Compilation of Data on Radionuclide Data for Specific Activity, Specific Heat and Fission Product Yields

by

B. Boggs (Contact)

Westinghouse Savannah River Company
Savannah River Site
Aiken, South Carolina 29808

A. Gibbs

R. S. Thomason

RECEIVED
SEP 14 2000
OSTI

DOE Contract No. **DE-AC09-96SR18500**

This paper was prepared in connection with work done under the above contract number with the U. S. Department of Energy. By acceptance of this paper, the publisher and/or recipient acknowledges the U. S. Government's right to retain a nonexclusive, royalty-free license in and to any copyright covering this paper, along with the right to reproduce and to authorize others to reproduce all or part of the copyrighted paper.

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

This report has been reproduced directly from the best available copy.

Available for sale to the public, in paper, from: U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22161

phone: (800) 553-6847

fax: (703) 605-6900

email: orders@ntis.fedworld.gov

online ordering: <http://www.ntis.gov/ordering.htm>

Available electronically at <http://www.doe.gov/bridge>

Available for a processing fee to U.S. Department of Energy and its contractors, in paper, from: U.S. Department of Energy, Office of Scientific and Technical Information, P.O. Box 62, Oak Ridge, TN 37831-0062

phone: (865)576-8401

fax: (865)576-5728

email: reports@adonis.osti.gov

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

WSRC-TR-99-00344
October, 1999

**COMPILATION OF RECENT RADIONUCLIDE DATA FOR SPECIFIC
ACTIVITY, SPECIFIC HEAT AND FISSION PRODUCT YIELDS**

compiled by

Ann Gibbs

reviewed by

R. S. Thomason

COMPILATION OF RECENT RADIONUCLIDE DATA FOR SPECIFIC
ACTIVITY, SPECIFIC HEAT AND FISSION PRODUCT YIELDS

Compiler	<u>Ann Gibbs</u>	<u>3/16/00</u>
	Ann Gibbs	Date
Reviewer	<u>R. S. Thomason</u>	<u>3/17/00</u>
	R. S. Thomason	Date
Approval	<u>A. M. Vincent, III</u>	<u>3/30/00</u>
	A. M. Vincent, III, Manager	Date
	Solid Waste Engineering, Safety Compliance	
Approval	<u>E. T. Sadowski</u>	<u>4/6/00</u>
	E. T. Sadowski, Manager	Date
	Safeguards & Security, Materials Accountability	

Table of Contents

Introduction	1
Discussion	1
Summary	2
References	3

Introduction

This compilation was undertaken to update the data used in calculation of curie and heat loadings of waste containers in the Solid Waste Management Facility. The data has broad general use and has been cross-checked extensively in order to be of use in the Materials Accountability arena. The fission product cross-sections have been included because they are of use in the Environmental Remediation and Waste Management areas where radionuclides which are not readily detectable need to be calculated from the relative fission yields and material dispersion data.

This document was reviewed and cross-checked by R. B. Thomason in the following manner:

Half lives (seconds): Each value was reviewed in comparison to Reference 6 or Reference 7. Reference 6 was available in an Access[®] database, and that was converted to Excel[®] Spreadsheet format and aligned row wise with the data to be reviewed. A spreadsheet formula was used to compare the report half life and the reference 6 half life for each row that had data from both sources, and to flag the row if the two values differed by more than four percent. The flagged half lives and those that had no corresponding value from reference 6 were compared with half lives from reference 7. Those rows that did not agree with reference 7, or for which reference 7 had no value, were flagged for further verification by the author.

Half lives (other units): These values were entered directly, and their unit (second, minute, hour, day, year) was entered in an adjacent column. A formula based on the unit was used to calculate each half life in units of seconds, and that value was validated as per the above. The review consisted of validating the formula.

Specific activities and inverses: The formula for calculating the specific activity was compared with a formula known to be correct, and representative specific activities were calculated using the two formulas and shown to be equal. The inverse of the specific activity was calculated by formula, the inverse of the specific activity cell.

Atomic weights: The atomic weight was compared with the atomic number for each radionuclide and flagged if the two numbers differed by more than 0.2 units. This review would have identified gross typographical errors, but it would not have caught errors in the second or higher decimal positions.

Watts/Ci: Not reviewed by RST.

Fission product yields: Not reviewed by RST.

This is the complete set of radionuclides existing in verified data files as of March 15, 2000. There are subsets available, at request from the compiler, for radionuclides which have been produced or brought to SRS and for radionuclides with half-lives greater than whatever breakpoint needed.

Discussion

There are continual changes in nuclear data which occur due to more exact measurement of half-lives and atomic masses. These changes have not been reflected in the tables used at SRS in Materials Accountability for some 14 years. These tables are used throughout the site to report waste disposal and

transportation and environmental concentrations of radioisotopes. These quantities are reported in the public media. While the differences between present values and those used 14 years ago are not great, it is important in dealing with the public to present the best data available. Since the data are available, this compilation was made to update SRS tables.

The original version of this compilation was made in 1991-92 to prove that the number of radioisotopes that need to be considered for performance assessments of waste disposal is not in the thousands. The complete compilation has a field for whether or not the radioisotope could have been produced or used in research at SRS. This field has not been included in the printout, although it has been continued in the spreadsheet.

The information for this compilation comes from the referenced sources, most of which have assembled their data from the ENSDF (Evaluated Nuclear Structure Data File) tabulation maintained at the Brookhaven National Laboratory in the United States. Values used in this compilation were originally taken from the 1996 Edition of the Table of Isotopes, but were checked with the latest Internet sources during the June-August, 1999 time period and confirmed in March, 2000 after the review by RST.

The half-lives were converted to seconds to simplify the calculations of specific activities to one formula. Half-lives reported in years are sidereal years so the conversion to days used is 365.26. A sidereal year is the time required for one complete revolution of the earth about the sun, relative to the fixed stars. It is equal to 365 days, 6 hours, 9 minutes, 9.54 seconds (365.25636 days) in calendar time units.

The formula for calculation of the specific activity is:

$$Ci/g = (6.0221E+23) / (3.7E+10)(Atomic\ Mass)(\lambda)$$

where:

$$\lambda = \ln 2 / \text{half-life in seconds} \quad \text{units} = (\text{sec}^{-1})$$

$$6.0221\text{ E}+23 = \text{Avogadro's constant} \quad \text{units} = (\text{mol}^{-1})$$

{NIST CODATA File Value, 1999 = 6.02214199 E+23 mol⁻¹}

$$\text{Curie (Ci)} = 3.7\text{ E}+10 \text{ disintegrations /second}$$

$$\text{Atomic Mass} = \text{grams/mol}$$

The atomic masses are entered into the spreadsheet rounded to 6 decimal places. Avogadro's value is entered to 4 places. The natural log of 2 is entered to 5 places. Calculated values are rounded to 4 decimal places. Fission product yields are entered and specific heat values are entered as reported in the literature.

Summary

An updated tabulation of radionuclidic specific activities and heat has been compiled. The use of the table is dependent upon the user. Subsets can be generated by the compiler upon request.

References

1. Table of Isotopes, 8th Edition, R. B. Firestone, et al, John Wiley & Sons, Inc., New York, NY, 1996.
2. The 1995 Update to the Atomic Mass Evaluation, G. Audi and A. H. Wapstra, Nuclear Physics, A595, Vol. 4, 409-480, Dec. 25, 1995.
3. Integrated Data Base Report - 1995: U. S. Spent Nuclear Fuel and Radioactive Waste Inventories, Projections, and Characteristics, Table B.1, DOE/RW-0006, Rev. 12, December 1996.
4. <http://www.dne.bnl.gov/CoN/index.html> , Chart of the Nuclides, Brookhaven National Laboratory and Korean Atomic Energy Agency.
5. <http://ie.lbl.gov/toi.htm> , LBNL Isotopes Project - LUNDS Universitet, Nuclear Data Dissemination, Lawrence Berkeley National Laboratory.
6. Database from Nuclide Navigator © by EGG/Ortec, now Perkin Elmer, containing data from Topical Presentations in Nuclear Chemistry, Volume 7, The Gamma Rays of the Radionuclides, Verlag Chemie, Weinheim – New York, 1979.
7. Nuclides and Isotopes, Fifteenth Edition: Chart of the Nuclides, General Electric Co. and KAPL, Inc., 1996.

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
H 3	3.0161	1.233E+01	year	3.89E+08	9.6130E+03	1.0403E-04	0.000034		
He 6	6.0189	8.067E-01	second	8.07E-01	2.3235E+12	4.3038E-13			
He 8	8.0339	1.190E-01	second	1.19E-01	1.1801E+13	8.4742E-14			
Li 8	8.0225	8.380E-01	second	8.38E-01	1.6781E+12	5.9590E-13			
Li 9	9.0268	1.780E-01	second	1.78E-01	7.0214E+12	1.4242E-13			
Li 11	11.0438	8.500E-03	second	8.50E-03	1.2018E+14	8.3207E-15			
Be 7	7.0169	5.329E+01	day	4.60E+06	3.4920E+05	2.8637E-06			
Be 10	10.0135	1.600E+06	year	5.05E+13	2.2313E-02	4.4817E+01			
Be 11	11.0217	1.381E+01	second	1.38E+01	7.4120E+10	1.3492E-11			
Be 12	12.0269	2.360E-02	second	2.36E-02	3.9748E+13	2.5159E-14			
B 8	8.0246	7.700E-01	second	7.70E-01	1.8258E+12	5.4769E-13			
B 12	12.0144	2.020E-02	second	2.02E-02	4.6486E+13	2.1512E-14			
B 13	13.0178	1.736E-02	second	1.74E-02	4.9922E+13	2.0031E-14			
B 14	14.0425	1.380E-02	second	1.38E-02	5.8217E+13	1.7177E-14			
C 9	9.0310	1.265E-01	second	1.27E-01	9.8753E+12	1.0126E-13			
C 10	10.0169	1.926E+01	second	1.93E+01	5.8493E+10	1.7096E-11			
C 11	11.0114	2.039E+01	minute	1.22E+03	8.3746E+08	1.1941E-09			
C 14	14.0032	5.730E+03	year	1.81E+11	4.4553E+00	2.2445E-01	0.000293		
C 15	15.0106	2.449E+00	second	2.45E+00	3.0689E+11	3.2584E-12			
C 16	16.0147	7.470E-01	second	7.47E-01	9.4306E+11	1.0604E-12			
N 12	12.0186	1.100E-02	second	1.10E-02	8.5335E+13	1.1718E-14			
N 13	13.0057	9.965E+00	minute	5.98E+02	1.4508E+09	6.8927E-10			
N 16	16.0061	7.130E+00	second	7.13E+00	9.8856E+10	1.0116E-11			
N 17	17.0085	4.173E+00	second	4.17E+00	1.5895E+11	6.2912E-12			
N 18	18.0141	6.240E-01	second	6.24E-01	1.0036E+12	9.9637E-13			
O 13	13.0248	8.580E-03	second	8.58E-03	1.0095E+14	9.9056E-15			
O 14	14.0086	7.061E+01	second	7.06E+01	1.1406E+10	8.7672E-11			
O 15	15.0031	2.037E+00	minute	1.22E+02	6.1525E+09	1.6253E-10			
O 19	19.0036	2.691E+01	second	2.69E+01	2.2061E+10	4.5329E-11			
O 20	20.0040	1.352E+01	second	1.35E+01	4.1729E+10	2.3964E-11			
F 17	17.0021	6.449E+01	second	6.45E+01	1.0289E+10	9.7189E-11			
F 18	18.0009	1.830E+00	hour	6.59E+03	9.5158E+07	1.0509E-08			
F 20	20.0000	1.100E+01	second	1.10E+01	5.1281E+10	1.9501E-11			
F 21	20.9999	4.158E+00	second	4.16E+00	1.2920E+11	7.7397E-12			
F 22	22.0030	4.230E+00	second	4.23E+00	1.2121E+11	8.2498E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
F 23	23.0036	2.230E+00	second	2.23E+00	2.1993E+11	4.5470E-12			
Ne 17	17.0177	1.092E-01	second	1.09E-01	6.0709E+12	1.6472E-13			
Ne 18	18.0057	1.672E+00	second	1.67E+00	3.7474E+11	2.6685E-12			
Ne 19	19.0014	1.735E+01	second	1.73E+01	3.4223E+10	2.9220E-11			
Ne 23	22.9945	3.724E+01	second	3.72E+01	1.3175E+10	7.5903E-11			
Ne 24	23.9936	3.380E+00	minute	2.03E+02	2.3185E+09	4.3131E-10			
Ne 25	24.9978	6.020E-01	second	6.02E-01	7.4968E+11	1.3339E-12			
Na 20	20.0073	4.479E-01	second	4.48E-01	1.2589E+12	7.9432E-13			
Na 21	20.9977	2.249E+01	second	2.25E+01	2.3890E+10	4.1859E-11			
Na 22	21.9944	2.602E+00	year	8.21E+07	6.2468E+03	1.6008E-04			
Na 24	23.9910	1.496E+01	hour	5.39E+04	8.7322E+06	1.1452E-07			
Na 24m	23.9910	2.020E-02	second	2.02E-02	2.3280E+13	4.2956E-14			
Na 25	24.9900	5.910E+01	second	5.91E+01	7.6388E+09	1.3091E-10			
Na 26	25.9926	1.072E+00	second	1.07E+00	4.0489E+11	2.4698E-12			
Na 27	26.9940	3.010E-01	second	3.01E-01	1.3885E+12	7.2021E-13			
Na 28	27.9989	3.050E-02	second	3.05E-02	1.3211E+13	7.5694E-14			
Na 29	29.0028	4.490E-02	second	4.49E-02	8.6634E+12	1.1543E-13			
Na 30	30.0092	4.800E-02	second	4.80E-02	7.8321E+12	1.2768E-13			
Na 31	31.0136	1.700E-02	second	1.70E-02	2.1398E+13	4.6733E-14			
Na 32	32.0196	1.320E-02	second	1.32E-02	2.6692E+13	3.7464E-14			
Na 33	33.0274	8.200E-03	second	8.20E-03	4.1657E+13	2.4006E-14			
Mg 20	20.0189	9.500E-02	second	9.50E-02	5.9322E+12	1.6857E-13			
Mg 21	21.0117	1.220E-01	second	1.22E-01	4.4010E+12	2.2722E-13			
Mg 22	21.9996	3.857E+00	second	3.86E+00	1.3296E+11	7.5212E-12			
Mg 23	22.9941	1.117E+01	second	1.12E+01	4.3924E+10	2.2766E-11			
Mg 27	26.9843	9.462E+00	minute	5.68E+02	7.3643E+08	1.3579E-09			
Mg 28	27.9839	2.130E+01	hour	7.67E+04	5.2576E+06	1.9020E-07			
Mg 29	28.9886	1.300E-03	second	1.30E-03	2.9937E+14	3.3404E-15			
Mg 30	29.9905	3.300E-01	second	3.30E-01	1.1399E+12	8.7724E-13			
Mg 31	30.9965	2.500E-01	second	2.50E-01	1.4559E+12	6.8687E-13			
Al 24	23.9999	2.053E+00	second	2.05E+00	2.2897E+11	4.3674E-12			
Al 24m	23.9999	1.313E-01	second	1.31E-01	3.5802E+12	2.7932E-13			
Al25	24.9904	7.183E+00	second	7.18E+00	6.2849E+10	1.5911E-11			
Al 26	25.9869	7.400E+05	year	2.34E+13	1.8590E-02	5.3793E+01	0.018250		
Al 26m	25.9869	6.345E+00	second	6.35E+00	6.8419E+10	1.4616E-11			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Al 28	27.9819	2.241E+00	minute	1.34E+02	2.9980E+09	3.3356E-10			
Al 29	28.9804	6.560E+00	minute	3.94E+02	9.8905E+08	1.0111E-09			
Al 30	29.9830	3.600E+00	second	3.60E+00	1.0452E+11	9.5675E-12			
Al 31	30.9839	6.440E-01	second	6.44E-01	5.6540E+11	1.7687E-12			
Si 25	25.0041	2.200E-01	second	2.20E-01	2.0509E+12	4.8759E-13			
Si 26	25.9923	2.234E+00	second	2.23E+00	1.9429E+11	5.1470E-12			
Si 27	26.9867	4.160E+00	second	4.16E+00	1.0049E+11	9.9510E-12			
Si 31	30.9754	2.622E+00	hour	9.44E+03	3.8586E+07	2.5916E-08			
Si 32	31.9741	1.500E+02	year	4.73E+09	7.4537E+01	1.3416E-02	0.001245		
Si 33	32.9780	6.180E+00	second	6.18E+00	5.5356E+10	1.8065E-11			
P 28	27.9923	2.703E-01	second	2.70E-01	1.4910E+12	6.7067E-13			
P 29	28.9818	4.140E+00	second	4.14E+00	9.4027E+10	1.0635E-11			
P 30	29.9783	2.498E+00	minute	1.50E+02	2.5109E+09	3.9827E-10			
P 32	31.9739	1.426E+01	day	1.23E+06	2.8634E+05	3.4923E-06	0.005120		
P 33	32.9717	2.534E+01	day	2.19E+06	1.5628E+05	6.3986E-06			
P 34	33.9736	1.243E+01	second	1.24E+01	2.6716E+10	3.7431E-11			
P 35	34.9733	4.730E+01	second	4.73E+01	6.8199E+09	1.4663E-10			
S 29	28.9966	1.870E-01	second	1.87E-01	2.0806E+12	4.8063E-13			
S 30	29.9849	1.178E+00	second	1.18E+00	3.1940E+11	3.1309E-12			
S 31	30.9796	2.572E+00	second	2.57E+00	1.4159E+11	7.0627E-12			
S 35	34.9690	8.751E+01	day	7.56E+06	4.2670E+04	2.3436E-05	0.000288		
S 37	36.9711	5.050E+00	minute	3.03E+02	1.0071E+09	9.9295E-10			
S 38	37.9712	2.838E+00	hour	1.02E+04	2.9081E+07	3.4387E-08			
Cl 32	31.9857	2.980E-01	second	2.98E-01	1.1836E+12	8.4488E-13			
Cl 33	32.9775	2.511E+00	second	2.51E+00	1.3624E+11	7.3399E-12			
Cl 34	33.9738	1.526E+00	second	1.53E+00	2.1755E+11	4.5966E-12			
Cl 34m	33.9738	3.200E+01	minute	1.92E+03	1.7295E+08	5.7819E-09			
Cl 36	35.9683	3.010E+05	year	9.50E+12	3.3020E-02	3.0285E+01	0.001458		
Cl 38	37.9680	3.724E+01	minute	2.23E+03	1.3298E+08	7.5197E-09			
Cl 38m	37.9680	7.150E-01	second	7.15E-01	4.1558E+11	2.4063E-12			
Cl 39	38.9680	5.560E+01	minute	3.34E+03	8.6785E+07	1.1523E-08			
Cl 40	39.9704	1.350E+00	minute	8.10E+01	3.4846E+09	2.8698E-10			
Cl 41	40.9707	3.840E+01	second	3.84E+01	7.1709E+09	1.3945E-10			
Ar 33	32.9899	1.730E-01	second	1.73E-01	1.9767E+12	5.0588E-13			
Ar 34	33.9803	8.440E-01	second	8.44E-01	3.9338E+11	2.5421E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ar 35	34.9753	1.775E+00	second	1.78E+00	1.8173E+11	5.5028E-12			
Ar 37	36.9668	3.504E+01	day	3.03E+06	1.0081E+05	9.9200E-06			
Ar 39	38.9643	2.690E+02	year	8.49E+09	3.4107E+01	2.9320E-02			
Ar 41	40.9645	1.822E+00	hour	6.56E+03	4.1980E+07	2.3821E-08			
Ar 42	41.9630	3.290E+01	year	1.04E+09	2.5894E+02	3.8619E-03			
Ar 43	42.9657	5.370E+00	minute	3.22E+02	8.1495E+08	1.2271E-09			
Ar 44	43.9654	1.187E+01	minute	7.12E+02	3.6030E+08	2.7755E-09			
Ar 45	44.9607	2.148E+01	second	2.15E+01	1.1682E+10	8.5603E-11			
Ar 46	45.9681	8.400E+00	second	8.40E+00	2.9217E+10	3.4226E-11			
K 35	34.9880	1.900E-01	second	1.90E-01	1.6971E+12	5.8925E-13			
K 36	35.9813	3.420E-01	second	3.42E-01	9.1680E+11	1.0908E-12			
K 37	36.9734	1.226E+00	second	1.23E+00	2.4888E+11	4.0179E-12			
K 38	37.9691	7.636E+00	minute	4.58E+02	6.4853E+08	1.5420E-09			
K 38m	37.9691	9.239E-01	second	9.24E-01	3.2160E+11	3.1094E-12			
K 40	39.9640	1.277E+09	year	4.03E+16	7.0049E-06	1.4276E+05	0.003620		
K 42	41.9624	1.236E+01	hour	4.45E+04	6.0422E+06	1.6550E-07			
K 43	42.9607	2.230E+01	hour	8.03E+04	3.2711E+06	3.0570E-07			
K 44	43.9616	2.213E+01	minute	1.33E+03	1.9327E+08	5.1740E-09			
K 45	44.9607	1.730E+01	minute	1.04E+03	2.4174E+08	4.1367E-09			
K 46	45.9620	1.750E+00	minute	1.05E+02	2.3377E+09	4.2777E-10			
K 47	46.9617	1.750E+01	second	1.75E+01	1.3728E+10	7.2846E-11			
K 48	47.9655	6.800E+00	second	6.80E+00	3.4589E+10	2.8911E-11			
K 49	48.9675	1.260E+00	second	1.26E+00	1.8285E+11	5.4689E-12			
K 50	49.9728	4.720E-01	second	4.72E-01	4.7830E+11	2.0907E-12			
K 51	50.9764	3.650E-01	second	3.65E-01	6.0634E+11	1.6492E-12			
K 52	51.9826	1.050E-01	second	1.05E-01	2.0669E+12	4.8381E-13			
K 53	52.9871	3.000E-02	second	3.00E-02	7.0972E+12	1.4090E-13			
K 54	53.9940	1.000E-02	second	1.00E-02	2.0894E+13	4.7860E-14			
Ca 37	36.9859	1.750E-01	second	1.75E-01	1.7430E+12	5.7372E-13			
Ca 38	37.9763	4.400E-01	second	4.40E-01	6.7517E+11	1.4811E-12			
Ca 39	38.9707	8.596E-01	second	8.60E-01	3.3678E+11	2.9693E-12			
Ca 41	40.9623	1.030E+05	year	3.25E+12	8.4730E-02	1.1802E+01			
Ca 45	44.9562	1.638E+02	day	1.42E+07	1.7732E+04	5.6395E-05	0.000456		
Ca 47	46.9545	4.536E+00	day	3.92E+05	6.1307E+05	1.6311E-06			
Ca 49	48.9557	8.715E+00	minute	5.23E+02	4.4071E+08	2.2691E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ca 50	49.9575	1.390E+01	second	1.39E+01	1.6247E+10	6.1552E-11			
Sc 40	39.9780	1.823E-01	second	1.82E-01	1.5480E+12	6.4600E-13			
Sc 41	40.9693	5.963E-01	second	5.96E-01	4.6180E+11	2.1654E-12			
Sc 42	41.9655	6.813E-01	second	6.81E-01	3.9459E+11	2.5343E-12			
Sc 43	42.9612	3.891E+00	hour	1.40E+04	1.8747E+07	5.3341E-08			
Sc 44	43.9594	3.927E+00	hour	1.41E+04	1.8154E+07	5.5086E-08			
Sc 44m	43.9594	2.440E+00	day	2.11E+05	1.2174E+06	8.2145E-07			
Sc 46	45.9952	8.379E+01	day	7.24E+06	3.3881E+04	2.9515E-05	0.012570		
Sc 46m	45.9952	1.875E+01	second	1.88E+01	1.3082E+10	7.6443E-11			
Sc 47	46.9524	3.345E+00	day	2.89E+05	8.3140E+05	1.2028E-06			
Sc 48	47.9522	1.820E+00	day	1.57E+05	1.4965E+06	6.6822E-07			
Sc 49	48.9500	5.720E+01	minute	3.43E+03	6.7155E+07	1.4891E-08			
Sc 50	49.9522	1.708E+00	minute	1.02E+02	2.2035E+09	4.5383E-10			
Sc 50m	49.9522	3.500E-01	second	3.50E-01	6.4529E+11	1.5497E-12			
Sc 51	50.9536	1.240E+01	second	1.24E+01	1.7856E+10	5.6004E-11			
Ti 41	40.9831	8.000E-02	second	8.00E-02	3.4410E+12	2.9062E-13			
Ti 42	41.9730	1.990E-01	second	1.99E-01	1.3507E+12	7.4037E-13			
Ti 43	42.9685	5.090E-01	second	5.09E-01	5.1583E+11	1.9386E-12			
Ti 44	43.9597	4.900E+01	year	1.55E+09	1.6596E+02	6.0255E-03			
Ti 45	44.9581	3.080E+00	hour	1.11E+04	2.2632E+07	4.4186E-08			
Ti 51	50.9466	5.760E+00	minute	3.46E+02	6.4075E+08	1.5607E-09			
Ti 52	51.9469	1.700E+00	minute	1.02E+02	2.1292E+09	4.6966E-10			
Ti 53	52.9497	3.270E+01	second	3.27E+01	6.5158E+09	1.5347E-10			
V 44	43.9744	9.000E-02	second	9.00E-02	2.8506E+12	3.5081E-13			
V 46	45.9602	4.224E-01	second	4.22E-01	5.8117E+11	1.7207E-12			
V 47	46.9549	3.260E+01	minute	1.96E+03	1.2284E+08	8.1409E-09			
V 48	47.9523	1.597E+01	day	1.38E+06	1.7047E+05	5.8661E-06			
V 49	48.9485	3.300E+02	day	2.85E+07	8.0837E+03	1.2371E-04			
V 52	51.9448	3.750E+00	minute	2.25E+02	9.6528E+08	1.0360E-09			
V 53	52.9443	1.610E+00	minute	9.66E+01	2.2059E+09	4.5334E-10			
V 54	53.9464	4.980E+01	second	4.98E+01	4.1994E+09	2.3813E-10			
Cr 45	44.9792	5.000E-02	second	5.00E-02	5.0164E+12	1.9934E-13			
Cr 46	45.9684	2.600E-01	second	2.60E-01	9.4394E+11	1.0594E-12			
Cr 47	46.9629	5.000E-01	second	5.00E-01	4.8045E+11	2.0814E-12			
Cr 48	47.9540	2.300E+01	hour	8.28E+04	2.8413E+06	3.5195E-07			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Cr 49	48.9513	4.230E+01	minute	2.54E+03	9.0807E+07	1.1012E-08			
Cr 51	50.9448	2.770E+01	day	2.39E+06	9.2523E+04	1.0808E-05	0.000211		
Cr 55	54.9408	3.497E+00	minute	2.10E+02	9.7867E+08	1.0218E-09			
Cr 56	55.9406	5.940E+00	minute	3.56E+02	5.6586E+08	1.7672E-09			
Cr 57	56.9438	2.110E+01	second	2.11E+01	9.3896E+09	1.0650E-10			
Mn 49	48.9596	3.820E-01	second	3.82E-01	6.0322E+11	1.6578E-12			
Mn 50	49.9542	2.830E-01	second	2.83E-01	7.9803E+11	1.2531E-12			
Mn 50m	49.9542	1.750E+00	minute	1.05E+02	2.1509E+09	4.6493E-10			
Mn 51	50.9482	4.620E+01	minute	2.77E+03	7.9883E+07	1.2518E-08			
Mn 52	51.9456	5.591E+00	day	4.83E+05	4.4960E+05	2.2242E-06			
Mn 52m	51.9456	2.110E+01	minute	1.27E+03	1.7155E+08	5.8292E-09			
Mn 53	52.9413	3.740E+06	year	1.18E+14	1.8055E-03	5.5387E+02			
Mn 54	53.9404	3.123E+02	day	2.70E+07	7.7513E+03	1.2901E-04	0.004975		
Mn 56	55.9389	2.579E+00	hour	9.28E+03	2.1727E+07	4.6026E-08			
Mn 57	56.9383	8.540E+01	second	8.54E+01	2.3201E+09	4.3101E-10			
Mn 58	57.9400	3.000E+00	second	3.00E+00	2.9819E+07	3.3535E-08			
Mn 58m	57.9400	1.088E+02	minute	6.53E+03	6.4905E+10	1.5407E-11			
Mn 59	58.9404	4.600E+00	second	4.60E+00	4.1611E+10	2.4032E-11			
Mn 60	59.9432	5.100E+01	second	5.10E+01	3.6903E+09	2.7098E-10			
Mn 60m	59.9432	1.770E+00	second	1.77E+00	1.0633E+11	9.4045E-12			
Mn 62	61.9480	8.800E-01	second	8.80E-01	2.0695E+11	4.8321E-12			
Fe 49	48.9736	7.500E-02	second	7.50E-02	3.0715E+12	3.2557E-13			
Fe 51	50.9568	3.050E-01	second	3.05E-01	7.2590E+11	1.3776E-12			
Fe 52	51.9481	8.275E+00	hour	2.98E+04	7.2901E+06	1.3717E-07			
Fe 52m	51.9481	4.590E+01	second	4.59E+01	4.7314E+09	2.1135E-10			
Fe 53	52.9453	8.510E+00	minute	5.11E+02	4.1732E+08	2.3962E-09			
Fe 53m	52.9453	2.580E+00	minute	1.55E+02	1.3765E+09	7.2648E-10			
Fe 55	54.9383	2.730E+00	year	8.62E+07	2.3835E+03	4.1954E-04	0.000032		
Fe 59	58.9349	4.450E+01	day	3.85E+06	4.9785E+04	2.0086E-05	0.007741		
Fe 60	59.9341	1.500E+06	year	4.73E+13	3.9765E-03	2.5148E+02			
Fe 61	60.9367	5.980E+00	minute	3.59E+02	5.1599E+08	1.9380E-09			
Fe 62	61.9368	6.800E+01	second	6.80E+01	2.6787E+09	3.7332E-10			
Fe 63	62.9401	6.100E+00	second	6.10E+00	2.9385E+10	3.4031E-11			
Co 53	52.9542	2.400E-01	second	2.40E-01	8.8770E+11	1.1265E-12			
Co 53m	52.9542	2.470E-01	second	2.47E-01	8.6254E+11	1.1594E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Co 54	53.9485	1.933E-01	second	1.93E-01	1.0819E+12	9.2430E-13			
Co 54m	53.9485	1.480E+00	minute	8.88E+01	2.3550E+09	4.2463E-10			
Co 55	54.9420	1.753E+01	hour	6.31E+04	3.2538E+06	3.0734E-07			
Co 56	55.9398	7.727E+01	day	6.68E+06	3.0209E+04	3.3103E-05			
Co 57	56.9363	2.718E+02	day	2.35E+07	8.4380E+03	1.1851E-04	0.846400		
Co 58	57.9358	7.082E+01	day	6.12E+06	3.1824E+04	3.1422E-05	0.005990		
Co 58m	57.9358	9.150E+00	hour	3.29E+04	5.9116E+06	1.6916E-07			
Co 60	59.9338	5.271E+00	year	1.66E+08	1.1315E+03	8.8377E-04	0.015410		
Co 60m	59.9338	1.047E+01	minute	6.28E+02	2.9964E+08	3.3373E-09	0.000357		
Co 61	60.9325	1.650E+00	hour	5.94E+03	3.1170E+07	3.2082E-08			
Co 62	61.9341	1.500E+00	minute	9.00E+01	2.0240E+09	4.9408E-10			
Co 62m	61.9341	1.391E+01	minute	8.35E+02	2.1826E+08	4.5818E-09			
Co 63	62.9336	2.740E+01	second	2.74E+01	6.5425E+09	1.5285E-10			
Co 64	63.9358	3.000E-01	second	3.00E-01	5.8818E+11	1.7002E-12			
Ni 53	52.9685	4.500E-02	second	4.50E-02	4.7331E+12	2.1128E-13			
Ni 55	54.9513	2.121E-01	second	2.12E-01	9.6796E+11	1.0331E-12			
Ni 56	55.9421	5.900E+00	day	5.10E+05	3.9561E+05	2.5277E-06			
Ni 57	56.9398	1.483E+00	day	1.28E+05	1.5460E+06	6.4682E-07			
Ni 59	58.9344	7.600E+04	year	2.40E+12	7.9814E-02	1.2529E+01	0.000040		
Ni 63	62.9297	1.001E+02	year	3.16E+09	5.6751E+01	1.7621E-02	0.000101		
Ni 65	64.9301	2.517E+00	hour	9.06E+03	1.9174E+07	5.2154E-08			
Ni 66	65.9291	2.275E+00	day	1.97E+05	8.7057E+05	1.1487E-06		2.129E-11	7.622E-10
Ni 67	66.9316	2.100E+01	second	2.10E+01	8.0265E+09	1.2459E-10		6.029E-10	3.908E-09
Cu 58	57.9445	3.204E+00	second	3.20E+00	6.0768E+10	1.6456E-11			
Cu 59	58.9395	1.358E+00	minute	8.15E+01	2.3492E+09	4.2568E-10			
Cu 60	59.9374	2.370E+01	minute	1.42E+03	1.3237E+08	7.5548E-09			
Cu 61	60.9335	3.333E+00	hour	1.20E+04	1.5431E+07	6.4806E-08			
Cu 62	61.9326	9.740E+00	minute	5.84E+02	3.1171E+08	3.2081E-09			
Cu 64	63.9298	1.270E+01	hour	4.57E+04	3.8598E+06	2.5908E-07			
Cu 66	65.9289	5.088E+00	minute	3.05E+02	5.6053E+08	1.7840E-09		7.808E-14	7.623E-10
Cu 67	66.9278	2.576E+00	day	2.23E+05	7.5730E+05	1.3205E-06		5.619E-12	3.913E-09
Cu 68	67.9296	3.110E+01	second	3.11E+01	5.3402E+09	1.8726E-10		1.921E-11	6.598E-09
Cu 68m	67.9296	3.750E+00	minute	2.25E+02	7.3813E+08	1.3548E-09		4.498E-11	4.498E-11
Cu 69	68.9294	2.850E+00	minute	1.71E+02	9.5714E+08	1.0448E-09		7.028E-10	1.432E-08
Cu 70	69.9324	4.500E+00	second	4.50E+00	3.5850E+10	2.7894E-11		1.090E-09	2.962E-08

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Cu 70m	69.9324	4.700E+01	second	4.70E+01	3.4324E+09	2.9134E-10		3.289E-09	3.289E-09
Cu 71	70.9326	1.950E+01	second	1.95E+01	8.1564E+09	1.2260E-10		2.579E-08	7.473E-08
Cu 72	71.9355	6.600E+00	second	6.60E+00	2.3762E+10	4.2083E-11		1.249E-07	2.290E-07
Cu 73	72.9365	3.900E+00	second	3.90E+00	3.9661E+10	2.5213E-11		5.999E-07	7.540E-07
Cu 74	73.9402	1.594E+00	second	1.59E+00	9.5721E+10	1.0447E-11		1.060E-06	1.177E-06
Cu 75	74.9417	1.224E+00	second	1.22E+00	1.2299E+11	8.1307E-12		1.760E-06	1.815E-06
Zn 57	56.9649	4.000E-02	second	4.00E-02	4.9512E+12	2.0197E-13			
Zn 59	58.9493	1.820E-01	second	1.82E-01	1.0515E+12	9.5098E-13			
Zn 60	59.9418	2.380E+00	minute	1.43E+02	1.3180E+09	7.5872E-10			
Zn 61	60.9395	1.485E+00	minute	8.91E+01	2.0778E+09	4.8128E-10			
Zn 62	61.9343	9.186E+00	hour	3.31E+04	5.5083E+06	1.8154E-07			
Zn 63	62.9332	3.847E+01	minute	2.31E+03	7.7665E+07	1.2876E-08			
Zn 65	64.9292	2.443E+02	day	2.11E+07	8.2332E+03	1.2146E-04	0.003510		
Zn 69	68.9266	5.640E+01	minute	3.38E+03	4.8368E+07	2.0675E-08		1.375E-12	1.433E-08
Zn 69m	68.9266	1.376E+01	hour	4.95E+04	3.3042E+06	3.0264E-07		5.944E-12	5.9439d-12
Zn 71	70.9277	2.450E+00	minute	1.47E+02	1.0820E+09	9.2418E-10		4.497E-10	6.809E-08
Zn 71m	70.9277	3.960E+00	hour	1.43E+04	1.1157E+07	8.9627E-08		1.945E-09	9.044E-09
Zn 72	71.9269	1.938E+00	day	1.67E+05	9.3698E+05	1.0673E-06		3.889E-08	2.679E-07
Zn 73	72.9298	2.350E+01	second	2.35E+01	6.5827E+09	1.5191E-10		4.139E-07	1.168E-06
Zn 73m	72.9298	5.800E+00	second	5.80E+00	2.6671E+10	3.7494E-11			
Zn 74	73.9295	1.600E+00	minute	9.60E+01	1.5896E+09	6.2909E-10		2.310E-06	3.550E-06
Zn 75	74.9329	1.020E+01	second	1.02E+01	1.4761E+10	6.7748E-11		8.348E-06	1.015E-05
Zn 76	75.9334	5.700E+00	second	5.70E+00	2.6066E+10	3.8365E-11		2.538E-05	2.699E-05
Zn 77	76.9371	2.080E+00	second	2.08E+00	7.0498E+10	1.4185E-11		3.059E-05	3.141E-05
Zn 77m	76.9371	1.050E+00	second	1.05E+00	1.3965E+11	7.1606E-12			
Zn 78	77.9386	1.470E+00	second	1.47E+00	9.8471E+10	1.0155E-11			
Ga 62	61.9442	1.161E-01	second	1.16E-01	1.5684E+12	6.3757E-13			
Ga 63	62.9391	3.240E+01	second	3.24E+01	5.5324E+09	1.8075E-10			
Ga 64	63.9368	2.630E+00	minute	1.58E+02	1.1182E+09	8.9430E-10			
Ga 65	64.9327	1.520E+01	minute	9.12E+02	1.9051E+08	5.2491E-09			
Ga 66	65.9316	9.490E+00	hour	3.42E+04	5.0086E+06	1.9966E-07			
Ga 67	66.9282	3.261E+00	day	2.82E+05	5.9824E+05	1.6716E-06	0.001115		
Ga 68	67.9280	1.127E+00	hour	4.06E+03	4.0930E+07	2.4432E-08		3.762E-18	3.762E-18
Ga 70	69.9260	2.114E+01	minute	1.27E+03	1.2720E+08	7.8617E-09		1.130E-13	1.130E-13
Ga 72	71.9264	1.410E+01	hour	5.08E+04	3.0901E+06	3.2362E-07		2.609E-10	2.681E-07

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ga 72m	71.9264	3.970E-02	second	3.97E-02	3.9509E+12	2.5311E-13			
Ga 73	72.9252	4.860E+00	hour	1.75E+04	8.8422E+06	1.1309E-07		9.998E-09	1.178E-06
Ga 74	73.9269	8.120E+00	minute	4.87E+02	3.1323E+08	3.1925E-09		1.074E-07	3.683E-06
Ga 74m	73.9269	9.500E+00	second	9.50E+00	1.6064E+10	6.2252E-11		2.555E-08	3.114E-06
Ga 75	74.9265	2.100E+00	minute	1.26E+02	1.1950E+09	8.3682E-10		1.580E-06	1.173E-05
Ga 76	75.9289	3.260E+01	second	3.26E+01	4.5578E+09	2.1941E-10		1.051E-05	3.750E-05
Ga 77	76.9293	1.320E+01	second	1.32E+01	1.1110E+10	9.0010E-11		4.077E-05	7.218E-05
Ga 78	77.9317	5.090E+00	second	5.09E+00	2.8441E+10	3.5161E-11		1.077E-04	1.428E-04
Ga 79	78.9329	2.847E+00	second	2.85E+00	5.0203E+10	1.9919E-11		1.710E-04	1.877E-04
Ga 80	79.9366	1.697E+00	second	1.70E+00	8.3167E+10	1.2024E-11		1.057E-04	1.093E-04
Ga 81	80.9378	1.217E+00	second	1.22E+00	1.1453E+11	8.7310E-12		7.030E-05	7.094E-05
Ga 82	81.9432	5.990E-01	second	5.99E-01	2.2985E+11	4.3507E-12		6.885E-05	6.908E-05
Ga 83	82.9469	3.100E-01	second	3.10E-01	4.3875E+11	2.2792E-12		3.729E-06	3.732E-06
Ge 64	63.9416	1.062E+00	minute	6.37E+01	2.7697E+09	3.6104E-10			
Ge 65	64.9394	3.090E+01	second	3.09E+01	5.6222E+09	1.7787E-10			
Ge 66	65.9338	2.260E+00	hour	8.14E+03	2.1031E+07	4.7549E-08			
Ge 67	66.9327	1.890E+01	minute	1.13E+03	1.4864E+08	6.7278E-09			
Ge 68	67.9281	2.708E+02	day	2.34E+07	7.0979E+03	1.4089E-04			
Ge 69	68.9280	1.627E+00	day	1.41E+05	1.1643E+06	8.5890E-07		8.006E-21	8.005E-21
Ge 71	70.9250	1.143E+01	day	9.88E+05	1.6107E+05	6.2084E-06		4.056E-16	4.056E-16
Ge 71m	70.9250	2.040E-02	second	2.04E-02	7.7974E+12	1.2825E-13		5.353E-12	1.168E-06
Ge 73m	72.9235	4.990E-01	second	4.99E-01	3.1003E+11	3.2255E-12		2.315E-11	1.178E-06
Ge 75	74.9229	1.380E+00	hour	4.97E+03	3.0316E+07	3.2986E-08		5.774E-09	1.177E-05
Ge 75m	74.9229	4.770E+01	second	4.77E+01	3.1568E+09	3.1678E-10		3.778E-08	5.421E-07
Ge 77	76.9235	1.130E+01	hour	4.07E+04	3.6053E+06	2.7737E-07		1.045E-05	2.602E-05
Ge 77m	76.9235	5.290E+01	second	5.29E+01	2.7724E+09	3.6069E-10		1.597E-06	7.378E-05
Ge 78	77.9229	1.467E+00	hour	5.28E+03	2.7421E+07	3.6469E-08		7.362E-05	2.166E-04
Ge 79	78.9254	1.910E+01	second	1.91E+01	7.4839E+09	1.3362E-10		3.148E-05	2.190E-04
Ge 79m	78.9254	3.900E+01	second	3.90E+01	3.6652E+09	2.7284E-10		2.060E-04	2.069E-04
Ge 80	79.9252	2.950E+01	second	2.95E+01	4.7849E+09	2.0899E-10		1.079E-03	1.196E-03
Ge 81	80.9288	7.600E+00	second	7.60E+00	1.8343E+10	5.4518E-11		1.230E-03	1.307E-03
Ge 81m	80.9288	7.600E+00	second	7.60E+00	1.8343E+10	5.4518E-11			
Ge 82	81.9296	4.600E+00	second	4.60E+00	2.9935E+10	3.3406E-11		1.279E-03	1.335E-03
Ge 83	82.9345	1.850E+00	second	1.85E+00	7.3531E+10	1.3600E-11		4.982E-04	5.361E-04
Ge 84	83.9373	1.200E+00	second	1.20E+00	1.1201E+11	8.9281E-12		2.226E-04	2.787E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
As 67	66.9392	4.250E+01	second	4.25E+01	3.9656E+09	2.5217E-10			
As 68	67.9368	2.527E+00	minute	1.52E+02	1.0954E+09	9.1289E-10			
As 69	68.9323	1.520E+01	minute	9.12E+02	1.7946E+08	5.5724E-09			
As 70	69.9309	5.260E+01	minute	3.16E+03	5.1118E+07	1.9563E-08			
As 71	70.9271	2.720E+00	day	2.35E+05	6.7683E+05	1.4775E-06			
As 72	71.9268	1.083E+00	day	9.36E+04	1.6758E+06	5.9673E-07		8.330E-19	8.330E-19
As 73	72.9238	8.030E+01	day	6.94E+06	2.2299E+04	4.4846E-05		4.212E-16	4.212E-16
As 74	73.9239	1.777E+01	day	1.54E+06	9.9401E+04	1.0060E-05		2.555E-13	2.555E-13
As 76	75.9224	1.097E+00	day	9.48E+04	1.5682E+06	6.3767E-07		1.910E-09	1.910E-09
As 77	76.9206	1.618E+00	day	1.40E+05	1.0492E+06	9.5309E-07		9.688E-08	8.433E-05
As 78	77.9218	1.512E+00	hour	5.44E+03	2.6604E+07	3.7588E-08		1.620E-06	2.182E-04
As 79	78.9209	9.010E+00	minute	5.41E+02	2.6443E+08	3.7817E-09		2.713E-05	4.530E-04
As 80	79.9226	1.520E+01	second	1.52E+01	9.2867E+09	1.0768E-10		1.109E-04	1.307E-03
As 81	80.9221	3.330E+01	second	3.33E+01	4.1866E+09	2.3886E-10		5.653E-04	1.873E-03
As 82	81.9245	1.910E+01	second	1.91E+01	7.2099E+09	1.3870E-10		4.008E-04	1.736E-03
As 82m	81.9245	1.360E+01	second	1.36E+01	1.0126E+10	9.8759E-11		1.209E-03	1.209E-03
As 83	82.9250	1.340E+01	second	1.34E+01	1.0153E+10	9.8495E-11		2.960E-03	3.509E-03
As 84	83.9291	5.500E+00	second	5.50E+00	2.4440E+10	4.0917E-11		5.435E-04	8.086E-04
As 84m	83.9291	6.500E-01	second	6.50E-01	2.0680E+11	4.8356E-12		1.640E-03	1.645E-03
As 85	84.9318	2.028E+00	second	2.03E+00	6.5500E+10	1.5267E-11		1.521E-03	1.560E-03
As 86	85.9243	9.000E-01	second	9.00E-01	1.4589E+11	6.8546E-12		8.925E-04	9.472E-04
As 87	86.9396	4.800E-01	second	4.80E-01	2.7034E+11	3.6990E-12		4.949E-04	6.448E-04
Se 68	67.9419	3.550E+01	second	3.55E+01	4.6775E+09	2.1379E-10			
Se 69	68.9396	2.740E+01	second	2.74E+01	5.9725E+09	1.6743E-10			
Se 70	69.9335	4.110E+01	minute	2.47E+03	6.5418E+07	1.5286E-08			
Se 71	70.9323	4.740E+00	minute	2.84E+02	5.5925E+08	1.7881E-09			
Se 72	71.9271	8.400E+00	day	7.26E+05	2.1612E+05	4.6271E-06			
Se 73	72.9268	7.150E+00	hour	2.57E+04	6.0101E+06	1.6639E-07			
Se 73m	72.9268	3.980E+01	minute	2.39E+03	6.4782E+07	1.5436E-08			
Se 75	74.9225	1.198E+02	day	1.03E+07	1.4550E+04	6.8727E-05	0.002410	4.360E-16	4.359E-16
Se 77m	76.9199	1.736E+01	second	1.74E+01	8.4487E+09	1.1836E-10		1.044E-11	8.433E-05
Se 79	78.9185	6.500E+04	year	2.05E+12	6.9690E-02	1.4349E+01	0.000313	1.644E-07	4.532E-04
Se 79m	78.9185	3.910E+00	minute	2.35E+02	6.0935E+08	1.6411E-09		2.513E-08	4.482E-04
Se 81	80.9180	1.845E+01	minute	1.11E+03	1.2595E+08	7.9399E-09		1.050E-05	1.952E-03
Se 81m	80.9180	5.728E+01	minute	3.44E+03	4.0567E+07	2.4650E-08		6.867E-05	9.320E-05

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Se 83	82.9191	2.230E+01	minute	1.34E+03	1.0169E+08	9.8341E-09		1.363E-03	2.170E-03
Se 83m	82.9191	1.168E+00	minute	7.01E+01	1.9410E+09	5.1521E-10		3.152E-04	3.018E-03
Se 84	83.9185	3.100E+00	minute	1.86E+02	7.2278E+08	1.3835E-09		6.621E-03	9.854E-03
Se 85	84.9222	3.170E+01	second	3.17E+01	4.1908E+09	2.3862E-10		9.219E-03	1.011E-02
Se 86	85.9243	1.530E+01	second	1.53E+01	8.5816E+09	1.1653E-10		1.179E-02	1.290E-02
Se 87	86.9285	5.850E+00	second	5.85E+00	2.2185E+10	4.5076E-11		7.120E-03	7.591E-03
Se 88	87.9314	1.520E+00	second	1.52E+00	8.4409E+10	1.1847E-11		3.337E-03	3.564E-03
Se 89	88.9360	4.100E-01	second	4.10E-01	3.0940E+11	3.2321E-12		1.203E-03	1.205E-03
Se 91	90.9454	2.700E-01	second	2.70E-01	4.5944E+11	2.1765E-12		1.614E-05	1.614E-05
Br 72	71.9365	1.310E+00	minute	7.86E+01	1.9953E+09	5.0118E-10			
Br 72m	71.9365	1.060E+01	second	1.06E+01	1.4795E+10	6.7589E-11			
Br 73	72.9318	3.400E+00	minute	2.04E+02	7.5828E+08	1.3188E-09			
Br 74	73.9299	2.540E+01	minute	1.52E+03	1.0013E+08	9.9869E-09			
Br 74m	73.9299	4.600E+01	minute	2.76E+03	5.5290E+07	1.8086E-08			
Br 75	74.9258	1.612E+00	hour	5.80E+03	2.5951E+07	3.8534E-08			
Br 76	75.9245	1.620E+01	hour	5.83E+04	2.5479E+06	3.9249E-07			
Br 76m	75.9245	1.310E+00	second	1.31E+00	1.1343E+11	8.8161E-12			
Br 77	76.9214	2.377E+00	day	2.05E+05	7.1430E+05	1.4000E-06			
Br 77m	76.9214	4.280E+00	minute	2.57E+02	5.7113E+08	1.7509E-09			
Br 78	77.9211	6.460E+00	minute	3.88E+02	3.7354E+08	2.6771E-09		2.190E-13	
Br 79m	78.9183	4.860E+00	second	4.86E+00	2.9415E+10	3.3997E-11			
Br 80	79.9185	1.768E+01	minute	1.06E+03	1.3307E+08	7.5146E-09		1.944E-10	7.808E-10
Br 80m	79.9185	4.421E+00	hour	1.59E+04	8.8706E+06	1.1273E-07		5.864E-10	5.864E-10
Br 82	81.9168	1.471E+00	day	1.27E+05	1.0837E+06	9.2273E-07		4.309E-07	6.104E-07
Br 82m	81.9168	6.130E+00	minute	3.68E+02	3.7445E+08	2.6706E-09		1.840E-07	1.840E-07
Br 83	82.9152	2.400E+00	hour	8.64E+03	1.5748E+07	6.3500E-08		1.921E-04	5.380E-03
Br 84	83.9165	3.180E+01	minute	1.91E+03	7.0461E+07	1.4192E-08		1.768E-04	1.003E-02
Br 84m	83.9165	6.000E+00	minute	3.60E+02	3.7344E+08	2.6778E-09		3.181E-04	3.181E-04
Br 85	84.9156	2.900E+00	minute	1.74E+02	7.6355E+08	1.3097E-09		2.520E-03	1.263E-02
Br 86	85.9188	5.510E+01	second	5.51E+01	2.3831E+09	4.1963E-10		5.254E-03	1.816E-02
Br 87	86.9207	5.560E+01	second	5.56E+01	2.3344E+09	4.2837E-10		1.257E-02	2.018E-02
Br 88	87.9241	1.650E+01	second	1.65E+01	7.7765E+09	1.2859E-10		1.672E-02	2.034E-02
Br 89	88.9264	4.400E+00	second	4.40E+00	2.8833E+10	3.4682E-11		1.206E-02	1.319E-02
Br 90	89.9306	1.910E+00	second	1.91E+00	6.5680E+10	1.5225E-11		6.617E-03	6.841E-03
Br 91	90.9340	5.410E-01	second	5.41E-01	2.2933E+11	4.3606E-12		2.446E-03	2.458E-03

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Br 92	91.9393	3.430E-01	second	3.43E-01	3.5775E+11	2.7952E-12		3.605E-04	3.614E-04
Kr 72	71.9419	1.720E+01	second	1.72E+01	9.1173E+09	1.0968E-10			
Kr 73	72.9389	2.700E+01	second	2.70E+01	5.7287E+09	1.7456E-10			
Kr 74	73.9333	1.150E+01	minute	6.90E+02	2.2115E+08	4.5218E-09			
Kr 75	74.9310	4.300E+00	minute	2.58E+02	5.8357E+08	1.7136E-09			
Kr 76	75.9259	1.480E+01	hour	5.33E+04	2.7888E+06	3.5857E-07			
Kr 77	76.9247	1.240E+00	hour	4.46E+03	3.2854E+07	3.0438E-08			
Kr 79	78.9201	1.460E+00	day	1.26E+05	1.1332E+06	8.8242E-07			
Kr 79m	78.9201	5.000E+01	second	5.00E+01	2.8590E+09	3.4977E-10			
Kr 81	80.9166	2.290E+05	year	7.23E+12	1.9292E-02	5.1834E+01		3.240E-11	3.735E-11
Kr 81m	80.9166	1.310E+01	second	1.31E+01	1.0643E+10	9.3958E-11		4.952E-12	4.952E-12
Kr 83m	82.9141	1.830E+00	hour	6.59E+03	2.0654E+07	4.8418E-08		2.805E-08	5.379E-03
Kr 85	84.9125	1.076E+01	year	3.39E+08	3.9142E+02	2.5548E-03	0.001500	5.664E-05	2.743E-03
Kr 85m	84.9125	4.480E+00	hour	1.61E+04	8.2380E+06	1.2139E-07		1.310E-05	1.262E-02
Kr 87	86.9134	7.630E+01	minute	4.58E+03	2.8354E+07	3.5268E-08		4.196E-03	2.515E-02
Kr 88	87.9144	2.840E+00	hour	1.02E+04	1.2551E+07	7.9672E-08		1.475E-02	3.568E-02
Kr 89	88.9176	3.150E+00	minute	1.89E+02	6.7132E+08	1.4896E-09		3.309E-02	4.611E-02
Kr 90	89.9195	3.232E+01	second	3.23E+01	3.8820E+09	2.5760E-10		4.483E-02	5.042E-02
Kr 91	90.9234	8.570E+00	second	8.57E+00	1.4478E+10	6.9069E-11		3.183E-02	3.396E-02
Kr 92	91.9262	1.840E+00	second	1.84E+00	6.6699E+10	1.4993E-11		1.693E-02	1.719E-02
Kr 93	92.9313	1.286E+00	second	1.29E+00	9.4400E+10	1.0593E-11		5.245E-03	5.266E-03
Kr 94	93.9344	2.000E-01	second	2.00E-01	6.0051E+11	1.6652E-12		2.216E-03	2.218E-03
Kr 95	94.9293	7.800E-01	second	7.80E-01	1.5236E+11	6.5632E-12		6.970E-05	6.970E-05
Kr 97	96.9486	1.500E-07	second	1.50E-07	7.7579E+17	1.2890E-18		7.984E-08	7.984E-08
Rb 75	74.9386	1.900E+01	second	1.90E+01	7.9235E+09	1.2621E-10			
Rb 76	75.9351	3.650E+01	second	3.65E+01	4.0704E+09	2.4567E-10			
Rb 77	76.9304	3.750E+00	minute	2.25E+02	6.5177E+08	1.5343E-09			
Rb 78	77.9281	1.766E+01	minute	1.06E+03	1.3663E+08	7.3191E-09			
Rb 78m	77.9281	5.740E+00	minute	3.44E+02	4.2036E+08	2.3789E-09			
Rb 79	78.9240	2.290E+01	minute	1.37E+03	1.0404E+08	9.6121E-09			
Rb 80	79.9225	3.400E+01	second	3.40E+01	4.1517E+09	2.4086E-10			
Rb 81	80.9190	4.576E+00	hour	1.65E+04	8.4633E+06	1.1816E-07			
Rb 81m	80.9190	3.050E+01	minute	1.83E+03	7.6186E+07	1.3126E-08			
Rb 82	81.9182	1.273E+00	minute	7.64E+01	1.8031E+09	5.5460E-10			
Rb 82m	81.9182	6.472E+00	hour	2.33E+04	5.9109E+06	1.6918E-07			

Radionuclide Specific Data

Isotope	Atomic Mass	Half-life	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Rb 83	82.9151	8.620E+01	day	7.45E+06	1.8269E+04	5.4737E-05			
Rb 84	83.9144	3.277E+01	day	2.83E+06	4.7484E+04	2.1060E-05			
Rb 84m	83.9144	2.026E+01	minute	1.22E+03	1.1060E+08	9.0417E-09			
Rb 86	85.9112	1.863E+01	day	1.61E+06	8.1579E+04	1.2258E-05	0.004520		
Rb 86m	85.9112	1.017E+00	minute	6.10E+01	2.1521E+09	4.6467E-10			
Rb 87	86.9092	4.750E+10	year	1.50E+18	8.6597E-08	1.1548E+07			
Rb 88	87.9113	1.778E+01	minute	1.07E+03	1.2030E+08	8.3129E-09		8.096E-04	3.649E-02
Rb 89	88.9123	1.515E+01	minute	9.09E+02	1.3959E+08	7.1639E-09		2.396E-03	4.851E-02
Rb 90	89.9148	2.633E+00	minute	1.58E+02	7.9413E+08	1.2592E-09		1.589E-03	4.641E-02
Rb 90m	89.9148	4.300E+00	minute	2.58E+02	4.8632E+08	2.0562E-09		6.681E-03	1.283E-02
Rb 91	90.9165	5.840E+01	second	5.84E+01	2.1248E+09	4.7063E-10		2.262E-02	5.658E-02
Rb 92	91.9197	4.492E+00	second	4.49E+00	2.7323E+10	3.6599E-11		3.147E-02	4.875E-02
Rb 93	92.9220	5.840E+00	second	5.84E+00	2.0790E+10	4.8101E-11		3.084E-02	3.613E-02
Rb 94	93.9264	2.702E+00	second	2.70E+00	4.4453E+10	2.2496E-11		1.572E-02	1.781E-02
Rb 95	94.9293	3.775E-01	second	3.78E-01	3.1482E+11	3.1764E-12		8.120E-03	8.183E-03
Rb 96	95.9343	1.990E-01	second	1.99E-01	5.9095E+11	1.6922E-12		2.049E-03	2.063E-03
Rb 97	96.9373	1.699E-01	second	1.70E-01	6.8500E+11	1.4598E-12		7.805E-04	7.806E-04
Rb 98	97.9417	1.140E-01	second	1.14E-01	1.0104E+12	9.8968E-13		2.444E-05	2.445E-05
Rb 98m	97.9417	9.600E-02	second	9.60E-02	1.1999E+12	8.3342E-13			
Rb 99	98.9454	5.030E-02	second	5.03E-02	2.2668E+12	4.4115E-13		3.953E-07	3.953E-07
Rb 100	99.9499	5.100E-02	second	5.10E-02	2.2132E+12	4.5183E-13		7.668E-08	7.669E-08
Rb 101	100.9532	3.200E-02	second	3.20E-02	3.4923E+12	2.8635E-13		2.918E-10	2.921E-10
Rb 102	101.9430	3.700E-02	second	3.70E-02	2.9910E+12	3.3434E-13		1.526E-12	1.528E-12
Sr 78	77.9322	2.500E+00	minute	1.50E+02	9.6509E+08	1.0362E-09			
Sr 79	78.9297	2.250E+00	minute	1.35E+02	1.0588E+09	9.4449E-10			
Sr 80	79.9245	1.063E+02	minute	6.38E+03	2.2132E+07	4.5184E-08			
Sr 81	80.9232	2.230E+01	minute	1.34E+03	1.0420E+08	9.5974E-09			
Sr 82	81.9184	2.555E+01	day	2.21E+06	6.2386E+04	1.6029E-05			
Sr 83	82.9176	1.350E+00	day	1.17E+05	1.1661E+06	8.5752E-07			
Sr 83m	82.9176	4.950E+00	second	4.95E+00	2.7487E+10	3.6381E-11			
Sr 85	84.9129	6.484E+01	day	5.60E+06	2.3716E+04	4.2165E-05		3.938E-12	4.732E-12
Sr 85m	84.9129	1.127E+00	hour	4.06E+03	3.2742E+07	3.0541E-08		9.107E-13	9.107E-13
Sr 87m	86.9089	2.803E+00	hour	1.01E+04	1.2864E+07	7.7734E-08		3.599E-08	2.554E-02
Sr 89	88.9075	5.053E+01	day	4.37E+06	2.9065E+04	3.4405E-05	0.003460	3.417E-04	4.885E-02
Sr 90	89.9077	2.878E+01	year	9.08E+08	1.3816E+02	7.2381E-03	0.001160	3.563E-04	5.904E-02

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Sr 91	90.9102	9.630E+00	hour	3.47E+04	3.5796E+06	2.7936E-07		2.592E-03	5.918E-02
Sr 92	91.9110	2.710E+00	hour	9.76E+03	1.2582E+07	7.9481E-08		9.845E-03	5.908E-02
Sr 93	92.9140	7.423E+00	minute	4.45E+02	2.7262E+08	3.6681E-09		2.508E-02	6.254E-02
Sr 94	93.9140	1.255E+00	minute	7.53E+01	1.5953E+09	6.2683E-10		4.344E-02	6.014E-02
Sr 95	94.9194	2.390E+01	second	2.39E+01	4.9731E+09	2.0108E-10		4.614E-02	5.391E-02
Sr 96	95.9217	1.070E+00	second	1.07E+00	1.0992E+11	9.0975E-12		3.699E-02	3.897E-02
Sr 97	96.9261	4.260E-01	second	4.26E-01	2.7323E+11	3.6599E-12		1.971E-02	2.028E-02
Sr 98	97.9285	6.530E-01	second	6.53E-01	1.7642E+11	5.6682E-12		6.832E-03	6.853E-03
Sr 99	98.9333	2.690E-01	second	2.69E-01	4.2392E+11	2.3589E-12		3.530E-03	3.530E-03
Sr 100	99.9354	2.020E-01	second	2.02E-01	5.5886E+11	1.7893E-12		1.519E-04	1.519E-04
Sr 101	100.9405	1.180E-01	second	1.18E-01	9.4717E+11	1.0558E-12		3.347E-05	3.347E-05
Sr 102	101.9430	6.900E-02	second	6.90E-02	1.6039E+12	6.2349E-13		8.708E-06	8.708E-06
Y 80	79.9343	3.500E+01	second	3.50E+01	4.0325E+09	2.4798E-10			
Y 81	80.9291	1.173E+00	minute	7.04E+01	1.9807E+09	5.0487E-10			
Y 82	81.9268	9.500E+00	second	9.50E+00	1.4495E+10	6.8988E-11			
Y 83	82.9224	7.080E+00	minute	4.25E+02	3.2027E+08	3.1223E-09			
Y 83m	82.9224	2.850E+00	minute	1.71E+02	7.9563E+08	1.2569E-09			
Y 84	83.9204	4.600E+00	second	4.60E+00	2.9225E+10	3.4218E-11			
Y 84m	83.9204	3.950E+01	minute	2.37E+03	5.6723E+07	1.7629E-08			
Y 85	84.9164	2.680E+00	hour	9.65E+03	1.3770E+07	7.2619E-08			
Y 85m	84.9164	4.860E+00	hour	1.75E+04	7.5936E+06	1.3169E-07			
Y 86	85.9149	1.474E+01	hour	5.31E+04	2.4746E+06	4.0410E-07			
Y 86m	85.9149	4.800E+01	minute	2.88E+03	4.5595E+07	2.1932E-08			
Y 87	86.9109	3.325E+00	day	2.87E+05	4.5185E+05	2.2131E-06			
Y 87m	86.9109	1.337E+01	hour	4.81E+04	2.6969E+06	3.7079E-07			
Y 88	87.9095	1.067E+02	day	9.21E+06	1.3927E+04	7.1802E-05			
Y 89m	88.9058	1.606E+01	second	1.61E+01	7.9013E+09	1.2656E-10		2.505E-09	4.885E-02
Y 90	89.9072	2.671E+00	day	2.31E+05	5.4374E+05	1.8391E-06	0.005540	1.777E-07	5.905E-02
Y 90m	89.9072	3.190E+00	hour	1.15E+04	1.0927E+07	9.1519E-08		2.522E-07	2.522E-07
Y 91	90.9073	5.851E+01	day	5.06E+06	2.4549E+04	4.0735E-05	0.003600	1.835E-06	5.919E-02
Y 91m	90.9073	4.971E+01	minute	2.98E+03	4.1609E+07	2.4034E-08		7.933E-06	3.380E-02
Y 92	91.9089	3.540E+00	hour	1.27E+04	9.6319E+06	1.0382E-07		5.380E-04	5.962E-02
Y 93	92.9096	1.018E+01	hour	3.66E+04	3.3133E+06	3.0181E-07		4.229E-06	6.390E-02
Y 93m	92.9096	8.200E-01	second	8.20E-01	1.4808E+11	6.7530E-12			
Y 94	93.9116	1.870E+01	minute	1.12E+03	1.0707E+08	9.3398E-09		3.872E-03	6.401E-02

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Y 95	94.9128	1.030E+01	minute	6.18E+02	1.9234E+08	5.1992E-09		1.029E-02	6.421E-02
Y 96	95.9159	5.340E+00	second	5.34E+00	2.2026E+10	4.5400E-11		3.213E-03	4.218E-02
Y 96m	95.9159	9.600E+00	second	9.60E+00	1.2252E+10	8.1618E-11		1.790E-02	1.790E-02
Y 97	96.9181	3.750E+00	second	3.75E+00	3.1041E+10	3.2215E-11		5.974E-03	2.643E-02
Y 97m1	96.9181	1.170E+00	second	1.17E+00	9.9491E+10	1.0051E-11		2.583E-02	2.586E-02
Y 97m2	96.9181	1.420E-01	second	1.42E-01	8.1975E+11	1.2199E-12			
Y 98	97.9222	5.480E-01	second	5.48E-01	2.1024E+11	4.7565E-12		7.254E-03	1.409E-02
Y 98m	97.9222	2.000E+00	second	2.00E+00	5.7606E+10	1.7359E-11		2.188E-02	2.190E-02
Y 99	98.9246	1.470E+00	second	1.47E+00	7.7581E+10	1.2890E-11		2.018E-02	2.370E-02
Y 100	99.9278	7.350E-01	second	7.35E-01	1.5360E+11	6.5102E-12		1.297E-03	1.444E-03
Y 100m	99.9278	9.400E-01	second	9.40E-01	1.2011E+11	8.3260E-12		3.914E-03	3.915E-03
Y 101	100.9303	4.480E-01	second	4.48E-01	2.4950E+11	4.0080E-12		4.013E-03	4.046E-03
Y 102	101.9336	3.000E-01	second	3.00E-01	3.6892E+11	2.7106E-12		2.589E-03	2.597E-03
Y 102m	101.9336	3.600E-01	second	3.60E-01	3.0744E+11	3.2527E-12			
Zr 81	80.9368	1.500E+01	second	1.50E+01	9.2926E+09	1.0761E-10			
Zr 82	81.9311	3.200E+01	second	3.20E+01	4.3031E+09	2.3239E-10			
Zr 83	82.9287	4.400E+01	second	4.40E+01	3.0919E+09	3.2343E-10			
Zr 84	83.9233	2.590E+01	minute	1.55E+03	8.6505E+07	1.1560E-08			
Zr 85	84.9215	7.860E+00	minute	4.72E+02	2.8170E+08	3.5499E-09			
Zr 85m	84.9215	1.090E+01	second	1.09E+01	1.2188E+10	8.2048E-11			
Zr 86	85.9165	1.650E+01	hour	5.94E+04	2.2106E+06	4.5236E-07			
Zr 87	86.9148	1.680E+00	hour	6.05E+03	2.1462E+07	4.6594E-08			
Zr 87m	86.9148	1.400E+01	second	1.40E+01	9.2716E+09	1.0786E-10			
Zr 88	87.9102	8.340E+01	day	7.21E+06	1.7810E+04	5.6149E-05			
Zr 89	88.9089	3.267E+00	day	2.82E+05	4.4953E+05	2.2246E-06		3.337E-13	4.056E-13
Zr 89m	88.9089	4.180E+00	minute	2.51E+02	5.0595E+08	1.9765E-09		7.717E-14	7.717E-14
Zr 90m	89.9047	8.092E-01	second	8.09E-01	1.5507E+11	6.4485E-12		4.434E-11	6.452E-11
Zr 93	92.9064	1.530E+06	year	4.83E+13	2.5149E-03	3.9763E+02	0.000290	4.229E-06	6.390E-02
Zr 95	94.9080	6.402E+01	day	5.53E+06	2.1490E+04	4.6532E-05	0.005060	7.540E-04	6.496E-02
Zr 96	95.9083	1.000E+18	year	3.16E+25	3.7274E-15	2.6828E+14		2.518E-03	6.264E-02
Zr 97	96.9110	1.691E+01	hour	6.09E+04	1.9123E+06	5.2293E-07		7.181E-03	5.995E-02
Zr 98	97.9127	3.070E+01	second	3.07E+01	3.7532E+09	2.6644E-10		3.268E-02	5.619E-02
Zr 99	98.9165	2.100E+00	second	2.10E+00	5.4311E+10	1.8412E-11		3.268E-02	5.619E-02
Zr 100	99.9178	7.100E+00	second	7.10E+00	1.5903E+10	6.2882E-11		5.245E-02	5.778E-02
Zr 101	100.9211	2.100E+00	second	2.10E+00	5.3232E+10	1.8786E-11		2.642E-02	3.055E-02

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Zr 102	101.9230	2.900E+00	second	2.90E+00	3.8169E+10	2.6200E-11		2.081E-02	2.341E-02
Zr 103	102.9266	1.300E+00	second	1.30E+00	8.4315E+10	1.1860E-11		5.413E-03	6.061E-03
Zr 104	103.9288	1.200E+00	second	1.20E+00	9.0461E+10	1.1055E-11		1.129E-03	1.132E-03
Nb 86	85.9250	1.467E+00	minute	8.80E+01	1.4920E+09	6.7025E-10			
Nb 87	86.9204	2.600E+00	minute	1.56E+02	8.3201E+08	1.2019E-09			
Nb 87m	86.9204	3.700E+00	minute	2.22E+02	5.8466E+08	1.7104E-09			
Nb 88	87.9180	1.450E+01	minute	8.70E+02	1.4750E+08	6.7799E-09			
Nb 88m	87.9180	7.800E+00	minute	4.68E+02	2.7419E+08	3.6471E-09			
Nb 89	88.9135	1.900E+00	hour	6.84E+03	1.8550E+07	5.3907E-08			
Nb 89m	88.9135	1.180E+00	hour	4.25E+03	2.9869E+07	3.3479E-08			
Nb 90	89.9113	1.460E+01	hour	5.26E+04	2.3873E+06	4.1888E-07			
Nb 90m	89.9113	1.881E+01	second	1.88E+01	6.6707E+09	1.4991E-10			
Nb 91	90.9070	6.800E+02	year	2.15E+10	5.7830E+00	1.7292E-01			
Nb 91m	90.9070	6.086E+01	day	5.26E+06	2.3601E+04	4.2371E-05			
Nb 92	91.9072	3.470E+07	year	1.10E+15	1.1209E-04	8.9211E+03			
Nb 92m	91.9072	1.015E+01	day	8.77E+05	1.3997E+05	7.1442E-06		1.517E-12	1.517E-12
Nb 93m	92.9064	1.613E+01	year	5.09E+08	2.3855E+02	4.1920E-03	0.000177	7.531E-11	6.071E-02
Nb 94	93.9073	2.030E+04	year	6.41E+11	1.8753E-01	5.3325E+00	0.010180	9.900E-09	1.684E-08
Nb 94m	93.9073	6.263E+00	minute	3.76E+02	3.1970E+08	3.1279E-09		6.976E-09	6.976E-09
Nb 95	94.9068	3.498E+01	day	3.02E+06	3.9338E+04	2.5421E-05	0.004788	1.032E-06	6.495E-02
Nb 95m	94.9068	8.660E+01	hour	3.12E+05	3.8129E+05	2.6227E-06		2.387E-07	5.849E-04
Nb 96	95.9081	2.335E+01	hour	8.41E+04	1.3994E+06	7.1461E-07		5.589E-06	5.589E-06
Nb 97	96.9081	1.202E+00	hour	4.33E+03	2.6910E+07	3.7161E-08		1.035E-04	6.008E-02
Nb 97m	96.9081	5.270E+01	second	5.27E+01	2.2091E+09	4.5268E-10		2.394E-05	5.836E-02
Nb 98	97.9103	2.860E+00	second	2.86E+00	4.0289E+10	2.4821E-11		1.049E-04	5.676E-02
Nb 98m	97.9103	5.130E+01	minute	3.08E+03	3.7435E+07	2.6713E-08		3.165E-04	3.165E-04
Nb 99	98.9116	1.500E+01	second	1.50E+01	7.6039E+09	1.3151E-10		3.357E-03	3.932E-02
Nb 99m	98.9116	2.600E+00	minute	1.56E+02	7.3115E+08	1.3677E-09		7.762E-04	2.101E-02
Nb 100	99.9142	1.500E+00	second	1.50E+00	7.5276E+10	1.3284E-11		9.863E-04	5.761E-02
Nb 100m	99.9142	2.990E+00	second	2.99E+00	3.7764E+10	2.6480E-11		2.976E-03	4.131E-03
Nb 101	100.9153	7.100E+00	second	7.10E+00	1.5746E+10	6.3509E-11		1.878E-02	4.933E-02
Nb 102	101.9180	1.300E+00	second	1.30E+00	8.5149E+10	1.1744E-11		3.905E-03	2.731E-02
Nb 102m	101.9180	4.300E+00	second	4.30E+00	2.5743E+10	3.8846E-11		1.178E-02	1.178E-02
Nb 103	102.9191	1.500E+00	second	1.50E+00	7.3078E+10	1.3684E-11		1.621E-02	2.227E-02
Nb 104	103.9225	4.800E+00	second	4.80E+00	2.2617E+10	4.4215E-11		4.423E-03	5.557E-03

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Nb 104m	103.9225	9.200E-01	second	9.20E-01	1.1800E+11	8.4746E-12		1.889E-03	1.889E-03
Nb 105	104.9239	2.950E+00	second	2.95E+00	3.6449E+10	2.7436E-11		1.701E-03	2.587E-03
Nb 106	105.9282	1.020E+00	second	1.02E+00	1.0442E+11	9.5771E-12		1.453E-04	1.472E-04
Nb 107	106.9303	3.300E-01	second	3.30E-01	3.1971E+11	3.1278E-12		2.051E-05	2.053E-05
Mo 88	87.9220	8.000E+00	minute	4.80E+02	2.6732E+08	3.7408E-09			
Mo 89	88.9195	2.040E+00	minute	1.22E+02	1.0366E+09	9.6472E-10			
Mo 89m	88.9195	1.900E-01	second	1.90E-01	6.6777E+11	1.4975E-12			
Mo 90	89.9139	5.670E+00	hour	2.04E+04	6.1470E+06	1.6268E-07			
Mo 91	90.9118	1.549E+01	minute	9.29E+02	1.3352E+08	7.4894E-09			
Mo 91m	90.9118	1.083E+00	minute	6.50E+01	1.9098E+09	5.2363E-10			
Mo 93	92.9068	4.000E+03	year	1.26E+11	9.6195E-01	1.0396E+00	0.000094	3.473E-16	5.593E-16
Mo 93m	92.9068	6.850E+00	hour	2.47E+04	4.9242E+06	2.0308E-07		2.122E-16	2.122E-16
Mo 99	98.9077	2.748E+00	day	2.37E+05	4.8050E+05	2.0812E-06	0.004028	7.778E-04	6.110E-02
Mo 101	100.9103	1.461E+01	minute	8.77E+02	1.2754E+08	7.8408E-09		1.483E-03	5.081E-02
Mo 102	101.9103	1.130E+01	minute	6.78E+02	1.6328E+08	6.1245E-09		3.198E-03	4.229E-02
Mo 103	102.9132	1.125E+00	minute	6.75E+01	1.6241E+09	6.1574E-10		7.227E-03	2.953E-02
Mo 104	103.9138	1.000E+00	minute	6.00E+01	1.8095E+09	5.5265E-10		1.032E-02	1.785E-02
Mo 105	104.9170	3.560E+01	second	3.56E+01	3.0205E+09	3.3107E-10		6.865E-03	9.340E-03
Mo 106	105.9181	8.400E+00	second	8.40E+00	1.2680E+10	7.8863E-11		3.555E-03	3.700E-03
Mo 107	106.9217	3.500E+00	second	3.50E+00	3.0147E+10	3.3171E-11		1.012E-03	1.030E-03
Mo 108	107.9236	1.500E+00	second	1.50E+00	6.9690E+10	1.4349E-11		5.076E-05	5.096E-05
Mo 109	108.9278	5.300E-01	second	5.30E-01	1.9542E+11	5.1173E-12		3.809E-06	3.814E-06
Tc 89	88.9275	1.280E+01	second	1.28E+01	9.9113E+09	1.0090E-10			
Tc 89m	88.9275	1.290E+01	second	1.29E+01	9.8345E+09	1.0168E-10			
Tc 90	89.9236	8.700E+00	second	8.70E+00	1.4421E+10	6.9345E-11			
Tc 90m	89.9236	4.920E+01	second	4.92E+01	2.5500E+09	3.9216E-10			
Tc 91	90.9184	3.140E+00	minute	1.88E+02	6.5863E+08	1.5183E-09			
Tc 91m	90.9184	3.300E+00	minute	1.98E+02	6.2670E+08	1.5957E-09			
Tc 92	91.9153	4.230E+00	minute	2.54E+02	4.8361E+08	2.0678E-09			
Tc 93	92.9102	2.750E+00	hour	9.90E+03	1.2265E+07	8.1531E-08			
Tc 93m	92.9102	4.350E+01	minute	2.61E+03	4.6523E+07	2.1495E-08			
Tc 94	93.9097	4.883E+00	hour	1.76E+04	6.8336E+06	1.4634E-07			
Tc 94m	93.9097	5.200E+01	minute	3.12E+03	3.8505E+07	2.5971E-08			
Tc 95	94.9077	2.000E+01	hour	7.20E+04	1.6510E+06	6.0570E-07			
Tc 95m	94.9077	6.100E+01	day	5.27E+06	2.2554E+04	4.4337E-05			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Tc 96	95.9079	4.280E+00	day	3.70E+05	3.1810E+05	3.1437E-06			
Tc 96m	95.9079	5.150E+01	minute	3.09E+03	3.8068E+07	2.6269E-08			
Tc 97	96.9064	2.600E+06	year	8.21E+13	1.4188E-03	7.0480E+02			
Tc 97m	96.9064	9.010E+01	day	7.78E+06	1.4955E+04	6.6867E-05		8.581E-13	8.581E-13
Tc 98	97.9072	4.200E+06	year	1.33E+14	8.6935E-04	1.1503E+03		7.228E-09	7.228E-09
Tc 99	98.9063	2.111E+05	year	6.66E+12	1.7122E-02	5.8405E+01	0.000501	1.173E-08	6.110E-02
Tc 99m	98.9063	6.010E+00	hour	2.16E+04	5.2720E+06	1.8968E-07	0.000819	2.713E-09	5.316E-02
Tc 100	99.9077	1.580E+01	second	1.58E+01	7.1469E+09	1.3992E-10		3.029E-07	3.029E-07
Tc 101	100.9073	1.422E+01	minute	8.53E+02	1.3104E+08	7.6313E-09		4.579E-06	5.081E-02
Tc 102	101.9092	5.280E+00	second	5.28E+00	2.0967E+10	4.7695E-11		9.926E-06	4.230E-02
Tc 102m	101.9092	4.350E+00	minute	2.61E+02	4.2415E+08	2.3576E-09		2.995E-05	2.995E-05
Tc 103	102.9092	5.420E+01	second	5.42E+01	2.0227E+09	4.9440E-10		7.411E-04	3.027E-02
Tc 104	103.9114	1.830E+01	minute	1.10E+03	9.8881E+07	1.0113E-08		5.463E-04	1.839E-02
Tc 105	104.9117	7.600E+00	minute	4.56E+02	2.3582E+08	4.2405E-09		2.720E-04	9.612E-03
Tc 106	105.9144	3.560E+01	second	3.56E+01	2.9921E+09	3.3422E-10		2.278E-04	3.928E-03
Tc 107	106.9151	2.120E+01	second	2.12E+01	4.9774E+09	2.0091E-10		1.750E-04	1.205E-03
Tc 108	107.9185	5.170E+00	second	5.17E+00	2.0220E+10	4.9455E-11		2.645E-04	3.154E-04
Tc 109	108.9196	8.700E-01	second	8.70E-01	1.1906E+11	8.3994E-12		7.604E-05	7.985E-05
Tc 110	109.9234	9.200E-01	second	9.20E-01	1.1156E+11	8.9640E-12		2.604E-05	2.667E-05
Tc 111	110.9251	3.000E-01	second	3.00E-01	3.3902E+11	2.9497E-12		7.028E-06	7.084E-06
Tc 113	112.9313	1.300E-01	second	1.30E-01	7.6846E+11	1.3013E-12		3.569E-07	3.569E-07
Ru 90	89.9298	1.300E+01	second	1.30E+01	9.6501E+09	1.0363E-10			
Ru 91	90.9264	9.000E+00	second	9.00E+00	1.3786E+10	7.2536E-11			
Ru 91m	90.9264	7.600E+00	second	7.60E+00	1.6326E+10	6.1253E-11			
Ru 92	91.9201	3.650E+00	minute	2.19E+02	5.6043E+08	1.7843E-09			
Ru 93	92.9171	5.970E+01	second	5.97E+01	2.0338E+09	4.9169E-10			
Ru 93m	92.9171	1.080E+01	second	1.08E+01	1.1242E+10	8.8949E-11			
Ru 94	93.9114	5.180E+01	minute	3.11E+03	3.8652E+07	2.5872E-08			
Ru 95	94.9104	1.643E+00	hour	5.91E+03	2.0097E+07	4.9760E-08			
Ru 97	96.9076	2.900E+00	day	2.51E+05	4.6463E+05	2.1523E-06			
Ru 103	102.9063	3.926E+01	day	3.39E+06	3.2320E+04	3.0941E-05	0.003530	5.799E-07	3.027E-02
Ru 103m	102.9063	1.690E-03	second	1.69E-03	6.4871E+13	1.5415E-14			
Ru 105	104.9078	4.440E+00	hour	1.60E+04	6.7280E+06	1.4863E-07		2.683E-05	9.638E-03
Ru 106	105.9073	3.736E+02	day	3.23E+07	3.3002E+03	3.0301E-04	0.000595	9.553E-05	4.023E-03
Ru 107	106.9099	3.750E+00	minute	2.25E+02	4.6900E+08	2.1322E-09		1.960E-04	1.401E-03

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ru 108	107.9102	4.550E+00	minute	2.73E+02	3.8296E+08	2.6113E-09		3.425E-04	6.581E-04
Ru 109	108.9132	3.450E+01	second	3.45E+01	3.0025E+09	3.3306E-10		6.899E-05	1.487E-04
Ru 110	109.9140	1.460E+01	second	1.46E+01	7.0302E+09	1.4224E-10		1.666E-04	1.667E-04
Ru 111	110.9176	2.120E+00	second	2.12E+00	4.7978E+10	2.0843E-11		1.147E-04	1.215E-04
Ru 112	111.9186	1.750E+00	second	1.75E+00	5.7602E+10	1.7361E-11		6.687E-05	6.839E-05
Ru 113	112.9225	8.000E-01	second	8.00E-01	1.2488E+11	8.0074E-12		3.102E-05	3.138E-05
Ru 114	113.9240	5.000E-01	second	5.00E-01	1.9806E+11	5.0490E-12		1.105E-05	1.109E-05
Ru 115	114.9283	4.000E-01	second	4.00E-01	2.4541E+11	4.0748E-12		1.879E-06	1.880E-06
Rh 94	93.9217	2.580E+01	second	2.58E+01	4.6558E+09	2.1479E-10			
Rh 94m	93.9217	7.060E+01	second	7.06E+01	1.7014E+09	5.8775E-10			
Rh 95	94.9159	5.020E+00	minute	3.01E+02	3.9462E+08	2.5341E-09			
Rh 95m	94.9159	1.960E+00	minute	1.18E+02	1.0107E+09	9.8940E-10			
Rh 96	95.9145	9.900E+00	minute	5.94E+02	1.9802E+08	5.0500E-09			
Rh 96m	95.9145	1.510E+00	minute	9.06E+01	1.2983E+09	7.7026E-10			
Rh 97	96.9113	3.070E+01	minute	1.84E+03	6.3199E+07	1.5823E-08			
Rh 97m	96.9113	4.620E+01	minute	2.77E+03	4.1996E+07	2.3812E-08			
Rh 98	97.9107	8.700E+00	minute	5.22E+02	2.2074E+08	4.5303E-09			
Rh 98m	97.9107	3.500E+00	minute	2.10E+02	5.4869E+08	1.8225E-09			
Rh 99	98.9081	1.610E+01	day	1.39E+06	8.1998E+04	1.2195E-05			
Rh 99m	98.9081	4.700E+00	hour	1.69E+04	6.7413E+06	1.4834E-07			
Rh 100	99.9081	2.080E+01	hour	7.49E+04	1.5080E+06	6.6312E-07			
Rh 101	100.9062	3.300E+00	year	1.04E+08	1.0736E+03	9.3147E-04			
Rh 101m	100.9062	4.340E+00	day	3.75E+05	2.9816E+05	3.3539E-06			
Rh 102	101.9068	2.070E+02	day	1.79E+07	6.1900E+03	1.6155E-04		1.555E-09	1.556E-09
Rh 102m	101.9068	2.890E+00	year	9.12E+07	1.2138E+03	8.2384E-04		8.645E-10	8.645E-10
Rh 103m	102.9055	5.612E+01	minute	3.37E+03	3.2559E+07	3.0714E-08	0.000232	2.881E-11	3.020E-02
Rh 104	103.9067	4.230E+01	second	4.23E+01	2.5668E+09	3.8959E-10		1.839E-10	7.377E-10
Rh 104m	103.9067	4.340E+00	minute	2.60E+02	4.1696E+08	2.3983E-09		5.549E-10	5.549E-10
Rh 105	104.9057	1.473E+00	day	1.27E+05	8.4501E+05	1.1834E-06		1.475E-08	9.638E-03
Rh 105m	104.9057	4.500E+01	second	4.50E+01	2.3898E+09	4.1844E-10		2.255E-09	2.641E-03
Rh 106	105.9073	2.980E+01	second	2.98E+01	3.5747E+09	2.7975E-10	0.018940	5.169E-08	4.023E-03
Rh 106m	105.9073	2.183E+00	hour	7.86E+03	1.3553E+07	7.3785E-08		1.211E-07	1.211E-07
Rh 107	106.9068	2.170E+01	minute	1.30E+03	8.1051E+07	1.2338E-08		1.211E-07	1.403E-03
Rh 108	107.9087	1.680E+01	second	1.68E+01	6.2232E+09	1.6069E-10		3.368E-06	6.614E-04
Rh 108m	107.9087	6.000E+00	minute	3.60E+02	2.9041E+08	3.4434E-09		7.889E-06	7.889E-06

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Rh 109	108.9087	1.333E+00	minute	8.00E+01	1.2952E+09	7.7209E-10		2.891E-05	3.443E-04
Rh 110	109.9110	3.200E+00	second	3.20E+00	3.2076E+10	3.1176E-11		1.562E-05	2.650E-04
Rh 110m	109.9110	2.850E+01	second	2.85E+01	3.6016E+09	2.7766E-10		3.657E-05	3.657E-05
Rh 111	110.9117	1.100E+01	second	1.10E+01	9.2471E+09	1.0814E-10		7.130E-05	1.928E-04
Rh 112	111.9146	2.100E+00	second	2.10E+00	4.8003E+10	2.0832E-11		7.220E-05	1.406E-04
Rh 112m	111.9146	6.800E+00	second	6.80E+00	1.4825E+10	6.7456E-11			
Rh 113	112.9154	2.800E+00	second	2.80E+00	3.5683E+10	2.8024E-11		8.754E-05	1.189E-04
Rh 114	113.9188	1.850E+00	second	1.85E+00	5.3531E+10	1.8681E-11		5.608E-05	6.717E-05
Rh114m	113.9188	1.850E+00	second	1.85E+00	5.3531E+10	1.8681E-11			
Rh 115	114.9201	9.900E-01	second	9.90E-01	9.9162E+10	1.0085E-11		2.938E-05	3.126E-05
Rh 116	115.9237	6.800E-01	second	6.80E-01	1.4312E+11	6.9872E-12		1.799E-05	1.853E-05
Rh 116m	115.9237	9.000E-01	second	9.00E-01	1.0813E+11	9.2478E-12		5.259E-06	5.308E-06
Rh 117	116.9254	4.400E-01	second	4.40E-01	2.1929E+11	4.5602E-12			
Pd 95m	94.9247	1.330E+01	second	1.33E+01	8.9361E+09	1.1191E-10			
Pd 96	95.9182	1.220E+02	second	1.22E+02	9.6409E+08	1.0373E-09			
Pd 97	96.9165	3.100E+00	minute	1.86E+02	6.2584E+08	1.5978E-09			
Pd 98	97.9127	1.770E+01	minute	1.06E+03	1.0850E+08	9.2169E-09			
Pd 99	98.9118	2.140E+01	minute	1.28E+03	8.8831E+07	1.1257E-08			
Pd 100	99.9085	3.630E+00	day	3.14E+05	3.6004E+05	2.7775E-06			
Pd 101	100.9083	8.470E+00	hour	3.05E+04	3.6666E+06	2.7273E-07			
Pd 103	102.9061	1.699E+01	day	1.47E+06	7.4680E+04	1.3391E-05			
Pd 107	106.9051	6.500E+06	year	2.05E+14	5.1446E-04	1.9438E+03	0.000055	3.056E-10	1.403E-03
Pd 107m	106.9051	2.130E+01	second	2.13E+01	4.9545E+09	2.0184E-10		5.742E-10	5.742E-10
Pd 109	108.9060	1.370E+01	hour	4.93E+04	2.1002E+06	4.7614E-07		1.708E-07	3.448E-04
Pd 109m	108.9060	4.696E+00	minute	2.82E+02	3.6766E+08	2.7199E-09		3.211E-07	3.210E-07
Pd 111	110.9076	2.340E+01	minute	1.40E+03	7.2452E+07	1.3802E-08		2.559E-06	1.987E-04
Pd 111m	110.9076	5.500E+00	hour	1.98E+04	5.1375E+06	1.9465E-07		4.809E-06	4.809E-06
Pd 112	111.9073	2.103E+01	hour	7.57E+04	1.3316E+06	7.5097E-07		1.975E-05	1.603E-04
Pd 113	112.9102	1.550E+00	minute	9.30E+01	1.0744E+09	9.3076E-10		4.370E-05	1.626E-04
Pd 113m	112.9102	1.000E+02	second	1.00E+02	9.9918E+08	1.0008E-09			
Pd 113m2	112.9102	4.000E-01	second	4.00E-01	2.4979E+11	4.0033E-12			
Pd 114	113.9104	2.420E+00	minute	1.45E+02	6.8210E+08	1.4661E-09		7.086E-05	1.381E-04
Pd 115	114.9137	2.500E+01	second	2.50E+01	3.9270E+09	2.5465E-10		7.288E-05	1.041E-04
Pd 115m	114.9137	5.000E+01	second	5.00E+01	1.9635E+09	5.0929E-10			
Pd 116	115.9142	1.240E+01	second	1.24E+01	7.8491E+09	1.2740E-10		1.254E-04	1.440E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pd 117	116.9178	4.300E+00	second	4.30E+00	2.2440E+10	4.4563E-11		7.322E-05	7.840E-05
Pd 117m	116.9178	1.910E-02	second	1.91E-02	5.0520E+12	1.9794E-13			
Pd 118	117.9190	1.900E+00	second	1.90E+00	5.0355E+10	1.9859E-11		3.214E-05	3.289E-05
Pd 119	118.9227	9.200E-01	second	9.20E-01	1.0312E+11	9.6979E-12		2.438E-05	2.467E-05
Ag 96	95.9307	5.100E+00	second	5.10E+00	2.3059E+10	4.3366E-11			
Ag 97	96.9240	1.900E+01	second	1.90E+01	6.1262E+09	1.6323E-10			
Ag 98	97.9218	4.670E+01	second	4.67E+01	2.4671E+09	4.0534E-10			
Ag 99	98.9176	1.240E+02	second	1.24E+02	9.1977E+08	1.0872E-09			
Ag 99m	98.9176	1.050E+01	second	1.05E+01	1.0862E+10	9.2063E-11			
Ag 100	99.9161	2.010E+00	minute	1.21E+02	9.3625E+08	1.0681E-09			
Ag 100m	99.9161	2.240E+00	minute	1.34E+02	8.4012E+08	1.1903E-09			
Ag 101	100.9128	1.110E+01	minute	6.66E+02	1.6786E+08	5.9572E-09			
Ag 101m	100.9128	3.100E+00	second	3.10E+00	3.6064E+10	2.7729E-11			
Ag 102	101.9120	1.290E+01	minute	7.74E+02	1.4302E+08	6.9918E-09			
Ag 102m	101.9120	7.700E+00	minute	4.62E+02	2.3961E+08	4.1734E-09			
Ag 103	102.9090	1.095E+00	hour	3.94E+03	2.7810E+07	3.5958E-08			
Ag 103m	102.9090	5.700E+00	second	5.70E+00	1.9233E+10	5.1994E-11			
Ag 104	103.9086	1.153E+00	hour	4.15E+03	2.6157E+07	3.8230E-08			
Ag 104m	103.9086	3.350E+01	minute	2.01E+03	5.4017E+07	1.8513E-08			
Ag 105	104.9065	4.129E+01	day	3.57E+06	3.0145E+04	3.3173E-05			
Ag 105m	104.9065	7.230E+00	minute	4.34E+02	2.4790E+08	4.0338E-09			
Ag 106	105.9067	2.396E+01	minute	1.44E+03	7.4099E+07	1.3495E-08			
Ag 106m	105.9067	8.280E+00	day	7.15E+05	1.4890E+05	6.7157E-06			
Ag 107m	106.9051	4.430E+01	second	4.43E+01	2.3822E+09	4.1978E-10			
Ag 108	107.9060	2.370E+00	minute	1.42E+02	7.3524E+08	1.3601E-09			
Ag 108m	107.9060	4.180E+02	year	1.32E+10	7.9257E+00	1.2617E-01			
Ag 109m	108.9048	3.960E+01	second	3.96E+01	2.6160E+09	3.8227E-10			
Ag 110	109.9061	2.457E+01	second	2.46E+01	4.1778E+09	2.3936E-10	0.007208	7.607E-10	7.857E-10
Ag 110m	109.9061	2.498E+02	day	2.16E+07	4.7563E+03	2.1025E-04	0.016690	1.782E-09	1.782E-09
Ag 111	110.9053	7.450E+00	day	6.44E+05	1.5804E+05	6.3277E-06		2.850E-09	1.996E-04
Ag 111m	110.9053	1.080E+00	minute	6.48E+01	1.5698E+09	6.3702E-10		1.865E-08	1.986E-04
Ag 112	111.9070	3.130E+00	hour	1.13E+04	8.9469E+06	1.1177E-07		1.250E-08	1.604E-04
Ag 113	112.9066	5.370E+00	hour	1.93E+04	5.1687E+06	1.9347E-07		9.766E-08	1.633E-04
Ag 113m	112.9066	1.145E+00	minute	6.87E+01	1.4545E+09	6.8754E-10		6.390E-07	6.390E-07
Ag 114	113.9088	4.600E+00	second	4.60E+00	2.1531E+10	4.6445E-11		2.270E-06	1.404E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ag 115	114.9088	2.000E+01	minute	1.20E+03	8.1817E+07	1.2222E-08		9.570E-07	7.698E-05
Ag 115m	114.9088	1.800E+01	second	1.80E+01	5.4544E+09	1.8334E-10		6.261E-06	3.438E-05
Ag 116	115.9114	2.680E+00	minute	1.61E+02	6.0529E+08	1.6521E-09		4.629E-06	1.491E-04
Ag 116m	115.9114	1.040E+01	second	1.04E+01	9.3587E+09	1.0685E-10		1.947E-05	1.947E-05
Ag 117	116.9117	1.213E+00	minute	7.28E+01	1.3256E+09	7.5440E-10		3.422E-06	8.182E-05
Ag 117m	116.9117	5.340E+00	second	5.34E+00	1.8071E+10	5.5338E-11		2.239E-05	2.239E-05
Ag 118	117.9146	3.760E+00	second	3.76E+00	2.5446E+10	3.9299E-11		1.199E-05	6.554E-05
Ag 118m	117.9146	2.000E+00	second	2.00E+00	4.7839E+10	2.0904E-11		5.040E-05	5.040E-05
Ag 119	118.9157	2.100E+00	second	2.10E+00	4.5177E+10	2.2135E-11		6.539E-05	9.006E-05
Ag 119m	118.9157	6.000E+00	second	6.00E+00	1.5812E+10	6.3243E-11			
Ag 120	119.9188	1.230E+00	second	1.23E+00	7.6486E+10	1.3074E-11		2.022E-05	4.076E-05
Ag 120m	119.9188	3.200E-01	second	3.20E-01	2.9399E+11	3.4014E-12		2.869E-05	2.869E-05
Ag 121	120.9199	7.800E-01	second	7.80E-01	1.1961E+11	8.3602E-12		3.818E-05	4.107E-05
Ag 122	121.9233	4.800E-01	second	4.80E-01	1.9277E+11	5.1874E-12		2.097E-05	2.180E-05
Ag 122m	121.9233	1.500E+00	second	1.50E+00	6.1688E+10	1.6211E-11			
Ag 123	122.9249	3.090E-01	second	3.09E-01	2.9701E+11	3.3668E-12		6.769E-06	6.846E-06
Cd 97	96.9349	3.000E+00	second	3.00E+00	3.8795E+10	2.5777E-11			
Cd 98	97.9276	9.200E+00	second	9.20E+00	1.2522E+10	7.9858E-11			
Cd 99	98.9250	1.600E+01	second	1.60E+01	7.1277E+09	1.4030E-10			
Cd 100	99.9202	4.910E+01	second	4.91E+01	2.2995E+09	4.3487E-10			
Cd 101	100.9187	1.200E+00	minute	7.20E+01	1.5526E+09	6.4406E-10			
Cd 102	101.9148	5.500E+00	minute	3.30E+02	3.3545E+08	2.9811E-09			
Cd 103	102.9134	7.300E+00	minute	4.38E+02	2.5028E+08	3.9955E-09			
Cd 104	103.9098	5.770E+01	minute	3.46E+03	3.1361E+07	3.1887E-08			
Cd 105	104.9095	5.550E+01	minute	3.33E+03	3.2294E+07	3.0966E-08			
Cd 107	106.9066	6.500E+00	hour	2.34E+04	4.5098E+06	2.2174E-07			
Cd 109	108.9050	4.626E+02	day	4.00E+07	2.5918E+03	3.8583E-04			1.010E-14
Cd 111m	110.9042	4.854E+01	minute	2.91E+03	3.4928E+07	2.8630E-08			4.985E-12
Cd 113	112.9044	9.300E+15	year	2.93E+23	3.4046E-13	2.9372E+12	0.000541		1.607E-04
Cd 113m	112.9044	1.410E+01	year	4.45E+08	2.2456E+02	4.4532E-03	0.001080		2.614E-06
Cd 115	114.9054	2.228E+00	day	1.92E+05	5.1016E+05	1.9602E-06			1.025E-04
Cd 115m	114.9054	4.460E+01	day	3.85E+06	2.5479E+04	3.9248E-05	0.003760		8.940E-06
Cd 117	116.9072	2.490E+00	hour	8.96E+03	1.0765E+07	9.2890E-08			9.041E-05
Cd 117m	116.9072	3.360E+00	hour	1.21E+04	7.9780E+06	1.2534E-07			1.792E-05
Cd 118	117.9069	5.030E+01	minute	3.02E+03	3.1704E+07	3.1541E-08			1.093E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Cd 119	118.9099	2.690E+00	minute	1.61E+02	5.8783E+08	1.7012E-09			8.003E-05
Cd 119m	118.9099	2.200E+00	minute	1.32E+02	7.1876E+08	1.3913E-09			4.108E-05
Cd 120	119.9099	5.080E+01	second	5.08E+01	1.8521E+09	5.3994E-10			1.192E-04
Cd 121	120.9130	1.350E+01	second	1.35E+01	6.9115E+09	1.4469E-10			6.496E-05
Cd 121m	120.9130	8.300E+00	second	8.30E+00	1.1242E+10	8.8956E-11			5.780E-05
Cd 122	121.9135	5.240E+00	second	5.24E+00	1.7660E+10	5.6625E-11			1.355E-04
Cd 123	122.9170	2.100E+00	second	2.10E+00	4.3706E+10	2.2880E-11			8.529E-05
Cd 123m	122.9170	1.820E+00	second	1.82E+00	5.0430E+10	1.9829E-11			
Cd 124	123.9176	1.250E+00	second	1.25E+00	7.2834E+10	1.3730E-11			1.618E-04
Cd 125	124.9212	6.500E-01	second	6.50E-01	1.3894E+11	7.1974E-12			8.974E-05
Cd 125m	124.9212	5.700E-01	second	5.70E-01	1.5844E+11	6.3115E-12			
Cd 126	125.9224	5.070E-01	second	5.07E-01	1.7671E+11	5.6589E-12			1.162E-04
Cd 127	126.9264	4.300E-01	second	4.30E-01	2.0671E+11	4.8378E-12			8.513E-05
Cd 128	127.9278	3.400E-01	second	3.40E-01	2.5938E+11	3.8554E-12			6.363E-05
Cd 129	128.9323	2.700E-01	second	2.70E-01	3.2408E+11	3.0857E-12			2.160E-05
Cd 130	129.9340	2.000E-01	second	2.00E-01	4.3413E+11	2.3034E-12			9.169E-06
In 101	100.9266	1.600E+01	second	1.60E+01	6.9864E+09	1.4314E-10			
In 102	101.9247	2.400E+01	second	2.40E+01	4.6120E+09	2.1683E-10			
In 103	102.9199	6.500E+01	second	6.50E+01	1.6864E+09	5.9297E-10			
In 104	103.9183	1.800E+00	minute	1.08E+02	1.0052E+09	9.9481E-10			
In 104m	103.9183	1.570E+01	second	1.57E+01	6.9149E+09	1.4462E-10			
In 105	104.9147	5.070E+00	minute	3.04E+02	3.5349E+08	2.8289E-09			
In 105m	104.9147	4.800E+01	second	4.80E+01	2.2403E+09	4.4638E-10			
In 106	105.9135	6.200E+00	minute	3.72E+02	2.8634E+08	3.4923E-09			
In 106m	105.9135	5.200E+00	minute	3.12E+02	3.4141E+08	2.9291E-09			
In 107	106.9103	3.240E+01	minute	1.94E+03	5.4283E+07	1.8422E-08			
In 107m	106.9103	5.040E+01	second	5.04E+01	2.0938E+09	4.7761E-10			
In 108	107.9097	5.800E+01	minute	3.48E+03	3.0043E+07	3.3286E-08			
In 108m	107.9097	3.960E+01	minute	2.38E+03	4.4002E+07	2.2726E-08			
In 109	108.9072	4.200E+00	hour	1.51E+04	6.8512E+06	1.4596E-07			
In 109m	108.9072	1.340E+00	minute	8.04E+01	1.2884E+09	7.7613E-10			
In 110	109.9072	4.900E+00	hour	1.76E+04	5.8190E+06	1.7185E-07			
In 110m	109.9072	1.152E+00	hour	4.15E+03	2.4751E+07	4.0402E-08			
In 111	110.9051	2.805E+00	day	2.42E+05	4.1975E+05	2.3824E-06	0.002604		
In 111m	110.9051	7.700E+00	minute	4.62E+02	2.2018E+08	4.5417E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
In 112	111.9055	1.497E+01	minute	8.98E+02	1.1224E+08	8.9094E-09			
In 112m	111.9055	2.056E+01	minute	1.23E+03	8.1724E+07	1.2236E-08			
In 113m	112.9041	1.658E+00	hour	5.97E+03	1.6739E+07	5.9741E-08	0.002310		
In 114	113.9049	1.198E+00	minute	7.19E+01	1.3779E+09	7.2573E-10			
In 114m	113.9049	4.951E+01	day	4.28E+06	2.3154E+04	4.3189E-05	0.001400		
In 115	114.9039	4.410E+14	year	1.39E+22	7.0548E-12	1.4175E+11			1.076E-04
In 115m	114.9039	4.486E+00	hour	1.61E+04	6.0797E+06	1.6448E-07			1.025E-04
In 116	115.9053	1.410E+01	second	1.41E+01	6.9033E+09	1.4486E-10			1.361E-10
In 116m	115.9053	5.441E+01	minute	3.26E+03	2.9816E+07	3.3540E-08			6.037E-10
In 116m2	115.9053	2.180E+00	second	2.18E+00	4.4650E+10	2.2397E-11			
In 117	116.9045	4.320E+01	minute	2.59E+03	3.7231E+07	2.6859E-08			6.435E-05
In 117m	116.9045	1.162E+02	minute	6.97E+03	1.3842E+07	7.2246E-08			8.300E-05
In 118	117.9064	5.000E+00	second	5.00E+00	1.9137E+10	5.2255E-11			1.093E-04
In 118m	117.9064	4.450E+00	minute	2.67E+02	3.5837E+08	2.7904E-09			6.414E-08
In 118m2	117.9064	8.500E+00	second	8.50E+00	1.1257E+10	8.8834E-11			
In 119	118.9058	2.400E+00	minute	1.44E+02	6.5889E+08	1.5177E-09			5.095E-05
In 119m	118.9058	1.800E+01	minute	1.08E+03	8.7852E+07	1.1383E-08			7.438E-05
In 120	119.9080	3.080E+00	second	3.08E+00	3.0548E+10	3.2736E-11			1.196E-04
In 120m	119.9080	4.620E+01	second	4.62E+01	2.0365E+09	4.9104E-10			1.409E-06
In 120m2	119.9080	4.730E+01	second	4.73E+01	1.9891E+09	5.0273E-10			
In 121	120.9078	2.310E+01	second	2.31E+01	4.0393E+09	2.4757E-10			6.412E-05
In 121m	120.9078	3.880E+00	minute	2.33E+02	4.0081E+08	2.4949E-09			6.623E-05
In 122	121.9103	1.500E+00	second	1.50E+00	6.1694E+10	1.6209E-11			1.387E-04
In 122m	121.9103	1.030E+01	second	1.03E+01	8.9846E+09	1.1130E-10			1.371E-05
In 122m2	121.9103	1.080E+01	second	1.08E+01	8.5687E+09	1.1670E-10			
In 123	122.9104	5.980E+00	second	5.98E+00	1.5349E+10	6.5150E-11			1.141E-04
In 123m	122.9104	4.780E+01	second	4.78E+01	1.9203E+09	5.2076E-10			6.653E-06
In 124	123.9132	3.170E+00	second	3.17E+00	2.8721E+10	3.4818E-11			1.874E-04
In 124m	123.9132	2.400E+00	second	2.40E+00	3.7936E+10	2.6360E-11			6.014E-05
In 125	124.9136	2.360E+00	second	2.36E+00	3.8270E+10	2.6130E-11			1.845E-04
In 125m	124.9136	1.220E+01	second	1.22E+01	7.4030E+09	1.3508E-10			2.190E-05
In 126	125.9165	1.600E+00	second	1.60E+00	5.5998E+10	1.7858E-11			2.026E-04
In 126m	125.9165	1.640E+00	second	1.64E+00	5.4632E+10	1.8304E-11			1.834E-04
In 127	126.9173	1.090E+00	second	1.09E+00	8.1551E+10	1.2262E-11			4.610E-04
In 127m	126.9173	3.670E+00	second	3.67E+00	2.4221E+10	4.1287E-11			1.557E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
In 128	127.9202	8.400E-01	second	8.40E-01	1.0499E+11	9.5245E-12			2.217E-04
In 128m	127.9202	7.200E-01	second	7.20E-01	1.2249E+11	8.1639E-12			6.647E-04
In 129	128.9217	6.100E-01	second	6.10E-01	1.4346E+11	6.9707E-12			7.674E-04
In 129m	128.9217	1.230E+00	second	1.23E+00	7.1145E+10	1.4056E-11			1.725E-04
In 130	129.9249	2.600E-01	second	2.60E-01	3.3397E+11	2.9943E-12			9.487E-04
In 130m	129.9249	5.500E-01	second	5.50E-01	1.5788E+11	6.3340E-12			
In 130m2	129.9249	5.500E-01	second	5.50E-01	1.5788E+11	6.3340E-12			
In 131	130.9268	2.820E-01	second	2.82E-01	3.0556E+11	3.2727E-12			1.785E-04
In 131m	130.9268	3.500E+01	second	3.50E+01	2.4620E+09	4.0618E-10			4.110E-05
In 131m2	130.9268	3.200E-01	second	3.20E-01	2.6928E+11	3.7137E-12			
In 132	131.9329	2.010E-01	second	2.01E-01	4.2543E+11	2.3506E-12			6.747E-05
In 133	132.9383	1.800E-01	second	1.80E-01	4.7147E+11	2.1210E-12			3.987E-07
Sn 103	102.9281	7.000E+00	second	7.00E+00	1.5658E+10	6.3864E-11			
Sn 104	103.9232	2.080E+01	second	2.08E+01	5.2192E+09	1.9160E-10			
Sn 105	104.9214	3.100E+01	second	3.10E+01	3.4686E+09	2.8830E-10			
Sn 106	105.9169	1.150E+02	second	1.15E+02	9.2622E+08	1.0797E-09			
Sn 107	106.9157	2.900E+00	minute	1.74E+02	6.0644E+08	1.6490E-09			
Sn 108	107.9120	1.030E+01	minute	6.18E+02	1.6917E+08	5.9113E-09			
Sn 109	108.9113	1.800E+01	minute	1.08E+03	9.5914E+07	1.0426E-08			
Sn 110	109.9079	4.110E+00	hour	1.48E+04	6.9375E+06	1.4414E-07			
Sn 111	110.9077	3.530E+01	minute	2.12E+03	4.8027E+07	2.0821E-08			
Sn 113	112.9052	1.151E+02	day	9.94E+06	1.0049E+04	9.9515E-05	0.002480		
Sn 113m	112.9052	2.140E+01	minute	1.28E+03	7.7821E+07	1.2850E-08			
Sn 117m	116.9030	1.360E+01	day	1.18E+06	8.2129E+04	1.2176E-05	0.001890		
Sn 119m	118.9033	2.931E+02	day	2.53E+07	3.7467E+03	2.6690E-04	0.000532		
Sn 121	120.9042	1.128E+00	day	9.74E+04	9.5787E+05	1.0440E-06			1.280E-04
Sn 121m	120.9042	5.500E+01	year	1.74E+09	5.3760E+01	1.8601E-02	0.000243		7.107E-06
Sn 123	122.9057	1.292E+02	day	1.12E+07	8.2230E+03	1.2161E-04	0.003140		3.059E-05
Sn 123m	122.9057	4.006E+01	minute	2.40E+03	3.8189E+07	2.6185E-08			1.282E-04
Sn 125	124.9078	9.640E+00	day	8.33E+05	1.0844E+05	9.2215E-06	0.006656		8.197E-05
Sn 125m	124.9078	9.520E+00	minute	5.71E+02	1.5812E+08	6.3241E-09			2.116E-04
Sn 126	125.9077	1.000E+05	year	3.16E+12	2.8393E-02	3.5220E+01	0.001080		5.493E-04
Sn 127	126.9104	2.100E+00	hour	7.56E+03	1.1759E+07	8.5044E-08			4.780E-04
Sn 127m	126.9104	4.130E+00	minute	2.48E+02	3.5874E+08	2.7875E-09			7.094E-04
Sn 128	127.9105	5.907E+01	minute	3.54E+03	2.4886E+07	4.0184E-08			3.350E-03

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Sn 128m	127.9105	6.500E+00	second	6.50E+00	1.3569E+10	7.3696E-11			
Sn 129	128.9134	2.230E+00	minute	1.34E+02	6.5407E+08	1.5289E-09			2.479E-03
Sn 129m	128.9134	6.900E+00	minute	4.14E+02	2.1139E+08	4.7307E-09			4.063E-03
Sn 130	129.9139	3.720E+00	minute	2.23E+02	3.8907E+08	2.5702E-09			4.089E-03
Sn 130m	129.9139	1.700E+00	minute	1.02E+02	8.5137E+08	1.1746E-09			7.390E-03
Sn 131	130.9169	5.600E+01	second	5.60E+01	1.5388E+09	6.4984E-10			2.706E-03
Sn 131m	130.9169	5.840E+01	second	5.84E+01	1.4756E+09	6.7769E-10			6.125E-03
Sn 132	131.9177	3.970E+01	second	3.97E+01	2.1542E+09	4.6421E-10			5.774E-03
Sn 133	132.9238	1.440E+00	second	1.44E+00	5.8940E+10	1.6966E-11			1.459E-03
Sn 134	133.9285	1.040E+00	second	1.04E+00	8.0997E+10	1.2346E-11			1.124E-04
Sb 108	107.9222	7.000E+00	second	7.00E+00	1.4934E+10	6.6963E-11			
Sb 109	108.9181	1.700E+01	second	1.70E+01	6.0929E+09	1.6412E-10			
Sb 111	110.9132	7.500E+01	second	7.50E+01	1.3562E+09	7.3734E-10			
Sb 112	111.9124	5.140E+01	second	5.14E+01	1.9613E+09	5.0988E-10			
Sb 113	112.9094	6.670E+00	minute	4.00E+02	2.4967E+08	4.0053E-09			
Sb 114	113.9091	3.490E+00	minute	2.09E+02	4.7298E+08	2.1143E-09			
Sb 115	114.9066	3.210E+01	minute	1.93E+03	5.0977E+07	1.9617E-08			
Sb 116	115.9068	1.580E+01	minute	9.48E+02	1.0267E+08	9.7396E-09			
Sb 116m	115.9068	6.030E+01	minute	3.62E+03	2.6903E+07	3.7171E-08			
Sb 117	116.9048	2.800E+00	hour	1.01E+04	9.5738E+06	1.0445E-07			
Sb 118	117.9055	3.600E+00	minute	2.16E+02	4.4298E+08	2.2574E-09			
Sb 118m	117.9055	5.000E+00	hour	1.80E+04	5.3158E+06	1.8812E-07			
Sb 119	118.9039	1.591E+00	day	1.37E+05	6.9015E+05	1.4490E-06			
Sb 120	119.9051	1.589E+01	minute	9.53E+02	9.8688E+07	1.0133E-08			3.752E-13
Sb 120m	119.9051	5.760E+00	day	4.98E+05	1.8906E+05	5.2893E-06			5.326E-13
Sb 122	121.9052	2.700E+00	day	2.33E+05	3.9671E+05	2.5207E-06			2.909E-10
Sb 122m	121.9052	4.210E+00	minute	2.53E+02	3.6637E+08	2.7295E-09			1.546E-10
Sb 124	123.9059	6.020E+01	day	5.20E+06	1.7505E+04	5.7125E-05	0.013290		1.061E-07
Sb 124m	123.9059	1.550E+00	minute	9.30E+01	9.7904E+08	1.0214E-09			9.068E-08
Sb 124m2	123.9059	2.020E+01	minute	1.21E+03	7.5125E+07	1.3311E-08			
Sb 125	124.9052	2.758E+00	year	8.70E+07	1.0377E+03	9.6371E-04	0.003370		2.938E-04
Sb 126	125.9072	1.246E+01	day	1.08E+06	8.3233E+04	1.2015E-05	0.018390		7.807E-05
Sb 126m	125.9072	1.915E+01	minute	1.15E+03	7.7984E+07	1.2823E-08	0.012920		5.509E-04
Sb 127	126.9069	3.850E+00	day	3.33E+05	2.6725E+05	3.7418E-06			1.246E-03
Sb 128	127.9092	9.010E+00	hour	3.24E+04	2.7192E+06	3.6775E-07			1.896E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Sb 128m	127.9092	1.040E+01	minute	6.24E+02	1.4135E+08	7.0747E-09			3.461E-03
Sb 129	128.9092	4.400E+00	hour	1.58E+04	5.5251E+06	1.8099E-07			7.128E-03
Sb 129m	128.9092	1.770E+01	minute	1.06E+03	8.2408E+07	1.2135E-08			3.238E-04
Sb 130	129.9115	3.950E+01	minute	2.37E+03	3.6642E+07	2.7291E-08			7.432E-03
Sb 130m	129.9115	6.300E+00	minute	3.78E+02	2.2974E+08	4.3527E-09			9.853E-03
Sb 131	130.9119	2.303E+01	minute	1.38E+03	6.2367E+07	1.6034E-08			2.581E-02
Sb 132	131.9144	2.790E+00	minute	1.67E+02	5.1089E+08	1.9574E-09			1.852E-02
Sb 132m	131.9144	4.100E+00	minute	2.46E+02	3.4766E+08	2.8764E-09			9.393E-03
Sb 133	132.9152	2.500E+00	minute	1.50E+02	5.6586E+08	1.7672E-09			2.373E-02
Sb 134	133.9206	7.800E-01	second	7.80E-01	1.0800E+11	9.2590E-12			1.438E-03
Sb 134m	133.9206	1.022E+01	second	1.02E+01	8.2429E+09	1.2132E-10			5.656E-03
Sb 135	134.9252	1.710E+00	second	1.71E+00	4.8898E+10	2.0451E-11			1.463E-03
Sb 136	135.9307	8.200E-01	second	8.20E-01	1.0122E+11	9.8800E-12			1.577E-04
Te 107	106.9157	3.100E-03	second	3.10E-03	3.4039E+13	2.9378E-14			
Te 108	107.9120	2.100E+00	second	2.10E+00	4.9784E+10	2.0087E-11			
Te 109	108.9275	4.600E+00	second	4.60E+00	2.2515E+10	4.4414E-11			
Te 110	109.9224	1.860E+01	second	1.86E+01	5.5179E+09	1.8123E-10			
Te 111	110.9211	1.930E+01	second	1.93E+01	5.2699E+09	1.8976E-10			
Te 112	111.9171	2.000E+00	minute	1.20E+02	8.4004E+08	1.1904E-09			
Te 113	112.9159	1.700E+00	minute	1.02E+02	9.7954E+08	1.0209E-09			
Te 114	113.9121	1.520E+01	minute	9.12E+02	1.0860E+08	9.2085E-09			
Te 115	114.9116	5.800E+00	minute	3.48E+02	2.8212E+08	3.5446E-09			
Te 115m	114.9116	6.700E+00	minute	4.02E+02	2.4422E+08	4.0946E-09			
Te 116	115.9084	2.490E+00	hour	8.96E+03	1.0858E+07	9.2096E-08			
Te 117	116.9086	1.033E+00	hour	3.72E+03	2.5942E+07	3.8548E-08			
Te 118	117.9058	6.000E+00	day	5.18E+05	1.8458E+05	5.4178E-06			
Te 119	118.9064	1.603E+01	hour	5.77E+04	1.6441E+06	6.0823E-07			
Te 119m	118.9064	4.700E+00	day	4.06E+05	2.3365E+05	4.2800E-06			
Te 121	120.9049	1.678E+01	day	1.45E+06	6.4362E+04	1.5537E-05			
Te 121m	120.9049	1.540E+02	day	1.33E+07	7.0129E+03	1.4259E-04			
Te 123	122.9043	1.300E+13	year	4.10E+20	2.2374E-10	4.4694E+09			1.350E-12
Te 123m	122.9043	1.197E+02	day	1.03E+07	8.8757E+03	1.1267E-04	0.001482		1.034E-12
Te 125m	124.9044	5.740E+01	day	4.96E+06	1.8213E+04	5.4907E-05	0.000869		6.404E-05
Te 127	126.9052	9.350E+00	hour	3.37E+04	2.6411E+06	3.7863E-07	0.001360		1.242E-03
Te 127m	126.9052	1.090E+02	day	9.42E+06	9.4397E+03	1.0594E-04	0.000552		1.733E-04

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Te 128	127.9045	8.000E+24	year	2.52E+32	3.4937E-22	2.8623E+21			3.528E-03
Te 129	128.9066	6.960E+01	minute	4.18E+03	2.0958E+07	4.7715E-08	0.003580		6.926E-03
Te 129m	128.9066	3.360E+01	day	2.90E+06	3.0147E+04	3.3170E-05	0.001800		7.199E-04
Te 130	129.9062	2.700E+21	year	8.52E+28	1.0192E-18	9.8114E+17			1.785E-02
Te 131	130.9085	2.500E+01	minute	1.50E+03	5.7454E+07	1.7405E-08			2.483E-02
Te 131m	130.9085	3.000E+01	hour	1.08E+05	7.9797E+05	1.2532E-06			5.110E-03
Te 132	131.9085	3.204E+00	day	2.77E+05	3.0896E+05	3.2367E-06			4.283E-02
Te 133	132.9109	1.250E+01	minute	7.50E+02	1.1318E+08	8.8358E-09			3.663E-02
Te 133m	132.9109	5.540E+01	minute	3.32E+03	2.5536E+07	3.9160E-08			3.359E-02
Te 134	133.9115	4.180E+01	minute	2.51E+03	3.3592E+07	2.9769E-08			6.912E-02
Te 135	134.9165	1.900E+01	second	1.90E+01	4.4011E+09	2.2722E-10			3.243E-02
Te 136	135.9201	1.750E+01	second	1.75E+01	4.7430E+09	2.1084E-10			1.533E-02
Te 137	136.9253	2.490E+00	second	2.49E+00	3.3090E+10	3.0221E-11			4.256E-03
Te 138	137.9224	1.400E+00	second	1.40E+00	5.8427E+10				6.746E-04
I 108	107.9433	5.000E-02	second	5.00E-02	2.0903E+12	4.7840E-13			
I 109	108.9382	1.100E-04	second	1.10E-04	9.4146E+14				
I 110	109.9352	6.500E-01	second	6.50E-01	1.5788E+11	6.3339E-12			
I 111	110.9303	2.500E+00	second	2.50E+00	4.0681E+10	2.4582E-11			
I 112	111.9280	3.420E+00	second	3.42E+00	2.9472E+10	3.3930E-11			
I 113	112.9236	6.600E+00	second	6.60E+00	1.5137E+10	6.6062E-11			
I 114	113.9219	2.100E+00	second	2.10E+00	4.7157E+10	2.1206E-11			
I 115	114.9179	1.300E+00	minute	7.80E+01	1.2586E+09	7.9452E-10			
I 116	115.9167	2.910E+00	second	2.91E+00	3.3445E+10	2.9899E-11			
I 117	116.9136	2.220E+00	minute	1.33E+02	7.2445E+08	1.3804E-09			
I 118	117.9134	1.370E+01	minute	8.22E+02	1.1640E+08	8.5913E-09			
I 118m	117.9134	8.500E+00	minute	5.10E+02	1.8760E+08	5.3304E-09			
I 119	118.9102	1.910E+01	minute	1.15E+03	8.2789E+07	1.2079E-08			
I 120	119.9100	1.350E+00	hour	4.86E+03	1.9359E+07	5.1655E-08			
I 120m	119.9100	5.300E+01	minute	3.18E+03	2.9587E+07	3.3799E-08			
I 121	120.9074	2.120E+00	hour	7.63E+03	1.2226E+07	8.1793E-08			
I 122	121.9076	3.630E+00	minute	2.18E+02	4.2490E+08	2.3535E-09			3.497E-21
I 123	122.9056	1.327E+01	hour	4.78E+04	1.9215E+06	5.2044E-07	0.001188		9.017E-19
I 124	123.9062	4.180E+00	day	3.61E+05	2.5211E+05	3.9665E-06			1.187E-17
I 125	124.9046	5.941E+01	day	5.13E+06	1.7597E+04	5.6828E-05	0.000357		6.090E-16
I 126	125.9056	1.311E+01	day	1.13E+06	7.9107E+04	1.2641E-05			2.809E-12

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/gram	Grams/Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
I 128	127.9058	2.499E+01	minute	1.50E+03	5.8826E+07	1.6999E-08			1.070E-08
I 129	128.9050	1.570E+07	year	4.95E+14	1.7664E-04	5.6612E+03	0.000477		7.178E-03
I 130	129.9067	1.236E+01	hour	4.45E+04	1.9517E+06	5.1236E-07			2.061E-06
I 130m	129.9067	9.000E+00	minute	5.40E+02	1.6082E+08	6.2180E-09	0.003400		6.492E-07
I 131	130.9061	8.021E+00	day	6.93E+05	1.2436E+05	8.0410E-06			2.884E-02
I 132	131.9080	2.295E+00	hour	8.26E+03	1.0352E+07	9.6601E-08			4.299E-02
I 132m	131.9080	1.387E+00	hour	4.99E+03	1.7129E+07	5.8381E-08			7.103E-05
I 133	132.9078	2.080E+01	hour	7.49E+04	1.1336E+06	8.8214E-07			6.699E-02
I 133m	132.9078	9.000E+00	second	9.00E+00	9.4316E+09	1.0603E-10			3.845E-03
I 134	133.9099	5.260E+01	minute	3.16E+03	2.6695E+07	3.7460E-08			7.736E-02
I 134m	133.9099	3.690E+00	minute	2.21E+02	3.8053E+08	2.6279E-09			3.531E-03
I 135	134.9101	6.570E+00	hour	2.37E+04	3.5356E+06	2.8284E-07			6.290E-02
I 136	135.9147	8.340E+01	second	8.34E+01	9.9528E+08	1.0047E-09			2.472E-02
I 136m	135.9147	4.690E+01	second	4.69E+01	1.7699E+09	5.6502E-10			2.250E-02
I 137	136.9179	2.450E+01	second	2.45E+01	3.3632E+09	2.9734E-10			3.222E-02
I 138	137.9224	6.490E+00	second	6.49E+00	1.2604E+10	7.9342E-11			1.593E-02
I 139	138.9261	2.290E+00	second	2.29E+00	3.5462E+10	2.8200E-11			9.814E-03
I 140	139.9312	8.600E-01	second	8.60E-01	9.3748E+10	1.0667E-11			2.178E-03
I 141	140.9348	4.300E-01	second	4.30E-01	1.8616E+11	5.3717E-12			1.455E-04
I 142	141.9402	2.000E-01	second	2.00E-01	3.9741E+11	2.5163E-12			6.090E-05
Xe 111	110.9211	7.400E-01	second	7.40E-01	1.3745E+11	7.2756E-12			
Xe 112	111.9357	2.700E+00	second	2.70E+00	3.7329E+10	2.6789E-11			
Xe 113	112.9334	2.740E+00	second	2.74E+00	3.6459E+10	2.7428E-11			
Xe 114	113.9282	1.000E+01	second	1.00E+01	9.9025E+09	1.0098E-10			
Xe 115	114.9265	1.800E+01	second	1.80E+01	5.4536E+09	1.8336E-10			
Xe 116	115.9217	5.600E+01	second	5.60E+01	1.7379E+09	5.7541E-10			
Xe 117	116.9206	6.100E+01	second	6.10E+01	1.5818E+09	6.3219E-10			
Xe 118	117.9166	6.000E+00	minute	3.60E+02	2.6577E+08	3.7627E-09			
Xe 119	118.9156	5.800E+00	minute	3.48E+02	2.7262E+08	3.6681E-09			
Xe 120	119.9122	4.000E+01	minute	2.40E+03	3.9201E+07	2.5509E-08			
Xe 121	120.9114	4.010E+01	minute	2.41E+03	3.8781E+07	2.5786E-08			
Xe 122	121.9085	2.010E+01	hour	7.24E+04	1.2789E+06	7.8191E-07			
Xe 123	122.9085	2.080E+00	hour	7.49E+03	1.2258E+07	8.1578E-08			
Xe 125	124.9064	1.690E+01	hour	6.08E+04	1.4846E+06	6.7359E-07			
Xe 125m	124.9064	5.700E+01	second	5.70E+01	1.5846E+09	6.3108E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Xe 127	126.9052	3.640E+01	day	3.14E+06	2.8267E+04	3.5377E-05			
Xe 127m	126.9052	6.920E+01	second	6.92E+01	1.2847E+09	7.7841E-10			1.805E-17
Xe 129m	128.9048	8.880E+00	day	7.67E+05	1.1407E+05	8.7664E-06			3.477E-12
Xe 131m	130.9051	1.184E+01	day	1.02E+06	8.4247E+04	1.1870E-05			3.173E-04
Xe 132m	131.9042	8.390E-03	second	8.39E-03	1.0194E+13	9.8094E-14			
Xe 133	132.9059	5.243E+00	day	4.53E+05	1.8739E+05	5.3366E-06	0.001080		6.702E-02
Xe 133m	132.9059	2.190E+00	day	1.89E+05	4.4862E+05	2.2291E-06			1.949E-03
Xe 134m	133.9099	2.900E-01	second	2.90E-01	2.9051E+11	3.4422E-12			6.564E-04
Xe 135	134.9072	9.140E+00	hour	3.29E+04	2.5415E+06	3.9347E-07			6.532E-02
Xe 135m	134.9072	1.529E+01	minute	9.17E+02	9.1155E+07	1.0970E-08			1.213E-02
Xe 136	135.9072	9.300E+19	year	2.93E+27	2.8284E-17	3.5356E+16			6.306E-02
Xe 137	136.9116	3.818E+00	minute	2.29E+02	3.5971E+08	2.7800E-09			6.111E-02
Xe 138	137.9140	1.408E+01	minute	8.45E+02	9.6831E+07	1.0327E-08			6.373E-02
Xe 139	138.9188	3.968E+01	second	3.97E+01	2.0467E+09	4.8860E-10			5.141E-02
Xe 140	139.9216	1.360E+01	second	1.36E+01	5.9286E+09	1.6867E-10			3.768E-02
Xe 141	140.9266	1.730E+00	second	1.73E+00	4.6274E+10	2.1610E-11			1.319E-02
Xe 142	141.9297	1.220E+00	second	1.22E+00	6.5154E+10	1.5348E-11			4.454E-03
Xe 143	142.9349	3.000E-01	second	3.00E-01	2.6310E+11	3.8009E-12			1.555E-04
Xe143m	142.9349	9.600E-01	second	9.60E-01	8.2218E+10	1.2163E-11			4.668E-04
Xe 144	143.9382	1.150E+00	second	1.15E+00	6.8156E+10	1.4672E-11			6.257E-05
Xe 145	144.9437	9.000E-01	second	9.00E-01	8.6484E+10	1.1563E-11			7.918E-07
Cs 114	113.9414	5.700E-01	second	5.70E-01	1.7371E+11	5.7568E-12			
Cs 115	114.9359	1.400E+00	second	1.40E+00	7.0112E+10	1.4263E-11			
Cs116	115.9329	3.840E+00	second	3.84E+00	2.5342E+10	3.9460E-11			
Cs 116m	115.9329	7.000E-01	second	7.00E-01	1.3902E+11	7.1933E-12			
Cs 117	116.9286	8.400E+00	second	8.40E+00	1.1486E+10	8.7061E-11			
Cs 117m	116.9286	6.500E+00	second	6.50E+00	1.4844E+10	6.7369E-11			
Cs 118	117.9266	1.400E+01	second	1.40E+01	6.8334E+09	1.4634E-10			
Cs 118m	117.9266	1.700E+01	second	1.70E+01	5.6275E+09	1.7770E-10			
Cs 119	118.9224	4.300E+01	second	4.30E+01	2.2062E+09	4.5327E-10			
Cs 119m	118.9224	3.040E+01	second	3.04E+01	3.1206E+09	3.2045E-10			
Cs 120	119.9207	6.400E+01	second	6.40E+01	1.4699E+09	6.8030E-10			
Cs 120m	119.9207	5.700E+01	second	5.70E+01	1.6505E+09	6.0589E-10			
Cs 121	120.9172	1.280E+02	second	1.28E+02	7.2892E+08	1.3719E-09			
Cs121m	120.9172	1.220E+02	second	1.22E+02	7.6477E+08	1.3076E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Cs 122	121.9161	2.100E+01	second	2.10E+01	4.4065E+09	2.2694E-10			
Cs 122m	121.9161	4.500E+00	minute	2.70E+02	3.4273E+08	2.9178E-09			
Cs 122m2	121.9161	3.600E-01	second	3.60E-01	2.5705E+11	3.8903E-12			
Cs 123	122.9130	5.940E+00	minute	3.56E+02	2.5754E+08	3.8829E-09			
Cs 123m	122.9130	1.640E+00	second	1.64E+00	5.5967E+10	1.7868E-11			
Cs 124	123.9122	3.080E+01	second	3.08E+01	2.9560E+09	3.3829E-10			
Cs 124m	123.9122	6.300E+00	second	6.30E+00	1.4452E+10	6.9196E-11			
Cs 125	124.9097	4.500E+01	minute	2.70E+03	3.3452E+07	2.9894E-08			
Cs 126	125.9094	1.640E+00	minute	9.84E+01	9.1059E+08	1.0982E-09			
Cs 127	126.9074	6.250E+00	hour	2.25E+04	3.9510E+06	2.5310E-07			
Cs 128	127.9077	3.660E+00	minute	2.20E+02	4.0165E+08	2.4897E-09			
Cs 129	128.9061	3.206E+01	hour	1.15E+05	7.5829E+05	1.3188E-06			
Cs 130	129.9067	2.921E+01	minute	1.75E+03	4.9552E+07	2.0181E-08			
Cs 130m	129.9067	3.460E+00	minute	2.08E+02	4.1833E+08	2.3905E-09			
Cs 131	130.9055	9.689E+00	day	8.37E+05	1.0295E+05	9.7135E-06			
Cs 132	131.9064	6.479E+00	day	5.60E+05	1.5279E+05	6.5450E-06			7.408E-10
Cs 134	133.9067	2.062E+00	year	6.51E+07	1.2947E+03	7.7238E-04	0.010190		1.270E-07
Cs 134m	133.9067	2.910E+00	hour	1.05E+04	8.0423E+06	1.2434E-07			5.387E-08
Cs 135	134.9060	2.300E+06	year	7.26E+13	1.1521E-03	8.6796E+02	0.000330		6.534E-02
Cs 135m	134.9060	5.300E+01	minute	3.18E+03	2.6298E+07	3.8026E-08			7.899E-06
Cs 136	135.9072	1.316E+01	day	1.14E+06	7.3007E+04	1.3697E-05			5.472E-05
Cs 136m	135.9072	1.900E+01	second	1.90E+01	4.3690E+09	2.2889E-10			1.637E-05
Cs 137	136.9071	3.007E+01	year	9.49E+08	8.6836E+01	1.1516E-02	0.001010		6.269E-02
Cs 138	137.9110	3.341E+01	minute	2.00E+03	4.0808E+07	2.4505E-08			6.646E-02
Cs 138m	137.9110	2.910E+00	minute	1.75E+02	4.6853E+08	2.1344E-09			1.874E-03
Cs 139	138.9134	9.270E+00	minute	5.56E+02	1.4602E+08	6.8485E-09			6.282E-02
Cs 140	139.9173	6.370E+01	second	6.37E+01	1.2658E+09	7.9001E-10			5.745E-02
Cs 141	140.9200	2.494E+01	second	2.49E+01	3.2100E+09	3.1152E-10			4.424E-02
Cs 142	141.9243	1.700E+00	second	1.70E+00	4.6760E+10	2.1386E-11			2.677E-02
Cs 143	142.9273	1.780E+00	second	1.78E+00	4.4345E+10	2.2551E-11			1.481E-02
Cs 144	143.9320	1.010E+00	second	1.01E+00	7.7606E+10	1.2886E-11			3.558E-03
Cs 145	144.9354	5.940E-01	second	5.94E-01	1.3104E+11	7.6311E-12			5.782E-04
Cs 146	145.9402	3.210E-01	second	3.21E-01	2.4082E+11	4.1524E-12			1.684E-04
Cs 147	146.9439	2.250E-01	second	2.25E-01	3.4123E+11	2.9306E-12			5.546E-07
Cs 148	147.9489	1.580E-01	second	1.58E-01	4.8262E+11	2.0720E-12			7.719E-08

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ba 117	116.9286	1.750E+00	second	1.75E+00	5.5134E+10	1.8138E-11			
Ba 119	118.9311	5.400E+00	second	5.40E+00	1.7567E+10	5.6926E-11			
Ba120	119.9260	3.200E+01	second	3.20E+01	2.9398E+09	3.4016E-10			
Ba 121	120.9245	2.970E+01	second	2.97E+01	3.1413E+09	3.1834E-10			
Ba122	121.9203	1.950E+00	minute	1.17E+02	7.9089E+08	1.2644E-09			
Ba 123	122.9185	2.700E+00	minute	1.62E+02	5.6656E+08	1.7650E-09			
Ba 124	123.9151	1.190E+01	minute	7.14E+02	1.2751E+08	7.8423E-09			
Ba 125	124.9146	3.500E+00	minute	2.10E+02	4.3007E+08	2.3252E-09			
Ba 125m	124.9146	8.000E+00	minute	4.80E+02	1.8816E+08	5.3147E-09			
Ba 126	125.9112	1.000E+02	minute	6.00E+03	1.4933E+07	6.6964E-08			
Ba 127	126.9111	1.270E+01	minute	7.62E+02	1.1666E+08	8.5719E-09			
Ba 127m	126.9111	1.900E+00	second	1.90E+00	4.6787E+10	2.1374E-11			
Ba 128	127.9083	2.430E+00	day	2.10E+05	4.2010E+05	2.3804E-06			
Ba 129	128.9087	2.230E+00	hour	8.03E+03	1.0902E+07	9.1730E-08			
Ba 129m	128.9087	2.170E+00	hour	7.81E+03	1.1203E+07	8.9262E-08			
Ba 130m	129.9063	1.100E-02	second	1.10E-02	7.8950E+12	1.2666E-13			
Ba 131	130.9069	1.150E+01	day	9.94E+05	8.6737E+04	1.1529E-05			
Ba 131m	130.9069	1.460E+01	minute	8.76E+02	9.8381E+07	1.0165E-08			
Ba 133	132.9060	1.052E+01	year	3.32E+08	2.5568E+02	3.9111E-03	0.002722		5.018E-13
Ba 133m	132.9060	3.890E+01	hour	1.40E+05	6.0615E+05	1.6498E-06			3.844E-13
Ba 135m	134.9057	2.870E+01	hour	1.03E+05	8.0940E+05	1.2355E-06			7.282E-09
Ba 136m	135.9046	3.084E-01	second	3.08E-01	2.6917E+11	3.7151E-12			8.837E-06
Ba 137m	136.9058	2.552E+00	minute	1.53E+02	5.3817E+08	1.8581E-09	0.003940		5.937E-02
Ba 139	138.9088	8.306E+01	minute	4.98E+03	1.6297E+07	6.1362E-08			6.311E-02
Ba 140	139.9106	1.275E+01	day	1.10E+06	7.3187E+04	1.3664E-05			6.119E-02
Ba 141	140.9144	1.827E+01	minute	1.10E+03	7.3035E+07	1.3692E-08			5.938E-02
Ba 142	141.9164	1.060E+01	minute	6.36E+02	1.2499E+08	8.0004E-09			5.586E-02
Ba 143	142.9206	1.433E+01	second	1.43E+01	5.5085E+09	1.8154E-10			5.276E-02
Ba 144	143.9229	1.150E+01	second	1.15E+01	6.8163E+09	1.4671E-10			4.160E-02
Ba 145	144.9269	4.310E+00	second	4.31E+00	1.8061E+10	5.5367E-11			2.011E-02
Ba 146	145.9301	2.220E+00	second	2.22E+00	3.4824E+10	2.8716E-11			7.400E-03
Ba 147	146.9340	8.930E-01	second	8.93E-01	8.5981E+10	1.1630E-11			1.327E-03
Ba 148	147.9377	6.070E-01	second	6.07E-01	1.2563E+11	7.9596E-12			1.753E-04
Ba 149	148.9425	3.440E-01	second	3.44E-01	2.2019E+11	4.5415E-12			1.121E-05
Ba 150	149.9456	3.000E-01	second	3.00E-01	2.5080E+11	3.9873E-12			5.498E-07

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
La 120	119.9381	2.800E+00	second	2.80E+00	3.3594E+10	2.9767E-11			
La 121	120.9330	5.300E+00	second	5.30E+00	1.7602E+10	5.6813E-11			
La 122	121.9307	8.700E+00	second	8.70E+00	1.0635E+10	9.4028E-11			
La 123	122.9262	1.700E+01	second	1.70E+01	5.3986E+09	1.8523E-10			
La 124	123.9245	2.900E+01	second	2.90E+01	3.1392E+09	3.1855E-10			
La 125	124.9207	7.600E+01	second	7.60E+01	1.1883E+09	8.4153E-10			
La 126	125.9194	5.400E+01	second	5.40E+01	1.6592E+09	6.0271E-10			
La 127	126.9162	3.800E+00	minute	2.28E+02	3.8987E+08	2.5649E-09			
La 128	127.9154	5.000E+00	minute	3.00E+02	2.9399E+08	3.4015E-09			
La 129	128.9127	1.160E+01	minute	6.96E+02	1.2574E+08	7.9530E-09			
La 129m	128.9127	5.600E-01	second	5.60E-01	1.5628E+11	6.3989E-12			
La 130	129.9123	8.700E+00	minute	5.22E+02	1.6636E+08	6.0110E-09			
La 131	130.9101	5.900E+01	minute	3.54E+03	2.4344E+07	4.1077E-08			
La 132	131.9101	4.800E+00	hour	1.73E+04	4.9494E+06	2.0204E-07			
La 132m	131.9101	2.430E+01	minute	1.46E+03	5.8660E+07	1.7047E-08			
La 133	132.9084	3.912E+00	hour	1.41E+04	6.0273E+06	1.6591E-07			
La 134	133.9085	6.450E+00	minute	3.87E+02	2.1770E+08	4.5935E-09			
La 135	134.9070	1.950E+01	hour	7.02E+04	1.1913E+06	8.3945E-07			
La 136	135.9077	9.870E+00	minute	5.92E+02	1.4017E+08	7.1340E-09			
La 136m	135.9077	1.140E-01	second	1.14E-01	7.2816E+11	1.3733E-12			
La 137	136.9065	6.000E+04	year	1.89E+12	4.3520E-02	2.2978E+01			1.080E-07
La 138	137.9071	1.050E+11	year	3.31E+18	2.4688E-08	4.0506E+07			6.312E-02
La 140	139.9095	1.678E+00	day	1.45E+05	5.5616E+05	1.7981E-06			6.120E-02
La 141	140.9110	3.920E+00	hour	1.41E+04	5.6734E+06	1.7626E-07			5.954E-02
La 142	141.9141	9.110E+01	minute	5.47E+03	1.4544E+07	6.8757E-08			5.670E-02
La 143	142.9161	1.420E+01	minute	8.52E+02	9.2652E+07	1.0793E-08			5.684E-02
La 144	143.9196	4.080E+01	second	4.08E+01	1.9213E+09	5.2048E-10			5.218E-02
La 145	144.9216	2.480E+01	second	2.48E+01	3.1390E+09	3.1857E-10			3.575E-02
La 146	145.9257	6.270E+00	second	6.27E+00	1.2330E+10	8.1100E-11			1.074E-02
La 146m	145.9257	1.000E+01	second	1.00E+01	7.7312E+09	1.2935E-10			1.165E-02
La 147	146.9278	4.015E+00	second	4.02E+00	1.9124E+10	5.2289E-11			1.130E-02
La 148	147.9322	1.428E+00	second	1.43E+00	5.3405E+10	1.8725E-11			3.803E-03
La 149	148.9344	1.050E+00	second	1.05E+00	7.2143E+10	1.3861E-11			8.424E-04
La 150	149.9386	8.600E-01	second	8.60E-01	8.7491E+10	1.1430E-11			1.205E-04
Ce 123	122.9355	3.200E+00	second	3.20E+00	2.8678E+10	3.4870E-11			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ce 124	123.9305	6.000E+00	second	6.00E+00	1.5172E+10	6.5910E-11			
Ce 125	124.9285	9.000E+00	second	9.00E+00	1.0034E+10	9.9662E-11			
Ce 126	125.9241	5.000E+01	second	5.00E+01	1.7918E+09	5.5809E-10			
Ce 127	126.9228	3.200E+01	second	3.20E+01	2.7777E+09	3.6001E-10			
Ce 128	127.9189	3.000E+00	minutes	1.80E+02	4.8997E+08	2.0409E-09			
Ce 129	128.9181	3.500E+00	minute	2.10E+02	4.1672E+08	2.3997E-09			
Ce 130	129.9147	2.500E+01	minute	1.50E+03	5.7893E+07	1.7273E-08			
Ce 131	130.9144	1.020E+01	minute	6.12E+02	1.4081E+08	7.1017E-09			
Ce 131m	130.9144	5.000E+00	minute	3.00E+02	2.8726E+08	3.4812E-09			
Ce 132	131.9115	3.510E+00	hour	1.26E+04	6.7684E+06	1.4775E-07			
Ce 132m	131.9115	1.300E-02	second	1.30E-02	6.5789E+12	1.5200E-13			
Ce 133	132.9116	4.900E+00	hour	1.76E+04	4.8119E+06	2.0782E-07			
Ce 133m	132.9116	9.700E+01	minute	5.82E+03	1.4584E+07	6.8566E-08			
Ce 134	133.9090	7.590E+01	hour	2.73E+05	3.0833E+05	3.2432E-06			
Ce 135	134.9091	1.770E+01	hour	6.37E+04	1.3124E+06	7.6197E-07			
Ce 135m	134.9091	2.000E+01	second	2.00E+01	4.1812E+09	2.3916E-10			
Ce 137	136.9078	9.000E+00	hour	3.24E+04	2.5433E+06	3.9318E-07			
Ce 137m	136.9078	3.440E+01	hour	1.24E+05	6.6541E+05	1.5028E-06			
Ce 138m	137.9060	8.650E-03	second	8.65E-03	9.4575E+12	1.0574E-13			
Ce 139	138.9066	1.376E+02	day	1.19E+07	6.8296E+03	1.4642E-04			6.727E-11
Ce 139m	138.9066	5.480E+01	second	5.48E+01	1.4821E+09	6.7473E-10			4.956E-11
Ce 141	140.9083	3.250E+01	day	2.81E+06	2.8512E+04	3.5073E-05	0.001470		5.954E-02
Ce 142	141.9092	5.000E+16	year	1.58E+24	5.0383E-14	1.9848E+13			5.670E-02
Ce 143	142.9124	3.304E+01	hour	1.19E+05	6.6371E+05	1.5067E-06			5.689E-02
Ce 144	143.9136	2.849E+02	day	2.46E+07	3.1848E+03	3.1399E-04	0.000658		5.258E-02
Ce 145	144.9172	3.010E+00	minute	1.81E+02	4.3106E+08	2.3199E-09			3.742E-02
Ce 146	145.9187	1.352E+01	minute	8.11E+02	9.5310E+07	1.0492E-08			2.896E-02
Ce 147	146.9225	5.640E+01	second	5.64E+01	1.3615E+09	7.3450E-10			2.049E-02
Ce 148	147.9244	5.600E+01	second	5.60E+01	1.3619E+09	7.3426E-10			1.524E-02
Ce 149	148.9283	5.300E+00	second	5.30E+00	1.4293E+10	6.9964E-11			7.434E-03
Ce 150	149.9302	4.000E+00	second	4.00E+00	1.8812E+10	5.3158E-11			3.265E-03
Ce 151	150.9340	1.020E+00	second	1.02E+00	7.3281E+10	1.3646E-11			8.218E-04
Pr 121	120.9554	1.400E+00	second	1.40E+00	6.6623E+10	1.5010E-11			
Pr 126	125.9353	3.100E+00	second	3.10E+00	2.8898E+10	3.4605E-11			
Pr 127	126.9308	4.900E+00	second	4.90E+00	1.8139E+10	5.5130E-11			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pr 128	127.9288	3.100E+00	second	3.10E+00	2.8448E+10	3.5152E-11			
Pr 129	128.9249	2.400E+01	second	2.40E+01	3.6461E+09	2.7427E-10			
Pr 130	129.9234	4.000E+01	second	4.00E+01	2.1708E+09	4.6065E-10			
Pr 131	130.9201	1.530E+00	minute	9.18E+01	9.3870E+08	1.0653E-09			
Pr 131m	130.9201	5.700E+00	second	5.70E+00	1.5118E+10	6.6146E-11			
Pr 132	131.9191	1.600E+00	minute	9.60E+01	8.9084E+08	1.1225E-09			
Pr 133	132.9162	6.500E+00	minute	3.90E+02	2.1764E+08	4.5948E-09			
Pr 134	133.9157	1.700E+01	minute	1.02E+03	8.2593E+07	1.2108E-08			
Pr 134m	133.9157	1.100E+01	minute	6.60E+02	1.2764E+08	7.8343E-09			
Pr 135	134.9131	2.400E+01	minute	1.44E+03	5.8071E+07	1.7220E-08			
Pr 136	135.9126	1.310E+01	minute	7.86E+02	1.0561E+08	9.4690E-09			
Pr 137	136.9107	1.280E+00	hour	4.61E+03	1.7882E+07	5.5921E-08			
Pr 138	137.9107	1.450E+00	minute	8.70E+01	9.4028E+08	1.0635E-09			
Pr 138m	137.9107	2.120E+00	hour	7.63E+03	1.0719E+07	9.3295E-08			
Pr 139	138.9089	4.410E+00	hour	1.59E+04	5.1157E+06	1.9548E-07			
Pr 140	139.9091	3.390E+00	minute	2.03E+02	3.9644E+08	2.5224E-09			
Pr 142	141.9100	1.912E+01	hour	6.88E+04	1.1550E+06	8.6582E-07			3.538E-10
Pr 142m	141.9100	1.460E+01	minute	8.76E+02	9.0753E+07	1.1019E-08			2.589E-10
Pr 143	142.9108	1.357E+01	day	1.17E+06	6.7331E+04	1.4852E-05	0.001870		5.689E-02
Pr 144	143.9133	1.728E+01	minute	1.04E+03	7.5610E+07	1.3226E-08	0.007338		5.258E-02
Pr 144m	143.9133	7.200E+00	minute	4.32E+02	1.8146E+08	5.5107E-09	0.000340		7.944E-04
Pr 145	144.9145	5.984E+00	hour	2.15E+04	3.6139E+06	2.7671E-07			3.743E-02
Pr 146	145.9176	2.415E+01	minute	1.45E+03	5.3358E+07	1.8741E-08			2.903E-02
Pr 147	146.9190	1.340E+01	minute	8.04E+02	9.5509E+07	1.0470E-08			2.096E-02
Pr 148	147.9222	2.270E+00	minute	1.36E+02	5.5997E+08	1.7858E-09			1.578E-02
Pr 148m	147.9222	2.000E+00	minute	1.20E+02	6.3557E+08	1.5734E-09			9.093E-04
Pr 149	148.9238	2.260E+00	minute	1.36E+02	5.5867E+08	1.7900E-09			1.013E-02
Pr 150	149.9270	6.190E+00	second	6.19E+00	1.2156E+10	8.2261E-11			6.334E-03
Pr 151	150.9282	1.890E+01	second	1.89E+01	3.9550E+09	2.5285E-10			3.125E-03
Pr 152	151.9316	3.240E+00	second	3.24E+00	2.2918E+10	4.3633E-11			1.326E-03
Pr 153	152.9337	4.300E+00	second	4.30E+00	1.7156E+10	5.8290E-11			4.431E-04
Pr 154	153.9374	2.300E+00	second	2.30E+00	3.1864E+10	3.1383E-11			6.061E-05
Nd 127	126.9405	1.800E+00	second	1.80E+00	4.9375E+10	2.0253E-11			
Nd 128	127.9354	4.000E+00	second	4.00E+00	2.2046E+10	4.5360E-11			
Nd 129	128.9249	4.900E+00	second	4.90E+00	1.7858E+10	5.5996E-11			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Nd 130	129.9288	2.800E+01	second	2.80E+01	3.1011E+09	3.2247E-10			
Nd 131	130.9201	2.700E+01	second	2.70E+01	3.1916E+09	3.1332E-10			
Nd 132	131.9231	1.750E+00	minute	1.05E+02	8.1445E+08	1.2278E-09			
Nd 133	132.9222	7.000E+01	second	7.00E+01	1.2125E+09	8.2474E-10			
Nd 133m	132.9222	7.000E+01	second	7.00E+01	1.2125E+09	8.2474E-10			
Nd 134	133.9186	8.500E+00	minute	5.10E+02	1.6518E+08	6.0539E-09			
Nd 135	134.9182	1.240E+01	minute	7.44E+02	1.1239E+08	8.8975E-09			
Nd 135m	134.9182	5.500E+00	minute	3.30E+02	2.5339E+08	3.9465E-09			
Nd 136	135.9150	5.065E+01	minute	3.04E+03	2.7314E+07	3.6612E-08			
Nd 137	136.9146	3.850E+01	minute	2.31E+03	3.5671E+07	2.8034E-08			
Nd 137m	136.9146	1.600E+00	second	1.60E+00	5.1500E+10	1.9418E-11			
Nd 138	137.9119	5.040E+00	hour	1.81E+04	4.5086E+06	2.2180E-07			
Nd 139	138.9119	2.970E+01	minute	1.78E+03	4.5575E+07	2.1942E-08			
Nd 139m	138.9119	5.500E+00	hour	1.98E+04	4.1018E+06	2.4380E-07			
Nd 140	139.9093	3.370E+00	day	2.91E+05	2.7694E+05	3.6109E-06			
Nd 141	140.9096	2.490E+00	hour	8.96E+03	8.9317E+06	1.1196E-07			1.480E-17
Nd 141m	140.9096	6.200E+01	second	6.20E+01	1.2914E+09	7.7438E-10			
Nd 144	143.9101	2.290E+15	year	7.23E+22	1.0848E-12	9.2186E+11			5.258E-02
Nd 147	146.9161	1.098E+01	day	9.49E+05	8.0945E+04	1.2354E-05			2.096E-02
Nd 149	148.9201	1.728E+00	hour	6.22E+03	1.2178E+07	8.2115E-08			1.026E-02
Nd 150	149.9209	1.100E+19	year	3.47E+26	2.1677E-16	4.6131E+15			6.841E-03
Nd 151	150.9238	1.244E+01	minute	7.46E+02	1.0015E+08	9.9851E-09			4.060E-03
Nd 152	151.9247	1.140E+01	minute	6.84E+02	1.0857E+08	9.2110E-09			2.733E-03
Nd 153	152.9277	2.890E+01	second	2.89E+01	2.5527E+09	3.9175E-10			1.579E-03
Nd 154	153.9295	2.590E+01	second	2.59E+01	2.8298E+09	3.5338E-10			5.637E-04
Nd 155	154.9327	8.900E+00	second	8.90E+00	8.1817E+09	1.2222E-10			2.824E-04
Nd 156	155.9441	5.470E+00	second	5.47E+00	1.3226E+10	7.5610E-11			5.770E-05
Pm 130	129.9405	2.200E+00	second	2.20E+00	3.9465E+10	2.5339E-11			
Pm 132	131.9338	6.300E+00	second	6.30E+00	1.3573E+10	7.3675E-11			
Pm 133	132.9297	1.500E+01	second	1.50E+01	5.6580E+09	1.7674E-10			
Pm 134	133.9285	2.400E+01	second	2.40E+01	3.5099E+09	2.8491E-10			
Pm 135	134.9246	4.900E+01	second	4.90E+01	1.7064E+09	5.8602E-10			
Pm 136	135.9234	1.070E+02	second	1.07E+02	7.7571E+08	1.2891E-09			
Pm 136m	135.9234	4.700E+01	second	4.70E+01	1.7660E+09	5.6626E-10			
Pm 137	136.9207	2.400E+00	minute	1.44E+02	5.7220E+08	1.7477E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pm 138	137.9194	1.000E+01	second	1.00E+01	8.1800E+09	1.2225E-10			
Pm 138m	137.9194	3.240E+00	minute	1.94E+02	4.2078E+08	2.3765E-09			
Pm 138m2	137.9194	3.240E+00	minute	1.94E+02	4.2078E+08	2.3765E-09			
Pm 139	138.9168	4.150E+00	minute	2.49E+02	3.2615E+08	3.0660E-09			
Pm 139m	138.9168	1.800E-01	second	1.80E-01	4.5118E+11	2.2164E-12			
Pm 140	139.9158	9.200E+00	second	9.20E+00	8.7644E+09	1.1410E-10			
Pm 140m	139.9158	5.950E+00	minute	3.57E+02	2.2586E+08	4.4275E-09			
Pm 141	140.9136	2.090E+01	minute	1.25E+03	6.3845E+07	1.5663E-08			
Pm 142	141.9130	4.050E+01	second	4.05E+01	1.9629E+09	5.0945E-10			
Pm 143	142.9109	2.650E+02	day	2.29E+07	3.4479E+03	2.9003E-04			
Pm 144	143.9126	3.630E+02	day	3.14E+07	2.4995E+03	4.0008E-04			1.236E-16
Pm 145	144.9127	1.770E+01	year	5.59E+08	1.3937E+02	7.1750E-03			1.889E-14
Pm 146	145.9147	5.530E+00	year	1.75E+08	4.4303E+02	2.2572E-03	0.005020		2.579E-12
Pm 147	146.9151	2.623E+00	year	8.28E+07	9.2753E+02	1.0781E-03	0.000370		2.096E-02
Pm 148	147.9175	5.370E+00	day	4.64E+05	1.6439E+05	6.0832E-06	0.007691		3.312E-09
Pm 148m	147.9175	4.129E+01	day	3.57E+06	2.1380E+04	4.6774E-05	0.012780		8.022E-09
Pm 149	148.9183	5.308E+01	hour	1.91E+05	3.9646E+05	2.5223E-06			1.026E-02
Pm 150	149.9210	2.680E+00	hour	9.65E+03	7.7997E+06	1.2821E-07			2.529E-06
Pm 151	150.9212	2.840E+01	hour	1.02E+05	7.3115E+05	1.3677E-06			4.076E-03
Pm 152	151.9235	4.120E+00	minute	2.47E+02	3.0040E+08	3.3289E-09			5.207E-03
Pm 152m	151.9235	7.520E+00	minute	4.51E+02	1.6458E+08	6.0760E-09			
Pm 152m2	151.9235	1.380E+01	minute	8.28E+02	8.9685E+07	1.1150E-08			
Pm 153	152.9241	5.400E+00	minute	3.24E+02	2.2770E+08	4.3918E-09			1.749E-03
Pm 154	153.9265	1.730E+00	minute	1.04E+02	7.0610E+08	1.4162E-09			5.790E-04
Pm 154m	153.9265	2.680E+00	minute	1.61E+02	4.5580E+08	2.1939E-09			1.553E-04
Pm 155	154.9281	4.150E+01	second	4.15E+01	1.7547E+09	5.6990E-10			5.310E-04
Pm 156	155.9311	2.670E+01	second	2.67E+01	2.7098E+09	3.6903E-10			1.603E-04
Pm 157	156.9332	1.056E+01	second	1.06E+01	6.8077E+09	1.4689E-10			7.149E-05
Pm 158	157.9367	4.800E+00	second	4.80E+00	1.4882E+10	6.7197E-11			2.325E-05
Sm 131	130.9358	1.200E+00	second	1.20E+00	7.1802E+10	1.3927E-11			
Sm 132	131.9408	4.000E+00	second	4.00E+00	2.1377E+10	4.6780E-11			
Sm 133	132.9387	3.700E+00	second	3.70E+00	2.2936E+10	4.3599E-11			
Sm 134	133.9285	1.200E+01	second	1.20E+01	7.0198E+09	1.4246E-10			
Sm 135	134.9324	1.000E+01	second	1.00E+01	8.3610E+09	1.1960E-10			
Sm 136	135.9283	4.700E+01	second	4.70E+01	1.7659E+09	5.6628E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Sm 137	136.9270	4.500E+01	second	4.50E+01	1.8309E+09	5.4617E-10			
Sm 138	137.9235	3.100E+00	minute	1.86E+02	4.3977E+08	2.2739E-09			
Sm 139	138.9223	2.570E+00	minute	1.54E+02	5.2665E+08	1.8988E-09			
Sm 139m	138.9223	1.070E+01	second	1.07E+01	7.5896E+09	1.3176E-10			
Sm 140	139.9190	1.482E+01	minute	8.89E+02	9.0678E+07	1.1028E-08			
Sm 141	140.9185	1.020E+01	minute	6.12E+02	1.3081E+08	7.6444E-09			
Sm 141m	140.9185	2.260E+01	minute	1.36E+03	5.9040E+07	1.6938E-08			
Sm 142	141.9152	7.249E+01	minute	4.35E+03	1.8278E+07	5.4712E-08			
Sm 143	142.9146	8.830E+00	minute	5.30E+02	1.4900E+08	6.7114E-09			
Sm 143m	142.9146	1.100E+00	minute	6.60E+01	1.1961E+09	8.3607E-10			
Sm 143m2	142.9146	3.000E-02	second	3.00E-02	2.6313E+12	3.8003E-13			
Sm 145	144.9134	3.400E+02	day	2.94E+07	2.6502E+03	3.7733E-04			
Sm 146	145.9130	1.030E+08	year	3.25E+15	2.3786E-05	4.2041E+04			9.542E-13
Sm 147	146.9149	1.060E+11	year	3.35E+18	2.2956E-08	4.3562E+07			2.096E-02
Sm 148	147.9148	7.000E+15	year	2.21E+23	3.4526E-13	2.8963E+12			1.097E-08
Sm 149	148.9172	2.000E+15	year	6.31E+22	1.2003E-12	8.3313E+11		1.392E-13	1.608E-02
Sm 151	150.9199	9.000E+01	year	2.84E+09	2.6319E+01	3.7995E-02	0.000741	5.126E-10	8.006E-03
Sm 153	152.9221	4.627E+01	hour	1.67E+05	4.4290E+05	2.2579E-06		2.513E-07	4.109E-03
Sm 155	154.9246	2.230E+01	minute	1.34E+03	5.4425E+07	1.8374E-08		7.889E-06	1.327E-03
Sm 156	155.9255	9.400E+00	hour	3.38E+04	2.1381E+06	4.6770E-07		2.135E-05	6.748E-04
Sm 157	156.9284	4.820E+02	second	4.82E+02	1.4915E+08	6.7046E-09		4.447E-05	3.869E-04
Sm 158	157.9300	5.300E+00	minute	3.18E+02	2.2464E+08	4.4516E-09		6.452E-05	1.722E-04
Sm 159	158.9332	1.137E+01	second	1.14E+01	6.2431E+09	1.6018E-10		4.787E-05	7.863E-05
Sm 160	159.9351	9.600E+00	second	9.60E+00	7.3479E+09	1.3609E-10		2.533E-05	2.971E-05
Eu 136	135.9390	3.300E+00	second	3.30E+00	2.5149E+10	3.9763E-11			
Eu 136m	135.9390	3.700E+00	second	3.70E+00	2.2430E+10	4.4583E-11			
Eu 137	136.9352	1.100E+01	second	1.10E+01	7.4898E+09	1.3352E-10			
Eu 138	137.9335	1.210E+01	second	1.21E+01	6.7596E+09	1.4794E-10			
Eu 139	138.9298	1.790E+01	second	1.79E+01	4.5366E+09	2.2043E-10			
Eu 140	139.9281	1.510E+00	second	1.51E+00	5.3394E+10	1.8729E-11			
Eu 140m	139.9281	1.250E-01	second	1.25E-01	6.4500E+11	1.5504E-12			
Eu 141	140.9249	4.000E+01	second	4.00E+01	2.0014E+09	4.9966E-10			
Eu 141m	140.9249	2.700E+00	second	2.70E+00	2.9650E+10	3.3727E-11			
Eu 142	141.9234	2.340E+00	second	2.34E+00	3.3971E+10	2.9437E-11			
Eu 142m	141.9234	1.220E+00	minute	7.32E+01	1.0860E+09	9.2085E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curles/ gram	Grams/ Curle	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Eu 143	142.9203	2.630E+00	minute	1.58E+02	5.0024E+08	1.9991E-09			
Eu 144	143.9188	1.020E+01	second	1.02E+01	7.6853E+09	1.3012E-10			
Eu 145	144.9163	5.930E+00	day	5.12E+05	1.5195E+05	6.5813E-06			
Eu 146	145.9172	4.590E+00	day	3.97E+05	1.9496E+05	5.1293E-06			
Eu 147	146.9167	2.410E+01	day	2.08E+06	3.6879E+04	2.7116E-05			
Eu 148	147.9182	5.450E+01	day	4.71E+06	1.6197E+04	6.1738E-05			
Eu 149	148.9179	9.310E+01	day	8.04E+06	9.4182E+03	1.0618E-04			
Eu 150	149.9197	3.690E+01	year	1.16E+09	6.4621E+01	1.5475E-02		1.273E-17	1.273E-17
Eu 150m	149.9197	1.280E+01	hour	4.61E+04	1.6331E+06	6.1234E-07		1.994E-18	1.994E-18
Eu 152	151.9217	1.354E+01	year	4.27E+08	1.7376E+02	5.7550E-03	0.007646	2.650E-09	5.506E-09
Eu 152m	151.9217	9.274E+00	hour	3.34E+04	2.2243E+06	4.4959E-07		2.604E-10	2.604E-10
Eu 152m2	151.9217	9.600E+01	minute	5.76E+03	1.2892E+07	7.7565E-08		2.857E-09	2.857E-09
Eu 154	153.9230	8.593E+00	year	2.71E+08	2.7028E+02	3.6999E-03	0.009081	1.657E-10	3.444E-10
Eu 154m	153.9230	4.630E+01	minute	2.78E+03	2.6384E+07	3.7902E-08		1.787E-10	1.787E-10
Eu 155	154.9229	4.761E+00	year	1.50E+08	4.8466E+02	2.0633E-03	0.000759	5.927E-09	1.327E-03
Eu 156	155.9248	1.519E+01	day	1.31E+06	5.5130E+04	1.8139E-05		3.224E-08	6.748E-04
Eu 157	156.9254	1.518E+01	hour	5.46E+04	1.3156E+06	7.6014E-07		2.483E-07	3.872E-04
Eu 158	157.9278	4.590E+01	minute	2.75E+03	2.5939E+07	3.8552E-08		7.949E-07	1.730E-04
Eu 159	158.9291	1.810E+01	minute	1.09E+03	6.5365E+07	1.5299E-08		2.263E-06	8.089E-05
Eu 160	159.9320	3.800E+01	second	3.80E+01	1.8563E+09	5.3869E-10		2.483E-06	3.219E-05
Eu 161	160.9337	2.600E+01	second	2.60E+01	2.6962E+09	3.7089E-10		3.044E-06	1.256E-05
Eu 162	161.9370	1.060E+01	second	1.06E+01	6.5724E+09	1.5215E-10		1.762E-06	4.411E-06
Gd 137	136.9447	7.000E+00	second	7.00E+00	1.1769E+10	8.4970E-11			
Gd 139	138.9381	4.900E+00	second	4.90E+00	1.6571E+10	6.0345E-11			
Gd 140	139.9339	1.580E+01	second	1.58E+01	5.1027E+09	1.9598E-10			
Gd 141	140.9322	1.400E+01	second	1.40E+01	5.7179E+09	1.7489E-10			
Gd 141m	140.9322	2.450E+01	second	2.45E+01	3.2674E+09	3.0606E-10			
Gd 142	141.9282	7.020E+01	second	7.02E+01	1.1323E+09	8.8314E-10			
Gd 143	142.9267	3.900E+01	second	3.90E+01	2.0239E+09	4.9408E-10			
Gd 143m	142.9267	1.120E+02	second	1.12E+02	7.0477E+08	1.4189E-09			
Gd 144	143.9228	4.500E+00	minute	2.70E+02	2.9032E+08	3.4444E-09			
Gd 145	144.9217	2.300E+01	minute	1.38E+03	5.6411E+07	1.7727E-08			
Gd 145m	144.9217	8.500E+01	second	8.50E+01	9.1585E+08	1.0919E-09			
Gd 146	145.9183	4.827E+01	day	4.17E+06	1.8539E+04	5.3942E-05			
Gd 147	146.9191	3.806E+01	hour	1.37E+05	5.6044E+05	1.7843E-06			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Gd 148	147.9181	7.460E+01	year	2.35E+09	3.2397E+01	3.0867E-02			
Gd 149	148.9193	9.280E+00	day	8.02E+05	9.4485E+04	1.0584E-05			
Gd 150	149.9187	1.790E+06	year	5.65E+13	1.3321E-03	7.5067E+02			
Gd 151	150.9203	1.240E+02	day	1.07E+07	6.9774E+03	1.4332E-04		2.013E-21	2.013E-21
Gd 152	151.9198	1.080E+14	year	3.41E+21	2.1788E-11	4.5896E+10		5.226E-13	1.685E-09
Gd 153	152.9217	2.416E+02	day	2.09E+07	3.5342E+03	2.8295E-04	0.000838	1.415E-16	1.415E-16
Gd 155m	154.9226	3.197E-02	second	3.20E-02	2.2778E+12	4.3902E-13			
Gd 159	158.9264	1.848E+01	hour	6.65E+04	1.0671E+06	9.3713E-07		1.922E-08	8.091E-05
Gd 161	160.9297	3.660E+00	minute	2.20E+02	3.1923E+08	3.1325E-09		2.363E-07	1.280E-05
Gd 162	161.9310	8.400E+00	minute	5.04E+02	1.3823E+08	7.2341E-09		5.136E-07	4.925E-06
Gd 163	162.9340	6.800E+01	second	6.80E+01	1.0183E+09	9.8207E-10		3.544E-07	1.203E-06
Gd 164	163.9359	4.500E+01	second	4.50E+01	1.5293E+09	6.5390E-10		2.433E-07	3.843E-07
Tb 140	139.9455	2.400E+00	second	2.40E+00	3.3590E+10	2.9771E-11			
Tb 141	140.9412	3.500E+00	second	3.50E+00	2.2870E+10	4.3725E-11			
Tb 142	141.9389	5.970E-01	second	5.97E-01	1.3314E+11	7.5110E-12			
Tb 142m	141.9389	3.030E-01	second	3.03E-01	2.6232E+11	3.8121E-12			
Tb 143	142.9348	1.200E+01	second	1.20E+01	6.5774E+09	1.5203E-10			
Tb 143m	142.9348	2.100E+01	second	2.10E+01	3.7585E+09	2.6606E-10			
Tb 144	143.9325	1.000E+00	second	1.00E+00	7.8382E+10	1.2758E-11			
Tb 144m	143.9325	4.250E+00	second	4.25E+00	1.8443E+10	5.4221E-11			
Tb 145m	144.9289	2.950E+01	second	2.95E+01	2.6388E+09	3.7897E-10			
Tb 146	145.9272	8.000E+00	second	8.00E+00	9.6639E+09	1.0348E-10			
Tb 146m	145.9272	2.410E+01	second	2.41E+01	3.2079E+09	3.1173E-10			
Tb 146m2	145.9272	1.180E-03	second	1.18E-03	6.5518E+13	1.5263E-14			
Tb 147	146.9240	1.700E+00	hour	6.12E+03	1.2547E+07	7.9702E-08			
Tb 147m	146.9240	1.830E+00	minute	1.10E+02	6.9933E+08	1.4299E-09			
Tb 148	147.9243	1.000E+00	hour	3.60E+03	2.1185E+07	4.7203E-08			
Tb 148m	147.9243	2.200E+00	minute	1.32E+02	5.7778E+08	1.7308E-09			
Tb 149	148.9232	4.118E+00	hour	1.48E+04	5.1101E+06	1.9569E-07			
Tb 149m	148.9232	4.160E+00	minute	2.50E+02	3.0351E+08	3.2948E-09			
Tb 150	149.9237	3.480E+00	hour	1.25E+04	6.0065E+06	1.6649E-07			
Tb 150m	149.9237	5.800E+00	minute	3.48E+02	2.1624E+08	4.6246E-09			
Tb 151	150.9231	1.761E+01	hour	6.34E+04	1.1792E+06	5.4333E+05			
Tb 151m	150.9231	2.500E+01	second	2.50E+01	2.9901E+09	1.5092E+02			
Tb 152	151.9241	1.750E+01	hour	6.30E+04	1.1787E+06	8.4838E-07			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Tb 152m	151.9241	4.200E+00	minute	2.52E+02	2.9468E+08	3.3935E-09			
Tb 153	152.9234	2.340E+00	day	2.02E+05	3.6490E+05	2.7405E-06			
Tb 154	153.9247	2.150E+01	hour	7.74E+04	9.4695E+05	1.0560E-06			
Tb 154m	153.9247	2.270E+01	hour	8.17E+04	8.9689E+05	1.1150E-06			
Tb 154m2	153.9247	9.400E+00	hour	3.38E+04	2.1659E+06	4.6170E-07			
Tb 155	154.9235	5.320E+00	day	4.60E+05	1.5843E+05	6.3120E-06			
Tb 156	155.9247	5.350E+00	day	4.62E+05	1.5653E+05	6.3886E-06			
Tb 156m	155.9247	2.440E+01	hour	8.78E+04	8.2370E+05	1.2140E-06			
Tb 156m2	155.9247	5.000E+00	hour	1.80E+04	4.0197E+06	2.4878E-07			
Tb 157	156.9240	7.100E+01	year	2.24E+09	3.2086E+01	3.1166E-02	0.000048	2.068E-15	2.068E-15
Tb 158	157.9254	1.800E+02	year	5.68E+09	1.2576E+01	7.9518E-02	0.005347	7.502E-14	8.240E-14
Tb 158m	157.9254	1.070E+01	second	1.07E+01	6.6764E+09	1.4978E-10		7.374E-15	7.374E-15
Tb 160	159.9272	7.230E+01	day	6.25E+06	1.1293E+04	8.8552E-05	0.008186	3.024E-11	3.024E-11
Tb 161	160.9276	6.880E+00	day	5.94E+05	1.1794E+05	8.4792E-06		3.524E-10	1.280E-05
Tb 162	161.9295	7.600E+00	minute	4.56E+02	1.5279E+08	6.5451E-09		1.814E-09	4.926E-06
Tb 163	162.9306	1.950E+01	minute	1.17E+03	5.9182E+07	1.6897E-08		5.046E-09	1.208E-06
Tb 163m	162.9306	6.500E+00	hour	2.34E+04	2.9591E+06	3.3794E-07			
Tb 163m2	162.9306	7.100E+00	minute	4.26E+02	1.6254E+08	6.1523E-09			
Tb 164	163.9333	3.000E+00	minute	1.80E+02	3.8233E+08	2.6156E-09		7.579E-09	3.919E-07
Tb 165	164.9349	2.110E+00	minute	1.27E+02	5.4029E+08	1.8508E-09		1.261E-08	1.500E-07
Dy 141	140.9512	9.000E-01	second	9.00E-01	8.8933E+10	1.1244E-11			
Dy 142	141.9463	2.300E+00	second	2.30E+00	3.4556E+10	2.8938E-11			
Dy 143	142.9438	4.100E+00	second	4.10E+00	1.9250E+10	5.1948E-11			
Dy 144	143.9391	9.100E+00	second	9.10E+00	8.6130E+09	1.1610E-10			
Dy 145	144.9370	1.000E+01	second	1.00E+01	7.7839E+09	1.2847E-10			
Dy 145m	144.9370	1.360E+01	second	1.36E+01	5.7235E+09	1.7472E-10			
Dy 146	145.9327	2.900E+01	second	2.90E+01	2.6658E+09	3.7512E-10			
Dy 146m	145.9327	1.500E-01	second	1.50E-01	5.1539E+11	1.9403E-12			
Dy 147	146.9309	4.000E+01	second	4.00E+01	1.9196E+09	5.2095E-10			
Dy 147m	146.9309	5.570E+01	second	5.57E+01	1.3785E+09	7.2542E-10			
Dy 148	147.9272	3.100E+00	minute	1.86E+02	4.1003E+08	2.4388E-09			
Dy 149	148.9273	4.200E+00	minute	2.52E+02	3.0061E+08	3.3266E-09			
Dy 149m	148.9273	4.900E-01	second	4.90E-01	1.5460E+11	6.4684E-12			
Dy 150	149.9256	7.170E+00	minute	4.30E+02	1.7492E+08	5.7170E-09			
Dy 151	150.9262	1.790E+01	minute	1.07E+03	6.9600E+07	1.4368E-08			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Dy 152	151.9247	2.380E+00	hour	8.57E+03	8.6670E+06	1.1538E-07			
Dy 153	152.9258	6.400E+00	hour	2.30E+04	3.2019E+06	3.1231E-07			
Dy 154	153.9244	3.000E+06	year	9.47E+13	7.7416E-04	1.2917E+03			
Dy 155	154.9257	9.900E+00	hour	3.56E+04	2.0432E+06	4.8942E-07			
Dy 157	156.9255	8.140E+00	hour	2.93E+04	2.4533E+06	4.0761E-07		3.303E-21	3.303E-21
Dy 157m	156.9255	2.160E-02	second	2.16E-02	3.3284E+12	3.0045E-13			
Dy 159	158.9257	1.444E+02	day	1.25E+07	5.6899E+03	1.7575E-04		3.859E-17	3.859E-17
Dy 165	164.9317	2.334E+00	hour	8.40E+03	8.1408E+06	1.2284E-07		2.520E-10	1.478E-07
Dy 165m	164.9317	1.257E+00	minute	7.54E+01	9.0696E+08	1.1026E-09		3.355E-11	1.095E-07
Dy 166	165.9328	8.160E+01	hour	2.94E+05	2.3145E+05	4.3206E-06		8.440E-10	5.384E-08
Dy 167	166.9356	6.200E+00	minute	3.72E+02	1.8167E+08	5.5045E-09		1.241E-09	1.596E-08
Dy 168	167.9372	8.700E+00	minute	5.22E+02	1.2869E+08	7.7704E-09		2.032E-09	6.803E-09
Dy 169	168.9403	3.900E+01	second	3.90E+01	1.7123E+09	5.8401E-10		1.191E-09	2.203E-09
Ho 144	143.9516	7.000E-01	second	7.00E-01	1.1196E+11	8.9318E-12			
Ho 145	144.9469	2.400E+00	second	2.40E+00	3.2431E+10	3.0835E-11			
Ho 146	145.9441	3.600E+00	second	3.60E+00	2.1473E+10	4.6571E-11			
Ho 147	146.9398	5.800E+00	second	5.80E+00	1.3238E+10	7.5542E-11			
Ho 148	147.9373	2.200E+00	second	2.20E+00	3.4664E+10	2.8849E-11			
Ho 148m	147.9373	9.300E+00	second	9.30E+00	8.2000E+09	1.2195E-10			
Ho 149	148.9338	2.110E+01	second	2.11E+01	3.5901E+09	2.7855E-10			
Ho 149m	148.9338	5.600E+01	second	5.60E+01	1.3527E+09	7.3927E-10			
Ho 150	149.9334	7.200E+01	second	7.20E+01	1.0451E+09	9.5687E-10			
Ho 150m	149.9334	2.600E+01	second	2.60E+01	2.8940E+09	3.4554E-10			
Ho 151	150.9317	3.520E+01	second	3.52E+01	2.1235E+09	4.7092E-10			
Ho 151m	150.9317	4.720E+01	second	4.72E+01	1.5836E+09	6.3146E-10			
Ho 152	151.9317	1.618E+02	second	1.62E+02	4.5893E+08	2.1790E-09			
Ho 152m	151.9317	5.000E+01	second	5.00E+01	1.4851E+09	6.7335E-10			
Ho 153	152.9302	2.020E+00	minute	1.21E+02	6.0867E+08	1.6429E-09			
Ho 153m	152.9302	9.300E+00	minute	5.58E+02	1.3221E+08	7.5640E-09			
Ho 154	153.9306	1.176E+01	minute	7.06E+02	1.0387E+08	9.6274E-09			
Ho 154m	153.9306	3.100E+00	minute	1.86E+02	3.9404E+08	2.5378E-09			
Ho 155	154.9291	4.800E+01	minute	2.88E+03	2.5284E+07	3.9550E-08			
Ho 156	155.9297	5.600E+01	minute	3.36E+03	2.1533E+07	4.6440E-08			
Ho 157	156.9282	1.260E+01	minute	7.56E+02	9.5094E+07	1.0516E-08			
Ho 158	157.9289	1.130E+01	minute	6.78E+02	1.0536E+08	9.4911E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Half-life	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ho 158m	157.9289	2.800E+01	minute	1.68E+03	4.2521E+07	2.3518E-08			
Ho 158m2	157.9289	2.130E+01	minute	1.28E+03	5.5896E+07	1.7890E-08			
Ho 159	158.9277	3.305E+01	minute	1.98E+03	3.5798E+07	2.7935E-08			
Ho 159m	158.9277	8.300E+00	second	8.30E+00	8.5526E+09	1.1692E-10			
Ho 160	159.9287	2.560E+01	minute	1.54E+03	4.5926E+07	2.1774E-08			
Ho 160m	159.9287	5.020E+00	hour	1.81E+04	3.9034E+06	2.5619E-07			
Ho 160m2	159.9287	3.000E+00	second	3.00E+00	2.3514E+10	4.2528E-11			
Ho 161	160.9279	2.480E+00	hour	8.93E+03	7.8522E+06	1.2735E-07			
Ho 161m	160.9279	6.760E+00	second	6.76E+00	1.0370E+10	9.6428E-11			
Ho 162	161.9291	1.500E+01	minute	9.00E+02	7.7412E+07	1.2918E-08			
Ho 162m	161.9291	6.700E+01	minute	4.02E+03	1.7331E+07	5.7700E-08			
Ho 163	162.9287	4.570E+03	year	1.44E+11	4.8012E-01	2.0828E+00			
Ho 163m	162.9287	1.090E+00	second	1.09E+00	6.3526E+10	1.5742E-11			
Ho 164	163.9302	2.900E+01	minute	1.74E+03	3.9552E+07	2.5283E-08			
Ho 164m	163.9302	3.750E+01	minute	2.25E+03	3.0587E+07	3.2694E-08			
Ho 166	165.9323	2.683E+01	hour	9.66E+04	7.0392E+05	1.4206E-06			
Ho 166m	165.9323	1.200E+03	year	3.79E+10	1.7953E+00	5.5700E-01			
Ho 167	166.9331	3.100E+00	hour	1.12E+04	6.0558E+06	1.6513E-07			
Ho 168	167.9355	2.990E+00	minute	1.79E+02	3.7447E+08	2.6705E-09			
Ho 168m	167.9355	1.320E+02	second	1.32E+02	5.0893E+08	1.9649E-09			
Ho 169	168.9369	4.700E+00	minute	2.82E+02	2.3681E+08	4.2228E-09			
Ho 170	169.9396	4.300E+01	second	4.30E+01	1.5439E+09	6.4772E-10			
Ho 170m	169.9396	2.800E+00	minute	1.68E+02	3.9516E+08	2.5306E-09			
Ho 171	170.9415	5.300E+01	second	5.30E+01	1.2452E+09	8.0306E-10			
Ho 172	171.9448	2.500E+01	second	2.50E+01	2.6245E+09	3.8102E-10			
Er 145	144.9575	9.000E-01	second	9.00E-01	8.6476E+10	1.1564E-11			
Er 147	146.9493	2.500E+00	second	2.50E+00	3.0709E+10	3.2563E-11			
Er 147m	146.9493	2.500E+00	second	2.50E+00	3.0709E+10	3.2563E-11			
Er 148	147.9444	4.600E+00	second	4.60E+00	1.6578E+10	6.0323E-11			
Er 149	148.9422	4.000E+00	second	4.00E+00	1.8936E+10	5.2808E-11			
Er 149m	148.9422	8.900E+00	second	8.90E+00	8.5108E+09	1.1750E-10			
Er 150	149.9378	1.850E+01	second	1.85E+01	4.0672E+09	2.4587E-10			
Er 151	150.9317	2.350E+01	second	2.35E+01	3.1807E+09	3.1439E-10			
Er 151m	150.9317	5.800E-01	second	5.80E-01	1.2887E+11	7.7595E-12			
Er 152	151.9351	1.030E+01	second	1.03E+01	7.2091E+09	1.3871E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Er 153	152.9351	3.710E+01	second	3.71E+01	1.9884E+09	5.0293E-10			
Er 154	153.9328	3.730E+00	minute	2.24E+02	3.2748E+08	3.0536E-09			
Er 155	154.9332	5.300E+00	minute	3.18E+02	2.2898E+08	4.3671E-09			
Er 156	155.9310	1.950E+01	minute	1.17E+03	6.1838E+07	1.6171E-08			
Er 157	156.9319	1.865E+01	minute	1.12E+03	6.4244E+07	1.5566E-08			
Er 157m	156.9319	7.600E-02	second	7.60E-02	9.4591E+11	1.0572E-12			
Er 158	157.9299	2.290E+00	hour	8.24E+03	8.6651E+06	1.1541E-07			
Er 159	158.9307	3.600E+01	minute	2.16E+03	3.2864E+07	3.0429E-08			
Er 160	159.9291	2.858E+01	hour	1.03E+05	6.8562E+05	1.4585E-06			
Er 161	160.9300	3.210E+00	hour	1.16E+04	6.0664E+06	1.6484E-07			
Er 163	162.9300	7.500E+01	minute	4.50E+03	1.5387E+07	6.4989E-08		1.468E-21	1.468E-21
Er 165	164.9307	1.036E+01	hour	3.73E+04	1.8341E+06	5.4524E-07		4.736E-18	4.736E-18
Er 167m	166.9320	2.269E+00	second	2.27E+00	2.9785E+10	3.3574E-11			
Er 169	168.9346	9.400E+00	day	8.12E+05	8.2227E+04	1.2161E-05		2.723E-13	2.246E-09
Er 171	170.9380	7.516E+00	hour	2.71E+04	2.4392E+06	4.0997E-07		2.193E-12	1.911E-10
Er 172	171.9394	4.930E+01	hour	1.77E+05	3.6970E+05	2.7049E-06		7.088E-12	9.978E-11
Er 173	172.9424	1.400E+00	minute	8.40E+01	7.7660E+08	1.2877E-09			
Er 174	173.9443	3.300E+00	minute	1.98E+02	3.2757E+08	3.0528E-09			
Tm 147	146.9611	5.600E-01	second	5.60E-01	1.3708E+11	7.2948E-12			
Tm 148	147.9576	7.000E-01	second	7.00E-01	1.0893E+11	9.1803E-12			
Tm 149	148.9527	9.000E-01	second	9.00E-01	8.4156E+10	1.1883E-11			
Tm 150	149.9497	2.200E+00	second	2.20E+00	3.4199E+10	2.9241E-11			
Tm 151	150.9454	5.200E+00	second	5.20E+00	1.4373E+10	6.9574E-11			
Tm 151m	150.9454	4.130E+00	second	4.13E+00	1.8097E+10	5.5258E-11			
Tm 152	151.9443	5.200E+00	second	5.20E+00	1.4279E+10	7.0034E-11			
Tm 152m	151.9443	8.000E+00	second	8.00E+00	9.2812E+09	1.0775E-10			
Tm 153	152.9420	1.480E+00	second	1.48E+00	4.9841E+10	2.0064E-11			
Tm 153m	152.9420	2.500E+00	second	2.50E+00	2.9506E+10	3.3891E-11			
Tm 154	153.9414	8.100E+00	second	8.10E+00	9.0477E+09	1.1053E-10			
Tm 154m	153.9414	3.300E+00	second	3.30E+00	2.2208E+10	4.5029E-11			
Tm 155	154.9392	2.160E+01	second	2.16E+01	3.3710E+09	2.9665E-10			
Tm 155m	154.9392	4.500E+01	second	4.50E+01	1.6181E+09	6.1801E-10			
Tm 156	155.9390	8.380E+01	second	8.38E+01	8.6333E+08	1.1583E-09			
Tm 156m	155.9390	1.900E+01	second	1.90E+01	3.8077E+09	2.6262E-10			
Tm 157	156.9368	3.630E+00	minute	2.18E+02	3.3006E+08	3.0297E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Tm 158	157.9370	3.980E+00	minute	2.39E+02	2.9913E+08	3.3430E-09			
Tm 159	158.9348	9.130E+00	minute	5.48E+02	1.2958E+08	7.7173E-09			
Tm 160	159.9351	9.400E+00	minute	5.64E+02	1.2507E+08	7.9955E-09			
Tm 160m	159.9351	7.450E+01	second	7.45E+01	9.4684E+08	1.0561E-09			
Tm 161	160.9334	3.020E+01	minute	1.81E+03	3.8688E+07	2.5848E-08			
Tm 162	161.9340	2.170E+01	minute	1.30E+03	5.3509E+07	1.8688E-08			
Tm 162	161.9340	1.280E+00	hour	4.61E+03	1.5119E+07	6.6141E-08			
Tm 162m	161.9340	2.430E+01	second	2.43E+01	2.8670E+09	3.4879E-10			
Tm 163	162.9326	1.810E+00	hour	6.52E+03	1.0626E+07	9.4105E-08			
Tm 164	163.9335	2.000E+00	minute	1.20E+02	5.7349E+08	1.7437E-09			
Tm 164m	163.9335	5.100E+00	minute	3.06E+02	2.2490E+08	4.4464E-09			
Tm 165	164.9324	3.006E+01	hour	1.08E+05	6.3209E+05	1.5821E-06			
Tm 166	165.9336	7.700E+00	hour	2.77E+04	2.4527E+06	4.0771E-07			
Tm 167	166.9328	9.250E+00	day	7.99E+05	8.4563E+04	1.1826E-05			
Tm 168	167.9342	9.310E+01	day	8.04E+06	8.3517E+03	1.1974E-04			
Tm 170	169.9358	1.286E+02	day	1.11E+07	5.9750E+03	1.6736E-04		2.182E-16	2.182E-16
Tm 171	170.9364	1.920E+00	year	6.06E+07	1.0892E+03	9.1807E-04		2.013E-15	1.911E-10
Tm 172	171.9384	6.360E+01	hour	2.29E+05	2.8658E+05	3.4894E-06		1.872E-14	9.980E-11
Tm 173	172.9396	8.240E+00	hour	2.97E+04	2.1991E+06	4.5472E-07			
Tm 174	173.9422	5.400E+00	minute	3.24E+02	2.0018E+08	4.9954E-09			
Tm 175	174.9438	1.520E+01	minute	9.12E+02	7.0710E+07	1.4142E-08			
Tm 176	175.9470	1.900E+00	minute	1.14E+02	5.6246E+08	1.7779E-09			
Tm 177	176.9490	8.500E+01	second	8.50E+01	7.5008E+08	1.3332E-09			
Yb 151	150.9552	1.600E+00	second	1.60E+00	4.6710E+10	2.1409E-11			
Yb 151m	150.9552	1.600E+00	second	1.60E+00	4.6710E+10	2.1409E-11			
Yb 152	151.9502	3.100E+00	second	3.10E+00	2.3950E+10	4.1753E-11			
Yb 153	152.9420	4.200E+00	second	4.20E+00	1.7563E+10	5.6938E-11			
Yb 154	153.9462	4.040E-01	second	4.04E-01	1.8140E+11	5.5128E-12			
Yb 155	154.9458	1.750E+00	second	1.75E+00	4.1606E+10	2.4035E-11			
Yb 156	155.9428	2.610E+01	second	2.61E+01	2.7719E+09	3.6077E-10			
Yb 157	156.9427	3.860E+01	second	3.86E+01	1.8623E+09	5.3697E-10			
Yb 158	157.9399	1.490E+00	minute	8.94E+01	7.9900E+08	1.2516E-09			
Yb 159	158.9402	1.580E+00	minute	9.48E+01	7.4875E+08	1.3356E-09			
Yb 160	159.9376	4.800E+00	minute	2.88E+02	2.4493E+08	4.0829E-09			
Yb 161	160.9379	4.200E+00	minute	2.52E+02	2.7817E+08	3.5949E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Yb 162	161.9358	1.887E+01	minute	1.13E+03	6.1533E+07	1.6251E-08			
Yb 163	162.9363	1.105E+01	minute	6.63E+02	1.0443E+08	9.5754E-09			
Yb 164	163.9345	7.580E+01	minute	4.55E+03	1.5132E+07	6.6087E-08			
Yb 165	164.9354	9.900E+00	minute	5.94E+02	1.1515E+08	8.6841E-09			
Yb 166	165.9339	5.670E+01	hour	2.04E+05	3.3309E+05	3.0022E-06			
Yb 167	166.9349	1.750E+01	minute	1.05E+03	6.4364E+07	1.5537E-08			
Yb 169	168.9352	3.203E+01	day	2.77E+06	2.4135E+04	4.1434E-05	0.002512	2.927E-22	2.927E-22
Yb 169m	168.9352	4.600E+01	second	4.60E+01	1.4518E+09	6.8881E-10			
Yb 175	174.9413	4.185E+00	day	3.62E+05	1.7835E+05	5.6069E-06			
Yb 176m	175.9426	1.140E+01	second	1.14E+01	5.6247E+09	1.7779E-10			
Yb 177	176.9453	1.911E+00	hour	6.88E+03	9.2678E+06	1.0790E-07			
Yb 177m	176.9453	6.410E+00	second	6.41E+00	9.9467E+09	1.0054E-10			
Yb 178	177.9466	7.400E+01	minute	4.44E+03	1.4279E+07	7.0032E-08			
Yb 179	178.9502	8.000E+00	minute	4.80E+02	1.3134E+08	7.6137E-09			
Yb 180	179.9523	2.400E+00	minute	1.44E+02	4.3537E+08	2.2969E-09			
Lu 151	150.9671	8.500E-02	second	8.50E-02	8.7917E+11	1.1374E-12			
Lu 152	151.9636	7.000E-01	second	7.00E-01	1.0606E+11	9.4289E-12			
Lu 154	153.9571	1.120E+00	second	1.12E+00	6.5427E+10	1.5284E-11			
Lu 155	154.9542	1.400E-01	second	1.40E-01	5.2005E+11	1.9229E-12			
Lu 155m	154.9542	6.800E-02	second	6.80E-02	1.0707E+12	9.3398E-13			
Lu 155m2	154.9542	2.600E-03	second	2.60E-03	2.8003E+13	3.5711E-14			
Lu 156	155.9529	7.300E-01	second	7.30E-01	9.9097E+10	1.0091E-11			
Lu 157	156.9501	6.800E+00	second	6.80E+00	1.0571E+10	9.4601E-11			
Lu 157m	156.9501	4.790E+00	second	4.79E+00	1.5006E+10	6.6638E-11			
Lu 158	157.9492	1.040E+01	second	1.04E+01	6.8679E+09	1.4560E-10			
Lu 159	158.9466	1.210E+01	second	1.21E+01	5.8660E+09	1.7047E-10			
Lu 160	159.9460	3.610E+01	second	3.61E+01	1.9539E+09	5.1180E-10			
Lu 160m	159.9460	4.000E+01	second	4.00E+01	1.7634E+09	5.6710E-10			
Lu 161	160.9435	7.200E+01	second	7.20E+01	9.7358E+08	1.0271E-09			
Lu 161m	160.9435	7.300E-03	second	7.30E-03	9.6024E+12	1.0414E-13			
Lu 162	161.9432	1.370E+00	minute	8.22E+01	8.4750E+08	1.1799E-09			
Lu 162m	161.9432	1.500E+00	minute	9.00E+01	7.7405E+08	1.2919E-09			
Lu 162m2	161.9432	1.900E+00	minute	1.14E+02	6.1110E+08	1.6364E-09			
Lu 163	162.9412	2.380E+02	second	2.38E+02	2.9092E+08	3.4374E-09			
Lu 164	163.9412	3.140E+00	minute	1.88E+02	3.6526E+08	2.7377E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Lu 165	164.9396	1.074E+01	minute	6.44E+02	1.0614E+08	9.4212E-09			
Lu 165m	164.9396	1.200E+01	minute	7.20E+02	9.4999E+07	1.0526E-08			
Lu 166	165.9398	2.650E+00	minute	1.59E+02	4.2759E+08	2.3387E-09			
Lu 166m	165.9398	1.410E+00	minute	8.46E+01	8.0363E+08	1.2444E-09			
Lu 166m2	165.9398	2.120E+00	minute	1.27E+02	5.3449E+08	1.8709E-09			
Lu 167	166.9383	5.150E+01	minute	3.09E+03	2.1871E+07	4.5723E-08			
Lu 168	167.9387	5.500E+00	minute	3.30E+02	2.0357E+08	4.9123E-09			
Lu 168m	167.9387	6.700E+00	minute	4.02E+02	1.6711E+08	5.9841E-09			
Lu 169	168.9376	3.406E+01	hour	1.23E+05	5.4463E+05	1.8361E-06			
Lu 169m	168.9376	1.600E+02	second	1.60E+02	4.1738E+08	2.3959E-09			
Lu 170	169.9385	2.000E+00	day	1.73E+05	3.8419E+05	2.6029E-06			
Lu 170m	169.9385	6.700E-01	second	6.70E-01	9.9085E+10	1.0092E-11			
Lu 171	170.9379	8.240E+00	day	7.12E+05	9.2704E+04	1.0787E-05			
Lu 171m	170.9379	7.900E+01	second	7.90E+01	8.3543E+08	1.1970E-09			
Lu 172	171.9391	6.700E+00	day	5.79E+05	1.1335E+05	8.8224E-06			
Lu 172m	171.9391	3.700E+00	minute	2.22E+02	2.9556E+08	3.3834E-09			
Lu 173	172.9389	1.370E+00	year	4.32E+07	1.5089E+03	6.6275E-04			
Lu 174	173.9403	3.310E+00	year	1.04E+08	6.2092E+02	1.6105E-03			
Lu 174m	173.9403	1.420E+02	day	1.23E+07	5.2866E+03	1.8916E-04			
Lu 176	175.9427	3.780E+10	year	1.19E+18	5.3752E-08	1.8604E+07			
Lu 176m	175.9427	3.635E+00	hour	1.31E+04	4.9000E+06	2.0408E-07			
Lu 177	176.9438	6.734E+00	day	5.82E+05	1.0959E+05	9.1253E-06			
Lu 177m	176.9438	1.604E+02	day	1.39E+07	4.6007E+03	2.1736E-04			
Lu 178	177.9460	2.840E+01	minute	1.70E+03	3.7206E+07	2.6877E-08			
Lu 178m	177.9460	2.310E+01	minute	1.39E+03	4.5743E+07	2.1861E-08			
Lu 179	178.9473	4.590E+00	hour	1.65E+04	3.8154E+06	2.6210E-07			
Lu 179m	178.9473	3.100E-03	second	3.10E-03	2.0337E+13	4.9171E-14			
Lu 180	179.9499	5.700E+00	minute	3.42E+02	1.8332E+08	5.4551E-09			
Lu 181	180.9520	3.500E+00	minute	2.10E+02	2.9689E+08	3.3683E-09			
Lu 182	181.9506	2.000E+00	minute	1.20E+02	5.1670E+08	1.9353E-09			
Lu 183	182.9576	5.800E+01	second	5.80E+01	1.0632E+09	9.4059E-10			
Lu 184	183.9612	2.000E+01	second	2.00E+01	3.0663E+09	3.2612E-10			
Hf 154	153.9643	2.000E+00	second	2.00E+00	3.6638E+10	2.7294E-11			
Hf 155	154.9542	8.900E-01	second	8.90E-01	8.1806E+10	1.2224E-11			
Hf 156	155.9529	2.500E-02	second	2.50E-02	2.8936E+12	3.4559E-13			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curles/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Hf 157	156.9581	1.100E-01	second	1.10E-01	6.5343E+11	1.5304E-12			
Hf 158	157.9546	2.860E+00	second	2.86E+00	2.4973E+10	4.0043E-11			
Hf 159	158.9540	5.600E+00	second	5.60E+00	1.2674E+10	7.8901E-11			
Hf 160	159.9507	1.300E+01	second	1.30E+01	5.4256E+09	1.8431E-10			
Hf 161	160.9503	1.680E+01	second	1.68E+01	4.1723E+09	2.3968E-10			
Hf 162	161.9472	3.760E+01	second	3.76E+01	1.8527E+09	5.3974E-10			
Hf 163	162.9471	4.000E+01	second	4.00E+01	1.7309E+09	5.7774E-10			
Hf 164	163.9444	1.110E+02	second	1.11E+02	6.1995E+08	1.6130E-09			
Hf 165	164.9445	7.600E+01	second	7.60E+01	8.9996E+08	1.1112E-09			
Hf 166	165.9423	6.770E+00	minute	4.06E+02	1.6737E+08	5.9748E-09			
Hf 167	166.9426	2.050E+00	minute	1.23E+02	5.4942E+08	1.8201E-09			
Hf 168	167.9406	2.595E+01	minute	1.56E+03	4.3145E+07	2.3178E-08			
Hf 169	168.9412	3.240E+00	minute	1.94E+02	3.4351E+08	2.9111E-09			
Hf 170	169.9397	1.601E+01	hour	5.76E+04	1.1518E+06	8.6818E-07			
Hf 171	170.9405	1.210E+01	hour	4.36E+04	1.5151E+06	6.6002E-07			
Hf 172	171.9395	1.870E+00	year	5.90E+07	1.1118E+03	8.9941E-04			
Hf 173	172.9407	2.360E+01	hour	8.50E+04	7.6783E+05	1.3024E-06			
Hf 174	173.9400	2.000E+15	year	6.31E+22	1.0276E-12	9.7313E+11			
Hf 175	174.9415	7.000E+01	day	6.05E+06	1.0663E+04	9.3784E-05	0.002422		
Hf 177m	176.9432	1.080E+00	second	1.08E+00	5.9036E+10	1.6939E-11			
Hf 177m2	176.9432	5.140E+01	minute	3.08E+03	2.0674E+07	4.8370E-08			
Hf 178m	177.9437	4.000E+00	second	4.00E+00	1.5850E+10	6.3091E-11			
Hf 178m2	177.9437	3.100E+01	year	9.78E+08	6.4806E+01	1.5431E-02			
Hf 179m	178.9458	1.867E+01	second	1.87E+01	3.3768E+09	2.9613E-10			
Hf 179m2	178.9458	2.505E+01	day	2.16E+06	2.9130E+04	3.4329E-05			
Hf 180m	179.9465	5.500E+00	hour	1.98E+04	3.1664E+06	3.1581E-07			
Hf 181	180.9491	4.239E+01	day	3.66E+06	1.7023E+04	5.8743E-05	0.004470		
Hf 182	181.9506	9.000E+06	year	2.84E+14	2.1831E-04	4.5807E+03			
Hf 182m	181.9506	6.150E+01	minute	3.69E+03	1.6803E+07	5.9512E-08			
Hf 183	182.9514	1.067E+00	hour	3.84E+03	1.6054E+07	6.2291E-08			
Hf 184	183.9554	4.120E+00	hour	1.48E+04	4.1349E+06	2.4184E-07			
Hf 185	184.9556	3.500E+00	minute	2.10E+02	2.9046E+08	3.4428E-09			
Ta 156	155.9717	1.100E-01	second	1.10E-01	6.5756E+11	1.5208E-12			
Ta 157	156.9681	5.300E-03	second	5.30E-03	1.3561E+13	7.3741E-14			
Ta 158	157.9664	3.680E-02	second	3.68E-02	1.9407E+12	5.1527E-13			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ta 159	158.9629	5.700E-01	second	5.70E-01	1.2451E+11	8.0315E-12			
Ta 160	159.9614	1.500E+00	second	1.50E+00	4.7019E+10	2.1268E-11			
Ta 161	160.9584	2.700E+00	second	2.70E+00	2.5960E+10	3.8521E-11			
Ta 162	161.9571	3.520E+00	second	3.52E+00	1.9789E+10	5.0532E-11			
Ta 163	162.9543	1.060E+01	second	1.06E+01	6.5314E+09	1.5311E-10			
Ta 164	163.9536	1.420E+01	second	1.42E+01	4.8458E+09	2.0636E-10			
Ta 165	164.9508	3.100E+01	second	3.10E+01	2.2063E+09	4.5325E-10			
Ta 166	165.9505	3.440E+01	second	3.44E+01	1.9762E+09	5.0601E-10			
Ta 167	166.9480	1.330E+00	minute	7.98E+01	8.4682E+08	1.1809E-09			
Ta 168	167.9478	2.000E+00	minute	1.20E+02	5.5978E+08	1.7864E-09			
Ta 169	168.9459	4.900E+00	minute	2.94E+02	2.2713E+08	4.4027E-09			
Ta 170	169.9461	6.760E+00	minute	4.06E+02	1.6367E+08	6.1099E-09			
Ta 171	170.9445	2.330E+01	minute	1.40E+03	4.7208E+07	2.1183E-08			
Ta 172	171.9447	3.680E+01	minute	2.21E+03	2.9716E+07	3.3652E-08			
Ta 173	172.9435	3.140E+00	hour	1.13E+04	5.7709E+06	1.7328E-07			
Ta 174	173.9442	1.050E+00	hour	3.78E+03	1.7158E+07	5.8281E-08			
Ta 175	174.9437	1.050E+01	hour	3.78E+04	1.7060E+06	5.8616E-07			
Ta 176	175.9447	8.090E+00	hour	2.91E+04	2.2017E+06	4.5420E-07			
Ta 177	176.9445	5.656E+01	hour	2.04E+05	3.1313E+05	3.1935E-06			
Ta 178	177.9458	9.310E+00	minute	5.59E+02	1.1350E+08	8.8107E-09			
Ta 178m	177.9458	2.360E+00	hour	8.50E+03	7.4623E+06	1.3401E-07			
Ta 178m2	177.9458	6.000E-02	second	6.00E-02	1.0567E+12	9.4637E-13			
Ta 179	178.9459	1.820E+00	year	5.74E+07	1.0977E+03	9.1103E-04			
Ta 180	179.9475	8.152E+00	hour	2.93E+04	2.1363E+06	4.6810E-07			
Ta 180m	179.9475	1.200E+15	year	3.79E+22	1.6555E-12	6.0404E+11			
Ta 182	181.9502	1.144E+02	day	9.89E+06	6.2715E+03	1.5945E-04	0.008940		
Ta 182m	181.9502	2.830E-01	second	2.83E-01	2.1910E+11	4.5642E-12			
Ta 182m2	181.9502	1.584E+01	minute	9.50E+02	6.5241E+07	1.5328E-08			
Ta 183	182.9514	5.100E+00	day	4.41E+05	1.3994E+05	7.1457E-06			
Ta 184	183.9540	8.700E+00	hour	3.13E+04	1.9581E+06	5.1069E-07			
Ta 185	184.9556	4.940E+01	minute	2.96E+03	2.0579E+07	4.8592E-08			
Ta 186	185.9586	1.050E+01	minute	6.30E+02	9.6299E+07	1.0384E-08			
W 158	157.9739	9.000E-04	second	9.00E-04	7.9350E+13	1.2602E-14			
W 159	158.9723	7.300E-03	second	7.30E-03	9.7215E+12	1.0287E-13			
W 160	159.9684	8.100E-02	second	8.10E-02	8.7068E+11	1.1485E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
W 161	160.9671	4.100E-01	second	4.10E-01	1.7094E+11	5.8498E-12			
W 162	161.9633	1.390E+00	second	1.39E+00	5.0112E+10	1.9955E-11			
W 163	162.9625	2.750E+00	second	2.75E+00	2.5174E+10	3.9723E-11			
W 164	163.9590	6.000E+00	second	6.00E+00	1.1468E+10	8.7199E-11			
W 165	164.9583	5.100E+00	second	5.10E+00	1.3410E+10	7.4571E-11			
W 166	165.9550	1.880E+01	second	1.88E+01	3.6160E+09	2.7655E-10			
W 167	166.9547	1.990E+01	second	1.99E+01	3.3957E+09	2.9449E-10			
W 168	167.9519	5.100E+01	second	5.10E+01	1.3171E+09	7.5924E-10			
W 169	168.9518	7.600E+01	second	7.60E+01	8.7862E+08	1.1382E-09			
W 170	169.9493	4.000E+00	minute	2.40E+02	2.7660E+08	3.6154E-09			
W 171	170.9495	2.380E+00	minute	1.43E+02	4.6215E+08	2.1638E-09			
W 172	171.9474	6.600E+00	minute	3.96E+02	1.6569E+08	6.0355E-09			
W 173	172.9478	7.600E+00	minute	4.56E+02	1.4305E+08	6.9904E-09			
W 174	173.9462	3.100E+01	minute	1.86E+03	3.4870E+07	2.8678E-08			
W 175	174.9468	3.520E+01	minute	2.11E+03	3.0534E+07	3.2751E-08			
W 176	175.9456	2.500E+00	hour	9.00E+03	7.1245E+06	1.4036E-07			
W 177	176.9466	1.350E+02	minute	8.10E+03	7.8713E+06	1.2704E-07			
W 178	177.9458	2.160E+01	day	1.87E+06	3.3972E+04	2.9436E-05			
W 179	178.9471	3.705E+01	minute	2.22E+03	2.8360E+07	3.5260E-08			
W 179m	178.9471	6.400E+00	minute	3.84E+02	1.6418E+08	6.0909E-09			
W 180m	179.9467	5.470E-03	second	5.47E-03	1.1462E+13	8.7248E-14			
W 181	180.9482	1.212E+02	day	1.05E+07	5.9540E+03	1.6796E-04			
W 183	182.9502	1.100E+17	year	3.47E+24	1.7764E-14	5.6294E+13			
W 183m	182.9502	5.200E+00	second	5.20E+00	1.1859E+10	8.4326E-11			
W 184	183.9509	3.000E+17	year	9.47E+24	6.4779E-15	1.5437E+14			
W 185	184.9534	7.510E+01	day	6.49E+06	9.4007E+03	1.0637E-04			
W 185m	184.9534	1.670E+00	minute	1.00E+02	6.0876E+08	1.6427E-09			
W 187	186.9572	2.372E+01	hour	8.54E+04	7.0667E+05	1.4151E-06			
W 188	187.9585	6.940E+01	day	6.00E+06	1.0010E+04	9.9898E-05			
W 189	188.9619	1.150E+01	minute	6.90E+02	8.6527E+07	1.1557E-08			
W 190	189.9632	3.000E+01	minute	1.80E+03	3.2994E+07	3.0309E-08			
Re 160	159.9815	7.900E-04	second	7.90E-04	8.9265E+13	1.1203E-14			
Re 161	160.9777	1.000E-02	second	1.00E-02	7.0083E+12	1.4269E-13			
Re 162	161.9757	1.000E-01	second	1.00E-01	6.9651E+11	1.4357E-12			
Re 163	162.9720	2.600E-01	second	2.60E-01	2.6625E+11	3.7559E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Half-life	Time Units	$t_{1/2}$, sec	Curies/gram	Grams/Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Re 164	163.9703	8.800E-01	second	8.80E-01	7.8186E+10	1.2790E-11			
Re 165	164.9671	2.400E+00	second	2.40E+00	2.8495E+10	3.5094E-11			
Re 166	165.9658	2.800E+00	second	2.80E+00	2.4277E+10	4.1191E-11			
Re 167	166.9626	6.100E+00	second	6.10E+00	1.1077E+10	9.0276E-11			
Re 168	167.9616	4.400E+00	second	4.40E+00	1.5266E+10	6.5507E-11			
Re 169	168.9588	1.290E+01	second	1.29E+01	5.1761E+09	1.9319E-10			
Re 170	169.9582	9.200E+00	second	9.20E+00	7.2152E+09	1.3860E-10			
Re 171	170.9555	1.520E+01	second	1.52E+01	4.3416E+09	2.3033E-10			
Re 172	171.9553	1.500E+01	second	1.50E+01	4.3739E+09	2.2863E-10			
Re 172m	171.9553	5.500E+01	second	5.50E+01	1.1929E+09	8.3830E-10			
Re 173	172.9531	1.980E+00	minute	1.19E+02	5.4908E+08	1.8212E-09			
Re 174	173.9531	2.400E+00	minute	1.44E+02	4.5038E+08	2.2203E-09			
Re 175	174.9514	5.890E+00	minute	3.53E+02	1.8247E+08	5.4803E-09			
Re 176	175.9516	5.300E+00	minute	3.18E+02	2.0163E+08	4.9596E-09			
Re 177	176.9503	1.400E+01	minute	8.40E+02	7.5901E+07	1.3175E-08			
Re 178	177.9509	1.320E+01	minute	7.92E+02	8.0048E+07	1.2492E-08			
Re 179	178.9500	1.950E+01	minute	1.17E+03	5.3884E+07	1.8558E-08			
Re 180	179.9508	2.440E+00	minute	1.46E+02	4.2823E+08	2.3352E-09			
Re 181	180.9501	1.990E+01	hour	7.16E+04	8.7029E+05	1.1490E-06			
Re 182	181.9512	6.400E+01	hour	2.30E+05	2.6912E+05	3.7159E-06			
Re 182m	181.9512	1.270E+01	hour	4.57E+04	1.3562E+06	7.3737E-07			
Re 183	182.9508	7.000E+01	day	6.05E+06	1.0196E+04	9.8078E-05			
Re 183m	182.9508	1.040E-03	second	1.04E-03	5.9294E+13	1.6865E-14			
Re 184	183.9525	3.800E+01	day	3.28E+06	1.8680E+04	5.3534E-05			
Re 184m	183.9525	1.690E+02	day	1.46E+07	4.2002E+03	2.3808E-04			
Re 186	185.9550	9.084E+01	hour	3.26E+05	1.8593E+05	5.3784E-06			
Re 186m	185.9550	2.000E+05	year	6.31E+12	9.6122E-03	1.0403E+02			
Re 187	186.9558	4.350E+10	year	1.37E+18	4.3957E-08	2.2749E+07	0.015350		
Re 188	187.9581	1.698E+01	hour	6.11E+04	9.8192E+05	1.0184E-06			
Re 188m	187.9581	1.860E+01	minute	1.12E+03	5.3784E+07	1.8593E-08			
Re 189	188.9592	2.430E+01	hour	8.75E+04	6.8250E+05	1.4652E-06			
Re 190	189.9618	3.100E+00	minute	1.86E+02	3.1930E+08	3.1319E-09			
Re 190m	189.9618	3.200E+00	hour	1.15E+04	5.1553E+06	1.9397E-07			
Re 191	190.9631	9.800E+00	minute	5.88E+02	1.0047E+08	9.9529E-09			
Re 192	191.9660	1.600E+01	second	1.60E+01	3.6731E+09	2.7225E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Os 162	161.9757	1.900E-03	second	1.90E-03	3.6658E+13	2.7279E-14			
Os 164	163.9779	4.100E-02	second	4.10E-02	1.6781E+12	5.9593E-13			
Os 165	164.9765	6.500E-02	second	6.50E-02	1.0521E+12	9.5051E-13			
Os 166	165.9725	1.810E-01	second	1.81E-01	3.7554E+11	2.6628E-12			
Os 167	166.9716	8.300E-01	second	8.30E-01	8.1406E+10	1.2284E-11			
Os 168	167.9678	2.200E+00	second	2.20E+00	3.0530E+10	3.2755E-11			
Os 169	168.9671	3.400E+00	second	3.40E+00	1.9638E+10	5.0922E-11			
Os 170	169.9636	7.300E+00	second	7.30E+00	9.0928E+09	1.0998E-10			
Os 171	170.9630	8.000E+00	second	8.00E+00	8.2487E+09	1.2123E-10			
Os 172	171.9601	1.900E+01	second	1.90E+01	3.4530E+09	2.8960E-10			
Os 173	172.9598	1.600E+01	second	1.60E+01	4.0767E+09	2.4529E-10			
Os 174	173.9571	4.400E+01	second	4.40E+01	1.4739E+09	6.7845E-10			
Os 175	174.9571	1.400E+00	minute	8.40E+01	7.6765E+08	1.3027E-09			
Os 176	175.9550	3.600E+00	minute	2.16E+02	2.9684E+08	3.3688E-09			
Os 177	176.9550	2.800E+00	minute	1.68E+02	3.7949E+08	2.6351E-09			
Os 178	177.9533	5.000E+00	minute	3.00E+02	2.1132E+08	4.7321E-09			
Os 179	178.9540	6.500E+00	minute	3.90E+02	1.6165E+08	6.1863E-09			
Os 180	179.9524	2.150E+01	minute	1.29E+03	4.8599E+07	2.0576E-08			
Os 181	180.9533	1.050E+02	minute	6.30E+03	9.8962E+06	1.0105E-07			
Os 181m	180.9533	2.700E+00	minute	1.62E+02	3.8485E+08	2.5984E-09			
Os 182	181.9522	2.210E+01	hour	7.96E+04	7.7934E+05	1.2831E-06			
Os 183	182.9531	1.300E+01	hour	4.68E+04	1.3176E+06	7.5894E-07			
Os 183m	182.9531	9.900E+00	hour	3.56E+04	1.7302E+06	5.7796E-07			
Os 184	183.9525	5.600E+13	year	1.77E+21	3.4703E-11	2.8816E+10			
Os 185	184.9540	9.360E+01	day	8.09E+06	7.5426E+03	1.3258E-04			
Os 186	185.9538	2.000E+15	year	6.31E+22	9.6123E-13	1.0403E+12			
Os 189m	188.9581	5.800E+00	hour	2.09E+04	2.8594E+06	3.4972E-07			
Os 190m	189.9584	9.900E+00	minute	5.94E+02	9.9984E+07	1.0002E-08			
Os 191	190.9609	1.540E+01	day	1.33E+06	4.4401E+04	2.2522E-05			
Os 191m	190.9609	1.310E+01	hour	4.72E+04	1.2527E+06	7.9826E-07			
Os 192m	191.9615	5.900E+00	second	5.90E+00	9.9612E+09	1.0039E-10			
Os 193	192.9641	3.050E+01	hour	1.10E+05	5.3247E+05	1.8780E-06			
Os 194	193.9652	6.000E+00	year	1.89E+08	3.0717E+02	3.2555E-03			
Os 195	194.9681	6.500E+00	minute	3.90E+02	1.4837E+08	6.7399E-09			
Os 196	195.9696	3.490E+01	minute	2.09E+03	2.7492E+07	3.6374E-08			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ir 166	165.9855	5.000E-03	second	5.00E-03	1.3594E+13	7.3564E-14			
Ir 167	166.9815	5.000E-03	second	5.00E-03	1.3513E+13	7.4005E-14			
Ir 169	168.9764	4.000E-01	second	4.00E-01	1.6691E+11	5.9911E-12			
Ir 170	169.9750	1.050E+00	second	1.05E+00	6.3212E+10	1.5820E-11			
Ir 171	170.9718	1.500E+00	second	1.50E+00	4.3991E+10	2.2732E-11			
Ir 172	171.9706	4.400E+00	second	4.40E+00	1.4910E+10	6.7070E-11			
Ir 172m	171.9706	2.000E+00	second	2.00E+00	3.2801E+10	3.0487E-11			
Ir 173	172.9677	9.000E+00	second	9.00E+00	7.2472E+09	1.3798E-10			
Ir 173m	172.9677	2.200E+00	second	2.20E+00	2.9648E+10	3.3730E-11			
Ir 174	173.9668	4.000E+00	second	4.00E+00	1.6213E+10	6.1681E-11			
Ir 175	174.9643	9.000E+00	second	9.00E+00	7.1645E+09	1.3958E-10			
Ir 176	175.9635	8.000E+00	second	8.00E+00	8.0143E+09	1.2478E-10			
Ir 177	176.9612	3.000E+01	second	3.00E+01	2.1251E+09	4.7057E-10			
Ir 178	177.9611	1.200E+01	second	1.20E+01	5.2829E+09	1.8929E-10			
Ir 179	178.9592	7.900E+01	second	7.90E+01	7.9799E+08	1.2532E-09			
Ir 180	179.9593	1.500E+00	minute	9.00E+01	6.9656E+08	1.4356E-09			
Ir 181	180.9576	4.900E+00	minute	2.94E+02	2.1206E+08	4.7157E-09			
Ir 182	181.9581	1.500E+01	minute	9.00E+02	6.8891E+07	1.4516E-08			
Ir 183	182.9568	5.800E+01	minute	3.48E+03	1.7719E+07	5.6435E-08			
Ir 184	183.9574	3.090E+00	hour	1.11E+04	5.5131E+06	1.8139E-07			
Ir 185	184.9566	1.440E+01	hour	5.18E+04	1.1766E+06	8.4988E-07			
Ir 186	185.9580	1.664E+01	hour	5.99E+04	1.0128E+06	9.8740E-07			
Ir 186m	185.9580	2.000E+00	hour	7.20E+03	8.4262E+06	1.1868E-07			
Ir 187	186.9574	1.050E+01	hour	3.78E+04	1.5964E+06	6.2641E-07			
Ir 187m	186.9574	3.030E-02	second	3.03E-02	1.9916E+12	5.0212E-13			
Ir 188	187.9589	4.150E+01	hour	1.49E+05	4.0176E+05	2.4891E-06			
Ir 189	188.9587	1.320E+01	day	1.14E+06	5.2351E+04	1.9102E-05			
Ir 189m	188.9587	1.330E-02	second	1.33E-02	4.4891E+12	2.2276E-13			
Ir 190	189.9606	1.178E+01	day	1.02E+06	5.8352E+04	1.7137E-05			
Ir 190m	189.9606	1.200E+00	hour	4.32E+03	1.3748E+07	7.2740E-08			
Ir 190m2	189.9606	3.250E+00	hour	1.17E+04	5.0761E+06	1.9700E-07			
Ir 191m	190.9606	4.940E+00	second	4.94E+00	1.1959E+10	8.3617E-11			
Ir 191m2	190.9606	5.500E+00	second	5.50E+00	1.0742E+10	9.3096E-11			
Ir 192	191.9626	7.383E+01	day	6.38E+06	9.2131E+03	1.0854E-04	0.006105		
Ir 192m	191.9626	1.450E+00	minute	8.70E+01	6.7552E+08	1.4803E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ir 192m2	191.9626	2.410E+02	year	7.61E+09	7.7273E+00	1.2941E-01			
Ir 193m	192.9629	1.053E+01	day	9.10E+05	6.4263E+04	1.5561E-05			
Ir 194	193.9651	1.915E+01	hour	6.89E+04	8.4369E+05	1.1853E-06			
Ir 194m	193.9651	3.185E-02	second	3.19E-02	1.8262E+12	5.4759E-13			
Ir 194m2	193.9651	1.710E+02	day	1.48E+07	3.9368E+03	2.5401E-04			
Ir 195	194.9660	2.500E+00	hour	9.00E+03	6.4295E+06	1.5553E-07			
Ir 195m	194.9660	3.800E+00	hour	1.37E+04	4.2299E+06	2.3641E-07			
Ir 196	195.9684	5.200E+01	second	5.20E+01	1.1071E+09	9.0326E-10			
Ir 196m	195.9684	1.400E+00	hour	5.04E+03	1.1422E+07	8.7547E-08			
Ir 197	196.9696	5.800E+00	minute	3.48E+02	1.6459E+08	6.0758E-09			
Ir 197m	196.9696	8.900E+00	minute	5.34E+02	1.0726E+08	9.3232E-09			
Ir 198	197.9723	8.000E+00	second	8.00E+00	7.1233E+09	1.4038E-10			
Pt 169	168.9864	2.500E-03	second	2.50E-03	2.6705E+13	3.7447E-14			
Pt 170	169.9823	6.000E-03	second	6.00E-03	1.1062E+13	9.0402E-14			
Pt 171	170.9813	2.500E-02	second	2.50E-02	2.6393E+12	3.7889E-13			
Pt 172	171.9774	1.040E-01	second	1.04E-01	6.3077E+11	1.5854E-12			
Pt 173	172.9765	3.420E-01	second	3.42E-01	1.9071E+11	5.2437E-12			
Pt 174	173.9728	9.000E-01	second	9.00E-01	7.2053E+10	1.3879E-11			
Pt 175	174.9723	2.520E+00	second	2.52E+00	2.5586E+10	3.9083E-11			
Pt 176	175.9690	6.330E+00	second	6.33E+00	1.0128E+10	9.8733E-11			
Pt 177	176.9685	1.100E+01	second	1.10E+01	5.7955E+09	1.7255E-10			
Pt 178	177.9657	2.110E+01	second	2.11E+01	3.0044E+09	3.3285E-10			
Pt 179	178.9655	2.120E+01	second	2.12E+01	2.9735E+09	3.3630E-10			
Pt 180	179.9632	5.200E+01	second	5.20E+01	1.2056E+09	8.2949E-10			
Pt 181	180.9632	5.100E+01	second	5.10E+01	1.2224E+09	8.1806E-10			
Pt 182	181.9613	2.600E+00	minute	1.56E+02	3.9744E+08	2.5161E-09			
Pt 183	182.9617	6.500E+00	minute	3.90E+02	1.5811E+08	6.3248E-09			
Pt 183m	182.9617	4.300E+01	second	4.30E+01	1.4340E+09	6.9735E-10			
Pt 184	183.9599	1.730E+01	minute	1.04E+03	5.9082E+07	1.6926E-08			
Pt 184m	183.9599	1.010E-03	second	1.01E-03	6.0720E+13	1.6469E-14			
Pt 185	184.9608	7.090E+01	minute	4.25E+03	1.4338E+07	6.9743E-08			
Pt 185m	184.9608	3.300E+01	minute	1.98E+03	3.0806E+07	3.2461E-08			
Pt 186	185.9594	2.000E+00	hour	7.20E+03	8.4261E+06	1.1868E-07			
Pt 187	186.9606	2.350E+00	hour	8.46E+03	7.1327E+06	1.4020E-07			
Pt 188	187.9594	1.020E+01	day	8.81E+05	6.8108E+04	1.4683E-05			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pt 189	188.9608	1.087E+01	hour	3.91E+04	1.5257E+06	6.5543E-07			
Pt 190	189.9599	6.500E+11	year	2.05E+19	2.8952E-09	3.4539E+08			
Pt 191	190.9617	2.900E+00	day	2.51E+05	2.3579E+05	4.2411E-06			
Pt 193	192.9630	5.000E+01	year	1.58E+09	3.7052E+01	2.6989E-02			
Pt 193m	192.9630	4.330E+00	day	3.74E+05	1.5628E+05	6.3988E-06			
Pt 195m	194.9648	4.020E+00	day	3.47E+05	1.6660E+05	6.0023E-06			
Pt 197	196.9673	1.830E+01	hour	6.59E+04	8.6942E+05	1.1502E-06			
Pt 197m	196.9673	9.541E+01	minute	5.72E+03	1.0005E+07	9.9945E-08			
Pt 199	198.9706	3.080E+01	minute	1.85E+03	3.0682E+07	3.2592E-08			
Pt 199m	198.9706	1.360E+01	second	1.36E+01	4.1692E+09	2.3986E-10			
Pt 200	199.9714	1.250E+01	hour	4.50E+04	1.2537E+06	7.9763E-07			
Pt 201	200.9745	2.500E+00	minute	1.50E+02	3.7423E+08	2.6721E-09			
Au 172	171.9901	4.000E-03	second	4.00E-03	1.6399E+13	6.0980E-14			
Au 173	172.9864	5.900E-02	second	5.90E-02	1.1054E+12	9.0466E-13			
Au 174	173.9849	1.200E-01	second	1.20E-01	5.4036E+11	1.8506E-12			
Au 175	174.9816	2.000E-01	second	2.00E-01	3.2237E+11	3.1020E-12			
Au 176	175.9803	1.250E+00	second	1.25E+00	5.1286E+10	1.9498E-11			
Au 177	176.9772	1.180E+00	second	1.18E+00	5.4023E+10	1.8511E-11			
Au 178	177.9760	2.600E+00	second	2.60E+00	2.4380E+10	4.1016E-11			
Au 179	178.9734	7.100E+00	second	7.10E+00	8.8783E+09	1.1263E-10			
Au 180	179.9724	8.100E+00	second	8.10E+00	7.7390E+09	1.2922E-10			
Au 181	180.9699	1.140E+01	second	1.14E+01	5.4685E+09	1.8287E-10			
Au 182	181.9696	2.100E+01	second	2.10E+01	2.9523E+09	3.3872E-10			
Au 183	182.9676	4.200E+01	second	4.20E+01	1.4681E+09	6.8116E-10			
Au 184	183.9675	5.300E+01	second	5.30E+01	1.1571E+09	8.6425E-10			
Au 185	184.9658	4.250E+00	minute	2.55E+02	2.3919E+08	4.1808E-09			
Au 185m	184.9658	6.800E+00	minute	4.08E+02	1.4949E+08	6.6892E-09			
Au 186	185.9660	1.070E+01	minute	6.42E+02	9.4495E+07	1.0583E-08			
Au 187	186.9645	8.400E+00	minute	5.04E+02	1.1973E+08	8.3524E-09			
Au 187m	186.9645	2.300E+00	second	2.30E+00	2.6236E+10	3.8116E-11			
Au 188	187.9651	8.840E+00	minute	5.30E+02	1.1316E+08	8.8370E-09			
Au 189	188.9639	2.870E+01	minute	1.72E+03	3.4671E+07	2.8843E-08			
Au 189m	188.9639	4.590E+00	minute	2.75E+02	2.1679E+08	4.6128E-09			
Au 190	189.9647	4.280E+01	minute	2.57E+03	2.3126E+07	4.3241E-08			
Au 190m	189.9647	1.250E-01	second	1.25E-01	4.7511E+11	2.1048E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Au 191	190.9636	3.180E+00	hour	1.14E+04	5.1606E+06	1.9378E-07			
Au 191m	190.9636	9.200E-01	second	9.20E-01	6.4215E+10	1.5573E-11			
Au 192	191.9648	4.940E+00	hour	1.78E+04	3.3046E+06	3.0260E-07			
Au 192m	191.9648	1.600E-01	second	1.60E-01	3.6731E+11	2.7225E-12			
Au 193	192.9641	1.765E+01	hour	6.35E+04	9.2014E+05	1.0868E-06			
Au 193m	192.9641	3.900E+00	second	3.90E+00	1.4991E+10	6.6706E-11			
Au 194	193.9653	3.802E+01	hour	1.37E+05	4.2495E+05	2.3532E-06			
Au 194m	193.9653	6.000E-01	second	6.00E-01	9.6940E+10	1.0316E-11			
Au 194m2	193.9653	4.200E-01	second	4.20E-01	1.3849E+11	7.2210E-12			
Au 195	194.9650	1.861E+02	day	1.61E+07	3.5990E+03	2.7785E-04			
Au 195m	194.9650	3.050E+01	second	3.05E+01	1.8972E+09	5.2708E-10			
Au 196	195.9666	6.183E+00	day	5.34E+05	1.0777E+05	9.2794E-06			
Au 196m	195.9666	8.100E+00	second	8.10E+00	7.1074E+09	1.4070E-10			
Au 196m2	195.9666	9.700E+00	hour	3.49E+04	1.6486E+06	6.0657E-07			
Au 197m	196.9666	7.730E+00	second	7.73E+00	7.4098E+09	1.3496E-10			
Au 198	197.9682	2.695E+00	day	2.33E+05	2.4473E+05	4.0862E-06			
Au 198m	197.9682	2.300E+00	day	1.99E+05	2.8677E+05	3.4871E-06			
Au 199	198.9687	3.139E+00	day	2.71E+05	2.0907E+05	4.7831E-06			
Au 200	199.9707	4.840E+01	minute	2.90E+03	1.9427E+07	5.1474E-08			
Au 200m	199.9707	1.870E+01	hour	6.73E+04	8.3804E+05	1.1933E-06			
Au 201	200.9716	2.600E+01	minute	1.56E+03	3.5985E+07	2.7790E-08			
Au 202	201.9738	2.880E+01	second	2.88E+01	1.9395E+09	5.1560E-10			
Au 203	202.9751	5.300E+01	second	5.30E+01	1.0487E+09	9.5355E-10			
Au 204	203.9777	3.980E+01	second	3.98E+01	1.3897E+09	7.1960E-10			
Hg 175	174.9914	2.000E-02	second	2.00E-02	3.2235E+12	3.1022E-13			
Hg 176	175.9874	3.400E-02	second	3.40E-02	1.8855E+12	5.3038E-13			
Hg 177	176.9772	1.300E-01	second	1.30E-01	4.9036E+11	2.0393E-12			
Hg 178	177.9825	2.540E-01	second	2.54E-01	2.4955E+11	4.0071E-12			
Hg 179	178.9818	1.090E+00	second	1.09E+00	5.7828E+10	1.7293E-11			
Hg 180	179.9783	2.800E+00	second	2.80E+00	2.2387E+10	4.4669E-11			
Hg 181	180.9778	3.600E+00	second	3.60E+00	1.7316E+10	5.7750E-11			
Hg 182	181.9748	1.083E+01	second	1.08E+01	5.7245E+09	1.7469E-10			
Hg 183	182.9746	8.800E+00	second	8.80E+00	7.0065E+09	1.4272E-10			
Hg 184	183.9719	3.060E+01	second	3.06E+01	2.0040E+09	4.9900E-10			
Hg 185	184.9720	4.910E+01	second	4.91E+01	1.2422E+09	8.0503E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Hg 185m	184.9720	2.160E+01	second	2.16E+01	2.8237E+09	3.5415E-10			
Hg 186	185.9695	1.380E+00	minute	8.28E+01	7.3266E+08	1.3649E-09			
Hg 187	186.9698	2.400E+00	minute	1.44E+02	4.1903E+08	2.3865E-09			
Hg 187m	186.9698	1.900E+00	minute	1.14E+02	5.2930E+08	1.8893E-09			
Hg 188	187.9676	3.250E+00	minute	1.95E+02	3.0779E+08	3.2489E-09			
Hg 189	188.9681	7.600E+00	minute	4.56E+02	1.3093E+08	7.6380E-09			
Hg 189m	188.9681	8.600E+00	minute	5.16E+02	1.1570E+08	8.6429E-09			
Hg 190	189.9663	2.000E+01	minute	1.20E+03	4.9490E+07	2.0206E-08			
Hg 191	190.9671	4.900E+01	minute	2.94E+03	2.0094E+07	4.9766E-08			
Hg 191m	190.9671	5.080E+01	minute	3.05E+03	1.9382E+07	5.1594E-08			
Hg 192	191.9656	4.850E+00	hour	1.75E+04	3.3660E+06	2.9709E-07			
Hg 193	192.9666	3.800E+00	hour	1.37E+04	4.2737E+06	2.3399E-07			
Hg 193m	192.9666	1.180E+01	hour	4.25E+04	1.3763E+06	7.2659E-07			
Hg 194	193.9654	4.440E+02	year	1.40E+10	4.1510E+00	2.4091E-01			
Hg 195	194.9666	9.900E+00	hour	3.56E+04	1.6236E+06	6.1592E-07			
Hg 195m	194.9666	4.160E+01	hour	1.50E+05	3.8639E+05	2.5881E-06			
Hg 197	196.9672	6.414E+01	hour	2.31E+05	2.4806E+05	4.0313E-06			
Hg 197m	196.9672	2.380E+01	hour	8.57E+04	6.6850E+05	1.4959E-06			
Hg 199m	198.9683	4.260E+01	minute	2.56E+03	2.2184E+07	4.5078E-08			
Hg 203	202.9729	4.661E+01	day	4.03E+06	1.3802E+04	7.2456E-05			
Hg 205	204.9761	5.200E+00	minute	3.12E+02	1.7641E+08	5.6687E-09			
Hg 206	205.9775	8.150E+00	minute	4.89E+02	1.1201E+08	8.9280E-09			
Hg 207	206.9826	2.900E+00	minute	1.74E+02	3.1325E+08	3.1923E-09			
Tl 179	178.9915	1.600E-01	second	1.60E-01	3.9393E+11	2.5385E-12			
Tl 179m	178.9915	1.400E-03	second	1.40E-03	4.5021E+13	2.2212E-14			
Tl 180	179.9902	7.000E-01	second	7.00E-01	8.9543E+10	1.1168E-11			
Tl 182	181.9856	3.100E+00	second	3.10E+00	1.9998E+10	5.0006E-11			
Tl 183	182.9827	6.900E+00	second	6.90E+00	8.9355E+09	1.1191E-10			
Tl 183m	182.9827	6.000E-02	second	6.00E-02	1.0276E+12	9.7316E-13			
Tl 184	183.9818	1.100E+01	second	1.10E+01	5.5745E+09	1.7939E-10			
Tl 185	184.9791	1.950E+01	second	1.95E+01	3.1277E+09	3.1973E-10			
Tl 185m	184.9791	1.830E+00	second	1.83E+00	3.3328E+10	3.0005E-11			
Tl 186	185.9785	2.750E+01	second	2.75E+01	2.2059E+09	4.5333E-10			
Tl 186m	185.9785	2.900E+00	second	2.90E+00	2.0918E+10	4.7806E-11			
Tl 187	186.9762	5.100E+01	second	5.10E+01	1.1831E+09	8.4524E-10			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Tl 187m	186.9762	1.560E+01	second	1.56E+01	3.8678E+09	2.5854E-10			
Tl 188	187.9759	7.100E+01	second	7.10E+01	8.4531E+08	1.1830E-09			
Tl 188m	187.9759	7.100E+01	second	7.10E+01	8.4531E+08	1.1830E-09			
Tl 189	188.9737	2.300E+00	minute	1.38E+02	4.3261E+08	2.3116E-09			
Tl 189m	188.9737	1.400E+00	minute	8.40E+01	7.1072E+08	1.4070E-09			
Tl 190	189.9738	2.600E+00	minute	1.56E+02	3.8068E+08	2.6269E-09			
Tl 190m	189.9738	3.700E+00	minute	2.22E+02	2.6750E+08	3.7383E-09			
Tl 191m	190.9719	5.220E+00	minute	3.13E+02	1.8862E+08	5.3017E-09			
Tl 192	191.9721	9.600E+00	minute	5.76E+02	1.0203E+08	9.8013E-09			
Tl 192m	191.9721	1.080E+01	minute	6.48E+02	9.0691E+07	1.1026E-08			
Tl 193	192.9705	2.160E+01	minute	1.30E+03	4.5111E+07	2.2168E-08			
Tl 193m	192.9705	2.110E+00	minute	1.27E+02	4.6180E+08	2.1655E-09			
Tl 194	193.9711	3.300E+01	minute	1.98E+03	2.9375E+07	3.4043E-08			
Tl 194m	193.9711	3.280E+01	minute	1.97E+03	2.9554E+07	3.3837E-08			
Tl 195	194.9697	1.160E+00	hour	4.18E+03	1.3856E+07	7.2169E-08			
Tl 195m	194.9697	3.600E+00	second	3.60E+00	1.6073E+10	6.2215E-11			
Tl 196	195.9705	1.840E+00	hour	6.62E+03	8.6909E+06	1.1506E-07			
Tl 196m	195.9705	1.410E+00	hour	5.08E+03	1.1341E+07	8.8173E-08			
Tl 197	196.9695	2.840E+00	hour	1.02E+04	5.6022E+06	1.7850E-07			
Tl 197m	196.9695	5.400E-01	second	5.40E-01	1.0607E+11	9.4279E-12			
Tl 198	197.9405	5.300E+00	hour	1.91E+04	2.9872E+06	3.3476E-07			
Tl 198m	197.9405	1.870E+00	hour	6.73E+03	8.4664E+06	1.1811E-07			
Tl 198m2	197.9405	3.210E-02	second	3.21E-02	1.7756E+12	5.6320E-13			
Tl 199	198.9698	7.420E+00	hour	2.67E+04	2.1227E+06	4.7110E-07			
Tl 199m	198.9698	2.840E-02	second	2.84E-02	1.9965E+12	5.0087E-13			
Tl 200	199.9709	2.610E+01	hour	9.40E+04	6.0044E+05	1.6655E-06			
Tl 200m	199.9709	3.430E-02	second	3.43E-02	1.6448E+12	6.0797E-13			
Tl 201	200.9708	7.291E+01	hour	2.62E+05	2.1387E+05	4.6758E-06	0.000830		
Tl 201m	200.9708	2.035E-03	second	2.04E-03	2.7585E+13	3.6251E-14			
Tl 202	201.9721	1.223E+01	day	1.06E+06	5.2862E+04	1.8917E-05			
Tl 204	203.9738	3.780E+00	year	1.19E+08	4.6365E+02	2.1568E-03			
Tl 206	205.9761	4.199E+00	minute	2.52E+02	2.1740E+08	4.5998E-09			
Tl 206m	205.9761	3.740E+00	minute	2.24E+02	2.4408E+08	4.0970E-09			
Tl 207	206.9774	4.770E+00	minute	2.86E+02	1.9045E+08	5.2507E-09	0.002930		
Tl 207m	206.9774	1.330E+00	second	1.33E+00	4.0983E+10	2.4400E-11			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Tl 208	207.9820	3.053E+00	minute	1.83E+02	2.9612E+08	3.3770E-09	0.023540		
Tl 209	208.9853	2.200E+00	minute	1.32E+02	4.0897E+08	2.4452E-09			
Tl 210	209.9901	1.300E+00	minute	7.80E+01	6.8878E+08	1.4518E-09			
Pb 181	180.9967	5.000E-02	second	5.00E-02	1.2466E+12	8.0217E-13			
Pb 182	181.9927	5.500E-02	second	5.50E-02	1.1271E+12	8.8724E-13			
Pb 183	182.9919	3.000E-01	second	3.00E-01	2.0551E+11	4.8661E-12			
Pb 184	183.9882	5.500E-01	second	5.50E-01	1.1149E+11	8.9697E-12			
Pb 185	184.9876	4.100E+00	second	4.10E+00	1.4875E+10	6.7228E-11			
Pb 186	185.9843	4.700E+00	second	4.70E+00	1.2906E+10	7.7481E-11			
Pb 187	186.9840	1.830E+01	second	1.83E+01	3.2970E+09	3.0330E-10			
Pb 187m	186.9840	1.520E+01	second	1.52E+01	3.9694E+09	2.5193E-10			
Pb 188	187.9759	2.420E+01	second	2.42E+01	2.4800E+09	4.0322E-10			
Pb 189	188.9809	5.100E+01	second	5.10E+01	1.1705E+09	8.5430E-10			
Pb 190	189.9782	1.200E+00	minute	7.20E+01	8.2478E+08	1.2124E-09			
Pb 191	190.9782	1.330E+00	minute	7.98E+01	7.4027E+08	1.3509E-09			
Pb 191m	190.9782	2.180E+00	minute	1.31E+02	4.5163E+08	2.2142E-09			
Pb 192	191.9758	3.500E+00	minute	2.10E+02	2.7984E+08	3.5735E-09			
Pb 193m	192.9761	5.800E+00	minute	3.48E+02	1.6799E+08	5.9526E-09			
Pb 194	193.9740	1.200E+01	minute	7.20E+02	8.0779E+07	1.2379E-08			
Pb 195	194.9745	1.500E+01	minute	9.00E+02	6.4292E+07	1.5554E-08			
Pb 195m	194.9745	1.500E+01	minute	9.00E+02	6.4292E+07	1.5554E-08			
Pb 196	195.9727	3.700E+01	minute	2.22E+03	2.5932E+07	3.8563E-08			
Pb 197	196.9734	8.000E+00	minute	4.80E+02	1.1932E+08	8.3805E-09			
Pb 197m	196.9734	4.300E+01	minute	2.58E+03	2.2200E+07	4.5045E-08			
Pb 198	197.9720	2.400E+00	hour	8.64E+03	6.5957E+06	1.5161E-07			
Pb 199	198.9729	1.500E+00	hour	5.40E+03	1.0500E+07	9.5238E-08			
Pb 199m	198.9729	1.220E+01	minute	7.32E+02	7.7459E+07	1.2910E-08			
Pb 200	199.9718	2.150E+01	hour	7.74E+04	7.2890E+05	1.3719E-06			
Pb 201	200.9728	9.330E+00	hour	3.36E+04	1.6713E+06	5.9834E-07			
Pb 201m	200.9728	6.100E+01	second	6.10E+01	9.2026E+08	1.0867E-09			
Pb 202	201.9721	5.250E+04	year	1.66E+12	3.3714E-02	2.9661E+01			
Pb 202m	201.9721	3.530E+00	hour	1.27E+04	4.3955E+06	2.2751E-07			
Pb 203	202.9734	5.187E+01	hour	1.87E+05	2.9764E+05	3.3597E-06			
Pb 203m	202.9734	6.300E+00	second	6.30E+00	8.8226E+09	1.1335E-10			
Pb 203m2	202.9734	4.800E-01	second	4.80E-01	1.1580E+11	8.6358E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pb 204	203.9730	1.400E+17	year	4.42E+24	1.2519E-14	7.9880E+13			
Pb 204m	203.9730	6.720E+01	minute	4.03E+03	1.3718E+07	7.2898E-08			
Pb 205	204.9745	1.530E+07	year	4.83E+14	1.1399E-04	8.7726E+03			
Pb 205m	204.9745	5.540E-03	second	5.54E-03	9.9350E+12	1.0065E-13			
Pb 207m	206.9759	8.050E-01	second	8.05E-01	6.7711E+10	1.4769E-11			
Pb 209	208.9811	3.253E+00	hour	1.17E+04	4.6098E+06	2.1693E-07	0.001170		
Pb 210	209.9842	2.230E+01	year	7.04E+08	7.6343E+01	1.3099E-02	0.000203		
Pb 211	210.9887	3.610E+01	minute	2.17E+03	2.4686E+07	4.0508E-08	0.003083		
Pb 212	211.9919	1.064E+01	hour	3.83E+04	1.3894E+06	7.1976E-07	0.001900		
Pb 213	212.9965	1.020E+01	minute	6.12E+02	8.6547E+07	1.1554E-08			
Pb 214	213.9998	2.680E+01	minute	1.61E+03	3.2785E+07	3.0502E-08			
Bi 187	186.9935	3.500E-02	second	3.50E-02	1.7238E+12	5.8012E-13			
Bi 187m	186.9935	8.000E-04	second	8.00E-04	7.5415E+13	1.3260E-14			
Bi 188	187.9922	4.400E-02	second	4.40E-02	1.3639E+12	7.3319E-13			
Bi 189	188.9895	6.800E-01	second	6.80E-01	8.7787E+10	1.1391E-11			
Bi 189m	188.9895	5.000E-03	second	5.00E-03	1.1939E+13	8.3759E-14			
Bi 190	189.9885	5.700E+00	second	5.70E+00	1.0418E+10	9.5990E-11			
Bi 190m	189.9885	5.900E+00	second	5.90E+00	1.0065E+10	9.9358E-11			
Bi 190m2	189.9885	5.700E+00	second	5.70E+00	1.0418E+10	9.5990E-11			
Bi 191	190.9860	1.200E+01	second	1.20E+01	4.9226E+09	2.0315E-10			
Bi 191m	190.9860	1.500E-01	second	1.50E-01	3.9381E+11	2.5393E-12			
Bi 192	191.9854	3.460E+01	second	3.46E+01	1.6984E+09	5.8880E-10			
Bi 192m	191.9854	4.060E+01	second	4.06E+01	1.4474E+09	6.9090E-10			
Bi 193	192.9831	6.700E+01	second	6.70E+01	8.7253E+08	1.1461E-09			
Bi 193m	192.9831	3.200E+00	second	3.20E+00	1.8269E+10	5.4738E-11			
Bi 194	193.9827	9.500E+01	second	9.50E+01	6.1220E+08	1.6335E-09			
Bi 194m	193.9827	1.250E+02	second	1.25E+02	4.6527E+08	2.1493E-09			
Bi 194m2	193.9827	1.150E+02	second	1.15E+02	5.0573E+08	1.9774E-09			
Bi 195	194.9808	1.830E+02	second	1.83E+02	3.1618E+08	3.1628E-09			
Bi 195m	194.9808	8.700E+01	second	8.70E+01	6.6507E+08	1.5036E-09			
Bi 196	195.9806	3.080E+02	second	3.08E+02	1.8690E+08	5.3504E-09			
Bi 196m	195.9806	6.000E-01	second	6.00E-01	9.5943E+10	1.0423E-11			
Bi 196m2	195.9806	2.400E+02	second	2.40E+02	2.3986E+08	4.1692E-09			
Bi 197	196.9789	9.330E+00	minute	5.60E+02	1.0231E+08	9.7741E-09			
Bi 197m	196.9789	5.040E+00	minute	3.02E+02	1.8940E+08	5.2799E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Bi 198	197.9790	1.030E+01	minute	6.18E+02	9.2208E+07	1.0845E-08			
Bi 198m	197.9790	1.160E+01	minute	6.96E+02	8.1874E+07	1.2214E-08			
Bi 198m2	197.9790	7.700E+00	second	7.70E+00	7.4006E+09	1.3512E-10			
Bi 199	198.9776	2.700E+01	minute	1.62E+03	3.4999E+07	2.8572E-08			
Bi 199m	198.9776	2.470E+01	minute	1.48E+03	3.8258E+07	2.6138E-08			
Bi 200	199.9781	3.640E+01	minute	2.18E+03	2.5831E+07	3.8713E-08			
Bi 200m	199.9781	3.100E+01	minute	1.86E+03	3.0331E+07	3.2970E-08			
Bi 200m2	199.9781	4.000E-01	second	4.00E-01	1.4104E+11	7.0903E-12			
Bi 201	200.9770	1.080E+02	minute	6.48E+03	8.6627E+06	1.1544E-07			
Bi 201m	200.9770	5.910E+01	minute	3.55E+03	1.5830E+07	6.3170E-08			
Bi 202	201.9777	1.720E+00	hour	6.19E+03	9.0207E+06	1.1086E-07			
Bi 203	202.9769	1.176E+01	hour	4.23E+04	1.3129E+06	7.6169E-07			
Bi 203m	202.9769	3.030E-01	second	3.03E-01	1.8344E+11	5.4515E-12			
Bi 204	203.9778	1.122E+01	hour	4.04E+04	1.3693E+06	7.3030E-07			
Bi 204m	203.9778	1.300E-02	second	1.30E-02	4.2545E+12	2.3504E-13			
Bi 204m2	203.9778	1.070E-03	second	1.07E-03	5.1690E+13	1.9346E-14			
Bi 205	204.9774	1.531E+01	day	1.32E+06	4.1608E+04	2.4034E-05			
Bi 206	205.9785	6.243E+00	day	5.39E+05	1.0154E+05	9.8481E-06			
Bi 207	206.9785	3.155E+01	year	9.96E+08	5.4744E+01	1.8267E-02			
Bi 208	207.9797	3.680E+05	year	1.16E+13	4.6708E-03	2.1410E+02			
Bi 208m	207.9797	2.580E-03	second	2.58E-03	2.1025E+13	4.7562E-14			
Bi 210	209.9841	5.013E+00	day	4.33E+05	1.2404E+05	8.0616E-06			
Bi 210m	209.9841	3.040E+06	year	9.59E+13	5.6002E-04	1.7857E+03			
Bi 211	210.9873	2.140E+00	minute	1.28E+02	4.1644E+08	2.4013E-09	0.039160		
Bi 212	211.9913	6.055E+01	minute	3.63E+03	1.4648E+07	6.8266E-08	0.016490		
Bi 212m	211.9913	2.500E+01	minute	1.50E+03	3.5479E+07	2.8186E-08			
Bi 212m2	211.9913	7.000E+00	minute	4.20E+02	1.2671E+08	7.8921E-09			
Bi 213	212.9944	4.559E+01	minute	2.74E+03	1.9364E+07	5.1643E-08	0.003950		
Bi 214	213.9987	1.990E+01	minute	1.19E+03	4.4153E+07	2.2648E-08			
Bi 215	215.0018	7.600E+00	minute	4.56E+02	1.1507E+08	8.6902E-09			
Bi 216	216.0019	3.600E+00	minute	2.16E+02	2.4180E+08	4.1356E-09			
Po 191	190.9947	1.550E-02	second	1.55E-02	3.8109E+12	2.6241E-13			
Po 192	191.9915	3.400E-02	second	3.40E-02	1.7283E+12	5.7861E-13			
Po 193	192.9911	3.600E-01	second	3.60E-01	1.6238E+11	6.1583E-12			
Po 193m	192.9911	2.600E-01	second	2.60E-01	2.2484E+11	4.4477E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Po 194	193.9883	3.920E-01	second	3.92E-01	1.4836E+11	6.7404E-12			
Po 195	194.9880	4.640E+00	second	4.64E+00	1.2470E+10	8.0195E-11			
Po 195m	194.9880	1.920E+00	second	1.92E+00	3.0135E+10	3.3184E-11			
Po 196	195.9855	5.800E+00	second	5.80E+00	9.9249E+09	1.0076E-10			
Po 197	196.9856	5.600E+01	second	5.60E+01	1.0227E+09	9.7779E-10			
Po 197m	196.9856	2.600E+01	second	2.60E+01	2.2028E+09	4.5397E-10			
Po 198	197.9833	1.760E+00	minute	1.06E+02	5.3961E+08	1.8532E-09			
Po 199	198.9836	5.480E+00	minute	3.29E+02	1.7244E+08	5.7993E-09			
Po 199m	198.9836	4.130E+00	minute	2.48E+02	2.2880E+08	4.3706E-09			
Po 200	199.9817	1.150E+01	minute	6.90E+02	8.1759E+07	1.2231E-08			
Po 201	200.9822	1.530E+01	minute	9.18E+02	6.1147E+07	1.6354E-08			
Po 201m	200.9822	8.900E+00	minute	5.34E+02	1.0512E+08	9.5131E-09			
Po 202	201.9807	4.470E+01	minute	2.68E+03	2.0826E+07	4.8017E-08			
Po 203	202.9814	3.670E+01	minute	2.20E+03	2.5241E+07	3.9618E-08			
Po 203m	202.9814	1.200E+00	minute	7.20E+01	7.7195E+08	1.2954E-09			
Po 204	203.9803	3.530E+00	hour	1.27E+04	4.3522E+06	2.2977E-07			
Po 205	204.9812	1.660E+00	hour	5.98E+03	9.2098E+06	1.0858E-07			
Po 206	205.9805	8.800E+00	day	7.60E+05	7.2037E+04	1.3882E-05			
Po 207	206.9816	5.800E+00	hour	2.09E+04	2.6104E+06	3.8308E-07			
Po 207m	206.9816	2.800E+00	second	2.80E+00	1.9466E+10	5.1370E-11			
Po 208	207.9812	2.898E+00	year	9.15E+07	5.9311E+02	1.6860E-03			
Po 209	208.9824	1.020E+02	year	3.22E+09	1.6771E+01	5.9628E-02	0.294300		
Po 210	209.9829	1.384E+02	day	1.20E+07	4.4938E+03	2.2253E-04			
Po 211	210.9866	5.160E-01	second	5.16E-01	1.0363E+11	9.6500E-12			
Po 211m	210.9866	2.520E+01	second	2.52E+01	2.1219E+09	4.7128E-10			
Po 212	211.9889	2.990E-07	second	2.99E-07	1.7799E+17	5.6183E-18	0.052070		
Po 212m	211.9889	4.510E+01	second	4.51E+01	1.1800E+09	8.4745E-10			
Po 213	212.9928	4.200E-06	second	4.20E-06	1.2611E+16	7.9294E-17	0.049640		
Po 214	213.9952	1.643E-04	second	1.64E-04	3.2087E+14	3.1165E-15			
Po 215	214.9994	1.781E-03	second	1.78E-03	2.9463E+13	3.3941E-14	0.043780		
Po 216	216.0019	1.450E-01	second	1.45E-01	3.6021E+11	2.7762E-12	0.040180		
Po 217	217.0063	1.000E+01	second	1.00E+01	5.1988E+09	1.9235E-10			
Po 218	218.0090	3.100E+00	minute	1.86E+02	2.7822E+08	3.5943E-09			
At 194	193.9990	1.800E-01	second	1.80E-01	3.2308E+11	3.0952E-12			
At 196	195.9957	3.000E-01	second	3.00E-01	1.9187E+11	5.2118E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$,sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
At 197	196.9933	3.500E-01	second	3.50E-01	1.6363E+11	6.1114E-12			
At 197m	196.9933	3.700E+00	second	3.70E+00	1.5478E+10	6.4607E-11			
At 198	197.9928	4.200E+00	second	4.20E+00	1.3567E+10	7.3709E-11			
At 198m	197.9928	1.000E+00	second	1.00E+00	5.6981E+10	1.7550E-11			
At 199	198.9906	7.200E+00	second	7.20E+00	7.8743E+09	1.2700E-10			
At 200	199.9903	4.300E+01	second	4.30E+01	1.3119E+09	7.6226E-10			
At 200m	199.9903	4.700E+01	second	4.70E+01	1.2002E+09	8.3316E-10			
At 200m2	199.9903	3.500E+00	second	3.50E+00	1.6118E+10	6.2044E-11			
At 201	200.9885	8.900E+01	second	8.90E+01	6.3069E+08	1.5856E-09			
At 202	201.9884	1.840E+02	second	1.84E+02	3.0355E+08	3.2943E-09			
At 202m	201.9884	1.820E+02	second	1.82E+02	3.0689E+08	3.2585E-09			
At 202m2	201.9884	4.600E-01	second	4.60E-01	1.2142E+11	8.2358E-12			
At 203	202.9868	7.400E+00	minute	4.44E+02	1.2518E+08	7.9887E-09			
At 204	203.9873	9.200E+00	minute	5.52E+02	1.0019E+08	9.9808E-09			
At 204m	203.9873	1.080E-01	second	1.08E-01	5.1209E+11	1.9528E-12			
At 205	204.9860	2.620E+01	minute	1.57E+03	3.5011E+07	2.8563E-08			
At 206	205.9866	3.000E+01	minute	1.80E+03	3.0427E+07	3.2865E-08			
At 207	206.9858	1.800E+00	hour	6.48E+03	8.4113E+06	1.1889E-07			
At 208	207.9866	1.630E+00	hour	5.87E+03	9.2438E+06	1.0818E-07			
At 209	208.9862	5.410E+00	hour	1.95E+04	2.7718E+06	3.6078E-07			
At 210	209.9871	8.100E+00	hour	2.92E+04	1.8425E+06	5.4275E-07			
At 211	210.9875	7.214E+00	hour	2.60E+04	2.0589E+06	4.8569E-07			
At 212	211.9907	3.140E-01	second	3.14E-01	1.6948E+11	5.9002E-12			
At 212m	211.9907	1.190E-01	second	1.19E-01	4.4721E+11	2.2361E-12			
At 213	212.9929	1.250E-07	second	1.25E-07	4.2374E+17	2.3599E-18			
At 214	213.9964	5.580E-07	second	5.58E-07	9.4479E+16	1.0584E-17			
At 214m	213.9964	2.650E-07	second	2.65E-07	1.9894E+17	5.0266E-18			
At 214m2	213.9964	7.600E-07	second	7.60E-07	6.9368E+16	1.4416E-17			
At 215	214.9986	1.000E-04	second	1.00E-04	5.2474E+14	1.9057E-15			
At 216	216.0024	3.000E-04	second	3.00E-04	1.7410E+14	5.7439E-15			
At 217	217.0047	3.230E-02	second	3.23E-02	1.6096E+12	6.2129E-13	0.041890		
At 218	218.0087	1.500E+00	second	1.50E+00	3.4499E+10	2.8986E-11			
At 219	219.0113	5.600E+01	second	5.60E+01	9.1986E+08	1.0871E-09			
At 220	220.0153	2.240E+02	second	2.24E+02	2.2892E+08	4.3684E-09			
At 221	221.0181	2.300E+00	minute	1.38E+02	3.6989E+08	2.7035E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
At 222	222.0223	5.400E+01	second	5.40E+01	9.4099E+08	1.0627E-09			
At 223	223.0253	5.000E+01	second	5.00E+01	1.0117E+09	9.8843E-10			
Rn 198	197.9988	5.000E-02	second	5.00E-02	1.1396E+12	8.7752E-13			
Rn 199	198.9983	6.200E-01	second	6.20E-01	9.1440E+10	1.0936E-11			
Rn 199m	198.9983	3.200E-01	second	3.20E-01	1.7716E+11	5.6445E-12			
Rn 200	199.9957	1.060E+00	second	1.06E+00	5.3217E+10	1.8791E-11			
Rn 201	200.9955	7.000E+00	second	7.00E+00	8.0185E+09	1.2471E-10			
Rn 201m	200.9955	3.800E+00	second	3.80E+00	1.4771E+10	6.7701E-11			
Rn 202	201.9932	9.850E+00	second	9.85E+00	5.6703E+09	1.7636E-10			
Rn 203	202.9933	4.500E+01	second	4.50E+01	1.2350E+09	8.0969E-10			
Rn 203m	202.9933	2.800E+01	second	2.80E+01	1.9849E+09	5.0381E-10			
Rn 204	203.9914	1.240E+00	minute	7.44E+01	7.4335E+08	1.3453E-09			
Rn 205	204.9917	2.800E+00	minute	1.68E+02	3.2759E+08	3.0526E-09			
Rn 206	205.9902	5.670E+00	minute	3.40E+02	1.6099E+08	6.2116E-09			
Rn 207	206.9907	9.250E+00	minute	5.55E+02	9.8205E+07	1.0183E-08			
Rn 208	207.9896	2.435E+01	minute	1.46E+03	3.7127E+07	2.6935E-08			
Rn 209	208.9904	2.850E+01	minute	1.71E+03	3.1569E+07	3.1677E-08			
Rn 210	209.9897	2.400E+00	hour	8.64E+03	6.2182E+06	1.6082E-07			
Rn 211	210.9906	1.460E+01	hour	5.26E+04	1.0173E+06	9.8297E-07			
Rn 212	211.9907	2.390E+01	minute	1.43E+03	3.7112E+07	2.6946E-08			
Rn 213	212.9939	2.500E-02	second	2.50E-02	2.1187E+12	4.7199E-13			
Rn 214	213.9953	2.700E-07	second	2.70E-07	1.9526E+17	5.1214E-18			
Rn 214m	213.9953	7.000E-10	second	7.00E-10	7.5314E+19	1.3278E-20			
Rn 214m2	213.9953	6.500E-09	second	6.50E-09	8.1107E+18	1.2329E-19			
Rn 215	214.9987	2.300E-06	second	2.30E-06	2.2815E+16	4.3832E-17			
Rn 216	216.0003	4.500E-05	second	4.50E-05	1.1607E+15	8.6157E-16			
Rn 217	217.0039	5.400E-04	second	5.40E-04	9.6275E+13	1.0387E-14			
Rn 218	218.0056	3.500E-02	second	3.50E-02	1.4786E+12	6.7633E-13			
Rn 219	219.0095	3.960E+00	second	3.96E+00	1.3008E+10	7.6874E-11	0.040760		
Rn 220	220.0114	5.560E+01	second	5.56E+01	9.2227E+08	1.0843E-09	0.037270		
Rn 221	221.0155	2.500E+01	minute	1.50E+03	3.4030E+07	2.9386E-08	0.032550		
Rn 222	222.0176	3.824E+00	day	3.30E+05	1.5382E+05	6.5011E-06			
Rn 223	223.0218	2.320E+01	minute	1.39E+03	3.6340E+07	2.7518E-08			
Rn 224	224.0241	1.070E+02	minute	6.42E+03	7.8442E+06	1.2748E-07			
Rn 225	225.0284	4.500E+00	minute	2.70E+02	1.8568E+08	5.3855E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Rn 226	226.0309	6.000E+00	minute	3.60E+02	1.3865E+08	7.2126E-09			
Rn 227	227.0354	2.250E+01	second	2.25E+01	2.2085E+09	4.5279E-10			
Rn 228	228.0381	6.500E+01	second	6.50E+01	7.6112E+08	1.3138E-09			
Fr 201	201.0040	4.800E-02	second	4.80E-02	1.1693E+12	8.5520E-13			
Fr 202	202.0033	3.400E-01	second	3.40E-01	1.6426E+11	6.0878E-12			
Fr 203	203.0010	5.500E-01	second	5.50E-01	1.0105E+11	9.8966E-12			
Fr 204	204.0006	1.700E+00	second	1.70E+00	3.2531E+10	3.0740E-11			
Fr 204m	204.0006	2.600E+00	second	2.60E+00	2.1270E+10	4.7014E-11			
Fr 204m2	204.0006	1.000E+00	second	1.00E+00	5.5303E+10	1.8082E-11			
Fr 205	204.9987	3.850E+00	second	3.85E+00	1.4294E+10	6.9958E-11			
Fr 206	205.9985	1.590E+01	second	1.59E+01	3.4444E+09	2.9033E-10			
Fr 206m	205.9985	7.000E-01	second	7.00E-01	7.8237E+10	1.2782E-11			
Fr 207	206.9969	1.480E+01	second	1.48E+01	3.6826E+09	2.7155E-10			
Fr 208	207.9971	5.910E+01	second	5.91E+01	9.1777E+08	1.0896E-09			
Fr 209	208.9959	5.000E+01	second	5.00E+01	1.0796E+09	9.2626E-10			
Fr 210	209.9964	3.180E+00	minute	1.91E+02	2.8157E+08	3.5515E-09			
Fr 211	210.9955	3.100E+00	minute	1.86E+02	2.8747E+08	3.4786E-09			
Fr 212	211.9962	2.000E+01	minute	1.20E+03	4.4347E+07	2.2549E-08			
Fr 213	212.9962	3.460E+01	second	3.46E+01	1.5308E+09	6.5324E-10			
Fr 214	213.9990	5.000E-03	second	5.00E-03	1.0544E+13	9.4843E-14			
Fr 214m	213.9990	3.350E-03	second	3.35E-03	1.5737E+13	6.3545E-14			
Fr 215	215.0003	8.600E-08	second	8.60E-08	6.1015E+17	1.6389E-18			
Fr 216	216.0032	7.000E-07	second	7.00E-07	7.4614E+16	1.3402E-17			
Fr 217	217.0046	2.200E-05	second	2.20E-05	2.3631E+15	4.2317E-16			
Fr 218	218.0076	1.000E-03	second	1.00E-03	5.1749E+13	1.9324E-14			
Fr 218m	218.0076	2.200E-02	second	2.20E-02	2.3522E+12	4.2513E-13			
Fr 219	219.0092	2.000E-02	second	2.00E-02	2.5756E+12	3.8825E-13			
Fr 220	220.0123	2.740E+01	second	2.74E+01	1.8715E+09	5.3434E-10			
Fr 221	221.0142	4.900E+00	minute	2.94E+02	1.7362E+08	5.7596E-09	0.037890		
Fr 222	222.0175	1.420E+01	minute	8.52E+02	5.9642E+07	1.6767E-08			
Fr 223	223.0197	2.180E+01	minute	1.31E+03	3.8675E+07	2.5857E-08	0.002850		
Fr 224	224.0232	3.300E+00	minute	1.98E+02	2.5434E+08	3.9317E-09			
Fr 225	225.0256	4.000E+00	minute	2.40E+02	2.0890E+08	4.7870E-09			
Fr 226	226.0293	4.800E+01	second	4.80E+01	1.0398E+09	9.6168E-10			
Fr 227	227.0318	2.470E+00	minute	1.48E+02	3.3531E+08	2.9823E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Fr 228	228.0357	3.900E+01	second	3.90E+01	1.2686E+09	7.8830E-10			
Fr 229	229.0384	5.000E+01	second	5.00E+01	9.8514E+08	1.0151E-09			
Fr 230	230.0425	1.910E+01	second	1.91E+01	2.5676E+09	3.8946E-10			
Fr 231	231.0454	1.750E+01	second	1.75E+01	2.7902E+09	3.5839E-10			
Fr 232	232.0497	5.000E+00	second	5.00E+00	9.7236E+09	1.0284E-10			
Ra 205	205.0062	2.200E-01	second	2.20E-01	2.5014E+11	3.9977E-12			
Ra 206	206.0038	2.400E-01	second	2.40E-01	2.2819E+11	4.3824E-12			
Ra 207	207.0037	1.300E+00	second	1.30E+00	4.1923E+10	2.3853E-11			
Ra 207m	207.0037	5.500E-02	second	5.50E-02	9.9091E+11	1.0092E-12			
Ra 208	208.0018	1.300E+00	second	1.30E+00	4.1722E+10	2.3968E-11			
Ra 209	209.0019	4.600E+00	second	4.60E+00	1.1735E+10	8.5218E-11			
Ra 210	210.0004	3.700E+00	second	3.70E+00	1.4520E+10	6.8872E-11			
Ra 211	211.0009	1.300E+01	second	1.30E+01	4.1129E+09	2.4314E-10			
Ra 212	211.9998	1.300E+01	second	1.30E+01	4.0935E+09	2.4429E-10			
Ra 213	213.0003	2.740E+00	minute	1.64E+02	3.2218E+08	3.1039E-09			
Ra 213m	213.0003	2.100E-03	second	2.10E-03	2.5222E+13	3.9648E-14			
Ra 214	214.0001	2.460E+00	second	2.46E+00	2.1430E+10	4.6663E-11			
Ra 215	215.0027	1.590E-03	second	1.59E-03	3.3002E+13	3.0302E-14			
Ra 216	216.0035	1.820E-07	second	1.82E-07	2.8698E+17	3.4846E-18			
Ra 217	217.0063	1.600E-06	second	1.60E-06	3.2493E+16	3.0776E-17			
Ra 218	218.0071	2.560E-05	second	2.56E-05	2.0215E+15	4.9469E-16			
Ra 219	219.0101	1.000E-02	second	1.00E-02	5.1512E+12	1.9413E-13			
Ra 220	220.0110	1.800E-02	second	1.80E-02	2.8488E+12	3.5103E-13			
Ra 221	221.0139	2.800E+01	second	2.80E+01	1.8231E+09	5.4853E-10			
Ra 222	222.0154	3.800E+01	second	3.80E+01	1.3372E+09	7.4781E-10			
Ra 223	223.0185	1.144E+01	day	9.88E+05	5.1202E+04	1.9531E-05	0.035000		
Ra 224	224.0202	3.660E+00	day	3.16E+05	1.5926E+05	6.2792E-06	0.033720		
Ra 225	225.0236	1.490E+01	day	1.29E+06	3.8945E+04	2.5677E-05	0.000708		
Ra 226	226.0254	1.600E+03	year	5.05E+10	9.8852E-01	1.0116E+00	0.028360		
Ra 227	227.0292	4.220E+01	minute	2.53E+03	1.9626E+07	5.0953E-08			
Ra 228	228.0311	5.750E+00	year	1.81E+08	2.7265E+02	3.6678E-03	0.000069		
Ra 229	229.0348	4.000E+00	minute	2.40E+02	2.0524E+08	4.8723E-09			
Ra 230	230.0371	9.300E+01	minute	5.58E+03	8.7891E+06	1.1378E-07			
Ra 231	231.0412	1.030E+02	second	1.03E+02	4.7408E+08	2.1094E-09			
Ra 232	232.0437	2.500E+02	second	2.50E+02	1.9448E+08	5.1420E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Fr 228	228.0357	3.900E+01	second	3.90E+01	1.2686E+09	7.8830E-10			
Fr 229	229.0384	5.000E+01	second	5.00E+01	9.8514E+08	1.0151E-09			
Fr 230	230.0425	1.910E+01	second	1.91E+01	2.5676E+09	3.8946E-10			
Fr 231	231.0454	1.750E+01	second	1.75E+01	2.7902E+09	3.5839E-10			
Fr 232	232.0497	5.000E+00	second	5.00E+00	9.7236E+09	1.0284E-10			
Ra 205	205.0062	2.200E-01	second	2.20E-01	2.5014E+11	3.9977E-12			
Ra 206	206.0038	2.400E-01	second	2.40E-01	2.2819E+11	4.3824E-12			
Ra 207	207.0037	1.300E+00	second	1.30E+00	4.1923E+10	2.3853E-11			
Ra 207m	207.0037	5.500E-02	second	5.50E-02	9.9091E+11	1.0092E-12			
Ra 208	208.0018	1.300E+00	second	1.30E+00	4.1722E+10	2.3968E-11			
Ra 209	209.0019	4.600E+00	second	4.60E+00	1.1735E+10	8.5218E-11			
Ra 210	210.0004	3.700E+00	second	3.70E+00	1.4520E+10	6.8872E-11			
Ra 211	211.0009	1.300E+01	second	1.30E+01	4.1129E+09	2.4314E-10			
Ra 212	211.9998	1.300E+01	second	1.30E+01	4.0935E+09	2.4429E-10			
Ra 213	213.0003	2.740E+00	minute	1.64E+02	3.2218E+08	3.1039E-09			
Ra 213m	213.0003	2.100E-03	second	2.10E-03	2.5222E+13	3.9648E-14			
Ra 214	214.0001	2.460E+00	second	2.46E+00	2.1430E+10	4.6663E-11			
Ra 215	215.0027	1.590E-03	second	1.59E-03	3.3002E+13	3.0302E-14			
Ra 216	216.0035	1.820E-07	second	1.82E-07	2.8698E+17	3.4846E-18			
Ra 217	217.0063	1.600E-06	second	1.60E-06	3.2493E+16	3.0776E-17			
Ra 218	218.0071	2.560E-05	second	2.56E-05	2.0215E+15	4.9469E-16			
Ra 219	219.0101	1.000E-02	second	1.00E-02	5.1512E+12	1.9413E-13			
Ra 220	220.0110	1.800E-02	second	1.80E-02	2.8488E+12	3.5103E-13			
Ra 221	221.0139	2.800E+01	second	2.80E+01	1.8231E+09	5.4853E-10			
Ra 222	222.0154	3.800E+01	second	3.80E+01	1.3372E+09	7.4781E-10			
Ra 223	223.0185	1.144E+01	day	9.88E+05	5.1202E+04	1.9531E-05	0.035000		
Ra 224	224.0202	3.660E+00	day	3.16E+05	1.5926E+05	6.2792E-06	0.033720		
Ra 225	225.0236	1.490E+01	day	1.29E+06	3.8945E+04	2.5677E-05	0.000708		
Ra 226	226.0254	1.600E+03	year	5.05E+10	9.8852E-01	1.0116E+00	0.028360		
Ra 227	227.0292	4.220E+01	minute	2.53E+03	1.9626E+07	5.0953E-08			
Ra 228	228.0311	5.750E+00	year	1.81E+08	2.7265E+02	3.6678E-03	0.000069		
Ra 229	229.0348	4.000E+00	minute	2.40E+02	2.0524E+08	4.8723E-09			
Ra 230	230.0371	9.300E+01	minute	5.58E+03	8.7891E+06	1.1378E-07			
Ra 231	231.0412	1.030E+02	second	1.03E+02	4.7408E+08	2.1094E-09			
Ra 232	232.0437	2.500E+02	second	2.50E+02	1.9448E+08	5.1420E-09			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Ra 233	233.0480	3.000E+01	second	3.00E+01	1.6137E+09	6.1971E-10			
Ra 234	234.0505	3.000E+01	second	3.00E+01	1.6067E+09	6.2238E-10			
Ac 208	208.0018	9.500E-02	second	9.50E-02	5.7093E+11	1.7515E-12			
Ac 208m	208.0018	2.500E-02	second	2.50E-02	2.1695E+12	4.6093E-13			
Ac 209	209.0096	1.000E-01	second	1.00E-01	5.3977E+11	1.8526E-12			
Ac 210	210.0093	3.500E-01	second	3.50E-01	1.5349E+11	6.5152E-12			
Ac 211	211.0076	2.500E-01	second	2.50E-01	2.1386E+11	4.6759E-12			
Ac 212	212.0078	9.300E-01	second	9.30E-01	5.7219E+10	1.7477E-11			
Ac 213	213.0066	8.000E-01	second	8.00E-01	6.6205E+10	1.5105E-11			
Ac 214	214.0069	8.200E+00	second	8.20E+00	6.4289E+09	1.5555E-10			
Ac 215	215.0065	1.700E-01	second	1.70E-01	3.0866E+11	3.2398E-12			
Ac 216	216.0087	3.300E-04	second	3.30E-04	1.5827E+14	6.3184E-15			
Ac 216m	216.0087	3.300E-04	second	3.30E-04	1.5827E+14	6.3184E-15			
Ac 217	217.0093	6.900E-08	second	6.90E-08	7.5344E+17	1.3272E-18			
Ac 217m	217.0093	7.400E-07	second	7.40E-07	7.0253E+16	1.4234E-17			
Ac 218	218.0016	1.080E-06	second	1.08E-06	4.7917E+16	2.0869E-17			
Ac 219	219.0124	1.180E-05	second	1.18E-05	4.3654E+15	2.2907E-16			
Ac 220	220.0156	2.610E-02	second	2.61E-02	1.9646E+12	5.0900E-13			
Ac 221	221.0156	5.200E-02	second	5.20E-02	9.8164E+11	1.0187E-12			
Ac 222	222.0178	5.000E+00	second	5.00E+00	1.0163E+10	9.8397E-11			
Ac 222m	222.0178	6.300E+01	second	6.30E+01	8.0658E+08	1.2398E-09			
Ac 223	223.0191	2.100E+00	minute	1.26E+02	4.0148E+08	2.4908E-09			
Ac 224	224.0217	2.900E+00	hour	1.04E+04	4.8238E+06	2.0731E-07			
Ac 225	225.0232	1.000E+01	day	8.64E+05	5.8028E+04	1.7233E-05	0.034340		
Ac 226	226.0261	2.937E+01	hour	1.06E+05	4.7208E+05	2.1183E-06			
Ac 227	227.0277	2.177E+01	year	6.87E+08	7.2321E+01	1.3827E-02	0.000474		
Ac 228	228.0310	6.150E+00	hour	2.21E+04	2.2346E+06	4.4750E-07	0.008038		
Ac 229	229.0329	6.270E+01	minute	3.76E+03	1.3094E+07	7.6373E-08			
Ac 230	230.0360	1.220E+02	second	1.22E+02	4.0200E+08	2.4876E-09			
Ac 231	231.0386	7.500E+00	minute	4.50E+02	1.0851E+08	9.2155E-09			
Ac 232	232.0420	1.190E+02	second	1.19E+02	4.0857E+08	2.4476E-09			
Ac 233	233.0416	1.450E+02	second	1.45E+02	3.3387E+08	2.9952E-09			
Ac 234	234.0484	4.400E+01	second	4.40E+01	1.0955E+09	9.1281E-10			
Th 212	212.0129	3.000E-02	second	3.00E-02	1.7738E+12	5.6378E-13			
Th 213	213.0130	1.400E-01	second	1.40E-01	3.7831E+11	2.6434E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Th 214	214.0115	1.000E-01	second	1.00E-01	5.2716E+11	1.8970E-12			
Th 215	215.0117	1.200E+00	second	1.20E+00	4.3725E+10	2.2870E-11			
Th 216	216.0111	2.800E-02	second	2.80E-02	1.8653E+12	5.3611E-13			
Th 216m	216.0111	1.800E-04	second	1.80E-04	2.9015E+14	3.4464E-15			
Th 217	217.0131	2.520E-04	second	2.52E-04	2.0630E+14	4.8474E-15			
Th 218	218.0133	1.090E-07	second	1.09E-07	4.7475E+17	2.1064E-18			
Th 219	219.0155	1.050E-06	second	1.05E-06	4.9058E+16	2.0384E-17			
Th 220	220.0157	9.700E-06	second	9.70E-06	5.2863E+15	1.8917E-16			
Th 221	221.0182	1.680E-03	second	1.68E-03	3.0384E+13	3.2912E-14			
Th 222	222.0185	2.800E-03	second	2.80E-03	1.8148E+13	5.5102E-14			
Th 223	223.0208	6.000E-01	second	6.00E-01	8.4310E+10	1.1861E-11			
Th 224	224.0215	1.050E+00	second	1.05E+00	4.7962E+10	2.0850E-11			
Th 225	225.0239	8.720E+00	minute	5.23E+02	9.5825E+07	1.0436E-08			
Th 226	226.0249	3.090E+01	minute	1.85E+03	2.6922E+07	3.7144E-08			
Th 227	227.0277	1.872E+01	day	1.62E+06	3.0724E+04	3.2548E-05	0.035970		
Th 228	228.0287	1.913E+00	year	6.04E+07	8.1947E+02	1.2203E-03	0.032140		
Th 229	229.0318	7.340E+03	year	2.32E+11	2.1265E-01	4.7025E+00	0.029020		
Th 230	230.0331	7.538E+04	year	2.38E+12	2.0616E-02	4.8505E+01	0.027650		
Th 231	231.0363	2.552E+01	hour	9.19E+04	5.3151E+05	1.8814E-06	0.001210		
Th 232	232.0381	1.405E+10	year	4.43E+17	1.0965E-07	9.1196E+06	0.023750		
Th 233	233.0416	2.230E+01	minute	1.34E+03	3.6182E+07	2.7638E-08			
Th 234	234.0436	2.410E+01	day	2.08E+06	2.3150E+04	4.3197E-05	0.000149		
Th 235	235.0475	7.100E+00	minute	4.26E+02	1.1267E+08	8.8754E-09			
Th 236	236.0497	3.750E+01	minute	2.25E+03	2.1242E+07	4.7077E-08			
Pa 214	214.0207	1.700E-02	second	1.70E-02	3.1008E+12	3.2250E-13			
Pa 215	215.0191	1.400E-02	second	1.40E-02	3.7478E+12	2.6683E-13			
Pa 216	216.0191	2.000E-01	second	2.00E-01	2.6113E+11	3.8295E-12			
Pa 217	217.0183	4.900E-03	second	4.90E-03	1.0609E+13	9.4258E-14			
Pa 217m	217.0183	1.600E-03	second	1.60E-03	3.2491E+13	3.0778E-14			
Pa 218	218.0200	1.200E-04	second	1.20E-04	4.3122E+14	2.3190E-15			
Pa 219	219.0199	5.300E-08	second	5.30E-08	9.7189E+17	1.0289E-18			
Pa 221	221.0219	5.900E-06	second	5.90E-06	8.6515E+15	1.1559E-16			
Pa 222	222.0237	2.900E-03	second	2.90E-03	1.7522E+13	5.7072E-14			
Pa 223	223.0240	6.500E-03	second	6.50E-03	7.7824E+12	1.2850E-13			
Pa 224	224.0256	9.500E-01	second	9.50E-01	5.3010E+10	1.8864E-11			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pa 225	225.0261	1.700E+00	second	1.70E+00	2.9491E+10	3.3908E-11			
Pa 226	226.0279	1.800E+00	minute	1.08E+02	4.6216E+08	2.1638E-09			
Pa 227	227.0288	3.830E+01	minute	2.30E+03	2.1624E+07	4.6244E-08			
Pa 228	228.0310	2.200E+01	hour	7.92E+04	6.2468E+05	1.6008E-06			
Pa 229	229.0321	1.500E+00	day	1.30E+05	3.8008E+05	2.6310E-06			
Pa 230	230.0345	1.740E+01	day	1.50E+06	3.2623E+04	3.0653E-05			
Pa 231	231.0359	3.276E+04	year	1.03E+12	4.7232E-02	2.1172E+01	0.029700		
Pa 232	232.0386	1.310E+00	day	1.13E+05	4.2957E+05	2.3279E-06			
Pa 233	233.0402	2.697E+01	day	2.33E+06	2.0778E+04	4.8128E-05	0.002360		
Pa 234	234.0433	6.700E+00	hour	2.41E+04	1.9985E+06	5.0038E-07			
Pa 234m	234.0433	1.170E+00	minute	7.02E+01	6.8666E+08	1.4563E-09	0.004950		
Pa 235	235.0454	2.450E+01	minute	1.47E+03	3.2652E+07	3.0626E-08			
Pa 236	236.0487	9.100E+00	minute	5.46E+02	8.7535E+07	1.1424E-08			
Pa 237	237.0511	8.700E+00	minute	5.22E+02	9.1173E+07	1.0968E-08			
Pa 238	238.0545	2.300E+00	minute	1.38E+02	3.4342E+08	2.9119E-09			
U 218	218.0200	1.500E-03	second	1.50E-03	3.4498E+13	2.8988E-14			
U 219	219.0249	4.200E-05	second	4.20E-05	1.2264E+15	8.1539E-16			
U-222	222.0261	1.000E-06	second	1.00E-06	5.0813E+16	1.9680E-17			
U-223	223.0277	1.800E-05	second	1.80E-05	2.8103E+15	3.5584E-16			
U 224	224.0276	9.000E-04	second	9.00E-04	5.5954E+13	1.7872E-14			
U 225	225.0261	9.500E-02	second	9.50E-02	5.2774E+11	1.8949E-12			
U 226	226.0293	5.000E-01	second	5.00E-01	9.9826E+10	1.0017E-11			
U 227	227.0311	1.100E+00	minute	6.60E+01	7.5292E+08	1.3282E-09			
U 228	228.0314	9.100E+00	minute	5.46E+02	9.0613E+07	1.1036E-08			
U 229	229.0335	5.800E+01	minute	3.48E+03	1.4155E+07	7.0648E-08			
U 230	230.0339	2.080E+01	day	1.80E+06	2.7290E+04	3.6643E-05			
U 231	231.0363	4.200E+00	day	3.63E+05	1.3457E+05	7.4313E-06			
U 232	232.0371	6.890E+01	year	2.17E+09	2.2361E+01	4.4721E-02	0.031460		
U 233	233.0396	1.592E+05	year	5.02E+12	9.6358E-03	1.0378E+02	0.028570		
U 234	234.0409	2.455E+05	year	7.75E+12	6.2218E-03	1.6072E+02	0.028290		
U 235	235.0439	7.038E+08	year	2.22E+16	2.1610E-06	4.6274E+05	0.027130		
U 235m	235.0439	2.500E+01	minute	1.50E+03	3.1999E+07	3.1251E-08			
U 236	236.0456	2.342E+07	year	7.39E+14	6.4666E-05	1.5464E+04	0.026620		
U 236m	236.0456	1.210E-07	second	1.21E-07	3.9500E+17	2.5317E-18			
U 237	237.0487	6.750E+00	day	5.83E+05	8.1606E+04	1.2254E-05			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
U 238	238.0508	4.468E+09	year	1.41E+17	3.3611E-07	2.9752E+06	0.024920		
U 239	239.0543	2.345E+01	minute	1.41E+03	3.3542E+07	2.9814E-08			
U 240	240.0566	1.410E+01	hour	5.08E+04	9.2585E+05	1.0801E-06			
U-242	242.0629	1.680E+01	minute	1.01E+03	4.6237E+07	2.1628E-08			
Np 225	225.0339	?	second	?					
Np 226	226.0351	3.100E-02	second	3.10E-02	1.6100E+12	6.2110E-13			
Np 227	227.0350	5.100E-01	second	5.10E-01	9.7435E+10	1.0263E-11			
Np 228	228.0387	5.800E+01	second	5.80E+01	8.5298E+08	1.1724E-09			
Np 229	229.0362	4.000E+00	minute	2.40E+02	2.0524E+08	4.8724E-09			
Np 230	230.0378	4.600E+00	minute	2.76E+02	1.7769E+08	5.6277E-09			
Np 231	231.0382	4.880E+01	minute	2.93E+03	1.6677E+07	5.9962E-08			
Np 232	232.0401	1.470E+01	minute	8.82E+02	5.5125E+07	1.8141E-08			
Np 233	233.0407	3.620E+01	minute	2.17E+03	2.2289E+07	4.4866E-08			
Np 234	234.0429	4.400E+00	day	3.80E+05	1.2680E+05	7.8865E-06			
Np 235	235.0441	3.961E+02	day	3.42E+07	1.4025E+03	7.1300E-04			
Np 236	236.0466	1.540E+05	year	4.86E+12	9.8343E-03	1.0169E+02	0.002000		
Np 236m	236.0466	2.250E+01	hour	8.10E+04	5.9006E+05	1.6948E-06			
Np 237	237.0482	2.140E+06	year	6.75E+13	7.0471E-04	1.4190E+03	0.028790		
Np 237m	237.0482	4.500E-08	second	4.50E-08	1.0576E+18	9.4552E-19			
Np 238	238.0509	2.117E+00	day	1.83E+05	2.5910E+05	3.8595E-06			
Np 239	239.0529	2.357E+00	day	2.04E+05	2.3179E+05	4.3142E-06	0.002530		
Np 240	240.0562	6.190E+01	minute	3.71E+03	1.2654E+07	7.9028E-08			
Np 240m	240.0562	7.220E+00	minute	4.33E+02	1.0849E+08	9.2177E-09			
Np 241	241.0582	1.390E+01	minute	8.34E+02	5.6116E+07	1.7820E-08			
Np 242	242.0616	5.500E+00	minute	3.30E+02	1.4123E+08	7.0805E-09			
Np 242m	242.0616	2.200E+00	minute	1.32E+02	3.5308E+08	2.8322E-09			
Np 243	243.0643	1.850E+00	minute	1.11E+02	4.1815E+08	2.3915E-09			
Np 244	244.0679	2.290E+00	minute	1.37E+02	3.3642E+08	2.9725E-09			
Pu 231	231.0413	?	minute	?	?	#VALUE!			
Pu 232	232.0412	3.410E+01	minute	2.05E+03	2.3763E+07	4.2082E-08			
Pu 233	233.0430	2.090E+01	minute	1.25E+03	3.8605E+07	2.5903E-08			
Pu 234	234.0433	8.800E+00	hour	3.17E+04	1.5216E+06	6.5721E-07			
Pu 235	235.0453	2.530E+01	minute	1.52E+03	3.1619E+07	3.1626E-08			
Pu 236	236.0460	2.858E+00	year	9.02E+07	5.2991E+02	1.8871E-03	0.034180		
Pu 237	237.0484	4.520E+01	day	3.91E+06	1.2187E+04	8.2056E-05			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Pu 237m	237.0484	1.800E-01	second	1.80E-01	2.6440E+11	3.7821E-12			
Pu 237m2	237.0484	8.500E-08	second	8.50E-08	5.5991E+17	1.7860E-18			
Pu 237m3	237.0484	1.100E-06	second	1.10E-06	4.3266E+16	2.3113E-17			
Pu 238	238.0496	8.774E+01	year	2.77E+09	1.7116E+01	5.8426E-02	0.032593		
Pu 238m	238.0496	6.000E-10	second	6.00E-10	7.8987E+19	1.2660E-20			
Pu 238m2	238.0496	6.000E-09	second	6.00E-09	7.8987E+18	1.2660E-19			
Pu 239	239.0522	2.411E+04	year	7.61E+11	6.2026E-02	1.6122E+01	0.030240		
Pu 240	240.0538	6.564E+03	year	2.07E+11	2.2687E-01	4.4077E+00	0.030560		
Pu 240m	240.0538	3.700E-09	second	3.70E-09	1.2702E+19	7.8729E-20			
Pu 241	241.0568	1.435E+01	year	4.53E+08	1.0334E+02	9.6763E-03	0.000032		
Pu 241m	241.0568	2.100E-05	second	2.10E-05	2.2286E+15	4.4871E-16			
Pu 242	242.0587	3.733E+05	year	1.18E+13	3.9562E-03	2.5277E+02	0.029040		
Pu 243	243.0620	4.956E+00	hour	1.78E+04	2.6015E+06	3.8439E-07			
Pu 244	244.0642	8.080E+07	year	2.55E+15	1.8128E-05	5.5164E+04	0.027120		
Pu 245	245.0677	1.050E+01	hour	3.78E+04	1.2179E+06	8.2111E-07			
Pu 246	246.0702	1.084E+01	day	9.37E+05	4.8952E+04	2.0428E-05			
Pu 247	247.0741	2.270E+00	day	1.96E+05	2.3281E+05	4.2953E-06			
Am 232	232.0466	7.900E+01	second	7.90E+01	6.1542E+08	1.6249E-09			
Am 234	234.0478	2.320E+00	minute	1.39E+02	3.4628E+08	2.8878E-09			
Am 237	237.0500	7.300E+01	minute	4.38E+03	1.0866E+07	9.2032E-08			
Am 237m	237.0500	5.000E-09	second	5.00E-09	9.5185E+18	1.0506E-19			
Am 238	238.0520	9.800E+01	minute	5.88E+03	8.0599E+06	1.2407E-07			
Am 239	239.0530	1.190E+01	hour	4.28E+04	1.1016E+06	9.0775E-07			
Am 240	240.0553	5.080E+01	hour	1.83E+05	2.5698E+05	3.8914E-06			
Am 240m	240.0553	9.420E-04	second	9.42E-04	4.9890E+13	2.0044E-14			
Am 241	241.0568	4.322E+02	year	1.36E+10	3.4313E+00	2.9144E-01	0.032830		
Am 241m	241.0568	1.200E-06	second	1.20E-06	3.9001E+16	2.5640E-17			
Am 242	242.0595	1.602E+01	hour	5.77E+04	8.0814E+05	1.2374E-06	0.001160		
Am 242m	242.0595	1.410E+02	year	4.45E+09	1.0474E+01	9.5473E-02	0.000405		
Am 242m2	242.0595	1.400E-02	second	1.40E-02	3.3291E+12	3.0038E-13			
Am 243	243.0614	7.370E+03	year	2.33E+11	1.9956E-01	5.0110E+00	0.031496		
Am 244	244.0643	1.010E+01	hour	3.64E+04	1.2713E+06	7.8660E-07			
Am 244m	244.0643	6.500E-06	second	6.50E-06	7.1115E+15	1.4062E-16			
Am 244m2	244.0643	2.600E+01	minute	1.56E+03	2.9631E+07	3.3748E-08			
Am 245	245.0664	2.050E+00	hour	7.38E+03	6.2379E+06	1.6031E-07			

Radionuclide Specific Data

Isotope	Atomic Mass	Half-life	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Am 246	246.0698	3.900E+01	minute	2.34E+03	1.9593E+07	5.1038E-08			
Am 246m	246.0698	2.500E+01	minute	1.50E+03	3.0565E+07	3.2717E-08			
Am 247	247.0721	2.300E+01	minute	1.38E+03	3.3088E+07	3.0222E-08			
Cm 238	238.0530	2.400E+00	hour	8.64E+03	5.4852E+06	1.8231E-07			
Cm 239	239.0550	2.900E+00	hour	1.04E+04	4.5204E+06	2.2122E-07			
Cm 240	240.0555	2.700E+01	day	2.33E+06	2.0146E+04	4.9638E-05			
Cm 240m	240.0555	1.000E-11	second	1.00E-11	4.6996E+21	2.1278E-22			
Cm 240m2	240.0555	5.500E-08	second	5.50E-08	8.5448E+17	1.1703E-18			
Cm 241	241.0576	3.280E+01	day	2.83E+06	1.6515E+04	6.0552E-05			
Cm 242	242.0588	1.628E+02	day	1.41E+07	3.3135E+03	3.0180E-04	0.035886		
Cm 242m	242.0588	1.800E-07	second	1.80E-07	2.5893E+17	3.8620E-18			
Cm 243	243.0614	2.910E+01	year	9.18E+08	5.0542E+01	1.9786E-02	0.036050		
Cm 244	244.0627	1.810E+01	year	5.71E+08	8.0925E+01	1.2357E-02	0.034370		
Cm 244m	244.0627	3.400E-02	second	3.40E-02	1.3596E+12	7.3554E-13			
Cm 245	245.0655	8.500E+03	year	2.68E+11	1.7162E-01	5.8269E+00	0.033290		
Cm 246	246.0672	4.730E+03	year	1.49E+11	3.0715E-01	3.2558E+00	0.031920		
Cm 247	247.0703	1.560E+07	year	4.92E+14	9.2750E-05	1.0782E+04	0.031190		
Cm 248	248.0723	3.400E+05	year	1.07E+13	4.2384E-03	2.3594E+02	0.027577		
Cm 249	249.0759	6.415E+01	minute	3.85E+03	1.1768E+07	8.4977E-08			
Cm 250	250.0784	9.700E+03	year	3.06E+11	1.4737E-01	6.7856E+00			
Cm 251	251.0823	1.680E+01	minute	1.01E+03	4.4576E+07	2.2434E-08			
Cm 252	252.0849	2.000E+00	day	1.73E+05	2.5899E+05	3.8611E-06			
Bk 238	238.0583	1.440E+02	second	1.44E+02	3.2910E+08	3.0386E-09			
Bk 240	240.0597	4.800E+00	minute	2.88E+02	1.6318E+08	6.1282E-09			
Bk 242	242.0621	7.000E+00	minute	4.20E+02	1.1097E+08	9.0116E-09			
Bk 243	243.0630	4.500E+00	hour	1.62E+04	2.8651E+06	3.4903E-07			
Bk 244	244.0652	4.350E+00	hour	1.57E+04	2.9517E+06	3.3878E-07			
Bk 244m	244.0652	8.200E-07	second	8.20E-07	5.6371E+16	1.7740E-17			
Bk 245	245.0664	4.940E+00	day	4.27E+05	1.0786E+05	9.2715E-06			
Bk 246	246.0687	1.800E+00	day	1.56E+05	2.9480E+05	3.3921E-06			
Bk 247	247.0703	1.380E+03	year	4.36E+10	1.0485E+00	9.5376E-01			
Bk 248	248.0731	9.000E+00	year	2.84E+08	1.6012E+02	6.2454E-03			
Bk 248m	248.0731	2.370E+01	hour	8.53E+04	5.3302E+05	1.8761E-06			
Bk 249	249.0750	3.200E+02	day	2.76E+07	1.6383E+03	6.1040E-04			
Bk 250	250.0783	3.217E+00	hour	1.16E+04	3.8954E+06	2.5672E-07			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Bk 251	251.0808	5.560E+01	minute	3.34E+03	1.3469E+07	7.4244E-08			
Cf 239	239.0626	3.900E+01	second	3.90E+01	1.2100E+09	8.2642E-10			
Cf 240	240.0623	1.060E+00	minute	6.36E+01	7.3892E+08	1.3533E-09			
Cf 241	241.0637	3.780E+00	minute	2.27E+02	2.0635E+08	4.8462E-09			
Cf 242	242.0637	3.490E+00	minute	2.09E+02	2.2257E+08	4.4929E-09			
Cf 243	243.0654	1.070E+01	minute	6.42E+02	7.2297E+07	1.3832E-08			
Cf 244	244.0660	1.940E+01	minute	1.16E+03	3.9711E+07	2.5182E-08			
Cf 245	245.0680	4.500E+01	minute	2.70E+03	1.7050E+07	5.8651E-08			
Cf 246	246.0688	3.570E+01	hour	1.29E+05	3.5674E+05	2.8032E-06			
Cf 247	247.0710	3.110E+00	hour	1.12E+04	4.0784E+06	2.4519E-07			
Cf 248	248.0722	3.335E+02	day	2.88E+07	1.5783E+03	6.3359E-04			
Cf 249	249.0748	3.510E+02	year	1.11E+10	4.0891E+00	2.4455E-01			
Cf 250	250.0764	1.308E+01	year	4.13E+08	1.0929E+02	9.1500E-03			
Cf 251	251.0796	8.980E+02	year	2.83E+10	1.5855E+00	6.3071E-01			
Cf 252	252.0816	2.645E+00	year	8.35E+07	5.3616E+02	1.8651E-03	0.035191		
Cf 253	253.0851	1.781E+01	day	1.54E+06	2.8969E+04	3.4520E-05			
Cf 254	254.0873	6.050E+01	day	5.23E+06	8.4942E+03	1.1773E-04			
Cf 255	255.0910	8.500E+01	minute	5.10E+03	8.6718E+06	1.1532E-07			
Cf 256	256.1074	1.230E+01	minute	7.38E+02	5.9690E+07	1.6753E-08			
Es 242	242.0697	7.000E+00	second	7.00E+00	6.6579E+09	1.5020E-10			
Es 243	243.0696	2.100E+01	second	2.10E+01	2.2102E+09	4.5245E-10			
Es 244	244.0710	3.700E+01	second	3.70E+01	1.2493E+09	8.0046E-10			
Es 245	245.0713	1.100E+00	minute	6.60E+01	6.9749E+08	1.4337E-09			
Es 246	246.0730	7.700E+00	minute	4.62E+02	9.9236E+07	1.0077E-08			
Es 247	247.0737	4.550E+00	minute	2.73E+02	1.6726E+08	5.9788E-09			
Es 248	248.0772	2.700E+01	minute	1.62E+03	2.8072E+07	3.5623E-08			
Es 249	249.0764	1.022E+02	minute	6.13E+03	7.3866E+06	1.3538E-07			
Es 250	250.0787	8.600E+00	hour	3.10E+04	1.4571E+06	6.8628E-07			
Es 250m	250.0787	2.220E+00	hour	7.99E+03	5.6447E+06	1.7716E-07			
Es 251	251.0800	3.300E+01	hour	1.19E+05	3.7822E+05	2.6439E-06			
Es 252	252.0830	4.717E+02	day	4.08E+07	1.0981E+03	9.1064E-04			
Es 253	253.0848	2.047E+01	day	1.77E+06	2.5205E+04	3.9675E-05			
Es 254	254.0880	2.757E+02	day	2.38E+07	1.8640E+03	5.3649E-04			
Es 254m	254.0880	3.930E+01	hour	1.41E+05	3.1383E+05	3.1864E-06			
Es 255	255.0903	3.980E+01	day	3.44E+06	1.2861E+04	7.7752E-05			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Es 256	256.0936	2.540E+01	minute	1.52E+03	2.8906E+07	3.4595E-08			
Es 256m	256.0936	7.600E+00	hour	2.74E+04	1.6101E+06	6.2107E-07			
Fm 242	242.0734	8.000E-04	second	8.00E-04	5.8256E+13	1.7166E-14			
Fm 243	243.0745	1.800E-01	second	1.80E-01	2.5785E+11	3.8782E-12			
Fm 244	244.0741	3.300E-03	second	3.30E-03	1.4007E+13	7.1394E-14			
Fm 245	245.0754	4.200E+00	second	4.20E+00	1.0960E+10	9.1237E-11			
Fm 246	246.0753	1.100E+00	second	1.10E+00	4.1679E+10	2.3993E-11			
Fm 247	247.0768	3.500E+01	second	3.50E+01	1.3046E+09	7.6652E-10			
Fm 247m	247.0768	9.200E+00	second	9.20E+00	4.9631E+09	2.0149E-10			
Fm 248	248.0772	3.600E+01	second	3.60E+01	1.2632E+09	7.9161E-10			
Fm 249	249.0790	2.600E+00	minute	1.56E+02	2.9035E+08	3.4442E-09			
Fm 250	250.0795	3.000E+01	minute	1.80E+03	2.5063E+07	3.9900E-08			
Fm 250m	250.0795	1.800E+00	second	1.80E+00	2.5063E+10	3.9900E-11			
Fm 251	251.0816	5.300E+00	hour	1.91E+04	2.3550E+06	4.2464E-07			
Fm 252	252.0825	2.539E+01	hour	9.14E+04	4.8963E+05	2.0424E-06			
Fm 253	253.0852	3.000E+00	day	2.59E+05	1.7198E+05	5.8147E-06			
Fm 254	254.0868	3.240E+00	hour	1.17E+04	3.8067E+06	2.6270E-07			
Fm 255	255.0900	2.007E+01	hour	7.23E+04	6.1212E+05	1.6337E-06			
Fm 256	256.0918	1.576E+02	minute	9.46E+03	4.6588E+06	2.1465E-07			
Fm 257	257.0951	1.005E+02	day	8.68E+06	5.0536E+03	1.9788E-04			
Fm 258	258.0971	3.700E-04	second	3.70E-04	1.1814E+14	8.4646E-15			
Fm 259	259.1006	1.500E+00	second	1.50E+00	2.9028E+10	3.4450E-11			
Fm 260	260.0000	4.000E-03	second	4.00E-03	1.0848E+13	9.2184E-14			
Md 246	246.0819	1.000E+00	second	1.00E+00	4.5846E+10	2.1812E-11			
Md 247	247.0818	1.120E+00	second	1.12E+00	4.0768E+10	2.4529E-11			
Md 248	248.0829	7.000E+00	second	7.00E+00	6.4965E+09	1.5393E-10			
Md 249	249.0830	2.400E+01	second	2.40E+01	1.8872E+09	5.2988E-10			
Md 250	250.0845	5.200E+01	second	5.20E+01	8.6753E+08	1.1527E-09			
Md 251	251.0849	4.000E+00	minute	2.40E+02	1.8722E+08	5.3414E-09			
Md 252	252.0866	2.300E+00	minute	1.38E+02	3.2430E+08	3.0836E-09			
Md 253	253.0873	6.000E+00	minute	3.60E+02	1.2382E+08	8.0760E-09			
Md 254	254.0897	2.800E+01	minute	1.68E+03	2.6429E+07	3.7837E-08			
Md 255	255.0911	2.700E+01	minute	1.62E+03	2.7300E+07	3.6630E-08			
Md 256	256.0941	7.810E+01	minute	4.69E+03	9.4010E+06	1.0637E-07			
Md 257	257.0955	5.300E+00	hour	1.91E+04	2.2999E+06	4.3481E-07			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Md 258	258.0984	5.150E+01	day	4.45E+06	9.8236E+03	1.0180E-04			
Md 258m	258.0984	5.700E+01	minute	3.42E+03	1.2781E+07	7.8241E-08			
Md 259	259.1005	9.600E+01	minute	5.76E+03	7.5594E+06	1.3229E-07			
Md 260	260.1036	3.180E+01	day	2.75E+06	1.5787E+04	6.3345E-05			
No 250	250.0875	2.500E-04	second	2.50E-04	1.8044E+14	5.5419E-15			
No 251	251.0890	8.000E-01	second	8.00E-01	5.6164E+10	1.7805E-11			
No 252	252.0890	2.300E+00	second	2.30E+00	1.9458E+10	5.1393E-11			
No 253	253.0906	1.700E+00	minute	1.02E+02	4.3702E+08	2.2882E-09			
No 254	254.0909	5.500E+01	second	5.50E+01	8.0728E+08	1.2387E-09			
No 254m	254.0909	2.800E-01	second	2.80E-01	1.5857E+11	6.3062E-12			
No 255	255.0932	3.100E+00	minute	1.86E+02	2.3777E+08	4.2057E-09			
No 256	256.0943	2.910E+00	second	2.91E+00	1.5139E+10	6.6057E-11			
No 257	257.0969	2.500E+01	second	2.50E+01	1.7553E+09	5.6972E-10			
No 258	258.0982	1.200E-03	second	1.20E-03	3.6426E+13	2.7453E-14			
No 259	259.1010	5.800E+01	minute	3.48E+03	1.2512E+07	7.9923E-08			
No 260	260.1026	1.060E-01	second	1.06E-01	4.0919E+11	2.4438E-12			
No 262	262.1075	5.000E-03	second	5.00E-03	8.6085E+12	1.1616E-13			
Lr 253	253.0953	1.300E+00	second	1.30E+00	3.4289E+10	2.9164E-11			
Lr 254	254.0966	1.300E+01	second	1.30E+01	3.4153E+09	2.9280E-10			
Lr 255	255.0968	2.200E+01	second	2.20E+01	2.0102E+09	4.9745E-10			
Lr 256	256.0988	2.800E+01	second	2.80E+01	1.5733E+09	6.3561E-10			
Lr 257	257.0996	6.460E-01	second	6.46E-01	6.7927E+10	1.4722E-11			
Lr 258	258.1019	3.900E+00	second	3.90E+00	1.1208E+10	8.9224E-11			
Lr 259	259.1030	6.100E+00	second	6.10E+00	7.1380E+09	1.4010E-10			
Lr 260	260.1056	1.800E+02	second	1.80E+02	2.4097E+08	4.1500E-09			
Lr 261	261.1069	3.900E+01	minute	2.34E+03	1.8465E+07	5.4157E-08			
Lr 262	262.1097	3.600E+00	hour	1.30E+04	3.3211E+06	3.0110E-07			
Rf 253	253.1007	1.800E+00	second	1.80E+00	2.4763E+10	4.0382E-11			
Rf 254	254.1002	5.000E-04	second	5.00E-04	8.8798E+13	1.1262E-14			
Rf 255	255.1015	1.500E+00	second	1.50E+00	2.9483E+10	3.3918E-11			
Rf 256	256.1012	6.700E-03	second	6.70E-03	6.5749E+12	1.5209E-13			
Rf 257	257.1031	4.700E+00	second	4.70E+00	9.3362E+09	1.0711E-10			
Rf 258	258.1036	1.200E-02	second	1.20E-02	3.6425E+12	2.7454E-13			
Rf 259	259.1056	3.100E+00	second	3.10E+00	1.4046E+10	7.1197E-11			
Rf 260	260.1064	2.010E-02	second	2.01E-02	2.1579E+12	4.6342E-13			

Radionuclide Specific Data

Isotope	Atomic Mass	Half-life	Time Units	$t_{1/2}$, sec	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
Rf 261	261.1088	6.500E+01	second	6.50E+01	6.6472E+08	1.5044E-09			
Rf 262	262.1099	1.200E+00	second	1.20E+00	3.5868E+10	2.7880E-11			
Db 255	255.1074	1.600E+00	second	1.60E+00	2.7640E+10	3.6180E-11			
Db 256	256.1081	2.600E+00	second	2.60E+00	1.6943E+10	5.9023E-11			
Db 257	257.1079	1.300E+00	second	1.30E+00	3.3753E+10	2.9627E-11			
Db 258	258.1094	2.000E+01	second	2.00E+01	2.1855E+09	4.5757E-10			
Db 260	260.1114	1.520E+00	second	1.52E+00	2.8535E+10	3.5045E-11			
Db 261	261.1121	1.800E+00	second	1.80E+00	2.4004E+10	4.1660E-11			
Db 262	262.1142	3.400E+01	second	3.40E+01	1.2659E+09	7.8994E-10			
Db 263	263.1151	2.700E+01	second	2.70E+01	1.5881E+09	6.2970E-10			
Sg 258	258.1132	2.900E-03	second	2.90E-03	1.5072E+13	6.6349E-14			
Sg 259	259.1147	4.800E-01	second	4.80E-01	9.0708E+10	1.1024E-11			
Sg 260	260.1114	3.600E-03	second	3.60E-03	1.2048E+13	8.3001E-14			
Sg 261	261.1162	2.300E-01	second	2.30E-01	1.8785E+11	5.3234E-12			
Sg 263	263.1183	8.000E-01	second	8.00E-01	5.3596E+10	1.8658E-11			
Sg 263m	263.1183	3.100E-01	second	3.10E-01	1.3831E+11	7.2300E-12			
Sg 265	265.1211	1.000E+01	second	1.00E+01	4.2553E+09	2.3500E-10			
Sg 266	266.1219	2.100E+01	second	2.10E+01	2.0187E+09	4.9536E-10			
Bh 261	261.1218	1.180E-02	second	1.18E-02	3.6614E+12	2.7312E-13			
Bh 262	262.1230	1.020E-01	second	1.02E-01	4.2196E+11	2.3699E-12			
Bh 262m	262.1230	8.000E-03	second	8.00E-03	5.3800E+12	1.8587E-13			
Bh 264	264.1247	4.400E-01	second	4.40E-01	9.7077E+10	1.0301E-11			
Hs 264	264.1284	8.500E-04	second	8.50E-04	5.0251E+13	1.9900E-14			
Hs 265	265.1300	9.000E-04	second	9.00E-04	4.7280E+13	2.1151E-14			
Hs 265m	265.1300	1.550E-03	second	1.55E-03	2.7453E+13	3.6426E-14			
Hs 267	267.1318	2.600E-02	second	2.60E-02	1.6243E+12	6.1563E-13			
Hs 269	269.1341	9.000E+00	second	9.00E+00	4.6576E+09	2.1470E-10			
Mt 266	266.1379	3.400E-03	second	3.40E-03	1.2468E+13	8.0206E-14			
Mt 268	268.1388	7.000E-02	second	7.00E-02	6.0106E+11	1.6637E-12			
110-267	267.1440	3.000E-06	second	3.00E-06	1.4077E+16	7.1038E-17			
110-269	269.1451	1.700E-04	second	1.70E-04	2.4657E+14	4.0556E-15			
110-271	271.1461	6.000E-02	second	6.00E-02	6.9346E+11	1.4420E-12			
110-271m	271.1461	1.100E-03	second	1.10E-03	3.7825E+13	2.6437E-14			
110-273	273.1492	1.800E-04	second	1.80E-04	2.2946E+14	4.3581E-15			
110-273m	273.1492	1.200E-01	second	1.20E-01	3.4419E+11	2.9054E-12			

Radionuclide Specific Data

Isotope	Atomic Mass	Halflife	Time Units	$t_{1/2}, \text{sec}$	Curies/ gram	Grams/ Curie	Watts/Ci (Ref.3)	Individual ¹ Fission Product Yield (Ref.4)	Cumulative ¹ Fission Product Yield (Ref.4)
111-272	272.1535	1.500E-03	second	1.50E-03	2.7636E+13	3.6185E-14			
112-277	277.0000	2.400E-04	second	2.40E-04	1.6970E+14	5.8927E-15			
114-287	287.0000	<0.5	second	<0.5					
114-289	289.0000	<0.5	second	<0.5					
116-289	289.0000	<0.5	second	<0.5					
118-293	293.0000	<0.5	second	<0.5					
¹ Fission product yields are for 0.0253 eV neutron on U-235 until Sm when they are 1.0 Mev on U-238. Sum of individual yields = 2. Values are for guidance only.									