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IDO-16954
December 1963

DOPPLER BROADENING OF THE TOTAL, FISSION, CAPTURE, AND
SCATTERING NEUTRON CROSS SECTIONS OF Pu-241

MASTER

N. H. Marshall and O. D. Simpson

PHILLIPS
PETROLEUM
COMPANY

ATOMIC ENERGY DIVISION

NATIONAL REACTOR TESTING STATION
US ATOMIC ENERGY COMMISSION

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Printed in USA

IDO-16954
AEC Research and Development Report
Physics
TID-4500 (24th Ed.)
Issued: December 16, 1963

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Nuclear Physics Branch

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ABSTRACT

The Doppler distortion of the total, fission, capture, and scattering neutron cross sections obtained from the multilevel analysis of the total neutron cross section of Pu-241⁽¹⁾ are presented. The extent of the Doppler distortion of the resonances below 11 eV at temperatures ranging from 0 to 3000 degrees centigrade has been studied. Tables of cross sections versus neutron energy for different sample temperatures are given.

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I. INTRODUCTION

Interest has been expressed in the low energy partial neutron cross sections of Pu-241 because of their practical importance to the U-238-Pu-239 breeding cycle. The authors therefore decided to publish the capture, fission, and scattering cross sections as predicted from the resonance parameters obtained from a multilevel analysis of the Pu-241 total cross sections. The experimental total neutron cross sections of Pu-241⁽¹⁾ have been published previously in tabular form. Additional tabulations have been made and a study has been conducted to determine the extent of the Doppler effect on the fission, capture, and scattering cross sections as predicted from the multilevel resonance parameters.⁽¹⁾ These parameters were used to compute the partial cross sections as a function of neutron energy.

II. DISCUSSION

Experimental cross section data are generally not adequate to describe reactor behavior for two reasons: (1) Instrumental resolution may not be small compared to the width of the level, which tends to distort the cross section by reducing the peak values and by widening the levels; (2) Cross section measurements are usually made at temperatures different from those at which the reactor would be operated.

The cross sections in Figs. 1 through 4 represented by curve A were computed from the Reich-Moore multilevel formula⁽²⁾ from 0.02 to 11 eV.

These cross sections were then convoluted with Doppler functions corresponding to the various sample temperatures and are shown by the other curves. Tabular data of the total, fission, capture, and scattering cross sections as a function of neutron energy are given in the Appendix. The Doppler broadening of the theoretical cross section curves was performed as follows. If it is assumed that the motion of the target can be represented by that of a gas, with a Debye corrected effective temperature, then the Doppler corrected cross section $\sigma(v_n)$, i.e., that which would be measured with perfect instrumental resolution, is related to the true cross section $\sigma(v)$ by the expression

$$v_n \sigma(v_n) = \left(\frac{1}{2\pi}\right)^{\frac{3}{2}} \left(\frac{M}{kT}\right)^{\frac{1}{2}} \int_{-\infty}^{\infty} v \sigma(v) e^{-\frac{M}{2kT} (\bar{v}_n - \bar{v})^2} d\bar{v}. \quad (1)$$

Here $\bar{v}_n$ is the velocity of the neutron in laboratory co-ordinates, $\bar{v}$ is the velocity of the neutron relative to the target nucleus, $v_n = \bar{v}_n$ and $v = \bar{v}$ are the respective speeds, M is the mass of the target nucleus, k is Boltzmann's constant, and T is the effective temperature of the sample, which will be discussed in greater detail below. Eq. (1) can be rewritten in terms of the neutron and relative speeds as follows:

$$v_n \sigma(v_n) = \left(\frac{M}{2\pi kT}\right)^{\frac{1}{2}} \int_0^{\infty} \frac{v^2 \sigma(v)}{v_n} \left[e^{-\frac{M}{2kT} (v_n - v)^2} - e^{-\frac{M}{2kT} (v_n + v)^2} \right] dv \quad (2)$$

In performing this convolution numerically, the integral was replaced by a summation, which is a sufficiently accurate approximation for neutron energies above 0.01 eV.

$$v_n \sigma(v_n) = \sum_j v_j \sigma(v_j) P(v_n - v_j), \quad (3)$$

where $P(v_n - v_j)$ is a step-function approximation to the normalized Gaussian function

$$\left(\frac{M}{2\pi kT}\right)^{\frac{1}{2}} e^{-\frac{M}{2kT} (v_n - v)^2}$$

Now one of the convenient properties of the function $P(v_n - v_j)$ is that it does not depend on v_n , but only on the difference $(v_n - v_j)$. In performing the convolution numerically, the functions $P(v_n - v_j)$ and $v_j \sigma(v_j)$ must have the same spacing. In order to compute $v_j \sigma(v_j)$ at the proper values of v_j it is convenient to perform a four-point Lagrange interpolation of the calculated curve $\sigma(E)\sqrt{E}$ at energies E_j given by the expression

$$E_j = (E_0^{\frac{1}{2}} + jk)^2 \quad (4)$$

where E_0 is the initial energy under consideration, and k is a constant which is determined by the width and spacing of the points defining the function $P(v_n - v_j)$.

Plutonium oxide has a Debye temperature of $403 \pm 8^\circ K^{(3)}$ at room temperature. The Doppler functions for the various sample temperatures were obtained by utilizing the Debye temperature correction.⁽⁴⁾ For temperatures where the sample temperature was greater than $500^\circ C$ the effective temperature was assumed equal to the sample temperature. The calculated cross section curves in the figures do not include resolution effects, and are thus not directly comparable to the measured cross section data.⁽¹⁾ It may be pointed out that the curves in the figures correspond to the cross sections which should be used to describe reactor behavior at the temperature indicated. Similar effects are present in the other fissile nuclei and should also be considered in reactor calculations.

It should be noted that the theoretical data presented will probably not describe actual experimental data if it were available. For example, in the analysis of the total data, the thermal fission cross section was assumed to be 1010 barns. More recent measurements indicate the thermal value to be closer to 965 barns. This is a discrepancy of approximately 5%. Recent fission measurements of Pu-241⁽⁵⁾ indicate that the theoretical fission data (as predicted from the total data) are in good agreement with the experimental fission data, of the order of 10-20 per cent. Since no experimental data were available for the capture and scattering cross sections of Pu-241, it is impossible to estimate the accuracy of the tabular data presented. In the analysis of the total cross section data, the capture widths were assumed to be constant (40 mV). Therefore, it is not expected that the capture data are too accurate. The scattering cross sections are expected to be less accurate than the other cross section values, both because of the strong dependence of the scattering on the assumed value of the nuclear radius (chosen by pure guesswork) and because errors in the parameters Γ_n^0 are reflected in the scattering cross section quadratically rather than linearly.

Although the tabular data are theoretical predictions, the changes in the cross section for the different temperatures should be significant. It is hoped that the fission capture, and scattering data presented will be of value until experimental data becomes available.⁽⁶⁾

III. ACKNOWLEDGMENTS

The authors wish to express appreciation to Dr. M. S. Moore and to Dr. A. W. Solbrig, Jr. for their guidance and assistance.

IV. REFERENCES

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6. Note added in proof: The multilevel parameters used in the present work were obtained by fitting total cross section data measured by Simpson and Schuman in 1960, as tabulated in Reference 1. Recent measurements have been made of the fission cross section of Pu-241 by one of the present authors (ODS) in collaboration with others, and of the total cross section of Pu-241 by N. J. Pattenden (private communication) and by D. S. Craig and C. H. Westcott (private communication). These data all indicate that the older data of Simpson and Schuman are not accurate over the peaks of the narrow resonances, because the Pu-241 sample used was too thick. To a first approximation, the parameter Γ_n^0 for the 4.28, 6.94, and 8.60 eV resonances should be increased by a factor of approximately 1.25 to give a more reasonable fit to the later data.

Figure 1

The total neutron cross section from 0.02 to 11 eV as a function of sample temperature. Curve A represents the calculated cross section obtained by using the multilevel parameters in Table II. This cross section was then convoluted with Doppler functions having widths corresponding to the various sample temperatures.

Figure 2

The fission neutron cross section from 0.02 to 11 eV as a function of sample temperature. Curve A represents the calculated cross section obtained by using the multilevel parameters in Table II. This cross section was then convoluted with Doppler functions having widths corresponding to the various sample temperatures.

Figure 3

The capture neutron cross section from 0.02 to 11 eV as a function of sample temperature. Curve A represents the calculated cross section obtained by using the multilevel parameters in Table II. This cross section was then convoluted with Doppler functions having widths corresponding to the various sample temperatures.

Figure 4

The scattering neutron cross section from 0.02 to 11 eV as a function of sample temperature. Curve A represents the calculated cross section obtained by using the multilevel parameters in Table II. This cross section was then convoluted with Doppler functions having widths corresponding to the various sample temperatures.

APPENDIX

Tables of the calculated total, fission, capture, and scattering neutron cross sections from 0.02 eV to 11 eV for different sample temperatures.

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.020	1566.33	1566.50	1566.73	1566.98	1567.49	1568.00
.021	1526.48	1526.66	1526.91	1527.19	1527.75	1528.31
.022	1489.45	1489.65	1489.92	1490.22	1490.83	1491.43
.023	1454.94	1455.15	1455.45	1455.77	1456.42	1457.06
.024	1422.69	1422.92	1423.23	1423.57	1424.27	1424.96
.025	1392.48	1392.72	1393.05	1393.41	1394.14	1394.87
.026	1364.11	1364.36	1364.71	1365.09	1365.87	1366.64
.027	1337.41	1337.68	1338.05	1338.44	1339.25	1340.06
.028	1312.24	1312.52	1312.91	1313.32	1314.17	1315.01
.029	1288.47	1288.76	1289.17	1289.60	1290.48	1291.36
.030	1265.99	1266.29	1266.71	1267.16	1268.08	1268.99
.031	1244.69	1245.00	1245.43	1245.90	1246.85	1247.80
.032	1224.48	1224.81	1225.25	1225.74	1226.72	1227.70
.033	1205.29	1205.62	1206.08	1206.58	1207.60	1208.61
.034	1187.03	1187.38	1187.85	1188.37	1189.42	1190.46
.035	1169.65	1170.01	1170.50	1171.03	1172.11	1173.18
.036	1153.09	1153.46	1153.96	1154.51	1155.61	1156.72
.037	1137.29	1137.67	1138.19	1138.74	1139.88	1141.02
.038	1122.21	1122.60	1123.13	1123.70	1124.87	1126.03
.039	1107.80	1108.19	1108.74	1109.32	1110.52	1111.71
.040	1094.02	1094.42	1094.98	1095.58	1096.81	1098.03
.041	1080.83	1081.24	1081.81	1082.43	1083.69	1084.94
.042	1068.21	1068.63	1069.21	1069.84	1071.13	1072.40
.043	1056.11	1056.54	1057.14	1057.78	1059.09	1060.40
.044	1044.52	1044.96	1045.57	1046.22	1047.56	1048.90
.045	1033.40	1033.85	1034.47	1035.14	1036.51	1037.88
.046	1022.73	1023.19	1023.82	1024.51	1025.91	1027.30
.047	1012.49	1012.96	1013.61	1014.30	1015.73	1017.15
.048	1002.66	1003.14	1003.80	1004.51	1005.97	1007.42
.049	993.22	993.70	994.38	995.10	996.59	998.07
.050	984.15	984.64	985.33	986.07	987.58	989.09
.055	943.80	944.35	945.10	945.91	947.57	949.23
.060	910.65	911.24	912.06	912.95	914.77	916.59
.065	883.45	884.09	884.99	885.96	887.94	889.93
.070	861.28	861.98	862.96	864.02	866.18	868.36
.075	843.47	844.24	845.30	846.45	848.82	851.20
.080	829.50	830.33	831.50	832.75	835.34	837.95
.085	818.97	819.89	821.16	822.54	825.38	828.24
.090	811.61	812.61	814.00	815.52	818.63	821.78
.095	807.18	808.28	809.81	811.48	814.91	818.38

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.100	805.54	806.75	808.44	810.27	814.06	817.90
.105	806.59	807.92	809.78	811.81	816.00	820.25
.110	810.26	811.73	813.79	816.03	820.68	825.41
.120	825.45	827.27	829.81	832.58	838.34	844.21
.125	837.05	839.07	841.90	844.99	851.43	858.00
.130	851.43	853.69	856.85	860.30	867.50	874.85
.135	868.71	871.23	874.77	878.64	886.70	894.95
.140	889.05	891.88	895.85	900.18	909.22	918.48
.145	912.66	915.83	920.28	925.15	935.30	945.67
.150	939.76	943.32	948.32	953.78	965.17	976.80
.155	970.62	974.62	980.23	986.37	999.14	1012.13
.160	1005.56	1010.05	1016.36	1023.24	1037.53	1051.97
.165	1044.93	1049.98	1057.04	1064.74	1080.66	1096.62
.170	1089.12	1094.78	1102.68	1111.26	1128.89	1146.35
.175	1138.56	1144.87	1153.66	1163.18	1182.53	1201.39
.180	1193.68	1200.70	1210.42	1220.87	1241.85	1261.86
.185	1254.96	1262.69	1273.33	1284.67	1307.03	1327.75
.190	1322.83	1331.25	1342.73	1354.81	1378.07	1398.86
.195	1397.68	1406.69	1418.84	1431.39	1454.78	1474.70
.200	1479.76	1489.19	1501.66	1514.23	1536.64	1554.50
.205	1569.15	1578.66	1590.92	1602.82	1622.75	1637.11
.210	1665.58	1674.66	1685.88	1696.20	1711.76	1720.96
.215	1768.30	1776.18	1785.27	1792.80	1801.79	1804.12
.220	1875.88	1881.53	1887.06	1890.39	1890.47	1884.28
.225	1985.99	1988.10	1988.43	1986.04	1974.96	1958.89
.230	2095.21	2092.29	2085.69	2076.15	2052.09	2025.26
.235	2198.90	2189.46	2174.39	2156.63	2118.51	2080.70
.240	2291.24	2274.09	2249.60	2223.13	2170.99	2122.74
.245	2365.57	2340.26	2306.31	2271.52	2206.61	2149.30
.250	2415.12	2382.25	2340.00	2298.24	2223.08	2158.86
.255	2433.96	2395.42	2347.24	2300.72	2218.95	2150.57
.260	2418.19	2376.95	2326.21	2277.79	2193.76	2124.21
.265	2366.85	2326.48	2276.94	2229.79	2148.07	2080.49
.270	2282.26	2246.21	2201.50	2158.55	2083.41	2020.74
.275	2169.72	2140.60	2103.54	2067.19	2002.15	1946.83
.280	2036.44	2015.66	1987.96	1959.74	1907.27	1861.08
.285	1890.37	1878.07	1860.22	1840.75	1802.10	1766.12
.290	1738.97	1734.33	1725.74	1714.81	1690.06	1664.67
.295	1588.49	1590.10	1589.47	1586.19	1574.46	1559.33
.300	1443.62	1449.86	1455.51	1458.59	1458.29	1452.62

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.305	1307.48	1316.80	1326.99	1334.98	1344.11	1346.68
.310	1181.83	1192.94	1206.06	1217.54	1233.94	1243.31
.315	1067.41	1079.32	1094.05	1107.72	1129.30	1143.99
.320	964.22	976.21	991.53	1006.33	1031.21	1049.81
.325	871.79	883.38	898.56	913.68	940.29	961.46
.330	789.37	800.28	814.84	829.68	856.77	879.37
.335	716.08	726.15	739.80	753.97	780.62	803.75
.340	651.01	660.19	672.77	686.02	711.59	734.51
.345	593.26	601.55	613.01	625.23	649.28	671.45
.350	541.99	549.43	559.79	570.93	593.24	614.31
.355	496.43	503.09	512.39	522.47	542.94	562.67
.360	455.90	461.83	470.15	479.23	497.85	516.12
.365	419.77	425.05	432.48	440.62	457.47	474.23
.370	387.52	392.22	398.84	406.12	421.29	436.58
.375	358.66	362.85	368.75	375.25	388.87	402.74
.380	332.79	336.52	341.78	347.58	359.79	372.31
.385	309.55	312.87	317.56	322.74	333.67	344.96
.390	288.62	291.58	295.77	300.39	310.19	320.34
.395	269.73	272.38	276.12	280.26	289.03	298.14
.400	252.65	255.02	258.37	262.07	269.93	278.12
.405	237.17	239.29	242.29	245.61	252.66	260.02
.410	223.10	225.01	227.71	230.69	237.02	243.63
.415	210.30	212.02	214.45	217.13	222.82	228.77
.420	198.63	200.18	202.36	204.78	209.90	215.26
.425	187.96	189.36	191.33	193.52	198.14	202.97
.430	178.19	179.46	181.25	183.22	187.39	191.76
.435	169.23	170.38	172.00	173.79	177.57	181.52
.440	161.00	162.04	163.51	165.13	168.56	172.14
.445	153.42	154.37	155.71	157.18	160.29	163.54
.450	146.43	147.29	148.51	149.86	152.69	155.64
.460	134.00	134.72	135.74	136.86	139.22	141.67
.470	123.33	123.94	124.79	125.73	127.71	129.76
.480	114.11	114.63	115.35	116.15	117.81	119.54
.490	106.11	106.55	107.17	107.84	109.26	110.71
.500	99.13	99.50	100.03	100.61	101.81	103.06
.520	87.60	87.88	88.27	88.70	89.60	90.51
.540	78.58	78.79	79.09	79.42	80.09	80.78
.560	71.41	71.57	71.80	72.05	72.57	73.09
.580	65.62	65.75	65.92	66.12	66.52	66.93
.600	60.89	60.98	61.12	61.27	61.58	61.91

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.700	46.66	46.67	46.71	46.76	46.87	46.99
.800	40.02	40.02	40.04	40.06	40.12	40.17
.900	36.47	36.47	36.48	36.50	36.53	36.56
1.000	34.40	34.41	34.41	34.42	34.44	34.46
1.200	32.41	32.41	32.41	32.41	32.42	32.43
1.400	31.79	31.79	31.79	31.80	31.81	31.81
1.600	31.90	31.90	31.90	31.91	31.92	31.92
1.800	32.51	32.51	32.51	32.52	32.52	32.53
2.000	33.53	33.54	33.54	33.55	33.56	33.57
2.200	34.98	34.98	34.99	34.99	35.01	35.02
2.400	36.89	36.90	36.90	36.91	36.93	36.94
2.600	39.36	39.37	39.38	39.39	39.41	39.44
2.800	42.55	42.56	42.58	42.59	42.63	42.66
3.000	46.72	46.73	46.75	46.78	46.82	46.87
3.100	49.28	49.30	49.33	49.36	49.41	49.47
3.200	52.27	52.29	52.32	52.36	52.44	52.51
3.300	55.78	55.81	55.85	55.90	55.99	56.09
3.400	59.96	60.00	60.06	60.12	60.25	60.38
3.500	65.04	65.10	65.18	65.27	65.45	65.63
3.600	71.37	71.45	71.57	71.70	71.98	72.26
3.700	79.55	79.67	79.86	80.08	80.53	81.01
3.800	90.69	90.94	91.29	91.69	92.57	93.56
3.820	93.46	93.74	94.15	94.61	95.65	96.83
3.840	96.46	96.79	97.27	97.81	99.04	100.48
3.860	99.74	100.12	100.69	101.33	102.81	104.63
3.880	103.34	103.79	104.46	105.24	107.05	109.39
3.900	107.32	107.86	108.67	109.61	111.88	115.01
3.920	111.75	112.41	113.39	114.56	117.48	121.76
3.940	116.72	117.53	118.75	120.23	124.09	130.00
3.960	122.37	123.37	124.91	126.81	132.11	140.23
3.980	128.83	130.11	132.09	134.61	142.07	153.20
4.000	136.33	137.98	140.59	144.04	154.72	169.96
4.020	145.16	147.33	150.88	155.79	171.16	191.71
4.040	155.73	158.67	163.63	170.88	192.98	219.83
4.060	168.62	172.71	179.93	190.96	222.22	255.77
4.080	184.71	190.60	201.57	218.44	261.25	300.69
4.100	205.33	214.13	231.47	256.96	312.42	355.49
4.120	232.56	246.36	274.31	311.33	377.58	420.29
4.140	269.90	292.59	337.21	386.85	457.53	494.13
4.160	323.35	362.31	429.43	487.68	551.17	574.83

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.180	403.84	471.41	559.58	614.48	654.67	658.47
4.190	460.12	547.52	640.07	686.27	708.20	699.92
4.200	532.18	641.73	730.01	761.69	761.42	740.29
4.210	625.75	755.65	827.36	838.91	813.28	778.88
4.220	748.57	888.65	928.89	915.40	862.56	814.98
4.230	910.37	1036.60	1030.27	988.39	907.97	847.89
4.240	1121.01	1190.91	1126.25	1054.95	948.42	877.13
4.250	1383.54	1338.74	1211.06	1112.23	982.72	901.91
4.260	1677.81	1464.66	1279.28	1157.67	1009.99	921.93
4.270	1938.75	1553.53	1326.36	1109.12	1029.67	937.04
4.280	2065.17	1593.89	1349.05	1205.56	1041.14	946.69
4.290	1996.07	1581.04	1346.17	1206.10	1044.64	951.23
4.300	1775.76	1518.27	1318.73	1191.52	1039.85	950.57
4.310	1503.26	1415.74	1269.48	1162.86	1027.68	944.81
4.320	1250.49	1287.86	1202.68	1122.04	1008.36	934.51
4.330	1044.27	1149.88	1123.67	1071.67	983.09	919.85
4.340	885.35	1015.00	1038.05	1014.45	952.85	901.49
4.350	765.62	892.44	951.01	953.33	918.81	880.09
4.360	676.04	787.23	867.01	890.99	882.20	856.23
4.370	609.08	700.88	789.60	830.03	844.18	830.54
4.380	559.08	632.49	720.91	772.30	805.83	803.70
4.400	494.66	540.45	613.45	672.77	732.10	748.74
4.420	461.96	491.74	544.92	598.86	667.24	695.55
4.440	450.25	471.36	508.34	550.60	614.44	646.82
4.460	453.91	470.09	495.02	523.95	574.06	603.98
4.480	469.89	482.21	496.96	512.78	544.28	567.23
4.500	495.99	503.16	507.08	510.27	522.01	535.45
4.510	512.00	515.31	513.09	510.20	512.58	520.91
4.520	529.26	527.47	518.59	509.89	503.60	506.97
4.530	546.91	538.61	522.76	508.69	494.71	493.44
4.540	563.71	547.55	524.78	505.95	485.46	480.08
4.550	577.98	553.06	523.91	501.20	475.53	466.69
4.560	587.59	553.90	519.56	494.00	464.66	453.15
4.570	590.10	549.01	511.24	484.09	452.59	439.23
4.580	583.17	537.63	498.68	471.34	439.29	424.88
4.590	565.08	519.44	481.87	455.69	424.57	410.07
4.600	535.42	494.67	461.02	437.35	408.60	394.66
4.610	495.41	464.05	436.54	416.51	391.37	378.75
4.620	447.87	428.81	409.06	393.59	373.08	362.38
4.640	344.92	350.72	348.31	343.36	334.05	328.42

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.660	252.30	273.28	285.62	290.82	293.36	293.68
4.680	181.77	206.37	227.26	240.12	253.05	259.29
4.700	133.07	154.48	177.57	194.59	215.05	226.36
4.720	101.34	117.50	138.41	156.33	180.89	195.98
4.740	81.49	92.84	109.64	126.09	151.60	168.87
4.760	69.62	77.34	89.84	103.59	127.62	145.54
4.780	63.04	68.24	77.13	87.86	108.92	126.23
4.800	59.98	63.50	69.66	77.65	95.08	110.90
4.820	59.29	61.69	65.93	71.69	85.49	99.28
4.840	60.19	61.86	64.79	68.87	79.45	91.00
4.860	62.21	63.40	65.45	68.32	76.23	85.61
4.880	65.01	65.87	67.34	69.38	75.21	82.63
4.900	68.38	69.02	70.10	71.57	75.85	81.61
4.950	78.41	78.77	79.35	80.09	82.15	85.12
5.000	89.91	90.18	90.58	91.06	92.25	93.86
5.050	102.43	102.67	103.02	103.41	104.30	105.35
5.100	115.82	116.06	116.41	116.79	117.60	118.47
5.150	130.08	130.34	130.71	131.11	131.92	132.76
5.200	145.26	145.54	145.94	146.36	147.22	148.07
5.250	161.43	161.73	162.15	162.60	163.50	164.38
5.300	178.64	178.96	179.40	179.87	180.80	181.69
5.350	196.94	197.27	197.71	198.18	199.11	200.00
5.400	216.32	216.64	217.07	217.53	218.42	219.26
5.450	236.73	237.02	237.42	237.83	238.63	239.37
5.500	258.04	258.29	258.62	258.96	259.60	260.17
5.550	280.05	280.23	280.45	280.68	281.08	281.43
5.600	302.45	302.52	302.60	302.67	302.77	302.81
5.650	324.82	324.76	324.66	324.54	324.25	323.91
5.700	346.66	346.43	346.11	345.76	345.02	344.26
5.750	367.34	366.94	366.38	365.78	364.55	363.33
5.800	386.23	385.64	384.84	383.98	382.26	380.59
5.850	402.66	401.90	400.86	399.77	397.59	395.51
5.900	416.02	415.12	413.90	412.61	410.07	407.65
5.950	425.87	424.87	423.52	422.10	419.31	416.67
6.000	431.90	430.86	429.46	427.98	425.09	422.36
6.050	434.06	433.04	431.66	430.22	427.38	424.69
6.100	432.49	431.55	430.27	428.93	426.29	423.79
6.150	427.55	426.73	425.62	424.45	422.13	419.92
6.200	419.75	419.09	418.18	417.22	415.32	413.51
6.250	409.69	409.20	408.53	407.82	406.40	405.05

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
6.300	398.03	397.72	397.30	396.84	395.95	395.12
6.350	385.43	385.30	385.13	384.95	384.63	384.38
6.400	372.53	372.59	372.68	372.80	373.11	373.59
6.450	359.99	360.25	360.63	361.09	362.18	363.67
6.500	348.48	348.98	349.73	350.62	352.86	355.96
6.550	338.78	339.62	340.91	342.50	346.74	352.39
6.600	331.99	333.39	335.61	338.49	346.43	356.05
6.620	330.44	332.18	334.99	338.73	348.85	360.43
6.640	329.78	331.97	335.57	340.47	353.29	366.88
6.660	330.22	333.01	337.71	344.18	360.17	373.64
6.680	332.04	335.66	341.90	350.44	369.94	386.90
6.700	335.62	340.39	348.81	359.96	383.01	400.74
6.720	341.47	347.90	359.34	373.62	399.66	417.14
6.740	350.35	359.18	374.69	392.32	420.01	435.93
6.760	363.32	375.66	396.29	416.85	443.99	456.64
6.780	381.93	399.37	425.65	447.64	471.05	478.72
6.800	408.51	433.00	463.94	484.49	500.26	501.25
6.820	446.54	479.66	511.39	526.30	530.34	523.25
6.840	501.13	541.81	566.46	570.78	559.54	543.58
6.850	536.75	578.75	595.77	593.01	573.21	552.76
6.860	579.19	618.99	625.32	614.56	585.91	561.08
6.870	629.34	661.53	654.31	634.89	597.42	568.38
6.880	687.61	704.83	681.72	653.42	607.50	574.59
6.890	753.44	746.87	706.56	669.62	615.85	579.58
6.900	824.38	785.29	727.76	682.94	622.37	583.14
6.910	895.07	817.53	744.43	692.93	626.86	585.31
6.920	956.75	841.17	755.66	699.23	629.12	586.03
6.930	998.33	854.21	760.94	701.53	629.18	585.18
6.940	1009.91	855.39	759.07	699.74	626.91	582.77
6.950	987.42	844.34	752.34	693.75	622.31	578.85
6.960	934.98	821.66	738.65	683.78	615.52	573.43
6.970	862.77	788.84	719.16	669.94	606.50	566.47
6.980	782.35	748.03	694.69	652.69	595.44	558.15
6.990	702.86	701.77	666.09	632.35	582.55	548.53
7.000	629.77	652.65	634.37	609.52	567.92	537.64
7.010	565.46	603.05	600.58	584.71	551.86	525.67
7.020	510.29	554.92	565.77	558.48	534.59	512.75
7.030	463.60	509.70	530.84	531.44	516.36	499.00
7.040	424.30	468.32	496.63	504.05	497.41	484.57
7.060	363.36	398.46	432.89	450.30	458.41	454.27

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
7.080	319.62	345.12	377.92	400.33	419.41	423.03
7.100	287.48	305.33	332.78	356.08	382.00	391.88
7.120	263.23	275.65	296.94	318.38	347.36	361.75
7.140	244.44	253.17	268.99	287.19	316.17	333.39
7.160	229.52	235.77	247.29	261.91	288.81	307.24
7.180	217.41	221.98	230.33	241.66	265.30	283.72
7.200	207.37	210.78	216.88	225.47	245.39	262.83
7.220	198.90	201.49	206.02	212.47	228.73	244.59
7.240	191.63	193.65	197.06	201.90	214.90	228.81
7.260	185.31	186.90	189.53	193.19	203.42	215.29
7.280	179.74	181.02	183.08	185.88	193.89	203.79
7.300	174.78	175.82	177.47	179.65	185.90	194.04
7.350	164.38	165.04	166.06	167.32	170.75	175.55
7.400	156.04	156.49	157.17	157.97	159.99	162.82
7.450	149.11	149.44	149.92	150.48	151.80	153.51
7.500	143.21	143.47	143.84	144.25	145.19	146.31
7.550	138.12	138.32	138.62	138.95	139.67	140.47
7.600	133.67	133.84	134.09	134.36	134.94	135.57
7.650	129.76	129.91	130.13	130.36	130.86	131.38
7.700	126.32	126.46	126.65	126.86	127.31	127.77
7.750	123.31	123.44	123.62	123.81	124.23	124.66
7.800	120.68	120.81	120.98	121.17	121.58	122.00
7.850	118.43	118.56	118.74	118.93	119.35	119.79
7.900	116.55	116.69	116.88	117.09	117.55	118.04
7.950	115.07	115.22	115.43	115.67	116.21	116.81
8.000	114.01	114.19	114.44	114.74	115.41	116.20
8.050	113.44	113.67	114.00	114.39	115.32	116.58
8.100	113.49	113.79	114.25	114.80	116.23	118.52
8.150	114.35	114.78	115.46	116.31	118.83	122.98
8.200	116.34	117.02	118.11	119.59	124.49	131.95
8.250	120.09	121.22	123.18	126.11	135.87	148.72
8.300	126.71	128.83	132.80	139.30	158.00	177.44
8.320	130.62	133.43	138.92	147.90	171.43	193.13
8.340	135.59	139.37	147.14	159.44	188.18	211.55
8.360	141.94	147.17	158.33	174.90	208.68	232.67
8.380	150.17	157.60	173.67	195.37	233.19	256.59
8.400	160.99	171.83	194.82	221.96	261.83	282.86
8.420	175.50	191.72	223.76	255.59	294.49	311.22
8.440	195.37	220.11	262.59	296.77	330.49	340.84
8.460	223.29	261.09	312.94	345.31	368.92	371.02

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
8.480	263.67	319.80	375.30	400.01	408.39	400.70
8.500	323.94	401.05	448.12	458.36	447.17	428.89
8.520	416.52	506.11	527.06	516.70	483.40	454.43
8.530	480.66	565.84	566.69	544.47	499.92	465.88
8.540	560.43	628.11	604.98	570.53	515.05	476.30
8.550	658.25	690.35	640.75	594.31	528.61	485.52
8.560	774.37	749.43	672.83	615.14	540.34	493.39
8.570	903.81	801.88	700.03	632.62	549.99	499.95
8.580	1032.44	844.28	721.43	646.23	557.56	505.11
8.590	1135.64	873.71	736.17	655.65	562.91	508.73
8.600	1185.72	888.14	743.76	660.74	565.83	510.82
8.610	1167.83	886.63	743.95	661.21	566.47	511.43
8.620	1090.59	869.53	736.77	657.32	564.82	510.55
8.630	978.90	838.34	722.67	648.99	560.72	508.06
8.640	858.15	795.58	702.17	636.65	554.46	504.12
8.650	744.82	744.41	676.27	620.60	546.15	498.81
8.660	646.18	688.17	645.89	601.27	535.78	492.16
8.670	563.63	630.01	612.23	579.27	523.67	484.17
8.680	495.82	572.69	576.42	555.08	510.03	475.05
8.700	395.30	468.34	502.61	502.53	478.94	453.88
8.720	327.73	384.17	431.92	448.04	444.40	429.58
8.740	281.15	320.93	369.32	395.37	408.23	403.23
8.760	248.10	275.16	317.11	347.31	372.18	375.83
8.780	224.00	242.35	275.54	305.43	337.59	348.35
8.800	206.01	218.64	243.49	270.27	305.62	321.62
8.820	192.29	201.20	219.28	241.66	276.93	296.34
8.840	181.66	188.12	201.14	218.96	251.83	272.98
8.860	173.31	178.11	187.52	201.28	230.43	251.94
8.880	166.69	170.34	177.23	187.68	212.50	233.30
8.900	161.40	164.24	169.38	177.27	197.78	217.14
8.920	157.16	159.41	163.35	169.30	185.90	203.31
8.940	153.75	155.58	158.66	163.19	176.47	191.70
8.960	151.04	152.54	155.02	158.48	169.06	182.09
8.980	148.89	150.15	152.18	154.20	163.33	174.17
9.000	147.21	148.30	150.00	152.23	158.95	163.90
9.020	145.95	146.89	148.35	150.21	155.64	162.01
9.040	145.05	145.88	147.16	148.74	153.21	159.68
9.060	144.46	145.22	146.35	147.73	151.50	157.02
9.080	144.16	144.85	145.89	147.13	150.39	155.10
9.100	144.12	144.77	145.73	146.88	149.80	153.94

TOTAL NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
9.120	144.33	144.95	145.86	146.96	149.68	153.40
9.140	144.76	145.37	146.27	147.33	149.97	153.40
9.160	145.43	146.03	146.93	148.00	150.65	153.91
9.180	146.31	146.93	147.85	148.97	151.70	154.89
9.200	147.43	148.07	149.05	150.25	153.15	156.31
9.220	148.78	149.47	150.53	151.86	154.98	158.17
9.240	150.38	151.13	152.32	153.83	157.23	160.42
9.260	152.25	153.10	154.47	156.21	159.89	163.06
9.280	154.42	155.40	157.03	159.05	163.00	166.06
9.300	156.93	158.10	160.07	162.41	166.54	169.39
9.320	159.85	161.28	163.69	166.36	170.50	173.03
9.340	163.25	165.05	168.00	170.93	174.86	176.90
9.360	167.26	169.56	173.10	176.15	179.55	180.95
9.380	172.02	175.02	179.09	181.99	184.49	185.10
9.400	177.78	181.67	185.99	188.36	189.57	189.26
9.420	184.87	189.75	193.72	195.07	194.64	193.33
9.440	193.75	199.38	202.04	201.89	199.55	197.22
9.460	205.04	210.41	210.53	208.48	204.12	200.83
9.480	219.39	222.14	218.58	214.47	208.21	204.07
9.500	236.96	233.27	225.50	219.49	211.65	206.88
9.520	255.82	242.05	230.63	223.24	214.36	209.17
9.540	269.54	246.77	233.46	225.49	216.25	210.95
9.560	269.13	246.47	233.76	226.17	217.31	212.19
9.580	253.72	241.37	231.68	225.36	217.60	212.92
9.600	233.21	232.88	227.67	223.27	217.15	213.15
9.620	216.16	223.00	222.42	220.26	216.13	212.98
9.640	204.71	213.62	216.71	216.70	214.66	212.45
9.660	197.91	205.98	211.23	212.98	212.93	211.67
9.680	194.33	200.56	206.51	209.46	211.07	210.71
9.700	192.84	197.27	202.86	206.42	209.25	209.65
9.720	192.72	195.70	200.37	204.00	207.58	208.58
9.740	193.47	195.40	198.97	202.29	206.13	207.54
9.760	194.77	195.98	198.49	201.26	204.98	206.59
9.780	196.41	197.10	198.73	200.84	204.13	205.74
9.800	198.24	198.55	199.48	200.92	203.57	205.03
9.850	202.93	202.61	202.36	202.43	203.12	203.68
9.900	206.83	206.08	205.13	204.29	203.22	202.58
9.950	209.02	207.92	206.50	205.09	202.77	201.05
10.000	208.75	207.41	205.68	203.95	200.88	198.42
10.050	205.52	204.08	202.22	200.37	197.00	194.21

TOTAL NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
10.100	199.13	197.75	195.97	194.19	190.93	188.14
10.150	189.75	188.59	187.08	185.55	182.71	180.22
10.200	177.90	177.06	175.96	174.81	172.64	170.67
10.250	164.32	163.87	163.23	162.54	161.15	159.82
10.300	149.87	149.78	149.59	149.35	148.76	148.10
10.350	135.34	135.53	135.73	135.88	136.01	135.98
10.400	121.33	121.73	122.21	122.66	123.38	123.88
10.450	108.29	108.81	109.47	110.12	111.24	112.15
10.500	96.45	97.03	97.77	98.53	99.90	101.07
10.550	85.91	86.48	87.25	88.04	89.52	90.84
10.600	76.64	77.19	77.93	78.70	80.19	81.55
10.650	68.58	69.08	69.77	70.49	71.91	73.24
10.700	61.61	62.06	62.67	63.33	64.64	65.89
10.750	55.61	56.00	56.54	57.13	58.30	59.45
10.800	50.45	50.79	51.26	51.77	52.81	53.84
10.850	46.02	46.31	46.72	47.16	48.07	48.98
10.900	42.21	42.46	42.81	43.19	43.98	44.77
10.950	38.93	39.15	39.45	39.77	40.45	41.14
11.000	36.11	36.29	36.55	36.83	37.41	38.00

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.020	1153.98	1154.10	1154.26	1154.43	1154.78	1155.13
.021	1124.74	1124.87	1125.04	1125.23	1125.61	1125.99
.022	1097.57	1097.70	1097.89	1098.09	1098.50	1098.91
.023	1072.24	1072.38	1072.58	1072.80	1073.24	1073.67
.024	1048.56	1048.72	1048.93	1049.16	1049.63	1050.09
.025	1026.38	1026.54	1026.76	1027.00	1027.50	1027.99
.026	1005.54	1005.71	1005.94	1006.20	1006.72	1007.24
.027	985.92	986.10	986.35	986.62	987.16	987.70
.028	967.43	967.61	967.87	968.15	968.72	969.28
.029	949.95	950.15	950.42	950.71	951.30	951.88
.030	933.42	933.62	933.90	934.20	934.81	935.42
.031	917.75	917.96	918.25	918.56	919.19	919.82
.032	902.88	903.09	903.39	903.71	904.37	905.02
.033	888.74	888.97	889.27	889.61	890.28	890.96
.034	875.30	875.53	875.84	876.18	876.88	877.58
.035	862.49	862.72	863.05	863.40	864.12	864.84
.036	850.28	850.52	850.85	851.22	851.95	852.69
.037	838.62	838.87	839.21	839.59	840.34	841.10
.038	827.49	827.74	828.09	828.48	829.25	830.03
.039	816.84	817.10	817.46	817.85	818.65	819.44
.040	806.66	806.92	807.29	807.69	808.51	809.32
.041	796.90	797.18	797.56	797.96	798.80	799.63
.042	787.56	787.84	788.23	788.64	789.50	790.35
.043	778.60	778.89	779.28	779.71	780.58	781.45
.044	770.01	770.30	770.70	771.14	772.03	772.92
.045	761.76	762.06	762.47	762.91	763.82	764.73
.046	753.84	754.14	754.56	755.02	755.95	756.87
.047	746.23	746.54	746.97	747.43	748.38	749.32
.048	738.92	739.23	739.67	740.14	741.11	742.07
.049	731.89	732.21	732.65	733.14	734.12	735.10
.050	725.12	725.45	725.91	726.40	727.40	728.40
.055	694.95	695.31	695.81	696.35	697.45	698.55
.060	669.99	670.38	670.93	671.51	672.72	673.92
.065	649.32	649.75	650.34	650.98	652.29	653.61
.070	632.28	632.74	633.39	634.08	635.52	636.95
.075	618.35	618.86	619.56	620.32	621.89	623.46
.080	607.17	607.73	608.49	609.32	611.03	612.75
.085	598.45	599.05	599.89	600.79	602.66	604.55
.090	591.95	592.61	593.53	594.52	596.57	598.64
.095	587.52	588.25	589.25	590.34	592.59	594.87

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.100	585.04	585.83	586.93	588.14	590.61	593.12
.105	584.42	585.29	586.50	587.83	590.56	593.34
.110	585.60	586.56	587.90	589.37	592.39	595.46
.120	593.32	594.49	596.14	597.94	601.66	605.46
.125	599.87	601.18	603.01	605.01	609.15	613.39
.130	608.28	609.74	611.77	614.00	618.62	623.34
.135	618.61	620.23	622.51	624.99	630.15	635.42
.140	630.95	632.76	635.30	638.07	643.85	649.74
.145	645.42	647.45	650.28	653.38	659.83	666.41
.150	662.15	664.42	667.59	671.05	678.26	685.60
.155	681.30	683.83	687.38	691.26	699.30	707.45
.160	703.05	705.88	709.85	714.18	723.13	732.15
.165	727.61	730.78	735.21	740.02	749.94	759.83
.170	755.21	758.74	763.66	769.00	779.92	790.66
.175	786.08	790.00	795.45	801.32	813.22	824.73
.180	820.48	824.81	830.79	837.20	849.99	862.08
.185	858.67	863.40	869.90	876.79	890.28	902.64
.190	900.87	905.98	912.92	920.18	934.04	946.23
.195	947.27	952.69	959.94	967.38	981.07	992.49
.200	997.98	1003.56	1010.89	1018.20	1031.00	1040.87
.205	1052.95	1058.47	1065.51	1072.24	1083.17	1090.57
.210	1111.91	1117.03	1123.24	1128.79	1136.65	1140.56
.215	1174.29	1178.51	1183.18	1186.79	1190.20	1189.56
.220	1239.06	1241.72	1243.95	1244.74	1242.27	1236.11
.225	1304.64	1304.91	1303.69	1300.72	1291.04	1278.58
.230	1368.75	1365.72	1359.99	1352.44	1334.51	1315.30
.235	1428.37	1421.15	1410.04	1397.30	1370.60	1344.61
.240	1479.81	1467.74	1450.76	1432.63	1397.35	1365.05
.245	1518.92	1501.82	1479.07	1455.92	1413.03	1375.40
.250	1541.56	1519.96	1492.32	1465.10	1416.34	1374.84
.255	1544.28	1519.47	1488.55	1458.75	1406.54	1362.96
.260	1524.97	1498.91	1466.89	1436.38	1383.50	1339.78
.265	1483.43	1458.40	1427.68	1398.44	1347.78	1305.87
.270	1421.55	1399.66	1372.47	1346.32	1300.50	1262.22
.275	1342.98	1325.79	1303.81	1282.17	1243.30	1210.11
.280	1252.53	1240.79	1224.96	1208.69	1178.18	1151.09
.285	1155.29	1148.96	1139.45	1128.83	1107.29	1086.88
.290	1055.96	1054.41	1050.73	1045.51	1032.83	1019.22
.295	958.37	960.64	961.87	961.40	956.89	949.77
.300	865.34	870.36	875.37	878.79	881.32	880.09

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.305	778.64	785.43	793.10	799.44	807.67	811.49
.310	699.24	706.98	716.28	724.63	737.15	745.06
.315	627.43	635.51	645.63	655.17	670.64	681.68
.320	563.08	571.08	581.39	591.46	608.69	621.96
.325	505.79	513.42	523.49	533.59	551.63	566.27
.330	455.00	462.11	471.65	481.44	499.51	514.83
.335	410.09	416.60	425.45	434.70	452.26	467.70
.340	370.42	376.31	384.41	392.99	409.66	424.78
.345	335.40	340.69	348.02	355.86	371.42	385.91
.350	304.47	309.19	315.77	322.88	337.20	350.85
.355	277.12	281.31	287.19	293.59	306.64	319.33
.360	252.90	256.62	261.86	267.58	279.39	291.06
.365	231.43	234.72	239.37	244.48	255.10	265.75
.370	212.34	215.26	219.39	223.93	233.45	243.11
.375	195.35	197.94	201.60	205.64	214.15	222.86
.380	180.18	182.48	185.73	189.32	196.91	204.74
.385	166.62	168.66	171.54	174.74	181.51	188.53
.390	154.46	156.27	158.84	161.68	167.72	174.01
.395	143.54	145.16	147.44	149.97	155.36	160.98
.400	133.71	135.15	137.19	139.44	144.25	149.29
.405	124.84	126.12	127.94	129.96	134.25	138.76
.410	116.82	117.97	119.60	121.40	125.24	129.28
.415	109.55	110.58	112.04	113.66	117.10	120.72
.420	102.95	103.87	105.19	106.64	109.73	112.97
.425	96.94	97.78	98.96	100.26	103.04	105.96
.430	91.47	92.22	93.29	94.46	96.96	99.59
.435	86.47	87.15	88.11	89.17	91.43	93.80
.440	81.89	82.51	83.38	84.34	86.38	88.52
.445	77.70	78.26	79.05	79.92	81.77	83.70
.450	73.85	74.36	75.08	75.87	77.54	79.29
.460	67.05	67.47	68.07	68.72	70.11	71.55
.470	61.26	61.61	62.11	62.66	63.81	65.01
.480	56.30	56.60	57.01	57.47	58.44	59.44
.490	52.03	52.28	52.63	53.02	53.84	54.68
.500	48.33	48.55	48.85	49.18	49.87	50.58
.520	42.31	42.46	42.68	42.93	43.43	43.95
.540	37.66	37.78	37.95	38.13	38.51	38.89
.560	34.03	34.12	34.24	34.38	34.67	34.96
.580	31.14	31.21	31.31	31.41	31.63	31.85
.600	28.82	28.86	28.94	29.02	29.19	29.37

FISSION NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.700	22.08	22.08	22.10	22.13	22.19	22.25
.800	19.15	19.15	19.16	19.18	19.20	19.23
.900	17.70	17.70	17.71	17.72	17.73	17.75
1.000	16.94	16.95	16.95	16.95	16.96	16.97
1.200	16.42	16.42	16.42	16.42	16.43	16.43
1.400	16.56	16.56	16.56	16.57	16.57	16.58
1.600	17.11	17.11	17.12	17.12	17.12	17.13
1.800	17.99	17.99	17.99	18.00	18.00	18.01
2.000	19.18	19.18	19.19	19.19	19.20	19.21
2.200	20.72	20.72	20.73	20.73	20.74	20.76
2.400	22.66	22.66	22.67	22.68	22.69	22.71
2.600	25.10	25.10	25.11	25.12	25.14	25.16
2.800	28.18	28.18	28.20	28.21	28.24	28.27
3.000	32.12	32.13	32.15	32.17	32.21	32.25
3.100	34.51	34.52	34.55	34.57	34.62	34.68
3.200	37.26	37.28	37.31	37.34	37.41	37.47
3.300	40.46	40.48	40.52	40.56	40.64	40.72
3.400	44.21	44.24	44.29	44.34	44.44	44.55
3.500	48.67	48.72	48.78	48.85	48.99	49.13
3.600	54.10	54.16	54.25	54.34	54.55	54.75
3.700	60.87	60.96	61.09	61.24	61.56	61.89
3.800	69.69	69.85	70.08	70.34	70.90	71.51
3.820	71.80	71.98	72.25	72.54	73.19	73.91
3.840	74.07	74.28	74.58	74.92	75.67	76.54
3.860	76.50	76.75	77.09	77.49	78.38	79.45
3.880	79.14	79.42	79.83	80.29	81.37	82.71
3.900	82.01	82.34	82.82	83.37	84.69	86.46
3.920	85.14	85.53	86.11	86.79	88.45	90.83
3.940	88.60	89.07	89.77	90.62	92.78	96.02
3.960	92.44	93.02	93.89	94.96	97.88	102.29
3.980	96.75	97.47	98.57	99.97	104.03	110.04
4.000	101.64	102.55	103.99	105.88	111.63	119.82
4.020	107.26	108.46	110.38	113.03	121.26	132.29
4.040	113.84	115.43	118.11	121.98	133.77	148.18
4.060	121.68	123.87	127.72	133.58	150.24	168.26
4.080	131.23	134.36	140.17	149.12	171.93	193.20
4.100	143.18	147.84	156.99	170.49	200.13	223.49
4.120	158.64	165.90	180.64	200.29	235.86	259.27
4.140	179.40	191.33	214.89	241.34	279.61	300.06
4.160	208.62	229.10	264.69	295.94	330.88	344.79

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.180	252.02	287.65	334.74	364.62	387.74	391.45
4.190	282.14	328.34	378.05	403.57	417.29	414.75
4.200	320.55	378.65	426.52	444.62	446.81	437.58
4.210	370.28	439.52	479.09	486.76	475.76	459.58
4.220	435.46	510.70	534.13	528.75	503.49	480.40
4.230	521.31	590.13	589.37	569.08	529.32	499.65
4.240	633.20	673.38	642.07	606.27	552.70	517.07
4.250	773.13	753.76	689.19	638.74	572.94	532.27
4.260	930.99	823.16	727.85	665.24	589.67	545.05
4.270	1073.02	873.54	755.62	684.47	602.46	555.36
4.280	1145.74	898.71	770.74	695.93	611.10	562.88
4.290	1115.89	896.01	772.51	699.22	615.57	567.79
4.300	1005.45	866.98	761.39	694.54	615.85	570.03
4.310	866.07	816.80	738.79	682.57	612.27	569.66
4.320	735.92	752.95	706.88	664.16	604.99	566.93
4.330	629.61	683.44	668.46	640.76	594.65	561.96
4.340	547.90	615.27	626.46	613.74	581.69	555.04
4.350	486.78	553.36	583.63	584.66	566.77	546.53
4.360	441.60	500.48	542.35	554.92	550.52	536.70
4.370	408.48	457.51	504.51	525.93	533.50	525.87
4.380	384.49	424.07	471.27	498.67	516.32	514.36
4.400	355.88	381.17	420.75	452.54	483.33	490.37
4.420	344.92	361.88	391.15	419.98	454.59	466.72
4.440	346.04	358.39	378.80	400.85	431.56	444.53
4.460	356.28	365.72	378.84	392.66	414.04	424.29
4.480	373.89	380.43	386.42	391.52	400.59	405.79
4.500	397.23	399.22	396.78	393.02	389.15	388.18
4.510	410.27	408.81	401.47	393.38	383.46	379.40
4.520	423.54	417.59	404.99	392.77	377.38	370.43
4.530	436.24	424.72	406.73	390.78	370.70	361.19
4.540	447.25	429.25	406.09	386.98	363.13	351.55
4.550	455.11	430.19	402.56	381.07	354.57	341.41
4.560	458.06	426.66	395.76	372.85	344.83	330.75
4.570	454.20	417.93	385.42	362.13	333.87	319.45
4.580	441.83	403.58	371.47	348.98	321.68	307.54
4.590	419.96	383.61	354.04	333.44	308.25	295.06
4.600	388.80	358.45	333.45	315.77	293.76	281.96
4.610	349.93	328.97	310.17	296.26	278.26	268.38
4.620	306.13	296.39	284.85	275.30	261.99	254.40
4.640	216.74	227.60	231.03	230.82	227.90	225.56

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.660	141.40	163.02	177.99	186.08	193.29	196.46
4.680	87.61	110.12	130.75	144.51	159.96	168.17
4.700	53.16	71.48	92.40	108.67	129.49	141.70
4.720	32.83	45.97	63.86	79.91	103.03	117.90
4.740	21.92	30.71	44.42	58.45	81.24	97.34
4.760	17.02	22.71	32.46	43.70	64.29	80.31
4.780	15.91	19.55	26.16	34.57	51.97	66.91
4.800	17.18	19.50	23.85	29.85	43.75	56.98
4.820	19.95	21.44	24.26	28.39	39.00	50.19
4.840	23.66	24.63	26.46	29.23	37.05	46.14
4.860	27.98	28.61	29.81	31.65	37.25	44.40
4.880	32.68	33.10	33.90	35.12	39.06	44.53
4.900	37.63	37.92	38.47	39.29	42.04	46.14
4.950	50.62	50.77	51.04	51.40	52.56	54.48
5.000	64.11	64.24	64.44	64.68	65.33	66.29
5.050	77.98	78.13	78.34	78.58	79.11	79.76
5.100	92.30	92.48	92.73	93.00	93.57	94.16
5.150	107.19	107.40	107.69	108.01	108.64	109.28
5.200	122.76	123.01	123.34	123.70	124.42	125.12
5.250	139.14	139.41	139.78	140.18	140.96	141.73
5.300	156.42	156.71	157.11	157.53	158.36	159.16
5.350	174.65	174.95	175.36	175.79	176.64	177.44
5.400	193.86	194.16	194.56	194.98	195.80	196.56
5.450	214.01	214.28	214.65	215.03	215.76	216.44
5.500	234.97	235.20	235.50	235.81	236.40	236.92
5.550	256.56	256.72	256.92	257.13	257.49	257.79
5.600	278.49	278.55	278.61	278.67	278.73	278.73
5.650	300.35	300.28	300.16	300.03	299.72	299.36
5.700	321.64	321.42	321.09	320.74	319.99	319.22
5.750	341.79	341.39	340.83	340.24	339.02	337.81
5.800	360.15	359.57	358.78	357.93	356.24	354.59
5.850	376.09	375.35	374.33	373.26	371.12	369.08
5.900	389.04	388.15	386.95	385.69	383.20	380.83
5.950	398.53	397.55	396.23	394.84	392.11	389.52
6.000	404.30	403.28	401.91	400.46	397.64	394.96
6.050	406.28	405.28	403.93	402.52	399.74	397.11
6.100	404.61	403.69	402.44	401.13	398.54	396.08
6.150	399.65	398.85	397.76	396.60	394.32	392.15
6.200	391.88	391.23	390.33	389.38	387.50	385.69
6.250	381.89	381.40	380.72	380.01	378.57	377.20

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
6.300	370.28	369.96	369.52	369.05	368.10	367.21
6.350	357.70	357.55	357.34	357.11	356.68	356.31
6.400	344.73	344.75	344.77	344.81	344.93	345.16
6.450	331.97	332.16	332.43	332.75	333.52	334.56
6.500	319.99	320.37	320.94	321.61	323.28	325.53
6.550	309.43	310.08	311.07	312.27	315.42	319.53
6.600	301.16	302.23	303.90	306.05	311.85	318.76
6.620	298.75	300.07	302.17	304.94	312.29	320.55
6.640	297.03	298.67	301.35	304.95	314.17	323.81
6.660	296.13	298.21	301.68	306.39	317.81	328.70
6.680	296.28	298.95	303.52	309.67	323.50	335.34
6.700	297.73	301.23	307.33	315.30	331.51	343.78
6.720	300.87	305.54	313.76	323.87	342.03	353.99
6.740	306.22	312.58	323.63	336.00	355.10	365.82
6.760	314.53	323.36	337.91	352.18	370.63	378.92
6.780	326.91	339.28	357.63	372.69	388.24	392.90
6.800	344.98	362.20	383.52	397.31	407.22	407.08
6.820	371.16	394.19	415.63	425.18	426.63	420.79
6.840	408.98	436.82	452.77	454.64	445.26	433.20
6.850	433.68	462.08	472.41	469.23	453.85	438.68
6.860	463.08	489.50	492.11	483.28	461.72	443.53
6.870	497.75	518.32	511.27	496.37	468.71	447.64
6.880	537.89	547.44	529.18	508.11	474.65	450.97
6.890	583.00	575.43	545.16	518.16	479.36	453.42
6.900	631.20	600.61	558.46	526.09	482.76	454.86
6.910	678.61	621.21	568.48	531.67	484.69	455.32
6.920	719.02	635.57	574.61	534.57	485.07	454.76
6.930	744.70	642.36	576.51	534.69	483.91	453.09
6.940	748.97	640.76	573.93	531.90	481.08	450.34
6.950	729.37	630.60	566.85	526.22	476.67	446.54
6.960	689.19	612.40	555.49	517.74	470.73	441.70
6.970	635.83	587.27	540.16	506.63	463.23	435.81
6.980	577.45	556.79	521.45	493.17	454.37	428.98
6.990	520.37	522.76	499.97	477.65	444.25	421.27
7.000	468.30	487.02	476.46	460.47	432.97	412.71
7.010	422.73	451.21	451.64	441.99	420.73	403.41
7.020	383.81	416.69	426.27	422.63	407.71	393.50
7.030	350.97	384.42	400.97	402.79	394.07	383.04
7.040	323.40	355.00	376.31	382.82	379.98	372.16
7.060	280.74	305.59	330.63	343.87	351.23	349.49

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
7.080	250.13	268.01	291.47	307.91	322.72	326.35
7.100	227.59	240.01	259.43	276.23	295.51	303.43
7.120	210.51	219.10	234.03	249.32	270.45	281.38
7.140	197.20	203.21	214.22	227.09	247.97	260.71
7.160	186.54	190.83	198.80	209.06	228.26	241.70
7.180	177.80	180.93	186.68	194.59	211.34	224.64
7.200	170.48	172.81	177.00	182.97	196.99	209.48
7.220	164.23	166.01	169.10	173.57	184.96	196.24
7.240	158.81	160.18	162.52	165.86	174.93	184.77
7.260	154.03	155.12	156.92	159.43	166.55	174.92
7.280	149.76	150.64	152.06	153.98	159.54	166.49
7.300	145.92	146.64	147.78	149.27	153.61	159.30
7.350	137.71	138.17	138.88	139.75	142.13	145.48
7.400	130.94	131.26	131.74	132.31	133.73	135.71
7.450	125.19	125.43	125.78	126.18	127.12	128.33
7.500	120.19	120.38	120.66	120.96	121.65	122.45
7.550	115.80	115.96	116.18	116.43	116.96	117.56
7.600	111.91	112.04	112.23	112.44	112.88	113.35
7.650	108.43	108.55	108.72	108.90	109.28	109.68
7.700	105.33	105.44	105.59	105.76	106.10	106.46
7.750	102.57	102.67	102.81	102.96	103.28	103.62
7.800	100.11	100.21	100.35	100.50	100.81	101.13
7.850	97.96	98.05	98.19	98.34	98.65	98.98
7.900	96.09	96.19	96.33	96.49	96.82	97.18
7.950	94.52	94.63	94.79	94.96	95.34	95.76
8.000	93.27	93.39	93.57	93.77	94.23	94.78
8.050	92.36	92.51	92.74	92.99	93.60	94.44
8.100	91.88	92.07	92.37	92.72	93.64	95.09
8.150	91.93	92.20	92.63	93.17	94.75	97.36
8.200	92.71	93.13	93.81	94.73	97.79	102.47
8.250	94.58	95.28	96.49	98.31	104.41	112.51
8.300	98.24	99.55	102.00	106.04	117.80	130.13
8.320	100.48	102.21	105.61	111.21	126.04	139.85
8.340	103.37	105.71	110.53	118.22	136.39	151.31
8.360	107.12	110.35	117.29	127.70	149.12	164.52
8.380	112.02	116.62	126.65	140.33	164.42	179.53
8.400	118.53	125.25	139.66	156.84	182.36	196.07
8.420	127.31	137.41	157.58	177.82	202.91	213.99
8.440	139.42	154.89	181.76	203.64	225.65	232.77
8.460	156.54	180.28	213.28	234.21	249.99	251.99

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
8.480	181.44	216.88	252.51	268.77	275.12	270.96
8.500	218.81	267.83	298.54	305.84	299.92	289.07
8.520	276.54	334.09	348.71	343.10	323.23	305.59
8.530	316.70	371.94	374.02	360.93	333.91	313.05
8.540	366.82	411.55	398.57	377.74	343.76	319.87
8.550	428.50	451.31	421.61	393.14	352.64	325.94
8.560	502.02	489.25	442.40	406.74	360.35	331.19
8.570	584.43	523.18	460.19	418.28	366.81	335.61
8.580	666.96	550.92	474.38	427.36	371.97	339.16
8.590	734.14	570.60	484.41	433.88	375.70	341.74
8.600	768.30	580.87	489.95	437.62	377.95	343.37
8.610	759.66	581.12	490.83	438.51	378.76	344.07
8.620	713.18	571.48	487.05	436.62	378.08	343.82
8.630	644.34	552.86	478.88	431.91	375.90	342.56
8.640	569.14	526.82	466.62	424.68	372.35	340.39
8.650	498.13	495.31	450.90	415.03	367.47	337.34
8.660	436.06	460.44	432.29	403.32	361.28	333.45
8.670	383.93	424.20	411.53	389.86	353.99	328.69
8.680	340.99	388.34	389.33	374.99	345.71	323.22
8.700	277.12	322.75	343.34	342.48	326.68	310.39
8.720	234.04	269.57	299.06	308.56	305.39	295.53
8.740	204.27	229.46	259.68	275.64	282.97	279.33
8.760	183.12	200.35	226.73	245.46	260.55	262.41
8.780	167.69	179.43	200.42	219.12	238.99	245.39
8.800	156.19	164.31	180.11	196.97	218.99	228.79
8.820	147.44	153.19	164.75	178.92	201.04	213.07
8.840	140.69	144.88	153.25	164.60	185.33	198.54
8.860	135.43	138.56	144.65	153.45	171.93	185.44
8.880	131.30	133.70	138.18	144.91	160.72	173.86
8.900	128.04	129.92	133.30	138.41	151.54	163.83
8.920	125.48	126.99	129.59	133.48	144.17	155.28
8.940	123.48	124.72	126.78	129.76	138.37	148.14
8.960	121.95	122.98	124.65	126.97	133.87	142.29
8.980	120.80	121.67	123.06	124.92	130.46	137.61
9.000	119.98	120.74	121.92	123.44	127.93	133.95
9.020	119.45	120.12	121.14	122.43	126.11	131.18
9.040	119.17	119.77	120.68	121.79	124.87	129.17
9.060	119.12	119.67	120.49	121.48	124.11	127.81
9.080	119.27	119.79	120.55	121.46	123.77	127.01
9.100	119.62	120.11	120.83	121.68	123.80	126.69

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
9.120	120.16	120.63	121.33	122.15	124.15	126.79
9.140	120.87	121.34	122.03	122.84	124.80	127.26
9.160	121.75	122.22	122.92	123.75	125.73	128.09
9.180	122.81	123.30	124.02	124.89	126.94	129.25
9.200	124.05	124.56	125.33	126.26	128.43	130.73
9.220	125.47	126.02	126.86	127.89	130.21	132.51
9.240	127.09	127.70	128.63	129.79	132.29	134.57
9.260	128.93	129.61	130.68	131.99	134.68	136.90
9.280	131.01	131.78	133.04	134.54	137.37	139.48
9.300	133.36	134.27	135.76	137.47	140.36	142.28
9.320	136.02	137.12	138.92	140.82	143.64	145.28
9.340	139.06	140.42	142.57	144.61	147.18	148.42
9.360	142.56	144.27	146.78	148.83	150.93	151.67
9.380	146.64	148.82	151.61	153.45	154.82	154.96
9.400	151.45	154.20	157.03	158.38	158.76	158.23
9.420	157.22	160.56	162.96	163.49	162.64	161.41
9.440	164.27	167.93	169.19	168.57	166.36	164.42
9.460	172.97	176.10	175.38	173.39	169.79	167.22
9.480	183.66	184.51	181.10	177.68	172.83	169.72
9.500	196.23	192.16	185.86	181.21	175.39	171.91
9.520	208.97	197.81	189.21	183.76	177.40	173.73
9.540	217.05	200.35	190.87	185.23	178.84	175.18
9.560	214.53	199.29	190.74	185.60	179.70	176.26
9.580	201.97	195.01	189.00	184.98	180.03	176.99
9.600	187.07	188.66	186.06	183.54	179.90	177.41
9.620	175.58	181.74	182.43	181.56	179.41	177.57
9.640	168.54	175.57	178.69	179.32	178.68	177.51
9.660	164.92	170.92	175.31	177.11	177.81	177.30
9.680	163.58	168.02	172.63	175.15	176.92	177.00
9.700	163.68	166.70	170.82	173.62	176.11	176.66
9.720	164.66	166.61	169.90	172.60	175.44	176.34
9.740	166.18	167.38	169.77	172.12	174.97	176.05
9.760	168.03	168.70	170.28	172.13	174.72	175.83
9.780	170.05	170.34	171.25	172.55	174.67	175.67
9.800	172.13	172.15	172.52	173.29	174.81	175.59
9.850	177.08	176.61	176.10	175.79	175.66	175.55
9.900	180.93	180.11	179.04	178.03	176.46	175.32
9.950	182.92	181.81	180.35	178.88	176.33	174.31
10.000	182.42	181.10	179.39	177.66	174.54	171.95
10.050	179.00	177.61	175.81	174.00	170.69	167.89

FISSION NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
10.100	172.53	171.21	169.51	167.80	164.65	161.94
10.150	163.20	162.11	160.68	159.24	156.55	154.17
10.200	151.55	150.78	149.76	148.70	146.67	144.83
10.250	138.32	137.92	137.35	136.73	135.48	134.27
10.300	124.33	124.27	124.15	123.96	123.49	122.93
10.350	110.34	110.56	110.79	110.98	111.19	111.24
10.400	96.93	97.34	97.84	98.31	99.07	99.62
10.450	84.51	85.03	85.69	86.34	87.48	88.41
10.500	73.28	73.84	74.58	75.33	76.69	77.86
10.550	63.32	63.88	64.63	65.40	66.86	68.16
10.600	54.61	55.14	55.86	56.61	58.06	59.39
10.650	47.07	47.55	48.21	48.91	50.28	51.58
10.700	40.57	41.00	41.59	42.22	43.48	44.70
10.750	35.00	35.38	35.90	36.46	37.59	38.69
10.800	30.24	30.57	31.02	31.50	32.50	33.49
10.850	26.17	26.45	26.84	27.26	28.13	28.99
10.900	22.69	22.93	23.26	23.62	24.37	25.12
10.950	19.72	19.92	20.20	20.51	21.15	21.80
11.000	17.16	17.34	17.58	17.84	18.39	18.95

CAPTURE NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.020	399.69	399.74	399.82	399.90	400.06	400.23
.021	389.09	389.15	389.23	389.32	389.50	389.69
.022	379.24	379.31	379.40	379.50	379.70	379.90
.023	370.07	370.14	370.24	370.35	370.56	370.78
.024	361.51	361.58	361.69	361.80	362.03	362.26
.025	353.49	353.57	353.68	353.80	354.05	354.29
.026	345.97	346.05	346.17	346.30	346.55	346.81
.027	338.89	338.98	339.11	339.24	339.51	339.78
.028	332.23	332.32	332.45	332.59	332.88	333.16
.029	325.94	326.04	326.18	326.32	326.62	326.92
.030	320.00	320.11	320.25	320.40	320.71	321.01
.031	314.38	314.49	314.63	314.79	315.11	315.43
.032	309.06	309.17	309.32	309.48	309.81	310.14
.033	304.00	304.12	304.27	304.44	304.79	305.13
.034	299.21	299.32	299.48	299.66	300.01	300.36
.035	294.64	294.76	294.93	295.11	295.47	295.84
.036	290.30	290.43	290.60	290.78	291.16	291.53
.037	286.17	286.30	286.47	286.66	287.05	287.43
.038	282.23	282.36	282.54	282.73	283.13	283.52
.039	278.47	278.60	278.79	278.99	279.39	279.80
.040	274.88	275.02	275.21	275.41	275.83	276.24
.041	271.46	271.60	271.79	272.00	272.43	272.85
.042	268.19	268.33	268.53	268.74	269.18	269.61
.043	265.06	265.20	265.41	265.62	266.07	266.51
.044	262.07	262.22	262.42	262.65	263.10	263.55
.045	259.20	259.36	259.57	259.80	260.26	260.72
.046	256.47	256.62	256.84	257.07	257.54	258.02
.047	253.84	254.00	254.22	254.46	254.94	255.43
.048	251.33	251.50	251.72	251.96	252.46	252.95
.049	248.93	249.10	249.32	249.57	250.08	250.58
.050	246.63	246.80	247.03	247.28	247.80	248.31
.055	236.50	236.68	236.94	237.22	237.78	238.34
.060	228.36	228.56	228.84	229.14	229.76	230.37
.065	221.87	222.09	222.39	222.72	223.39	224.07
.070	216.79	217.03	217.36	217.72	218.46	219.20
.075	212.94	213.20	213.56	213.96	214.77	215.58
.080	210.19	210.48	210.87	211.30	212.19	213.09
.085	208.44	208.75	209.19	209.66	210.63	211.62
.090	207.61	207.95	208.43	208.95	210.03	211.12
.095	207.66	208.04	208.56	209.14	210.33	211.53

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.100	208.55	208.96	209.55	210.18	211.50	212.83
.105	210.26	210.72	211.37	212.07	213.53	215.02
.110	212.79	213.30	214.02	214.81	216.43	218.09
.120	220.36	221.00	221.89	222.87	224.91	226.99
.125	225.45	226.16	227.16	228.26	230.55	232.89
.130	231.46	232.26	233.39	234.62	237.19	239.84
.135	238.46	239.36	240.63	242.01	244.91	247.89
.140	246.50	247.52	248.95	250.51	253.79	257.15
.145	255.69	256.83	258.45	260.21	263.91	267.71
.150	266.10	267.40	269.22	271.22	275.40	279.69
.155	277.85	279.32	281.38	283.64	288.36	293.20
.160	291.08	292.74	295.07	297.63	302.95	308.37
.165	305.93	307.80	310.44	313.32	319.31	325.36
.170	322.56	324.68	327.65	330.89	337.58	344.28
.175	341.14	343.53	346.87	350.50	357.93	365.26
.180	361.89	364.57	368.30	372.33	380.49	388.38
.185	384.99	387.98	392.11	396.54	405.37	413.69
.190	410.66	413.96	418.48	423.27	432.63	441.16
.195	439.09	442.67	447.54	452.62	462.26	470.69
.200	470.44	474.26	479.37	484.59	494.13	502.03
.205	504.80	508.76	513.94	519.07	527.98	534.83
.210	542.19	546.11	551.07	555.78	563.37	568.56
.215	582.41	586.03	590.38	594.24	599.69	602.54
.220	625.05	628.00	631.23	633.70	636.11	635.95
.225	669.39	671.17	672.64	673.14	671.59	667.85
.230	714.25	714.30	713.33	711.27	704.98	697.24
.235	758.00	755.71	751.66	746.57	735.01	723.07
.240	798.53	793.39	785.80	777.39	760.41	744.36
.245	833.34	825.07	813.80	802.11	779.99	760.23
.250	859.78	848.48	833.83	819.24	792.79	770.02
.255	875.42	861.67	844.40	827.66	798.10	773.27
.260	878.47	863.30	844.58	826.69	795.58	769.76
.265	868.19	852.90	834.12	816.24	785.26	759.63
.270	845.06	830.96	813.50	796.77	767.56	743.24
.275	810.71	798.85	783.86	769.23	743.20	721.18
.280	767.58	758.63	746.85	734.99	713.20	694.21
.285	718.52	712.64	704.39	695.64	678.70	663.27
.290	666.29	663.28	658.48	652.85	640.96	629.31
.295	613.31	612.72	610.96	608.22	601.18	593.30
.300	561.44	562.71	563.43	563.18	560.50	556.19

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.305	512.00	514.58	517.16	518.89	519.92	518.79
.310	465.79	469.20	473.07	476.27	480.26	481.82
.315	423.25	427.10	431.76	435.94	442.15	445.89
.320	384.49	388.50	393.55	398.32	406.04	411.46
.325	349.44	353.42	358.56	363.61	372.24	378.84
.330	317.92	321.73	326.77	331.84	340.91	348.25
.335	289.65	293.23	298.02	302.96	312.09	319.82
.340	264.36	267.66	272.14	276.83	285.74	293.57
.345	241.74	244.75	248.88	253.26	261.77	269.48
.350	221.51	224.24	228.01	232.05	240.04	247.48
.355	203.41	205.87	209.29	212.98	220.39	227.44
.360	187.19	189.40	192.49	195.84	202.65	209.25
.365	172.64	174.62	177.40	180.43	186.64	192.76
.370	159.57	161.34	163.84	166.56	172.21	177.84
.375	147.80	149.39	151.62	154.08	159.19	164.33
.380	137.18	138.60	140.61	142.81	147.43	152.11
.385	127.58	128.86	130.66	132.64	136.79	141.05
.390	118.88	120.03	121.65	123.43	127.17	131.02
.395	110.99	112.02	113.47	115.08	118.45	121.93
.400	103.81	104.74	106.05	107.49	110.53	113.68
.405	97.27	98.10	99.28	100.58	103.32	106.17
.410	91.29	92.05	93.11	94.28	96.76	99.33
.415	85.82	86.51	87.47	88.53	90.77	93.09
.420	80.81	81.43	82.30	83.26	85.28	87.39
.425	76.20	76.76	77.55	78.42	80.26	82.17
.430	71.96	72.47	73.19	73.98	75.65	77.38
.435	68.05	68.52	69.17	69.89	71.41	72.99
.440	64.44	64.87	65.47	66.12	67.50	68.94
.445	61.10	61.49	62.04	62.64	63.90	65.20
.450	58.01	58.36	58.86	59.41	60.56	61.76
.460	52.47	52.77	53.19	53.65	54.62	55.62
.470	47.67	47.92	48.28	48.67	49.48	50.33
.480	43.48	43.70	44.00	44.34	45.03	45.75
.490	39.82	40.00	40.26	40.55	41.14	41.75
.500	36.59	36.75	36.98	37.22	37.73	38.26
.520	31.21	31.33	31.50	31.68	32.07	32.46
.540	26.93	27.02	27.15	27.29	27.59	27.89
.560	23.47	23.55	23.65	23.76	23.99	24.22
.580	20.65	20.71	20.79	20.88	21.06	21.24
.600	18.32	18.36	18.42	18.49	18.63	18.78

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.700	11.09	11.09	11.11	11.14	11.19	11.25
.800	7.56	7.56	7.57	7.58	7.61	7.64
.900	5.59	5.60	5.60	5.61	5.62	5.64
1.000	4.40	4.40	4.40	4.41	4.42	4.43
1.200	3.10	3.10	3.11	3.11	3.11	3.11
1.400	2.48	2.48	2.48	2.48	2.48	2.49
1.600	2.16	2.16	2.16	2.16	2.17	2.17
1.800	2.01	2.01	2.01	2.01	2.01	2.01
2.000	1.96	1.96	1.96	1.96	1.96	1.96
2.200	1.99	1.99	1.99	1.99	1.99	1.99
2.400	2.09	2.09	2.09	2.09	2.09	2.10
2.600	2.27	2.27	2.27	2.27	2.27	2.27
2.800	2.54	2.54	2.54	2.54	2.55	2.55
3.000	2.95	2.95	2.95	2.95	2.96	2.97
3.100	3.22	3.23	3.23	3.24	3.25	3.26
3.200	3.58	3.58	3.59	3.59	3.60	3.62
3.300	4.02	4.03	4.04	4.05	4.07	4.08
3.400	4.61	4.62	4.63	4.65	4.67	4.70
3.500	5.40	5.42	5.44	5.46	5.50	5.55
3.600	6.52	6.54	6.58	6.61	6.69	6.77
3.700	8.18	8.22	8.28	8.35	8.50	8.67
3.800	10.84	10.93	11.07	11.22	11.55	11.94
3.820	11.57	11.68	11.84	12.01	12.42	12.90
3.840	12.39	12.52	12.71	12.92	13.42	14.02
3.860	13.32	13.48	13.70	13.96	14.58	15.36
3.880	14.38	14.57	14.84	15.17	15.94	16.96
3.900	15.60	15.83	16.17	16.57	17.56	18.95
3.920	17.01	17.29	17.71	18.22	19.51	21.45
3.940	18.65	19.00	19.54	20.19	21.93	24.64
3.960	20.58	21.03	21.72	22.57	25.00	28.74
3.980	22.89	23.46	24.36	25.51	28.97	34.11
4.000	25.66	26.41	27.61	29.21	34.18	41.23
4.020	29.04	30.04	31.69	33.98	41.16	50.65
4.040	33.22	34.60	36.93	40.34	50.64	62.99
4.060	38.50	40.43	43.84	49.03	63.57	78.91
4.080	45.29	48.08	53.28	61.21	81.01	98.89
4.100	54.22	58.41	66.62	78.55	104.01	123.29
4.120	66.32	72.88	86.07	103.27	133.35	152.10
4.140	83.23	94.01	114.91	137.73	169.29	184.77
4.160	107.83	126.24	157.35	183.68	211.16	220.19

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.180	145.28	176.92	217.14	241.21	257.03	256.46
4.190	171.59	212.26	253.96	273.57	280.52	274.21
4.200	205.34	255.91	294.92	307.39	303.68	291.29
4.210	249.16	308.49	338.99	341.72	326.02	307.39
4.220	306.59	369.53	384.60	375.41	346.94	322.18
4.230	382.01	436.92	429.68	407.14	365.84	335.32
4.240	479.65	506.47	471.74	435.54	382.25	346.60
4.250	600.31	572.06	508.10	459.27	395.56	355.67
4.260	733.60	626.49	536.27	477.25	405.47	362.37
4.270	848.32	662.82	554.20	488.41	411.62	366.68
4.280	897.55	675.96	560.49	492.37	413.88	368.33
4.290	854.94	664.06	554.71	488.87	412.25	367.51
4.300	743.57	629.04	537.44	478.18	406.74	364.20
4.310	610.55	575.93	510.11	460.99	397.70	358.44
4.320	488.93	511.64	474.78	438.12	385.28	350.54
4.330	390.35	443.36	434.01	410.89	370.11	340.60
4.340	314.47	377.16	390.42	380.59	352.60	328.93
4.350	257.08	317.22	346.43	348.59	333.36	315.88
4.360	213.74	265.70	304.09	316.12	312.97	301.73
4.370	180.82	223.13	264.99	284.42	291.98	286.81
4.380	155.62	188.97	230.06	254.31	270.93	271.44
4.400	121.07	141.16	174.20	201.66	230.50	240.52
4.420	100.26	112.75	136.24	161.07	194.72	211.14
4.440	88.11	96.61	112.78	132.62	165.37	184.82
4.460	82.02	88.53	99.97	114.70	142.92	162.47
4.480	80.70	86.25	94.65	105.01	126.90	144.44
4.500	83.60	88.51	94.53	101.17	116.29	130.44
4.510	86.56	91.05	95.84	100.77	112.60	124.75
4.520	90.48	94.26	97.78	101.04	109.75	119.84
4.530	95.31	98.24	100.12	101.78	107.57	115.60
4.540	100.92	102.50	102.66	102.78	105.88	111.92
4.550	107.08	106.85	105.18	103.84	104.52	108.70
4.560	113.43	110.99	107.47	104.79	103.35	105.85
4.570	119.46	114.58	109.32	105.48	102.23	103.25
4.580	124.52	117.29	110.55	105.77	101.08	100.83
4.590	127.93	118.84	111.02	105.57	99.77	98.52
4.600	129.10	119.02	110.63	104.80	98.28	96.23
4.610	127.73	117.72	109.33	103.42	96.53	93.93
4.620	123.84	114.96	107.11	101.42	94.51	91.57
4.640	110.33	105.65	100.16	95.67	89.60	86.52

CAPTURE NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.660	93.43	93.01	90.65	87.98	83.63	80.99
4.680	77.22	79.39	79.81	79.05	76.82	75.03
4.700	63.54	66.60	68.82	69.66	69.51	68.77
4.720	52.65	55.62	58.61	60.51	62.07	62.39
4.740	44.17	46.66	49.70	52.09	54.85	56.09
4.760	37.60	39.56	42.24	44.70	48.11	50.04
4.780	32.48	33.98	36.19	38.44	42.04	44.39
4.800	28.46	29.60	31.34	33.26	36.71	39.26
4.820	25.25	26.12	27.47	29.05	32.15	34.69
4.840	22.68	23.35	24.39	25.64	28.31	30.70
4.860	20.58	21.11	21.92	22.90	25.12	27.28
4.880	18.87	19.28	19.91	20.69	22.50	24.38
4.900	17.45	17.77	18.28	18.89	20.35	21.95
4.950	14.84	15.03	15.33	15.68	16.52	17.53
5.000	13.13	13.26	13.45	13.66	14.17	14.78
5.050	12.01	12.10	12.22	12.37	12.69	13.07
5.100	11.28	11.34	11.43	11.53	11.75	12.00
5.150	10.83	10.87	10.94	11.02	11.18	11.35
5.200	10.58	10.62	10.67	10.73	10.85	10.98
5.250	10.49	10.52	10.57	10.61	10.71	10.81
5.300	10.53	10.56	10.59	10.63	10.71	10.79
5.350	10.68	10.70	10.73	10.76	10.83	10.89
5.400	10.91	10.92	10.95	10.98	11.03	11.08
5.450	11.20	11.22	11.24	11.26	11.30	11.35
5.500	11.56	11.57	11.58	11.60	11.63	11.66
5.550	11.95	11.96	11.97	11.98	12.00	12.02
5.600	12.37	12.37	12.37	12.38	12.39	12.39
5.650	12.79	12.79	12.79	12.79	12.78	12.77
5.700	13.20	13.20	13.19	13.18	13.16	13.14
5.750	13.59	13.58	13.56	13.54	13.51	13.48
5.800	13.92	13.91	13.88	13.86	13.81	13.77
5.850	14.19	14.17	14.14	14.11	14.06	14.01
5.900	14.38	14.36	14.33	14.29	14.23	14.18
5.950	14.48	14.46	14.43	14.39	14.33	14.27
6.000	14.50	14.48	14.45	14.41	14.36	14.30
6.050	14.43	14.41	14.39	14.36	14.31	14.27
6.100	14.29	14.28	14.26	14.24	14.21	14.18
6.150	14.11	14.10	14.09	14.08	14.07	14.06
6.200	13.90	13.90	13.90	13.91	13.92	13.93
6.250	13.70	13.71	13.72	13.74	13.79	13.84

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
6.300	13.53	13.56	13.59	13.63	13.71	13.81
6.350	13.45	13.49	13.54	13.61	13.75	13.92
6.400	13.50	13.56	13.64	13.74	13.96	14.25
6.450	13.74	13.83	13.96	14.11	14.47	14.96
6.500	14.27	14.40	14.60	14.85	15.47	16.36
6.550	15.24	15.45	15.77	16.19	17.33	18.91
6.600	16.89	17.24	17.81	18.57	20.75	23.47
6.620	17.83	18.27	19.00	20.01	22.81	26.12
6.640	18.99	19.56	20.51	21.84	25.44	29.35
6.660	20.42	21.16	22.43	24.21	28.76	33.25
6.680	22.22	23.19	24.90	27.29	32.90	37.88
6.700	24.47	25.77	28.11	31.29	38.00	43.27
6.720	27.34	29.11	32.35	36.47	44.15	49.42
6.740	31.03	33.50	37.95	43.11	51.40	56.29
6.760	35.85	39.36	45.36	51.47	59.74	63.76
6.780	42.26	47.29	55.05	61.70	69.05	71.67
6.800	50.95	58.11	67.41	73.79	79.05	79.76
6.820	62.94	72.79	82.57	87.46	89.39	87.75
6.840	79.80	92.15	100.15	102.06	99.56	95.30
6.850	90.69	103.65	109.55	109.42	104.41	90.00
6.860	103.64	116.21	119.09	116.63	108.99	102.06
6.870	118.94	129.55	128.55	123.53	113.25	105.04
6.880	136.75	143.26	137.61	129.95	117.10	107.70
6.890	156.98	156.74	145.99	135.72	120.46	110.01
6.900	178.99	169.30	153.36	140.67	123.30	111.90
6.910	201.28	180.18	159.46	144.69	125.53	113.38
6.920	221.31	188.64	164.01	147.62	127.13	114.44
6.930	235.78	194.06	166.83	149.40	128.08	115.03
6.940	241.63	196.03	167.78	149.96	128.32	115.15
6.950	237.43	194.38	166.82	149.29	127.89	114.82
6.960	224.17	189.24	164.02	147.41	126.79	114.04
6.970	204.69	181.00	159.45	144.37	125.00	112.79
6.980	182.36	170.27	153.35	140.27	122.60	111.12
6.990	159.93	157.77	145.95	135.22	119.63	109.05
7.000	139.08	144.26	137.55	129.39	116.12	106.58
7.010	120.62	130.44	128.45	122.90	112.15	103.77
7.020	104.70	116.92	118.95	115.94	107.79	100.66
7.030	91.20	104.12	109.33	108.67	103.11	97.28
7.040	79.83	92.35	99.83	101.24	98.19	93.67
7.060	62.23	72.41	82.01	86.51	87.89	85.95

CAPTURE NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
7.080	49.68	57.17	66.54	72.69	77.45	77.83
7.100	40.57	45.87	53.83	60.40	67.34	69.64
7.120	33.82	37.53	43.77	49.92	57.94	61.65
7.140	28.71	31.33	36.01	41.29	49.46	54.09
7.160	24.76	26.64	30.07	34.35	42.03	47.11
7.180	21.65	23.03	25.52	28.86	35.68	40.84
7.200	19.17	20.19	22.02	24.57	30.35	35.29
7.220	17.15	17.93	19.29	21.21	25.95	30.49
7.240	15.50	16.10	17.12	18.56	22.37	26.37
7.260	14.12	14.60	15.38	16.46	19.47	22.90
7.280	12.97	13.34	13.95	14.78	17.13	20.01
7.300	11.99	12.29	12.77	13.41	15.25	17.61
7.350	10.11	10.30	10.58	10.94	11.93	13.32
7.400	8.79	8.91	9.09	9.31	9.88	10.68
7.450	7.84	7.92	8.04	8.19	8.54	9.01
7.500	7.13	7.19	7.28	7.38	7.62	7.91
7.550	6.61	6.66	6.72	6.80	6.97	7.17
7.600	6.22	6.26	6.31	6.37	6.50	6.65
7.650	5.95	5.98	6.02	6.07	6.18	6.30
7.700	5.76	5.79	5.83	5.88	5.97	6.08
7.750	5.66	5.69	5.73	5.77	5.86	5.96
7.800	5.64	5.67	5.71	5.75	5.85	5.95
7.850	5.69	5.72	5.77	5.82	5.93	6.05
7.900	5.84	5.87	5.92	5.98	6.12	6.26
7.950	6.08	6.12	6.19	6.26	6.43	6.63
8.000	6.44	6.50	6.59	6.69	6.92	7.22
8.050	6.96	7.04	7.16	7.30	7.65	8.13
8.100	7.69	7.81	7.98	8.19	8.74	9.62
8.150	8.72	8.89	9.16	9.50	10.48	12.05
8.200	10.20	10.47	10.90	11.49	13.39	16.18
8.250	12.36	12.82	13.61	14.76	18.46	23.18
8.300	15.69	16.54	18.11	20.60	27.53	34.49
8.320	17.53	18.65	20.80	24.20	32.82	40.50
8.340	19.79	21.29	24.30	28.90	39.30	47.46
8.360	22.60	24.66	28.92	35.05	47.11	55.35
8.380	26.15	29.04	35.10	43.02	56.32	64.17
8.400	30.73	34.89	43.44	53.19	66.94	73.76
8.420	36.73	42.89	54.61	65.84	78.90	83.99
8.440	44.79	54.06	69.33	81.11	91.93	94.55
8.460	55.92	69.85	88.09	98.85	105.65	105.17

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
8.480	71.73	92.03	110.95	118.53	119.55	115.47
8.500	94.91	122.13	137.19	139.19	132.98	125.07
8.520	129.85	160.27	165.09	159.46	145.26	133.58
8.530	153.71	181.59	178.87	168.93	150.74	137.30
8.540	183.06	203.54	191.99	177.68	155.68	140.62
8.550	218.59	225.14	204.03	185.51	160.00	143.48
8.560	260.15	245.25	214.58	192.18	163.60	145.83
8.570	305.59	262.61	223.23	197.58	166.44	147.68
8.580	349.47	276.03	229.66	201.49	168.50	149.01
8.590	382.76	284.53	233.60	203.87	169.71	149.77
8.600	395.83	287.47	234.90	204.62	170.05	149.97
8.610	384.15	284.60	233.50	203.72	169.56	149.62
8.620	351.74	276.17	229.46	201.24	168.21	148.74
8.630	308.12	262.82	222.98	197.18	166.02	147.28
8.640	262.49	245.54	214.27	191.72	163.06	145.30
8.650	220.54	225.52	203.72	184.96	159.37	142.84
8.660	184.58	204.00	191.69	177.11	154.97	139.90
8.670	154.85	182.11	178.61	168.35	149.97	136.51
8.680	130.68	160.82	164.92	158.90	144.46	132.72
8.700	95.31	122.70	137.19	138.77	132.19	124.16
8.720	71.90	92.52	111.12	118.31	118.86	114.59
8.740	55.96	70.21	88.40	98.83	105.13	104.39
8.760	44.78	54.31	69.70	81.27	91.62	93.93
8.780	36.69	43.05	55.00	66.15	78.81	83.56
8.800	30.68	35.00	43.79	53.59	67.06	73.56
8.820	26.12	29.12	35.41	43.46	56.62	64.18
8.840	22.59	24.73	29.18	35.49	47.54	55.56
8.860	19.80	21.37	24.53	29.32	39.84	47.84
8.880	17.57	18.74	21.01	24.59	33.41	41.03
8.900	15.77	16.66	18.32	20.97	28.15	35.13
8.920	14.29	14.98	16.23	18.18	23.90	30.09
8.940	13.07	13.62	14.57	16.02	20.51	25.84
8.960	12.05	12.49	13.23	14.32	17.82	22.31
8.980	11.20	11.56	12.15	12.98	15.70	19.42
9.000	10.48	10.78	11.26	11.91	14.03	17.07
9.020	9.88	10.13	10.52	11.05	12.70	15.18
9.040	9.37	9.58	9.92	10.34	11.65	13.68
9.060	8.94	9.13	9.41	9.77	10.83	12.49
9.080	8.58	8.75	9.00	9.31	10.18	11.57
9.100	8.29	8.43	8.66	8.93	9.68	10.86

CAPTURE NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
9.120	8.05	8.18	8.39	8.64	9.31	10.34
9.140	7.86	7.98	8.18	8.41	9.04	9.96
9.160	7.72	7.84	8.03	8.26	8.88	9.74
9.180	7.62	7.74	7.93	8.17	8.81	9.64
9.200	7.57	7.70	7.89	8.15	8.84	9.67
9.220	7.56	7.70	7.92	8.21	8.97	9.81
9.240	7.61	7.76	8.01	8.35	9.20	10.07
9.260	7.71	7.88	8.18	8.59	9.55	10.44
9.280	7.86	8.07	8.44	8.94	10.02	10.91
9.300	8.09	8.35	8.82	9.43	10.61	11.48
9.320	8.41	8.73	9.34	10.08	11.33	12.15
9.340	8.83	9.26	10.05	10.91	12.18	12.90
9.360	9.39	9.98	10.99	11.94	13.15	13.71
9.380	10.15	10.95	12.19	13.18	14.21	14.57
9.400	11.15	12.26	13.69	14.62	15.34	15.46
9.420	12.52	14.02	15.50	16.21	16.51	16.34
9.440	14.40	16.30	17.57	17.91	17.67	17.18
9.460	17.02	19.12	19.80	19.62	18.76	17.96
9.480	20.67	22.37	22.05	21.23	19.75	18.65
9.500	25.58	25.71	24.10	22.64	20.57	19.22
9.520	31.48	28.64	25.73	23.71	21.19	19.64
9.540	36.73	30.58	26.75	24.37	21.57	19.91
9.560	38.37	31.10	27.02	24.56	21.69	20.00
9.580	35.16	30.08	26.53	24.27	21.55	19.93
9.600	29.42	27.79	25.35	23.53	21.17	19.69
9.620	23.86	24.74	23.63	22.42	20.57	19.30
9.640	19.53	21.51	21.60	21.03	19.78	18.78
9.660	16.44	18.53	19.47	19.49	18.86	18.15
9.680	14.27	16.05	17.43	17.91	17.85	17.44
9.700	12.76	14.12	15.60	16.38	16.80	16.68
9.720	11.69	12.69	14.04	14.98	15.76	15.89
9.740	10.94	11.65	12.79	13.75	14.76	15.11
9.760	10.41	10.92	11.82	12.71	13.84	14.34
9.780	10.04	10.40	11.09	11.86	13.01	13.62
9.800	9.78	10.04	10.55	11.19	12.28	12.95
9.850	9.45	9.57	9.80	10.14	10.92	11.56
9.900	9.38	9.43	9.52	9.67	10.11	10.59
9.950	9.41	9.42	9.44	9.48	9.67	9.95
10.000	9.45	9.43	9.41	9.39	9.43	9.54
10.050	9.44	9.40	9.35	9.30	9.24	9.25

CAPTURE NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
10.100	9.33	9.28	9.21	9.15	9.05	9.00
10.150	9.11	9.05	8.98	8.92	8.80	8.72
10.200	8.76	8.71	8.65	8.59	8.48	8.39
10.250	8.32	8.28	8.23	8.18	8.09	8.02
10.300	7.80	7.78	7.75	7.71	7.65	7.59
10.350	7.24	7.23	7.21	7.20	7.16	7.13
10.400	6.66	6.66	6.67	6.66	6.66	6.64
10.450	6.10	6.11	6.12	6.13	6.15	6.15
10.500	5.56	5.58	5.59	5.61	5.64	5.67
10.550	5.06	5.08	5.10	5.12	5.17	5.20
10.600	4.60	4.62	4.64	4.67	4.72	4.76
10.650	4.18	4.20	4.23	4.25	4.31	4.35
10.700	3.81	3.83	3.85	3.88	3.93	3.97
10.750	3.48	3.49	3.51	3.54	3.59	3.63
10.800	3.18	3.19	3.21	3.24	3.28	3.32
10.850	2.91	2.93	2.94	2.96	3.00	3.04
10.900	2.68	2.69	2.70	2.72	2.76	2.79
10.950	2.46	2.48	2.49	2.51	2.54	2.57
11.000	2.28	2.29	2.30	2.31	2.34	2.37

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.020	12.66	12.66	12.65	12.65	12.65	12.64
.021	12.65	12.65	12.64	12.64	12.64	12.63
.022	12.64	12.64	12.64	12.63	12.63	12.62
.023	12.63	12.63	12.63	12.62	12.62	12.62
.024	12.62	12.62	12.62	12.61	12.61	12.61
.025	12.61	12.61	12.61	12.61	12.60	12.60
.026	12.60	12.60	12.60	12.60	12.59	12.59
.027	12.59	12.59	12.59	12.59	12.58	12.58
.028	12.58	12.58	12.58	12.58	12.57	12.57
.029	12.58	12.57	12.57	12.57	12.57	12.56
.030	12.57	12.57	12.56	12.56	12.56	12.55
.031	12.56	12.56	12.55	12.55	12.55	12.54
.032	12.55	12.55	12.55	12.54	12.54	12.54
.033	12.54	12.54	12.54	12.54	12.53	12.53
.034	12.53	12.53	12.53	12.53	12.52	12.52
.035	12.52	12.52	12.52	12.52	12.51	12.51
.036	12.51	12.51	12.51	12.51	12.50	12.50
.037	12.51	12.50	12.50	12.50	12.50	12.49
.038	12.50	12.50	12.49	12.49	12.49	12.48
.039	12.49	12.49	12.48	12.48	12.48	12.47
.040	12.48	12.48	12.48	12.47	12.47	12.47
.041	12.47	12.47	12.47	12.46	12.46	12.46
.042	12.46	12.46	12.46	12.46	12.45	12.45
.043	12.45	12.45	12.45	12.45	12.44	12.44
.044	12.44	12.44	12.44	12.44	12.43	12.43
.045	12.44	12.43	12.43	12.43	12.43	12.42
.046	12.43	12.43	12.42	12.42	12.42	12.41
.047	12.42	12.42	12.42	12.41	12.41	12.40
.048	12.41	12.41	12.41	12.40	12.40	12.40
.049	12.40	12.40	12.40	12.40	12.39	12.39
.050	12.39	12.39	12.39	12.39	12.38	12.38
.055	12.35	12.35	12.35	12.34	12.34	12.34
.060	12.31	12.30	12.30	12.30	12.30	12.29
.065	12.26	12.26	12.26	12.26	12.25	12.25
.070	12.22	12.22	12.22	12.21	12.21	12.21
.075	12.18	12.18	12.17	12.17	12.17	12.16
.080	12.13	12.13	12.13	12.13	12.12	12.12
.085	12.09	12.09	12.09	12.08	12.08	12.07
.090	12.05	12.04	12.04	12.04	12.04	12.03
.095	12.00	12.00	12.00	12.00	11.99	11.99

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.100	11.96	11.96	11.95	11.95	11.95	11.94
.105	11.91	11.91	11.91	11.91	11.90	11.90
.110	11.87	11.87	11.86	11.86	11.86	11.85
.120	11.78	11.78	11.77	11.77	11.77	11.76
.125	11.73	11.73	11.73	11.73	11.72	11.72
.130	11.69	11.69	11.68	11.68	11.68	11.67
.135	11.64	11.64	11.64	11.64	11.63	11.63
.140	11.60	11.60	11.59	11.59	11.59	11.59
.145	11.55	11.55	11.55	11.55	11.55	11.55
.150	11.51	11.51	11.51	11.51	11.51	11.51
.155	11.47	11.47	11.47	11.47	11.47	11.48
.160	11.43	11.43	11.43	11.43	11.44	11.45
.165	11.39	11.39	11.40	11.40	11.41	11.42
.170	11.36	11.36	11.37	11.37	11.39	11.41
.175	11.33	11.34	11.34	11.35	11.37	11.40
.180	11.31	11.32	11.33	11.34	11.37	11.41
.185	11.30	11.31	11.32	11.34	11.38	11.42
.190	11.30	11.31	11.33	11.36	11.41	11.46
.195	11.31	11.33	11.36	11.39	11.45	11.52
.200	11.35	11.37	11.40	11.44	11.52	11.60
.205	11.40	11.43	11.47	11.52	11.61	11.71
.210	11.48	11.52	11.57	11.63	11.74	11.85
.215	11.60	11.64	11.71	11.77	11.90	12.02
.220	11.76	11.81	11.88	11.96	12.10	12.22
.225	11.96	12.02	12.10	12.18	12.33	12.46
.230	12.21	12.28	12.37	12.45	12.60	12.72
.235	12.52	12.59	12.68	12.76	12.90	13.02
.240	12.89	12.96	13.04	13.11	13.24	13.33
.245	13.31	13.37	13.44	13.50	13.59	13.66
.250	13.77	13.81	13.86	13.90	13.96	14.00
.255	14.26	14.28	14.30	14.31	14.33	14.34
.260	14.75	14.74	14.73	14.72	14.70	14.67
.265	15.22	15.19	15.15	15.11	15.04	14.99
.270	15.65	15.60	15.53	15.47	15.37	15.28
.275	16.03	15.95	15.87	15.79	15.65	15.55
.280	16.33	16.25	16.15	16.06	15.90	15.78
.285	16.56	16.48	16.37	16.28	16.11	15.97
.290	16.72	16.64	16.54	16.44	16.27	16.13
.295	16.81	16.74	16.65	16.56	16.39	16.25
.300	16.85	16.79	16.71	16.63	16.47	16.34

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.305	16.84	16.79	16.73	16.65	16.52	16.39
.310	16.80	16.76	16.71	16.65	16.53	16.42
.315	16.73	16.70	16.66	16.61	16.51	16.42
.320	16.65	16.63	16.59	16.56	16.48	16.39
.325	16.55	16.54	16.51	16.48	16.42	16.35
.330	16.45	16.44	16.42	16.40	16.35	16.30
.335	16.34	16.33	16.32	16.31	16.27	16.23
.340	16.23	16.22	16.22	16.21	16.18	16.15
.345	16.12	16.12	16.11	16.11	16.09	16.07
.350	16.01	16.01	16.01	16.01	16.00	15.98
.355	15.90	15.91	15.91	15.91	15.90	15.89
.360	15.80	15.80	15.81	15.81	15.81	15.81
.365	15.70	15.71	15.71	15.71	15.72	15.72
.370	15.61	15.61	15.62	15.62	15.63	15.63
.375	15.52	15.52	15.53	15.53	15.54	15.54
.380	15.43	15.44	15.44	15.45	15.46	15.46
.385	15.35	15.35	15.36	15.36	15.37	15.38
.390	15.27	15.28	15.28	15.29	15.30	15.30
.395	15.20	15.20	15.21	15.21	15.22	15.23
.400	15.12	15.13	15.13	15.14	15.15	15.16
.405	15.06	15.06	15.07	15.07	15.08	15.09
.410	14.99	15.00	15.00	15.00	15.01	15.02
.415	14.93	14.93	14.94	14.94	14.95	14.96
.420	14.87	14.87	14.88	14.88	14.89	14.90
.425	14.81	14.82	14.82	14.83	14.83	14.84
.430	14.76	14.76	14.77	14.77	14.78	14.79
.435	14.71	14.71	14.72	14.72	14.73	14.74
.440	14.66	14.66	14.67	14.67	14.68	14.68
.445	14.61	14.61	14.62	14.62	14.63	14.64
.450	14.57	14.57	14.57	14.58	14.58	14.59
.460	14.48	14.48	14.49	14.49	14.50	14.50
.470	14.40	14.41	14.41	14.41	14.42	14.42
.480	14.33	14.33	14.34	14.34	14.34	14.35
.490	14.26	14.27	14.27	14.27	14.27	14.28
.500	14.20	14.20	14.21	14.21	14.21	14.22
.520	14.09	14.09	14.09	14.09	14.10	14.10
.540	13.99	13.99	13.99	13.99	14.00	14.00
.560	13.90	13.90	13.91	13.91	13.91	13.91
.580	13.83	13.83	13.83	13.83	13.83	13.83
.600	13.76	13.76	13.76	13.76	13.76	13.76

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
.700	13.49	13.49	13.49	13.49	13.49	13.49
.800	13.31	13.31	13.31	13.31	13.31	13.31
.900	13.17	13.17	13.17	13.17	13.17	13.17
1.000	13.06	13.06	13.06	13.06	13.06	13.06
1.200	12.89	12.89	12.89	12.89	12.89	12.89
1.400	12.75	12.75	12.75	12.75	12.75	12.75
1.600	12.63	12.63	12.63	12.63	12.62	12.62
1.800	12.51	12.51	12.51	12.51	12.51	12.51
2.000	12.39	12.39	12.39	12.39	12.39	12.39
2.200	12.27	12.27	12.27	12.27	12.27	12.27
2.400	12.14	12.14	12.14	12.14	12.14	12.14
2.600	12.00	12.00	12.00	12.00	12.00	12.00
2.800	11.84	11.84	11.84	11.84	11.84	11.84
3.000	11.66	11.65	11.65	11.65	11.65	11.65
3.100	11.55	11.55	11.55	11.55	11.54	11.54
3.200	11.43	11.43	11.43	11.43	11.42	11.42
3.300	11.30	11.30	11.29	11.29	11.29	11.29
3.400	11.14	11.14	11.14	11.14	11.14	11.13
3.500	10.97	10.97	10.96	10.96	10.96	10.95
3.600	10.76	10.75	10.75	10.75	10.74	10.73
3.700	10.50	10.49	10.49	10.48	10.47	10.46
3.800	10.16	10.16	10.15	10.14	10.12	10.10
3.820	10.08	10.08	10.07	10.06	10.04	10.02
3.840	10.00	9.99	9.98	9.97	9.95	9.92
3.860	9.91	9.90	9.89	9.88	9.85	9.82
3.880	9.81	9.80	9.79	9.78	9.75	9.71
3.900	9.71	9.70	9.68	9.67	9.63	9.60
3.920	9.60	9.59	9.57	9.55	9.51	9.47
3.940	9.48	9.46	9.44	9.42	9.38	9.34
3.960	9.34	9.33	9.31	9.28	9.23	9.20
3.980	9.20	9.18	9.15	9.13	9.07	9.05
4.000	9.04	9.02	8.99	8.96	8.91	8.91
4.020	8.86	8.84	8.80	8.77	8.73	8.77
4.040	8.67	8.64	8.60	8.56	8.56	8.66
4.060	8.45	8.41	8.37	8.34	8.40	8.60
4.080	8.20	8.16	8.12	8.12	8.29	8.60
4.100	7.92	7.88	7.86	7.91	8.26	8.70
4.120	7.61	7.58	7.60	7.77	8.35	8.92
4.140	7.27	7.25	7.41	7.77	8.62	9.30
4.160	6.89	6.97	7.39	8.01	9.10	9.84

SCATTERING NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.180	6.53	6.84	7.71	8.60	9.84	10.55
4.190	6.38	6.92	8.06	9.06	10.30	10.97
4.200	6.29	7.17	8.58	9.63	10.82	11.42
4.210	6.31	7.64	9.27	10.32	11.40	11.90
4.220	6.52	8.42	10.16	11.12	12.02	12.40
4.230	7.05	9.55	11.22	12.02	12.68	12.92
4.240	8.15	11.06	12.44	12.99	13.37	13.45
4.250	10.10	12.91	13.77	14.01	14.06	13.98
4.260	13.21	15.00	15.16	15.04	14.74	14.50
4.270	17.41	17.17	16.53	16.05	15.41	15.01
4.280	21.87	19.22	17.82	16.99	16.03	15.48
4.290	25.24	20.97	18.96	17.84	16.61	15.93
4.300	26.74	22.25	19.89	18.57	17.13	16.34
4.310	26.63	23.02	20.58	19.16	17.58	16.71
4.320	25.63	23.27	21.02	19.59	17.94	17.03
4.330	24.32	23.08	21.21	19.86	18.23	17.30
4.340	22.98	22.57	21.17	19.98	18.43	17.51
4.350	21.76	21.86	20.94	19.97	18.56	17.68
4.360	20.69	21.05	20.57	19.83	18.61	17.80
4.370	19.77	20.24	20.10	19.60	18.60	17.87
4.380	18.97	19.46	19.58	19.29	18.52	17.89
4.400	17.71	18.12	18.50	18.55	18.24	17.84
4.420	16.78	17.10	17.53	17.79	17.86	17.68
4.440	16.10	16.36	16.76	17.11	17.44	17.46
4.460	15.61	15.84	16.21	16.59	17.07	17.23
4.480	15.30	15.53	15.89	16.25	16.77	17.01
4.500	15.16	15.42	15.76	16.08	16.57	16.83
4.510	15.17	15.45	15.77	16.06	16.50	16.76
4.520	15.23	15.52	15.82	16.08	16.46	16.70
4.530	15.36	15.64	15.91	16.12	16.44	16.64
4.540	15.54	15.81	16.03	16.19	16.44	16.60
4.550	15.79	16.01	16.17	16.28	16.45	16.57
4.560	16.10	16.25	16.33	16.38	16.46	16.55
4.570	16.45	16.50	16.49	16.48	16.49	16.52
4.580	16.82	16.76	16.66	16.58	16.51	16.51
4.590	17.19	16.99	16.81	16.68	16.54	16.49
4.600	17.51	17.20	16.94	16.76	16.56	16.47
4.610	17.76	17.36	17.04	16.82	16.57	16.45
4.620	17.89	17.46	17.10	16.86	16.57	16.42
4.640	17.85	17.47	17.12	16.86	16.53	16.34

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
4.660	17.47	17.25	16.97	16.74	16.43	16.23
4.680	16.94	16.86	16.70	16.53	16.26	16.08
4.700	16.38	16.40	16.34	16.24	16.05	15.90
4.720	15.86	15.92	15.93	15.90	15.79	15.68
4.740	15.40	15.47	15.52	15.54	15.51	15.44
4.760	14.99	15.06	15.14	15.18	15.21	15.18
4.780	14.65	14.71	14.78	14.84	14.91	14.92
4.800	14.35	14.40	14.47	14.53	14.62	14.66
4.820	14.09	14.13	14.19	14.25	14.35	14.40
4.840	13.86	13.89	13.94	14.00	14.09	14.16
4.860	13.65	13.68	13.72	13.77	13.86	13.93
4.880	13.47	13.49	13.53	13.57	13.65	13.72
4.900	13.31	13.33	13.36	13.39	13.46	13.53
4.950	12.96	12.97	12.99	13.01	13.06	13.12
5.000	12.67	12.68	12.70	12.71	12.75	12.79
5.050	12.44	12.44	12.45	12.47	12.49	12.52
5.100	12.24	12.24	12.25	12.26	12.28	12.30
5.150	12.06	12.07	12.08	12.08	12.10	12.12
5.200	11.92	11.92	11.93	11.94	11.95	11.97
5.250	11.79	11.80	11.80	11.81	11.83	11.84
5.300	11.69	11.69	11.70	11.71	11.72	11.74
5.350	11.61	11.61	11.62	11.63	11.65	11.66
5.400	11.55	11.56	11.57	11.57	11.59	11.61
5.450	11.52	11.53	11.54	11.55	11.57	11.59
5.500	11.51	11.52	11.53	11.54	11.57	11.59
5.550	11.54	11.55	11.56	11.57	11.59	11.62
5.600	11.60	11.60	11.62	11.63	11.65	11.68
5.650	11.69	11.69	11.71	11.72	11.75	11.77
5.700	11.81	11.82	11.83	11.84	11.87	11.89
5.750	11.97	11.98	11.99	12.00	12.02	12.05
5.800	12.16	12.16	12.17	12.19	12.21	12.23
5.850	12.37	12.38	12.39	12.40	12.41	12.43
5.900	12.61	12.61	12.62	12.62	12.63	12.64
5.950	12.86	12.86	12.86	12.86	12.87	12.87
6.000	13.11	13.11	13.11	13.10	13.10	13.10
6.050	13.35	13.35	13.35	13.34	13.33	13.32
6.100	13.58	13.58	13.57	13.56	13.55	13.53
6.150	13.79	13.78	13.77	13.76	13.74	13.72
6.200	13.97	13.96	13.94	13.93	13.90	13.88
6.250	14.11	14.10	14.08	14.07	14.04	14.01

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
6.300	14.21	14.20	14.19	14.17	14.14	14.10
6.350	14.28	14.26	14.25	14.23	14.20	14.16
6.400	14.30	14.29	14.27	14.25	14.21	14.18
6.450	14.28	14.27	14.25	14.23	14.19	14.15
6.500	14.22	14.20	14.18	14.16	14.11	14.07
6.550	14.11	14.09	14.07	14.04	13.99	13.96
6.600	13.94	13.92	13.90	13.87	13.83	13.82
6.620	13.86	13.84	13.81	13.78	13.75	13.77
6.640	13.77	13.74	13.71	13.69	13.67	13.72
6.660	13.66	13.64	13.61	13.58	13.60	13.69
6.680	13.54	13.52	13.49	13.48	13.54	13.67
6.700	13.41	13.39	13.36	13.37	13.50	13.69
6.720	13.27	13.24	13.24	13.28	13.49	13.73
6.740	13.11	13.09	13.11	13.21	13.52	13.82
6.760	12.94	12.94	13.02	13.19	13.61	13.96
6.780	12.76	12.79	12.97	13.24	13.77	14.16
6.800	12.58	12.69	13.01	13.39	14.00	14.41
6.820	12.43	12.68	13.18	13.66	14.32	14.72
6.840	12.36	12.84	13.54	14.08	14.73	15.08
6.850	12.38	13.02	13.80	14.35	14.96	15.28
6.860	12.47	13.29	14.12	14.65	15.21	15.48
6.870	12.65	13.66	14.50	14.99	15.48	15.70
6.880	12.97	14.13	14.93	15.36	15.75	15.92
6.890	13.46	14.71	15.41	15.75	16.04	16.15
6.900	14.19	15.39	15.93	16.16	16.34	16.38
6.910	15.18	16.15	16.48	16.59	16.63	16.61
6.920	16.42	16.96	17.04	17.02	16.93	16.84
6.930	17.85	17.79	17.61	17.45	17.22	17.06
6.940	19.31	18.61	18.15	17.86	17.50	17.28
6.950	20.62	19.36	18.67	18.26	17.78	17.49
6.960	21.62	20.02	19.14	18.62	18.03	17.69
6.970	22.26	20.56	19.55	18.95	18.27	17.88
6.980	22.54	20.97	19.89	19.24	18.48	18.05
6.990	22.56	21.24	20.16	19.48	18.68	18.21
7.000	22.39	21.37	20.36	19.68	18.84	18.35
7.010	22.11	21.39	20.49	19.83	18.99	18.48
7.020	21.78	21.32	20.55	19.93	19.10	18.59
7.030	21.42	21.16	20.55	19.98	19.19	18.67
7.040	21.06	20.96	20.49	20.00	19.25	18.75
7.060	20.40	20.46	20.25	19.92	19.30	18.83

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
7.080	19.81	19.94	19.91	19.72	19.25	18.85
7.100	19.32	19.45	19.52	19.45	19.14	18.81
7.120	18.89	19.01	19.13	19.14	18.97	18.72
7.140	18.53	18.64	18.76	18.82	18.76	18.59
7.160	18.22	18.31	18.42	18.50	18.52	18.43
7.180	17.96	18.02	18.12	18.21	18.28	18.25
7.200	17.72	17.77	17.86	17.94	18.05	18.05
7.220	17.51	17.56	17.63	17.70	17.82	17.86
7.240	17.32	17.36	17.42	17.49	17.60	17.66
7.260	17.16	17.19	17.24	17.29	17.40	17.47
7.280	17.00	17.03	17.07	17.12	17.22	17.29
7.300	16.86	16.89	16.92	16.96	17.05	17.12
7.350	16.56	16.58	16.60	16.62	16.69	16.75
7.400	16.31	16.32	16.33	16.35	16.39	16.44
7.450	16.08	16.09	16.10	16.11	16.14	16.17
7.500	15.89	15.89	15.90	15.91	15.93	15.95
7.550	15.71	15.71	15.72	15.72	15.73	15.75
7.600	15.54	15.54	15.55	15.55	15.56	15.57
7.650	15.38	15.38	15.38	15.39	15.39	15.40
7.700	15.23	15.23	15.23	15.23	15.23	15.24
7.750	15.08	15.08	15.08	15.08	15.08	15.08
7.800	14.93	14.93	14.93	14.93	14.92	14.92
7.850	14.78	14.78	14.78	14.77	14.77	14.76
7.900	14.63	14.62	14.62	14.62	14.61	14.60
7.950	14.47	14.46	14.46	14.45	14.44	14.43
8.000	14.30	14.30	14.29	14.28	14.26	14.24
8.050	14.12	14.11	14.10	14.09	14.07	14.04
8.100	13.92	13.91	13.90	13.88	13.85	13.81
8.150	13.70	13.69	13.67	13.64	13.60	13.56
8.200	13.44	13.43	13.40	13.37	13.31	13.29
8.250	13.14	13.12	13.08	13.04	13.00	13.03
8.300	12.78	12.74	12.69	12.65	12.68	12.82
8.320	12.61	12.57	12.51	12.48	12.57	12.78
8.340	12.42	12.38	12.32	12.32	12.49	12.78
8.360	12.22	12.17	12.12	12.16	12.45	12.81
8.380	11.99	11.93	11.91	12.02	12.45	12.89
8.400	11.74	11.68	11.72	11.93	12.52	13.04
8.420	11.46	11.42	11.57	11.92	12.67	13.24
8.440	11.16	11.17	11.50	12.02	12.92	13.52
8.460	10.83	10.96	11.57	12.26	13.26	13.86

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
8.480	10.50	10.89	11.85	12.68	13.71	14.27
8.500	10.22	11.10	12.40	13.29	14.26	14.74
8.520	10.13	11.75	13.26	14.10	14.90	15.26
8.530	10.25	12.30	13.80	14.57	15.25	15.53
8.540	10.56	13.02	14.42	15.07	15.61	15.81
8.550	11.16	13.90	15.11	15.60	15.97	16.09
8.560	12.20	14.93	15.84	16.16	16.35	16.38
8.570	13.79	16.09	16.61	16.73	16.73	16.66
8.580	16.01	17.32	17.39	17.30	17.10	16.94
8.590	18.74	18.58	18.17	17.86	17.47	17.22
8.600	21.58	19.80	18.92	18.41	17.82	17.48
8.610	24.02	20.91	19.62	18.92	18.16	17.74
8.620	25.67	21.88	20.26	19.40	18.48	17.99
8.630	26.44	22.66	20.82	19.83	18.78	18.22
8.640	26.51	23.22	21.28	20.21	19.06	18.43
8.650	26.15	23.58	21.65	20.53	19.31	18.63
8.660	25.55	23.73	21.92	20.80	19.52	18.81
8.670	24.86	23.70	22.09	21.00	19.71	18.97
8.680	24.16	23.53	22.17	21.14	19.86	19.11
8.700	22.87	22.89	22.08	21.25	20.07	19.33
8.720	21.79	22.08	21.74	21.15	20.15	19.46
8.740	20.92	21.25	21.24	20.90	20.13	19.51
8.760	20.20	20.51	20.68	20.55	20.01	19.49
8.780	19.62	19.87	20.12	20.13	19.81	19.41
8.800	19.14	19.34	19.59	19.70	19.56	19.27
8.820	18.73	18.89	19.12	19.27	19.27	19.09
8.840	18.38	18.51	18.70	18.87	18.97	18.88
8.860	18.08	18.18	18.34	18.50	18.67	18.65
8.880	17.82	17.90	18.03	18.18	18.37	18.41
8.900	17.59	17.66	17.76	17.89	18.09	18.17
8.920	17.39	17.44	17.53	17.64	17.83	17.94
8.940	17.20	17.25	17.32	17.41	17.59	17.71
8.960	17.04	17.08	17.14	17.21	17.37	17.50
8.980	16.89	16.92	16.97	17.03	17.18	17.30
9.000	16.75	16.78	16.82	16.88	17.00	17.11
9.020	16.63	16.65	16.69	16.73	16.84	16.94
9.040	16.51	16.53	16.56	16.60	16.69	16.79
9.060	16.40	16.42	16.45	16.48	16.56	16.64
9.080	16.30	16.32	16.34	16.37	16.44	16.51
9.100	16.21	16.22	16.24	16.27	16.32	16.39

SCATTERING NEUTRON CROSS SECTION

E(ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
9.120	16.12	16.13	16.15	16.17	16.22	16.28
9.140	16.04	16.05	16.06	16.08	16.12	16.18
9.160	15.96	15.97	15.98	16.00	16.03	16.08
9.180	15.88	15.89	15.90	15.92	15.95	16.00
9.200	15.81	15.82	15.83	15.84	15.87	15.92
9.220	15.74	15.75	15.75	15.77	15.80	15.85
9.240	15.67	15.68	15.69	15.70	15.73	15.78
9.260	15.61	15.61	15.62	15.63	15.67	15.72
9.280	15.54	15.55	15.55	15.57	15.61	15.67
9.300	15.48	15.48	15.49	15.51	15.56	15.63
9.320	15.42	15.42	15.43	15.46	15.53	15.60
9.340	15.36	15.36	15.38	15.41	15.50	15.58
9.360	15.30	15.30	15.33	15.38	15.48	15.56
9.380	15.24	15.25	15.29	15.35	15.47	15.56
9.400	15.18	15.20	15.27	15.35	15.48	15.57
9.420	15.13	15.17	15.27	15.36	15.50	15.59
9.440	15.08	15.16	15.29	15.39	15.53	15.62
9.460	15.05	15.19	15.34	15.45	15.58	15.65
9.480	15.07	15.27	15.43	15.53	15.64	15.70
9.500	15.15	15.41	15.55	15.62	15.70	15.75
9.520	15.37	15.60	15.69	15.73	15.78	15.81
9.540	15.76	15.84	15.85	15.85	15.86	15.87
9.560	16.23	16.08	16.00	15.97	15.94	15.93
9.580	16.59	16.28	16.15	16.08	16.02	15.99
9.600	16.73	16.44	16.26	16.17	16.09	16.06
9.620	16.71	16.52	16.35	16.26	16.16	16.11
9.640	16.64	16.55	16.41	16.32	16.22	16.17
9.660	16.55	16.53	16.44	16.36	16.27	16.22
9.680	16.47	16.49	16.45	16.39	16.31	16.27
9.700	16.41	16.45	16.44	16.41	16.35	16.31
9.720	16.37	16.41	16.42	16.41	16.38	16.35
9.740	16.34	16.38	16.41	16.42	16.40	16.38
9.760	16.33	16.36	16.40	16.42	16.43	16.42
9.780	16.32	16.36	16.40	16.43	16.45	16.45
9.800	16.33	16.36	16.40	16.44	16.47	16.48
9.850	16.40	16.43	16.46	16.49	16.54	16.57
9.900	16.52	16.54	16.57	16.59	16.64	16.67
9.950	16.69	16.70	16.72	16.73	16.77	16.79
10.000	16.87	16.88	16.89	16.90	16.91	16.93
10.050	17.07	17.07	17.07	17.07	17.07	17.07

SCATTERING NEUTRON CROSS SECTION

E (ev)	σ (param)	σ (27°C)	σ (500°C)	σ (1000°C)	σ (2000°C)	σ (3000°C)
10.100	17.27	17.26	17.25	17.24	17.22	17.21
10.150	17.45	17.43	17.41	17.40	17.36	17.34
10.200	17.59	17.57	17.55	17.52	17.48	17.44
10.250	17.69	17.67	17.64	17.62	17.57	17.53
10.300	17.75	17.73	17.70	17.68	17.63	17.59
10.350	17.76	17.74	17.72	17.70	17.65	17.61
10.400	17.74	17.73	17.71	17.69	17.65	17.61
10.450	17.69	17.68	17.66	17.65	17.62	17.59
10.500	17.62	17.61	17.60	17.59	17.56	17.54
10.550	17.53	17.53	17.52	17.51	17.49	17.47
10.600	17.43	17.43	17.43	17.42	17.41	17.40
10.650	17.33	17.33	17.33	17.33	17.32	17.31
10.700	17.23	17.23	17.23	17.23	17.23	17.22
10.750	17.13	17.13	17.13	17.13	17.13	17.13
10.800	17.03	17.03	17.03	17.03	17.03	17.04
10.850	16.93	16.93	16.94	16.94	16.94	16.94
10.900	16.84	16.84	16.84	16.85	16.85	16.85
10.950	16.75	16.75	16.76	16.76	16.76	16.77
11.000	16.67	16.67	16.67	16.67	16.68	16.68

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