	0.565E-01	0.0	0.0	0.0	0.0	0.0249	0.0	0.0565	0.0248	0.0248
1.2500	0.143E-06	0.119E-04	0.505E-01	0.842E-05	0.0	0.0	0.0	0.0238	0.0	0.0505	0.0238	0.0237
1.5000	0.104E-06	0.825E-05	0.459E-01	0.471E-04	0.0	0.0	0.0	0.0227	0.0	0.0460	0.0227	0.0227
2.0000	0.658E-07	0.464E-05	0.392E-01	0.186E-03	0.0	0.0	0.0	0.0208	0.0001	0.0394	0.0209	0.0208
3.0000	0.371E-07	0.206E-05	0.308E-01	0.540E-03	0.108E-04	0.0	0.0	0.0178	0.0004	0.0314	0.0181	0.0180
4.0000	0.256E-07	0.116E-05	0.257E-01	0.877E-03	0.440E-04	0.0	0.0	0.0156	0.0007	0.0266	0.0162	0.0161
5.0000	0.195E-07	0.743E-06	0.222E-01	0.116E-02	0.877E-04	0.0	0.0	0.0139	0.0010	0.0235	0.0149	0.0148
6.0000	0.157E-07	0.516E-06	0.196E-01	0.145E-02	0.135E-03	0.0	0.0	0.0126	0.0013	0.0212	0.0139	0.0137
8.0000	0.113E-07	0.290E-06	0.161E-01	0.191E-02	0.227E-03	0.0	0.0	0.0107	0.0019	0.0212	0.0139	0.0123
10.0000	0.891E-08	0.186E-06	0.137E-01	0.229E-02	0.313E-03	0.0	0.0	0.0094	0.0023	0.0163	0.0117	0.0114
15.0000	0.568E-08	0.825E-07	0.101E-01	0.299E-02	0.491E-03	0.0	0.0	0.0072	0.0032	0.0136	0.0104	0.0100
20.0000	0.419E-08	0.464E-07	0.813E-02	0.351E-02	0.631E-03	0.0	0.0	0.00591	0.00393	0.0127	0.00983	0.00929
30.0000	0.275E-08	0.206E-07	0.591E-02	0.424E-02	0.839E-03	0.0	0.0	0.00442	0.00491	0.01099	0.00834	0.00857
40.0000	0.204E-08	0.116E-07	0.470E-02	0.476E-02	0.992E-03	0.0	0.0	0.00358	0.00560	0.01045	0.00919	0.00921
50.0000	0.163E-08	0.742E-08	0.392E-02	0.514E-02	0.111E-02	0.0	0.0	0.00303	0.00613	0.01017	0.00916	0.00799
60.0000	0.135E-08	0.516E-08	0.338E-02	0.545E-02	0.121E-02	0.0	0.0	0.00264	0.00655	0.01004	0.00919	0.00783
80.0000	0.101E-08	0.290E-08	0.267E-02	0.592E-02	0.136E-02	0.0	0.0	0.00212	0.00719	0.00995	0.00930	0.00759
100.0000	0.804E-09	0.186E-08	0.221E-02	0.625E-02	0.148E-02	0.0	0.0	0.00178	0.00765	0.00994	0.00943	0.00740

[All Units: cm²/g]

CARBON, GRAPHITE

Z = 6

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.221E+04	0.108E+01	0.126E-01	0.0	0.0	2208.0	0.0	0.0	2211.1	2208.0	2208.0
0.0015	0.699E+03	0.959E+00	0.251E-01	0.0	0.0	699.1	0.0	0.0	700.0	699.1	699.1
0.0020	0.302E+03	0.832E+00	0.386E-01	0.0	0.0	301.6	0.0	0.0	302.9	301.6	301.6
0.0030	0.896E+02	0.613E+00	0.641E-01	0.0	0.0	89.63	0.0	0.0	90.28	89.63	89.63
0.0040	0.372E+02	0.460E+00	0.845E-01	0.0	0.0	37.23	0.0	0.0	37.74	37.23	37.23
0.0050	0.187E+02	0.359E+00	0.995E-01	0.0	0.0	18.65	0.0	0.0	19.16	18.65	18.65
0.0060	0.105E+02	0.292E+00	0.110E+00	0.0	0.0	10.54	0.0	0.0	10.90	10.54	10.54
0.0080	0.424E+01	0.210E+00	0.125E+00	0.0	0.0	4.241	0.002	0.0	4.575	4.243	4.243
0.0100	0.208E+01	0.162E+00	0.135E+00	0.0	0.0	2.075	0.003	0.0	2.377	2.078	2.078
0.0150	0.559E+00	0.979E-01	0.151E+00	0.0	0.0	0.5585	0.0046	0.0	0.8079	0.5631	0.5631
0.0200	0.218E+00	0.648E-01	0.160E+00	0.0	0.0	0.2177	0.0062	0.0	0.4428	0.2239	0.2239
0.0300	0.571E-01	0.336E-01	0.165E+00	0.0	0.0	0.0571	0.0091	0.0	0.2557	0.0662	0.0662
0.0400	0.219E-01	0.205E-01	0.165E+00	0.0	0.0	0.0219	0.0115	0.0	0.2074	0.0334	0.0334
0.0500	0.104E-01	0.137E-01	0.163E+00	0.0	0.0	0.0104	0.0136	0.0	0.1871	0.0240	0.0240
0.0600	0.567E-02	0.981E-02	0.160E+00	0.0	0.0	0.0057	0.0153	0.0	0.1755	0.0210	0.0210
0.0800	0.217E-02	0.571E-02	0.153E+00	0.0	0.0	0.0022	0.0182	0.0	0.1609	0.0204	0.0204
0.1000	0.103E-02	0.372E-02	0.147E+00	0.0	0.0	0.0010	0.0205	0.0	0.1517	0.0215	0.0215
0.1500	0.271E-03	0.168E-02	0.133E+00	0.0	0.0	0.0002	0.0243	0.0	0.1350	0.0245	0.0245
0.2000	0.106E-03	0.954E-03	0.122E+00	0.0	0.0	0.0001	0.0265	0.0	0.1231	0.0266	0.0266
0.3000	0.298E-04	0.426E-03	0.106E+00	0.0	0.0	0.0	0.0287	0.0	0.1065	0.0287	0.0287
0.4000	0.127E-04	0.240E-03	0.952E-01	0.0	0.0	0.0	0.0295	0.0	0.0955	0.0295	0.0295
0.5000	0.684E-05	0.154E-03	0.870E-01	0.0	0.0	0.0	0.0297	0.0	0.0872	0.0297	0.0297
0.6000	0.425E-05	0.107E-03	0.805E-01	0.0	0.0	0.0	0.0296	0.0	0.0806	0.0296	0.0296
0.8000	0.214E-05	0.602E-04	0.707E-01	0.0	0.0	0.0	0.0289	0.0	0.0708	0.0289	0.0289
1.0000	0.133E-05	0.385E-04	0.636E-01	0.0	0.0	0.0	0.0280	0.0	0.0636	0.0280	0.0279
1.2500	0.835E-06	0.247E-04	0.569E-01	0.144E-04	0.0	0.0	0.0268	0.0	0.0569	0.0268	0.0267
1.5000	0.606E-06	0.171E-04	0.517E-01	0.799E-04	0.0	0.0	0.0255	0.0	0.0518	0.0256	0.0255
2.0000	0.383E-06	0.963E-05	0.441E-01	0.319E-03	0.0	0.0	0.0234	0.0002	0.0444	0.0235	0.0234
3.0000	0.215E-06	0.428E-05	0.347E-01	0.133E-03	0.121E-04	0.0	0.0200	0.0006	0.0356	0.0206	0.0205
4.0000	0.148E-06	0.241E-05	0.289E-01	0.148E-02	0.496E-04	0.0	0.0175	0.0011	0.0304	0.0187	0.0185
5.0000	0.112E-06	0.154E-05	0.250E-01	0.199E-02	0.988E-04	0.0	0.0173	0.0017	0.0271	0.0173	0.0171
6.0000	0.903E-07	0.107E-05	0.221E-01	0.244E-02	0.152E-03	0.0	0.0142	0.0022	0.0247	0.0164	0.0160
8.0000	0.649E-07	0.602E-06	0.181E-01	0.322E-02	0.256E-03	0.0	0.0121	0.0030	0.0216	0.0151	0.0147
10.0000	0.506E-07	0.385E-06	0.154E-01	0.385E-02	0.352E-03	0.0	0.0105	0.0038	0.0196	0.0143	0.0138
15.0000	0.325E-07	0.171E-06	0.114E-01	0.504E-02	0.553E-03	0.0	0.0081	0.0052	0.0170	0.0133	0.0126
20.0000	0.240E-07	0.963E-07	0.914E-02	0.590E-02	0.709E-03	0.0	0.0067	0.0063	0.0157	0.0129	0.0120
30.0000	0.157E-07	0.428E-07	0.665E-02	0.712E-02	0.944E-03	0.0	0.0050	0.0078	0.0147	0.0128	0.0114
40.0000	0.117E-07	0.241E-07	0.529E-02	0.796E-02	0.112E-02	0.0	0.0040	0.0088	0.0144	0.0129	0.0112
50.0000	0.928E-08	0.154E-07	0.441E-02	0.859E-02	0.125E-02	0.0	0.0034	0.0096	0.0143	0.0131	0.0110
60.0000	0.771E-08	0.107E-07	0.380E-02	0.910E-02	0.136E-02	0.0	0.0030	0.0103	0.0143	0.0133	0.0108
80.0000	0.576E-08	0.602E-08	0.300E-02	0.986E-02	0.152E-02	0.0	0.0024	0.0113	0.0144	0.0136	0.0106
100.0000	0.459E-08	0.385E-08	0.249E-02	0.104E-01	0.165E-02	0.0	0.0020	0.0120	0.0145	0.0140	0.0103

E (MeV)	τ/p	σ_{τ}/p	σ/p	κ_{τ}/p	κ_{∞}/p	τ_{τ}/p	$\sigma_{\tau x}/p$	[All Units: cm ² /g]						
								μ/p	$\mu_{\tau x}/p$	μ_{∞}/p	$\kappa_{\tau x}/p$	μ/p	$\mu_{\tau x}/p$	μ_{∞}/p
0.0010	0.331E+04	0.129E+01	0.110E-01	0.0	0.0	3305.0	0.0	3311.3	3305.0	3305.0	3305.0	0.0	0.0	0.0
0.0015	0.108E+04	0.118E+01	0.223E-01	0.0	0.0	1080.0	0.0	1081.2	1080.0	1080.0	1080.0	0.0	0.0	0.0
0.0020	0.476E+03	0.105E+01	0.351E-01	0.0	0.0	475.6	0.0	477.1	475.6	475.6	475.6	0.0	0.0	0.0
0.0030	0.145E+03	0.800E+00	0.598E-01	0.0	0.0	144.7	0.0	145.9	144.7	144.7	144.7	0.0	0.0	0.0
0.0040	0.610E+02	0.611E+00	0.802E-01	0.0	0.0	60.94	0.0	61.69	60.94	60.94	60.94	0.0	0.0	0.0
0.0050	0.309E+02	0.477E+00	0.957E-01	0.0	0.0	30.86	0.0	31.47	30.86	30.86	30.86	0.0	0.0	0.0
0.0060	0.176E+02	0.364E+00	0.107E+00	0.0	0.0	17.59	0.0	18.09	17.59	17.59	17.59	0.0	0.0	0.0
0.0080	0.717E+01	0.269E+00	0.123E+00	0.0	0.0	7.166	0.002	7.562	7.168	7.168	7.168	0.002	0.0	0.0
0.0100	0.354E+01	0.203E+00	0.133E+00	0.0	0.0	3.542	0.003	3.876	3.545	3.545	3.545	0.003	0.0	0.0
0.0150	0.967E+00	0.121E+00	0.148E+00	0.0	0.0	0.9672	0.0045	1.2360	0.9717	0.9717	0.9717	0.0045	0.0	0.0
0.0200	0.381E+00	0.804E-01	0.157E+00	0.0	0.0	0.3807	0.0061	0.6184	0.3868	0.3868	0.3868	0.0061	0.0	0.0
0.0300	0.101E+00	0.423E-01	0.163E+00	0.0	0.0	0.1010	0.0090	0.3063	0.1100	0.1100	0.1100	0.0090	0.0	0.0
0.0400	0.391E-01	0.258E-01	0.164E+00	0.0	0.0	0.0390	0.0115	0.2289	0.0505	0.0505	0.0505	0.0115	0.0	0.0
0.0500	0.187E-01	0.174E-01	0.162E+00	0.0	0.0	0.0187	0.0135	0.1981	0.0322	0.0322	0.0322	0.0135	0.0	0.0
0.0600	0.102E-01	0.125E-01	0.159E+00	0.0	0.0	0.0102	0.0153	0.1817	0.0255	0.0255	0.0255	0.0153	0.0	0.0
0.0800	0.392E-02	0.730E-02	0.153E+00	0.0	0.0	0.0039	0.0182	0.1642	0.0221	0.0221	0.0221	0.0182	0.0	0.0
0.1000	0.187E-02	0.477E-02	0.146E+00	0.0	0.0	0.0019	0.0204	0.1526	0.0223	0.0223	0.0223	0.0204	0.0	0.0
0.1500	0.492E-03	0.217E-02	0.133E+00	0.0	0.0	0.0004	0.0243	0.1357	0.0247	0.0247	0.0247	0.0243	0.0	0.0
0.2000	0.194E-03	0.123E-02	0.122E+00	0.0	0.0	0.0002	0.0265	0.1234	0.0267	0.0267	0.0267	0.0265	0.0	0.0
0.3000	0.546E-04	0.551E-03	0.106E+00	0.0	0.0	0.0001	0.0286	0.1066	0.0287	0.0287	0.0287	0.0286	0.0	0.0
0.4000	0.233E-04	0.310E-03	0.952E-01	0.0	0.0	0.0	0.0295	0.0955	0.0295	0.0295	0.0295	0.0295	0.0	0.0
0.5000	0.126E-04	0.199E-03	0.870E-01	0.0	0.0	0.0	0.0297	0.0872	0.0297	0.0297	0.0297	0.0297	0.0	0.0
0.6000	0.782E-05	0.138E-03	0.805E-01	0.0	0.0	0.0	0.0296	0.0806	0.0296	0.0296	0.0296	0.0296	0.0	0.0
0.8000	0.395E-05	0.778E-04	0.707E-01	0.0	0.0	0.0	0.0289	0.0708	0.0289	0.0289	0.0289	0.0289	0.0	0.0
1.0000	0.245E-05	0.498E-04	0.636E-01	0.0	0.0	0.0	0.0280	0.0637	0.0280	0.0280	0.0280	0.0280	0.0	0.0
1.2500	0.154E-05	0.319E-04	0.569E-01	0.169E-04	0.0	0.0	0.0268	0.0570	0.0268	0.0268	0.0268	0.0268	0.0	0.0
1.5000	0.112E-05	0.221E-04	0.517E-01	0.936E-04	0.0	0.0	0.0256	0.0518	0.0256	0.0256	0.0256	0.0256	0.0	0.0
2.0000	0.706E-06	0.125E-04	0.441E-01	0.373E-03	0.0	0.0	0.0234	0.0445	0.0234	0.0234	0.0234	0.0234	0.0	0.0
3.0000	0.396E-06	0.553E-05	0.347E-01	0.107E-02	0.121E-04	0.0	0.0200	0.0358	0.0200	0.0200	0.0200	0.0200	0.0	0.0
4.0000	0.272E-06	0.311E-05	0.290E-01	0.173E-02	0.496E-04	0.0	0.0176	0.0308	0.0176	0.0176	0.0176	0.0176	0.0	0.0
5.0000	0.206E-06	0.199E-05	0.250E-01	0.232E-02	0.988E-04	0.0	0.0157	0.0274	0.0157	0.0157	0.0157	0.0157	0.0	0.0
6.0000	0.166E-06	0.138E-05	0.221E-01	0.285E-02	0.152E-03	0.0	0.0142	0.0251	0.0142	0.0142	0.0142	0.0142	0.0	0.0
8.0000	0.119E-06	0.779E-06	0.181E-01	0.375E-02	0.256E-03	0.0	0.0121	0.0221	0.0121	0.0121	0.0121	0.0121	0.0	0.0
10.0000	0.927E-07	0.498E-06	0.154E-01	0.449E-02	0.352E-03	0.0	0.0105	0.0202	0.0105	0.0105	0.0105	0.0105	0.0	0.0
15.0000	0.596E-07	0.221E-06	0.114E-01	0.588E-02	0.552E-03	0.0	0.0081	0.0178	0.0081	0.0081	0.0081	0.0081	0.0	0.0
20.0000	0.439E-07	0.125E-06	0.914E-02	0.687E-02	0.709E-03	0.0	0.0066	0.0167	0.0066	0.0066	0.0066	0.0066	0.0	0.0
30.0000	0.287E-07	0.554E-07	0.666E-02	0.828E-02	0.944E-03	0.0	0.0050	0.0159	0.0050	0.0050	0.0050	0.0050	0.0	0.0
40.0000	0.214E-07	0.311E-07	0.529E-02	0.926E-02	0.111E-02	0.0	0.0040	0.0157	0.0040	0.0040	0.0040	0.0040	0.0	0.0
50.0000	0.170E-07	0.199E-07	0.442E-02	0.100E-01	0.125E-02	0.0	0.0034	0.0157	0.0034	0.0034	0.0034	0.0034	0.0	0.0
60.0000	0.141E-07	0.138E-07	0.381E-02	0.106E-01	0.135E-02	0.0	0.0030	0.0157	0.0030	0.0030	0.0030	0.0030	0.0	0.0
80.0000	0.105E-07	0.778E-08	0.300E-02	0.115E-01	0.152E-02	0.0	0.0024	0.0128	0.0024	0.0024	0.0024	0.0024	0.0	0.0
100.0000	0.840E-08	0.498E-08	0.249E-02	0.121E-01	0.165E-02	0.0	0.0020	0.0137	0.0020	0.0020	0.0020	0.0020	0.0	0.0

E (MeV)	τ/p	σ_x/p	σ/p	κ_n/p	κ_e/p	OXYGEN				[ALL Units: cm ² /g]			
						τ_{tr}/p	σ_{tr}/p	κ_{tr}/p	μ/p	μ_{tr}/p	μ_{en}/p		
0.0010	0.459E+04	0.150E+01	0.851E-02	0.0	0.0	4573.0	0.0	0.0	4591.5	4573.0	4573.0	5.568	
0.0015	0.155E+04	0.139E+01	0.177E-01	0.0	0.0	1544.0	0.0	0.0	1551.4	1544.0	1544.0	1.546	
0.0020	0.694E+03	0.126E+01	0.285E-01	0.0	0.0	692.5	0.0	0.0	695.3	692.5	692.5	0.6183	
0.0030	0.216E+03	0.100E+01	0.509E-01	0.0	0.0	215.8	0.0	0.0	217.1	215.8	215.8	0.1730	
0.0040	0.923E+02	0.783E+00	0.710E-01	0.0	0.0	92.21	0.0	0.0	93.15	92.21	92.21	0.0753	
0.0050	0.472E+02	0.618E+00	0.874E-01	0.0	0.0	47.17	0.0	0.0	47.91	47.17	47.17	0.0442	
0.0060	0.271E+02	0.498E+00	0.100E+00	0.0	0.0	27.08	0.0	0.0	27.70	27.08	27.08	0.0321	
0.0080	0.112E+02	0.345E+00	0.118E+00	0.0	0.0	11.16	0.0	0.0	11.66	11.16	11.16	0.0247	
0.0100	0.557E+01	0.256E+00	0.129E+00	0.0	0.0	5.565	0.003	0.0	5.955	5.568	5.568	0.0236	
0.0150	0.154E+01	0.149E+00	0.145E+00	0.0	0.0	1.542	0.004	0.0	1.834	1.546	1.546	0.0251	
0.0200	0.612E+00	0.989E-01	0.154E+00	0.0	0.0	0.6123	0.0060	0.0	0.8649	0.6183	0.6183	0.0268	
0.0300	0.164E+00	0.525E-01	0.161E+00	0.0	0.0	0.1641	0.0089	0.0	0.3775	0.1730	0.1730	0.0288	
0.0400	0.639E-01	0.321E-01	0.162E+00	0.0	0.0	0.0639	0.0114	0.0	0.2580	0.0753	0.0753	0.0295	
0.0500	0.307E-01	0.217E-01	0.161E+00	0.0	0.0	0.0307	0.0135	0.0	0.2134	0.0442	0.0442	0.0296	
0.0600	0.168E-01	0.156E-01	0.158E+00	0.0	0.0	0.0169	0.0152	0.0	0.1904	0.0321	0.0321	0.0296	
0.0800	0.650E-02	0.914E-02	0.152E+00	0.0	0.0	0.0065	0.0182	0.0	0.1676	0.0247	0.0247	0.0289	
0.1000	0.311E-02	0.599E-02	0.146E+00	0.0	0.0	0.0032	0.0204	0.0	0.1551	0.0236	0.0236	0.0279	
0.1500	0.823E-03	0.273E-02	0.133E+00	0.0	0.0	0.0008	0.0243	0.0	0.1366	0.0251	0.0251	0.0256	
0.2000	0.325E-03	0.155E-02	0.122E+00	0.0	0.0	0.0003	0.0265	0.0	0.1239	0.0268	0.0268	0.0235	
0.3000	0.919E-04	0.696E-03	0.106E+00	0.0	0.0	0.0001	0.0287	0.0	0.1068	0.0288	0.0288	0.0206	
0.4000	0.393E-04	0.393E-03	0.952E-01	0.0	0.0	0.0	0.0296	0.0	0.0956	0.0296	0.0296	0.0188	
0.5000	0.212E-04	0.252E-03	0.870E-01	0.0	0.0	0.0	0.0298	0.0	0.0873	0.0298	0.0298	0.0167	
0.6000	0.132E-04	0.175E-03	0.805E-01	0.0	0.0	0.0	0.0296	0.0	0.0807	0.0296	0.0296	0.0155	
0.8000	0.667E-05	0.984E-04	0.708E-01	0.0	0.0	0.0	0.0289	0.0	0.0709	0.0289	0.0289	0.0148	
1.0000	0.414E-05	0.630E-04	0.636E-01	0.0	0.0	0.0	0.0280	0.0	0.0637	0.0280	0.0280	0.0139	
1.2500	0.262E-05	0.403E-04	0.569E-01	0.194E-04	0.0	0.0	0.0268	0.0	0.0570	0.0268	0.0268	0.0136	
1.5000	0.190E-05	0.280E-04	0.517E-01	0.107E-03	0.0	0.0	0.0255	0.0	0.0518	0.0256	0.0256	0.0132	
2.0000	0.120E-05	0.158E-04	0.442E-01	0.427E-03	0.0	0.0	0.0234	0.0002	0.0446	0.0236	0.0236	0.0129	
3.0000	0.668E-06	0.700E-05	0.347E-01	0.122E-02	0.121E-04	0.0	0.0200	0.0008	0.0359	0.0208	0.0208	0.0129	
4.0000	0.459E-06	0.394E-05	0.290E-01	0.198E-02	0.495E-04	0.0	0.0176	0.0015	0.0310	0.0191	0.0191	0.0129	
5.0000	0.348E-06	0.252E-05	0.250E-01	0.265E-02	0.989E-04	0.0	0.0157	0.0022	0.0278	0.0179	0.0179	0.0129	
6.0000	0.280E-06	0.175E-05	0.221E-01	0.326E-02	0.152E-03	0.0	0.0142	0.0028	0.0255	0.0170	0.0170	0.0129	
8.0000	0.200E-06	0.985E-06	0.181E-01	0.429E-02	0.256E-03	0.0	0.0121	0.0040	0.0226	0.0160	0.0160	0.0129	
10.0000	0.156E-06	0.630E-06	0.154E-01	0.513E-02	0.352E-03	0.0	0.0105	0.0049	0.0209	0.0154	0.0154	0.0129	
15.0000	0.100E-06	0.280E-06	0.114E-01	0.670E-02	0.553E-03	0.0	0.0081	0.0068	0.0187	0.0149	0.0149	0.0129	
20.0000	0.738E-07	0.158E-06	0.915E-02	0.784E-02	0.709E-03	0.0	0.0067	0.0081	0.0177	0.0148	0.0148	0.0129	
30.0000	0.483E-07	0.700E-07	0.666E-02	0.945E-02	0.943E-03	0.0	0.0050	0.0100	0.0171	0.0150	0.0150	0.0129	
40.0000	0.359E-07	0.394E-07	0.529E-02	0.106E-01	0.111E-02	0.0	0.0040	0.0114	0.0170	0.0154	0.0154	0.0129	
50.0000	0.285E-07	0.252E-07	0.442E-02	0.114E-01	0.125E-02	0.0	0.0034	0.0123	0.0171	0.0158	0.0158	0.0129	
60.0000	0.237E-07	0.175E-07	0.381E-02	0.121E-01	0.135E-02	0.0	0.0030	0.0132	0.0173	0.0162	0.0162	0.0129	
80.0000	0.177E-07	0.985E-08	0.300E-02	0.131E-01	0.152E-02	0.0	0.0024	0.0144	0.0176	0.0168	0.0168	0.0129	
100.0000	0.141E-07	0.630E-08	0.249E-02	0.138E-01	0.164E-02	0.0	0.0020	0.0153	0.0179	0.0173	0.0173	0.0129	

E (MeV)	FLUORINE												μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
	τ/ρ	σ_T/ρ	σ/ρ	κ_H/ρ	κ_Θ/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ				
0.0010	0.565E+04	0.162E+01	0.643E-02	0.0	0.0	5611.0	0.0	0.0	5651.6	5611.0	5611.0	7.779	7.779	7.779	
0.0015	0.198E+04	0.152E+01	0.135E-01	0.0	0.0	1968.0	0.0	0.0	1981.5	1968.0	1968.0	2.187	2.187	2.187	
0.0020	0.903E+03	0.140E+01	0.221E-01	0.0	0.0	900.4	0.0	0.0	904.4	900.4	900.4	0.880	0.880	0.880	
0.0030	0.288E+03	0.115E+01	0.410E-01	0.0	0.0	287.0	0.0	0.0	289.2	287.0	287.0	0.2453	0.2453	0.2453	
0.0040	0.125E+03	0.920E+00	0.590E-01	0.0	0.0	124.4	0.0	0.0	126.0	124.4	124.4	0.1037	0.1037	0.1037	
0.0050	0.643E+02	0.737E+00	0.746E-01	0.0	0.0	64.23	0.0	0.0	65.11	64.23	64.23	0.0575	0.0575	0.0575	
0.0060	0.372E+02	0.598E+00	0.875E-01	0.0	0.0	37.17	0.0	0.0	37.89	37.17	37.17	0.0391	0.0391	0.0391	
0.0080	0.155E+02	0.414E+00	0.106E+00	0.0	0.0	15.48	0.0	0.0	16.02	15.48	15.48	0.0268	0.0268	0.0268	
0.0100	0.778E+01	0.306E+00	0.118E+00	0.0	0.0	7.776	0.003	0.0	8.204	7.779	7.779	0.0239	0.0239	0.0239	
0.0150	0.218E+01	0.173E+00	0.135E+00	0.0	0.0	2.183	0.004	0.0	2.488	2.187	2.187	0.0242	0.0242	0.0242	
0.0200	0.875E+00	0.114E+00	0.143E+00	0.0	0.0	0.8746	0.0056	0.0	1.1320	0.880	0.880	0.0256	0.0256	0.0256	
0.0300	0.237E+00	0.609E-01	0.151E+00	0.0	0.0	0.2369	0.0084	0.0	0.4489	0.2453	0.2453	0.0273	0.0273	0.0273	
0.0400	0.930E-01	0.374E-01	0.152E+00	0.0	0.0	0.0930	0.0107	0.0	0.2824	0.1037	0.1037	0.0280	0.0280	0.0280	
0.0500	0.488E-01	0.253E-01	0.151E+00	0.0	0.0	0.0448	0.0127	0.0	0.2211	0.0575	0.0575	0.0281	0.0281	0.0281	
0.0600	0.246E-01	0.182E-01	0.149E+00	0.0	0.0	0.0247	0.0144	0.0	0.1918	0.0391	0.0391	0.0273	0.0273	0.0273	
0.0800	0.956E-02	0.107E-01	0.144E+00	0.0	0.0	0.0095	0.0173	0.0	0.1643	0.0268	0.0268	0.0239	0.0239	0.0239	
0.1000	0.459E-02	0.701E-02	0.138E+00	0.0	0.0	0.0045	0.0194	0.0	0.1496	0.0239	0.0239	0.0242	0.0242	0.0242	
0.1500	0.122E-02	0.321E-02	0.125E+00	0.0	0.0	0.0013	0.0229	0.0	0.1294	0.0242	0.0242	0.0256	0.0256	0.0256	
0.2000	0.484E-03	0.183E-02	0.115E+00	0.0	0.0	0.0006	0.0250	0.0	0.1173	0.0256	0.0256	0.0273	0.0273	0.0273	
0.3000	0.137E-03	0.819E-03	0.101E+00	0.0	0.0	0.0	0.0273	0.0	0.1020	0.0273	0.0273	0.0280	0.0280	0.0280	
0.4000	0.589E-04	0.462E-03	0.902E-01	0.0	0.0	0.0	0.0280	0.0	0.0907	0.0280	0.0280	0.0281	0.0281	0.0281	
0.5000	0.318E-04	0.296E-03	0.824E-01	0.0	0.0	0.0	0.0282	0.0	0.0827	0.0282	0.0282	0.0281	0.0281	0.0281	
0.6000	0.198E-04	0.206E-03	0.763E-01	0.0	0.0	0.0	0.0274	0.0	0.0765	0.0281	0.0281	0.0273	0.0273	0.0273	
0.8000	0.999E-05	0.116E-03	0.670E-01	0.0	0.0	0.0	0.0274	0.0	0.0671	0.0274	0.0274	0.0264	0.0264	0.0264	
1.0000	0.621E-05	0.742E-04	0.603E-01	0.0	0.0	0.0	0.0265	0.0	0.0604	0.0265	0.0265	0.0253	0.0253	0.0253	
1.2500	0.394E-05	0.475E-04	0.539E-01	0.206E-04	0.0	0.0	0.0253	0.0	0.0540	0.0254	0.0254	0.0242	0.0242	0.0242	
1.5000	0.286E-05	0.330E-04	0.490E-01	0.114E-03	0.0	0.0	0.0242	0.0	0.0491	0.0242	0.0242	0.0222	0.0222	0.0222	
2.0000	0.180E-05	0.186E-04	0.418E-01	0.455E-03	0.0	0.0	0.0221	0.0002	0.0423	0.0224	0.0224	0.0198	0.0198	0.0198	
3.0000	0.100E-05	0.825E-05	0.329E-01	0.130E-02	0.115E-04	0.0	0.0189	0.0009	0.0342	0.0198	0.0198	0.0179	0.0179	0.0179	
4.0000	0.687E-06	0.464E-05	0.274E-01	0.211E-02	0.470E-04	0.0	0.0166	0.0016	0.0296	0.0182	0.0182	0.0168	0.0168	0.0168	
5.0000	0.520E-06	0.297E-05	0.237E-01	0.283E-02	0.936E-04	0.0	0.0149	0.0023	0.0266	0.0172	0.0172	0.0160	0.0160	0.0160	
6.0000	0.418E-06	0.206E-05	0.209E-01	0.347E-02	0.144E-03	0.0	0.0134	0.0030	0.0245	0.0165	0.0165	0.0151	0.0151	0.0151	
8.0000	0.299E-06	0.116E-05	0.171E-01	0.457E-02	0.243E-03	0.0	0.0114	0.0042	0.0219	0.0156	0.0156	0.0145	0.0145	0.0145	
10.0000	0.233E-06	0.743E-06	0.146E-01	0.546E-02	0.334E-03	0.0	0.0100	0.0052	0.0204	0.0152	0.0152	0.0136	0.0136	0.0136	
15.0000	0.150E-06	0.330E-06	0.108E-01	0.714E-02	0.524E-03	0.0	0.0077	0.0071	0.0185	0.0148	0.0148	0.0133	0.0133	0.0133	
20.0000	0.110E-06	0.186E-06	0.867E-02	0.835E-02	0.672E-03	0.0	0.0063	0.0086	0.0177	0.0149	0.0149	0.0134	0.0134	0.0134	
30.0000	0.720E-07	0.825E-07	0.631E-02	0.100E-01	0.893E-03	0.0	0.0047	0.0105	0.0172	0.0153	0.0153	0.0134	0.0134	0.0134	
40.0000	0.534E-07	0.464E-07	0.501E-02	0.112E-01	0.105E-02	0.0	0.0038	0.0120	0.0173	0.0158	0.0158	0.0133	0.0133	0.0133	
50.0000	0.425E-07	0.297E-07	0.419E-02	0.121E-01	0.118E-02	0.0	0.0033	0.0130	0.0175	0.0163	0.0163	0.0133	0.0133	0.0133	
60.0000	0.353E-07	0.206E-07	0.361E-02	0.128E-01	0.128E-02	0.0	0.0028	0.0139	0.0177	0.0167	0.0167	0.0133	0.0133	0.0133	
80.0000	0.263E-07	0.116E-07	0.284E-02	0.139E-01	0.144E-02	0.0	0.0023	0.0151	0.0182	0.0174	0.0174	0.0131	0.0131	0.0131	
100.0000	0.210E-07	0.743E-08	0.236E-02	0.147E-01	0.155E-02	0.0	0.0019	0.0160	0.0186	0.0180	0.0180	0.0129	0.0129	0.0129	

[All Units: cm²/g]

FLUORINE

Z = 9

NEON											
[All Units: cm ² /g]											
Z = 10	τ/p	σ_T/p	σ/p	κ_e/p	κ_e/p	τ_{tr}/p	σ_{tr}/p	κ_{tr}/p	μ/p	μ_{tr}/p	μ_{en}/p
0.0010	0.741E+04	0.190E+01	0.548E-02	0.0	0.0	7319.0	0.0	0.0	7411.9	7319.0	7319.0
0.0015	0.266E+04	0.180E+01	0.116E-01	0.0	0.0	2643.0	0.0	0.0	2661.8	2643.0	2643.0
0.0020	0.124E+04	0.168E+01	0.193E-01	0.0	0.0	1234.0	0.0	0.0	1241.7	1234.0	1234.0
0.0030	0.404E+03	0.142E+01	0.364E-01	0.0	0.0	402.2	0.0	0.0	405.5	402.2	402.2
0.0040	0.177E+03	0.116E+01	0.536E-01	0.0	0.0	176.7	0.0	0.0	178.2	176.7	176.7
0.0050	0.924E+02	0.945E+00	0.692E-01	0.0	0.0	92.14	0.0	0.0	93.41	92.14	92.14
0.0060	0.538E+02	0.774E+00	0.828E-01	0.0	0.0	53.73	0.0	0.0	54.66	53.73	53.73
0.0080	0.226E+02	0.540E+00	0.104E+00	0.0	0.0	22.61	0.0	0.0	23.24	22.61	22.61
0.0100	0.115E+02	0.398E+00	0.118E+00	0.0	0.0	11.44	0.0	0.0	12.02	11.44	11.44
0.0150	0.325E+01	0.223E+00	0.137E+00	0.0	0.0	3.251	0.004	0.0	3.610	3.255	3.255
0.0200	0.131E+01	0.146E+00	0.147E+00	0.0	0.0	1.312	0.006	0.0	1.603	1.318	1.318
0.0300	0.359E+00	0.773E-01	0.156E+00	0.0	0.0	0.3592	0.0087	0.0	0.5923	0.3679	0.3679
0.0400	0.142E+00	0.476E-01	0.158E+00	0.0	0.0	0.1418	0.0112	0.0	0.3476	0.1530	0.1530
0.0500	0.68E-01	0.322E-01	0.157E+00	0.0	0.0	0.0686	0.0133	0.0	0.2579	0.0819	0.0819
0.0600	0.379E-01	0.231E-01	0.155E+00	0.0	0.0	0.0378	0.0151	0.0	0.2160	0.0529	0.0529
0.0800	0.148E-01	0.136E-01	0.150E+00	0.0	0.0	0.0148	0.0180	0.0	0.1784	0.0328	0.0328
0.1000	0.712E-02	0.895E-02	0.144E+00	0.0	0.0	0.0072	0.0202	0.0	0.1601	0.0274	0.0273
0.1500	0.190E-02	0.411E-02	0.131E+00	0.0	0.0	0.0019	0.0240	0.0	0.1370	0.0259	0.0259
0.2000	0.757E-03	0.234E-02	0.121E+00	0.0	0.0	0.0007	0.0263	0.0	0.1241	0.0270	0.0270
0.3000	0.215E-03	0.105E-02	0.105E+00	0.0	0.0	0.0003	0.0284	0.0	0.1063	0.0287	0.0286
0.4000	0.925E-04	0.593E-03	0.943E-01	0.0	0.0	0.0	0.0293	0.0	0.0950	0.0293	0.0293
0.5000	0.500E-04	0.380E-03	0.862E-01	0.0	0.0	0.0	0.0295	0.0	0.0866	0.0295	0.0295
0.6000	0.311E-04	0.264E-03	0.798E-01	0.0	0.0	0.0	0.0294	0.0	0.0801	0.0294	0.0293
0.8000	0.157E-04	0.149E-03	0.701E-01	0.0	0.0	0.0	0.0287	0.0	0.0703	0.0287	0.0286
1.0000	0.978E-05	0.952E-04	0.631E-01	0.0	0.0	0.0	0.0277	0.0	0.0632	0.0277	0.0276
1.2500	0.623E-05	0.610E-04	0.564E-01	0.241E-04	0.0	0.0	0.0265	0.0	0.0565	0.0265	0.0264
1.5000	0.451E-05	0.423E-04	0.513E-01	0.133E-03	0.0	0.0	0.0253	0.0	0.0515	0.0254	0.0252
2.0000	0.283E-05	0.238E-04	0.438E-01	0.530E-03	0.0	0.0	0.0232	0.0003	0.0444	0.0234	0.0233
3.0000	0.157E-05	0.106E-04	0.344E-01	0.151E-02	0.120E-04	0.0	0.0198	0.0010	0.0359	0.0208	0.0206
4.0000	0.108E-05	0.596E-05	0.287E-01	0.245E-02	0.492E-04	0.0	0.0174	0.0019	0.0312	0.0192	0.0189
5.0000	0.818E-06	0.381E-05	0.248E-01	0.329E-02	0.980E-04	0.0	0.0155	0.0027	0.0282	0.0182	0.0178
6.0000	0.655E-06	0.265E-05	0.219E-01	0.404E-02	0.150E-03	0.0	0.0141	0.0035	0.0261	0.0176	0.0171
8.0000	0.469E-06	0.149E-05	0.179E-01	0.531E-02	0.254E-03	0.0	0.0119	0.0048	0.0235	0.0168	0.0161
10.0000	0.364E-06	0.953E-06	0.153E-01	0.635E-02	0.349E-03	0.0	0.0104	0.0060	0.0220	0.0164	0.0156
15.0000	0.234E-06	0.423E-06	0.113E-01	0.828E-02	0.548E-03	0.0	0.0080	0.0082	0.0201	0.0162	0.0151
20.0000	0.172E-06	0.238E-06	0.907E-02	0.968E-02	0.703E-03	0.0	0.0066	0.0099	0.0195	0.0165	0.0149
30.0000	0.112E-06	0.106E-06	0.660E-02	0.117E-01	0.933E-03	0.0	0.0049	0.0122	0.0192	0.0171	0.0148
40.0000	0.835E-07	0.596E-07	0.525E-02	0.130E-01	0.110E-02	0.0	0.0040	0.0137	0.0194	0.0178	0.0148
50.0000	0.664E-07	0.381E-07	0.438E-02	0.140E-01	0.123E-02	0.0	0.0034	0.0150	0.0196	0.0183	0.0148
60.0000	0.551E-07	0.265E-07	0.377E-02	0.149E-01	0.134E-02	0.0	0.0030	0.0159	0.0200	0.0189	0.0147
80.0000	0.411E-07	0.149E-07	0.298E-02	0.161E-01	0.150E-02	0.0	0.0024	0.0174	0.0206	0.0197	0.0146
100.0000	0.328E-07	0.953E-08	0.247E-02	0.170E-01	0.162E-02	0.0	0.0020	0.0184	0.0211	0.0204	0.0143

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_N/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.118E+04	0.226E+01	0.143E-01	0.0	0.0	1183.0	0.0	0.0	1183.0	1183.0	1183.0
0.0015	0.400E+03	0.204E+01	0.248E-01	0.0	0.0	400.2	0.0	0.0	402.1	400.2	400.2
0.001560	0.360E+03	0.201E+01	0.259E-01	0.0	0.0	360.0	0.0	0.0	362.0	360.0	360.0
K. 0.01560	0.395E+04	0.201E+01	0.259E-01	0.0	0.0	3820.8	0.0	0.0	3952.0	3820.8	3820.8
0.0020	0.226E+04	0.184E+01	0.337E-01	0.0	0.0	2261.0	0.0	0.0	2261.9	2261.0	2261.0
0.0030	0.787E+03	0.152E+01	0.473E-01	0.0	0.0	786.5	0.0	0.0	788.6	786.5	786.5
0.0040	0.359E+03	0.130E+01	0.581E-01	0.0	0.0	359.1	0.0	0.0	360.4	359.1	359.1
0.0050	0.192E+03	0.112E+01	0.679E-01	0.0	0.0	192.2	0.0	0.0	193.2	192.2	192.2
0.0060	0.114E+03	0.964E+00	0.770E-01	0.0	0.0	114.3	0.0	0.0	115.0	114.3	114.3
0.0080	0.495E+02	0.723E+00	0.929E-01	0.0	0.0	49.51	0.0	0.0	50.32	49.51	49.51
0.0100	0.258E+02	0.551E+00	0.106E+00	0.0	0.0	25.42	0.0	0.0	26.26	25.42	25.42
0.0150	0.751E+01	0.314E+00	0.127E+00	0.0	0.0	7.488	0.004	0.0	7.951	7.492	7.492
0.0200	0.310E+01	0.205E+00	0.137E+00	0.0	0.0	3.091	0.006	0.0	3.442	3.097	3.097
0.0300	0.872E+00	0.110E+00	0.146E+00	0.0	0.0	0.8707	0.0082	0.0	1.1280	0.8789	0.8789
0.0400	0.350E+00	0.686E-01	0.149E+00	0.0	0.0	0.3500	0.0106	0.0	0.5676	0.3606	0.3606
0.0500	0.172E+00	0.468E-01	0.150E+00	0.0	0.0	0.1715	0.0128	0.0	0.3688	0.1843	0.1843
0.0600	0.956E-01	0.339E-01	0.148E+00	0.0	0.0	0.0956	0.0145	0.0	0.2775	0.1101	0.1101
0.0800	0.378E-01	0.200E-01	0.144E+00	0.0	0.0	0.0378	0.0174	0.0	0.2018	0.0552	0.0552
0.1000	0.184E-01	0.132E-01	0.139E+00	0.0	0.0	0.0183	0.0197	0.0	0.1706	0.0380	0.0380
0.1500	0.499E-02	0.612E-02	0.127E+00	0.0	0.0	0.0050	0.0233	0.0	0.1381	0.0283	0.0283
0.2000	0.200E-02	0.358E-02	0.117E+00	0.0	0.0	0.0020	0.0255	0.0	0.1225	0.0275	0.0275
0.3000	0.574E-03	0.158E-02	0.102E+00	0.0	0.0	0.0006	0.0276	0.0	0.1042	0.0282	0.0282
0.4000	0.248E-03	0.893E-03	0.916E-01	0.0	0.0	0.0003	0.0284	0.0	0.0927	0.0287	0.0287
0.5000	0.134E-03	0.573E-03	0.837E-01	0.0	0.0	0.0002	0.0286	0.0	0.0844	0.0288	0.0288
0.6000	0.840E-04	0.399E-03	0.775E-01	0.0	0.0	0.0001	0.0285	0.0	0.0780	0.0286	0.0285
0.8000	0.425E-04	0.225E-03	0.681E-01	0.0	0.0	0.0	0.0279	0.0	0.0684	0.0279	0.0278
1.0000	0.264E-04	0.144E-03	0.613E-01	0.0	0.0	0.0	0.0270	0.0	0.0615	0.0270	0.0268
1.2500	0.169E-04	0.921E-04	0.548E-01	0.313E-04	0.0	0.0	0.0258	0.0	0.0549	0.0258	0.0256
1.5000	0.122E-04	0.639E-04	0.498E-01	0.171E-03	0.0	0.0	0.0246	0.0001	0.0500	0.0247	0.0245
2.0000	0.763E-05	0.360E-04	0.425E-01	0.675E-03	0.0	0.0	0.0225	0.0003	0.0432	0.0228	0.0226
3.0000	0.422E-05	0.160E-04	0.335E-01	0.192E-02	0.117E-04	0.0	0.0193	0.0013	0.0355	0.0205	0.0202
4.0000	0.288E-05	0.900E-05	0.279E-01	0.310E-02	0.478E-04	0.0	0.0159	0.0023	0.0311	0.0192	0.0188
5.0000	0.219E-05	0.576E-05	0.241E-01	0.415E-02	0.952E-04	0.0	0.0151	0.0034	0.0284	0.0185	0.0179
6.0000	0.174E-05	0.400E-05	0.213E-01	0.510E-02	0.146E-03	0.0	0.0137	0.0043	0.0266	0.0180	0.0174
8.0000	0.124E-05	0.225E-05	0.174E-01	0.669E-02	0.247E-03	0.0	0.0116	0.0061	0.0243	0.0177	0.0168
10.0000	0.966E-06	0.144E-05	0.148E-01	0.800E-02	0.339E-03	0.0	0.0101	0.0075	0.0231	0.0176	0.0165
15.0000	0.619E-06	0.640E-06	0.110E-01	0.104E-01	0.532E-03	0.0	0.0078	0.0103	0.0219	0.0180	0.0163
20.0000	0.455E-06	0.360E-06	0.882E-02	0.122E-01	0.682E-03	0.0	0.0064	0.0122	0.0217	0.0186	0.0163
30.0000	0.297E-06	0.160E-06	0.642E-02	0.146E-01	0.905E-03	0.0	0.0048	0.0150	0.0215	0.0198	0.0165
40.0000	0.220E-06	0.900E-07	0.510E-02	0.163E-01	0.107E-02	0.0	0.0039	0.0170	0.0225	0.0209	0.0165
50.0000	0.175E-06	0.576E-07	0.426E-02	0.176E-01	0.119E-02	0.0	0.0033	0.0184	0.0231	0.0217	0.0164
60.0000	0.145E-06	0.400E-07	0.367E-02	0.186E-01	0.129E-02	0.0	0.0029	0.0196	0.0225	0.0225	0.0163
80.0000	0.108E-06	0.225E-07	0.289E-02	0.201E-01	0.145E-02	0.0	0.0023	0.0213	0.0244	0.0236	0.0159
100.0000	0.864E-07	0.144E-07	0.240E-02	0.212E-01	0.156E-02	0.0	0.0019	0.0226	0.0252	0.0245	0.0154

(All Units: cm²/g)

SILICON

Z = 14

E (MeV)	τ/ρ	σ_x/ρ	σ/ρ	κ_n/ρ	κ_o/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.157E+04	0.253E+01	0.132E-01	0.0	0.0	1567.0	0.0	0.0	1572.5	1567.0	1567.0
0.0015	0.533E+03	0.229E+01	0.239E-01	0.0	0.0	533.3	0.0	0.0	535.3	533.3	533.3
0.001839	0.307E+03	0.212E+01	0.308E-01	0.0	0.0	307.0	0.0	0.0	307.0	307.0	307.0
0.001839	0.319E+04	0.212E+01	0.308E-01	0.0	0.0	3053.0	0.0	0.0	3192.2	3053.0	3053.0
0.0020	0.277E+04	0.205E+01	0.339E-01	0.0	0.0	2770.0	0.0	0.0	2772.1	2770.0	2770.0
0.0030	0.977E+03	0.167E+01	0.496E-01	0.0	0.0	976.7	0.0	0.0	978.7	976.7	976.7
0.0040	0.451E+03	0.140E+01	0.613E-01	0.0	0.0	451.4	0.0	0.0	452.5	451.4	451.4
0.0050	0.244E+03	0.121E+01	0.711E-01	0.0	0.0	243.8	0.0	0.0	245.3	243.8	243.8
0.0060	0.146E+03	0.105E+01	0.798E-01	0.0	0.0	145.8	0.0	0.0	147.1	145.8	145.8
0.0080	0.638E+02	0.804E+00	0.951E-01	0.0	0.0	63.79	0.0	0.0	64.70	63.79	63.79
0.0100	0.331E+02	0.622E+00	0.108E+00	0.0	0.0	32.89	0.0	0.0	33.83	32.89	32.89
0.0150	0.985E+01	0.359E+00	0.129E+00	0.0	0.0	9.796	0.004	0.0	10.338	9.800	9.800
0.0200	0.409E+01	0.234E+00	0.140E+00	0.0	0.0	4.072	0.006	0.0	4.464	4.078	4.078
0.0300	0.116E+01	0.125E+00	0.150E+00	0.0	0.0	1.158	0.008	0.0	1.166	1.166	1.166
0.0400	0.469E+00	0.789E-01	0.153E+00	0.0	0.0	0.4678	0.0109	0.0	0.7009	0.4787	0.4787
0.0500	0.231E+00	0.540E-01	0.154E+00	0.0	0.0	0.2303	0.0131	0.0	0.4390	0.2434	0.2434
0.0600	0.129E+00	0.392E-01	0.153E+00	0.0	0.0	0.1286	0.0150	0.0	0.3212	0.1436	0.1436
0.0800	0.512E-01	0.232E-01	0.148E+00	0.0	0.0	0.0512	0.0179	0.0	0.2224	0.0691	0.0691
0.1000	0.250E-01	0.154E-01	0.143E+00	0.0	0.0	0.0250	0.0202	0.0	0.1834	0.0452	0.0452
0.1500	0.681E-02	0.713E-02	0.131E+00	0.0	0.0	0.0067	0.0242	0.0	0.1449	0.0309	0.0309
0.2000	0.274E-02	0.408E-02	0.121E+00	0.0	0.0	0.0027	0.0264	0.0	0.1278	0.0291	0.0291
0.3000	0.788E-03	0.184E-02	0.106E+00	0.0	0.0	0.0006	0.0287	0.0	0.1086	0.0294	0.0294
0.4000	0.341E-03	0.104E-02	0.948E-01	0.0	0.0	0.0003	0.0295	0.0	0.0962	0.0298	0.0298
0.5000	0.185E-03	0.670E-03	0.866E-01	0.0	0.0	0.0002	0.0296	0.0	0.0875	0.0298	0.0297
0.6000	0.116E-03	0.466E-03	0.802E-01	0.0	0.0	0.0001	0.0295	0.0	0.0808	0.0296	0.0295
0.8000	0.585E-04	0.262E-03	0.705E-01	0.0	0.0	0.0001	0.0288	0.0	0.0708	0.0289	0.0288
1.0000	0.364E-04	0.168E-03	0.634E-01	0.0	0.0	0.0	0.0279	0.0	0.0636	0.0279	0.0278
1.2500	0.233E-04	0.108E-03	0.567E-01	0.352E-04	0.0	0.0	0.0267	0.0	0.0569	0.0267	0.0265
1.5000	0.168E-04	0.747E-04	0.515E-01	0.191E-03	0.0	0.0	0.0254	0.0001	0.0518	0.0255	0.0253
2.0000	0.105E-04	0.420E-04	0.440E-01	0.753E-03	0.0	0.0	0.0233	0.0004	0.0448	0.0237	0.0234
3.0000	0.580E-05	0.187E-04	0.346E-01	0.214E-02	0.121E-04	0.0	0.0199	0.0014	0.0368	0.0213	0.0210
4.0000	0.395E-05	0.105E-04	0.289E-01	0.346E-02	0.494E-04	0.0	0.0175	0.0026	0.0324	0.0201	0.0196
5.0000	0.298E-05	0.673E-05	0.249E-01	0.463E-02	0.985E-04	0.0	0.0156	0.0038	0.0296	0.0194	0.0188
6.0000	0.239E-05	0.467E-05	0.220E-01	0.568E-02	0.151E-03	0.0	0.0141	0.0048	0.0278	0.0190	0.0182
8.0000	0.170E-05	0.263E-05	0.180E-01	0.745E-02	0.255E-03	0.0	0.0120	0.0067	0.0257	0.0187	0.0177
10.0000	0.132E-05	0.168E-05	0.154E-01	0.890E-02	0.351E-03	0.0	0.0105	0.0083	0.0247	0.0188	0.0175
15.0000	0.846E-06	0.746E-06	0.114E-01	0.116E-01	0.550E-03	0.0	0.0081	0.0114	0.0236	0.0194	0.0175
20.0000	0.622E-06	0.421E-06	0.912E-02	0.135E-01	0.705E-03	0.0	0.0066	0.0136	0.0230	0.0202	0.0176
30.0000	0.406E-06	0.187E-06	0.664E-02	0.163E-01	0.936E-03	0.0	0.0050	0.0166	0.0239	0.0216	0.0178
40.0000	0.301E-06	0.105E-06	0.528E-02	0.182E-01	0.110E-02	0.0	0.0040	0.0188	0.0246	0.0228	0.0179
50.0000	0.239E-06	0.673E-07	0.441E-02	0.196E-01	0.123E-02	0.0	0.0034	0.0204	0.0252	0.0238	0.0178
60.0000	0.199E-06	0.467E-07	0.380E-02	0.207E-01	0.133E-02	0.0	0.0030	0.0216	0.0258	0.0246	0.0176
80.0000	0.148E-06	0.263E-07	0.299E-02	0.224E-01	0.149E-02	0.0	0.0024	0.0236	0.0269	0.0259	0.0172
100.0000	0.118E-06	0.168E-07	0.249E-02	0.235E-01	0.161E-02	0.0	0.0020	0.0249	0.0276	0.0269	0.0167

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	Z = 16		SULFUR		[All Units: cm ² /g]				
				κ_n/ρ	κ_g/ρ	$\kappa_{t,r}/\rho$	$\kappa_{t,r}/\rho$	μ/ρ	$\mu_{t,r}/\rho$	μ_{en}/ρ		
0.0010	0.243E+04	0.295E+01	0.101E-01	0.0	0.0	2426.0	0.0	0.0	2433.0	2426.0	2426.0	2426.0
0.0015	0.832E+03	0.270E+01	0.195E-01	0.0	0.0	831.4	0.0	0.0	834.7	831.4	831.4	831.4
0.0020	0.383E+03	0.243E+01	0.292E-01	0.0	0.0	382.8	0.0	0.0	385.5	382.8	382.8	382.8
0.002472	0.215E+03	0.218E+01	0.377E-01	0.0	0.0	214.7	0.0	0.0	217.2	214.7	214.7	214.7
0.002872	0.207E+04	0.218E+01	0.377E-01	0.0	0.0	1927.5	0.0	0.0	2072.2	1927.5	1927.5	1927.5
0.0030	0.134E+04	0.195E+01	0.464E-01	0.0	0.0	1337.0	0.0	0.0	1342.0	1337.0	1337.0	1337.0
0.0040	0.632E+03	0.160E+01	0.600E-01	0.0	0.0	632.2	0.0	0.0	633.7	632.2	632.2	632.2
0.0050	0.347E+03	0.135E+01	0.707E-01	0.0	0.0	347.3	0.0	0.0	348.4	347.3	347.3	347.3
0.0060	0.210E+03	0.117E+01	0.795E-01	0.0	0.0	210.4	0.0	0.0	211.2	210.4	210.4	210.4
0.0080	0.937E+02	0.911E+00	0.936E-01	0.0	0.0	93.65	0.0	0.0	94.70	93.65	93.65	93.65
0.0100	0.493E+02	0.723E+00	0.105E+00	0.0	0.0	48.48	0.0	0.0	50.13	48.48	48.48	48.48
0.0150	0.149E+02	0.430E+00	0.125E+00	0.0	0.0	14.78	0.0	0.0	15.45	14.78	14.78	14.78
0.0200	0.629E+01	0.282E+00	0.137E+00	0.0	0.0	6.237	0.006	0.006	6.709	6.243	6.243	6.243
0.0300	0.181E+01	0.151E+00	0.148E+00	0.0	0.0	1.804	0.008	0.008	2.109	1.812	1.812	1.812
0.0400	0.740E+00	0.955E-01	0.151E+00	0.0	0.0	0.7374	0.0108	0.0108	0.9865	0.7482	0.7482	0.7482
0.0500	0.367E+00	0.658E-01	0.152E+00	0.0	0.0	0.3658	0.0130	0.0130	0.5848	0.3788	0.3788	0.3788
0.0600	0.206E+00	0.480E-01	0.151E+00	0.0	0.0	0.2055	0.0148	0.0148	0.4050	0.2203	0.2203	0.2203
0.0800	0.826E-01	0.286E-01	0.147E+00	0.0	0.0	0.0824	0.0179	0.0179	0.2582	0.1003	0.1003	0.1003
0.1000	0.405E-01	0.190E-01	0.143E+00	0.0	0.0	0.0404	0.0203	0.0203	0.2025	0.0607	0.0607	0.0607
0.1500	0.111E-01	0.882E-02	0.131E+00	0.0	0.0	0.0111	0.0242	0.0242	0.1509	0.0353	0.0353	0.0353
0.2000	0.451E-02	0.507E-02	0.121E+00	0.0	0.0	0.0044	0.0265	0.0265	0.1306	0.0309	0.0309	0.0309
0.3000	0.131E-02	0.230E-02	0.106E+00	0.0	0.0	0.0012	0.0287	0.0287	0.1096	0.0299	0.0299	0.0299
0.4000	0.567E-03	0.130E-02	0.948E-01	0.0	0.0	0.0005	0.0295	0.0295	0.0967	0.0300	0.0300	0.0299
0.5000	0.308E-03	0.835E-03	0.867E-01	0.0	0.0	0.0003	0.0297	0.0297	0.0878	0.0300	0.0300	0.0299
0.6000	0.193E-03	0.581E-03	0.803E-01	0.0	0.0	0.0002	0.0295	0.0295	0.0811	0.0297	0.0297	0.0296
0.8000	0.978E-04	0.328E-03	0.706E-01	0.0	0.0	0.0001	0.0288	0.0288	0.0710	0.0289	0.0289	0.0288
1.0000	0.608E-04	0.210E-03	0.635E-01	0.0	0.0	0.0001	0.0279	0.0279	0.0638	0.0280	0.0280	0.0278
1.2500	0.399E-04	0.134E-03	0.568E-01	0.0	0.0	0.0	0.0267	0.0267	0.0570	0.0267	0.0267	0.0265
1.5000	0.282E-04	0.933E-04	0.516E-01	0.221E-03	0.0	0.0	0.0254	0.0254	0.0519	0.0255	0.0255	0.0253
2.0000	0.175E-04	0.525E-04	0.440E-01	0.867E-03	0.0	0.0	0.0233	0.0233	0.0004	0.0237	0.0237	0.0234
3.0000	0.964E-05	0.233E-04	0.347E-01	0.246E-02	0.121E-04	0.0	0.0199	0.0199	0.0016	0.0216	0.0216	0.0211
4.0000	0.656E-05	0.131E-04	0.289E-01	0.396E-02	0.495E-04	0.0	0.0175	0.0175	0.0030	0.0205	0.0205	0.0199
5.0000	0.494E-05	0.841E-05	0.250E-01	0.530E-02	0.987E-04	0.0	0.0156	0.0156	0.0043	0.0199	0.0199	0.0192
6.0000	0.395E-05	0.584E-05	0.221E-01	0.649E-02	0.152E-03	0.0	0.0142	0.0142	0.0055	0.0197	0.0197	0.0188
8.0000	0.282E-05	0.328E-05	0.181E-01	0.851E-02	0.255E-03	0.0	0.0121	0.0121	0.0076	0.0197	0.0197	0.0185
10.0000	0.218E-05	0.210E-05	0.154E-01	0.102E-01	0.351E-03	0.0	0.0105	0.0105	0.0094	0.0200	0.0200	0.0187
15.0000	0.139E-05	0.934E-06	0.114E-01	0.132E-01	0.550E-03	0.0	0.0081	0.0081	0.0129	0.0210	0.0210	0.0187
20.0000	0.102E-05	0.525E-06	0.913E-02	0.155E-01	0.706E-03	0.0	0.0067	0.0067	0.0154	0.0220	0.0220	0.0190
30.0000	0.668E-06	0.233E-06	0.665E-02	0.185E-01	0.935E-03	0.0	0.0050	0.0050	0.0188	0.0238	0.0238	0.0193
40.0000	0.495E-06	0.131E-06	0.528E-02	0.207E-01	0.110E-02	0.0	0.0041	0.0041	0.0212	0.0253	0.0253	0.0194
50.0000	0.394E-06	0.841E-07	0.441E-02	0.223E-01	0.123E-02	0.0	0.0035	0.0035	0.0230	0.0265	0.0265	0.0192
60.0000	0.326E-06	0.584E-07	0.380E-02	0.236E-01	0.133E-02	0.0	0.0030	0.0030	0.0245	0.0275	0.0275	0.0192
80.0000	0.243E-06	0.328E-07	0.300E-02	0.254E-01	0.149E-02	0.0	0.0025	0.0025	0.0266	0.0290	0.0290	0.0187
100.0000	0.194E-06	0.210E-07	0.249E-02	0.267E-01	0.160E-02	0.0	0.0021	0.0021	0.0281	0.0308	0.0308	0.0181

E (MeV)	τ/ρ	σ_r/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.318E+04	0.304E+01	0.708E-02	0.0	0.0	3179.0	0.0	0.0	3183.0	3179.0	3179.0
0.0015	0.110E+04	0.282E+01	0.142E-01	0.0	0.0	1101.0	0.0	0.0	1102.8	1101.0	1101.0
0.0020	0.509E+03	0.257E+01	0.220E-01	0.0	0.0	509.3	0.0	0.0	511.6	509.3	509.3
0.0030	0.168E+03	0.208E+01	0.372E-01	0.0	0.0	168.2	0.0	0.0	170.1	168.2	168.2
0.003203	0.140E+03	0.199E+01	0.400E-01	0.0	0.0	140.4	0.0	0.0	142.0	140.4	140.4
0.003203	0.127E+04	0.199E+01	0.400E-01	0.0	0.0	1145.4	0.0	0.0	1272.0	1145.4	1145.4
0.0040	0.755E+03	0.169E+01	0.502E-01	0.0	0.0	755.3	0.0	0.0	756.7	755.3	755.3
0.0050	0.421E+03	0.141E+01	0.610E-01	0.0	0.0	421.0	0.0	0.0	422.5	421.0	421.0
0.0060	0.258E+03	0.120E+01	0.697E-01	0.0	0.0	258.1	0.0	0.0	259.3	258.1	258.1
0.0080	0.117E+03	0.925E+00	0.829E-01	0.0	0.0	117.0	0.0	0.0	118.0	117.0	117.0
0.0100	0.623E+02	0.741E+00	0.929E-01	0.0	0.0	60.32	0.0	0.0	63.13	60.32	60.32
0.0150	0.193E+02	0.456E+00	0.110E+00	0.0	0.0	18.86	0.0	0.0	19.87	18.86	18.86
0.0200	0.821E+01	0.302E+00	0.121E+00	0.0	0.0	8.075	0.005	0.0	8.633	8.080	8.080
0.0300	0.240E+01	0.162E+00	0.132E+00	0.0	0.0	2.378	0.007	0.0	2.694	2.385	2.385
0.0400	0.991E+00	0.102E+00	0.135E+00	0.0	0.0	0.9829	0.0097	0.0	1.2280	0.9926	0.9926
0.0500	0.495E+00	0.707E-01	0.136E+00	0.0	0.0	0.4915	0.0116	0.0	0.7017	0.5031	0.5031
0.0600	0.279E+00	0.518E-01	0.135E+00	0.0	0.0	0.2779	0.0133	0.0	0.4658	0.2912	0.2912
0.0800	0.113E+00	0.311E-01	0.132E+00	0.0	0.0	0.1123	0.0161	0.0	0.2761	0.1284	0.1284
0.1000	0.556E-01	0.206E-01	0.128E+00	0.0	0.0	0.0555	0.0182	0.0	0.2042	0.0737	0.0737
0.1500	0.154E-01	0.63E-02	0.118E+00	0.0	0.0	0.0154	0.0218	0.0	0.1430	0.0372	0.0372
0.2000	0.628E-02	0.555E-02	0.109E+00	0.0	0.0	0.0062	0.0239	0.0	0.1208	0.0301	0.0301
0.3000	0.183E-02	0.252E-02	0.952E-01	0.0	0.0	0.0018	0.0259	0.0	0.0996	0.0277	0.0276
0.4000	0.798E-03	0.143E-02	0.855E-01	0.0	0.0	0.0008	0.0266	0.0	0.0877	0.0274	0.0273
0.5000	0.434E-03	0.918E-03	0.782E-01	0.0	0.0	0.0004	0.0268	0.0	0.0796	0.0272	0.0272
0.6000	0.272E-03	0.639E-03	0.724E-01	0.0	0.0	0.0003	0.0266	0.0	0.0733	0.0269	0.0268
0.8000	0.138E-03	0.360E-03	0.637E-01	0.0	0.0	0.0001	0.0260	0.0	0.0642	0.0261	0.0260
1.0000	0.859E-04	0.231E-03	0.573E-01	0.0	0.0	0.0001	0.0252	0.0	0.0576	0.0253	0.0251
1.2500	0.550E-04	0.148E-03	0.513E-01	0.426E-04	0.0	0.0	0.0241	0.0	0.0515	0.0241	0.0239
1.5000	0.398E-04	0.103E-03	0.466E-01	0.227E-03	0.0	0.0	0.0230	0.0001	0.0470	0.0231	0.0228
2.0000	0.247E-04	0.578E-04	0.398E-01	0.866E-03	0.0	0.0	0.0210	0.0004	0.0408	0.0215	0.0212
3.0000	0.136E-04	0.257E-04	0.313E-01	0.250E-02	0.109E-04	0.0	0.0180	0.0017	0.0339	0.0196	0.0192
4.0000	0.920E-05	0.144E-04	0.261E-01	0.402E-02	0.447E-04	0.0	0.0157	0.0030	0.0302	0.0188	0.0182
5.0000	0.692E-05	0.925E-05	0.225E-01	0.538E-02	0.891E-04	0.0	0.0141	0.0044	0.0280	0.0184	0.0177
6.0000	0.553E-05	0.642E-05	0.199E-01	0.659E-02	0.137E-03	0.0	0.0127	0.0056	0.0266	0.0183	0.0175
8.0000	0.393E-05	0.361E-05	0.163E-01	0.864E-02	0.231E-03	0.0	0.0108	0.0077	0.0252	0.0186	0.0174
10.0000	0.305E-05	0.231E-05	0.139E-01	0.103E-01	0.317E-03	0.0	0.0095	0.0095	0.0245	0.0190	0.0175
15.0000	0.194E-05	0.103E-05	0.103E-01	0.134E-01	0.497E-03	0.0	0.0073	0.0130	0.0242	0.0202	0.0180
20.0000	0.143E-05	0.578E-06	0.825E-02	0.156E-01	0.636E-03	0.0	0.0060	0.0155	0.0245	0.0214	0.0184
30.0000	0.930E-06	0.257E-06	0.600E-02	0.188E-01	0.843E-03	0.0	0.0045	0.0189	0.0256	0.0234	0.0190
40.0000	0.689E-06	0.145E-06	0.477E-02	0.209E-01	0.991E-03	0.0	0.0036	0.0213	0.0267	0.0250	0.0192
50.0000	0.548E-06	0.925E-07	0.398E-02	0.225E-01	0.111E-02	0.0	0.0031	0.0231	0.0276	0.0262	0.0192
60.0000	0.454E-06	0.642E-07	0.343E-02	0.238E-01	0.120E-02	0.0	0.0027	0.0246	0.0284	0.0272	0.0191
80.0000	0.339E-06	0.361E-07	0.271E-02	0.257E-01	0.134E-02	0.0	0.0022	0.0267	0.0298	0.0288	0.0187
100.0000	0.270E-06	0.231E-07	0.225E-02	0.270E-01	0.144E-02	0.0	0.0018	0.0281	0.0307	0.0300	0.0182

Z = 20

CALCIUM

[All Units: cm²/g]

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.486E+04	0.358E+01	0.149E-01	0.0	0.0	4858.0	0.0	0.0	4863.6	4858.0	4858.0
0.0015	0.171E+04	0.326E+01	0.236E-01	0.0	0.0	1709.0	0.0	0.0	1713.3	1709.0	1709.0
0.0020	0.797E+03	0.296E+01	0.310E-01	0.0	0.0	796.4	0.0	0.0	800.0	796.4	796.4
0.0030	0.265E+03	0.246E+01	0.448E-01	0.0	0.0	265.0	0.0	0.0	267.5	265.0	265.0
0.0040	0.120E+03	0.205E+01	0.572E-01	0.0	0.0	119.7	0.0	0.0	122.1	119.7	119.7
0.004038	0.117E+03	0.204E+01	0.576E-01	0.0	0.0	116.6	0.0	0.0	119.1	116.6	116.6
0.004038	0.102E+04	0.204E+01	0.576E-01	0.0	0.0	880.0	0.0	0.0	1022.1	880.0	880.0
0.0050	0.601E+03	0.172E+01	0.679E-01	0.0	0.0	600.6	0.0	0.0	602.8	600.6	600.6
0.0060	0.372E+03	0.146E+01	0.772E-01	0.0	0.0	371.5	0.0	0.0	373.5	371.5	371.5
0.0080	0.171E+03	0.112E+01	0.917E-01	0.0	0.0	171.4	0.0	0.0	172.2	171.4	171.4
0.0100	0.924E+02	0.895E+00	0.102E+00	0.0	0.0	87.24	0.0	0.0	93.40	87.24	87.24
0.0150	0.291E+02	0.567E+00	0.121E+00	0.0	0.0	28.01	0.0	0.0	29.79	28.02	28.02
0.0200	0.125E+02	0.382E+00	0.132E+00	0.0	0.0	12.19	0.01	0.0	13.01	12.20	12.20
0.0300	0.373E+01	0.206E+00	0.148E+00	0.0	0.0	3.660	0.008	0.0	4.080	3.668	3.668
0.0400	0.155E+01	0.130E+00	0.148E+00	0.0	0.0	1.530	0.011	0.0	1.828	1.541	1.541
0.0500	0.780E+00	0.904E-01	0.149E+00	0.0	0.0	0.7712	0.0128	0.0	1.0194	0.7840	0.7840
0.0600	0.443E+00	0.665E-01	0.149E+00	0.0	0.0	0.4386	0.0147	0.0	0.6585	0.4533	0.4533
0.0800	0.180E+00	0.401E-01	0.145E+00	0.0	0.0	0.1788	0.0177	0.0	0.3651	0.1965	0.1965
0.1000	0.893E-01	0.267E-01	0.141E+00	0.0	0.0	0.0888	0.0201	0.0	0.2570	0.1089	0.1089
0.1500	0.250E-01	0.125E-01	0.130E+00	0.0	0.0	0.0249	0.0241	0.0	0.1675	0.0490	0.0490
0.2000	0.102E-01	0.723E-02	0.120E+00	0.0	0.0	0.0103	0.0263	0.0	0.1374	0.0366	0.0366
0.3000	0.300E-02	0.329E-02	0.105E+00	0.0	0.0	0.0031	0.0285	0.0	0.1113	0.0316	0.0315
0.4000	0.131E-02	0.187E-02	0.946E-01	0.0	0.0	0.0014	0.0294	0.0	0.0978	0.0308	0.0306
0.5000	0.716E-03	0.120E-02	0.866E-01	0.0	0.0	0.0007	0.0296	0.0	0.0885	0.0303	0.0302
0.6000	0.449E-03	0.836E-03	0.802E-01	0.0	0.0	0.0005	0.0295	0.0	0.0815	0.0300	0.0298
0.8000	0.228E-03	0.471E-03	0.705E-01	0.0	0.0	0.0002	0.0288	0.0	0.0712	0.0290	0.0289
1.0000	0.142E-03	0.302E-03	0.634E-01	0.0	0.0	0.0002	0.0278	0.0	0.0638	0.0280	0.0278
1.2500	0.909E-04	0.194E-03	0.567E-01	0.536E-04	0.0	0.0001	0.0266	0.0	0.0570	0.0267	0.0265
1.5000	0.656E-04	0.134E-03	0.516E-01	0.282E-03	0.0	0.0001	0.0254	0.0001	0.0521	0.0256	0.0253
2.0000	0.407E-04	0.757E-04	0.440E-01	0.110E-02	0.0	0.0	0.0232	0.0005	0.0452	0.0238	0.0235
3.0000	0.223E-04	0.336E-04	0.346E-01	0.308E-02	0.121E-04	0.0	0.0199	0.0020	0.0377	0.0219	0.0214
4.0000	0.151E-04	0.189E-04	0.289E-01	0.496E-02	0.495E-04	0.0	0.0174	0.0037	0.0339	0.0212	0.0205
5.0000	0.113E-04	0.121E-04	0.250E-01	0.662E-02	0.986E-04	0.0	0.0156	0.0053	0.0317	0.0209	0.0201
6.0000	0.905E-05	0.841E-05	0.221E-01	0.810E-02	0.151E-03	0.0	0.0142	0.0068	0.0304	0.0210	0.0199
8.0000	0.643E-05	0.473E-05	0.180E-01	0.106E-01	0.255E-03	0.0	0.0120	0.0095	0.0289	0.0215	0.0200
10.0000	0.497E-05	0.303E-05	0.154E-01	0.127E-01	0.351E-03	0.0	0.0105	0.0117	0.0285	0.0222	0.0203
15.0000	0.317E-05	0.135E-05	0.114E-01	0.165E-01	0.549E-03	0.0	0.0081	0.0158	0.0285	0.0240	0.0210
20.0000	0.232E-05	0.757E-06	0.913E-02	0.192E-01	0.704E-03	0.0	0.0067	0.0189	0.0290	0.0256	0.0215
30.0000	0.151E-05	0.337E-06	0.665E-02	0.230E-01	0.932E-03	0.0	0.0051	0.0231	0.0306	0.0282	0.0221
40.0000	0.112E-05	0.189E-06	0.528E-02	0.256E-01	0.110E-02	0.0	0.0041	0.0260	0.0320	0.0302	0.0223
50.0000	0.891E-06	0.121E-06	0.441E-02	0.276E-01	0.122E-02	0.0	0.0035	0.0282	0.0332	0.0318	0.0222
60.0000	0.739E-06	0.841E-07	0.380E-02	0.291E-01	0.132E-02	0.0	0.0031	0.0299	0.0342	0.0330	0.0220
80.0000	0.551E-06	0.473E-07	0.300E-02	0.314E-01	0.148E-02	0.0	0.0025	0.0325	0.0359	0.0350	0.0213
100.0000	0.439E-06	0.303E-07	0.249E-02	0.330E-01	0.159E-02	0.0	0.0021	0.0342	0.0371	0.0364	0.0206

[All Units: cm²/g]

TITANIUM

Z = 22

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_N/ρ	κ_θ/ρ	τ_{TX}/ρ	σ_{TX}/ρ	κ_{TX}/ρ	μ/ρ	μ_{TX}/ρ	μ_{en}/ρ
0.0010	0.586E+04	0.369E+01	0.118E-01	0.0	0.0	5855.0	0.0	0.0	5863.7	5855.0	5855.0
0.0015	0.209E+04	0.339E+01	0.195E-01	0.0	0.0	2091.0	0.0	0.0	2093.4	2091.0	2091.0
0.0020	0.983E+03	0.309E+01	0.262E-01	0.0	0.0	982.1	0.0	0.0	986.1	982.1	982.1
0.0030	0.330E+03	0.258E+01	0.384E-01	0.0	0.0	329.5	0.0	0.0	332.6	329.5	329.5
0.0040	0.150E+03	0.216E+01	0.494E-01	0.0	0.0	149.5	0.0	0.0	152.2	149.5	149.5
0.004966	0.819E+02	0.182E+01	0.588E-01	0.0	0.0	81.9	0.0	0.0	83.8	81.9	81.9
0.004966	0.686E+03	0.182E+01	0.588E-01	0.0	0.0	560.5	0.0	0.0	687.9	560.5	560.5
0.0050	0.682E+03	0.181E+01	0.591E-01	0.0	0.0	681.7	0.0	0.0	683.9	681.7	681.7
0.0060	0.431E+03	0.154E+01	0.677E-01	0.0	0.0	430.7	0.0	0.0	432.6	430.7	430.7
0.0080	0.201E+03	0.116E+01	0.816E-01	0.0	0.0	201.1	0.0	0.0	202.2	201.1	201.1
0.0100	0.110E+03	0.920E+00	0.919E-01	0.0	0.0	99.72	0.0	0.0	111.01	99.72	99.72
0.0150	0.352E+02	0.585E+00	0.109E+00	0.0	0.0	33.06	0.0	0.0	35.89	33.06	33.06
0.0200	0.153E+02	0.401E+00	0.120E+00	0.0	0.0	14.64	0.0	0.0	15.82	14.64	14.64
0.0300	0.462E+01	0.217E+00	0.131E+00	0.0	0.0	4.484	0.007	0.0	4.968	4.491	4.491
0.0400	0.194E+01	0.137E+00	0.135E+00	0.0	0.0	1.896	0.010	0.0	2.212	1.906	1.906
0.0500	0.982E+00	0.953E-01	0.136E+00	0.0	0.0	0.9642	0.0117	0.0	1.2133	0.9759	0.9759
0.0600	0.560E+00	0.702E-01	0.136E+00	0.0	0.0	0.5516	0.0134	0.0	0.7652	0.5650	0.5650
0.0800	0.230E+00	0.426E-01	0.133E+00	0.0	0.0	0.2269	0.0163	0.0	0.4056	0.2432	0.2432
0.1000	0.114E+00	0.285E-01	0.129E+00	0.0	0.0	0.1134	0.0184	0.0	0.2715	0.1318	0.1318
0.1500	0.323E-01	0.134E-01	0.119E+00	0.0	0.0	0.0321	0.0221	0.0	0.1647	0.0542	0.0542
0.2000	0.133E-01	0.775E-02	0.110E+00	0.0	0.0	0.0133	0.0242	0.0	0.1311	0.0374	0.0374
0.3000	0.392E-02	0.353E-02	0.968E-01	0.0	0.0	0.0039	0.0263	0.0	0.1042	0.0302	0.0302
0.4000	0.172E-02	0.201E-02	0.871E-01	0.0	0.0	0.0017	0.0271	0.0	0.0908	0.0288	0.0288
0.5000	0.940E-03	0.129E-02	0.797E-01	0.0	0.0	0.0009	0.0273	0.0	0.0819	0.0282	0.0281
0.6000	0.590E-03	0.901E-03	0.738E-01	0.0	0.0	0.0006	0.0272	0.0	0.0753	0.0276	0.0276
0.8000	0.300E-03	0.508E-03	0.649E-01	0.0	0.0	0.0003	0.0265	0.0	0.0657	0.0268	0.0266
1.0000	0.187E-03	0.326E-03	0.584E-01	0.0	0.0	0.0002	0.0256	0.0	0.0589	0.0258	0.0256
1.2500	0.120E-03	0.209E-03	0.522E-01	0.557E-04	0.0	0.0002	0.0245	0.0	0.0526	0.0247	0.0244
1.5000	0.864E-04	0.145E-03	0.475E-01	0.290E-03	0.0	0.0001	0.0234	0.0001	0.0480	0.0236	0.0233
2.0000	0.535E-04	0.816E-04	0.405E-01	0.112E-02	0.0	0.0001	0.0214	0.0005	0.0418	0.0220	0.0216
3.0000	0.292E-04	0.563E-04	0.319E-01	0.313E-02	0.112E-04	0.0	0.0183	0.0021	0.0351	0.0204	0.0198
4.0000	0.197E-04	0.204E-04	0.266E-01	0.503E-02	0.456E-04	0.0	0.0160	0.0038	0.0317	0.0198	0.0191
5.0000	0.148E-04	0.131E-04	0.230E-01	0.670E-02	0.908E-04	0.0	0.0144	0.0054	0.0298	0.0198	0.0188
6.0000	0.118E-04	0.907E-05	0.203E-01	0.820E-02	0.139E-03	0.0	0.0130	0.0069	0.0287	0.0200	0.0188
8.0000	0.838E-05	0.510E-05	0.166E-01	0.107E-01	0.235E-03	0.0	0.0110	0.0096	0.0275	0.0206	0.0190
10.0000	0.648E-05	0.327E-05	0.141E-01	0.128E-01	0.323E-03	0.0	0.0096	0.0118	0.0272	0.0214	0.0194
15.0000	0.412E-05	0.145E-05	0.105E-01	0.166E-01	0.506E-03	0.0	0.0075	0.0159	0.0276	0.0234	0.0203
20.0000	0.302E-05	0.817E-06	0.841E-02	0.194E-01	0.647E-03	0.0	0.0062	0.0285	0.0252	0.0209	0.0209
30.0000	0.197E-05	0.563E-06	0.612E-02	0.232E-01	0.857E-03	0.0	0.0047	0.0233	0.0302	0.0279	0.0214
40.0000	0.146E-05	0.204E-06	0.486E-02	0.259E-01	0.101E-02	0.0	0.0038	0.0262	0.0318	0.0300	0.0216
50.0000	0.116E-05	0.131E-06	0.406E-02	0.278E-01	0.112E-02	0.0	0.0033	0.0283	0.0330	0.0316	0.0214
60.0000	0.959E-06	0.907E-07	0.350E-02	0.294E-01	0.121E-02	0.0	0.0029	0.0301	0.0341	0.0329	0.0212
80.0000	0.715E-06	0.510E-07	0.276E-02	0.317E-01	0.136E-02	0.0	0.0023	0.0326	0.0358	0.0349	0.0205
100.0000	0.570E-06	0.327E-07	0.229E-02	0.333E-01	0.146E-02	0.0	0.0020	0.0344	0.0371	0.0364	0.0197

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_n/ρ	κ_α/ρ	τ_{TX}/ρ	[ALL Units: cm ² /g]					μ_{an}/ρ
							κ_n/ρ	σ_{TX}/ρ	κ_{TX}/ρ	μ/ρ	μ_{TX}/ρ	
0.0010	0.908E+04	0.454E+01	0.878E-02	0.0	0.0	9039.0	0.0	0.0	9084.5	9039.0	9039.0	9039.0
0.0015	0.340E+04	0.424E+01	0.153E-01	0.0	0.0	3385.0	0.0	0.0	3404.3	3385.0	3385.0	3385.0
0.0020	0.162E+04	0.393E+01	0.212E-01	0.0	0.0	1619.0	0.0	0.0	1624.0	1619.0	1619.0	1619.0
0.0030	0.554E+03	0.335E+01	0.321E-01	0.0	0.0	553.4	0.0	0.0	557.4	553.4	553.4	553.4
0.0040	0.254E+03	0.285E+01	0.421E-01	0.0	0.0	253.5	0.0	0.0	256.9	253.5	253.5	253.5
0.0050	0.137E+03	0.242E+01	0.513E-01	0.0	0.0	137.3	0.0	0.0	139.5	137.3	137.3	137.3
0.0060	0.827E+02	0.206E+01	0.597E-01	0.0	0.0	82.66	0.0	0.0	84.82	82.66	82.66	82.66
0.007112	0.514E+02	0.174E+01	0.680E-01	0.0	0.0	51.35	0.0	0.0	53.21	51.35	51.35	51.35
0.007112	0.406E+03	0.174E+01	0.680E-01	0.0	0.0	290.8	0.0	0.0	407.8	290.8	290.8	290.8
0.0080	0.304E+03	0.154E+01	0.740E-01	0.0	0.0	303.8	0.0	0.0	305.6	303.8	303.8	303.8
0.0100	0.169E+03	0.120E+01	0.854E-01	0.0	0.0	135.3	0.0	0.0	170.3	135.3	135.3	135.3
0.0150	0.562E+02	0.746E+00	0.105E+00	0.0	0.0	48.68	0.0	0.0	57.05	48.68	48.68	48.68
0.0200	0.250E+02	0.517E+00	0.116E+00	0.0	0.0	22.53	0.0	0.0	25.63	22.53	22.53	22.53
0.0300	0.776E+01	0.285E+00	0.129E+00	0.0	0.0	7.242	0.0	0.0	8.174	7.242	7.242	7.242
0.0400	0.332E+01	0.180E+00	0.134E+00	0.0	0.0	3.148	0.0	0.0	3.634	3.158	3.158	3.158
0.0500	0.170E+01	0.124E+00	0.136E+00	0.0	0.0	1.629	0.0	0.0	1.960	1.641	1.641	1.641
0.0600	0.978E+00	0.918E-01	0.136E+00	0.0	0.0	0.9447	0.0	0.0	1.2058	0.9582	0.9582	0.9582
0.0800	0.406E+00	0.560E-01	0.133E+00	0.0	0.0	0.3958	0.0	0.0	0.5950	0.4121	0.4121	0.4121
0.1000	0.204E+00	0.377E-01	0.130E+00	0.0	0.0	0.2002	0.0	0.0	0.3717	0.2189	0.2189	0.2189
0.1500	0.586E-01	0.178E-01	0.120E+00	0.0	0.0	0.0579	0.0	0.0	0.1964	0.0802	0.0802	0.0801
0.2000	0.243E-01	0.103E-01	0.111E+00	0.0	0.0	0.0241	0.0	0.0	0.1456	0.0486	0.0486	0.0486
0.3000	0.727E-02	0.473E-02	0.979E-01	0.0	0.0	0.0072	0.0	0.0	0.1099	0.0339	0.0339	0.0338
0.4000	0.321E-02	0.269E-02	0.881E-01	0.0	0.0	0.0031	0.0	0.0	0.0940	0.0306	0.0306	0.0305
0.5000	0.176E-02	0.174E-02	0.806E-01	0.0	0.0	0.0018	0.0	0.0	0.0841	0.0294	0.0294	0.0292
0.6000	0.111E-02	0.121E-02	0.747E-01	0.0	0.0	0.0011	0.0	0.0	0.0770	0.0286	0.0286	0.0284
0.8000	0.565E-03	0.683E-03	0.657E-01	0.0	0.0	0.0006	0.0	0.0	0.0669	0.0274	0.0274	0.0272
1.0000	0.351E-03	0.438E-03	0.592E-01	0.0	0.0	0.0003	0.0	0.0	0.0600	0.0263	0.0263	0.0260
1.2500	0.226E-03	0.281E-03	0.529E-01	0.703E-04	0.0	0.0003	0.0	0.0	0.0535	0.0251	0.0251	0.0247
1.5000	0.163E-03	0.195E-03	0.481E-01	0.358E-03	0.0	0.0002	0.0	0.0001	0.0488	0.0240	0.0240	0.0236
2.0000	0.100E-03	0.110E-03	0.411E-01	0.136E-02	0.0	0.0001	0.0	0.0007	0.0427	0.0224	0.0224	0.0220
3.0000	0.545E-04	0.488E-04	0.323E-01	0.378E-02	0.113E-04	0.0001	0.0	0.0185	0.0362	0.0211	0.0211	0.0204
4.0000	0.367E-04	0.275E-04	0.270E-01	0.604E-02	0.462E-04	0.0	0.0	0.0162	0.0332	0.0208	0.0208	0.0199
5.0000	0.219E-04	0.176E-04	0.233E-01	0.803E-02	0.920E-04	0.0	0.0	0.0145	0.0065	0.0210	0.0210	0.0198
6.0000	0.275E-04	0.122E-04	0.206E-01	0.981E-02	0.141E-03	0.0	0.0	0.0132	0.0306	0.0214	0.0214	0.0200
8.0000	0.155E-04	0.687E-05	0.168E-01	0.128E-01	0.238E-03	0.0	0.0	0.0111	0.0299	0.0226	0.0226	0.0205
10.0000	0.120E-04	0.440E-05	0.143E-01	0.153E-01	0.327E-03	0.0	0.0	0.0097	0.0299	0.0238	0.0238	0.0212
15.0000	0.759E-05	0.195E-05	0.106E-01	0.198E-01	0.511E-03	0.0	0.0	0.0075	0.0309	0.0264	0.0264	0.0224
20.0000	0.555E-05	0.110E-05	0.852E-02	0.231E-01	0.655E-03	0.0	0.0	0.0062	0.0323	0.0287	0.0287	0.0232
30.0000	0.361E-05	0.489E-06	0.620E-02	0.276E-01	0.865E-03	0.0	0.0	0.0047	0.0347	0.0322	0.0322	0.0239
40.0000	0.267E-05	0.275E-06	0.493E-02	0.307E-01	0.102E-02	0.0	0.0	0.0038	0.0367	0.0347	0.0347	0.0240
50.0000	0.212E-05	0.176E-06	0.411E-02	0.330E-01	0.113E-02	0.0	0.0	0.0032	0.0382	0.0367	0.0367	0.0238
60.0000	0.176E-05	0.122E-06	0.354E-02	0.348E-01	0.122E-02	0.0	0.0	0.0028	0.0396	0.0383	0.0383	0.0234
80.0000	0.131E-05	0.687E-07	0.280E-02	0.376E-01	0.137E-02	0.0	0.0	0.0023	0.0418	0.0407	0.0407	0.0226
100.0000	0.104E-05	0.440E-07	0.232E-02	0.395E-01	0.147E-02	0.0	0.0	0.0019	0.0433	0.0424	0.0424	0.0217

[All Units: cm²/g]

COPPER

Z = 29

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_{tr}/ρ	κ_{e}/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.106E+05	0.505E+01	0.591E-02	0.0	0.0	10570.0	0.0	0.0	10605.1	10570.0	10570.0
0.00196	0.824E+04	0.501E+01	0.684E-02	0.0	0.0	8240.0	0.0	0.0	8245.0	8240.0	8240.0
0.0030	0.934E+04	0.501E+01	0.684E-02	0.0	0.0	9271.0	0.0	0.0	9345.0	9271.0	9271.0
0.0045	0.441E+04	0.481E+01	0.109E-01	0.0	0.0	4413.0	0.0	0.0	4414.8	4413.0	4413.0
0.0070	0.215E+04	0.453E+01	0.159E-01	0.0	0.0	2149.0	0.0	0.0	2154.5	2149.0	2149.0
0.0100	0.745E+03	0.395E+01	0.259E-01	0.0	0.0	744.9	0.0	0.0	749.0	744.9	744.9
0.0150	0.344E+03	0.340E+01	0.353E-01	0.0	0.0	343.9	0.0	0.0	347.4	343.9	343.9
0.0200	0.187E+03	0.291E+01	0.439E-01	0.0	0.0	187.0	0.0	0.0	190.0	187.0	187.0
0.0300	0.113E+03	0.250E+01	0.518E-01	0.0	0.0	113.1	0.0	0.0	115.6	113.1	113.1
0.0400	0.506E+02	0.187E+01	0.657E-01	0.0	0.0	50.6	0.0	0.0	52.5	50.6	50.6
0.08979	0.366E+02	0.165E+01	0.716E-01	0.0	0.0	36.5	0.0	0.0	38.3	36.5	36.5
K 0.008979	0.277E+03	0.165E+01	0.716E-01	0.0	0.0	177.2	0.0	0.0	278.4	177.2	177.2
0.0100	0.214E+03	0.145E+01	0.773E-01	0.0	0.0	145.2	0.0	0.0	215.5	145.2	145.2
0.0150	0.731E+02	0.880E+00	0.976E-01	0.0	0.0	57.35	0.0	0.0	74.08	57.35	57.35
0.0200	0.331E+02	0.606E+00	0.110E+00	0.0	0.0	27.75	0.0	0.0	33.82	27.75	27.75
0.0300	0.105E+02	0.337E+00	0.123E+00	0.0	0.0	9.328	0.007	0.0	10.960	9.335	9.335
0.0400	0.452E+01	0.212E+00	0.129E+00	0.0	0.0	4.157	0.009	0.0	4.861	4.165	4.165
0.0500	0.234E+01	0.147E+00	0.131E+00	0.0	0.0	2.185	0.011	0.0	2.618	2.196	2.196
0.0600	0.135E+01	0.108E+00	0.131E+00	0.0	0.0	1.281	0.013	0.0	1.589	1.294	1.294
0.0800	0.568E+00	0.659E-01	0.129E+00	0.0	0.0	0.5447	0.0159	0.0	0.7629	0.5606	0.5606
0.1000	0.288E+00	0.445E-01	0.126E+00	0.0	0.0	0.2786	0.0181	0.0	0.4585	0.2967	0.2967
0.1500	0.835E-01	0.211E-01	0.117E+00	0.0	0.0	0.0817	0.0218	0.0	0.2216	0.1035	0.1035
0.2000	0.349E-01	0.123E-01	0.109E+00	0.0	0.0	0.0342	0.0241	0.0	0.1562	0.0583	0.0583
0.3000	0.105E-01	0.562E-02	0.958E-01	0.0	0.0	0.0104	0.0261	0.0	0.0665	0.0364	0.0364
0.4000	0.466E-02	0.321E-02	0.863E-01	0.0	0.0	0.0046	0.0269	0.0	0.0942	0.0315	0.0314
0.5000	0.257E-02	0.207E-02	0.790E-01	0.0	0.0	0.0025	0.0271	0.0	0.0836	0.0295	0.0295
0.6000	0.162E-02	0.144E-02	0.732E-01	0.0	0.0	0.0016	0.0270	0.0	0.0763	0.0286	0.0284
0.8000	0.826E-03	0.815E-03	0.644E-01	0.0	0.0	0.0008	0.0263	0.0	0.0660	0.0271	0.0269
1.0000	0.514E-03	0.523E-03	0.580E-01	0.0	0.0	0.0005	0.0255	0.0	0.0590	0.0260	0.0256
1.2500	0.330E-03	0.335E-03	0.518E-01	0.802E-04	0.0	0.0004	0.0243	0.0	0.0526	0.0247	0.0243
1.5000	0.238E-03	0.233E-03	0.472E-01	0.402E-03	0.0	0.0003	0.0232	0.0	0.0481	0.0236	0.0231
2.0000	0.146E-03	0.131E-03	0.403E-01	0.151E-02	0.0	0.0002	0.0212	0.0007	0.0421	0.0216	0.0216
3.0000	0.792E-04	0.583E-04	0.317E-01	0.416E-02	0.111E-04	0.0002	0.0181	0.0027	0.0360	0.0210	0.0202
4.0000	0.532E-04	0.328E-04	0.268E-01	0.662E-02	0.453E-04	0.0	0.0159	0.0050	0.0332	0.0209	0.0199
5.0000	0.398E-04	0.210E-04	0.228E-01	0.879E-02	0.901E-04	0.0	0.0142	0.0071	0.0317	0.0213	0.0200
6.0000	0.317E-04	0.146E-04	0.202E-01	0.107E-01	0.138E-03	0.0	0.0129	0.0090	0.0311	0.0219	0.0203
8.0000	0.224E-04	0.820E-05	0.165E-01	0.140E-01	0.233E-03	0.0	0.0109	0.0124	0.0308	0.0233	0.0211
10.0000	0.172E-04	0.525E-05	0.141E-01	0.166E-01	0.320E-03	0.0	0.0096	0.0153	0.0310	0.0248	0.0218
15.0000	0.109E-04	0.233E-05	0.104E-01	0.215E-01	0.501E-03	0.0	0.0074	0.0206	0.0324	0.0279	0.0233
20.0000	0.799E-05	0.131E-05	0.835E-02	0.251E-01	0.641E-03	0.0	0.0061	0.0244	0.0341	0.0305	0.0242
30.0000	0.519E-05	0.583E-06	0.608E-02	0.300E-01	0.846E-03	0.0	0.0046	0.0297	0.0369	0.0344	0.0250
40.0000	0.384E-05	0.328E-06	0.483E-02	0.348E-01	0.993E-03	0.0	0.0037	0.0335	0.0392	0.0372	0.0250
50.0000	0.305E-05	0.210E-06	0.403E-02	0.359E-01	0.111E-02	0.0	0.0032	0.0362	0.0410	0.0394	0.0248
60.0000	0.253E-05	0.146E-06	0.348E-02	0.379E-01	0.120E-02	0.0	0.0028	0.0384	0.0426	0.0411	0.0244
80.0000	0.188E-05	0.820E-07	0.274E-02	0.408E-01	0.133E-02	0.0	0.0022	0.0416	0.0449	0.0438	0.0235
100.0000	0.150E-05	0.525E-07	0.227E-02	0.429E-01	0.143E-02	0.0	0.0019	0.0438	0.0466	0.0457	0.0225

[All Units: cm²/g]

GERMANIUM

Z = 32

E (MeV)	τ/p	σ_{τ}/p	σ/p	κ_{α}/p	κ_{β}/p	κ_{γ}/p	$\sigma_{\tau r}/p$	$\kappa_{\tau r}/p$	μ/p	$\mu_{\tau r}/p$	μ_{en}/p
0.0010	0.189E+04	0.534E+01	0.619E-02	0.0	0.0	1887.0	0.0	0.0	1895.3	1887.0	1887.0
0.0012	0.119E+04	0.521E+01	0.843E-02	0.0	0.0	1185.0	0.0	0.0	1195.2	1185.0	1185.0
0.0012	0.436E+04	0.521E+01	0.843E-02	0.0	0.0	4303.0	0.0	0.0	4365.2	4303.0	4303.0
0.0012	0.497E+04	0.519E+01	0.876E-02	0.0	0.0	4908.0	0.0	0.0	4975.2	4908.0	4908.0
0.0012	0.665E+04	0.519E+01	0.876E-02	0.0	0.0	6572.0	0.0	0.0	6655.2	6572.0	6572.0
0.0014	0.555E+04	0.509E+01	0.105E-01	0.0	0.0	5491.2	0.0	0.0	5555.1	5491.0	5491.0
0.0014	0.628E+04	0.509E+01	0.105E-01	0.0	0.0	6217.0	0.0	0.0	6285.1	6217.0	6217.0
0.0015	0.547E+04	0.504E+01	0.115E-01	0.0	0.0	5471.0	0.0	0.0	5475.1	5471.0	5471.0
0.0020	0.271E+04	0.471E+01	0.167E-01	0.0	0.0	2707.0	0.0	0.0	2714.7	2707.0	2707.0
0.0030	0.957E+03	0.410E+01	0.260E-01	0.0	0.0	957.4	0.0	0.0	961.1	957.4	957.4
0.0040	0.446E+03	0.358E+01	0.342E-01	0.0	0.0	446.2	0.0	0.0	449.6	446.2	446.2
0.0050	0.244E+03	0.312E+01	0.417E-01	0.0	0.0	244.2	0.0	0.0	247.2	244.2	244.2
0.0060	0.148E+03	0.273E+01	0.486E-01	0.0	0.0	148.2	0.0	0.0	150.8	148.2	148.2
0.0080	0.668E+02	0.209E+01	0.608E-01	0.0	0.0	66.77	0.0	0.0	68.95	66.77	66.77
0.0100	0.357E+02	0.164E+01	0.712E-01	0.0	0.0	35.57	0.0	0.0	37.41	35.57	35.57
0.0110	0.266E+02	0.145E+01	0.762E-01	0.0	0.0	26.56	0.0	0.0	28.13	26.56	26.56
0.0110	0.197E+03	0.145E+01	0.762E-01	0.0	0.0	113.2	0.0	0.0	198.5	113.2	113.2
0.0150	0.904E+02	0.988E+00	0.905E-01	0.0	0.0	62.02	0.0	0.0	91.48	62.02	62.02
0.0200	0.414E+02	0.677E+00	0.103E+00	0.0	0.0	31.69	0.0	0.0	42.18	31.69	31.69
0.0300	0.134E+02	0.380E+00	0.116E+00	0.0	0.0	11.26	0.01	0.0	13.90	11.27	11.27
0.0400	0.584E+01	0.241E+00	0.122E+00	0.0	0.0	5.156	0.009	0.0	6.203	5.165	5.165
0.0500	0.304E+01	0.166E+00	0.125E+00	0.0	0.0	2.758	0.011	0.0	3.331	2.769	2.769
0.0600	0.178E+01	0.122E+00	0.125E+00	0.0	0.0	1.635	0.013	0.0	2.027	1.648	1.648
0.0800	0.752E+00	0.747E-01	0.124E+00	0.0	0.0	0.7074	0.0153	0.0	0.9507	0.7227	0.7227
0.1000	0.384E+00	0.505E-01	0.121E+00	0.0	0.0	0.3656	0.0174	0.0	0.5555	0.3830	0.3830
0.1500	0.112E+00	0.241E-01	0.113E+00	0.0	0.0	0.1089	0.0211	0.0	0.2491	0.1300	0.1300
0.2000	0.473E-01	0.140E-01	0.105E+00	0.0	0.0	0.0462	0.0232	0.0	0.1663	0.0694	0.0693
0.3000	0.144E-01	0.643E-02	0.923E-01	0.0	0.0	0.0142	0.0252	0.0	0.1131	0.0394	0.0393
0.4000	0.641E-02	0.368E-02	0.832E-01	0.0	0.0	0.0063	0.0260	0.0	0.0933	0.0323	0.0322
0.5000	0.354E-02	0.237E-02	0.762E-01	0.0	0.0	0.0036	0.0261	0.0	0.0821	0.0297	0.0295
0.6000	0.224E-02	0.166E-02	0.706E-01	0.0	0.0	0.0023	0.0260	0.0	0.0745	0.0283	0.0280
0.8000	0.114E-02	0.937E-03	0.622E-01	0.0	0.0	0.0011	0.0254	0.0	0.0643	0.0265	0.0262
1.0000	0.712E-03	0.601E-03	0.560E-01	0.0	0.0	0.0007	0.0246	0.0	0.0573	0.0253	0.0249
1.2500	0.457E-03	0.385E-03	0.501E-01	0.890E-04	0.0	0.0004	0.0235	0.0	0.0510	0.0239	0.0235
1.5000	0.329E-03	0.268E-03	0.455E-01	0.441E-03	0.0	0.0003	0.0224	0.0002	0.0465	0.0229	0.0224
2.0000	0.202E-03	0.151E-03	0.389E-01	0.164E-02	0.0	0.0002	0.0205	0.0008	0.0409	0.0215	0.0209
3.0000	0.109E-03	0.670E-04	0.306E-01	0.446E-02	0.107E-04	0.0001	0.0175	0.0029	0.0352	0.0205	0.0197
4.0000	0.731E-04	0.377E-04	0.255E-01	0.707E-02	0.437E-04	0.0001	0.0153	0.0053	0.0327	0.0207	0.0196
5.0000	0.546E-04	0.241E-04	0.221E-01	0.937E-02	0.870E-04	0.0001	0.0137	0.0075	0.0316	0.0213	0.0199
6.0000	0.433E-04	0.168E-04	0.195E-01	0.114E-01	0.134E-03	0.0	0.0124	0.0095	0.0311	0.0220	0.0203
8.0000	0.306E-04	0.943E-05	0.159E-01	0.148E-01	0.225E-03	0.0	0.0105	0.0132	0.0310	0.0237	0.0213
10.0000	0.236E-04	0.604E-05	0.136E-01	0.176E-01	0.309E-03	0.0	0.0092	0.0162	0.0315	0.0254	0.0222
15.0000	0.149E-04	0.268E-05	0.101E-01	0.229E-01	0.483E-03	0.0	0.0071	0.0217	0.0335	0.0289	0.0239
20.0000	0.109E-04	0.151E-05	0.807E-02	0.266E-01	0.618E-03	0.0	0.0059	0.0258	0.0353	0.0317	0.0249
30.0000	0.706E-05	0.671E-06	0.587E-02	0.318E-01	0.816E-03	0.0	0.0044	0.0315	0.0385	0.0359	0.0258
40.0000	0.523E-05	0.377E-06	0.467E-02	0.354E-01	0.957E-03	0.0	0.0036	0.0354	0.0410	0.0390	0.0258
50.0000	0.415E-05	0.241E-06	0.390E-02	0.380E-01	0.106E-02	0.0	0.0030	0.0383	0.0430	0.0413	0.0256
60.0000	0.344E-05	0.168E-06	0.336E-02	0.401E-01	0.115E-02	0.0	0.0027	0.0405	0.0446	0.0432	0.0252
80.0000	0.256E-05	0.943E-07	0.265E-02	0.431E-01	0.128E-02	0.0	0.0021	0.0438	0.0470	0.0460	0.0242
100.0000	0.204E-05	0.604E-07	0.220E-02	0.453E-01	0.137E-02	0.0	0.0018	0.0462	0.0489	0.0480	0.0231

[All Units: cm²/g]

KRYPTON

Z = 36

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_N/ρ	κ_B/ρ	τ_{TX}/ρ	σ_{TX}/ρ	κ_{TX}/ρ	μ/ρ	μ_{TX}/ρ	μ_{en}/ρ
0.0010	0.285E+04	0.590E+01	0.476E-02	0.0	0.0	2848.0	0.0	0.0	2855.9	2848.0	2848.0
0.0015	0.109E+04	0.558E+01	0.937E-02	0.0	0.0	1087.0	0.0	0.0	1095.6	1087.0	1087.0
0.001675	0.831E+03	0.545E+01	0.111E-01	0.0	0.0	830.7	0.0	0.0	836.5	830.7	830.7
0.001675	0.391E+04	0.545E+01	0.111E-01	0.0	0.0	3840.0	0.0	0.0	3915.5	3840.0	3840.0
0.001727	0.316E+04	0.541E+01	0.116E-01	0.0	0.0	3104.0	0.0	0.0	3165.4	3104.0	3104.0
0.001727	0.456E+04	0.541E+01	0.116E-01	0.0	0.0	4479.0	0.0	0.0	4565.4	4479.0	4479.0
0.001921	0.348E+04	0.528E+01	0.135E-01	0.0	0.0	3423.0	0.0	0.0	3485.3	3423.0	3423.0
0.001921	0.394E+04	0.528E+01	0.135E-01	0.0	0.0	3880.0	0.0	0.0	3945.3	3880.0	3880.0
0.0020	0.359E+04	0.522E+01	0.143E-01	0.0	0.0	3595.0	0.0	0.0	3595.2	3595.0	3595.0
0.0030	0.130E+04	0.449E+01	0.240E-01	0.0	0.0	1301.0	0.0	0.0	1304.5	1301.0	1301.0
0.0040	0.615E+03	0.368E+01	0.327E-01	0.0	0.0	614.8	0.0	0.0	614.8	614.8	614.8
0.0050	0.339E+03	0.339E+01	0.403E-01	0.0	0.0	339.1	0.0	0.0	339.1	339.1	339.1
0.0060	0.207E+03	0.298E+01	0.469E-01	0.0	0.0	207.1	0.0	0.0	210.0	207.1	207.1
0.0080	0.941E+02	0.235E+01	0.581E-01	0.0	0.0	94.07	0.0	0.0	96.51	94.07	94.07
0.0100	0.506E+02	0.188E+01	0.673E-01	0.0	0.0	50.47	0.0	0.0	52.55	50.47	50.47
0.01433	0.184E+02	0.122E+01	0.829E-01	0.0	0.0	18.37	0.0	0.0	19.70	18.37	18.37
0.01433	0.130E+03	0.122E+01	0.829E-01	0.0	0.0	64.86	0.0	0.0	131.30	64.86	64.86
0.0150	0.116E+03	0.115E+01	0.849E-01	0.0	0.0	60.26	0.0	0.0	117.23	60.26	60.26
0.0200	0.546E+02	0.781E+00	0.967E-01	0.0	0.0	35.01	0.0	0.0	55.48	35.01	35.01
0.0300	0.180E+02	0.442E+00	0.110E+00	0.0	0.0	13.67	0.0	0.0	18.55	13.68	13.68
0.0400	0.799E+01	0.284E+00	0.117E+00	0.0	0.0	6.557	0.009	0.0	8.391	6.566	6.566
0.0500	0.421E+01	0.196E+00	0.120E+00	0.0	0.0	3.602	0.011	0.0	4.526	3.613	3.613
0.0600	0.247E+01	0.144E+00	0.121E+00	0.0	0.0	2.178	0.012	0.0	2.735	2.190	2.190
0.0800	0.106E+01	0.880E-01	0.120E+00	0.0	0.0	0.9648	0.0149	0.0	1.2680	0.9797	0.9797
0.1000	0.546E+00	0.595E-01	0.117E+00	0.0	0.0	0.5065	0.0169	0.0	0.7225	0.5234	0.5234
0.1500	0.162E+00	0.286E-01	0.109E+00	0.0	0.0	0.1545	0.0204	0.0	0.2996	0.1749	0.1749
0.2000	0.689E-01	0.167E-01	0.102E+00	0.0	0.0	0.0663	0.0226	0.0	0.1876	0.0889	0.0889
0.3000	0.212E-01	0.767E-02	0.898E-01	0.0	0.0	0.0206	0.0246	0.0	0.1187	0.0452	0.0451
0.4000	0.949E-02	0.439E-02	0.809E-01	0.0	0.0	0.0093	0.0253	0.0	0.0948	0.0346	0.0344
0.5000	0.527E-02	0.284E-02	0.742E-01	0.0	0.0	0.0051	0.0255	0.0	0.0823	0.0306	0.0304
0.6000	0.334E-02	0.198E-02	0.688E-01	0.0	0.0	0.0032	0.0254	0.0	0.0741	0.0286	0.0284
0.8000	0.171E-02	0.112E-02	0.606E-01	0.0	0.0	0.0017	0.0247	0.0	0.0634	0.0264	0.0261
1.0000	0.106E-02	0.720E-03	0.545E-01	0.0	0.0	0.0011	0.0239	0.0	0.0563	0.0250	0.0246
1.2500	0.683E-03	0.462E-03	0.488E-01	0.103E-03	0.0	0.0007	0.0228	0.0	0.0500	0.0235	0.0231
1.5000	0.491E-03	0.321E-03	0.444E-01	0.504E-03	0.0	0.0004	0.0218	0.0002	0.0457	0.0224	0.0219
2.0000	0.301E-03	0.181E-03	0.379E-01	0.183E-02	0.0	0.0003	0.0199	0.0009	0.0402	0.0211	0.0205
3.0000	0.162E-03	0.804E-04	0.298E-01	0.494E-02	0.104E-04	0.0001	0.0170	0.0033	0.0350	0.0204	0.0195
4.0000	0.108E-03	0.452E-04	0.249E-01	0.778E-02	0.426E-04	0.0001	0.0149	0.0058	0.0329	0.0208	0.0196
5.0000	0.806E-04	0.290E-04	0.215E-01	0.103E-01	0.848E-04	0.0	0.0133	0.0083	0.0320	0.0216	0.0201
6.0000	0.639E-04	0.201E-04	0.190E-01	0.125E-01	0.130E-03	0.0	0.0121	0.0105	0.0317	0.0226	0.0217
8.0000	0.450E-04	0.113E-04	0.155E-01	0.162E-01	0.219E-03	0.0	0.0102	0.0143	0.0320	0.0246	0.0219
10.0000	0.346E-04	0.724E-05	0.132E-01	0.192E-01	0.301E-03	0.0	0.0089	0.0175	0.0327	0.0265	0.0231
15.0000	0.219E-04	0.322E-05	0.979E-02	0.249E-01	0.470E-03	0.0	0.0069	0.0237	0.0352	0.0305	0.0251
20.0000	0.159E-04	0.181E-05	0.786E-02	0.289E-01	0.601E-03	0.0	0.0057	0.0280	0.0374	0.0337	0.0264
30.0000	0.103E-04	0.805E-06	0.572E-02	0.346E-01	0.793E-03	0.0	0.0043	0.0342	0.0411	0.0384	0.0276
40.0000	0.764E-05	0.453E-06	0.455E-02	0.384E-01	0.928E-03	0.0	0.0035	0.0384	0.0439	0.0418	0.0278
50.0000	0.606E-05	0.290E-06	0.380E-02	0.413E-01	0.103E-02	0.0	0.0029	0.0414	0.0461	0.0444	0.0277
60.0000	0.502E-05	0.201E-06	0.327E-02	0.435E-01	0.111E-02	0.0	0.0026	0.0438	0.0479	0.0464	0.0273
80.0000	0.374E-05	0.113E-06	0.258E-02	0.468E-01	0.124E-02	0.0	0.0021	0.0474	0.0506	0.0495	0.0263
100.0000	0.298E-05	0.724E-07	0.214E-02	0.491E-01	0.133E-02	0.0	0.0017	0.0500	0.0526	0.0517	0.0253

[All Units: cm²/g]

MOLYBDENUM

Z = 42

E (MeV)	τ/p	σ_T/p	σ/p	κ_{α}/p	κ_{α^0}/p	τ_{TX}/p	σ_{TX}/p	κ_{TX}/p	μ/p	μ_{TX}/p	μ_{en}/p
0.0010	0.494E+04	0.694E+01	0.643E-02	0.0	0.0	4936.0	0.0	0.0	4946.9	4936.0	4936.0
0.0015	0.192E+04	0.654E+01	0.112E-01	0.0	0.0	1918.0	0.0	0.0	1926.6	1918.0	1918.0
0.0020	0.953E+03	0.611E+01	0.158E-01	0.0	0.0	953.5	0.0	0.0	959.1	953.5	953.5
0.00250	0.536E+03	0.567E+01	0.205E-01	0.0	0.0	535.9	0.0	0.0	541.7	535.9	535.9
0.002865	0.197E+04	0.567E+01	0.205E-01	0.0	0.0	1917.0	0.0	0.0	1975.7	1917.0	1917.0
0.002865	0.174E+04	0.558E+01	0.214E-01	0.0	0.0	1697.0	0.0	0.0	1745.6	1697.0	1697.0
0.002865	0.243E+04	0.558E+01	0.214E-01	0.0	0.0	2361.0	0.0	0.0	2435.6	2361.0	2361.0
0.002865	0.196E+04	0.538E+01	0.234E-01	0.0	0.0	1907.0	0.0	0.0	1965.4	1907.0	1907.0
0.002865	0.224E+04	0.538E+01	0.234E-01	0.0	0.0	2181.0	0.0	0.0	2245.4	2181.0	2181.0
0.0030	0.201E+04	0.527E+01	0.245E-01	0.0	0.0	2006.0	0.0	0.0	2015.3	2006.0	2006.0
0.0040	0.966E+03	0.456E+01	0.325E-01	0.0	0.0	966.0	0.0	0.0	970.6	966.0	966.0
0.0050	0.541E+03	0.397E+01	0.398E-01	0.0	0.0	541.0	0.0	0.0	545.0	541.0	541.0
0.0060	0.334E+03	0.349E+01	0.465E-01	0.0	0.0	333.6	0.0	0.0	337.5	333.6	333.6
0.0080	0.154E+03	0.277E+01	0.580E-01	0.0	0.0	153.7	0.0	0.0	156.8	153.7	153.7
0.0100	0.834E+02	0.227E+01	0.672E-01	0.0	0.0	82.82	0.0	0.0	85.74	82.82	82.82
0.0150	0.270E+02	0.145E+01	0.837E-01	0.0	0.0	26.88	0.0	0.0	28.53	26.88	26.88
0.0200	0.120E+02	0.989E+00	0.951E-01	0.0	0.0	11.96	0.0	0.0	13.08	11.96	11.96
0.0300	0.785E+02	0.989E+00	0.951E-01	0.0	0.0	32.59	0.0	0.0	79.58	32.59	32.59
0.0400	0.274E+02	0.558E+00	0.109E+00	0.0	0.0	16.73	0.01	0.0	28.07	16.74	16.74
0.0400	0.125E+02	0.364E+00	0.116E+00	0.0	0.0	8.817	0.009	0.0	12.980	8.826	8.826
0.0500	0.667E+01	0.254E+00	0.119E+00	0.0	0.0	5.106	0.011	0.0	7.043	5.117	5.117
0.0600	0.397E+01	0.187E+00	0.120E+00	0.0	0.0	3.193	0.012	0.0	4.277	3.205	3.205
0.0800	0.173E+01	0.114E+00	0.120E+00	0.0	0.0	1.475	0.015	0.0	1.964	1.490	1.490
0.1000	0.901E+00	0.773E-01	0.118E+00	0.0	0.0	0.7954	0.0171	0.0	1.0963	0.8125	0.8125
0.1500	0.273E+00	0.374E-01	0.110E+00	0.0	0.0	0.2520	0.0207	0.0	0.4204	0.2727	0.2726
0.2000	0.118E+00	0.219E-01	0.103E+00	0.0	0.0	0.1106	0.0229	0.0	0.2429	0.1335	0.1334
0.3000	0.367E-01	0.101E-01	0.911E-01	0.0	0.0	0.0352	0.0250	0.0	0.1379	0.0602	0.0600
0.4000	0.166E-01	0.582E-02	0.823E-01	0.0	0.0	0.0162	0.0257	0.0	0.1047	0.0419	0.0417
0.5000	0.926E-02	0.376E-02	0.754E-01	0.0	0.0	0.0091	0.0259	0.0	0.0884	0.0350	0.0347
0.6000	0.589E-02	0.263E-02	0.700E-01	0.0	0.0	0.0058	0.0258	0.0	0.0785	0.0316	0.0313
0.8000	0.303E-02	0.149E-02	0.617E-01	0.0	0.0	0.0030	0.0252	0.0	0.0662	0.0282	0.0278
1.0000	0.189E-02	0.958E-03	0.555E-01	0.0	0.0	0.0019	0.0243	0.0	0.0583	0.0262	0.0257
1.2500	0.121E-02	0.615E-03	0.497E-01	0.134E-03	0.0	0.0012	0.0233	0.0	0.0517	0.0245	0.0239
1.5000	0.870E-03	0.428E-03	0.452E-01	0.637E-03	0.0	0.0009	0.0222	0.0002	0.0471	0.0233	0.0226
2.0000	0.532E-03	0.241E-03	0.386E-01	0.226E-02	0.0	0.0005	0.0203	0.0011	0.0416	0.0219	0.0211
3.0000	0.284E-03	0.107E-03	0.304E-01	0.597E-02	0.106E-04	0.0003	0.0173	0.0039	0.0368	0.0215	0.0204
4.0000	0.189E-03	0.603E-04	0.254E-01	0.931E-02	0.434E-04	0.0002	0.0152	0.0070	0.0350	0.0223	0.0208
5.0000	0.141E-03	0.386E-04	0.219E-01	0.122E-01	0.864E-04	0.0001	0.0136	0.0098	0.0344	0.0235	0.0215
6.0000	0.111E-03	0.268E-04	0.194E-01	0.148E-01	0.133E-03	0.0001	0.0123	0.0124	0.0345	0.0248	0.0224
8.0000	0.781E-04	0.151E-04	0.158E-01	0.191E-01	0.223E-03	0.0001	0.0105	0.0168	0.0352	0.0274	0.0239
10.0000	0.600E-04	0.965E-05	0.135E-01	0.226E-01	0.306E-03	0.0	0.0092	0.0206	0.0365	0.0298	0.0253
15.0000	0.378E-04	0.429E-05	0.998E-02	0.293E-01	0.478E-03	0.0	0.0071	0.0278	0.0349	0.0349	0.0277
20.0000	0.275E-04	0.241E-05	0.801E-02	0.340E-01	0.610E-03	0.0	0.0059	0.0328	0.0328	0.0387	0.0290
30.0000	0.178E-04	0.107E-05	0.583E-02	0.406E-01	0.804E-03	0.0	0.0045	0.0400	0.0445	0.0473	0.0300
40.0000	0.132E-04	0.604E-06	0.463E-02	0.451E-01	0.941E-03	0.0	0.0037	0.0448	0.0507	0.0485	0.0300
50.0000	0.104E-04	0.386E-06	0.387E-02	0.484E-01	0.105E-02	0.0	0.0031	0.0484	0.0515	0.0515	0.0295
60.0000	0.864E-05	0.268E-06	0.333E-02	0.509E-01	0.113E-02	0.0	0.0027	0.0512	0.0554	0.0539	0.0289
80.0000	0.643E-05	0.151E-06	0.263E-02	0.548E-01	0.125E-02	0.0	0.0022	0.0552	0.0575	0.0575	0.0276
100.0000	0.512E-05	0.965E-07	0.218E-02	0.575E-01	0.134E-02	0.0	0.0019	0.0582	0.0610	0.0601	0.0263

[ALL Units: cm²/g]

SILVER

Z = 47

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_{tr}/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.703E+04	0.783E+01	0.498E-02	0.0	0.0	7029.0	0.0	0.0	7037.8	7029.0	7029.0
0.0015	0.278E+04	0.745E+01	0.917E-02	0.0	0.0	2783.0	0.0	0.0	2787.5	2783.0	2783.0
0.0020	0.139E+04	0.702E+01	0.135E-01	0.0	0.0	1393.0	0.0	0.0	1397.0	1393.0	1393.0
0.0030	0.507E+03	0.611E+01	0.217E-01	0.0	0.0	507.5	0.0	0.0	513.1	507.5	507.5
0.00351	0.383E+03	0.581E+01	0.245E-01	0.0	0.0	382.9	0.0	0.0	388.8	382.9	382.9
0.003351	0.127E+04	0.581E+01	0.245E-01	0.0	0.0	1217.0	0.0	0.0	1275.8	1217.0	1217.0
0.003524	0.112E+04	0.567E+01	0.258E-01	0.0	0.0	1077.0	0.0	0.0	1125.7	1077.0	1077.0
0.003524	0.154E+04	0.567E+01	0.258E-01	0.0	0.0	1482.0	0.0	0.0	1545.7	1482.0	1482.0
0.003806	0.128E+04	0.544E+01	0.279E-01	0.0	0.0	1231.0	0.0	0.0	1285.5	1231.0	1231.0
0.003806	0.146E+04	0.544E+01	0.279E-01	0.0	0.0	1410.0	0.0	0.0	1465.5	1410.0	1410.0
0.0040	0.130E+04	0.528E+01	0.293E-01	0.0	0.0	1300.0	0.0	0.0	1305.3	1300.0	1300.0
0.0050	0.734E+03	0.458E+01	0.362E-01	0.0	0.0	734.1	0.0	0.0	738.6	734.1	734.1
0.0060	0.457E+03	0.400E+01	0.427E-01	0.0	0.0	457.0	0.0	0.0	461.0	457.0	457.0
0.0080	0.213E+03	0.314E+01	0.542E-01	0.0	0.0	213.2	0.0	0.0	216.2	213.2	213.2
0.0100	0.117E+03	0.256E+01	0.639E-01	0.0	0.0	115.0	0.0	0.0	119.6	115.0	115.0
0.0150	0.382E+02	0.168E+01	0.810E-01	0.0	0.0	37.88	0.0	0.0	39.96	37.88	37.88
0.0200	0.171E+02	0.116E+01	0.922E-01	0.0	0.0	16.99	0.0	0.0	18.35	16.99	16.99
0.0251	0.860E+01	0.827E+00	0.101E+00	0.0	0.0	8.56	0.01	0.0	9.54	8.56	8.56
0.02551	0.545E+02	0.827E+00	0.101E+00	0.0	0.0	20.43	0.01	0.0	55.43	20.44	20.44
0.0300	0.359E+02	0.654E+00	0.106E+00	0.0	0.0	16.83	0.01	0.0	36.66	16.84	16.84
0.0400	0.167E+02	0.427E+00	0.113E+00	0.0	0.0	10.02	0.01	0.0	10.02	10.03	10.03
0.0500	0.903E+01	0.302E+00	0.116E+00	0.0	0.0	6.150	0.010	0.0	9.448	6.160	6.160
0.0600	0.542E+01	0.223E+00	0.118E+00	0.0	0.0	3.984	0.012	0.0	5.761	3.996	3.996
0.0800	0.240E+01	0.136E+00	0.118E+00	0.0	0.0	1.918	0.015	0.0	2.654	1.933	1.933
0.1000	0.126E+01	0.923E-01	0.116E+00	0.0	0.0	1.060	0.017	0.0	1.468	1.077	1.077
0.1500	0.389E+00	0.448E-01	0.109E+00	0.0	0.0	0.3475	0.0206	0.0	0.5428	0.3681	0.3681
0.2000	0.169E+00	0.264E-01	0.102E+00	0.0	0.0	0.1554	0.0227	0.0	0.2974	0.1781	0.1781
0.3000	0.534E-01	0.122E-01	0.904E-01	0.0	0.0	0.0506	0.0248	0.0	0.1560	0.0754	0.0752
0.4000	0.244E-01	0.703E-02	0.817E-01	0.0	0.0	0.0234	0.0256	0.0	0.1131	0.0490	0.0488
0.5000	0.137E-01	0.456E-02	0.750E-01	0.0	0.0	0.0132	0.0258	0.0	0.0933	0.0390	0.0387
0.6000	0.872E-02	0.319E-02	0.696E-01	0.0	0.0	0.0085	0.0257	0.0	0.0815	0.0342	0.0338
0.8000	0.450E-02	0.181E-02	0.614E-01	0.0	0.0	0.0044	0.0251	0.0	0.0677	0.0295	0.0290
1.0000	0.281E-02	0.116E-02	0.552E-01	0.0	0.0	0.0028	0.0242	0.0	0.0592	0.0270	0.0264
1.2500	0.180E-02	0.748E-03	0.494E-01	0.160E-03	0.0	0.0018	0.0231	0.0	0.0521	0.0249	0.0243
1.5000	0.129E-02	0.520E-03	0.450E-01	0.750E-03	0.0	0.0013	0.0221	0.0002	0.0476	0.0236	0.0228
2.0000	0.788E-03	0.293E-03	0.384E-01	0.260E-02	0.0	0.0007	0.0202	0.0013	0.0421	0.0222	0.0213
3.0000	0.419E-03	0.130E-03	0.302E-01	0.674E-02	0.106E-04	0.0004	0.0172	0.0045	0.0375	0.0221	0.0208
4.0000	0.279E-03	0.734E-04	0.252E-01	0.104E-01	0.431E-04	0.0003	0.0151	0.0078	0.0360	0.0232	0.0214
5.0000	0.207E-03	0.470E-04	0.218E-01	0.136E-01	0.859E-04	0.0002	0.0135	0.0109	0.0357	0.0246	0.0223
6.0000	0.163E-03	0.326E-04	0.193E-01	0.164E-01	0.132E-03	0.0001	0.0122	0.0138	0.0350	0.0261	0.0233
8.0000	0.114E-03	0.184E-04	0.158E-01	0.211E-01	0.222E-03	0.0001	0.0104	0.0186	0.0373	0.0291	0.0251
10.0000	0.876E-04	0.117E-04	0.134E-01	0.250E-01	0.304E-03	0.0001	0.0090	0.0227	0.0388	0.0319	0.0267
15.0000	0.551E-04	0.522E-05	0.993E-02	0.323E-01	0.475E-03	0.0	0.0070	0.0306	0.0428	0.0293	0.0293
20.0000	0.401E-04	0.294E-05	0.797E-02	0.375E-01	0.606E-03	0.0	0.0058	0.0362	0.0461	0.0419	0.0307
30.0000	0.259E-04	0.131E-05	0.581E-02	0.447E-01	0.797E-03	0.0	0.0044	0.0439	0.0513	0.0483	0.0317
40.0000	0.191E-04	0.734E-06	0.461E-02	0.496E-01	0.932E-03	0.0	0.0035	0.0492	0.0552	0.0528	0.0316
50.0000	0.152E-04	0.470E-06	0.385E-02	0.532E-01	0.104E-02	0.0	0.0030	0.0531	0.0581	0.0561	0.0311
60.0000	0.125E-04	0.326E-06	0.332E-02	0.560E-01	0.112E-02	0.0	0.0026	0.0561	0.0605	0.0588	0.0304
80.0000	0.933E-05	0.184E-06	0.262E-02	0.602E-01	0.124E-02	0.0	0.0021	0.0606	0.0641	0.0627	0.0290
100.0000	0.743E-05	0.117E-06	0.217E-02	0.631E-01	0.133E-02	0.0	0.0018	0.0638	0.0666	0.0656	0.0276

[ALL Units: cm²/g]

TIN

Z = 50

E (MeV)	τ/ρ	σ_r/ρ	σ/ρ	κ_n/ρ	κ_0/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.815E+04	0.800E+01	0.527E-02	0.0	0.0	8148.0	0.0	0.0	8158.0	8148.0	8148.0
0.0015	0.329E+04	0.757E+01	0.969E-02	0.0	0.0	3289.0	0.0	0.0	3297.6	3289.0	3289.0
0.0020	0.166E+04	0.710E+01	0.141E-01	0.0	0.0	1657.0	0.0	0.0	1667.1	1658.0	1658.0
0.0030	0.608E+03	0.621E+01	0.220E-01	0.0	0.0	607.8	0.0	0.0	614.2	607.8	607.8
0.003929	0.306E+03	0.546E+01	0.286E-01	0.0	0.0	306.0	0.0	0.0	311.5	306.0	306.0
L3.003929	0.920E+03	0.546E+01	0.286E-01	0.0	0.0	874.9	0.0	0.0	925.5	874.9	874.9
0.0040	0.934E+03	0.541E+01	0.291E-01	0.0	0.0	934.1	0.0	0.0	939.4	934.1	934.1
.004156	0.842E+03	0.530E+01	0.301E-01	0.0	0.0	802.4	0.0	0.0	847.3	802.4	802.4
L2.004156	0.114E+04	0.530E+01	0.301E-01	0.0	0.0	1086.0	0.0	0.0	1145.3	1086.0	1086.0
.004465	0.966E+03	0.508E+01	0.321E-01	0.0	0.0	924.1	0.0	0.0	971.1	924.1	924.1
L1.004465	0.111E+04	0.508E+01	0.321E-01	0.0	0.0	1064.0	0.0	0.0	1115.1	1064.0	1064.0
0.0050	0.842E+03	0.472E+01	0.354E-01	0.0	0.0	842.2	0.0	0.0	846.8	842.2	842.2
0.0060	0.525E+03	0.414E+01	0.412E-01	0.0	0.0	525.1	0.0	0.0	529.2	525.1	525.1
0.0080	0.247E+03	0.326E+01	0.517E-01	0.0	0.0	246.8	0.0	0.0	250.3	246.8	246.8
0.0100	0.136E+03	0.265E+01	0.607E-01	0.0	0.0	133.1	0.0	0.0	138.7	133.1	133.1
0.0150	0.448E+02	0.174E+01	0.773E-01	0.0	0.0	44.25	0.0	0.0	46.62	44.25	44.25
0.0200	0.201E+02	0.123E+01	0.881E-01	0.0	0.0	19.96	0.0	0.0	21.42	19.96	19.96
.02920	0.694E+01	0.719E+00	0.100E+00	0.0	0.0	6.89	0.01	0.0	7.76	6.90	6.90
K.02920	0.428E+02	0.719E+00	0.100E+00	0.0	0.0	15.29	0.01	0.0	43.62	15.30	15.30
0.0300	0.404E+02	0.692E+00	0.101E+00	0.0	0.0	15.15	0.01	0.0	41.19	15.16	15.16
0.0400	0.189E+02	0.451E+00	0.108E+00	0.0	0.0	10.02	0.01	0.0	19.46	10.03	10.03
0.0500	0.103E+02	0.320E+00	0.111E+00	0.0	0.0	8.417	0.010	0.0	10.731	6.427	6.427
0.0600	0.622E+01	0.238E+00	0.113E+00	0.0	0.0	4.272	0.012	0.0	6.571	4.284	4.284
0.0800	0.277E+01	0.146E+00	0.113E+00	0.0	0.0	2.121	0.014	0.0	3.029	2.135	2.135
0.1000	0.147E+01	0.086E-01	0.112E+00	0.0	0.0	1.192	0.016	0.0	1.681	1.208	1.208
0.1500	0.456E+00	0.479E-01	0.105E+00	0.0	0.0	0.3994	0.0198	0.0	0.6089	0.4192	0.4191
0.2000	0.200E+00	0.283E-01	0.982E-01	0.0	0.0	0.1807	0.0219	0.0	0.3265	0.2027	0.2026
0.3000	0.635E-01	0.132E-01	0.872E-01	0.0	0.0	0.0596	0.0239	0.0	0.1639	0.0835	0.0833
0.4000	0.292E-01	0.756E-02	0.789E-01	0.0	0.0	0.0278	0.0247	0.0	0.1157	0.0525	0.0523
0.5000	0.164E-01	0.491E-02	0.725E-01	0.0	0.0	0.0158	0.0249	0.0	0.0938	0.0407	0.0404
0.6000	0.105E-01	0.344E-02	0.672E-01	0.0	0.0	0.0102	0.0248	0.0	0.0811	0.0350	0.0346
0.8000	0.542E-02	0.195E-02	0.593E-01	0.0	0.0	0.0053	0.0242	0.0	0.0667	0.0295	0.0290
1.0000	0.338E-02	0.126E-02	0.534E-01	0.0	0.0	0.0033	0.0234	0.0	0.0580	0.0267	0.0261
1.2500	0.217E-02	0.806E-03	0.478E-01	0.172E-03	0.0	0.0022	0.0223	0.0	0.0509	0.0245	0.0238
1.5000	0.155E-02	0.561E-03	0.435E-01	0.800E-03	0.0	0.0015	0.0213	0.0	0.0464	0.0231	0.0223
2.0000	0.947E-03	0.316E-03	0.371E-01	0.273E-02	0.0	0.0010	0.0194	0.0013	0.0411	0.0217	0.0208
3.0000	0.503E-03	0.141E-03	0.292E-01	0.699E-02	0.102E-04	0.0005	0.0166	0.0046	0.0368	0.0217	0.0204
4.0000	0.334E-03	0.792E-04	0.244E-01	0.108E-01	0.417E-04	0.0004	0.0145	0.0080	0.0357	0.0229	0.0211
5.0000	0.247E-03	0.507E-04	0.211E-01	0.140E-01	0.830E-04	0.0003	0.0130	0.0063	0.0355	0.0245	0.0222
6.0000	0.195E-03	0.352E-04	0.186E-01	0.169E-01	0.127E-03	0.0002	0.0118	0.0141	0.0359	0.0261	0.0232
8.0000	0.136E-03	0.198E-04	0.152E-01	0.216E-01	0.214E-03	0.0002	0.0100	0.0190	0.0372	0.0292	0.0251
10.0000	0.105E-03	0.127E-04	0.130E-01	0.256E-01	0.294E-03	0.0001	0.0087	0.0233	0.0390	0.0321	0.0267
15.0000	0.657E-04	0.564E-05	0.960E-02	0.330E-01	0.458E-03	0.0001	0.0067	0.0312	0.0431	0.0380	0.0294
20.0000	0.477E-04	0.317E-05	0.771E-02	0.383E-01	0.585E-03	0.0	0.0056	0.0369	0.0425	0.0466	0.0308
30.0000	0.308E-04	0.141E-05	0.561E-02	0.456E-01	0.769E-03	0.0	0.0042	0.0448	0.0520	0.0490	0.0319
40.0000	0.227E-04	0.793E-06	0.446E-02	0.506E-01	0.899E-03	0.0	0.0034	0.0502	0.0560	0.0536	0.0318
50.0000	0.180E-04	0.507E-06	0.372E-02	0.542E-01	0.998E-03	0.0	0.0029	0.0541	0.0589	0.0570	0.0312
60.0000	0.149E-04	0.352E-06	0.321E-02	0.571E-01	0.108E-02	0.0	0.0025	0.0572	0.0614	0.0598	0.0305
80.0000	0.111E-04	0.198E-06	0.253E-02	0.613E-01	0.119E-02	0.0	0.0020	0.0617	0.0650	0.0638	0.0290
100.0000	0.883E-05	0.127E-06	0.210E-02	0.644E-01	0.128E-02	0.0	0.0017	0.0650	0.0678	0.0667	0.0277

[ALL Units: cm²/g]

IODINE

Z = 53

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_H/ρ	κ_e/ρ	τ_{TX}/ρ	σ_{TX}/ρ	κ_{TX}/ρ	μ/ρ	μ_{TX}/ρ	μ_{en}/ρ
0.0010	0.909E+04	0.842E+01	0.469E-02	0.0	0.0	9087.0	0.0	0.0	9098.4	9087.0	9087.0
0.001072	0.786E+04	0.836E+01	0.527E-02	0.0	0.0	7858.0	0.0	0.0	7868.4	7858.0	7858.0
0.001072	0.820E+04	0.836E+01	0.527E-02	0.0	0.0	8195.0	0.0	0.0	8208.4	8195.0	8195.0
0.0015	0.391E+04	0.796E+01	0.897E-02	0.0	0.0	3911.0	0.0	0.0	3911.0	3911.0	3911.0
0.0020	0.199E+04	0.745E+01	0.134E-01	0.0	0.0	1989.0	0.0	0.0	1997.5	1989.0	1989.0
0.0030	0.736E+03	0.646E+01	0.219E-01	0.0	0.0	735.5	0.0	0.0	742.5	735.5	735.5
0.0040	0.355E+03	0.563E+01	0.293E-01	0.0	0.0	355.1	0.0	0.0	360.7	355.1	355.1
0.004557	0.254E+03	0.523E+01	0.330E-01	0.0	0.0	253.9	0.0	0.0	259.3	253.9	253.9
0.005188	0.750E+03	0.523E+01	0.330E-01	0.0	0.0	705.2	0.0	0.0	755.2	705.2	705.2
0.004852	0.659E+03	0.503E+01	0.348E-01	0.0	0.0	621.9	0.0	0.0	664.1	621.9	621.9
0.0050	0.838E+03	0.494E+01	0.357E-01	0.0	0.0	838.7	0.0	0.0	893.1	838.7	838.7
0.0050	0.838E+03	0.494E+01	0.357E-01	0.0	0.0	838.7	0.0	0.0	843.0	838.7	838.0
0.005188	0.762E+03	0.482E+01	0.368E-01	0.0	0.0	721.9	0.0	0.0	766.9	721.9	721.9
0.005188	0.879E+03	0.482E+01	0.368E-01	0.0	0.0	832.9	0.0	0.0	883.9	832.9	832.9
0.0060	0.613E+03	0.436E+01	0.413E-01	0.0	0.0	613.1	0.0	0.0	617.4	613.1	613.1
0.0080	0.289E+03	0.345E+01	0.511E-01	0.0	0.0	288.6	0.0	0.0	292.5	288.6	288.6
0.0100	0.160E+03	0.280E+01	0.596E-01	0.0	0.0	155.4	0.0	0.0	162.9	155.4	155.4
0.0150	0.532E+02	0.184E+01	0.758E-01	0.0	0.0	52.24	0.0	0.0	55.12	52.24	52.24
0.0200	0.240E+02	0.131E+01	0.865E-01	0.0	0.0	23.71	0.0	0.0	25.40	23.71	23.71
0.0300	0.772E+01	0.745E+00	0.991E-01	0.0	0.0	7.64	0.01	0.0	8.56	7.65	7.65
0.03317	0.581E+01	0.643E+00	0.102E+00	0.0	0.0	5.76	0.01	0.0	6.55	5.77	5.77
0.0400	0.353E-01	0.829E-02	0.781E-01	0.0	0.0	12.21	0.01	0.0	35.85	12.22	12.22
0.0400	0.215E+02	0.486E+00	0.106E+00	0.0	0.0	9.881	0.008	0.0	22.092	9.889	9.889
0.0500	0.119E+02	0.345E+00	0.109E+00	0.0	0.0	6.736	0.010	0.0	12.354	6.746	6.746
0.0600	0.127E-01	0.258E+00	0.111E+00	0.0	0.0	4.611	0.011	0.0	7.579	4.622	4.622
0.0800	0.324E+01	0.158E+00	0.112E+00	0.0	0.0	2.364	0.014	0.0	3.510	2.378	2.378
0.1000	0.172E+01	0.107E+00	0.110E+00	0.0	0.0	1.352	0.016	0.0	1.937	1.368	1.368
0.1500	0.542E+00	0.522E-01	0.104E+00	0.0	0.0	0.4637	0.0197	0.0	0.6982	0.4834	0.4833
0.2000	0.238E+00	0.309E-01	0.971E-01	0.0	0.0	0.2125	0.0217	0.0	0.3660	0.2342	0.2341
0.3000	0.765E-01	0.144E-01	0.863E-01	0.0	0.0	0.0710	0.0237	0.0	0.1772	0.0945	0.0945
0.4000	0.353E-01	0.829E-02	0.781E-01	0.0	0.0	0.0333	0.0245	0.0	0.1217	0.0578	0.0576
0.5000	0.199E-01	0.538E-02	0.717E-01	0.0	0.0	0.0190	0.0247	0.0	0.0970	0.0437	0.0434
0.6000	0.127E-01	0.377E-02	0.666E-01	0.0	0.0	0.0123	0.0246	0.0	0.0831	0.0369	0.0364
0.8000	0.660E-02	0.214E-02	0.587E-01	0.0	0.0	0.0065	0.0239	0.0	0.0674	0.0304	0.0299
1.0000	0.412E-02	0.138E-02	0.529E-01	0.0	0.0	0.0040	0.0232	0.0	0.0584	0.0272	0.0266
1.2500	0.264E-02	0.886E-03	0.474E-01	0.188E-03	0.0	0.0027	0.0221	0.0	0.0511	0.0248	0.0241
1.5000	0.189E-02	0.616E-03	0.431E-01	0.871E-03	0.0	0.0018	0.0211	0.0003	0.0465	0.0232	0.0224
2.0000	0.115E-02	0.348E-03	0.368E-01	0.294E-02	0.0	0.0011	0.0193	0.0014	0.0412	0.0218	0.0209
3.0000	0.611E-03	0.155E-03	0.290E-01	0.741E-02	0.101E-04	0.0006	0.0164	0.0049	0.0372	0.0219	0.0205
4.0000	0.405E-03	0.871E-04	0.242E-01	0.114E-01	0.413E-04	0.0004	0.0144	0.0085	0.0361	0.0233	0.0214
5.0000	0.299E-03	0.558E-04	0.209E-01	0.149E-01	0.823E-04	0.0003	0.0129	0.0118	0.0361	0.0250	0.0225
6.0000	0.236E-03	0.387E-04	0.177E-01	0.126E-03	0.0002	0.0002	0.0117	0.0148	0.0366	0.0267	0.0236
8.0000	0.165E-03	0.218E-04	0.151E-01	0.226E-01	0.212E-03	0.0002	0.0099	0.0200	0.0381	0.0300	0.0257
10.0000	0.126E-03	0.139E-04	0.129E-01	0.267E-01	0.291E-03	0.0001	0.0087	0.0242	0.0400	0.0331	0.0274
15.0000	0.792E-04	0.620E-05	0.952E-02	0.345E-01	0.454E-03	0.0001	0.0067	0.0325	0.0446	0.0393	0.0302
20.0000	0.575E-04	0.349E-05	0.764E-02	0.400E-01	0.579E-03	0.0001	0.0056	0.0384	0.0483	0.0441	0.0317
30.0000	0.371E-04	0.155E-05	0.556E-02	0.476E-01	0.761E-03	0.0	0.0042	0.0467	0.0540	0.0510	0.0327
40.0000	0.274E-04	0.872E-06	0.442E-02	0.527E-01	0.889E-03	0.0	0.0034	0.0522	0.0580	0.0557	0.0327
50.0000	0.217E-04	0.872E-06	0.369E-02	0.566E-01	0.987E-03	0.0	0.0029	0.0564	0.0613	0.0593	0.0321
60.0000	0.180E-04	0.387E-06	0.319E-02	0.596E-01	0.116E-02	0.0	0.0026	0.0639	0.0622	0.0622	0.0314
80.0000	0.133E-04	0.218E-06	0.251E-02	0.639E-01	0.118E-02	0.0	0.0021	0.0654	0.0676	0.0654	0.0298
100.0000	0.106E-04	0.139E-06	0.208E-02	0.671E-01	0.126E-02	0.0	0.0018	0.0676	0.0705	0.0694	0.0284

	E (MeV)	τ/p	σ_T/p	σ/p	κ_0/p	κ_0/p	κ_{tr}/p	κ_{tr}/p	μ/p	μ_{tr}/p	μ_{en}/p
	0.0010	0.853E+04	0.852E+01	0.686E-02	0.0	0.0	8533.0	0.0	8538.5	8533.0	8533.0
	.001062	0.746E+04	0.846E+01	0.739E-02	0.0	0.0	7459.0	0.0	7468.5	7459.0	7459.0
M3	.001062	0.854E+04	0.846E+01	0.739E-02	0.0	0.0	8538.0	0.0	8548.5	8538.0	8538.0
	.001137	0.740E+04	0.838E+01	0.802E-02	0.0	0.0	7398.0	0.0	7408.4	7398.0	7398.0
M2	.001137	0.783E+04	0.838E+01	0.802E-02	0.0	0.0	7827.0	0.0	7838.4	7827.0	7827.0
	.001293	0.598E+04	0.823E+01	0.926E-02	0.0	0.0	5981.0	0.0	5988.2	5981.0	5981.0
M1	.001293	0.625E+04	0.823E+01	0.926E-02	0.0	0.0	6249.0	0.0	6258.2	6249.0	6249.0
	0.0015	0.449E+04	0.802E+01	0.109E-01	0.0	0.0	4490.0	0.0	4498.0	4490.0	4490.0
	0.0020	0.231E+04	0.751E+01	0.149E-01	0.0	0.0	2311.0	0.0	2317.5	2311.0	2311.0
	0.0030	0.863E+03	0.656E+01	0.225E-01	0.0	0.0	863.0	0.0	869.6	863.0	863.0
	0.0040	0.419E+03	0.573E+01	0.295E-01	0.0	0.0	418.8	0.0	424.8	418.8	418.8
	0.0050	0.236E+03	0.503E+01	0.358E-01	0.0	0.0	236.3	0.0	241.1	236.3	236.3
	.005247	0.209E+03	0.488E+01	0.372E-01	0.0	0.0	208.6	0.0	213.9	208.6	208.6
I3	.005247	0.605E+03	0.488E+01	0.372E-01	0.0	0.0	561.2	0.0	609.9	561.2	561.2
	.005624	0.512E+03	0.466E+01	0.393E-01	0.0	0.0	477.8	0.0	516.7	477.8	477.8
I2	.005624	0.697E+03	0.466E+01	0.393E-01	0.0	0.0	650.0	0.0	701.7	650.0	650.0
	.005989	0.597E+03	0.446E+01	0.412E-01	0.0	0.0	559.2	0.0	601.5	559.2	559.2
I1	.005989	0.689E+03	0.446E+01	0.412E-01	0.0	0.0	645.5	0.0	693.5	645.5	645.5
	0.0060	0.685E+03	0.446E+01	0.412E-01	0.0	0.0	685.4	0.0	685.4	685.4	685.4
	0.0080	0.330E+03	0.355E+01	0.503E-01	0.0	0.0	329.8	0.0	333.6	329.8	329.8
	0.0100	0.183E+03	0.290E+01	0.581E-01	0.0	0.0	176.1	0.0	186.0	176.1	176.1
	0.0150	0.615E+02	0.191E+01	0.734E-01	0.0	0.0	59.93	0.0	63.48	59.93	59.93
	0.0200	0.279E+02	0.137E+01	0.838E-01	0.0	0.0	27.40	0.0	29.35	27.40	27.40
	.03744	0.902E+01	0.787E+00	0.959E-01	0.0	0.0	8.90	0.01	9.90	8.91	8.91
K	.03744	0.483E+01	0.566E+00	0.101E+00	0.0	0.0	4.784	0.007	5.497	4.791	4.791
	.0400	0.285E+02	0.566E+00	0.101E+00	0.0	0.0	9.816	0.007	29.167	9.823	9.823
	0.0400	0.240E+02	0.512E+00	0.102E+00	0.0	0.0	9.250	0.008	24.614	9.258	9.258
	0.0500	0.133E+02	0.364E+00	0.106E+00	0.0	0.0	6.778	0.009	13.770	6.787	6.787
	0.0600	0.813E+01	0.273E+00	0.108E+00	0.0	0.0	4.833	0.011	8.511	4.814	4.814
	0.0800	0.369E+01	0.169E+00	0.108E+00	0.0	0.0	2.554	0.014	3.967	2.568	2.568
	0.1000	0.197E+01	0.114E+00	0.107E+00	0.0	0.0	1.489	0.016	2.191	1.505	1.505
	0.1500	0.626E+00	0.566E-01	0.101E+00	0.0	0.0	0.7826	0.0191	0.5428	0.5427	0.5427
	0.2000	0.277E+00	0.300E-01	0.945E-01	0.0	0.0	0.4045	0.0211	0.2641	0.2640	0.2640
	0.3000	0.895E-01	0.154E-01	0.841E-01	0.0	0.0	0.0822	0.0231	0.1053	0.1051	0.1051
	0.4000	0.415E-01	0.890E-02	0.762E-01	0.0	0.0	0.0390	0.0238	0.1266	0.0628	0.0625
	0.5000	0.235E-01	0.578E-02	0.700E-01	0.0	0.0	0.0223	0.0241	0.0993	0.0464	0.0460
	0.6000	0.151E-01	0.405E-02	0.650E-01	0.0	0.0	0.0144	0.0240	0.0842	0.0384	0.0380
	0.8000	0.782E-02	0.230E-02	0.573E-01	0.0	0.0	0.0076	0.0234	0.0674	0.0310	0.0304
	1.0000	0.488E-02	0.148E-02	0.517E-01	0.0	0.0	0.0048	0.0226	0.0581	0.0274	0.0267
	1.2500	0.315E-02	0.954E-03	0.463E-01	0.202E-03	0.0	0.0031	0.0216	0.0506	0.0247	0.0240
	1.5000	0.226E-02	0.664E-03	0.421E-01	0.933E-03	0.0	0.0022	0.0206	0.0460	0.0231	0.0223
	2.0000	0.137E-02	0.374E-03	0.359E-01	0.310E-02	0.0	0.0014	0.0188	0.0407	0.0217	0.0206
	3.0000	0.726E-03	0.167E-03	0.283E-01	0.772E-02	0.989E-05	0.0007	0.0160	0.0369	0.0218	0.0204
	4.0000	0.480E-03	0.938E-04	0.236E-01	0.118E-01	0.403E-04	0.0005	0.0140	0.0088	0.0360	0.0213
	5.0000	0.355E-03	0.601E-04	0.204E-01	0.152E-01	0.803E-04	0.0004	0.0126	0.0122	0.0251	0.0225
	6.0000	0.280E-03	0.417E-04	0.180E-01	0.182E-01	0.123E-03	0.0003	0.0114	0.0366	0.0269	0.0237
	8.0000	0.195E-03	0.235E-04	0.147E-01	0.233E-01	0.207E-03	0.0002	0.0097	0.0384	0.0304	0.0258
	10.0000	0.149E-03	0.150E-04	0.126E-01	0.274E-01	0.284E-03	0.0001	0.0085	0.0404	0.0335	0.0276
	15.0000	0.934E-04	0.668E-05	0.930E-02	0.353E-01	0.443E-03	0.0001	0.0066	0.0451	0.0400	0.0305
	20.0000	0.679E-04	0.376E-05	0.746E-02	0.409E-01	0.564E-03	0.0001	0.0055	0.0394	0.0449	0.0320
	30.0000	0.438E-04	0.167E-05	0.543E-02	0.487E-01	0.742E-03	0.0	0.0042	0.0549	0.0520	0.0331
	40.0000	0.323E-04	0.939E-06	0.432E-02	0.540E-01	0.866E-03	0.0	0.0034	0.0592	0.0566	0.0330
	50.0000	0.256E-04	0.601E-06	0.360E-02	0.579E-01	0.961E-03	0.0	0.0029	0.0625	0.0609	0.0324
	60.0000	0.211E-04	0.417E-06	0.310E-02	0.609E-01	0.104E-02	0.0	0.0026	0.0651	0.0631	0.0316
	80.0000	0.157E-04	0.235E-06	0.245E-02	0.654E-01	0.115E-02	0.0	0.0021	0.0690	0.0678	0.0310
	100.0000	0.125E-04	0.150E-06	0.203E-02	0.686E-01	0.123E-02	0.0	0.0018	0.0719	0.0709	0.0286

E (MeV)	τ/ρ	σ_r/ρ	σ/p	κ_n/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.228E+04	0.988E+01	0.563E-02	0.0	0.0	2281.0	0.0	0.0	2289.9	2281.0	2281.0
.001185	0.166E+04	0.969E+01	0.702E-02	0.0	0.0	1659.7	0.0	0.0	1659.7	1659.0	1659.0
.001185	0.183E+04	0.969E+01	0.702E-02	0.0	0.0	1834.0	0.0	0.0	1839.7	1834.0	1834.0
.001217	0.399E+04	0.966E+01	0.726E-02	0.0	0.0	3987.0	0.0	0.0	3999.7	3987.0	3987.0
M4 .001217	0.481E+04	0.966E+01	0.726E-02	0.0	0.0	4806.0	0.0	0.0	4819.7	4806.0	4806.0
0.0015	0.503E+04	0.937E+01	0.928E-02	0.0	0.0	5039.4	0.0	0.0	5039.4	5032.0	5032.0
.001544	0.469E+04	0.933E+01	0.960E-02	0.0	0.0	4691.0	0.0	0.0	4699.3	4691.0	4691.0
M3 .001544	0.542E+04	0.933E+01	0.960E-02	0.0	0.0	5423.0	0.0	0.0	5429.3	5423.0	5423.0
.001688	0.441E+04	0.918E+01	0.106E-01	0.0	0.0	4412.0	0.0	0.0	4419.2	4412.0	4412.0
M2 .001688	0.468E+04	0.918E+01	0.106E-01	0.0	0.0	4684.0	0.0	0.0	4689.2	4684.0	4684.0
.001881	0.368E+04	0.898E+01	0.120E-01	0.0	0.0	3683.0	0.0	0.0	3689.0	3683.0	3683.0
M1 .001881	0.384E+04	0.898E+01	0.120E-01	0.0	0.0	3845.0	0.0	0.0	3849.0	3845.0	3845.0
0.0020	0.335E+04	0.885E+01	0.128E-01	0.0	0.0	3351.0	0.0	0.0	3358.9	3351.0	3351.0
0.0030	0.128E+04	0.785E+01	0.196E-01	0.0	0.0	1284.0	0.0	0.0	1287.9	1284.0	1284.0
0.0040	0.631E+03	0.692E+01	0.260E-01	0.0	0.0	631.1	0.0	0.0	637.9	631.1	631.1
0.0050	0.359E+03	0.611E+01	0.318E-01	0.0	0.0	359.2	0.0	0.0	365.1	359.2	359.2
0.0060	0.225E+03	0.542E+01	0.371E-01	0.0	0.0	225.1	0.0	0.0	230.5	225.1	225.1
.007243	0.138E+03	0.470E+01	0.428E-01	0.0	0.0	138.1	0.0	0.0	142.7	138.1	138.1
I3 .007243	0.380E+03	0.470E+01	0.428E-01	0.0	0.0	385.7	0.0	0.0	384.7	335.7	335.7
.007243	0.301E+03	0.436E+01	0.457E-01	0.0	0.0	268.8	0.0	0.0	305.4	268.8	268.8
I2 .007930	0.410E+03	0.436E+01	0.457E-01	0.0	0.0	366.8	0.0	0.0	414.4	366.8	366.8
0.0080	0.402E+03	0.433E+01	0.460E-01	0.0	0.0	402.5	0.0	0.0	406.4	402.5	402.5
.008376	0.359E+03	0.416E+01	0.475E-01	0.0	0.0	323.0	0.0	0.0	363.2	323.0	323.0
I1 .008376	0.415E+03	0.416E+01	0.475E-01	0.0	0.0	373.3	0.0	0.0	419.2	373.3	373.3
0.0100	0.266E+03	0.353E+01	0.535E-01	0.0	0.0	243.4	0.0	0.0	269.6	243.4	243.4
0.0150	0.910E+02	0.229E+01	0.682E-01	0.0	0.0	85.91	0.0	0.0	93.36	85.91	85.91
0.0200	0.419E+02	0.164E+01	0.791E-01	0.0	0.0	40.14	0.0	0.0	43.62	40.14	40.14
0.0300	0.138E+02	0.964E+00	0.923E-01	0.0	0.0	13.39	0.0	0.0	14.86	13.40	13.40
0.0400	0.619E+01	0.628E+00	0.993E-01	0.0	0.0	6.063	0.0	0.0	6.917	6.070	6.070
0.0500	0.331E+01	0.445E+00	0.103E+00	0.0	0.0	3.256	0.0	0.0	3.858	3.265	3.265
.05024	0.327E+01	0.442E+00	0.103E+00	0.0	0.0	3.213	0.0	0.0	3.815	3.222	3.222
0.05024	0.161E+02	0.442E+00	0.103E+00	0.0	0.0	5.847	0.0	0.0	18.645	5.856	5.856
0.0600	0.113E+02	0.334E+00	0.105E+00	0.0	0.0	4.901	0.0	0.0	11.739	4.912	4.912
0.0800	0.526E+01	0.209E+00	0.106E+00	0.0	0.0	3.024	0.0	0.0	5.575	3.037	3.037
0.1000	0.286E+01	0.142E+00	0.105E+00	0.0	0.0	1.889	0.0	0.0	3.107	1.904	1.904
0.1500	0.931E+00	0.694E-01	0.996E-01	0.0	0.0	0.7200	0.0	0.0	1.1000	0.7389	0.7388
0.2000	0.419E+00	0.413E-01	0.937E-01	0.0	0.0	0.3474	0.0	0.0	0.5540	0.3684	0.3683
0.3000	0.138E+00	0.195E-01	0.835E-01	0.0	0.0	0.1224	0.0	0.0	0.2410	0.1454	0.1454
0.4000	0.648E-01	0.113E-01	0.757E-01	0.0	0.0	0.0592	0.0	0.0	0.1518	0.0830	0.0827
0.5000	0.369E-01	0.732E-02	0.697E-01	0.0	0.0	0.0344	0.0	0.0	0.1139	0.0584	0.0580
0.6000	0.238E-01	0.514E-02	0.647E-01	0.0	0.0	0.0225	0.0	0.0	0.0936	0.0464	0.0459
0.8000	0.125E-01	0.293E-02	0.571E-01	0.0	0.0	0.0120	0.0	0.0	0.0725	0.0353	0.0346
1.0000	0.780E-02	0.189E-02	0.515E-01	0.0	0.0	0.0076	0.0	0.0	0.0612	0.0301	0.0293
1.2500	0.503E-02	0.122E-02	0.461E-01	0.254E-03	0.0	0.0049	0.0	0.0	0.0526	0.0265	0.0256
1.5000	0.359E-02	0.847E-03	0.420E-01	0.117E-02	0.0	0.0035	0.0004	0.0	0.0476	0.0234	0.0234
2.0000	0.218E-02	0.478E-03	0.358E-01	0.377E-02	0.0	0.0021	0.0018	0.0018	0.0422	0.0227	0.0215
3.0000	0.115E-02	0.213E-03	0.282E-01	0.904E-02	0.987E-05	0.0011	0.0060	0.0060	0.0386	0.0231	0.0214
4.0000	0.757E-03	0.120E-03	0.236E-01	0.135E-01	0.402E-04	0.0008	0.0141	0.0141	0.0380	0.0249	0.0225
5.0000	0.536E-03	0.768E-04	0.204E-01	0.174E-01	0.801E-04	0.0006	0.0139	0.0139	0.0385	0.0270	0.0239
6.0000	0.439E-03	0.533E-04	0.180E-01	0.207E-01	0.123E-03	0.0004	0.0114	0.0114	0.0393	0.0291	0.0252
8.0000	0.305E-03	0.300E-04	0.147E-01	0.262E-01	0.206E-03	0.0003	0.0097	0.0097	0.0414	0.0330	0.0276
10.0000	0.233E-03	0.192E-04	0.125E-01	0.308E-01	0.283E-03	0.0002	0.0085	0.0085	0.0438	0.0366	0.0294
15.0000	0.146E-03	0.854E-05	0.928E-02	0.396E-01	0.440E-03	0.0001	0.0066	0.0066	0.0495	0.0440	0.0341
20.0000	0.106E-03	0.480E-05	0.745E-02	0.457E-01	0.561E-03	0.0001	0.0058	0.0058	0.0538	0.0495	0.0341
30.0000	0.679E-04	0.213E-05	0.542E-02	0.543E-01	0.736E-03	0.0001	0.0042	0.0042	0.0654	0.0575	0.0351
40.0000	0.501E-04	0.120E-05	0.431E-02	0.602E-01	0.860E-03	0.0001	0.0034	0.0034	0.0654	0.0630	0.0348
50.0000	0.396E-04	0.769E-06	0.360E-02	0.645E-01	0.952E-03	0.0	0.0030	0.0030	0.0691	0.0671	0.0341
60.0000	0.328E-04	0.534E-06	0.310E-02	0.679E-01	0.103E-02	0.0	0.0026	0.0026	0.0721	0.0704	0.0333
80.0000	0.243E-04	0.300E-06	0.244E-02	0.729E-01	0.114E-02	0.0	0.0021	0.0021	0.0732	0.0752	0.0316
100.0000	0.194E-04	0.192E-06	0.203E-02	0.764E-01	0.122E-02	0.0	0.0018	0.0018	0.0797	0.0787	0.0300

E (MeV)	τ/ρ	σ_r/ρ	σ/ρ	κ_n/ρ	κ_o/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.367E+04	0.114E+02	0.434E-02	0.0	0.0	3672.0	0.0	0.0	3681.4	3672.0	3672.0
0.0015	0.163E+04	0.110E+02	0.751E-02	0.0	0.0	1633.0	0.0	0.0	1641.0	1633.0	1633.0
0.01809	0.110E+04	0.106E+02	0.938E-02	0.0	0.0	1097.0	0.0	0.0	1110.6	1097.0	1097.0
M5	0.01809	0.130E+04	0.106E+02	0.938E-02	0.0	1305.0	0.0	0.0	1310.6	1305.0	1305.0
0.01872	0.285E+04	0.106E+02	0.975E-02	0.0	0.0	2854.0	0.0	0.0	2860.6	2854.0	2854.0
M4	0.01872	0.311E+04	0.106E+02	0.975E-02	0.0	3112.0	0.0	0.0	3120.6	3112.0	3112.0
0.0020	0.391E+04	0.104E+02	0.105E-01	0.0	0.0	3911.0	0.0	0.0	3920.4	3911.0	3911.0
M3	0.002281	0.282E+04	0.101E+02	0.122E-01	0.0	2818.0	0.0	0.0	2830.1	2818.0	2818.0
0.002281	0.327E+04	0.101E+02	0.122E-01	0.0	0.0	3269.0	0.0	0.0	3280.1	3269.0	3269.0
0.002575	0.244E+04	0.982E+01	0.139E-01	0.0	0.0	2436.0	0.0	0.0	2449.8	2436.0	2436.0
M2	0.002575	0.259E+04	0.982E+01	0.139E-01	0.0	2589.0	0.0	0.0	2599.8	2589.0	2589.0
0.002820	0.209E+04	0.955E+01	0.153E-01	0.0	0.0	2094.0	0.0	0.0	2099.6	2094.0	2094.0
M1	0.002820	0.218E+04	0.955E+01	0.153E-01	0.0	2184.0	0.0	0.0	2189.6	2184.0	2184.0
0.0030	0.189E+04	0.936E+01	0.163E-01	0.0	0.0	1893.0	0.0	0.0	1899.4	1893.0	1893.0
0.0040	0.948E+03	0.837E+01	0.219E-01	0.0	0.0	947.9	0.0	0.0	956.4	947.9	947.9
0.0050	0.546E+03	0.748E+01	0.271E-01	0.0	0.0	545.7	0.0	0.0	553.5	545.7	545.7
0.0060	0.345E+03	0.670E+01	0.320E-01	0.0	0.0	344.6	0.0	0.0	351.7	344.6	344.6
0.0080	0.165E+03	0.542E+01	0.407E-01	0.0	0.0	165.1	0.0	0.0	170.5	165.1	165.1
0.0100	0.924E+02	0.445E+01	0.479E-01	0.0	0.0	92.4	0.0	0.0	96.9	92.4	92.4
0.01021	0.876E+02	0.436E+01	0.486E-01	0.0	0.0	87.6	0.0	0.0	92.0	87.6	87.6
I3	0.01021	0.229E+03	0.436E+01	0.486E-01	0.0	185.2	0.0	0.0	233.4	185.2	185.2
0.01154	0.165E+03	0.386E+01	0.528E-01	0.0	0.0	137.1	0.0	0.0	168.9	137.1	137.1
L2	0.01154	0.227E+03	0.386E+01	0.528E-01	0.0	188.9	0.0	0.0	230.9	188.9	188.9
0.01210	0.203E+03	0.368E+01	0.544E-01	0.0	0.0	170.1	0.0	0.0	206.7	170.1	170.1
L1	0.01210	0.234E+03	0.368E+01	0.544E-01	0.0	196.7	0.0	0.0	237.7	196.7	196.7
0.0150	0.136E+03	0.289E+01	0.620E-01	0.0	0.0	118.3	0.0	0.0	139.0	118.3	118.3
0.0200	0.636E+02	0.204E+01	0.725E-01	0.0	0.0	57.42	0.0	0.0	65.71	57.42	57.42
0.0300	0.214E+02	0.120E+01	0.864E-01	0.0	0.0	20.04	0.01	0.0	22.69	20.05	20.05
0.0400	0.978E+01	0.794E+00	0.943E-01	0.0	0.0	9.304	0.007	0.0	10.668	9.311	9.311
0.0500	0.529E+01	0.561E+00	0.986E-01	0.0	0.0	5.084	0.009	0.0	5.950	5.093	5.093
0.0600	0.319E+01	0.421E+00	0.101E+00	0.0	0.0	3.088	0.010	0.0	3.712	3.098	3.098
0.06953	0.212E+01	0.322E+00	0.102E+00	0.0	0.0	2.058	0.012	0.0	2.554	2.070	2.070
0.06953	0.108E+02	0.332E+00	0.102E+00	0.0	0.0	3.514	0.012	0.0	11.234	3.526	3.526
0.0800	0.744E+01	0.264E+00	0.103E+00	0.0	0.0	3.079	0.013	0.0	7.807	3.092	3.092
0.1000	0.415E+01	0.181E+00	0.102E+00	0.0	0.0	2.206	0.015	0.0	4.433	2.221	2.221
0.1500	0.140E+01	0.688E-01	0.974E-01	0.0	0.0	0.9588	0.0186	0.0	1.5862	0.9774	0.9774
0.2000	0.640E+00	0.529E-01	0.918E-01	0.0	0.0	0.4897	0.0206	0.0	0.7847	0.5102	0.5102
0.3000	0.217E+00	0.251E-01	0.821E-01	0.0	0.0	0.1827	0.0227	0.0	0.3242	0.2054	0.2054
0.4000	0.103E+00	0.146E-01	0.746E-01	0.0	0.0	0.0911	0.0235	0.0	0.1922	0.1146	0.1146
0.5000	0.596E-01	0.954E-02	0.687E-01	0.0	0.0	0.0540	0.0237	0.0	0.1378	0.0777	0.0777
0.6000	0.387E-01	0.671E-02	0.638E-01	0.0	0.0	0.0357	0.0236	0.0	0.1092	0.0593	0.0593
0.8000	0.204E-01	0.384E-02	0.564E-01	0.0	0.0	0.0193	0.0230	0.0	0.0806	0.0423	0.0415
1.0000	0.128E-01	0.248E-02	0.509E-01	0.0	0.0	0.0122	0.0223	0.0	0.0662	0.0345	0.0336
1.2500	0.828E-02	0.160E-02	0.456E-01	0.323E-03	0.0	0.0080	0.0213	0.0001	0.0558	0.0293	0.0283
1.5000	0.591E-02	0.111E-02	0.415E-01	0.151E-02	0.0	0.0057	0.0203	0.0005	0.0500	0.0265	0.0253
2.0000	0.375E-02	0.629E-03	0.354E-01	0.468E-02	0.0	0.0035	0.0185	0.0023	0.0443	0.0228	0.0228
3.0000	0.188E-02	0.281E-03	0.279E-01	0.107E-01	0.975E-05	0.0019	0.0158	0.0071	0.0408	0.0247	0.0226
4.0000	0.123E-02	0.158E-03	0.233E-01	0.157E-01	0.398E-04	0.0012	0.0138	0.0117	0.0404	0.0267	0.0239
5.0000	0.904E-03	0.101E-03	0.201E-01	0.198E-01	0.791E-04	0.0009	0.0123	0.0158	0.0410	0.0291	0.0254
6.0000	0.710E-03	0.703E-04	0.178E-01	0.234E-01	0.121E-03	0.0007	0.0112	0.0195	0.0421	0.0314	0.0268
8.0000	0.492E-03	0.396E-04	0.146E-01	0.294E-01	0.204E-03	0.0005	0.0095	0.0258	0.0447	0.0358	0.0293
10.0000	0.375E-03	0.253E-04	0.124E-01	0.344E-01	0.279E-03	0.0004	0.0083	0.0312	0.0475	0.0398	0.0313
15.0000	0.233E-03	0.113E-04	0.917E-02	0.40E-01	0.434E-03	0.0002	0.0064	0.0414	0.0538	0.0480	0.0345
20.0000	0.169E-03	0.633E-05	0.736E-02	0.508E-01	0.553E-03	0.0002	0.0053	0.0488	0.0589	0.0542	0.0361
30.0000	0.108E-03	0.281E-05	0.536E-02	0.603E-01	0.724E-03	0.0001	0.0040	0.0665	0.0663	0.0631	0.0369
40.0000	0.798E-04	0.158E-05	0.426E-02	0.668E-01	0.843E-03	0.0001	0.0032	0.0660	0.0720	0.0693	0.0365
50.0000	0.631E-04	0.101E-05	0.356E-02	0.716E-01	0.934E-03	0.0001	0.0028	0.0711	0.0762	0.0739	0.0357
60.0000	0.522E-04	0.704E-06	0.306E-02	0.754E-01	0.100E-02	0.0001	0.0024	0.0751	0.0795	0.0775	0.0347
80.0000	0.387E-04	0.396E-06	0.242E-02	0.809E-01	0.111E-02	0.0	0.0019	0.0810	0.0845	0.0829	0.0329
100.0000	0.308E-04	0.253E-06	0.201E-02	0.847E-01	0.119E-02	0.0	0.0016	0.0850	0.0879	0.0867	0.0312

[All Units: cm²/g]

PLATINUM

Z = 78

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_N/ρ	κ_o/ρ	τ_{tR}/ρ	σ_{tR}/ρ	κ_{tR}/ρ	μ/ρ	μ_{tR}/ρ	μ_{en}/ρ
0.0010	0.442E+04	0.121E+02	0.337E-02	0.0	0.0	4421.0	0.0	0.0	4432.1	4421.0	4421.0
0.0015	0.197E+04	0.116E+02	0.621E-02	0.0	0.0	1975.0	0.0	0.0	1981.6	1975.0	1975.0
0.0020	0.107E+04	0.111E+02	0.913E-02	0.0	0.0	1069.0	0.0	0.0	1081.1	1069.0	1069.0
0.002126	0.940E+03	0.109E+02	0.984E-02	0.0	0.0	939.7	0.0	0.0	950.9	939.7	939.7
M5 .002126	0.102E+04	0.109E+02	0.948E-02	0.0	0.0	1019.0	0.0	0.0	1030.9	1019.0	1019.0
.002202	0.229E+04	0.108E+02	0.103E-01	0.0	0.0	2293.0	0.0	0.0	2300.8	2293.0	2293.0
M4 .002202	0.244E+04	0.108E+02	0.103E-01	0.0	0.0	2441.0	0.0	0.0	2450.8	2441.0	2441.0
.002645	0.229E+04	0.103E+02	0.128E-01	0.0	0.0	2295.0	0.0	0.0	2300.3	2295.0	2295.0
M3 .002645	0.265E+04	0.103E+02	0.128E-01	0.0	0.0	2650.0	0.0	0.0	2660.3	2650.0	2650.0
0.0030	0.196E+04	0.992E+01	0.148E-01	0.0	0.0	1955.0	0.0	0.0	1969.9	1955.0	1955.0
.003026	0.191E+04	0.989E+01	0.150E-01	0.0	0.0	1913.0	0.0	0.0	1919.9	1913.0	1913.0
M2 .003026	0.203E+04	0.989E+01	0.150E-01	0.0	0.0	2031.0	0.0	0.0	2039.9	2031.0	2031.0
.003296	0.166E+04	0.959E+01	0.164E-01	0.0	0.0	1661.0	0.0	0.0	1669.6	1661.0	1661.0
M1 .003296	0.173E+04	0.959E+01	0.164E-01	0.0	0.0	1732.0	0.0	0.0	1739.6	1732.0	1732.0
0.0040	0.109E+04	0.884E+01	0.202E-01	0.0	0.0	1091.0	0.0	0.0	1098.9	1091.0	1091.0
.0050	0.632E+03	0.789E+01	0.253E-01	0.0	0.0	632.2	0.0	0.0	639.9	632.2	632.2
0.0060	0.401E+03	0.706E+01	0.302E-01	0.0	0.0	401.0	0.0	0.0	408.1	401.0	401.0
0.0080	0.193E+03	0.574E+01	0.391E-01	0.0	0.0	192.9	0.0	0.0	198.8	192.9	192.9
0.0100	0.108E+03	0.474E+01	0.465E-01	0.0	0.0	108.4	0.0	0.0	112.8	108.4	108.4
.01156	0.743E+02	0.412E+01	0.515E-01	0.0	0.0	74.3	0.0	0.0	78.5	74.3	74.3
L3 .01156	0.190E+03	0.412E+01	0.515E-01	0.0	0.0	147.1	0.0	0.0	154.2	147.1	147.1
.01327	0.131E+03	0.356E+01	0.561E-01	0.0	0.0	105.3	0.0	0.0	108.5	105.3	105.3
L2 .01327	0.182E+03	0.356E+01	0.561E-01	0.0	0.0	145.7	0.0	0.0	148.6	145.7	145.7
.01388	0.163E+03	0.339E+01	0.577E-01	0.0	0.0	132.2	0.0	0.0	136.4	132.2	132.2
L1 .01388	0.189E+03	0.339E+01	0.577E-01	0.0	0.0	152.9	0.0	0.0	157.4	152.9	152.9
0.0150	0.155E+03	0.311E+01	0.604E-01	0.0	0.0	127.5	0.0	0.0	128.2	127.5	127.5
.0200	0.735E+02	0.219E+01	0.706E-01	0.0	0.0	63.81	0.0	0.0	65.76	63.81	63.81
0.0300	0.250E+02	0.129E+01	0.844E-01	0.0	0.0	22.83	0.01	0.0	26.37	22.84	22.84
0.0400	0.115E+02	0.859E+00	0.923E-01	0.0	0.0	10.74	0.01	0.0	12.45	10.75	10.75
0.0500	0.625E+01	0.609E+00	0.968E-01	0.0	0.0	5.919	0.009	0.0	6.956	5.928	5.928
0.0600	0.378E+01	0.456E+00	0.993E-01	0.0	0.0	3.619	0.010	0.0	4.335	3.629	3.629
.07839	0.181E+01	0.296E+00	0.101E+00	0.0	0.0	1.745	0.013	0.0	2.207	1.758	1.758
K .07839	0.898E+01	0.296E+00	0.101E+00	0.0	0.0	2.884	0.013	0.0	3.377	2.897	2.897
0.0800	0.834E+01	0.286E+00	0.101E+00	0.0	0.0	2.793	0.013	0.0	3.377	2.897	2.897
0.1000	0.470E+01	0.197E+00	0.101E+00	0.0	0.0	2.196	0.015	0.0	4.998	2.211	2.211
0.1500	0.160E+01	0.969E-01	0.963E-01	0.0	0.0	1.034	0.018	0.0	1.793	1.052	1.052
0.2000	0.741E+00	0.578E-01	0.909E-01	0.0	0.0	0.5438	0.0204	0.0	0.8897	0.5642	0.5642
0.3000	0.254E+00	0.275E-01	0.814E-01	0.0	0.0	0.2086	0.0225	0.0	0.3629	0.2311	0.2308
0.4000	0.122E+00	0.160E-01	0.740E-01	0.0	0.0	0.1055	0.0233	0.0	0.2120	0.1288	0.1284
0.5000	0.706E-01	0.105E-01	0.681E-01	0.0	0.0	0.0631	0.0235	0.0	0.1492	0.0866	0.0860
0.6000	0.461E-01	0.738E-02	0.633E-01	0.0	0.0	0.0420	0.0234	0.0	0.1168	0.0654	0.0648
0.8000	0.244E-01	0.423E-02	0.560E-01	0.0	0.0	0.0228	0.0229	0.0	0.0846	0.0456	0.0448
1.0000	0.153E-01	0.273E-02	0.505E-01	0.0	0.0	0.0145	0.0221	0.0	0.0685	0.0366	0.0356
1.2500	0.990E-02	0.176E-02	0.453E-01	0.351E-03	0.0	0.0095	0.0211	0.0001	0.0573	0.0307	0.0295
1.5000	0.707E-02	0.123E-02	0.412E-01	0.166E-02	0.0	0.0068	0.0201	0.0005	0.0511	0.0274	0.0262
2.0000	0.427E-02	0.695E-03	0.352E-01	0.507E-02	0.0	0.0042	0.0184	0.0025	0.0452	0.0250	0.0235
3.0000	0.223E-02	0.310E-03	0.277E-01	0.113E-01	0.969E-05	0.0022	0.0157	0.0075	0.0415	0.0253	0.0231
4.0000	0.147E-02	0.175E-03	0.231E-01	0.164E-01	0.785E-04	0.0015	0.0137	0.0123	0.0412	0.0274	0.0244
5.0000	0.107E-02	0.112E-03	0.200E-01	0.207E-01	0.785E-04	0.0011	0.0122	0.0165	0.0420	0.0298	0.0259
6.0000	0.843E-03	0.778E-04	0.177E-01	0.244E-01	0.120E-03	0.0008	0.0111	0.0203	0.0431	0.0323	0.0274
8.0000	0.584E-03	0.438E-04	0.145E-01	0.306E-01	0.202E-03	0.0006	0.0094	0.0269	0.0459	0.0368	0.0299
10.0000	0.444E-03	0.280E-04	0.123E-01	0.357E-01	0.277E-03	0.0004	0.0082	0.0322	0.0487	0.0409	0.0319
15.0000	0.276E-03	0.125E-04	0.912E-02	0.455E-01	0.431E-03	0.0003	0.0063	0.0429	0.0553	0.0494	0.0352
20.0000	0.200E-03	0.700E-05	0.732E-02	0.526E-01	0.548E-03	0.0002	0.0052	0.0504	0.0607	0.0558	0.0367
30.0000	0.128E-03	0.311E-05	0.533E-02	0.624E-01	0.717E-03	0.0001	0.0040	0.0609	0.0686	0.0650	0.0375
40.0000	0.943E-04	0.175E-05	0.423E-02	0.691E-01	0.835E-03	0.0001	0.0032	0.0681	0.0743	0.0715	0.0371
50.0000	0.745E-04	0.112E-05	0.353E-02	0.741E-01	0.924E-03	0.0001	0.0027	0.0735	0.0786	0.0763	0.0362
60.0000	0.616E-04	0.779E-06	0.304E-02	0.779E-01	0.994E-03	0.0001	0.0024	0.0776	0.0820	0.0800	0.0353
80.0000	0.457E-04	0.438E-06	0.240E-02	0.836E-01	0.110E-02	0.0	0.0019	0.0836	0.0871	0.0856	0.0334
100.0000	0.364E-04	0.280E-06	0.199E-02	0.876E-01	0.117E-02	0.0	0.0016	0.0879	0.0895	0.0885	0.0317

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_H/ρ	κ_0/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.520E+04	0.125E+02	0.359E-02	0.0	0.0	5197.0	0.0	0.0	5212.5	5197.0	5197.0
0.0015	0.234E+04	0.120E+02	0.660E-02	0.0	0.0	2344.0	0.0	0.0	2352.0	2344.0	2344.0
0.0020	0.127E+04	0.114E+02	0.962E-02	0.0	0.0	1274.0	0.0	0.0	1281.4	1274.0	1274.0
0.002484	0.790E+03	0.109E+02	0.124E-01	0.0	0.0	790.0	0.0	0.0	800.9	790.0	790.0
M5_002484	0.138E+04	0.109E+02	0.124E-01	0.0	0.0	1385.0	0.0	0.0	1390.9	1385.0	1385.0
M4_002586	0.193E+04	0.108E+02	0.130E-01	0.0	0.0	1933.0	0.0	0.0	1940.8	1933.0	1933.0
0.002586	0.244E+04	0.108E+02	0.130E-01	0.0	0.0	2439.0	0.0	0.0	2450.8	2439.0	2439.0
0.0030	0.195E+04	0.103E+02	0.152E-01	0.0	0.0	1955.0	0.0	0.0	1960.3	1955.0	1955.0
0.003066	0.185E+04	0.102E+02	0.156E-01	0.0	0.0	1847.0	0.0	0.0	1860.2	1847.0	1847.0
M3_003066	0.214E+04	0.102E+02	0.156E-01	0.0	0.0	2136.0	0.0	0.0	2150.2	2136.0	2136.0
M2_003554	0.149E+04	0.965E+01	0.181E-01	0.0	0.0	1486.0	0.0	0.0	1499.7	1486.0	1486.0
0.003554	0.157E+04	0.965E+01	0.181E-01	0.0	0.0	1575.0	0.0	0.0	1579.7	1575.0	1575.0
0.003851	0.130E+04	0.934E+01	0.196E-01	0.0	0.0	1302.0	0.0	0.0	1309.4	1302.0	1302.0
M1_003851	0.136E+04	0.934E+01	0.196E-01	0.0	0.0	1358.0	0.0	0.0	1369.4	1358.0	1358.0
0.0040	0.124E+04	0.918E+01	0.204E-01	0.0	0.0	1242.0	0.0	0.0	1249.2	1242.0	1242.0
0.0050	0.722E+03	0.821E+01	0.252E-01	0.0	0.0	722.2	0.0	0.0	730.2	722.2	722.2
0.0060	0.460E+03	0.736E+01	0.297E-01	0.0	0.0	459.8	0.0	0.0	467.4	459.8	459.8
0.0080	0.223E+03	0.600E+01	0.381E-01	0.0	0.0	222.6	0.0	0.0	229.0	222.6	222.6
0.0100	0.126E+03	0.498E+01	0.454E-01	0.0	0.0	125.6	0.0	0.0	131.0	125.6	125.6
0.1304	0.631E+02	0.385E+01	0.543E-01	0.0	0.0	63.1	0.0	0.0	67.0	63.1	63.1
L3_01304	0.158E+03	0.385E+01	0.543E-01	0.0	0.0	117.1	0.0	0.0	161.9	117.1	117.1
0.0150	0.108E+03	0.331E+01	0.592E-01	0.0	0.0	108.2	0.0	0.0	111.4	108.2	108.2
0.01520	0.104E+03	0.326E+01	0.596E-01	0.0	0.0	81.2	0.0	0.0	107.3	81.2	81.2
L2_01520	0.145E+03	0.326E+01	0.596E-01	0.0	0.0	112.8	0.0	0.0	148.3	112.8	112.8
0.01586	0.131E+03	0.310E+01	0.611E-01	0.0	0.0	103.2	0.0	0.0	103.2	103.2	103.2
L1_01586	0.152E+03	0.310E+01	0.611E-01	0.0	0.0	119.2	0.0	0.0	155.2	119.2	119.2
0.0200	0.840E+02	0.234E+01	0.690E-01	0.0	0.0	69.74	0.0	0.0	86.41	69.74	69.74
0.0300	0.289E+02	0.138E+01	0.823E-01	0.0	0.0	25.60	0.0	0.0	30.36	25.60	25.60
0.0400	0.133E+02	0.920E+00	0.902E-01	0.0	0.0	12.21	0.0	0.0	14.31	12.22	12.22
0.0500	0.729E+01	0.655E+00	0.948E-01	0.0	0.0	6.797	0.009	0.0	8.040	6.806	6.806
0.0600	0.443E+01	0.490E+00	0.973E-01	0.0	0.0	4.182	0.010	0.0	5.017	4.192	4.192
0.0800	0.201E+01	0.308E+00	0.992E-01	0.0	0.0	1.927	0.013	0.0	2.417	1.940	1.940
0.0805	0.155E+01	0.263E+00	0.993E-01	0.0	0.0	1.488	0.013	0.0	1.501	1.501	1.501
0.0805	0.732E+01	0.263E+00	0.993E-01	0.0	0.0	2.409	0.013	0.0	7.682	2.422	2.422
0.1000	0.524E+01	0.213E+00	0.989E-01	0.0	0.0	2.145	0.015	0.0	2.159	2.159	2.159
0.1000	0.181E+01	0.105E+00	0.948E-01	0.0	0.0	1.101	0.018	0.0	2.010	1.119	1.118
0.2000	0.846E+00	0.626E-01	0.897E-01	0.0	0.0	0.5964	0.0202	0.0	0.9983	0.6166	0.6165
0.3000	0.293E+00	0.299E-01	0.804E-01	0.0	0.0	0.2353	0.0222	0.0	0.4033	0.2575	0.2572
0.4000	0.142E+00	0.175E-01	0.731E-01	0.0	0.0	0.1208	0.0230	0.0	0.2326	0.1438	0.1434
0.5000	0.826E-01	0.114E-01	0.673E-01	0.0	0.0	0.0728	0.0232	0.0	0.1613	0.0960	0.0955
0.6000	0.541E-01	0.806E-02	0.628E-01	0.0	0.0	0.0488	0.0231	0.0	0.1248	0.0719	0.0712
0.8000	0.287E-01	0.462E-02	0.554E-01	0.0	0.0	0.0266	0.0226	0.0	0.0887	0.0492	0.0483
1.0000	0.181E-01	0.299E-02	0.499E-01	0.0	0.0	0.0171	0.0218	0.0	0.0710	0.0389	0.0379
1.2500	0.117E-01	0.193E-02	0.448E-01	0.378E-03	0.0	0.0111	0.0209	0.0001	0.0588	0.0321	0.0309
1.5000	0.832E-02	0.135E-02	0.407E-01	0.181E-02	0.0	0.0080	0.0199	0.0006	0.0522	0.0284	0.0271
2.0000	0.503E-02	0.763E-03	0.348E-01	0.545E-02	0.0	0.0049	0.0181	0.0027	0.0460	0.0257	0.0241
3.0000	0.263E-02	0.341E-03	0.274E-01	0.119E-01	0.959E-05	0.0026	0.0155	0.0078	0.0423	0.0259	0.0236
4.0000	0.172E-02	0.192E-03	0.229E-01	0.171E-01	0.391E-04	0.0017	0.0135	0.0128	0.0420	0.0280	0.0248
5.0000	0.126E-02	0.123E-03	0.198E-01	0.215E-01	0.777E-04	0.0012	0.0121	0.0172	0.0428	0.0305	0.0264
6.0000	0.989E-03	0.854E-04	0.175E-01	0.252E-01	0.119E-03	0.0010	0.0110	0.0210	0.0439	0.0279	0.0279
8.0000	0.684E-03	0.481E-04	0.143E-01	0.315E-01	0.200E-03	0.0007	0.0093	0.0276	0.0467	0.0376	0.0304
10.0000	0.520E-03	0.308E-04	0.122E-01	0.367E-01	0.274E-03	0.0005	0.0081	0.0332	0.0497	0.0418	0.0325
15.0000	0.323E-03	0.137E-04	0.902E-02	0.468E-01	0.425E-03	0.0003	0.0062	0.0566	0.0620	0.0506	0.0358
20.0000	0.233E-03	0.770E-05	0.724E-02	0.540E-01	0.541E-03	0.0002	0.0052	0.0518	0.0620	0.0572	0.0374
30.0000	0.150E-03	0.342E-05	0.527E-02	0.641E-01	0.708E-03	0.0001	0.0039	0.0626	0.0702	0.0566	0.0383
40.0000	0.110E-03	0.192E-05	0.419E-02	0.710E-01	0.825E-03	0.0001	0.0027	0.0700	0.0761	0.0733	0.0378
50.0000	0.870E-04	0.123E-05	0.350E-02	0.761E-01	0.912E-03	0.0001	0.0022	0.0754	0.0806	0.0782	0.0370
60.0000	0.719E-04	0.855E-06	0.301E-02	0.800E-01	0.981E-03	0.0001	0.0019	0.0841	0.0820	0.0841	0.0360
80.0000	0.534E-04	0.481E-06	0.238E-02	0.858E-01	0.108E-02	0.0001	0.0014	0.0858	0.0893	0.0878	0.0340
100.0000	0.424E-04	0.308E-06	0.197E-02	0.899E-01	0.116E-02	0.0	0.0016	0.0902	0.0931	0.0918	0.0323

URANIUM

Z = 92

Table with 10 columns: E (MeV), τ/p, σ_T/p, σ/p, κ_a/p, κ_g/p, κ_{tr}/p, κ_{ex}/p, μ/p, μ_{tr}/p, μ_{en}/p. Rows include energy levels (e.g., N3, N2, N1) and various isotopes (L3, L2, L1, K).

A-150 TISSUE-EQUIVALENT PLASTIC [ALL Units: cm²/g]

A-150 TISSUE-EQUIVALENT PLASTIC

E (MeV)	τ/ρ	σ_z/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	τ_{tx}/ρ	σ_{tx}/ρ	κ_{tx}/ρ	μ/ρ	μ_{tx}/ρ	μ_{en}/ρ
0.0010	0.226E+04	0.109E+01	0.161E-01	0.0	0.0	2258.0	0.0	0.0	2261.1	2258.0	2258.0
0.0015	0.727E+03	0.974E+00	0.318E-01	0.0	0.0	727.3	0.0	0.0	728.0	727.3	727.3
0.0020	0.317E+03	0.852E+00	0.486E-01	0.0	0.0	317.4	0.0	0.0	317.9	317.4	317.4
0.0030	0.958E+02	0.638E+00	0.791E-01	0.0	0.0	95.79	0.0	0.0	96.52	95.79	95.79
0.0040	0.402E+02	0.484E+00	0.102E+00	0.0	0.0	40.22	0.0	0.0	40.79	40.22	40.22
0.0050	0.302E+02	0.380E+00	0.119E+00	0.0	0.0	30.70	0.0	0.0	30.70	30.18	30.18
0.0060	0.177E+02	0.309E+00	0.131E+00	0.0	0.0	17.69	0.0	0.0	18.14	17.69	17.69
0.0080	0.755E+01	0.221E+00	0.146E+00	0.0	0.0	7.545	0.003	0.0	7.917	7.548	7.548
0.0100	0.386E+01	0.170E+00	0.157E+00	0.0	0.0	3.764	0.003	0.0	4.187	3.767	3.767
0.0150	0.112E+01	0.103E+00	0.171E+00	0.0	0.0	1.101	0.005	0.0	1.394	1.106	1.106
0.0200	0.460E+00	0.679E-01	0.179E+00	0.0	0.0	0.4535	0.0069	0.0	0.7069	0.4604	0.4604
0.0300	0.129E+00	0.355E-01	0.184E+00	0.0	0.0	0.1278	0.0100	0.0	0.3485	0.1378	0.1378
0.0400	0.519E-01	0.217E-01	0.183E+00	0.0	0.0	0.0514	0.0127	0.0	0.2566	0.0641	0.0641
0.0500	0.255E-01	0.146E-01	0.180E+00	0.0	0.0	0.0253	0.0149	0.0	0.2201	0.0402	0.0402
0.0600	0.142E-01	0.105E-01	0.176E+00	0.0	0.0	0.0142	0.0168	0.0	0.2007	0.0310	0.0310
0.0800	0.563E-02	0.613E-02	0.169E+00	0.0	0.0	0.0055	0.0201	0.0	0.1808	0.0256	0.0256
0.1000	0.275E-02	0.401E-02	0.161E+00	0.0	0.0	0.0028	0.0224	0.0	0.1678	0.0252	0.0252
0.1500	0.751E-03	0.182E-02	0.146E+00	0.0	0.0	0.0008	0.0266	0.0	0.1486	0.0274	0.0274
0.2000	0.303E-03	0.104E-02	0.134E+00	0.0	0.0	0.0003	0.0291	0.0	0.1353	0.0294	0.0294
0.3000	0.873E-04	0.464E-03	0.117E+00	0.0	0.0	0.0	0.0316	0.0	0.1176	0.0316	0.0316
0.4000	0.379E-04	0.262E-03	0.105E+00	0.0	0.0	0.0	0.0325	0.0	0.1053	0.0324	0.0324
0.5000	0.206E-04	0.168E-03	0.956E-01	0.0	0.0	0.0	0.0326	0.0	0.0958	0.0327	0.0326
0.6000	0.129E-04	0.117E-03	0.884E-01	0.0	0.0	0.0	0.0325	0.0	0.0885	0.0325	0.0325
0.8000	0.651E-05	0.657E-04	0.777E-01	0.0	0.0	0.0	0.0317	0.0	0.0778	0.0318	0.0317
1.0000	0.405E-05	0.420E-04	0.699E-01	0.0	0.0	0.0	0.0307	0.0	0.0699	0.0307	0.0307
1.2500	0.258E-05	0.269E-04	0.625E-01	0.146E-04	0.0	0.0	0.0294	0.0	0.0625	0.0294	0.0293
1.5000	0.187E-05	0.187E-04	0.568E-01	0.807E-04	0.0	0.0	0.0281	0.0	0.0569	0.0281	0.0280
2.0000	0.116E-05	0.105E-04	0.485E-01	0.321E-03	0.0	0.0	0.0257	0.0002	0.0488	0.0258	0.0258
3.0000	0.642E-06	0.467E-05	0.381E-01	0.919E-03	0.133E-04	0.0	0.0220	0.0006	0.0390	0.0226	0.0224
4.0000	0.437E-06	0.263E-05	0.318E-01	0.149E-02	0.545E-04	0.0	0.0193	0.0012	0.0333	0.0204	0.0202
5.0000	0.330E-06	0.168E-05	0.275E-01	0.200E-02	0.109E-03	0.0	0.0172	0.0017	0.0296	0.0189	0.0187
6.0000	0.264E-06	0.117E-05	0.243E-01	0.246E-02	0.167E-03	0.0	0.0156	0.0022	0.0269	0.0178	0.0175
8.0000	0.188E-06	0.657E-06	0.199E-01	0.323E-02	0.281E-03	0.0	0.0133	0.0031	0.0234	0.0163	0.0159
10.0000	0.146E-06	0.421E-06	0.169E-01	0.387E-02	0.387E-03	0.0	0.0115	0.0038	0.0212	0.0154	0.0149
15.0000	0.934E-07	0.187E-06	0.125E-01	0.506E-02	0.607E-03	0.0	0.0099	0.0053	0.0182	0.0142	0.0135
20.0000	0.686E-07	0.105E-06	0.100E-01	0.593E-02	0.780E-03	0.0	0.0073	0.0064	0.0167	0.0137	0.0128
30.0000	0.448E-07	0.467E-07	0.731E-02	0.715E-02	0.104E-02	0.0	0.0055	0.0079	0.0155	0.0134	0.0121
40.0000	0.332E-07	0.263E-07	0.581E-02	0.799E-02	0.123E-02	0.0	0.0045	0.0090	0.0150	0.0135	0.0118
50.0000	0.264E-07	0.168E-07	0.485E-02	0.863E-02	0.137E-02	0.0	0.0038	0.0098	0.0149	0.0136	0.0115
60.0000	0.219E-07	0.117E-07	0.418E-02	0.913E-02	0.149E-02	0.0	0.0033	0.0104	0.0148	0.0137	0.0114
80.0000	0.163E-07	0.657E-08	0.330E-02	0.990E-02	0.168E-02	0.0	0.0027	0.0115	0.0149	0.0141	0.0111
100.0000	0.130E-07	0.421E-08	0.274E-02	0.105E-01	0.182E-02	0.0	0.0023	0.0122	0.0151	0.0144	0.0109

(All Units: cm²/g)

ADIPOSE TISSUE (ICRP)

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.251E+04	0.110E+01	0.162E-01	0.0	0.0	2509.0	0.0	0.0	2511.1	2509.0	2509.0
0.0015	0.818E+03	0.967E+00	0.321E-01	0.0	0.0	818.2	0.0	0.0	819.0	818.2	818.2
0.0020	0.359E+03	0.659E+00	0.493E-01	0.0	0.0	359.2	0.0	0.0	359.9	359.2	359.2
0.0030	0.112E+03	0.655E+00	0.805E-01	0.0	0.0	111.8	0.0	0.0	112.7	111.8	111.8
0.0040	0.475E+02	0.498E+00	0.105E+00	0.0	0.0	47.48	0.0	0.0	48.10	47.48	47.48
0.0050	0.241E+02	0.390E+00	0.122E+00	0.0	0.0	24.11	0.0	0.0	24.61	24.11	24.11
0.0060	0.138E+02	0.315E+00	0.134E+00	0.0	0.0	13.77	0.0	0.0	14.25	13.77	13.77
0.0080	0.564E+01	0.223E+00	0.150E+00	0.0	0.0	5.635	0.003	0.0	6.013	5.638	5.638
0.0100	0.280E+01	0.169E+00	0.160E+00	0.0	0.0	2.791	0.003	0.0	3.129	2.794	2.794
0.0150	0.769E+00	0.100E+00	0.175E+00	0.0	0.0	0.7673	0.0052	0.0	1.0440	0.7725	0.7725
0.0200	0.304E+00	0.665E-01	0.182E+00	0.0	0.0	0.3035	0.0070	0.0	0.5525	0.3105	0.3105
0.0300	0.811E-01	0.348E-01	0.187E+00	0.0	0.0	0.0810	0.0102	0.0	0.0912	0.0912	0.0912
0.0400	0.315E-01	0.212E-01	0.186E+00	0.0	0.0	0.0315	0.0129	0.0	0.2387	0.0444	0.0444
0.0500	0.151E-01	0.142E-01	0.183E+00	0.0	0.0	0.0150	0.0152	0.0	0.2123	0.0302	0.0302
0.0600	0.827E-02	0.102E-01	0.179E+00	0.0	0.0	0.0083	0.0171	0.0	0.1975	0.0254	0.0254
0.0800	0.319E-02	0.596E-02	0.171E+00	0.0	0.0	0.0032	0.0203	0.0	0.1802	0.0235	0.0235
0.1000	0.153E-02	0.389E-02	0.164E+00	0.0	0.0	0.0015	0.0228	0.0	0.1694	0.0244	0.0244
0.1500	0.404E-03	0.177E-02	0.148E+00	0.0	0.0	0.0004	0.0270	0.0	0.1502	0.0275	0.0275
0.2000	0.160E-03	0.100E-02	0.136E+00	0.0	0.0	0.0002	0.0295	0.0	0.1372	0.0297	0.0297
0.3000	0.451E-04	0.448E-03	0.119E+00	0.0	0.0	0.0	0.0321	0.0	0.1195	0.0321	0.0321
0.4000	0.193E-04	0.253E-03	0.106E+00	0.0	0.0	0.0	0.0328	0.0	0.1063	0.0330	0.0330
0.5000	0.104E-04	0.162E-03	0.972E-01	0.0	0.0	0.0	0.0332	0.0	0.0974	0.0332	0.0332
0.6000	0.649E-05	0.112E-03	0.900E-01	0.0	0.0	0.0	0.0331	0.0	0.0901	0.0330	0.0330
0.8000	0.328E-05	0.633E-04	0.790E-01	0.0	0.0	0.0	0.0323	0.0	0.0791	0.0323	0.0323
1.0000	0.204E-05	0.405E-04	0.711E-01	0.0	0.0	0.0	0.0313	0.0	0.0711	0.0313	0.0312
1.2500	0.128E-05	0.259E-04	0.636E-01	0.145E-04	0.0	0.0	0.0299	0.0	0.0636	0.0299	0.0298
1.5000	0.932E-06	0.180E-04	0.578E-01	0.804E-04	0.0	0.0	0.0286	0.0	0.0579	0.0286	0.0285
2.0000	0.586E-06	0.101E-04	0.493E-01	0.320E-03	0.0	0.0	0.0261	0.0002	0.0496	0.0263	0.0262
3.0000	0.328E-06	0.451E-05	0.388E-01	0.917E-03	0.136E-04	0.0	0.0244	0.0006	0.0397	0.0230	0.0228
4.0000	0.225E-06	0.253E-05	0.324E-01	0.149E-02	0.554E-04	0.0	0.0196	0.0011	0.0339	0.0205	0.0205
5.0000	0.171E-06	0.162E-05	0.279E-01	0.200E-02	0.110E-03	0.0	0.0175	0.0017	0.0300	0.0192	0.0190
6.0000	0.137E-06	0.113E-05	0.247E-01	0.245E-02	0.170E-03	0.0	0.0159	0.0022	0.0273	0.0182	0.0178
8.0000	0.983E-07	0.634E-06	0.202E-01	0.323E-02	0.286E-03	0.0	0.0135	0.0031	0.0237	0.0165	0.0161
10.0000	0.765E-07	0.405E-06	0.172E-01	0.387E-02	0.393E-03	0.0	0.0118	0.0038	0.0215	0.0156	0.0151
15.0000	0.491E-07	0.180E-06	0.127E-01	0.505E-02	0.618E-03	0.0	0.0090	0.0053	0.0184	0.0143	0.0136
20.0000	0.362E-07	0.101E-06	0.102E-01	0.592E-02	0.793E-03	0.0	0.0074	0.0064	0.0169	0.0138	0.0129
30.0000	0.237E-07	0.451E-07	0.744E-02	0.714E-02	0.106E-02	0.0	0.0056	0.0079	0.0156	0.0122	0.0122
40.0000	0.176E-07	0.253E-07	0.591E-02	0.798E-02	0.125E-02	0.0	0.0045	0.0090	0.0151	0.0135	0.0135
50.0000	0.140E-07	0.162E-07	0.494E-02	0.862E-02	0.140E-02	0.0	0.0039	0.0098	0.0150	0.0137	0.0116
60.0000	0.116E-07	0.113E-07	0.425E-02	0.913E-02	0.152E-02	0.0	0.0034	0.0104	0.0149	0.0138	0.0115
80.0000	0.867E-08	0.634E-08	0.335E-02	0.989E-02	0.171E-02	0.0	0.0027	0.0115	0.0150	0.0145	0.0112
100.0000	0.691E-08	0.405E-08	0.278E-02	0.105E-01	0.185E-02	0.0	0.0023	0.0122	0.0151	0.0145	0.0110

AIR, DRY (NEAR SEA LEVEL) [All Units: cm²/g]

E(MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_H/ρ	κ_Θ/ρ	τ_{TX}/ρ	σ_{TX}/ρ	κ_{TX}/ρ	μ/ρ	μ_{TX}/ρ	μ_{en}/ρ
0.0010	0.360E+04	0.136E+01	0.104E-01	0.0	0.0	3605.0	0.0	0.0	3601.4	3605.0	3605.0
0.0015	0.119E+04	0.125E+01	0.212E-01	0.0	0.0	1190.0	0.0	0.0	1191.3	1190.0	1190.0
0.0020	0.527E+03	0.112E+01	0.334E-01	0.0	0.0	526.8	0.0	0.0	528.2	526.8	526.8
0.0030	0.162E+03	0.863E+00	0.575E-01	0.0	0.0	161.6	0.0	0.0	162.9	161.6	161.6
0.0040	0.771E+02	0.665E+00	0.777E-01	0.0	0.0	77.13	0.0	0.0	77.84	77.13	77.13
0.0050	0.397E+02	0.522E+00	0.933E-01	0.0	0.0	39.66	0.0	0.0	40.32	39.66	39.66
0.0060	0.229E+02	0.421E+00	0.105E+00	0.0	0.0	22.88	0.0	0.0	23.43	22.88	22.88
0.0080	0.950E+01	0.295E+00	0.121E+00	0.0	0.0	9.503	0.002	0.0	9.916	9.505	9.505
0.0100	0.477E+01	0.222E+00	0.132E+00	0.0	0.0	4.739	0.003	0.0	5.124	4.742	4.742
0.0150	0.134E+01	0.131E+00	0.147E+00	0.0	0.0	1.330	0.004	0.0	1.618	1.334	1.334
0.0200	0.535E+00	0.875E-01	0.156E+00	0.0	0.0	0.5330	0.0061	0.0	0.7785	0.5391	0.5391
0.0300	0.145E+00	0.462E-01	0.162E+00	0.0	0.0	0.1448	0.0090	0.0	0.3532	0.1538	0.1538
0.0400	0.570E-01	0.283E-01	0.163E+00	0.0	0.0	0.0570	0.0114	0.0	0.2483	0.0684	0.0684
0.0500	0.275E-01	0.191E-01	0.161E+00	0.0	0.0	0.0275	0.0135	0.0	0.2076	0.0410	0.0410
0.0600	0.152E-01	0.137E-01	0.159E+00	0.0	0.0	0.0151	0.0153	0.0	0.1879	0.0304	0.0304
0.0800	0.591E-02	0.803E-02	0.152E+00	0.0	0.0	0.0060	0.0181	0.0	0.1659	0.0241	0.0241
0.1000	0.285E-02	0.525E-02	0.146E+00	0.0	0.0	0.0029	0.0204	0.0	0.1541	0.0233	0.0233
0.1500	0.760E-03	0.240E-02	0.132E+00	0.0	0.0	0.0009	0.0241	0.0	0.1352	0.0250	0.0250
0.2000	0.303E-03	0.136E-02	0.122E+00	0.0	0.0	0.0002	0.0265	0.0	0.1237	0.0267	0.0267
0.3000	0.860E-04	0.610E-03	0.106E+00	0.0	0.0	0.0001	0.0286	0.0	0.1067	0.0287	0.0287
0.4000	0.370E-04	0.344E-03	0.951E-01	0.0	0.0	0.0	0.0295	0.0	0.0955	0.0295	0.0295
0.5000	0.200E-04	0.220E-03	0.869E-01	0.0	0.0	0.0	0.0297	0.0	0.0871	0.0297	0.0297
0.6000	0.125E-04	0.153E-03	0.804E-01	0.0	0.0	0.0	0.0296	0.0	0.0806	0.0296	0.0296
0.8000	0.630E-05	0.862E-04	0.706E-01	0.0	0.0	0.0	0.0288	0.0	0.0707	0.0289	0.0288
1.0000	0.391E-05	0.552E-04	0.635E-01	0.0	0.0	0.0	0.0279	0.0	0.0636	0.0279	0.0279
1.2500	0.248E-05	0.353E-04	0.568E-01	0.178E-04	0.0	0.0	0.0267	0.0	0.0569	0.0267	0.0267
1.5000	0.180E-05	0.245E-04	0.516E-01	0.985E-04	0.0	0.0	0.0255	0.0	0.0517	0.0256	0.0255
2.0000	0.113E-05	0.138E-04	0.441E-01	0.392E-03	0.0	0.0	0.0234	0.0002	0.0445	0.0236	0.0234
3.0000	0.628E-06	0.613E-05	0.347E-01	0.112E-02	0.121E-04	0.0	0.0200	0.0007	0.0358	0.0207	0.0205
4.0000	0.430E-06	0.345E-05	0.289E-01	0.162E-02	0.485E-04	0.0	0.0175	0.0014	0.0308	0.0189	0.0187
5.0000	0.325E-06	0.221E-05	0.250E-01	0.244E-02	0.987E-04	0.0	0.0157	0.0020	0.0275	0.0177	0.0174
6.0000	0.261E-06	0.153E-05	0.221E-01	0.300E-02	0.152E-03	0.0	0.0142	0.0026	0.0253	0.0168	0.0165
8.0000	0.187E-06	0.863E-06	0.181E-01	0.394E-02	0.256E-03	0.0	0.0121	0.0037	0.0223	0.0157	0.0152
10.0000	0.145E-06	0.552E-06	0.154E-01	0.472E-02	0.352E-03	0.0	0.0105	0.0046	0.0205	0.0150	0.0145
15.0000	0.932E-07	0.245E-06	0.114E-01	0.617E-02	0.552E-03	0.0	0.0081	0.0063	0.0181	0.0143	0.0135
20.0000	0.686E-07	0.138E-06	0.913E-02	0.721E-02	0.708E-03	0.0	0.0066	0.0075	0.0170	0.0142	0.0131
30.0000	0.448E-07	0.614E-07	0.665E-02	0.869E-02	0.942E-03	0.0	0.0050	0.0093	0.0163	0.0143	0.0127
40.0000	0.333E-07	0.345E-07	0.529E-02	0.971E-02	0.111E-02	0.0	0.0040	0.0105	0.0161	0.0146	0.0126
50.0000	0.265E-07	0.221E-07	0.441E-02	0.105E-01	0.124E-02	0.0	0.0034	0.0115	0.0162	0.0149	0.0125
60.0000	0.220E-07	0.153E-07	0.380E-02	0.111E-01	0.135E-02	0.0	0.0030	0.0122	0.0162	0.0152	0.0124
80.0000	0.164E-07	0.862E-08	0.300E-02	0.120E-01	0.152E-02	0.0	0.0024	0.0133	0.0165	0.0158	0.0123
100.0000	0.131E-07	0.552E-08	0.249E-02	0.127E-01	0.164E-02	0.0	0.0020	0.0142	0.0168	0.0162	0.0121

[All Units: cm²/g]

BONE, CORTICAL (ICRP)

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_H/ρ	κ_0/ρ	τ_{eF}/ρ	σ_{eF}/ρ	κ_{eF}/ρ	μ/ρ	μ_{eF}/ρ	μ_{en}/ρ
0.0010	0.374E+04	0.194E+01	0.128E-01	0.0	0.0	3736.0	0.0	0.0	3742.0	3736.0	3736.0
0.0015	0.128E+04	0.177E+01	0.243E-01	0.0	0.0	1276.0	0.0	0.0	1281.8	1276.0	1276.0
0.0020	0.577E+03	0.160E+01	0.366E-01	0.0	0.0	577.4	0.0	0.0	578.6	577.4	577.4
0.0030	0.294E+03	0.129E+01	0.598E-01	0.0	0.0	293.9	0.0	0.0	295.3	293.9	293.9
0.0040	0.132E+03	0.104E+01	0.789E-01	0.0	0.0	131.8	0.0	0.0	133.1	131.8	131.8
0.0050	0.183E+03	0.849E+00	0.939E-01	0.0	0.0	182.5	0.0	0.0	183.9	182.5	182.5
0.0060	0.111E+03	0.710E+00	0.105E+00	0.0	0.0	111.2	0.0	0.0	111.8	111.2	111.2
0.0080	0.502E+02	0.523E+00	0.122E+00	0.0	0.0	50.22	0.0	0.0	50.85	50.22	50.22
0.0100	0.267E+02	0.408E+00	0.133E+00	0.0	0.0	25.57	0.0	0.0	27.24	25.57	25.57
0.0150	0.823E+01	0.247E+00	0.149E+00	0.0	0.0	7.994	0.005	0.0	8.626	7.999	7.999
0.0200	0.350E+01	0.165E+00	0.158E+00	0.0	0.0	3.427	0.006	0.0	3.823	3.433	3.433
0.0300	0.103E+01	0.882E-01	0.166E+00	0.0	0.0	1.011	0.009	0.0	1.284	1.020	1.020
0.0400	0.423E+00	0.551E-01	0.167E+00	0.0	0.0	0.4184	0.0117	0.0	0.6451	0.4301	0.4301
0.0500	0.211E+00	0.378E-01	0.166E+00	0.0	0.0	0.2094	0.0139	0.0	0.4148	0.2233	0.2233
0.0600	0.119E+00	0.275E-01	0.163E+00	0.0	0.0	0.1185	0.0158	0.0	0.3095	0.1343	0.1343
0.0800	0.482E-01	0.164E-01	0.157E+00	0.0	0.0	0.0480	0.0188	0.0	0.2216	0.0668	0.0668
0.1000	0.238E-01	0.109E-01	0.151E+00	0.0	0.0	0.0238	0.0212	0.0	0.1857	0.0450	0.0450
0.1500	0.662E-02	0.504E-02	0.138E+00	0.0	0.0	0.0065	0.0253	0.0	0.1497	0.0318	0.0318
0.2000	0.270E-02	0.289E-02	0.127E+00	0.0	0.0	0.0026	0.0277	0.0	0.1326	0.0303	0.0303
0.3000	0.788E-03	0.131E-02	0.111E+00	0.0	0.0	0.0007	0.0300	0.0	0.1131	0.0307	0.0307
0.4000	0.344E-03	0.741E-03	0.992E-01	0.0	0.0	0.0003	0.0308	0.0	0.1003	0.0311	0.0311
0.5000	0.187E-03	0.476E-03	0.907E-01	0.0	0.0	0.0002	0.0310	0.0	0.0914	0.0312	0.0312
0.6000	0.117E-03	0.331E-03	0.839E-01	0.0	0.0	0.0001	0.0309	0.0	0.0843	0.0310	0.0310
0.8000	0.596E-04	0.187E-03	0.737E-01	0.0	0.0	0.0001	0.0301	0.0	0.0739	0.0302	0.0301
1.0000	0.370E-04	0.120E-03	0.663E-01	0.0	0.0	0.0	0.0291	0.0	0.0665	0.0292	0.0291
1.2500	0.237E-04	0.765E-04	0.593E-01	0.270E-04	0.0	0.0	0.0279	0.0	0.0594	0.0279	0.0278
1.5000	0.171E-04	0.532E-04	0.539E-01	0.146E-03	0.0	0.0	0.0266	0.0	0.0541	0.0267	0.0265
2.0000	0.106E-04	0.299E-04	0.460E-01	0.575E-03	0.0	0.0	0.0244	0.0003	0.0466	0.0247	0.0245
3.0000	0.564E-05	0.133E-04	0.362E-01	0.163E-02	0.127E-04	0.0	0.0208	0.0011	0.0379	0.0219	0.0217
4.0000	0.396E-05	0.748E-05	0.302E-01	0.263E-02	0.517E-04	0.0	0.0183	0.0020	0.0329	0.0203	0.0199
5.0000	0.298E-05	0.479E-05	0.261E-01	0.352E-02	0.103E-03	0.0	0.0164	0.0029	0.0297	0.0192	0.0188
6.0000	0.238E-05	0.333E-05	0.231E-01	0.432E-02	0.159E-03	0.0	0.0148	0.0037	0.0276	0.0185	0.0180
8.0000	0.169E-05	0.187E-05	0.189E-01	0.567E-02	0.267E-03	0.0	0.0126	0.0052	0.0248	0.0178	0.0170
10.0000	0.131E-05	0.120E-05	0.161E-01	0.677E-02	0.367E-03	0.0	0.0110	0.0064	0.0232	0.0174	0.0165
15.0000	0.836E-06	0.532E-06	0.119E-01	0.883E-02	0.576E-03	0.0	0.0085	0.0088	0.0213	0.0173	0.0159
20.0000	0.613E-06	0.299E-06	0.954E-02	0.103E-01	0.739E-03	0.0	0.0070	0.0105	0.0206	0.0175	0.0157
30.0000	0.399E-06	0.133E-06	0.695E-02	0.124E-01	0.981E-03	0.0	0.0053	0.0129	0.0203	0.0182	0.0156
40.0000	0.235E-06	0.748E-07	0.552E-02	0.138E-01	0.116E-02	0.0	0.0043	0.0146	0.0205	0.0190	0.0155
50.0000	0.296E-06	0.479E-07	0.461E-02	0.149E-01	0.129E-02	0.0	0.0037	0.0159	0.0208	0.0196	0.0154
60.0000	0.195E-06	0.333E-07	0.397E-02	0.158E-01	0.141E-02	0.0	0.0033	0.0169	0.0212	0.0201	0.0153
80.0000	0.145E-06	0.187E-07	0.313E-02	0.170E-01	0.158E-02	0.0	0.0027	0.0184	0.0217	0.0210	0.0150
100.0000	0.116E-06	0.120E-07	0.260E-02	0.180E-01	0.171E-02	0.0	0.0023	0.0195	0.0223	0.0217	0.0146

[All Units: cm²/g]

CALCIUM FLUORIDE

E (MeV)	τ/ρ	σ_r/ρ	σ/ρ	κ_n/ρ	κ_o/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.524E+04	0.263E+01	0.108E-01	0.0	0.0	5237.9	0.0	0.0	5242.6	5237.9	5237.9
0.0015	0.184E+04	0.241E+01	0.187E-01	0.0	0.0	1839.0	0.0	0.0	1842.4	1839.0	1839.0
0.0020	0.849E+03	0.220E+01	0.267E-01	0.0	0.0	848.5	0.0	0.0	851.2	848.5	848.5
0.0030	0.276E+03	0.182E+01	0.429E-01	0.0	0.0	276.0	0.0	0.0	277.9	276.0	276.0
0.0040	0.122E+03	0.150E+01	0.580E-01	0.0	0.0	122.1	0.0	0.0	123.6	122.1	122.1
0.0050	0.340E+03	0.124E+01	0.712E-01	0.0	0.0	339.6	0.0	0.0	341.3	339.6	339.6
0.0060	0.209E+03	0.104E+01	0.822E-01	0.0	0.0	208.8	0.0	0.0	210.1	208.8	208.8
0.0080	0.955E+02	0.775E+00	0.988E-01	0.0	0.0	95.54	0.0	0.0	96.37	95.54	95.54
0.0100	0.512E+02	0.608E+00	0.110E+00	0.0	0.0	48.57	0.0	0.0	51.92	48.57	48.57
0.0150	0.160E+02	0.375E+00	0.128E+00	0.0	0.0	15.45	0.0	0.0	16.50	15.45	15.45
0.0200	0.687E+01	0.252E+00	0.138E+00	0.0	0.0	6.686	0.005	0.0	7.260	6.691	6.691
0.0300	0.203E+01	0.135E+00	0.147E+00	0.0	0.0	1.994	0.008	0.0	2.312	2.002	2.002
0.0400	0.842E+00	0.851E-01	0.150E+00	0.0	0.0	0.8308	0.0107	0.0	1.0771	0.8415	0.8415
0.0500	0.422E+00	0.587E-01	0.150E+00	0.0	0.0	0.4178	0.0127	0.0	0.6307	0.4305	0.4305
0.0600	0.239E+00	0.430E-01	0.149E+00	0.0	0.0	0.2371	0.0146	0.0	0.4310	0.2517	0.2517
0.0800	0.971E-01	0.258E-01	0.145E+00	0.0	0.0	0.0964	0.0175	0.0	0.2679	0.1139	0.1139
0.1000	0.481E-01	0.171E-01	0.140E+00	0.0	0.0	0.0478	0.0198	0.0	0.2052	0.0676	0.0676
0.1500	0.134E-01	0.799E-02	0.128E+00	0.0	0.0	0.0133	0.0236	0.0	0.1494	0.0369	0.0369
0.2000	0.548E-02	0.460E-02	0.118E+00	0.0	0.0	0.0054	0.0258	0.0	0.1281	0.0312	0.0312
0.3000	0.161E-02	0.209E-02	0.103E+00	0.0	0.0	0.0016	0.0279	0.0	0.1067	0.0295	0.0295
0.4000	0.702E-03	0.118E-02	0.925E-01	0.0	0.0	0.0007	0.0287	0.0	0.0944	0.0294	0.0294
0.5000	0.383E-03	0.761E-03	0.846E-01	0.0	0.0	0.0004	0.0289	0.0	0.0857	0.0293	0.0292
0.6000	0.240E-03	0.529E-03	0.783E-01	0.0	0.0	0.0002	0.0288	0.0	0.0791	0.0290	0.0289
0.8000	0.122E-03	0.298E-03	0.688E-01	0.0	0.0	0.0001	0.0281	0.0	0.0692	0.0282	0.0281
1.0000	0.759E-04	0.191E-03	0.619E-01	0.0	0.0	0.0001	0.0272	0.0	0.0622	0.0273	0.0271
1.2500	0.486E-04	0.122E-03	0.554E-01	0.376E-04	0.0	0.0	0.0260	0.0	0.0556	0.0261	0.0259
1.5000	0.351E-04	0.851E-04	0.503E-01	0.200E-03	0.0	0.0	0.0248	0.0001	0.0506	0.0249	0.0247
2.0000	0.218E-04	0.479E-04	0.429E-01	0.786E-03	0.0	0.0	0.0227	0.0004	0.0438	0.0231	0.0229
3.0000	0.119E-04	0.213E-04	0.338E-01	0.222E-02	0.118E-04	0.0	0.0194	0.0004	0.0361	0.0209	0.0205
4.0000	0.807E-05	0.120E-04	0.282E-01	0.357E-02	0.483E-04	0.0	0.0170	0.0015	0.0318	0.0198	0.0192
5.0000	0.607E-05	0.766E-05	0.243E-01	0.477E-02	0.962E-04	0.0	0.0152	0.0039	0.0292	0.0191	0.0185
6.0000	0.485E-05	0.532E-05	0.215E-01	0.585E-02	0.148E-03	0.0	0.0138	0.0050	0.0275	0.0188	0.0180
8.0000	0.345E-05	0.299E-05	0.176E-01	0.767E-02	0.249E-03	0.0	0.0117	0.0069	0.0255	0.0187	0.0176
10.0000	0.267E-05	0.192E-05	0.150E-01	0.916E-02	0.343E-03	0.0	0.0103	0.0085	0.0245	0.0188	0.0175
15.0000	0.170E-05	0.852E-06	0.111E-01	0.119E-01	0.537E-03	0.0	0.0080	0.0116	0.0235	0.0196	0.0175
20.0000	0.125E-05	0.479E-06	0.891E-02	0.139E-01	0.688E-03	0.0	0.0066	0.0139	0.0235	0.0204	0.0177
30.0000	0.812E-06	0.213E-06	0.648E-02	0.167E-01	0.913E-03	0.0	0.0050	0.0170	0.0241	0.0220	0.0180
40.0000	0.602E-06	0.120E-06	0.515E-02	0.186E-01	0.108E-02	0.0	0.0041	0.0192	0.0248	0.0233	0.0180
50.0000	0.478E-06	0.767E-07	0.430E-02	0.201E-01	0.120E-02	0.0	0.0035	0.0209	0.0256	0.0243	0.0180
60.0000	0.396E-06	0.532E-07	0.371E-02	0.212E-01	0.130E-02	0.0	0.0031	0.0221	0.0262	0.0252	0.0178
80.0000	0.296E-06	0.299E-07	0.292E-02	0.229E-01	0.146E-02	0.0	0.0025	0.0240	0.0273	0.0265	0.0173
100.0000	0.236E-06	0.192E-07	0.243E-02	0.241E-01	0.157E-02	0.0	0.0021	0.0254	0.0281	0.0276	0.0168

[All Units: cm²/g]

FERROUS SULFATE

E (MeV)	τ/ρ	σ_I/ρ	σ/ρ	κ_H/ρ	κ_0/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.406E+04	0.139E+01	0.131E-01	0.0	0.0	4060.0	0.0	0.0	4061.4	4060.0	4060.0
0.0015	0.137E+04	0.129E+01	0.265E-01	0.0	0.0	1371.0	0.0	0.0	1371.3	1371.0	1371.0
0.0020	0.615E+03	0.117E+01	0.414E-01	0.0	0.0	614.7	0.0	0.0	616.2	614.7	614.7
0.0030	0.207E+03	0.924E+00	0.701E-01	0.0	0.0	206.8	0.0	0.0	208.0	206.8	206.8
0.0040	0.891E+02	0.721E+00	0.934E-01	0.0	0.0	89.11	0.0	0.0	89.91	89.11	89.11
0.0050	0.459E+02	0.569E+00	0.111E+00	0.0	0.0	45.87	0.0	0.0	46.58	45.87	45.87
0.0060	0.265E+02	0.459E+00	0.125E+00	0.0	0.0	26.48	0.0	0.0	27.08	26.48	26.48
0.0080	0.110E+02	0.318E+00	0.143E+00	0.0	0.0	11.02	0.0	0.0	11.46	11.02	11.02
0.0100	0.552E+01	0.237E+00	0.154E+00	0.0	0.0	5.510	0.003	0.0	5.911	5.513	5.513
0.0150	0.155E+01	0.137E+00	0.169E+00	0.0	0.0	1.544	0.005	0.0	1.856	1.549	1.549
0.0200	0.619E+00	0.912E-01	0.176E+00	0.0	0.0	0.6180	0.0068	0.0	0.8862	0.6248	0.6248
0.0300	0.168E+00	0.484E-01	0.182E+00	0.0	0.0	0.1673	0.0100	0.0	0.3984	0.1773	0.1773
0.0400	0.657E-01	0.297E-01	0.182E+00	0.0	0.0	0.0656	0.0127	0.0	0.2774	0.0783	0.0783
0.0500	0.317E-01	0.200E-01	0.180E+00	0.0	0.0	0.0316	0.0150	0.0	0.2317	0.0466	0.0466
0.0600	0.174E-01	0.144E-01	0.176E+00	0.0	0.0	0.0174	0.0169	0.0	0.2078	0.0343	0.0343
0.0800	0.677E-02	0.844E-02	0.169E+00	0.0	0.0	0.0068	0.0201	0.0	0.1842	0.0269	0.0269
0.1000	0.326E-02	0.553E-02	0.162E+00	0.0	0.0	0.0033	0.0226	0.0	0.1708	0.0259	0.0259
0.1500	0.867E-03	0.253E-02	0.147E+00	0.0	0.0	0.0008	0.0269	0.0	0.1504	0.0277	0.0277
0.2000	0.344E-03	0.144E-02	0.135E+00	0.0	0.0	0.0004	0.0293	0.0	0.1368	0.0297	0.0296
0.3000	0.976E-04	0.644E-03	0.118E+00	0.0	0.0	0.0	0.0319	0.0	0.1187	0.0319	0.0318
0.4000	0.419E-04	0.363E-03	0.105E+00	0.0	0.0	0.0	0.0325	0.0	0.1054	0.0327	0.0327
0.5000	0.226E-04	0.233E-03	0.963E-01	0.0	0.0	0.0	0.0329	0.0	0.0966	0.0329	0.0329
0.6000	0.141E-04	0.162E-03	0.891E-01	0.0	0.0	0.0	0.0328	0.0	0.0893	0.0327	0.0327
0.8000	0.712E-05	0.911E-04	0.783E-01	0.0	0.0	0.0	0.0320	0.0	0.0784	0.0320	0.0320
1.0000	0.443E-05	0.583E-04	0.704E-01	0.0	0.0	0.0	0.0310	0.0	0.0705	0.0310	0.0309
1.2500	0.281E-05	0.374E-04	0.630E-01	0.181E-04	0.0	0.0	0.0296	0.0	0.0631	0.0296	0.0295
1.5000	0.204E-05	0.259E-04	0.572E-01	0.999E-04	0.0	0.0	0.0283	0.0	0.0573	0.0282	0.0282
2.0000	0.128E-05	0.146E-04	0.489E-01	0.398E-03	0.0	0.0	0.0259	0.0002	0.0493	0.0261	0.0260
3.0000	0.712E-06	0.649E-05	0.384E-01	0.114E-02	0.134E-04	0.0	0.0221	0.0008	0.0396	0.0229	0.0227
4.0000	0.488E-06	0.365E-05	0.321E-01	0.184E-02	0.549E-04	0.0	0.0195	0.0014	0.0340	0.0208	0.0206
5.0000	0.370E-06	0.234E-05	0.277E-01	0.247E-02	0.109E-03	0.0	0.0174	0.0021	0.0303	0.0194	0.0191
6.0000	0.297E-06	0.162E-05	0.245E-01	0.304E-02	0.168E-03	0.0	0.0158	0.0027	0.0277	0.0184	0.0180
8.0000	0.213E-06	0.912E-06	0.200E-01	0.399E-02	0.283E-03	0.0	0.0133	0.0037	0.0243	0.0171	0.0166
10.0000	0.165E-06	0.584E-06	0.170E-01	0.478E-02	0.390E-03	0.0	0.0116	0.0046	0.0222	0.0163	0.0157
15.0000	0.106E-06	0.259E-06	0.126E-01	0.624E-02	0.612E-03	0.0	0.0090	0.0064	0.0195	0.0154	0.0145
20.0000	0.781E-07	0.146E-06	0.101E-01	0.730E-02	0.785E-03	0.0	0.0074	0.0077	0.0182	0.0151	0.0139
30.0000	0.511E-07	0.649E-07	0.737E-02	0.880E-02	0.104E-02	0.0	0.0056	0.0095	0.0172	0.0151	0.0134
40.0000	0.379E-07	0.365E-07	0.586E-02	0.983E-02	0.123E-02	0.0	0.0046	0.0108	0.0169	0.0154	0.0132
50.0000	0.302E-07	0.234E-07	0.489E-02	0.106E-01	0.138E-02	0.0	0.0039	0.0118	0.0169	0.0157	0.0130
60.0000	0.250E-07	0.162E-07	0.421E-02	0.112E-01	0.150E-02	0.0	0.0034	0.0125	0.0169	0.0159	0.0129
80.0000	0.187E-07	0.912E-08	0.332E-02	0.122E-01	0.169E-02	0.0	0.0028	0.0137	0.0172	0.0165	0.0126
100.0000	0.149E-07	0.584E-08	0.276E-02	0.129E-01	0.183E-02	0.0	0.0024	0.0146	0.0175	0.0169	0.0123

LITHIUM FLUORIDE [All Units: cm²/g]

LITHIUM FLUORIDE

E (MeV)	τ/ρ	σ_I/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	τ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.420E+04	0.130E+01	0.129E-01	0.0	0.0	4172.0	0.0	4201.3	4172.0	4172.0
0.0015	0.147E+04	0.121E+01	0.222E-01	0.0	0.0	1459.0	0.0	1471.2	1459.0	1459.0
0.0020	0.669E+03	0.111E+01	0.310E-01	0.0	0.0	666.6	0.0	670.1	666.6	666.6
0.0030	0.213E+03	0.904E+00	0.485E-01	0.0	0.0	212.1	0.0	214.0	212.1	212.1
0.0040	0.920E+02	0.726E+00	0.649E-01	0.0	0.0	91.87	0.0	92.79	91.87	91.87
0.0050	0.475E+02	0.584E+00	0.793E-01	0.0	0.0	47.41	0.0	48.16	47.41	47.41
0.0060	0.275E+02	0.475E+00	0.914E-01	0.0	0.0	27.43	0.0	28.07	27.43	27.43
0.0080	0.114E+02	0.330E+00	0.109E+00	0.0	0.0	11.42	0.0	11.84	11.42	11.42
0.0100	0.574E+01	0.244E+00	0.121E+00	0.0	0.0	5.732	0.003	6.105	5.735	5.735
0.0150	0.161E+01	0.138E+00	0.137E+00	0.0	0.0	1.608	0.004	1.885	1.612	1.612
0.0200	0.644E+00	0.905E-01	0.145E+00	0.0	0.0	0.6440	0.0057	0.8795	0.6497	0.6497
0.0300	0.174E+00	0.478E-01	0.150E+00	0.0	0.0	0.1744	0.0083	0.3718	0.1827	0.1827
0.0400	0.684E-01	0.293E-01	0.151E+00	0.0	0.0	0.0684	0.0106	0.2487	0.0790	0.0790
0.0500	0.330E-01	0.197E-01	0.149E+00	0.0	0.0	0.0329	0.0125	0.2017	0.0454	0.0454
0.0600	0.181E-01	0.142E-01	0.147E+00	0.0	0.0	0.0180	0.0142	0.1793	0.0322	0.0322
0.0800	0.704E-02	0.831E-02	0.141E+00	0.0	0.0	0.0071	0.0168	0.1564	0.0239	0.0239
0.1000	0.338E-02	0.545E-02	0.135E+00	0.0	0.0	0.0034	0.0189	0.1438	0.0223	0.0223
0.1500	0.899E-03	0.249E-02	0.123E+00	0.0	0.0	0.0009	0.0225	0.1264	0.0233	0.0233
0.2000	0.358E-03	0.142E-02	0.113E+00	0.0	0.0	0.0002	0.0246	0.1148	0.0248	0.0248
0.3000	0.101E-03	0.635E-03	0.982E-01	0.0	0.0	0.0002	0.0265	0.0989	0.0267	0.0266
0.4000	0.433E-04	0.359E-03	0.881E-01	0.0	0.0	0.0	0.0273	0.0885	0.0274	0.0273
0.5000	0.234E-04	0.230E-03	0.805E-01	0.0	0.0	0.0	0.0275	0.0808	0.0275	0.0275
0.6000	0.146E-04	0.160E-03	0.745E-01	0.0	0.0	0.0	0.0274	0.0747	0.0274	0.0274
0.8000	0.735E-05	0.899E-04	0.655E-01	0.0	0.0	0.0	0.0268	0.0656	0.0268	0.0267
1.0000	0.457E-05	0.575E-04	0.589E-01	0.0	0.0	0.0	0.0259	0.0590	0.0259	0.0258
1.2500	0.290E-05	0.368E-04	0.527E-01	0.167E-04	0.0	0.0	0.0248	0.0528	0.0248	0.0247
1.5000	0.210E-05	0.256E-04	0.479E-01	0.928E-04	0.0	0.0	0.0237	0.0480	0.0237	0.0236
2.0000	0.132E-05	0.144E-04	0.408E-01	0.370E-03	0.0	0.0	0.0216	0.0412	0.0218	0.0217
3.0000	0.737E-06	0.640E-05	0.321E-01	0.106E-02	0.112E-04	0.0	0.0185	0.0332	0.0192	0.0190
4.0000	0.505E-06	0.360E-05	0.268E-01	0.172E-02	0.459E-04	0.0	0.0162	0.0286	0.0176	0.0173
5.0000	0.383E-06	0.230E-05	0.231E-01	0.230E-02	0.914E-04	0.0	0.0145	0.0019	0.0164	0.0161
6.0000	0.307E-06	0.160E-05	0.205E-01	0.283E-02	0.140E-03	0.0	0.0132	0.0025	0.0156	0.0153
8.0000	0.220E-06	0.900E-06	0.167E-01	0.372E-02	0.237E-03	0.0	0.0111	0.0035	0.0146	0.0142
10.0000	0.171E-06	0.576E-06	0.143E-01	0.445E-02	0.326E-03	0.0	0.0098	0.0191	0.0141	0.0135
15.0000	0.110E-06	0.256E-06	0.105E-01	0.581E-02	0.511E-03	0.0	0.0075	0.0168	0.0134	0.0126
20.0000	0.809E-07	0.144E-06	0.847E-02	0.680E-02	0.656E-03	0.0	0.0062	0.0159	0.0133	0.0122
30.0000	0.529E-07	0.640E-07	0.616E-02	0.819E-02	0.873E-03	0.0	0.0047	0.0088	0.0135	0.0118
40.0000	0.393E-07	0.360E-07	0.490E-02	0.915E-02	0.103E-02	0.0	0.0038	0.0099	0.0137	0.0116
50.0000	0.313E-07	0.230E-07	0.409E-02	0.988E-02	0.115E-02	0.0	0.0033	0.0151	0.0141	0.0115
60.0000	0.259E-07	0.160E-07	0.352E-02	0.105E-01	0.125E-02	0.0	0.0029	0.0115	0.0144	0.0114
80.0000	0.194E-07	0.900E-08	0.278E-02	0.113E-01	0.141E-02	0.0	0.0023	0.0155	0.0149	0.0111
100.0000	0.154E-07	0.576E-08	0.231E-02	0.120E-01	0.152E-02	0.0	0.0020	0.0158	0.0153	0.0109

MUSCLE, SKELETAL (ICRP) [All Units: cm²/g]

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_n/ρ	κ_e/ρ	κ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.382E+04	0.135E+01	0.133E-01	0.0	0.0	3819.0	0.0	0.0	3821.4	3819.0	3819.0
0.0015	0.129E+04	0.124E+01	0.268E-01	0.0	0.0	1285.0	0.0	0.0	1291.3	1285.0	1285.0
0.0020	0.575E+03	0.112E+01	0.418E-01	0.0	0.0	574.9	0.0	0.0	576.2	574.9	574.9
0.0030	0.184E+03	0.880E+00	0.704E-01	0.0	0.0	184.4	0.0	0.0	185.0	184.4	184.4
0.0040	0.814E+02	0.684E+00	0.935E-01	0.0	0.0	81.43	0.0	0.0	82.18	81.43	81.43
0.0050	0.419E+02	0.539E+00	0.111E+00	0.0	0.0	41.87	0.0	0.0	42.55	41.87	41.87
0.0060	0.241E+02	0.435E+00	0.124E+00	0.0	0.0	24.14	0.0	0.0	24.66	24.14	24.14
0.0080	0.100E+02	0.302E+00	0.142E+00	0.0	0.0	10.02	0.0	0.0	10.44	10.02	10.02
0.0100	0.503E+01	0.226E+00	0.153E+00	0.0	0.0	5.010	0.003	0.0	5.409	5.013	5.013
0.0150	0.141E+01	0.131E+00	0.168E+00	0.0	0.0	1.402	0.005	0.0	1.709	1.407	1.407
0.0200	0.563E+00	0.872E-01	0.175E+00	0.0	0.0	0.5612	0.0068	0.0	0.8252	0.5680	0.5680
0.0300	0.152E+00	0.461E-01	0.181E+00	0.0	0.0	0.1520	0.0099	0.0	0.3791	0.1619	0.1619
0.0400	0.597E-01	0.283E-01	0.181E+00	0.0	0.0	0.0596	0.0126	0.0	0.2690	0.0722	0.0722
0.0500	0.288E-01	0.190E-01	0.179E+00	0.0	0.0	0.0287	0.0149	0.0	0.2268	0.0436	0.0436
0.0600	0.158E-01	0.137E-01	0.175E+00	0.0	0.0	0.0158	0.0168	0.0	0.2045	0.0326	0.0326
0.0800	0.615E-02	0.803E-02	0.168E+00	0.0	0.0	0.0061	0.0200	0.0	0.1822	0.0261	0.0261
0.1000	0.296E-02	0.526E-02	0.161E+00	0.0	0.0	0.0029	0.0225	0.0	0.1692	0.0254	0.0254
0.1500	0.788E-03	0.240E-02	0.146E+00	0.0	0.0	0.0007	0.0267	0.0	0.1492	0.0274	0.0274
0.2000	0.313E-03	0.136E-02	0.134E+00	0.0	0.0	0.0003	0.0291	0.0	0.1357	0.0294	0.0294
0.3000	0.888E-04	0.611E-03	0.117E+00	0.0	0.0	0.0	0.0316	0.0	0.1177	0.0316	0.0316
0.4000	0.381E-04	0.345E-03	0.105E+00	0.0	0.0	0.0	0.0325	0.0	0.1054	0.0325	0.0325
0.5000	0.206E-04	0.221E-03	0.956E-01	0.0	0.0	0.0	0.0326	0.0	0.0958	0.0327	0.0327
0.6000	0.128E-04	0.154E-03	0.885E-01	0.0	0.0	0.0	0.0325	0.0	0.0887	0.0325	0.0325
0.8000	0.649E-05	0.865E-04	0.778E-01	0.0	0.0	0.0	0.0318	0.0	0.0779	0.0318	0.0317
1.0000	0.403E-05	0.554E-04	0.699E-01	0.0	0.0	0.0	0.0307	0.0	0.0700	0.0308	0.0307
1.2500	0.256E-05	0.354E-04	0.625E-01	0.175E-04	0.0	0.0	0.0294	0.0	0.0626	0.0294	0.0293
1.5000	0.185E-05	0.246E-04	0.568E-01	0.968E-04	0.0	0.0	0.0281	0.0	0.0569	0.0281	0.0280
2.0000	0.116E-05	0.138E-04	0.485E-01	0.385E-03	0.0	0.0	0.0257	0.0002	0.0489	0.0259	0.0258
3.0000	0.648E-06	0.615E-05	0.382E-01	0.110E-02	0.133E-04	0.0	0.0220	0.0007	0.0393	0.0227	0.0225
4.0000	0.444E-06	0.346E-05	0.318E-01	0.179E-02	0.545E-04	0.0	0.0193	0.0014	0.0336	0.0207	0.0204
5.0000	0.336E-06	0.222E-05	0.275E-01	0.240E-02	0.109E-03	0.0	0.0172	0.0020	0.0300	0.0192	0.0189
6.0000	0.270E-06	0.154E-05	0.243E-01	0.294E-02	0.167E-03	0.0	0.0156	0.0026	0.0274	0.0182	0.0179
8.0000	0.193E-06	0.865E-06	0.199E-01	0.387E-02	0.281E-03	0.0	0.0133	0.0036	0.0241	0.0169	0.0164
10.0000	0.150E-06	0.554E-06	0.169E-01	0.463E-02	0.387E-03	0.0	0.0116	0.0045	0.0219	0.0161	0.0155
15.0000	0.965E-07	0.246E-06	0.125E-01	0.605E-02	0.607E-03	0.0	0.0089	0.0062	0.0192	0.0151	0.0143
20.0000	0.710E-07	0.138E-06	0.101E-01	0.709E-02	0.780E-03	0.0	0.0074	0.0075	0.0180	0.0148	0.0137
30.0000	0.464E-07	0.615E-07	0.732E-02	0.854E-02	0.104E-02	0.0	0.0056	0.0093	0.0169	0.0148	0.0132
40.0000	0.345E-07	0.346E-07	0.582E-02	0.954E-02	0.122E-02	0.0	0.0045	0.0105	0.0166	0.0150	0.0129
50.0000	0.274E-07	0.222E-07	0.486E-02	0.103E-01	0.137E-02	0.0	0.0039	0.0115	0.0165	0.0153	0.0128
60.0000	0.228E-07	0.154E-07	0.418E-02	0.109E-01	0.149E-02	0.0	0.0034	0.0122	0.0166	0.0156	0.0126
80.0000	0.170E-07	0.865E-08	0.330E-02	0.118E-01	0.168E-02	0.0	0.0027	0.0133	0.0168	0.0161	0.0123
100.0000	0.135E-07	0.554E-08	0.274E-02	0.125E-01	0.182E-02	0.0	0.0023	0.0142	0.0171	0.0165	0.0121

POLYETHYLENE [All Units: cm²/g]

E (MeV)	τ/ρ	σ_x/ρ	σ/ρ	κ_N/ρ	κ_o/ρ	τ_{tx}/ρ	σ_{tx}/ρ	κ_{tx}/ρ	μ/ρ	μ_{tx}/ρ	μ_{en}/ρ
0.0010	0.189E+04	0.974E+00	0.180E-01	0.0	0.0	1888.7	0.0	0.0	1891.0	1888.7	1888.7
0.0015	0.599E+03	0.864E+00	0.356E-01	0.0	0.0	598.9	0.0	0.0	599.9	598.9	598.9
0.0020	0.258E+03	0.748E+00	0.543E-01	0.0	0.0	258.3	0.0	0.0	258.8	258.3	258.3
0.0030	0.768E+02	0.548E+00	0.877E-01	0.0	0.0	76.77	0.0	0.0	77.44	76.77	76.77
0.0040	0.319E+02	0.410E+00	0.112E+00	0.0	0.0	31.89	0.0	0.0	32.42	31.89	31.89
0.0050	0.160E+02	0.319E+00	0.130E+00	0.0	0.0	15.98	0.0	0.0	16.45	15.98	15.98
0.0060	0.903E+01	0.258E+00	0.142E+00	0.0	0.0	9.030	0.002	0.0	9.430	9.032	9.032
0.0080	0.363E+01	0.185E+00	0.157E+00	0.0	0.0	3.632	0.003	0.0	3.972	3.635	3.635
0.0100	0.178E+01	0.142E+00	0.167E+00	0.0	0.0	1.778	0.003	0.0	2.089	1.781	1.781
0.0150	0.478E+00	0.855E-01	0.182E+00	0.0	0.0	0.4783	0.0054	0.0	0.7455	0.4837	0.4837
0.0200	0.186E+00	0.564E-01	0.189E+00	0.0	0.0	0.1863	0.0073	0.0	0.4314	0.1936	0.1936
0.0300	0.489E-01	0.292E-01	0.193E+00	0.0	0.0	0.0488	0.0105	0.0	0.2711	0.0593	0.0593
0.0400	0.188E-01	0.178E-01	0.191E+00	0.0	0.0	0.0188	0.0132	0.0	0.2276	0.0320	0.0320
0.0500	0.893E-02	0.119E-01	0.188E+00	0.0	0.0	0.0089	0.0155	0.0	0.2088	0.0244	0.0244
0.0600	0.486E-02	0.851E-02	0.184E+00	0.0	0.0	0.0049	0.0175	0.0	0.1974	0.0224	0.0224
0.0800	0.186E-02	0.495E-02	0.175E+00	0.0	0.0	0.0019	0.0207	0.0	0.1818	0.0226	0.0226
0.1000	0.883E-03	0.322E-02	0.168E+00	0.0	0.0	0.0008	0.0234	0.0	0.1721	0.0242	0.0242
0.1500	0.232E-03	0.146E-02	0.152E+00	0.0	0.0	0.0002	0.0277	0.0	0.1537	0.0279	0.0279
0.2000	0.911E-04	0.827E-03	0.139E+00	0.0	0.0	0.0002	0.0301	0.0	0.1399	0.0303	0.0303
0.3000	0.255E-04	0.370E-03	0.121E+00	0.0	0.0	0.0	0.0327	0.0	0.1214	0.0328	0.0328
0.4000	0.109E-04	0.208E-03	0.109E+00	0.0	0.0	0.0	0.0337	0.0	0.1092	0.0337	0.0337
0.5000	0.586E-05	0.133E-03	0.993E-01	0.0	0.0	0.0	0.0339	0.0	0.0994	0.0339	0.0339
0.6000	0.364E-05	0.927E-04	0.919E-01	0.0	0.0	0.0	0.0338	0.0	0.0920	0.0338	0.0338
0.8000	0.184E-05	0.521E-04	0.807E-01	0.0	0.0	0.0	0.0330	0.0	0.0808	0.0330	0.0330
1.0000	0.114E-05	0.334E-04	0.726E-01	0.0	0.0	0.0	0.0319	0.0	0.0726	0.0319	0.0319
1.2500	0.715E-06	0.214E-04	0.649E-01	0.130E-04	0.0	0.0	0.0305	0.0	0.0649	0.0305	0.0305
1.5000	0.519E-06	0.148E-04	0.590E-01	0.722E-04	0.0	0.0	0.0292	0.0	0.0591	0.0292	0.0291
2.0000	0.328E-06	0.835E-05	0.503E-01	0.288E-03	0.0	0.0	0.0267	0.0001	0.0506	0.0268	0.0267
3.0000	0.184E-06	0.371E-05	0.396E-01	0.825E-03	0.139E-04	0.0	0.0228	0.0006	0.0404	0.0234	0.0233
4.0000	0.127E-06	0.209E-05	0.330E-01	0.134E-02	0.566E-04	0.0	0.0200	0.0010	0.0344	0.0211	0.0209
5.0000	0.961E-07	0.134E-05	0.285E-01	0.180E-02	0.113E-03	0.0	0.0179	0.0015	0.0304	0.0194	0.0192
6.0000	0.774E-07	0.928E-06	0.252E-01	0.221E-02	0.173E-03	0.0	0.0162	0.0020	0.0276	0.0182	0.0179
8.0000	0.556E-07	0.522E-06	0.206E-01	0.291E-02	0.292E-03	0.0	0.0137	0.0028	0.0238	0.0165	0.0162
10.0000	0.433E-07	0.334E-06	0.176E-01	0.348E-02	0.402E-03	0.0	0.0120	0.0035	0.0215	0.0155	0.0150
15.0000	0.279E-07	0.148E-06	0.130E-01	0.456E-02	0.631E-03	0.0	0.0092	0.0048	0.0182	0.0141	0.0134
20.0000	0.205E-07	0.835E-07	0.104E-01	0.534E-02	0.810E-03	0.0	0.0076	0.0058	0.0166	0.0134	0.0126
30.0000	0.134E-07	0.371E-07	0.760E-02	0.644E-02	0.108E-02	0.0	0.0057	0.0073	0.0151	0.0130	0.0118
40.0000	0.999E-08	0.209E-07	0.604E-02	0.720E-02	0.127E-02	0.0	0.0046	0.0083	0.0145	0.0129	0.0114
50.0000	0.795E-08	0.134E-07	0.504E-02	0.778E-02	0.143E-02	0.0	0.0039	0.0090	0.0143	0.0129	0.0111
60.0000	0.660E-08	0.928E-08	0.434E-02	0.824E-02	0.155E-02	0.0	0.0034	0.0096	0.0141	0.0131	0.0110
80.0000	0.493E-08	0.522E-08	0.342E-02	0.894E-02	0.175E-02	0.0	0.0027	0.0106	0.0141	0.0133	0.0107
100.0000	0.393E-08	0.334E-08	0.284E-02	0.945E-02	0.189E-02	0.0	0.0023	0.0112	0.0142	0.0136	0.0104

POLYMETHYL METHACRYLATE

[All Units: cm²/g]

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_N/ρ	κ_e/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{en}/ρ
0.0010	0.279E+04	0.116E+01	0.144E-01	0.0	0.0	2787.0	0.0	0.0	2791.2	2787.0	2787.0
0.0015	0.914E+03	0.104E+01	0.286E-01	0.0	0.0	912.9	0.0	0.0	915.1	912.9	912.9
0.0020	0.403E+03	0.923E+00	0.442E-01	0.0	0.0	402.3	0.0	0.0	404.0	402.3	402.3
0.0030	0.123E+03	0.701E+00	0.731E-01	0.0	0.0	122.7	0.0	0.0	123.8	122.7	122.7
0.0040	0.518E+02	0.535E+00	0.959E-01	0.0	0.0	51.81	0.0	0.0	52.43	51.81	51.81
0.0050	0.263E+02	0.420E+00	0.113E+00	0.0	0.0	26.27	0.0	0.0	26.83	26.27	26.27
0.0060	0.150E+02	0.339E+00	0.125E+00	0.0	0.0	14.98	0.0	0.0	15.46	14.98	14.98
0.0080	0.611E+01	0.239E+00	0.141E+00	0.0	0.0	6.113	0.002	0.0	6.490	6.115	6.115
0.0100	0.302E+01	0.181E+00	0.151E+00	0.0	0.0	3.024	0.003	0.0	3.352	3.027	3.027
0.0150	0.828E+00	0.107E+00	0.166E+00	0.0	0.0	0.8277	0.0050	0.0	1.1010	0.8327	0.8327
0.0200	0.326E+00	0.710E-01	0.174E+00	0.0	0.0	0.3263	0.0067	0.0	0.5710	0.3330	0.3330
0.0300	0.867E-01	0.372E-01	0.179E+00	0.0	0.0	0.0867	0.0098	0.0	0.3029	0.0965	0.0965
0.0400	0.336E-01	0.227E-01	0.179E+00	0.0	0.0	0.0336	0.0124	0.0	0.2353	0.0460	0.0460
0.0500	0.161E-01	0.152E-01	0.176E+00	0.0	0.0	0.0161	0.0146	0.0	0.2073	0.0307	0.0307
0.0600	0.877E-02	0.109E-01	0.173E+00	0.0	0.0	0.0087	0.0166	0.0	0.1927	0.0253	0.0253
0.0800	0.338E-02	0.638E-02	0.165E+00	0.0	0.0	0.0034	0.0196	0.0	0.1748	0.0230	0.0230
0.1000	0.161E-02	0.417E-02	0.158E+00	0.0	0.0	0.0017	0.0220	0.0	0.1638	0.0237	0.0237
0.1500	0.425E-03	0.189E-02	0.143E+00	0.0	0.0	0.0005	0.0261	0.0	0.1453	0.0266	0.0266
0.2000	0.168E-03	0.107E-02	0.132E+00	0.0	0.0	0.0	0.0287	0.0	0.1332	0.0287	0.0287
0.3000	0.472E-04	0.481E-03	0.115E+00	0.0	0.0	0.0	0.0310	0.0	0.1155	0.0310	0.0310
0.4000	0.202E-04	0.271E-03	0.103E+00	0.0	0.0	0.0	0.0319	0.0	0.1033	0.0319	0.0319
0.5000	0.109E-04	0.174E-03	0.939E-01	0.0	0.0	0.0	0.0321	0.0	0.0941	0.0321	0.0321
0.6000	0.677E-05	0.121E-03	0.869E-01	0.0	0.0	0.0	0.0320	0.0	0.0870	0.0320	0.0320
0.8000	0.342E-05	0.679E-04	0.763E-01	0.0	0.0	0.0	0.0312	0.0	0.0764	0.0312	0.0312
1.0000	0.212E-05	0.435E-04	0.687E-01	0.0	0.0	0.0	0.0302	0.0	0.0687	0.0302	0.0302
1.2500	0.134E-05	0.278E-04	0.614E-01	0.152E-04	0.0	0.0	0.0289	0.0	0.0614	0.0289	0.0289
1.5000	0.972E-06	0.193E-04	0.558E-01	0.843E-04	0.0	0.0	0.0276	0.0	0.0559	0.0276	0.0276
2.0000	0.612E-06	0.109E-04	0.476E-01	0.336E-03	0.0	0.0	0.0252	0.0002	0.0479	0.0254	0.0253
3.0000	0.342E-06	0.483E-05	0.375E-01	0.962E-03	0.131E-04	0.0	0.0216	0.0006	0.0385	0.0222	0.0221
4.0000	0.235E-06	0.272E-05	0.312E-01	0.156E-02	0.535E-04	0.0	0.0189	0.0012	0.0328	0.0201	0.0199
5.0000	0.179E-06	0.174E-05	0.270E-01	0.209E-02	0.107E-03	0.0	0.0169	0.0018	0.0292	0.0187	0.0184
6.0000	0.144E-06	0.121E-05	0.239E-01	0.257E-02	0.164E-03	0.0	0.0154	0.0023	0.0266	0.0176	0.0173
8.0000	0.103E-06	0.680E-06	0.195E-01	0.339E-02	0.276E-03	0.0	0.0130	0.0032	0.0232	0.0162	0.0158
10.0000	0.802E-07	0.435E-06	0.166E-01	0.405E-02	0.380E-03	0.0	0.0113	0.0040	0.0210	0.0153	0.0148
15.0000	0.516E-07	0.193E-06	0.123E-01	0.530E-02	0.596E-03	0.0	0.0088	0.0055	0.0182	0.0142	0.0135
20.0000	0.380E-07	0.109E-06	0.987E-02	0.621E-02	0.766E-03	0.0	0.0072	0.0066	0.0168	0.0138	0.0128
30.0000	0.249E-07	0.483E-07	0.718E-02	0.748E-02	0.102E-02	0.0	0.0054	0.0082	0.0157	0.0136	0.0122
40.0000	0.185E-07	0.272E-07	0.571E-02	0.837E-02	0.120E-02	0.0	0.0044	0.0093	0.0153	0.0137	0.0119
50.0000	0.147E-07	0.174E-07	0.477E-02	0.903E-02	0.135E-02	0.0	0.0037	0.0102	0.0152	0.0139	0.0117
60.0000	0.122E-07	0.121E-07	0.411E-02	0.956E-02	0.146E-02	0.0	0.0033	0.0108	0.0151	0.0141	0.0116
80.0000	0.910E-08	0.680E-08	0.324E-02	0.104E-01	0.165E-02	0.0	0.0026	0.0118	0.0145	0.0145	0.0113
100.0000	0.726E-08	0.435E-08	0.269E-02	0.110E-01	0.179E-02	0.0	0.0022	0.0126	0.0155	0.0148	0.0111

[All Units: cm²/g]

POLYSTYRENE

E (MeV)	τ/p	σ_T/p	σ/p	κ_n/p	κ_g/p	κ_{tr}/p	σ_{tr}/p	κ_{tr}/p	μ/p	μ_{tr}/p	μ_{en}/p
0.0010	0.204E+04	0.102E+01	0.155E-01	0.0	0.0	2038.0	0.0	0.0	2041.0	2038.0	2038.0
0.0015	0.645E+03	0.907E+00	0.308E-01	0.0	0.0	645.1	0.0	0.0	645.9	645.1	645.1
0.0020	0.278E+03	0.787E+00	0.471E-01	0.0	0.0	278.3	0.0	0.0	278.8	278.3	278.3
0.0030	0.827E+02	0.578E+00	0.768E-01	0.0	0.0	82.70	0.0	0.0	83.35	82.70	82.70
0.0040	0.344E+02	0.433E+00	0.986E-01	0.0	0.0	34.35	0.0	0.0	34.93	34.35	34.35
0.0050	0.172E+02	0.338E+00	0.116E+00	0.0	0.0	17.21	0.0	0.0	17.65	17.21	17.21
0.0060	0.973E+01	0.274E+00	0.127E+00	0.0	0.0	9.728	0.002	0.0	10.131	9.730	9.730
0.0080	0.391E+01	0.196E+00	0.143E+00	0.0	0.0	3.913	0.002	0.0	4.249	3.915	3.915
0.0100	0.192E+01	0.151E+00	0.152E+00	0.0	0.0	1.915	0.003	0.0	2.223	1.918	1.918
0.0150	0.515E+00	0.912E-01	0.168E+00	0.0	0.0	0.5153	0.0050	0.0	0.7742	0.5203	0.5203
0.0200	0.201E+00	0.603E-01	0.175E+00	0.0	0.0	0.2008	0.0068	0.0	0.4363	0.2076	0.2076
0.0300	0.526E-01	0.313E-01	0.180E+00	0.0	0.0	0.0527	0.0098	0.0	0.2639	0.0625	0.0625
0.0400	0.202E-01	0.190E-01	0.179E+00	0.0	0.0	0.0202	0.0124	0.0	0.2182	0.0326	0.0326
0.0500	0.962E-02	0.127E-01	0.176E+00	0.0	0.0	0.0096	0.0146	0.0	0.1883	0.0242	0.0242
0.0600	0.523E-02	0.911E-02	0.173E+00	0.0	0.0	0.0052	0.0165	0.0	0.1873	0.0217	0.0217
0.0800	0.200E-02	0.530E-02	0.165E+00	0.0	0.0	0.0020	0.0196	0.0	0.1723	0.0216	0.0216
0.1000	0.952E-03	0.345E-02	0.158E+00	0.0	0.0	0.0010	0.0220	0.0	0.1624	0.0230	0.0230
0.1500	0.250E-03	0.186E-02	0.143E+00	0.0	0.0	0.0002	0.0261	0.0	0.1448	0.0263	0.0263
0.2000	0.981E-04	0.886E-03	0.131E+00	0.0	0.0	0.0002	0.0284	0.0	0.1320	0.0286	0.0286
0.3000	0.275E-04	0.396E-03	0.114E+00	0.0	0.0	0.0	0.0309	0.0	0.1144	0.0309	0.0309
0.4000	0.117E-04	0.223E-03	0.102E+00	0.0	0.0	0.0	0.0318	0.0	0.1022	0.0318	0.0318
0.5000	0.631E-05	0.143E-03	0.936E-01	0.0	0.0	0.0	0.0320	0.0	0.0937	0.0320	0.0320
0.6000	0.392E-05	0.993E-04	0.866E-01	0.0	0.0	0.0	0.0318	0.0	0.0867	0.0318	0.0318
0.8000	0.198E-05	0.558E-04	0.761E-01	0.0	0.0	0.0	0.0311	0.0	0.0762	0.0311	0.0311
1.0000	0.123E-05	0.357E-04	0.684E-01	0.0	0.0	0.0	0.0301	0.0	0.0684	0.0301	0.0301
1.2500	0.770E-06	0.229E-04	0.612E-01	0.136E-04	0.0	0.0	0.0288	0.0	0.0612	0.0288	0.0287
1.5000	0.559E-06	0.159E-04	0.556E-01	0.758E-04	0.0	0.0	0.0275	0.0	0.0557	0.0275	0.0274
2.0000	0.353E-06	0.894E-05	0.475E-01	0.302E-03	0.0	0.0	0.0252	0.0001	0.0478	0.0252	0.0252
3.0000	0.198E-06	0.397E-05	0.373E-01	0.865E-03	0.131E-04	0.0	0.0215	0.0006	0.0382	0.0221	0.0220
4.0000	0.136E-06	0.224E-05	0.311E-01	0.140E-02	0.533E-04	0.0	0.0188	0.0011	0.0326	0.0200	0.0198
5.0000	0.104E-06	0.143E-05	0.269E-01	0.189E-02	0.105E-03	0.0	0.0169	0.0016	0.0289	0.0184	0.0182
6.0000	0.834E-07	0.994E-06	0.238E-01	0.232E-02	0.163E-03	0.0	0.0153	0.0021	0.0263	0.0173	0.0171
8.0000	0.599E-07	0.559E-06	0.194E-01	0.305E-02	0.275E-03	0.0	0.0129	0.0029	0.0227	0.0159	0.0155
10.0000	0.467E-07	0.358E-06	0.166E-01	0.365E-02	0.379E-03	0.0	0.0113	0.0036	0.0206	0.0149	0.0145
15.0000	0.300E-07	0.159E-06	0.123E-01	0.478E-02	0.595E-03	0.0	0.0087	0.0050	0.0137	0.0130	0.0130
20.0000	0.221E-07	0.894E-07	0.984E-02	0.560E-02	0.764E-03	0.0	0.0072	0.0060	0.0162	0.0132	0.0123
30.0000	0.145E-07	0.397E-07	0.716E-02	0.675E-02	0.102E-02	0.0	0.0054	0.0075	0.0149	0.0129	0.0116
40.0000	0.108E-07	0.224E-07	0.569E-02	0.755E-02	0.120E-02	0.0	0.0044	0.0085	0.0144	0.0129	0.0113
50.0000	0.856E-08	0.143E-07	0.475E-02	0.816E-02	0.134E-02	0.0	0.0037	0.0093	0.0143	0.0130	0.0111
60.0000	0.711E-08	0.994E-08	0.409E-02	0.864E-02	0.146E-02	0.0	0.0032	0.0099	0.0142	0.0131	0.0109
80.0000	0.531E-08	0.559E-08	0.323E-02	0.936E-02	0.164E-02	0.0	0.0026	0.0109	0.0142	0.0135	0.0106
100.0000	0.424E-08	0.358E-08	0.268E-02	0.990E-02	0.178E-02	0.0	0.0022	0.0116	0.0144	0.0137	0.0104

POLYTETRAFLUOROETHYLENE

[All Units: cm²/g]

E (MeV)	τ/p	σ_x/p	σ/p	κ_D/p	κ_a/p	τ_{Tx}/p	σ_{Tx}/p	κ_{Tx}/p	μ/p	μ_{Tx}/p	μ_{en}/p
0.0010	0.482E+04	0.149E+01	0.792E-02	0.0	0.0	4794.0	0.0	0.0	4821.5	4794.0	4794.0
0.0015	0.167E+04	0.139E+01	0.163E-01	0.0	0.0	1663.0	0.0	0.0	1671.4	1663.0	1663.0
0.0020	0.759E+03	0.127E+01	0.261E-01	0.0	0.0	756.6	0.0	0.0	760.3	756.6	756.6
0.0030	0.240E+03	0.102E+01	0.465E-01	0.0	0.0	239.6	0.0	0.0	241.1	239.6	239.6
0.0040	0.104E+03	0.809E+00	0.651E-01	0.0	0.0	103.5	0.0	0.0	104.9	103.5	103.5
0.0050	0.533E+02	0.646E+00	0.806E-01	0.0	0.0	53.28	0.0	0.0	54.03	53.28	53.28
0.0060	0.308E+02	0.524E+00	0.930E-01	0.0	0.0	30.78	0.0	0.0	31.42	30.78	30.78
0.0080	0.128E+02	0.365E+00	0.111E+00	0.0	0.0	12.78	0.0	0.0	13.28	12.78	12.78
0.0100	0.641E+01	0.271E+00	0.122E+00	0.0	0.0	6.407	0.003	0.0	6.803	6.410	6.410
0.0150	0.179E+01	0.155E+00	0.139E+00	0.0	0.0	1.793	0.004	0.0	2.084	1.797	1.797
0.0200	0.717E+00	0.103E+00	0.147E+00	0.0	0.0	0.7168	0.0058	0.0	0.9670	0.7226	0.7226
0.0300	0.194E+00	0.543E-01	0.154E+00	0.0	0.0	0.1938	0.0085	0.0	0.4023	0.2023	0.2023
0.0400	0.759E-01	0.334E-01	0.155E+00	0.0	0.0	0.0759	0.0109	0.0	0.2643	0.0868	0.0868
0.0500	0.366E-01	0.225E-01	0.154E+00	0.0	0.0	0.0366	0.0129	0.0	0.2131	0.0495	0.0495
0.0600	0.201E-01	0.162E-01	0.152E+00	0.0	0.0	0.0200	0.0147	0.0	0.1883	0.0347	0.0347
0.0800	0.779E-02	0.949E-02	0.146E+00	0.0	0.0	0.0077	0.0175	0.0	0.1633	0.0252	0.0252
0.1000	0.374E-02	0.622E-02	0.140E+00	0.0	0.0	0.0038	0.0196	0.0	0.1500	0.0234	0.0234
0.1500	0.993E-03	0.284E-02	0.127E+00	0.0	0.0	0.0011	0.0232	0.0	0.1308	0.0243	0.0243
0.2000	0.393E-03	0.162E-02	0.117E+00	0.0	0.0	0.0004	0.0254	0.0	0.1190	0.0258	0.0258
0.3000	0.111E-03	0.725E-03	0.102E+00	0.0	0.0	0.0001	0.0276	0.0	0.1028	0.0277	0.0276
0.4000	0.478E-04	0.409E-03	0.914E-01	0.0	0.0	0.0	0.0284	0.0	0.0919	0.0284	0.0284
0.5000	0.259E-04	0.262E-03	0.935E-01	0.0	0.0	0.0	0.0286	0.0	0.0838	0.0286	0.0286
0.6000	0.161E-04	0.182E-03	0.773E-01	0.0	0.0	0.0	0.0284	0.0	0.0775	0.0284	0.0284
0.8000	0.811E-05	0.103E-03	0.679E-01	0.0	0.0	0.0	0.0278	0.0	0.0680	0.0278	0.0277
1.0000	0.504E-05	0.657E-04	0.611E-01	0.0	0.0	0.0	0.0269	0.0	0.0612	0.0269	0.0268
1.2500	0.320E-05	0.420E-04	0.546E-01	0.191E-04	0.0	0.0	0.0257	0.0	0.0547	0.0257	0.0256
1.5000	0.232E-05	0.292E-04	0.496E-01	0.106E-03	0.0	0.0	0.0245	0.0	0.0497	0.0246	0.0245
2.0000	0.146E-05	0.164E-04	0.424E-01	0.422E-03	0.0	0.0	0.0225	0.0002	0.0428	0.0227	0.0225
3.0000	0.813E-06	0.730E-05	0.333E-01	0.121E-02	0.117E-04	0.0	0.0192	0.0008	0.0345	0.0200	0.0198
4.0000	0.557E-06	0.411E-05	0.278E-01	0.196E-02	0.476E-04	0.0	0.0168	0.0015	0.0298	0.0183	0.0181
5.0000	0.422E-06	0.263E-05	0.240E-01	0.263E-02	0.949E-04	0.0	0.0151	0.0022	0.0267	0.0172	0.0169
6.0000	0.339E-06	0.182E-05	0.212E-01	0.323E-02	0.146E-03	0.0	0.0136	0.0028	0.0246	0.0165	0.0160
8.0000	0.243E-06	0.103E-05	0.174E-01	0.424E-02	0.246E-03	0.0	0.0116	0.0039	0.0219	0.0155	0.0150
10.0000	0.189E-06	0.657E-06	0.148E-01	0.508E-02	0.338E-03	0.0	0.0101	0.0049	0.0202	0.0150	0.0143
15.0000	0.121E-06	0.292E-06	0.109E-01	0.663E-02	0.531E-03	0.0	0.0078	0.0067	0.0181	0.0145	0.0135
20.0000	0.894E-07	0.164E-06	0.878E-02	0.776E-02	0.681E-03	0.0	0.0064	0.0080	0.0172	0.0144	0.0132
30.0000	0.584E-07	0.730E-07	0.639E-02	0.934E-02	0.905E-03	0.0	0.0049	0.0099	0.0166	0.0148	0.0129
40.0000	0.434E-07	0.411E-07	0.508E-02	0.104E-01	0.107E-02	0.0	0.0040	0.0112	0.0166	0.0152	0.0127
50.0000	0.345E-07	0.263E-07	0.424E-02	0.113E-01	0.120E-02	0.0	0.0034	0.0122	0.0167	0.0156	0.0126
60.0000	0.287E-07	0.182E-07	0.365E-02	0.119E-01	0.130E-02	0.0	0.0029	0.0130	0.0169	0.0159	0.0125
80.0000	0.214E-07	0.103E-07	0.288E-02	0.129E-01	0.146E-02	0.0	0.0024	0.0142	0.0172	0.0166	0.0122
100.0000	0.171E-07	0.657E-08	0.239E-02	0.136E-01	0.158E-02	0.0	0.0020	0.0150	0.0176	0.0171	0.0119

[All Units: cm²/g]

TE GAS (METHANE)

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_n/ρ	κ_0/ρ	τ_{tr}/ρ	σ_{tr}/ρ	κ_{tr}/ρ	μ/ρ	μ_{tr}/ρ	μ_{em}/ρ
0.0010	0.299E+04	0.118E+01	0.147E-01	0.0	0.0	2984.0	0.0	0.0	2991.2	2984.0	2984.0
0.0015	0.987E+03	0.108E+01	0.295E-01	0.0	0.0	985.1	0.0	0.0	988.1	985.1	985.1
0.0020	0.437E+03	0.955E+00	0.455E-01	0.0	0.0	436.1	0.0	0.0	438.0	436.1	436.1
0.0030	0.134E+03	0.732E+00	0.753E-01	0.0	0.0	133.8	0.0	0.0	134.8	133.8	133.8
0.0040	0.567E+02	0.561E+00	0.987E-01	0.0	0.0	56.65	0.0	0.0	57.36	56.65	56.65
0.0050	0.288E+02	0.440E+00	0.116E+00	0.0	0.0	28.79	0.0	0.0	29.36	28.79	28.79
0.0060	0.165E+02	0.355E+00	0.128E+00	0.0	0.0	16.45	0.0	0.0	16.98	16.45	16.45
0.0080	0.673E+01	0.249E+00	0.145E+00	0.0	0.0	6.731	0.003	0.0	7.124	6.731	6.731
0.0100	0.334E+01	0.188E+00	0.155E+00	0.0	0.0	3.336	0.003	0.0	3.683	3.339	3.339
0.0150	0.916E+00	0.111E+00	0.170E+00	0.0	0.0	0.9159	0.0051	0.0	1.1970	0.9210	0.9210
0.0200	0.362E+00	0.733E-01	0.178E+00	0.0	0.0	0.3617	0.0069	0.0	0.6133	0.3686	0.3686
0.0300	0.963E-01	0.385E-01	0.183E+00	0.0	0.0	0.0963	0.0100	0.0	0.3178	0.1063	0.1063
0.0400	0.374E-01	0.235E-01	0.182E+00	0.0	0.0	0.0374	0.0126	0.0	0.2429	0.0500	0.0500
0.0500	0.179E-01	0.158E-01	0.180E+00	0.0	0.0	0.0179	0.0149	0.0	0.2137	0.0328	0.0328
0.0600	0.978E-02	0.113E-01	0.176E+00	0.0	0.0	0.0098	0.0168	0.0	0.1971	0.0266	0.0266
0.0800	0.377E-02	0.662E-02	0.169E+00	0.0	0.0	0.0037	0.0201	0.0	0.1794	0.0238	0.0238
0.1000	0.180E-02	0.433E-02	0.161E+00	0.0	0.0	0.0019	0.0224	0.0	0.1671	0.0243	0.0243
0.1500	0.475E-03	0.197E-02	0.146E+00	0.0	0.0	0.0005	0.0266	0.0	0.1484	0.0271	0.0271
0.2000	0.188E-03	0.112E-02	0.134E+00	0.0	0.0	0.0002	0.0291	0.0	0.1353	0.0293	0.0293
0.3000	0.529E-04	0.500E-03	0.117E+00	0.0	0.0	0.0	0.0316	0.0	0.1176	0.0316	0.0316
0.4000	0.226E-04	0.282E-03	0.105E+00	0.0	0.0	0.0	0.0325	0.0	0.1053	0.0325	0.0325
0.5000	0.122E-04	0.181E-03	0.957E-01	0.0	0.0	0.0	0.0327	0.0	0.0959	0.0327	0.0327
0.6000	0.759E-05	0.126E-03	0.886E-01	0.0	0.0	0.0	0.0326	0.0	0.0887	0.0326	0.0326
0.8000	0.383E-05	0.707E-04	0.778E-01	0.0	0.0	0.0	0.0318	0.0	0.0779	0.0318	0.0318
1.0000	0.238E-05	0.452E-04	0.700E-01	0.0	0.0	0.0	0.0308	0.0	0.0700	0.0308	0.0307
1.2500	0.150E-05	0.290E-04	0.626E-01	0.155E-04	0.0	0.0	0.0295	0.0	0.0626	0.0294	0.0294
1.5000	0.109E-05	0.201E-04	0.569E-01	0.861E-04	0.0	0.0	0.0281	0.0	0.0570	0.0281	0.0280
2.0000	0.686E-06	0.113E-04	0.485E-01	0.343E-03	0.0	0.0	0.0257	0.0002	0.0489	0.0259	0.0258
3.0000	0.384E-06	0.503E-05	0.382E-01	0.981E-03	0.134E-04	0.0	0.0220	0.0007	0.0392	0.0227	0.0225
4.0000	0.264E-06	0.283E-05	0.319E-01	0.159E-02	0.546E-04	0.0	0.0193	0.0012	0.0335	0.0205	0.0203
5.0000	0.200E-06	0.181E-05	0.275E-01	0.214E-02	0.109E-03	0.0	0.0172	0.0018	0.0298	0.0190	0.0188
6.0000	0.161E-06	0.126E-05	0.243E-01	0.262E-02	0.167E-03	0.0	0.0156	0.0023	0.0271	0.0179	0.0176
8.0000	0.115E-06	0.707E-06	0.199E-01	0.345E-02	0.282E-03	0.0	0.0132	0.0033	0.0236	0.0165	0.0161
10.0000	0.898E-07	0.453E-06	0.169E-01	0.413E-02	0.387E-03	0.0	0.0115	0.0041	0.0214	0.0156	0.0151
15.0000	0.577E-07	0.201E-06	0.125E-01	0.540E-02	0.608E-03	0.0	0.0088	0.0056	0.0185	0.0145	0.0138
20.0000	0.425E-07	0.113E-06	0.101E-01	0.632E-02	0.781E-03	0.0	0.0067	0.0067	0.0172	0.0130	0.0126
30.0000	0.278E-07	0.503E-07	0.733E-02	0.763E-02	0.104E-02	0.0	0.0055	0.0084	0.0160	0.0138	0.0126
40.0000	0.207E-07	0.283E-07	0.582E-02	0.853E-02	0.123E-02	0.0	0.0044	0.0095	0.0156	0.0139	0.0123
50.0000	0.164E-07	0.181E-07	0.486E-02	0.921E-02	0.137E-02	0.0	0.0037	0.0104	0.0154	0.0141	0.0121
60.0000	0.136E-07	0.126E-07	0.419E-02	0.975E-02	0.149E-02	0.0	0.0032	0.0110	0.0154	0.0143	0.0120
80.0000	0.102E-07	0.707E-08	0.330E-02	0.106E-01	0.169E-02	0.0	0.0026	0.0120	0.0156	0.0147	0.0118
100.0000	0.813E-08	0.453E-08	0.274E-02	0.112E-01	0.182E-02	0.0	0.0022	0.0129	0.0158	0.0150	0.0116

[All Units: cm²/g]

WATER, LIQUID

E (MeV)	τ/ρ	σ_T/ρ	σ/ρ	κ_H/ρ	κ_a/ρ	τ_{tR}/ρ	σ_{tR}/ρ	κ_{tR}/ρ	μ/ρ	μ_{tR}/ρ	μ_{en}/ρ
0.0010	0.408E+04	0.137E+01	0.132E-01	0.0	0.0	4062.0	0.0	0.0	4081.4	4062.0	4062.0
0.0015	0.137E+04	0.127E+01	0.267E-01	0.0	0.0	1371.0	0.0	0.0	1371.3	1371.0	1371.0
0.0020	0.616E+03	0.115E+01	0.418E-01	0.0	0.0	615.1	0.0	0.0	617.2	615.1	615.1
0.0030	0.192E+03	0.909E+00	0.707E-01	0.0	0.0	191.6	0.0	0.0	193.0	191.6	191.6
0.0040	0.820E+02	0.708E+00	0.943E-01	0.0	0.0	81.90	0.0	0.0	82.80	81.90	81.90
0.0050	0.419E+02	0.558E+00	0.112E+00	0.0	0.0	41.89	0.0	0.0	42.57	41.89	41.89
0.0060	0.241E+02	0.449E+00	0.126E+00	0.0	0.0	24.05	0.0	0.0	24.67	24.05	24.05
0.0080	0.992E+01	0.310E+00	0.144E+00	0.0	0.0	9.914	0.0	0.0	10.374	9.917	9.917
0.0100	0.494E+01	0.231E+00	0.155E+00	0.0	0.0	4.943	0.003	0.0	5.326	4.946	4.946
0.0150	0.137E+01	0.133E+00	0.170E+00	0.0	0.0	1.369	0.005	0.0	1.673	1.374	1.374
0.0200	0.544E+00	0.886E-01	0.177E+00	0.0	0.0	0.5438	0.0068	0.0	0.8096	0.5506	0.5506
0.0300	0.146E+00	0.469E-01	0.183E+00	0.0	0.0	0.1457	0.0100	0.0	0.3759	0.1557	0.1557
0.0400	0.568E-01	0.287E-01	0.183E+00	0.0	0.0	0.0568	0.0127	0.0	0.2685	0.0695	0.0695
0.0500	0.272E-01	0.194E-01	0.180E+00	0.0	0.0	0.0272	0.0150	0.0	0.2266	0.0422	0.0422
0.0600	0.149E-01	0.139E-01	0.177E+00	0.0	0.0	0.0149	0.0170	0.0	0.2058	0.0319	0.0319
0.0800	0.577E-02	0.816E-02	0.170E+00	0.0	0.0	0.0058	0.0202	0.0	0.1839	0.0260	0.0260
0.1000	0.276E-02	0.535E-02	0.163E+00	0.0	0.0	0.0027	0.0228	0.0	0.1711	0.0255	0.0255
0.1500	0.731E-03	0.244E-02	0.147E+00	0.0	0.0	0.0008	0.0269	0.0	0.1502	0.0277	0.0276
0.2000	0.289E-03	0.139E-02	0.135E+00	0.0	0.0	0.0004	0.0293	0.0	0.1367	0.0297	0.0297
0.3000	0.816E-04	0.622E-03	0.118E+00	0.0	0.0	0.0	0.0319	0.0	0.1187	0.0319	0.0319
0.4000	0.349E-04	0.351E-03	0.106E+00	0.0	0.0	0.0	0.0328	0.0	0.1064	0.0328	0.0328
0.5000	0.188E-04	0.225E-03	0.966E-01	0.0	0.0	0.0	0.0330	0.0	0.0968	0.0330	0.0330
0.6000	0.117E-04	0.156E-03	0.894E-01	0.0	0.0	0.0	0.0329	0.0	0.0896	0.0329	0.0328
0.8000	0.592E-05	0.879E-04	0.786E-01	0.0	0.0	0.0	0.0321	0.0	0.0787	0.0321	0.0320
1.0000	0.368E-05	0.563E-04	0.707E-01	0.0	0.0	0.0	0.0311	0.0	0.0708	0.0311	0.0310
1.2500	0.233E-05	0.360E-04	0.632E-01	0.178E-04	0.0	0.0	0.0297	0.0	0.0633	0.0297	0.0296
1.5000	0.169E-05	0.250E-04	0.574E-01	0.982E-04	0.0	0.0	0.0284	0.0	0.0575	0.0284	0.0283
2.0000	0.106E-05	0.141E-04	0.490E-01	0.391E-03	0.0	0.0	0.0260	0.0002	0.0494	0.0262	0.0260
3.0000	0.594E-06	0.626E-05	0.385E-01	0.112E-02	0.135E-04	0.0	0.0222	0.0007	0.0396	0.0230	0.0228
4.0000	0.407E-06	0.352E-05	0.322E-01	0.181E-02	0.551E-04	0.0	0.0195	0.0014	0.0341	0.0209	0.0206
5.0000	0.309E-06	0.225E-05	0.278E-01	0.243E-02	0.110E-03	0.0	0.0174	0.0020	0.0303	0.0194	0.0191
6.0000	0.248E-06	0.156E-05	0.245E-01	0.299E-02	0.169E-03	0.0	0.0158	0.0026	0.0277	0.0184	0.0181
8.0000	0.178E-06	0.880E-06	0.201E-01	0.393E-02	0.284E-03	0.0	0.0134	0.0037	0.0243	0.0171	0.0166
10.0000	0.139E-06	0.563E-06	0.171E-01	0.470E-02	0.391E-03	0.0	0.0117	0.0046	0.0222	0.0163	0.0157
15.0000	0.891E-07	0.250E-06	0.127E-01	0.614E-02	0.613E-03	0.0	0.0091	0.0063	0.0195	0.0153	0.0144
20.0000	0.656E-07	0.141E-06	0.102E-01	0.719E-02	0.788E-03	0.0	0.0075	0.0076	0.0182	0.0150	0.0139
30.0000	0.429E-07	0.626E-07	0.740E-02	0.866E-02	0.105E-02	0.0	0.0056	0.0094	0.0171	0.0150	0.0133
40.0000	0.319E-07	0.352E-07	0.588E-02	0.967E-02	0.124E-02	0.0	0.0046	0.0106	0.0168	0.0152	0.0131
50.0000	0.253E-07	0.225E-07	0.491E-02	0.104E-01	0.139E-02	0.0	0.0039	0.0116	0.0167	0.0155	0.0129
60.0000	0.210E-07	0.156E-07	0.422E-02	0.111E-01	0.151E-02	0.0	0.0034	0.0124	0.0168	0.0158	0.0128
80.0000	0.157E-07	0.880E-08	0.333E-02	0.120E-01	0.169E-02	0.0	0.0028	0.0135	0.0170	0.0163	0.0125
100.0000	0.125E-07	0.563E-08	0.277E-02	0.127E-01	0.183E-02	0.0	0.0024	0.0144	0.0173	0.0167	0.0122

Table 2

Radiative loss factors for electrons generated in Compton interactions (G_c), for electrons and positrons produced in pair or triplet production processes (G_p) and the weighted, summed correction factors ($1-G$) that may be applied to determine the total fraction of energy absorbed in energy transfer processes.

Z=1		HYDROGEN	
E (MeV)	G_e	G_e	(1-G)
0.0150	0.0000	0.0000	1.0000
0.0200	0.0000	0.0000	1.0000
0.0300	0.0000	0.0000	1.0000
0.0400	0.0000	0.0000	1.0000
0.0500	0.0000	0.0000	1.0000
0.0600	0.0000	0.0000	1.0000
0.0800	0.0000	0.0000	1.0000
0.1000	0.0000	0.0000	1.0000
0.1500	0.0000	0.0000	1.0000
0.2000	0.0000	0.0000	1.0000
0.3000	0.0000	0.0000	1.0000
0.4000	0.0000	0.0000	1.0000
0.5000	0.0000	0.0000	1.0000
0.6000	0.0000	0.0000	1.0000
0.8000	0.0000	0.0000	1.0000
1.0000	0.0004	0.0000	1.0000
1.2500	0.0005	0.0010	0.9996
1.5000	0.0006	0.0025	0.9994
2.0000	0.0009	0.0053	0.9989
3.0000	0.0016	0.0097	0.9982
4.0000	0.0023	0.0131	0.9975
5.0000	0.0030	0.0158	0.9965
6.0000	0.0038	0.0179	0.9955
8.0000	0.0055	0.0218	0.9937
10.0000	0.0073	0.0251	0.9912
15.0000	0.0120	0.0319	0.9850
20.0000	0.0168	0.0378	0.9787
30.0000	0.0268	0.0481	0.9671
40.0000	0.0368	0.0573	0.9562
50.0000	0.0468	0.0660	0.9445
60.0000	0.0567	0.0743	0.9346
80.0000	0.0761	0.0899	0.9155
100.0000	0.0951	0.1045	0.8986

Z=13 ALUMINUM

E (MeV)	G _e	G _r	(1-G)
0.0100	0.0000	0.0000	1.0000
0.0150	0.0000	0.0000	1.0000
0.0200	0.0000	0.0000	1.0000
0.0300	0.0000	0.0000	1.0000
0.0400	0.0000	0.0000	1.0000
0.0500	0.0000	0.0000	1.0000
0.0600	0.0000	0.0000	1.0000
0.0800	0.0003	0.0000	1.0000
0.1000	0.0004	0.0000	1.0000
0.1500	0.0006	0.0000	1.0000
0.2000	0.0009	0.0000	0.9993
0.3000	0.0015	0.0000	0.9986
0.4000	0.0020	0.0000	0.9983
0.5000	0.0025	0.0000	0.9976
0.6000	0.0029	0.0000	0.9972
0.8000	0.0039	0.0000	0.9964
1.0000	0.0049	0.0000	0.9952
1.2500	0.0061	0.0026	0.9938
1.5000	0.0074	0.0055	0.9923
2.0000	0.0100	0.0110	0.9899
3.0000	0.0157	0.0203	0.9839
4.0000	0.0218	0.0283	0.9771
5.0000	0.0281	0.0356	0.9707
6.0000	0.0345	0.0423	0.9639
8.0000	0.0476	0.0550	0.9496
10.0000	0.0608	0.0670	0.9364
15.0000	0.0932	0.0948	0.9056
20.0000	0.1241	0.1203	0.8781
30.0000	0.1802	0.1657	0.8310
40.0000	0.2292	0.2050	0.7905
50.0000	0.2719	0.2396	0.7552
60.0000	0.3096	0.2701	0.7247
80.0000	0.3728	0.3219	0.6730
100.0000	0.4239	0.3644	0.6311

Z=29

COPPER

E (MeV)	G_e	G_r	(1-G)
0.0100	0.0000	0.0000	1.0000
0.0150	0.0000	0.0000	1.0000
0.0200	0.0000	0.0000	1.0000
0.0300	0.0000	0.0000	1.0000
0.0400	0.0000	0.0000	1.0000
0.0500	0.0000	0.0000	1.0000
0.0600	0.0000	0.0000	1.0000
0.0800	0.0006	0.0000	1.0000
0.1000	0.0009	0.0000	1.0000
0.1500	0.0016	0.0000	0.9994
0.2000	0.0024	0.0000	0.9991
0.3000	0.0038	0.0000	0.9973
0.4000	0.0052	0.0000	0.9956
0.5000	0.0065	0.0000	0.9943
0.6000	0.0078	0.0000	0.9923
0.8000	0.0103	0.0000	0.9901
1.0000	0.0127	0.0000	0.9877
1.2500	0.0157	0.0045	0.9846
1.5000	0.0187	0.0092	0.9817
2.0000	0.0249	0.0178	0.9756
3.0000	0.0377	0.0327	0.9628
4.0000	0.0509	0.0462	0.9502
5.0000	0.0641	0.0587	0.9376
6.0000	0.0772	0.0704	0.9256
8.0000	0.1028	0.0928	0.9027
10.0000	0.1273	0.1137	0.8810
15.0000	0.1831	0.1604	0.8339
20.0000	0.2320	0.2011	0.7927
30.0000	0.3120	0.2682	0.7260
40.0000	0.3752	0.3217	0.6729
50.0000	0.4263	0.3655	0.6294
60.0000	0.4685	0.4022	0.5933
80.0000	0.5346	0.4602	0.5362
100.0000	0.5843	0.5043	0.4926

	Z=50	TIN	
E (MeV)	G _e	G _r	(1-G)
0.0100	0.0000	0.0000	1.0000
0.0150	0.0000	0.0000	1.0000
0.0200	0.0000	0.0000	1.0000
0.0290	0.0000	0.0000	1.0000
0.0300	0.0000	0.0000	1.0000
0.0400	0.0000	0.0000	1.0000
0.0500	0.0000	0.0000	1.0000
0.0600	0.0000	0.0000	1.0000
0.0800	0.0010	0.0000	1.0000
0.1000	0.0015	0.0000	1.0000
0.1500	0.0028	0.0000	1.0000
0.2000	0.0042	0.0000	0.9995
0.3000	0.0072	0.0000	0.9980
0.4000	0.0100	0.0000	0.9952
0.5000	0.0127	0.0000	0.9921
0.6000	0.0152	0.0000	0.9891
0.8000	0.0199	0.0000	0.9837
1.0000	0.0245	0.0000	0.9787
1.2500	0.0299	0.0070	0.9727
1.5000	0.0353	0.0140	0.9671
2.0000	0.0459	0.0263	0.9572
3.0000	0.0667	0.0476	0.9388
4.0000	0.0869	0.0665	0.9219
5.0000	0.1065	0.0841	0.9052
6.0000	0.1253	0.1005	0.8891
8.0000	0.1607	0.1310	0.8592
10.0000	0.1931	0.1588	0.8325
15.0000	0.2631	0.2184	0.7742
20.0000	0.3207	0.2677	0.7258
30.0000	0.4094	0.3449	0.6498
40.0000	0.4753	0.4031	0.5925
50.0000	0.5263	0.4488	0.5474
60.0000	0.5671	0.4858	0.5109
80.0000	0.6286	0.5420	0.4553
100.0000	0.6733	0.5829	0.4149

E (MeV)	Z=82	LEAD	
	G _e	G _e	(1-G)
0.0100	0.0000	0.0000	1.0000
0.0130	0.0000	0.0000	1.0000
0.0150	0.0000	0.0000	1.0000
0.0160	0.0000	0.0000	1.0000
0.0200	0.0000	0.0000	1.0000
0.0300	0.0000	0.0000	1.0000
0.0400	0.0000	0.0000	1.0000
0.0500	0.0000	0.0000	1.0000
0.0600	0.0000	0.0000	1.0000
0.0800	0.0015	0.0000	1.0000
0.0880	0.0018	0.0000	1.0000
0.1000	0.0023	0.0000	1.0000
0.1500	0.0047	0.0000	1.0000
0.2000	0.0073	0.0000	1.0000
0.3000	0.0128	0.0000	0.9988
0.4000	0.0183	0.0000	0.9972
0.5000	0.0236	0.0000	0.9943
0.6000	0.0286	0.0000	0.9908
0.8000	0.0379	0.0000	0.9827
1.0000	0.0464	0.0000	0.9740
1.2500	0.0563	0.0111	0.9632
1.5000	0.0656	0.0222	0.9536
2.0000	0.0830	0.0409	0.9370
3.0000	0.1144	0.0714	0.9101
4.0000	0.1430	0.0972	0.8865
5.0000	0.1694	0.1204	0.8652
6.0000	0.1938	0.1416	0.8453
8.0000	0.2378	0.1801	0.8089
10.0000	0.2765	0.2141	0.7765
15.0000	0.3555	0.2843	0.7087
20.0000	0.4168	0.3396	0.6549
30.0000	0.5062	0.4216	0.5745
40.0000	0.5692	0.4802	0.5166
50.0000	0.6163	0.5246	0.4728
60.0000	0.6530	0.5594	0.4383
80.0000	0.7068	0.6104	0.3878
100.0000	0.7449	0.6462	0.3523

Z=92 URANIUM

E (MeV)	G _o	G _r	(1-G)
0.0100	0.0000	0.0000	1.0000
0.0150	0.0000	0.0000	1.0000
0.0170	0.0000	0.0000	1.0000
0.0200	0.0000	0.0000	1.0000
0.0210	0.0000	0.0000	1.0000
0.0220	0.0000	0.0000	1.0000
0.0300	0.0000	0.0000	1.0000
0.0400	0.0000	0.0000	1.0000
0.0500	0.0006	0.0000	1.0000
0.0600	0.0007	0.0000	1.0000
0.0800	0.0017	0.0000	1.0000
0.1000	0.0026	0.0000	1.0000
0.1160	0.0033	0.0000	1.0000
0.1500	0.0052	0.0000	1.0000
0.2000	0.0081	0.0000	1.0000
0.3000	0.0145	0.0000	1.0000
0.4000	0.0209	0.0000	0.9978
0.5000	0.0270	0.0000	0.9951
0.6000	0.0329	0.0000	0.9918
0.8000	0.0438	0.0000	0.9840
1.0000	0.0537	0.0000	0.9749
1.2500	0.0652	0.0123	0.9639
1.5000	0.0758	0.0247	0.9533
2.0000	0.0953	0.0456	0.9345
3.0000	0.1298	0.0790	0.9042
4.0000	0.1604	0.1068	0.8783
5.0000	0.1882	0.1314	0.8553
6.0000	0.2137	0.1536	0.8343
8.0000	0.2591	0.1936	0.7962
10.0000	0.2988	0.2287	0.7625
15.0000	0.3788	0.3006	0.6932
20.0000	0.4403	0.3567	0.6383
30.0000	0.5288	0.4392	0.5573
40.0000	0.5907	0.4976	0.4997
50.0000	0.6365	0.5415	0.4563
60.0000	0.6721	0.5756	0.4225
80.0000	0.7240	0.6252	0.3734
100.0000	0.7604	0.6597	0.3390

TABLE 3
 PERCENT DIFFERENCES IN MASS ENERGY-ABSORPTION COEFFICIENTS
 COMPARED WITH PREVIOUS TABULATIONS

<u>E (MeV)</u>		<u>1</u>	<u>6</u>	<u>$\frac{Z}{20}$</u>	<u>50</u>	<u>82</u>
.01	a)	-	+3.6	+1.1	+2.8	-
	b)	-	+9.0	-0.2	-1.5	-1.0
.10	a)	-	+0.5	+0.8	+0.7	-3.2
	b)	-	+0.9	-1.5	+1.2	+9.6
1.0	a)	-	-	-	-	-
	b)	-	-0.4	-	-	+4.0
10.0	a)	-	-	+1.0	+2.2	+4.3
	b)	-	-	-	-	+3.7
20.0						
100.0	b)	-	-1.0	-1.0	+2.2	+5.9

a): Comparison with Hubbell⁶

b): Comparison with Johns and Cunningham¹¹

Dashes indicate less than 0.1% difference.

BIBLIOGRAPHIC DATA SHEET

4. TITLE AND SUBTITLE

Mass Energy-Transfer and Mass Energy-Absorption Coefficients,
Including In-Flight Positron Annihilation for Photon Energies 1 keV to 100 MeV

5. AUTHOR(S)

P.D. Higgins, F.H. Attix, J.H. Hubbell, S.M. Seltzer, M.J. Berger, and C.H. Sibata

6. PERFORMING ORGANIZATION (IF JOINT OR OTHER THAN NIST, SEE INSTRUCTIONS)

U.S. DEPARTMENT OF COMMERCE
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
GAITHERSBURG, MD 20899

7. CONTRACT/GRANT NUMBER

8. TYPE OF REPORT AND PERIOD COVERED

9. SPONSORING ORGANIZATION NAME AND COMPLETE ADDRESS (STREET, CITY, STATE, ZIP)

The same as #6

10. SUPPLEMENTARY NOTES

DOCUMENT DESCRIBES A COMPUTER PROGRAM; SF-185, FIPS SOFTWARE SUMMARY, IS ATTACHED.

11. ABSTRACT (A 200-WORD OR LESS FACTUAL SUMMARY OF MOST SIGNIFICANT INFORMATION. IF DOCUMENT INCLUDES A SIGNIFICANT BIBLIOGRAPHY OR LITERATURE SURVEY, MENTION IT HERE.)

Mass energy-transfer μ_{tr}/ρ and mass energy-absorption coefficients μ_{en}/ρ are tabulated in units of cm^2/g for photon energies between 1 keV and 100 MeV for 29 elements ($Z = 1-92$), and 14 mixtures and compounds of general dosimetric interest. Cross sections for photo-effect, incoherent scattering, pair and triplet production are those compiled or generated by the National Institute of Standards and Technology (NIST) (formerly the National Bureau of Standards). Corrections are included for in-flight positron annihilation, previously not applied in NIST calculations for energies above 10 MeV. Agreement with recently published data is good for energies above 1 MeV, but we find differences in mass energy-absorption coefficients in the low energy region of as much as 4% compared with the last NIST compilation, and as much as 9% when compared with other recent compilations.

12. KEY WORDS (6 TO 12 ENTRIES; ALPHABETICAL ORDER; CAPITALIZE ONLY PROPER NAMES; AND SEPARATE KEY WORDS BY SEMICOLONS)

attenuation coefficients; energy-absorption coefficients; energy-transfer coefficients; photons; positron annihilation; x-rays

13. AVAILABILITY

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WASHINGTON, DC 20402.
 ORDER FROM NATIONAL TECHNICAL INFORMATION SERVICE (NTIS), SPRINGFIELD, VA 22161.

14. NUMBER OF PRINTED PAGES

69

15. PRICE

A04



