UKAEA FUS 487

EURATOM/UKAEA Fusion

The European Activation File: EAF-2003 decay data library

RA Forrest

December 2002

EURATOM/UKAEA Fusion Association

Culham Science Centre
Abingdon
Oxfordshire
OX14 3DB
United Kingdom

Telephone: +44 1235 466586
Facsimile: +44 1235 466435

EASY Documentation Series UKAEA FUS 487

The European Activation File: EAF-2003 decay data library

RA Forrest

EURATOM/UKAEA Fusion Association, Culham Science Centre,
Abingdon, Oxfordshire, OX14 3DB, UK.

Abstract

The European Activation System (EASY) includes, as the source of nuclear data, the European Activation File (EAF). A new version of EAF, EAF-2003, has been developed, and this report gives details of the EAF decay data library. The sources of data and the methods of assembly are described, but the bulk of the report is devoted to a listing of summary properties of all the 1917 nuclides contained in the library.

The summary properties listed are: nuclide spin, decay modes, half-life (with percentage error), mean decay energies and data source.

Contents

Introduction 1
Data sources 2
Library processing 6
Library contents 7
References 36
Acknowledgements 37
Disclaimer 37
Contact person 37

Introduction

The European Activation File (EAF) is a set of libraries of nuclear data that is designed as input to inventory codes (specifically FISPACT) to enable the activation of fusion devices to be calculated. The EAF effort was initially based at ECN Petten and grew from work over 1986 to 1989 on the REAC-ECN libraries 1 - 5 based on the American REAC library. It is important to note that at this time EAF referred only to the neutron-induced cross section library; further details and the history of this element of EAF is covered in the EAF Cross section library report [1]. Initial work in the UK on cross section libraries followed a parallel course with UKACT1 [2], which was also developed from the REAC library, UKACT1 was tailored as an input to FISPACT. To accompany this the decay data library UKDECAY1 [2] was developed based on JEF-1 evaluations, in the ENDF/B-5 format. The UKDECAY libraries continued to be developed to remain compatible with the EAF cross section libraries, but the description and documentation of these libraries remained sparse, as most effort was given to the documentation and development of the cross section libraries and the FISPACT inventory code.

With the release of EAF-4.1 in mid 1995, and the decision to move all activation library development to the EURATOM/UKAEA Fusion Association, the scope of the term EAF was enlarged to cover all the data libraries required as input to FISPACT. Thus the decay data library was termed EAF_DEC-4.1, and this is briefly described in the FISPACT 4 User Manual [3]. A full description of the decay data library was given as part of EASY-99 [4] and EASY-2001 [5], and the purpose of the current report is to update these reports for EASY-2003. This report is now seen as part of the complete documentation of the European Activation System (EASY) for the version released at the beginning of 2003 - EASY-2003 [6].

The report consists of a description of the composition of the library, which relies heavily on existing European evaluations, but also includes original, fusion-funded work to deal with deficiencies in the existing data. The method of compiling the decay library has been further improved by embedding it in the SAFEPAQ-II system [7] that enables more thorough auditing and quality assurance to be applied to library maintenance. Finally a list of each nuclide in EAF_DEC-2003, and a summary of their properties forms the major part of the report and acts as a convenient guide to the contents of the library. Similar information, but in a different format is available to FISPACT users in the **PRINTLIB** output, and the

recommendation, given in the FISPACT-2003 User manual [8], to use this output for reference still holds.

Data sources

The requirement of FISPACT for decay data is that every stable nuclide and every radionuclide that can be formed either directly by a reaction or as a decay daughter of an existing radionuclide needs to be identified (be included in the FISPACT index file) and to have information on half-life, decay modes, decay energies and, if possible, the γ spectrum. For EAF-2003 a total of 1917 nuclides are included, and for the majority the most comprehensive source of data is the set of evaluated files in JEF-2.2. This library of radioactive nuclides [9] was compiled by the NEA Data Bank based on the UK and French national libraries, supplemented by entries from the Evaluated Nuclear Structure Data File (ENSDF). The library is in ENDF/B-6 format (MF = 8, MT = 457) but its main deficiency is the lack of data for stable nuclides. FISPACT is able to read directly the ENDF/B-6 (and ENDF/B-5) formats, and although it does 'process' this in the sense of binning the γ spectrum data and storing the other data in internal arrays, there is no need for a separate file format that the ENDF/B format data needs to be converted into.

To overcome the lack of stable nuclides in JEF-2.2, a file for each stable nuclide was generated (MF = 1, MT = 451 format). Data identifying the nuclide can be entered in this format file, but because no MF = 8, MT = 457 file is possible under the existing ENDF rules it is not possible to include data on the spin and parity. The data for these stable nuclides are trivial (ZA and AWR are the main data) and are extracted from a source such as the Nuclear Wallet Cards [10]. The JEF library was compiled to satisfy the requirements of the nuclear industry, and so concentrates on nuclides relevant to fission power plants. Fusion activation studies require information on a broader range of nuclides and it is therefore found that there are gaps in the JEF-2.2 library. To fill these, standard printed data sources such as Browne and Firestone [11] and the Nuclear Wallet cards are used and converted into ENDF/B format. Using these standard sources there are still nuclides for which some of the required information is missing. In the last resort estimates of the missing quantities were made using the relationships shown below.

β^- decay: if $\langle\gamma\rangle$ not known, $\langle\gamma\rangle = Q_{\beta^-} / 3$ and $\langle\beta\rangle = Q_{\beta^-} / 3$
if $\langle\gamma\rangle$ known, $\langle\beta\rangle = (Q_{\beta^-} - \langle\gamma\rangle) / 2$

ε and β^+ decays: from neighbouring nuclides take typical value of f_β = fraction of decay that is β^+, and define $e = (Q_\varepsilon - 2m_ec^2)$ /

2. Then $\langle\gamma\rangle = (1-f_\beta)e$ and $\langle\beta\rangle = f_\beta e$. If $e < 0$ then assume $\langle\beta\rangle = 0$ and choose $\langle\gamma\rangle$ from available data.

α decay: $\langle\alpha\rangle$ = energy of alpha x branching fraction for α decay.

In these relationships the mean value of a quantity is shown by $\langle\ \rangle$, α, β, γ represent the alpha, beta and gamma energies and the Q-value for a decay is shown by Q.

During the use of previous decay data libraries it was noted that for some nuclides the average γ energy did not agree with the mean energy calculated from the γ spectrum data. In view of these deficiencies and the fact that some existing JEF evaluations do not contain any γ spectrum data, A. Nichols (previously with AEA Technology) has carried out new evaluations over the last six years. The nuclides that have been studied and that are included in EAF_DEC-2003 are given in Table 1. A description of the evaluation work is given in reference 12, the ENDF format files are stored in the libraries UKPADD-n (n = 2, 3, 4, 5, 6, 6.1, 6.2, 6.3) maintained by Serco (previously AEA Technology) [13,14]. These new files have been included in the UKPADD-6.3 library that is used within the UK and will form part of the input to the next version of JEF. UKPADD-6.3 contains all the evaluations made by Nichols for fusion, including ones from UKPADD-6.2 and other recent ones made for BNFL [15]. Differences between EAF_DEC-2001 and EAF_DEC-2003 are indicated in column 3.

Table 1. Nuclides in UKPADD-6.3 for fusion applications

Nuclide	Half-life	Comment
N-17	4.17 s	
Mn-58	1.09 min	
Mn-58m	2.70 s	
Fe-63	6.10 s	New in EAF-2003
Ni-67	21.00 s	New in EAF-2003
Ga-77	13.00 s	
As-82	20.00 s	
As-82m	13.60 s	
Se-79	$1.12\text{x}10^6$ y	
Se-79m	3.90 min	
Rb-89	15.40 min	New in EAF-2003
Sr-87m	2.81 h	
Sr-92	2.71 h	New in EAF-2003
Y-96	5.37 s	
Y-96m	9.62 s	
Y-96n	Shown not to exist	
Nb-100	1.40 s	
Nb-100m	2.90 s	
Mo-103	1.13 min	New in EAF-2003
Tc-97	$2.60\text{x}10^6$ y	
Tc-97m	90.20 d	

Nuclide	Half-life	Comment
Pd-109	13.46 h	
Pd-109m	4.71 m	
Pd-112	20.30 h	
Ag-107m	44.10 s	
Ag-109m	39.80 s	
Ag-114	4.70 s	
Ag-114m	1.50×10^{-3} s	
Ag-115	20.50 m	
Ag-115m	18.60 s	
Cd-107	6.52 h	
In-112	14.70 min	
In-112m	20.70 min	
Sn-110	4.10 h	New in EAF-2003
Te-121	19.16 d	New in EAF-2003
Te-121m	154.00 d	New in EAF-2003
Ba-126	1.67 h	New in EAF-2003
Ba-129	2.38 h	
Ba-129m	2.14 h	
La-137	6.00×10^{4} y	New in EAF-2003
Ce-145	2.95 min	New in EAF-2003
Ce-147	57.00 s	
Pr-143	13.56 d	
Pr-144	17.28 min	
Pr-144m	6.90 min	
Pr-150	6.10 s	
Pm-152	4.12 min	
Pm-152m	7.50 min	
Pm-152n	14.40 min	
Tb-156	5.17 d	
Tb-156m	24.40 h	
Tb-156n	5.10 h	
Ho-160	25.30 min	
Ho-160m	5.00 h	
Ho-160n	2.90 s	
Ho-161	2.48 h	
Ho-161m	6.77 s	
Ho-163	4.57×10^{3} y	New in EAF-2003
Ho-163m	1.10 s	New in EAF-2003
Ho-164	28.60 min	New in EAF-2003
Ho-164m	37.60 min	New in EAF-2003
Ho-170	2.78 min	
Ho-170m	43.00 s	
Er-172	2.05 d	New in EAF-2003
Hf-178m	4.00 s	
Hf-178n	31.00 y	
Hf-180m	5.50 h	
Re-191	9.70 min	
Re-192	6.20 s	
Os-185	93.80 d	
Os-190m	9.90 min	
Os-191m	13.10 h	
Os-195	6.50 min	
Ir-187	10.50 h	New in EAF-2003

Nuclide	Half-life	Comment
Ir-190	12.00 d	
Ir-190m	1.12 h	
Ir-190n	3.09 h	
Ir-191m	4.90 s	New in EAF-2003
Ir-191n	5.50 s	New in EAF-2003
Ir-197	5.80 min	New in EAF-2003
Ir-197m	8.90 min	New in EAF-2003
Pt-193	50.00 y	
Pt-193m	4.34 d	
Pt-197	19.89 h	New in EAF-2003
Pt-197m	1.59 h	New in EAF-2003
Au-197m	7.74 s	New in EAF-2003
Au-199	3.14 d	New in EAF-2003
Hg-190	20.00 min	New in EAF-2003
Hg-199m	42.10 m	
Hg-205	5.20 min	New in EAF-2003
Tl-193	21.80 min	New in EAF-2003
Tl-193m	2.11 min	New in EAF-2003
Pb-201	9.40 h	
Pb-201m	1.02 m	
Bi-208	3.68×10^5 y	
Po-208	2.93 y	

Another source of evaluated files is the US decay data library assembled by F. Mann to accompany the REAC activation library [16]. In most instances these files are not significantly better than files generated from the standard sources for nuclides missing from JEF-2.2, but some of these files have been used during the compilation of EAF_DEC-2003.

An additional feature in FISPACT-97, i.e. inclusion of half-life uncertainties in uncertainty estimation of radiological quantities, placed a new requirement on the decay data library. It was necessary to ensure that the file for each nuclide contains a value for the half-life uncertainty. Many of the existing evaluations contain no value for this quantity, and it was necessary to enter this by hand using either the standard sources or using an estimated value (typically 50% uncertainty).

Another use of the decay data library is to generate a list of the spins and state energies of all isomeric states. This information is required by the SAFEPAQ-II processing code when the splitting of total cross sections between ground and isomeric states is calculated by systematics. The systematic formula requires the spins of both the ground and isomeric states, and to try and ensure consistency between the various EAF libraries these values are taken directly from the decay data library. In many instances the spin data are missing from the evaluations and standard sources were used to fill in the gaps.

The details of the compilation of the library are discussed in the next section, but it can be noted here that in all cases where corrections to the above sources were made, these were done on a copy of the file, not on the original file itself. The sources of data are shown in Table 2, which gives an identification number for each source that is used in the main nuclide listing.

Table 2. Data sources for EAF_DEC-2001

Data source	Source number	Comments
stables	1	Identification information for stable nuclides
ukpadd6.3	2	Collection of recent evaluations by A. Nichols
culham_93	3	New files from standard sources created in 1993
culham_95	4	New files from standard sources created in 1995
culham_96	5	New files from standard sources created in 1996
culham_97	6	Additions and amendments to existing files, or new files from standard sources created for EAF-97
culham_98	7	Additions and amendments to existing files, or new files from standard sources created for EAF-99
culham_01	8	Additions and amendments to existing files, (primarily to AWR) created for EAF-2001
jef22_dec	9	JEF-2.2 library
jef22_dec_cul	10	Additions and amendments to JEF-2.2 files
usdecay_aug93	11	US decay library dated August 1993
ukhedd2.2	12	Collection of evaluations (generally heavy nuclides) by A. Nichols, some have been adopted by JEF-2.2

Library processing

EAF-2003 library processing uses the SAFEPAQ-II code [7]. This has been developed from the SYMPAL [17] and SAFEPAQ [18] applications. In addition to the tasks related to cross section processing, the decay data library management is also handled by SAFEPAQ-II. Details of the use of SAFEPAQ-II for the decay data library processing are described in the User manual. Here only an outline of the processing is given.

The files of decay data are stored in separate folders on a hard disk. A list of all required nuclides with the source of data is constructed; this list is part of the Parameter database and using the interactive tools in SAFEPAQ-II nuclides can be added or deleted and data sources changed - there is no direct editing of the database to introduce errors. Each change is logged so that a record of when changes were made is automatically stored. When a new version of the decay data library is built, SAFEPAQ-II using the list of nuclides, copies the file for each nuclide from the specified source and produces the new library. In addition a database of decay properties is constructed that can be used in the subsequent cross section processing. The database can also be viewed in SAFEPAQ-II and is also used in

the EASY User Interface [8] so that users can view decay data. A new index of nuclides in the correct format for FISPACT and other data libraries are also generated during this processing phase. The list of nuclide information given in the next section was generated by SAFEPAQ-II from the Parameter database. By using tables in Parameter as the basic source of all decay data it is possible to ensure consistency between the various EAF libraries and FISPACT.

The library EAF_DEC-2003 is split into 10 sub-files for ease of handling, FISPACT expects them to be numbered *library_name*.001 - *library_name*.010. Only the final sub-file is terminated by the TEND line. The first sub-file contains an additional two header lines: the first contains an integer value of the number of header lines and the second a description of the library. FISPACT expects this header and it must be present on any decay library used as input. The nuclides at which the splitting into the 10 sub-files occurs is determined by SAFEPAQ-II by reading data from a Table in Parameter. This lists the nuclides that end each sub-file. These nuclides are shown in Table 3.

Table 3. Last nuclides in sub-files of EAF_DEC-2003.

Sub-file	Last nuclide in sub-file
1	Br- 86
2	Ru-111
3	Sn-131m
4	Cs-140
5	Eu-160
6	Tm-176
7	Re-195
8	Tl-210
9	Ac-234

Library contents

The contents of EAF_DEC-2003 is listed below. Column 1 shows the ID of the nuclide as used in FISPACT, column 2 is the nuclide name, column 3 is the nuclide spin, column 4 shows the decay modes, column 5 is the nuclide half-life, column 6 the uncertainty in the half-life, column 7 is the heavy particle energy (mean α), column 8 is the light particle energy (mean β), column 9 is the photon energy (mean γ) and column 10 is the data source number. To aid readability zero values in columns 4 - 9 are replaced by blanks. The key to symbols is given at the end of the listing.

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1	H-1	0.5							1
2	H-2	1.0							1
3	H-3	0.5	β^-	12.330 y	0.16		5.7074E+03		2
4	He-3	0.5							1
5	He-4	0.0							1
6	He-6	0.0	β^-	0.808 s	0.25		1.5613E+06	5.6441E+03	2
7	Li-5	1.5	p	3.00E-22 s	83.33	1.9669E+00			6
8	Li-6	1.0							1
9	Li-7	1.5							1
10	Li-8	2.0	β^-,α	0.838 s	0.72	3.1253E+06	6.2046E+06	3.2983E+04	2
11	Li-9	1.5	β^-:50.5;β^-,n:49.5	0.178 s	0.22		5.6963E+06	2.9896E+04	2
12	Be-6	0.0	p	5.00E-21 s	6.00				6
13	Be-7	1.5	β^+	53.240 d	0.08			4.9296E+04	2
14	Be-8	0.0	α	7.00E-17 s	28.57	9.1898E+04			2
15	Be-9	1.5							1
16	Be-10	0.0	β^-	1.60E+06 y	12.50		2.5221E+05		2
17	Be-11	0.5	β^-:97.0;β^-,α:3.0	13.810 s	0.58	3.6273E+04	4.6473E+06	1.4188E+06	2
18	B-8	2.0	β^+	0.770 s	0.39		5.9870E+00	5.9870E+00	6
19	B-9	1.5	p	8.00E-19 s	37.50	1.8494E-01			6
20	B-10	3.0							1
21	B-11	1.5							1
22	B-12	1.0	β^-:98.42;β^-,α:1.58	0.020 s	0.10	6.6417E+03	6.3084E+06	9.0565E+04	2
23	B-13	1.5	β^-:99.7;β^-,n:0.28	0.017 s	0.98	1.2997E+04	6.2783E+06	3.1353E+05	2
24	C-9	1.5	β^+	0.127 s	0.71		5.4991E+06	5.4991E+06	6
25	C-10	0.0	β^+	19.260 s	0.31		1.2170E+06	7.2270E+05	9
26	C-11	1.5	β^+	20.385 m	0.10		3.8460E+05	1.0195E+06	9
27	C-12	0.0							1
28	C-13	0.5							1
29	C-14	0.0	β^-	5730.121 y	0.70		4.9476E+04		2
30	C-15	0.5	β^-	2.449 s	0.20		2.8562E+06	3.6218E+06	2
31	N-12	1.0	β^+	0.011 s	0.15		7.6000E+06	1.0850E+06	6
32	N-13	0.5	β^+	9.965 m	0.04		4.9011E+05	1.0207E+06	2
33	N-14	1.0							1
34	N-15	0.5							1
35	N-16	2.0	β^-:100.0;β^-,α:~	7.130 s	0.28	2.9699E+01	2.6795E+06	4.6215E+06	2
36	N-17	0.5	β^-:5.0;β^-,n:95.0;β^-,α:~	4.170 s	0.10	9.0113E+05	1.6978E+06	4.4508E+04	2
37	N-18	1.0	β^-	0.630 s	4.76		4.5630E+06	4.5700E+06	6
38	O-14	0.0	β^+	1.177 m	0.03		7.7700E+05	3.3189E+06	9
39	O-15	0.5	β^+	2.037 m	0.13		7.3440E+05	1.0208E+06	9
40	O-16	0.0							1
41	O-17	2.5							1
42	O-18	0.0							1
43	O-19	2.5	β^-	26.910 s	0.30		1.7096E+06	1.0046E+06	2
44	O-20	0.0	β^-	13.570 s	0.74		1.1990E+06	1.0350E+06	9
45	F-17	2.5	β^+	1.075 m	0.37		7.3900E+05	1.0200E+06	6
46	F-18	1.0	β^+	1.828 h	0.09		2.4149E+05	9.8727E+05	2
47	F-19	0.5							1
48	F-20	2.0	β^-	11.030 s	0.27		2.4673E+06	1.6447E+06	2
49	F-21	2.5	β^-	4.320 s	0.69		2.4400E+06	3.5000E+05	9
50	F-22	4.0	β^-	4.240 s	0.94		2.3600E+06	5.7500E+06	6
51	F-23	1.5	β^-	2.230 s	6.28		8.0000E+06	2.1200E+06	6
52	Ne-18	0.0	β^+	1.672 s	0.30		1.5040E+06	1.1060E+06	9
53	Ne-19	0.5	β^+	17.220 s	0.12		9.6330E+05	1.0220E+06	9
54	Ne-20	0.0							1
55	Ne-21	1.5							1
56	Ne-22	0.0							1
57	Ne-23	2.5	β^-	37.200 s	0.54		1.8901E+06	1.7279E+05	2
58	Ne-24	0.0	β^-	3.380 m	0.59		8.0200E+05	5.4200E+05	9
59	Ne-25	0.5	β^-	0.602 s	1.33		3.5000E+06	3.2400E+05	6
60	Na-20	2.0	β^+	0.446 s	0.67		4.7600E+06	2.3510E+06	6
61	Na-21	1.5	β^+	22.490 s	0.18		1.1020E+06	1.0370E+06	9
62	Na-22	3.0	β^+	2.603 y	0.12		1.9576E+05	2.1989E+06	2
63	Na-23	1.5							1
64	Na-24	4.0	β^-	14.965 h	0.03		5.5360E+05	4.1222E+06	2
65	Na-24m	1.0	β^-:0.5;IT:99.5	0.020 s	0.50		1.3769E+04	4.7000E+05	2
66	Na-25	2.5	β^-	59.600 s	1.17		1.4965E+06	4.3690E+05	2
67	Na-26	3.0	β^-	1.080 s	0.93		3.3295E+06	2.1803E+06	2
68	Na-27	2.5	β^-	0.304 s	2.30		3.7000E+06	1.0800E+06	6
69	Na-28	1.0	β^-	0.031 s	1.31		6.1000E+06	1.1400E+06	6
70	Mg-22	0.0	β^+	3.857 s	0.23		1.3690E+06	1.7220E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
71	Mg-23	1.5	β^+	11.317 s	0.10		1.3380E+06	1.0580E+06	9
72	Mg-24	0.0							1
73	Mg-25	2.5							1
74	Mg-26	0.0							1
75	Mg-27	0.5	β^-	9.458 m	0.13		6.9962E+05	8.9499E+05	2
76	Mg-28	0.0	β^-	20.900 h	0.14		1.9786E+05	1.3800E+06	2
77	Mg-29	1.5	β^-	1.300 s	9.23		2.6000E+06	1.8600E+06	9
78	Al-24	4.0	β^+	2.066 s	0.48		1.9900E+06	9.5000E+06	6
79	Al-24m	1.0	β^+:7.0;IT:93.0	0.130 s	3.08		4.4000E+05	5.3800E+05	9
80	Al-25	2.5	β^+	7.183 s	0.17		1.4536E+06	1.0352E+06	9
81	Al-26	5.0	β^+	7.20E+05 y	4.17		4.4615E+05	2.6781E+06	2
82	Al-26m	0.0	β^+	6.345 s	0.09		1.4338E+06	1.0261E+06	2
83	Al-27	2.5							1
84	Al-28	3.0	β^-	2.241 m	0.13		1.2376E+06	1.7829E+06	2
85	Al-29	2.5	β^-	6.560 m	0.91		9.7276E+05	1.3809E+06	2
86	Al-30	3.0	β^-	3.650 s	1.64		2.2902E+06	3.5124E+06	2
87	Al-31	?	β^-	0.640 s	4.69		2.6166E+06	3.2600E+06	9
88	Al-32	1.0	β^-	0.033 s	12.12		5.9000E+06	2.3297E+05	6
89	Si-26	0.0	β^+	2.210 s	0.95		1.6190E+06	1.2570E+06	9
90	Si-27	2.5	β^+	4.170 s	0.24		1.7154E+06	1.0265E+06	9
91	Si-28	0.0							1
92	Si-29	0.5							1
93	Si-30	0.0							1
94	Si-31	1.5	β^-	2.620 h	0.38		5.9375E+05	2.1724E+03	2
95	Si-32	0.0	β^-	330.007 y	12.12		6.4675E+04		2
96	Si-33	?	β^-	6.180 s	2.91		2.0000E+06	2.3000E+06	9
97	Si-34	0.0	β^-	2.770 s	7.22		7.0000E+05	1.5900E+06	9
98	P-28	3.0	β^+	0.270 s	0.18		4.5600E+06	4.6200E+06	6
99	P-29	0.5	β^+	4.140 s	0.34		1.7709E+06	2.4000E+06	9
100	P-30	1.0	β^+	2.498 m	0.16		1.4354E+06	1.0221E+06	9
101	P-31	0.5							1
102	P-32	1.0	β^-	14.270 d	0.28		6.9292E+05	1.7104E+03	2
103	P-33	0.5	β^-	25.400 d	0.39		7.6573E+04		2
104	P-34	1.0	β^-	12.400 s	0.81		2.2846E+06	3.4748E+05	2
105	P-35	0.5	β^-	47.300 s	1.48		1.0600E+06	1.5789E+06	9
106	P-36	?	β^-	5.600 s	5.36		1.8700E+06	6.2820E+06	9
107	S-30	?	β^+	1.178 s	0.42		2.0840E+06	1.6080E+06	9
108	S-31	0.5	β^+	2.572 s	0.51		1.9961E+06	1.0381E+06	9
109	S-32	0.0							1
110	S-33	1.5							1
111	S-34	0.0							1
112	S-35	1.5	β^-	87.500 d	0.46		4.8832E+04		2
113	S-36	0.0							1
114	S-37	3.5	β^-	4.990 m	0.40		7.9324E+05	2.9369E+06	2
115	S-38	0.0	β^-	2.839 h	0.49		4.9000E+05	1.7000E+06	9
116	S-39	3.5	β^-	11.500 s	4.35		2.2700E+06	1.7800E+06	9
117	S-40	0.0	β^-	9.000 s	24.44		1.6700E+06	1.6700E+06	6
118	Cl-32	1.0	β^+	0.298 s	0.67		3.8100E+06	4.3100E+06	6
119	Cl-33	1.5	β^+	2.511 s	0.12		2.0820E+06	1.0480E+06	6
120	Cl-34	0.0	β^+	1.526 s	0.20		2.0438E+06	1.0292E+06	2
121	Cl-34m	3.0	β^+:52.0;IT:48.0	32.100 m	0.31		4.4140E+05	1.9791E+06	2
122	Cl-35	1.5							1
123	Cl-36	2.0	β^-:98.1;β^+:1.9	3.07E+05 y	0.98		2.4609E+05	2.7180E+01	2
124	Cl-37	1.5							1
125	Cl-38	2.0	β^-	37.200 m	0.27		1.5230E+06	1.4937E+06	2
126	Cl-38m	5.0	IT	0.715 s	0.42		4.2949E+02	6.7130E+05	2
127	Cl-39	1.5	β^-	55.600 m	0.36		8.2300E+05	1.4500E+06	9
128	Cl-40	2.0	β^-	1.350 m	1.48		1.5700E+06	4.0400E+06	9
129	Cl-41	?	β^-	34.000 s	8.82		1.5200E+06	1.8900E+06	9
130	Cl-42	?	β^-	6.800 s	4.41		3.3333E+06	3.3333E+06	9
131	Ar-34	0.0	β^+	0.845 s	0.47		2.2890E+06	1.1050E+06	9
132	Ar-35	1.5	β^+	1.775 s	0.23		2.2655E+06	1.0495E+06	9
133	Ar-36	0.0							1
134	Ar-37	1.5	β^+	35.040 d	0.29		2.3554E+03	3.2353E+02	2
135	Ar-38	0.0							1
136	Ar-39	3.5	β^-	269.006 y	3.35		2.1865E+05		2
137	Ar-40	0.0							1
138	Ar-41	3.5	β^-	1.827 h	0.36		4.6360E+05	1.2845E+06	2
139	Ar-42	0.0	β^-	33.001 y	6.06		2.3282E+05		2
140	Ar-43	?	β^-	5.367 m	1.24		1.3900E+06	1.5400E+06	9
141	Ar-44	0.0	β^-	11.867 m	0.42		8.6000E+05	1.8200E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
142	Ar-45	3.5	β^-	21.480 s	0.70		2.0000E+06	2.9800E+06	9
143	Ar-46	0.0	β^-	8.400 s	7.14		1.7300E+06	1.9570E+06	9
144	K-36	2.0	β^+:99.95;β^+,α:~;β^+,p:0.05	0.342 s	0.58	1.5300E+03	3.5000E+06	5.4800E+06	9
145	K-37	1.5	β^+	1.226 s	0.57		2.3470E+06	1.0720E+06	9
146	K-38	3.0	β^+	7.610 m	0.53		1.2013E+06	3.1905E+06	2
147	K-38m	0.0	β^+	0.924 s	0.22		2.3124E+06	1.0306E+06	2
148	K-39	1.5							1
149	K-40	4.0	β^-:89.3;β^+:10.7	1.28E+09 y	0.78		5.2175E+05	1.5720E+05	2
150	K-41	1.5							1
151	K-42	2.0	β^-	12.370 h	0.16		1.4171E+06	2.9638E+05	2
152	K-43	1.5	β^-	22.200 h	0.90		3.0956E+05	9.6616E+05	2
153	K-44	2.0	β^-	22.130 m	0.86		1.4361E+06	2.3913E+06	2
154	K-45	1.5	β^-	17.333 m	3.85		9.9100E+05	1.8600E+06	9
155	K-46	2.0	β^-	1.583 m	5.26		2.3220E+06	2.8700E+06	9
156	K-47	0.5	β^-	17.500 s	1.71		1.8400E+06	2.6240E+06	9
157	K-48	2.0	β^-	6.800 s	2.94		2.7500E+06	6.3100E+06	6
158	Ca-38	0.0	β^+	0.440 s	1.82		2.4300E+06	1.3700E+06	9
159	Ca-39	1.5	β^+	0.860 s	0.16		2.5594E+06	1.0213E+06	6
160	Ca-40	0.0							1
161	Ca-41	3.5	β^+	1.03E+05 y	3.88		2.8431E+03	4.3712E+02	2
162	Ca-42	0.0							1
163	Ca-43	3.5							1
164	Ca-44	0.0							1
165	Ca-45	3.5	β^-	162.700 d	0.25		7.7216E+04	1.1674E-02	2
166	Ca-46	0.0							1
167	Ca-47	3.5	β^-	4.538 d	0.04		3.4461E+05	1.0604E+06	2
168	Ca-48	0.0							1
169	Ca-49	1.5	β^-	8.720 m	0.23		8.6951E+05	3.1671E+06	2
170	Sc-40	4.0	β^+:99.54;β^+,α:0.02;β^+,p:0.44	0.182 s	0.38	1.5600E+03	3.4000E+06	7.1100E+06	6
171	Sc-41	3.5	β^+	0.596 s	0.29		2.5413E+06	1.0220E+06	6
172	Sc-42	0.0	β^+	0.681 s	0.10		2.5068E+06	1.0212E+06	6
173	Sc-42m	7.0	β^+	1.027 m	0.81		1.2546E+06	4.2040E+06	10
174	Sc-43	3.5	β^+	3.892 h	0.36		4.2000E+05	9.8300E+05	9
175	Sc-44	2.0	β^+	3.927 h	0.20		5.9565E+05	2.1365E+06	2
176	Sc-44m	6.0	β^+:1.23;IT:98.77	2.442 d	0.17		3.2820E+04	2.7527E+05	2
177	Sc-45	3.5							1
178	Sc-45m	1.5	IT	0.316 s	2.85		8.6000E+03	6.1000E+02	9
179	Sc-46	4.0	β^-	83.790 d	0.05		1.1224E+05	2.0095E+06	2
180	Sc-46m	1.0	IT	18.700 s	0.37		5.8900E+04	8.2959E+04	2
181	Sc-47	3.5	β^-	3.346 d	0.06		1.6253E+05	1.0853E+05	2
182	Sc-48	6.0	β^-	1.820 d	0.21		2.1959E+05	3.3496E+06	2
183	Sc-49	3.5	β^-	57.200 m	0.35		8.1988E+05	3.3403E+03	2
184	Sc-50	5.0	β^-	1.708 m	0.49		1.6241E+06	3.1981E+06	2
185	Sc-50m	2.0	β^-:1.25;IT:98.75	0.350 s	8.57		4.0686E+04	2.6440E+05	2
186	Ti-42	0.0	β^+	0.199 s	3.02		2.6000E+06	1.3900E+06	9
187	Ti-43	3.5	β^+	0.490 s	2.04		2.7280E+06	1.0220E+06	9
188	Ti-44	0.0	β^+	47.216 y	2.68		1.0580E+04	1.3800E+05	9
189	Ti-45	3.5	β^+	3.080 h	0.32		3.7334E+05	8.7185E+05	2
190	Ti-46	0.0							1
191	Ti-47	2.5							1
192	Ti-48	0.0							1
193	Ti-49	3.5							1
194	Ti-50	0.0							1
195	Ti-51	1.5	β^-	5.800 m	0.52		8.6893E+05	3.6456E+05	2
196	Ti-52	0.0	β^-	1.700 m	5.88		7.5100E+05	1.2840E+05	9
197	Ti-53	1.5	β^-	32.700 s	2.75		1.4100E+06	1.9700E+06	9
198	V-44	?	β^+:50.0;β^+,α:50.0	0.090 s	33.33		4.2427E+06	4.2427E+06	10
199	V-45	3.5	β^+	0.539 s	3.34		2.8500E+06	1.0230E+06	9
200	V-46	0.0	β^+	0.422 s	0.05		2.8144E+06	1.0210E+06	6
201	V-47	1.5	β^+	32.600 m	0.92		8.0290E+05	9.9500E+05	9
202	V-48	4.0	β^+	15.974 d	0.02		1.4928E+05	2.9159E+06	2
203	V-49	3.5	β^+	330.000 d	6.06		3.5832E+03	9.4695E+02	2
204	V-50	6.0	β^+	1.49E+17 y	21.28		2.3840E+03	1.0883E+06	9
205	V-51	3.5							1
206	V-52	3.0	β^-	3.745 m	0.13		1.0643E+06	1.4484E+06	2
207	V-53	3.5	β^-	1.620 m	2.47		1.0051E+06	1.0416E+06	2
208	V-54	3.0	β^-	49.800 s	1.00		1.3575E+06	4.0975E+06	2
209	Cr-46	0.0	β^+	0.260 s	23.08		3.0920E+06	1.0220E+06	9
210	Cr-47	1.5	β^+	0.508 s	1.97		3.0100E+06	1.0250E+06	9
211	Cr-48	0.0	β^+	21.561 h	0.14		8.2000E+03	4.3200E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
212	Cr-49	2.5	β^+	41.900 m	0.72		5.9649E+05	1.0472E+06	2
213	Cr-50	0.0							1
214	Cr-51	3.5	β^+	27.706 d	0.03		3.8540E+03	3.2753E+04	2
215	Cr-52	0.0							1
216	Cr-53	1.5							1
217	Cr-54	0.0							1
218	Cr-55	1.5	β^-	3.540 m	0.85		1.0965E+06	4.2428E+03	2
219	Cr-56	0.0	β^-	5.933 m	1.69		6.0700E+05	9.2800E+04	9
220	Cr-57	?	β^-	21.100 s	4.74		1.9000E+06	4.5000E+05	9
221	Cr-58	0.0	β^-	7.000 s	4.29		1.2600E+06	1.2600E+06	6
222	Mn-48	4.0	β^+	0.150 s	1.47		4.1950E+06	4.1950E+06	6
223	Mn-49	2.5	β^+	0.384 s	4.43		3.1400E+06	1.0400E+06	9
224	Mn-50	0.0	β^+	0.283 s	0.14		3.1029E+06	1.0220E+06	6
225	Mn-50m	5.0	β^+	1.750 m	1.71		1.6600E+06	4.7800E+06	9
226	Mn-51	2.5	β^+	46.200 m	0.22		9.3540E+05	9.9770E+05	9
227	Mn-52	6.0	β^+	5.591 d	0.06		7.4200E+04	3.4660E+06	9
228	Mn-52m	2.0	β^+:98.32;IT:1.68	21.100 m	0.95		1.0641E+06	2.4521E+06	9
229	Mn-53	3.5	β^+	3.68E+06 y	5.71		4.0016E+03	1.4222E+03	2
230	Mn-54	3.0	β^+	312.300 d	0.13		4.2093E+03	8.3604E+05	2
231	Mn-55	2.5							1
232	Mn-56	3.0	β^-	2.579 h	0.12		8.2381E+05	1.7007E+06	2
233	Mn-57	2.5	β^-	1.610 m	3.11		1.0972E+06	7.5197E+04	9
234	Mn-58	3.0	β^-	1.087 m	0.77		1.7114E+06	2.3822E+06	2
235	Mn-58m	0.0	β^-	2.700 s	22.22		2.8284E+06	1.2007E+05	2
236	Mn-59	?	β^-	4.600 s	2.17		1.0000E+06	6.8400E+05	9
237	Mn-60	3.0	β^-	1.790 s	5.59		2.7200E+06	2.6900E+06	9
238	Fe-49	0.0							1
239	Fe-50	0.0	β^+	0.150 s	20.00		2.3780E+06	2.3780E+06	6
240	Fe-51	2.5	β^+	0.310 s	1.61		3.2900E+06	1.0340E+06	9
241	Fe-52	0.0	β^+	8.275 h	0.10		1.9300E+05	7.4700E+05	9
242	Fe-52m	12.0	β^+:80.0;IT:20.0	46.000 s	4.35		2.0000E+06	3.6300E+06	9
243	Fe-53	3.5	β^+	8.510 m	0.82		1.1070E+06	1.1843E+06	2
244	Fe-53m	9.5	IT	2.580 m	1.16			3.0347E+06	2
245	Fe-54	0.0							1
246	Fe-55	1.5	β^+	2.735 y	0.80		4.2207E+03	1.6701E+03	2
247	Fe-56	0.0							1
248	Fe-57	0.5							1
249	Fe-58	0.0							1
250	Fe-59	1.5	β^-	44.502 d	0.01		1.1790E+05	1.1892E+06	2
251	Fe-60	0.0	β_m^-	1.50E+06 y	20.00		8.7668E+04		2
252	Fe-61	1.5	β^-	5.980 m	1.00		1.0548E+06	1.3910E+06	9
253	Fe-62	0.0	β^-	1.133 m	2.94		8.4400E+05	5.0610E+05	9
254	Fe-63	2.5	β^-	6.100 s	9.84		2.6043E+06	3.1773E+05	2
255	Fe-64	0.0	β^-	2.000 s	10.00		1.4800E+06	1.4800E+06	6
256	Fe-65	?	β^-	0.400 s	50.00		2.2930E+06	2.2930E+06	6
257	Co-54	0.0	β^+	0.193 s	0.07		3.3992E+06	1.0209E+06	6
258	Co-54m	7.0	β^+	1.480 m	1.35		2.0472E+06	3.9300E+06	10
259	Co-55	3.5	β^+	17.530 h	0.17		4.3658E+05	2.0070E+06	2
260	Co-56	4.0	β^+	77.260 d	0.10		1.2102E+05	3.5898E+06	2
261	Co-57	3.5	β^+	271.791 d	0.03		2.0005E+04	1.2399E+05	2
262	Co-58	2.0	β^+	70.860 d	0.10		3.4311E+04	9.7620E+05	2
263	Co-58m	5.0	IT	8.940 h	1.90		2.3146E+04	1.8226E+03	2
264	Co-59	3.5							1
265	Co-60	5.0	β^-	5.272 y	0.03		9.6708E+04	2.5040E+06	2
266	Co-60m	2.0	β^-:0.25;IT:99.75	10.470 m	0.29		5.6497E+04	6.7907E+03	2
267	Co-61	3.5	β^-	1.650 h	0.30		4.6277E+05	9.0724E+04	6
268	Co-62	2.0	β^-	1.500 m	2.67		1.6137E+06	1.6017E+06	9
269	Co-62m	5.0	β^-:99.0;IT:1.0	13.910 m	0.36		1.0110E+06	2.6982E+06	10
270	Co-63	3.5	β^-	27.400 s	1.82		1.5864E+06	1.1927E+05	9
271	Co-64	1.0	β^-	0.300 s	10.00		3.3169E+06	1.9255E+05	9
272	Co-65	?	β^-	1.250 s	4.00		1.9867E+06	1.9867E+06	9
273	Co-66	3.0	β^-	0.230 s	8.70		3.2200E+06	2.7500E+06	9
274	Ni-55	3.5	β^+	0.189 s	2.65		3.6230E+06	1.0210E+06	9
275	Ni-56	0.0	β^+	6.100 d	0.33		7.0765E+03	1.7207E+06	9
276	Ni-57	1.5	β^+	1.488 d	0.34		1.6212E+05	1.9600E+06	2
277	Ni-58	0.0							1
278	Ni-59	1.5	β^+	7.60E+04 y	6.58		4.6224E+03	2.5439E+03	2
279	Ni-60	0.0							1
280	Ni-61	1.5							1
281	Ni-62	0.0							1
282	Ni-63	0.5	β^-	99.002 y	7.07		1.7139E+04		2

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
283	Ni-64	0.0							1
284	Ni-65	2.5	β^-	2.520 h	0.04		6.2970E+05	5.4993E+05	2
285	Ni-66	0.0	β^-	2.267 d	0.92		6.5239E+04		2
286	Ni-67	0.5	β^-	21.000 s	4.76		1.5232E+06	5.0252E+04	2
287	Ni-68	0.0	β^-	19.000 s	23.68		6.8533E+05	6.8533E+05	6
288	Ni-69	?	β^-	11.400 s	2.63		1.1400E+06	2.7900E+06	9
289	Ni-70	0.0	β^-	0.166 s	90.36		1.3870E+06	1.3870E+06	6
290	Ni-71	?	β^-	1.860 s	18.82		2.3430E+06	2.3430E+06	6
291	Cu-56	4.0	β^+	0.022 s	91.74		4.7650E+06	4.7650E+06	6
292	Cu-57	1.5	β^+	0.233 s	6.87		3.6200E+06	1.0600E+06	9
293	Cu-58	1.0	β^+	3.204 s	0.22		3.3000E+06	1.5400E+06	9
294	Cu-59	1.5	β^+	1.358 m	0.61		1.4900E+06	1.4430E+06	9
295	Cu-60	2.0	β^+	24.383 m	0.41		9.0000E+05	3.9100E+06	9
296	Cu-61	1.5	β^+	3.408 h	0.33		3.1000E+05	8.3000E+05	9
297	Cu-62	1.0	β^+	9.750 m	0.10		1.2829E+06	1.0117E+06	2
298	Cu-63	1.5							1
299	Cu-64	1.0	β^-:38.86;β^+:61.14	12.702 h	0.02		1.2575E+05	1.9056E+05	2
300	Cu-65	1.5							1
301	Cu-66	1.0	β^-	5.100 m	0.20		1.0706E+06	8.1860E+04	2
302	Cu-67	1.5	β^-	2.579 d	0.16		1.5567E+05	1.1541E+05	2
303	Cu-68	1.0	β^-	31.100 s	4.82		1.4700E+06	1.0200E+06	9
304	Cu-68m	6.0	β^-:16.0;IT:84.0	3.750 m	1.33		2.0400E+05	1.1000E+06	9
305	Cu-69	1.5	β^-	3.000 m	3.33		1.0320E+06	2.2200E+05	9
306	Cu-70	1.0	β^-	4.500 s	2.22		2.8000E+06	5.2000E+05	9
307	Cu-70m	5.0	β^-	47.000 s	10.64		1.7400E+06	2.8300E+06	9
308	Cu-71	1.5	β^-	19.500 s	8.21		1.4580E+06	1.2443E+06	6
309	Cu-72	?	β^-	6.600 s	1.52		2.9700E+06	1.9425E+06	9
310	Zn-58	0.0	β^+	0.065 s	13.85		2.8100E+06	2.8100E+06	6
311	Zn-59	1.5	β^+	0.184 s	1.25		3.8000E+06	1.0600E+06	9
312	Zn-60	0.0	β^+	2.383 m	2.10		1.1200E+06	1.5200E+06	9
313	Zn-61	1.5	β^+	1.485 m	0.22		1.8600E+06	1.5300E+06	9
314	Zn-62	0.0	β^+	9.261 h	0.24		3.2000E+04	4.3900E+05	9
315	Zn-63	1.5	β^+	38.400 m	0.26		9.1674E+05	1.1042E+06	2
316	Zn-64	0.0							1
317	Zn-65	2.5	β^+	244.260 d	0.11		6.9841E+03	5.8252E+05	2
318	Zn-66	0.0							1
319	Zn-67	2.5							1
320	Zn-68	0.0							1
321	Zn-69	0.5	β^-	57.000 m	1.75		3.2100E+05	6.1000E+00	9
322	Zn-69m	4.5	β^-:0.03;IT:99.97	13.760 h	0.22		2.2125E+04	4.1659E+05	9
323	Zn-70	0.0							1
324	Zn-71	0.5	β^-	2.450 m	4.08		1.0458E+06	3.1503E+05	9
325	Zn-71m	4.5	β^-:99.95;IT:0.05	3.940 h	1.27		5.3760E+05	1.5742E+06	9
326	Zn-72	0.0	β^-	1.938 d	0.24		1.0260E+05	1.5250E+05	9
327	Zn-73	0.5	β^-	23.500 s	4.26		1.8440E+06	1.1900E+05	10
328	Zn-73m	3.5	β^-:50.0;IT:50.0	5.800 s	13.79		7.4833E+05	8.4608E+05	10
329	Zn-74	0.0	β^-	1.593 m	1.26		8.0000E+05	3.0000E+05	9
330	Zn-75	3.5	β^-	10.200 s	1.96		1.9700E+06	1.8200E+06	9
331	Zn-76	0.0	β^-	5.700 s	5.26		1.3267E+06	1.3267E+06	9
332	Ga-64	0.0	β^+	2.630 m	0.44		1.7900E+06	3.4100E+06	9
333	Ga-65	1.5	β^+	15.200 m	1.32		8.0000E+05	1.1400E+06	9
334	Ga-66	0.0	β^+	9.500 h	0.88		9.9000E+05	2.4600E+06	9
335	Ga-67	1.5	β^+	3.261 d	0.03		3.0000E+04	1.5500E+05	9
336	Ga-68	1.0	β^+	1.127 h	0.04		7.4000E+05	9.4800E+05	9
337	Ga-69	1.5							1
338	Ga-70	1.0	β^-:99.59;β^+:0.41	21.140 m	0.14		6.4400E+05	7.3000E+03	9
339	Ga-71	1.5							1
340	Ga-72	3.0	β^-	14.100 h	0.08		5.0300E+05	2.7070E+06	9
341	Ga-73	1.5	β_g^-:0.88;β_m^-:99.12	4.870 h	0.62		4.8565E+05	2.0158E+05	9
342	Ga-74	3.0	β^-	8.117 m	1.64		1.0000E+06	3.0200E+06	9
343	Ga-74m	1.0	IT	9.500 s	10.53		1.6867E+04	4.2963E+04	9
344	Ga-75	1.5	β_g^-:99.3;β_m^-:0.7	2.170 m	4.61		1.3853E+06	6.7089E+04	9
345	Ga-76	3.0	β^-	27.100 s	0.74		2.0740E+06	2.7952E+06	9
346	Ga-77	1.5	β_m^-	13.000 s	2.31		2.1117E+06	4.5702E+05	2
347	Ge-66	0.0	β^+	2.261 h	2.21		9.9000E+04	6.8500E+05	9
348	Ge-67	?	β^+	18.667 m	2.68		1.1920E+06	1.4400E+06	9
349	Ge-68	0.0	β^+	270.822 d	0.10		4.7400E+03	4.1400E+03	9
350	Ge-69	2.5	β^+	1.627 d	0.28		1.2000E+05	9.5000E+05	9
351	Ge-70	0.0							1
352	Ge-71	0.5	β^+	11.435 d	0.30		4.7900E+03	4.2000E+03	9
353	Ge-72	0.0							1

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
354	Ge-73	4.5							1
355	Ge-73m	0.5	IT	0.500 s	2.20		5.5869E+04	1.1032E+04	9
356	Ge-74	0.0							1
357	Ge-75	0.5	β^-	1.380 h	0.05		4.2117E+05	3.4933E+04	9
358	Ge-75m	3.5	β^-:0.03;IT:99.97	47.700 s	1.47		8.2532E+04	5.6905E+04	9
359	Ge-76	0.0							1
360	Ge-77	3.5	β^-	11.300 h	0.10		6.4300E+05	1.0780E+06	9
361	Ge-77m	0.5	β^-:81.0;IT:19.0	52.900 s	1.13		1.0200E+06	6.6000E+04	9
362	Ge-78	0.0	β^-	1.450 h	1.15		2.3676E+05	2.7806E+05	9
363	Ge-79	0.5	β^-	19.100 s	1.57		1.6300E+06	3.0800E+05	9
364	Ge-79m	3.5	β^-:96.0;IT:4.0	39.000 s	2.56		1.3300E+06	1.7800E+06	9
365	Ge-80	0.0	β^-	29.500 s	1.36		1.0000E+06	4.3000E+05	9
366	Ge-81	4.5	β^-	7.600 s	13.16		1.5800E+06	2.6500E+06	9
367	Ge-81m	0.5	β^-	7.500 s	13.33		2.1858E+06	1.9856E+06	9
368	As-68	?	β^+	2.527 m	0.53		2.0200E+06	3.7300E+06	9
369	As-69	2.5	β^+	15.233 m	1.09		1.1970E+06	1.1410E+06	9
370	As-70	4.0	β^+	52.600 m	0.57		8.4000E+05	4.1900E+06	9
371	As-71	2.5	β^+	2.720 d	0.26		1.1600E+05	5.7700E+05	9
372	As-72	2.0	β^+	1.083 d	0.43		1.0300E+06	1.7800E+06	9
373	As-73	1.5	β^+	80.301 d	0.09		5.7700E+04	1.5870E+04	9
374	As-74	2.0	β^-:34.0;β^+:66.0	17.780 d	0.17		2.6831E+05	7.5966E+05	2
375	As-75	1.5							1
376	As-76	2.0	β^-	1.097 d	0.27		1.0603E+06	4.3330E+05	9
377	As-77	1.5	β_g^-:99.79;β_m^-:0.21	1.618 d	0.13		2.2600E+05	7.9500E+03	9
378	As-78	2.0	β^-	1.512 h	0.22		1.2800E+06	1.3400E+06	9
379	As-79	1.5	β_g^-:1.06;β_m^-:98.94	9.010 m	1.66		8.3000E+05	2.2000E+04	9
380	As-80	1.0	β^-	16.500 s	1.82		2.1700E+06	8.1000E+05	9
381	As-81	1.5	β_g^-:98.7;β_m^-:1.3	33.000 s	6.06		1.5580E+06	1.4600E+05	9
382	As-82	1.0	β^-	20.000 s	5.00		3.1561E+06	3.4310E+05	2
383	As-82m	5.0	β^-	13.600 s	2.21		2.0372E+06	2.9696E+06	2
384	Se-70	0.0	β^+	41.100 m	0.73		4.8000E+05	9.4546E+05	9
385	Se-71	2.5	β^+	4.733 m	1.06		8.8000E+05	1.3000E+06	9
386	Se-72	0.0	β^+	8.403 d	0.96		2.2500E+04	3.4300E+04	9
387	Se-73	4.5	β^+	7.139 h	1.17		3.9000E+05	1.1440E+06	9
388	Se-73m	1.5	β^+:27.4;IT:72.6	39.833 m	3.35		1.6300E+05	2.6400E+05	9
389	Se-74	0.0							1
390	Se-75	2.5	β^+	119.640 d	0.20		1.4650E+04	3.9020E+05	2
391	Se-76	0.0							1
392	Se-77	0.5							1
393	Se-77m	3.5	IT	17.360 s	0.29		7.0800E+04	8.7700E+04	9
394	Se-78	0.0							1
395	Se-79	3.5	β^-	1.12E+06 y	10.71		5.2590E+04		2
396	Se-79m	0.5	IT:99.94;β^-:0.06	3.900 m	0.51		8.1866E+04	1.3961E+04	2
397	Se-80	0.0							1
398	Se-81	0.5	β^-	18.500 m	0.54		6.0796E+05	1.0718E+04	9
399	Se-81m	3.5	β^-:0.06;IT:99.94	57.250 m	0.16		8.5486E+04	1.7795E+04	9
400	Se-82	0.0	β^-	1.39E+20 y	29.55		9.9832E+05	9.9832E+05	9
401	Se-83	4.5	β^-	22.333 m	5.22		6.0000E+05	2.4100E+06	9
402	Se-83m	0.5	β^-	1.168 m	0.57		1.3400E+06	9.5400E+05	9
403	Se-84	0.0	β^-	3.100 m	3.23		5.3600E+05	4.2000E+05	9
404	Se-85	2.5	β^-	31.700 s	2.84		1.6200E+06	2.3800E+06	9
405	Br-72	3.0	β^+	1.310 m	3.05		2.7900E+06	2.9400E+06	9
406	Br-72m	1.0	IT	10.600 s	2.83			1.0110E+05	6
407	Br-73	1.5	β^+	3.400 m	8.82		1.3500E+06	1.5100E+06	9
408	Br-74	0.0	β^+	25.400 m	1.18		1.0600E+06	4.6300E+06	10
409	Br-74m	4.0	β^+	46.000 m	4.35		1.3400E+06	3.9800E+06	9
410	Br-75	1.5	β^+	1.617 h	2.06		5.0000E+05	1.2000E+06	9
411	Br-76	1.0	β^+	16.194 h	1.37		6.5000E+05	2.7800E+06	9
412	Br-76m	4.0	β^+:0.3;IT:99.7	1.310 s	1.53			3.4000E+04	9
413	Br-77	1.5	β^+	2.377 d	0.01		6.0200E+03	3.2100E+05	9
414	Br-77m	4.5	IT	4.283 m	2.33			1.4400E+04	9
415	Br-78	1.0	β^-:0.01;β^+:99.99	6.460 m	0.62		1.0230E+06	1.0330E+06	9
416	Br-79	1.5							1
417	Br-79m	4.5	IT	4.880 s	0.82		4.9995E+04	1.5716E+05	2
418	Br-80	1.0	β^-:91.7;β^+:8.3	17.600 m	0.28		7.2405E+05	7.7004E+04	2
419	Br-80m	5.0	IT	4.410 h	0.23		6.1759E+04	2.4259E+04	2
420	Br-81	1.5							1
421	Br-82	5.0	β^-	1.472 d	0.08		1.4269E+05	2.6380E+06	2
422	Br-82m	2.0	β^-:2.4;IT:97.6	6.090 m	1.15		7.0088E+04	8.1810E+03	2
423	Br-83	1.5	β_g^-:0.03;β_m^-:99.98	2.390 h	0.84		3.1989E+05	7.5029E+03	9
424	Br-84	2.0	β^-	31.800 m	0.26		1.1000E+06	1.7600E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
425	Br-84m	5.0	β^-	6.000 m	3.33		9.1000E+05	2.7700E+06	10
426	Br-85	1.5	β_g^-:0.27;β_m^-:99.73	2.867 m	1.16		1.0500E+06	6.6000E+04	9
427	Br-86	2.0	β^-	55.000 s	1.45		1.9200E+06	3.4200E+06	9
428	Kr-74	0.0	β^+	11.500 m	1.01		7.2000E+05	1.1500E+06	9
429	Kr-75	?	β^+	4.300 m	2.33		1.4100E+06	1.4703E+06	9
430	Kr-76	0.0	β^+	14.806 h	0.75		5.4000E+03	4.2500E+05	9
431	Kr-77	2.5	β^+	1.239 h	0.90		6.1100E+05	1.0200E+06	9
432	Kr-78	0.0							1
433	Kr-79	0.5	β^+	1.460 d	0.29		2.4631E+04	2.5777E+05	2
434	Kr-79m	3.5	IT	50.000 s	6.00		9.0064E+04	3.9801E+04	2
435	Kr-80	0.0							1
436	Kr-81	3.5	β^+	2.10E+05 y	4.76		5.3851E+03	7.3689E+03	2
437	Kr-81m	0.5	β^+:~;IT:100.0	13.200 s	0.76		5.8768E+04	1.3172E+05	2
438	Kr-82	0.0							1
439	Kr-83	4.5							1
440	Kr-83m	0.5	IT	1.830 h	1.09		3.9320E+04	2.4371E+03	2
441	Kr-84	0.0							1
442	Kr-85	4.5	β^-	10.730 y	0.18		2.5065E+05	2.2311E+03	2
443	Kr-85m	0.5	β^-:78.9;IT:21.1	4.480 h	0.18		2.5551E+05	1.5718E+05	2
444	Kr-86	0.0							1
445	Kr-87	4.5	β^-	1.272 h	0.66		1.3500E+06	7.9200E+05	9
446	Kr-88	0.0	β^-	2.840 h	0.70		3.6433E+05	1.9511E+06	9
447	Kr-89	0.0	β^-	3.170 m	0.63		7.7000E+05	3.1300E+06	9
448	Rb-78	0.0	β^+	17.667 m	0.47		1.2300E+06	4.1800E+06	9
449	Rb-78m	4.0	β^+:90.0;IT:10.0	5.733 m	1.16		1.5700E+06	3.2300E+06	9
450	Rb-79	2.5	β^+	22.833 m	2.19		6.8000E+05	1.4350E+06	9
451	Rb-80	1.0	β^+	34.000 s	11.76		2.0400E+06	1.1900E+06	9
452	Rb-81	1.5	β^+	4.576 h	0.11		1.8600E+05	6.4600E+05	9
453	Rb-81m	4.5	β^+:2.3;IT:97.7	30.483 m	0.98		8.2000E+04	3.4000E+04	9
454	Rb-82	1.0	β^+	1.273 m	0.16		1.4120E+06	1.0930E+06	9
455	Rb-82m	5.0	β^+	6.472 h	0.09		9.5000E+04	2.9300E+06	9
456	Rb-83	2.5	β_g^+:25.0;β_m^+:75.0	86.200 d	0.12		8.6362E+03	4.9607E+05	2
457	Rb-84	2.0	β^-:3.2;β^+:96.8	33.500 d	1.79		1.4404E+05	8.8723E+05	2
458	Rb-84m	6.0	IT	20.400 m	0.49		8.0182E+04	3.8288E+05	2
459	Rb-85	2.5							1
460	Rb-86	2.0	β^-:99.99;β^+:~	18.630 d	0.16		6.6579E+05	9.6745E+04	2
461	Rb-86m	6.0	IT	1.017 m	0.33		9.9598E+03	5.4602E+05	2
462	Rb-87	1.5	β^-	4.80E+10 y	2.71		7.8800E+04		9
463	Rb-88	2.0	β^-	17.800 m	0.56		2.0610E+06	6.3729E+05	9
464	Rb-89	1.5	β^-	15.400 m	1.30		9.2924E+05	2.2342E+06	2
465	Rb-90	1.0	β^-	2.550 m	1.96		1.8650E+06	2.1719E+06	9
466	Rb-90m	4.0	β^-:95.7;IT:4.3	4.300 m	1.94		1.2770E+06	3.6900E+06	9
467	Sr-80	0.0	β^+	1.772 h	1.41		2.9000E+04	4.1000E+05	9
468	Sr-81	0.5	β^+	22.300 m	1.79		1.0700E+06	1.5000E+06	9
469	Sr-82	0.0	β^+	25.556 d	0.59		5.0500E+03	7.8800E+03	9
470	Sr-83	3.5	β^+	1.350 d	0.09		1.4899E+05	7.7622E+05	2
471	Sr-83m	0.5	IT	4.950 s	2.42		3.1172E+04	2.2809E+05	2
472	Sr-84	0.0							1
473	Sr-85	4.5	β^+	64.849 d	0.01		9.1627E+03	5.1850E+05	2
474	Sr-85m	0.5	β^+:13.4;IT:86.6	1.127 h	0.07		1.3247E+04	2.1591E+05	2
475	Sr-86	0.0							1
476	Sr-87	4.5							1
477	Sr-87m	0.5	IT:99.7;β^+:0.3	2.808 h	0.21		6.7306E+04	3.2016E+05	2
478	Sr-88	0.0							1
479	Sr-89	2.5	β_g^-:99.99;β_m^-:~	50.520 d	0.16		5.8230E+05	1.2892E+03	2
480	Sr-90	0.0	β^-	28.869 y	0.19		1.9571E+05		2
481	Sr-91	2.5	β_g^-:50.0;β_m^-:50.0	9.520 h	0.63		6.4226E+05	7.0505E+05	9
482	Sr-92	0.0	β^-	2.710 h	0.37		1.7990E+05	1.3810E+06	2
483	Sr-93	0.0	β_g^-:64.4;β_m^-:35.6	7.320 m	1.37		9.5000E+05	1.7600E+06	9
484	Sr-94	0.0	β^-	1.268 m	0.39		8.8000E+05	1.4500E+06	9
485	Sr-95	0.5	β^-	25.100 s	0.36		2.0866E+06	1.3414E+06	9
486	Sr-96	0.0	β^-:99.99;β^-,n:0.01	1.060 s	3.77		2.2700E+06	8.9000E+05	9
487	Y-82	1.0	β^+	9.500 s	3.16		3.1000E+06	1.2600E+06	9
488	Y-83	4.5	β^+	7.083 m	0.94		1.3900E+06	1.4100E+06	9
489	Y-83m	0.5	β^+	2.850 m	0.70		1.3500E+06	1.1700E+06	9
490	Y-84	1.0	β^+	4.600 s	4.35		2.4000E+06	1.2800E+06	9
491	Y-84m	5.0	β^+	40.000 m	2.50		1.2000E+06	3.9700E+06	9
492	Y-85	0.5	β^+	2.681 h	1.87		4.9700E+05	1.2760E+06	9
493	Y-85m	4.5	β^+	4.861 h	2.86		5.7200E+05	1.3540E+06	9
494	Y-86	4.0	β^+	14.739 h	0.15		2.1800E+05	3.5800E+06	9
495	Y-86m	8.0	β^+:0.69;IT:99.31	48.000 m	2.08		2.3100E+04	2.2010E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
496	Y-87	0.5	β^+	3.346 d	0.38		6.7600E+03	4.5800E+05	9
497	Y-87m	4.5	β^+:1.57;IT:98.43	12.889 h	3.23		7.6900E+04	3.0700E+05	9
498	Y-88	4.0	β^+	106.630 d	0.02		6.7692E+03	2.6966E+06	2
499	Y-89	0.5							1
500	Y-89m	4.5	IT	16.050 s	0.25		7.7137E+03	9.0137E+05	2
501	Y-90	2.0	β^-	2.671 d	0.09		9.3035E+05	3.0736E+03	2
502	Y-90m	7.0	IT	3.190 h	0.31		4.8490E+04	6.3365E+05	2
503	Y-91	0.5	β^-	58.700 d	0.17		6.0241E+05	5.0015E+03	2
504	Y-91m	4.5	IT	49.720 m	0.18		2.7991E+04	5.2761E+05	2
505	Y-92	2.0	β^-	3.540 h	0.28		1.4460E+06	2.5252E+05	9
506	Y-93	0.5	β^-	10.100 h	1.98		1.1703E+06	9.2962E+04	9
507	Y-93m	4.5	IT	0.820 s	4.88		8.0198E+04	6.7876E+05	9
508	Y-94	2.0	β^-	19.100 m	2.09		1.7930E+06	9.0000E+05	9
509	Y-95	0.5	β^-	10.300 m	0.97		1.3400E+06	1.0600E+06	9
510	Y-96	0.0	β^-	5.370 s	1.30		3.1793E+06	9.5614E+04	2
511	Y-96m	8.0	β^-	9.620 s	1.56		1.8511E+06	4.4865E+06	2
512	Y-97	0.5	β^-:99.94;β^-,n:0.06	3.700 s	2.70		2.1800E+06	1.6500E+06	9
513	Y-97m	4.5	β^-:99.22;β^-,n:0.08;IT:0.7	1.210 s	2.48		2.3100E+06	1.7600E+06	9
514	Zr-84	0.0	β^+	25.833 m	3.23		9.3332E+05	9.3000E+05	9
515	Zr-85	3.5	β^+	7.860 m	0.51		1.3800E+06	1.5100E+06	9
516	Zr-85m	0.5	IT	10.900 s	2.75			2.9220E+05	9
517	Zr-86	0.0	β^+	16.500 h	0.67		3.0300E+04	2.9500E+05	9
518	Zr-87	4.5	β^+	1.733 h	0.48		7.7000E+05	9.2000E+05	9
519	Zr-87m	0.5	IT	14.000 s	1.43		9.2000E+04	2.3700E+05	9
520	Zr-88	0.0	β^+	83.400 d	0.36		1.6093E+04	3.9181E+05	2
521	Zr-89	4.5	β_g^+:0.13;β_m^+:99.87	3.267 d	0.26		9.2784E+04	2.5388E+05	2
522	Zr-89m	0.5	β^+:6.66;IT:93.34	4.180 m	0.24		3.2738E+04	6.3804E+05	2
523	Zr-90	0.0							1
524	Zr-90m	5.0	IT	0.830 s	0.36			2.3191E+06	9
525	Zr-91	2.5							1
526	Zr-92	0.0							1
527	Zr-93	2.5	β_g^-:2.5;β_m^-:97.5	1.53E+06 y	6.54		1.9131E+04		2
528	Zr-94	0.0							1
529	Zr-95	2.5	β_g^-:98.9;β_m^-:1.1	64.030 d	0.05		1.1803E+05	7.3054E+05	2
530	Zr-96	0.0							1
531	Zr-97	0.5	β_g^-:5.32;β_m^-:94.68	16.900 h	0.30		7.3000E+05	1.9320E+05	9
532	Zr-98	?	β^-	30.700 s	1.30		9.1399E+05		9
533	Zr-99	0.5	β_g^-:62.5;β_m^-:37.5	2.100 s	4.76		1.6000E+06	9.3000E+05	9
534	Nb-86	5.0	β^+	1.467 m	1.14		1.9900E+06	3.7000E+06	9
535	Nb-87	4.5	β^+	2.600 m	3.21		6.0000E+05	1.5000E+06	9
536	Nb-87m	0.5	β^+	3.817 m	2.62		1.6750E+06	1.2110E+06	9
537	Nb-88	8.0	β^+	14.500 m	0.69		1.5000E+06	4.2500E+06	9
538	Nb-88m	4.0	β^+	7.800 m	1.28		1.4800E+06	4.0600E+06	9
539	Nb-89	4.5	β^+	2.033 h	3.28		1.1160E+06	1.3920E+06	9
540	Nb-89m	0.5	β^+	1.100 h	3.03		8.1000E+05	1.9300E+06	9
541	Nb-90	8.0	β^+	14.600 h	0.34		3.5000E+05	4.2100E+06	9
542	Nb-90m	4.0	IT	18.820 s	0.48		3.9400E+04	8.2400E+04	9
543	Nb-91	4.5	β^+	680.016 y	19.12		5.8802E+03	1.2566E+04	2
544	Nb-91m	0.5	IT:97.6;β^+:2.4	60.900 d	0.33		9.3459E+04	3.8033E+04	2
545	Nb-92	7.0	β^+	3.50E+07 y	8.57		7.9320E+03	1.5033E+06	2
546	Nb-92m	2.0	β^+	10.150 d	0.20		6.4474E+03	9.7038E+05	2
547	Nb-93	4.5							1
548	Nb-93m	0.5	IT	16.126 y	0.85		2.8959E+04	1.9547E+03	2
549	Nb-94	6.0	β^-	2.00E+04 y	12.33		1.6828E+05	1.5715E+06	2
550	Nb-94m	3.0	β^-:0.5;IT:99.5	6.260 m	0.16		3.5089E+04	1.2271E+04	2
551	Nb-95	4.5	β^-	34.975 d	0.02		4.4603E+04	7.6435E+05	2
552	Nb-95m	0.5	β^-:3.4;IT:96.6	3.608 d	0.92		1.7365E+05	7.1679E+04	2
553	Nb-96	6.0	β^-	23.350 h	0.21		2.5076E+05	2.4243E+06	9
554	Nb-97	4.5	β^-	1.202 h	0.97		4.6624E+05	6.6738E+05	9
555	Nb-97m	0.5	IT	1.000 m	1.67		1.5010E+04	7.2833E+05	9
556	Nb-98	1.0	β^-	2.800 s	7.14		1.9480E+06	8.4000E+04	9
557	Nb-98m	5.0	β^-	51.300 m	0.78		7.9000E+05	2.7100E+06	9
558	Nb-99	4.5	β^-	14.300 s	1.40		1.6040E+06	1.7500E+05	6
559	Nb-99m	0.5	β^-	2.600 m	7.69		1.4400E+06	7.5300E+05	9
560	Nb-100	1.0	β^-	1.400 s	7.14		2.4432E+06	7.4436E+05	2
561	Nb-100m	4.0	β^-	2.900 s	6.90		2.0473E+06	2.0644E+06	2
562	Mo-88	0.0	β^+	8.000 m	2.50		1.2000E+06	3.0570E+05	9
563	Mo-89	4.5	β^+	2.033 m	5.74		1.9700E+06	1.1940E+06	11
564	Mo-90	0.0	β^+	5.669 h	0.88		1.2230E+05	8.1300E+05	9
565	Mo-91	4.5	β^+	15.490 m	0.06		1.4529E+06	9.7745E+05	9
566	Mo-91m	0.5	β^+:49.9;IT:50.1	1.087 m	1.23		5.5293E+05	1.3909E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
567	Mo-92	0.0							1
568	Mo-93	2.5	β_g^+:15.0;β_m^+:85.0	3011.700 y	18.18		5.6479E+03	1.0941E+04	2
569	Mo-93m	10.5	β^+:0.12;IT:99.88	6.850 h	1.02		1.0722E+05	2.3175E+06	2
570	Mo-94	0.0							1
571	Mo-95	2.5							1
572	Mo-96	0.0							1
573	Mo-97	2.5							1
574	Mo-98	0.0							1
575	Mo-99	0.5	β_g^-:11.9;β_m^-:88.1	2.748 d	0.03		3.9236E+05	1.4676E+05	2
576	Mo-100	0.0							1
577	Mo-101	0.5	β^-	14.600 m	0.68		5.2567E+05	1.4733E+06	9
578	Mo-102	0.0	β^-	11.200 m	2.68		3.6060E+05	1.9067E+04	9
579	Mo-103	1.5	β^-	1.132 m	0.88		1.3163E+06	6.3620E+05	2
580	Mo-104	0.0	β^-	1.000 m	3.33		8.8000E+05	1.7600E+05	9
581	Mo-105	1.5	β^-	36.700 s	4.36		9.8083E+05	2.3930E+06	6
582	Tc-92	8.0	β^+	4.400 m	6.82		1.7600E+06	3.9300E+06	9
583	Tc-93	4.5	β^+	2.750 h	1.82		3.6200E+04	1.3270E+06	9
584	Tc-93m	0.5	β^+:22.2;IT:77.8	43.500 m	2.30		8.3000E+04	7.9600E+05	9
585	Tc-94	7.0	β^+	4.883 h	0.34		4.6200E+04	2.6590E+06	9
586	Tc-94m	2.0	β^+	52.000 m	1.92		7.5500E+05	1.9360E+06	9
587	Tc-95	4.5	β^+	20.000 h	0.56		5.2500E+03	7.9800E+05	9
588	Tc-95m	0.5	β^+:96.0;IT:4.0	60.995 d	3.42		1.4700E+04	7.1900E+05	9
589	Tc-96	7.0	β^+	4.280 d	1.40		8.1682E+03	2.5032E+06	9
590	Tc-96m	4.0	β^+:2.0;IT:98.0	51.500 m	1.94		9.5436E+01	4.5113E+04	10
591	Tc-97	4.5	β^+	2.60E+06 y	15.38		5.6534E+03	1.1679E+04	2
592	Tc-97m	0.5	IT	90.200 d	1.22		8.7044E+04	9.4963E+03	2
593	Tc-98	?	β^-	4.20E+06 y	7.14		1.1900E+05	1.4127E+06	9
594	Tc-99	4.5	β^-	2.11E+05 y	0.52		1.0098E+05	7.0187E-01	2
595	Tc-99m	0.5	β^-:~;IT:100.0	6.010 h	0.17		1.6134E+04	1.2648E+05	2
596	Tc-100	1.0	β^-	15.800 s	0.63		1.3150E+06	8.3000E+04	9
597	Tc-101	4.5	β^-	14.200 m	0.70		4.7696E+05	3.3630E+05	9
598	Tc-102	1.0	β^-	5.280 s	2.84		1.9450E+06	8.0762E+04	9
599	Tc-102m	4.0	β^-:98.0;IT:2.0	4.350 m	1.61		7.7978E+05	2.5247E+06	9
600	Tc-103	2.5	β^-	50.000 s	8.00		8.4756E+05	2.6351E+05	9
601	Tc-104	3.0	β^-	18.400 m	1.63		1.8100E+06	2.2400E+06	6
602	Tc-105	0.0	β^-	7.600 m	2.63		1.2437E+06	4.9147E+05	9
603	Tc-106	0.0	β^-	36.000 s	2.78		2.0879E+06	2.1046E+06	9
604	Ru-94	0.0	β^+	51.833 m	1.29		5.0000E+03	5.2000E+05	9
605	Ru-95	2.5	β^+	1.639 h	0.68		7.6000E+04	1.2430E+06	9
606	Ru-96	0.0							1
607	Ru-97	2.5	β_g^+:99.96;β_m^+:0.04	2.900 d	3.45		1.1994E+04	2.4375E+05	9
608	Ru-98	0.0							1
609	Ru-99	2.5							1
610	Ru-100	0.0							1
611	Ru-101	2.5							1
612	Ru-102	0.0							1
613	Ru-103	1.5	β_g^-:1.15;β_m^-:98.85	39.260 d	0.05		6.6450E+04	4.9768E+05	2
614	Ru-104	0.0							1
615	Ru-105	1.5	β_g^-:72.0;β_m^-:28.0	4.439 h	0.50		4.4000E+05	7.1170E+05	9
616	Ru-106	0.0	β^-	1.008 y	0.33		1.0036E+04		9
617	Ru-107	2.5	β^-	3.750 m	1.33		1.0800E+06	3.4500E+05	9
618	Ru-108	0.0	β^-	4.500 m	4.44		4.6688E+05	4.6186E+04	9
619	Ru-109	2.5	β^-	34.500 s	1.45		1.0400E+06	2.1000E+06	9
620	Ru-109m	5.5	β^-	12.900 s	7.75		1.2700E+06	1.3000E+06	9
621	Ru-110	?	β^-	12.600 s	3.97		8.9800E+05	4.6500E+05	9
622	Ru-111	?	β^-	2.200 s	45.45		2.0000E+06	7.3000E+05	9
623	Rh-96	5.0	β^+	9.900 m	1.01		8.5000E+05	3.9900E+06	9
624	Rh-96m	2.0	β^+:40.0;IT:60.0	1.510 m	1.32		6.0000E+05	1.2200E+06	9
625	Rh-97	4.5	β^+	31.167 m	2.67		5.1000E+05	1.4300E+06	9
626	Rh-97m	0.5	β^+:95.1;IT:4.9	44.333 m	1.88		2.0600E+05	2.2500E+06	9
627	Rh-98	2.0	β^+	8.700 m	2.30		1.3080E+06	1.7380E+06	9
628	Rh-98m	5.0	β^+	3.500 m	8.57		9.9000E+05	2.3400E+06	9
629	Rh-99	0.5	β^+	16.100 d	1.29		5.8000E+04	5.0200E+05	9
630	Rh-99m	4.5	β^+	4.694 h	2.37		3.5200E+04	6.4200E+05	9
631	Rh-100	1.0	β^+	20.806 h	0.53		5.9900E+04	2.7800E+06	9
632	Rh-100m	5.0	β^+:1.7;IT:98.3	4.600 m	4.35		2.9000E+03	4.6300E+04	9
633	Rh-101	0.5	β^+	3.296 y	9.62		2.6400E+04	3.0000E+05	9
634	Rh-101m	4.5	β^+:92.3;IT:7.7	4.340 d	0.24		1.9800E+04	3.0400E+05	9
635	Rh-102	6.0	β^+	2.902 y	1.42		1.2156E+04	2.1221E+06	2
636	Rh-102m	2.0	β^-:20.0;β^+:75.0;IT:5.0	208.000 d	1.92		1.7360E+05	4.9317E+05	2
637	Rh-103	0.5							1

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
638	Rh-103m	3.5	IT	56.115 m	0.02		3.8209E+04	1.7008E+03	2
639	Rh-104	1.0	β^-:99.55;β^+:0.45	42.300 s	0.95		9.8050E+05	1.5022E+04	2
640	Rh-104m	5.0	β^-:0.13;IT:99.87	4.340 m	0.69		8.6203E+04	4.5522E+04	2
641	Rh-105	3.5	β^-	1.474 d	0.14		1.5321E+05	7.8039E+04	2
642	Rh-105m	0.5	IT	40.000 s	25.00		9.5242E+04	3.4598E+04	2
643	Rh-106	1.0	β^-	30.100 s	0.33		1.4013E+06	2.1809E+05	2
644	Rh-106m	6.0	β^-	2.200 h	2.27		3.2163E+05	2.7592E+06	2
645	Rh-107	3.5	β^-	21.700 m	1.84		4.3207E+05	3.1301E+05	9
646	Rh-108	5.0	β^-	5.900 m	3.39		9.1403E+05	2.2653E+06	9
647	Rh-108m	1.0	β^-	16.800 s	2.98		1.8030E+06	5.2910E+05	9
648	Rh-109	2.5	β^-	1.333 m	2.50		8.7689E+05	3.2455E+05	9
649	Rh-110	0.0	β^-	3.000 s	6.67		2.3489E+06	6.6353E+04	9
650	Rh-110m	2.0	β^-	28.500 s	5.26		1.3096E+06	2.1934E+06	9
651	Rh-111	?	β^-	11.000 s	9.09		1.4850E+06	2.0800E+05	9
652	Rh-112	?	β^-	3.800 s	2.63		1.9300E+06	2.6800E+06	9
653	Pd-98	0.0	β^+	17.700 m	1.69		4.0000E+04	4.7000E+05	9
654	Pd-99	2.5	β^+	21.400 m	0.93		4.2400E+05	1.2600E+06	9
655	Pd-100	0.0	β^+	3.634 d	2.55		4.1200E+04	1.0462E+05	9
656	Pd-101	2.5	β^+	8.469 h	0.72		3.0900E+04	3.5400E+05	9
657	Pd-102	0.0							1
658	Pd-103	2.5	β_g^+:0.03;β_m^+:99.97	16.980 d	0.12		5.8831E+03	1.4678E+04	2
659	Pd-104	0.0							1
660	Pd-105	2.5							1
661	Pd-106	0.0							1
662	Pd-107	2.5	β^-	6.50E+06 y	4.62		9.4045E+03		2
663	Pd-107m	5.5	IT	21.300 s	2.35		6.2990E+04	1.5184E+05	2
664	Pd-108	0.0							1
665	Pd-109	2.5	β_g^-:0.05;β_m^-:99.95	13.460 h	0.07		3.5982E+05	1.0507E+03	2
666	Pd-109m	5.5	IT	4.710 m	0.64		7.7489E+04	1.1143E+05	2
667	Pd-110	0.0							1
668	Pd-111	2.5	β_g^-:0.75;β_m^-:99.25	23.400 m	0.85		8.3272E+05	4.4865E+04	9
669	Pd-111m	5.5	β_g^-:7.5;β_m^-:19.5;IT_g:73.0	5.500 h	1.82		1.7330E+05	3.8293E+05	9
670	Pd-112	0.0	β^-	20.300 h	0.99		8.9897E+04	5.2483E+03	2
671	Pd-113	2.5	β_g^-:81.5;β_m^-:18.5	1.550 m	5.38		1.3900E+06	6.8710E+04	9
672	Pd-113m	5.5	IT	1.667 m	50.00			1.0000E+03	6
673	Pd-114	0.0	β^-	2.450 m	4.08		5.3137E+05	2.7332E+04	9
674	Pd-115	?	β_g^-:73.0;β_m^-:27.0	41.000 s	7.32		1.3600E+06	1.4400E+06	9
675	Ag-100	5.0	β^+	2.017 m	4.96		1.4600E+06	3.4100E+06	9
676	Ag-100m	2.0	β^+	2.233 m	5.97		1.5000E+06	2.5800E+06	9
677	Ag-101	4.5	β^+	11.100 m	2.70		7.7000E+05	1.5400E+06	9
678	Ag-101m	0.5	IT	3.100 s	3.23		2.7500E+04	1.4920E+05	9
679	Ag-102	5.0	β^+	12.900 m	2.33		9.6000E+05	3.4100E+06	9
680	Ag-102m	2.0	β^+:51.0;IT:49.0	7.667 m	6.52		4.7000E+05	1.9900E+06	9
681	Ag-103	3.5	β^+	1.094 h	1.27		1.7700E+05	8.4000E+05	9
682	Ag-103m	0.5	IT	5.700 s	5.26		9.5000E+04	3.7700E+04	9
683	Ag-104	5.0	β^+	1.153 h	1.45		9.0000E+04	2.7100E+06	9
684	Ag-104m	2.0	β^+:67.0;IT:33.0	33.500 m	5.97		5.1000E+05	1.2400E+06	9
685	Ag-105	0.5	β^+	41.300 d	0.24		1.9926E+04	5.3041E+05	2
686	Ag-105m	3.5	β^+:0.34;IT:99.66	7.230 m	2.21		2.5339E+04	1.2209E+03	2
687	Ag-106	1.0	β^-:0.5;β^+:99.5	24.000 m	0.42		5.0352E+05	7.0598E+05	2
688	Ag-106m	6.0	β^+	8.460 d	1.18		1.2274E+04	2.7544E+06	2
689	Ag-107	0.5							1
690	Ag-107m	3.5	IT	44.100 s	0.91		8.0670E+04	1.2509E+04	2
691	Ag-108	1.0	β^-:97.1;β^+:2.9	2.400 m	0.83		6.0553E+05	2.2825E+04	2
692	Ag-108m	6.0	β^+:91.3;IT:8.7	418.010 y	3.59		1.6041E+04	1.6301E+06	2
693	Ag-109	0.5							1
694	Ag-109m	3.5	IT	39.800 s	0.50		7.7100E+04	1.1099E+04	2
695	Ag-110	1.0	β^-:99.7;β^+:0.3	24.700 s	0.81		1.1749E+06	3.4774E+04	2
696	Ag-110m	6.0	β^-:98.73;IT:1.27	249.791 d	0.07		6.9019E+04	2.7606E+06	2
697	Ag-111	0.5	β^-	7.450 d	0.13		3.5329E+05	2.6340E+04	2
698	Ag-111m	3.5	β^-:0.5;IT:99.5	1.080 m	1.23		5.6008E+04	6.8782E+03	2
699	Ag-112	2.0	β^-	3.140 h	0.64		1.4204E+06	6.9052E+05	9
700	Ag-113	0.5	β_g^-:98.3;β_m^-:1.7	5.370 h	0.93		7.6136E+05	7.1941E+04	9
701	Ag-113m	3.5	β^-:20.0;IT:80.0	1.145 m	7.28		1.4051E+05	1.2216E+05	9
702	Ag-114	1.0	β^-	4.700 s	2.13		2.0965E+06	2.7179E+05	2
703	Ag-114m	4.0	IT	0.002 s	3.33		1.0188E+05	9.7116E+04	2
704	Ag-115	0.5	β_g^-:88.0;β_m^-:12.0	20.500 m	1.95		7.7923E+05	1.1323E+06	2
705	Ag-115m	3.5	β_g^-:76.7;β_m^-:2.3;IT:21.0	18.600 s	4.30		8.4406E+05	4.5499E+05	2
706	Ag-116	1.0	β^-	2.640 m	1.89		1.5907E+06	2.1073E+06	9
707	Ag-116m	5.0	β^-:98.0;IT:2.0	10.500 s	4.76		1.8650E+06	1.3062E+06	9
708	Cd-102	0.0	β^+	5.500 m	9.09		1.7400E+05	7.8043E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
709	Cd-103	2.5	β^+	7.300 m	1.37		3.4000E+05	2.0800E+06	9
710	Cd-104	0.0	β^+	57.667 m	1.73		2.9000E+04	1.8638E+05	9
711	Cd-105	2.5	β^+	55.500 m	0.72		2.1500E+05	1.2600E+06	9
712	Cd-106	0.0							1
713	Cd-107	2.5	β_g^+:0.06;β_m^+:99.94	6.520 h	0.31		6.2740E+03	2.1241E+04	2
714	Cd-108	0.0							1
715	Cd-109	2.5	β_m^+	1.267 y	0.15		5.7124E+03	1.5146E+04	2
716	Cd-110	0.0							1
717	Cd-111	0.5							1
718	Cd-111m	5.5	IT	48.540 m	0.10		1.0488E+05	2.9167E+05	2
719	Cd-112	0.0							1
720	Cd-113	0.5	β^-	9.30E+15 y	20.43		1.3616E+05		2
721	Cd-113m	5.5	β^-:99.88;IT:0.12	13.700 y	2.19		1.8320E+05	7.1409E+01	2
722	Cd-114	0.0							1
723	Cd-115	0.5	β_g^-:~;β_m^-:100.0	2.225 d	0.07		3.1716E+05	1.9334E+05	2
724	Cd-115m	5.5	β_g^-:99.99;β_m^-:~	44.600 d	0.67		6.0187E+05	3.4264E+04	2
725	Cd-116	0.0							1
726	Cd-117	0.5	β_g^-:8.4;β_m^-:91.6	2.490 h	1.61		4.3080E+05	1.0883E+06	9
727	Cd-117m	5.5	β_g^-:98.6;β_m^-:1.4	3.360 h	1.49		2.0570E+05	2.0385E+06	9
728	Cd-118	?	β^-	50.300 m	0.40		2.4662E+05		9
729	Cd-119	0.5	β_g^-:6.8;β_m^-:93.2	2.690 m	0.74		6.7490E+05	1.6745E+06	9
730	Cd-119m	5.5	β_g^-:98.6;β_m^-:1.4	2.200 m	0.91		5.7609E+05	2.3547E+06	9
731	Cd-120	0.0	β^-	50.800 s	0.41		6.5608E+05	1.7292E+03	9
732	Cd-121	1.5	β_g^-:34.0;β_m^-:66.0	12.500 s	12.00		1.3194E+06	1.7472E+06	9
733	Cd-121m	4.5	β^-	4.800 s	16.67		1.1275E+06	2.2401E+06	9
734	Cd-122	?	β^-	5.780 s	1.56		1.0511E+06	7.1000E+05	9
735	Cd-123	1.5	β_g^-:77.0;β_m^-:23.0	2.200 s	0.91		1.2710E+06	2.8490E+06	6
736	Cd-124	?	β^-	1.000 s	20.00		2.0474E+06	1.1978E+05	9
737	Cd-125	1.5	β_g^-:70.0;β_m^-:30.0	0.700 s	2.86		1.7430E+06	3.1070E+06	6
738	In-106	7.0	β^+	6.200 m	1.61		9.2000E+05	3.5600E+06	9
739	In-106m	3.0	β^+	5.200 m	1.92		1.5500E+06	2.9500E+06	9
740	In-107	4.5	β^+	32.400 m	0.93		3.3000E+05	1.5200E+06	9
741	In-107m	0.5	IT	50.400 s	1.19		3.7300E+04	6.4080E+05	9
742	In-108	6.0	β^+	58.000 m	2.30		1.6700E+05	3.2300E+06	9
743	In-108m	3.0	β^+	39.667 m	2.10		7.0900E+05	2.7600E+06	9
744	In-109	4.5	β^+	4.194 h	2.65		4.7500E+04	6.7100E+05	9
745	In-109m	0.5	IT	1.333 m	6.25		3.7000E+04	6.1030E+05	9
746	In-109n	9.5	IT	0.210 s	4.76			2.1100E+06	10
747	In-110	7.0	β^+	4.889 h	2.27		9.8000E+03	3.1000E+06	9
748	In-110m	2.0	β^+	1.153 h	0.72		6.3000E+05	1.5600E+06	9
749	In-111	4.5	β_g^+:99.99;β_m^+:~	2.805 d	0.02		3.3492E+04	4.0647E+05	2
750	In-111m	0.5	IT	7.900 m	5.06		6.7837E+04	4.6964E+05	2
751	In-112	1.0	β^-:44.0;β^+:56.0	14.700 m	4.76		2.4521E+05	2.9019E+05	2
752	In-112m	4.0	IT	20.700 m	0.48		1.2220E+05	3.4564E+04	2
753	In-113	4.5							1
754	In-113m	0.5	IT	1.658 h	0.06		1.3133E+05	2.6035E+05	2
755	In-114	1.0	β^-:99.5;β^+:0.5	1.198 m	0.14		7.6923E+05	4.3697E+03	2
756	In-114m	5.0	β^+:3.5;IT:96.5	50.000 d	0.40		1.4090E+05	8.8989E+04	2
757	In-115	4.5	β^-	4.41E+14 y	5.67		2.0788E+05		2
758	In-115m	0.5	β^-:5.05;IT:94.95	4.486 h	0.07		1.7099E+05	1.6250E+05	2
759	In-116	1.0	β^-	14.200 s	2.11		1.3567E+06	5.2650E+03	2
760	In-116m	5.0	β^-	54.600 m	0.55		3.1260E+05	2.4908E+06	2
761	In-116n	8.0	IT_m	2.170 s	2.30		9.4116E+04	6.8171E+04	2
762	In-117	4.5	β_g^-:99.68;β_m^-:0.32	43.800 m	1.60		2.6400E+05	6.9200E+05	9
763	In-117m	0.5	β^-:52.9;IT:47.1	1.942 h	0.60		4.3355E+05	9.0905E+04	9
764	In-118	1.0	β^-	5.000 s	6.00		1.7072E+06	3.4711E+05	9
765	In-118m	5.0	β^-	4.450 m	1.12		5.6857E+05	2.7215E+06	9
766	In-118n	8.0	β_g^-:1.5;IT_m:98.5	8.500 s	3.53		1.1059E+05	7.5137E+04	9
767	In-119	4.5	β_g^-:99.07;β_m^-:0.93	2.400 m	4.17		6.1137E+05	7.6634E+05	9
768	In-119m	0.5	β^-:97.5;IT:2.5	18.000 m	1.67		1.0496E+06	1.0958E+04	6
769	In-120	1.0	β^-	3.080 s	2.60		2.3716E+06	3.3142E+05	9
770	In-120m	5.0	β^-	44.400 s	2.25		9.3323E+05	2.9764E+06	9
771	In-120n	8.0	β^-	46.200 s	1.73		1.3000E+06	2.8400E+06	10
772	In-121	4.5	β_g^-:88.0;β_m^-:12.0	23.100 s	2.60		9.7867E+05	9.2996E+05	9
773	In-121m	0.5	β^-:98.8;IT:1.2	3.880 m	2.58		1.5171E+06	6.9157E+04	9
774	In-122	1.0	β^-	1.500 s	20.00		2.5300E+06	6.4000E+05	9
775	In-122m	4.0	β^-	10.000 s	5.00		1.5293E+06	3.0327E+06	9
776	In-122n	8.0	β^-	10.800 s	3.70		1.3000E+06	3.4000E+06	9
777	In-123	4.5	β_g^-:3.5;β_m^-:96.5	5.970 s	1.01		1.3519E+06	1.1064E+06	6
778	In-123m	0.5	β_m^-	47.800 s	1.05		2.0164E+06	6.5494E+04	9
779	In-124	3.0	β^-	3.200 s	9.38		2.1247E+06	2.6981E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
780	In-124m	8.0	β^-	2.400 s	8.33		1.6813E+06	3.8073E+06	9
781	In-125	4.5	β_g^-:88.0;β_m^-:12.0	2.330 s	1.72		1.7520E+06	1.3005E+06	9
782	In-125m	0.5	β_m^-	12.200 s	0.82		2.4193E+06	1.6809E+05	9
783	In-126	3.0	β^-	1.500 s	13.33		2.4331E+06	2.8119E+06	9
784	In-126m	6.0	β^-	1.450 s	15.17		1.8814E+06	4.3144E+06	10
785	Sn-108	0.0	β^+	10.300 m	0.81		2.6000E+04	6.7300E+05	9
786	Sn-109	3.5	β^+	18.000 m	1.11		1.1000E+05	2.3000E+06	9
787	Sn-110	0.0	β_m^+	4.100 h	2.44		1.4169E+04	2.9043E+05	2
788	Sn-111	3.5	β^+	35.300 m	2.27		2.0075E+05	5.0128E+05	9
789	Sn-112	0.0							1
790	Sn-113	0.5	β_g^+:0.01;β_m^+:99.99	115.090 d	0.03		6.2722E+03	2.3254E+04	2
791	Sn-113m	3.5	β^+:8.9;IT:91.1	20.900 m	2.39		5.8576E+04	1.4483E+04	2
792	Sn-114	0.0							1
793	Sn-115	0.5							1
794	Sn-116	0.0							1
795	Sn-117	0.5							1
796	Sn-117m	5.5	IT	13.600 d	0.29		1.5824E+05	1.5634E+05	2
797	Sn-118	0.0							1
798	Sn-119	0.5							1
799	Sn-119m	5.5	IT	293.000 d	0.44		7.8261E+04	1.1361E+04	2
800	Sn-120	0.0							1
801	Sn-121	1.5	β^-	1.121 d	0.37		1.1518E+05		2
802	Sn-121m	5.5	β^-:22.4;IT:77.6	55.001 y	9.09		3.5326E+04	5.0957E+03	2
803	Sn-122	0.0							1
804	Sn-123	5.5	β^-	129.200 d	0.31		5.1990E+05	7.9953E+03	2
805	Sn-123m	1.5	β^-	40.100 m	2.00		4.7546E+05	1.4120E+05	2
806	Sn-124	0.0							1
807	Sn-125	5.5	β^-	9.640 d	0.31		8.0501E+05	3.1610E+05	2
808	Sn-125m	1.5	β^-	9.520 m	0.53		7.9681E+05	3.4703E+05	2
809	Sn-126	0.0	β_m^-:33.2;β_n^-:66.8	2.42E+05 y	5.79		1.0899E+05	5.6236E+04	2
810	Sn-127	5.5	β^-	2.100 h	1.90		4.9003E+05	1.8572E+06	9
811	Sn-127m	1.5	β^-	4.130 m	0.73		1.0008E+06	5.6840E+05	9
812	Sn-128	0.0	β_m^-	59.100 m	0.85		2.5150E+05	5.9946E+05	9
813	Sn-128m	7.0	IT	6.500 s	7.69		7.8000E+04	2.0116E+06	9
814	Sn-129	1.5	β^-	2.400 m	4.17		6.7000E+05	2.4800E+06	6
815	Sn-129m	5.5	β^-:100.0;IT:~	6.900 m	1.45		6.0861E+05	2.4272E+06	6
816	Sn-130	0.0	β_m^-	3.720 m	2.96		8.2000E+05	1.6000E+05	9
817	Sn-130m	7.0	β^-	1.700 m	5.88		4.6000E+05	2.3520E+06	9
818	Sn-131	1.5	β^-	39.000 s	5.13		8.8000E+05	2.3600E+06	9
819	Sn-131m	5.5	β^-	1.020 m	4.90		1.0980E+06	2.3910E+06	6
820	Sb-112	3.0	β^+	51.400 s	1.95		1.7540E+06	2.8200E+06	9
821	Sb-113	2.5	β^+	6.667 m	1.25		7.3000E+05	1.2900E+06	9
822	Sb-114	3.0	β^+	3.490 m	0.86		1.1990E+06	2.7350E+06	9
823	Sb-115	2.5	β^+	32.100 m	0.93		2.3100E+05	8.8600E+05	9
824	Sb-116	3.0	β^+	15.833 m	5.26		4.7000E+05	2.2300E+06	9
825	Sb-116m	8.0	β^+	1.006 h	1.10		1.8500E+05	3.2100E+06	9
826	Sb-117	2.5	β^+	2.800 h	0.40		2.8100E+04	1.8500E+05	9
827	Sb-118	1.0	β^+	3.600 m	2.78		8.7300E+05	8.0300E+05	9
828	Sb-118m	8.0	β^+	5.000 h	0.22		3.1000E+04	2.5800E+06	9
829	Sb-119	2.5	β^+	1.596 d	0.52		2.5972E+04	2.3418E+04	2
830	Sb-120	1.0	β^+	15.900 m	0.63		3.0676E+05	4.6003E+05	2
831	Sb-120m	8.0	β^+	5.760 d	0.52		4.5054E+04	2.4623E+06	2
832	Sb-121	2.5							1
833	Sb-122	2.0	β^-:97.63;β^+:2.37	2.696 d	0.31		5.6467E+05	4.3788E+05	2
834	Sb-122m	8.0	IT	4.190 m	2.15		9.3057E+04	7.0525E+04	2
835	Sb-123	3.5							1
836	Sb-124	3.0	β^-	60.240 d	0.15		3.8174E+05	1.8633E+06	2
837	Sb-124m	5.0	β^-:25.0;IT:75.0	1.550 m	5.38		1.1407E+05	4.3754E+05	2
838	Sb-124n	8.0	IT_m	20.200 m	0.99		2.5771E+04	3.3800E+02	2
839	Sb-125	3.5	β_g^-:76.4;β_m^-:23.6	2.759 y	0.06		1.0109E+05	4.3025E+05	2
840	Sb-126	8.0	β^-	12.410 d	0.40		3.3268E+05	2.7525E+06	2
841	Sb-126m	5.0	IT:14.0;β^-:86.0	19.100 m	1.05		6.2477E+05	1.5760E+06	2
842	Sb-126n	3.0	IT_m	11.000 s	18.18		2.2436E+04	3.7851E+02	2
843	Sb-127	3.5	β_g^-:83.2;β_m^-:16.8	3.840 d	0.78		3.1467E+05	6.5838E+05	2
844	Sb-128	8.0	β^-	9.010 h	0.33		4.2081E+05	3.0921E+06	9
845	Sb-128m	5.0	β^-:96.4;IT:3.6	10.400 m	1.92		9.2119E+05	1.9996E+06	9
846	Sb-129	3.5	β_g^-:83.4;β_m^-:16.6	4.360 h	0.69		3.5483E+05	1.3801E+06	2
847	Sb-129m	9.5	β_g^-:2.0;β_m^-:83.0;IT:15.0	17.700 m	0.56		9.9886E+05	1.4780E+06	2
848	Sb-130	8.0	β^-	40.000 m	2.50		6.9339E+05	3.2637E+06	9
849	Sb-130m	4.0	β^-	6.300 m	3.17		9.9738E+05	2.4907E+06	9
850	Sb-131	3.5	β_g^-:93.2;β_m^-:6.8	23.000 m	8.70		8.3000E+05	1.6950E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
851	Sb-131m	9.5	β_g^-:92.0;β_m^-:8.0	16.700 m	49.90		1.0300E+06	1.0300E+06	6
852	Sb-132	8.0	β^-	4.200 m	2.38		1.3418E+06	2.3630E+06	9
853	Sb-132m	4.0	β^-	2.800 m	3.57		1.2610E+06	2.5281E+06	9
854	Te-114	0.0	β^+	15.167 m	5.49		9.7332E+05	9.7332E+05	9
855	Te-115	3.5	β^+	5.800 m	3.45		5.6100E+05	2.0700E+06	9
856	Te-115m	0.5	β^+	6.700 m	5.97		5.0300E+05	2.4900E+06	9
857	Te-116	0.0	β^+	2.489 h	1.67		5.6000E+04	8.2000E+04	9
858	Te-117	0.5	β^+	1.033 h	3.23		1.9800E+05	1.5400E+06	9
859	Te-117m	5.5	IT	0.103 s	2.91		2.9200E+04	2.6439E+05	9
860	Te-118	0.0	β^+	6.000 d	0.35		4.9600E+03	1.9900E+04	9
861	Te-119	0.5	β^+	16.050 h	0.31		1.2900E+04	7.7100E+05	9
862	Te-119m	5.5	β^+	4.688 d	0.99		1.6100E+04	1.5160E+06	9
863	Te-120	0.0							1
864	Te-121	0.5	β^+	19.160 d	0.26		9.8405E+03	5.7747E+05	2
865	Te-121m	5.5	β^+:11.3;IT:88.7	154.000 d	4.55		8.0090E+04	2.1695E+05	2
866	Te-122	0.0							1
867	Te-123	0.5	β^+	9.99E+12 y	60.25		2.0026E+03	2.6184E+02	6
868	Te-123m	5.5	IT	119.699 d	0.08		1.0065E+05	1.4827E+05	9
869	Te-124	0.0							1
870	Te-125	0.5							1
871	Te-125m	5.5	IT	58.000 d	1.72		1.0878E+05	3.6000E+04	2
872	Te-126	0.0							1
873	Te-127	1.5	β^-	9.350 h	0.64		2.2440E+05	4.8472E+03	2
874	Te-127m	5.5	IT:97.6;β^-:2.4	109.000 d	1.83		8.2138E+04	1.1580E+04	2
875	Te-128	0.0							1
876	Te-129	1.5	β^-	1.160 h	0.57		5.4303E+05	6.0453E+04	2
877	Te-129m	5.5	β^-:31.0;IT:69.0	33.800 d	0.30		2.4018E+05	3.8939E+04	2
878	Te-130	0.0							1
879	Te-131	5.5	β^-	25.000 m	0.40		7.1624E+05	4.2202E+05	9
880	Te-131m	5.5	β^-:77.8;IT:22.2	1.250 d	6.67		1.9427E+05	1.4281E+06	9
881	Te-132	0.0	β^-	3.230 d	0.93		1.0313E+05	2.3369E+05	2
882	Te-133	1.5	β^-	12.500 m	2.40		7.2000E+05	1.2000E+06	9
883	Te-133m	5.5	β^-:82.5;IT:17.5	55.400 m	0.72		5.3000E+05	1.9200E+06	9
884	Te-134	0.0	β_g^-:89.8;β_m^-:10.2	41.833 m	1.99		2.3000E+05	8.5800E+05	9
885	Te-135	3.5	β^-	19.000 s	1.05		2.3400E+06	4.8000E+05	9
886	I-118	2.0	β^+	13.667 m	3.66		1.6700E+06	2.0000E+06	9
887	I-118m	7.0	β^+	8.500 m	5.88		6.7000E+05	3.5700E+06	10
888	I-119	2.5	β^+	19.100 m	2.09		5.0000E+05	8.6000E+05	9
889	I-120	2.0	β^+	1.350 h	0.82		1.3000E+06	2.7000E+06	9
890	I-120m	4.0	β^+	53.000 m	7.55		8.9900E+05	5.1100E+06	10
891	I-121	2.5	β^+	2.119 h	0.52		8.5000E+04	4.3000E+05	9
892	I-122	1.0	β^+	3.633 m	1.83		1.1100E+06	9.6100E+05	9
893	I-123	2.5	β^+	13.194 h	0.84		2.6600E+04	1.7280E+05	9
894	I-124	2.0	β^+	4.181 d	0.50		1.9600E+05	1.0850E+06	9
895	I-125	2.5	β^+	59.430 d	0.10		1.9219E+04	4.2440E+04	2
896	I-126	2.0	β^-:43.7;β^+:56.3	12.980 d	0.39		1.4382E+05	4.3563E+05	2
897	I-127	2.5							1
898	I-128	1.0	β^-:93.9;β^+:6.1	24.990 m	0.08		7.4332E+05	8.7457E+04	9
899	I-129	3.5	β^-	1.57E+07 y	2.55		5.5112E+04	2.3048E+04	9
900	I-130	5.0	β^-	12.360 h	0.08		2.8829E+05	2.1381E+06	9
901	I-130m	2.0	β^-:16.7;IT:83.3	9.000 m	1.11		1.9023E+05	1.1903E+05	9
902	I-131	3.5	β_g^-:98.91;β_m^-:1.09	8.040 d	0.12		1.9141E+05	3.8154E+05	9
903	I-132	4.0	β^-	2.283 h	0.35		4.8982E+05	2.2557E+06	2
904	I-132m	8.0	IT:86.0;β^-:14.0	1.383 h	1.20		1.6274E+05	3.4482E+05	2
905	I-133	3.5	β_g^-:97.12;β_m^-:2.88	20.800 h	0.48		4.0884E+05	6.0781E+05	9
906	I-133m	9.5	IT	9.000 s	22.22		4.9083E+04	1.5824E+06	6
907	I-134	4.0	β^-	52.600 m	0.76		6.2000E+05	2.6100E+06	9
908	I-134m	8.0	β_m^-:2.0;IT:98.0	3.700 m	2.70		8.7245E+04	2.4218E+05	9
909	I-135	3.5	β_g^-:84.5;β_m^-:15.5	6.610 h	0.15		3.6500E+05	1.5930E+06	9
910	I-136	2.0	β^-	1.400 m	1.19		1.9600E+06	2.3940E+06	9
911	I-136m	6.0	β^-	45.000 s	2.22		2.2100E+06	2.5100E+06	9
912	Xe-120	0.0	β^+	40.000 m	2.50		4.3000E+04	4.3000E+05	9
913	Xe-121	2.5	β^+	40.100 m	0.50		5.6000E+05	1.6442E+06	9
914	Xe-122	0.0	β^+	20.111 h	0.55		8.0000E+03	1.4861E+05	9
915	Xe-123	0.5	β^+	2.081 h	1.07		1.8600E+05	6.4000E+05	9
916	Xe-124	0.0							1
917	Xe-125	0.5	β^+	16.900 h	1.18		3.4513E+04	2.7053E+05	2
918	Xe-125m	4.5	IT	56.000 s	5.36		1.3639E+05	1.1606E+05	2
919	Xe-126	0.0							1
920	Xe-127	0.5	β^+	36.440 d	0.19		3.2499E+04	2.8066E+05	2
921	Xe-127m	4.5	IT	1.160 m	1.29		1.2874E+05	1.6848E+05	2

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
922	Xe-128	0.0							1
923	Xe-129	0.5							1
924	Xe-129m	5.5	IT	8.870 d	0.56		1.8417E+05	5.1702E+04	2
925	Xe-130	0.0							1
926	Xe-131	1.5							1
927	Xe-131m	5.5	IT	11.870 d	0.42		1.4262E+05	2.1198E+04	2
928	Xe-132	0.0							1
929	Xe-133	1.5	β^-	5.243 d	0.06		1.3567E+05	4.6187E+04	2
930	Xe-133m	5.5	IT	2.190 d	0.91		1.9238E+05	4.0790E+04	2
931	Xe-134	0.0							1
932	Xe-134m	7.0	IT	0.290 s	0.59		6.8226E+04	1.8971E+06	9
933	Xe-135	1.5	β^-	9.090 h	0.11		3.1654E+05	2.4859E+05	9
934	Xe-135m	5.5	β^-:0.04;IT:99.96	15.650 m	0.64		9.5144E+04	4.3174E+05	6
935	Xe-136	0.0							1
936	Xe-137	3.5	β^-	3.818 m	0.35		1.5100E+06	2.3500E+05	9
937	Xe-138	0.0	β^-	14.170 m	0.49		6.7110E+05	1.1257E+06	9
938	Xe-139	1.5	β^-	39.680 s	0.35		1.8000E+06	9.2000E+05	9
939	Cs-122	1.0	β^+	21.000 s	3.33		2.6800E+06	1.2347E+06	9
940	Cs-122m	8.0	β^+	4.500 m	4.44		1.4600E+06	3.1291E+06	9
941	Cs-122n	5.0	IT	0.360 s	5.56		4.0000E+03	3.3000E+03	10
942	Cs-123	0.5	β^+	5.867 m	0.85		9.5000E+05	9.1200E+05	9
943	Cs-123m	5.5	IT	1.600 s	9.38			1.5900E+05	9
944	Cs-124	1.0	β^+	30.800 s	1.62		1.9400E+06	1.2400E+06	9
945	Cs-124m	7.0	IT	6.300 s	3.17		1.0400E+05	3.0400E+05	9
946	Cs-125	0.5	β^+	45.000 m	2.22		3.3000E+05	7.4000E+05	9
947	Cs-126	1.0	β^+	1.640 m	1.22		1.3400E+06	1.1450E+06	9
948	Cs-127	0.5	β^+	6.250 h	1.78		3.1000E+04	3.9900E+05	9
949	Cs-128	1.0	β^+	3.620 m	0.55		8.7000E+05	8.8900E+05	9
950	Cs-129	0.5	β^+	1.342 d	0.62		1.7418E+04	2.8321E+05	2
951	Cs-130	1.0	β^+	29.900 m	0.33		3.9400E+05	5.1000E+05	9
952	Cs-131	2.5	β^+	9.690 d	0.21		6.3696E+03	2.3121E+04	2
953	Cs-132	2.0	β^-:1.8;β^+:98.2	6.530 d	0.31		1.4114E+04	7.1525E+05	2
954	Cs-133	3.5							1
955	Cs-134	4.0	β^-:100.0;β^+:~	2.065 y	0.03		1.6339E+05	1.5541E+06	2
956	Cs-134m	8.0	IT	2.908 h	0.10		1.1178E+05	2.7075E+04	2
957	Cs-135	3.5	β^-	2.40E+06 y	12.50		6.6864E+04		2
958	Cs-135m	9.5	IT	53.000 m	3.77		3.6918E+04	1.5965E+06	2
959	Cs-136	5.0	β^-	13.030 d	0.54		1.4189E+05	2.1456E+06	2
960	Cs-136m	8.0	β^-:50.0;IT:50.0	19.000 s	10.53		6.1667E+05	6.1667E+05	2
961	Cs-137	3.5	β_g^-:5.4;β_m^-:94.6	30.172 y	0.54		1.8654E+05	3.7697E+01	2
962	Cs-138	3.0	β^-	32.200 m	0.31		1.2688E+06	2.3611E+06	9
963	Cs-138m	6.0	β^-:19.0;IT:81.0	2.900 m	3.45		3.2600E+05	4.2000E+05	9
964	Cs-139	3.5	β^-	9.267 m	0.54		1.6400E+06	2.9900E+05	9
965	Cs-140	1.0	β^-	1.062 m	0.47		1.8600E+06	1.5900E+06	9
966	Ba-124	?	β^+	11.833 m	8.45		8.6666E+05	3.2523E+05	9
967	Ba-125	0.5	β^+	3.500 m	11.43		1.5267E+06	3.1600E+05	9
968	Ba-126	0.0	β^+	1.667 h	2.00		1.8127E+04	5.6512E+05	2
969	Ba-127	0.5	β^+	12.700 m	3.15		5.9000E+05	7.2200E+05	9
970	Ba-128	0.0	β^+	2.431 d	2.38		7.0100E+03	6.6000E+04	9
971	Ba-129	0.5	β^+	2.380 h	4.62		1.2727E+05	4.6647E+05	2
972	Ba-129m	3.5	β^+	2.140 h	2.34		6.9097E+04	1.2075E+06	2
973	Ba-130	0.0							1
974	Ba-131	0.5	β^+	11.550 d	0.43		4.6252E+04	4.5952E+05	2
975	Ba-131m	4.5	IT	14.600 m	1.37		1.1009E+05	7.7147E+04	2
976	Ba-132	0.0							1
977	Ba-133	0.5	β^+	10.574 y	0.39		5.3643E+04	4.0264E+05	2
978	Ba-133m	5.5	β^+:0.01;IT:99.99	1.592 d	0.79		2.2161E+05	6.6909E+04	2
979	Ba-134	0.0							1
980	Ba-135	1.5							1
981	Ba-135m	5.5	IT	1.196 d	0.70		2.0841E+05	5.8124E+04	9
982	Ba-136	0.0							1
983	Ba-136m	7.0	IT	0.308 s	0.62		1.0691E+05	1.9235E+06	9
984	Ba-137	1.5							1
985	Ba-137m	5.5	IT	2.553 m	0.04		6.2931E+04	5.9861E+05	2
986	Ba-138	0.0							1
987	Ba-139	3.5	β^-	1.384 h	0.34		8.9800E+05	4.6000E+04	9
988	Ba-140	0.0	β^-	12.740 d	0.39		3.1376E+05	1.8281E+05	9
989	Ba-141	0.0	β^-	18.270 m	0.38		8.9000E+05	9.6564E+05	9
990	Ba-142	0.0	β^-	10.600 m	1.89		4.7000E+05	7.6000E+05	9
991	Ba-143	0.0	β^-	14.500 s	3.45		1.2000E+06	8.7000E+05	9
992	La-128	?	β^+	5.000 m	6.00		2.2100E+06	2.9000E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
993	La-129	1.5	β^+	11.600 m	1.72		7.8000E+05	1.0000E+06	9
994	La-129m	5.5	IT	0.560 s	8.93		1.1100E+05	4.8400E+04	9
995	La-130	3.0	β^+	8.700 m	1.15		2.7000E+06	3.5000E+06	9
996	La-131	1.5	β^+	59.000 m	3.39		2.0700E+05	6.7000E+05	9
997	La-132	2.0	β^+	4.806 h	4.62		5.4000E+05	1.9800E+06	9
998	La-132m	6.0	β^+:24.0;IT:76.0	24.300 m	2.06			4.9100E+05	9
999	La-133	2.5	β^+	3.911 h	0.21		4.1000E+04	1.5000E+05	9
1000	La-134	1.0	β^+	6.450 m	2.58		7.5800E+05	7.1600E+05	9
1001	La-135	2.5	β^+	19.500 h	1.14		5.1200E+03	3.5700E+04	9
1002	La-136	1.0	β^+	9.870 m	0.30		6.0000E+05	4.1000E+05	9
1003	La-136m	7.0	IT	0.114 s	2.63		4.2000E+04	1.5000E+05	10
1004	La-137	3.5	β^+	6.00E+04 y	33.33		6.5521E+03	2.5590E+04	2
1005	La-138	5.0	β^-:32.9;β^+:67.1	1.05E+11 y	15.24		3.5011E+04	1.2381E+06	9
1006	La-139	3.5							1
1007	La-140	3.0	β^-	1.679 d	0.01		5.3511E+05	2.3126E+06	2
1008	La-141	0.0	β^-	3.930 h	1.27		9.4244E+05	4.6057E+04	9
1009	La-142	2.0	β^-	1.519 h	0.55		8.6400E+05	2.3680E+06	9
1010	La-143	?	β^-	14.133 m	1.18		1.2500E+06	1.3000E+05	9
1011	La-144	?	β^-	40.800 s	0.98		1.3800E+06	2.2400E+06	9
1012	Ce-130	0.0	β^+	25.000 m	8.00		2.3000E+04	6.0000E+04	11
1013	Ce-131	3.5	β^+	10.000 m	10.00		9.7000E+03	7.3856E+05	10
1014	Ce-131m	0.5	β^+	5.000 m	20.00		1.3403E+06	1.8422E+05	10
1015	Ce-132	0.0	β^+	3.510 h	3.13		1.6900E+04	2.7300E+05	3
1016	Ce-133	4.5	β^+	4.889 h	8.52		6.1000E+04	1.7290E+06	9
1017	Ce-133m	0.5	β^+	1.617 h	4.12		3.5000E+05	5.2000E+05	9
1018	Ce-134	0.0	β^+	3.160 d	1.47		5.2000E+03	2.9100E+04	9
1019	Ce-135	0.5	β^+	17.694 h	1.26		1.7500E+04	8.2100E+05	9
1020	Ce-135m	5.5	IT	20.000 s	5.00		2.0000E+05	2.5800E+05	9
1021	Ce-136	0.0							1
1022	Ce-137	1.5	β^+	9.000 h	3.40		5.0700E+03	4.0500E+04	9
1023	Ce-137m	5.5	β^+:0.78;IT:99.22	1.433 d	0.89		2.0300E+05	5.5400E+04	9
1024	Ce-138	0.0							1
1025	Ce-139	1.5	β^+	137.650 d	0.02		3.4161E+04	1.6139E+05	2
1026	Ce-139m	5.5	IT	56.100 s	1.07		5.5095E+04	6.9912E+05	2
1027	Ce-140	0.0							1
1028	Ce-141	3.5	β^-	32.500 d	0.03		1.7085E+05	7.6571E+04	9
1029	Ce-142	0.0	α	5.00E+16 y	50.10	1.3050E+06			6
1030	Ce-143	1.5	β^-	1.375 d	0.61		4.3731E+05	2.7263E+05	9
1031	Ce-144	0.0	β_g^-:98.5;β_m^-:1.5	284.896 d	0.07		9.1600E+04	1.9400E+04	9
1032	Ce-145	1.5	β^-	2.950 m	2.03		7.6259E+05	6.0103E+05	2
1033	Ce-146	0.0	β^-	14.200 m	3.52		2.6000E+05	1.8000E+05	9
1034	Ce-147	2.5	β^-	57.000 s	3.51		1.2820E+06	1.7416E+05	2
1035	Ce-148	0.0	β^-	56.000 s	1.79		6.3000E+05	3.0300E+05	9
1036	Ce-149	?	β^-	5.200 s	9.62		6.1531E+05	2.6370E+06	9
1037	Pr-134	2.0	β^+	17.000 m	11.76		2.0333E+06	2.0333E+06	9
1038	Pr-134m	5.0	β^+	11.000 m	45.45		2.0337E+06	2.0337E+06	6
1039	Pr-135	1.5	β^+	24.000 m	8.33		6.1000E+05	8.9000E+05	9
1040	Pr-136	2.0	β^+	13.100 m	0.76		1.4500E+06	2.1400E+06	9
1041	Pr-137	2.5	β^+	1.281 h	1.74		1.9000E+05	3.7000E+05	9
1042	Pr-138	1.0	β^+	1.450 m	3.45		1.1600E+06	8.1500E+05	9
1043	Pr-138m	7.0	β^+	2.111 h	5.26		2.2600E+05	2.4800E+06	9
1044	Pr-139	2.5	β^+	4.411 h	0.94		8.7680E+04	1.2950E+05	9
1045	Pr-140	1.0	β^+	3.390 m	0.29		5.4460E+05	5.4250E+05	9
1046	Pr-141	2.5							1
1047	Pr-142	2.0	β^-:99.98;β^+:0.02	19.130 h	0.21		8.0871E+05	5.8432E+04	9
1048	Pr-142m	5.0	IT	14.600 m	3.42			3.6830E+03	9
1049	Pr-143	3.5	β^-	13.560 d	0.07		3.1460E+05	8.9038E-03	2
1050	Pr-144	0.0	β^-	17.280 m	0.12		1.2006E+06	3.3763E+04	2
1051	Pr-144m	3.0	IT:99.93;β^-:0.07	6.900 m	10.14		4.7168E+04	1.3662E+04	2
1052	Pr-145	3.5	β^-	5.980 h	0.33		6.7375E+05	2.7710E+04	9
1053	Pr-146	2.0	β^-	24.150 m	0.76		1.3200E+06	1.0100E+06	9
1054	Pr-147	0.0	β^-	13.600 m	3.68		7.6000E+05	8.4000E+05	9
1055	Pr-148	1.0	β^-	2.270 m	1.76		1.7655E+06	7.1581E+05	9
1056	Pr-148m	4.0	β^-	2.000 m	5.00		1.7159E+06	9.4519E+05	9
1057	Pr-149	2.5	β^-	2.267 m	3.68		1.1000E+06	4.1783E+05	9
1058	Pr-150	1.0	β^-	6.100 s	6.56		2.2302E+06	5.5420E+05	2
1059	Nd-136	0.0	β^+	50.650 m	0.66		1.0600E+05	2.9000E+05	9
1060	Nd-137	0.5	β^+	38.500 m	3.90		2.5400E+05	1.1664E+06	9
1061	Nd-137m	5.5	IT	1.600 s	9.38		7.9900E+04	3.5400E+05	9
1062	Nd-138	0.0	β^+	5.028 h	2.21		5.7000E+03	4.7500E+04	9
1063	Nd-139	1.5	β^+	29.667 m	1.69		4.0000E+05	4.4200E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1064	Nd-139m	5.5	β^+:88.2;IT:11.8	5.500 h	4.04		1.1300E+07	1.5800E+06	9
1065	Nd-140	0.0	β^+	3.370 d	0.59		6.7347E+03	2.7727E+04	2
1066	Nd-141	1.5	β^+	2.489 h	1.23		1.4200E+04	7.5100E+04	9
1067	Nd-141m	5.5	β^+:0.03;IT:99.97	1.040 m	1.44		5.8900E+04	6.9430E+05	9
1068	Nd-142	0.0							1
1069	Nd-143	3.5							1
1070	Nd-144	0.0	α	2.10E+15 y	19.05	1.8823E+06			9
1071	Nd-145	3.5							1
1072	Nd-146	0.0							1
1073	Nd-147	2.5	β^-	11.020 d	0.18		2.7060E+05	1.3813E+05	2
1074	Nd-148	0.0							1
1075	Nd-149	2.5	β^-	1.725 h	0.48		5.1000E+05	3.7100E+05	9
1076	Nd-150	0.0							1
1077	Nd-151	1.5	β^-	12.433 m	0.67		5.3800E+05	9.4600E+05	9
1078	Nd-152	0.0	β^-	11.400 m	1.75		3.5179E+05	1.6271E+05	9
1079	Nd-153	0.5	β^-	32.000 s	1.25		1.4070E+06	9.3000E+04	6
1080	Pm-140	1.0	β^+	9.200 s	2.17		2.0340E+06	1.0500E+06	9
1081	Pm-140m	7.0	β^+	5.950 m	0.84		9.8000E+05	3.0200E+06	9
1082	Pm-141	2.5	β^+	20.900 m	0.24		6.3100E+05	7.4900E+05	9
1083	Pm-142	1.0	β^+	40.500 s	1.23		1.3680E+06	8.6900E+05	9
1084	Pm-143	2.5	β^+	266.000 d	3.01		8.1138E+03	3.1582E+05	2
1085	Pm-144	5.0	β^+	363.000 d	3.86		1.6773E+04	1.5556E+06	2
1086	Pm-145	2.5	β^+:100.0;α:~	17.700 y	2.26	6.5020E-03	1.2201E+04	3.1528E+04	2
1087	Pm-146	3.0	β^-:34.0;β^+:66.0	5.531 y	0.89		9.4413E+04	7.5429E+05	2
1088	Pm-147	3.5	β^-	2.622 y	0.23		6.1761E+04	4.2643E+00	2
1089	Pm-148	1.0	β^-	5.368 d	0.15		7.2630E+05	5.7649E+05	2
1090	Pm-148m	6.0	β^-:95.0;IT:5.0	41.050 d	0.34		1.7105E+05	1.9836E+06	2
1091	Pm-149	3.5	β^-	2.212 d	0.09		3.6677E+05	1.2698E+04	2
1092	Pm-150	1.0	β^-	2.680 h	0.75		7.4643E+05	1.4919E+06	9
1093	Pm-151	2.5	β^-	1.171 d	1.07		3.0320E+05	3.2416E+05	2
1094	Pm-152	1.0	β^-	4.120 m	2.18		1.3913E+06	1.4710E+05	2
1095	Pm-152m	4.0	β^-	7.500 m	1.33		9.0026E+05	1.5018E+06	2
1096	Pm-152n	8.0	β^-	14.400 m	4.86		7.2841E+05	2.1608E+06	2
1097	Pm-153	2.5	β^-	5.400 m	3.70		6.8468E+05	5.3666E+04	9
1098	Pm-154	0.0	β^-	1.700 m	11.76		8.8445E+05	1.7925E+06	9
1099	Pm-154m	3.0	β^-	2.700 m	3.70		8.9759E+05	1.8530E+06	9
1100	Pm-155	2.5	β^-	48.000 s	8.33		1.1290E+06	2.9600E+05	9
1101	Pm-156	?	β^-	26.700 s	3.75		1.0512E+06	2.2150E+06	9
1102	Sm-142	0.0	β^+	1.208 h	0.07		3.2700E+04	9.5000E+04	9
1103	Sm-143	1.5	β^+	8.830 m	0.23		4.7760E+05	5.1510E+05	9
1104	Sm-143m	5.5	β^+:0.33;IT:99.67	1.100 m	3.03		6.8500E+04	6.8460E+05	9
1105	Sm-144	0.0							1
1106	Sm-145	3.5	β^+	340.000 d	0.88		2.9495E+04	6.2987E+04	2
1107	Sm-146	0.0	α	1.00E+08 y	8.00	2.5705E+06			2
1108	Sm-147	3.5	α	1.06E+11 y	0.94	2.3107E+06			2
1109	Sm-148	0.0	α	6.97E+15 y	45.45	1.9862E+06			9
1110	Sm-149	3.5	α	2.00E+15 y	47.53	1.8400E+06			6
1111	Sm-150	0.0							1
1112	Sm-151	2.5	β^-	90.002 y	6.67		1.9873E+04	1.4325E+01	2
1113	Sm-152	0.0							1
1114	Sm-153	1.5	β^-	1.929 d	0.09		2.6830E+05	6.2819E+04	2
1115	Sm-154	0.0							1
1116	Sm-155	1.5	β^-	22.100 m	0.90		5.9576E+05	1.0448E+05	9
1117	Sm-156	0.0	β^-	9.400 h	2.13		2.0115E+05	1.2473E+05	9
1118	Sm-157	1.5	β^-	8.067 m	1.65		1.2000E+04	5.3200E+05	9
1119	Sm-158	0.0	β^-	5.517 m	1.81		4.7943E+05	3.3000E+05	9
1120	Sm-159	2.5	β^-	11.200 s	1.34		1.3799E+06	5.1600E+05	6
1121	Eu-143	2.5	β^+	2.633 m	1.90		1.2950E+06	1.1060E+06	9
1122	Eu-144	1.0	β^+	10.200 s	0.98		2.0630E+06	1.0900E+06	9
1123	Eu-145	2.5	β^+	5.926 d	0.78		2.5000E+04	1.3400E+06	9
1124	Eu-146	4.0	β^+	4.595 d	0.76		4.6400E+04	2.1700E+06	9
1125	Eu-147	2.5	β^+:100.0;α:~	23.958 d	4.35	6.3980E+01	3.9000E+04	4.9700E+05	9
1126	Eu-148	5.0	β^+:100.0;α:~	54.514 d	1.06	2.4720E-02	1.8900E+04	2.2300E+06	9
1127	Eu-149	2.5	β^+	93.100 d	0.43		2.4141E+04	6.6020E+04	2
1128	Eu-150	5.0	β^+	36.359 y	1.96		2.7212E+04	1.5280E+06	2
1129	Eu-150m	0.0	β^-:88.0;β^+:12.0	12.800 h	1.56		3.0729E+05	5.0219E+04	2
1130	Eu-151	2.5							1
1131	Eu-152	3.0	β^-:28.0;β^+:72.0	13.523 y	0.10		1.2910E+05	1.1642E+06	2
1132	Eu-152m	0.0	β^-:72.0;β^+:28.0	9.275 h	0.10		5.0195E+05	3.1109E+05	2
1133	Eu-152n	8.0	IT	1.600 h	3.13		7.2264E+04	7.5506E+04	2
1134	Eu-153	2.5							1

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1135	Eu-154	3.0	β^-:99.98;β^+:0.02	8.593 y	0.04		2.7446E+05	1.2453E+06	2
1136	Eu-154m	8.0	IT	46.400 m	1.08		8.2497E+04	7.4358E+04	2
1137	Eu-155	2.5	β^-	4.846 y	2.82		6.6564E+04	6.4157E+04	2
1138	Eu-156	0.0	β^-	15.200 d	0.86		4.4784E+05	1.2832E+06	2
1139	Eu-157	2.5	β^-	15.181 h	0.20		1.7800E+04	2.9200E+05	9
1140	Eu-158	1.0	β^-	45.900 m	0.44		9.6000E+05	1.0840E+06	9
1141	Eu-159	2.5	β^-	18.700 m	2.14		8.8535E+05	2.7335E+05	9
1142	Eu-160	?	β^-	52.800 s	18.94		1.3776E+06	1.8151E+06	9
1143	Gd-145	0.5	β^+	23.000 m	1.74		3.4400E+05	2.4300E+06	9
1144	Gd-145m	5.5	β^+:5.7;IT:94.3	1.417 m	3.53		1.8400E+05	6.7300E+05	9
1145	Gd-146	0.0	β^+	48.275 d	0.22		1.2170E+05	2.5450E+05	9
1146	Gd-147	3.5	β^+	1.588 d	0.29		5.2000E+04	1.2500E+06	9
1147	Gd-148	0.0	α	74.469 y	4.26	3.2690E+06			9
1148	Gd-149	3.5	β^+	9.375 d	3.70		6.5000E+04	5.2000E+05	9
1149	Gd-150	0.0	α	1.82E+06 y	9.34	2.7967E+06			2
1150	Gd-151	3.5	β^+:100.0;α:~	124.000 d	0.81	2.6708E-02	3.8833E+04	7.0400E+04	2
1151	Gd-152	0.0	α	1.08E+14 y	7.41	2.1978E+06			9
1152	Gd-153	1.5	β^+	240.500 d	0.29		4.3730E+04	1.0665E+05	2
1153	Gd-154	0.0							1
1154	Gd-155	1.5							1
1155	Gd-156	0.0							1
1156	Gd-157	1.5							1
1157	Gd-158	0.0							1
1158	Gd-159	1.5	β^-	18.560 h	0.43		3.1167E+05	5.1946E+04	9
1159	Gd-160	0.0							1
1160	Gd-161	2.5	β^-	3.667 m	1.36		5.8020E+05	3.9300E+05	9
1161	Gd-162	0.0	β^-	9.000 m	11.11		3.5259E+05	4.2706E+05	9
1162	Gd-163	2.5	β^-	1.133 m	4.41		3.8800E+05	1.9880E+06	9
1163	Gd-164	0.0	β^-	31.800 s	9.43		1.1502E+06	8.9700E+05	6
1164	Gd-165	?	β^-	42.295 s	47.29		1.2300E+06	8.8110E+05	6
1165	Tb-146	1.0	β^+	8.000 s	50.00		3.0270E+06	1.1700E+06	9
1166	Tb-146m	5.0	β^+	23.000 s	8.70		1.2100E+06	3.5300E+06	9
1167	Tb-147	2.5	β^+	1.639 h	6.78		5.6000E+05	1.5900E+06	9
1168	Tb-147m	5.5	β^+	1.833 m	3.64		3.5800E+05	1.8000E+06	10
1169	Tb-148	2.0	β^+	1.000 h	1.67		8.2300E+05	2.3330E+06	9
1170	Tb-148m	9.0	β^+	2.200 m	2.27		2.7900E+05	2.9000E+06	9
1171	Tb-149	0.5	β^+:83.3;α:16.7	4.131 h	0.54	6.6270E+05	9.2100E+04	1.3950E+06	9
1172	Tb-149m	5.5	β^+:99.98;α:0.02	4.160 m	0.96	1.2139E+06	1.7148E+05	1.4199E+06	9
1173	Tb-150	2.0	β^+:95.0;α:5.0	3.472 h	4.80	1.7460E+05	4.0000E+05	2.0200E+06	9
1174	Tb-150m	9.0	β^+	5.800 m	3.45		1.4500E+04	2.3700E+06	10
1175	Tb-151	0.5	β^+:99.99;α:~	17.608 h	0.08	3.2420E+02	7.6000E+04	9.9300E+05	9
1176	Tb-151m	5.5	β^+:6.6;IT:93.4	25.000 s	12.00		1.2000E+03	7.8000E+04	9
1177	Tb-152	2.0	β^+	17.500 h	1.75		2.2000E+05	1.3800E+06	9
1178	Tb-152m	8.0	β^+:21.1;IT:78.9	4.300 m	4.65		1.3000E+05	7.5000E+05	9
1179	Tb-153	2.5	β^+	2.340 d	0.45		3.4400E+04	3.0700E+05	9
1180	Tb-154	0.0	β^+	21.500 h	1.94		3.2000E+04	2.2100E+06	9
1181	Tb-154m	3.0	β^+:78.2;IT:21.8	9.000 h	5.56		4.6000E+04	1.2900E+06	9
1182	Tb-154n	7.0	β^+:98.2;IT:1.8	22.694 h	2.20		9.4000E+04	2.0600E+06	9
1183	Tb-155	1.5	β^+	5.324 d	1.30		3.8000E+04	1.7600E+05	9
1184	Tb-156	3.0	β^+	5.170 d	2.32		8.4601E+04	1.9354E+06	2
1185	Tb-156m	7.0	IT	1.017 d	4.10		2.2064E+04	3.7589E+04	2
1186	Tb-156n	0.0	β^+:0.19;IT:99.81	5.100 h	5.88		8.4062E+04	4.7432E+03	2
1187	Tb-157	1.5	β^+	99.002 y	10.10		5.6996E+03	1.0394E+04	2
1188	Tb-158	3.0	β^-:16.6;β^+:83.4	180.626 y	7.02		1.0100E+05	8.0400E+05	9
1189	Tb-158m	0.0	IT	10.500 s	1.90		8.2400E+04	2.4100E+04	9
1190	Tb-159	1.5							1
1191	Tb-160	3.0	β^-	72.300 d	0.28		2.5424E+05	1.1245E+06	9
1192	Tb-161	1.5	β^-	6.890 d	0.44		2.0074E+05	3.3762E+04	2
1193	Tb-162	1.0	β^-	7.600 m	1.97		5.4000E+05	1.1060E+06	9
1194	Tb-163	1.5	β^-	19.500 m	1.54		3.3600E+05	7.8800E+05	9
1195	Tb-164	5.0	β^-	3.000 m	3.33		7.0000E+04	2.3400E+06	9
1196	Tb-165	1.5	β_m^-:86.0;β_g^-:14.0	2.110 m	4.74		9.8900E+05	4.9700E+05	6
1197	Tb-166	?	β^-	1.388 m	48.02		8.2509E+05	2.3420E+06	6
1198	Dy-148	0.0	β^+	3.100 m	3.23		2.3200E+04	6.9000E+05	9
1199	Dy-149	3.5	β^+	4.233 m	4.33		1.2000E+06	2.2500E+06	9
1200	Dy-150	0.0	β^+:64.0;α:36.0	7.170 m	0.28	1.3969E+06	1.9000E+03	2.5400E+05	9
1201	Dy-151	3.5	β^+:94.4;α:5.6	17.900 m	1.68	2.2775E+05	7.5000E+04	1.3500E+06	9
1202	Dy-152	0.0	β^+:99.9;α:0.1	2.369 h	0.94	3.6290E+03	1.0200E+04	2.5014E+05	9
1203	Dy-153	3.5	β^+:99.99;α:~	6.389 h	1.74	3.2570E+02	4.9000E+04	6.8900E+05	9
1204	Dy-154	0.0	α	2.85E+06 y	55.56	2.9470E+06			9
1205	Dy-155	1.5	β^+	10.000 h	3.06		2.3000E+04	6.4100E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1206	Dy-156	0.0							1
1207	Dy-157	1.5	β^+	8.140 h	0.61		1.3286E+04	3.5036E+05	2
1208	Dy-158	0.0							1
1209	Dy-159	1.5	β^+	144.400 d	0.14		1.2822E+04	4.5509E+04	2
1210	Dy-160	0.0							1
1211	Dy-161	2.5							1
1212	Dy-162	0.0							1
1213	Dy-163	2.5							1
1214	Dy-164	0.0							1
1215	Dy-165	3.5	β^-	2.334 h	0.26		4.4607E+05	2.6562E+04	9
1216	Dy-165m	0.5	β^-:2.4;IT:97.6	1.258 m	0.48		1.0533E+05	1.9360E+04	9
1217	Dy-166	0.0	β^-	3.400 d	0.12		1.5589E+05	3.9681E+04	9
1218	Dy-167	0.5	β^-	6.200 m	1.34		7.1000E+05	5.3400E+05	9
1219	Dy-168	0.0	β^-	8.500 m	3.53		3.0666E+05	5.8665E+05	6
1220	Dy-169	2.5	β^-	38.900 s	20.57		9.4999E+05	9.4999E+05	8
1221	Dy-170	?	β^-	20.400 s	49.02		6.9666E+05	6.9666E+05	8
1222	Dy-171	?	β^-	3.280 s	48.78		1.4330E+06	1.4330E+06	6
1223	Ho-153	5.5	β^+:99.95;α:0.05	2.000 m	5.00	1.9940E+03	5.2000E+05	1.0100E+06	6
1224	Ho-153m	0.5	β^+:99.82;α:0.18	9.333 m	5.36	7.2200E+03	2.4800E+05	1.5500E+06	9
1225	Ho-154	2.0	β^+:99.98;α:0.02	11.833 m	4.23	7.4800E+02	1.5800E+04	1.1500E+06	10
1226	Ho-154m	8.0	β^+:99.98;α:0.02	3.250 m	3.08	3.7210E+01	3.2000E+04	1.9900E+06	9
1227	Ho-155	2.5	β^+	48.000 m	4.17		2.2000E+05	5.7000E+05	9
1228	Ho-156	5.0	β^+	56.000 m	1.79		6.2800E+04	1.4040E+06	9
1229	Ho-157	3.5	β^+	12.600 m	1.59		4.7100E+04	4.6300E+05	9
1230	Ho-158	5.0	β^+	11.000 m	3.64		1.4067E+06	1.4067E+06	6
1231	Ho-158m	2.0	IT	27.000 m	7.41			1.2500E+02	9
1232	Ho-158n	9.0	β^+	21.333 m	10.94		5.5000E+03	2.7357E+06	9
1233	Ho-159	3.5	β^+	33.050 m	0.35		5.0800E+04	4.5200E+05	9
1234	Ho-159m	0.5	IT	8.300 s	0.96		1.0360E+05	1.0000E+05	9
1235	Ho-160	5.0	β^+	25.300 m	2.77		7.0342E+04	1.7135E+06	2
1236	Ho-160m	2.0	IT:65.0;β^+:35.0	5.000 h	2.00		8.1668E+04	6.4978E+05	2
1237	Ho-160n	9.0	IT	2.900 s	6.90		9.3875E+04	1.0568E+05	2
1238	Ho-161	3.5	β^+	2.480 h	4.84		3.3441E+04	5.8169E+04	2
1239	Ho-161m	0.5	IT	6.770 s	0.89		1.0719E+05	1.0368E+05	2
1240	Ho-162	1.0	β^+	15.000 m	6.67		2.3780E+04	1.5500E+05	9
1241	Ho-162m	6.0	β^+:37.0;IT:63.0	1.117 h	1.49		6.0000E+03	5.8000E+05	9
1242	Ho-163	3.5	β^+	4570.090 y	0.46		2.6500E+03	1.0534E-03	2
1243	Ho-163m	0.5	IT	1.100 s	6.36		6.1236E+04	2.3653E+05	2
1244	Ho-164	1.0	β^-:51.7;β^+:48.3	28.600 m	2.10		1.8426E+05	2.8159E+04	2
1245	Ho-164m	6.0	IT	37.600 m	1.33		9.1905E+04	4.8025E+04	2
1246	Ho-165	3.5							1
1247	Ho-166	0.0	β^-	1.117 d	0.07		6.9403E+05	2.9109E+04	9
1248	Ho-166m	7.0	β^-	1200.025 y	15.00		1.0271E+05	1.7280E+06	9
1249	Ho-167	3.5	β_g^-:88.5;β_m^-:11.5	3.100 h	3.23		2.0738E+05	3.5927E+05	9
1250	Ho-168	3.0	β^-	3.000 m	3.33		7.1594E+05	8.4473E+05	9
1251	Ho-169	3.5	β^-	4.400 m	4.55		6.0300E+05	4.8100E+05	9
1252	Ho-170	6.0	β^-	2.780 m	5.04		8.3608E+05	1.8346E+06	2
1253	Ho-170m	1.0	β^-	43.000 s	4.65		1.3653E+06	6.7937E+05	2
1254	Ho-171	3.5	β^-	53.000 s	3.77		3.3000E+05	3.3000E+05	6
1255	Ho-172	?	β^-	25.000 s	12.00		3.3000E+05	3.3000E+05	6
1256	Er-156	0.0	β^+	19.500 m	5.13		6.8000E+04	1.5063E+04	9
1257	Er-157	1.5	β^+	18.650 m	0.54		2.4000E+04	3.1300E+05	9
1258	Er-158	0.0	β^+	2.250 h	3.70		1.1000E+05	1.2960E+05	9
1259	Er-159	1.5	β^+	36.000 m	2.78		6.2000E+04	8.9000E+05	6
1260	Er-160	0.0	β^+	1.191 d	0.39		1.1000E+05	1.5660E+03	9
1261	Er-161	1.5	β^+	3.211 h	0.95		6.6866E+05	8.8000E+05	9
1262	Er-162	0.0							1
1263	Er-163	2.5	β^+	1.250 h	0.53		5.2600E+03	4.0200E+04	9
1264	Er-164	0.0							1
1265	Er-165	2.5	β^+	10.361 h	0.40		5.1700E+03	3.7800E+04	9
1266	Er-166	0.0							1
1267	Er-167	3.5							1
1268	Er-167m	0.5	IT	2.280 s	1.32		8.9535E+04	1.1828E+05	9
1269	Er-168	0.0							1
1270	Er-169	0.5	β^-	9.300 d	2.15		1.0285E+05	2.0341E+01	9
1271	Er-170	0.0							1
1272	Er-171	2.5	β^-	7.519 h	0.41		4.1400E+05	3.7300E+05	9
1273	Er-172	0.0	β^-	2.054 d	0.61		1.2872E+05	5.1568E+05	2
1274	Er-173	3.5	β^-	1.400 m	7.14		6.6000E+05	8.3000E+05	9
1275	Er-174	0.0	β^-	3.300 m	6.06		7.6700E+05	7.6700E+05	6
1276	Er-175	?	β^-	17.600 s	51.14		1.3630E+06	1.3630E+06	6

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1277	Tm-160	1.0	β^+	9.400 m	3.19		1.8667E+06	1.1100E+06	9
1278	Tm-160m	5.0	β^+	1.242 m	2.01		1.9000E+05	2.0000E+05	9
1279	Tm-161	3.5	β^+	38.000 m	10.53		1.0343E+06	8.9917E+05	9
1280	Tm-162	1.0	β^+	21.700 m	0.92		1.3100E+05	1.6390E+06	9
1281	Tm-162m	5.0	β^+:18.0;IT:82.0	24.300 s	7.00		8.0000E+04	3.0000E+05	9
1282	Tm-163	0.5	β^+	1.810 h	0.28		6.2600E+04	1.2930E+06	9
1283	Tm-164	1.0	β^+	2.000 m	5.00		5.2000E+05	7.1900E+05	9
1284	Tm-164m	6.0	β^+	5.100 m	1.96		3.1400E+04	3.4900E+05	9
1285	Tm-165	0.5	β^+	1.253 d	0.10		3.6100E+04	5.4700E+05	9
1286	Tm-166	2.0	β^+	7.700 h	0.40		8.4000E+04	1.9400E+06	9
1287	Tm-167	0.5	β^+	9.240 d	0.23		1.2300E+05	1.4600E+05	9
1288	Tm-168	3.0	β^-:0.01;β^+:99.99	93.102 d	0.22		1.2380E+05	1.2140E+06	9
1289	Tm-169	0.5							1
1290	Tm-170	1.0	β^-:99.85;β^+:0.15	128.600 d	0.23		3.2888E+05	5.5017E+03	9
1291	Tm-171	0.5	β^-	1.920 y	0.66		2.5400E+04	6.2400E+02	9
1292	Tm-172	2.0	β^-	2.650 d	0.48		5.2000E+05	4.8500E+05	9
1293	Tm-173	0.5	β^-	8.250 h	1.01		3.0800E+05	3.8800E+05	9
1294	Tm-174	4.0	β^-	5.400 m	1.85		5.1000E+05	1.7800E+06	9
1295	Tm-175	0.5	β^-	15.167 m	3.30		4.2600E+05	1.1650E+06	9
1296	Tm-176	4.0	β^-	1.900 m	5.26		8.4000E+05	1.7060E+06	9
1297	Yb-162	0.0	β^+	18.867 m	1.06		6.7000E+03	2.3335E+05	9
1298	Yb-163	1.5	β^+	11.050 m	2.26		4.5000E+05	7.1000E+05	9
1299	Yb-164	0.0	β^+	1.264 h	2.42		9.6000E+02	1.3441E+04	9
1300	Yb-165	2.5	β^+	9.900 m	3.03		1.4800E+05	3.3600E+05	9
1301	Yb-166	0.0	β^+	2.362 d	0.20		3.6100E+04	8.6400E+04	9
1302	Yb-167	2.5	β^+	17.500 m	1.14		7.4200E+04	2.7400E+05	9
1303	Yb-168	0.0							1
1304	Yb-169	3.5	β^+	32.010 d	0.06		1.0636E+05	3.2684E+05	9
1305	Yb-169m	0.5	IT	46.000 s	4.35		2.4200E+04	9.0977E-02	9
1306	Yb-170	0.0							1
1307	Yb-171	0.5							1
1308	Yb-172	0.0							1
1309	Yb-173	2.5							1
1310	Yb-174	0.0							1
1311	Yb-175	3.5	β^-	4.185 d	0.02		1.2164E+05	7.9937E+04	2
1312	Yb-176	0.0							1
1313	Yb-176m	8.0	IT	11.400 s	4.39		1.5000E+05	9.0000E+05	9
1314	Yb-177	4.5	β^-	1.889 h	5.88		4.2000E+05	1.8600E+05	9
1315	Yb-177m	0.5	IT	6.410 s	0.31		1.7800E+05	1.4940E+05	9
1316	Yb-178	0.0	β^-	1.233 h	4.05		2.1000E+05	6.1660E+05	9
1317	Yb-179	?	β^-	8.167 m	10.20		7.6999E+05	1.5900E+06	9
1318	Yb-180	0.0	β^-	2.400 m	20.83		7.3000E+05	7.3000E+05	6
1319	Lu-166	6.0	β^+	2.650 m	3.77		3.3300E+05	2.1500E+06	9
1320	Lu-166m	3.0	β^+:58.0;IT:42.0	1.417 m	7.06		4.7000E+04	8.7000E+05	9
1321	Lu-166n	0.0	β^+	2.117 m	4.72		4.7900E+05	2.1000E+06	9
1322	Lu-167	3.5	β^+	51.500 m	1.94		1.0233E+06	9.2400E+05	9
1323	Lu-168	6.0	β^+	5.500 m	1.82		2.7100E+05	4.4000E+06	9
1324	Lu-168m	3.0	β^+	6.700 m	5.97		1.7600E+05	2.2700E+06	9
1325	Lu-169	3.5	β^+	1.419 d	0.15		4.1000E+04	1.2140E+06	9
1326	Lu-169m	0.5	IT	2.667 m	6.25		2.1800E+04	1.4200E+03	9
1327	Lu-170	0.0	β^+	2.002 d	1.73		5.3000E+04	2.5200E+06	9
1328	Lu-170m	4.0	IT	0.670 s	14.93		7.6200E+04	3.6000E+03	9
1329	Lu-171	3.5	β^+	8.250 d	0.36		8.8330E+04	6.4130E+05	2
1330	Lu-171m	0.5	IT	1.300 m	2.56		6.9435E+04	1.7866E+03	2
1331	Lu-172	4.0	β^+	6.700 d	0.15		1.1138E+05	1.9552E+06	2
1332	Lu-172m	1.0	IT	3.700 m	13.51		4.0205E+04	1.6674E+03	2
1333	Lu-173	3.5	β^+	1.336 y	2.66		4.6178E+04	1.7016E+05	2
1334	Lu-174	1.0	β^+	3.559 y	11.54		4.4819E+04	1.1667E+05	2
1335	Lu-174m	6.0	β^+:0.58;IT:99.42	142.000 d	2.11		1.1685E+05	6.1667E+04	2
1336	Lu-175	3.5							1
1337	Lu-176	7.0	β^-	3.61E+10 y	4.39		2.9200E+05	4.9000E+05	9
1338	Lu-176m	1.0	β^-	3.681 h	0.30		4.7500E+05	1.4300E+04	9
1339	Lu-177	3.5	β^-	6.700 d	0.30		1.4742E+05	3.6862E+04	2
1340	Lu-177m	11.5	β_m^-:77.4;IT:22.6	160.300 d	0.25		8.2076E+04	1.6777E+05	2
1341	Lu-178	1.0	β^-	28.400 m	0.70		7.2000E+05	1.4400E+05	9
1342	Lu-178m	9.0	β^-	23.100 m	1.30		4.9000E+05	1.0520E+06	9
1343	Lu-179	3.5	β^-	4.589 h	1.33		4.6000E+05	3.0000E+04	9
1344	Lu-180	?	β^-	5.700 m	1.75		6.3000E+05	1.5120E+06	9
1345	Lu-181	3.5	β^-	3.500 m	8.57		8.9000E+04	5.6000E+05	9
1346	Lu-182	?	β^-	2.000 m	10.00		1.5900E+05	2.0600E+06	9
1347	Hf-168	0.0	β^+	25.950 m	0.77			4.3000E+05	11

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1348	Hf-169	2.5	β^+	3.240 m	1.23		5.0000E+05	1.1000E+06	9
1349	Hf-170	0.0	β^+	16.000 h	0.87		6.7500E+04	4.9545E+05	9
1350	Hf-171	3.5	β^+	12.111 h	3.44		1.3400E+06	7.9999E+05	9
1351	Hf-172	0.0	β^+	1.870 y	1.69		1.0200E+05	1.1000E+05	9
1352	Hf-173	0.5	β^+	23.900 h	1.26		5.2050E+04	3.9661E+05	2
1353	Hf-174	0.0	α	2.00E+15 y	20.00	2.5036E+06			2
1354	Hf-175	2.5	β^+	70.000 d	1.43		4.5512E+04	3.6299E+05	2
1355	Hf-176	0.0							1
1356	Hf-177	3.5							1
1357	Hf-177m	11.5	IT	1.080 s	5.56		2.4072E+05	1.0680E+06	2
1358	Hf-177n	18.5	IT_m	51.400 m	0.97		2.5154E+05	1.1773E+06	2
1359	Hf-178	0.0							1
1360	Hf-178m	8.0	IT	4.000 s	7.50		1.4152E+05	1.0059E+06	2
1361	Hf-178n	16.0	IT_m	31.001 y	3.23		7.3620E+04	1.2231E+06	2
1362	Hf-179	4.5							1
1363	Hf-179m	0.5	IT	18.670 s	0.16		1.2100E+05	2.3700E+05	9
1364	Hf-179n	12.5	IT	25.116 d	1.38		1.7000E+05	9.2700E+05	9
1365	Hf-180	0.0							1
1366	Hf-180m	8.0	β_m^-:0.31;IT:99.69	5.500 h	1.82		1.4858E+05	9.9243E+05	2
1367	Hf-181	0.5	β^-	42.380 d	0.14		2.0439E+05	5.3054E+05	2
1368	Hf-182	0.0	β^-	8.99E+06 y	33.33		7.1668E+04	2.1222E+05	10
1369	Hf-182m	8.0	β^-:54.0;IT:46.0	1.025 h	2.44		2.0404E+05	9.8045E+05	10
1370	Hf-183	1.5	β^-	1.067 h	1.82		4.2000E+05	7.7000E+05	9
1371	Hf-184	0.0	β^-	4.119 h	1.21		4.5000E+05	2.5000E+05	9
1372	Hf-185	?	β^-	3.500 m	17.14		2.0000E+06	2.0000E+06	6
1373	Hf-186	?	β^-	2.267 m	50.00		4.7300E+05	4.7300E+05	6
1374	Hf-187	?	β^-	1.733 m	48.08		1.1930E+06	1.1930E+06	6
1375	Ta-170	3.0	β^+	6.767 m	0.99		1.4200E+06	1.0200E+06	9
1376	Ta-171	2.5	β^+	23.300 m	1.29		1.3000E+05	1.9000E+06	9
1377	Ta-172	3.0	β^+	36.800 m	0.82		4.6200E+05	1.8500E+06	9
1378	Ta-173	2.5	β^+	3.139 h	4.42		1.2500E+05	5.3600E+05	9
1379	Ta-174	3.0	β^+	1.181 h	4.24		3.7000E+05	9.1000E+05	9
1380	Ta-175	3.5	β^+	10.500 h	2.12		4.7600E+04	8.4189E+05	9
1381	Ta-176	1.0	β^+	8.083 h	1.03		6.3000E+04	2.1400E+06	9
1382	Ta-177	3.5	β^+	2.350 d	0.89		2.2724E+04	6.7752E+04	2
1383	Ta-178	1.0	β^+	9.310 m	0.32		3.3000E+04	1.2000E+05	9
1384	Ta-178m	7.0	β^+	2.361 h	3.53		1.5260E+05	1.1540E+06	9
1385	Ta-179	3.5	β^+	1.610 y	1.70		7.3952E+03	2.9246E+04	2
1386	Ta-180	1.0	β^-:18.1;β^+:81.9	8.080 h	0.62		6.4058E+04	4.5930E+04	2
1387	Ta-180m	9.0	β^-:20.0;β^+:80.0	1.80E+15 y	33.33		1.2585E+05	5.6252E+05	2
1388	Ta-181	3.5							1
1389	Ta-182	3.0	β^-	114.700 d	0.35		2.1634E+05	1.2833E+06	2
1390	Ta-182m	5.0	IT	0.283 s	1.06		1.4319E+04	1.9174E+03	2
1391	Ta-182n	10.0	IT_m	15.840 m	0.63		2.4438E+05	2.5464E+05	2
1392	Ta-183	3.5	β_g^-:96.6;β_m^-:3.4	5.090 d	1.38		3.4936E+05	2.8664E+05	2
1393	Ta-184	?	β^-	8.700 h	1.15		5.0202E+05	1.6439E+06	9
1394	Ta-185	3.5	β^-	49.000 m	4.08		7.7596E+05	1.6459E+05	9
1395	Ta-186	?	β^-	10.500 m	4.76		8.8000E+05	1.3700E+06	9
1396	Ta-187	?	β^-	1.000 s	90.00		2.0000E+06	2.0000E+06	6
1397	Ta-188	?	β^-	1.000 s	90.00		2.0000E+06	2.0000E+06	6
1398	W-172	0.0	β^+	6.667 m	15.00		1.1600E+05	7.9000E+05	9
1399	W-173	?	β^+	7.967 m	3.56			1.6700E+05	11
1400	W-174	3.0	β^+	29.333 m	3.41		5.6666E+05	5.6666E+05	9
1401	W-175	0.5	β^+	34.000 m	2.94		9.9999E+05	9.9999E+05	9
1402	W-176	0.0	β^+	2.306 h	4.82		6.3200E+04	1.5572E+05	9
1403	W-177	0.5	β^+	2.250 h	2.22		7.5900E+04	9.0800E+05	9
1404	W-178	0.0	β^+	21.600 d	1.39		6.9949E+03	1.9164E+04	2
1405	W-179	3.5	β^+	37.500 m	1.33		5.5000E+03	5.3600E+04	9
1406	W-179m	0.5	β^+:0.28;IT:99.72	6.400 m	1.56		1.5800E+05	2.0900E+04	9
1407	W-180	0.0							1
1408	W-181	4.5	β^+	120.980 d	0.10		1.2682E+04	4.1206E+04	2
1409	W-182	0.0							1
1410	W-183	0.5							1
1411	W-183m	5.5	IT	5.250 s	1.33		1.8399E+05	1.2539E+05	2
1412	W-184	0.0							1
1413	W-185	1.5	β^-	75.100 d	0.40		1.2680E+05	5.0160E+01	2
1414	W-185m	5.5	IT	1.667 m	2.00		1.7199E+05	2.5739E+04	2
1415	W-186	0.0							1
1416	W-187	1.5	β^-	23.850 h	0.34		3.0126E+05	4.4210E+05	2
1417	W-188	0.0	β^-	69.444 d	0.83		9.9600E+04	1.8900E+03	9
1418	W-189	1.5	β^-	11.500 m	2.61		8.3333E+05	1.2300E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1419	W-190	0.0	β^-	30.000 m	5.00		4.7000E+05	1.5000E+05	9
1420	W-191	?	β^-	1.000 s	90.00		2.0000E+06	2.0000E+06	6
1421	W-192	?	β^-	1.280 m	52.08		5.9300E+05	5.9300E+05	6
1422	W-193	?	β^-	1.700 m	49.02		1.1870E+06	1.1870E+06	6
1423	Re-178	3.0	β^+	13.200 m	1.52		5.5000E+05	1.6600E+06	9
1424	Re-179	2.5	β^+	19.500 m	0.51		5.5900E+04	1.0740E+06	9
1425	Re-180	1.0	β^+	2.433 m	2.74		1.3300E+05	1.1700E+06	9
1426	Re-181	2.5	β^+	20.000 h	4.17		1.2800E+05	8.1000E+05	9
1427	Re-182	7.0	β^+	2.667 d	0.78		1.9000E+05	1.8000E+06	9
1428	Re-182m	2.0	β^+	12.694 h	1.75		8.2000E+04	1.2100E+06	9
1429	Re-183	2.5	β^+	70.023 d	1.65		9.7000E+04	1.5670E+05	9
1430	Re-184	3.0	β^+	37.963 d	1.52		4.9000E+04	8.9200E+05	9
1431	Re-184m	8.0	β^+:25.3;IT:74.7	165.509 d	3.50		1.3050E+05	3.8900E+05	9
1432	Re-185	2.5							1
1433	Re-186	1.0	β^-:93.1;β^+:6.9	3.777 d	0.12		3.3830E+05	1.7500E+04	9
1434	Re-186m	8.0	IT	2.00E+05 y	25.40		6.8200E+04	6.0000E+04	9
1435	Re-187	2.5	β^-	5.00E+10 y	16.01		6.6000E+02		6
1436	Re-188	1.0	β^-	16.981 h	0.13		7.8000E+05	5.7700E+04	9
1437	Re-188m	6.0	IT	18.600 m	0.54		8.2000E+04	7.4000E+04	9
1438	Re-189	2.5	β^-	1.013 d	1.68		3.2000E+05	6.0000E+04	6
1439	Re-190	2.0	β^-	3.100 m	9.68		7.1000E+05	1.3500E+06	9
1440	Re-190m	6.0	β^-:54.5;IT:45.5	3.194 h	6.96		2.9500E+05	9.2200E+05	9
1441	Re-191	1.5	β^-	9.700 m	4.12		7.2698E+05	2.2291E+03	2
1442	Re-192	1.0	β^-	6.200 s	12.90		1.6379E+06	1.5906E+05	2
1443	Re-193	?	β^-	1.000 s	90.00		2.0000E+06	2.0000E+06	6
1444	Re-194	?	β^-	1.000 s	90.00		2.0000E+06	2.0000E+06	6
1445	Re-195	?	β^-	10.200 s	49.02		1.1900E+06	1.1900E+06	6
1446	Os-180	0.0	β^+	21.500 m	1.86		1.2700E+04	5.6000E+03	9
1447	Os-181	3.5	β^+	2.700 m	3.70		7.2000E+04	3.7400E+05	9
1448	Os-181m	0.5	β^+	1.750 h	2.86		8.4000E+04	1.3800E+06	9
1449	Os-182	0.0	β^+	22.111 h	1.13		4.8100E+04	4.6148E+05	9
1450	Os-183	4.5	β^+	13.000 h	3.85		7.2600E+04	6.3200E+05	9
1451	Os-183m	0.5	β^+:85.0;IT:15.0	9.889 h	3.09		3.6000E+04	9.9900E+05	9
1452	Os-184	0.0							1
1453	Os-185	0.5	β^+	93.800 d	0.96		1.8331E+04	7.1903E+05	2
1454	Os-186	0.0	α	1.90E+15 y	66.67	2.8170E+06			9
1455	Os-187	0.5							1
1456	Os-188	0.0							1
1457	Os-189	1.5							1
1458	Os-189m	4.5	IT	4.806 h	2.31		2.4260E+04	2.0100E+03	9
1459	Os-190	0.0							1
1460	Os-190m	10.0	IT	9.900 m	4.04		1.1685E+05	1.5885E+06	2
1461	Os-191	4.5	β^-	15.405 d	0.68		8.5000E+04	4.0000E+04	9
1462	Os-191m	1.5	IT	13.100 h	0.76		6.6486E+04	7.8554E+03	2
1463	Os-192	0.0							1
1464	Os-192m	10.0	IT	5.900 s	1.69		1.6100E+05	1.8800E+06	9
1465	Os-193	1.5	β^-	1.271 d	1.37		3.7600E+05	6.7100E+04	9
1466	Os-194	0.0	β^-	5.989 y	3.70		3.2333E+04	2.3000E+03	9
1467	Os-195	0.5	β^-	6.500 m	9.23		7.1526E+05	1.4223E+05	2
1468	Os-196	0.0	β^-	34.900 m	0.57		2.4500E+05	9.6114E+04	9
1469	Os-197	?	β^-	3.410 s	49.85		7.1700E+05	7.1700E+05	6
1470	Os-198	?	β^-	32.900 s	51.67		3.6000E+05	3.6000E+05	6
1471	Os-199	?	β^-	36.600 s	51.91		1.1430E+06	1.1430E+06	6
1472	Ir-182	5.0	β^+	15.000 m	6.67		7.8000E+04	8.1900E+05	9
1473	Ir-183	3.5	β^+	55.000 m	15.15		6.1000E+05	2.7392E+06	9
1474	Ir-184	5.0	β^+	3.019 h	2.02		2.2700E+05	1.7225E+06	9
1475	Ir-185	2.5	β^+	13.889 h	8.00		8.3333E+05	8.3333E+05	9
1476	Ir-186	5.0	β^+	16.639 h	0.18		1.2800E+05	1.6200E+06	9
1477	Ir-186m	2.0	β^+	2.000 h	5.56		1.2000E+05	1.4300E+06	9
1478	Ir-187	1.5	β^+	10.500 h	2.86		6.3789E+04	3.0151E+05	2
1479	Ir-188	2.0	β^+	1.729 d	1.20		4.1600E+04	2.1000E+06	9
1480	Ir-189	1.5	β^+	13.194 d	0.76		3.7500E+04	8.2836E+04	6
1481	Ir-190	4.0	β^+	12.000 d	1.67		7.2110E+04	1.4781E+06	2
1482	Ir-190m	1.0	IT	1.120 h	0.27		2.3839E+04	2.2832E+03	2
1483	Ir-190n	11.0	IT_g:8.6;β_m^+:91.4	3.087 h	0.39		2.8879E+04	5.8873E+04	2
1484	Ir-191	1.5							1
1485	Ir-191m	5.5	IT	4.900 s	0.41		9.7091E+04	7.5475E+04	2
1486	Ir-191n	13.5	IT_m	5.500 s	12.73		4.5764E+04	1.8681E+06	2
1487	Ir-192	4.0	β^-:95.4;β^+:4.6	73.831 d	0.01		2.1620E+05	8.1500E+05	9
1488	Ir-192m	1.0	β^-:0.02;IT:99.98	1.440 m	3.47		5.8083E+04	1.5793E+02	10
1489	Ir-192n	9.0	IT	240.841 y	3.73			1.6100E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1490	Ir-193	1.5							1
1491	Ir-193m	5.5	IT	10.602 d	1.09		7.3300E+04	2.4100E+03	9
1492	Ir-194	1.0	β^-	19.150 h	0.16		8.1000E+05	9.1000E+04	9
1493	Ir-194m	11.0	β^-	171.296 d	6.76		8.2900E+04	2.3300E+06	10
1494	Ir-195	1.5	β^-	2.500 h	8.89		3.8000E+05	5.8000E+04	9
1495	Ir-195m	5.5	β^-:95.0;IT:5.0	3.806 h	5.84		3.4400E+05	4.0900E+05	9
1496	Ir-196	0.0	β^-	52.000 s	3.85		1.1700E+06	2.3300E+05	9
1497	Ir-196m	11.0	β^-	1.400 h	1.59		4.5000E+05	2.4700E+06	10
1498	Ir-197	1.5	β^-	5.800 m	8.62		7.3337E+05	2.2379E+05	2
1499	Ir-197m	5.5	β_m^-:99.75;IT:0.25	8.900 m	3.37		6.8001E+05	2.0424E+03	2
1500	Ir-198	?	β^-	8.000 s	12.50		1.3333E+06	8.2000E+05	9
1501	Ir-199	?	β^-	50.700 s	49.31		7.0000E+05	7.0000E+05	6
1502	Ir-200	?	β^-	5.190 s	50.10		1.2780E+06	1.2780E+06	6
1503	Pt-184	0.0	β^+:100.0;α:~	17.300 m	1.16	4.4900E+01		1.8157E+06	9
1504	Pt-185	4.5	β^+	1.183 h	3.38		1.2667E+06	2.5400E+06	6
1505	Pt-185m	0.5	β^+	33.000 m	2.53		3.7800E+05	3.1100E+06	11
1506	Pt-186	0.0	β^+:100.0;α:~	2.000 h	5.56	5.9200E+00	1.8500E+04	6.5200E+05	9
1507	Pt-187	1.5	β^+	2.350 h	1.30		9.6666E+05	9.6666E+05	9
1508	Pt-188	0.0	β^+:99.99;α:0.01	10.185 d	3.41	3.9190E+06	7.4700E+04	1.9483E+05	9
1509	Pt-189	1.5	β^+	10.889 h	1.02		6.1000E+04	2.9600E+05	9
1510	Pt-190	0.0	α	6.59E+11 y	4.81	3.2000E+06			9
1511	Pt-191	1.5	β^+	2.905 d	3.59		6.3300E+04	2.7200E+05	9
1512	Pt-192	0.0							1
1513	Pt-193	0.5	β^+	50.001 y	18.00		7.8562E+03	3.3781E+04	2
1514	Pt-193m	6.5	IT	4.340 d	0.69		1.3796E+05	1.2333E+04	2
1515	Pt-194	0.0							1
1516	Pt-195	0.5							1
1517	Pt-195m	6.5	IT	4.020 d	0.26		1.6900E+05	7.6000E+04	9
1518	Pt-196	0.0							1
1519	Pt-197	0.5	β^-	19.892 h	0.01		2.5443E+05	2.4381E+04	2
1520	Pt-197m	6.5	β_m^-:3.3;IT:96.7	1.588 h	0.21		3.1694E+05	7.6079E+04	2
1521	Pt-198	0.0							1
1522	Pt-199	2.5	β^-	30.800 m	1.30		5.4000E+05	2.0100E+05	9
1523	Pt-199m	6.5	IT	13.600 s	2.94		7.6000E+04	3.4050E+05	9
1524	Pt-200	0.0	β^-	12.500 h	2.44		2.4100E+05	5.7059E+04	9
1525	Pt-201	2.5	β^-	2.500 m	4.00		6.5700E+05	8.8666E+05	9
1526	Pt-202	0.0	β^-	1.833 d	34.09		1.6300E+05	1.6300E+05	6
1527	Au-187	0.5	β^+:99.9;α:0.1	8.400 m	3.57	1.3102E+06	2.9900E+06	1.5768E+06	9
1528	Au-187m	4.5	IT	2.300 s	4.35			1.2051E+05	6
1529	Au-188	1.0	β^+	8.833 m	0.75		4.2000E+04	2.0500E+06	9
1530	Au-189	0.5	β^+	28.700 m	1.05		8.0000E+04	8.4000E+05	6
1531	Au-189m	5.5	β^+	4.590 m	0.22		1.0324E+06	2.0770E+05	9
1532	Au-190	1.0	β^+	42.833 m	2.33		3.0000E+04	1.9900E+06	9
1533	Au-191	1.5	β^+	3.167 h	2.63		7.1900E+04	5.8700E+05	9
1534	Au-191m	5.5	IT	0.920 s	11.96		5.5000E+04	1.9000E+05	9
1535	Au-192	1.0	β^+	4.944 h	2.25		8.2000E+04	1.9000E+06	9
1536	Au-192m	11.0	IT	0.160 s	12.50			4.3170E+05	6
1537	Au-193	1.5	β^+	17.639 h	0.94		4.8700E+04	1.3715E+05	9
1538	Au-193m	5.5	β^+:0.03;IT:99.97	3.900 s	7.69		8.3000E+04	1.6348E+05	9
1539	Au-194	1.0	β^+	1.584 d	0.29		3.5400E+04	1.0150E+06	9
1540	Au-194m	5.0	IT	0.600 s	1.33			3.2000E+03	9
1541	Au-194n	11.0	IT	0.420 s	2.38			1.2100E+05	9
1542	Au-195	1.5	β^+	186.090 d	0.01		4.2000E+04	8.6700E+04	9
1543	Au-195m	5.5	IT	30.500 s	0.66		1.1080E+05	2.0120E+05	9
1544	Au-196	2.0	β^-:7.5;β^+:92.5	6.183 d	0.17		3.2500E+04	4.7500E+05	9
1545	Au-196m	5.0	IT	8.100 s	2.47		7.7000E+04	2.9000E+03	9
1546	Au-196n	12.0	IT	9.694 h	1.15		3.7000E+05	2.4000E+05	9
1547	Au-197	1.5							1
1548	Au-197m	5.5	IT	7.740 s	0.90		1.8382E+05	2.2544E+05	2
1549	Au-198	2.0	β^-	2.694 d	0.03		3.2734E+05	4.0289E+05	2
1550	Au-198m	12.0	IT	2.300 d	1.74		2.6208E+05	5.2782E+05	2
1551	Au-199	1.5	β^-	3.139 d	0.22		1.4508E+05	9.6067E+04	2
1552	Au-200	1.0	β^-	48.400 m	0.62		7.4000E+05	2.7300E+05	9
1553	Au-200m	12.0	β^-:82.0;IT:18.0	18.694 h	2.67		2.5000E+05	1.9800E+06	9
1554	Au-201	1.5	β^-	26.000 m	3.85		4.2400E+05	3.4000E+04	9
1555	Au-202	1.0	β^-	28.800 s	6.60		1.2400E+06	1.5192E+05	9
1556	Au-203	1.5	β^-	53.000 s	3.77		7.1333E+05	6.9000E+04	9
1557	Au-204	2.0	β^-	39.800 s	2.26		8.3000E+05	1.9025E+06	9
1558	Hg-190	0.0	β^+	20.000 m	2.00		6.8071E+04	2.0438E+05	2
1559	Hg-191	1.5	β^+	48.333 m	20.69		1.0600E+06	4.3796E+05	9
1560	Hg-191m	6.5	β^+	50.833 m	2.95		1.0100E+05	1.4500E+06	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1561	Hg-192	0.0	β^+	4.861 h	4.57		5.7300E+04	2.5375E+05	9
1562	Hg-193	1.5	β^+	3.806 h	4.38		7.7999E+05	7.7999E+05	9
1563	Hg-193m	6.5	β^+:92.0;IT:8.0	11.806 h	1.88		1.1900E+05	1.1177E+06	9
1564	Hg-194	0.0	β^+	519.696 y	6.10		2.8000E+03	2.1000E+03	9
1565	Hg-195	0.5	β^+	9.889 h	5.06		5.5000E+04	1.9900E+05	9
1566	Hg-195m	6.5	β^+:45.8;IT:54.2	1.736 d	2.00		1.3300E+05	2.0400E+05	9
1567	Hg-196	0.0							1
1568	Hg-197	0.5	β^+	2.692 d	0.93		6.9155E+04	7.3506E+04	2
1569	Hg-197m	6.5	β_m^+:8.6;IT:91.4	23.900 h	2.09		2.0056E+05	7.7979E+04	2
1570	Hg-198	0.0							1
1571	Hg-199	0.5							1
1572	Hg-199m	6.5	IT	42.100 m	2.14		3.4770E+05	1.8457E+05	2
1573	Hg-200	0.0							1
1574	Hg-201	1.5							1
1575	Hg-202	0.0							1
1576	Hg-203	2.5	β^-	46.595 d	0.03		9.9110E+04	2.3774E+05	2
1577	Hg-204	0.0							1
1578	Hg-205	0.5	β^-	5.200 m	1.92		5.3624E+05	6.8864E+03	2
1579	Hg-206	0.0	β^-	8.150 m	1.23		4.2324E+05	1.0661E+05	12
1580	Hg-207	4.5	β^-	2.900 m	6.90		1.5933E+06	2.7200E+06	9
1581	Hg-208	0.0	β^-	42.000 m	42.86		1.0610E+06	1.0610E+06	6
1582	Hg-209	?	β^-	56.300 s	49.73		1.5210E+06	1.5210E+06	6
1583	Tl-193	0.5	β^+	21.800 m	3.21		9.4344E+04	5.5590E+05	2
1584	Tl-193m	4.5	β^+:25.0;IT:75.0	2.110 m	7.11		1.0918E+05	3.6346E+05	2
1585	Tl-194	2.0	β^+	33.000 m	1.52		1.9000E+04	7.1000E+05	9
1586	Tl-194m	7.0	β^+	32.800 m	0.61		2.7000E+05	2.5100E+06	9
1587	Tl-195	0.5	β^+	1.161 h	4.31		4.9500E+04	1.1900E+06	9
1588	Tl-195m	4.5	IT	3.600 s	11.11		1.1700E+05	3.6000E+05	9
1589	Tl-196	2.0	β^+	1.839 h	1.66		2.9000E+05	1.7900E+06	9
1590	Tl-196m	7.0	β^+:95.5;IT:4.5	1.411 h	1.57		2.7800E+04	1.1300E+06	9
1591	Tl-197	0.5	β^+	2.839 h	1.47		5.1000E+04	4.1586E+05	9
1592	Tl-197m	4.5	IT	0.540 s	1.85		1.6900E+05	4.3500E+05	9
1593	Tl-198	2.0	β^+	5.306 h	9.42		1.1300E+04	2.0000E+06	9
1594	Tl-198m	7.0	β^+:54.0;IT:46.0	1.869 h	1.63		1.3300E+05	1.2000E+06	9
1595	Tl-199	0.5	β^+	7.417 h	1.12		5.2800E+04	2.4900E+05	9
1596	Tl-200	2.0	β^+	1.088 d	0.43		3.5800E+04	1.3100E+06	9
1597	Tl-201	0.5	β^+	3.041 d	0.07		4.4079E+04	9.5411E+04	2
1598	Tl-202	2.0	β^+	12.240 d	0.25		2.2508E+04	4.6654E+05	2
1599	Tl-203	0.5							1
1600	Tl-204	2.0	β^-:97.8;β^+:2.2	3.790 y	0.26		2.3621E+05	1.0582E+03	2
1601	Tl-205	0.5							1
1602	Tl-206	0.0	β^-	4.200 m	0.48		5.3697E+05	1.4124E+03	12
1603	Tl-206m	12.0	IT	3.760 m	1.06		1.5329E+05	2.4895E+06	12
1604	Tl-207	0.5	β^-	4.770 m	0.63		4.9135E+05	3.3412E+03	12
1605	Tl-207m	5.5	IT	1.330 s	8.27		1.8370E+05	1.1574E+06	12
1606	Tl-208	5.0	β^-	3.055 m	0.23		5.9355E+05	3.3852E+06	12
1607	Tl-209	0.5	β^-	2.200 m	3.18		6.8491E+05	2.1222E+06	12
1608	Tl-210	5.0	β^-:100.0;β^-,n:~	1.300 m	2.31		7.6257E+05	2.7859E+06	12
1609	Pb-195	1.5	β^+	15.000 m	33.33		1.0100E+03	2.9500E+05	6
1610	Pb-195m	6.5	β^+	15.000 m	8.89		3.0500E+05	1.6800E+06	9
1611	Pb-196	0.0	β^+	37.000 m	8.11		6.9333E+05	8.1309E+05	9
1612	Pb-197	1.5	β^+	10.000 m	20.00		6.0000E+04	1.6800E+06	9
1613	Pb-197m	6.5	β^+:81.0;IT:19.0	44.667 m	2.24		2.3600E+05	1.1700E+06	9
1614	Pb-198	0.0	β^+	2.389 h	4.65		4.9000E+04	4.3000E+05	9
1615	Pb-199	1.5	β^+	1.500 h	11.11		4.0000E+04	1.1480E+06	9
1616	Pb-199m	6.5	β^+:7.0;IT:93.0	12.200 m	2.46		2.7900E+05	1.4830E+05	9
1617	Pb-200	0.0	β^+	21.500 h	1.94		9.0800E+04	2.0800E+05	9
1618	Pb-201	2.5	β^+	9.400 h	1.06		5.8285E+04	7.6805E+05	2
1619	Pb-201m	6.5	IT	1.017 m	4.92		2.6219E+05	3.6614E+05	2
1620	Pb-202	0.0	β^+	5.30E+04 y	3.77		9.2832E+03	6.9968E+04	2
1621	Pb-202m	9.0	β^+:9.1;IT:90.9	3.570 h	0.84		1.3845E+05	1.9755E+06	2
1622	Pb-203	2.5	β^+	2.162 d	0.04		5.2334E+04	3.1518E+05	2
1623	Pb-203m	6.5	IT	6.290 s	1.91		1.7121E+05	6.5409E+05	2
1624	Pb-203n	14.5	IT_m	0.480 s	4.17		2.1640E+05	1.9066E+06	2
1625	Pb-204	0.0	α	1.40E+17 y	42.86	1.9717E+06			2
1626	Pb-204m	9.0	IT	1.125 h	0.74		1.0327E+05	2.0807E+06	2
1627	Pb-205	2.5	β^+	1.53E+07 y	4.58		8.9530E+03	5.9294E+04	2
1628	Pb-206	0.0							1
1629	Pb-207	0.5							1
1630	Pb-207m	6.5	IT	0.805 s	1.24			1.6330E+06	9
1631	Pb-208	0.0							1

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1632	Pb-209	4.5	β^-	3.253 h	0.43		1.9734E+05		12
1633	Pb-210	0.0	β^-:100.0;α:~	22.300 y	0.90	7.2053E-02	3.9840E+04	5.0429E+03	12
1634	Pb-211	4.5	β^-	36.100 m	0.55		4.4907E+05	6.8454E+04	12
1635	Pb-212	0.0	β^-	10.640 h	0.09		1.7460E+05	1.4456E+05	12
1636	Pb-213	4.5	β^-	10.200 m	2.94		6.9999E+05	6.9999E+05	6
1637	Pb-214	0.0	β^-	26.800 m	3.36		2.9639E+05	2.4642E+05	12
1638	Bi-200	7.0	β^+	36.333 m	1.38		2.0000E+05	2.4000E+06	9
1639	Bi-200m	2.0	β^+	31.000 m	6.45		3.6120E+05	1.5200E+06	9
1640	Bi-201	4.5	β^+	1.800 h	2.78		1.3400E+05	1.8600E+06	9
1641	Bi-201m	0.5	β^+:99.97;α:0.03	59.167 m	1.13	1.3624E+03			9
1642	Bi-202	5.0	β^+	1.669 h	1.33		1.4100E+05	2.7500E+06	9
1643	Bi-203	4.5	β^+:100.0;α:~	11.761 h	0.43	3.9700E-01	6.5100E+04	2.3700E+06	9
1644	Bi-203m	0.5	IT	0.303 s	1.65			9.4000E+05	9
1645	Bi-204	6.0	β^+	11.222 h	0.99		8.0000E+04	3.2100E+06	9
1646	Bi-205	4.5	β^+	15.313 d	0.30		2.3100E+04	1.6910E+06	9
1647	Bi-206	6.0	β^+	6.243 d	0.06		1.2350E+05	3.2790E+06	9
1648	Bi-207	4.5	β^+	31.760 y	6.03		1.1846E+05	1.5395E+06	2
1649	Bi-207m	10.5	IT	1.82E-04 s	54.95		1.2900E+05	1.8700E+06	6
1650	Bi-208	5.0	β^+	3.68E+05 y	1.09		8.5181E+03	2.6573E+06	2
1651	Bi-208m	10.0	IT	0.003 s	50.39		7.2000E+04	1.5000E+06	6
1652	Bi-209	4.5							1
1653	Bi-210	1.0	β^-:100.0;α:~	5.013 d	0.10	6.1792E+00	3.8776E+05	6.7710E+02	12
1654	Bi-210m	9.0	α	3.00E+06 y	3.33	5.0092E+06	4.6943E+04	2.6112E+05	12
1655	Bi-211	4.5	β^-:0.27;α:99.73	2.170 m	1.84	6.6753E+06	1.0061E+04	4.7579E+04	12
1656	Bi-212	1.0	β^-:64.05;β^+,α:0.01;α:35.94	1.009 h	0.10	2.2184E+06	4.9952E+05	1.0847E+05	12
1657	Bi-212m	9.0	β_m^-:10.0;α_g:90.0	25.000 m	4.00	5.8000E+06	4.9248E+04	1.8426E+03	6
1658	Bi-212n	15.0	β_n^-	9.000 m	11.11		1.2569E+06	5.0613E+03	6
1659	Bi-213	4.5	β^-:97.84;α:2.16	45.590 m	0.13	1.2870E+05	4.4436E+05	1.2920E+05	12
1660	Bi-214	1.0	β^-:99.98;α:0.02	19.900 m	2.01	1.1679E+03	6.2855E+05	1.5400E+06	12
1661	Bi-215	4.5	β^-	7.400 m	8.11		7.5067E+05	7.5067E+05	12
1662	Po-202	0.0	β^+:98.0;α:2.0	44.667 m	1.12	1.1174E+05	1.5800E+05	8.4000E+05	9
1663	Po-203	2.5	β^+:99.89;α:0.11	36.667 m	1.36	5.9230E+03	1.4700E+05	1.6300E+06	9
1664	Po-203m	6.5	β^+:4.5;IT:95.5	1.200 m	16.67		2.3600E+05	1.6000E+06	9
1665	Po-204	0.0	β^+:99.34;α:0.66	3.531 h	0.63	3.5488E+04	1.5000E+05	1.1540E+06	9
1666	Po-205	2.5	β^+:99.96;α:0.04	1.661 h	1.34	2.0900E+03	5.3200E+04	1.5900E+06	9
1667	Po-206	0.0	β^+:94.55;α:5.45	8.796 d	1.18	2.8468E+05	1.4100E+05	1.1900E+06	9
1668	Po-207	2.5	β^+:99.98;α:0.02	5.800 h	0.38	1.0733E+03	4.2200E+04	1.2900E+06	9
1669	Po-207m	9.5	IT	2.790 s	2.87		2.8800E+05	1.0880E+06	9
1670	Po-208	0.0	β^+:~;α:100.0	2.930 y	1.37	5.2153E+06	2.8603E+00	1.7210E+01	2
1671	Po-209	0.5	β^+:0.26;α:99.74	102.002 y	4.90	4.9637E+06	4.4429E+02	5.1499E+03	12
1672	Po-210	0.0	α	138.400 d	0.14	5.4076E+06	8.3560E-02	8.8410E+00	12
1673	Po-211	4.5	α	0.516 s	0.58	7.5861E+06	1.5731E+02	7.7474E+03	12
1674	Po-211m	12.5	α	25.500 s	1.18	7.5499E+06	1.0074E+04	1.4899E+06	12
1675	Po-212	0.0	α	3.00E-07 s	0.67	8.9537E+06			12
1676	Po-212m	8.0	IT:87.0;IT,α:7.0;α:6.0	1.42E-08 s	16.90	1.3420E+06	1.2321E+05	1.1211E+06	12
1677	Po-212n	16.0	α	45.100 s	1.33	1.1783E+07	3.7699E+02	9.1232E+04	12
1678	Po-213	4.5	α	4.20E-06 s	19.05	8.5364E+06	7.4905E-01	2.3438E+01	12
1679	Po-214	0.0	α	1.65E-04 s	1.82	7.8335E+06	8.0858E-01	8.3387E+01	12
1680	Po-215	4.5	β^-:~;α:100.0	0.002 s	0.56	7.5260E+06	3.1485E+01	2.1568E+02	12
1681	Po-216	0.0	α	0.145 s	1.38	6.9065E+06		1.4488E+01	12
1682	Po-217	?	β^-:5.0;α:95.0	10.000 s	50.00	6.3287E+06			6
1683	Po-218	0.0	β^-:0.02;α:99.98	3.050 m	2.95	6.1136E+06	1.4167E+01	9.2116E+00	12
1684	Po-219	?	β^-	9.170 s	54.53		6.3000E+05	6.3000E+05	6
1685	At-205	4.5	β^+:90.0;α:10.0	26.167 m	1.91	5.9020E+05	1.7000E+05	1.0800E+06	9
1686	At-206	5.0	β^+:99.13;α:0.87	29.333 m	0.45	4.9637E+04	2.9760E+05	2.4700E+06	9
1687	At-207	4.5	β^+:91.3;α:8.7	1.800 h	2.31	5.7580E+05	1.1100E+05	1.9900E+06	9
1688	At-208	6.0	β^+:99.45;α:0.55	1.631 h	1.87	3.1021E+04	1.2340E+05	3.0300E+06	9
1689	At-209	4.5	β^+:95.9;α:4.1	5.411 h	0.92	2.3174E+05	9.6000E+04	2.2840E+06	9
1690	At-210	5.0	β^+:85.08;α:14.92	8.111 h	5.14	9.5581E+05	6.9300E+04	2.9700E+06	9
1691	At-211	4.5	β^+:58.3;α:41.7	7.214 h	0.12	2.4465E+06	2.9800E+03	3.9100E+04	9
1692	At-212	1.0	β^-:~;β^+:0.05;α:99.95	0.315 s	0.95	7.8278E+06			9
1693	At-212m	9.0	IT:~;α:100.0	0.119 s	2.52	8.0183E+06	3.2494E+04	8.8364E+03	9
1694	At-213	4.5	α	1.10E-07 s	18.18	9.2538E+06			9
1695	At-214	1.0	α	5.58E-07 s	1.43	8.9800E+06			6
1696	At-215	4.5	α	1.00E-04 s	20.00	8.1781E+06	1.6514E+01	1.8532E+02	12
1697	At-216	1.0	α	3.00E-04 s	10.00	7.9400E+06			9
1698	At-217	4.5	β^-:0.01;α:99.99	0.032 s	1.24	7.1991E+06	8.2896E+01	2.9991E+02	12
1699	At-218	0.0	β^-:0.1;α:99.9	1.600 s	25.00	6.8117E+06	4.7345E+04	7.4107E+03	12
1700	At-219	2.5	β^-:3.0;α:97.0	54.000 s	11.11	6.1951E+06	1.7861E+04	5.0231E+01	12
1701	At-220	?	β^-	3.730 m	1.07		1.0530E+06	1.0530E+06	6
1702	At-221	?	β^-	2.300 m	8.70		6.3700E+05	6.3700E+05	6

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1703	At-222	?	β^-	54.000 s	18.52		1.2930E+06	1.2930E+06	6
1704	Rn-208	0.0	β^+:38.0;α:62.0	24.350 m	0.62	3.8072E+06	8.3000E+04	5.3200E+05	9
1705	Rn-209	2.5	β^+:83.0;α:17.0	28.500 m	3.51	1.0266E+06	4.3500E+04	1.0800E+06	9
1706	Rn-210	0.0	β^+:4.0;α:96.0	2.389 h	4.65	5.7983E+06	8.2000E+03	6.1000E+04	9
1707	Rn-211	0.5	β^+:74.0;α:26.0	14.611 h	1.52	1.5045E+06	5.7100E+04	1.9100E+06	9
1708	Rn-212	0.0	α	24.000 m	8.33	6.3820E+06			9
1709	Rn-213	4.5	α	0.025 s	0.80	8.2373E+06			9
1710	Rn-214	0.0	α	2.70E-07 s	7.41	9.2090E+06			6
1711	Rn-215	4.5	α	2.30E-06 s	4.35	8.8384E+06			9
1712	Rn-216	0.0	α	4.50E-05 s	11.11	8.2010E+06			9
1713	Rn-217	4.5	α	5.40E-04 s	9.26	7.8842E+06	8.3947E+01	1.5336E+02	12
1714	Rn-218	0.0	α	0.035 s	17.14	7.2654E+06	1.3834E+01	7.6932E+02	12
1715	Rn-219	2.5	α	3.960 s	1.26	6.8849E+06	6.6728E+03	5.5288E+04	12
1716	Rn-220	0.0	α	55.600 s	0.18	6.4041E+06		6.9267E+02	12
1717	Rn-221	3.5	β^-:78.0;α:22.0	25.000 m	8.00	1.3424E+06	1.9193E+05	1.0678E+05	9
1718	Rn-222	0.0	α	3.825 d	0.03	5.5901E+06	9.4629E+00	3.5824E+02	12
1719	Rn-223	3.5	β^-	24.200 m	2.89		6.2491E+05	3.3014E+05	2
1720	Rn-224	0.0	β^-	1.783 h	2.80		1.8333E+05	2.4029E+05	8
1721	Rn-225	3.5	β^-	4.500 m	6.67		7.9700E+05	7.9700E+05	6
1722	Fr-218	1.0	α	0.001 s	60.00	7.9520E+06			9
1723	Fr-219	4.5	α	0.021 s	4.76	7.4280E+06			9
1724	Fr-220	?	α	27.400 s	1.09	6.7493E+06		9.3016E+03	9
1725	Fr-221	2.5	α	4.900 m	4.08	6.4714E+06	8.8223E+03	2.9822E+04	12
1726	Fr-222	2.0	β^-	14.400 m	2.78		6.9910E+05	6.7533E+05	9
1727	Fr-223	1.5	β^-:99.99;α:~	21.800 m	1.83	3.2626E+02	3.7910E+05	5.8986E+04	12
1728	Fr-224	1.0	β^-	3.300 m	3.03		8.4000E+05	5.4300E+05	9
1729	Fr-225	?	β^-	3.900 m	5.13		7.0834E+05	5.9999E+05	9
1730	Fr-226	1.0	β^-	48.000 s	2.08		1.1800E+06	4.5500E+05	9
1731	Fr-227	0.5	β^-	2.470 m	8.10		8.0600E+05	8.0600E+05	6
1732	Fr-228	2.0	β^-	39.000 s	2.56		1.1400E+06	9.6400E+05	9
1733	Ra-220	0.0	α	0.023 s	21.74	7.5884E+06		4.6500E+03	9
1734	Ra-221	?	α	28.000 s	7.14	6.5582E+06		4.2922E+04	9
1735	Ra-222	0.0	α	38.000 s	1.32	6.6637E+06	7.0318E+02	9.3370E+03	9
1736	Ra-223	0.5	α	11.430 d	0.17	5.7817E+06	7.4741E+04	1.3429E+05	12
1737	Ra-224	0.0	α	3.620 d	0.28	5.7765E+06	2.2308E+03	1.0058E+04	12
1738	Ra-225	1.5	β^-	14.800 d	1.35		1.0780E+05	1.3827E+04	12
1739	Ra-226	0.0	α	1600.035 y	0.44	4.8608E+06	3.5859E+03	6.7621E+03	12
1740	Ra-227	1.5	β^-	42.200 m	1.18		4.1435E+05	1.6233E+05	9
1741	Ra-228	0.0	β^-	5.750 y	0.52		2.1466E+04	2.0048E+03	12
1742	Ra-229	?	β^-	4.000 m	5.00		5.8666E+05	5.8666E+05	9
1743	Ra-230	0.0	β^-	1.550 h	2.15		3.0000E+05	3.0000E+05	9
1744	Ra-231	3.5	β^-	1.717 m	2.91		8.7300E+05	8.7300E+05	6
1745	Ac-222	1.0	α	4.200 s	11.90	7.1389E+06			10
1746	Ac-222m	4.0	β^+:12.0;α:88.0	1.100 m	4.55	6.1317E+06			10
1747	Ac-223	?	β^+:1.0;α:99.0	2.200 m	4.55	6.7503E+06		3.9472E+03	9
1748	Ac-224	?	β^+:90.0;α:10.0	2.900 h	6.90	6.2176E+05	8.2758E+04	2.6617E+05	9
1749	Ac-225	1.5	α	10.000 d	1.00	5.8684E+06	2.7615E+04	1.7149E+04	12
1750	Ac-226	1.0	β^-:82.8;β^+:17.2;α:~	1.208 d	0.34	3.2978E+02	3.2848E+05	2.1279E+05	6
1751	Ac-227	1.5	β^-:98.62;α:1.38	21.773 y	0.01	6.9333E+04	1.4812E+04	5.6237E+02	12
1752	Ac-228	3.0	β^-	6.150 h	0.33		4.4018E+05	9.6325E+05	12
1753	Ac-229	1.5	β^-	1.045 h	0.80		3.9083E+05	4.3966E+05	9
1754	Ac-230	1.0	β^-	2.033 m	2.46		9.0000E+05	5.3800E+05	9
1755	Ac-231	?	β^-	7.500 m	1.33		5.7124E+05	1.0851E+06	9
1756	Ac-232	?	β^-	35.000 s	14.29		1.2333E+06	1.2333E+06	9
1757	Ac-233	0.5	β^-	2.417 m	6.90		4.5000E+03	5.0000E+05	11
1758	Ac-234	?	β^-	44.000 s	15.91		1.4330E+06	1.4330E+06	6
1759	Th-224	0.0	α	1.040 s	4.81	7.2604E+06	7.4417E+03	3.3620E+04	9
1760	Th-225	1.5	β^+:10.0;α:90.0	8.000 m	6.25	5.9844E+06		1.2735E+05	9
1761	Th-226	0.0	α	30.900 m	0.32	6.4210E+06	2.2174E+03	2.7782E+04	6
1762	Th-227	1.5	α	18.718 d	0.05	6.0171E+06	4.9306E+04	1.1007E+05	12
1763	Th-228	0.0	α	1.913 y	0.10	5.4946E+06	2.1692E+04	3.2281E+03	2
1764	Th-229	2.5	α	7340.164 y	2.18	4.9470E+06	1.1590E+05	9.0314E+04	12
1765	Th-230	0.0	α:100.0;SF:~	7.54E+04 y	0.40	4.7474E+06	1.2399E+04	1.2765E+03	12
1766	Th-231	2.5	β^-	1.063 d	0.04		1.6494E+05	2.5815E+04	2
1767	Th-232	0.0	α:100.0;SF:~	1.41E+10 y	0.43	4.0774E+06	1.3035E+04	1.2430E+03	12
1768	Th-233	1.5	β^-	22.300 m	0.45		4.1218E+05	3.7495E+04	12
1769	Th-234	0.0	β_m^-	24.090 d	0.12		6.0556E+04	8.8014E+03	12
1770	Th-235	2.5	β^-	6.900 m	2.90		6.4000E+05	6.4000E+05	12
1771	Pa-226	?	α	1.800 m	11.11	6.8967E+06			9
1772	Pa-227	?	β^+:15.0;α:85.0	38.300 m	0.78	5.5658E+06	4.7195E+03	1.4027E+04	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1773	Pa-228	?	β^+:98.0;α:2.0	22.000 h	4.55	1.2169E+05	5.2611E+04	1.1762E+06	9
1774	Pa-229	2.5	β^+:99.75;α:0.25	1.400 d	28.57	1.4023E+04		9.1695E+05	9
1775	Pa-230	?	β^-:9.5;β^+:90.5;α:~	17.400 d	2.87	1.6205E+02	7.0494E+04	6.9875E+05	9
1776	Pa-231	1.5	α:100.0;SF:~	3.28E+04 y	0.34	5.0613E+06	5.2297E+04	3.8726E+04	12
1777	Pa-232	2.0	β^-:100.0;β^+:~	1.310 d	1.53		1.6815E+05	9.3641E+05	12
1778	Pa-233	1.5	β^-	27.000 d	0.37		1.9633E+05	2.1579E+05	12
1779	Pa-234	4.0	β^-	6.780 h	0.44		3.8592E+05	1.4346E+06	12
1780	Pa-234m	0.0	β^-:99.85;IT:0.15	1.170 m	2.56		8.1650E+05	1.9739E+04	12
1781	Pa-235	1.5	β_m^-	24.200 m	1.24		4.6414E+05	9.8675E+03	12
1782	Pa-236	1.0	β^-	9.100 m	2.20		7.4598E+05	4.8292E+05	9
1783	Pa-237	0.5	β^-	8.700 m	2.30		5.6000E+05	6.1000E+05	9
1784	Pa-238	3.0	β^-	2.300 m	4.35		6.5893E+05	1.9894E+06	9
1785	U-228	0.0	β^+:5.0;α:95.0	9.100 m	2.20	6.4479E+06	2.2162E+04	6.4524E+03	9
1786	U-229	1.5	β^+:80.0;α:20.0	58.000 m	5.17	1.2907E+06			9
1787	U-230	0.0	α	20.800 d	9.46	5.9713E+06	1.9904E+04	4.7360E+03	6
1788	U-231	2.5	β^+:99.99;α:~	4.200 d	2.38	2.7756E+02	6.0766E+04	9.4841E+04	9
1789	U-232	0.0	α:100.0;SF:~	69.801 y	0.72	5.3970E+06	1.6844E+04	1.6853E+03	12
1790	U-233	2.5	α	1.59E+05 y	0.13	4.9041E+06	7.5965E+03	1.2254E+03	12
1791	U-234	0.0	α:100.0;SF:~	2.46E+05 y	0.12	4.8420E+06	1.4144E+04	1.4502E+03	12
1792	U-235	3.5	α:100.0;SF:~	7.04E+08 y	0.07	4.4630E+06	4.7537E+04	1.6781E+05	12
1793	U-235m	0.5	IT	26.000 m	7.69		7.6000E+01		12
1794	U-236	0.0	α:100.0;SF:~	2.34E+07 y	0.17	4.5638E+06	1.0102E+04	1.1878E+03	12
1795	U-237	0.5	β^-	6.750 d	0.15		1.9968E+05	1.4338E+05	12
1796	U-238	0.0	α:100.0;SF:~	4.47E+09 y	0.11	4.2600E+06	1.0545E+04	1.2540E+03	12
1797	U-239	2.5	β^-	23.470 m	0.21		4.0991E+05	5.1571E+04	12
1798	U-240	0.0	β^-	14.100 h	1.42		1.4543E+05	9.2581E+03	12
1799	U-241	?	β^-	4.500 m	51.85		7.5300E+05	7.5300E+05	6
1800	U-242	0.0	β^-	16.833 m	2.97		3.0000E+03	4.0000E+04	11
1801	U-243	?	β^-	2.667 m	50.00		9.9000E+05	9.9000E+05	6
1802	U-244	?	β^-	2.617 m	50.96		5.9300E+05	5.9300E+05	6
1803	U-245	?	β^-	11.400 s	52.63		1.2200E+06	1.2200E+06	6
1804	Np-230	?	β^+:97.0;α:3.0	4.600 m	6.52	2.0334E+05			9
1805	Np-231	2.5	β^+:98.0;α:2.0	48.800 m	0.41	1.0192E+05	2.1795E+05	1.1968E+06	9
1806	Np-232	?	β^+	14.700 m	2.04		2.0739E+05	1.2117E+06	9
1807	Np-233	?	β^+:100.0;α:~	36.200 m	0.28	5.6266E+01	2.4998E+04	1.2406E+05	9
1808	Np-234	0.0	β^+	4.398 d	2.37		1.3200E+04	1.1000E+06	9
1809	Np-235	2.5	β^+:100.0;α:~	1.084 y	0.30	7.2220E+01	2.9296E+03	7.1208E+03	9
1810	Np-236	6.0	β^-:11.8;β^+:88.0;α:0.16	1.52E+05 y	1.97	8.1087E+03	2.3960E+05	1.5299E+05	12
1811	Np-236m	1.0	β^-:50.0;β^+:50.0	22.500 h	1.33		9.1412E+04	4.9134E+04	6
1812	Np-237	2.5	α	2.14E+06 y	0.47	4.8627E+06	6.9863E+04	3.3520E+04	12
1813	Np-238	2.0	β^-	2.117 d	0.09		2.3246E+05	6.4432E+05	12
1814	Np-239	2.5	β^-	2.355 d	0.17		2.6284E+05	1.8219E+05	2
1815	Np-240	5.0	β^-	1.083 h	4.62		4.6684E+05	1.2468E+06	12
1816	Np-240m	1.0	β^-:99.9;IT:0.11	7.400 m	2.70		6.8296E+05	3.3680E+05	12
1817	Np-241	2.5	β^-	13.900 m	1.44		4.3722E+05	3.6085E+04	12
1818	Np-242	6.0	β^-	5.500 m	1.82		8.9900E+05	8.9900E+05	6
1819	Np-242m	1.0	β^-	2.200 m	9.09		8.9400E+05	2.5200E+05	6
1820	Np-243	2.5	β^-	1.850 m	8.11		7.2400E+05	7.2400E+05	6
1821	Np-244	7.0	β^-	2.290 m	6.99		1.2870E+06	1.2870E+06	6
1822	Np-245	?	β^-	38.400 s	49.48		8.9000E+05	8.9000E+05	6
1823	Np-246	?	β^-	16.000 s	50.00		1.5130E+06	1.5130E+06	6
1824	Pu-232	?	β^+:80.0;α:20.0	34.100 m	2.05	1.3387E+06	3.6732E+06	9.2949E+04	9
1825	Pu-233	?	β^+:99.88;α:0.12	20.900 m	1.91	7.6920E+03		3.3085E+06	9
1826	Pu-234	0.0	β^+:94.0;α:6.0	8.800 h	1.14	3.7907E+05			9
1827	Pu-235	2.5	β^+:100.0;α:~	25.300 m	2.37	1.3093E+02	3.7683E+04	9.6845E+04	9
1828	Pu-236	0.0	α:100.0;SF:~	2.900 y	3.45	5.8513E+06	1.3327E+04	1.5998E+03	12
1829	Pu-237	3.5	β^+:100.0;α:~	45.300 d	0.44	2.3409E+02	1.7499E+04	5.5156E+04	12
1830	Pu-237m	0.5	IT	0.180 s	11.11		1.3100E+05	9.6000E+03	6
1831	Pu-238	0.0	α:100.0;SF:~	87.702 y	0.34	5.5798E+06	1.1189E+04	1.5483E+03	12
1832	Pu-239	0.5	α_g:0.01;α_m:99.99;SF:~	2.41E+04 y	0.17	5.2368E+06	7.3859E+03	7.0756E+02	12
1833	Pu-240	0.0	α:100.0;SF:~	6563.155 y	0.08	5.2430E+06	1.1116E+04	1.3629E+03	12
1834	Pu-241	2.5	β^-:100.0;α:~	14.400 y	0.69	1.1999E+02	5.2380E+03	1.6527E+00	12
1835	Pu-242	0.0	α:100.0;SF:~	3.74E+05 y	0.29	4.9733E+06	9.3808E+03	1.2911E+03	12
1836	Pu-243	3.5	β^-	4.956 h	0.06		1.7365E+05	2.5083E+04	12
1837	Pu-244	0.0	α:99.88;SF:0.13	8.00E+07 y	1.12	4.8725E+06	7.7146E+03	9.7558E+03	12
1838	Pu-245	4.5	β^-	10.500 h	0.95		3.3143E+05	3.9858E+05	12
1839	Pu-246	0.0	β_m^-	10.850 d	0.18		1.1488E+05	1.2378E+05	12
1840	Pu-247	?	β^-	2.270 d	10.13		7.9000E+05	7.9000E+05	6
1841	Am-237	2.5	β^+:99.98;α:0.03	1.217 h	1.37	1.5364E+03	8.3233E+04	4.0321E+05	9
1842	Am-238	1.0	β^+:100.0;α:~	1.633 h	2.04	6.0415E-02	8.4122E+04	8.9494E+05	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1843	Am-239	2.5	β^+:99.99;α:0.01	11.900 h	0.84	5.8526E+02	1.2482E+05	2.6792E+05	9
1844	Am-240	3.0	β^+:100.0;α:~	2.117 d	0.59	1.0383E+01	8.2950E+04	1.0313E+06	12
1845	Am-241	2.5	α:100.0;SF:~	432.710 y	0.12	5.5717E+06	3.9274E+04	2.8203E+04	2
1846	Am-242	1.0	β^-:82.7;β^+:17.3	16.020 h	0.12		1.8067E+05	1.7330E+04	12
1847	Am-242m	5.0	IT:99.55;α:0.45;SF:~	141.003 y	1.42	2.3747E+04	4.2008E+04	4.9786E+03	12
1848	Am-243	2.5	α:100.0;SF:~	7364.976 y	0.30	5.3590E+06	2.3934E+04	5.6965E+04	2
1849	Am-244	6.0	β^-	10.100 h	0.99		3.0810E+05	8.4340E+05	12
1850	Am-244m	1.0	β^-:99.96;β^+:0.04	26.000 m	7.69		5.0389E+05	1.2440E+04	12
1851	Am-245	2.5	β^-	2.050 h	0.49		2.8473E+05	2.7744E+04	12
1852	Am-246	7.0	β^-	39.000 m	7.69		7.1534E+05	7.7520E+05	12
1853	Am-246m	2.0	β^-	25.000 m	0.80		4.8460E+05	1.0161E+06	12
1854	Am-247	2.5	β^-	22.000 m	13.64		5.7976E+05	1.7808E+05	9
1855	Am-248	?	β^-	7.133 m	51.40		1.0670E+06	1.0670E+06	6
1856	Am-249	2.5	β^-	23.900 m	41.84		8.8667E+05	8.8667E+05	5
1857	Am-250	2.5	β^-	5.100 m	32.68		1.3867E+06	1.3867E+06	5
1858	Cm-238	0.0	β^+:90.0;α:10.0	2.400 h	4.17	6.6314E+05			9
1859	Cm-239	3.5	β^+	3.000 h	33.33		1.5245E+05	1.2100E+06	6
1860	Cm-240	0.0	α:99.9;SF:0.1	27.000 d	3.70	6.3504E+06			9
1861	Cm-241	0.5	β^+:99.0;α:1.0	32.800 d	0.61	6.0294E+04	1.4084E+05	4.9676E+05	12
1862	Cm-242	0.0	α:100.0;SF:~	162.940 d	0.04	6.2003E+06	1.0171E+04	1.3725E+03	12
1863	Cm-243	2.5	β^+:0.24;α:99.76	30.001 y	6.67	5.9405E+06	1.3922E+05	1.3317E+05	12
1864	Cm-244	0.0	α:100.0;SF:~	18.100 y	0.11	5.8921E+06	8.6144E+03	1.3000E+03	12
1865	Cm-245	3.5	α	8500.194 y	2.35	5.4483E+06	8.1292E+04	9.3800E+04	12
1866	Cm-246	0.0	α:99.97;SF:0.03	4730.087 y	3.17	5.5143E+06	8.2004E+03	3.0021E+03	12
1867	Cm-247	4.5	α	1.60E+07 y	3.12	5.0282E+06	2.2388E+04	3.0280E+05	12
1868	Cm-248	0.0	α:91.74;SF:8.26	3.40E+05 y	1.18	1.9810E+07	6.2911E+03	5.7913E+05	12
1869	Cm-249	0.5	β^-	1.069 h	0.05		2.8372E+05	1.9675E+04	12
1870	Cm-250	0.0	α:30.0;SF:70.0	8000.177 y	50.00	1.2958E+08		4.9000E+06	12
1871	Cm-251	0.5	β^-	16.800 m	1.19		4.4900E+05	1.1000E+05	9
1872	Bk-243	1.5	β^+:99.85;α:0.15	4.500 h	4.44	9.9910E+03	1.6136E+02	1.7669E+05	6
1873	Bk-244	4.0	β^+:99.99;α:~	4.350 h	3.45	7.3236E+05		2.2406E+06	9
1874	Bk-245	?	β^+:99.88;α:0.12	4.940 d	0.61	7.6361E+03	9.3852E+04	3.0365E+05	9
1875	Bk-246	2.0	β^+	1.800 d	1.11		5.3275E+04	9.5201E+05	9
1876	Bk-247	1.5	α	1379.095 y	18.12	5.6571E+06	6.0101E+03	1.1438E+05	9
1877	Bk-248	6.0	α	9.000 y	10.56	5.7970E+06			4
1878	Bk-248m	1.0	β^-:70.0;β^+:30.0	23.700 h	0.84		1.7559E+05	6.6566E+04	9
1879	Bk-249	3.5	β^-:100.0;α:~;SF:~	320.000 d	1.88	7.9017E+01	3.3038E+04	3.1473E+01	12
1880	Bk-250	2.0	β^-	3.217 h	0.16		2.9705E+05	9.0541E+05	12
1881	Bk-251	1.5	β^-	55.600 m	3.60		3.7333E+05	3.7333E+05	6
1882	Bk-252	1.5	β^-	35.300 m	28.33		1.0033E+06	1.0033E+06	5
1883	Bk-253	1.5	β^-	16.100 h	10.35		5.4000E+04	5.4000E+04	5
1884	Bk-254	1.5	β^-	18.800 m	53.19		1.1300E+06	1.1300E+06	5
1885	Cf-244	0.0	α	19.400 m	3.09	7.3195E+06			9
1886	Cf-245	?	β^+:70.0;α:30.0	43.600 m	1.83	2.5421E+06			9
1887	Cf-246	0.0	α:100.0;SF:~	1.488 d	1.40	6.8519E+06	4.6076E+03	2.6977E+03	9
1888	Cf-247	3.5	β^+:99.97;α:0.03	3.111 h	0.98	2.2054E+03	4.2000E+06	2.7000E+06	9
1889	Cf-248	0.0	α	333.495 d	0.84	6.3557E+06			9
1890	Cf-249	4.5	α:100.0;SF:~	351.007 y	0.57	5.9276E+06	2.9846E+04	3.2919E+05	12
1891	Cf-250	0.0	α:99.92;SF:0.08	13.080 y	0.69	6.2622E+06	5.9584E+03	6.3430E+03	12
1892	Cf-251	0.5	α	898.018 y	4.90	5.8779E+06	1.8168E+05	1.2026E+05	12
1893	Cf-252	0.0	α:96.91;SF:3.09	2.645 y	0.30	1.1805E+07	6.0060E+03	2.1738E+05	12
1894	Cf-253	3.5	β^-:99.69;α:0.31	17.810 d	0.45	1.8823E+04	8.0458E+04	8.3693E+01	12
1895	Cf-254	0.0	α:0.31;SF:99.69	60.500 d	0.33	1.8943E+08			9
1896	Cf-255	?	β^-	1.417 h	42.35		2.7049E+05	2.6666E+05	8
1897	Es-249	?	β^+:99.43;α:0.57	1.703 h	0.59	3.9219E+04		3.0474E+05	9
1898	Es-250	6.0	β^+	8.600 h	1.16		2.3971E+05	1.2208E+06	9
1899	Es-250m	1.0	β^+	2.220 h	2.25		1.2221E+05	1.3424E+05	9
1900	Es-251	?	β^+:99.5;α:0.5	1.375 d	3.03	3.2907E+04			9
1901	Es-252	5.0	β^+:24.0;α:76.0	1.291 y	0.40	5.0994E+06	4.3036E+04	6.8810E+05	9
1902	Es-253	3.5	α:100.0;SF:~	20.470 d	0.15	6.7336E+06	4.5611E+03	1.0755E+03	12
1903	Es-254	7.0	α	275.498 d	0.18	6.5095E+06	1.7167E+06	1.5216E+06	9
1904	Es-254m	2.0	β^-:99.59;β^+:0.08;α:0.33	1.638 d	0.57	2.1111E+04	2.3000E+05	4.7000E+05	9
1905	Es-255	3.5	β^-:92.0;α:8.0;SF:~	39.800 d	3.02	6.0830E+05	6.8626E+04	7.2000E+03	9
1906	Es-256	1.0	β^-	22.000 m	10.91		6.9910E+05	5.5633E+05	6
1907	Es-256m	8.0	β^-	7.600 h	32.89		4.2346E+05	4.2727E+04	6
1908	Es-257	3.5	β^-	2.000 s	100.00		3.0333E+05	3.0333E+05	5
1909	Fm-250	0.0	β^+:10.0;α:89.99;SF:~	30.000 m	10.00	6.7895E+06			9
1910	Fm-251	4.5	β^+:98.2;α:1.8	5.306 h	1.57	1.2290E+05	1.3700E+04	1.6400E+05	9
1911	Fm-252	0.0	α:100.0;SF:~	1.058 d	0.20	7.1473E+06			9
1912	Fm-253	0.5	β^+:88.0;α:12.0	3.000 d	4.00	8.3389E+05	5.7014E+03	9.2842E+04	9

ID	Nuclide	J	Decay modes	T½	ΔT½ (%)	<α> (eV)	<β> (eV)	<γ> (eV)	Src
1913	Fm-254	0.0	α:99.94;SF:0.06	3.240 h	0.06	7.2897E+06	7.4881E+03	2.2776E+03	9
1914	Fm-255	3.5	α:100.0;SF:~	20.040 h	0.40	7.1322E+06	6.3047E+04	2.3784E+04	9
1915	Fm-256	0.0	α:8.1;SF:91.9	2.627 h	0.82	1.7518E+08			9
1916	Fm-257	4.5	α:99.79;SF:0.21	100.500 d	0.20	7.2416E+06	8.1123E+04	1.4144E+05	9
1917	Fm-258	0.0	SF	3.70E-04 s	11.62	1.8000E+08			6

Key to listing: Nuclide names may contain 'm' or 'n' following the mass number, these refer to 1st and 2nd isomeric states respectively. A nuclide spin (J) shown by '?' means that it is unknown, the file actually contains -77.777. If no decay mode is given then the nuclide is stable, a single mode is labelled as beta - decay (β^-), beta + or electron capture decay (β^+), an isomeric transition (IT), alpha decay (α), proton decay (p) or neutron decay (n). Combinations of these are shown separated by a comma *e.g.* 'β^-,n' is a beta - followed by neutron emission. If the daughter nuclide is not in the ground state then the decay symbol has the subscript 'm' or 'n'; if it is required then the subscript 'g' distinguishes the daughter in the ground state. Multiple decay modes are separated by a semicolon; for each mode the branching ratio is given in percent. If the percentage branching is less than 0.01% then the symbol '~' is used. The nuclide half-life (T½) is given in units of seconds (s), minutes (m), hours (h), days (d) or years (y); fixed format is used wherever possible, for very short- or long-lived nuclides scientific notation is applied.

Note that the nuclide ^{49}Fe is used in a special fashion by FISPACT. The nuclide is required to be stable and be totally unreactive: this pseudo-nuclide is shown in the listing, but in reality ^{49}Fe is very short lived (75 ms).

References

[1] RA Forrest, J Kopecky and J-Ch Sublet, *'The European Activation File: EAF-2003 cross section library'*, **UKAEA FUS 486**, 2002.

[2] RA Forrest, MG Sowerby, BH Patrick and DAJ Endacott, *'The Data Library UKACT1 and the Inventory code FISPACT'*, Int. Conf. Nuc. Data Sci. Tech., MITO, Japan, p 1061, 1988.

[3] RA Forrest and J-Ch Sublet, *'FISPACT 4 User manual'*, **UKAEA FUS 287**, 1995.

[4] RA Forrest and J-Ch Sublet, *'The European Activation File: EAF-99 decay data library'*, **UKAEA FUS 409**, 1998.

[5] RA Forrest, *'The European Activation File: EAF-2001 decay data library'*, **UKAEA FUS 452**, 2001.

[6] RA Forrest, *'The European Activation System: EASY-2003 overview'*, **UKAEA FUS 484**, 2002.

[7] RA Forrest, *'SAFEPAQ-II User manual'*, **UKAEA FUS 454**, 2001.

[8] RA Forrest, *'FISPACT-2003: User manual'*, **UKAEA FUS 485**, 2002.

[9] *'JEF-2.2 Radioactive Decay Data'*, OECD Nuclear Energy Agency, **JEF Report 13**, 1994.

[10] JK Tuli, *'Nuclear Wallet Cards'*, 6th Edition, Brookhaven National Laboratory, 2000.

[11] E Browne and RB Firestone, *'Table of Radioactive Isotopes'*, John Wiley and Sons, 1986.

[12] JS Backhouse and AL Nichols, *'Assessment and evaluation of decay data for nuclear reactor applications'*, Appl. Radiat. Isot., **49**, 1393, 1998.

[13] AL Nichols, *'Extension and maintenance of decay data files for UKAEA, fusion applications: UKPADD and JEFF-3'*, **UKNSF(97)P73**, 1997.

[14] AL Nichols, *'Assessment and evaluation of decay data for EAF – 1999/2000'*, **UKNSF(99)P130**, 1999.

[15] AL Nichols, *'Extension and maintenance of decay data files for BNFL plc applications: UKPADD and JEFF-3'*, **UKNSF(97)P72**, 1997.

[16] FM Mann and DE Lessor, *'REAC*3 Nuclear Data Libraries'*, Int. Conf. Nuc. Data Sci. Tech., Jülich, Germany, p 936, Springer-Verlag, 1991.

[17] JA Simpson, J-Ch Sublet and D Nierop, *'SYMPAL: User guide'*, **UKAEA FUS 356**, 1997.

[18] RA Forrest and JA Simpson, *'SAFEPAQ: User manual'*, **UKAEA FUS 355**, 1997.

Acknowledgements

The development of EAF and the production of this documentation have been funded by the UK Department of Trade and Industry and the Euratom Fusion Programme.

Disclaimer

Neither the authors nor UKAEA accept responsibility for consequences arising from any errors either in the present documentation, or in the EASY-2003 system.

Contact person

Feedback on the use of EAF is welcomed. Please contact RA Forrest with comments or in case of problems.

Dr R A Forrest
EURATOM/UKAEA Fusion Association
D3/1.92 Culham Science Centre
Abingdon
Oxfordshire OX14 3DB
Tel: +44 1235 466586
Fax: +44 1235 466435
e-mail: robin.forrest@ukaea.org.uk
Internet: www.fusion.org.uk/easy2003