MASTER APEX
489

Space-Energy Cell Homogenization

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GENERAL ELECTRIC
ATOMIC PRODUCTS DIVISION
AIRCRAFT NUCLEAR PROPULSION DEPARTMENT

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Printed in USA. Price \$3.00. Available from the

Office of Technical Services
U. S. Department of Commerce
Washington 25, D. C.

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Nuclear Development Laboratories Sub-Section

August 1, 1958

United States Air Force

Contract No. AF 33(600)-38062

United States Atomic Energy Commission

Contract No. AT (11-1)-171

GENERAL ELECTRIC
ATOMIC PRODUCTS DIVISION
AIRCRAFT NUCLEAR PROPULSION DEPARTMENT
CINCINNATI 15, OHIO

Published by
Technical Publications Sub-Section
July 1959

Abstract

Fine-structure nuclear analysis program S (GE-ANPD APEX-394, "Neutron and Photon Transport: Plane, Cylinder, Sphere") has been extended to provide properly averaged nuclear data for gross-structure analysis work.

The input extension consists of the gross-structure space-energy lattice. Cell homogenization is performed by direct space-energy integration of each of the reaction-rate terms in the transport equation, with preservation of the detailed balance of leakage, collision, scatter-transfer, fission production, and fixed-source production. On a flexible flux-or-adjoint weighted space-energy cell basis, the extended output includes: cell-homogenized cross sections for collision, absorption, scatter, scatter-transfer, and fission multiplication; field depression or accentuation; leakage; surface albedo; and field diffusion coefficient, with inclusion of lumped-void leakage enhancement and other fine-structure heterogeneity effects.

Specific areas of immediate engineering applicability in GE-ANPD fuel loading and gross power shaping work on epithermal reactors include: (1) two-energy albedo input to program K with inclusion of the effects of complex control rod cell structure and of energy degradation within a control rod cell, (2) complete three-energy input to program CURE and to program F_3 with inclusion of the effects of fine-structure void channels and strong absorbers and of three-energy control-rod cell albedos, and (3) nineteen-energy flux depression factors and control-rod cell albedos for input to program G_2 .

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1. Theory

The neutron transport equation solved by the interim version of digital computer program S has the canonical form

$$\begin{aligned} & \nabla \cdot \underline{\Omega} \phi(\underline{r}, \underline{p}) + \Sigma(\underline{r}, \underline{p}) \phi(\underline{r}, \underline{p}) \\ &= \int_0^\infty \phi(\underline{r}, \underline{p}') \cdot (4\pi)^{-1} \Sigma_s(\underline{r}, \underline{p}' | \underline{p}) \underline{p}'^2 d\underline{p}' \\ &+ (4\pi k)^{-1} S(\underline{p}) \int_0^\infty \phi(\underline{r}, \underline{p}') \nu \Sigma_f(\underline{r}, \underline{p}') \underline{p}'^2 d\underline{p}', \end{aligned} \quad (1.1)$$

where $\phi(\underline{r}, \underline{p}) dV(\underline{r}, \underline{p})$ is the neutron flux in position ($\underline{r}$) and momentum ($\underline{p}$) volume element $dV(\underline{r}, \underline{p})$, $\underline{\Omega}$ is the unit vector $\underline{p}/p$, Σ is the collision probability per path length, Σ_s is the scatter-transfer probability per path length, k is the reactivity eigenvalue, $S(\underline{p})$ is the fission production spectrum, and $\nu \Sigma_f$ is the fission multiplication probability per path length.*

The space-energy cell homogenization performed by the program S₂ extension proceeds by direct integration of each of the reaction rate terms in this balance equation, with preservation of the detailed balance of leakage, collision, scatter-transfer, and fission production within each space-energy cell. Multiplying equation (1.1) by a phase-space volume element $d_I V(\underline{r}) \underline{p}^2 d_N \underline{p} d\Omega$ and integrating over a space-energy cell (I, N), with preservation of the detailed balance of reaction rates, leads to the homogenized representation for flux and reaction probabilities,[†]

$$V(I) = \int d_I V(\underline{r}), \quad (1.2)$$

$$\phi(I, N) = \int \phi(\underline{r}, \underline{p}) d_I V(\underline{r}) \underline{p}^2 d_N \underline{p} / V(I), \quad (1.3)$$

$$\Sigma(I, N) = \int \phi(\underline{r}, \underline{p}) \Sigma(\underline{r}, \underline{p}) d_I V(\underline{r}) \underline{p}^2 d_N \underline{p} / \phi(I, N) V(I), \quad (1.4)$$

$$\Sigma_s(I, N' | N) = \int \phi(\underline{r}, \underline{p}') \Sigma_s(\underline{r}, \underline{p}' | \underline{p}) d_I V(\underline{r}) \underline{p}'^2 d_N \underline{p}' \underline{p}^2 d_N \underline{p} / \phi(I, N') V(I), \quad (1.5)$$

$$S(N) = \int S(\underline{p}) \underline{p}^2 d_N \underline{p}, \quad (1.6)$$

$$\nu \Sigma_f(I, N) = \int \phi(\underline{r}, \underline{p}) \nu \Sigma_f(\underline{r}, \underline{p}) d_I V(\underline{r}) \underline{p}^2 d_N \underline{p} / \phi(I, N) V(I). \quad (1.7)$$

*GE-ANPD APEX-394, "Neutron and Photon Transport: Plane, Cylinder, Sphere," by B. H. Duane, discusses validity limitations. Anisotropic scatter-transfer is neglected.

[†]The notation $\phi(\underline{r}, \underline{p}) = \int \phi(\underline{r}, \underline{p}) d\Omega$ is used for the integral of the flux distribution over all solid-angle elements $d\Omega$.

Similarly, the requirement that cell leakage be preserved leads uniquely to definition of the flux diffusion coefficient $D(I, N)$ for an homogenized cell by the relation*

$$\int \nabla \cdot \underline{J}(\underline{r}, p) d_T V(\underline{r}) p^2 d_N p = - \int \nabla \cdot D(I, N) \nabla \phi(\underline{r}, p) d_T V(\underline{r}) p^2 d_N p.$$

Performing the indicated integration by conversion to surface integrals yields

$$D(I, N) = - \frac{\int \underline{J}(\underline{r}, N) \cdot d_T \underline{A}(\underline{r})}{\int \nabla \phi(\underline{r}, N) \cdot d_T \underline{A}(\underline{r})} \quad (1.8)$$

where $D(I, N)$ is the leakage-preserving flux diffusion coefficient for the homogenized cell, $\underline{J}(\underline{r}, N) = \int \underline{J}(\underline{r}, p) p^2 d_N p$ is energy-band integrated current, $\phi(\underline{r}, N) = \int \phi(\underline{r}, p) p^2 d_N p$ is energy-band integrated flux, and $d_T \underline{A}(\underline{r})$ is an element of the surface area enclosing the cell. It is to be noted that this argument has both necessary and sufficient character. There is no other diffusion coefficient that preserves cell leakage.

For a reactor having slab, cylindrical, or spherical symmetry (with arbitrarily complex heterogeneity, which may include void gaps, annuli, or shells), equation (1.8) simplifies to

$$D(I, N) = - \frac{A(I_+) J(I_+, N) - A(I_-) J(I_-, N)}{A(I_+) \nabla \phi(I_+, N) - A(I_-) \nabla \phi(I_-, N)}, \quad (1.9)$$

where $I_{\pm}$ refers to inner and outer surfaces bounding cell I , J is current, and $\nabla \phi$ is flux gradient evaluated on the interior side of the cell surface area A .

Expressed in terms of these cell-homogenized quantities, the isotropic component of the neutron transport equation (1.1) becomes

$$\begin{aligned} & -D(I, N) \int \nabla \phi(\underline{r}, N) \cdot d_T \underline{A}(\underline{r}) + \Sigma(I, N) \phi(I, N) V(I) \\ &= \sum_{N'} \phi(I, N') \Sigma_s(I, N' | N) V(I) \\ &+ k^{-1} S_N \sum_{N'} \phi(I, N') \nu \Sigma_f(I, N') V(I). \end{aligned}$$

A transition to the gross-structure multienergy neutron diffusion equation now can be formulated on a secure logical basis by summing the last equation over an array of space cells, dividing by the volume of the array, replacing the cell label I by a gross position vector $\underline{R}$, and making use of the surface integral definition for the gross divergence operator† to obtain

$$\begin{aligned} & -\nabla \cdot D(\underline{R}, N) \nabla \phi(\underline{R}, N) + \Sigma(\underline{R}, N) \phi(\underline{R}, N) \\ &= \sum_{N'} \phi(\underline{R}, N') \Sigma_s(\underline{R}, N' | N) \\ &+ k^{-1} S_N \sum_{N'} \phi(\underline{R}, N') \nu \Sigma_f(\underline{R}, N'). \end{aligned} \quad (1.10)$$

* The notation $\underline{J}(\underline{r}, p) = \int \underline{\Omega} \phi(\underline{r}, \underline{\Omega}) d\Omega$ is used for the integral of the current distribution over all solid angle elements $d\Omega$.

† $\nabla \cdot \underline{F} = \lim_{V \rightarrow 0} [\int \underline{F} \cdot d\underline{A} / \int dV]$

Constructing the diffusion coefficient on a cell-leakage-preserving basis, in accordance with equation (1.8), provides maximum assurance of retaining a useful level of reliability, on at least a cell-average basis, even when engineering practicalities necessitate pushing diffusion theory considerably beyond its normal domain of applicability.

2. Input and Output: Program S₂

2.1 INPUT

An initial checkout study selected to delineate the limitations of the numerical analysis method in both voids and strong absorbers is shown in Figure 1. The input data following Figure 1 have been normalized to a void outer radius of unity to provide dimensional invariance in interpretation of the output. The input deck assembly is given in Table 1.

Fig. 1 – Control rod in void annulus

Slab, Cylinder, or Sphere

Program: T-1-140, T-1-139

8

[illegible]

Physics, Input, Output: GE-ANPD APEX-394

Mathematics: LA-1891

Program: T-1-140, T-1-139

Remarks

[illegible]

U N C L A S S I F I E D

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GE-ANP React analysis Program S
Neutron or Photon Transport
Slab, Cylinder, or Sphere

PROBABILITY/PATH (/CM)

FE 7.87 G/CC

Physics, Input, output: GE-ANPD APEX-394

Mathematics: LA-1891

Program: T-1-140, T-1-139

Slab, Cylinder, or Sphere										FE 7.87 G/cc										Program: T-1-140, T-1-139										Remarks									
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
0 48120532		1 40100532		55																																SG(FE)			
9 000000000		1 B2329000		1 B0739000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 000000000		1 FE ③		01					
		B4791000		1 B3026000		1 +1588500																														02			
		B6659000		1 B4761000		1 +1763600																														03			
		B4707000		1 B2947000		1 +1896500																														04			
		B0548000		1 A9083000		1 +1757600																														05			
		B4624000		1 B2868000		1 +1461700																														06			
		C0738000		1 B8546000		1 +1751600																														07			
		C1249000		1 B9019000		1 +2186400																														08			
		C6011000		1 C5356000		1 +2222700																														09			
DUPLICATE COL. 1-10		D6691000		1 D5821000		1 +0640230		DUPLICATE COL. 37-78																														10	
		FE409000		1 F7084000		1 +0829730																																11	
		H9566000		1 H7681000		1 +1214800																																12	
		I5087000		1 I2600000		1 +1587700																																13	
		I5346000		1 I1420000		1 +1676800																																14	
		I6256000		1 H9695000		1 +2220700																																15	
		I6964000		1 H8344000		1 +3308300																																16	
		I9126000		1 H7075000		1 +3258500																																17	
		I+512000		1 H7290000		1 +3211700																																18	
Y		I+906000		1 I0015000		1 -3045700		Y																														19	

GE-ANP Re : Analysis Program S

Neutron or Photon Transport

Slab, Cylinder, or Sphere

SENSORS

IN 7.31 G/CC

CU 8.94 G/CC

AU 19.3 G/CC

Physics, Input, Output: GE-ANPD APEX-394

Mathematics: LA-1891

Program: T-1-140, T-1-139

Slab, Cylinder, or Sphere			CE 8177 G/cc			AU 19.3 G/cc			Program: T-1-140, T-1-139			Remarks																												
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80	
0	48240570	1	48120570	55																																			SG(N, S)	
9	+0079745	1	+0102325	1	+0230080	1	+0421810	1	+0632710	1	+0939480	1	+1188730	1	+1399635	1	IN	1	0108																					
9	+2070695	1	+7055695	1	A5338465	1	B2624230	1	10766268	1	42E87236	1	43B58294	1	3G195768	1	IN	1	0916																					
9	3E278460	0	4E757214	1	6E978389	46																																IN	1	1719
9	+0001795	1	+0002305	1	+0002955	1	+0003805	1	+0004880	1	+0006255	1	+0008040	1	+0010320	1	CU	1	0108																					
9	+0021595	1	+0058645	1	+0159520	1	+0434150	1	+1179215	1	+2483550	1	+4735635	1	+7807225	1	CU	1	0916																					
9	A2871285	1	B1536012	1	B7744170	46																																CU	1	1719
9	+0177070	1	+0250850	1	+0368900	1	+0516460	1	+0737800	1	+1121455	1	+1564130	1	+2065830	1	AU	1	0108																					
9	+4574340	1	A2542540	1	B5970430	1	B3609480	1	E8433470	1	40C57461	1	40E78800	1	1D844463	1	AU	1	0916																					
9	2B812663	1	3G327726	1	5A257369	46																																AU	1	1719
0	48240562	64																																					N(s)	
9	2B511000	1	2B511000	1	2B511000																																			
0	48250725	64																																					I(IH+)	
I	000C0016	1	00000020																																					
0	48260726	64																																					N(NH+)	
I	000C0010	1	00000018	1	00000019																																			

GE-ANP Reactor Analysis Program S
Neutron or Photon Transport
Slab, Cylinder, or Sphere

CYLINDER S4 CONSTANTS

Physics, Input, Output: GE-ANPD APEX-394
Mathematics: LA-1691
Program: T-1-140, T-1-139

Program: 1-1-140, 1-1-139																			Remarks																				
2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60	62	64	66	68	70	72	74	76	78	80
048220515 (63)																			ANG BASIS																				
9J1870515 (1) J6787443 (1) 00000000 (1) A6787443 (1) A1870515																																							
048220516																																							
9I1+000000 (1) H5099140 (1) B5384240 (1) D9200400 (1) I4964120																																							
048220517																																							
900000000 (1) I4964120 (1) D9200400 (1) B5384240 (1) H5099140																																							
048220520																																							
900000000 (1) OI496412 (1) 2B926367 (1) 2B926367 (1) OI496412																																							
048210521																																							
9I4043230 (1) E0837410																																							
048210522																																							
9F.5214520 (1) C4785480																																							
048100503 (64)																			FP(I)																				
048100514 (64)																			SC(I)																				
048120523 (1) 048100523 (55)																			IPH(I,N)																				

UNCLASSIFIED

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GE-ANP Re: Analysis Program S
Neutron or Photon Transport
Slab, Cylinder, or Sphere

Physics, Input, Output: GE-ANPD APEX-394
Mathematics: LA-1891
Program: T-1-140, T-1-139

[illegible]

TABLE 1
INPUT DECK ASSEMBLY: PROGRAM S₂

FLOCO Definition	Physical Definition	Format	Note
040000000	Parameters (800-827) ₈ defining problem scope and digital lattice		1, 16
	800 Case number	Floating	
	801 Convergence parameter error tolerance DH	Floating	
	802 Estimated convergence parameter H	Floating	
	803 Zero (802 at previous iteration)	Floating	2
	804 Zero (803 at previous iteration)	Floating	2
	805 Zero (804 at previous iteration)	Floating	2
	806 Zero (iteration count)	Floating	2
	807 Field: +1, flux; -1, adjoint; 0, both	Floating	3
	810 Number of radial lattice increments II	Fixed	2
	811 Number of radial lattice points II + 1	Fixed	
	812 Number of energy bands NN	Fixed	
	813 Number of mixtures	Fixed	
	814 Type of convergence parameter H	Fixed	
	Homogeneous (Q = 0) eigenvalue:		
	0, Reactivity K		
	1, Critical radius R(II)		
	2, Inverse period OMEGA		4
	Inhomogeneous (Q ≠ 0) inverse multiplication 1/M:		
	0, Scatter		4
	1,		
	2,		
	815 Geometry: 0, plane; 1, sphere; 2, cylinder	Fixed	
	816 Volume source Q(I, N): 0, none; 1, given	Fixed	
	817 Surface source Q(N): 0, none; 1, given	Fixed	
	820 Number of relative-angle segments MM	Fixed	5, 2
	821 MM/2	Fixed	2
	822 MM+1	Fixed	
	823 2*MM. (Floating simulated as fixed)	Fixed	2
	824 Number of sensors SS	Fixed	17 ←
	825 Number of homogenized space zones IHH	Fixed	17 ←
	826 Number of homogenized energy bands NNH	Fixed	17 ←
	827 Number of theory words (1400)	Fixed	2 ←
040400767	Flexible free storage allocation		
048271401	Flexible theory storage allocation		←
048110501	Lattice radii R(I), I = 0, II	Floating	16
048120526	Inverse mean inverse velocities V(N), N = 1, NN	Floating	6
048120527	Composite prompt-plus-delayed fission production spectrum S(N), N = 1, NN	Floating	6, 7
040100565	Delay fractions BETA (J), J = 1, 8	Floating	6, 7
040100566	Inverse mean delays LAMDA (J), J = 1, 8	Floating	6, 7
048120567 40100567	Delayed fission production spectra (S(J, N), J = 1, 8), N = 1, NN	Floating	6, 7

TABLE 1 (Cont.)
INPUT DECK ASSEMBLY: PROGRAM S₂

FLOCO Definition	Physical Definition	Format	Note
048120530 40100530	Cross Sections	Floating	8, 9
...	Multiply Collide Scatter		
048120537 40100537	(NUSGF(N), SG(N), (SGSO(N1, N), N1=N, N-5)),		
048120540 40100540	N=1, NN		
...			
048120547 40100547			
048130550 40100550	Mixture compositions: (MAT(J), J = 1, JJ(MIX) ≤ 7), MIX), zeros to fill card (MAT(J), J = 1, JJ(MIX) ≤ 7), MIX) zeros to fill card ...	Octal	8, 10
048130560 40100560	Mixture proportions: (N(MAT(J)), J = 1, JJ(MIX)), zero, zeros to fill card (N(MAT(J)), J = 1, JJ(MIX)), zero, zeros to fill card ...	Floating	8, 11
048100502	Reactor material composition: MAT(I), I = 1, II	Octal	10
048100504	Reactor material concentrations N(I), I = 1, II	Floating	12
048120563	Surface source Q(N), N = 1, NN	Floating	13
048120513 48100513	Volume source (Q(I, N), I = 1, II), N = 1, NN	Floating	13
048240570 48120570	Sensor activation cross sections (SG(N, S), N = 1, NN), S = 1, SS	Floating	13 ←
048240562	Sensor concentrations N(S), S = 1, SS	Floating	13 ←
048250725	Zone homogenization I(IH+), IH = 1, IIH	Fixed	13 ←
048260726	Energy homogenization N(NH+), NH = 1, NNH	Fixed	13 ←
048220515	Angular basis	Floating	14
048220516			
048220517			
048220520			
048210521			
048210522			
048100503	Fission production/volume $\overline{FP}(I)$, I = 1, II	Floating	15, 16
048100514	Scattering/volume $\overline{SC}(I)$, I = 1, II	Floating	16
048120523 48100523	Flux ($\overline{PHI}(I, N)$, I = 1, II), N = 1, NN	Floating	16

TABLE 1
INPUT DECK ASSEMBLY: PROGRAM S₂
NOTES

1. Parameter block is to be recoded so as to eliminate forward reference in physical definitions.
2. Entry is to be stored in program or computed by program rather than fed in as input, at next recoding.
3. Entry is to be shifted to fixed point card at next recoding.
4. Operating in a useful form, but incomplete.
5. Number of cylindrical-geometry polar-angle lattice points LL is equal to number of relative-angle segments MM .
6. Control card may be omitted in steady-state system.
7. Control card may be omitted if system contains no fissile material. Normalization:

$$\sum_N S(N) = 1 = \sum_N S(J, N).$$

8. Flexibility:

$$N(I) \sum_{MAT(I)} N(MAT) SG(MAT) = PROBABILITY/PATH$$

Materials may be defined either directly, by entry of cross section storage allocation and data, or indirectly, by entry of storage allocation and specifications for mixing up to 7 previously defined materials or previously defined mixtures. Control cards not needed may be omitted.

9. For endothermic scatter, $N = 1$ labels high energy flux or low energy adjoint. For exothermic scatter, $N = 1$ labels low energy flux or high energy adjoint. If adjoint of stated problem is requested, machine transposes all transfer cross sections and inverts energy scale; user of program provides adjoint angle reversal by negative labelling of output current and leakage.
10. A material or mixture is entered as the last 3 octal integers of its *FLOCO* definition.
11. Machine computes $SG(MIX) = \sum_{J=1}^{JJ(MIX)} N(MAT(J)) SG(MAT)$,
for each successive mixture, and places these cross sections in the storage allocation reserved by previous entry of a *FLOCO* definition for the mixture.
12. Void regions, with $N(I) = 0$, are admissible. Strong absorbers cause no trouble. The mirror-reflection boundary condition commonly used in infinite-lattice idealization is obtainable by enveloping a cell with a synthetic scattering film ten or so mean free paths thick ($SGSO(N, N) = 1 = SG(N)$, all other $SG = 0$). However, a more realistic cell-fine-structure analysis, with inclusion of leakage effects, is obtainable by working with a typical cell centered in an homogenized core.
13. Control card not relevant to the problem may be omitted.
14. Given in Table 2 of APEX-394.

15. Initial estimate may be entered as 1 in fuel, 0 elsewhere.
16. Binary restart cards containing P800-807, $R(I)$, $\overline{FP}(I)$, $\overline{SC}(I)$, $\overline{PHI}(I,N)$ from same problem, or from problem having the same (I,N) lattice, may be inserted after these control cards to provide initial guess. Control card followed by no data sets a block to zero initial values.
17. Zero entry bypasses relevant subroutine.

Changes from the previous formulation of the program have been marked by margin arrows. In Table 1, the parameters 824–827 have been rearranged to make room for specification of the homogenized space-energy lattice dimensionality (IH, NH). The number of theory words has been extended to 1400 to make room for equations (1.2–1.9). Control cards 401 (theory storage), 570 (sensor cross sections), and 562 (sensor concentrations) have been altered in correspondence with parameter block changes. Two new control cards (725, 726) have been inserted near the end of the input deck for entry of the space-homogenization lattice $I(IH+)$, $IH=1$, IH and the energy-homogenization lattice $N(NH+)$, $NH=1$, NH .

In the illustration shown, the (2,3) entries in 825 and 826, respectively, call for a 2-zone, 3-energy homogenization. The entries (16,20) and (10,18,19) shown following the 725 and 726 control words, respectively, specify that homogenized zone $IH=1$ spans fine zones $I=1$ through $I=16$, that homogenized zone $IH=2$ spans fine zones $I=17$ through $I=20$, that homogenized energy band $NH=1$ spans fine energy bands $N=1$ through $N=10$, that homogenized energy band $NH=2$ spans fine energy bands $N=11$ through $N=18$, and that homogenized energy band $NH=3$ spans fine energy bands $N=19$ through $N=19$.

2.2 OUTPUT

Machine output follows for the study shown in Figure 1. The flux-weighted space-energy homogenization blocks in the output list fixed source $Q(IH, NH)$, fission multiplication probability/path $NUSGF(IH, NH)$, collision probability/path $SG(IH, NH)$, scatter-transfer probabilities/path $SGSO(IH, NH \rightarrow NH | NH)$, zone-average flux $PHI(IH, NH)$, leakage probability/path $L(IH, NH) / [V(IH) \cdot PHI(IH, NH)]$, flux diffusion coefficient $D(IH, NH)$, outer surface albedo $A(IH, NH)$, scatter probability/path $SGSO(IH, NH)$, and absorption probability/path $SGA(IH, NH)$.

A block of such information appears for each successive space-zone, followed by a similar block for the composite array of space-zones. (The study shown illustrates 2-zone, 3-energy output, with zone outer boundaries taken at the outer surface of the iron guide tube in Figure 1 and at the cell outer boundary, and with the energy divisions selected to span the fission production band, epithermal band, and thermal band.)

The output blocks of reaction probability/path and volume-averaged flux for the composite array of space-zones provide a compact summary of the nuclear performance of the cell. The leakage probability/path for the composite array of zones can be employed directly as an effective transverse leakage "cross section" in matched radial-and-axial studies. Multienergy flux depression and accentuation factors, properly normalized to unity cell-average, are obtainable by dividing zone-average flux by cell-average flux for each energy band.

Control rod cells of arbitrary structural complexity can be entered into a gross-structure study either by use of the cell-albedo output or by use of the cell-homogenized reaction probability/path output. The latter method has the intrinsic advantage of portraying energy-degradation effects in greater detail.

The reaction probability/path blocks also are provided as binary-card output. This punched-card output can be fed back into the program as cross section input for a gross-structure study, on a selective basis, simply by replacing corresponding decimal cards in the input deck with these binary cards.

If adjoint output has been specified, an analogous adjoint-weighted space-energy homogenization is provided. It is to be noted that the labelling of the adjoint energy scale is inverted and that a negative sign is attached to adjoint current and leakage labels.

TRANSPORT THEORY
GE-ANPD PROGRAM S2

INPUT	PARAMETERS											Arrows					
FLOCO	0.64000	BB	0.02250									Show					
800-807	5.950000	00	1.000000-06	1.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	Changes			
810-817	0.000024	00	0.000025	00	0.000023	00	0.000000	00	0.000000	00	0.000002	00	0.000000	00	20		
820-827	0.000004	00	0.000002	00	0.000005	00	8.000000	00	0.000003	00<	0.000002	00<	0.000003	00<	0.002570	00<	
CORE	0.64000	BB	0.01000	INDEX													
400-407	0.000000	00	0.002310	00	0.002353	00	0.002402	00	0.002431	00	0.002503	00	0.002521	00	0.002547	00	
410-417	0.002641	00	0.002660	00	0.002740	00	0.003027	00	0.003114	00	0.003210	00	0.003247	00	0.003174	00	
420-427	0.004740	00	0.003315	00	0.000000	00	0.000000	00	0.003372	00	0.003445	00	0.003622	00	0.000000	00	
430-437	0.003521	00	0.003653	00	0.003666	00	0.003725	00	0.004124	00	0.004203	00	0.000000	00	0.000000	00	
440-447	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.004400	00	0.004442	00	0.000000	00	0.000000	00	
450-457	0.004502	00	0.004625	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	
460-477	0.60000	STZ	0.00002														
500-507	0.000000	00	0.005125	00	0.006152	00	0.006401	00	0.006176	00	0.007270	00	0.007314	00	0.007340	00	
510-517	0.007364	00	0.007410	00	0.007435	00	0.000000	00	0.006425	00	0.006332	00	0.006337	00	0.006344	00	
520-527	0.006351	00	0.006353	00	0.006355	00	0.006450	00	0.007442	00	0.007635	00	0.000000	00	0.000000	00	
530-537	0.005150	00	0.005423	00	0.005676	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	
540-557	0.60000	STZ	0.00002														
560-567	0.000000	00	0.000000	00	0.006320	00	0.006221	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	
570-577	0.006224	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	
600-607	0.007661	00	0.010523	00	0.011367	00	0.011414	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	
610-617	0.011417	00	0.000000	00	0.000000	00	0.011521	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	
620-627	0.000000	00	0.000000	00	0.000000	00	0.011557	00	0.000000	00	0.011562	00	0.000000	00	0.000000	00	
630-637	0.011524	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.011565	00	0.011610	00	0.011613	00	
640-677	0.60000	STZ	0.00004														
700-707	0.011636	00	0.012500	00	0.013344	00	CORE	0.013371	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00
710-717	0.60000	STZ	0.00001														
720-727	0.000000	00	0.000000	00	0.000000	00	UTILIZATION	0.000000	00	0.000000	00	0.006322	00	0.006325	00	0.000000	00
730-757	0.60000	STZ	0.00003														
760-767	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.000000	00	0.002310	00	
770-777	0.001000	00	0.002017	00	0.001504	00	0.001330	00	0.002072	00	0.017400	00	0.000000	00	0.000000	00	
	0.64000	BB	0.05125	501	LATTICE RADII R(I), I = 0, II												
	0.000000	00	3.488773	-01	3.571272	-01	3.653771	-01	3.736270	-01	3.818769	-01	3.901268	-01	3.983767	-01	
	4.066266	-01	4.148765	-01	4.165265	-01	4.181765	-01	4.198265	-01	4.214765	-01	4.231264	-01	4.332770	-01	
	4.586646	-01	5.939985	-01	7.293323	-01	8.646661	-01	1.000000	00							

CROSS SECTIONS

BAND N	MULTIPLY		COLLIDE		SCATTER					
	NUSGF(N)		SG(N)		SGSO(N,N)	SGSO(N-1,N)	SGSO(N-2,N)	SGSO(N-3,N)	SGSO(N-4,N)	SGSO(N-5,N)
	0.64000	BB	0.05150	530 B4C						
1	0.000000	00	4.830300	-01	3.119000	-01	0.000000	00	0.000000	00
2	0.000000	00	4.857500	-01	3.128000	-01	1.663400	-01	0.000000	00
3	0.000000	00	4.977600	-01	3.198800	-01	1.667800	-01	0.000000	00
4	0.000000	00	5.048100	-01	3.231600	-01	1.700500	-01	0.000000	00
5	0.000000	00	5.213900	-01	3.213700	-01	1.715800	-01	0.000000	00
6	0.000000	00	5.417700	-01	3.439300	-01	1.759400	-01	0.000000	00
7	0.000000	00	5.599500	-01	3.531600	-01	1.812600	-01	0.000000	00
8	0.000000	00	5.767000	-01	3.614000	-01	1.855400	-01	0.000000	00
9	0.000000	00	6.185200	-01	5.111000	-01	1.889400	-01	0.000000	00
10	0.000000	00	7.235700	-01	5.114100	-01	4.818400	-02	0.000000	00
11	0.000000	00	9.909000	-01	5.194100	-01	4.872900	-02	0.000000	00

12	0.000000	00	1.718700	00	5.194100-01	4.872900-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
13	0.000000	00	3.693200	00	5.194100-01	4.872900-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
14	0.000000	00	7.151200	00	5.044000-01	4.872900-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
15	0.000000	00	1.312100	01	4.729900-01	6.511800-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
16	0.000000	00	2.126100	01	4.729900-01	9.789400-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
17	0.000000	00	3.468100	01	4.729900-01	9.789400-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
18	0.000000	00	5.764500	01	4.790500-01	9.789400-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00
19	0.000000	00	7.408300	01	5.675100-01	9.295400-02	0.000000	00	0.000000	00	0.000000	00	0.000000	00

0.64000 BB 0.05423 531 VOID
0.60000 STZ 0.00023

N	NUSGF(N)	BB	SG(N)	532 FE	SGSO(N,N)	SGSO(N-1,N)	SGSO(N-2,N)	SGSO(N-3,N)	SGSO(N-4,N)	SGSO(N-5,N)
1	0.000000	00	2.232900-01		2.073900-01	0.000000	00	0.000000	00	0.000000
2	0.000000	00	2.479100-01		2.302600-01	1.588500-02	0.000000	00	0.000000	00
3	C.000000	00	2.665900-01		2.476100-01	1.763600-02	0.000000	00	0.000000	00
4	C.000000	00	2.470700-01		2.294700-01	1.896500-02	0.000000	00	0.000000	00
5	C.000000	00	2.054800-01		1.908300-01	1.757600-02	0.000000	00	0.000000	00
6	C.000000	00	2.462400-01		2.286800-01	1.461700-02	0.000000	00	0.000000	00
7	C.000000	00	3.073800-01		2.854600-01	1.751600-02	0.000000	00	0.000000	00
8	C.000000	00	3.124900-01		2.901900-01	2.186400-02	0.000000	00	0.000000	00
9	C.000000	00	3.601100-01		3.535600-01	2.222700-02	0.000000	00	0.000000	00
10	C.000000	00	4.669100-01		4.582100-01	6.402300-03	0.000000	00	0.000000	00
11	C.000000	00	6.840900-01		6.708400-01	8.297300-03	0.000000	00	0.000000	00
12	C.000000	00	8.956600-01		8.768100-01	1.214800-02	0.000000	00	0.000000	00
13	C.000000	00	9.508700-01		9.260000-01	1.587700-02	0.000000	00	0.000000	00
14	C.000000	00	9.534600-01		9.142000-01	1.676800-02	0.000000	00	0.000000	00
15	0.000000	00	9.625600-01		8.969500-01	2.220700-02	0.000000	00	0.000000	00
16	0.000000	00	9.696400-01		8.834400-01	3.308300-02	0.000000	00	0.000000	00
17	0.000000	00	9.912600-01		8.707500-01	3.258500-02	0.000000	00	0.000000	00
18	0.000000	00	1.051200	00	8.729000-01	3.211700-02	0.000000	00	0.000000	00
19	0.000000	00	1.090600	00	9.001500-01	3.045700-02	0.000000	00	0.000000	00

REACTOR MATERIALS MAT(I), I = 1, 11

0.64000	BB	0.06152	502							
0.005150	00	0.005150	00	0.005150	00	0.005150	00	0.005150	00	0.005150
0.005150	00	0.005150	00	0.005150	00	0.005150	00	0.005150	00	0.005150
0.005423	00	0.005423	00	0.005423	00	0.005423	00	0.005423	00	0.005676

MATERIAL CONCENTRATIONS N(I), I = 1, 11

0.64000	BB	0.06176	504							
1.636180	00	1.636180	00	1.636180	00	1.636180	00	1.636180	00	1.636180
1.636180	00	1.636180	00	1.636180	00	1.636180	00	1.636180	00	2.251100
2.251100	00	2.251100	00	2.251100	00	2.251100	00	2.251100	00	2.228245

SURFACE SOURCE Q(N), N = 1, NN

0.64000	BB	0.06221	563							
9.471104-01		3.739646	00	6.346773	00	6.850132	00	6.002114	00	4.759334
7.517287	00	5.021930	00	4.517746	00	4.029646	00	3.284121	00	2.048087
7.598351-01		5.980839-01		2.176584	00					3.624363
										2.782745
										1.229335
										1.017542

SENSOR ACTIVATION CROSS SECTIONS (SG(N,S), N = 1, NN), S = 1, SS

IN	0.64000	BB	0.06224	570						
	7.974500-04		1.023250-03		2.300800-03	4.218100-03	6.327100-03	9.394800-03	1.188730-02	1.399635-02
	2.070695-02		7.055695-02		1.533846-01	2.262423-01	1.376626	00	4.258723	01
	3.527846	00	4.575721	00	6.597839	00			4.325829	01
									3.719577	00

CU	1.795000-05	2.305000-05	2.955000-05	3.805000-05	4.880000-05	6.255000-05	8.040000-05	1.031999-04
	2.159500-04	5.864500-04	1.595200-03	4.341500-03	1.179215-02	2.483550-02	4.735635-02	7.807225-02
	1.287128-01	2.153601-01	2.774417-01					
AU	1.770700-03	2.508500-03	3.689000-03	5.164600-03	7.378000-03	1.121455-02	1.564129-02	2.065830-02
	4.574340-02	1.254254-01	2.597043-01	2.360948-01	5.843347-01	4.035746 01	4.057880 01	1.484446 00
	2.281266 00	3.732772 00	5.125737 00					
	0.64000 BB	0.06320 562	SENSOR CONCENTRATIONS N(S), S = 1, SS					
	2.251100 00	2.251100 00	2.251100 00					
	0.64000 BB	0.06322 725	RADIAL HOMOGENIZATION I(IH+), IH = 1, IIH					
	0.000020 00	0.000024 00						
	0.64000 BB	0.06325 726	ENERGY HOMOGENIZATION N(NH+), NH = 1, NNH					
	0.000012 00	0.000022 00	0.000023 00					
	0.64000 BB	0.06332 515	ANGULAR BASIS					
	-1.187051-01	-1.678744-01	0.000000 00	1.678744-01	1.187051-01			
	0.64000 BB	0.06337 516						
	1.000000 00	8.509914-01	2.538424-01	4.920040-01	9.496412-01			
	0.64000 BB	0.06344 517						
	0.000000 00	9.496412-01	4.920040-01	2.538424-01	8.509914-01			
	0.64000 BB	0.06351 520						
	0.000000 00	9.496412-01	2.292636 00	2.292636 00	9.496412-01			
	0.64000 BB	0.06353 521						
	9.404323-01	5.083741-01						
	0.64000 BE	0.06355 522						
	6.521452-01	3.478548-01						
	0.64000 BB	0.06401 503	FISSION PRODUCTION/VOLUME FP(I), I = 1, II					
	0.60000 STZ	0.000003						
	0.64000 BB	0.06425 514	LABORATORY-ELASTIC SCATTER/VOLUME SC(I), I = 1, II					
	0.60000 STZ	0.000003						
	0.64000 BB	0.06450 515	FLUX/VOLUME (PHI(I,N),I = 1, II), N = 1, NN					
	0.60000 STZ	0.000071						

OUTPUT

LAST FOUR EIGENVALUES ORDERED CHRONOLOGICALLY								
ITERATION	HPPP	HPP	HP	H	LEAKAGE L	SCATTER SC	FISS PROD FP	
4.000000 00	0.000000 00	0.000000 00	1.000000 00	9.861240-01	-7.744675-01	1.807252 00	0.000000 00	
8.000000 00	9.960193-01	9.988302-01	9.996499-01	9.998936-01	-7.523721-01	1.817430 00	0.000000 00	
1.200000 01	9.999673-01	9.999898-01	9.999968-01	9.999990-01	-7.522018-01	1.817515 00	0.000000 00	
1.600000 01	9.999997-01	9.999999-01	1.000000 00	1.000000 00	-7.522002-01	1.817516 00	0.000000 00	
R(I)	DV(I-)/2	FP(I-)	FP(I+)	A(I,IN)	A(I,CU)	A(I,AU)		
0.000000 00	0.000000 00	0.000000 00	0.000000 00	3.687353 00	3.542635-02	5.352710 00		
3.488773-01	3.042884-02	0.000000 00	0.000000 00	3.441089 01	8.968609-02	3.324893 01		
3.571272-01	1.456118-03	0.000000 00	0.000000 00	3.883670 01	9.566074-02	3.733889 01		
3.653771-01	1.490148-03	0.000000 00	0.000000 00	4.419132 01	1.031736-01	4.228310 01		
3.736270-01	1.524179-03	0.000000 00	0.000000 00	5.084696 01	1.129365-01	4.842490 01		
3.818769-01	1.558209-03	0.000000 00	0.000000 00	5.912233 01	1.260968-01	5.605082 01		
3.901268-01	1.592240-03	0.000000 00	0.000000 00	6.963748 01	1.450948-01	6.572155 01		
3.983767-01	1.626267-03	0.000000 00	0.000000 00	8.350345 01	1.761645-01	7.842433 01		
4.066266-01	1.660301-03	0.000000 00	0.000000 00	1.046185 02	2.387591-01	9.772088 01		
4.148765-01	1.694331-03	0.000000 00	0.000000 00	1.417184 02	4.196949-01	1.313829 02		
4.165265-01	3.429487-04	0.000000 00	0.000000 00	1.525431 02	4.848881-01	1.411473 02		
4.181765-01	3.443130-04	0.000000 00	0.000000 00	1.652513 02	5.726139-01	1.525433 02		
4.198265-01	3.456711-04	0.000000 00	0.000000 00	1.803393 02	6.913081-01	1.659807 02		
4.214765-01	3.470323-04	0.000000 00	0.000000 00	1.996852 02	9.054817-01	1.829557 02		
4.231264-01	3.483936-04	0.000000 00	0.000000 00	2.289616 02	1.435998 00	2.079209 02		
4.332770-01	2.173250-03	0.000000 00	0.000000 00	2.357111 02	1.481314 00	2.139996 02		
4.586646-01	5.661061-03	0.000000 00	0.000000 00	2.666502 02	1.686836 00	2.417820 02		
5.939985-01	3.561523-02	0.000000 00	0.000000 00	3.191009 02	2.030483 00	2.888773 02		
7.293323-01	4.477286-02	0.000000 00	0.000000 00	3.336090 02	2.124131 00	3.019271 02		
8.646661-01	5.393047-02	0.000000 00	0.000000 00	3.423264 02	2.180214 00	3.097698 02		
1.000000 00	6.308810-02	0.000000 00	0.000000 00	3.483289 02	2.218769 00	3.151706 02		
R(I)	DV(I-)/2	PHI(I,1)	PHI(I,2)	PHI(I,3)	PHI(I,4)	PHI(I,5)	PHI(I,6)	
0.000000 00	0.000000 00	7.798649-01	3.210920 00	5.750040 00	6.594723 00	6.009643 00	4.877459 00	
3.488773-01	3.042884-02	8.289417-01	3.366874 00	5.928756 00	6.675037 00	6.010685 00	4.842102 00	
3.571272-01	1.456118-03	8.312213-01	3.374115 00	5.937065 00	6.678808 00	6.010773 00	4.840454 00	
3.653771-01	1.490148-03	8.336944-01	3.381953 00	5.946025 00	6.682843 00	6.010849 00	4.838663 00	
3.736270-01	1.524179-03	8.363932-01	3.390485 00	5.955743 00	6.687187 00	6.010912 00	4.836707 00	
3.818769-01	1.558209-03	8.393565-01	3.399832 00	5.966347 00	6.691891 00	6.010959 00	4.834555 00	
3.901268-01	1.592240-03	8.426310-01	3.410135 00	5.977991 00	6.697016 00	6.010988 00	4.832173 00	
3.983767-01	1.626267-03	8.462725-01	3.421565 00	5.990861 00	6.702636 00	6.010993 00	4.829519 00	
4.066266-01	1.660301-03	8.503474-01	3.434324 00	6.005172 00	6.708836 00	6.010971 00	4.826543 00	
4.148765-01	1.694331-03	8.549346-01	3.448653 00	6.021184 00	6.715717 00	6.010912 00	4.823184 00	
4.165265-01	3.429487-04	8.559192-01	3.451725 00	6.024609 00	6.717182 00	6.010896 00	4.822461 00	
4.181765-01	3.443130-04	8.569287-01	3.454872 00	6.028116 00	6.718680 00	6.010877 00	4.821721 00	
4.198265-01	3.456711-04	8.579636-01	3.458098 00	6.031709 00	6.720212 00	6.010857 00	4.820961 00	
4.214765-01	3.470323-04	8.590254-01	3.461405 00	6.035388 00	6.721778 00	6.010835 00	4.820181 00	
4.231264-01	3.483936-04	8.601145-01	3.464796 00	6.039159 00	6.723381 00	6.010810 00	4.819380 00	
4.332770-01	2.173250-03	8.628481-01	3.473244 00	6.048504 00	6.727567 00	6.011028 00	4.817398 00	
4.586646-01	5.661061-03	8.725665-01	3.504779 00	6.084391 00	6.741591 00	6.009367 00	4.810664 00	
5.939985-01	3.561523-02	8.952271-01	3.576216 00	6.164138 00	6.774209 00	6.006720 00	4.795097 00	
7.293323-01	4.477286-02	9.061099-01	3.610506 00	6.202443 00	6.790041 00	6.005645 00	4.787604 00	
8.646661-01	5.393047-02	9.129242-01	3.631972 00	6.226430 00	6.799998 00	6.005023 00	4.782909 00	
1.000000 00	6.308810-02	9.177059-01	3.647034 00	6.243262 00	6.806999 00	6.004602 00	4.779613 00	
PHI(I,7)	PHI(I,8)	PHI(I,9)	PHI(I,10)	PHI(I,11)	PHI(I,12)	PHI(I,13)	PHI(I,14)	
3.757408 00	2.875755 00	7.233880 00	4.308430 00	2.793108 00	1.090049 00	5.296759-02	5.226289-03	
3.716634 00	2.847400 00	7.321416 00	4.531621 00	3.338594 00	2.036525 00	8.783568-01	2.397383-01	

3.714731 00	2.846088 00	7.325513 00	4.542021 00	3.363791 00	2.079383 00	9.270286-01	2.708928-01
3.712676 00	2.844682 00	7.329955 00	4.553272 00	3.391203 00	2.127023 00	9.832341-01	3.076812-01
3.710447 00	2.843168 00	7.334799 00	4.565517 00	3.421205 00	2.180243 00	1.048395 00	3.526845-01
3.708012 00	2.841527 00	7.340117 00	4.578932 00	3.454275 00	2.240157 00	1.124747 00	4.073611-01
3.705335 00	2.839737 00	7.345996 00	4.593736 00	3.491018 00	2.308283 00	1.215753 00	4.753940-01
3.702372 00	2.837773 00	7.352540 00	4.610192 00	3.532194 00	2.386671 00	1.335266 00	5.635607-01
3.699071 00	2.835602 00	7.359874 00	4.628623 00	3.578750 00	2.478062 00	1.493443 00	6.902862-01
3.695371 00	2.833189 00	7.368150 00	4.649416 00	3.631867 00	2.586114 00	1.703071 00	8.913994-01
3.694578 00	2.832674 00	7.369929 00	4.653888 00	3.643368 00	2.610020 00	1.752724 00	9.437490-01
3.693766 00	2.832148 00	7.371754 00	4.658475 00	3.655198 00	2.634816 00	1.805630 00	1.001877 00
3.692934 00	2.831610 00	7.373626 00	4.663183 00	3.667372 00	2.660547 00	1.862078 00	1.066645 00
3.692082 00	2.831059 00	7.375548 00	4.668016 00	3.679904 00	2.687264 00	1.922386 00	1.139064 00
3.691207 00	2.830495 00	7.377521 00	4.672979 00	3.692808 00	2.715021 00	1.986904 00	1.220312 00
3.689068 00	2.829238 00	7.382293 00	4.683883 00	3.716140 00	2.750399 00	2.021068 00	1.254905 00
3.681137 00	2.823228 00	7.399276 00	4.731019 00	3.847360 00	2.989234 00	2.278544 00	1.419402 00
3.663932 00	2.810801 00	7.434946 00	4.819709 00	4.054735 00	3.374819 00	2.724411 00	1.698639 00
3.655646 00	2.804887 00	7.452168 00	4.862188 00	4.152733 00	3.516685 00	2.848368 00	1.776069 00
3.650451 00	2.801197 00	7.462974 00	4.888756 00	4.213686 00	3.603412 00	2.922928 00	1.822626 00
3.646804 00	2.798613 00	7.470565 00	4.907393 00	4.256328 00	3.663611 00	2.974293 00	1.854693 00
PHI(I,15)	PHI(I,16)	PHI(I,17)	PHI(I,18)	PHI(I,19)	J(I,1)	J(I,2)	J(I,3)
0.000000 00	0.000000 00	0.000000 00	9.557060-08	0.000000 00	5.711786-10	6.587817-10	4.569429-09
4.999923-02	1.150045-02	1.096413-03	2.201791-05	4.693457-06	-3.928238-02	-1.241013-01	-1.399066-01
6.241685-02	1.625267-02	1.903460-03	5.509941-05	1.511203-05	-4.026991-02	-1.271672-01	-1.432553-01
7.830835-02	2.313555-02	3.339403-03	1.400551-04	4.978763-05	-4.126156-02	-1.302422-01	-1.466069-01
9.875624-02	3.318470-02	5.902343-03	3.669622-04	1.645917-04	-4.225778-02	-1.333274-01	-1.499615-01
1.252372-01	4.802152-02	1.055454-02	9.703538-04	6.136038-04	-4.325903-02	-1.364239-01	-1.533194-01
1.597830-01	7.023572-02	1.914320-02	2.628707-03	2.340593-03	-4.426609-02	-1.395329-01	-1.566809-01
2.052153-01	1.040708-01	3.544707-02	7.215296-03	9.211497-03	-4.527950-02	-1.426561-01	-1.600462-01
2.787652-01	1.566814-01	6.775714-02	2.054821-02	3.692318-02	-4.630020-02	-1.457951-01	-1.634159-01
4.135268-01	2.584757-01	1.359101-01	6.747030-02	1.779842-01	-4.732916-02	-1.489522-01	-1.667903-01
4.561759-01	2.934837-01	1.562243-01	8.428275-02	2.355150-01	-4.753603-02	-1.495859-01	-1.674658-01
5.066343-01	3.387305-01	1.910117-01	1.057918-01	3.138779-01	-4.774328-02	-1.502205-01	-1.681415-01
5.668853-01	4.021204-01	2.377752-01	1.363307-01	4.217219-01	-4.795093-02	-1.508559-01	-1.688174-01
6.395018-01	4.861282-01	3.165532-01	1.983086-01	6.344077-01	-4.815899-02	-1.514922-01	-1.694935-01
7.278330-01	5.999406-01	4.453580-01	3.465837-01	1.251354 00	-4.836746-02	-1.521295-01	-1.701699-01
7.511760-01	6.200223-01	4.604996-01	3.582537-01	1.292929 00	-4.723434-02	-1.485655-01	-1.661833-01
8.503871-01	7.024836-01	5.229682-01	4.092458-01	1.483025 00	-4.537874-02	-1.429713-01	-1.599336-01
1.019185 00	8.432477-01	6.292225-01	4.945544-01	1.797925 00	-3.503986-02	-1.103974-01	-1.234951-01
1.065789 00	8.819347-01	6.582589-01	5.176406-01	1.882547 00	-2.853792-02	-8.991225-02	-1.005795-01
1.093794 00	9.051667-01	6.756757-01	5.314573-01	1.933111 00	-2.407128-02	-7.583958-02	-8.483730-02
1.113077 00	9.211589-01	6.876584-01	5.409530-01	1.967835 00	-2.081363-02	-6.557592-02	-7.335597-02
J(I,4)	J(I,5)	J(I,6)	J(I,7)	J(I,8)	J(I,9)	J(I,10)	J(I,11)
4.569429-09	0.000000 00	5.886992-09	3.602278-09	6.587817-10	8.522119-09	5.886992-09	6.587817-10
-6.057508-02	9.342014-04	2.739084-02	3.079061-02	2.123692-02	-6.465840-02	-1.574699-01	-3.510966-01
-6.189722-02	1.051109-03	2.808872-02	3.153287-02	2.172910-02	-6.628920-02	-1.614823-01	-3.611181-01
-6.321169-02	1.174663-03	2.879024-02	3.227611-02	2.222052-02	-6.792716-02	-1.655150-01	-3.712597-01
-6.451766-02	1.305456-03	2.949569-02	3.302041-02	2.271109-02	-6.957301-02	-1.695701-01	-3.815351-01
-6.581411-02	1.444239-03	3.020553-02	3.376585-02	2.320067-02	-7.122760-02	-1.736501-01	-3.919602-01
-6.709989-02	1.591893-03	3.092022-02	3.451253-02	2.368913-02	-7.289193-02	-1.777580-01	-4.025540-01
-6.837364-02	1.749427-03	3.164033-02	3.526055-02	2.417626-02	-7.456715-02	-1.818972-01	-4.133396-01
-6.963379-02	1.918056-03	3.236654-02	3.601003-02	2.466190-02	-7.625470-02	-1.860719-01	-4.243445-01
-7.087842-02	2.099180-03	3.309963-02	3.676114-02	2.514577-02	-7.795621-02	-1.902870-01	-4.356025-01
-7.112531-02	2.137020-03	3.324712-02	3.691156-02	2.524231-02	-7.829831-02	-1.911353-01	-4.378873-01
-7.137148-02	2.175424-03	3.339495-02	3.706208-02	2.533877-02	-7.864104-02	-1.919855-01	-4.401841-01
-7.161690-02	2.214430-03	3.354309-02	3.721266-02	2.543514-02	-7.898443-02	-1.928376-01	-4.424933-01

	-7.186154-02	2.254063-03	3.369155-02	3.736332-02	2.553142-02	-7.932855-02	-1.936917-01	-4.448154-01
	-7.210541-02	2.294297-03	3.384037-02	3.751406-02	2.562761-02	-7.967335-02	-1.945479-01	-4.471507-01
	-7.041619-02	2.240537-03	3.304756-02	3.663519-02	2.502721-02	-7.780681-02	-1.899902-01	-4.366751-01
	-6.670993-02	3.784115-03	3.140076-02	3.480238-02	2.460703-02	-7.270754-02	-1.791240-01	-4.131124-01
	-5.151107-02	2.921944-03	2.424653-02	2.687316-02	1.900066-02	-5.614221-02	-1.383133-01	-3.189908-01
	-4.195277-02	2.379724-03	1.974736-02	2.188661-02	1.547492-02	-4.572457-02	-1.126481-01	-2.597993-01
	-3.538651-02	2.007242-03	1.665657-02	1.846100-02	1.305284-02	-3.856799-02	-9.501693-02	-2.191367-01
	-3.059754-02	1.735571-03	1.440234-02	1.596258-02	1.128634-02	-3.334846-02	-8.215794-02	-1.894801-01
	J(I,12)	J(I,13)	J(I,14)	J(I,15)	J(I,16)	J(I,17)	J(I,18)	J(I,19)
	1.646954-10	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00
	-4.924630-01	-3.644528-01	-1.413925-01	-3.392575-02	-8.291732-03	-8.318130-04	-1.762559-05	-4.100721-06
	-5.118382-01	-3.929212-01	-1.601624-01	-4.212706-02	-1.167183-02	-1.443837-03	-4.461976-05	-1.339624-05
	-5.317480-01	-4.231383-01	-1.815390-01	-5.242008-02	-1.647480-02	-2.514014-03	-1.134485-04	-4.378475-05
	-5.522699-01	-4.554322-01	-2.055038-01	-6.540081-02	-2.334832-02	-4.399421-03	-2.925884-04	-1.451500-04
	-5.734953-01	-4.902020-01	-2.329051-01	-8.185424-02	-3.326201-02	-7.754714-03	-7.633755-04	-5.211686-04
	-5.955345-01	-5.279603-01	-2.642969-01	-1.028241-01	-4.769900-02	-1.379900-02	-2.020677-03	-1.915553-03
	-6.185243-01	-5.665123-01	-3.003969-01	-1.297103-01	-6.897419-02	-2.488202-02	-5.430429-03	-7.221068-03
	-6.426371-01	-6.058013-01	-3.424455-01	-1.649081-01	-1.007703-01	-4.576691-02	-1.496618-02	-2.794719-02
	-6.680932-01	-6.475830-01	-3.900538-01	-2.102458-01	-1.493969-01	-8.679177-02	-4.484939-02	-1.213023-01
	-6.733642-01	-6.562425-01	-4.003657-01	-2.207190-01	-1.616247-01	-9.856435-02	-5.511174-02	-1.574894-01
	-6.787020-01	-6.650035-01	-4.109596-01	-2.317519-01	-1.750825-01	-1.121584-01	-6.793825-02	-2.054239-01
	-6.841094-01	-6.738656-01	-4.218408-01	-2.433736-01	-1.896060-01	-1.276675-01	-8.412029-02	-2.694036-01
	-6.895892-01	-6.828282-01	-4.330147-01	-2.556145-01	-2.054293-01	-1.456004-01	-1.044698-01	-3.557279-01
	-6.951445-01	-6.918905-01	-4.444860-01	-2.685048-01	-2.226706-01	-1.661929-01	-1.303098-01	-4.727394-01
	-6.788591-01	-6.756813-01	-4.239297-01	-2.541550-01	-2.101138-01	-1.565314-01	-1.225806-01	-4.444782-01
	-6.417321-01	-6.229473-01	-3.892707-01	-2.344434-01	-1.947459-01	-1.462238-01	-1.162996-01	-4.264262-01
	-4.561089-01	-3.869857-01	-2.415327-01	-1.451744-01	-1.203372-01	-9.008923-02	-7.127143-02	-2.603187-01
	-3.714740-01	-3.151772-01	-1.967143-01	-1.182361-01	-9.800762-02	-7.337241-02	-5.804641-02	-2.120143-01
	-3.133325-01	-2.658470-01	-1.659254-01	-9.973032-02	-8.266789-02	-6.188847-02	-4.896124-02	-1.788307-01
	-2.709280-01	-2.298689-01	-1.434701-01	-8.623344-02	-7.148013-02	-5.351287-02	-4.233513-02	-1.546289-01
FLUX-WEIGHTED SPACE-ENERGY HOMOGENIZATION								
ZONE IH	0.64000 BB	0.11521 613	VOLUME SOURCE Q(NH), NH = 1, NNH					
1	0.60000 STZ	0.00001	PROBABILITY/PATH					
	NUSGF(NH)	SG(NH)	SGSO(NH,NH)	SGSO(NH-1,NH)	SGSO(NH-2,NH)	SGSO(NH-3,NH)	SGSO(NH-4,NH)	SGSO(NH-5,NH)
BAND NH	0.64000 BB	0.11524 630				(empty)	(empty)	(empty)
1	0.000000 00	8.444276-01	7.901842-01	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00
2	0.000000 00	3.088195 00	1.047053 00	6.805480-03	0.000000 00	0.000000 00	0.000000 00	0.000000 00
3	0.000000 00	1.242241 01	1.434310 00	5.469278-04	0.000000 00	0.000000 00	0.000000 00	0.000000 00
BAND NH	PHI(NH)	L/V/PHI	DIFFUSOR D(NH)	ALBEDO A(NH)	SGSO(NH)	SGA(NH)		
1	4.600015 01	-5.424340-02	1.092748-01	9.521171-01	7.969896-01	4.743794-02		
2	7.050229 00	-1.706270 00	6.442347-02	4.047042-01	1.047600 00	2.040595 00		
3	2.216916-01	-8.387442 00	5.694999-02	2.697798-01	1.434310 00	1.098810 01		
ZONE IH	0.64000 BB	0.11521 613	VOLUME SOURCE Q(NH), NH = 1, NNH					
2	0.60000 STZ	0.00001						
BAND NH	0.64000 BB	0.11524 630	PROBABILITY/PATH					
1-2-3	0.60000 STZ	0.00003	(3 rows of zero probabilities for void)					
BAND NH	PHI(NH)	L/V/PHI	DIFFUSOR D(NH)	ALBEDO A(NH)	SGSO(NH)	SGA(NH)	Note effect of using too coarse a lattice in a void region	
1	4.706021 01	-2.807000-08	-1.010630-06	9.780125-01	0.000000 00	0.000000 00		
2	1.528242 01	2.950821-02	4.074492-02	7.608522-01	0.000000 00	0.000000 00		
3	1.857892 00	5.583716-02	5.052405-02	7.283748-01	0.000000 00	0.000000 00		
CELL ITH	0.64000 BB	0.11521 613	VOLUME SOURCE Q(NH), NH = 1, NNH					
	0.60000 STZ	0.00001						

		NUSGF(NH)		SG(NH)	SGSO(NH, NH)	PROBABILITY/PATH		SGSO(NH-1, NH)	SGSO(NH-2, NH)	SGSC(NH-3, NH)	SGSO(NH-4, NH)	SGSO(NH-5, NH)
BAND	NH											
		0.64000	BB	0.11524 630								
	1	0.000000	00	1.744701-01	1.632627-01	0.000000	00	0.000000	00	0.000000	00	0.000000 00 <-
	2	0.000000	00	3.380183-01	1.146051-01	1.406104-03	0.000000	00	0.000000	00	0.000000 00 <-	0.000000 00 <-
	3	0.000000	00	3.827470-01	4.419255-02	5.986396-05	0.000000	00	0.000000	00	0.000000 00 <-	0.000000 00 <-
BAND	NH	PHI(NH)		L/V/PHI	DIFFUSOR D(NH)	ALBEDO A(NH)	SGSO(NH)		SGA(NH)			
	1	4.683721	01	-1.120744-02	5.924767-01	9.780125-01	1.646688-01	9.801321-03				<-
	2	1.355059	01	-1.604813-01	6.054866-01	7.608522-01	1.146650-01	2.233532-01				<-
	3	1.513679	00	-2.043387-01	6.026511-01	7.283748-01	4.419255-02	3.385544-01				<-

ADJOINT								
LAST FOUR EIGENVALUES ORDERED CHRONOLOGICALLY								
ITERATION	HPPP	HPP	HP	H	LEAKAGE -L*	SCATTER SC*	FISS PROD FP*	
4.000000 00	0.000000 00	0.000000 00	1.000000 00	1.000133 00	-6.807335-01	1.827431 00	0.000000 00	
8.000000 00	1.000060 00	1.000023 00	1.000008 00	1.000002 00	-6.809587-01	1.827258 00	0.000000 00	
1.200000 01	1.000001 00	1.000000 00	1.000000 00	1.000000 00	-6.809638-01	1.827255 00	0.000000 00	
1.300000 01	1.000000 00	1.000000 00	1.000000 00	1.000000 00	-6.809638-01	1.827255 00	0.000000 00	
R(I)	DV(I-)/2	FP*(I-)	FP*(I+)	A*(I,IN)	A*(I,CU)	A*(I,AU)		
0.000000 00	0.000000 00	0.000000 00	0.000000 00	3.530949 00	3.373326-02	5.134209 00		
3.488773-01	3.042884-02	0.000000 00	0.000000 00	3.368165 01	8.765205-02	3.254366 01		
3.571272-01	1.456118-03	0.000000 00	0.000000 00	3.809591 01	9.364270-02	3.662332 01		
3.653771-01	1.490148-03	0.000000 00	0.000000 00	4.348812 01	1.011976-01	4.160391 01		
3.736270-01	1.524179-03	0.000000 00	0.000000 00	5.013869 01	1.109769-01	4.774175 01		
3.818769-01	1.558209-03	0.000000 00	0.000000 00	5.841151 01	1.241539-01	5.536614 01		
3.901268-01	1.592240-03	0.000000 00	0.000000 00	6.893298 01	1.432024-01	6.504191 01		
3.983767-01	1.626267-03	0.000000 00	0.000000 00	8.277166 01	1.743507-01	7.771464 01		
4.066266-01	1.660301-03	0.000000 00	0.000000 00	1.039301 02	2.370103-01	9.705296 01		
4.148765-01	1.694331-03	0.000000 00	0.000000 00	1.410785 02	4.180403-01	1.307619 02		
4.165265-01	3.429487-04	0.000000 00	0.000000 00	1.519176 02	4.832399-01	1.405403 02		
4.181765-01	3.443130-04	0.000000 00	0.000000 00	1.646417 02	5.709955-01	1.519517 02		
4.198265-01	3.456711-04	0.000000 00	0.000000 00	1.797485 02	6.898407-01	1.654069 02		
4.214765-01	3.470323-04	0.000000 00	0.000000 00	1.991089 02	9.040364-01	1.823964 02		
4.231264-01	3.483936-04	0.000000 00	0.000000 00	2.283999 02	1.434776 00	2.073762 02		
4.332770-01	2.173250-03	0.000000 00	0.000000 00	2.353045 02	1.480308 00	2.136016 02		
4.586646-01	5.661061-03	0.000000 00	0.000000 00	2.662964 02	1.686063 00	2.414301 02		
5.939985-01	3.561523-02	0.000000 00	0.000000 00	3.189981 02	2.030187 00	2.887636 02		
7.293323-01	4.477286-02	0.000000 00	0.000000 00	3.335364 02	2.123906 00	3.018452 02		
8.646661-01	5.393047-02	0.000000 00	0.000000 00	3.422688 02	2.180029 00	3.097041 02		
1.000000 00	6.308810-02	0.000000 00	0.000000 00	3.482804 02	2.218612 00	3.151151 02		
R(I)	DV(I-)/2	PHI*(I,19)	PHI*(I,18)	PHI*(I,17)	PHI*(I,16)	PHI*(I,15)	PHI*(I,14)	
0.000000 00	0.000000 00	0.000000 00	4.364233-09	0.000000 00	0.000000 00	0.000000 00	5.079149-03	
3.488773-01	3.042884-02	4.640685-06	1.988176-05	1.054506-03	1.124847-02	4.900651-02	2.347378-01	
3.571272-01	1.456118-03	1.503900-05	5.145385-05	1.848267-03	1.595777-02	6.135441-02	2.658082-01	
3.653771-01	1.490148-03	4.945626-05	1.346166-04	3.261916-03	2.278629-02	7.717481-02	3.030261-01	
3.736270-01	1.524179-03	1.638514-04	3.575022-04	5.798997-03	3.277062-02	9.755219-02	3.480117-01	
3.818769-01	1.558209-03	6.113493-04	9.579780-04	1.041210-02	4.753259-02	1.239667-01	4.026903-01	
3.901268-01	1.592240-03	2.334879-03	2.616968-03	1.894571-02	6.965977-02	1.584593-01	4.707634-01	
3.983767-01	1.626267-03	9.192662-03	7.209237-03	3.517756-02	1.034006-01	2.038592-01	5.585297-01	
4.066266-01	1.660301-03	3.688043-02	2.061258-02	6.739545-02	1.559114-01	2.772821-01	6.857938-01	
4.148765-01	1.694331-03	1.778295-01	6.779660-02	1.354325-01	2.574684-01	4.120577-01	8.873106-01	
4.165265-01	3.429487-04	2.353212-01	8.4770503-02	1.556123-01	2.924475-01	4.547435-01	9.397648-01	
4.181765-01	3.443130-04	3.136332-01	1.063345-01	1.903740-01	3.375874-01	5.052428-01	9.980039-01	
4.198265-01	3.456711-04	4.214100-01	1.372654-01	2.370765-01	4.009234-01	5.655331-01	1.062888 00	
4.214765-01	3.470323-04	6.338380-01	1.997002-01	3.156682-01	4.848543-01	6.381766-01	1.135423 00	
4.231264-01	3.483936-04	1.250038 00	3.495397-01	4.442275-01	5.985338-01	7.265056-01	1.216784 00	
4.332770-01	2.173250-03	1.291492 00	3.615113-01	4.593674-01	6.187112-01	7.501897-01	1.252603 00	
4.586646-01	5.661061-03	1.481857 00	4.118960-01	5.220447-01	7.013561-01	8.494867-01	1.417299 00	
5.939985-01	3.561523-02	1.797599 00	4.952956-01	6.289638-01	8.429478-01	1.018960 00	1.698112 00	
7.293323-01	4.477286-02	1.882325 00	5.181445-01	6.580831-01	8.817308-01	1.065636 00	1.775710 00	
8.646661-01	5.393047-02	1.932937 00	5.318507-01	6.755385-01	9.050076-01	1.093674 00	1.822346 00	
1.000000 00	6.308810-02	1.967690 00	5.412808-01	6.875440-01	9.210262-01	1.112977 00	1.854460 00	
PHI*(I,13)	PHI*(I,12)	PHI*(I,11)	PHI*(I,10)	PHI*(I,9)	PHI*(I,8)	PHI*(I,7)	PHI*(I,6)	
4.945146-02	1.010053 00	2.666224 00	4.090803 00	6.854024 00	3.511197 00	3.501623 00	4.449118 00	
8.575896-01	1.984421 00	3.256843 00	4.384628 00	7.060375 00	3.300976 00	3.532538 00	4.542416 00	

9.068009-01	2.028593 00	3.284166 00	4.398327 00	7.070008 00	3.291289 00	3.533937 00	4.546762 00
9.635600-01	2.077672 00	3.313822 00	4.413094 00	7.080383 00	3.280715 00	3.535530 00	4.551469 00
1.029317 00	2.132471 00	3.346203 00	4.429111 00	7.091624 00	3.269104 00	3.537352 00	4.556595 00
1.106337 00	2.194121 00	3.381810 00	4.446597 00	7.103883 00	3.256275 00	3.539444 00	4.562215 00
1.199275 00	2.264166 00	3.421273 00	4.465821 00	7.117341 00	3.242006 00	3.541860 00	4.568414 00
1.322861 00	2.344675 00	3.465382 00	4.487113 00	7.132217 00	3.226026 00	3.544664 00	4.575298 00
1.482265 00	2.438412 00	3.515120 00	4.510869 00	7.148775 00	3.208012 00	3.547937 00	4.582992 00
1.693356 00	2.549052 00	3.571704 00	4.537567 00	7.167328 00	3.187571 00	3.551775 00	4.591645 00
1.743331 00	2.573505 00	3.583936 00	4.543295 00	7.171301 00	3.183163 00	3.552618 00	4.593501 00
1.796567 00	2.598857 00	3.596511 00	4.549168 00	7.175371 00	3.178636 00	3.553489 00	4.595404 00
1.853354 00	2.625154 00	3.609443 00	4.555191 00	7.179542 00	3.173987 00	3.554389 00	4.597355 00
1.914008 00	2.652447 00	3.622748 00	4.561368 00	7.183817 00	3.169210 00	3.555320 00	4.599355 00
1.978877 00	2.680789 00	3.636440 00	4.567707 00	7.188200 00	3.164300 00	3.556282 00	4.601408 00
2.013205 00	2.716876 00	3.661260 00	4.581563 00	7.198488 00	3.153224 00	3.558429 00	4.606435 00
2.275629 00	2.962023 00	3.801358 00	4.643181 00	7.239473 00	3.105906 00	3.566811 00	4.624344 00
2.723680 00	3.370282 00	4.022779 00	4.758686 00	7.323849 00	3.006571 00	3.584649 00	4.665352 00
2.847871 00	3.514010 00	4.127495 00	4.813993 00	7.364405 00	2.959353 00	3.593063 00	4.685059 00
2.922540 00	3.601323 00	4.192648 00	4.848582 00	7.389808 00	2.929913 00	3.598293 00	4.697401 00
2.973970 00	3.661870 00	4.238235 00	4.872840 00	7.407636 00	2.909294 00	3.601950 00	4.706063 00
PHI*(I,5)	PHI*(I,4)	PHI*(I,3)	PHI*(I,2)	PHI*(I,1)	-J*(I,19)	-J*(I,18)	-J*(I,17)
5.652683 00	6.578898 00	6.344876 00	4.165089 00	1.482750 00	0.000000 00	0.000000 00	0.000000 00
5.759102 00	6.661668 00	6.347754 00	4.040775 00	1.322598 00	-4.090867-06	-1.727808-05	-8.232467-04
5.764074 00	6.665533 00	6.347906 00	4.035012 00	1.315142 00	-1.336934-05	-4.389710-05	-1.430230-03
5.769440 00	6.669691 00	6.348045 00	4.028761 00	1.307093 00	-4.370279-05	-1.125033-04	-2.494306-03
5.775266 00	6.674191 00	6.348169 00	4.021943 00	1.298353 00	-1.448018-04	-2.914883-04	-3.73262-03
5.781631 00	6.679091 00	6.348274 00	4.014459 00	1.288806 00	-5.202253-04	-7.636020-04	-7.720935-03
5.788629 00	6.684460 00	6.348357 00	4.006193 00	1.278309 00	-1.912980-03	-2.025715-03	-1.375652-02
5.796373 00	6.690382 00	6.348411 00	3.997004 00	1.266698 00	-7.213549-03	-5.453755-03	-2.483122-02
5.804999 00	6.696953 00	6.348429 00	3.986726 00	1.253772 00	-2.792749-02	-1.503902-02	-4.571041-02
5.814665 00	6.704290 00	6.348402 00	3.975160 00	1.239297 00	-1.212400-01	-4.504922-02	-8.673662-02
5.816735 00	6.705858 00	6.348391 00	3.972678 00	1.236199 00	-1.574126-01	-5.534915-02	-9.849121-02
5.818855 00	6.707462 00	6.348377 00	3.970133 00	1.233027 00	-2.053288-01	-6.821926-02	-1.120756-01
5.821027 00	6.709105 00	6.348361 00	3.967524 00	1.229777 00	-2.692856-01	-8.446259-02	-1.275895-01
5.823253 00	6.710787 00	6.348342 00	3.964849 00	1.226447 00	-3.555715-01	-1.048736-01	-1.455160-01
5.825534 00	6.712510 00	6.348321 00	3.962104 00	1.223035 00	-4.725480-01	-1.307636-01	-1.661123-01
5.831291 00	6.716868 00	6.348370 00	3.955320 00	1.214397 00	-4.442683-01	-1.230550-01	-1.563672-01
5.850393 00	6.732415 00	6.347986 00	3.929688 00	1.183653 00	-4.270066-01	-1.149830-01	-1.466822-01
5.896305 00	6.768037 00	6.347434 00	3.871790 00	1.111903 00	-2.604804-01	-7.090427-02	-9.021724-02
5.918448 00	6.785217 00	6.347250 00	3.844041 00	1.077375 00	-2.121460-01	-5.774738-02	-7.347666-02
5.932336 00	6.795993 00	6.347156 00	3.826680 00	1.055738 00	-1.789418-01	-4.870901-02	-6.197641-02
5.942090 00	6.803560 00	6.347097 00	3.814502 00	1.040549 00	-1.547249-01	-4.211704-02	-5.358890-02
-J*(I,16)	-J*(I,15)	-J*(I,14)	-J*(I,13)	-J*(I,12)	-J*(I,11)	-J*(I,10)	-J*(I,9)
0.000000 00	0.000000 00	0.000000 00	0.000000 00	1.307052-09	6.587817-10	1.317563-09	1.317563-09
-8.248909-03	-3.384990-02	-1.413661-01	-3.665390-01	-5.061865-01	-3.777085-01	-2.057427-01	-1.510513-01
-1.161668-02	-4.205198-02	-1.601963-01	-3.952665-01	-5.260266-01	-3.882527-01	-2.108259-01	-1.546763-01
-1.640885-05	-5.235240-02	-1.814331-01	-4.257684-01	-5.464029-01	-3.989099-01	-2.159244-01	-1.530050-01
-2.327304-02	-6.534907-02	-2.054645-01	-4.583725-01	-5.673914-01	-4.096917-01	-2.210398-01	-1.619377-01
-3.317950-02	-8.182925-02	-2.329538-01	-4.934783-01	-5.890810-01	-4.206117-01	-2.261735-01	-1.655750-01
-4.761610-02	-1.028373-01	-2.644555-01	-5.313290-01	-6.115784-01	-4.316861-01	-2.313276-01	-1.692173-01
-6.889662-02	-1.297757-01	-3.006463-01	-5.689633-01	-6.350111-01	-4.429339-01	-2.365042-01	-1.728652-01
-1.007105-01	-1.649389-01	-3.427880-01	-6.085346-01	-6.595370-01	-4.543780-01	-2.417061-01	-1.765193-01
-1.493232-01	-2.103336-01	-3.905910-01	-6.505991-01	-6.853561-01	-4.660458-01	-2.469361-01	-1.801805-01
-1.615642-01	-2.208297-01	-4.009448-01	-6.593135-01	-6.906918-01	-4.684085-01	-2.479857-01	-1.809136-01
-1.750133-01	-2.318856-01	-4.115805-01	-6.681282-01	-6.960909-01	-4.707816-01	-2.490367-01	-1.816470-01
-1.895533-01	-2.435290-01	-4.225030-01	-6.770422-01	-7.015558-01	-4.731655-01	-2.500889-01	-1.823808-01

-2.053938-01	-2.557880-01	-4.337167-01	-6.860544-01	-7.070889-01	-4.755605-01	-2.511426-01	-1.831149-01
-2.226489-01	-2.686898-01	-4.452251-01	-6.951637-01	-7.126929-01	-4.779669-01	-2.521976-01	-1.838493-01
-2.099239-01	-2.540121-01	-4.235965-01	-6.786439-01	-6.959963-01	-4.667694-01	-2.462892-01	-1.795422-01
-1.953046-01	-2.348888-01	-3.903110-01	-6.243891-01	-6.585434-01	-4.417553-01	-2.331611-01	-1.705809-01
-1.204856-01	-1.452861-01	-2.417935-01	-3.873472-01	-4.581425-01	-3.411078-01	-1.800388-01	-1.317166-01
-9.812848-02	-1.183270-01	-1.969267-01	-3.154716-01	-3.731303-01	-2.778123-01	-1.466311-01	-1.072755-01
-8.276984-02	-9.980704-02	-1.661046-01	-2.660954-01	-3.147295-01	-2.343304-01	-1.236810-01	-9.048523-02
-7.156828-02	-8.629978-02	-1.436250-01	-2.300837-01	-2.721360-01	-2.026176-01	-1.069428-01	-7.823954-02
-J*(I,8)	-J*(I,7)	-J*(I,6)	-J*(I,5)	-J*(I,4)	-J*(I,3)	-J*(I,2)	-J*(I,1)
6.587817-10	6.854144-09	1.317563-09	1.317563-09	1.317563-09	0.000000 00	6.854144-09	1.471748-09
1.648994-01	-2.726920-02	-7.190603-02	-8.182415-02	-6.380621-02	-8.857723-04	9.963266-02	1.262907-01
1.693883-01	-2.823081-02	-7.369618-02	-8.378478-02	-6.529252-02	-8.120649-04	1.021420-01	1.293241-01
1.739186-01	-2.921458-02	-7.549264-02	-8.574723-02	-6.677721-02	-7.311078-04	1.046622-01	1.323608-01
1.784946-01	-3.022330-02	-7.729592-02	-8.771166-02	-6.826011-02	-6.439859-04	1.071943-01	1.354010-01
1.831218-01	-3.126024-02	-7.910654-02	-8.967824-02	-6.974097-02	-5.480791-04	1.097395-01	1.384452-01
1.878062-01	-3.232925-02	-8.092516-02	-9.164716-02	-7.121953-02	-4.430632-04	1.122993-01	1.414937-01
1.925551-01	-3.343488-02	-8.275248-02	-9.361866-02	-7.269545-02	-3.277424-04	1.148756-01	1.445468-01
1.973772-01	-3.458260-02	-8.458939-02	-9.559301-02	-7.416840-02	-2.008503-04	1.174705-01	1.476052-01
2.022828-01	-3.577885-02	-8.643688-02	-9.757052-02	-7.563788-02	-6.076861-05	1.200863-01	1.506693-01
2.032748-01	-3.602444-02	-8.680775-02	-9.796642-02	-7.593131-02	-3.103322-05	1.206121-01	1.512828-01
2.042706-01	-3.627234-02	-8.717907-02	-9.836247-02	-7.622458-02	-6.632962-07	1.211390-01	1.518967-01
2.052705-01	-3.652262-02	-8.755089-02	-9.875866-02	-7.651767-02	3.031374-05	1.216669-01	1.525107-01
2.062746-01	-3.677534-02	-8.792321-02	-9.915500-02	-7.681060-02	6.194763-05	1.221957-01	1.531251-01
2.072829-01	-3.703059-02	-8.829604-02	-9.955149-02	-7.710334-02	9.425735-05	1.227257-01	1.537398-01
2.024268-01	-3.616306-02	-8.622749-02	-9.721925-02	-7.529702-02	9.202251-05	1.198505-01	1.501380-01
1.962093-01	-3.469319-02	-8.248018-02	-9.283394-02	-7.199257-02	4.744046-04	1.155472-01	1.442238-01
1.515058-01	-2.578886-02	-6.368831-02	-7.168309-02	-5.559014-02	3.662942-04	8.922152-02	1.113645-01
1.233926-01	-2.181796-02	-5.187043-02	-5.838172-02	-4.527493-02	2.983013-04	7.266570-02	9.069991-02
1.040797-01	-1.840312-02	-4.375191-02	-4.924407-02	-3.818870-02	2.516108-04	6.129236-02	7.650395-02
8.999425-02	-1.591258-02	-3.783083-02	-4.257969-02	-3.302050-02	2.175253-04	5.299743-02	6.615037-02

ADJOINT-WEIGHTED SPACE-ENERGY HOMOGENIZATION

ZONE IH		0.64000 BB		0.11521 613		VOLUME SOURCE Q(NH), NH = NNH, 1				
1		0.60000 STZ		0.00001		PROBABILITY/PATH				
		NUSGF*(NH)		SG*(NH)		SGSO*(NH,NH)		SGSO*(NH+1,NH)		SGSO*(NH+2,NH)
BAND NH	0.64000 BB	0.11524 630								
3	0.000000 00	1.242294 01	1.434359 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	<
2	0.000000 00	3.099674 00	1.015259 00	5.926925-02	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	<
1	0.000000 00	8.404057-01	8.144417-01	3.168603-02	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	<
BAND NH	PHI*(NH)	-(L/V/PHI)*	DIFFUSOR D*(NH)	ALBEDO A*(NH)	SGSO*(NH)	SGA*(NH)				
3	2.214761-01	-8.407026 00	5.694656-02	2.687839-01	1.493628 00	1.092931 01				<
2	6.891928 00	-1.775883 00	6.435593-02	3.949045-01	1.046945 00	2.052729 00				<
1	4.691807 01	-2.130955-02	9.788826-02	9.807655-01	8.144417-01	2.596404-02				<

ZONE IH		0.64000 BB		0.11521 613		VOLUME SOURCE Q(NH), NH = NNH, 1				
2		0.60000 STZ		0.00001		PROBABILITY/PATH				
		NUSGF*(NH)		SG*(NH)		SGSO*(NH,NH)		SGSO*(NH+1,NH)		SGSO*(NH+2,NH)
BAND NH	0.64000 BB	0.11524 630								
3-2-1	0.60000 STZ	0.00003								<
BAND NH	PHI*(NH)	-(L/V/PHI)*	DIFFUSOR D*(NH)	ALBEDO A*(NH)	SGSO*(NH)	SGA*(NH)				
3	1.857590 00	5.607820-02	5.056935-02	7.282118-01	0.000000 00	0.000000 00				<
2	1.525025 01	3.078723-02	4.133445-02	7.577335-01	0.000000 00	0.000000 00				<
1	4.738161 01	-2.673454-08	-2.497044-06	9.911729-01	0.000000 00	0.000000 00				<

Note effect of using
too coarse a lattice
in a void region

CELL ITH		0.64000 BB		0.11521 613		VOLUME SOURCE Q(NH), NH = NNH, 1				
		0.60000 STZ		0.00001						
										<

		PROBABILITY/PATH								
BAND	NH	NUSGF*(NH)	SG*(NH)	SGSO*(NH,NH)	SGSO*(NH+1,NH)	SGSO*(NH+2,NH)	SGSO*(NH+3,NH)	SGSO*(NH+4,NH)	SGSO*(NH+5,NH)	
		0.64000 B8	0.11524 630				(empty)	(empty)	(empty)	
	3	0.000000 00	3.824631-01	4.415937-02	0.000000 00	0.000000 00	0.000000 00	0.000000 00	0.000000 00	<-
	2	0.000000 00	3.331001-01	1.091027-01	1.824712-03	0.000000 00	0.000000 00	0.000000 00	0.000000 00	<-
	1	0.000000 00	1.754302-01	1.700104-01	3.405073-03	0.000000 00	0.000000 00	0.000000 00	0.000000 00	<-
BAND	NH	PHI*(NH)	-(L/V/PHI)*	DIFFUSOR D*(NH)	ALBEDO A*(NH)	SGSO*(NH)	SGA*(NH)			
	3	1.513395 00	-2.044739-01	6.025249-01	7.282118-01	4.598408-02	3.364790-01			<-
	2	1.349188 01	-1.633628-01	6.052011-01	7.577335-01	1.125077-01	2.205923-01			<-
	1	4.728410 01	-4.448278-03	6.010203-01	9.911729-01	1.700104-01	5.419858-03			<-

2.3 PROGRAM S_2 LISTING

Development work in extending the capabilities of the program S sequence is still too far from completion to make a complete program report desirable or possible at this time. A formal record of each program released for engineering use definitely is needed, however, to provide users of the program with a basis for detailed trouble-shooting of malfunctioning cases. A direct listing of the program seems to provide the best interim integration of these requirements. Table 2 is a complete listing of program S_2 . Anyone in possession of Carlson's original *SNG* Neutron Diffusion Code can assemble this extended version in operating form by replacing the *SNG* formulae packet with a punched-card transcription of this listing. The *FLOCO* assembly packet remains unaltered.

TABLE 2
GE-ANPD PROGRAM S
FORMULATION 2

INTERNAL FLOCO DEFINITIONS

048100505		DR(I)/2
048100506		SR(I)/2
048100507		DR/SR
048100510		DH(I)
048100511		Q(I)
048100512		DV(I)/2
048220524	48110524	PH(INLM)
048120525		L(N)
048120600	48110600	PH(I,N)
048120601	48110601	J(I,N)
048110602		P(I-)
048110603		P(I+)
048240610	48110610	A(I,S)
048260613		Q(NH)
048260630	40100630	S(TH,NH)
048260623		PHI(NH)
048260625		L/V/PHI
048260635		D(NH)
048120636		A(NH)
048260637		SGS(NH)
048120700	48110700	PH*(I,N)
048120701	48110701	J*(I,N)
048110702		P*(I-)
048110703		P*(I+)

SUBROUTINE 401

CROSS SECTION MIXING

040000401	LXA1813	70001243	SXD4840	CLA1550	STA0216	CLA1560	STA0223SNG	MX00
0 STA0230	SXD1841	LXA1812	LXA2110	LXA4110	STZ0830	CLA4000	STA0220SNG	MX10
0 CLA1000	STA0225	STA0235	CLA4000	TZE0234	CLA2000	TZE0233	LRS0043SNG	MX20
0 FMP4000	FAD0830	STO0830	20014216	CLA0830	STO2000	20012214	20011213SNG	MX30
0 LXD1841	20011204	LXD4840	TRA4001				SNG	MX40

SUBROUTINE 402

GEOMETRY

040000402	LXA2815	CAL0207	SUB0101	STA0210	STA0213	LXA1810	CLA1501SNG	GE00
0 FAD1000	SUB0111	STO1506	FSB1000	STO1505	70002225	FDH1506	STQ1507SNG	GE10
0 LDQ1505	FMP1506	30012225	LRS0043	FMP1506	STO1512	20011207	TRA4001SNG	GE20

SUBROUTINE 403

MEAN FREE PATH

040000403	LXA1814	LXD2841	LDQ0100	70011207	CLA0802	FDH2526	STQ0830SNG	HI00
0 LXA1810	CLA1502	STA0213	CLA2000	SUB0107	STA0217	LDQ1504	FMP0000SNG	HI10
0 FAD0830	TPL0223	CLA0100	LRS0043	FMP1505	ST01510	20011211	TRA4001SNG	HI20

SUBROUTINE 404

FREE FLIGHT SOURCE

040000404	LXA1810	LXD2841	CLA1502	STA0205	CLA2000	STA0226	LDQ2527SNG	ST00
0 FMP1503	ST00830	CLA0816	TZE0222	CLA2513	STA0216	LDQ1000	FMP0802SNG	ST10
0 FAD0830	ST00830	STZ0831	CLA2523	LXA2106	STA0231	CLA2000	TZE0237SNG	ST20
LRS0043	FMP1000	FAD0831	ST00831	CAL0231	SUB0810	20012225	LDQ0831SNG	ST30
0 FMP1504	FAD0830	ADD0112	LRS0043	FMP1505	LDQ0120	TLQ0250	CLA0100SNG	ST40
0 ST01511	20011202	TRA4001					SNG	ST50

SUBROUTINE 405

BOUNDARY CONDITIONS

040000405	CLA0817	TZE0206	LXD1841	LDQ1563	TRA0207	LDQ0100	LXA1822	BC00 GE
0 CLA1524	SUB0101	STA0214	78211216	STQ0000	20011210	TRA4001		BC10 GE

SUBROUTINE 406

ANGULAR BASIS

040000406	LXA1815	30011206	CLA0121	LDQ0121	TRA0211	LXD1842	CLA1522SNG	SN00
0 LDQ1521	ST00836	STQ0837	FMP2516	ST00833	LDQ0837	FMP2517	ST00834SNG	SN10
0 LDQ0837	FMP2520	ST00835	LDQ0837	FMP0836	ST00837	TRA4001	SNG	SN20

SUBROUTINE 407

ANGULAR FLUX

040000407	CLS0101	38212204	CLA0101	ST00843	CLA2524	38212210	SUB0101SNG	AF00
0 STA0257	SUB0811	STA0235	ADD0843	STA0243	ADD0811	STA0264	LXA1101SNG	AF10
038212222	LXA1810	LDQ1507	FMP0835	ST00831	78202231	CLA1511	SUB0111SNG	AF20
0 TRA0246	CLA0834	FAD0831	FSB1510	LRS0043	FMP1000	ST00832	CLS0834SNG	AF30
0 FAD0831	FSB1510	LRS0043	FMP1000	FAD0832	FAD1511	ST00832	CLA0833SNG	AF40
0 FAD0831	FAD1510	ST00830	CLA0833	FSB0831	FSB1510	LRS0043	FMP1000SNG	AF50
0 FAD0832	FDH0830	TQP0264	LDQ0100	STQ1000	38212270	20011222	TRA0272SNG	AF60
010011271	78101222	TRA4001					SNG	AF70

SUBROUTINE 410

CENTER CONDITIONS

040000410	LXA1821	10011203	CLA1524	SUB0811	STA0207	STA0210	LDQ0000SNG	CC00
0 STQ0000	CAL0207	SUB0811	STA0207	CAL0210	ADD0811	20011206	TRA4001SNG	CC10

SUBROUTINE 411

TOTAL FLUX AND LEAKAGE

04	00411	SXD4840	LXD4842	10014204	LXD2841	CLA2523	STA0232	STA0233SNG	TF00
0	LXA1810	STZ0830	LXA2822	CLA2524	STA0217	SUB0101	STA0220	CLA1000SNG	TF10
0	FAD1000	38202223	30012224	SUB0111	FAD0830	STO0830	20012213	FDH0823SNG	TF20
0	FMP0836	38214233	FAD1000	STO1000	20011211	LXA2822	STZ0830	CLA2524SNG	TF30
0	STA0241	LDQ1000	FMP2515	FAD0830	STO0830	20012237	LRS0043	FMP0837SNG	TF40
0	LXD2841	38214253	FAD2525	STO2525	LXD4840	LXA2815	30012260	TRA4003SNG	TF50
0	TRA4001							SNG	TF60

SUBROUTINE 412

FISSION PRODUCTION AND ELASTIC SCATTER

0	000412	LXA1810	STZ0831	STZ0832	LDQ1503	FMP1512	FAD0831	STO0831SNG	FD00
0	LDQ1514	FMP1512	FAD0832	STO0832	20011204	LXA1810	CLA1502	STA0226SNG	FD10
0	LXA2812	STZ0830	STZ0833	CLA2523	STA0234	STA0240	CLA2000	SUB0106SNG	FD20
0	STA0237	SUB0102	STA0233	LDQ0000	FMP1000	FAD0830	STO0830	LDQ0000SNG	FD30
0	FMP1000	FAD0833	STO0833	20012223	LRS0043	FMP1504	STO1514	LDQ0830SNG	FD40
0	FMP1504	STO1503	20011216	LXA1810	STZ0830	STZ0833	LDQ1503	FMP1512SNG	FD50
0	FAD0830	STO0830	LDQ1514	FMP1512	FAD0833	STO0833	20011256	TRA4001SNG	FD60

SUBROUTINE 413

MISCELLANEOUS AVERAGES

040000413	CLA0816	TZE0222	LXA2812	STZ0837	CLA2513	STA0210	LXA1810SNG	AV00
0	LDQ1000	FMP1512	FAD0837	STO0837	20011210	20012205	LRS0043	FMP0802SNG
0	FAD0831	STO0831	LXA2814	70012240	LXA2812	STZ0835	CLA2523	STA0231SNG
0	LXA1810	CLA1000	FDH2526	FMP1512	FAD0835	STO0835	20011231	20012226SNG
0	LXA1812	CLA0100	FAD1525	20011242	LXA2815	70002253	LRS0043	FMP1501SNG
030012253	LRS0043	FMP1501	FDH0122	STQ0834	CLA0122	FSB0806	TPL4002SNG	AV50
0	CLA0832	FDH0833	STQ0836	FMP0831	STO0831	TRA4001		SNG AV60

SUBROUTINE 414

PARAMETER CHANGE

040000414	CLA0804	STO0805	CLA0803	STO0804	CLA0802	STO0803	CLA0817SNG	CP00
0	TZE0213	LDQ0836	TRA0257	CLA0816	TZE0221	CLA0831	FSB0830	FDH0837SNG
0	TRA0257	LXA2814	30002234	CLA0830	FDH0831	STQ0802	LXA1810	CLA1503SNG
0	FDH0802	STQ1503	20011227	TRA0260	30012252	CLA0831	FSB0834	STO0836SNG
0	CLA0830	FSB0834	FDH0836	STQ0836	LXA1811	CLA1501	FDH0836	STQ1501SNG
020011245	TRA0257	LDQ0802	FMP0835	FAD0830	FSB0831	FDH0835	STQ0802SNG	CP50
0	TRA4001							SNG CP60

SUBROUTINE 417

MONITOR PRINT

040000417	SXD4840	TSX4771	10011807	10011806	10011805	10011804	10011803	MP00	GE
010011835	10011834	50011831	LXD4840	TRA4001				MP10	GE

SUBROUTINE 415

CONVERGENCE TEST

040000415	CLA0806	FAD0121	STO0806	MSE0144	PSE0144	MSE0143	TRA0211	EX00	GE
0 TRA4002	CLA0111	ALS0006	ADD0040	STP0040	TNO0221	SXD4150	TSX4417	EX10	GE
0 LXD4150	LXA1103	CLA1806	TZE0235	FSB1805	LDQ0801	LLS0000	TLQ0235	EX20	GE
020011222	CLA0101	STO0127	PSE0143	TRA4001	PSE0166	TRA4001	TRA0233	EX30	GE

SUBROUTINE 416

DUMP

040000416	SXD4841	CLA0807	TMI0205	TRA0206	TSX4222	TSX4774	10101810	DP00	GE
018111501	18101503	18101514	58122523	CLA0807	TMI0220	LXD4841	TRA4001	DP10	GE
TSX4222	TRA0216	SXD4140	LXA1812	LXA2101	SXD2226	70001245	CLA2523	DP20	GE
0 STA0236	STA0240	CLA1523	STA0237	STA0241	LXA4810	LDQ4000	CLA4000	DP30	GE
0 STO4000	STQ4000	20014236	10012244	20011225	LXD4140	TRA4001		DP40	GE

SUBROUTINE 421

INPUT PRINT

040000421	SXD4153	TSX4772	10301830	14001770	18111501	18121526	18121527	IP00	GE
010101565	10101566	58122567	35500020	CLA0213	ARS0022	STA0220	LXA4213	IP10	GE
0 CLA4000	TZE0227	STA0225	SXD4152	TSX4772	58122000	LXD4152	20014220	IP20	GE
0 TSX4772	18132550	18132560	18101502	18101504	18121563	18122513	18242570	IP30	GE
018241562	18251725	18261726	18221515	18221516	18221517	18221520	18211521	IP40	GE
018211522	18101503	18101514	58122523	LXD4153	TRA4001			IP50	GE

SUBROUTINE 424

LATTICE POINT FLUX AND CURRENT

040000424	SXD4840	LXD4842	10014204	LXD2841	CLA2600	STA0242	STA0243	FJ00	GE
0 CLA2601	STA0247	STA0250	LXA1811	STZ0860	STZ0861	LXA2822	CLA2524	FJ10	GE
0 STA0222	STA0230	CLA1000	38202225	30012226	SUB0111	FAD0860	STO0860	FJ20	GE
0 LDQ1000	FMP2515	FAD0861	STO0861	20012217	CLA0860	ADD0111	FDH0823	FJ30	GE
0 FMP0836	38214243	FAD1000	STO1000	LDQ0861	FMP0837	38214250	FAD1000	FJ40	GE
0 STO1000	20011214	LXD4840	TRA4001					FJ50	GE

SUBROUTINE 425

LATTICE POINT FISSION PRODUCTION

040000425	LXA1810	CLA1502	STA0213	LXA2812	STZ0860	STZ0861	CLA2600	FP00	GE
0 STA0224	SUB0101	STA0220	CLA2000	SUB0110	STA0217	STA0223	LDQ0000	FP10	GE
0 FMP1000	FAD0861	STO0861	LDQ0000	FMP1000	FAD0860	STO0860	20012207	FP20	GE
LDQ0860	FMP1504	STO1602	LDQ0861	FMP1504	10011236	STO1603	20021202	FP30	GE
0 CLA0816	ADD0817	ADD0814	TNZ0254	LXA1811	CLA1602	FDH0802	STQ1602	FP40	GE
0 CLA1603	FDH0802	STQ1603	20011245	TRA4001				FP50	GE

SUBROUTINE 430

FISSION PRODUCTION NORMALIZATION

04 00430	CLA0816	ADD0817	TNZ4001	STZ0150	STZ0151	LXA1810	CLA1602	NF00	GE
010011211	FAD1603	20011213	TZE0223	LRS0043	FMP1512	FAD0150	STO0150	NF10	GE
0 CLA1512	FAD0151	STO0151	20011207	CLA0151	ADD0111	FDH0150	STQ0151	NF20	GE
0 LXA1106	LDQ1836	FMP0151	STO1836	20011231	LXA1811	38101245	LDQ1503	NF30	GE
0 FMP0151	STO1503	LDQ1514	FMP0151	STO1514	LDQ1602	FMP0151	STO1602	NF40	GE
0 LDQ1603	FMP0151	STO1603	LXA2812	38101263	CLA2523	STA0260	STA0262	NF50	GE
0 LDQ1000	FMP0151	STO1000	CLA2600	STA0266	STA0270	LDQ1000	FMP0151	NF60	GE
0 STO1000	CLA2601	STA0274	STA0276	LDQ1000	FMP0151	STO1000	20012254	NF70	GE
020011236	TRA4001							NF80	GE

ROUTINE 426

SENSOR ACTIVATION

040000426	CLA0824	TZE0231	SXD4140	LXA1824	CLA1610	STA0225	CLA1570	SA00	GE
0 STA0217	LXA2811	STZ0150	LXA4812	CLA4600	STA0216	LDQ2000	FMP4000	SA10	GE
0 FAD0150	STO0150	20014214	LDQ0150	FMP1562	STO2000	20012212	20011205	SA20	GE
0 LXD4140	TRA4001							SA30	GE

SUBROUTINE 431-435

SPACE-ENERGY HOMOGENIZATION

040000431	LXA1826	30001204	TRA4001	LXA1825	70001203	SXD4150	LXA2107	H000	GE
0 STZ2143	20012210	LXA2810	SXD2131					H010	GE
040000432	SXD1130	CLA0811	SUB1725	PAX1000	SXD1227	SXD1341	LXA2101	H020	GE
0 LDQ0121	LXA4815	70004217	LDQ1501	30014217	FMP1501	LRS0043	STQ2147	H030	GE
030012224	LXD1131	10011223	10012210	LXD1131	CLA0100	FAD1512	70001231	H040	GE
020011226	STO0144	CLA0121	FDH0144	STQ0144	LXA2826	LXA1812	SXD1141	H050	GE
040000433	CLA0812	ADD0101	SUB2726	PAX1000	SXD1236	SXD1266	SXD1342	H060	GE
0 CLA0816	TZE0213	STZ2613	STZ2623	LXD4131	STZ0151	STZ0152	LXD1141	H070	GE
0 CLA1600	STA0223	STA0225	CLA4000	10014225	FSB4000	FAD0151	STO0151	H100	GE
0 CLA1601	STA0232	CLA4000	FAD0152	STO0152	60014236	70001240	20011220	H110	GE
0 CLA0151	FDH4505	FMP0145	STO0151	LDQ0152	FMP0145	STO0152	STZ0147	H120	GE
0 STZ0153	LXD1141	CLA0816	TZE0261	CLA1513	STA0256	CLA4000	FAD0147	H130	GE
0 STO0147	CLA1523	STA0263	CLA4000	FAD0153	STO0153	70001270	20011252	H140	GE
0 CLA0816	TZE0276	LDQ0147	FMP4512	FAD2613	STO2613	LDQ0153	FMP4512	H150	GE
0 FAD2623	STO2623	70004304	20014247	CLA0816	TZE0311	LDQ0144	FMP2613	H160	GE
0 STO2613	LDQ0144	FMP2623	STO2623	STZ0143	STZ0147	STZ0153	LXD1141	H170	GE
0 CLA1600	STA0324	STA0327	STA0331	CLA4000	FAD0143	STO0143	CLA4000	H200	GE
0 014331	FSB4000	60014333	FAD0147	STO0147	CLA1601	STA0337	CLA4000	H210	GE
0 AD0153	STO0153	70001344	20011320	CLA0147	FDH4505	FMP0146	FSB0151	H220	GE
0 FDH0122	STQ0151	LDQ0153	FMP0146	FSB0152	STO0152	PSE0002	FDH0151	H230	GE
0 STQ2635	CLA0152	FDH2623	STQ2625	LDQ0125	FMP0143	FSB0153	STO0143	H240	GE
0 FAD0153	FAD0153	FDH0143	STQ2636	60011377	SXD1141	20012433	LXA2826	H250	GE
040000434	SXD4243	LXA1812	SXD1141	SXD2140	CLA2630	STA0251	CLA0812	H260	GE
0 ADD0101	SUB2726	PAX2000	SXD2233	LXA4110	STZ0151	LXD1131	STZ0152	H270	GE
0 CLA1502	STA0223	LXD2141	CLA2000	STA0227	CLA2523	STA0230	LDQ4000	H300	GE
0 FMP1000	FAD0152	STO0152	70002235	20012223	LDQ0152	FMP1504	LRS0043	H310	GE
0 1512	FAD0151	STO0151	70001245	20011217	LDQ0151	FMP0144	LXD2140	H320	GE
0 42623	STQ4000	70074254	20014215	LXD4233	60014260	SXD4141	20012204	H330	GE

040000435	SXD1311	LXA2826	LXA4812	SXD4135	SXD2134	CLA0812	ADD0101	H340	GE
3UB2726	PAX2000	SXD2300	LXA4826	LXA1812	SXD1141	STZ0147	SXD4140	H350	GE
CLA4630	STA0317	CLA0812	ADD0101	SUB4726	PAX4000	SXD4271	LXA1106	H360	GE
0 PXD1000	SUB0140	ADD0134	ARS0022	SUB0106	TNZ0322	SXD1137	LXD2131	H370	GE
0 STZ0151	SXD2132	CLA2502	STA0254	LXD4135	STZ0152	SXD4136	CLA4523	H400	GE
0 STA0274	LXD1141	STZ0153	SXD1142	CLA1000	STA0265	LXA2106	PXD2000	H410	GE
0 SUB0142	ADD0136	ARS0022	SUB0106	TNZ0270	CLA2000	FAD0153	STO0153	H420	GE
020012257	70001273	20011253	LXD2132	LDQ2000	FMP0153	FAD0152	STO0152	H430	GE
070004302	20014246	LXD2132	LDQ0152	FMP2504	LRS0043	FMP2512	FAD0151	H440	GE
0 STO0151	70002313	20012241	LXD1137	LXD2134	FDH2623	FMP0144	STO1000	H450	GE
0 FAD0147	STO0147	20011230	LXD4271	60014330	SXD4141	LXD4140	20014217	H460	GE
0 LXD2134	LDQ0147	STQ2637	LXD1300	60011337	SXD1135	20012205	LXA2107	H470	GE
LXA4826	CLA4630	STA0343	CLA2000	FSB4637	STO4525	LDQ4625	FMP0144	H500	GE
FDH0122	STQ4625	20014341	TSX4772	18261613	58262630	TSX4771	18261623	H510	GE
018261625	18261635	18261636	18261637	58261525	TSX4774	58262630	LXD1311	H520	GE
060011374	SXD1131	LXD1130	20011432	LXD4150	TRA4001			H530	GE

SUBROUTINE 444

OUTPUT PRINT

040000444	SXD4867	TSX4417	CLA0824	TNZ0213	TSX4771	18111501	18111512	OP00	GE
018111602	58111603	TRA0221	TSX4771	18111501	18111512	18111602	18111603	OP10	GE
058242610	TSX4771	18111501	18111512	18122600	58122601	TSX4416	TSX4431	OP20	GE
0 CLA0825	LDQ0101	TLQ0234	TRA0241	STO0857	STQ0825	TSX4431	LDQ0857	OP30	GE
0 STQ0825	LXD4867	TRA4001						OP40	GE

SUBROUTINE 445

FIELD STORAGE

040000445	LDQ0802	STQ0032	LXA1811	LDQ1602	STQ1702	LDQ1603	STQ1703	FS00	GE
0 LXA2812	CLA2600	STA0221	CLA2700	STA0222	CLA2601	STA0223	CLA2701	FS10	GE
0 STA0224	LDQ1000	STQ1000	LDQ1000	STQ1000	20012211	20011204	STZ0040	FS20	GE
0 CLS0800	STO0800	LXA1104	STZ1807	20011233	CLS0121	STO0807	STZ0127	FS30	GE
0 TRA4001								FS40	GE

SUBROUTINE 450-451

ADJOINT

040000450	MSE0142	PSE0142	SXD4140	LXA1812	LDQ1527	STQ1636	STZ1527	A000	GE
020011205	35500020	CLA0211	ARS0022	STA0216	LXA1211	CLA1000	TZE0323	A010	GE
0 STA0232	STA0242	STA0262	STA0264	STA0272	STA0305	STA0310	LXA2110	A020	GE
0 STZ0150	LXA4812	CLA4000	STA0234	CLA2000	FAD0150	STO0150	20014232	A030	GE
TZE0254	LXA4812	CLA4000	STA0245	STA0252	CLA2000	FDH0150	STQ4527	A040	GE
LDQ4636	FMP0150	STO2000	20014242	SXD1141	LXA2105	LXA1812	60011300	A050	GE
0 SXD1142	LXA4812	CLA1000	STA0266	CLA4000	STA0267	LDQ2000	STQ2000	A060	GE
020014271	20011262	CLA4000	STA0274	STZ2000	20014272	LXD1142	20012257	A070	GE
0 LXA2110	LXA1812	LXA4101	SXD4304	70001321	CLA1000	STA0313	STA0315	A100	GE
0 CLA4000	STA0314	STA0316	LDQ2000	CLA2000	STO2000	STQ2000	10014320	A110	GE
020011303	20012301	LXD1141	20011216					A120	GE

040000451	LXA1812	LXA2101	SXD2204	70001273	LDQ1526	CLA2526	STO1526	A200	GE
0 STQ2526	LDQ1527	CLA2527	STO1527	STQ2527	CLA0817	TZE0223	LDQ1563	A210	GE
0 CLA2563	STO1563	STQ2563	CLA0816	TZE0241	CLA1513	STA0234	STA0236	A220	GE
0 CLA2513	STA0235	STA0237	LXA4810	LDQ4000	CLA4000	STO4000	STQ4000	A230	GE
020014234	CLA1523	STA0250	STA0252	CLA2523	STA0251	STA0253	LXA4810	A240	GE
0 LDQ4000	CLA4000	STO4000	STQ4000	20014250	LXA4824	70004271	CLA4570	A250	GE
0 STA0264	STA0265	STA0266	STA0267	LDQ1000	CLA2000	STO1000	STQ2000	A260	GE
0014257	10012272	20011203	LXA1826	70011312	LXA2102	CLA0812	SUB1726	A270	GE
0 LDQ2726	STQ1726	STO2726	CLA0812	SUB1726	STO1726	10012307	SXD2310	A300	GE
070001312	20011276	LXD4140	TRA4001					A310	GE

SUBROUTINE 420

FLOW CODE

040000420	TSX4421	TSX4401	CLA0807	TMI0206	TRA0212	TSX4450	PSE0165	FC00	GE
0 TRA0212	TSX4421	TSX4402	LXA2812	SXD2841	TSX4403	TSX4404	TSX4405	FC10	GE
0 LXA2821	SXD2842	LXA2822	TSX4406	TSX4407	20012226	38212223	TSX4410	FC20	GE
0 TSX4406	TSX4407	20012230	MSE0143	TRA0243	PSE0143	TSX4424	PSE0165	FC30	GE
0 TRA0243	TSX4771	58222524	TSX4411	LXD2842	20012221	LXD2841	20012214	FC40	GE
0 TSX4412	TSX4413	TSX4414	TSX4415	TRA0212	TSX4425	TSX4430	TSX4426	FC50	GE
0 TSX4444	CLA0127	TZE0267	CLA0807	TNZ0267	TSX4445	TRA0206	STZ0127	FC60	GE
0 LXA4101	CLA0301	STO4000	PXD0000	MSE0003	PSE0006	STO0150	LDQ0150	FC70	GE
0 TRA4000	HTR0770							FC100GE	

+
0 TRA0420

TRANSFER
BLANK
BLANK

OPTIONS (PUNCH FIELD, PUNCH ADJOINT, PRINT THEORY)

+							
0	TSX4773	58270401	HTR0770				
0	TSX4774	18122600	18122601	18111602	58111603	HTR0770	
0	TSX4774	18122700	18122701	18111702	58111703	HTR0770	

PRINT S
PUNCH F
PUNCH F*

3. Nuclear Data

3.1 ANISOTROPIC SCATTER-TRANSFER CROSS SECTIONS

For elastic isotropic scattering in center-of-mass coordinates, with neglect of molecular binding and thermal agitation of nuclei, the scatter-transfer cross section for a nucleus having a mass A times that of a neutron is given by*

$$\sigma_{As}(p|p', \underline{\Omega} \cdot \underline{\Omega}') = \frac{(A+1)^2}{2A} \frac{\sigma_{As0}(p)}{p^2 p'} \delta \left[\underline{\Omega} \cdot \underline{\Omega}' - \left(\frac{A+1}{2} \frac{p'}{p} - \frac{A-1}{2} \frac{p}{p'} \right) \right]. \quad (3.1.1)$$

The momenta $p|p'$ are arranged in chronological order (p scatters to p').

Constructing the scatter-transfer L -th Legendre moment, by multiplying equation (3.1.1) by $P_L(\underline{\Omega} \cdot \underline{\Omega}') d(\underline{\Omega} \cdot \underline{\Omega}')$ and integrating over all scattering angles, yields

$$\begin{aligned} \sigma_{AsL}(p|p') &= \frac{(A+1)^2}{2A} \frac{\sigma_{As0}(p)}{p^2 p'} P_L \left(\frac{A+1}{2} \frac{p'}{p} - \frac{A-1}{2} \frac{p}{p'} \right) \\ &\times \begin{cases} 1, & p \frac{A-1}{A+1} < p' < p \\ 0, & \text{otherwise} \end{cases} \end{aligned} \quad (3.1.2)$$

Constructing a digital representation for this transfer moment, by incrementally averaging over an epithermal entrance flux having a uniform distribution in lethargy u and incrementally integrating over the corresponding exit adjoint (which has a uniform distribution in momentum space) normalized to unity, yields

$$\begin{aligned} \sigma_{AsLnn'} &= \int \frac{(A+1)^2}{2A} \frac{\sigma_{As0}(p)}{p^2 p'} P_L \left(\frac{A+1}{2} \frac{p'}{p} - \frac{A-1}{2} \frac{p}{p'} \right) \\ &\times \begin{cases} 1, & p \frac{A-1}{A+1} < p' < p \\ 0, & \text{otherwise} \end{cases} \left[\frac{d_n u}{\Lambda_n u} p'^2 d_n' p' \right], \end{aligned} \quad (3.1.3)$$

where $du = -2(dp)/p$, $\Lambda_n u = u_n - u_{n-1}$, and d_n signifies a differential lying within the increment n .

A digital representation of the thermal cross section is obtained by averaging the transfer moment (equation 3.1.2) over a Maxwellian entrance flux and integrating over the Maxwellian exit adjoint (which has a uniform distribution in momentum space) normalized to unity.

The integration for the isotropic component was worked out in GE-ANPD APEX-394.[†] Performing the integration for the first Legendre moment, with $\sigma_{As}(p) d_n u$ approximated by $\bar{\sigma}_{Asn} d_n u$ within each epithermal increment, yields:

$$\text{For } n > n', \quad \bar{\sigma}_{As1nn'} = 0. \quad (3.1.4)$$

*Marshak, R. E., "Theory of Slowing Down of Neutrons by Elastic Collision with Atomic Nuclei," *Rev. Mod. Phys.* 19, 185-238 (1947).

†Duane, *op. cit.*, equations 2.356.3-2.356.6.

For epithermal $n = n'$, with $\xi_{A1} = \frac{5}{3} - A^2 + \frac{(A+2)(A-1)^2}{4} \ln \left(\frac{A+1}{A-1} \right)^2$,

and with $\bar{\sigma}_{As1n} = (2/3A) \bar{\sigma}_{As0n}$,

$$\bar{\sigma}_{As1nn} = \frac{\bar{\sigma}_{As1n}}{\Delta_n u} \left[\begin{array}{c} \Delta_n u - \xi_{A1}, \Delta_n u \geq \ln [(A+1)/(A-1)]^2 \\ \frac{(A+1)^3}{12} \left(e^{-3\Delta_n u/2} - 1 + 3\Delta_n u/2 \right) - \frac{9(A-1)}{A+1} \left(e^{-\Delta_n u/2} - 1 + \frac{\Delta_n u}{2} \right) \\ \Delta_n u \leq \ln [(A+1)/(A-1)]^2 \end{array} \right], \quad (3.1.5)$$

For thermal $N = N'$, $\bar{\sigma}_{As1NN'} = \bar{\sigma}_{As1N}$. (3.1.6)

For $n < n'$, with

$$F_{As1}(\Delta u) = \left[\xi_{A1} - \Delta u + \frac{(A+1)^3}{12} \left\{ \left(e^{-3\Delta u/2} - 1 + 3\Delta u/2 \right) - \frac{9(A-1)}{A+1} \left(e^{-\Delta u/2} - 1 + \Delta u/2 \right) \right\} \right] \times \left[\begin{array}{c} 1, 0 \leq \Delta u \leq \ln [(A+1)/(A-1)]^2 \\ 0, \text{ otherwise} \end{array} \right], \quad (3.1.7)$$

$$\bar{\sigma}_{As1nn'} = \frac{\bar{\sigma}_{As1n}}{\Delta_n u} \left[F_{As1} \left(u_{n'-1} - u_n \right) - F_{As1} \left(u_{n'-1} - u_{n-1} \right) - F_{As1} \left(u_{n'} - u_n \right) + F_{As1} \left(u_{n'} - u_{n-1} \right) \right].$$

From the definitional identity,

$$\sigma_{AsL}(p) = \int_0^\infty \sigma_{AsL}(p|p') p'^2 dp',$$

it follows that these digitalized scatter-transfer moments satisfy the identity,

$$\bar{\sigma}_{AsLn} = \sum_{n'=1}^{n'=N} \bar{\sigma}_{AsLnn'}. \quad (3.1.8)$$

These formulas simplify extensively for heavy elements and for hydrogen. The calculational complexity is at its worst for deuterium.

Numerical calculation of these scatter-transfer first Legendre moments has been incorporated into an IBM 704 electronic data processing machine program.* A numerical compilation including these scatter-transfer first moments for fifty elements of interest in reactor design work has already been published;[†] but meeting immediate development needs precluded providing the supporting first-moment analysis work in APEX-394, where it logically belongs.

The following section extends this neutron transfer cross section compilation to include compounds and alloys of special interest in reactor development work.

*GE-ANPD program SIGMA.

[†]Duane, *op. cit.*, pp. 20-93.

There is urgent engineering need for assembling a similar compilation of photon cross sections, processed for use with transport theory. An initial compilation having a fairly wide range of usefulness seems obtainable from the Klein-Nishina theory of free electron effects supplemented by a semi-empirical representation for bound electron effects and for pair production.

Cross Sections for Reactor Analysis

**Volume Three
Neutron Transfer
Preliminary Data**

GE-ANPD REACTOR ANALYSIS

INPUT INTERPRETER

NUCLEAR DATA FORM 2

LEVEL N	ENERGY E (EV)	LETHARGY U=LN(10MEV/E)	1/VELOCITY 1/V (SEC/CM)	BAND N
0	+INFINITY	-INFINITY		
			2.5973792E-10	1
1	6.0653065E 06	5.0000000E-01	3.3351009E-10	2
2	3.6787944E 06	1.0000000E 00	4.2823544E-10	3
3	2.2313016E 06	1.5000000E 00	5.4986518E-10	4
4	1.3533528E 06	2.0000000E 00	7.0604085E-10	5
5	8.2084998E 05	2.5000000E 00	9.0657440E-10	6
6	4.9787068E 05	3.0000000E 00	1.1640646E-09	7
7	3.0197383E 05	3.5000000E 00	1.4946885E-09	8
8	1.8315639E 05	4.0000000E 00	2.9026958E-09	9
9	2.4787522E 04	6.0000000E 00	7.8903449E-09	10
10	3.3546263E 03	8.0000000E 00	2.1448182E-08	11
11	4.5399929E 02	1.0000000E 01	5.8302204E-08	12
12	6.1442124E 01	1.2000000E 01	1.5848182E-07	13
13	8.3152871E 00	1.4000000E 01	3.7339754E-07	14
14	1.8553914E 00	1.5500000E 01	6.8863408E-07	15
15	6.8256034E-01	1.6500000E 01	1.1353657E-06	16
16	2.5109992E-01	1.7500000E 01	1.8719016E-06	17
17	9.2374495E-02	1.8500000E 01	3.1326930E-06	18
18	3.2162206E-02	1.9555059E 01	4.0313012E-06	19
19	0	+INFINITY		

^a
*HYDROGEN 76 CM HG 20 DEG C

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
H	2.0400000E+00	1.0000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	8.3803942E-05	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)					
COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
5.7603E-05	0.	1.2273E-05	1.1387E-05	1.7836E-05	1.4259E-05
8.5152E-05	0.	1.8142E-05	1.6832E-05	2.6366E-05	2.1078E-05
1.2147E-04	0.	2.5880E-05	2.4010E-05	3.7610E-05	3.0066E-05
1.6530E-04	0.	3.5218E-05	3.2674E-05	5.1181E-05	4.0912E-05
2.1538E-04	0.	4.5890E-05	4.2574E-05	6.6690E-05	5.3309E-05
2.7549E-04	0.	5.8696E-05	5.4456E-05	8.5301E-05	6.8186E-05
3.5814E-04	0.	7.6305E-05	7.0793E-05	1.1089E-04	8.8644E-05
4.5331E-04	0.	9.6582E-05	8.9605E-05	3.0845E-04	2.0212E-04
6.9875E-04	0.	3.9665E-04	3.1834E-04	2.6120E-04	1.4033E-04
9.3920E-04	0.	5.3313E-04	4.2797E-04	3.5108E-04	1.8881E-04
9.9184E-04	0.	5.6299E-04	4.5193E-04	3.7074E-04	1.9937E-04
1.0020E-03	0.	5.6868E-04	4.5641E-04	3.7449E-04	2.0120E-04
1.0099E-03	0.	5.7294E-04	4.6014E-04	3.3899E-04	1.9133E-04
1.0331E-03	0.	4.9744E-04	4.1522E-04	3.3781E-04	2.1399E-04
1.0544E-03	0.	3.8696E-04	3.3786E-04	4.2030E-04	2.8149E-04
1.1211E-03	0.	4.1120E-04	3.5606E-04	4.4663E-04	2.8915E-04
1.2365E-03	0.	4.5403E-04	3.8834E-04	5.0853E-04	3.0913E-04
1.4752E-03	0.	5.6570E-04	4.7159E-04	8.9815E-04	3.1888E-04
1.6926E-03	0.	1.6780E-03	8.6153E-04		

^a
An asterisk indicates a macroscopic probability per path.

*HYDROGEN

 SCATTER
 L N1 N2
 SGSL(N1,N2)

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.0818E-05	6.5614E-06	3.9797E-06	2.4138E-06	1.4640E-06	8.8799E-07
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.1836E-06	1.6018E-07	2.1692E-08	2.9252E-09	3.9827E-10	9.6134E-11
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-5.4934E-11	0.	0.	0.	0.	1.5992E-05
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
9.6994E-06	5.8830E-06	3.5682E-06	2.1643E-06	2.8847E-06	3.9039E-07
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
5.2804E-08	7.1665E-09	9.9478E-10	8.1206E-11	4.0603E-11	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.2812E-05	1.3836E-05	8.3920E-06
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
5.0900E-06	6.7843E-06	9.1819E-07	1.2425E-07	1.6854E-08	2.2009E-09
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
3.1856E-10	5.7919E-11	-0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.1043E-05	1.8828E-05	1.1420E-05	1.5221E-05	2.0600E-06	2.7874E-07
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
3.7754E-08	5.1626E-09	5.5173E-10	1.1823E-10	1.9704E-10	-1.1823E-10
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	4.0450E-05	2.4534E-05	3.2701E-05	4.4255E-06
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
5.9891E-07	8.1109E-08	1.0938E-08	1.3351E-09	2.5676E-10	5.1351E-11
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
2.5676E-10	-2.0540E-10	0.	5.1738E-05	6.8960E-05	9.3327E-06
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.2631E-06	1.7090E-07	2.2989E-08	2.9557E-09	5.2545E-10	1.9704E-10
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
6.5682E-11	-0.	0.	1.4780E-04	2.0003E-05	2.7072E-06
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
3.6639E-07	4.9695E-08	5.8916E-09	1.1954E-09	4.2693E-10	-0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
8.5386E-11	0.	4.1744E-05	5.6494E-06	7.6448E-07	1.0359E-07
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.2645E-08	2.1615E-09	7.5653E-10	3.2423E-10	5.4038E-10	-3.2423E-10
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
3.5350E-05	4.7842E-06	6.4738E-07	7.8757E-08	1.4327E-08	5.2477E-09
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
1.9575E-09	7.0602E-10	3.3318E-10	4.7514E-05	6.4303E-06	7.8177E-07
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
1.4199E-07	5.2256E-08	1.9201E-08	7.2772E-09	3.5267E-09	5.0174E-05
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
6.1009E-06	1.1076E-06	4.0744E-07	1.4994E-07	5.6926E-08	2.9971E-08
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
4.5535E-05	8.2672E-06	3.0414E-06	1.1189E-06	4.2430E-07	2.2672E-07
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
6.1545E-05	2.2641E-05	8.3292E-06	3.1597E-06	1.6858E-06	1.2427E-04
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
4.5718E-05	1.7343E-05	9.2452E-06	1.5462E-04	5.8655E-05	3.1327E-05
0 16 18	0 16 19	0 17 19			
1.6943E-04	8.9717E-05	2.6712E-04			

*HYDROGEN

SCATTER
L N1 N2
SGSL(N1,N2)

*H2

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
6.7392E-06	3.1863E-06	1.5074E-06	7.1381E-07	3.3856E-07	1.6100E-07
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
1.4071E-07	8.9364E-09	1.1594E-09	3.2996E-10	1.0999E-10	-1.5066E-10
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
2.4231E-10	0.	0.	0.	0.	9.9618E-06
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
4.7097E-06	2.2279E-06	1.0549E-06	5.0022E-07	4.3228E-07	2.4997E-08
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
2.5200E-09	6.2322E-10	1.8968E-10	5.4193E-11	9.4838E-11	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.4208E-05	6.7160E-06	3.1761E-06
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
1.5031E-06	1.2886E-06	6.9251E-08	5.3330E-09	9.4679E-10	2.8983E-10
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
9.6612E-11	3.8645E-11	9.6612E-11	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
1.9332E-05	9.1372E-06	4.3202E-06	3.6894E-06	1.9104E-07	1.2251E-08
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
1.6037E-09	3.9436E-10	1.8403E-10	2.6291E-11	-1.7417E-10	3.0563E-10
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	2.5190E-05	1.1905E-05	1.0150E-05	5.1691E-07
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
2.9991E-08	3.1002E-09	6.8512E-10	2.0554E-10	6.8512E-11	6.8512E-11
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-1.3916E-10	2.4193E-10	0.	3.2219E-05	2.7445E-05	1.3853E-06
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
7.5954E-08	6.3094E-09	1.3145E-09	2.6289E-10	1.7526E-10	4.3816E-11
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
4.3816E-11	1.3145E-10	0.	7.5475E-05	3.7924E-06	2.0155E-07
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
1.4697E-08	2.4779E-09	5.6964E-10	3.9875E-10	5.6964E-11	5.6964E-11
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
2.2786E-10	0.	1.0119E-05	5.2428E-07	3.3671E-08	4.4342E-09
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.0815E-09	2.8840E-10	1.4420E-10	2.1630E-10	-4.9118E-10	7.7959E-10
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
7.0441E-06	3.7175E-07	2.6255E-08	3.5702E-09	1.0280E-09	6.1123E-10
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
3.6118E-10	2.5005E-10	4.7232E-10	9.5577E-06	5.3372E-07	4.2450E-08
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
9.2487E-09	4.8205E-09	2.7279E-09	1.6816E-09	3.3258E-09	1.0088E-05
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
5.2166E-07	6.2761E-08	2.1782E-08	9.5492E-09	5.2284E-09	7.7341E-09
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
9.4984E-06	8.9020E-07	2.0942E-07	5.3276E-08	1.6272E-08	1.2209E-08
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
1.7758E-05	4.0894E-06	9.8956E-07	2.7508E-07	1.6610E-07	4.8670E-05
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
1.1419E-05	2.9634E-06	1.4635E-06	6.2360E-05	1.3945E-05	3.0842E-06
1 16 18	1 16 19	1 17 19			
5.8391E-05	2.6499E-06	2.8820E-05			

*LITHIUM 6

*LI6

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
LI6	3.420000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
3.4300000E+00	4.5930626E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
8.6690E-02	0.	3.6548E-02	1.9967E-02	4.4937E-02	-8.1515E-03
9.4278E-02	0.	3.8839E-02	2.1218E-02	4.7753E-02	-8.6624E-03
8.6000E-02	0.	3.3660E-02	1.8389E-02	4.1386E-02	-7.5074E-03
6.4615E-02	0.	2.3005E-02	1.2568E-02	2.8284E-02	-5.1308E-03
6.1856E-02	0.	2.1411E-02	1.1697E-02	2.6325E-02	-4.7754E-03
8.2321E-02	0.	2.7884E-02	1.5233E-02	3.4284E-02	-6.2191E-03
2.2052E-01	0.	6.0051E-02	3.2806E-02	7.3833E-02	-1.3393E-02
2.2834E-01	0.	5.4773E-02	2.9923E-02	7.1698E-02	-1.5783E-02
8.0021E-02	0.	2.3445E-02	4.1404E-03	4.1483E-03	-1.0555E-03
1.3797E-01	0.	7.8151E-03	1.3801E-03	1.3828E-03	-3.5182E-04
2.7824E-01	0.	2.3445E-02	4.1404E-03	4.1483E-03	-1.0555E-03
5.9096E-01	0.	8.7920E-02	1.5527E-02	1.5556E-02	-3.9580E-03
1.4602E 00	0.	1.8561E-01	3.2778E-02	3.2841E-02	-8.3558E-03
3.3572E 00	0.	2.2063E-01	4.4923E-02	5.5311E-02	-1.4073E-02
6.0706E 00	0.	1.9297E-01	5.1959E-02	8.2966E-02	-2.1110E-02
1.0486E 01	0.	1.9297E-01	5.1959E-02	8.2966E-02	-2.1110E-02
1.7729E 01	0.	1.9297E-01	5.1959E-02	8.2966E-02	-2.1110E-02
2.9794E 01	0.	1.9730E-01	5.0858E-02	7.8636E-02	-2.0008E-02
3.8781E 01	0.	2.7594E-01	3.0850E-02		

*LITHIUM 6

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*L16

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
2.9054E-03	0.	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	3.0875E-03
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
0.	0.	0.	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.6758E-03	0.	0.
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
0.	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
1.8287E-03	0.	0.	0.	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	1.7021E-03	0.	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	2.2167E-03	0.	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	4.7737E-03	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*LITHIUM 6

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*LI6

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-2.3802E-03	0.	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	-2.5294E-03
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
0.	0.	0.	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	-2.1921E-03	0.	0.
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
0.	0.	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
-1.4982E-03	0.	0.	0.	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-1.3944E-03	0.	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	-1.8160E-03	0.	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-3.9108E-03	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*LITHIUM

*LI

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
LI	3.400000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
3.4100000E+00	5.2999986E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
8.6686E-02	0.	4.1958E-02	1.9698E-02	4.3843E-02	-1.0782E-02
1.0169E-01	0.	5.0311E-02	2.2816E-02	5.0621E-02	-1.2903E-02
9.2329E-02	0.	4.3215E-02	2.1272E-02	4.7551E-02	-1.0963E-02
7.8384E-02	0.	4.1214E-02	1.6719E-02	3.6743E-02	-1.0018E-02
6.9985E-02	0.	3.1272E-02	1.6295E-02	3.6586E-02	-7.5610E-03
5.7936E-02	0.	2.4101E-02	1.3609E-02	3.0640E-02	-4.9105E-03
7.8137E-02	0.	3.4515E-02	1.8168E-02	4.0819E-02	-8.2321E-03
1.0046E-01	0.	4.7658E-02	2.2761E-02	5.1724E-02	-1.3099E-02
8.1623E-02	0.	6.8432E-02	1.0918E-02	1.0935E-02	-2.8666E-03
6.3408E-02	0.	4.8352E-02	8.9125E-03	8.9309E-03	-2.2411E-03
6.7501E-02	0.	4.4239E-02	6.5930E-03	6.6020E-03	-1.7620E-03
9.5953E-02	0.	4.4298E-02	6.3048E-03	6.3126E-03	-1.7038E-03
1.7377E-01	0.	4.4298E-02	6.3048E-03	6.3126E-03	-1.7038E-03
3.0999E-01	0.	4.2194E-02	6.8727E-03	8.4169E-03	-2.2717E-03
5.4519E-01	0.	3.7986E-02	8.0085E-03	1.2625E-02	-3.4075E-03
8.6598E-01	0.	3.7986E-02	8.0085E-03	1.2625E-02	-3.4075E-03
1.3949E 00	0.	3.7986E-02	8.0085E-03	1.2625E-02	-3.4075E-03
2.2998E 00	0.	3.8352E-02	8.0112E-03	1.2259E-02	-3.2867E-03
2.9478E 00	0.	5.0611E-02	4.9042E-03		

*LITHIUM

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*LI

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
6.9807E-04	0.	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	5.1971E-04
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
0.	0.	0.	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	1.2548E-03	0.	0.
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
0.	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.0170E-05	0.	0.	0.	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	1.6163E-03	0.	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	2.5418E-03	0.	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	1.9632E-03	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*LITHIUM

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*Li

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-6.3382E-04	0.	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	-4.8123E-04
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
0.	0.	0.	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	-1.1068E-03	0.	0.
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
0.	0.	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
-2.9605E-05	0.	0.	0.	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-1.3720E-03	0.	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	-2.0269E-03	0.	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-1.6542E-03	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

BERYLLIUM

BE

FORMULA F	MASS A (OXY16=16)	FUEL MASS AF (OXY16=16)	TEMPERATURE T (DEG K)
4.0000000E 02	9.0150429E 00	0.	2.9316000E 02 100

CROSS SECTION (BARN)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.7613E 00	0.	1.0071E 00	2.7584E-01	1.7340E-01	-1.6856E-01
1.9806E 00	0.	9.3910E-01	3.4576E-01	4.2110E-01	-2.1129E-01
2.5500E 00	0.	1.5278E 00	3.8886E-01	6.8210E-01	-2.3763E-01
1.8900E 00	0.	1.3073E 00	3.8886E-01	5.4600E-01	-2.3763E-01
3.1710E 00	0.	1.9916E 00	6.1873E-01	1.1749E 00	-3.7810E-01
3.9500E 00	0.	2.3419E 00	7.6623E-01	1.6081E 00	-4.6823E-01
3.8230E 00	0.	2.2326E 00	7.3941E-01	1.5904E 00	-4.5184E-01
4.5130E 00	0.	2.6356E 00	8.4956E-01	1.8774E 00	-5.1915E-01
5.6622E 00	0.	4.8026E 00	5.5618E-01	5.5740E-01	-1.5686E-01
6.0000E 00	0.	5.3760E 00	6.2259E-01	6.2400E-01	-1.7559E-01
6.0000E 00	0.	5.3760E 00	6.2259E-01	6.2400E-01	-1.7559E-01
6.0001E 00	0.	5.3760E 00	6.2259E-01	6.2400E-01	-1.7559E-01
6.0004E 00	0.	5.3760E 00	6.2259E-01	6.2400E-01	-1.7559E-01
6.0008E 00	0.	5.1680E 00	6.8112E-01	8.3200E-01	-2.3412E-01
6.0015E 00	0.	4.7520E 00	7.9817E-01	1.2480E 00	-3.5117E-01
5.9175E 00	0.	4.6847E 00	7.8687E-01	1.2303E 00	-3.4620E-01
5.4291E 00	0.	4.2966E 00	7.2168E-01	1.1284E 00	-3.1752E-01
5.4260E 00	0.	4.3508E 00	7.0435E-01	1.0684E 00	-3.0063E-01
5.8894E 00	0.	5.8805E 00	4.3810E-01		

BERYLLIUM

SCATTER
L N1 N2
SGSL(N1,N2)

BE

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
0.	0.	5.5270E-01	5.5270E-01	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	0.
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
5.5620E-01	5.5620E-01	0.	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	3.0600E-02	3.5570E-01	6.1600E-02
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
3.2300E-02	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
0.	0.	0.	0.	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	0.	0.	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	0.	0.	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	0.	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*BERYLLIUM

*BE

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
BE	4.000000E+02	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.0000000E+02	1.8499995E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.1776E-01	0.	1.2451E-01	3.4104E-02	2.1438E-02	-2.0840E-02
2.4487E-01	0.	1.1611E-01	4.2748E-02	5.2063E-02	-2.6123E-02
3.1527E-01	0.	1.8889E-01	4.8077E-02	8.4331E-02	-2.9379E-02
2.3367E-01	0.	1.6163E-01	4.8077E-02	6.7505E-02	-2.9379E-02
3.9205E-01	0.	2.4623E-01	7.6497E-02	1.4526E-01	-4.6746E-02
4.8836E-01	0.	2.8954E-01	9.4733E-02	1.9882E-01	-5.7890E-02
4.7266E-01	0.	2.7603E-01	9.1417E-02	1.9663E-01	-5.5864E-02
5.5796E-01	0.	3.2585E-01	1.0504E-01	2.3211E-01	-6.4186E-02
7.0004E-01	0.	5.9377E-01	6.8763E-02	6.8914E-02	-1.9393E-02
7.4181E-01	0.	6.6466E-01	7.6973E-02	7.7148E-02	-2.1709E-02
7.4181E-01	0.	6.6466E-01	7.6973E-02	7.7148E-02	-2.1709E-02
7.4183E-01	0.	6.6466E-01	7.6973E-02	7.7148E-02	-2.1709E-02
7.4186E-01	0.	6.6466E-01	7.6973E-02	7.7148E-02	-2.1709E-02
7.4191E-01	0.	6.3894E-01	8.4210E-02	1.0286E-01	-2.8945E-02
7.4200E-01	0.	5.8751E-01	9.8682E-02	1.5430E-01	-4.3417E-02
7.3161E-01	0.	5.7919E-01	9.7284E-02	1.5211E-01	-4.2802E-02
6.7123E-01	0.	5.3121E-01	8.9225E-02	1.3951E-01	-3.9257E-02
6.7085E-01	0.	5.3791E-01	8.7083E-02	1.3209E-01	-3.7168E-02
7.2813E-01	0.	7.2703E-01	5.4164E-02		

*BERYLLIUM

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*BE

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
0.	0.	6.8333E-02	6.8333E-02	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	0.
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
6.8766E-02	6.8766E-02	0.	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	3.7832E-03	4.3977E-02	7.6159E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
3.9934E-03	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
0.	0.	0.	0.	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	0.	0.	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	0.	0.	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	0.	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*BORON 10

*B10

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
B10	8.020000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.0300000E+00	2.2666311E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.3589E-01	0.	1.2733E-01	3.5893E-02	7.7175E-02	-2.2151E-02
2.7204E-01	0.	1.4431E-01	4.0679E-02	8.7465E-02	-2.5104E-02
3.3110E-01	0.	1.7402E-01	4.9054E-02	1.0547E-01	-3.0272E-02
3.6296E-01	0.	1.8463E-01	5.2046E-02	1.1190E-01	-3.2118E-02
4.3977E-01	0.	2.2071E-01	6.2215E-02	1.3377E-01	-3.8394E-02
6.5129E-01	0.	3.3743E-01	9.5118E-02	2.0451E-01	-5.8699E-02
7.9834E-01	0.	4.0959E-01	1.1546E-01	2.4825E-01	-7.1251E-02
8.4507E-01	0.	4.1383E-01	1.1665E-01	2.5082E-01	-7.1989E-02
1.0592E 00	0.	6.1738E-01	6.4268E-02	6.4312E-02	-1.8459E-02
1.7136E 00	0.	6.2355E-01	6.4911E-02	6.4955E-02	-1.8643E-02
3.4359E 00	0.	5.8651E-01	6.1055E-02	6.1097E-02	-1.7536E-02
8.1679E 00	0.	5.2477E-01	5.4628E-02	5.4665E-02	-1.5690E-02
2.1157E 01	0.	4.9390E-01	5.1415E-02	5.1450E-02	-1.4767E-02
4.3955E 01	0.	4.7675E-01	5.6337E-02	6.8600E-02	-1.9689E-02
8.3318E 01	0.	4.4245E-01	6.6182E-02	1.0290E-01	-2.9534E-02
1.3701E 02	0.	4.4245E-01	6.6182E-02	1.0290E-01	-2.9534E-02
2.2552E 02	0.	4.4245E-01	6.6182E-02	1.0290E-01	-2.9534E-02
3.7697E 02	0.	4.4782E-01	6.4641E-02	9.7530E-02	-2.7993E-02
4.8542E 02	0.	5.4535E-01	3.6648E-02		

*BORON

*B

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
B	8.000000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.0100000E+00	2.4500007E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
5.5159E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.5326E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.5540E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.5819E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.6174E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.6628E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.7215E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
5.7967E-01	0.	3.5444E-01	8.9470E-02	1.9124E-01	-5.5584E-02
6.1680E-01	0.	4.9787E-01	4.7782E-02	4.7810E-02	-1.3896E-02
7.3880E-01	0.	4.9787E-01	4.7782E-02	4.7810E-02	-1.3896E-02
1.0710E 00	0.	4.9787E-01	4.7782E-02	4.7810E-02	-1.3896E-02
1.9753E 00	0.	4.9787E-01	4.7782E-02	4.7810E-02	-1.3896E-02
4.4286E 00	0.	4.9787E-01	4.7782E-02	4.7810E-02	-1.3896E-02
8.7236E 00	0.	4.8193E-01	5.2414E-02	6.3747E-02	-1.8528E-02
1.6139E 01	0.	4.5006E-01	6.1678E-02	9.5620E-02	-2.7792E-02
2.6254E 01	0.	4.5006E-01	6.1678E-02	9.5620E-02	-2.7792E-02
4.2929E 01	0.	4.5006E-01	6.1678E-02	9.5620E-02	-2.7792E-02
7.1460E 01	0.	4.5505E-01	6.0228E-02	9.0630E-02	-2.6342E-02
9.1891E 01	0.	5.4568E-01	3.3887E-02		

*CARBON

*C

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
C	3.300000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
3.3100000E+00	1.6000005E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.1434E-01	0.	7.7986E-02	1.7125E-02	3.6350E-02	-1.0722E-02
1.1835E-01	0.	8.0722E-02	1.7726E-02	3.7626E-02	-1.1098E-02
1.4844E-01	0.	1.0124E-01	2.2232E-02	4.7192E-02	-1.3920E-02
1.6248E-01	0.	1.1082E-01	2.4335E-02	5.1656E-02	-1.5236E-02
2.0260E-01	0.	1.3819E-01	3.0344E-02	6.4410E-02	-1.8998E-02
2.5154E-01	0.	1.7157E-01	3.7674E-02	7.9971E-02	-2.3588E-02
2.9086E-01	0.	1.9839E-01	4.3563E-02	9.2470E-02	-2.7275E-02
3.2215E-01	0.	2.1973E-01	4.8250E-02	1.0242E-01	-3.0209E-02
3.5705E-01	0.	3.2867E-01	2.8365E-02	2.8379E-02	-8.3707E-03
3.7711E-01	0.	3.4714E-01	2.9959E-02	2.9973E-02	-8.8409E-03
3.7711E-01	0.	3.4714E-01	2.9959E-02	2.9973E-02	-8.8409E-03
3.7711E-01	0.	3.4714E-01	2.9959E-02	2.9973E-02	-8.8409E-03
3.8114E-01	0.	3.4073E-01	3.3256E-02	4.0389E-02	-1.1913E-02
3.8517E-01	0.	3.2391E-01	3.9625E-02	6.1222E-02	-1.8058E-02
3.8520E-01	0.	3.2391E-01	3.9625E-02	6.1222E-02	-1.8058E-02
3.8524E-01	0.	3.2391E-01	3.9625E-02	6.1222E-02	-1.8058E-02
3.8858E-01	0.	3.2988E-01	3.9011E-02	5.8519E-02	-1.7261E-02
3.7549E-01	0.	3.7526E-01	2.1015E-02		

*SODIUM

*NA

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
NA	7.300000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
7.3100000E+00	9.7100111E-01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
5.5343E-02	0.	4.5924E-02	4.5699E-03	9.4189E-03	-2.9539E-03
5.9160E-02	0.	4.9091E-02	4.8850E-03	1.0068E-02	-3.1576E-03
6.8702E-02	0.	5.7009E-02	5.6728E-03	1.1692E-02	-3.6667E-03
5.8525E-02	0.	4.8563E-02	4.8325E-03	9.9602E-03	-3.1236E-03
9.2875E-02	0.	7.7067E-02	7.6690E-03	1.5806E-02	-4.9571E-03
1.2977E-01	0.	1.0768E-01	1.0715E-02	2.2086E-02	-6.9262E-03
9.5421E-02	0.	7.9178E-02	7.8792E-03	1.6239E-02	-5.0930E-03
1.0051E-01	0.	8.3401E-02	8.2995E-03	1.7106E-02	-5.3646E-03
1.0688E-01	0.	1.0232E-01	4.5466E-03	4.5470E-03	-1.4260E-03
6.4250E-01	0.	6.1514E-01	2.7333E-02	2.7336E-02	-8.5726E-03
6.3619E-01	0.	6.0905E-01	2.7062E-02	2.7066E-02	-8.4878E-03
7.7785E-02	0.	7.4305E-02	3.3016E-03	3.3020E-03	-1.0355E-03
7.9999E-02	0.	7.6132E-02	3.3828E-03	3.3832E-03	-1.0609E-03
8.1807E-02	0.	7.6204E-02	3.7962E-03	4.5831E-03	-1.4373E-03
8.4514E-02	0.	7.5542E-02	4.6144E-03	7.0263E-03	-2.2035E-03
8.7557E-02	0.	7.7172E-02	4.7139E-03	7.1778E-03	-2.2509E-03
9.0146E-02	0.	7.7637E-02	4.7425E-03	7.2211E-03	-2.2646E-03
9.3475E-02	0.	7.7802E-02	4.6116E-03	6.8257E-03	-2.1405E-03
9.7273E-02	0.	8.5876E-02	2.5076E-03		

*MAGNESIUM

*MG

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
MG	5.140000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.1500000E+00	1.7399992E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
7.0045E-02	0.	5.8759E-02	5.4850E-03	1.1286E-02	-3.5517E-03
7.5433E-02	0.	6.3279E-02	5.9068E-03	1.2154E-02	-3.8249E-03
9.8063E-02	0.	8.2263E-02	7.6789E-03	1.5800E-02	-4.9723E-03
1.1530E-01	0.	9.6726E-02	9.0288E-03	1.8578E-02	-5.8464E-03
1.2824E-01	0.	1.0757E-01	1.0041E-02	2.0662E-02	-6.5021E-03
1.8535E-01	0.	1.5549E-01	1.4513E-02	2.9864E-02	-9.3979E-03
2.9419E-01	0.	2.4679E-01	2.3037E-02	4.7400E-02	-1.4917E-02
3.7609E-01	0.	3.1549E-01	2.9451E-02	6.0596E-02	-1.9071E-02
2.6940E-01	0.	2.5855E-01	1.0850E-02	1.0852E-02	-3.4149E-03
1.4656E-01	0.	1.4065E-01	5.9026E-03	5.9033E-03	-1.8577E-03
1.4657E-01	0.	1.4065E-01	5.9026E-03	5.9033E-03	-1.8577E-03
1.4659E-01	0.	1.4065E-01	5.9026E-03	5.9033E-03	-1.8577E-03
1.4666E-01	0.	1.4065E-01	5.9026E-03	5.9033E-03	-1.8577E-03
1.4677E-01	0.	1.3868E-01	6.5219E-03	7.8710E-03	-2.4770E-03
1.4697E-01	0.	1.3475E-01	7.7604E-03	1.1807E-02	-3.7154E-03
1.4723E-01	0.	1.3475E-01	7.7604E-03	1.1807E-02	-3.7154E-03
1.4767E-01	0.	1.3475E-01	7.7604E-03	1.1807E-02	-3.7154E-03
1.4316E-01	0.	1.3050E-01	7.2945E-03	1.0788E-02	-3.3949E-03
1.3772E-01	0.	1.3531E-01	3.7347E-03		

ALUMINUM

AL

FORMULA F	MASS A (OXY16=16)	FUEL MASS AF (OXY16=16)	TEMPERATURE T (DEG K)		
5.1000000E 00	2.6980000E 01	0.	2.9316000E 02 100		
CROSS SECTION (BARN)					
COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.9500E 00	0.	5.4375E-01	4.2551E-01	7.9022E-01	2.8454E-01
2.1750E 00	0.	5.3450E-01	4.4870E-01	7.7678E-01	4.1347E-01
2.8250E 00	0.	6.2070E-01	5.5573E-01	9.0204E-01	6.3255E-01
2.7500E 00	0.	6.2498E-01	5.4778E-01	9.0827E-01	5.8513E-01
2.6500E 00	0.	7.7965E-01	5.9075E-01	1.1330E 00	3.2284E-01
4.3000E 00	0.	1.0389E 00	8.8018E-01	1.5098E 00	8.3896E-01
3.7251E 00	0.	9.4107E-01	7.7829E-01	1.3676E 00	6.7649E-01
4.9751E 00	0.	4.2458E 00	3.5534E-01	7.2922E-01	-2.3074E-01
4.7702E 00	0.	4.5962E 00	1.7379E-01	1.7380E-01	-5.5015E-02
1.4454E 00	0.	1.3923E 00	5.2647E-02	5.2651E-02	-1.6666E-02
1.3512E 00	0.	1.3008E 00	4.9186E-02	4.9190E-02	-1.5571E-02
1.3532E 00	0.	1.3008E 00	4.9186E-02	4.9190E-02	-1.5571E-02
1.3537E 00	0.	1.2960E 00	4.9003E-02	4.9008E-02	-1.5513E-02
1.3983E 00	0.	1.3130E 00	5.5584E-02	6.7044E-02	-2.1222E-02
1.4748E 00	0.	1.3351E 00	6.9072E-02	1.0494E-01	-3.3216E-02
1.5024E 00	0.	1.3397E 00	6.9313E-02	1.0530E-01	-3.3333E-02
1.5046E 00	0.	1.3072E 00	6.7630E-02	1.0275E-01	-3.2521E-02
1.5484E 00	0.	1.2940E 00	6.5001E-02	9.6008E-02	-3.0390E-02
1.6793E 00	0.	1.4753E 00	3.6735E-02		

RELIABILITY LIMITATION: First-significant-figure uncertainty in high energy scatter cross sections of aluminum.

ALUMINUM

SCATTER
L N1 N2
SGSL(N1,N2)

AL

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
4.7746E-01	1.3858E-01	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	4.7114E-01
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
2.8576E-01	1.0672E-01	1.0067E-04	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	5.4712E-01	3.3184E-01	2.0127E-01
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
1.2208E-01	9.9956E-02	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
5.5089E-01	3.3413E-01	2.0266E-01	1.2907E-01	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	6.4492E-01	9.2383E-02	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	9.1577E-01	8.3546E-01	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	1.4163E 00	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

ALUMINUM

SCATTER
L N1 N2
SGSL(N1,N2)

AL

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-1.5282E-01	-1.0723E-01	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	2.2563E-02
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-1.2388E-01	-8.5758E-02	-1.0026E-04	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	2.2517E-01	4.9026E-02	-2.1497E-02
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-4.4932E-02	-7.1049E-02	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
1.5911E-01	-1.6181E-02	-7.8779E-02	-9.7056E-02	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-2.8600E-01	-7.7598E-02	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	8.9924E-02	-4.0906E-01	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-3.7978E-01	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*ALUMINUM

*AL

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
AL	5.100000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.1100000E+00	2.7000001E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.1757E-01	0.	3.2784E-02	2.5655E-02	4.7644E-02	1.7156E-02
1.3114E-01	0.	3.2226E-02	2.7053E-02	4.6833E-02	2.4929E-02
1.7033E-01	0.	3.7423E-02	3.3506E-02	5.4386E-02	3.8138E-02
1.6580E-01	0.	3.7681E-02	3.3027E-02	5.4761E-02	3.5278E-02
1.5978E-01	0.	4.7007E-02	3.5617E-02	6.8313E-02	1.9465E-02
2.5926E-01	0.	6.2639E-02	5.3068E-02	9.1031E-02	5.0582E-02
2.2459E-01	0.	5.6739E-02	4.6925E-02	8.2457E-02	4.0787E-02
2.9996E-01	0.	2.5599E-01	2.1424E-02	4.3966E-02	-1.3912E-02
2.8760E-01	0.	2.7711E-01	1.0478E-02	1.0479E-02	-3.3170E-03
8.7148E-02	0.	8.3947E-02	3.1742E-03	3.1744E-03	-1.0048E-03
8.1465E-02	0.	7.8428E-02	2.9655E-03	2.9657E-03	-9.3879E-04
8.1586E-02	0.	7.8428E-02	2.9655E-03	2.9657E-03	-9.3879E-04
8.1615E-02	0.	7.8138E-02	2.9545E-03	2.9548E-03	-9.3528E-04
8.4304E-02	0.	7.9161E-02	3.3513E-03	4.0422E-03	-1.2795E-03
8.8920E-02	0.	8.0493E-02	4.1645E-03	6.3269E-03	-2.0027E-03
9.0583E-02	0.	8.0773E-02	4.1790E-03	6.3489E-03	-2.0097E-03
9.0718E-02	0.	7.8816E-02	4.0776E-03	6.1951E-03	-1.9608E-03
9.3353E-02	0.	7.8017E-02	3.9191E-03	5.7885E-03	-1.8323E-03
1.0125E-01	0.	8.8949E-02	2.2148E-03		

RELIABILITY LIMITATION: First-significant-figure uncertainty in high energy scatter cross sections of aluminum.

* ALUMINUM

SCATTER
L N1 N2
SGSL(N1,N2)

*AL

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
2.8787E-02	8.3551E-03	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	2.8406E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.7229E-02	6.4342E-03	6.0693E-06	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	3.2987E-02	2.0007E-02	1.2135E-02
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
7.3603E-03	6.0265E-03	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.3214E-02	2.0145E-02	1.2219E-02	7.7818E-03	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	3.8883E-02	5.5700E-03	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	5.5213E-02	5.0371E-02	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	8.5392E-02	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19	0.	0.	0.
0.	0.	0.			

*ALUMINUM

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*AL

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-9.2138E-03	-6.4653E-03	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	1.3604E-03
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-7.4687E-03	-5.1705E-03	-6.0449E-06	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.3576E-02	2.9559E-03	-1.2961E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-2.7090E-03	-4.2837E-03	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
9.5931E-03	-9.7560E-04	-4.7497E-03	-5.8517E-03	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-1.7243E-02	-4.6785E-03	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	5.4217E-03	-2.4663E-02	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-2.2898E-02	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*SILICON

*SI

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
SI	5.500000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.5900000E+00	2.3300010E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
9.2951E-02	0.	7.9882E-02	6.3759E-03	1.3069E-02	-4.1450E-03
1.0819E-01	0.	9.2981E-02	7.4217E-03	1.5212E-02	-4.8250E-03
1.3218E-01	0.	1.1360E-01	9.0671E-03	1.8585E-02	-5.8948E-03
1.6441E-01	0.	1.4130E-01	1.1277E-02	2.3117E-02	-7.3311E-03
1.7491E-01	0.	1.5031E-01	1.1999E-02	2.4593E-02	-7.8007E-03
1.6516E-01	0.	1.4194E-01	1.1329E-02	2.3223E-02	-7.3654E-03
1.7616E-01	0.	1.5139E-01	1.2083E-02	2.4768E-02	-7.8548E-03
1.8091E-01	0.	1.5547E-01	1.2408E-02	2.5436E-02	-8.0662E-03
1.2619E-01	0.	1.2175E-01	4.4353E-03	4.4355E-03	-1.4069E-03
9.1214E-02	0.	8.7996E-02	3.2057E-03	3.2059E-03	-1.0169E-03
1.0123E-01	0.	9.7640E-02	3.5569E-03	3.5572E-03	-1.1282E-03
1.0503E-01	0.	1.0126E-01	3.6887E-03	3.6889E-03	-1.1700E-03
1.0969E-01	0.	1.0560E-01	3.8468E-03	3.8470E-03	-1.2202E-03
1.1196E-01	0.	1.0622E-01	4.3313E-03	5.2231E-03	-1.6567E-03
1.1217E-01	0.	1.0337E-01	5.1476E-03	7.8170E-03	-2.4790E-03
1.1231E-01	0.	1.0291E-01	5.1245E-03	7.7819E-03	-2.4679E-03
1.1237E-01	0.	1.0198E-01	5.0784E-03	7.7116E-03	-2.4458E-03
1.1219E-01	0.	1.0056E-01	4.8539E-03	7.1661E-03	-2.2729E-03
1.1171E-01	0.	1.0594E-01	2.5321E-03		

*PHOSPHOROUS

*P

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
P	6.200000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
6.2100000E+00	1.8300000E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
7.8307E-02	0.	6.8329E-02	4.8795E-03	9.9778E-03	-3.1803E-03
8.8985E-02	0.	7.7647E-02	5.5448E-03	1.1338E-02	-3.6138E-03
1.0322E-01	0.	9.0070E-02	6.4319E-03	1.3153E-02	-4.1920E-03
1.0945E-01	0.	9.5505E-02	6.8203E-03	1.3946E-02	-4.4452E-03
1.0144E-01	0.	8.8517E-02	6.3210E-03	1.2926E-02	-4.1197E-03
9.9665E-02	0.	8.6964E-02	6.2103E-03	1.2699E-02	-4.0476E-03
1.0322E-01	0.	9.0070E-02	6.4319E-03	1.3153E-02	-4.1920E-03
1.0589E-01	0.	9.2399E-02	6.5979E-03	1.3493E-02	-4.3001E-03
1.1569E-01	0.	1.1200E-01	3.6846E-03	3.6850E-03	-1.1743E-03
1.2103E-01	0.	1.1716E-01	3.8548E-03	3.8551E-03	-1.2287E-03
1.2105E-01	0.	1.1716E-01	3.8548E-03	3.8551E-03	-1.2287E-03
1.2111E-01	0.	1.1716E-01	3.8548E-03	3.8551E-03	-1.2287E-03
1.2127E-01	0.	1.1716E-01	3.8548E-03	3.8551E-03	-1.2287E-03
1.2156E-01	0.	1.1588E-01	4.2644E-03	5.1401E-03	-1.6382E-03
1.2204E-01	0.	1.1331E-01	5.0835E-03	7.7101E-03	-2.4573E-03
1.2271E-01	0.	1.1331E-01	5.0835E-03	7.7101E-03	-2.4573E-03
1.2558E-01	0.	1.1498E-01	5.1581E-03	7.8235E-03	-2.4934E-03
1.3648E-01	0.	1.2387E-01	5.3979E-03	7.9604E-03	-2.5373E-03
1.4118E-01	0.	1.3519E-01	2.9335E-03		

*SULFUR

*S

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
S	6.100000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
6.1100000E+00	1.8110003E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
7.4007E-02	0.	5.2944E-02	3.6469E-03	7.4525E-03	-2.3786E-03
9.1870E-02	0.	6.8603E-02	4.7253E-03	9.6568E-03	-3.0819E-03
1.0072E-01	0.	8.0534E-02	5.5476E-03	1.1336E-02	-3.6183E-03
9.0067E-02	0.	7.6805E-02	5.2912E-03	1.0811E-02	-3.4513E-03
7.3566E-02	0.	6.4129E-02	4.4174E-03	9.0270E-03	-2.8812E-03
9.1023E-02	0.	7.9788E-02	5.4960E-03	1.1231E-02	-3.5846E-03
8.2517E-02	0.	7.2331E-02	4.9827E-03	1.0182E-02	-3.2499E-03
1.1059E-01	0.	9.6939E-02	6.6775E-03	1.3646E-02	-4.3552E-03
1.0209E-01	0.	9.8929E-02	3.1487E-03	3.1490E-03	-1.0050E-03
3.4057E-02	0.	3.2976E-02	1.0496E-03	1.0497E-03	-3.3501E-04
3.4111E-02	0.	3.2976E-02	1.0496E-03	1.0497E-03	-3.3501E-04
3.4257E-02	0.	3.2976E-02	1.0496E-03	1.0497E-03	-3.3501E-04
3.4655E-02	0.	3.2976E-02	1.0496E-03	1.0497E-03	-3.3501E-04
3.5459E-02	0.	3.2626E-02	1.1612E-03	1.3995E-03	-4.4668E-04
3.7285E-02	0.	3.2565E-02	1.4123E-03	2.1413E-03	-6.8343E-04
3.9639E-02	0.	3.3204E-02	1.4400E-03	2.1833E-03	-6.9685E-04
4.2396E-02	0.	3.3204E-02	1.4400E-03	2.1833E-03	-6.9685E-04
4.9012E-02	0.	3.4884E-02	1.4696E-03	2.1666E-03	-6.9155E-04
5.0944E-02	0.	3.6156E-02	7.5928E-04		

*POTASSIUM

*K

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
K	7.400000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
7.4100000E+00	8.6999990E-01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.7258E-02	0.	3.3477E-02	1.8575E-03	3.7796E-03	-1.2167E-03
4.2954E-02	0.	3.8595E-02	2.1415E-03	4.3574E-03	-1.4027E-03
4.4898E-02	0.	4.0341E-02	2.2379E-03	4.5545E-03	-1.4657E-03
4.2084E-02	0.	3.7812E-02	2.0973E-03	4.2690E-03	-1.3735E-03
3.5719E-02	0.	3.2092E-02	1.7803E-03	3.6232E-03	-1.1660E-03
2.9355E-02	0.	2.6372E-02	1.4630E-03	2.9774E-03	-9.5814E-04
2.5336E-02	0.	2.2759E-02	1.2626E-03	2.5696E-03	-8.2697E-04
2.7482E-02	0.	2.4686E-02	1.3692E-03	2.7871E-03	-8.9667E-04
2.5481E-02	0.	2.4817E-02	6.4572E-04	6.4579E-04	-2.0775E-04
2.0286E-02	0.	1.9723E-02	5.1324E-04	5.1323E-04	-1.6517E-04
2.1510E-02	0.	2.0833E-02	5.4210E-04	5.4212E-04	-1.7444E-04
2.3953E-02	0.	2.2989E-02	5.9818E-04	5.9821E-04	-1.9248E-04
2.7061E-02	0.	2.5405E-02	6.6114E-04	6.6109E-04	-2.1281E-04
2.9503E-02	0.	2.6480E-02	7.6966E-04	9.2677E-04	-2.9827E-04
3.1470E-02	0.	2.6080E-02	9.2088E-04	1.3935E-03	-4.4834E-04
3.4398E-02	0.	2.6398E-02	9.3207E-04	1.4105E-03	-4.5377E-04
3.9678E-02	0.	2.7352E-02	9.6600E-04	1.4615E-03	-4.7041E-04
4.8480E-02	0.	2.8846E-02	9.9006E-04	1.4568E-03	-4.6886E-04
5.3723E-02	0.	3.0308E-02	5.2129E-04		

*CALCIUM

*CA

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
CA	5.400000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.410000E+00	1.5500005E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
6.9898E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9898E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9899E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9899E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9899E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9900E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9900E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9901E-02	0.	6.2969E-02	3.4059E-03	6.9288E-03	-2.2317E-03
6.9905E-02	0.	6.8165E-02	1.7322E-03	1.7322E-03	-5.5792E-04
6.9916E-02	0.	6.8165E-02	1.7322E-03	1.7322E-03	-5.5792E-04
6.9949E-02	0.	6.8165E-02	1.7322E-03	1.7322E-03	-5.5792E-04
7.0037E-02	0.	6.8165E-02	1.7322E-03	1.7322E-03	-5.5792E-04
7.0275E-02	0.	6.8165E-02	1.7322E-03	1.7322E-03	-5.5792E-04
7.0693E-02	0.	6.7588E-02	1.9182E-03	2.3096E-03	-7.4389E-04
7.1414E-02	0.	6.6433E-02	2.2901E-03	3.4644E-03	-1.1158E-03
7.2398E-02	0.	6.6433E-02	2.2901E-03	3.4644E-03	-1.1158E-03
7.4020E-02	0.	6.6433E-02	2.2901E-03	3.4644E-03	-1.1158E-03
7.6796E-02	0.	6.6614E-02	2.2319E-03	3.2836E-03	-1.0576E-03
7.8783E-02	0.	6.9898E-02	1.1743E-03		

*SCANDIUM

*SC

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
SC	5.600000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.6100000E+00	3.1999993E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.2012E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2014E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2016E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2019E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2023E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2027E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2033E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.2041E-01	0.	1.0942E-01	5.2429E-03	1.0646E-02	-3.4419E-03
1.3793E-01	0.	1.3418E-01	3.0414E-03	3.0416E-03	-9.8312E-04
4.9720E-01	0.	4.8429E-01	1.0977E-02	1.0978E-02	-3.5482E-03
4.8765E-01	0.	4.7171E-01	1.0693E-02	1.0693E-02	-3.4569E-03
4.6453E-01	0.	4.4027E-01	9.9805E-03	9.9803E-03	-3.2269E-03
9.2857E-01	0.	8.7005E-01	1.9724E-02	1.9723E-02	-6.3772E-03
1.1001E 00	0.	9.8831E-01	2.5005E-02	3.0099E-02	-9.7288E-03
1.1849E 00	0.	9.8351E-01	3.0189E-02	4.5624E-02	-1.4752E-02
1.2860E 00	0.	9.8351E-01	3.0189E-02	4.5624E-02	-1.4752E-02
1.4698E 00	0.	9.9990E-01	3.0687E-02	4.6384E-02	-1.4992E-02
1.7790E 00	0.	1.0254E 00	3.0598E-02	4.4978E-02	-1.4542E-02
2.0295E 00	0.	1.1170E 00	1.6755E-02		

*TITANIUM

*TI

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
TI	4.300000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.2900000E+00	4.5070009E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.4014E-01	0.	3.1195E-01	1.3891E-02	2.8175E-02	-9.1294E-03
3.8550E-01	0.	3.5354E-01	1.5744E-02	3.1932E-02	-1.0348E-02
4.1952E-01	0.	3.8474E-01	1.7129E-02	3.4749E-02	-1.1256E-02
4.0819E-01	0.	3.7434E-01	1.6670E-02	3.3810E-02	-1.0956E-02
3.9403E-01	0.	3.6134E-01	1.6088E-02	3.2636E-02	-1.0572E-02
3.2318E-01	0.	2.9635E-01	1.3195E-02	2.6766E-02	-8.6716E-03
2.5518E-01	0.	2.3396E-01	1.0415E-02	2.1131E-02	-6.8434E-03
3.4873E-01	0.	3.1975E-01	1.4237E-02	2.8879E-02	-9.3559E-03
1.2190E 00	0.	1.1935E 00	2.5240E-02	2.5240E-02	-8.1772E-03
1.2307E 00	0.	1.2046E 00	2.5474E-02	2.5475E-02	-8.2519E-03
3.3863E-01	0.	3.3003E-01	6.9796E-03	6.9791E-03	-2.2615E-03
2.4476E-01	0.	2.3538E-01	4.9773E-03	4.9775E-03	-1.6124E-03
2.4495E-01	0.	2.2816E-01	4.8254E-03	4.8249E-03	-1.5636E-03
2.5706E-01	0.	2.2545E-01	5.3205E-03	6.4020E-03	-2.0745E-03
2.8332E-01	0.	2.2551E-01	6.4496E-03	9.7438E-03	-3.1561E-03
3.1591E-01	0.	2.2687E-01	6.4884E-03	9.8025E-03	-3.1750E-03
3.7070E-01	0.	2.3013E-01	6.5825E-03	9.9434E-03	-3.2215E-03
4.7702E-01	0.	2.4830E-01	6.9049E-03	1.0146E-02	-3.2866E-03
5.6297E-01	0.	2.8140E-01	3.9396E-03		

*CHROMIUM

*CR

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
CR	4.200000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.4300000E+00	7.1900017E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.1662E-01	0.	1.0769E-01	4.3987E-03	8.9097E-03	-2.8945E-03
1.1662E-01	0.	1.0769E-01	4.3987E-03	8.9097E-03	-2.8945E-03
1.1663E-01	0.	1.0769E-01	4.3987E-03	8.9097E-03	-2.8945E-03
1.1663E-01	0.	1.0769E-01	4.3987E-03	8.9097E-03	-2.8945E-03
1.2080E-01	0.	1.1154E-01	4.5543E-03	9.2279E-03	-2.9964E-03
1.2914E-01	0.	1.1923E-01	4.8692E-03	9.8644E-03	-3.2039E-03
1.3749E-01	0.	1.2692E-01	5.1837E-03	1.0501E-02	-3.4109E-03
1.5000E-01	0.	1.3846E-01	5.6541E-03	1.1455E-02	-3.7202E-03
2.2921E-01	0.	2.2466E-01	4.3760E-03	4.3753E-03	-1.4214E-03
6.3760E-01	0.	6.2498E-01	1.2173E-02	1.2171E-02	-3.9540E-03
6.6753E-01	0.	6.5357E-01	1.2729E-02	1.2728E-02	-4.1339E-03
3.5316E-01	0.	3.4312E-01	6.6821E-03	6.6823E-03	-2.1696E-03
3.4642E-01	0.	3.3087E-01	6.4441E-03	6.4436E-03	-2.0927E-03
3.5649E-01	0.	3.2872E-01	7.1417E-03	8.5915E-03	-2.7903E-03
3.7388E-01	0.	3.2443E-01	8.5368E-03	1.2887E-02	-4.1855E-03
4.0176E-01	0.	3.2843E-01	8.6449E-03	1.3046E-02	-4.2399E-03
4.4920E-01	0.	3.3644E-01	8.8521E-03	1.3365E-02	-4.3395E-03
5.1950E-01	0.	3.4041E-01	8.7099E-03	1.2790E-02	-4.1536E-03
5.6977E-01	0.	3.5555E-01	4.5866E-03		

*MANGANESE

*MN

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
MN	4.400000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.3900000E+00	7.4199984E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.7264E-01	0.	2.5287E-01	9.7340E-03	1.9712E-02	-6.4085E-03
3.0114E-01	0.	2.7929E-01	1.0758E-02	2.1771E-02	-7.0847E-03
3.0116E-01	0.	2.7929E-01	1.0758E-02	2.1771E-02	-7.0847E-03
2.8899E-01	0.	2.6797E-01	1.0318E-02	2.0889E-02	-6.7936E-03
2.7478E-01	0.	2.5476E-01	9.8125E-03	1.9859E-02	-6.4622E-03
2.6466E-01	0.	2.4532E-01	9.4493E-03	1.9123E-02	-6.2231E-03
2.9117E-01	0.	2.6985E-01	1.0388E-02	2.1036E-02	-6.8395E-03
3.1769E-01	0.	2.9439E-01	1.1334E-02	2.2948E-02	-7.4625E-03
5.8659E-01	0.	5.7526E-01	1.0593E-02	1.0591E-02	-3.4459E-03
8.8914E 00	0.	8.7287E 00	1.6071E-01	1.6071E-01	-5.2260E-02
1.0909E 01	0.	1.0706E 01	1.9714E-01	1.9712E-01	-6.4119E-02
2.5821E 00	0.	2.5207E 00	4.6421E-02	4.6411E-02	-1.5101E-02
2.5693E-01	0.	2.1253E-01	3.9130E-03	3.9129E-03	-1.2724E-03
2.6470E-01	0.	1.7509E-01	3.5949E-03	4.3248E-03	-1.4060E-03
3.4162E-01	0.	1.7254E-01	4.2894E-03	6.4725E-03	-2.1055E-03
4.6215E-01	0.	1.8705E-01	4.6495E-03	7.0168E-03	-2.2819E-03
6.6614E-01	0.	2.1606E-01	5.3721E-03	8.1054E-03	-2.6373E-03
9.7125E-01	0.	2.2381E-01	5.4123E-03	7.9423E-03	-2.5849E-03
1.1614E 00	0.	2.0855E-01	2.5443E-03		

*IRON

*FE

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.1100000E+00	7.8699977E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.2329E-01	0.	2.0739E-01	7.8504E-03	1.5885E-02	-5.1711E-03
2.4791E-01	0.	2.3026E-01	8.7184E-03	1.7636E-02	-5.7436E-03
2.6659E-01	0.	2.4761E-01	9.3790E-03	1.8965E-02	-6.1801E-03
2.4707E-01	0.	2.2947E-01	8.6867E-03	1.7576E-02	-5.7221E-03
2.0548E-01	0.	1.9083E-01	7.2264E-03	1.4617E-02	-4.7610E-03
2.4624E-01	0.	2.2868E-01	8.6583E-03	1.7516E-02	-5.7039E-03
3.0738E-01	0.	2.8546E-01	1.0813E-02	2.1864E-02	-7.1248E-03
3.1249E-01	0.	2.9019E-01	1.0987E-02	2.2227E-02	-7.2376E-03
3.6011E-01	0.	3.5356E-01	6.4049E-03	6.4023E-03	-2.0854E-03
4.6691E-01	0.	4.5821E-01	8.3002E-03	8.2973E-03	-2.7022E-03
6.8409E-01	0.	6.7084E-01	1.2154E-02	1.2148E-02	-3.9576E-03
8.9566E-01	0.	8.7681E-01	1.5886E-02	1.5877E-02	-5.1735E-03
9.5087E-01	0.	9.2600E-01	1.6772E-02	1.6768E-02	-5.4586E-03
9.5346E-01	0.	9.1420E-01	1.8473E-02	2.2207E-02	-7.2357E-03
9.6256E-01	0.	8.9695E-01	2.1933E-02	3.3083E-02	-1.0772E-02
9.6964E-01	0.	8.8344E-01	2.1603E-02	3.2585E-02	-1.0611E-02
9.9126E-01	0.	8.7075E-01	2.1296E-02	3.2117E-02	-1.0461E-02
1.0512E 00	0.	8.7290E-01	2.0759E-02	3.0457E-02	-9.9190E-03
1.0906E 00	0.	9.0015E-01	1.0802E-02		

*NICKEL

*Ni

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
NI	4.100000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.4100000E+00	8.8999976E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.5584E-01	0.	2.3836E-01	8.6282E-03	1.7450E-02	-5.6863E-03
2.7412E-01	0.	2.5539E-01	9.2404E-03	1.8696E-02	-6.0885E-03
2.8326E-01	0.	2.6390E-01	9.5481E-03	1.9319E-02	-6.2910E-03
2.7870E-01	0.	2.5964E-01	9.3984E-03	1.9008E-02	-6.1939E-03
2.9242E-01	0.	2.7241E-01	9.8708E-03	1.9943E-02	-6.5087E-03
3.2899E-01	0.	3.0647E-01	1.1098E-02	2.2436E-02	-7.3156E-03
4.2037E-01	0.	3.9159E-01	1.4176E-02	2.8668E-02	-9.3433E-03
5.1633E-01	0.	4.8098E-01	1.7414E-02	3.5211E-02	-1.1478E-02
8.2254E-01	0.	8.0823E-01	1.4023E-02	1.4022E-02	-4.5666E-03
1.3758E 00	0.	1.3515E 00	2.3449E-02	2.3448E-02	-7.6364E-03
1.7015E 00	0.	1.6703E 00	2.8979E-02	2.8979E-02	-9.4365E-03
1.7691E 00	0.	1.7332E 00	3.0080E-02	3.0070E-02	-9.8025E-03
1.7974E 00	0.	1.7512E 00	3.0396E-02	3.0382E-02	-9.9081E-03
1.8058E 00	0.	1.7321E 00	3.3529E-02	4.0301E-02	-1.3146E-02
1.7949E 00	0.	1.6722E 00	3.9156E-02	5.9049E-02	-1.9246E-02
1.8134E 00	0.	1.6502E 00	3.8665E-02	5.8271E-02	-1.9018E-02
1.7626E 00	0.	1.5355E 00	3.5966E-02	5.4220E-02	-1.7684E-02
1.7789E 00	0.	1.4414E 00	3.2825E-02	4.8152E-02	-1.5696E-02
1.9093E 00	0.	1.5366E 00	1.7671E-02		

*COPPER

*CU

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
CU	8.360000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.370000E+00	8.9399976E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.1281E-01	0.	2.9311E-01	9.7456E-03	1.9684E-02	-6.4300E-03
3.1875E-01	0.	2.9867E-01	9.9331E-03	2.0058E-02	-6.5547E-03
2.7637E-01	0.	2.5895E-01	8.6137E-03	1.7391E-02	-5.6845E-03
2.6578E-01	0.	2.4902E-01	8.2772E-03	1.6724E-02	-5.4603E-03
2.9546E-01	0.	2.7682E-01	9.2009E-03	1.8591E-02	-6.0695E-03
3.4210E-01	0.	3.2051E-01	1.0664E-02	2.1525E-02	-7.0383E-03
3.9425E-01	0.	3.6936E-01	1.2285E-02	2.4806E-02	-8.1072E-03
4.4555E-01	0.	4.1742E-01	1.3872E-02	2.8033E-02	-9.1499E-03
5.6519E-01	0.	5.5608E-01	8.8931E-03	8.8887E-03	-2.9043E-03
8.2283E-01	0.	8.0930E-01	1.2942E-02	1.2936E-02	-4.2266E-03
8.1112E-01	0.	7.9679E-01	1.2740E-02	1.2736E-02	-4.1593E-03
6.2102E-01	0.	6.0698E-01	9.7065E-03	9.7022E-03	-3.1697E-03
6.2847E-01	0.	6.0698E-01	9.7065E-03	9.7022E-03	-3.1697E-03
6.6398E-01	0.	6.2574E-01	1.1153E-02	1.3407E-02	-4.3785E-03
6.9413E-01	0.	6.2642E-01	1.3501E-02	2.0351E-02	-6.6453E-03
7.2018E-01	0.	6.2191E-01	1.3407E-02	2.0205E-02	-6.6003E-03
7.6531E-01	0.	6.1657E-01	1.3291E-02	2.0031E-02	-6.5429E-03
8.3005E-01	0.	5.9636E-01	1.2506E-02	1.8333E-02	-5.9906E-03
8.6962E-01	0.	5.9217E-01	6.2770E-03		

*ZIRCONIUM

*ZR

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
ZR	5.200000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.2100000E+00	6.5199981E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.7548E-01	0.	1.6774E-01	3.8615E-03	7.7343E-03	-2.5630E-03
1.7225E-01	0.	1.6466E-01	3.7909E-03	7.5919E-03	-2.5163E-03
1.8086E-01	0.	1.7289E-01	3.9806E-03	7.9715E-03	-2.6423E-03
2.1746E-01	0.	2.0788E-01	4.7833E-03	9.5847E-03	-3.1741E-03
2.7990E-01	0.	2.6757E-01	6.1481E-03	1.2337E-02	-4.0768E-03
3.4234E-01	0.	3.2725E-01	7.5252E-03	1.5089E-02	-4.9918E-03
3.7034E-01	0.	3.5401E-01	8.1391E-03	1.6322E-02	-5.3986E-03
3.7249E-01	0.	3.5607E-01	8.2039E-03	1.6418E-02	-5.4475E-03
3.6603E-01	0.	3.6199E-01	4.0407E-03	4.0331E-03	-1.3321E-03
3.1867E-01	0.	3.1515E-01	3.5221E-03	3.5113E-03	-1.1641E-03
2.8425E-01	0.	2.8108E-01	3.1423E-03	3.1317E-03	-1.0391E-03
2.7570E-01	0.	2.7256E-01	3.0444E-03	3.0367E-03	-1.0050E-03
2.6706E-01	0.	2.6383E-01	2.9475E-03	2.9395E-03	-9.7343E-04
2.6695E-01	0.	2.6243E-01	3.2665E-03	3.9130E-03	-1.2956E-03
2.6708E-01	0.	2.6005E-01	3.9085E-03	5.8600E-03	-1.9408E-03
2.6698E-01	0.	2.5921E-01	3.8964E-03	5.8410E-03	-1.9350E-03
2.6694E-01	0.	2.5794E-01	3.8781E-03	5.8126E-03	-1.9263E-03
2.6739E-01	0.	2.5658E-01	3.7519E-03	5.4737E-03	-1.8127E-03
2.6633E-01	0.	2.5946E-01	1.9200E-03		

NIOBIUM

NB

FORMULA F	MASS A (OXY16=16)	FUEL MASS AF (OXY16=16)	TEMPERATURE T (DEG K)
5.3600000E 00	9.2909999E 01	0.	2.9316000E 02 0

CROSS SECTION (BARN)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.3115E 00	0.	2.2013E 00	4.9175E-02	9.8652E-02	-3.2615E-02
3.0148E 00	0.	2.8713E 00	6.4035E-02	1.2867E-01	-4.2435E-02
3.9690E 00	0.	3.7806E 00	8.4480E-02	1.6942E-01	-5.6040E-02
5.2243E 00	0.	4.9770E 00	1.1126E-01	2.2304E-01	-7.3820E-02
6.7313E 00	0.	6.4126E 00	1.4344E-01	2.8738E-01	-9.5196E-02
8.0401E 00	0.	7.6569E 00	1.7073E-01	3.4313E-01	-1.1313E-01
8.8015E 00	0.	8.3747E 00	1.8712E-01	3.7531E-01	-1.2412E-01
9.0662E 00	0.	8.6140E 00	1.9209E-01	3.8602E-01	-1.2729E-01
9.1262E 00	0.	8.9014E 00	9.6592E-02	9.6287E-02	-3.1942E-02
8.2925E 00	0.	7.8584E 00	8.5032E-02	8.4819E-02	-2.8082E-02
7.3860E 00	0.	6.3678E 00	6.8887E-02	6.8734E-02	-2.2737E-02
7.3218E 00	0.	6.0506E 00	6.5462E-02	6.5308E-02	-2.1612E-02
7.0637E 00	0.	6.4516E 00	6.9780E-02	6.9627E-02	-2.3030E-02
6.4000E 00	0.	6.2197E 00	7.4986E-02	8.9858E-02	-2.9736E-02
6.4000E 00	0.	6.1002E 00	8.8609E-02	1.3315E-01	-4.3909E-02
6.4000E 00	0.	5.9944E 00	8.7409E-02	1.3077E-01	-4.3509E-02
6.4000E 00	0.	5.8200E 00	8.4581E-02	1.2704E-01	-4.1932E-02
6.3999E 00	0.	5.5275E 00	7.8399E-02	1.1433E-01	-3.7901E-02
6.4000E 00	0.	5.4245E 00	3.8900E-02		

*NIOBIUM

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
NB	5.3600000E+00	1.0000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
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8.5699978E 00	0.	2.9316000E 02	1
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PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.2845E-01	0.	1.2233E-01	2.7327E-03	5.4823E-03	-1.8125E-03
1.6754E-01	0.	1.5956E-01	3.5586E-03	7.1507E-03	-2.3582E-03
2.2056E-01	0.	2.1009E-01	4.6947E-03	9.4152E-03	-3.1142E-03
2.9033E-01	0.	2.7658E-01	6.1829E-03	1.2395E-02	-4.1023E-03
3.7407E-01	0.	3.5636E-01	7.9710E-03	1.5970E-02	-5.2902E-03
4.4681E-01	0.	4.2551E-01	9.4879E-03	1.9068E-02	-6.2870E-03
4.8912E-01	0.	4.6540E-01	1.0399E-02	2.0857E-02	-6.8978E-03
5.0382E-01	0.	4.7869E-01	1.0675E-02	2.1452E-02	-7.0738E-03
5.0716E-01	0.	4.9467E-01	5.3678E-03	5.3508E-03	-1.7751E-03
4.6083E-01	0.	4.3671E-01	4.7254E-03	4.7136E-03	-1.5606E-03
4.1045E-01	0.	3.5387E-01	3.8282E-03	3.8197E-03	-1.2635E-03
4.0689E-01	0.	3.3624E-01	3.6378E-03	3.6293E-03	-1.2010E-03
3.9254E-01	0.	3.5853E-01	3.8772E-03	3.8693E-03	-1.2798E-03
3.5566E-01	0.	3.4564E-01	4.1671E-03	4.9936E-03	-1.6525E-03
3.5566E-01	0.	3.3900E-01	4.9242E-03	7.3992E-03	-2.4401E-03
3.5566E-01	0.	3.3312E-01	4.8575E-03	7.2671E-03	-2.4179E-03
3.5566E-01	0.	3.2343E-01	4.7004E-03	7.0599E-03	-2.3302E-03
3.5566E-01	0.	3.0717E-01	4.3568E-03	6.3528E-03	-2.1062E-03
3.5566E-01	0.	3.0145E-01	2.1617E-03		

*MOLYBDENUM

*MO

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
MO	5.300000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.3100000E+00	1.0200004E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.1382E-01	0.	1.0894E-01	2.3640E-03	4.7415E-03	-1.5682E-03
1.8751E-01	0.	1.7952E-01	3.9091E-03	7.8137E-03	-2.5977E-03
2.5961E-01	0.	2.4857E-01	5.4050E-03	1.0819E-02	-3.5893E-03
3.3492E-01	0.	3.2068E-01	6.9811E-03	1.3958E-02	-4.6387E-03
4.0706E-01	0.	3.8973E-01	8.4613E-03	1.6963E-02	-5.6145E-03
4.7601E-01	0.	4.5571E-01	9.9181E-03	1.9835E-02	-6.5893E-03
5.4979E-01	0.	5.2629E-01	1.1419E-02	2.2906E-02	-7.5742E-03
5.7878E-01	0.	5.5391E-01	1.2049E-02	2.4109E-02	-8.0033E-03
5.3320E-01	0.	5.2604E-01	5.5573E-03	5.5430E-03	-1.8362E-03
4.8153E-01	0.	4.7219E-01	4.9770E-03	4.9565E-03	-1.6498E-03
6.2861E-01	0.	5.8848E-01	7.1605E-03	7.1477E-03	-2.3570E-03
1.1154E 00	0.	8.5188E-01	9.5534E-03	9.5362E-03	-3.1487E-03
1.1464E 00	0.	8.1346E-01	9.5506E-03	9.5329E-03	-3.1460E-03
6.3115E-01	0.	5.1469E-01	7.4060E-03	8.8904E-03	-2.9228E-03
4.1492E-01	0.	3.8305E-01	5.0887E-03	7.6356E-03	-2.5268E-03
4.2584E-01	0.	3.7824E-01	5.0890E-03	7.6350E-03	-2.5271E-03
4.5015E-01	0.	3.7664E-01	5.0968E-03	7.6349E-03	-2.5349E-03
4.8147E-01	0.	3.6400E-01	4.9521E-03	7.2346E-03	-2.3902E-03
4.7735E-01	0.	3.3535E-01	2.3474E-03		

*CADMIUM

*CD

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
CD	8.300000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.310000E+00	8.647997E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.9699E-01	0.	1.8994E-01	3.5394E-03	7.0496E-03	-2.3575E-03
1.8773E-01	0.	1.8100E-01	3.3773E-03	6.7180E-03	-2.2510E-03
2.1786E-01	0.	2.1005E-01	3.9027E-03	7.7959E-03	-2.5956E-03
2.6884E-01	0.	2.5921E-01	4.8330E-03	9.6207E-03	-3.2200E-03
3.0593E-01	0.	2.9496E-01	5.4777E-03	1.0947E-02	-3.6422E-03
3.3143E-01	0.	3.1954E-01	5.9395E-03	1.1860E-02	-3.9511E-03
3.4302E-01	0.	3.3071E-01	6.1678E-03	1.2275E-02	-4.1098E-03
3.3839E-01	0.	3.2624E-01	6.0715E-03	1.2109E-02	-4.0414E-03
3.2685E-01	0.	3.2384E-01	2.9341E-03	2.9235E-03	-9.7348E-04
3.1310E-01	0.	3.1006E-01	2.8096E-03	2.7991E-03	-9.3240E-04
3.0655E-01	0.	3.0317E-01	2.7460E-03	2.7369E-03	-9.1056E-04
3.0766E-01	0.	3.0317E-01	2.7460E-03	2.7369E-03	-9.1056E-04
2.5968E-01	0.	2.5264E-01	2.2937E-03	2.2808E-03	-7.6412E-04
2.5145E-01	0.	2.2211E-01	2.2431E-03	2.6816E-03	-8.9436E-04
1.0429E 00	0.	2.5036E-01	3.0578E-03	4.5616E-03	-1.5282E-03
4.3747E 01	0.	6.5322E-01	7.9581E-03	1.1901E-02	-3.9673E-03
1.2621E 02	0.	1.0470E 00	1.2736E-02	1.9075E-02	-6.3393E-03
1.4709E 02	0.	7.5455E-01	8.9316E-03	1.3018E-02	-4.3262E-03
1.3974E 02	0.	4.7759E-01	2.8655E-03		

*INDIUM

*IN

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
IN	8.320000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.3300000E+00	7.3100013E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.5418E-01	0.	1.4799E-01	2.7054E-03	5.3982E-03	-1.8004E-03
1.5441E-01	0.	1.4799E-01	2.7054E-03	5.3982E-03	-1.8004E-03
1.7774E-01	0.	1.6926E-01	3.0966E-03	6.1743E-03	-2.0615E-03
2.1800E-01	0.	2.0626E-01	3.7787E-03	7.5239E-03	-2.5174E-03
2.5117E-01	0.	2.3622E-01	4.3051E-03	8.6168E-03	-2.8606E-03
2.6823E-01	0.	2.4973E-01	4.5669E-03	9.1095E-03	-3.0397E-03
2.6823E-01	0.	2.4732E-01	4.5277E-03	9.0219E-03	-3.0153E-03
2.6689E-01	0.	2.4399E-01	4.4467E-03	8.9002E-03	-2.9546E-03
2.5845E-01	0.	2.3566E-01	2.1023E-03	2.0918E-03	-6.9956E-04
2.5941E-01	0.	1.8719E-01	1.6656E-03	1.6616E-03	-5.5134E-04
2.6842E-01	0.	1.1403E-01	1.0149E-03	1.0122E-03	-3.3618E-04
3.0294E-01	0.	7.6018E-02	6.7754E-04	6.7478E-04	-2.2506E-04
1.4533E 00	0.	7.6018E-02	6.7754E-04	6.7478E-04	-2.2506E-04
4.2664E 01	0.	7.5793E-02	7.5256E-04	8.9971E-04	-3.0007E-04
4.4064E 01	0.	7.9110E-01	9.4541E-03	1.4170E-02	-4.7030E-03
4.5632E 00	0.	8.2877E-01	9.9049E-03	1.4845E-02	-4.9275E-03
3.6812E 00	0.	1.5069E-01	1.8052E-03	2.6991E-03	-9.0022E-04
4.7291E 00	0.	1.5083E-01	1.7583E-03	2.5583E-03	-8.5335E-04
6.7432E 00	0.	1.4531E-01	8.5733E-04		

*BARIUM

*BA

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
BA	5.420000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.4300000E+00	3.4999992E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
8.4433E-02	0.	8.1962E-02	1.2468E-03	2.4704E-03	-8.3309E-04
8.4433E-02	0.	8.1962E-02	1.2468E-03	2.4704E-03	-8.3309E-04
8.8272E-02	0.	8.5687E-02	1.3031E-03	2.5827E-03	-8.7054E-04
1.0362E-01	0.	1.0059E-01	1.5287E-03	3.0318E-03	-1.0209E-03
1.0746E-01	0.	1.0431E-01	1.5812E-03	3.1441E-03	-1.0546E-03
9.3646E-02	0.	9.0903E-02	1.3824E-03	2.7399E-03	-9.2352E-04
8.3669E-02	0.	8.1217E-02	1.2337E-03	2.4479E-03	-8.2372E-04
7.7530E-02	0.	7.5256E-02	1.1368E-03	2.2682E-03	-7.5695E-04
9.9028E-02	0.	9.8291E-02	7.2984E-04	7.2427E-04	-2.4466E-04
1.1517E-01	0.	1.1429E-01	8.4493E-04	8.4214E-04	-2.8077E-04
1.1523E-01	0.	1.1429E-01	8.4493E-04	8.4214E-04	-2.8077E-04
1.3074E-01	0.	1.2953E-01	9.5751E-04	9.5442E-04	-3.1813E-04
1.4651E-01	0.	1.4477E-01	1.0720E-03	1.0667E-03	-3.5739E-04
1.5110E-01	0.	1.4822E-01	1.2212E-03	1.4597E-03	-4.8774E-04
1.4856E-01	0.	1.4370E-01	1.4294E-03	2.1335E-03	-7.1478E-04
1.5416E-01	0.	1.4749E-01	1.4650E-03	2.1896E-03	-7.3162E-04
1.6321E-01	0.	1.5354E-01	1.5294E-03	2.2794E-03	-7.6592E-04
2.0237E-01	0.	1.8737E-01	1.8100E-03	2.6345E-03	-8.7900E-04
2.4498E-01	0.	2.2906E-01	1.1224E-03		

*SAMARIUM

*SM

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
SM	8.220000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.2300000E+00	7.5400025E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.0198E-01	0.	2.6447E-01	3.6899E-03	7.3057E-03	-2.4669E-03
3.0198E-01	0.	2.6447E-01	3.6899E-03	7.3057E-03	-2.4669E-03
3.0198E-01	0.	2.6447E-01	3.6899E-03	7.3057E-03	-2.4669E-03
3.0198E-01	0.	2.6447E-01	3.6899E-03	7.3057E-03	-2.4669E-03
3.0198E-01	0.	2.4978E-01	3.4979E-03	6.8999E-03	-2.3428E-03
3.0198E-01	0.	2.3509E-01	3.2943E-03	6.4941E-03	-2.2071E-03
3.0198E-01	0.	2.2039E-01	3.0585E-03	6.0879E-03	-2.0393E-03
3.0198E-01	0.	1.9101E-01	2.6559E-03	5.2762E-03	-1.7726E-03
3.7747E-01	0.	1.6497E-01	1.1252E-03	1.1162E-03	-3.7780E-04
5.2846E-01	0.	1.4997E-01	1.0192E-03	1.0146E-03	-3.3972E-04
9.0593E-01	0.	2.2496E-01	1.5290E-03	1.5220E-03	-5.0984E-04
2.1138E 00	0.	4.4992E-01	3.0580E-03	3.0440E-03	-1.0197E-03
1.6609E 01	0.	7.4987E-01	5.0967E-03	5.0733E-03	-1.6995E-03
1.5854E 01	0.	5.9854E-01	4.5297E-03	5.4115E-03	-1.8119E-03
4.5297E 00	0.	3.7240E-01	3.3981E-03	5.0733E-03	-1.6995E-03
1.1324E 01	0.	4.4688E-01	4.0777E-03	6.0879E-03	-2.0393E-03
1.7364E 02	0.	1.7130E 00	1.5631E-02	2.3337E-02	-7.8175E-03
2.6526E 02	0.	2.4956E 00	2.2270E-02	3.2202E-02	-1.0895E-02
2.3853E 02	0.	1.6328E 00	7.3476E-03		

*EUROPIUM

*EU

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
EU	8.240000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.2500000E+00	5.1659987E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.0476E-01	0.	1.7944E-01	2.4353E-03	4.8440E-03	-1.6245E-03
2.0476E-01	0.	1.7944E-01	2.4353E-03	4.8440E-03	-1.6245E-03
2.0476E-01	0.	1.7944E-01	2.4353E-03	4.8440E-03	-1.6245E-03
2.0476E-01	0.	1.7944E-01	2.4353E-03	4.8440E-03	-1.6245E-03
2.0476E-01	0.	1.6947E-01	2.3000E-03	4.5749E-03	-1.5342E-03
2.0476E-01	0.	1.5950E-01	2.2225E-03	4.3064E-03	-1.5017E-03
2.0476E-01	0.	1.4953E-01	2.0295E-03	4.0367E-03	-1.3537E-03
2.0476E-01	0.	1.2960E-01	1.7589E-03	3.4985E-03	-1.1732E-03
2.5595E-01	0.	1.1188E-01	7.4371E-04	7.4006E-04	-2.4819E-04
3.5833E-01	0.	1.0171E-01	6.7610E-04	6.7278E-04	-2.2562E-04
1.2286E 00	0.	2.0342E-01	1.3522E-03	1.3456E-03	-4.5125E-04
4.0952E 00	0.	3.5598E-01	2.3789E-03	2.3549E-03	-8.0219E-04
6.1428E 00	0.	4.0683E-01	2.7396E-03	2.6915E-03	-9.3768E-04
6.1428E 00	0.	3.0445E-01	2.2878E-03	2.6915E-03	-9.3636E-04
2.8820E 01	0.	2.5259E-01	2.2543E-03	3.3639E-03	-1.1281E-03
3.6140E 01	0.	3.0311E-01	2.7052E-03	4.0367E-03	-1.3537E-03
1.7661E 01	0.	2.5259E-01	2.2543E-03	3.3639E-03	-1.1281E-03
4.7057E 01	0.	1.9397E-01	1.6866E-03	2.4468E-03	-8.2235E-04
7.8169E 01	0.	2.1623E-01	9.5140E-04		

*GADOLINIUM

*GD

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
GD	8.204000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.2140000E+00	7.8680030E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.4298E-01	0.	2.3549E-01	3.1377E-03	6.2095E-03	-2.0984E-03
2.2823E-01	0.	2.2077E-01	2.9468E-03	5.8214E-03	-1.9725E-03
1.9848E-01	0.	1.9133E-01	2.5658E-03	5.0453E-03	-1.7214E-03
1.6887E-01	0.	1.6190E-01	2.1432E-03	4.2689E-03	-1.4287E-03
1.5453E-01	0.	1.4718E-01	1.9560E-03	3.8809E-03	-1.3064E-03
1.5553E-01	0.	1.4718E-01	1.9560E-03	3.8809E-03	-1.3064E-03
1.5680E-01	0.	1.4718E-01	1.9560E-03	3.8809E-03	-1.3064E-03
1.5843E-01	0.	1.4718E-01	1.9560E-03	3.8809E-03	-1.3064E-03
1.6650E-01	0.	1.5009E-01	9.7616E-04	9.7022E-04	-3.2660E-04
1.9293E-01	0.	1.5009E-01	9.7616E-04	9.7022E-04	-3.2660E-04
2.6481E-01	0.	1.5009E-01	9.7616E-04	9.7022E-04	-3.2660E-04
5.3634E-01	0.	2.2513E-01	1.4633E-03	1.4553E-03	-4.8895E-04
1.4351E 00	0.	4.5027E-01	2.9266E-03	2.9106E-03	-9.7791E-04
4.1541E 00	0.	1.1232E 00	8.1607E-03	9.7024E-03	-3.2890E-03
3.8520E 00	0.	9.6927E-01	8.4731E-03	1.2613E-02	-4.2510E-03
1.5861E 01	0.	7.4560E-01	6.5566E-03	9.7026E-03	-3.3088E-03
1.8882E 02	0.	2.3859E 00	2.0844E-02	3.1047E-02	-1.0451E-02
7.7400E 02	0.	4.1076E 00	3.4927E-02	5.0628E-02	-1.7047E-02
1.0906E 03	0.	4.6617E 00	2.0045E-02		

*DYSPROSIUM

*DY

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
DY	8.260000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.2700000E+00	8.5620037E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.1832E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.1857E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.1889E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.1932E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.1986E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.2055E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.2144E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.2258E-01	0.	3.0964E-01	4.0066E-03	7.7778E-03	-2.7051E-03
3.2822E-01	0.	3.1547E-01	1.9777E-03	1.9445E-03	-6.7629E-04
3.4674E-01	0.	3.1547E-01	1.9777E-03	1.9445E-03	-6.7629E-04
3.9716E-01	0.	3.1547E-01	1.9777E-03	1.9445E-03	-6.7629E-04
6.1381E-01	0.	3.9434E-01	2.4723E-03	2.4306E-03	-8.4556E-04
3.1901E 00	0.	5.9940E-01	3.7655E-03	3.6945E-03	-1.2928E-03
1.6093E 01	0.	7.5558E-01	5.3140E-03	6.2225E-03	-2.1906E-03
1.5379E 01	0.	8.3085E-01	7.0280E-03	1.0306E-02	-3.5793E-03
6.9991E 00	0.	1.6931E 00	1.4373E-02	2.1000E-02	-7.3451E-03
1.3570E 01	0.	2.6650E 00	2.2662E-02	3.3057E-02	-1.1600E-02
2.4630E 01	0.	2.9514E 00	2.4280E-02	3.4675E-02	-1.2037E-02
3.1757E 01	0.	2.9044E 00	1.1908E-02		

*HAFNIUM

*HF

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
HF	8.280000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.2900000E+00	1.3089992E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.9769E-01	0.	2.8916E-01	3.4631E-03	6.7215E-03	-2.3387E-03
3.0152E-01	0.	2.9240E-01	3.4858E-03	6.7966E-03	-2.3488E-03
3.0548E-01	0.	2.9563E-01	3.5356E-03	6.8720E-03	-2.3861E-03
3.1075E-01	0.	2.9995E-01	3.5923E-03	6.9724E-03	-2.4260E-03
3.1405E-01	0.	3.0211E-01	3.6061E-03	7.0224E-03	-2.4314E-03
3.1765E-01	0.	3.0427E-01	3.6122E-03	7.0724E-03	-2.4291E-03
3.3049E-01	0.	3.1506E-01	3.7493E-03	7.3233E-03	-2.5243E-03
3.4604E-01	0.	3.2800E-01	3.8922E-03	7.6241E-03	-2.6168E-03
4.1261E-01	0.	3.8861E-01	2.2377E-03	2.2194E-03	-7.5255E-04
5.8908E-01	0.	5.2693E-01	3.0600E-03	3.0096E-03	-1.0462E-03
8.1667E-01	0.	6.5207E-01	3.7600E-03	3.7242E-03	-1.2679E-03
1.1378E 00	0.	6.9598E-01	4.0024E-03	3.9749E-03	-1.3426E-03
2.2633E 00	0.	9.0017E-01	5.2115E-03	5.1413E-03	-1.7713E-03
2.9014E 01	0.	1.6873E 00	1.0891E-02	1.2874E-02	-4.4303E-03
2.8705E 01	0.	1.3753E 00	1.0739E-02	1.5800E-02	-5.4526E-03
2.3406E 00	0.	4.1477E-01	3.2644E-03	4.7654E-03	-1.6701E-03
2.4178E 00	0.	3.4928E-01	2.7365E-03	4.0128E-03	-1.3940E-03
3.3725E 00	0.	3.4949E-01	2.5538E-03	3.8033E-03	-1.3113E-03
4.5288E 00	0.	3.5327E-01	1.3424E-03		

*TUNGSTEN

*W

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
W	8.370000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	1.9250004E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.1851E-01	0.	3.1140E-01	3.5571E-03	7.0437E-03	-2.3789E-03
3.6582E-01	0.	3.5765E-01	4.1145E-03	8.0901E-03	-2.7613E-03
4.1629E-01	0.	4.0698E-01	4.6302E-03	9.2055E-03	-3.0903E-03
4.3524E-01	0.	4.2547E-01	4.9452E-03	9.6248E-03	-3.3353E-03
4.3528E-01	0.	4.2547E-01	4.9452E-03	9.6248E-03	-3.3353E-03
4.4795E-01	0.	4.3781E-01	5.0505E-03	9.9035E-03	-3.3939E-03
4.7639E-01	0.	4.6556E-01	5.3465E-03	1.0531E-02	-3.5850E-03
5.1116E-01	0.	4.9947E-01	5.8181E-03	1.1299E-02	-3.9283E-03
5.8095E-01	0.	5.7692E-01	3.2457E-03	3.2082E-03	-1.0992E-03
7.5891E-01	0.	7.5251E-01	4.2072E-03	4.1843E-03	-1.4074E-03
9.5190E-01	0.	9.4064E-01	5.2893E-03	5.2307E-03	-1.7896E-03
1.1514E 00	0.	1.1288E 00	6.3533E-03	6.2769E-03	-2.1537E-03
2.0929E 00	0.	8.1522E-01	4.5670E-03	4.5331E-03	-1.5339E-03
1.7041E 00	0.	3.6930E-01	2.3086E-03	2.7432E-03	-9.3204E-04
5.2811E-01	0.	3.3675E-01	2.5352E-03	3.7660E-03	-1.2753E-03
6.2427E-01	0.	3.1180E-01	2.3767E-03	3.4873E-03	-1.2101E-03
8.2290E-01	0.	3.1180E-01	2.3767E-03	3.4873E-03	-1.2101E-03
1.1822E 00	0.	3.1198E-01	2.3141E-03	3.3053E-03	-1.1475E-03
1.3006E 00	0.	2.3792E-01	8.8029E-04		

*GOLD

*AU

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
AU	8.340000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.3500000E+00	1.9299994E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER	
			SGS1(N,N)	SGS0(N,N+1) SGS1(N,N+1)
3.0929E-01	0.	3.0126E-01	3.2398E-03	6.2530E-03 -2.1942E-03
3.8941E-01	0.	3.7903E-01	4.0749E-03	7.8672E-03 -2.7594E-03
4.1922E-01	0.	4.0708E-01	4.2895E-03	8.4487E-03 -2.8767E-03
3.6078E-01	0.	3.4839E-01	3.7655E-03	7.2313E-03 -2.5564E-03
3.1283E-01	0.	2.9924E-01	3.2038E-03	6.2109E-03 -2.1653E-03
3.3437E-01	0.	3.1658E-01	3.4411E-03	6.5713E-03 -2.3423E-03
4.0225E-01	0.	3.7874E-01	4.1282E-03	7.8617E-03 -2.8138E-03
4.6186E-01	0.	4.3223E-01	4.6600E-03	8.9715E-03 -3.1599E-03
5.6220E-01	0.	5.1383E-01	2.6931E-03	2.6255E-03 -9.3714E-04
6.9058E-01	0.	5.6228E-01	2.9292E-03	2.8729E-03 -1.0077E-03
8.0863E-01	0.	5.4613E-01	2.8414E-03	2.7904E-03 -9.7509E-04
9.2372E-01	0.	6.8413E-01	3.5885E-03	3.4957E-03 -1.2506E-03
3.6536E 00	0.	3.0536E 00	1.5791E-02	1.5602E-02 -5.3553E-03
4.3899E 01	0.	3.5174E 00	2.0582E-02	2.4005E-02 -8.5407E-03
4.1739E 01	0.	1.1480E 00	8.0890E-03	1.1792E-02 -4.1456E-03
2.0245E 00	0.	5.3458E-01	3.6949E-03	5.4904E-03 -1.8587E-03
2.7535E 00	0.	4.6739E-01	3.3261E-03	4.8010E-03 -1.7207E-03
4.1219E 00	0.	3.8538E-01	2.6223E-03	3.7496E-03 -1.2993E-03
5.5020E 00	0.	3.7624E-01	1.2792E-03	

*MERCURY

*HG

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
HG	7.700000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
7.7100000E+00	1.3550000E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.1476E-01	0.	2.0950E-01	2.2359E-03	4.3481E-03	-1.5088E-03
2.6894E-01	0.	2.6232E-01	2.8076E-03	5.4446E-03	-1.8972E-03
2.8677E-01	0.	2.7946E-01	3.0195E-03	5.8006E-03	-2.0496E-03
2.5547E-01	0.	2.4836E-01	2.6482E-03	5.1549E-03	-1.7862E-03
2.2347E-01	0.	2.1647E-01	2.3375E-03	4.4932E-03	-1.5862E-03
2.5510E-01	0.	2.4677E-01	2.6613E-03	5.1220E-03	-1.8049E-03
3.0932E-01	0.	2.9899E-01	3.2124E-03	6.2059E-03	-2.1747E-03
3.5892E-01	0.	3.4643E-01	3.7338E-03	7.1907E-03	-2.5315E-03
4.2676E-01	0.	4.1357E-01	2.1441E-03	2.1130E-03	-7.3082E-04
5.1290E-01	0.	4.8037E-01	2.5117E-03	2.4545E-03	-8.7010E-04
6.3318E-01	0.	5.4859E-01	2.8597E-03	2.8030E-03	-9.8498E-04
8.2282E-01	0.	5.9718E-01	3.1085E-03	3.0512E-03	-1.0677E-03
9.9699E-01	0.	6.6803E-01	3.4974E-03	3.4134E-03	-1.2145E-03
1.0987E 00	0.	7.6793E-01	4.4917E-03	5.2407E-03	-1.8629E-03
1.7498E 00	0.	8.0559E-01	5.6640E-03	8.2745E-03	-2.8969E-03
3.6726E 00	0.	8.0559E-01	5.6640E-03	8.2745E-03	-2.8969E-03
6.9280E 00	0.	8.0559E-01	5.6640E-03	8.2745E-03	-2.8969E-03
1.1888E 01	0.	8.0602E-01	5.5141E-03	7.8427E-03	-2.7470E-03
1.4784E 01	0.	8.1387E-01	2.7672E-03		

*LEAD

*PB

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
PB	7.600000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
7.6100000E+00	1.1349999E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.7243E-01	0.	1.6913E-01	1.7200E-03	3.3006E-03	-1.1682E-03
2.3595E-01	0.	2.3144E-01	2.4163E-03	4.5170E-03	-1.6613E-03
2.3843E-01	0.	2.3387E-01	2.4335E-03	4.5644E-03	-1.6705E-03
1.9800E-01	0.	1.9421E-01	1.9893E-03	3.7903E-03	-1.3557E-03
1.8233E-01	0.	1.7884E-01	1.8193E-03	3.4901E-03	-1.2358E-03
1.9058E-01	0.	1.8693E-01	1.9326E-03	3.6483E-03	-1.3227E-03
1.9883E-01	0.	1.9502E-01	2.0486E-03	3.8064E-03	-1.4123E-03
2.6648E-01	0.	2.6138E-01	2.6998E-03	5.1012E-03	-1.8470E-03
3.4321E-01	0.	3.4156E-01	1.6680E-03	1.6423E-03	-5.6978E-04
3.6632E-01	0.	3.6455E-01	1.8184E-03	1.7531E-03	-6.4619E-04
3.7624E-01	0.	3.7441E-01	1.8605E-03	1.8005E-03	-6.5660E-04
3.7628E-01	0.	3.7441E-01	1.8605E-03	1.8005E-03	-6.5660E-04
3.7642E-01	0.	3.7441E-01	1.8605E-03	1.8005E-03	-6.5660E-04
3.7665E-01	0.	3.7381E-01	2.0793E-03	2.4006E-03	-8.7547E-04
3.7623E-01	0.	3.7179E-01	2.5262E-03	3.5931E-03	-1.3250E-03
3.7348E-01	0.	3.6852E-01	2.4650E-03	3.5613E-03	-1.2744E-03
3.6202E-01	0.	3.5626E-01	2.3729E-03	3.4427E-03	-1.2219E-03
3.1872E-01	0.	3.1200E-01	2.0357E-03	2.8563E-03	-1.0282E-03
2.8694E-01	0.	2.8197E-01	9.0230E-04		

*BISMUTH

*BI

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
BI	7.500000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
7.5100000E+00	9.7470013E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.5734E-01	0.	1.5433E-01	1.5611E-03	3.0118E-03	-1.0576E-03
2.0511E-01	0.	2.0118E-01	2.0908E-03	3.9265E-03	-1.4345E-03
2.0370E-01	0.	1.9980E-01	2.0746E-03	3.8996E-03	-1.4227E-03
1.5032E-01	0.	1.4744E-01	1.5168E-03	2.8775E-03	-1.0358E-03
1.2644E-01	0.	1.2402E-01	1.2814E-03	2.4204E-03	-8.7676E-04
1.5172E-01	0.	1.4882E-01	1.5675E-03	2.9047E-03	-1.0820E-03
1.8825E-01	0.	1.8465E-01	1.8884E-03	3.6035E-03	-1.2860E-03
2.1494E-01	0.	2.1083E-01	2.1582E-03	4.1145E-03	-1.4703E-03
2.6552E-01	0.	2.6425E-01	1.2958E-03	1.2706E-03	-4.4619E-04
3.1188E-01	0.	3.1039E-01	1.5392E-03	1.4926E-03	-5.4116E-04
2.8660E-01	0.	2.8522E-01	1.3942E-03	1.3714E-03	-4.7713E-04
2.5570E-01	0.	2.5446E-01	1.2640E-03	1.2237E-03	-4.4585E-04
2.5853E-01	0.	2.5726E-01	1.2721E-03	1.2371E-03	-4.4489E-04
2.5856E-01	0.	2.5684E-01	1.4204E-03	1.6494E-03	-5.9319E-04
2.5568E-01	0.	2.5310E-01	1.6834E-03	2.4458E-03	-8.6565E-04
2.4860E-01	0.	2.4600E-01	1.6513E-03	2.3773E-03	-8.5652E-04
2.4158E-01	0.	2.3890E-01	1.6184E-03	2.3088E-03	-8.4651E-04
2.4483E-01	0.	2.4200E-01	1.5898E-03	2.2155E-03	-8.0833E-04
2.4897E-01	0.	2.4817E-01	7.9415E-04		

*THORIUM

*TH

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
TH	-1.300000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
1.3100000E+00	1.1500000E 01	1.1500000E 01	2.9316000E 02 11

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.4050E-01	2.6573E-02	2.2591E-01	2.0548E-03	3.9892E-03	-1.3881E-03
2.3438E-01	1.1346E-02	2.2591E-01	2.0548E-03	3.9892E-03	-1.3881E-03
2.2035E-01	9.8530E-03	2.1271E-01	1.9942E-03	3.7564E-03	-1.3665E-03
1.9751E-01	4.9265E-03	1.9217E-01	1.7651E-03	3.3935E-03	-1.1980E-03
1.9975E-01	7.4644E-04	1.9511E-01	1.8224E-03	3.4455E-03	-1.2466E-03
2.2244E-01	0.	2.1564E-01	1.9453E-03	3.8077E-03	-1.3089E-03
2.6051E-01	0.	2.5085E-01	2.2969E-03	4.4296E-03	-1.5565E-03
3.0589E-01	0.	2.9339E-01	2.7709E-03	5.1814E-03	-1.9051E-03
3.7546E-01	0.	3.6119E-01	1.6263E-03	1.5738E-03	-5.7430E-04
4.4891E-01	0.	4.2660E-01	1.8835E-03	1.8585E-03	-6.4098E-04
4.4488E-01	0.	4.1916E-01	1.8674E-03	1.8263E-03	-6.4650E-04
1.3660E 00	0.	3.8200E-01	1.7290E-03	1.6646E-03	-6.1635E-04
1.3346E 00	0.	3.5822E-01	1.5923E-03	1.5607E-03	-5.4894E-04
3.6426E-01	0.	3.4583E-01	1.7462E-03	2.0121E-03	-7.3751E-04
3.9412E-01	0.	3.5814E-01	2.1655E-03	3.1345E-03	-1.1178E-03
4.2696E-01	0.	3.6702E-01	2.2014E-03	3.2121E-03	-1.1277E-03
4.5831E-01	0.	3.6554E-01	2.2562E-03	3.1996E-03	-1.1868E-03
5.2028E-01	0.	3.7201E-01	2.1656E-03	3.0845E-03	-1.0778E-03
5.5485E-01	0.	3.7026E-01	1.0738E-03		

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
U233	-1.000000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
-1.0100000E+00	1.8288481E 01	1.8288481E 01	2.9316000E 02 11

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
5.7192E-01	2.3349E-01	4.6446E-01	4.3852E-03	8.2024E-03	-3.0145E-03
5.7192E-01	2.3468E-01	4.6446E-01	4.3852E-03	8.2024E-03	-3.0145E-03
5.7665E-01	2.4484E-01	4.6446E-01	4.3852E-03	8.2024E-03	-3.0145E-03
5.8846E-01	2.7060E-01	4.6446E-01	4.3852E-03	8.2024E-03	-3.0145E-03
5.9083E-01	2.7320E-01	4.6446E-01	4.3852E-03	8.2024E-03	-3.0145E-03
6.3100E-01	3.6442E-01	4.7061E-01	2.1243E-03	2.0506E-03	-7.5363E-04
1.0469E 00	1.4163E 00	4.7061E-01	2.1243E-03	2.0506E-03	-7.5363E-04
2.0797E 00	3.6631E 00	4.7061E-01	2.1243E-03	2.0506E-03	-7.5363E-04
2.7887E 00	5.3174E 00	4.7061E-01	2.1243E-03	2.0506E-03	-7.5363E-04
3.7813E 00	7.5626E 00	4.7061E-01	2.1243E-03	2.0506E-03	-7.5363E-04
1.0399E 01	2.2097E 01	4.6993E-01	2.3756E-03	2.7341E-03	-1.0048E-03
1.1344E 01	2.3964E 01	4.6856E-01	2.8780E-03	4.1012E-03	-1.5073E-03
8.0825E 00	1.5905E 01	4.6856E-01	2.8780E-03	4.1012E-03	-1.5073E-03
1.1958E 01	2.5524E 01	4.6856E-01	2.8780E-03	4.1012E-03	-1.5073E-03
1.8489E 01	4.4245E 01	4.6877E-01	2.8000E-03	3.8872E-03	-1.4292E-03
2.4884E 01	5.6209E 01	4.7266E-01	1.3707E-03		

*URANIUM 235

*U235

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
U235	9.223500E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
9.2235001E+01	1.8445784E 01	1.8445784E 01	2.9316000E 02 11

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.2451E-01	1.9819E-01	1.5104E-01	1.3143E-03	2.5737E-03	-8.8419E-04
2.4342E-01	1.7628E-01	1.6731E-01	1.4586E-03	2.8509E-03	-9.8220E-04
2.5524E-01	1.6951E-01	1.7428E-01	1.5543E-03	2.9699E-03	-1.0580E-03
2.9541E-01	1.7843E-01	2.0681E-01	1.8554E-03	3.5243E-03	-1.2664E-03
3.6395E-01	1.8999E-01	2.6723E-01	2.3862E-03	4.5539E-03	-1.6253E-03
4.7739E-01	2.6026E-01	3.5066E-01	1.4862E-03	1.4749E-03	-5.0021E-04
6.1682E-01	4.2657E-01	4.0008E-01	1.7009E-03	1.6828E-03	-5.7593E-04
8.8151E-01	8.4397E-01	4.0008E-01	1.7009E-03	1.6828E-03	-5.7593E-04
2.2806E 00	2.7912E 00	4.0008E-01	1.7009E-03	1.6828E-03	-5.7593E-04
4.6793E 00	6.1564E 00	4.0008E-01	1.7009E-03	1.6828E-03	-5.7593E-04
4.0649E 00	5.2843E 00	3.9952E-01	1.8928E-03	2.2437E-03	-7.6790E-04
3.3795E 00	5.7570E 00	3.9840E-01	2.2768E-03	3.3656E-03	-1.1519E-03
7.2317E 00	1.3896E 01	3.9840E-01	2.2768E-03	3.3656E-03	-1.1519E-03
1.2171E 01	2.4186E 01	3.9840E-01	2.2768E-03	3.3656E-03	-1.1519E-03
2.2007E 01	4.5082E 01	4.0812E-01	2.2442E-03	3.2662E-03	-1.0923E-03
2.8780E 01	5.8468E 01	4.0176E-01	1.1249E-03		

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
U238	-1.040000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
-1.0500000E+00	1.8681756E 01	1.8681756E 01	2.9316000E 02 11

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER		
			SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.3441E-01	4.5021E-02	3.1101E-01	1.9959E-03	2.8337E-03	-1.5232E-03
3.2944E-01	1.4771E-02	3.1480E-01	2.3693E-03	4.2458E-03	-1.6603E-03
3.6088E-01	0.	3.4884E-01	2.9634E-03	5.6577E-03	-2.0180E-03
4.2492E-01	0.	4.1005E-01	3.8265E-03	7.0718E-03	-2.6449E-03
4.8708E-01	0.	4.6938E-01	4.4824E-03	8.4844E-03	-3.0644E-03
5.8161E-01	0.	5.6401E-01	2.5635E-03	2.4748E-03	-9.0914E-04
6.5653E-01	0.	6.2108E-01	2.9574E-03	2.8283E-03	-1.0667E-03
7.1443E-01	0.	6.2108E-01	2.9574E-03	2.8283E-03	-1.0667E-03
1.1599E 00	0.	5.6944E-01	2.5574E-03	2.4748E-03	-9.0309E-04
7.1443E 00	0.	4.7763E-01	2.1751E-03	2.1211E-03	-7.5711E-04
6.5875E 00	0.	4.3320E-01	2.4210E-03	2.8272E-03	-1.0030E-03
4.4926E-01	0.	4.2517E-01	2.8872E-03	4.2404E-03	-1.4692E-03
4.5352E-01	0.	4.1737E-01	2.4435E-03	3.5356E-03	-1.2619E-03
4.6179E-01	0.	4.0531E-01	2.1224E-03	2.8306E-03	-1.1770E-03
4.8428E-01	0.	3.9197E-01	1.9096E-03	2.6819E-03	-9.6423E-04
4.8954E-01	0.	3.7426E-01	1.0493E-03		

*URANIUM

*URANIUM

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
U238	-1.0400000E+00	9.9284000E-01	U235	9.2235000E+03	7.1600000E-03

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	1.8900008E 01	1.8900008E 01	2.9316000E 02 11

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N) SGS0(N,N+1) SGS1(N,N+1)
3.3754E-01	4.6675E-02	3.1350E-01	2.0144E-03 2.8651E-03 -1.5365E-03
3.3269E-01	1.6129E-02	3.1743E-01	2.3905E-03 4.2855E-03 -1.6749E-03
3.6435E-01	1.2436E-03	3.5166E-01	2.9879E-03 5.7046E-03 -2.0348E-03
4.2898E-01	1.3090E-03	4.1339E-01	3.8571E-03 7.1290E-03 -2.6659E-03
4.9191E-01	1.3939E-03	4.7342E-01	4.5198E-03 8.5554E-03 -3.0900E-03
5.8769E-01	1.9093E-03	5.6909E-01	2.5857E-03 2.4966E-03 -9.1685E-04
6.6397E-01	3.1295E-03	6.2678E-01	2.9830E-03 2.8532E-03 -1.0757E-03
7.2407E-01	6.1916E-03	6.2678E-01	2.9830E-03 2.8532E-03 -1.0757E-03
1.1818E 00	2.0477E-02	5.7491E-01	2.5812E-03 2.4982E-03 -9.1132E-04
7.2103E 00	4.5166E-02	4.8268E-01	2.1972E-03 2.1428E-03 -7.6470E-04
6.6465E 00	3.8768E-02	4.3806E-01	2.4456E-03 2.8563E-03 -1.0131E-03
4.7605E-01	4.2235E-02	4.2998E-01	2.9167E-03 4.2839E-03 -1.4842E-03
5.0859E-01	1.0195E-01	4.2214E-01	2.4711E-03 3.5760E-03 -1.2759E-03
5.5313E-01	1.7744E-01	4.1003E-01	2.1485E-03 2.8679E-03 -1.1907E-03
6.4788E-01	3.3074E-01	3.9671E-01	1.9345E-03 2.7178E-03 -9.7653E-04
7.0285E-01	4.2894E-01	3.7887E-01	1.0622E-03

*PLUTONIUM 239

*PU239

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
PU239	-1.200000E+00	1.000000E+00			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
-1.2100000E+00	1.9599999E 01	1.9599999E 01	2.9316000E 02 11

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.4814E-01	2.8444E-01	2.0636E-01	1.7974E-03	3.5163E-03	-1.2097E-03
3.4814E-01	2.6320E-01	2.1121E-01	1.8596E-03	3.5991E-03	-1.2581E-03
3.9505E-01	2.4197E-01	2.7190E-01	2.4447E-03	4.6337E-03	-1.6704E-03
4.4937E-01	2.3481E-01	3.3260E-01	2.9931E-03	5.6680E-03	-2.0460E-03
4.8147E-01	2.2765E-01	3.6173E-01	3.1205E-03	6.1636E-03	-2.0904E-03
6.1603E-01	4.3382E-01	3.9340E-01	1.6843E-03	1.6548E-03	-5.7819E-04
7.9381E-01	8.1776E-01	3.9340E-01	1.6843E-03	1.6548E-03	-5.7819E-04
6.7900E-01	6.3998E-01	3.9340E-01	1.6843E-03	1.6548E-03	-5.7819E-04
1.7530E 00	2.1333E 00	3.9340E-01	1.6843E-03	1.6548E-03	-5.7819E-04
3.1604E 00	5.0478E 00	3.9340E-01	1.6843E-03	1.6548E-03	-5.7819E-04
3.3086E 00	6.1134E 00	3.9285E-01	1.8771E-03	2.2064E-03	-7.7092E-04
2.9012E 01	4.2167E 01	3.9174E-01	2.2625E-03	3.3095E-03	-1.1564E-03
6.2739E 01	1.0027E 02	3.9174E-01	2.2625E-03	3.3095E-03	-1.1564E-03
6.0557E 01	1.0844E 02	4.3092E-01	2.5518E-03	3.6409E-03	-1.3350E-03
3.9488E 01	8.0385E 01	4.7030E-01	2.6297E-03	3.7641E-03	-1.3023E-03
4.9910E 01	1.0243E 02	4.9360E-01	1.3821E-03		

*AIR 76 CM HG 20 DEG C

*4N2+O2

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
N	6.300000E+00	7.566504E-01	O	3.600000E+00	2.433496E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
7.8100000E+00	1.2046999E-03	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
8.0625E-05	0.	5.8726E-05	1.0414E-05	2.1895E-05	-6.5889E-06
9.0743E-05	0.	6.6416E-05	1.1575E-05	2.4322E-05	-7.3290E-06
8.6065E-05	0.	6.3029E-05	1.0961E-05	2.3029E-05	-6.9408E-06
9.6225E-05	0.	7.0474E-05	1.2253E-05	2.5743E-05	-7.7587E-06
1.1391E-04	0.	8.4075E-05	1.4210E-05	2.9823E-05	-9.0090E-06
1.3013E-04	0.	9.6080E-05	1.6217E-05	3.4033E-05	-1.0282E-05
1.5746E-04	0.	1.1561E-04	1.9918E-05	4.1832E-05	-1.2618E-05
1.8157E-04	0.	1.3304E-04	2.3085E-05	4.8498E-05	-1.4619E-05
2.2374E-04	0.	2.0867E-04	1.5013E-05	1.5018E-05	-4.5246E-06
2.6009E-04	0.	2.4244E-04	1.7502E-05	1.7508E-05	-5.2731E-06
3.3658E-04	0.	3.1346E-04	2.2736E-05	2.2744E-05	-6.8468E-06
4.1877E-04	0.	3.8941E-04	2.8333E-05	2.8343E-05	-8.5298E-06
4.3444E-04	0.	4.0237E-04	2.9289E-05	2.9298E-05	-8.8170E-06
4.3909E-04	0.	3.9403E-04	3.2346E-05	3.9208E-05	-1.1799E-05
4.4635E-04	0.	3.7611E-04	3.8421E-05	5.9081E-05	-1.7780E-05
4.5438E-04	0.	3.7679E-04	3.8491E-05	5.9189E-05	-1.7812E-05
4.6992E-04	0.	3.7991E-04	3.8810E-05	5.9680E-05	-1.7960E-05
5.0601E-04	0.	3.9669E-04	3.9217E-05	5.8574E-05	-1.7627E-05
5.3997E-04	0.	4.7460E-04	2.2505E-05		

*ALUMINUM OXIDE

*AL2 O3

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
AL	5.1000000E+00	5.2920000E-01	O	3.6000000E+00	4.7080000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	3.9699999E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.3933E-01	0.	6.1790E-02	2.5497E-02	4.8638E-02	9.8241E-03
2.1814E-01	0.	1.1311E-01	3.4480E-02	6.4506E-02	1.0844E-02
2.5004E-01	0.	1.1822E-01	3.9664E-02	7.0723E-02	2.1019E-02
2.6130E-01	0.	1.2962E-01	4.1000E-02	7.4587E-02	1.7705E-02
4.0683E-01	0.	2.5079E-01	6.0392E-02	1.2145E-01	-5.6662E-03
5.3138E-01	0.	2.9870E-01	7.9424E-02	1.5052E-01	1.5073E-02
4.4741E-01	0.	2.5089E-01	6.8052E-02	1.3007E-01	1.1649E-02
4.9726E-01	0.	3.9926E-01	4.7191E-02	9.7994E-02	-3.0264E-02
4.8764E-01	0.	4.6354E-01	2.4095E-02	2.4100E-02	-7.4407E-03
3.3167E-01	0.	3.1323E-01	1.8412E-02	1.8416E-02	-5.6416E-03
3.2725E-01	0.	3.0894E-01	1.8249E-02	1.8253E-02	-5.5902E-03
3.2734E-01	0.	3.0894E-01	1.8249E-02	1.8253E-02	-5.5902E-03
3.2736E-01	0.	3.0871E-01	1.8241E-02	1.8245E-02	-5.5874E-03
3.2946E-01	0.	3.0419E-01	2.0169E-02	2.4406E-02	-7.4752E-03
3.3305E-01	0.	2.9460E-01	2.4042E-02	3.6814E-02	-1.1278E-02
3.3434E-01	0.	2.9482E-01	2.4053E-02	3.6832E-02	-1.1283E-02
3.3621E-01	0.	2.9484E-01	2.4113E-02	3.6925E-02	-1.1310E-02
3.5149E-01	0.	3.0760E-01	2.4496E-02	3.6448E-02	-1.1161E-02
3.7167E-01	0.	3.6209E-01	1.4024E-02		

RELIABILITY LIMITATION: FIRST-SIGNIFICANT-FIGURE UNCERTAINTY IN HIGH ENERGY SCATTER CROSS SECTIONS FOR ALUMINUM CONTENT.

*ALUMINUM OXIDE

SCATTER
L N1 N2
SGSL(N1,N2)*AL₂O₃

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
2.2399E-02	6.5012E-03	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	2.2103E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.3406E-02	5.0066E-03	4.7227E-06	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.5668E-02	1.5568E-02	9.4426E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
5.7272E-03	4.6893E-03	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
2.5845E-02	1.5676E-02	9.5077E-03	6.0552E-03	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	3.0256E-02	4.3341E-03	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	4.2963E-02	3.9195E-02	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	6.6445E-02	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*ALUMINUM OXIDE

SCATTER
L N1 N2
SGSL(N1,N2)

*AL2 O3

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-7.1694E-03	-5.0308E-03	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	1.0585E-03
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-5.8116E-03	-4.0233E-03	-4.7037E-06	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.0564E-02	2.3000E-03	-1.0085E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-2.1079E-03	-3.3332E-03	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
7.4646E-03	-7.5913E-04	-3.6959E-03	-4.5533E-03	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-1.3417E-02	-3.6405E-03	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	4.2187E-03	-1.9191E-02	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-1.7817E-02	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

* BERYLLIUM OXIDE

*BEO

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
BE	4.0000000E+02	3.6030000E-01	O	3.6000000E+00	6.3970000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	3.0099996E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.7694E-01	0.	1.1037E-01	2.5694E-02	2.4483E-02	-1.5848E-02
2.6315E-01	0.	1.5875E-01	3.8894E-02	5.9432E-02	-2.4125E-02
3.0587E-01	0.	2.0252E-01	4.2186E-02	7.8699E-02	-2.6141E-02
2.7325E-01	0.	1.9808E-01	4.3947E-02	7.2514E-02	-2.7262E-02
5.2085E-01	0.	3.6502E-01	7.8508E-02	1.5550E-01	-4.8844E-02
6.2588E-01	0.	4.2724E-01	9.4817E-02	1.9864E-01	-5.8955E-02
5.5796E-01	0.	3.7479E-01	8.6081E-02	1.8317E-01	-5.3442E-02
5.9891E-01	0.	3.9713E-01	9.3016E-02	2.0178E-01	-5.7652E-02
6.8220E-01	0.	6.0347E-01	5.6733E-02	5.6826E-02	-1.6375E-02
7.0668E-01	0.	6.4503E-01	6.1546E-02	6.1653E-02	-1.7732E-02
7.0669E-01	0.	6.4503E-01	6.1546E-02	6.1653E-02	-1.7732E-02
7.0669E-01	0.	6.4503E-01	6.1546E-02	6.1653E-02	-1.7732E-02
7.0671E-01	0.	6.4503E-01	6.1546E-02	6.1653E-02	-1.7732E-02
7.0674E-01	0.	6.2448E-01	6.7457E-02	8.2204E-02	-2.3643E-02
7.0679E-01	0.	5.8338E-01	7.9278E-02	1.2331E-01	-3.5465E-02
7.0071E-01	0.	5.7850E-01	7.8459E-02	1.2202E-01	-3.5104E-02
6.6712E-01	0.	5.5196E-01	7.3877E-02	1.1486E-01	-3.3092E-02
6.8053E-01	0.	5.6968E-01	7.3143E-02	1.1034E-01	-3.1818E-02
7.2857E-01	0.	7.2791E-01	4.4424E-02		

*BERYLLIUM OXIDE

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*BEO

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
0.	0.	4.0058E-02	4.0058E-02	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	0.
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
4.0312E-02	4.0312E-02	0.	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.2178E-03	2.5780E-02	4.4646E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
2.3410E-03	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
0.	0.	0.	0.	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	0.	0.	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	0.	0.	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	0.	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*BORAL

*BORAL

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
AL	5.1000000E+00	8.0000000E-01	B	8.0000000E+00	1.5700000E-01
C	3.3000000E+00	4.3000000E-02			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	2.5300003E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SGS0(N,N)	SCATTER SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.8534E-01	0.	8.7342E-02	3.4902E-02	6.9192E-02	3.1197E-03
1.9605E-01	0.	8.7110E-02	3.5991E-02	6.8671E-02	8.9212E-03
2.2782E-01	0.	9.2401E-02	4.1134E-02	7.4983E-02	1.8631E-02
2.2584E-01	0.	9.3246E-02	4.0918E-02	7.5568E-02	1.6398E-02
2.2462E-01	0.	1.0210E-01	4.3269E-02	8.6594E-02	4.2881E-03
3.0326E-01	0.	1.1609E-01	5.6848E-02	1.0468E-01	2.7303E-02
2.8090E-01	0.	1.1349E-01	5.2644E-02	9.9105E-02	1.9709E-02
3.4074E-01	0.	2.6430E-01	3.3847E-02	7.0927E-02	-2.1494E-02
3.3987E-01	0.	3.1080E-01	1.7530E-02	1.7536E-02	-5.3085E-03
2.1075E-01	0.	1.6725E-01	1.2163E-02	1.2169E-02	-3.6073E-03
2.6034E-01	0.	1.6311E-01	1.2007E-02	1.2012E-02	-3.5578E-03
4.0704E-01	0.	1.6311E-01	1.2007E-02	1.2012E-02	-3.5578E-03
8.0482E-01	0.	1.6289E-01	1.1999E-02	1.2004E-02	-3.5551E-03
1.5034E 00	0.	1.6064E-01	1.3271E-02	1.6111E-02	-4.7731E-03
2.7095E 00	0.	1.5533E-01	1.5816E-02	2.4408E-02	-7.2349E-03
4.3505E 00	0.	1.5554E-01	1.5827E-02	2.4425E-02	-7.2401E-03
7.0541E 00	0.	1.5407E-01	1.5751E-02	2.4309E-02	-7.2035E-03
1.1682E 01	0.	1.5469E-01	1.5355E-02	2.3012E-02	-6.8178E-03
1.4999E 01	0.	1.8066E-01	8.5831E-03		

RELIABILITY LIMITATION: FIRST-SIGNIFICANT FIGURE UNCERTAINTY IN HIGH ENERGY SCATTER CROSS SECTIONS OF ALUMINUM CONTENT.

*BORAL

SCATTER
L N1 N2
SGSL(N1,N2)

*BORAI.

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
2.1579E-02	6.2632E-03	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	2.1294E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.2915E-02	4.8233E-03	4.5497E-06	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.4728E-02	1.4998E-02	9.0968E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
5.5175E-03	4.5176E-03	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
2.4898E-02	1.5102E-02	9.1596E-03	5.8334E-03	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	2.9148E-02	4.1754E-03	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	4.1390E-02	3.7760E-02	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	6.4012E-02	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*BORAL

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*BORAL

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-6.9069E-03	-4.8466E-03	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	1.0198E-03
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-5.5988E-03	-3.8760E-03	-4.5315E-06	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.0177E-02	2.2158E-03	-9.7158E-04
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-2.0308E-03	-3.2112E-03	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
7.1913E-03	-7.3134E-04	-3.5606E-03	-4.3866E-03	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-1.2926E-02	-3.3072E-03	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	4.0642E-03	-1.8488E-02	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-1.7165E-02	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*BORON CARBIDE

*B4C

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
B	8.000000E+00	7.827700E-01	C	3.300000E+00	2.172300E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.0500000E+00	2.5189999E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
4.8303E-01	0.	3.1193E-01	7.7864E-02	1.6634E-01	-4.8401E-02
4.8575E-01	0.	3.1286E-01	7.8069E-02	1.6678E-01	-4.8530E-02
4.9776E-01	0.	3.1988E-01	7.9610E-02	1.7005E-01	-4.9495E-02
5.0481E-01	0.	3.2316E-01	8.0330E-02	1.7158E-01	-4.9945E-02
5.2139E-01	0.	3.3252E-01	8.2385E-02	1.7594E-01	-5.1232E-02
5.4177E-01	0.	3.4393E-01	8.4892E-02	1.8126E-01	-5.2802E-02
5.5995E-01	0.	3.5310E-01	8.6906E-02	1.8554E-01	-5.4063E-02
5.7670E-01	0.	3.6040E-01	8.8508E-02	1.8894E-01	-5.5066E-02
6.1852E-01	0.	5.1310E-01	4.8157E-02	4.8184E-02	-1.4046E-02
7.2357E-01	0.	5.1941E-01	4.8702E-02	4.8729E-02	-1.4207E-02
9.9090E-01	0.	5.1941E-01	4.8702E-02	4.8729E-02	-1.4207E-02
1.7187E 00	0.	5.1941E-01	4.8702E-02	4.8729E-02	-1.4207E-02
3.6932E 00	0.	5.1941E-01	4.8702E-02	4.8729E-02	-1.4207E-02
7.1512E 00	0.	5.0440E-01	5.3558E-02	6.5118E-02	-1.8986E-02
1.3121E 01	0.	4.7299E-01	6.3192E-02	9.7894E-02	-2.8543E-02
2.1261E 01	0.	4.7299E-01	6.3192E-02	9.7894E-02	-2.8543E-02
3.4681E 01	0.	4.7299E-01	6.3192E-02	9.7894E-02	-2.8543E-02
5.7645E 01	0.	4.7905E-01	6.1814E-02	9.2954E-02	-2.7103E-02
7.4083E 01	0.	5.6751E-01	3.4459E-02		

*BF3

*BORON FLUORIDE 76 CM HG 20 DEG C

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
B	8.0000000E+00	1.5958808E-01	F	6.0000000E+00	8.4041192E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	2.8192308E-03	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGSC(N,N)	SGS1(N,N)	SGSO(N,N+1)	SGS1(N,N+1)
1.8206E-04	0.	1.2929E-04	2.4413E-05	5.1682E-05	-1.5331E-05
1.9927E-04	0.	1.4273E-04	2.6083E-05	5.5148E-05	-1.6403E-05
2.3722E-04	0.	1.7259E-04	2.9796E-05	6.2852E-05	-1.8786E-05
2.8469E-04	0.	2.0991E-04	3.4437E-05	7.2481E-05	-2.1765E-05
3.0225E-04	0.	2.2335E-04	3.6108E-05	7.5947E-05	-2.2837E-05
4.1953E-04	0.	3.1592E-04	4.7618E-05	9.9828E-05	-3.0225E-05
6.3660E-04	0.	4.8762E-04	6.8965E-05	1.4412E-04	-4.3926E-05
6.9997E-04	0.	5.3689E-04	7.5091E-05	1.5683E-04	-4.7858E-05
5.3587E-04	0.	4.9236E-04	3.0437E-05	3.0446E-05	-9.2538E-06
4.0989E-04	0.	3.5159E-04	2.2831E-05	2.2839E-05	-6.9007E-06
4.5587E-04	0.	3.3733E-04	2.2061E-05	2.2068E-05	-6.6625E-06
6.1818E-04	0.	3.3377E-04	2.1868E-05	2.1876E-05	-6.6029E-06
1.0687E-03	0.	3.3377E-04	2.1868E-05	2.1876E-05	-6.6029E-06
1.8575E-03	0.	3.2648E-04	2.4069E-05	2.9167E-05	-8.8038E-06
3.2194E-03	0.	3.1189E-04	2.8471E-05	4.3751E-05	-1.3206E-05
5.0806E-03	0.	3.1527E-04	2.8723E-05	4.4136E-05	-1.3325E-05
8.1467E-03	0.	3.1864E-04	2.8976E-05	4.4522E-05	-1.3444E-05
1.3401E-02	0.	3.3394E-04	2.9215E-05	4.3596E-05	-1.3175E-05
1.7163E-02	0.	3.8758E-04	1.6396E-05		

*CALCIUM HYDRIDE

*CAH

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
CA	5.4000000E+00	9.5211000E-01	H	2.0400000E+00	4.7890000E-02

FORMULA	DENSITY	FUEL DENSITY	TEMPERATURE
F	RHO (G/CC)	RHO F (G/CC)	T (DEG K)
	1.6999999E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.2895E-01	0.	7.7678E-02	1.4618E-02	2.4562E-02	1.1522E-02
1.5571E-01	0.	8.3380E-02	1.9909E-02	3.2849E-02	1.8146E-02
1.9099E-01	0.	9.0896E-02	2.6882E-02	4.3772E-02	2.6877E-02
2.3357E-01	0.	9.9968E-02	3.5298E-02	5.6956E-02	3.7415E-02
2.8223E-01	0.	1.1034E-01	4.4916E-02	7.2023E-02	4.9458E-02
3.4062E-01	0.	1.2278E-01	5.6459E-02	9.0103E-02	6.3910E-02
4.2091E-01	0.	1.3988E-01	7.2330E-02	1.1496E-01	8.3784E-02
5.1337E-01	0.	1.5958E-01	9.0605E-02	3.0688E-01	1.9403E-01
7.5181E-01	0.	4.5652E-01	3.1107E-01	2.5556E-01	1.3575E-01
9.8419E-01	0.	5.8841E-01	4.1693E-01	3.4242E-01	1.8241E-01
1.0354E 00	0.	6.1742E-01	4.4021E-01	3.6152E-01	1.9268E-01
1.0466E 00	0.	6.2363E-01	4.4520E-01	3.6561E-01	1.9487E-01
1.0472E 00	0.	6.2363E-01	4.4498E-01	3.2867E-01	1.8304E-01
1.0605E 00	0.	5.4561E-01	3.9772E-01	3.2500E-01	2.0213E-01
1.0770E 00	0.	4.3732E-01	3.2226E-01	4.0327E-01	2.6184E-01
1.1988E 00	0.	4.8318E-01	3.5490E-01	4.5308E-01	2.7037E-01
1.5364E 00	0.	6.1751E-01	4.5184E-01	6.1755E-01	3.0340E-01
2.0060E 00	0.	8.9021E-01	5.9525E-01	1.0976E 00	5.0473E-02
2.2979E 00	0.	2.2744E 00	6.5911E-01		

*CALCIUM HYDRIDE

SCATTER
L N1 N2
SGSL(N1,N2)

*CAH

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.0509E-02	6.3742E-03	3.8662E-03	2.3449E-03	1.4223E-03	8.6265E-04
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.1498E-03	1.5561E-04	2.1073E-05	2.8418E-06	3.8691E-07	9.3391E-08
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-5.3366E-08	0.	0.	0.	0.	1.5535E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
9.4227E-03	5.7152E-03	3.4664E-03	2.1025E-03	2.8024E-03	3.7925E-04
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
5.1298E-05	6.9620E-06	9.6640E-07	7.8889E-08	3.9445E-08	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.2161E-02	1.3441E-02	8.1525E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
4.9447E-03	6.5907E-03	8.9200E-04	1.2071E-04	1.6374E-05	2.1381E-06
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
3.0947E-07	5.6267E-08	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.0157E-02	1.8291E-02	1.1094E-02	1.4787E-02	2.0012E-03	2.7079E-04
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
3.6677E-05	5.0153E-06	5.3598E-07	1.1485E-07	1.9142E-07	-1.1485E-07
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	3.9296E-02	2.3834E-02	3.1768E-02	4.2993E-03
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
5.8182E-04	7.8795E-05	1.0626E-05	1.2970E-06	2.4943E-07	4.9886E-08
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
2.4943E-07	-1.9954E-07	0.	5.0262E-02	6.6993E-02	9.0665E-03
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.2270E-03	1.6603E-04	2.2333E-05	2.8713E-06	5.1046E-07	1.9142E-07
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
6.3808E-08	0.	0.	1.4359E-01	1.9432E-02	2.6299E-03
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
3.5594E-04	4.8277E-05	5.7235E-06	1.1613E-06	4.1475E-07	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
8.2950E-08	0.	4.0553E-02	5.4882E-03	7.4267E-04	1.0064E-04
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.2284E-05	2.0999E-06	7.3495E-07	3.1498E-07	5.2496E-07	-3.1498E-07
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
3.4342E-02	4.6477E-03	6.2891E-04	7.6510E-05	1.3918E-05	5.0979E-06
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
1.9016E-06	6.8782E-07	3.2368E-07	4.6097E-02	6.2385E-03	7.5845E-04
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
1.3775E-04	5.0752E-05	1.8682E-05	7.0059E-06	3.6930E-06	4.8681E-02
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
5.9194E-03	1.0747E-03	3.9523E-04	1.4545E-04	5.5232E-05	2.9423E-05
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
4.4236E-02	8.0313E-03	2.9546E-03	1.0869E-03	4.1220E-04	2.2025E-04
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
5.9344E-02	2.1831E-02	8.0313E-03	3.0467E-03	1.6272E-03	1.1867E-01
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
4.3658E-02	1.6562E-02	8.8463E-03	1.4702E-01	5.5773E-02	2.9571E-02
0 16 18	0 16 19	0 17 19			
1.7050E-01	8.5401E-02	2.9042E-01			

*CALCIUM HYDRIDE

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*CAH

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
6.5469E-03	3.0954E-03	1.4644E-03	6.9344E-04	3.2890E-04	1.5640E-04
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
1.3670E-04	8.6815E-06	1.1264E-06	3.2055E-07	1.0685E-07	-1.4636E-07
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
2.3540E-07	0.	0.	0.	0.	9.6776E-03
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
4.5754E-03	2.1643E-03	1.0248E-03	4.8595E-04	4.1995E-04	2.4283E-05
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
2.4481E-06	6.0544E-07	1.8426E-07	5.2647E-08	9.2132E-08	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.3803E-02	6.5244E-03	3.0855E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
1.4602E-03	1.2518E-03	6.7275E-05	5.1808E-06	9.1978E-07	2.8157E-07
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
9.3855E-08	3.7542E-08	9.3855E-08	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
1.8781E-02	8.8765E-03	4.1969E-03	3.5842E-03	1.8559E-04	1.1902E-05
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
1.5580E-06	3.8311E-07	1.7878E-07	2.5540E-08	-1.6921E-07	2.9691E-07
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	2.4471E-02	1.1566E-02	9.8604E-03	5.0217E-04
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
2.9135E-05	3.0117E-06	6.6557E-07	1.9967E-07	6.6557E-08	6.6557E-08
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-1.3519E-07	2.3503E-07	0.	3.1300E-02	2.6662E-02	1.3458E-03
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
7.3787E-05	6.1294E-06	1.2770E-06	2.5539E-07	1.7026E-07	4.2566E-08
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
4.2566E-08	1.2770E-07	0.	7.3322E-02	3.6842E-03	1.9580E-04
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
1.4277E-05	2.4072E-06	5.5339E-07	3.8737E-07	5.5339E-08	5.5339E-08
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
2.2135E-07	0.	9.8301E-03	5.0932E-04	3.2710E-05	4.3077E-06
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.0507E-06	2.8017E-07	1.4009E-07	2.1013E-07	-4.7717E-07	7.5734E-07
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
6.8431E-03	3.6115E-04	2.5506E-05	3.4683E-06	9.9865E-07	5.9379E-07
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
3.5088E-07	2.4292E-07	4.5884E-07	9.1866E-03	4.8524E-04	3.1085E-05
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
5.4345E-06	2.6448E-06	1.2680E-06	8.3328E-07	1.4130E-06	9.7022E-03
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
4.7898E-04	5.1251E-05	1.5266E-05	5.7775E-06	2.8313E-06	3.6731E-06
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
9.2274E-03	8.6480E-04	2.0345E-04	5.1757E-05	1.5807E-05	1.1860E-05
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
1.6728E-02	3.6920E-03	7.9920E-04	1.6668E-04	1.4430E-05	4.5275E-02
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
1.0102E-02	2.3054E-03	5.9603E-04	5.5113E-02	1.0297E-02	-1.1096E-03
1 16 18	1 16 19	1 17 19			
4.0471E-02	-1.7345E-02	-5.0876E-02			

*EUROPIUM OXIDE

*EUO

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
EU	8.2400000E+00	8.6360000E-01	O	3.6000000E+00	1.3640000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	7.4199998E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.7989E-01	0.	2.4222E-01	6.0177E-03	1.2271E-02	-3.9237E-03
3.1685E-01	0.	2.7025E-01	1.0293E-02	2.1205E-02	-6.6465E-03
3.1761E-01	0.	2.7083E-01	1.0381E-02	2.1389E-02	-6.7027E-03
3.2561E-01	0.	2.7689E-01	1.1306E-02	2.3324E-02	-7.2921E-03
4.0696E-01	0.	3.2621E-01	2.0547E-02	4.2653E-02	-1.3173E-02
4.3249E-01	0.	3.3320E-01	2.3404E-02	4.8491E-02	-1.5013E-02
4.0162E-01	0.	2.9743E-01	1.9595E-02	4.0696E-02	-1.2556E-02
3.9686E-01	0.	2.6909E-01	1.8708E-02	3.8877E-02	-1.1981E-02
4.6036E-01	0.	2.7302E-01	9.5547E-03	9.5524E-03	-2.9393E-03
5.8735E-01	0.	2.6040E-01	9.4709E-03	9.4690E-03	-2.9113E-03
1.6668E 00	0.	3.8656E-01	1.0310E-02	1.0303E-02	-3.1912E-03
5.2226E 00	0.	5.7580E-01	1.1583E-02	1.1555E-02	-3.6265E-03
7.7625E 00	0.	6.3887E-01	1.2030E-02	1.1973E-02	-3.7946E-03
7.7625E 00	0.	5.0900E-01	1.2347E-02	1.4851E-02	-4.6701E-03
3.5891E 01	0.	4.3892E-01	1.4060E-02	2.1442E-02	-6.6623E-03
4.4971E 01	0.	5.0158E-01	1.4619E-02	2.2276E-02	-6.9421E-03
2.2050E 01	0.	4.3975E-01	1.4135E-02	2.1557E-02	-6.6973E-03
5.8520E 01	0.	3.7430E-01	1.3705E-02	2.0332E-02	-6.2916E-03
9.7119E 01	0.	4.2680E-01	7.8408E-03		

*FECRAL

*FECRAL

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
FE	4.0000000E+00	6.5000000E-01	CR	4.2000000E+00	2.5000000E-01
AL	5.1000000E+00	5.0000000E-02	NB	5.3600000E+00	3.0000000E-02
Y	5.2440000E+00	2.0000000E-02			

FORMULA	DENSITY	FUEL DENSITY	TEMPERATURE
F	RHO (G/CC)	RHO F (G/CC)	T (DEG K)
	7.2770012E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.8684E-01	0.	1.6327E-01	9.4484E-03	1.8543E-02	-1.6344E-03
2.0439E-01	0.	1.7781E-01	1.0178E-02	1.9526E-02	-9.4396E-04
2.2245E-01	0.	1.9042E-01	1.1478E-02	2.1409E-02	5.5140E-04
2.1273E-01	0.	1.8204E-01	1.1055E-02	2.0739E-02	4.0329E-04
1.9154E-01	0.	1.6445E-01	1.0643E-02	2.1023E-02	-1.2268E-03
2.3483E-01	0.	1.9438E-01	1.4005E-02	2.6131E-02	2.3007E-03
2.7054E-01	0.	2.3109E-01	1.4586E-02	2.7816E-02	5.1571E-05
2.8669E-01	0.	2.6346E-01	1.1365E-02	2.3076E-02	-7.4603E-03
3.3328E-01	0.	3.2638E-01	6.5868E-03	6.5846E-03	-2.1320E-03
4.7214E-01	0.	4.6259E-01	8.6928E-03	8.6902E-03	-2.8246E-03
6.0775E-01	0.	5.9434E-01	1.1093E-02	1.1089E-02	-3.6066E-03
6.5516E-01	0.	6.3898E-01	1.1800E-02	1.1795E-02	-3.8383E-03
6.8630E-01	0.	6.6598E-01	1.2277E-02	1.2274E-02	-3.9917E-03
6.8988E-01	0.	6.5812E-01	1.3544E-02	1.6285E-02	-5.2997E-03
7.0046E-01	0.	6.4664E-01	1.6121E-02	2.4324E-02	-7.9110E-03
7.1211E-01	0.	6.3942E-01	1.5950E-02	2.4065E-02	-7.8280E-03
7.3731E-01	0.	6.3331E-01	1.5800E-02	2.3838E-02	-7.7548E-03
7.9184E-01	0.	6.3509E-01	1.5409E-02	2.2615E-02	-7.3563E-03
8.2954E-01	0.	6.5676E-01	8.0527E-03		

RELIABILITY LIMITATION: FIRST-SIGNIFICANT FIGURE UNCERTAINTY IN HIGH ENERGY SCATTER CROSS SECTIONS OF ALUMINUM CONTENT.

*FECRAL

SCATTER
L N1 N2
SGSL(N1,N2)

*FECRAL

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
3.8793E-03	1.1259E-03	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	3.8280E-03
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
2.3218E-03	8.6707E-04	8.1790E-07	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	4.4453E-03	2.6962E-03	1.6353E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
9.9187E-04	8.1213E-04	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
4.4759E-03	2.7148E-03	1.6466E-03	1.0487E-03	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	5.2399E-03	7.5061E-04	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	7.4405E-03	6.7880E-03	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	1.1507E-02	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*FECRAL

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*FECRAL

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-1.2416E-03	-8.7126E-04	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	1.8332E-04
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-1.0065E-03	-6.9677E-04	-8.1461E-07	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.8295E-03	3.9833E-04	-1.7466E-04
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-3.6506E-04	-5.7726E-04	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
1.2928E-03	-1.3147E-04	-6.4007E-04	-7.8857E-04	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-2.3237E-03	-6.3048E-04	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	7.3062E-04	-3.3236E-03	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-3.0857E-03	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*FECRAL

*FECRAL

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
FE	4.0000000E+00	7.0530000E-01	CR	4.2000000E+00	2.4000000E-01
AL	5.1000000E+00	5.2500000E-02	C	3.3000000E+00	2.0000000E-03
LI	3.4000000E+00	9.0000000E-05	HF	8.2800000E+00	9.0000000E-05
B	8.0000000E+00	1.0000000E-05	CD	8.3000000E+00	1.0000000E-05

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	7.2000012E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.8973E-01	0.	1.6507E-01	9.8954E-03	1.9448E-02	-1.7420E-03
2.0758E-01	0.	1.7979E-01	1.0660E-02	2.0485E-02	-1.0292E-03
2.2538E-01	0.	1.9188E-01	1.2029E-02	2.2482E-02	5.1545E-04
2.1226E-01	0.	1.8030E-01	1.1528E-02	2.1665E-02	3.9991E-04
1.8593E-01	0.	1.5783E-01	1.1040E-02	2.1844E-02	-1.2492E-03
2.2859E-01	0.	1.8659E-01	1.4545E-02	2.7180E-02	2.4109E-03
2.6557E-01	0.	2.2450E-01	1.5209E-02	2.9064E-02	3.5700E-05
2.8274E-01	0.	2.5843E-01	1.1912E-02	2.4241E-02	-7.8016E-03
3.3107E-01	0.	3.2400E-01	6.9216E-03	6.9200E-03	-2.2309E-03
4.7024E-01	0.	4.6084E-01	9.0079E-03	9.0057E-03	-2.9173E-03
6.1680E-01	0.	6.0415E-01	1.1596E-02	1.1592E-02	-3.7608E-03
6.7786E-01	0.	6.6244E-01	1.2550E-02	1.2545E-02	-4.0732E-03
7.1209E-01	0.	6.9121E-01	1.3064E-02	1.3061E-02	-4.2383E-03
7.1821E-01	0.	6.8319E-01	1.4415E-02	1.7336E-02	-5.6294E-03
7.2944E-01	0.	6.7105E-01	1.7156E-02	2.5900E-02	-8.4049E-03
7.4068E-01	0.	6.6329E-01	1.6971E-02	2.5620E-02	-8.3145E-03
7.6788E-01	0.	6.5675E-01	1.6808E-02	2.5373E-02	-8.2354E-03
8.2604E-01	0.	6.5903E-01	1.6400E-02	2.4082E-02	-7.8153E-03
8.6593E-01	0.	6.8221E-01	8.5786E-03		

RELIABILITY LIMITATION: FIRST-SIGNIFICANT-FIGURE UNCERTAINTY IN HIGH ENERGY SCATTER CROSS SECTIONS OF ALUMINUM CONTENT.

*FECRAL

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*FECRAL

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
4.0310E-03	1.1697E-03	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	3.9775E-03
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
2.4121E-03	9.0079E-04	8.4970E-07	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	4.6197E-03	2.8010E-03	1.6989E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
1.0304E-03	8.4371E-04	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
4.6500E-03	2.8204E-03	1.7106E-03	1.0894E-03	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	5.4457E-03	7.7980E-04	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	7.7330E-03	7.0520E-03	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	1.1957E-02	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*FECRAL

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*FECRAL

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-1.2907E-03	-9.0515E-04	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	1.8986E-04
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-1.0456E-03	-7.2387E-04	-8.4629E-07	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.8993E-03	4.1382E-04	-1.8145E-04
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-3.7926E-04	-5.9971E-04	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
1.3430E-03	-1.3658E-04	-6.6496E-04	-8.1924E-04	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-2.4157E-03	-6.5499E-04	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	7.5656E-04	-3.4528E-03	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-3.2077E-03	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*GADOLINIUM OXIDE

*GDO

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
GD	8.2040000E+00	8.6730000E-01	O	3.6000000E+00	1.3270000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	7.4100021E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.2364E-01	0.	2.1143E-01	5.4745E-03	1.1157E-02	-3.5684E-03
2.4750E-01	0.	2.2664E-01	9.4720E-03	1.9520E-02	-6.1109E-03
2.2394E-01	0.	2.0316E-01	9.2465E-03	1.9065E-02	-5.9604E-03
2.0753E-01	0.	1.8501E-01	9.8004E-03	2.0309E-02	-6.2940E-03
2.7485E-01	0.	2.3291E-01	1.8789E-02	3.9097E-02	-1.2016E-02
3.0046E-01	0.	2.5172E-01	2.1658E-02	4.5092E-02	-1.3844E-02
2.7152E-01	0.	2.2898E-01	1.8190E-02	3.7844E-02	-1.1635E-02
2.6822E-01	0.	2.2547E-01	1.7654E-02	3.6726E-02	-1.1294E-02
2.7481E-01	0.	2.5302E-01	9.1841E-03	9.1814E-03	-2.8234E-03
2.9640E-01	0.	2.5302E-01	9.1841E-03	9.1814E-03	-2.8234E-03
3.5511E-01	0.	2.5302E-01	9.1841E-03	9.1814E-03	-2.8234E-03
5.7690E-01	0.	3.1432E-01	9.5820E-03	9.5776E-03	-2.9560E-03
1.3110E 00	0.	4.9821E-01	1.0777E-02	1.0766E-02	-3.3554E-03
3.5320E 00	0.	1.0451E 00	1.5905E-02	1.9110E-02	-6.0954E-03
3.2852E 00	0.	9.1375E-01	1.7864E-02	2.7080E-02	-8.5856E-03
1.3095E 01	0.	7.3105E-01	1.6299E-02	2.4703E-02	-7.8160E-03
1.5437E 02	0.	2.0717E 00	2.8042E-02	4.2249E-02	-1.3684E-02
6.3236E 02	0.	3.4851E 00	3.9812E-02	5.8158E-02	-1.9046E-02
8.9095E 02	0.	3.9618E 00	2.2845E-02		

* HEVIMET

* HEVIMET

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
W	8.500000E+00	9.000000E-01	NI	4.100000E+00	6.000000E-02
CU	8.360000E+00	4.000000E-02			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.5500000E+00	1.6799989E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.0266E-01	0.	2.9362E-01	4.5037E-03	8.9885E-03	-2.9959E-03
3.4234E-01	0.	3.3229E-01	5.0250E-03	9.9796E-03	-3.3511E-03
3.7983E-01	0.	3.6901E-01	5.3656E-03	1.0726E-02	-3.5671E-03
3.9341E-01	0.	3.8232E-01	5.5708E-03	1.0970E-02	-3.7317E-03
3.9722E-01	0.	3.8585E-01	5.6938E-03	1.1216E-02	-3.8131E-03
4.1482E-01	0.	4.0268E-01	6.0254E-03	1.1938E-02	-4.0234E-03
4.5143E-01	0.	4.3779E-01	6.7285E-03	1.3383E-02	-4.4834E-03
4.9346E-01	0.	4.7816E-01	7.5848E-03	1.4970E-02	-5.0732E-03
5.9195E-01	0.	5.8649E-01	4.8060E-03	4.7761E-03	-1.5989E-03
8.1376E-01	0.	8.0497E-01	6.9332E-03	6.9147E-03	-2.2880E-03
1.0014E 00	0.	9.8790E-01	8.3942E-03	8.3479E-03	-2.7871E-03
1.1514E 00	0.	1.1285E 00	9.1267E-03	9.0652E-03	-3.0401E-03
1.8947E 00	0.	8.8428E-01	7.7594E-03	7.7308E-03	-2.5653E-03
1.5930E 00	0.	5.3328E-01	6.4491E-03	7.7269E-03	-2.5501E-03
6.7027E-01	0.	5.0098E-01	7.4409E-03	1.1176E-02	-3.6810E-03
7.4985E-01	0.	4.7855E-01	7.2537E-03	1.0857E-02	-3.6006E-03
9.0351E-01	0.	4.6516E-01	6.9393E-03	1.0386E-02	-3.4452E-03
1.1924E 00	0.	4.5312E-01	6.4754E-03	9.4278E-03	-3.1293E-03
1.3031E 00	0.	4.0542E-01	3.1647E-03		

*INCONEL X

*INCONEL X

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
NI	4.1000000E+00	7.0000000E-01	CR	4.2000000E+00	1.3500000E-01
FE	4.0000000E+00	7.4000000E-02	TI	4.3000000E+00	2.5000000E-02
CO		1.0000000E-02	MN	4.4000000E+00	1.0000000E-02
NB	5.3600000E+00	9.0000000E-03	AL	5.1000000E+00	7.0000000E-03
CU	8.3600000E+00	5.0000000E-03	SI	5.5000000E+00	5.0000000E-03
FORMULA		DENSITY	FUEL DENSITY		TEMPERATURE
F		RHO (G/CC)	RHOF (G/CC)		T (DEG K)
		8.3099978E 00	0.		2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.3405E-01	0.	2.1585E-01	8.6331E-03	1.7378E-02	-4.9520E-03
2.5158E-01	0.	2.3184E-01	9.2660E-03	1.8585E-02	-5.1805E-03
2.6213E-01	0.	2.4094E-01	9.7549E-03	1.9457E-02	-5.1259E-03
2.5788E-01	0.	2.3704E-01	9.6127E-03	1.9194E-02	-5.1013E-03
2.6431E-01	0.	2.4336E-01	9.8863E-03	1.9914E-02	-5.5880E-03
2.9224E-01	0.	2.6777E-01	1.1100E-02	2.2104E-02	-5.4684E-03
3.5578E-01	0.	3.2753E-01	1.3127E-02	2.6289E-02	-7.1020E-03
4.2816E-01	0.	3.9763E-01	1.5005E-02	3.0370E-02	-9.8811E-03
6.9166E-01	0.	6.7910E-01	1.2243E-02	1.2243E-02	-3.9821E-03
1.3113E 00	0.	1.2874E 00	2.3050E-02	2.3049E-02	-7.5000E-03
1.5487E 00	0.	1.5194E 00	2.6996E-02	2.6995E-02	-8.7859E-03
1.3677E 00	0.	1.3384E 00	2.3555E-02	2.3547E-02	-7.6724E-03
1.3389E 00	0.	1.3017E 00	2.2865E-02	2.2856E-02	-7.4498E-03
1.3471E 00	0.	1.2870E 00	2.5215E-02	3.0310E-02	-9.8823E-03
1.3470E 00	0.	1.2456E 00	2.9533E-02	4.4542E-02	-1.4511E-02
1.3688E 00	0.	1.2311E 00	2.9214E-02	4.4035E-02	-1.4363E-02
1.3530E 00	0.	1.1572E 00	2.7476E-02	4.1429E-02	-1.3505E-02
1.3928E 00	0.	1.0972E 00	2.5356E-02	3.7201E-02	-1.2120E-02
1.4986E 00	0.	1.1658E 00	1.3602E-02		

RELIABILITY LIMITATION: COBALT CONTENT MOCKED UP WITH MANGANESE, BY ATOMS. FIRST-SIGNIFICANT-FIGURE UNCERTAINTY IN HIGH ENERGY SCATTER CROSS SECTIONS OF ALUMINUM CONTENT.

*INCONEL X

SCATTER
L N1 N2
SGSL(N1,N2)

*INCONEL X

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
6.2061E-04	1.8013E-04	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	6.1240E-04
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
3.7144E-04	1.3872E-04	1.3085E-07	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	7.1116E-04	4.3134E-04	2.6162E-04
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
1.5868E-04	1.2993E-04	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
7.1607E-04	4.3432E-04	2.6343E-04	1.6777E-04	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	8.3829E-04	1.2008E-04	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	1.1903E-03	1.0860E-03	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	1.8410E-03	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*INCONEL X

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*INCONEL X

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-1.9864E-04	-1.3939E-04	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	2.9328E-05
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-1.6102E-04	-1.1147E-04	-1.3032E-07	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	2.9269E-04	6.3726E-05	-2.7942E-05
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-5.8404E-05	-9.2352E-05	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
2.0682E-04	-2.1033E-05	-1.0240E-04	-1.2616E-04	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-3.7175E-04	-1.0086E-04	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	1.1689E-04	-5.3171E-04	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-4.9365E-04	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*LITHIUM HYDRIDE

*LITHIUM HYDRIDE

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
LI	3.4000000E+00	8.7318000E-01	H	2.0400000E+00	1.2682000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	7.4900002E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.7226E-01	0.	6.5686E-02	3.7213E-02	7.4318E-02	2.8572E-03
2.2200E-01	0.	8.2647E-02	4.7233E-02	9.2351E-02	7.9695E-03
2.5161E-01	0.	8.2660E-02	5.3464E-02	1.0131E-01	2.0550E-02
2.8408E-01	0.	9.0775E-02	5.7665E-02	1.0335E-01	3.4010E-02
3.3049E-01	0.	9.0604E-02	6.8364E-02	1.2074E-01	5.1094E-02
3.8375E-01	0.	9.6269E-02	7.8516E-02	1.3449E-01	7.1227E-02
5.0235E-01	0.	1.2908E-01	1.0266E-01	1.7606E-01	9.0315E-02
6.3777E-01	0.	1.6828E-01	1.2965E-01	4.1344E-01	2.1293E-01
8.9273E-01	0.	5.3403E-01	3.7430E-01	3.0956E-01	1.5552E-01
1.1414E 00	0.	6.6314E-01	4.9534E-01	4.0843E-01	2.1075E-01
1.2061E 00	0.	6.9191E-01	5.1964E-01	4.2784E-01	2.2331E-01
1.2541E 00	0.	6.9923E-01	5.2510E-01	4.3225E-01	2.2595E-01
1.3506E 00	0.	6.9923E-01	5.2485E-01	3.8916E-01	2.1214E-01
1.5337E 00	0.	6.0630E-01	4.7019E-01	3.8677E-01	2.3394E-01
1.8423E 00	0.	4.7617E-01	3.8309E-01	4.8187E-01	3.0265E-01
2.3791E 00	0.	5.2968E-01	4.2117E-01	5.3999E-01	3.1261E-01
3.4236E 00	0.	6.8641E-01	5.3427E-01	7.3188E-01	3.5114E-01
5.0849E 00	0.	1.0048E 00	7.0167E-01	1.2917E 00	5.6122E-02
6.2226E 00	0.	2.6309E 00	7.7363E-01		

*LITHIUM HYDRIDE

SCATTER
L N1 N2
SGSL(N1,N2)

*LITHIUM HYDRIDE

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.3123E-02	7.4371E-03	4.5108E-03	2.7359E-03	1.6594E-03	1.0065E-03
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.3415E-03	1.8156E-04	2.4587E-05	3.3156E-06	4.5142E-07	1.0896E-07
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-6.2265E-08	0.	0.	0.	0.	1.8767E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.0994E-02	6.6682E-03	4.0444E-03	2.4531E-03	3.2696E-03	4.4249E-04
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
5.9852E-05	8.1229E-06	1.1275E-06	9.2044E-08	4.6022E-08	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.7405E-02	1.5682E-02	9.5119E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
5.7693E-03	7.6897E-03	1.0407E-03	1.4083E-04	1.9104E-05	2.4947E-06
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
3.6107E-07	6.5649E-08	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.5223E-02	2.1341E-02	1.2944E-02	1.7253E-02	2.3349E-03	3.1594E-04
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
4.2792E-05	5.8516E-06	6.2536E-07	1.3401E-07	2.2334E-07	-1.3401E-07
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	4.7842E-02	2.7808E-02	3.7065E-02	5.0162E-03
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
6.7884E-04	9.1934E-05	1.2397E-05	1.5133E-06	2.9102E-07	5.8204E-08
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
2.9102E-07	-2.3282E-07	0.	6.1779E-02	7.8163E-02	1.0578E-02
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.4316E-03	1.9371E-04	2.6057E-05	3.3501E-06	5.9558E-07	2.2334E-07
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
7.4447E-08	0.	0.	1.6995E-01	2.2673E-02	3.0685E-03
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
4.1529E-04	5.6327E-05	6.6779E-06	1.3549E-06	4.8391E-07	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
9.6781E-08	0.	4.7315E-02	6.4033E-03	8.6650E-04	1.1742E-04
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.4332E-05	2.4500E-06	8.5750E-07	3.6750E-07	6.1250E-07	-3.6750E-07
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
4.0068E-02	5.4227E-03	7.3378E-04	8.9267E-05	1.6239E-05	5.9480E-06
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
2.2187E-06	8.0251E-07	3.7765E-07	5.3783E-02	7.2787E-03	8.8492E-04
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
1.6072E-04	5.9214E-05	2.1797E-05	8.1741E-06	4.3088E-06	5.6799E-02
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
6.9064E-03	1.2539E-03	4.6113E-04	1.6970E-04	6.4442E-05	3.4329E-05
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
5.1612E-02	9.3705E-03	3.4473E-03	1.2682E-03	4.8093E-04	2.5698E-04
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
6.9239E-02	2.5472E-02	9.3705E-03	3.5547E-03	1.8985E-03	1.3846E-01
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
5.0938E-02	1.9323E-02	1.0321E-02	1.7154E-01	6.5072E-02	3.4502E-02
0 16 18	0 16 19	0 17 19			
1.9893E-01	9.9641E-02	3.3885E-01			

*LITHIUM HYDRIDE

SCATTER
L N1 N2
SGSL(N1,N2)

*LITHIUM HYDRIDE

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
6.8565E-03	3.6115E-03	1.7085E-03	8.0907E-04	3.8374E-04	1.8248E-04
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
1.5949E-04	1.0129E-05	1.3142E-06	3.7400E-07	1.2467E-07	-1.7077E-07
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
2.7465E-07	0.	0.	0.	0.	1.0697E-02
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
5.3383E-03	2.5252E-03	1.1957E-03	5.6698E-04	4.8997E-04	2.8333E-05
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
2.8563E-06	7.0640E-07	2.1499E-07	6.1426E-08	1.0750E-07	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.4738E-02	7.6123E-03	3.5999E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
1.7037E-03	1.4606E-03	7.8493E-05	6.0447E-06	1.0732E-06	3.2852E-07
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
1.0951E-07	4.3802E-08	1.0951E-07	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
2.1876E-02	1.0357E-02	4.8968E-03	4.1818E-03	2.1654E-04	1.3886E-05
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
1.8178E-06	4.4699E-07	2.0859E-07	2.9799E-08	-1.9742E-07	3.4642E-07
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	2.6859E-02	1.3494E-02	1.1505E-02	5.8590E-04
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
3.3994E-05	3.5139E-06	7.7655E-07	2.3297E-07	7.7655E-08	7.7655E-08
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-1.5774E-07	2.7422E-07	0.	3.4018E-02	3.1108E-02	1.5702E-03
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
8.6091E-05	7.1515E-06	1.4899E-06	2.9798E-07	1.9865E-07	4.9663E-08
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
4.9663E-08	1.4899E-07	0.	8.3506E-02	4.2985E-03	2.2845E-04
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
1.6658E-05	2.8086E-06	6.4566E-07	4.5196E-07	6.4566E-08	6.4566E-08
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
2.5826E-07	0.	1.1469E-02	5.9425E-04	3.8165E-05	5.0260E-06
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.2258E-06	3.2689E-07	1.6345E-07	2.4517E-07	-5.5674E-07	8.8363E-07
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
7.9842E-03	4.2137E-04	2.9759E-05	4.0466E-06	1.1652E-06	6.9281E-07
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
4.0939E-07	2.8342E-07	5.3535E-07	1.0718E-02	5.6615E-04	3.6268E-05
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
6.3406E-06	3.0858E-06	1.4795E-06	9.7223E-07	1.6486E-06	1.1320E-02
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
5.5885E-04	5.9797E-05	1.7812E-05	6.7408E-06	3.3035E-06	4.2856E-06
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
1.0766E-02	1.0090E-03	2.3737E-04	6.0387E-05	1.8443E-05	1.3838E-05
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
1.9518E-02	4.3077E-03	9.3246E-04	1.9448E-04	1.6837E-05	5.2824E-02
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
1.1787E-02	2.6898E-03	6.9541E-04	6.4302E-02	1.2014E-02	-1.2946E-03
1 16 18	1 16 19	1 17 19			
4.7220E-02	-2.0238E-02	-5.9359E-02			

*LITHIUM OXIDE

*L120

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
LI	3.400000E+00	4.644600E-01	O	3.600000E+00	5.355400E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
3.4700000E+00	1.8120000E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM) .

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.6249E-01	0.	8.5462E-02	3.4152E-02	7.5625E-02	-1.8951E-02
2.2176E-01	0.	1.2560E-01	4.3202E-02	9.4954E-02	-2.4929E-02
2.0762E-01	0.	1.1488E-01	4.0835E-02	9.0254E-02	-2.1903E-02
1.9315E-01	0.	1.1752E-01	3.4493E-02	7.4947E-02	-2.0968E-02
2.5780E-01	0.	1.6087E-01	4.2840E-02	9.3552E-02	-2.2812E-02
2.6314E-01	0.	1.6804E-01	4.1407E-02	9.0026E-02	-2.0407E-02
2.6563E-01	0.	1.6214E-01	4.5224E-02	9.9037E-02	-2.3501E-02
2.9651E-01	0.	1.7955E-01	5.1989E-02	1.1525E-01	-3.0893E-02
2.6660E-01	0.	2.3738E-01	2.5614E-02	2.5643E-02	-7.0751E-03
2.3768E-01	0.	2.0549E-01	2.2429E-02	2.2460E-02	-6.0817E-03
2.4418E-01	0.	1.9896E-01	1.8746E-02	1.8762E-02	-5.3209E-03
2.8936E-01	0.	1.9905E-01	1.8288E-02	1.8303E-02	-5.2285E-03
4.1292E-01	0.	1.9905E-01	1.8288E-02	1.8303E-02	-5.2285E-03
6.2923E-01	0.	1.9295E-01	2.0031E-02	2.4404E-02	-6.9714E-03
1.0027E 00	0.	1.8075E-01	2.3517E-02	3.6606E-02	-1.0457E-02
1.5121E 00	0.	1.8075E-01	2.3517E-02	3.6606E-02	-1.0457E-02
2.3529E 00	0.	1.8155E-01	2.3589E-02	3.6716E-02	-1.0491E-02
3.7967E 00	0.	1.8908E-01	2.3856E-02	3.6051E-02	-1.0273E-02
4.8329E 00	0.	2.3242E-01	1.4174E-02		

*LITHIUM OXIDE

SCATTER
L N1 N2
SGSL(N1,N2)

*L120

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.1085E-03 0.	0.	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	8.2527E-04
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
0.	0.	0.	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	1.9926E-03	0.	0.
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
0.	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
4.7907E-05 0.	0.	0.	0.	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	2.5666E-03	0.	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	4.0361E-03	0.	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	3.1174E-03	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*LITHIUM OXIDE

SCATTER
L N1 N2
SGSL(N1,N2)

*LI2O

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-1.0065E-03	0.	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	-7.6416E-04
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
0.	0.	0.	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	-1.7575E-03	0.	0.
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
0.	0.	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
-4.7011E-05	0.	0.	0.	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-2.1786E-03	0.	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	-3.2185E-03	0.	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-2.6267E-03	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*MAGNESIUM OXIDE

*MAGNESIUM OXIDE

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
MG	5.1400000E+00	6.0320000E-01	O	3.6000000E+00	3.9680000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	3.5799982E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.2329E-01	0.	1.0050E-01	1.1014E-02	2.2797E-02	-7.0870E-03
1.8185E-01	0.	1.4544E-01	1.7537E-02	3.6413E-02	-1.1248E-02
2.1101E-01	0.	1.6981E-01	1.9860E-02	4.1197E-02	-1.2750E-02
2.4364E-01	0.	1.9628E-01	2.2835E-02	4.7359E-02	-1.4663E-02
3.7386E-01	0.	2.9631E-01	3.7298E-02	7.7544E-02	-2.3887E-02
4.8057E-01	0.	3.8294E-01	4.6993E-02	9.7626E-02	-3.0121E-02
5.7233E-01	0.	4.6341E-01	5.2560E-02	1.0892E-01	-3.3780E-02
6.6729E-01	0.	5.4361E-01	5.9747E-02	1.2368E-01	-3.8442E-02
5.3489E-01	0.	5.0930E-01	2.5582E-02	2.5587E-02	-7.9316E-03
3.8243E-01	0.	3.6298E-01	1.9442E-02	1.9445E-02	-5.9990E-03
3.8244E-01	0.	3.6298E-01	1.9442E-02	1.9445E-02	-5.9990E-03
3.8247E-01	0.	3.6298E-01	1.9442E-02	1.9445E-02	-5.9990E-03
3.8255E-01	0.	3.6298E-01	1.9442E-02	1.9445E-02	-5.9990E-03
3.8269E-01	0.	3.5649E-01	2.1441E-02	2.5927E-02	-7.9987E-03
3.8293E-01	0.	3.4353E-01	2.5441E-02	3.8891E-02	-1.1998E-02
3.8327E-01	0.	3.4353E-01	2.5441E-02	3.8891E-02	-1.1998E-02
3.8515E-01	0.	3.4471E-01	2.5546E-02	3.9053E-02	-1.2047E-02
3.8960E-01	0.	3.4960E-01	2.5353E-02	3.7667E-02	-1.1612E-02
3.9352E-01	0.	3.9052E-01	1.3984E-02		

*NICKEL-CHROMIUM ALLOY

*NICKEL-CHROMIUM ALLOY

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
NI	4.1000000E+00	7.7000000E-01	CR	4.2000000E+00	1.9500000E-01
FE	4.0000000E+00	1.0000000E-02	NB	5.3600000E+00	1.0000000E-02
SI	5.5000000E+00	9.0000000E-03	MN	4.4000000E+00	5.0000000E-03
CU	8.3600000E+00	1.0000000E-03			

FORMULA
F

DENSITY
RHO (G/CC)

FUEL DENSITY
RHOF (G/CC)

TEMPERATURE
T (DEG K)

8.4399979E 00

0.

2.9316000E 02

1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.2204E-01	0.	2.0645E-01	7.6907E-03	1.5562E-02	-5.0657E-03
2.3670E-01	0.	2.2008E-01	8.1953E-03	1.6590E-02	-5.3970E-03
2.4485E-01	0.	2.2761E-01	8.4906E-03	1.7189E-02	-5.5911E-03
2.4297E-01	0.	2.2579E-01	8.4577E-03	1.7118E-02	-5.5699E-03
2.5461E-01	0.	2.3661E-01	8.8618E-03	1.7921E-02	-5.8385E-03
2.8404E-01	0.	2.6404E-01	9.8378E-03	1.9902E-02	-6.4805E-03
3.5431E-01	0.	3.2946E-01	1.2221E-02	2.4727E-02	-8.0502E-03
4.2780E-01	0.	3.9787E-01	1.4715E-02	2.9769E-02	-9.6940E-03
6.6993E-01	0.	6.5803E-01	1.1576E-02	1.1575E-02	-3.7680E-03
1.2144E 00	0.	1.1924E 00	2.1075E-02	2.1074E-02	-6.8599E-03
1.4727E 00	0.	1.4448E 00	2.5491E-02	2.5491E-02	-8.2971E-03
1.4050E 00	0.	1.3751E 00	2.4094E-02	2.4086E-02	-7.8487E-03
1.4114E 00	0.	1.3731E 00	2.4045E-02	2.4034E-02	-7.8351E-03
1.4197E 00	0.	1.3583E 00	2.6529E-02	3.1890E-02	-1.0398E-02
1.4163E 00	0.	1.3132E 00	3.1035E-02	4.6806E-02	-1.5250E-02
1.4370E 00	0.	1.2979E 00	3.0698E-02	4.6270E-02	-1.5095E-02
1.4122E 00	0.	1.2159E 00	2.8772E-02	4.3381E-02	-1.4143E-02
1.4426E 00	0.	1.1479E 00	2.6429E-02	3.8774E-02	-1.2633E-02
1.5509E 00	0.	1.2212E 00	1.4193E-02		

*NICHROME V

*NICHROME V

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
NI	4.100000E+00	8.000000E-01	CR	4.200000E+00	2.000000E-01
FORMULA		DENSITY	FUEL	DENSITY	TEMPERATURE
F		RHO (G/CC)	RHOF	(G/CC)	T (DEG K)
4.3100000E+00		8.5999994E 00	0.		2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.2567E-01	0.	2.1002E-01	7.7221E-03	1.5621E-02	-5.0882E-03
2.3980E-01	0.	2.2319E-01	8.1954E-03	1.6584E-02	-5.3990E-03
2.4687E-01	0.	2.2977E-01	8.4332E-03	1.7066E-02	-5.5556E-03
2.4335E-01	0.	2.2648E-01	8.3175E-03	1.6825E-02	-5.4805E-03
2.5495E-01	0.	2.3727E-01	8.7200E-03	1.7624E-02	-5.7483E-03
2.8521E-01	0.	2.6543E-01	9.7439E-03	1.9703E-02	-6.4217E-03
3.5785E-01	0.	3.3308E-01	1.2199E-02	2.4673E-02	-8.0387E-03
4.3502E-01	0.	4.0494E-01	1.4814E-02	2.9960E-02	-9.7627E-03
6.9068E-01	0.	6.7853E-01	1.1887E-02	1.1886E-02	-3.8702E-03
1.2160E 00	0.	1.1943E 00	2.1039E-02	2.1038E-02	-6.8491E-03
1.4750E 00	0.	1.4476E 00	2.5447E-02	2.5447E-02	-8.2837E-03
1.4521E 00	0.	1.4219E 00	2.4851E-02	2.4844E-02	-8.0967E-03
1.4723E 00	0.	1.4329E 00	2.5039E-02	2.5027E-02	-8.1600E-03
1.4812E 00	0.	1.4176E 00	2.7628E-02	3.3209E-02	-1.0830E-02
1.4770E 00	0.	1.3703E 00	3.2311E-02	4.8730E-02	-1.5879E-02
1.4979E 00	0.	1.3542E 00	3.1957E-02	4.8166E-02	-1.5716E-02
1.4700E 00	0.	1.2675E 00	2.9920E-02	4.5111E-02	-1.4709E-02
1.4994E 00	0.	1.1957E 00	2.7459E-02	4.0283E-02	-1.3127E-02
1.6123E 00	0.	1.2729E 00	1.4758E-02		

*PENTALENE

*PENTALENE

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
C	3.3000000E+00	8.8670000E-01	H	2.0400000E+00	1.1330000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	9.2999951E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.3135E-01	0.	5.5624E-02	2.3143E-02	4.1160E-02	1.2402E-02
1.6806E-01	0.	6.4415E-02	3.0299E-02	5.2543E-02	2.0782E-02
2.2923E-01	0.	8.4720E-02	4.1647E-02	7.1610E-02	3.0628E-02
2.9157E-01	0.	1.0140E-01	5.3624E-02	9.0974E-02	4.3587E-02
3.7523E-01	0.	1.2892E-01	6.9169E-02	1.1705E-01	5.7235E-02
4.7603E-01	0.	1.6223E-01	8.7886E-02	1.4847E-01	7.3575E-02
6.0020E-01	0.	1.9819E-01	1.1146E-01	1.8709E-01	9.7396E-02
7.3599E-01	0.	2.3468E-01	1.3753E-01	4.4060E-01	2.3857E-01
1.0626E 00	0.	6.6812E-01	4.1488E-01	3.4305E-01	1.7213E-01
1.3737E 00	0.	8.4834E-01	5.5271E-01	4.5628E-01	2.3229E-01
1.4399E 00	0.	8.8588E-01	5.8284E-01	4.8100E-01	2.4557E-01
1.4542E 00	0.	8.9392E-01	5.8930E-01	4.8630E-01	2.4841E-01
1.4547E 00	0.	8.9392E-01	5.8902E-01	4.3849E-01	2.3310E-01
1.4734E 00	0.	7.9042E-01	5.2930E-01	4.3833E-01	2.5647E-01
1.4959E 00	0.	6.4316E-01	4.3442E-01	5.4880E-01	3.3108E-01
1.6522E 00	0.	7.0251E-01	4.7666E-01	6.1327E-01	3.4213E-01
2.0870E 00	0.	8.7637E-01	6.0212E-01	8.2614E-01	3.8488E-01
2.6928E 00	0.	1.2321E 00	7.8749E-01	1.4463E 00	5.7858E-02
3.0611E 00	0.	3.0425E 00	8.6229E-01		

*PENTALENE

SCATTER
L N1 N2
SGSL(N1,N2)

*PENTALENE

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.3602E-02	8.2498E-03	5.0038E-03	3.0349E-03	1.8408E-03	1.1165E-03
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.4881E-03	2.0140E-04	2.7274E-05	3.6780E-06	5.0075E-07	1.2087E-07
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-6.9070E-08	0.	0.	0.	0.	2.0107E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.2195E-02	7.3969E-03	4.4864E-03	2.7212E-03	3.6270E-03	4.9085E-04
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
6.6392E-05	9.0106E-06	1.2508E-06	1.0210E-07	5.1051E-08	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.8682E-02	1.7396E-02	1.0551E-02
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
6.3998E-03	8.5300E-03	1.1545E-03	1.5622E-04	2.1192E-05	2.7673E-06
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
4.0053E-07	7.2823E-08	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.9031E-02	2.3673E-02	1.4359E-02	1.9138E-02	2.5901E-03	3.5047E-04
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
4.7469E-05	6.4910E-06	6.9370E-07	1.4865E-07	2.4775E-07	-1.4865E-07
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	5.0858E-02	3.0847E-02	4.1115E-02	5.5644E-03
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
7.5302E-04	1.0198E-04	1.3752E-05	1.6787E-06	3.2283E-07	6.4565E-08
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
3.2283E-07	-2.5826E-07	0.	6.5051E-02	8.6705E-02	1.1734E-02
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.5881E-03	2.1488E-04	2.8904E-05	3.7162E-06	6.6067E-07	2.4775E-07
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
8.2583E-08	0.	0.	1.8584E-01	2.5151E-02	3.4038E-03
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
4.6067E-04	6.2482E-05	7.4077E-06	1.5030E-06	5.3679E-07	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
1.0736E-07	0.	5.2485E-02	7.1031E-03	9.6120E-04	1.3025E-04
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.5899E-05	2.7177E-06	9.5121E-07	4.0766E-07	6.7943E-07	-4.0766E-07
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
4.4447E-02	6.0153E-03	8.1397E-04	9.9023E-05	1.8014E-05	6.5980E-06
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
2.4612E-06	8.9021E-07	4.1892E-07	5.9661E-02	8.0742E-03	9.8163E-04
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
1.7829E-04	6.5686E-05	2.4180E-05	9.0674E-06	4.7797E-06	6.3006E-02
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
7.6612E-03	1.3909E-03	5.1153E-04	1.8825E-04	7.1484E-05	3.8081E-05
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
5.7253E-02	1.0395E-02	3.8240E-03	1.4068E-03	5.3349E-04	2.8506E-04
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
7.6806E-02	2.8255E-02	1.0395E-02	3.7432E-03	2.1059E-03	1.5359E-01
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
5.6504E-02	2.1435E-02	1.1449E-02	1.9028E-01	7.2184E-02	3.8273E-02
0 16 18	0 16 19	0 17 19			
2.2067E-01	1.1053E-01	3.7588E-01			

*PENTALENE

SCATTER
L N1 N2
SGSL(N1,N2)

*PENTALENE

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
8.4734E-03	4.0062E-03	1.8953E-03	8.9749E-04	4.2568E-04	2.0243E-04
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
1.7692E-04	1.1236E-05	1.4578E-06	4.1487E-07	1.3829E-07	-1.8943E-07
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
3.0467E-07	0.	0.	0.	0.	1.2525E-02
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
5.9217E-03	2.8012E-03	1.3263E-03	6.2894E-04	5.4352E-04	3.1429E-05
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
3.1684E-06	7.8359E-07	2.3849E-07	6.8139E-08	1.1924E-07	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.7864E-02	8.4443E-03	3.9934E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
1.8899E-03	1.6202E-03	8.7071E-05	6.7053E-06	1.1904E-06	3.6442E-07
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
1.2147E-07	4.8589E-08	1.2147E-07	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
2.4307E-02	1.1488E-02	5.4319E-03	4.6388E-03	2.4020E-04	1.5404E-05
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
2.0164E-06	4.9584E-07	2.3139E-07	3.3056E-08	-2.1899E-07	3.8427E-07
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	3.1672E-02	1.4969E-02	1.2762E-02	6.4993E-04
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
3.7709E-05	3.8979E-06	8.6142E-07	2.5843E-07	8.6142E-08	8.6142E-08
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-1.7498E-07	3.0419E-07	0.	4.0510E-02	3.4508E-02	1.7418E-03
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
9.5499E-05	7.9330E-06	1.6527E-06	3.3054E-07	2.2036E-07	5.5091E-08
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
5.5091E-08	1.6527E-07	0.	9.4897E-02	4.7682E-03	2.5342E-04
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
1.8479E-05	3.1156E-06	7.1622E-07	5.0136E-07	7.1622E-08	7.1622E-08
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
2.8649E-07	0.	1.2723E-02	6.5919E-04	4.2335E-05	5.5752E-06
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.3598E-06	3.6262E-07	1.8131E-07	2.7196E-07	-6.1758E-07	9.8019E-07
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
8.8567E-03	4.6742E-04	3.3011E-05	4.4889E-06	1.2925E-06	7.6852E-07
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
4.5413E-07	3.1439E-07	5.9386E-07	1.1890E-02	6.2803E-04	4.0232E-05
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
7.0336E-06	3.4230E-06	1.6412E-06	1.0785E-06	1.8287E-06	1.2557E-02
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
6.1993E-04	6.6332E-05	1.9758E-05	7.4775E-06	3.6645E-06	4.7539E-06
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
1.1943E-02	1.1193E-03	2.6331E-04	6.6986E-05	2.0459E-05	1.5350E-05
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
2.1651E-02	4.7784E-03	1.0344E-03	2.1573E-04	1.8677E-05	5.8597E-02
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
1.3075E-02	2.9837E-03	7.7141E-04	7.1330E-02	1.3326E-02	-1.4361E-03
1 16 18	1 16 19	1 17 19			
5.2380E-02	-2.2449E-02	-5.5847E-02			

*PLEXIGLAS

*PLEXIGLAS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
C	3.300000E+00	5.870000E-01	O	3.600000E+00	3.315000E-01
H	2.040000E+00	8.150000E-02			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
2.5500000E+00	1.1799994E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.2561E-01	0.	5.5438E-02	2.1639E-02	3.8625E-02	1.0984E-02
1.7325E-01	0.	7.4189E-02	2.9800E-02	5.2418E-02	1.7594E-02
2.2824E-01	0.	9.2176E-02	4.0023E-02	6.9534E-02	2.6664E-02
2.8771E-01	0.	1.0938E-01	5.1232E-02	8.7787E-02	3.8314E-02
3.9400E-01	0.	1.5731E-01	6.8832E-02	1.1871E-01	4.8595E-02
4.9403E-01	0.	1.9394E-01	8.6781E-02	1.4919E-01	6.2953E-02
5.9396E-01	0.	2.1672E-01	1.0670E-01	1.8108E-01	8.5712E-02
7.1488E-01	0.	2.4783E-01	1.3010E-01	4.1165E-01	2.1480E-01
1.0116E 00	0.	6.4935E-01	3.8094E-01	3.1537E-01	1.5640E-01
1.2948E 00	0.	8.1315E-01	5.0667E-01	4.1866E-01	2.1132E-01
1.3552E 00	0.	8.4741E-01	5.3417E-01	4.4122E-01	2.2345E-01
1.3683E 00	0.	8.5475E-01	5.4006E-01	4.4606E-01	2.2604E-01
1.3688E 00	0.	8.5475E-01	5.3981E-01	4.0242E-01	2.1206E-01
1.3857E 00	0.	7.5941E-01	4.8552E-01	4.0300E-01	2.3317E-01
1.4061E 00	0.	6.2341E-01	3.9936E-01	5.0527E-01	3.0082E-01
1.5487E 00	0.	6.7759E-01	4.3791E-01	5.6411E-01	3.1091E-01
1.9459E 00	0.	8.3659E-01	5.5245E-01	7.5844E-01	3.4990E-01
2.5015E 00	0.	1.1639E 00	7.2177E-01	1.3245E 00	5.1416E-02
2.8411E 00	0.	2.8241E 00	7.8880E-01		

*PLEXIGLAS

SCATTER
L N1 N2
SGSL(N1,N2)

*PLEXIGLAS

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.2414E-02	7.5296E-03	4.5669E-03	2.7700E-03	1.6801E-03	1.0190E-03
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.3582E-03	1.8382E-04	2.4893E-05	3.3569E-06	4.5704E-07	1.1032E-07
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-6.3040E-08	0.	0.	0.	0.	1.8351E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.1131E-02	6.7511E-03	4.0947E-03	2.4836E-03	3.3103E-03	4.4799E-04
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
6.0596E-05	8.2239E-06	1.1416E-06	9.3189E-08	4.6595E-08	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	2.6178E-02	1.5878E-02	9.6303E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
5.8410E-03	7.7854E-03	1.0537E-03	1.4259E-04	1.9342E-05	2.5257E-06
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
3.6556E-07	6.6466E-08	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.5623E-02	2.1607E-02	1.3105E-02	1.7467E-02	2.3640E-03	3.1987E-04
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
4.3325E-05	5.9244E-06	6.3314E-07	1.3567E-07	2.2612E-07	-1.3567E-07
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	4.6418E-02	2.8154E-02	3.7526E-02	5.0786E-03
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
6.8728E-04	9.3077E-05	1.2552E-05	1.5321E-06	2.9464E-07	5.8928E-08
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
2.9464E-07	-2.3571E-07	0.	5.9372E-02	7.9136E-02	1.0710E-02
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.4494E-03	1.9612E-04	2.6381E-05	3.3918E-06	6.0299E-07	2.2612E-07
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
7.5373E-08	0.	0.	1.6961E-01	2.2955E-02	3.1067E-03
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
4.2046E-04	5.7028E-05	6.7610E-06	1.3718E-06	4.8993E-07	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
9.7986E-08	0.	4.7903E-02	6.4830E-03	8.7728E-04	1.1888E-04
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.4511E-05	2.4805E-06	8.6817E-07	3.7207E-07	6.2012E-07	-3.7207E-07
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
4.0566E-02	5.4901E-03	7.4290E-04	9.0378E-05	1.6441E-05	6.0220E-06
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
2.2463E-06	8.1249E-07	3.8235E-07	5.4452E-02	7.3693E-03	8.9593E-04
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
1.6272E-04	5.9951E-05	2.2069E-05	8.2757E-06	4.3624E-06	5.7505E-02
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
6.9923E-03	1.2695E-03	4.6687E-04	1.7182E-04	6.5244E-05	3.4756E-05
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
5.2254E-02	9.4871E-03	3.4902E-03	1.2840E-03	4.8691E-04	2.6018E-04
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
7.0101E-02	2.5789E-02	9.4871E-03	3.5989E-03	1.9221E-03	1.4019E-01
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
5.1571E-02	1.9564E-02	1.0450E-02	1.7367E-01	6.5882E-02	3.4931E-02
0 16 18	0 16 19	0 17 19			
2.0141E-01	1.0088E-01	3.4306E-01			

*PLEXIGLAS

SCATTER
L N1 N2
SGSL(N1,N2)

*PLEXIGLAS

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
7.7336E-03	3.6565E-03	1.7298E-03	8.1913E-04	3.8852E-04	1.8475E-04
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
1.6148E-04	1.0255E-05	1.3305E-06	3.7865E-07	1.2622E-07	-1.7289E-07
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
2.7807E-07	0.	0.	0.	0.	1.1432E-02
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
5.4047E-03	2.5567E-03	1.2105E-03	5.7403E-04	4.9607E-04	2.8685E-05
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
2.8918E-06	7.1518E-07	2.1766E-07	6.2190E-08	1.0883E-07	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.6304E-02	7.7070E-03	3.6447E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
1.7249E-03	1.4787E-03	7.9470E-05	6.1199E-06	1.0865E-06	3.3260E-07
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
1.1087E-07	4.4347E-08	1.1087E-07	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
2.2185E-02	1.0485E-02	4.9577E-03	4.2338E-03	2.1923E-04	1.4059E-05
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
1.8404E-06	4.5255E-07	2.1119E-07	3.0170E-08	-1.9988E-07	3.5073E-07
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	2.8907E-02	1.3662E-02	1.1648E-02	5.9319E-04
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
3.4417E-05	3.5576E-06	7.8621E-07	2.3586E-07	7.8621E-08	7.8621E-08
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-1.5970E-07	2.7763E-07	0.	3.6974E-02	3.1495E-02	1.5897E-03
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
8.7162E-05	7.2405E-06	1.5084E-06	3.0169E-07	2.0112E-07	5.0281E-08
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
5.0281E-08	1.5084E-07	0.	8.6612E-02	4.3520E-03	2.3129E-04
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
1.6865E-05	2.8436E-06	6.5369E-07	4.5759E-07	6.5369E-08	6.5369E-08
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
2.6148E-07	0.	1.1612E-02	6.0164E-04	3.8639E-05	5.0885E-06
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.2411E-06	3.3096E-07	1.6548E-07	2.4822E-07	-5.6366E-07	8.9462E-07
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
8.0835E-03	4.2661E-04	3.0129E-05	4.0970E-06	1.1797E-06	7.0143E-07
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
4.1448E-07	2.8695E-07	5.4201E-07	1.0852E-02	5.7320E-04	3.6720E-05
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
6.4195E-06	3.1242E-06	1.4979E-06	9.8432E-07	1.6691E-06	1.1461E-02
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
5.6581E-04	6.0541E-05	1.8033E-05	6.8247E-06	3.3446E-06	4.3389E-06
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
1.0900E-02	1.0216E-03	2.4032E-04	6.1138E-05	1.8673E-05	1.4010E-05
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
1.9761E-02	4.3613E-03	9.4406E-04	1.9690E-04	1.7046E-05	5.3481E-02
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
1.1933E-02	2.7232E-03	7.0406E-04	6.5102E-02	1.2163E-02	-1.3107E-03
1 16 18	1 16 19	1 17 19			
4.7807E-02	-2.0490E-02	-6.0098E-02			

*POLYETHYLENE

*POLYETHYLENE

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
C	3.300000E+00	8.563000E-01	H	2.040000E+00	1.437000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
2.5700000E+00	9.2000104E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.4717E-01	0.	5.7759E-02	2.6395E-02	4.6034E-02	1.7215E-02
1.9260E-01	0.	6.8366E-02	3.5281E-02	6.0119E-02	2.7787E-02
2.6471E-01	0.	9.0676E-02	4.8824E-02	8.2567E-02	4.0576E-02
3.4076E-01	0.	1.1012E-01	6.3526E-02	1.0617E-01	5.7039E-02
4.3953E-01	0.	1.4043E-01	8.2103E-02	1.3692E-01	7.4743E-02
5.5845E-01	0.	1.7707E-01	1.0446E-01	1.7394E-01	9.5952E-02
7.0819E-01	0.	2.1805E-01	1.3313E-01	2.2047E-01	1.2641E-01
8.7373E-01	0.	2.6055E-01	1.6511E-01	5.3701E-01	3.0398E-01
1.2781E 00	0.	7.8756E-01	5.1617E-01	4.2603E-01	2.1726E-01
1.6653E 00	0.	1.0108E 00	6.8885E-01	5.6786E-01	2.9281E-01
1.7484E 00	0.	1.0579E 00	7.2666E-01	5.9888E-01	3.0948E-01
1.7664E 00	0.	1.0680E 00	7.3475E-01	6.0553E-01	3.1304E-01
1.7670E 00	0.	1.0680E 00	7.3441E-01	5.4554E-01	2.9383E-01
1.7898E 00	0.	9.3915E-01	6.5897E-01	5.4373E-01	3.2363E-01
1.8174E 00	0.	7.5698E-01	5.3894E-01	6.7912E-01	4.1819E-01
2.0136E 00	0.	3.3146E-01	5.9194E-01	2.6001E-01	4.1205E-01
2.5591E 00	0.	1.0496E 00	7.6935E-01	1.0271E 00	4.0568E-01
3.3187E 00	0.	1.4950E 00	9.8203E-01	1.8056E 00	7.5256E-02
3.7827E 00	0.	3.7595E 00	1.0787E 00		

*POLYETHYLENE

SCATTER
L N1 N2
SGSL(N1,N2)

*POLYETHYLENE

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.7066E-02	1.0351E-02	6.2781E-03	3.8079E-03	2.3096E-03	1.4008E-03
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.8671E-03	2.5269E-04	3.4220E-05	4.6147E-06	6.2829E-07	1.5166E-07
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-8.6660E-08	0.	0.	0.	0.	2.5228E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.5301E-02	9.2807E-03	5.6290E-03	3.4142E-03	4.5507E-03	6.1585E-04
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
8.3301E-05	1.1305E-05	1.5693E-06	1.2811E-07	6.4053E-08	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	3.5986E-02	2.1827E-02	1.3239E-02
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
8.0296E-03	1.0702E-02	1.4485E-03	1.9601E-04	2.6589E-05	3.4721E-06
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
5.0253E-07	9.1370E-08	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
4.8971E-02	2.9702E-02	1.8015E-02	2.4012E-02	3.2497E-03	4.3972E-04
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
5.9558E-05	8.1442E-06	8.7037E-07	1.8651E-07	3.1085E-07	-1.8651E-07
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	6.3811E-02	3.8703E-02	5.1587E-02	6.9815E-03
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
9.4480E-04	1.2795E-04	1.7255E-05	2.1062E-06	4.0504E-07	8.1008E-08
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
4.0504E-07	-3.2403E-07	0.	8.1619E-02	1.0879E-01	1.4723E-02
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.9925E-03	2.6961E-04	3.6265E-05	4.6627E-06	8.2892E-07	3.1085E-07
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
1.0362E-07	0.	0.	2.3317E-01	3.1556E-02	4.2707E-03
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
5.7800E-04	7.8395E-05	9.2943E-06	1.8858E-06	6.7350E-07	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
1.3470E-07	0.	6.5852E-02	8.9121E-03	1.2060E-03	1.6342E-04
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.9948E-05	3.4099E-06	1.1935E-06	5.1148E-07	8.5247E-07	-5.1148E-07
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
5.5766E-02	7.5472E-03	1.0213E-03	1.2424E-04	2.2601E-05	8.2784E-06
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
3.0880E-06	1.1169E-06	5.2561E-07	7.4855E-02	1.0131E-02	1.2316E-03
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
2.2370E-04	8.2414E-05	3.0338E-05	1.1377E-05	5.9970E-06	7.9052E-02
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
9.6123E-03	1.7452E-03	6.4180E-04	2.3619E-04	8.9690E-05	4.7779E-05
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
7.1834E-02	1.3042E-02	4.7979E-03	1.7650E-03	6.6936E-04	3.5766E-04
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
9.6367E-02	3.5451E-02	1.3042E-02	4.9474E-03	2.6423E-03	1.9271E-01
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
7.0895E-02	2.6894E-02	1.4365E-02	2.3874E-01	9.0568E-02	4.8020E-02
0 16 18	0 16 19	0 17 19			
2.7687E-01	1.3868E-01	4.7161E-01			

*POLYETHYLENE

SCATTER
L N1 N2
SGSL(N1,N2)

*POLYETHYLENE

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
1.0631E-02	5.0265E-03	2.3779E-03	1.1261E-03	5.3409E-04	2.5398E-04
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
2.2198E-04	1.4098E-05	1.8291E-06	5.2053E-07	1.7351E-07	-2.3767E-07
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
3.8226E-07	0.	0.	0.	0.	1.5715E-02
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
7.4298E-03	3.5146E-03	1.6641E-03	7.8912E-04	6.8194E-04	3.9433E-05
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
3.9754E-06	9.8316E-07	2.9922E-07	8.5492E-08	1.4961E-07	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	2.2414E-02	1.0595E-02	5.0104E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
2.3712E-03	2.0328E-03	1.0925E-04	8.4130E-06	1.4936E-06	4.5723E-07
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
1.5241E-07	6.0964E-08	1.5241E-07	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
3.0498E-02	1.4414E-02	6.8153E-03	5.8202E-03	3.0137E-04	1.9327E-05
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
2.5299E-06	6.2212E-07	2.9032E-07	4.1474E-08	-2.7477E-07	4.8214E-07
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	3.9738E-02	1.8781E-02	1.6012E-02	8.1545E-04
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
4.7312E-05	4.8906E-06	1.0808E-06	3.2424E-07	1.0808E-07	1.0808E-07
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-2.1954E-07	3.8166E-07	0.	5.0827E-02	4.3296E-02	2.1854E-03
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
1.1982E-04	9.9534E-06	2.0736E-06	4.1473E-07	2.7648E-07	6.9121E-08
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
6.9121E-08	2.0736E-07	0.	1.1906E-01	5.9826E-03	3.1796E-04
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
2.3185E-05	3.9090E-06	8.9863E-07	6.2904E-07	8.9863E-08	8.9863E-08
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
3.5945E-07	0.	1.5963E-02	8.2707E-04	5.3117E-05	6.9951E-06
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.7061E-06	4.5497E-07	2.2748E-07	3.4122E-07	-7.7486E-07	1.2298E-06
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
1.1112E-02	5.8646E-04	4.1419E-05	5.6321E-06	1.6217E-06	9.6424E-07
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
5.6978E-07	3.9446E-07	7.4510E-07	1.4918E-02	7.8797E-04	5.0478E-05
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
8.8249E-06	4.2948E-06	2.0591E-06	1.3531E-06	2.2945E-06	1.5755E-02
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
7.7781E-04	8.3225E-05	2.4790E-05	9.3819E-06	4.5977E-06	5.9646E-06
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
1.4984E-02	1.4043E-03	3.3037E-04	8.4046E-05	2.5669E-05	1.9260E-05
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
2.7165E-02	5.9954E-03	1.2978E-03	2.7067E-04	2.3433E-05	7.3520E-02
1 14 17	1 14 18	1 14 19	1 1 17	1 15 18	1 15 19
1.6404E-02	3.7436E-03	9.6787E-04	8.94 6E-02	1.6720E-02	-1.8019E-03
1 16 18	1 16 19	1 17 19			
6.5720E-02	-2.8167E-02	-8.2616E-02			

*REFRASIL

*REFRASIL

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
O	3.600000E+00	5.326100E-01	SI	5.500000E+00	4.668200E-01
B	8.000000E+00	5.710000E-04			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.570000E+00	2.2400022E-01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE- SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
7.2544E-03	0.	5.9193E-03	6.4408E-04	1.3348E-03	-4.1392E-04
1.2295E-02	0.	9.8105E-03	1.1949E-03	2.4841E-03	-7.6540E-04
1.3461E-02	0.	1.0804E-02	1.2792E-03	2.6572E-03	-8.2003E-04
1.5851E-02	0.	1.2762E-02	1.4875E-03	3.0885E-03	-9.5397E-04
2.5911E-02	0.	2.0438E-02	2.6290E-03	5.4727E-03	-1.6814E-03
2.8483E-02	0.	2.2344E-02	2.9471E-03	6.1386E-03	-1.8837E-03
2.5339E-02	0.	2.0009E-02	2.5601E-03	5.3286E-03	-1.6376E-03
2.4991E-02	0.	1.9767E-02	2.5097E-03	5.2228E-03	-1.6057E-03
2.2537E-02	0.	2.1314E-02	1.2191E-03	1.2194E-03	-3.7406E-04
2.0974E-02	0.	1.9799E-02	1.1639E-03	1.1642E-03	-3.5656E-04
2.1441E-02	0.	2.0232E-02	1.1797E-03	1.1800E-03	-3.6156E-04
2.1659E-02	0.	2.0395E-02	1.1856E-03	1.1859E-03	-3.6343E-04
2.1996E-02	0.	2.0589E-02	1.1927E-03	1.1930E-03	-3.6568E-04
2.2322E-02	0.	2.0277E-02	1.3181E-03	1.5948E-03	-4.8891E-04
2.2719E-02	0.	1.9469E-02	1.5620E-03	2.3915E-03	-7.3310E-04
2.3253E-02	0.	1.9448E-02	1.5610E-03	2.3899E-03	-7.3260E-04
2.4239E-02	0.	1.9505E-02	1.5677E-03	2.4003E-03	-7.3574E-04
2.6565E-02	0.	2.0296E-02	1.5899E-03	2.3653E-03	-7.2479E-04
2.8506E-02	0.	2.3477E-02	9.0057E-04		

*SAMARIUM OXIDE

*SAMARIUM OXIDE

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
SM	8.2200000E+00	8.6240000E-01	O	3.6000000E+00	1.3760000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	7.4300014E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.8280E-01	0.	2.4460E-01	6.1631E-03	1.2535E-02	-4.0245E-03
3.2013E-01	0.	2.7291E-01	1.0481E-02	2.1559E-02	-6.7750E-03
3.2090E-01	0.	2.7349E-01	1.0571E-02	2.1746E-02	-6.8317E-03
3.2898E-01	0.	2.7962E-01	1.1505E-02	2.3699E-02	-7.4271E-03
4.1115E-01	0.	3.2944E-01	2.0847E-02	4.3218E-02	-1.3375E-02
4.3694E-01	0.	3.3651E-01	2.3657E-02	4.9106E-02	-1.5160E-02
4.0576E-01	0.	3.0038E-01	1.9851E-02	4.1225E-02	-1.2721E-02
4.0095E-01	0.	2.7176E-01	1.8952E-02	3.9372E-02	-1.2139E-02
4.6511E-01	0.	2.7580E-01	9.6761E-03	9.6707E-03	-2.9793E-03
5.9342E-01	0.	2.6306E-01	9.5860E-03	9.5844E-03	-2.9469E-03
9.1420E-01	0.	3.2678E-01	1.0019E-02	1.0016E-02	-3.0915E-03
1.9407E 00	0.	5.1796E-01	1.1319E-02	1.1309E-02	-3.5247E-03
1.4259E 01	0.	7.7286E-01	1.3051E-02	1.3034E-02	-4.1024E-03
1.3617E 01	0.	6.4135E-01	1.3455E-02	1.6228E-02	-5.0840E-03
3.9937E 00	0.	4.4335E-01	1.4266E-02	2.1756E-02	-6.7606E-03
9.7678E 00	0.	5.0665E-01	1.4843E-02	2.2618E-02	-7.0495E-03
1.4771E 02	0.	1.5835E 00	2.4738E-02	3.7393E-02	-1.1995E-02
2.2558E 02	0.	2.2558E 00	3.0656E-02	4.4838E-02	-1.4583E-02
2.0287E 02	0.	1.5478E 00	1.2972E-02		

*SILICON CARBIDE

*SILICON CARBIDE

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
SI	5.500000E+00	7.002600E-01	C	3.300000E+00	2.997400E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.530000E+00	3.2100009E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.5843E-01	0.	1.2396E-01	1.6449E-02	3.4468E-02	-1.0447E-02
1.7555E-01	0.	1.3824E-01	1.7819E-02	3.7302E-02	-1.1329E-02
2.1678E-01	0.	1.7047E-01	2.2117E-02	4.6309E-02	-1.4058E-02
2.5632E-01	0.	2.0296E-01	2.5513E-02	5.3365E-02	-1.6235E-02
2.9057E-01	0.	2.2811E-01	2.9823E-02	6.2459E-02	-1.8950E-02
3.1060E-01	0.	2.4011E-01	3.3585E-02	7.0494E-02	-2.1291E-02
3.4485E-01	0.	2.6535E-01	3.7853E-02	7.9502E-02	-2.3980E-02
3.6825E-01	0.	2.8212E-01	4.0985E-02	8.6129E-02	-2.5948E-02
3.3645E-01	0.	3.1510E-01	2.1337E-02	2.1345E-02	-6.3910E-03
3.1477E-01	0.	2.9364E-01	2.1109E-02	2.1117E-02	-6.2975E-03
3.2444E-01	0.	3.0295E-01	2.1447E-02	2.1456E-02	-6.4049E-03
3.2811E-01	0.	3.0644E-01	2.1575E-02	2.1583E-02	-6.4452E-03
3.3260E-01	0.	3.1062E-01	2.1727E-02	2.1736E-02	-6.4936E-03
3.3721E-01	0.	3.0737E-01	2.4177E-02	2.9327E-02	-8.7624E-03
3.3984E-01	0.	2.9451E-01	2.8795E-02	4.4357E-02	-1.3251E-02
3.3999E-01	0.	2.9407E-01	2.8773E-02	4.4323E-02	-1.3240E-02
3.4007E-01	0.	2.9317E-01	2.8728E-02	4.4255E-02	-1.3219E-02
3.4191E-01	0.	2.9538E-01	2.8142E-02	4.2104E-02	-1.2573E-02
3.3357E-01	0.	3.2787E-01	1.5080E-02		

*SILICON DIOXIDE

*SILICON DIOXIDE

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
O	3.600000E+00	5.328000E-01	SI	5.500000E+00	4.672000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
5.510000E+00	2.6499994E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
8.5534E-02	0.	6.9853E-02	7.5687E-03	1.5682E-02	-4.8653E-03
1.4519E-01	0.	1.1591E-01	1.4088E-02	2.9284E-02	-9.0250E-03
1.5900E-01	0.	1.2767E-01	1.5086E-02	3.1333E-02	-9.6718E-03
1.8729E-01	0.	1.5085E-01	1.7551E-02	3.6439E-02	-1.1257E-02
3.0634E-01	0.	2.4169E-01	3.1060E-02	6.4655E-02	-1.9867E-02
3.3678E-01	0.	2.6424E-01	3.4825E-02	7.2535E-02	-2.2260E-02
2.9957E-01	0.	2.3662E-01	3.0245E-02	6.2949E-02	-1.9348E-02
2.9545E-01	0.	2.3375E-01	2.9649E-02	6.1698E-02	-1.8970E-02
2.6637E-01	0.	2.5197E-01	1.4399E-02	1.4402E-02	-4.4186E-03
2.4779E-01	0.	2.3403E-01	1.3746E-02	1.3749E-02	-4.2114E-03
2.5311E-01	0.	2.3916E-01	1.3932E-02	1.3936E-02	-4.2705E-03
2.5513E-01	0.	2.4108E-01	1.4003E-02	1.4006E-02	-4.2928E-03
2.5760E-01	0.	2.4338E-01	1.4087E-02	1.4090E-02	-4.3194E-03
2.5881E-01	0.	2.3970E-01	1.5568E-02	1.8836E-02	-5.7750E-03
2.5893E-01	0.	2.3016E-01	1.8449E-02	2.8245E-02	-8.6594E-03
2.5900E-01	0.	2.2991E-01	1.8437E-02	2.8226E-02	-8.6535E-03
2.6036E-01	0.	2.3059E-01	1.8517E-02	2.8349E-02	-8.6906E-03
2.7026E-01	0.	2.3994E-01	1.8780E-02	2.7938E-02	-8.5618E-03
2.8061E-01	0.	2.7753E-01	1.0638E-02		

*MILD STEEL

*MILD STEEL

ATOM	FORMULA	MASS FRACTION	ATOM	FORMULA	MASS FRACTION
FE	4.0000000E+00	9.9000000E-01	C	3.3000000E+00	1.0000000E-02

FORMULA
F

DENSITY
RHO (G/CC)

FUEL DENSITY
RHO F (G/CC)

TEMPERATURE
T (DEG K)

7.8300025E 00

0.

2.9316000E 02

1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.2553E-01	0.	2.0809E-01	8.5704E-03	1.7425E-02	-5.6181E-03
2.4998E-01	0.	2.3075E-01	9.4548E-03	1.9213E-02	-6.2004E-03
2.6985E-01	0.	2.4884E-01	1.0326E-02	2.0990E-02	-6.7684E-03
2.5131E-01	0.	2.3145E-01	9.7471E-03	1.9840E-02	-6.3818E-03
2.1231E-01	0.	1.9473E-01	8.6027E-03	1.7549E-02	-5.6192E-03
2.5485E-01	0.	2.3364E-01	1.0372E-02	2.1166E-02	-6.7725E-03
3.1699E-01	0.	2.9088E-01	1.2782E-02	2.6061E-02	-8.3525E-03
3.2356E-01	0.	2.9658E-01	1.3183E-02	2.6905E-02	-8.6072E-03
3.7217E-01	0.	3.6433E-01	7.6968E-03	7.6948E-03	-2.4637E-03
4.7834E-01	0.	4.6831E-01	9.6416E-03	9.6394E-03	-3.0942E-03
6.9226E-01	0.	6.7775E-01	1.3437E-02	1.3432E-02	-4.3308E-03
9.0066E-01	0.	8.8061E-01	1.7113E-02	1.7106E-02	-5.5284E-03
9.5503E-01	0.	9.2907E-01	1.7986E-02	1.7983E-02	-5.8092E-03
9.5778E-01	0.	9.1713E-01	1.9822E-02	2.3850E-02	-7.7099E-03
9.6694E-01	0.	8.9932E-01	2.3542E-02	3.5582E-02	-1.1494E-02
9.7392E-01	0.	8.8602E-01	2.3217E-02	3.5091E-02	-1.1335E-02
9.9521E-01	0.	8.7352E-01	2.2915E-02	3.4630E-02	-1.1188E-02
1.0545E 00	0.	8.7592E-01	2.2356E-02	3.2863E-02	-1.0615E-02
1.0926E 00	0.	9.0499E-01	1.1668E-02		

*302 STAINLESS STEEL

*302 SS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	7.500000E-01	CR	4.200000E+00	1.740000E-01
NI	4.100000E+00	7.600000E-02			

FORMULA	DENSITY	FUEL DENSITY	TEMPERATURE
F	RHO (G/CC)	RHO F (G/CC)	T (DEG K)
4.130000E+00	7.8700014E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE	MULTIPLY	SCATTER			
SG(N)	NUSGF(N)	SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.0687E-01	0.	1.9207E-01	7.3054E-03	1.4783E-02	-4.8117E-03
2.2657E-01	0.	2.1037E-01	7.9976E-03	1.6181E-02	-5.2682E-03
2.4119E-01	0.	2.2395E-01	8.5137E-03	1.7219E-02	-5.6091E-03
2.2625E-01	0.	2.1006E-01	7.9844E-03	1.6156E-02	-5.2591E-03
1.9677E-01	0.	1.8267E-01	6.9506E-03	1.4060E-02	-4.5789E-03
2.3139E-01	0.	2.1482E-01	8.1670E-03	1.6523E-02	-5.3798E-03
2.8497E-01	0.	2.6459E-01	1.0050E-02	2.0325E-02	-6.6212E-03
2.9763E-01	0.	2.7634E-01	1.0487E-02	2.1218E-02	-6.9081E-03
3.6901E-01	0.	3.6227E-01	6.5795E-03	6.5774E-03	-2.1417E-03
5.6407E-01	0.	5.5352E-01	1.0119E-02	1.0117E-02	-3.2929E-03
7.5455E-01	0.	7.3986E-01	1.3487E-02	1.3483E-02	-4.3897E-03
8.5790E-01	0.	8.3943E-01	1.5208E-02	1.5202E-02	-4.9521E-03
8.9992E-01	0.	8.7521E-01	1.5849E-02	1.5845E-02	-5.1584E-03
9.0435E-01	0.	8.6466E-01	1.7468E-02	2.1000E-02	-6.8417E-03
9.1375E-01	0.	8.4689E-01	2.0707E-02	3.1235E-02	-1.0170E-02
9.2562E-01	0.	8.3604E-01	2.0447E-02	3.0840E-02	-1.0044E-02
9.4745E-01	0.	8.2033E-01	2.0075E-02	3.0277E-02	-9.8611E-03
1.0069E 00	0.	8.1638E-01	1.9434E-02	2.8515E-02	-9.2852E-03
1.0548E 00	0.	8.4610E-01	1.0163E-02		

*304 STAINLESS STEEL

*304 SS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	7.142000E-01	CR	4.200000E+00	1.900000E-01
NI	4.100000E+00	9.500000E-02	C	3.300000E+00	8.000000E-04

FORMULA	DENSITY	FUEL	DENSITY	TEMPERATURE
F	RHO (G/CC)	RHOF	(G/CC)	T (DEG K)
4.1500000E+00	7.9399976E 00	0.		2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE	MULTIPLY	SCATTER			
SG(N)	NUSGF(N)	SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.0750E-01	0.	1.9254E-01	7.3788E-03	1.4939E-02	-4.8579E-03
2.2681E-01	0.	2.1048E-01	8.0585E-03	1.6311E-02	-5.3060E-03
2.4116E-01	0.	2.2378E-01	8.5785E-03	1.7360E-02	-5.6488E-03
2.2677E-01	0.	2.1039E-01	8.0753E-03	1.6350E-02	-5.3159E-03
1.9900E-01	0.	1.8454E-01	7.1196E-03	1.4414E-02	-4.6863E-03
2.3341E-01	0.	2.1645E-01	8.3506E-03	1.6910E-02	-5.4959E-03
2.8711E-01	0.	2.6630E-01	1.0253E-02	2.0755E-02	-6.7496E-03
3.0168E-01	0.	2.7979E-01	1.0770E-02	2.1810E-02	-7.0884E-03
3.7870E-01	0.	3.7170E-01	6.8343E-03	6.8323E-03	-2.2212E-03
5.8831E-01	0.	5.7722E-01	1.0641E-02	1.0639E-02	-3.4590E-03
7.7868E-01	0.	7.6345E-01	1.4003E-02	1.3999E-02	-4.5539E-03
8.7091E-01	0.	8.5205E-01	1.5517E-02	1.5510E-02	-5.0489E-03
9.1167E-01	0.	8.8645E-01	1.6132E-02	1.6128E-02	-5.2472E-03
9.1637E-01	0.	8.7585E-01	1.7783E-02	2.1380E-02	-6.9606E-03
9.2567E-01	0.	8.5739E-01	2.1071E-02	3.1790E-02	-1.0343E-02
9.3819E-01	0.	8.4662E-01	2.0814E-02	3.1398E-02	-1.0219E-02
9.5942E-01	0.	8.2944E-01	2.0408E-02	3.0785E-02	-1.0019E-02
1.0188E 00	0.	8.2386E-01	1.9723E-02	2.8943E-02	-9.4174E-03
1.0687E 00	0.	8.5493E-01	1.0327E-02		

*310 STAINLESS STEEL

*310 SS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	5.590000E-01	CR	4.200000E+00	2.500000E-01
NI	4.100000E+00	1.910000E-01			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.1700000E+00	7.9799978E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.0273E-01	0.	1.8825E-01	7.1478E-03	1.4464E-02	-4.7080E-03
2.1982E-01	0.	2.0413E-01	7.7447E-03	1.5671E-02	-5.1014E-03
2.3198E-01	0.	2.1542E-01	8.1718E-03	1.6531E-02	-5.3835E-03
2.2014E-01	0.	2.0441E-01	7.7538E-03	1.5690E-02	-5.1073E-03
2.0007E-01	0.	1.8577E-01	7.0502E-03	1.4261E-02	-4.6447E-03
2.3175E-01	0.	2.1519E-01	8.1593E-03	1.6507E-02	-5.3749E-03
2.8437E-01	0.	2.6408E-01	9.9949E-03	2.0216E-02	-6.5850E-03
3.0717E-01	0.	2.8527E-01	1.0778E-02	2.1807E-02	-7.1003E-03
4.0858E-01	0.	4.0115E-01	7.2461E-03	7.2443E-03	-2.3585E-03
6.7717E-01	0.	6.6459E-01	1.2098E-02	1.2096E-02	-3.9365E-03
8.6435E-01	0.	8.4764E-01	1.5384E-02	1.5380E-02	-5.0063E-03
9.0864E-01	0.	8.8901E-01	1.6010E-02	1.6003E-02	-5.2131E-03
9.4290E-01	0.	9.1658E-01	1.6500E-02	1.6495E-02	-5.3715E-03
9.4860E-01	0.	9.0602E-01	1.8194E-02	2.1873E-02	-7.1269E-03
9.5672E-01	0.	8.8481E-01	2.1506E-02	3.2440E-02	-1.0563E-02
9.7163E-01	0.	8.7448E-01	2.1265E-02	3.2069E-02	-1.0448E-02
9.8836E-01	0.	8.4987E-01	2.0686E-02	3.1198E-02	-1.0162E-02
1.0446E 00	0.	8.3607E-01	1.9805E-02	2.9059E-02	-9.4627E-03
1.1033E 00	0.	8.7203E-01	1.0422E-02		

*316 STAINLESS STEEL

*316 SS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	7.100000E-01	CR	4.200000E+00	1.700000E-01
NI	4.100000E+00	1.200000E-01			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.1900000E+00	8.0300018E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.1160E-01	0.	1.9650E-01	7.4564E-03	1.5088E-02	-4.9113E-03
2.3142E-01	0.	2.1491E-01	8.1515E-03	1.6492E-02	-5.3696E-03
2.4594E-01	0.	2.2840E-01	8.6634E-03	1.7522E-02	-5.7077E-03
2.3131E-01	0.	2.1480E-01	8.1457E-03	1.6482E-02	-5.3655E-03
2.0346E-01	0.	1.8892E-01	7.1685E-03	1.4500E-02	-4.7227E-03
2.3852E-01	0.	2.2148E-01	8.3984E-03	1.6991E-02	-5.5325E-03
2.9429E-01	0.	2.7329E-01	1.0352E-02	2.0937E-02	-6.8207E-03
3.1076E-01	0.	2.8859E-01	1.0918E-02	2.2089E-02	-7.1922E-03
3.9345E-01	0.	3.8629E-01	6.9890E-03	6.9869E-03	-2.2750E-03
6.0825E-01	0.	5.9693E-01	1.0863E-02	1.0860E-02	-3.5350E-03
8.0653E-01	0.	7.9092E-01	1.4359E-02	1.4354E-02	-4.6736E-03
9.0744E-01	0.	8.8799E-01	1.6034E-02	1.6027E-02	-5.2211E-03
9.4922E-01	0.	9.2325E-01	1.6665E-02	1.6660E-02	-5.4245E-03
9.5391E-01	0.	9.1222E-01	1.8368E-02	2.2082E-02	-7.1949E-03
9.6263E-01	0.	8.9244E-01	2.1749E-02	3.2807E-02	-1.0682E-02
9.7505E-01	0.	8.8102E-01	2.1478E-02	3.2392E-02	-1.0551E-02
9.9422E-01	0.	8.6093E-01	2.1002E-02	3.1675E-02	-1.0317E-02
1.0528E 00	0.	8.5305E-01	2.0246E-02	2.9706E-02	-9.6736E-03
1.1050E 00	0.	8.8598E-01	1.0609E-02		

*410 STAINLESS STEEL

*410 SS

TOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	6.840000E-01	CR	4.200000E+00	1.700000E-01
NI	4.100000E+00	1.200000E-01	MO	5.300000E+00	2.500000E-02
C	3.300000E+00	1.000000E-03			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
4.2100000E+00	7.7000014E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.9992E-01	0.	1.8558E-01	7.0773E-03	1.4329E-02	-4.6591E-03
2.1971E-01	0.	2.0399E-01	7.7538E-03	1.5694E-02	-5.1053E-03
2.3467E-01	0.	2.1789E-01	8.2777E-03	1.6751E-02	-5.4507E-03
2.2262E-01	0.	2.0672E-01	7.8388E-03	1.5870E-02	-5.1603E-03
1.9852E-01	0.	1.8432E-01	6.9958E-03	1.4162E-02	-4.6049E-03
2.3265E-01	0.	2.1599E-01	8.2015E-03	1.6606E-02	-5.3979E-03
2.8616E-01	0.	2.6569E-01	1.0077E-02	2.0398E-02	-6.6333E-03
3.0251E-01	0.	2.8086E-01	1.0649E-02	2.1564E-02	-7.0090E-03
3.7990E-01	0.	3.7293E-01	6.7802E-03	6.7781E-03	-2.2034E-03
5.8228E-01	0.	5.7133E-01	1.0444E-02	1.0441E-02	-3.3947E-03
7.6966E-01	0.	7.5412E-01	1.3739E-02	1.3735E-02	-4.4679E-03
8.7023E-01	0.	8.4694E-01	1.5295E-02	1.5288E-02	-4.9769E-03
9.0947E-01	0.	8.7877E-01	1.5878E-02	1.5873E-02	-5.1646E-03
9.0420E-01	0.	8.6283E-01	1.7443E-02	2.0972E-02	-6.8276E-03
9.0827E-01	0.	8.4173E-01	2.0584E-02	3.1056E-02	-1.0104E-02
9.2021E-01	0.	8.3104E-01	2.0332E-02	3.0670E-02	-9.9818E-03
9.3850E-01	0.	8.1206E-01	1.9884E-02	2.9995E-02	-9.7619E-03
9.9374E-01	0.	8.0424E-01	1.9167E-02	2.8129E-02	-9.1519E-03
1.0427E 00	0.	8.3480E-01	1.0044E-02		

*430 STAINLESS STEEL

*430 SS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	8.388000E-01	CR	4.200000E+00	1.600000E-01
C	3.300000E+00	1.200000E-03			

FORMULA	DENSITY	FUEL	DENSITY	TEMPERATURE
F	RHO (G/CC)	RHOF	(G/CC)	T (DEG K)
4.2300000E+00	7.7499983E 00	0.		2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE	MULTIPLY		SCATTER		
SG(N)	NUSGF(N)	SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
2.0522E-01	0.	1.9033E-01	7.3427E-03	1.4869E-02	-4.8329E-03
2.2558E-01	0.	2.0924E-01	8.0631E-03	1.6323E-02	-5.3080E-03
2.4119E-01	0.	2.2369E-01	8.6350E-03	1.7476E-02	-5.6849E-03
2.2514E-01	0.	2.0876E-01	8.0754E-03	1.6355E-02	-5.3143E-03
1.9174E-01	0.	1.7767E-01	6.9309E-03	1.4039E-02	-4.5599E-03
2.2713E-01	0.	2.1045E-01	8.2106E-03	1.6634E-02	-5.4012E-03
2.7930E-01	0.	2.5884E-01	1.0079E-02	2.0409E-02	-6.6320E-03
2.8586E-01	0.	2.6486E-01	1.0331E-02	2.0930E-02	-6.7955E-03
3.3906E-01	0.	3.3270E-01	6.2101E-03	6.2079E-03	-2.0164E-03
4.9782E-01	0.	4.8829E-01	9.1296E-03	9.1270E-03	-2.9653E-03
6.8238E-01	0.	6.6886E-01	1.2408E-02	1.2404E-02	-4.0334E-03
8.0293E-01	0.	7.8544E-01	1.4448E-02	1.4442E-02	-4.6989E-03
8.4736E-01	0.	8.2397E-01	1.5139E-02	1.5136E-02	-4.9212E-03
8.5126E-01	0.	8.1381E-01	1.6683E-02	2.0059E-02	-6.5272E-03
8.6180E-01	0.	7.9873E-01	1.9819E-02	2.9906E-02	-9.7247E-03
8.7246E-01	0.	7.8826E-01	1.9566E-02	2.9522E-02	-9.6007E-03
8.9850E-01	0.	7.7916E-01	1.9348E-02	2.9190E-02	-9.4947E-03
9.6019E-01	0.	7.8165E-01	1.8876E-02	2.7704E-02	-9.0099E-03
1.0013E 00	0.	8.0704E-01	9.8356E-03		

*446 STAINLESS STEEL

*446 SS

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
FE	4.000000E+00	6.975000E-01	NB	5.360000E+00	5.000000E-03
CR	4.200000E+00	2.700000E-01	NI	4.100000E+00	5.000000E-03
SI	4.500000E+00	1.000000E-02	N	6.300000E+00	2.500000E-03
MN	4.400000E+00	8.000000E-03	C	3.300000E+00	2.000000E-03

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	7.6000012E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGSO(N,N)	SGS1(N,N)	SGSO(N,N+1)	SGS1(N,N+1)
1.9322E-01	0.	1.7851E-01	7.2415E-03	1.4693E-02	-4.7569E-03
2.1082E-01	0.	1.9481E-01	7.8790E-03	1.5981E-02	-5.1769E-03
2.2464E-01	0.	2.0755E-01	8.4135E-03	1.7062E-02	-5.5284E-03
2.1303E-01	0.	1.9663E-01	8.0630E-03	1.6366E-02	-5.2944E-03
1.8712E-01	0.	1.7247E-01	7.1942E-03	1.4610E-02	-4.7209E-03
2.1768E-01	0.	2.0071E-01	8.3294E-03	1.6916E-02	-5.4657E-03
2.6353E-01	0.	2.4300E-01	1.0074E-02	2.0454E-02	-6.6117E-03
2.7222E-01	0.	2.5085E-01	1.0473E-02	2.1279E-02	-6.8696E-03
3.2985E-01	0.	3.2326E-01	6.4085E-03	6.4067E-03	-2.0698E-03
5.8836E-01	0.	5.7664E-01	1.1205E-02	1.1202E-02	-3.6275E-03
7.6280E-01	0.	7.4702E-01	1.4398E-02	1.4394E-02	-4.6645E-03
7.4947E-01	0.	7.3197E-01	1.4076E-02	1.4070E-02	-4.5589E-03
7.6622E-01	0.	7.4329E-01	1.4284E-02	1.4281E-02	-4.6241E-03
7.7098E-01	0.	7.3408E-01	1.5746E-02	1.8941E-02	-6.1370E-03
7.8285E-01	0.	7.2034E-01	1.8711E-02	2.8264E-02	-9.1518E-03
7.9682E-01	0.	7.1238E-01	1.8521E-02	2.7975E-02	-9.0592E-03
8.2669E-01	0.	7.0585E-01	1.8372E-02	2.7749E-02	-8.9862E-03
8.9047E-01	0.	7.0834E-01	1.7949E-02	2.6370E-02	-8.5378E-03
9.3399E-01	0.	7.3335E-01	9.4018E-03		

*TEFLON

*TEFLON

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
F	6.000000E+00	7.598000E-01	C	3.300000E+00	2.402000E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
3.3300000E+00	2.1999983E 00	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
9.4741E-02	0.	7.1051E-02	1.1288E-02	2.3690E-02	-7.1558E-03
1.0799E-01	0.	8.1435E-02	1.2665E-02	2.6557E-02	-8.0366E-03
1.4443E-01	0.	1.0928E-01	1.6773E-02	3.5151E-02	-1.0650E-02
1.8220E-01	0.	1.3878E-01	2.0741E-02	4.3419E-02	-1.3186E-02
2.0737E-01	0.	1.5729E-01	2.3904E-02	5.0077E-02	-1.5185E-02
3.0569E-01	0.	2.3363E-01	3.4446E-02	7.2065E-02	-2.1913E-02
4.7106E-01	0.	3.6362E-01	5.1451E-02	1.0744E-01	-3.2797E-02
5.2513E-01	0.	4.0543E-01	5.7321E-02	1.1970E-01	-3.6540E-02
4.1607E-01	0.	3.9141E-01	2.4651E-02	2.4658E-02	-7.4929E-03
3.1801E-01	0.	2.9819E-01	1.9811E-02	1.9818E-02	-5.9880E-03
3.0741E-01	0.	2.8814E-01	1.9268E-02	1.9274E-02	-5.8200E-03
3.0477E-01	0.	2.8562E-01	1.9132E-02	1.9138E-02	-5.7780E-03
3.0478E-01	0.	2.8562E-01	1.9132E-02	1.9138E-02	-5.7780E-03
3.0614E-01	0.	2.8043E-01	2.1174E-02	2.5658E-02	-7.7454E-03
3.0750E-01	0.	2.6871E-01	2.5183E-02	3.8698E-02	-1.1680E-02
3.1022E-01	0.	2.7109E-01	2.5361E-02	3.8970E-02	-1.1764E-02
3.1297E-01	0.	2.7347E-01	2.5539E-02	3.9242E-02	-1.1848E-02
3.2436E-01	0.	2.8560E-01	2.5693E-02	3.8343E-02	-1.1583E-02
3.2723E-01	0.	3.2668E-01	1.4118E-02		

*THERMOFLEX

*THERMOFLEX

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
O	3.600000E+00	4.942000E-01	FE	4.000000E+00	4.200000E-03
SI	5.500000E+00	2.337000E-01	K	7.400000E+00	3.300000E-03
AL	5.100000E+00	2.223000E-01	CA	5.400000E+00	2.100000E-03
TI	4.300000E+00	4.020000E-02			

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
	2.2399994E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
7.8496E-03	0.	5.2437E-03	9.7549E-04	1.9208E-03	-6.0763E-06
1.2583E-02	0.	8.6831E-03	1.4964E-03	2.9394E-03	-1.7847E-04
1.4000E-02	0.	9.3712E-03	1.6650E-03	3.1806E-03	3.3042E-05
1.5488E-02	0.	1.0637E-02	1.8059E-03	3.4986E-03	-1.1570E-04
2.4472E-02	0.	1.7722E-02	2.8974E-03	5.9292E-03	-1.0723E-03
2.8737E-02	0.	1.9810E-02	3.5213E-03	6.9804E-03	-6.9051E-04
2.4838E-02	0.	1.7233E-02	3.0291E-03	6.0299E-03	-6.2990E-04
2.6003E-02	0.	2.0777E-02	2.5135E-03	5.2249E-03	-1.6101E-03
2.6288E-02	0.	2.4998E-02	1.2893E-03	1.2896E-03	-3.9754E-04
2.1837E-02	0.	2.0707E-02	1.1276E-03	1.1278E-03	-3.4533E-04
2.0202E-02	0.	1.9101E-02	1.0952E-03	1.0954E-03	-3.3580E-04
2.0130E-02	0.	1.9020E-02	1.0946E-03	1.0949E-03	-3.3560E-04
2.0245E-02	0.	1.9105E-02	1.0978E-03	1.0981E-03	-3.3662E-04
2.0372E-02	0.	1.8817E-02	1.2133E-03	1.4681E-03	-4.5008E-04
2.0517E-02	0.	1.8146E-02	1.4415E-03	2.2068E-03	-6.7660E-04
2.0620E-02	0.	1.8142E-02	1.4413E-03	2.2065E-03	-6.7650E-04
2.0845E-02	0.	1.8182E-02	1.4467E-03	2.2150E-03	-6.7903E-04
2.1901E-02	0.	1.8966E-02	1.4693E-03	2.1858E-03	-6.6992E-04
2.3049E-02	0.	2.2084E-02	8.3624E-04		

RELIABILITY LIMITATION: First-significant-figure uncertainty in high energy scatter cross sections of aluminum content.

*THERMOFLEX

SCATTER
L N1 N2
SGSL(N1,N2)

*THERMOFLEX

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
5.3090E-04	1.5409E-04	0.	0.	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	5.2388E-04
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
3.1775E-04	1.1866E-04	1.1193E-07	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	6.0836E-04	3.6899E-04	2.2380E-04
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
1.3574E-04	1.1114E-04	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
6.1256E-04	3.7154E-04	2.2535E-04	1.4352E-04	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	7.1711E-04	1.0273E-04	0.	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	1.0183E-03	9.2898E-04	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	1.5748E-03	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	0.	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
0.	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	0.	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	0.
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
0.	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
0.	0.	0.	0.	0.	0.
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
0.	0.	0.	0.	0.	0.
0 16 18	0 16 19	0 17 19			
0.	0.	0.			

*THERMOFLEX

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*THERMOFLEX

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
-1.6993E-04	-1.1924E-04	0.	0.	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	2.5089E-05
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-1.3774E-04	-9.5358E-05	-1.1148E-07	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	2.5038E-04	5.4514E-05	-2.3903E-05
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-4.9961E-05	-7.9002E-05	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
1.7692E-04	-1.7993E-05	-8.7598E-05	-1.0792E-04	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	-3.1801E-04	-8.6285E-05	0.	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	9.9990E-05	-4.5485E-04	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-4.2229E-04	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	0.	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
0.	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	0.	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	0.
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
0.	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
0.	0.	0.	0.	0.	0.
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
0.	0.	0.	0.	0.	0.
1 16 18	1 16 19	1 17 19			
0.	0.	0.			

*TUNGSTEN CARBIDE

*WC

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
W	8.500000E+00	9.387000E-01	C	3.300000E+00	6.130000E-02

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
8.5300000E+00	1.5630006E 01	0.	2.9316000E 02 1

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
3.1123E-01	0.	2.8404E-01	1.2966E-02	2.7136E-02	-8.2337E-03
3.4969E-01	0.	3.2093E-01	1.3751E-02	2.8697E-02	-8.7505E-03
4.0618E-01	0.	3.7082E-01	1.6842E-02	3.5276E-02	-1.0691E-02
4.2903E-01	0.	3.9065E-01	1.8342E-02	3.8268E-02	-1.1666E-02
4.5308E-01	0.	4.0703E-01	2.1940E-02	4.5906E-02	-1.3919E-02
4.9204E-01	0.	4.3643E-01	2.6410E-02	5.5437E-02	-1.6712E-02
5.3726E-01	0.	4.7363E-01	3.0162E-02	6.3400E-02	-1.9066E-02
5.8250E-01	0.	5.1226E-01	3.3327E-02	6.9942E-02	-2.1084E-02
6.5660E-01	0.	6.3653E-01	1.9460E-02	1.9439E-02	-5.8503E-03
8.0425E-01	0.	7.8142E-01	2.1147E-02	2.1138E-02	-6.3668E-03
9.5134E-01	0.	9.2480E-01	2.1972E-02	2.1935E-02	-6.6581E-03
1.1034E 00	0.	1.0682E 00	2.2783E-02	2.2733E-02	-6.9356E-03
1.8210E 00	0.	8.2921E-01	2.1421E-02	2.1404E-02	-6.4633E-03
1.5271E 00	0.	4.8551E-01	2.1674E-02	2.6277E-02	-7.8444E-03
6.3316E-01	0.	4.5063E-01	2.5661E-02	3.9531E-02	-1.1786E-02
7.0647E-01	0.	4.3161E-01	2.5540E-02	3.9319E-02	-1.1736E-02
8.5789E-01	0.	4.3161E-01	2.5540E-02	3.9319E-02	-1.1736E-02
1.1337E 00	0.	4.3533E-01	2.5125E-02	3.7562E-02	-1.1211E-02
1.2161E 00	0.	4.0605E-01	1.3255E-02		

*WATER

*H2O

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
H	2.040000E+00	1.119020E-01	O	3.600000E+00	8.880980E-01

FORMULA F	DENSITY RHO (G/CC)	FUEL DENSITY RHOF (G/CC)	TEMPERATURE T (DEG K)
2.5100000E+00	9.9799999E-01	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
9.9451E-02	0.	3.3559E-02	1.7798E-02	2.9253E-02	1.7330E-02
1.6853E-01	0.	6.5922E-02	2.8799E-02	4.8444E-02	2.4033E-02
2.1759E-01	0.	7.6739E-02	3.8442E-02	6.3589E-02	3.5961E-02
2.8300E-01	0.	9.4495E-02	5.0797E-02	8.3367E-02	4.9899E-02
4.2099E-01	0.	1.6273E-01	7.2231E-02	1.2126E-01	6.1171E-02
5.2344E-01	0.	1.9675E-01	9.0650E-02	1.5146E-01	7.9349E-02
6.0655E-01	0.	1.9972E-01	1.0930E-01	1.7903E-01	1.0860E-01
7.2921E-01	0.	2.2358E-01	1.3388E-01	4.4128E-01	2.6013E-01
1.0563E 00	0.	6.4614E-01	4.3179E-01	3.5565E-01	1.8471E-01
1.3750E 00	0.	8.2707E-01	5.7700E-01	4.7479E-01	2.4872E-01
1.4452E 00	0.	8.6686E-01	6.0893E-01	5.0099E-01	2.6280E-01
1.4604E 00	0.	8.7538E-01	6.1578E-01	5.0661E-01	2.6581E-01
1.4609E 00	0.	8.7538E-01	6.1548E-01	4.5594E-01	2.4958E-01
1.4785E 00	0.	7.6666E-01	5.5116E-01	4.5260E-01	2.7527E-01
1.5001E 00	0.	6.1473E-01	4.4865E-01	5.6334E-01	3.5616E-01
1.6658E 00	0.	6.7764E-01	4.9342E-01	6.3167E-01	3.6787E-01
2.1275E 00	0.	8.6264E-01	6.2646E-01	8.5738E-01	4.1315E-01
2.7740E 00	0.	1.2428E 00	8.2350E-01	1.5160E 00	6.6134E-02
3.1781E 00	0.	3.1586E 00	9.0828E-01		

*WATER

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*H2O

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.4416E-02	8.7438E-03	5.3034E-03	3.2167E-03	1.9510E-03	1.1833E-03
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
1.5772E-03	2.1346E-04	2.8907E-05	3.8982E-06	5.3074E-07	1.2811E-07
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
-7.3205E-08	0.	0.	0.	0.	2.1311E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.2926E-02	7.8398E-03	4.7550E-03	2.8841E-03	3.8441E-03	5.2024E-04
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
7.0368E-05	9.5501E-06	1.3257E-06	1.0822E-07	5.4108E-08	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	3.0399E-02	1.8438E-02	1.1183E-02
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
6.7830E-03	9.0408E-03	1.2236E-03	1.6558E-04	2.2461E-05	2.9330E-06
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
4.2451E-07	7.7184E-08	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
4.1368E-02	2.5091E-02	1.5218E-02	2.0284E-02	2.7452E-03	3.7145E-04
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
5.0311E-05	6.8797E-06	7.3524E-07	1.5755E-07	2.6258E-07	-1.5755E-07
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	5.3904E-02	3.2694E-02	4.3577E-02	5.8975E-03
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
7.9811E-04	1.0809E-04	1.4576E-05	1.7792E-06	3.4216E-07	6.8431E-08
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
3.4216E-07	-2.7372E-07	0.	6.8946E-02	9.1897E-02	1.2437E-02
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
1.6832E-03	2.2775E-04	3.0635E-05	3.9388E-06	7.0022E-07	2.6258E-07
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
8.7528E-08	0.	0.	1.9697E-01	2.6656E-02	3.6076E-03
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
4.8826E-04	6.6224E-05	7.8513E-06	1.5930E-06	5.6893E-07	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
1.1379E-07	0.	5.5628E-02	7.5284E-03	1.0188E-03	1.3805E-04
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
1.6851E-05	2.8805E-06	1.0082E-06	4.3207E-07	7.2012E-07	-4.3207E-07
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
4.7108E-02	6.3755E-03	8.6270E-04	1.0495E-04	1.9092E-05	6.9931E-06
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
2.6085E-06	9.4351E-07	4.4401E-07	6.3233E-02	8.5576E-03	1.0404E-03
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
1.8897E-04	6.9619E-05	2.5627E-05	9.6103E-06	5.0659E-06	6.6779E-02
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
8.1199E-03	1.4742E-03	5.4216E-04	1.9952E-04	7.5765E-05	4.0361E-05
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
6.0681E-02	1.1017E-02	4.0530E-03	1.4910E-03	5.6543E-04	3.0213E-04
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
8.1405E-02	2.9947E-02	1.1017E-02	4.1793E-03	2.2320E-03	1.6279E-01
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
5.9888E-02	2.2718E-02	1.2135E-02	2.0168E-01	7.6506E-02	4.0564E-02
0 16 18	0 16 19	0 17 19			
2.3389E-01	1.1715E-01	3.9839E-01			

*WATER

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*H2O

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
8.9808E-03	4.2461E-03	2.0087E-03	9.5123E-04	4.5117E-04	2.1455E-04
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
1.8751E-04	1.1909E-05	1.5451E-06	4.3971E-07	1.4657E-07	-2.0077E-07
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
3.2291E-07	0.	0.	0.	0.	1.3275E-02
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
6.2763E-03	2.9689E-03	1.4057E-03	6.6660E-04	5.7606E-04	3.3311E-05
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
3.3582E-06	8.3051E-07	2.5277E-07	7.2219E-08	1.2638E-07	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	1.8934E-02	8.9499E-03	4.2325E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
2.0030E-03	1.7172E-03	9.2285E-05	7.1068E-06	1.2617E-06	3.8624E-07
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
1.2875E-07	5.1498E-08	1.2875E-07	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
2.5762E-02	1.2176E-02	5.7571E-03	4.9166E-03	2.5458E-04	1.6326E-05
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
2.1371E-06	5.2553E-07	2.4525E-07	3.5035E-08	-2.3211E-07	4.0728E-07
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	3.3568E-02	1.5865E-02	1.3526E-02	6.8885E-04
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
3.9966E-05	4.1313E-06	9.1300E-07	2.7390E-07	9.1300E-08	9.1300E-08
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
-1.8545E-07	3.2240E-07	0.	4.2936E-02	3.6574E-02	1.8461E-03
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
1.0122E-04	8.4080E-06	1.7517E-06	3.5034E-07	2.3356E-07	5.8389E-08
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
5.8389E-08	1.7517E-07	0.	1.0058E-01	5.0538E-03	2.6859E-04
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
1.9585E-05	3.3021E-06	7.5911E-07	5.3138E-07	7.5911E-08	7.5911E-08
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
3.0364E-07	0.	1.3484E-02	6.9866E-04	4.4870E-05	5.9090E-06
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
1.4412E-06	3.8433E-07	1.9216E-07	2.8825E-07	-6.5456E-07	1.0389E-06
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
9.3870E-03	4.9540E-04	3.4988E-05	4.7576E-06	1.3699E-06	8.1454E-07
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
4.8132E-07	3.3322E-07	6.2941E-07	1.2602E-02	6.6563E-04	4.2641E-05
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
7.4547E-06	3.6280E-06	1.7394E-06	1.1431E-06	1.9382E-06	1.3309E-02
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
6.5705E-04	7.0304E-05	2.0942E-05	7.9252E-06	3.8839E-06	5.0386E-06
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
1.2658E-02	1.1863E-03	2.7908E-04	7.0997E-05	2.1684E-05	1.6270E-05
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
2.2947E-02	5.0646E-03	1.0963E-03	2.2865E-04	1.9795E-05	6.2106E-02
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
1.3858E-02	3.1624E-03	8.1760E-04	7.5601E-02	1.4124E-02	-1.5221E-03
1 16 18	1 16 19	1 17 19			
5.5516E-02	-2.3794E-02	-6.9789E-02			

*HEAVY WATER

*D2O

ATOM	CODE	MASS FRACTION	ATOM	CODE	MASS FRACTION
D	3.100000E+00	2.011327E-01	O	3.600000E+00	7.988674E-01

FORMULA	DENSITY	FUEL DENSITY	TEMPERATURE
F	RHO (G/CC)	RHOF (G/CC)	T (DEG K)
3.1100000E+00	1.1110002E 00	0.	2.9316000E 02 101

PROBABILITY/PATH (/CM)

COLLIDE SG(N)	MULTIPLY NUSGF(N)	SCATTER			
		SGS0(N,N)	SGS1(N,N)	SGS0(N,N+1)	SGS1(N,N+1)
1.0190E-01	0.	3.6199E-02	1.8774E-02	3.3063E-02	1.3969E-02
1.6505E-01	0.	6.8138E-02	2.8791E-02	5.1599E-02	1.7654E-02
2.0214E-01	0.	7.7370E-02	3.6294E-02	6.4441E-02	2.4799E-02
2.4323E-01	0.	9.0855E-02	4.4054E-02	7.8003E-02	3.1014E-02
3.4130E-01	0.	1.5135E-01	5.7755E-02	1.0455E-01	3.1039E-02
3.7805E-01	0.	1.7177E-01	6.3275E-02	1.1497E-01	3.2228E-02
3.5333E-01	0.	1.5180E-01	6.0621E-02	1.0924E-01	3.4684E-02
3.4915E-01	0.	1.4864E-01	6.0138E-02	1.9931E-01	2.0970E-02
3.4915E-01	0.	2.6061E-01	8.7057E-02	8.8233E-02	-6.7910E-03
3.4915E-01	0.	2.6061E-01	8.7057E-02	8.8233E-02	-6.7910E-03
3.4915E-01	0.	2.6061E-01	8.7057E-02	8.8233E-02	-6.7910E-03
3.4915E-01	0.	2.6061E-01	8.7057E-02	8.4149E-02	-3.7883E-03
3.4915E-01	0.	2.3655E-01	8.5411E-02	9.1751E-02	5.9454E-03
3.4915E-01	0.	2.0275E-01	7.7634E-02	1.1573E-01	1.8846E-02
3.6085E-01	0.	2.0759E-01	8.1173E-02	1.2098E-01	2.0072E-02
3.9176E-01	0.	2.2076E-01	9.0341E-02	1.3831E-01	2.2066E-02
4.3956E-01	0.	2.4926E-01	1.0522E-01	1.9028E-01	2.7977E-03
4.6647E-01	0.	4.6644E-01	1.1663E-01		

*HEAVY WATER

 SCATTER
 L N1 N2
 SGSL(N1,N2)

*D2O

0 1 3	0 1 4	0 1 5	0 1 6	0 1 7	0 1 8
1.6722E-02	1.0143E-02	5.3520E-03	4.2611E-04	0.	0.
0 1 9	0 1 10	0 1 11	0 1 12	0 1 13	0 1 14
0.	0.	0.	0.	0.	0.
0 1 15	0 1 16	0 1 17	0 1 18	0 1 19	0 2 4
0.	0.	0.	0.	0.	2.3214E-02
0 2 5	0 2 6	0 2 7	0 2 8	0 2 9	0 2 10
1.4080E-02	7.4296E-03	5.9152E-04	0.	0.	0.
0 2 11	0 2 12	0 2 13	0 2 14	0 2 15	0 2 16
0.	0.	0.	0.	0.	0.
0 2 17	0 2 18	0 2 19	0 3 5	0 3 6	0 3 7
0.	0.	0.	3.0905E-02	1.8745E-02	9.8911E-03
0 3 8	0 3 9	0 3 10	0 3 11	0 3 12	0 3 13
7.8749E-04	0.	0.	0.	0.	0.
0 3 14	0 3 15	0 3 16	0 3 17	0 3 18	0 3 19
0.	0.	0.	0.	0.	0.
0 4 6	0 4 7	0 4 8	0 4 9	0 4 10	0 4 11
3.8101E-02	2.3110E-02	1.2195E-02	9.7089E-04	0.	0.
0 4 12	0 4 13	0 4 14	0 4 15	0 4 16	0 4 17
0.	0.	0.	0.	0.	0.
0 4 18	0 4 19	0 5 7	0 5 8	0 5 9	0 5 10
0.	0.	4.3746E-02	2.6533E-02	1.5116E-02	0.
0 5 11	0 5 12	0 5 13	0 5 14	0 5 15	0 5 16
0.	0.	0.	0.	0.	0.
0 5 17	0 5 18	0 5 19	0 6 8	0 6 9	0 6 10
0.	0.	0.	4.6780E-02	4.4538E-02	0.
0 6 11	0 6 12	0 6 13	0 6 14	0 6 15	0 6 16
0.	0.	0.	0.	0.	0.
0 6 17	0 6 18	0 6 19	0 7 9	0 7 10	0 7 11
0.	0.	0.	9.2282E-02	0.	0.
0 7 12	0 7 13	0 7 14	0 7 15	0 7 16	0 7 17
0.	0.	0.	0.	0.	0.
0 7 18	0 7 19	0 8 10	0 8 11	0 8 12	0 8 13
0.	0.	1.2046E-03	0.	0.	0.
0 8 14	0 8 15	0 8 16	0 8 17	0 8 18	0 8 19
0.	0.	0.	0.	0.	0.
0 9 11	0 9 12	0 9 13	0 9 14	0 9 15	0 9 16
3.0115E-04	0.	0.	0.	0.	0.
0 9 17	0 9 18	0 9 19	0 10 12	0 10 13	0 10 14
0.	0.	0.	3.0115E-04	0.	0.
0 10 15	0 10 16	0 10 17	0 10 18	0 10 19	0 11 13
0.	0.	0.	0.	0.	3.0115E-04
0 11 14	0 11 15	0 11 16	0 11 17	0 11 18	0 11 19
0.	0.	0.	0.	0.	0.
0 12 14	0 12 15	0 12 16	0 12 17	0 12 18	0 12 19
3.0115E-04	0.	0.	0.	0.	0.
0 13 15	0 13 16	0 13 17	0 13 18	0 13 19	0 14 16
4.3849E-03	0.	0.	0.	0.	2.0448E-02
0 14 17	0 14 18	0 14 19	0 15 17	0 15 18	0 15 19
4.0154E-04	0.	0.	3.0069E-02	6.0231E-04	0.
0 16 18	0 16 19	0 17 19			
3.1946E-02	3.2781E-04	3.2673E-02			

*HEAVY WATER

SCATTER
L N1 N2
SGSL(N1,N2)

*D20

1 1 3	1 1 4	1 1 5	1 1 6	1 1 7	1 1 8
2.0639E-03	-3.1724E-03	-3.8515E-03	-3.9701E-04	0.	0.
1 1 9	1 1 10	1 1 11	1 1 12	1 1 13	1 1 14
0.	0.	0.	0.	0.	0.
1 1 15	1 1 16	1 1 17	1 1 18	1 1 19	1 2 4
0.	0.	0.	0.	0.	2.8651E-03
1 2 5	1 2 6	1 2 7	1 2 8	1 2 9	1 2 10
-4.4039E-03	-5.3466E-03	-5.5112E-04	0.	0.	0.
1 2 11	1 2 12	1 2 13	1 2 14	1 2 15	1 2 16
0.	0.	0.	0.	0.	0.
1 2 17	1 2 18	1 2 19	1 3 5	1 3 6	1 3 7
0.	0.	0.	3.8143E-03	-5.8629E-03	-7.1180E-03
1 3 8	1 3 9	1 3 10	1 3 11	1 3 12	1 3 13
-7.3371E-04	0.	0.	0.	0.	0.
1 3 14	1 3 15	1 3 16	1 3 17	1 3 18	1 3 19
0.	0.	0.	0.	0.	0.
1 4 6	1 4 7	1 4 8	1 4 9	1 4 10	1 4 11
4.7026E-03	-7.2282E-03	-8.7756E-03	-9.0457E-04	0.	0.
1 4 12	1 4 13	1 4 14	1 4 15	1 4 16	1 4 17
0.	0.	0.	0.	0.	0.
1 4 18	1 4 19	1 5 7	1 5 8	1 5 9	1 5 10
0.	0.	5.3993E-03	-8.2991E-03	-1.1114E-02	0.
1 5 11	1 5 12	1 5 13	1 5 14	1 5 15	1 5 16
0.	0.	0.	0.	0.	0.
1 5 17	1 5 18	1 5 19	1 6 8	1 6 9	1 6 10
0.	0.	0.	5.7737E-03	-2.0760E-02	0.
1 6 11	1 6 12	1 6 13	1 6 14	1 6 15	1 6 16
0.	0.	0.	0.	0.	0.
1 6 17	1 6 18	1 6 19	1 7 9	1 7 10	1 7 11
0.	0.	0.	-1.5144E-02	0.	0.
1 7 12	1 7 13	1 7 14	1 7 15	1 7 16	1 7 17
0.	0.	0.	0.	0.	0.
1 7 18	1 7 19	1 8 10	1 8 11	1 8 12	1 8 13
0.	0.	-1.1224E-03	0.	0.	0.
1 8 14	1 8 15	1 8 16	1 8 17	1 8 18	1 8 19
0.	0.	0.	0.	0.	0.
1 9 11	1 9 12	1 9 13	1 9 14	1 9 15	1 9 16
-2.8059E-04	0.	0.	0.	0.	0.
1 9 17	1 9 18	1 9 19	1 10 12	1 10 13	1 10 14
0.	0.	0.	-2.8059E-04	0.	0.
1 10 15	1 10 16	1 10 17	1 10 18	1 10 19	1 11 13
0.	0.	0.	0.	0.	-2.8059E-04
1 11 14	1 11 15	1 11 16	1 11 17	1 11 18	1 11 19
0.	0.	0.	0.	0.	0.
1 12 14	1 12 15	1 12 16	1 12 17	1 12 18	1 12 19
-2.8059E-04	0.	0.	0.	0.	0.
1 13 15	1 13 16	1 13 17	1 13 18	1 13 19	1 14 16
-3.2832E-03	0.	0.	0.	0.	-1.0997E-02
1 14 17	1 14 18	1 14 19	1 15 17	1 15 18	1 15 19
-3.7412E-04	0.	0.	-1.5934E-02	-5.6118E-04	0.
1 16 18	1 16 19	1 17 19			
-1.7045E-02	-3.1165E-04	-1.8445E-02			