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Introduction

Non-destructive gamma-ray analysis is a fundamental part of nuclear safeguards, including nuclear energy safeguards technology. Developing safeguards capabilities for nuclear energy will certainly benefit from the advanced use of gamma-ray spectroscopy as well as the ability to model various reactor scenarios.

There is currently a wide variety of nuclear data that could be used in computer modeling and gamma-ray spectroscopy analysis. The data can be discrepant (with varying uncertainties), and it may difficult for a modeler or software developer to determine the best nuclear data set for a particular situation. To use gamma-ray spectroscopy to determine the relative isotopic composition of nuclear materials, the gamma-ray energies and the branching ratios or intensities of the gamma-rays emitted from the nuclides in the material must be well known. A variety of computer simulation codes will be used during the development of the nuclear energy safeguards, and, to compare the results of various codes, it will be essential to have all the γ -ray libraries agree. Assessing our nuclear data needs allows us to create a prioritized list of desired measurements, and provides uncertainties for energies and especially for branching intensities. Of interest are actinides, fission products, and activation products, and most particularly mixtures of all of these radioactive isotopes, including mixtures of actinides and other products.

Recent work includes¹ the development of new detectors with increased energy resolution, and studies of gamma-rays and their lines used in simulation codes. Because new detectors are being developed, there is an increased need for well known nuclear data for radioactive isotopes of some elements. Safeguards technology should take advantage of all types of gamma-ray detectors, including new super cooled detectors, germanium detectors and cadmium zinc telluride detectors. Mixed isotopes, particularly mixed actinides found in nuclear reactor streams can be especially challenging to identify. The super cooled detectors have a marked improvement in energy resolution, allowing the possibility of deconvolution of mixtures of gamma rays that was unavailable with high purity germanium detectors.

Isotopic analysis codes require libraries of gamma rays. In certain situations, isotope identification can be made in the field, sometimes with a short turnaround time, depending on the choice of detector and software analysis package. Sodium iodide and

high purity germanium detectors have been successfully used in field scenarios. The newer super cooled detectors offer dramatically increased resolution, but they have lower efficiency and so can require longer collection times. The different peak shapes require software development for the specific detector type and field application. Libraries can be tailored to specific scenarios; by eliminating isotopes that are certainly not present, the analysis time may be shortened and the accuracy may be increased.

The intent of this project was to create one accurate library of gamma rays emitted from isotopes of interest to be used as a reliable reference in safeguards work. All simulation and spectroscopy analysis codes can draw upon this best library to improve accuracy and cross-code consistency. Modeling codes may include MCNP and COG. Gamma-ray spectroscopy analysis codes may include MGA, MGAU, U235 and FRAM. The intent is to give developers and users the tools to use in nuclear energy safeguards work. In this project, the library created was limited to a selection of actinide isotopes of immediate interest to reactor technology. These isotopes included $^{234-238}\text{U}$, ^{237}Np , $^{238-242}\text{Pu}$, $^{241,243}\text{Am}$ and ^{244}Cm . These isotopes were examined, and the best of gamma-ray data, including line energies and relative strengths were selected.

There have been several isotopic analysis codes developed at Livermore,² including GAMANAL, GRPANAL, MGA and U235/MGAU. GAMANAL (gamma-ray isotopic analysis) is an isotopic analysis code that analyzes gamma-ray spectra, collected with a germanium detector, and identifies isotopes that produced the gamma rays. GRPANAL is a group analysis program, which focuses on groups of isotopes, and was based on the GAMANAL code. MGA is the Multi Group Analysis code, which is a plutonium isotopic analysis code that uses an intrinsic calibration method to determine the efficiency and energy calibrations for the analysis. MGA uses data collected non-destructively with germanium detectors (small planar or two detectors) and determines isotopic ratios for $^{238,239,240,241}\text{Pu}$, and also give a percent of ^{241}Am , $^{235,238}\text{U}$, determines the U/Pu ratio and the ^{243}Am - ^{239}Np and ^{241}Am inhomogeneity. MGA is part of the MGA++ code suite. The MGA++ code also includes U235 (MGAU) for determining the relative abundance of ^{234}U , ^{235}U and ^{238}U . CZTU, a ^{235}U and ^{238}U isotopic analysis code for data collected with a cadmium zinc telluride detector, is also included in the MGA++ code suite. The MGAHI code determines relative isotopic ratios for Pu and ^{241}Am and sets a lower bound on the ^{239}Pu mass. The MGAHI code uses the 200 keV - 1 MeV energy region, and is designed for situations in which the low energy gamma rays are not available.

New codes are being developed, including CZT-Pu, U-Pu HI, and U235HI. The CZTPu code will determine plutonium isotopic ratios using data collected with a cadmium zinc telluride detector. The U235HI code uses data collected with germanium detector to determine uranium isotopic ratios from the higher energy gamma-ray lines. The HI in these code names is for high energy and is for situations where low energy lines are unavailable, such as if the material is located in a thick walled container. U-Pu HI determines isotopic ratios for mixtures of uranium and plutonium, using higher energy gamma-ray data collected with Ge detectors. Table 1 gives a very general description of radiation detection history.³ The codes mentioned above all used subsets of the same library. Now that the super cooled detectors are becoming available, the exact energies of

the gamma rays are more important, because gamma peaks that previously overlapped with each other will be distinct.

Table 1. A simple picture of radiation detection history.³

Decade	Technology	Volume	Operating Temperature	Energy Resolution
~1930s	Gas detectors	Large	300 K	Low
~1950s	Scintillators	Large	300 K	Moderate
~1970s	Germanium	Medium	77 K	High
~1990s	Cryogenic: Tunnel Jcts	Small	~0.4 K	Very High
	Calorimeters	Small	~0.1 K	Extremely High

In general, low temperature operation allows higher resolution and higher precision; however efficiency is often sacrificed as the detector size can decrease dramatically.

Our original proposal allowed for the investigation and creation of a gamma-ray library that would typically be found in a reactor environment, including actinides, fission products and activation products. Funding issues forced us to limit the project in scope. There are a variety of reactor fuels and daughter products, including uranium, plutonium, americium and neptunium; for this project we focused on isotopes of these four elements.

Data

For selected isotopes of uranium, neptunium, plutonium, americium and curium, gamma-ray libraries were created using the RADSRC⁴ code (based on the GAMGEN program) and using the ENSDF library⁵ available from the National Nuclear Data Center. It was found that the gamma-ray energies and branching intensities are in good agreement, with a few exceptions in the lower intensity gamma rays.

Energies of gamma rays are well known, but there can be large uncertainties in gamma-ray branching intensities.⁶ Tables 2 – 4 give isotopes of neptunium, americium, curium, plutonium and uranium and the percent uncertainty in the gamma-ray branching ratio. Isotopes with large gamma-ray branching uncertainties are highlighted in red. Many plutonium isotopes (²³⁷Pu, ²³⁸Pu, ²³⁹Pu, ²⁴⁰Pu and ²⁴¹Pu) have small uncertainties in their gamma-ray branching intensities, while others (²³⁵Pu, ²³⁶Pu, ²⁴²Pu, ²⁴³Pu, ²⁴⁴Pu) have higher uncertainties. There are high uncertainties in the gamma branching intensities for several uranium, protactinium, and thorium isotopes: ²³³U, ²³⁴Pa, ²³⁵U, ²³⁶U, ²³⁶Th, ²³⁶Pa, ²³⁷U, and ²³⁹U.

A selection of fission products (and daughters of fission products) are given in Table 5; some have large gamma-ray branching ratio intensity uncertainties, including ¹¹¹Ag, ¹⁴³Ce,

^{147}Nd , and ^{161}Tb . It should be noted that there is also uncertainty in the fission branch, and this uncertainty is not presented in this document.

Table 2. Selected neptunium, americium and curium isotopes and the associated % uncertainties in gamma-ray branching ratios.

Isotope	Half-life	% Uncertainty in γ -ray branching ratio
²³⁵ Np	1.085 years	14%
²³⁶ Np	1.55E5 years	6.0% for ϵ , 2.1% for β^-
²³⁷ Np	2.14E6 years	11%
²³⁸ Np	2.117 days	3.0%
²³⁹ Np	2.355 days	2.8%
²⁴⁰ Np	1.03 hours	20%
^{240,241} Am	2.12 days, 432.7 years	5.0%, 1.4%
²⁴³ Am	7.37E3 years	10%
^{242,244} Cm	162.8 days, 18.1 years	8.8%, 10%

Table 3. Selected plutonium isotopes and the associated % uncertainties in gamma-ray branching ratios.

Isotope	Half-life	% Uncertainty in γ -ray branching ratio
²³⁵ Pu	25.3 minutes	17%
²³⁶ Pu	2.87 years	30%
²³⁷ Pu	45.2 days	3%
²³⁸ Pu	87.7 years	2%
²³⁹ Pu	2.41E4 years	3%
²⁴⁰ Pu	6.56E3 years	1%
²⁴¹ Pu	14.4 years	1.7%
²⁴² Pu	3.75E5 years	14%
²⁴³ Pu	4.956 hours	8.7%
²⁴⁴ Pu	8.0E7 years	10%

Table 4. Selected uranium, thorium, and protactinium isotopes and the associated % uncertainties in gamma-ray branching ratios.

Isotope	Half-life	% uncertainty in γ -ray branching ratio
²³³ U	1.59E5 years	20%
²³⁴ U	2.46E5 years	8.5%
²³⁴ Th	24.1 days	7.7%
²³⁴ Pa	6.7 hours	30%
²³⁵ U	7.04E8 years	10%
²³⁶ U	2.34E7 years	17%
²³⁶ Th	37.5 minutes	34%
²³⁶ Pa	9.1 minutes	33%
²³⁷ U	6.75 days	11%
²³⁹ U	23.5 minutes	10%

Table 5. Selected fission products and the associated % uncertainties in gamma-ray branching ratios.

Isotope	Half-life	% Uncertainty in γ -ray branching ratio
⁸⁹ Sr	50.5 days	8.6% (in equil. with ⁸⁹ Y)
⁹⁵ Zr, ⁹⁷ Zr	64 days, 18 hours	0.37 % 0.33%
⁹⁹ Mo	2.75 days	1.8%
¹¹¹ Ag	7.47 days	4.7% for IT, 33% for β^-
¹³⁶ Cs, ¹³⁷ Cs	13 days, 30 years	<0.1%, 0.08%
¹⁴⁰ Ba	12.7 days	0.9%
¹⁴¹ Ce, ¹⁴³ Ce,	32 days, 1.4 days, 285	0.8%, 9.5%, 1.4%
¹⁴⁴ Ce	days	
¹⁴⁷ Nd	11 days	6.4%
¹⁵⁶ Eu	15 days	4.9%
¹⁶¹ Tb	6.9 days	10%

The RADSRC code allows the creation of libraries (generally intended for use in Monte Carlo simulations) of mixtures of isotopes at various ages. For example a radioactive source could be a mixture of uranium isotopes, five years old. In this report, only individual isotopes were run, at ages of zero years, five years and ten years. For example, at time zero, the gamma rays are associated with alpha decay from $^{235}\text{U} \rightarrow ^{231}\text{Th}$. At an age of five years, the gamma rays are from an assortment of decay products, as seen in Figure 1.

Figure 1. Naturally occurring decays from ^{235}U . This is part of the actinium series. The dark arrows denote the major branch. The entire series, along with the thorium and uranium series may be found in Ref. [7].

The RADSRC gamma rays from the zero year-old isotopes are given in Appendix A, along with the energies found in the ENSDF library. The gamma rays from the five year-old isotopes are given in Appendix B, along with the radioactive decay associated with the gamma rays. The ten-year old gamma ray list was very similar to that generated from the five-year old material, so it is not included here.

Suggestions for Future Work

There are a variety of isotopic mixtures that are typically found in reactor materials that could be investigated using the RADSRC code. Particular mixtures of isotopes, such as aged uranium plus fission products, will produce unique spectra of gamma rays that could be used as a characteristic signature in safeguards work. In this report, we included the uncertainties for the gamma-ray branching intensities. There is also a need for the investigation of the impact of uncertainties on modeling radiation signatures.

The activation products should also be investigated, both separately and within possible mixtures of radioactive isotopes. There are a variety of activation products which will appear due to the presence of structural materials (from a variety of neutron induced reactions). These materials include iron, cobalt, nickel, copper, zinc and molybdenum. Some activation products will have gamma rays suitable for fast characterization of waste streams or used materials. The ^{55}Fe and ^{59}Fe activation products have characteristic high-energy gamma-ray lines that could be used as a signature. Activation isotopes of cobalt include $^{58,59,60}\text{Co}$.

Other investigations could overlap with the creation of a gamma-ray library for safeguards. Measuring the cross sections for the creation of activation products could be important; the reactions (n,p), (n,d), (n,t), (n,alpha) and (n,gamma) will all create activation products. These cross sections are all neutron energy dependent. Some are well known, other important cross sections have only been modeled. The (n,gamma) cross sections can be difficult to model due to the exponential rise in cross section at the lower energy and a strong resonance region.

The important nuclear data needs highlighted in this study are the high overall uncertainty in branching intensity for some isotopes of uranium, protactinium, thorium, neptunium and plutonium americium and curium. The data presented here are only some of the possible nuclear data needs for safeguards technology.

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Appendix A. Gamma-ray energies from RADSRC and from ENSDF are compared for selected isotopes of uranium, neptunium, plutonium and americium. RADSRC was calculated for pure isotopes, that is age zero. Curium-244 is shown for RADSRC only.

234U zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	% diff
		13	
		53.2	
		89.957	
		93.35	
		104.819	
		105.604	
		108.582	
120.912	9.44E+04	120.9	0.010
454.97	5.99E+01	454.95	0.004
503.53	2.30E+00	503.5	0.006
508.2	3.39E+01	508.2	0.000
581.78	2.76E+01	581.7	0.014
624.44	1.84E+00	624.4	0.006
677.67	2.30E+00	677.6	0.010

235U zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	% diff
93.36	4.40E+03	93.35	0.011
96.154	6.88E+01	96.09	0.067
105.362	1.58E+03	105.604	0.229
108.99	5.28E+02	108.582	0.376
109.16	1.23E+03	109.16	0.000
116.11	5.60E+01	115.45	0.572
119.98	2.08E+01	120.35	0.307
136.72	9.60E+00	136.55	0.124
140.76	1.76E+02	140.76	0.000
		142.40	
143.76	8.76E+03	143.76	0.000
150.93	6.40E+01	150.93	0.000
163.33	4.06E+03	163.33	0.000
172.27	8.00E+00	173.3	0.594
182.61	2.72E+02	182.61	0.000
185.72	4.57E+04	185.715	0.003
194.94	5.04E+02	194.94	0.000
198.90	3.36E+01	198.90	0.000

202.11	8.64E+02	202.11	0.000
205.31	4.01E+03	205.311	0.000
215.305	2.16E+01	215.28	0.012
221.38	9.60E+01	221.38	0.000
228.77	6.40E+00	228.78	0.004
233.5	2.32E+01	233.5	0.000
240.85	4.32E+01	240.87	0.008
246.84	4.24E+01	246.84	0.000
266.483	4.80E+00	266.45	0.012
		275.129	
275.47	3.92E+00	275.43	0.015
281.45	4.80E+00	281.42	0.011
282.98	4.00E+00	282.92	0.021
289.57	5.60E+00	289.56	0.003
291.72	1.12E+01	291.65	0.024
301.72	4.00E+00	301.7	0.007
310.71	3.20E+00		
317.12	8.00E-01	317.1	0.006
343.78	2.40E+00	343.5	0.082
345.921	2.32E+01	345.9	0.006
356.068	4.00E+00	356.03	0.011
387.874	3.04E+00	387.82	0.014
390.32	8.00E-01		
410.269	2.40E+00	410.29	0.005
		428.71	
448.42	8.00E-01	448.4	0.004
455.12	6.40E-01		
517.2	3.20E-01		
742.52	3.20E-01		
794.72	4.80E-01		

236U zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	% diff
		13.0	
		49.46	
		89.957	
		93.35	
		104.819	
		105.604	
		108.582	
112.75	4.55E+02	112.79	0.035
		171.15	

238U zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	% diff
		13.0	
		49.55	
		89.957	
		93.35	
		104.819	
		105.604	
		108.582	
110.5	2.99E+00	113.5	2.643

237Np zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	comment	% diff
		5.18		
		8.22		
11.372	3.00E+05			
13.274	5.01E+06	13.3	XR I	0.195
14.953	1.23E+05			
16.632	6.52E+06			
19.718	1.51E+06			
29.378	3.36E+06	29.374		0.014
		36.32		
46.57	3.47E+04	46.53		0.086
57.149	1.02E+05	57.104		0.079
62.66	3.13E+03	62.59		0.112
63.95	4.17E+03	63.9		0.078
70.62	4.17E+03	70.49		0.184
74.46	2.89E+03	74.54		0.107
86.5	3.65E+06	86.477		0.027
88.05	4.69E+04	87.99		0.068
92.282	4.15E+05	92.282	XR ka2	
94.723	1.98E+05	94.64		0.088
95.858	7.56E+05	95.863	XR ka1	0.005
106.13	1.46E+04	106.15		0.019
		107.595	XR kβ3	
108.166	2.45E+05	108.422	XR kβ1	0.236
108.69	1.90E+04	108.7		0.009

111.897	8.08E+04	111.486	XR kβ2	0.369
115.19	6.52E+02	115.4		0.182
117.689	4.20E+04	117.702		0.011
131.09	2.22E+04	131.101		0.008
134.23	1.75E+04	134.285		0.041
		139.9 ?		
		143.249		
151.423	6.26E+04	151.414		0.006
153.72	1.80E+03	153.37		0.228
155.263	2.40E+04	155.239		0.015
162.51	9.65E+03	162.41		0.062
169.18	1.88E+04	169.156		0.014
170.67	4.96E+03	170.59		0.047
172.56	1.77E+03			
176.09	5.22E+03	176.12		0.017
180.801	6.00E+03	180.81		0.005
186.7	1.75E+03	186.86		0.086
191.46	7.04E+03	191.46		
193.29	1.33E+04	193.26		0.016
194.74	1.28E+04	194.67		0.036
195.04	5.24E+04	194.95		0.046
196.89	6.52E+03	196.86		0.015
200.17	9.13E+02	199.95		0.110
201.72	1.10E+04	201.62		0.050
202.85	9.39E+02	202.9		0.025
209.19	4.04E+03	209.19		
212.412	3.96E+04	212.29		0.057
214.08	1.10E+04	214.01		0.033
		222.6		
229.98	3.42E+03	229.94		0.017
237.95	1.67E+04	237.86		0.038
248.91	1.25E+03	248.95		0.016
256.98	1.75E+03	257.09		0.043
262.41	1.75E+03	262.44		0.011
		279.65		

238Pu zero years

RADSRC energy (keV)	RADSRC intensity ph/s/gm	ENSDF energy (keV)	comment	% diff
11.62	1.58E+09			
13.6	2.66E+10	13.6		0.000
15.4	6.46E+08			
17.128	3.29E+10			
20.292	7.28E+09			

43.498	2.50E+08	43.498	0.000
62.78	2.53E+02	62.7	0.128
94.66	7.28E+05	94.654	0.006
98.441	1.17E+06	98.434	0.007
99.864	4.50E+07	99.853	0.011
110.421	1.27E+05	110.421	0.000
111.3	2.47E+05	111.298	0.002
114.333	2.47E+05	114.445	0.098
114.561	1.00E+05		
		140.15	
152.68	6.06E+06	152.72	0.026
174.52	3.17E+01		
		192.91	
200.98	2.60E+04	200.97	0.005
203.2	6.33E+01	203.12	0.039
236.03	6.33E+01	235.9	0.055
258.18	7.54E+02	258.3	0.046
299.08	8.23E+02	299.2	0.040
706.02	9.56E+02	705.9	0.017
708.4	2.41E+03	708.42	0.003
742.817	4.94E+04	742.81	0.001
766.412	2.09E+05	766.39	0.003
783.38	2.91E+02	783.4	0.003
786.287	2.98E+04	786.3	0.002
		804.4	
805.87	1.09E+03	805.6	0.034
808.25	6.71E+03	808.25	0.000
851.72	1.29E+04	851.7	0.002
860	0.00E+00		
880.53	1.46E+03	880.5	0.003
883.24	7.03E+03	883.23	0.001
904.38	6.33E+02	904.3	0.009
926.71	5.19E+03	926.72	0.001
942.05	4.05E+03	941.9	0.016
946.02	8.23E+02	946	0.002
980.39	5.07E+02		
1001	8.68E+03	1001.03	0.003
1041.9	1.83E+03	1041.8	0.010
1085.37	6.65E+02	1085.4	0.003

239Pu zero years

RADSRC energy (keV)	RADSRC intensity ph/s/gm	ENSDF energy (keV)	comment	% diff
		0.0765		
		12.975		

		13.6		
30.08	2.41E+03	30.04		0.133
38.66	2.41E+05	38.661		0.003
40.41	3.72E+03	41.93		3.625
42.06	3.79E+03			
46.218	1.69E+04	46.21		0.017
46.69	1.33E+03	46.68		0.021
47.52	6.66E+02	47.6		0.168
51.624	6.22E+05	51.624		0.000
54.02	3.88E+03	54.039		0.035
56.825	2.59E+04	56.828		0.005
65.7	7.58E+02	65.708		0.012
67.69	3.26E+03	67.674		0.024
68.73	2.76E+03	68.696		0.049
74.89	8.73E+02	68.74		8.947
77.593	9.80E+03	77.592		0.001
78.37	3.88E+03	78.43		0.077
		89.64 3		
		≈89.7		
94.66	9.64E+04	94.654	XR ka2	0.006
96.16	8.45E+02	96.14		0.021
		97.6		
98.441	1.57E+05	98.434	XR ka1	0.007
98.79	2.80E+04	98.78		0.010
103.035	4.87E+03	103.06		0.024
110.421	1.83E+04	110.421	XR kβ3	0.000
111.3	3.56E+04	111.298	XR kβ1	0.002
111.89	7.05E+02			
114.333	1.44E+04	114.445	XR kβ2	0.098
115.38	1.49E+04	115.38		0.000
116.266	1.37E+04	116.26		0.005
		119.7		
		≈119.7 ?		
122.34	6.89E+01	122.35		0.008
123.55	0.00E+00	123.228		0.261
123.62	4.52E+02	123.62		0.000
124.51	1.41E+03	124.51		0.000
125.21	1.63E+03	125.21		0.000
129.296	1.44E+05	129.296		0.000
141.657	7.35E+02	141.657		0.000
143.35	3.97E+02	143.35		0.000
144.201	6.97E+03	144.201		0.000
146.094	2.73E+03	146.094		0.000
		158.1		
160.19	1.42E+02	160.19		0.000
161.482	2.82E+03	161.45		0.020
167.81	6.73E+01	167.81		0.000
171.393	2.53E+03	171.393		0.000
		172.56		

173.7	9.18E+01	173.7	0.000
179.22	1.52E+03	179.22	0.000
184.55	4.87E+01		
188.23	2.50E+02	188.23	0.000
189.36	1.91E+03	189.36	0.000
195.679	2.46E+03	195.679	0.000
196.87	8.50E+01		
203.54	1.29E+04	203.55	0.005
218.45	2.30E+01	218.0	0.206
225.39	3.74E+02	225.42	0.013
237.75	3.44E+02	237.77	0.008
242.12	1.91E+02	242.08	0.017
243.36	5.33E+02	243.38	0.008
244.86	1.19E+02	244.92	0.024
248.88	1.72E+02	248.95	0.028
255.384	1.84E+03	255.384	0.000
263.9	5.86E+02	263.95	0.019
265.81	6.89E+01	265.7	0.041
281.12	4.82E+01	281.2	0.028
285.27	3.44E+01	285.3	0.011
297.46	1.14E+03	297.46	0.000
302.89	1.31E+02	302.87	0.007
307.82	1.42E+02	307.85	0.010
311.78	5.92E+02	311.78	0.000
313.39	4.59E+01		
316.4	3.24E+02	316.41	0.003
		319.68	
		320.862	
323.77	1.24E+03	323.84	0.022
332.853	1.16E+04	332.845	0.002
336.116	2.61E+03	336.113	0.001
341.526	1.52E+03	341.506	0.006
		345.013	
345.014	1.28E+04	345.014	0.000
354.02	1.84E+01	354	0.006
361.84	2.69E+02	361.89	0.014
367.048	1.99E+03	367.073	0.007
368.543	2.07E+03	368.554	0.003
372.47	4.82E+01		
375.039	3.60E+04	375.054	0.004
379.05	2.41E+01		
380.16	7.00E+03	380.191	0.008
382.732	5.95E+03	382.75	0.005
392.914	1.27E+04	392.53	0.098
		393.14	
399.46	1.40E+02	399.53	0.018
		406.8 2	
		411.2	
410.94	1.84E+02		

412.83	4.59E-01	412.3	0.129
413.713	3.37E+04	413.713	0.000
422.598	2.80E+03	422.598	0.000
426.64	5.26E+02	426.68	0.009
		428.4	
430.16	1.13E+02	430.08	0.019
445.81	2.02E+02	445.72	0.020
451.481	4.35E+03	451.481	0.000
457.57	3.54E+01	457.61	0.009
461.25	4.59E+01	461.25	0.000
463.8	3.67E+00	463.9	0.022
474.26	2.07E+00	473.9	0.076
481.78	1.06E+02	481.66	0.025
486.99	5.74E+00	487.06	0.014
493.25	2.02E+01	493.08	0.034
538.9	6.89E+00	526.4	2.375
550.6	9.18E+00	550.5	0.018
557.7	1.38E+00	579.4	3.745
		582.89	
586.27	3.21E+00	586.3	0.005
		596	
		597.99	
		599.6	
606.9	3.44E+00	606.9	0.000
612.93	1.86E+01	612.83	0.016
617.43	4.68E+01	617.1	0.053
618.94	5.60E+01	618.28	0.107
		619.21	
624.8	9.18E+00	624.78	0.003
		624.78	
633.15	5.81E+01	633.15	0.000
		637.7	
637.862	5.88E+01	637.8	0.010
640.096	1.88E+02	639.99	0.017
645.969	3.42E+02	645.94	0.004
647.296	4.36E+00		
649.377	1.63E+01	649.32	0.009
650.529	5.97E+00		
652.052	1.50E+02	652.05	0.000
654.89	5.17E+01	654.88	0.002
658.919	2.27E+02	658.86	0.009
664.587	3.80E+01	664.58	0.001
686.16	2.04E+01	668.2	2.688
		670.8	
		670.99	
		674.05	
		674.4	
690.85	1.26E+01	690.81	0.006
		693.2	

		697.8	
		701.1	
703.8	8.91E+01	703.68	0.017
714.58	2.07E+00	714.71	0.018
718	6.43E+01	718.0	0.000
		720.3	
727.84	2.50E+01	727.9	0.008
		736.5	
		747.4	
		756.4	
756.42	7.74E+01	756.4	0.003
766.6	6.31E-02	766.47	0.017
		767.29	
769.19	2.73E+02	769.15	0.005
		769.37	
779.46	3.05E+00	779.4	0.008
787.3	1.93E+00		
793	5.74E-01	792.9	0.013
796.5	7.35E-01		
803.3	1.01E+00		
		805.9	
808.2	3.38E+00	808.4	0.025
813.9	1.42E+00	813.7	0.025
		816	
821.1	1.17E+00	821.3	0.024
828.8	3.17E+00		
831.93	5.74E-01	832.5	0.068
839	9.18E-01	840.4	0.167
843.8	3.67E+00	843.78	0.002
879	1.15E+00	879.2	0.023
891.1	1.77E+00	891	0.011
		918.7	
940.1	9.64E-01	940.3	0.021
956.4	1.29E+00	955.6	0.084
		957.6	
979.52	5.28E-01	979.7	0.018
986.7	2.76E-01	986.9	0.020
992.47	5.28E-01	992.7	0.023
1005.63	2.76E-01	1005.7	0.007
1057.32	1.03E+00	1057.3	0.002

240Pu zero years

RADSRC energy (keV)	RADSRC intensity ph/s/gm	ENSDF energy (keV)	comment	% diff
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		13.6	XR I	
		45.244		
94.66	5.71E+03	94.654	XR ka2	0.006
98.441	8.40E+03	98.434	XR ka1	0.007
104.244	5.84E+05	104.234		0.010
110.421	9.91E+02	110.421	XR kβ3	0.000
111.3	3.02E+03	111.298	XR kβ1	0.002
114.866	8.40E+02	114.445	XR kβ2	0.368
160.28	3.53E+04	160.308		0.017
212.46	2.52E+03	212.46		0.000
538.11	1.01E+01	538.09		0.004
642.5	1.06E+03	642.35		0.023
687.59	2.27E+02	687.57		0.003
		699		
873.94	4.87E+01	873.92		0.002
		958		
		960		
		967		

241Pu zero years

RADSRC energy (keV)	RADSRC intensity ph/s/gm	ENSDF energy (keV)	comment	% diff
		13.6	XR I	
		26.7		
44.2	3.84E+00	44.2		0.000
44.86	7.68E-01	44.86		0.000
56.32	2.30E+00	56.32		0.000
56.76	8.96E-01	56.76		0.000
71.6	2.57E+00	71.6		0.000
77.1	1.99E+01	77.1		0.000
94.66	2.74E+02	94.654	XR ka2	0.006
98.441	4.45E+02	98.434	XR ka1	0.007
		101		
103.68	9.05E+01	103.68		0.000
110.421	5.42E+01	110.421	XR kβ3	0.000
111.3	1.47E+02	111.298	XR kβ1	0.002
111.89	3.04E+00			
114.333	1.47E+01	114		0.292
114.561	3.34E+01	114.445	XR kβ2	0.101
115.4	1.23E+01			
121.2	6.15E-01	121.2		0.000
148.567	1.68E+02	148.567		0.000
		159.955		

242Pu zero years

RADSRC energy (keV)	RADSRC intensity ph/s/gm	ENSDF energy (keV)	comment	% diff
11.62	2.90E+05			
13.6	4.79E+06	13.6	XR I	0.000
15.4	1.18E+05			
17.128	5.95E+06			
20.292	1.32E+06			
44.915	5.23E+04	44.915		0.000
		94.654	XR ka2	
		98.434	XR ka1	
103.5	1.13E+04	103.5		0.000
		110.421	XR kβ3	
		111.298	XR kβ1	
		114.445	XR kβ2	
158.8	6.54E+02	158.8		0.000

241Am zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	comment	% diff
11.871	1.03E+09			
13.927	1.65E+10	13.9	XR I	0.194
15.861	4.18E+08			
17.611	2.56E+10			
20.997	6.59E+09			
26.3445	3.04E+09	26.3446		0.000
32.2	2.21E+07			
33.192	1.52E+08	33.196		0.012
42.64	1.27E+06	42.704		0.150
43.415	9.26E+07	43.42		0.012
51.013	3.17E+04	51.01		0.006
54.04	7.61E+05			
55.528	2.54E+07	55.56		0.058
59.536	4.55E+10	59.5409		0.008
64.817	1.77E+05	64.83		0.020
67.46	5.58E+05	67.45		0.015
69.76	3.04E+07	69.76		

75.83	1.39E+05	75.8		0.040
96.67	5.96E+04			
97.071	1.50E+06	97.069	XR ka2	0.002
98.951	2.57E+07	98.97 2		
101.066	2.50E+06	101.059	XR ka1	0.007
102.966	2.47E+07	102.98 2		
		109.70 7		
113.3	3.00E+05	113.303	XR kβ3	0.003
114.23	5.98E+05	114.234	XR kβ1	0.004
117.58	2.92E+05	117.463	XR kβ2	0.100
		120.36		
122.994	1.27E+06	123.052		0.047
125.292	5.17E+06	125.3		0.006
139.53	6.77E+03	139.44		0.065
146.557	5.83E+05	146.55		0.005
150.11	1.01E+05	150.04		0.047
154.4	1.01E+04	154.27		0.084
156.4	1.52E+04			
158.48	1.77E+03			
		159.26		
161.7	1.14E+04	161.54		0.099
164.58	8.46E+04	164.69		0.067
165.92	3.04E+04	165.81		0.066
169.56	2.13E+05	169.56		
175.09	2.28E+04	175.07		0.011
190.4	2.79E+03			
191.9	2.74E+02	191.96		0.031
197	1.65E+04	197		
203.9	3.68E+03	204.06		0.078
208	1.00E+06	208.01		0.005
221.45	5.32E+04	221.46		0.005
232.86	5.83E+03	232.81		0.021
234.352	8.87E+02	234.33		0.009
242.4	3.80E+04			
245	3.80E+04			
246.66	3.04E+03	246.73		0.028
249.1	5.07E+03	249		0.040
260.9	1.27E+03	260.8		0.038
264.87	1.14E+04	264.89		0.008
267.54	3.33E+04	267.58		0.015
271.58	8.14E+02			
275.68	8.37E+03	275.77		0.033
		278.04		
291.21	3.93E+03	291.3		0.031
292.76	1.75E+04	292.77		0.003
294.9	6.97E+04			
304.2	1.27E+03	304.21		0.003
		309.1		
310.3	1.90E+04			

		316.8	
322.54	1.93E+05	322.52	0.006
332.39	1.88E+05	332.35	0.012
335.43	6.26E+05	335.37	0.018
337.727	5.32E+03	337.7	0.008
349.46	1.52E+03		
358.36	1.52E+03	358.25	0.031
368.61	2.75E+05	368.65	0.011
370.933	6.66E+04	370.94	0.002
376.6	1.78E+05	376.65	0.013
383.744	3.58E+04	383.81	0.017
390.6	7.48E+03		
		398.64	
		401.3	
406.4	1.77E+03	406.35	0.012
419.22	3.55E+04	419.33	0.026
426.39	3.12E+04	426.47	0.019
429.8	1.27E+03		
435.3	2.54E+03		
442.75	4.44E+03		
		446.43	
452.41	3.04E+03	452.6	0.042
454.67	1.23E+04	454.66	0.002
459.58	4.56E+03	459.68	0.022
		463.22	
468	3.68E+03	468.12	0.026
486.3	1.27E+03	487.3	0.205
512	1.46E+03	512.5	0.098
514.2	3.30E+03	514	0.039
522	1.14E+03	522.06	0.011
		529.17	
		545.4	
		563.05	
574.05	1.27E+03	573.94	0.019
582.6	2.54E+02		
586.5	1.65E+03	586.59	0.015
590.3	3.55E+03	590.28	0.003
597.41	1.19E+04	597.48	0.012
619.011	7.48E+04	619.01	0.000
620.87	0.00E+00		
627.2	7.10E+02	627.18	0.003
633	1.60E+03	632.93	0.011
641.436	9.00E+03	641.47	0.005
652.99	4.78E+04	653.02	0.005
662.456	4.65E+05	662.4	0.008
669.9	4.82E+02	666.5	0.510
		669.83	
675.8	8.11E+02	676.03	0.034
680.06	3.93E+03	680.1	0.006

688.77	3.80E+04	688.72	0.007
693.5	4.69E+03		
696.36	6.34E+03	696.6	0.034
707.47	0.00E+00		
710.95	8.11E+03		
721.962	7.61E+04	722.01	0.007
722.7	1.65E+05		
729.5	1.65E+03	729.72	0.030
731.5	5.96E+02		
737.3	1.01E+04	737.34	0.005
755.89	9.64E+03	755.9	0.001
759.5	2.16E+03		
763.4	2.51E+02		
766.79	6.34E+03	767	0.027
770.49	6.34E+03	770.57	0.010
772.1	3.37E+03		
777.2	7.61E+01	772.4	0.621
780.5	3.17E+02		
788.8	4.94E+02	786	0.356
801.9	1.65E+03	801.94	0.005
807.27	0.00E+00	806.26	0.125
811.8	7.61E+02		
819.3	5.07E+02		
822.6	2.79E+02		
828.5	3.04E+02	828.5	
851.5	4.82E+02		
854.7	2.54E+02		
859.2	1.06E+02	860.7	0.174
862.6	6.72E+02	862.7	0.012
872.7	8.87E+02		
887.5	2.79E+02	887.3	0.023
898.4	8.87E+01		
902.5	3.80E+02		
912.4	3.17E+02		
922.2	2.41E+02	921.5	0.076
928.8	6.34E+01		
945.7	6.34E+01		
955.7	7.35E+02		

243Am zero years

RADSRC energy (keV)	RADSRC intensity	ENSDF energy (keV)	% diff
		13.9	
31.136	4.87E+06	31.14 3	
43.03	4.28E+06	43.1	
43.537	3.76E+08	43.53 2	

50.8	1.92E+05	50.6
55.4	6.78E+05	55.4
74.672	4.42E+09	74.66 2
86.57	2.21E+07	86.71 2
		97.069
98.43	5.90E+05	98.5
		101.059
		113.303
		114.234
117.7	4.06E+07	117.463
		117.60 15
141.97	8.41E+06	141.89 3
170.14	8.85E+04	169
195.3	6.19E+04	195
544.55	1.25E+03	
631.116	2.43E+04	631.09
662.251	7.01E+04	662.24

244Cm zero years

Energy keV	Intensity ph/s/gm	Initial Isotopes and Decays			
12.124	6.88E+09	Cm-244	->	Pu-240	
14.262	1.20E+11	Cm-244	->	Pu-240	
16.333	2.69E+09	Cm-244	->	Pu-240	
18.135	1.20E+11	Cm-244	->	Pu-240	
21.554	2.99E+10	Cm-244	->	Pu-240	
42.817	7.48E+08	Cm-244	->	Pu-240	
98.855	4.49E+07	Cm-244	->	Pu-240	
152.622	2.93E+07	Cm-244	->	Pu-240	
251.43	3.62E+05	Cm-244	->	Pu-240	
263.33	1.71E+06	Cm-244	->	Pu-240	
302.96	4.61E+05	Cm-244	->	Pu-240	
507.22	2.27E+05	Cm-244	->	Pu-240	
554.54	2.36E+06	Cm-244	->	Pu-240	
597.35	1.35E+06	Cm-244	->	Pu-240	
606.07	2.15E+05	Cm-244	->	Pu-240	
758.64	4.58E+05	Cm-244	->	Pu-240	
817.87	2.01E+06	Cm-244	->	Pu-240	
857.5	1.83E+05	Cm-244	->	Pu-240	
900.31	5.09E+04	Cm-244	->	Pu-240	

Appendix B.

The gamma-ray lines calculated by the RADSRC code are given for selected isotopes of uranium, neptunium, plutonium, americium and curium. The materials here have been aged five years.

U-234 100% Aged 5 years

307 lines computed.

Sorted by Energy

Intensity	Energy	Initial Isotopes and Decays			
keV	ph/s/gm				
8.953	8.95E-10	Hg-206	->	Tl-206	
9.185	9.79E-06	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
9.419	3.56E-02	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
9.658	2.27E-03	Bi-214	->	Po-214	
10.137	1.64E-03	Ra-226	->	Rn-222	
10.259	1.87E-08	Hg-206	->	Tl-206	
10.541	1.98E-04	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
10.828	7.12E-01	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
10.994	2.36E-10	Hg-206	->	Tl-206	
11.119	4.36E-02	Bi-214	->	Po-214	
11.349	4.78E-06	Tl-210	->	Pb-210	
11.439	2.77E-12	Tl-206	->	Pb-206	
11.712	8.29E-03	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
11.713	3.03E-02	Ra-226	->	Rn-222	
12.085	6.26E-04	Bi-214	->	Po-214	
12.313	1.62E-08	Hg-206	->	Tl-206	
12.678	2.63E-04	Tl-210	->	Pb-210	
12.71	1.74E-10	Tl-206	->	Pb-206	
12.855	8.36E-04	Ra-226	->	Rn-222	
13.066	5.88E-02	Pb-210	->	Bi-210	
13.088	6.48E-01	Pb-214	->	Bi-214	
13.502	4.21E-02	Bi-214	->	Po-214	
14.336	4.38E-02	Ra-226	->	Rn-222	
14.407	2.98E-09	Hg-206	->	Tl-206	
14.836	5.26E-05	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
15.439	1.32E-01	Pb-214	->	Bi-214	
15.537	1.41E-02	Pb-210	->	Bi-210	
15.874	8.08E-03	Bi-214	->	Po-214	
16.874	9.61E-03	Ra-226	->	Rn-222	
46.52	2.29E-02	Pb-210	->	Bi-210	
53.172	1.25E-01	Pb-214	->	Bi-214	
53.23	2.74E+05	U-234	->	Th-230	

67.6758	3.98E+01	Th-230	->	Ra-226		
70.832	3.11E-08	Hg-206	->	Tl-206		
72.803	6.69E-05	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
72.873	5.22E-08	Hg-206	->	Tl-206		
74.814	7.42E-01	Pb-214	->	Bi-214		
74.969	1.10E-04	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
76.838	6.60E-02	Bi-214	->	Po-214		
77.107	1.25E+00	Pb-214	->	Bi-214		
79.29	1.10E-01	Bi-214	->	Po-214		
81	4.78E-05	Tl-210	->	Pb-210		
81.067	2.01E-02	Ra-226	->	Rn-222		
82.434	1.87E-08	Hg-206	->	Tl-206		
83.787	3.34E-02	Ra-226	->	Rn-222		
84.789	3.92E-05	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
85.185	5.22E-09	Hg-206	->	Tl-206		
87.19	4.41E-01	Pb-214	->	Bi-214		
87.632	1.12E-05	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
89.639	3.92E-02	Bi-214	->	Po-214		
90.128	1.31E-01	Pb-214	->	Bi-214		
92.673	1.19E-02	Bi-214	->	Po-214		
94.677	1.18E-02	Ra-226	->	Rn-222		
95	9.56E-05	Tl-210	->	Pb-210		
97.907	3.77E-03	Ra-226	->	Rn-222		
109.97	6.24E-03	Th-230	->	Ra-226		
120.912	9.44E+04	U-234	->	Th-230		
137.4	6.71E-03	Pb-214	->	Bi-214		
141.3	4.44E-03	Pb-214	->	Bi-214		
143.876	5.14E+00	Th-230	->	Ra-226		
186.057	9.31E-01	Th-230	->	Ra-226		
186.11	3.75E-01	Ra-226	->	Rn-222		
196.3	5.57E-03	Pb-214	->	Bi-214		
205.1	5.29E-04	Th-230	->	Ra-226		
235.01	8.57E-04	Th-230	->	Ra-226		
241.92	8.48E-01	Pb-214	->	Bi-214		
253.732	1.17E+00	Th-230	->	Ra-226		
253.84	8.99E-02	Th-230	->	Ra-226		
258.94	6.26E-02	Pb-214	->	Bi-214		
262.41	6.18E-04	Ra-226	->	Rn-222		
266.15	2.95E-13	Bi-210	->	Tl-206		
273.7	2.05E-02	Bi-214	->	Po-214		
274.56	3.64E-02	Pb-214	->	Bi-214		
280.93	9.21E-03	Bi-214	->	Po-214		
286.9	3.64E-03	Bi-214	->	Po-214		
295.091	2.18E+00	Pb-214	->	Bi-214		
298.1	1.89E-03	Tl-210	->	Pb-210,	Po-214	-> Pb-210
302.25	3.36E-07	Hg-206	->	Tl-206		
304.42	3.87E-03	Bi-214	->	Po-214		
305.5	2.62E-03	Pb-214	->	Bi-214		
314.2	8.99E-03	Pb-214	->	Bi-214		
324.3	2.27E-03	Pb-214	->	Bi-214		

333.6	1.08E-02	Bi-214	->	Po-214
334.9	6.48E-03	Bi-214	->	Po-214
338.5	4.44E-03	Bi-214	->	Po-214
344.96	6.47E-09	Hg-206	->	Tl-206
347.1	6.82E-03	Bi-214	->	Po-214
351.87	4.22E+00	Pb-214	->	Bi-214
354	9.56E-05	Tl-210	->	Pb-210
364.2	7.17E-04	Bi-214	->	Po-214
376.6	5.57E-04	Bi-214	->	Po-214
380	7.17E-05	Tl-210	->	Pb-210
384.06	4.73E-11	Hg-206	->	Tl-206
386.834	4.09E-02	Bi-214	->	Po-214
388.95	4.66E-02	Bi-214	->	Po-214
394	1.02E-03	Bi-214	->	Po-214
396	3.41E-03	Bi-214	->	Po-214
405.73	1.90E-02	Bi-214	->	Po-214
414.72	4.46E-05	Ra-226	->	Rn-222
426.5	1.25E-02	Bi-214	->	Po-214
440.4	3.30E-03	Bi-214	->	Po-214
449.5	3.09E-05	Ra-226	->	Rn-222
454.832	3.62E-02	Bi-214	->	Po-214
454.97	5.99E+01	U-234	->	Th-230
462.05	1.93E-02	Pb-214	->	Bi-214
469.76	1.51E-02	Bi-214	->	Po-214
470.8	1.14E-03	Pb-214	->	Bi-214
474.51	1.34E-02	Bi-214	->	Po-214
478	4.78E-05	Tl-210	->	Pb-210
480.32	3.84E-02	Pb-214	->	Bi-214
487.13	4.99E-02	Pb-214	->	Bi-214
494.6	1.02E-03	Bi-214	->	Po-214
502.2	2.05E-03	Bi-214	->	Po-214
503.53	2.30E+00	U-234	->	Th-230
508.2	3.39E+01	U-234	->	Th-230
510	7.96E-03	Rn-222	->	Po-218
511	3.30E-03	Pb-214	->	Bi-214
520.4	6.48E-04	Bi-214	->	Po-214
525	1.82E-03	Bi-214	->	Po-214
533.5	2.16E-02	Pb-214	->	Bi-214
536.93	8.08E-03	Bi-214	->	Po-214
538.7	5.57E-04	Pb-214	->	Bi-214
542.84	9.67E-03	Bi-214	->	Po-214
543.91	2.62E-03	Pb-214	->	Bi-214
547.1	3.64E-03	Bi-214	->	Po-214
551.8	1.07E-04	Th-230	->	Ra-226
570.5	3.17E-04	Th-230	->	Ra-226
572.67	9.33E-03	Bi-214	->	Po-214
580.06	4.14E-02	Pb-214	->	Bi-214
581.78	2.76E+01	U-234	->	Th-230
596	1.36E-03	Bi-214	->	Po-214
600.83	6.98E-05	Ra-226	->	Rn-222

609.311	5.24E+00	Bi-214	->	Po-214	
615.77	7.96E-03	Bi-214	->	Po-214	
617.1	3.87E-03	Bi-214	->	Po-214	
620	1.07E-04	Th-230	->	Ra-226	
624.44	1.84E+00	U-234	->	Th-230	
626.4	5.57E-04	Bi-214	->	Po-214	
631.2	1.93E-03	Bi-214	->	Po-214	
633.14	6.82E-03	Bi-214	->	Po-214	
639.36	3.53E-03	Bi-214	->	Po-214	
649.18	6.71E-03	Bi-214	->	Po-214	
650.21	3.11E-08	Hg-206	->	Tl-206	
660.75	4.89E-03	Bi-214	->	Po-214	
665.442	1.77E-01	Bi-214	->	Po-214	
668	4.78E-05	Tl-210	->	Pb-210	
677.67	2.30E+00	U-234	->	Th-230	
683.21	8.99E-03	Bi-214	->	Po-214	
687.7	6.82E-04	Bi-214	->	Po-214	
693.3	6.82E-04	Bi-214	->	Po-214	
697.89	4.21E-03	Bi-214	->	Po-214	
703.07	5.37E-02	Bi-214	->	Po-214	
710.84	8.50E-03	Bi-214	->	Po-214	
719.856	4.58E-02	Bi-214	->	Po-214	
723.32	5.12E-03	Bi-214	->	Po-214	
727.8	1.79E-03	Bi-214	->	Po-214	
733.64	5.35E-03	Bi-214	->	Po-214	
740.87	4.44E-03	Bi-214	->	Po-214	
752.843	1.51E-02	Bi-214	->	Po-214	
765.9	8.99E-03	Pb-214	->	Bi-214	
768.35	5.55E-01	Bi-214	->	Po-214	
785.827	1.24E-01	Pb-214	->	Bi-214	
786.42	3.53E-02	Bi-214	->	Po-214	
797.88	3.55E-03	Tl-210	->	Pb-210,	Po-214 -> Pb-210
799.75	4.66E-03	Bi-214	->	Po-214	
803.13	4.36E-06	Tl-206	->	Pb-206,	Po-210 -> Pb-206
806.155	1.40E-01	Bi-214	->	Po-214	
814.87	4.55E-03	Bi-214	->	Po-214	
821.166	1.71E-02	Bi-214	->	Po-214	
826.44	1.05E-02	Bi-214	->	Po-214	
832.34	2.62E-03	Bi-214	->	Po-214	
838.999	6.68E-02	Pb-214	->	Bi-214	
847.2	1.93E-03	Bi-214	->	Po-214	
860	1.65E-04	Tl-210	->	Pb-210	
904.33	1.19E-02	Bi-214	->	Po-214	
908	7.17E-05	Tl-210	->	Pb-210	
915.8	2.62E-03	Bi-214	->	Po-214	
934.039	3.59E-01	Bi-214	->	Po-214	
943.3	1.93E-03	Bi-214	->	Po-214	
964.07	4.36E-02	Bi-214	->	Po-214	
976.2	2.62E-03	Bi-214	->	Po-214	
989.2	1.36E-03	Bi-214	->	Po-214	

1013.4	1.14E-03	Bi-214	->	Po-214
1020.5	1.36E-03	Bi-214	->	Po-214
1032.22	1.09E-02	Bi-214	->	Po-214
1038	1.93E-03	Bi-214	->	Po-214
1045.4	3.30E-03	Bi-214	->	Po-214
1051.95	3.58E-02	Bi-214	->	Po-214
1067.3	3.30E-03	Bi-214	->	Po-214
1068	2.87E-04	Tl-210	->	Pb-210
1070.02	3.24E-02	Bi-214	->	Po-214
1103.7	1.14E-02	Bi-214	->	Po-214
1104.766	9.10E-03	Bi-214	->	Po-214
1110	1.65E-04	Tl-210	->	Pb-210
1120.273	1.71E+00	Bi-214	->	Po-214
1130.6	5.12E-03	Bi-214	->	Po-214
1133.65	2.90E-02	Bi-214	->	Po-214
1155.183	1.92E-01	Bi-214	->	Po-214
1172.93	6.60E-03	Bi-214	->	Po-214
1173.04	6.60E-03	Bi-214	->	Po-214
1207.764	5.23E-02	Bi-214	->	Po-214
1208	4.06E-04	Tl-210	->	Pb-210
1226.8	3.07E-03	Bi-214	->	Po-214
1230.84	2.50E-03	Bi-214	->	Po-214
1238.107	6.73E-01	Bi-214	->	Po-214
1280.952	1.67E-01	Bi-214	->	Po-214
1303.76	1.38E-02	Bi-214	->	Po-214
1314	5.02E-04	Tl-210	->	Pb-210
1317.02	9.78E-03	Bi-214	->	Po-214
1330	1.25E-03	Bi-214	->	Po-214
1341.5	2.62E-03	Bi-214	->	Po-214
1353	5.12E-04	Bi-214	->	Po-214
1377.659	4.57E-01	Bi-214	->	Po-214
1385.295	8.87E-02	Bi-214	->	Po-214
1392.5	2.16E-03	Bi-214	->	Po-214
1401.48	1.58E-01	Bi-214	->	Po-214
1407.97	2.82E-01	Bi-214	->	Po-214
1408	1.17E-04	Tl-210	->	Pb-210
1419.7	5.80E-04	Bi-214	->	Po-214
1471.1	1.36E-03	Bi-214	->	Po-214
1479.19	7.85E-03	Bi-214	->	Po-214
1509.22	2.49E-01	Bi-214	->	Po-214
1538	4.78E-05	Tl-210	->	Pb-210
1538.49	4.66E-02	Bi-214	->	Po-214
1543.347	3.98E-02	Bi-214	->	Po-214
1583.22	8.19E-02	Bi-214	->	Po-214
1588	4.78E-05	Tl-210	->	Pb-210
1594.78	3.01E-02	Bi-214	->	Po-214
1599.3	3.80E-02	Bi-214	->	Po-214
1636.6	2.16E-03	Bi-214	->	Po-214
1637.37	7.96E-03	Bi-214	->	Po-214
1648	4.78E-05	Tl-210	->	Pb-210

1661.258	1.31E-01	Bi-214	->	Po-214
1683.99	2.68E-02	Bi-214	->	Po-214
1729.58	3.47E-01	Bi-214	->	Po-214
1764.49	1.81E+00	Bi-214	->	Po-214
1782.1	1.82E-03	Bi-214	->	Po-214
1814.01	1.36E-03	Bi-214	->	Po-214
1838.37	4.36E-02	Bi-214	->	Po-214
1847.41	2.41E-01	Bi-214	->	Po-214
1873.112	2.57E-02	Bi-214	->	Po-214
1890.259	1.01E-02	Bi-214	->	Po-214
1896.28	2.01E-02	Bi-214	->	Po-214
1898.9	7.17E-03	Bi-214	->	Po-214
1935.8	5.80E-03	Bi-214	->	Po-214
1994.7	5.69E-04	Bi-214	->	Po-214
2004.5	3.30E-04	Bi-214	->	Po-214
2008	1.65E-04	Tl-210	->	Pb-210
2010.79	5.57E-03	Bi-214	->	Po-214
2021.7	2.16E-03	Bi-214	->	Po-214
2052.93	7.96E-03	Bi-214	->	Po-214
2085	1.14E-03	Bi-214	->	Po-214
2088	1.17E-04	Tl-210	->	Pb-210
2089.55	6.37E-03	Bi-214	->	Po-214
2109.91	9.89E-03	Bi-214	->	Po-214
2118.53	1.38E-01	Bi-214	->	Po-214
2147.8	1.82E-03	Bi-214	->	Po-214
2192.52	6.94E-03	Bi-214	->	Po-214
2204.09	5.68E-01	Bi-214	->	Po-214
2251.2	7.96E-04	Bi-214	->	Po-214
2259.7	1.02E-03	Bi-214	->	Po-214
2266.67	2.05E-03	Bi-214	->	Po-214
2268	7.17E-05	Tl-210	->	Pb-210
2270	3.30E-04	Bi-214	->	Po-214
2284.4	5.80E-04	Bi-214	->	Po-214
2293.29	3.69E-02	Bi-214	->	Po-214
2324.8	2.16E-04	Bi-214	->	Po-214
2331.2	2.50E-03	Bi-214	->	Po-214
2358	1.91E-04	Tl-210	->	Pb-210
2360.9	2.16E-04	Bi-214	->	Po-214
2369.3	3.30E-04	Bi-214	->	Po-214
2376.99	1.34E-03	Bi-214	->	Po-214
2390.9	2.27E-04	Bi-214	->	Po-214
2423.32	6.71E-04	Bi-214	->	Po-214
2428	2.15E-04	Tl-210	->	Pb-210
2447.68	1.76E-01	Bi-214	->	Po-214
2482.417	2.39E-04	Bi-214	->	Po-214
2505.58	6.71E-04	Bi-214	->	Po-214
2551	4.44E-05	Bi-214	->	Po-214
2604.5	5.12E-05	Bi-214	->	Po-214
2631	1.02E-04	Bi-214	->	Po-214
2662.23	3.30E-05	Bi-214	->	Po-214

2694.67	3.69E-03	Bi-214	->	Po-214
2698.86	3.18E-04	Bi-214	->	Po-214
2719.21	2.05E-04	Bi-214	->	Po-214
2769.99	2.91E-03	Bi-214	->	Po-214
2786.09	6.71E-04	Bi-214	->	Po-214
2827	2.84E-04	Bi-214	->	Po-214
2860.9	3.87E-05	Bi-214	->	Po-214
2880.4	1.05E-03	Bi-214	->	Po-214
2893.59	7.28E-04	Bi-214	->	Po-214
2922.09	1.79E-03	Bi-214	->	Po-214
2928.7	1.36E-04	Bi-214	->	Po-214
2934.9	6.48E-05	Bi-214	->	Po-214
2940.5	1.93E-04	Bi-214	->	Po-214
2978.79	1.67E-03	Bi-214	->	Po-214
2988.7	1.25E-04	Bi-214	->	Po-214
2999.99	1.00E-03	Bi-214	->	Po-214
3053.89	2.57E-03	Bi-214	->	Po-214
3081.7	4.89E-04	Bi-214	->	Po-214
3093.9	5.80E-05	Bi-214	->	Po-214
3136.3	3.87E-05	Bi-214	->	Po-214
3142.6	1.82E-04	Bi-214	->	Po-214
3160.5	5.80E-05	Bi-214	->	Po-214
3183.6	1.71E-04	Bi-214	->	Po-214
3233.3	2.27E-05	Bi-214	->	Po-214
3269.7	1.14E-05	Bi-214	->	Po-214

234U Aged 5 years Sorted by Intensity

Intensity	Energy	Initial Isotopes and Decays	
ph/s/gm	keV		
2.74E+05	53.23	U-234	-> Th-230
9.44E+04	120.912	U-234	-> Th-230
5.99E+01	454.97	U-234	-> Th-230
3.98E+01	67.6758	Th-230	-> Ra-226
3.39E+01	508.2	U-234	-> Th-230
2.76E+01	581.78	U-234	-> Th-230
5.24E+00	609.311	Bi-214	-> Po-214
5.14E+00	143.876	Th-230	-> Ra-226
4.22E+00	351.87	Pb-214	-> Bi-214
2.30E+00	677.67	U-234	-> Th-230
2.30E+00	503.53	U-234	-> Th-230
2.18E+00	295.091	Pb-214	-> Bi-214
1.84E+00	624.44	U-234	-> Th-230
1.81E+00	1764.49	Bi-214	-> Po-214
1.71E+00	1120.273	Bi-214	-> Po-214
1.25E+00	77.107	Pb-214	-> Bi-214

1.17E+00	253.732	Th-230 ->	Ra-226	
9.31E-01	186.057	Th-230 ->	Ra-226	
8.48E-01	241.92	Pb-214 ->	Bi-214	
7.42E-01	74.814	Pb-214 ->	Bi-214	
7.12E-01	10.828	Pb-210 ->	Bi-210,	Pb-214 -> Bi-214
6.73E-01	1238.107	Bi-214 ->	Po-214	
6.48E-01	13.088	Pb-214 ->	Bi-214	
5.68E-01	2204.09	Bi-214 ->	Po-214	
5.55E-01	768.35	Bi-214 ->	Po-214	
4.57E-01	1377.659	Bi-214 ->	Po-214	
4.41E-01	87.19	Pb-214 ->	Bi-214	
3.75E-01	186.11	Ra-226 ->	Rn-222	
3.59E-01	934.039	Bi-214 ->	Po-214	
3.47E-01	1729.58	Bi-214 ->	Po-214	
2.82E-01	1407.97	Bi-214 ->	Po-214	
2.49E-01	1509.22	Bi-214 ->	Po-214	
2.41E-01	1847.41	Bi-214 ->	Po-214	
1.92E-01	1155.183	Bi-214 ->	Po-214	
1.77E-01	665.442	Bi-214 ->	Po-214	
1.76E-01	2447.68	Bi-214 ->	Po-214	
1.67E-01	1280.952	Bi-214 ->	Po-214	
1.58E-01	1401.48	Bi-214 ->	Po-214	
1.40E-01	806.155	Bi-214 ->	Po-214	
1.38E-01	2118.53	Bi-214 ->	Po-214	
1.32E-01	15.439	Pb-214 ->	Bi-214	
1.31E-01	90.128	Pb-214 ->	Bi-214	
1.31E-01	1661.258	Bi-214 ->	Po-214	
1.25E-01	53.172	Pb-214 ->	Bi-214	
1.24E-01	785.827	Pb-214 ->	Bi-214	
1.10E-01	79.29	Bi-214 ->	Po-214	
8.99E-02	253.84	Th-230 ->	Ra-226	
8.87E-02	1385.295	Bi-214 ->	Po-214	
8.19E-02	1583.22	Bi-214 ->	Po-214	
6.68E-02	838.999	Pb-214 ->	Bi-214	
6.60E-02	76.838	Bi-214 ->	Po-214	
6.26E-02	258.94	Pb-214 ->	Bi-214	
5.88E-02	13.066	Pb-210 ->	Bi-210	
5.37E-02	703.07	Bi-214 ->	Po-214	
5.23E-02	1207.764	Bi-214 ->	Po-214	
4.99E-02	487.13	Pb-214 ->	Bi-214	
4.66E-02	388.95	Bi-214 ->	Po-214	
4.66E-02	1538.49	Bi-214 ->	Po-214	
4.58E-02	719.856	Bi-214 ->	Po-214	
4.38E-02	14.336	Ra-226 ->	Rn-222	
4.36E-02	964.07	Bi-214 ->	Po-214	
4.36E-02	1838.37	Bi-214 ->	Po-214	
4.36E-02	11.119	Bi-214 ->	Po-214	
4.21E-02	13.502	Bi-214 ->	Po-214	
4.14E-02	580.06	Pb-214 ->	Bi-214	
4.09E-02	386.834	Bi-214 ->	Po-214	

3.98E-02	1543.347	Bi-214	->	Po-214	
3.92E-02	89.639	Bi-214	->	Po-214	
3.84E-02	480.32	Pb-214	->	Bi-214	
3.80E-02	1599.3	Bi-214	->	Po-214	
3.69E-02	2293.29	Bi-214	->	Po-214	
3.64E-02	274.56	Pb-214	->	Bi-214	
3.62E-02	454.832	Bi-214	->	Po-214	
3.58E-02	1051.95	Bi-214	->	Po-214	
3.56E-02	9.419	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
3.53E-02	786.42	Bi-214	->	Po-214	
3.34E-02	83.787	Ra-226	->	Rn-222	
3.24E-02	1070.02	Bi-214	->	Po-214	
3.03E-02	11.713	Ra-226	->	Rn-222	
3.01E-02	1594.78	Bi-214	->	Po-214	
2.90E-02	1133.65	Bi-214	->	Po-214	
2.68E-02	1683.99	Bi-214	->	Po-214	
2.57E-02	1873.112	Bi-214	->	Po-214	
2.29E-02	46.52	Pb-210	->	Bi-210	
2.16E-02	533.5	Pb-214	->	Bi-214	
2.05E-02	273.7	Bi-214	->	Po-214	
2.01E-02	81.067	Ra-226	->	Rn-222	
2.01E-02	1896.28	Bi-214	->	Po-214	
1.93E-02	462.05	Pb-214	->	Bi-214	
1.90E-02	405.73	Bi-214	->	Po-214	
1.71E-02	821.166	Bi-214	->	Po-214	
1.51E-02	469.76	Bi-214	->	Po-214	
1.51E-02	752.843	Bi-214	->	Po-214	
1.41E-02	15.537	Pb-210	->	Bi-210	
1.38E-02	1303.76	Bi-214	->	Po-214	
1.34E-02	474.51	Bi-214	->	Po-214	
1.25E-02	426.5	Bi-214	->	Po-214	
1.19E-02	904.33	Bi-214	->	Po-214	
1.19E-02	92.673	Bi-214	->	Po-214	
1.18E-02	94.677	Ra-226	->	Rn-222	
1.14E-02	1103.7	Bi-214	->	Po-214	
1.09E-02	1032.22	Bi-214	->	Po-214	
1.08E-02	333.6	Bi-214	->	Po-214	
1.05E-02	826.44	Bi-214	->	Po-214	
1.01E-02	1890.259	Bi-214	->	Po-214	
9.89E-03	2109.91	Bi-214	->	Po-214	
9.78E-03	1317.02	Bi-214	->	Po-214	
9.67E-03	542.84	Bi-214	->	Po-214	
9.61E-03	16.874	Ra-226	->	Rn-222	
9.33E-03	572.67	Bi-214	->	Po-214	
9.21E-03	280.93	Bi-214	->	Po-214	
9.10E-03	1104.766	Bi-214	->	Po-214	
8.99E-03	314.2	Pb-214	->	Bi-214	
8.99E-03	765.9	Pb-214	->	Bi-214	
8.99E-03	683.21	Bi-214	->	Po-214	
8.50E-03	710.84	Bi-214	->	Po-214	

8.29E-03	11.712	Pb-210	->	Bi-210,	Pb-214	->	Bi-214
8.08E-03	536.93	Bi-214	->	Po-214			
8.08E-03	15.874	Bi-214	->	Po-214			
7.96E-03	510	Rn-222	->	Po-218			
7.96E-03	615.77	Bi-214	->	Po-214			
7.96E-03	1637.37	Bi-214	->	Po-214			
7.96E-03	2052.93	Bi-214	->	Po-214			
7.85E-03	1479.19	Bi-214	->	Po-214			
7.17E-03	1898.9	Bi-214	->	Po-214			
6.94E-03	2192.52	Bi-214	->	Po-214			
6.82E-03	347.1	Bi-214	->	Po-214			
6.82E-03	633.14	Bi-214	->	Po-214			
6.71E-03	137.4	Pb-214	->	Bi-214			
6.71E-03	649.18	Bi-214	->	Po-214			
6.60E-03	1172.93	Bi-214	->	Po-214			
6.60E-03	1173.04	Bi-214	->	Po-214			
6.48E-03	334.9	Bi-214	->	Po-214			
6.37E-03	2089.55	Bi-214	->	Po-214			
6.24E-03	109.97	Th-230	->	Ra-226			
5.80E-03	1935.8	Bi-214	->	Po-214			
5.57E-03	196.3	Pb-214	->	Bi-214			
5.57E-03	2010.79	Bi-214	->	Po-214			
5.35E-03	733.64	Bi-214	->	Po-214			
5.12E-03	723.32	Bi-214	->	Po-214			
5.12E-03	1130.6	Bi-214	->	Po-214			
4.89E-03	660.75	Bi-214	->	Po-214			
4.66E-03	799.75	Bi-214	->	Po-214			
4.55E-03	814.87	Bi-214	->	Po-214			
4.44E-03	141.3	Pb-214	->	Bi-214			
4.44E-03	338.5	Bi-214	->	Po-214			
4.44E-03	740.87	Bi-214	->	Po-214			
4.21E-03	697.89	Bi-214	->	Po-214			
3.87E-03	304.42	Bi-214	->	Po-214			
3.87E-03	617.1	Bi-214	->	Po-214			
3.77E-03	97.907	Ra-226	->	Rn-222			
3.69E-03	2694.67	Bi-214	->	Po-214			
3.64E-03	286.9	Bi-214	->	Po-214			
3.64E-03	547.1	Bi-214	->	Po-214			
3.55E-03	797.88	Tl-210	->	Pb-210,	Po-214	->	Pb-210
3.53E-03	639.36	Bi-214	->	Po-214			
3.41E-03	396	Bi-214	->	Po-214			
3.30E-03	511	Pb-214	->	Bi-214			
3.30E-03	440.4	Bi-214	->	Po-214			
3.30E-03	1045.4	Bi-214	->	Po-214			
3.30E-03	1067.3	Bi-214	->	Po-214			
3.07E-03	1226.8	Bi-214	->	Po-214			
2.91E-03	2769.99	Bi-214	->	Po-214			
2.62E-03	305.5	Pb-214	->	Bi-214			
2.62E-03	543.91	Pb-214	->	Bi-214			
2.62E-03	1341.5	Bi-214	->	Po-214			

2.62E-03	976.2	Bi-214	->	Po-214	
2.62E-03	915.8	Bi-214	->	Po-214	
2.62E-03	832.34	Bi-214	->	Po-214	
2.57E-03	3053.89	Bi-214	->	Po-214	
2.50E-03	1230.84	Bi-214	->	Po-214	
2.50E-03	2331.2	Bi-214	->	Po-214	
2.27E-03	324.3	Pb-214	->	Bi-214	
2.27E-03	9.658	Bi-214	->	Po-214	
2.16E-03	1636.6	Bi-214	->	Po-214	
2.16E-03	2021.7	Bi-214	->	Po-214	
2.16E-03	1392.5	Bi-214	->	Po-214	
2.05E-03	2266.67	Bi-214	->	Po-214	
2.05E-03	502.2	Bi-214	->	Po-214	
1.93E-03	943.3	Bi-214	->	Po-214	
1.93E-03	847.2	Bi-214	->	Po-214	
1.93E-03	631.2	Bi-214	->	Po-214	
1.93E-03	1038	Bi-214	->	Po-214	
1.89E-03	298.1	Tl-210	->	Pb-210,	Po-214 -> Pb-210
1.82E-03	1782.1	Bi-214	->	Po-214	
1.82E-03	525	Bi-214	->	Po-214	
1.82E-03	2147.8	Bi-214	->	Po-214	
1.79E-03	727.8	Bi-214	->	Po-214	
1.79E-03	2922.09	Bi-214	->	Po-214	
1.67E-03	2978.79	Bi-214	->	Po-214	
1.64E-03	10.137	Ra-226	->	Rn-222	
1.36E-03	1020.5	Bi-214	->	Po-214	
1.36E-03	1814.01	Bi-214	->	Po-214	
1.36E-03	989.2	Bi-214	->	Po-214	
1.36E-03	1471.1	Bi-214	->	Po-214	
1.36E-03	596	Bi-214	->	Po-214	
1.34E-03	2376.99	Bi-214	->	Po-214	
1.25E-03	1330	Bi-214	->	Po-214	
1.14E-03	470.8	Pb-214	->	Bi-214	
1.14E-03	2085	Bi-214	->	Po-214	
1.14E-03	1013.4	Bi-214	->	Po-214	
1.05E-03	2880.4	Bi-214	->	Po-214	
1.02E-03	2259.7	Bi-214	->	Po-214	
1.02E-03	394	Bi-214	->	Po-214	
1.02E-03	494.6	Bi-214	->	Po-214	
1.00E-03	2999.99	Bi-214	->	Po-214	
8.57E-04	235.01	Th-230	->	Ra-226	
8.36E-04	12.855	Ra-226	->	Rn-222	
7.96E-04	2251.2	Bi-214	->	Po-214	
7.28E-04	2893.59	Bi-214	->	Po-214	
7.17E-04	364.2	Bi-214	->	Po-214	
6.82E-04	693.3	Bi-214	->	Po-214	
6.82E-04	687.7	Bi-214	->	Po-214	
6.71E-04	2423.32	Bi-214	->	Po-214	
6.71E-04	2505.58	Bi-214	->	Po-214	
6.71E-04	2786.09	Bi-214	->	Po-214	

6.48E-04	520.4	Bi-214	->	Po-214	
6.26E-04	12.085	Bi-214	->	Po-214	
6.18E-04	262.41	Ra-226	->	Rn-222	
5.80E-04	1419.7	Bi-214	->	Po-214	
5.80E-04	2284.4	Bi-214	->	Po-214	
5.69E-04	1994.7	Bi-214	->	Po-214	
5.57E-04	538.7	Pb-214	->	Bi-214	
5.57E-04	376.6	Bi-214	->	Po-214	
5.57E-04	626.4	Bi-214	->	Po-214	
5.29E-04	205.1	Th-230	->	Ra-226	
5.12E-04	1353	Bi-214	->	Po-214	
5.02E-04	1314	Tl-210	->	Pb-210	
4.89E-04	3081.7	Bi-214	->	Po-214	
4.06E-04	1208	Tl-210	->	Pb-210	
3.30E-04	2369.3	Bi-214	->	Po-214	
3.30E-04	2270	Bi-214	->	Po-214	
3.30E-04	2004.5	Bi-214	->	Po-214	
3.18E-04	2698.86	Bi-214	->	Po-214	
3.17E-04	570.5	Th-230	->	Ra-226	
2.87E-04	1068	Tl-210	->	Pb-210	
2.84E-04	2827	Bi-214	->	Po-214	
2.63E-04	12.678	Tl-210	->	Pb-210	
2.39E-04	2482.417	Bi-214	->	Po-214	
2.27E-04	2390.9	Bi-214	->	Po-214	
2.16E-04	2360.9	Bi-214	->	Po-214	
2.16E-04	2324.8	Bi-214	->	Po-214	
2.15E-04	2428	Tl-210	->	Pb-210	
2.05E-04	2719.21	Bi-214	->	Po-214	
1.98E-04	10.541	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
1.93E-04	2940.5	Bi-214	->	Po-214	
1.91E-04	2358	Tl-210	->	Pb-210	
1.82E-04	3142.6	Bi-214	->	Po-214	
1.71E-04	3183.6	Bi-214	->	Po-214	
1.65E-04	1110	Tl-210	->	Pb-210	
1.65E-04	2008	Tl-210	->	Pb-210	
1.65E-04	860	Tl-210	->	Pb-210	
1.36E-04	2928.7	Bi-214	->	Po-214	
1.25E-04	2988.7	Bi-214	->	Po-214	
1.17E-04	1408	Tl-210	->	Pb-210	
1.17E-04	2088	Tl-210	->	Pb-210	
1.10E-04	74.969	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
1.07E-04	620	Th-230	->	Ra-226	
1.07E-04	551.8	Th-230	->	Ra-226	
1.02E-04	2631	Bi-214	->	Po-214	
9.56E-05	95	Tl-210	->	Pb-210	
9.56E-05	354	Tl-210	->	Pb-210	
7.17E-05	2268	Tl-210	->	Pb-210	
7.17E-05	908	Tl-210	->	Pb-210	
7.17E-05	380	Tl-210	->	Pb-210	
6.98E-05	600.83	Ra-226	->	Rn-222	

6.69E-05	72.803	Tl-206 ->	Pb-206,	Tl-210 ->	Pb-210
6.48E-05	2934.9	Bi-214 ->	Po-214		
5.80E-05	3093.9	Bi-214 ->	Po-214		
5.80E-05	3160.5	Bi-214 ->	Po-214		
5.26E-05	14.836	Tl-206 ->	Pb-206,	Tl-210 ->	Pb-210
5.12E-05	2604.5	Bi-214 ->	Po-214		
4.78E-05	1538	Tl-210 ->	Pb-210		
4.78E-05	1588	Tl-210 ->	Pb-210		
4.78E-05	668	Tl-210 ->	Pb-210		
4.78E-05	1648	Tl-210 ->	Pb-210		
4.78E-05	478	Tl-210 ->	Pb-210		
4.78E-05	81	Tl-210 ->	Pb-210		
4.46E-05	414.72	Ra-226 ->	Rn-222		
4.44E-05	2551	Bi-214 ->	Po-214		
3.92E-05	84.789	Tl-206 ->	Pb-206,	Tl-210 ->	Pb-210
3.87E-05	2860.9	Bi-214 ->	Po-214		
3.87E-05	3136.3	Bi-214 ->	Po-214		
3.30E-05	2662.23	Bi-214 ->	Po-214		
3.09E-05	449.5	Ra-226 ->	Rn-222		
2.27E-05	3233.3	Bi-214 ->	Po-214		
1.14E-05	3269.7	Bi-214 ->	Po-214		
1.12E-05	87.632	Tl-206 ->	Pb-206,	Tl-210 ->	Pb-210
9.79E-06	9.185	Tl-206 ->	Pb-206,	Tl-210 ->	Pb-210
4.78E-06	11.349	Tl-210 ->	Pb-210		
4.36E-06	803.13	Tl-206 ->	Pb-206,	Po-210 ->	Pb-206
3.36E-07	302.25	Hg-206 ->	Tl-206		
5.22E-08	72.873	Hg-206 ->	Tl-206		
3.11E-08	70.832	Hg-206 ->	Tl-206		
3.11E-08	650.21	Hg-206 ->	Tl-206		
1.87E-08	82.434	Hg-206 ->	Tl-206		
1.87E-08	10.259	Hg-206 ->	Tl-206		
1.62E-08	12.313	Hg-206 ->	Tl-206		
6.47E-09	344.96	Hg-206 ->	Tl-206		
5.22E-09	85.185	Hg-206 ->	Tl-206		
2.98E-09	14.407	Hg-206 ->	Tl-206		
8.95E-10	8.953	Hg-206 ->	Tl-206		
2.36E-10	10.994	Hg-206 ->	Tl-206		
1.74E-10	12.71	Tl-206 ->	Pb-206		
4.73E-11	384.06	Hg-206 ->	Tl-206		
2.77E-12	11.439	Tl-206 ->	Pb-206		
2.95E-13	266.15	Bi-210 ->	Tl-206		

U-235

100%

Aged 5 years

604 lines computed.

Sorted by Energy:

Energy	Intensity	Initial Isotopes and Decays	
(keV)	(ph/s/gm)		
8.953	1.31E-04	Bi-211 ->	Tl-207
9.185	2.73E-07	Tl-207 ->	Pb-207
9.3	8.17E-07	Ac-227 ->	Th-227
9.419	1.16E-04	Pb-211 ->	Bi-211
9.658	1.28E-04	Rn-219 ->	Po-215
10.137	3.35E-03	Ra-223 ->	Rn-219
10.259	2.66E-03	Bi-211 ->	Tl-207
10.541	5.46E-06	Tl-207 ->	Pb-207
10.622	6.06E-03	Fr-223 ->	Ra-223, Th-227 -> Ra-223
10.828	2.25E-03	Pb-211 ->	Bi-211
10.871	1.01E-01	Pa-231 ->	Ac-227
10.994	3.46E-05	Bi-211 ->	Tl-207
11.118	8.00E+02	Ac-227 ->	Th-227, U-235 -> Th-231
11.119	2.49E-03	Rn-219 ->	Po-215
11.349	7.10E-08	Tl-207 ->	Pb-207
11.372	2.40E+03	Th-231 ->	Pa-231
11.712	3.65E-05	Pb-211 ->	Bi-211
11.713	6.20E-02	Ra-223 ->	Rn-219
12.085	4.56E-05	Rn-219 ->	Po-215
12.313	2.43E-03	Bi-211 ->	Tl-207
12.325	1.05E-01	Fr-223 ->	Ra-223, Th-227 -> Ra-223
12.636	1.86E+00	Pa-231 ->	Ac-227
12.703	4.97E-06	Tl-207 ->	Pb-207
12.855	8.82E-04	Ra-223 ->	Rn-219
12.952	1.76E+04	Ac-227 ->	Th-227, U-235 -> Th-231
13.082	2.49E-03	Pb-211 ->	Bi-211
13.495	2.74E-03	Rn-219 ->	Po-215
13.662	2.22E-03	Fr-223 ->	Ra-223, Th-227 -> Ra-223
13.724	3.92E+04	Th-231 ->	Pa-231
14.082	3.12E-02	Pa-231 ->	Ac-227
14.341	5.96E-02	Ra-223 ->	Rn-219
14.407	4.43E-04	Bi-211 ->	Tl-207
14.511	1.76E+02	Ac-227 ->	Th-227, U-235 -> Th-231
14.886	9.10E-07	Tl-207 ->	Pb-207
14.953	3.20E+02	Th-231 ->	Pa-231
15.2	2.20E-04	Ac-227 ->	Th-227
15.213	1.67E-03	Fr-223 ->	Ra-223
15.218	1.28E-01	Th-227 ->	Ra-223
15.397	5.47E-04	Pb-211 ->	Bi-211
15.69	2.11E+00	Pa-231 ->	Ac-227
15.856	5.53E-04	Rn-219 ->	Po-215
16.074	9.42E-04	Ac-227 ->	Th-227
16.119	1.20E+04	U-235 ->	Th-231
16.397	3.21E-02	Pa-231 ->	Ac-227
16.559	2.96E+04	Th-231 ->	Pa-231
16.918	1.18E-02	Ra-223 ->	Rn-219

17.187	1.76E+02	Th-231	->	Pa-231		
17.997	2.93E-02	Th-227	->	Ra-223		
18.016	3.78E-04	Fr-223	->	Ra-223		
18.607	4.98E-01	Pa-231	->	Ac-227		
18.998	2.79E-02	Pa-231	->	Ac-227		
19.118	2.08E+03	U-235	->	Th-231		
19.308	2.51E-04	Ac-227	->	Th-227		
19.811	5.92E+03	Th-231	->	Pa-231		
20.27	1.29E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
23.55	1.44E-05	Pa-231	->	Ac-227		
24.5	2.20E-05	Ac-227	->	Th-227		
24.56	2.53E-03	Pa-231	->	Ac-227		
25.464	7.60E-03	Pa-231	->	Ac-227		
25.642	1.17E+04	Th-231	->	Pa-231		
27.396	7.85E-01	Pa-231	->	Ac-227		
29.58	3.88E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
29.869	6.13E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
29.996	7.77E-03	Pa-231	->	Ac-227		
31.04	7.60E-04	Pa-231	->	Ac-227		
31.566	4.88E-04	Th-227	->	Ra-223		
31.58	5.91E-04	Pa-231	->	Ac-227		
31.585	1.28E+01	U-235	->	Th-231		
31.87	6.08E-07	Ra-223	->	Rn-219		
33.52	8.55E-05	Th-227	->	Ra-223		
35.884	1.35E-03	Pa-231	->	Ac-227		
38.235	1.26E-02	Pa-231	->	Ac-227		
39.61	1.18E-04	Pa-231	->	Ac-227		
40.006	1.01E-03	Pa-231	->	Ac-227		
40.16	1.22E-04	Th-227	->	Ra-223		
41.13	2.40E+01	U-235	->	Th-231		
41.88	2.44E-04	Th-227	->	Ra-223		
41.96	4.80E+01	U-235	->	Th-231		
42.52	5.07E-04	Pa-231	->	Ac-227		
42.828	4.64E+01	Th-231	->	Pa-231		
43.09	5.91E-04	Pa-231	->	Ac-227		
43.53	3.05E-04	Th-227	->	Ra-223		
43.73	1.40E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
44.06	5.60E-01	Th-231	->	Pa-231		
44.08	4.27E-05	Th-227	->	Ra-223		
44.213	5.07E-03	Pa-231	->	Ac-227		
44.37	7.94E-05	Th-227	->	Ra-223		
46.13	1.23E-07	Ac-227	->	Fr-223		
46.393	1.76E-02	Pa-231	->	Ac-227		
48.27	6.11E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
49.85	1.29E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
50.14	5.48E-02	Fr-223	->	Ra-223,	Th-227	-> Ra-223
50.82	9.77E-05	Th-227	->	Ra-223		
50.97	1.18E-04	Pa-231	->	Ac-227		
51.179	1.60E+01	U-235	->	Th-231		
51.29	1.83E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223

52.763	7.18E-03	Pa-231	->	Ac-227		
54.18	4.88E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
54.632	6.84E-03	Pa-231	->	Ac-227		
56.03	3.05E-05	Th-227	->	Ra-223		
56.63	4.27E-05	Th-227	->	Ra-223		
56.8	5.07E-04	Pa-231	->	Ac-227		
56.9	9.29E-04	Pa-231	->	Ac-227		
57.2	1.27E-03	Pa-231	->	Ac-227		
57.233	2.11E-03	Pa-231	->	Ac-227		
58.562	3.84E+02	Th-231	->	Pa-231		
59.5	5.49E-05	Th-227	->	Ra-223		
60.526	5.91E-04	Pa-231	->	Ac-227		
61.435	4.88E-04	Th-227	->	Ra-223		
62.05	1.22E-05	Th-227	->	Ra-223		
62.36	1.46E-03	Th-227	->	Ra-223		
62.54	5.49E-05	Th-227	->	Ra-223		
63.7	4.22E-03	Pa-231	->	Ac-227		
63.834	1.84E+01	Th-231	->	Pa-231		
64.348	1.60E+01	U-235	->	Th-231		
64.37	1.71E-04	Th-227	->	Ra-223		
65.516	4.68E-04	Pb-211	->	Bi-211		
66.1	3.66E-05	Th-227	->	Ra-223		
66.3	4.27E-05	Th-227	->	Ra-223		
68.5	4.56E+00	Th-231	->	Pa-231		
68.7	3.48E-05	Th-227	->	Ra-223		
68.75	2.44E-04	Th-227	->	Ra-223		
69.13	4.84E-07	Ac-227	->	Fr-223		
69.65	5.49E-05	Th-227	->	Ra-223		
69.83	1.49E-06	Ac-227	->	Fr-223		
70.54	5.91E-04	Pa-231	->	Ac-227		
70.832	4.55E-03	Bi-211	->	Tl-207		
71.92	1.69E-04	Pa-231	->	Ac-227		
72.57	3.38E-04	Pa-231	->	Ac-227		
72.71	8.80E+01	U-235	->	Th-231		
72.767	2.01E+02	Th-231	->	Pa-231		
72.8	1.71E-04	Th-227	->	Ra-223		
72.803	9.10E-06	Tl-207	->	Pb-207		
72.873	7.70E-03	Bi-211	->	Tl-207		
73.66	1.16E-04	Th-227	->	Ra-223		
74.209	2.11E-03	Pa-231	->	Ac-227		
74.8	4.80E+01	U-235	->	Th-231		
74.814	1.56E-03	Pb-211	->	Bi-211		
74.969	1.52E-05	Tl-207	->	Pb-207		
75.1	5.49E-05	Th-227	->	Ra-223		
76.858	3.16E-03	Rn-219	->	Po-215		
77.107	2.62E-03	Pb-211	->	Bi-211		
77.405	5.74E-03	Pa-231	->	Ac-227		
79.29	5.29E-03	Rn-219	->	Po-215		
79.72	1.36E-02	Fr-223	->	Ra-223,	Th-227	-> Ra-223
81	2.74E-04	Pb-211	->	Bi-211		

81.067	9.24E-02	Ra-223	->	Rn-219		
81.229	7.20E+02	Th-231	->	Pa-231		
82.434	2.71E-03	Bi-211	->	Tl-207		
83.787	1.53E-01	Ra-223	->	Rn-219		
83.81	3.47E-04	Pb-211	->	Bi-211		
84.203	5.28E+03	Th-231	->	Pa-231		
84.979	5.40E-06	Tl-207	->	Pb-207		
85.185	7.64E-04	Bi-211	->	Tl-207		
85.429	1.16E-02	Fr-223	->	Ra-223,	Th-227	-> Ra-223
87.19	9.24E-04	Pb-211	->	Bi-211		
87.632	1.58E-06	Tl-207	->	Pb-207		
87.673	4.02E-02	Pa-231	->	Ac-227		
88.2	1.03E-04	Pb-211	->	Bi-211		
88.471	1.92E-02	Fr-223	->	Ra-223,	Th-227	-> Ra-223
89.639	1.89E-03	Rn-219	->	Po-215		
89.85	2.08E-05	Th-227	->	Ra-223		
89.954	7.52E+02	Th-231	->	Pa-231		
89.955	2.69E+03	U-235	->	Th-231		
90.128	2.74E-04	Pb-211	->	Bi-211		
90.886	6.59E-02	Pa-231	->	Ac-227		
92.279	3.12E+02	Th-231	->	Pa-231		
92.673	5.72E-04	Rn-219	->	Po-215		
93.07	3.92E+01	Th-231	->	Pa-231		
93.36	4.40E+03	U-235	->	Th-231		
93.93	8.55E-03	Th-227	->	Ra-223		
94.3	6.69E-05	Pb-211	->	Bi-211		
94.677	5.41E-02	Ra-223	->	Rn-219		
94.89	1.09E-04	Pb-211	->	Bi-211		
94.9	7.32E-05	Th-227	->	Ra-223		
95.863	5.04E+02	Th-231	->	Pa-231		
96.06	3.66E-04	Th-227	->	Ra-223		
96.154	6.88E+01	U-235	->	Th-231		
96.979	7.43E-03	Pa-231	->	Ac-227		
97.3	6.99E-05	Pb-211	->	Bi-211		
97.907	1.73E-02	Ra-223	->	Rn-219		
99.28	9.60E+01	Th-231	->	Pa-231		
99.56	7.94E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
99.64	1.22E-05	Th-227	->	Ra-223		
99.7	2.81E-06	Ac-227	->	Fr-223		
99.915	6.84E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
100.31	6.13E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
100.96	2.70E-03	Pa-231	->	Ac-227		
102.255	3.28E+02	Th-231	->	Pa-231		
102.45	7.32E-06	Th-227	->	Ra-223		
102.613	2.36E-02	Pa-231	->	Ac-227		
103.341	2.23E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
103.85	1.03E-04	Ra-223	->	Rn-219		
104.9	2.44E-04	Th-227	->	Ra-223		
105.362	1.58E+03	U-235	->	Th-231		
105.803	5.68E+00	Th-231	->	Pa-231		

106.1	1.23E-07	Ac-227	->	Fr-223	
106.137	7.77E-03	Pa-231	->	Ac-227	
106.581	1.36E+01	Th-231	->	Pa-231	
106.66	1.34E-04	Ra-223	->	Rn-219	
107.92	4.27E-05	Th-227	->	Ra-223	
108.166	1.82E+02	Th-231	->	Pa-231	
108.99	5.28E+02	U-235	->	Th-231	
109.1	3.66E-05	Th-227	->	Ra-223	
109.16	1.23E+03	U-235	->	Th-231	
110.58	3.05E-05	Th-227	->	Ra-223	
110.8	2.92E-04	Ra-223	->	Rn-219	
111.897	6.08E+01	Th-231	->	Pa-231	
112.54	4.88E-05	Th-227	->	Ra-223	
113.12	9.16E-04	Th-227	->	Ra-223	
113.19	3.42E-03	Th-227	->	Ra-223	
114.5	5.47E-05	Ra-223	->	Rn-219	
115.3	2.01E-05	Rn-219	->	Po-215	
115.595	8.00E-01	Th-231	->	Pa-231	
116.11	5.60E+01	U-235	->	Th-231	
116.827	1.66E+01	Th-231	->	Pa-231	
117.17	1.04E-03	Th-227	->	Ra-223	
117.3	7.32E-05	Th-227	->	Ra-223	
119.98	2.08E+01	U-235	->	Th-231	
120.9	4.84E-07	Ac-227	->	Fr-223	
122.31	7.24E-03	Ra-223	->	Rn-219	
123.55	4.88E-05	Th-227	->	Ra-223	
124.48	3.05E-05	Th-227	->	Ra-223	
124.6	1.83E-05	Th-227	->	Ra-223	
124.69	4.22E-04	Pa-231	->	Ac-227	
124.922	4.48E+01	Th-231	->	Pa-231	
130.57	7.66E-04	Rn-219	->	Po-215	
131.1	3.04E-05	Ra-223	->	Rn-219	
133.8	2.46E-07	Ac-227	->	Fr-223	
134.014	1.92E+01	Th-231	->	Pa-231	
134.5	2.03E-04	Fr-223	->	Ra-223,	Th-227 -> Ra-223
135.681	6.24E+01	Th-231	->	Pa-231	
136.705	3.36E+00	Th-231	->	Pa-231	
136.72	9.60E+00	U-235	->	Th-231	
140.33	1.95E-04	Th-227	->	Ra-223	
140.537	5.68E-01	Th-231	->	Pa-231	
140.76	1.76E+02	U-235	->	Th-231	
141.44	7.94E-04	Th-227	->	Ra-223	
143.76	8.76E+03	U-235	->	Th-231	
144.18	1.98E-02	Ra-223	->	Rn-219	
144.5	3.38E-04	Pa-231	->	Ac-227	
145.063	4.64E+00	Th-231	->	Pa-231	
145.927	2.56E+01	Th-231	->	Pa-231	
147.2	7.30E-07	Ac-227	->	Fr-223	
150.02	6.10E-05	Th-227	->	Ra-223	
150.93	6.40E+01	U-235	->	Th-231	

154.18	3.40E-02	Ra-223	->	Rn-219		
158.59	4.18E-03	Ra-223	->	Rn-219		
162.18	4.27E-05	Th-227	->	Ra-223		
163.114	1.24E+02	Th-231	->	Pa-231		
163.33	4.06E+03	U-235	->	Th-231		
164.97	3.12E+00	Th-231	->	Pa-231		
165.5	3.04E-05	Ra-223	->	Rn-219		
168.19	8.55E-05	Th-227	->	Ra-223		
169.637	9.60E-01	Th-231	->	Pa-231		
169.98	1.83E-05	Th-227	->	Ra-223		
171.21	6.10E-06	Th-227	->	Ra-223		
171.4	3.60E-07	Ac-227	->	Fr-223		
172.27	8.00E+00	U-235	->	Th-231		
173.38	1.05E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
174.157	1.46E+01	Th-231	->	Pa-231		
175.23	1.10E-04	Th-227	->	Ra-223		
175.55	1.03E-04	Ra-223	->	Rn-219		
176.8	2.43E-05	Ra-223	->	Rn-219		
177.35	2.86E-04	Ra-223	->	Rn-219		
179.28	1.22E-05	Th-227	->	Ra-223		
179.69	9.31E-04	Ra-223	->	Rn-219		
182.61	2.72E+02	U-235	->	Th-231		
183.483	2.63E+01	Th-231	->	Pa-231		
184.68	2.39E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
185.72	4.57E+04	U-235	->	Th-231		
188.756	2.56E+00	Th-231	->	Pa-231		
194.94	5.04E+02	U-235	->	Th-231		
197.61	7.32E-05	Th-227	->	Ra-223		
198.9	3.36E+01	U-235	->	Th-231		
198.96	4.73E-04	Pa-231	->	Ac-227		
199.43	1.82E-05	Ra-223	->	Rn-219		
200.48	1.22E-04	Th-227	->	Ra-223		
201.64	1.22E-04	Th-227	->	Ra-223		
202.11	8.64E+02	U-235	->	Th-231		
202.4	3.66E-05	Th-227	->	Ra-223		
204.2	1.40E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
204.95	9.17E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
205.31	4.01E+03	U-235	->	Th-231		
206.04	1.40E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
210.58	6.90E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
212.56	4.27E-04	Th-227	->	Ra-223		
212.69	1.04E-04	Th-227	->	Ra-223		
215.305	2.16E+01	U-235	->	Th-231		
217.934	3.20E+01	Th-231	->	Pa-231		
218.77	3.66E-04	Th-227	->	Ra-223		
218.94	2.44E-04	Th-227	->	Ra-223		
220.2	2.03E-05	Pa-231	->	Ac-227		
220.38	2.01E-04	Ra-223	->	Rn-219		
221.38	9.60E+01	U-235	->	Th-231		
221.9	1.82E-04	Rn-219	->	Po-215		

224.68	9.16E-05	Fr-223	->	Ra-223,	Th-227	->	Ra-223
226.77	2.20E-04	Pa-231	->	Ac-227			
228.16	2.03E-05	Pa-231	->	Ac-227			
228.77	6.40E+00	U-235	->	Th-231			
230.17	4.27E-06	Th-227	->	Ra-223			
233.5	2.32E+01	U-235	->	Th-231			
234.82	3.01E-03	Fr-223	->	Ra-223,	Th-227	->	Ra-223
235.97	6.84E-02	Fr-223	->	Ra-223,	Th-227	->	Ra-223
235.985	7.36E+00	Th-231	->	Pa-231			
240.25	2.24E-01	Th-231	->	Pa-231			
240.85	4.32E+01	U-235	->	Th-231			
242	6.76E-04	Pa-231	->	Ac-227			
242.508	6.72E-01	Th-231	->	Pa-231			
243.17	3.97E-03	Pa-231	->	Ac-227			
245.19	5.47E-05	Ra-223	->	Rn-219			
245.438	5.91E-04	Pa-231	->	Ac-227			
245.77	5.83E-04	Pa-231	->	Ac-227			
246.07	6.71E-05	Th-227	->	Ra-223			
246.84	4.24E+01	U-235	->	Th-231			
249.36	4.27E-05	Th-227	->	Ra-223			
249.49	2.25E-04	Ra-223	->	Rn-219			
249.56	6.24E-01	Th-231	->	Pa-231			
250.12	2.26E-03	Fr-223	->	Ra-223,	Th-227	->	Ra-223
250.33	7.94E-04	Th-227	->	Ra-223			
250.43	5.20E-01	Th-231	->	Pa-231			
251.12	2.13E-04	Ra-223	->	Rn-219			
251.58	1.89E-04	Ra-223	->	Rn-219			
252.46	6.71E-04	Th-227	->	Ra-223			
254.66	4.88E-03	Fr-223	->	Ra-223,	Th-227	->	Ra-223
254.98	1.95E-04	Ra-223	->	Rn-219			
255.74	3.04E-05	Ra-223	->	Rn-219			
255.858	8.45E-03	Pa-231	->	Ac-227			
256.24	4.09E-02	Fr-223	->	Ra-223,	Th-227	->	Ra-223
258.43	1.94E-04	Pa-231	->	Ac-227			
260.29	1.54E-02	Pa-231	->	Ac-227			
260.4	3.65E-05	Ra-223	->	Rn-219			
262.72	6.11E-04	Fr-223	->	Ra-223,	Th-227	->	Ra-223
266.3	1.53E-05	Th-227	->	Ra-223			
266.483	4.80E+00	U-235	->	Th-231			
267.62	9.28E-01	Th-231	->	Pa-231			
267.82	6.10E-05	Th-227	->	Ra-223			
269.39	8.27E-02	Ra-223	->	Rn-219			
270.34	4.88E-05	Th-227	->	Ra-223			
270.76	1.95E-04	Th-227	->	Ra-223			
271.13	6.02E-02	Rn-219	->	Po-215			
272.95	2.99E-03	Fr-223	->	Ra-223,	Th-227	->	Ra-223
273.17	4.81E-03	Pa-231	->	Ac-227			
274.14	2.40E-02	Th-231	->	Pa-231			
275.2	9.16E-06	Th-227	->	Ra-223			
275.47	3.92E+00	U-235	->	Th-231			

277.17	5.24E-03	Pa-231	->	Ac-227		
277.43	2.79E-04	Pa-231	->	Ac-227		
279.7	4.27E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
281	4.27E-05	Th-227	->	Ra-223		
281.31	9.77E-04	Th-227	->	Ra-223		
281.45	4.80E+00	U-235	->	Th-231		
282.98	4.00E+00	U-235	->	Th-231		
283.673	1.34E-01	Pa-231	->	Ac-227		
284.24	3.05E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
285.48	3.36E-04	Th-227	->	Ra-223		
286.11	9.71E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
288.15	9.37E-04	Ra-223	->	Rn-219		
289.5	5.49E-05	Th-227	->	Ra-223		
289.57	5.60E+00	U-235	->	Th-231		
289.6	8.91E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
291.72	1.12E+01	U-235	->	Th-231		
292.3	3.67E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
293.8	3.95E-04	Rn-219	->	Po-215		
296.54	2.62E-03	Th-227	->	Ra-223		
299.97	1.28E-02	Fr-223	->	Ra-223,	Th-227	-> Ra-223
300.07	2.01E-01	Pa-231	->	Ac-227		
300.34	1.22E-03	Th-227	->	Ra-223		
301.72	4.00E+00	U-235	->	Th-231		
302.638	5.41E-02	Pa-231	->	Ac-227		
302.671	1.44E-01	Pa-231	->	Ac-227		
304.51	6.65E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
307.89	1.06E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
308.49	9.16E-05	Th-227	->	Ra-223		
308.75	3.12E-01	Th-231	->	Pa-231		
310.19	1.18E-04	Pa-231	->	Ac-227		
310.71	3.20E+00	U-235	->	Th-231		
311	2.32E+00	Th-231	->	Pa-231		
312.57	2.87E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
313.058	9.54E-03	Pa-231	->	Ac-227		
313.85	1.89E-04	Pb-211	->	Bi-211		
314.78	1.83E-04	Th-227	->	Ra-223		
314.82	2.81E-03	Th-227	->	Ra-223		
317.12	8.00E-01	U-235	->	Th-231		
317.93	6.40E-02	Th-231	->	Pa-231		
318.1	1.69E-04	Pa-231	->	Ac-227		
318.58	3.66E-05	Th-227	->	Ra-223		
319.18	1.94E-04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
320.188	8.80E-02	Th-231	->	Pa-231		
323.88	2.37E-02	Ra-223	->	Rn-219		
325.08	3.66E-05	Th-227	->	Ra-223		
326.12	3.05E-05	Th-227	->	Ra-223		
327.23	2.54E-03	Pa-231	->	Ac-227		
328.08	9.15E-06	Tl-207	->	Pb-207,	Po-211	-> Pb-207
328.49	1.20E-03	Ra-223	->	Rn-219		
329.84	1.67E-02	Fr-223	->	Ra-223,	Th-227	-> Ra-223

330.066	1.11E-01	Pa-231	->	Ac-227		
333.87	6.02E-04	Ra-223	->	Rn-219		
334.38	6.04E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
338.28	1.69E-02	Ra-223	->	Rn-219		
339.1	8.55E-06	Th-227	->	Ra-223		
339.45	2.41E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
340.873	1.47E-02	Pa-231	->	Ac-227		
341.17	1.86E-03	Pa-231	->	Ac-227		
342.44	2.32E-03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
342.9	1.22E-03	Ra-223	->	Rn-219		
343.02	2.07E-04	Pb-211	->	Bi-211		
343.78	2.40E+00	U-235	->	Th-231		
345.921	2.32E+01	U-235	->	Th-231		
346.39	4.58E-05	Th-227	->	Ra-223		
348.4	3.66E-05	Th-227	->	Ra-223		
350.1	7.76E-02	Bi-211	->	Tl-207		
350.48	6.71E-04	Th-227	->	Ra-223		
351.82	5.60E-02	Th-231	->	Pa-231		
352.57	6.10E-05	Th-227	->	Ra-223		
354.63	6.76E-03	Pa-231	->	Ac-227		
356.068	4.00E+00	U-235	->	Th-231		
357.2	1.30E-02	Pa-231	->	Ac-227		
359.51	7.60E-04	Pa-231	->	Ac-227		
361.8	2.62E-04	Ra-223	->	Rn-219		
362.55	3.05E-05	Th-227	->	Ra-223		
364.03	6.25E-04	Pa-231	->	Ac-227		
368.78	4.87E-05	Ra-223	->	Rn-219		
369.32	3.87E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
369.48	1.22E-04	Ra-223	->	Rn-219		
370.85	4.27E-05	Th-227	->	Ra-223		
371.8	2.98E-03	Ra-223	->	Rn-219		
374.93	8.55E-06	Th-227	->	Ra-223		
376.26	3.66E-05	Th-227	->	Ra-223		
376.9	4.26E-05	Rn-219	->	Po-215		
379.4	3.89E-03	Rn-219	->	Po-215,	Pa-231	-> Ac-227
382.15	3.66E-05	Th-227	->	Ra-223		
383.12	2.43E-05	Ra-223	->	Rn-219		
383.47	2.93E-04	Th-227	->	Ra-223		
384.97	3.46E-04	Pa-231	->	Ac-227		
387.267	4.22E-05	Pa-231	->	Ac-227		
387.874	3.04E+00	U-235	->	Th-231		
387.9	2.43E-06	Rn-219	->	Po-215		
388.3	8.51E-05	Ra-223	->	Rn-219		
388.98	9.04E-05	Pa-231	->	Ac-227		
390.32	8.00E-01	U-235	->	Th-231		
391	1.82E-05	Ra-223	->	Rn-219		
391.85	5.74E-04	Pa-231	->	Ac-227		
392.24	5.49E-05	Th-227	->	Ra-223		
395.8	2.20E-04	Pa-231	->	Ac-227		
398.4	7.85E-04	Pa-231	->	Ac-227		

398.6	5.49E-05	Th-227	->	Ra-223		
401.7	4.04E-02	Rn-219	->	Po-215		
402.42	7.32E-05	Th-227	->	Ra-223		
404.86	2.33E-02	Pb-211	->	Bi-211,	At-215	-> Bi-211
407.98	2.87E-03	Pa-231	->	Ac-227		
410.269	2.40E+00	U-235	->	Th-231		
410.84	1.60E-04	Pa-231	->	Ac-227		
415.09	1.04E-05	Th-227	->	Ra-223		
427	1.05E-02	Pb-211	->	Bi-211		
430.26	3.89E-05	Pb-211	->	Bi-211		
430.53	1.16E-04	Ra-223	->	Rn-219		
432.29	3.05E-05	Th-227	->	Ra-223		
432.34	2.01E-04	Ra-223	->	Rn-219		
435.38	2.79E-04	Pa-231	->	Ac-227		
438.24	3.46E-04	Pa-231	->	Ac-227		
438.8	2.43E-04	Po-215	->	Pb-211		
444.94	7.72E-03	Ra-223	->	Rn-219		
448	9.95E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
448.42	8.00E-01	U-235	->	Th-231		
452.52	7.86E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
455.12	6.40E-01	U-235	->	Th-231		
457.07	5.50E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
461.9	3.05E-07	Th-227	->	Ra-223		
466.2	3.05E-07	Th-227	->	Ra-223		
471.33	1.27E-05	Pa-231	->	Ac-227		
478	7.91E-05	Pb-211	->	Bi-211		
478.22	6.50E-06	Pa-231	->	Ac-227		
480.25	1.94E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
481.1	1.58E-04	Pb-211	->	Bi-211		
482.14	1.01E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
487.59	6.08E-05	Ra-223	->	Rn-219		
492	8.51E-05	Pb-211	->	Bi-211		
493.15	3.55E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
500.4	6.69E-05	Pb-211	->	Bi-211		
501.33	5.07E-05	Pa-231	->	Ac-227		
504.33	9.12E-05	Pb-211	->	Bi-211		
507.64	2.71E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
515.7	2.43E-04	Rn-219	->	Po-215		
515.96	1.30E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
516.45	1.10E-04	Pa-231	->	Ac-227		
517.2	3.20E-01	U-235	->	Th-231		
524.02	1.08E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
527.3	4.32E-04	Ra-223	->	Rn-219		
534.9	6.10E-07	Th-227	->	Ra-223		
535.45	4.73E-05	Pa-231	->	Ac-227		
536.88	7.10E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
540.1	3.65E-05	Rn-219	->	Po-215		
546.9	4.22E-05	Pa-231	->	Ac-227		
552.09	1.81E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
555.91	1.49E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223

568.76	6.91E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
569.15	8.87E-06	Po-211	->	Pb-207			
572.3	4.22E-05	Pa-231	->	Ac-227			
575.8	3.34E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
578.2	9.43E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
588.17	3.87E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
596.44	2.54E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
598.69	5.47E-04	Ra-223	->	Rn-219			
607.2	1.22E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
608.5	2.43E-05	Rn-219	->	Po-215			
609.08	3.83E-04	Ra-223	->	Rn-219			
609.62	1.40E-04	Pb-211	->	Bi-211			
621.92	3.99E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
623.38	4.87E-05	Ra-223	->	Rn-219			
623.52	9.77E-07	Th-227	->	Ra-223			
633.2	7.94E-07	Th-227	->	Ra-223			
641.45	1.22E-07	Th-227	->	Ra-223			
643.93	5.43E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
648.43	1.29E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
662.8	3.66E-07	Th-227	->	Ra-223			
675.33	3.89E-05	Pb-211	->	Bi-211			
676.4	3.65E-05	Rn-219	->	Po-215			
691.46	1.04E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
704.19	8.75E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
704.51	2.93E-03	Pb-211	->	Bi-211			
707.18	3.14E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
711.2	2.13E-05	Ra-223	->	Rn-219			
718.22	2.04E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
722.6	4.52E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
723.86	9.19E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
733.9	1.23E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
734.6	1.15E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
736.76	5.50E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
742.52	3.20E-01	U-235	->	Th-231			
746.24	2.67E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
748.56	3.24E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
753.44	1.16E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
754.17	1.19E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
756.79	2.36E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
757.03	6.17E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
762.3	1.76E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
764.52	8.78E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
766.35	4.32E-03	Pb-211	->	Bi-211			
772.85	8.38E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
775.82	4.45E-05	Fr-223	->	Ra-223,	Th-227	->	Ra-223
780.59	2.17E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
784.04	1.19E-06	Fr-223	->	Ra-223,	Th-227	->	Ra-223
786.9	8.26E-07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
788.36	2.44E-07	Th-227	->	Ra-223			
792.6	2.44E-07	Th-227	->	Ra-223			

793.11	1.05E-08	Fr-223	->	Ra-223		
793.12	1.83E-07	Th-227	->	Ra-223		
794.72	4.80E-01	U-235	->	Th-231		
796.96	5.71E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
803.58	1.09E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
808.26	3.58E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
812.15	1.77E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
817.31	1.05E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
818.23	1.83E-07	Th-227	->	Ra-223		
822.99	1.61E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
825.96	5.56E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
825.97	1.14E-07	Fr-223	->	Ra-223		
828.31	1.33E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
828.53	7.25E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
831.86	2.32E-02	Pb-211	->	Bi-211		
834.2	6.08E-06	Rn-219	->	Po-215		
837.36	3.04E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
842.02	4.22E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
846.56	4.05E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
848.88	6.56E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
854.2	4.27E-07	Th-227	->	Ra-223		
857.89	3.99E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
858.4	1.74E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
863.2	2.98E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
865.81	3.89E-05	Pb-211	->	Bi-211		
867.23	5.39E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
876.14	4.70E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
878.16	7.37E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
887.7	9.12E-06	Rn-219	->	Po-215		
891	2.98E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
892.8	1.94E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
896.41	2.18E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
897.23	1.46E-03	Tl-207	->	Pb-207,	Po-211	-> Pb-207
908.03	1.40E-05	Fr-223	->	Ra-223,	Th-227	-> Ra-223
909.85	9.16E-08	Th-227	->	Ra-223		
920.06	7.32E-08	Th-227	->	Ra-223		
926.28	1.83E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
938.34	6.10E-08	Th-227	->	Ra-223		
941.41	4.39E-07	Th-227	->	Ra-223		
951	1.34E-04	Pb-211	->	Bi-211		
958.6	3.78E-07	Th-227	->	Ra-223		
969.91	1.83E-07	Th-227	->	Ra-223		
971.28	6.10E-08	Th-227	->	Ra-223		
990.2	2.14E-07	Th-227	->	Ra-223		
994.9	4.27E-08	Th-227	->	Ra-223		
999.78	1.83E-07	Th-227	->	Ra-223		
1014.48	1.09E-04	Pb-211	->	Bi-211		
1015.1	9.16E-08	Th-227	->	Ra-223		
1020	1.22E-07	Th-227	->	Ra-223		
1024.8	9.16E-08	Th-227	->	Ra-223		

1055.8	3.65E-06	Rn-219	->	Po-215
1080.19	9.31E-05	Pb-211	->	Bi-211
1090.5	1.58E-05	Pb-211	->	Bi-211
1103.4	3.10E-05	Pb-211	->	Bi-211
1109.37	8.94E-04	Pb-211	->	Bi-211
1196.61	7.78E-05	Pb-211	->	Bi-211
1234.3	7.91E-06	Pb-211	->	Bi-211
1270.67	5.41E-05	Pb-211	->	Bi-211

235U		Aged 5 years		Sorted by Intensity		
Intensity	Energy	Initial Isotopes and Decays				
ph/s/gm	keV					
4.57E+04	185.72	U-235	->	Th-231		
3.92E+04	13.724	Th-231	->	Pa-231		
2.96E+04	16.559	Th-231	->	Pa-231		
1.76E+04	12.952	Ac-227	->	Th-227,	U-235	-> Th-231
1.20E+04	16.119	U-235	->	Th-231		
1.17E+04	25.642	Th-231	->	Pa-231		
8.76E+03	143.76	U-235	->	Th-231		
5.92E+03	19.811	Th-231	->	Pa-231		
5.28E+03	84.203	Th-231	->	Pa-231		
4.40E+03	93.36	U-235	->	Th-231		
4.06E+03	163.33	U-235	->	Th-231		
4.01E+03	205.31	U-235	->	Th-231		
2.69E+03	89.955	U-235	->	Th-231		
2.40E+03	11.372	Th-231	->	Pa-231		
2.08E+03	19.118	U-235	->	Th-231		
1.58E+03	105.362	U-235	->	Th-231		
1.23E+03	109.16	U-235	->	Th-231		
8.64E+02	202.11	U-235	->	Th-231		
8.00E+02	11.118	Ac-227	->	Th-227,	U-235	-> Th-231
7.52E+02	89.954	Th-231	->	Pa-231		
7.20E+02	81.229	Th-231	->	Pa-231		
5.28E+02	108.99	U-235	->	Th-231		
5.04E+02	95.863	Th-231	->	Pa-231		
5.04E+02	194.94	U-235	->	Th-231		
3.84E+02	58.562	Th-231	->	Pa-231		
3.28E+02	102.255	Th-231	->	Pa-231		
3.20E+02	14.953	Th-231	->	Pa-231		
3.12E+02	92.279	Th-231	->	Pa-231		
2.72E+02	182.61	U-235	->	Th-231		
2.01E+02	72.767	Th-231	->	Pa-231		
1.82E+02	108.166	Th-231	->	Pa-231		
1.76E+02	14.511	Ac-227	->	Th-227,	U-235	-> Th-231
1.76E+02	17.187	Th-231	->	Pa-231		
1.76E+02	140.76	U-235	->	Th-231		

1.24E+02	163.114	Th-231	->	Pa-231
9.60E+01	99.28	Th-231	->	Pa-231
9.60E+01	221.38	U-235	->	Th-231
8.80E+01	72.71	U-235	->	Th-231
6.88E+01	96.154	U-235	->	Th-231
6.40E+01	150.93	U-235	->	Th-231
6.24E+01	135.681	Th-231	->	Pa-231
6.08E+01	111.897	Th-231	->	Pa-231
5.60E+01	116.11	U-235	->	Th-231
4.80E+01	74.8	U-235	->	Th-231
4.80E+01	41.96	U-235	->	Th-231
4.64E+01	42.828	Th-231	->	Pa-231
4.48E+01	124.922	Th-231	->	Pa-231
4.32E+01	240.85	U-235	->	Th-231
4.24E+01	246.84	U-235	->	Th-231
3.92E+01	93.07	Th-231	->	Pa-231
3.36E+01	198.9	U-235	->	Th-231
3.20E+01	217.934	Th-231	->	Pa-231
2.63E+01	183.483	Th-231	->	Pa-231
2.56E+01	145.927	Th-231	->	Pa-231
2.40E+01	41.13	U-235	->	Th-231
2.32E+01	233.5	U-235	->	Th-231
2.32E+01	345.921	U-235	->	Th-231
2.16E+01	215.305	U-235	->	Th-231
2.08E+01	119.98	U-235	->	Th-231
1.92E+01	134.014	Th-231	->	Pa-231
1.84E+01	63.834	Th-231	->	Pa-231
1.66E+01	116.827	Th-231	->	Pa-231
1.60E+01	64.348	U-235	->	Th-231
1.60E+01	51.179	U-235	->	Th-231
1.46E+01	174.157	Th-231	->	Pa-231
1.36E+01	106.581	Th-231	->	Pa-231
1.28E+01	31.585	U-235	->	Th-231
1.12E+01	291.72	U-235	->	Th-231
9.60E+00	136.72	U-235	->	Th-231
8.00E+00	172.27	U-235	->	Th-231
7.36E+00	235.985	Th-231	->	Pa-231
6.40E+00	228.77	U-235	->	Th-231
5.68E+00	105.803	Th-231	->	Pa-231
5.60E+00	289.57	U-235	->	Th-231
4.80E+00	281.45	U-235	->	Th-231
4.80E+00	266.483	U-235	->	Th-231
4.64E+00	145.063	Th-231	->	Pa-231
4.56E+00	68.5	Th-231	->	Pa-231
4.00E+00	301.72	U-235	->	Th-231
4.00E+00	282.98	U-235	->	Th-231
4.00E+00	356.068	U-235	->	Th-231
3.92E+00	275.47	U-235	->	Th-231
3.36E+00	136.705	Th-231	->	Pa-231
3.20E+00	310.71	U-235	->	Th-231

3.12E+00	164.97	Th-231	->	Pa-231	
3.04E+00	387.874	U-235	->	Th-231	
2.56E+00	188.756	Th-231	->	Pa-231	
2.40E+00	410.269	U-235	->	Th-231	
2.40E+00	343.78	U-235	->	Th-231	
2.32E+00	311	Th-231	->	Pa-231	
2.11E+00	15.69	Pa-231	->	Ac-227	
1.86E+00	12.636	Pa-231	->	Ac-227	
9.60E-01	169.637	Th-231	->	Pa-231	
9.28E-01	267.62	Th-231	->	Pa-231	
8.00E-01	115.595	Th-231	->	Pa-231	
8.00E-01	317.12	U-235	->	Th-231	
8.00E-01	390.32	U-235	->	Th-231	
8.00E-01	448.42	U-235	->	Th-231	
7.85E-01	27.396	Pa-231	->	Ac-227	
6.72E-01	242.508	Th-231	->	Pa-231	
6.40E-01	455.12	U-235	->	Th-231	
6.24E-01	249.56	Th-231	->	Pa-231	
5.68E-01	140.537	Th-231	->	Pa-231	
5.60E-01	44.06	Th-231	->	Pa-231	
5.20E-01	250.43	Th-231	->	Pa-231	
4.98E-01	18.607	Pa-231	->	Ac-227	
4.80E-01	794.72	U-235	->	Th-231	
3.20E-01	517.2	U-235	->	Th-231	
3.20E-01	742.52	U-235	->	Th-231	
3.12E-01	308.75	Th-231	->	Pa-231	
2.24E-01	240.25	Th-231	->	Pa-231	
2.01E-01	300.07	Pa-231	->	Ac-227	
1.53E-01	83.787	Ra-223	->	Rn-219	
1.44E-01	302.671	Pa-231	->	Ac-227	
1.34E-01	283.673	Pa-231	->	Ac-227	
1.28E-01	15.218	Th-227	->	Ra-223	
1.11E-01	330.066	Pa-231	->	Ac-227	
1.05E-01	12.325	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.01E-01	10.871	Pa-231	->	Ac-227	
9.24E-02	81.067	Ra-223	->	Rn-219	
8.80E-02	320.188	Th-231	->	Pa-231	
8.27E-02	269.39	Ra-223	->	Rn-219	
7.76E-02	350.1	Bi-211	->	Tl-207	
6.84E-02	235.97	Fr-223	->	Ra-223,	Th-227 -> Ra-223
6.59E-02	90.886	Pa-231	->	Ac-227	
6.40E-02	317.93	Th-231	->	Pa-231	
6.20E-02	11.713	Ra-223	->	Rn-219	
6.02E-02	271.13	Rn-219	->	Po-215	
5.96E-02	14.341	Ra-223	->	Rn-219	
5.60E-02	351.82	Th-231	->	Pa-231	
5.48E-02	50.14	Fr-223	->	Ra-223,	Th-227 -> Ra-223
5.41E-02	94.677	Ra-223	->	Rn-219	
5.41E-02	302.638	Pa-231	->	Ac-227	
4.09E-02	256.24	Fr-223	->	Ra-223,	Th-227 -> Ra-223

4.04E-02	401.7	Rn-219	->	Po-215		
4.02E-02	87.673	Pa-231	->	Ac-227		
3.40E-02	154.18	Ra-223	->	Rn-219		
3.21E-02	16.397	Pa-231	->	Ac-227		
3.12E-02	14.082	Pa-231	->	Ac-227		
2.93E-02	17.997	Th-227	->	Ra-223		
2.79E-02	18.998	Pa-231	->	Ac-227		
2.40E-02	274.14	Th-231	->	Pa-231		
2.37E-02	323.88	Ra-223	->	Rn-219		
2.36E-02	102.613	Pa-231	->	Ac-227		
2.33E-02	404.86	Pb-211	->	Bi-211,	At-215	-> Bi-211
2.32E-02	831.86	Pb-211	->	Bi-211		
1.98E-02	144.18	Ra-223	->	Rn-219		
1.92E-02	88.471	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.76E-02	46.393	Pa-231	->	Ac-227		
1.73E-02	97.907	Ra-223	->	Rn-219		
1.69E-02	338.28	Ra-223	->	Rn-219		
1.67E-02	329.84	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.54E-02	260.29	Pa-231	->	Ac-227		
1.47E-02	340.873	Pa-231	->	Ac-227		
1.36E-02	79.72	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.30E-02	357.2	Pa-231	->	Ac-227		
1.28E-02	299.97	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.26E-02	38.235	Pa-231	->	Ac-227		
1.18E-02	16.918	Ra-223	->	Rn-219		
1.16E-02	85.429	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.05E-02	427	Pb-211	->	Bi-211		
9.71E-03	286.11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
9.54E-03	313.058	Pa-231	->	Ac-227		
8.55E-03	93.93	Th-227	->	Ra-223		
8.45E-03	255.858	Pa-231	->	Ac-227		
7.77E-03	29.996	Pa-231	->	Ac-227		
7.77E-03	106.137	Pa-231	->	Ac-227		
7.72E-03	444.94	Ra-223	->	Rn-219		
7.70E-03	72.873	Bi-211	->	Tl-207		
7.60E-03	25.464	Pa-231	->	Ac-227		
7.43E-03	96.979	Pa-231	->	Ac-227		
7.24E-03	122.31	Ra-223	->	Rn-219		
7.18E-03	52.763	Pa-231	->	Ac-227		
6.90E-03	210.58	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.84E-03	54.632	Pa-231	->	Ac-227		
6.84E-03	99.915	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.76E-03	354.63	Pa-231	->	Ac-227		
6.65E-03	304.51	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.06E-03	10.622	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.04E-03	334.38	Fr-223	->	Ra-223,	Th-227	-> Ra-223
5.74E-03	77.405	Pa-231	->	Ac-227		
5.29E-03	79.29	Rn-219	->	Po-215		
5.24E-03	277.17	Pa-231	->	Ac-227		
5.07E-03	44.213	Pa-231	->	Ac-227		

4.88E-03	254.66	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.81E-03	273.17	Pa-231	->	Ac-227			
4.55E-03	70.832	Bi-211	->	Tl-207			
4.32E-03	766.35	Pb-211	->	Bi-211			
4.22E-03	63.7	Pa-231	->	Ac-227			
4.18E-03	158.59	Ra-223	->	Rn-219			
3.97E-03	243.17	Pa-231	->	Ac-227			
3.89E-03	379.4	Rn-219	->	Po-215,	Pa-231	->	Ac-227
3.42E-03	113.19	Th-227	->	Ra-223			
3.35E-03	10.137	Ra-223	->	Rn-219			
3.16E-03	76.858	Rn-219	->	Po-215			
3.01E-03	234.82	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.99E-03	272.95	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.98E-03	371.8	Ra-223	->	Rn-219			
2.93E-03	704.51	Pb-211	->	Bi-211			
2.87E-03	407.98	Pa-231	->	Ac-227			
2.87E-03	312.57	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.81E-03	314.82	Th-227	->	Ra-223			
2.74E-03	13.495	Rn-219	->	Po-215			
2.71E-03	82.434	Bi-211	->	Tl-207			
2.70E-03	100.96	Pa-231	->	Ac-227			
2.66E-03	10.259	Bi-211	->	Tl-207			
2.62E-03	296.54	Th-227	->	Ra-223			
2.62E-03	77.107	Pb-211	->	Bi-211			
2.54E-03	327.23	Pa-231	->	Ac-227			
2.53E-03	24.56	Pa-231	->	Ac-227			
2.49E-03	11.119	Rn-219	->	Po-215			
2.49E-03	13.082	Pb-211	->	Bi-211			
2.43E-03	12.313	Bi-211	->	Tl-207			
2.32E-03	342.44	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.26E-03	250.12	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.25E-03	10.828	Pb-211	->	Bi-211			
2.23E-03	103.341	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.22E-03	13.662	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.11E-03	74.209	Pa-231	->	Ac-227			
2.11E-03	57.233	Pa-231	->	Ac-227			
1.89E-03	89.639	Rn-219	->	Po-215			
1.86E-03	341.17	Pa-231	->	Ac-227			
1.67E-03	15.213	Fr-223	->	Ra-223			
1.56E-03	74.814	Pb-211	->	Bi-211			
1.46E-03	62.36	Th-227	->	Ra-223			
1.46E-03	897.23	Tl-207	->	Pb-207,	Po-211	->	Pb-207
1.40E-03	204.2	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.40E-03	206.04	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.40E-03	43.73	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.35E-03	35.884	Pa-231	->	Ac-227			
1.29E-03	20.27	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.29E-03	49.85	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.27E-03	57.2	Pa-231	->	Ac-227			
1.22E-03	300.34	Th-227	->	Ra-223			

1.22E-03	342.9	Ra-223	->	Rn-219	
1.20E-03	328.49	Ra-223	->	Rn-219	
1.04E-03	117.17	Th-227	->	Ra-223	
1.01E-03	40.006	Pa-231	->	Ac-227	
9.77E-04	281.31	Th-227	->	Ra-223	
9.42E-04	16.074	Ac-227	->	Th-227	
9.37E-04	288.15	Ra-223	->	Rn-219	
9.31E-04	179.69	Ra-223	->	Rn-219	
9.29E-04	56.9	Pa-231	->	Ac-227	
9.24E-04	87.19	Pb-211	->	Bi-211	
9.17E-04	204.95	Fr-223	->	Ra-223,	Th-227 -> Ra-223
9.16E-04	113.12	Th-227	->	Ra-223	
8.94E-04	1109.37	Pb-211	->	Bi-211	
8.82E-04	12.855	Ra-223	->	Rn-219	
7.94E-04	250.33	Th-227	->	Ra-223	
7.94E-04	141.44	Th-227	->	Ra-223	
7.85E-04	398.4	Pa-231	->	Ac-227	
7.66E-04	130.57	Rn-219	->	Po-215	
7.64E-04	85.185	Bi-211	->	Tl-207	
7.60E-04	31.04	Pa-231	->	Ac-227	
7.60E-04	359.51	Pa-231	->	Ac-227	
6.76E-04	242	Pa-231	->	Ac-227	
6.71E-04	252.46	Th-227	->	Ra-223	
6.71E-04	350.48	Th-227	->	Ra-223	
6.25E-04	364.03	Pa-231	->	Ac-227	
6.13E-04	29.869	Fr-223	->	Ra-223,	Th-227 -> Ra-223
6.13E-04	100.31	Fr-223	->	Ra-223,	Th-227 -> Ra-223
6.11E-04	262.72	Fr-223	->	Ra-223,	Th-227 -> Ra-223
6.02E-04	333.87	Ra-223	->	Rn-219	
5.91E-04	245.438	Pa-231	->	Ac-227	
5.91E-04	60.526	Pa-231	->	Ac-227	
5.91E-04	70.54	Pa-231	->	Ac-227	
5.91E-04	31.58	Pa-231	->	Ac-227	
5.91E-04	43.09	Pa-231	->	Ac-227	
5.83E-04	245.77	Pa-231	->	Ac-227	
5.74E-04	391.85	Pa-231	->	Ac-227	
5.72E-04	92.673	Rn-219	->	Po-215	
5.53E-04	15.856	Rn-219	->	Po-215	
5.47E-04	598.69	Ra-223	->	Rn-219	
5.47E-04	15.397	Pb-211	->	Bi-211	
5.07E-04	56.8	Pa-231	->	Ac-227	
5.07E-04	42.52	Pa-231	->	Ac-227	
4.88E-04	61.435	Th-227	->	Ra-223	
4.88E-04	31.566	Th-227	->	Ra-223	
4.73E-04	198.96	Pa-231	->	Ac-227	
4.68E-04	65.516	Pb-211	->	Bi-211	
4.43E-04	14.407	Bi-211	->	Tl-207	
4.32E-04	527.3	Ra-223	->	Rn-219	
4.27E-04	279.7	Fr-223	->	Ra-223,	Th-227 -> Ra-223
4.27E-04	212.56	Th-227	->	Ra-223	

4.22E-04	124.69	Pa-231	->	Ac-227		
3.95E-04	293.8	Rn-219	->	Po-215		
3.83E-04	609.08	Ra-223	->	Rn-219		
3.78E-04	18.016	Fr-223	->	Ra-223		
3.67E-04	292.3	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.66E-04	218.77	Th-227	->	Ra-223		
3.66E-04	96.06	Th-227	->	Ra-223		
3.47E-04	83.81	Pb-211	->	Bi-211		
3.46E-04	438.24	Pa-231	->	Ac-227		
3.46E-04	384.97	Pa-231	->	Ac-227		
3.38E-04	72.57	Pa-231	->	Ac-227		
3.38E-04	144.5	Pa-231	->	Ac-227		
3.36E-04	285.48	Th-227	->	Ra-223		
3.05E-04	284.24	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.05E-04	43.53	Th-227	->	Ra-223		
2.93E-04	383.47	Th-227	->	Ra-223		
2.92E-04	110.8	Ra-223	->	Rn-219		
2.86E-04	177.35	Ra-223	->	Rn-219		
2.79E-04	435.38	Pa-231	->	Ac-227		
2.79E-04	277.43	Pa-231	->	Ac-227		
2.74E-04	90.128	Pb-211	->	Bi-211		
2.74E-04	81	Pb-211	->	Bi-211		
2.62E-04	361.8	Ra-223	->	Rn-219		
2.51E-04	19.308	Ac-227	->	Th-227		
2.44E-04	41.88	Th-227	->	Ra-223		
2.44E-04	104.9	Th-227	->	Ra-223		
2.44E-04	68.75	Th-227	->	Ra-223		
2.44E-04	218.94	Th-227	->	Ra-223		
2.43E-04	438.8	Po-215	->	Pb-211		
2.43E-04	515.7	Rn-219	->	Po-215		
2.39E-04	184.68	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.25E-04	249.49	Ra-223	->	Rn-219		
2.20E-04	15.2	Ac-227	->	Th-227		
2.20E-04	226.77	Pa-231	->	Ac-227		
2.20E-04	395.8	Pa-231	->	Ac-227		
2.13E-04	251.12	Ra-223	->	Rn-219		
2.07E-04	343.02	Pb-211	->	Bi-211		
2.03E-04	134.5	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.01E-04	220.38	Ra-223	->	Rn-219		
2.01E-04	432.34	Ra-223	->	Rn-219		
1.95E-04	270.76	Th-227	->	Ra-223		
1.95E-04	140.33	Th-227	->	Ra-223		
1.95E-04	254.98	Ra-223	->	Rn-219		
1.94E-04	258.43	Pa-231	->	Ac-227		
1.94E-04	319.18	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.89E-04	251.58	Ra-223	->	Rn-219		
1.89E-04	313.85	Pb-211	->	Bi-211		
1.83E-04	314.78	Th-227	->	Ra-223		
1.82E-04	221.9	Rn-219	->	Po-215		
1.71E-04	64.37	Th-227	->	Ra-223		

1.71E-04	72.8	Th-227	->	Ra-223	
1.69E-04	318.1	Pa-231	->	Ac-227	
1.69E-04	71.92	Pa-231	->	Ac-227	
1.60E-04	410.84	Pa-231	->	Ac-227	
1.58E-04	481.1	Pb-211	->	Bi-211	
1.40E-04	609.62	Pb-211	->	Bi-211	
1.34E-04	106.66	Ra-223	->	Rn-219	
1.34E-04	951	Pb-211	->	Bi-211	
1.31E-04	8.953	Bi-211	->	Tl-207	
1.28E-04	9.658	Rn-219	->	Po-215	
1.22E-04	201.64	Th-227	->	Ra-223	
1.22E-04	200.48	Th-227	->	Ra-223	
1.22E-04	40.16	Th-227	->	Ra-223	
1.22E-04	369.48	Ra-223	->	Rn-219	
1.18E-04	310.19	Pa-231	->	Ac-227	
1.18E-04	50.97	Pa-231	->	Ac-227	
1.18E-04	39.61	Pa-231	->	Ac-227	
1.16E-04	73.66	Th-227	->	Ra-223	
1.16E-04	430.53	Ra-223	->	Rn-219	
1.16E-04	9.419	Pb-211	->	Bi-211	
1.10E-04	175.23	Th-227	->	Ra-223	
1.10E-04	516.45	Pa-231	->	Ac-227	
1.09E-04	94.89	Pb-211	->	Bi-211	
1.09E-04	1014.48	Pb-211	->	Bi-211	
1.05E-04	173.38	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.04E-04	212.69	Th-227	->	Ra-223	
1.03E-04	175.55	Ra-223	->	Rn-219	
1.03E-04	103.85	Ra-223	->	Rn-219	
1.03E-04	88.2	Pb-211	->	Bi-211	
9.77E-05	50.82	Th-227	->	Ra-223	
9.31E-05	1080.19	Pb-211	->	Bi-211	
9.16E-05	224.68	Fr-223	->	Ra-223,	Th-227 -> Ra-223
9.16E-05	308.49	Th-227	->	Ra-223	
9.12E-05	504.33	Pb-211	->	Bi-211	
9.04E-05	388.98	Pa-231	->	Ac-227	
8.91E-05	289.6	Fr-223	->	Ra-223,	Th-227 -> Ra-223
8.55E-05	168.19	Th-227	->	Ra-223	
8.55E-05	33.52	Th-227	->	Ra-223	
8.51E-05	388.3	Ra-223	->	Rn-219	
8.51E-05	492	Pb-211	->	Bi-211	
7.94E-05	99.56	Fr-223	->	Ra-223,	Th-227 -> Ra-223
7.94E-05	44.37	Th-227	->	Ra-223	
7.91E-05	478	Pb-211	->	Bi-211	
7.78E-05	1196.61	Pb-211	->	Bi-211	
7.32E-05	197.61	Th-227	->	Ra-223	
7.32E-05	402.42	Th-227	->	Ra-223	
7.32E-05	94.9	Th-227	->	Ra-223	
7.32E-05	117.3	Th-227	->	Ra-223	
6.99E-05	97.3	Pb-211	->	Bi-211	
6.71E-05	246.07	Th-227	->	Ra-223	

6.69E-05	94.3	Pb-211	->	Bi-211		
6.69E-05	500.4	Pb-211	->	Bi-211		
6.11E-05	48.27	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.10E-05	267.82	Th-227	->	Ra-223		
6.10E-05	352.57	Th-227	->	Ra-223		
6.10E-05	150.02	Th-227	->	Ra-223		
6.08E-05	487.59	Ra-223	->	Rn-219		
5.49E-05	62.54	Th-227	->	Ra-223		
5.49E-05	392.24	Th-227	->	Ra-223		
5.49E-05	289.5	Th-227	->	Ra-223		
5.49E-05	59.5	Th-227	->	Ra-223		
5.49E-05	398.6	Th-227	->	Ra-223		
5.49E-05	69.65	Th-227	->	Ra-223		
5.49E-05	75.1	Th-227	->	Ra-223		
5.47E-05	245.19	Ra-223	->	Rn-219		
5.47E-05	114.5	Ra-223	->	Rn-219		
5.41E-05	1270.67	Pb-211	->	Bi-211		
5.07E-05	501.33	Pa-231	->	Ac-227		
4.88E-05	54.18	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.88E-05	270.34	Th-227	->	Ra-223		
4.88E-05	112.54	Th-227	->	Ra-223		
4.88E-05	123.55	Th-227	->	Ra-223		
4.87E-05	368.78	Ra-223	->	Rn-219		
4.87E-05	623.38	Ra-223	->	Rn-219		
4.73E-05	535.45	Pa-231	->	Ac-227		
4.58E-05	346.39	Th-227	->	Ra-223		
4.56E-05	12.085	Rn-219	->	Po-215		
4.45E-05	775.82	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.27E-05	370.85	Th-227	->	Ra-223		
4.27E-05	44.08	Th-227	->	Ra-223		
4.27E-05	281	Th-227	->	Ra-223		
4.27E-05	249.36	Th-227	->	Ra-223		
4.27E-05	162.18	Th-227	->	Ra-223		
4.27E-05	66.3	Th-227	->	Ra-223		
4.27E-05	107.92	Th-227	->	Ra-223		
4.27E-05	56.63	Th-227	->	Ra-223		
4.26E-05	376.9	Rn-219	->	Po-215		
4.22E-05	387.267	Pa-231	->	Ac-227		
4.22E-05	572.3	Pa-231	->	Ac-227		
4.22E-05	546.9	Pa-231	->	Ac-227		
3.89E-05	430.26	Pb-211	->	Bi-211		
3.89E-05	675.33	Pb-211	->	Bi-211		
3.89E-05	865.81	Pb-211	->	Bi-211		
3.88E-05	29.58	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.87E-05	369.32	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.66E-05	202.4	Th-227	->	Ra-223		
3.66E-05	348.4	Th-227	->	Ra-223		
3.66E-05	318.58	Th-227	->	Ra-223		
3.66E-05	109.1	Th-227	->	Ra-223		
3.66E-05	325.08	Th-227	->	Ra-223		

3.66E-05	66.1	Th-227	->	Ra-223		
3.66E-05	382.15	Th-227	->	Ra-223		
3.66E-05	376.26	Th-227	->	Ra-223		
3.65E-05	260.4	Ra-223	->	Rn-219		
3.65E-05	676.4	Rn-219	->	Po-215		
3.65E-05	540.1	Rn-219	->	Po-215		
3.65E-05	11.712	Pb-211	->	Bi-211		
3.48E-05	68.7	Th-227	->	Ra-223		
3.46E-05	10.994	Bi-211	->	Tl-207		
3.10E-05	1103.4	Pb-211	->	Bi-211		
3.05E-05	326.12	Th-227	->	Ra-223		
3.05E-05	56.03	Th-227	->	Ra-223		
3.05E-05	124.48	Th-227	->	Ra-223		
3.05E-05	362.55	Th-227	->	Ra-223		
3.05E-05	432.29	Th-227	->	Ra-223		
3.05E-05	110.58	Th-227	->	Ra-223		
3.04E-05	165.5	Ra-223	->	Rn-219		
3.04E-05	255.74	Ra-223	->	Rn-219		
3.04E-05	131.1	Ra-223	->	Rn-219		
2.43E-05	383.12	Ra-223	->	Rn-219		
2.43E-05	176.8	Ra-223	->	Rn-219		
2.43E-05	608.5	Rn-219	->	Po-215		
2.41E-05	339.45	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.20E-05	24.5	Ac-227	->	Th-227		
2.13E-05	711.2	Ra-223	->	Rn-219		
2.08E-05	89.85	Th-227	->	Ra-223		
2.03E-05	228.16	Pa-231	->	Ac-227		
2.03E-05	220.2	Pa-231	->	Ac-227		
2.01E-05	115.3	Rn-219	->	Po-215		
1.83E-05	51.29	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.83E-05	169.98	Th-227	->	Ra-223		
1.83E-05	124.6	Th-227	->	Ra-223		
1.82E-05	391	Ra-223	->	Rn-219		
1.82E-05	199.43	Ra-223	->	Rn-219		
1.77E-05	812.15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.61E-05	822.99	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.58E-05	1090.5	Pb-211	->	Bi-211		
1.53E-05	266.3	Th-227	->	Ra-223		
1.52E-05	74.969	Tl-207	->	Pb-207		
1.44E-05	23.55	Pa-231	->	Ac-227		
1.40E-05	908.03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.27E-05	471.33	Pa-231	->	Ac-227		
1.22E-05	99.64	Th-227	->	Ra-223		
1.22E-05	62.05	Th-227	->	Ra-223		
1.22E-05	179.28	Th-227	->	Ra-223		
1.09E-05	803.58	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.06E-05	307.89	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.04E-05	415.09	Th-227	->	Ra-223		
9.19E-06	723.86	Fr-223	->	Ra-223,	Th-227	-> Ra-223
9.16E-06	275.2	Th-227	->	Ra-223		

9.15E-06	328.08	Tl-207	->	Pb-207,	Po-211	->	Pb-207
9.12E-06	887.7	Rn-219	->	Po-215			
9.10E-06	72.803	Tl-207	->	Pb-207			
8.87E-06	569.15	Po-211	->	Pb-207			
8.78E-06	764.52	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.55E-06	339.1	Th-227	->	Ra-223			
8.55E-06	374.93	Th-227	->	Ra-223			
7.91E-06	1234.3	Pb-211	->	Bi-211			
7.32E-06	102.45	Th-227	->	Ra-223			
7.10E-06	536.88	Fr-223	->	Ra-223,	Th-227	->	Ra-223
6.91E-06	568.76	Fr-223	->	Ra-223,	Th-227	->	Ra-223
6.50E-06	478.22	Pa-231	->	Ac-227			
6.17E-06	757.03	Fr-223	->	Ra-223,	Th-227	->	Ra-223
6.10E-06	171.21	Th-227	->	Ra-223			
6.08E-06	834.2	Rn-219	->	Po-215			
5.71E-06	796.96	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.56E-06	825.96	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.46E-06	10.541	Tl-207	->	Pb-207			
5.40E-06	84.979	Tl-207	->	Pb-207			
4.97E-06	12.703	Tl-207	->	Pb-207			
4.70E-06	876.14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.52E-06	722.6	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.27E-06	230.17	Th-227	->	Ra-223			
4.22E-06	842.02	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.05E-06	846.56	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.65E-06	1055.8	Rn-219	->	Po-215			
3.55E-06	493.15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.34E-06	575.8	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.24E-06	748.56	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.04E-06	837.36	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.81E-06	99.7	Ac-227	->	Fr-223			
2.71E-06	507.64	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.67E-06	746.24	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.43E-06	387.9	Rn-219	->	Po-215			
2.36E-06	756.79	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.18E-06	896.41	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.17E-06	780.59	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.94E-06	480.25	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.81E-06	552.09	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.76E-06	762.3	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.74E-06	858.4	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.58E-06	87.632	Tl-207	->	Pb-207			
1.49E-06	69.83	Ac-227	->	Fr-223			
1.49E-06	555.91	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.33E-06	828.31	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.30E-06	515.96	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.23E-06	733.9	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.22E-06	607.2	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.19E-06	784.04	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.19E-06	754.17	Fr-223	->	Ra-223,	Th-227	->	Ra-223

1.16E-06	753.44	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.15E-06	734.6	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.08E-06	524.02	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.05E-06	817.31	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.04E-06	691.46	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.01E-06	482.14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
9.95E-07	448	Fr-223	->	Ra-223,	Th-227	->	Ra-223
9.77E-07	623.52	Th-227	->	Ra-223			
9.43E-07	578.2	Fr-223	->	Ra-223,	Th-227	->	Ra-223
9.10E-07	14.886	Tl-207	->	Pb-207			
8.75E-07	704.19	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.38E-07	772.85	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.26E-07	786.9	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.17E-07	9.3	Ac-227	->	Th-227			
7.94E-07	633.2	Th-227	->	Ra-223			
7.86E-07	452.52	Fr-223	->	Ra-223,	Th-227	->	Ra-223
7.37E-07	878.16	Fr-223	->	Ra-223,	Th-227	->	Ra-223
7.30E-07	147.2	Ac-227	->	Fr-223			
6.56E-07	848.88	Fr-223	->	Ra-223,	Th-227	->	Ra-223
6.10E-07	534.9	Th-227	->	Ra-223			
6.08E-07	31.87	Ra-223	->	Rn-219			
5.50E-07	457.07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.50E-07	736.76	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.43E-07	643.93	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.39E-07	867.23	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.84E-07	69.13	Ac-227	->	Fr-223			
4.84E-07	120.9	Ac-227	->	Fr-223			
4.39E-07	941.41	Th-227	->	Ra-223			
4.27E-07	854.2	Th-227	->	Ra-223			
3.99E-07	621.92	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.99E-07	857.89	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.87E-07	588.17	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.78E-07	958.6	Th-227	->	Ra-223			
3.66E-07	662.8	Th-227	->	Ra-223			
3.60E-07	171.4	Ac-227	->	Fr-223			
3.58E-07	808.26	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.14E-07	707.18	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.05E-07	461.9	Th-227	->	Ra-223			
3.05E-07	466.2	Th-227	->	Ra-223			
2.98E-07	863.2	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.98E-07	891	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.73E-07	9.185	Tl-207	->	Pb-207			
2.54E-07	596.44	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.46E-07	133.8	Ac-227	->	Fr-223			
2.44E-07	788.36	Th-227	->	Ra-223			
2.44E-07	792.6	Th-227	->	Ra-223			
2.14E-07	990.2	Th-227	->	Ra-223			
2.04E-07	718.22	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.94E-07	892.8	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.83E-07	926.28	Fr-223	->	Ra-223,	Th-227	->	Ra-223

1.83E-07	793.12	Th-227	->	Ra-223	
1.83E-07	969.91	Th-227	->	Ra-223	
1.83E-07	999.78	Th-227	->	Ra-223	
1.83E-07	818.23	Th-227	->	Ra-223	
1.29E-07	648.43	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.23E-07	46.13	Ac-227	->	Fr-223	
1.23E-07	106.1	Ac-227	->	Fr-223	
1.22E-07	641.45	Th-227	->	Ra-223	
1.22E-07	1020	Th-227	->	Ra-223	
1.14E-07	825.97	Fr-223	->	Ra-223	
9.16E-08	1024.8	Th-227	->	Ra-223	
9.16E-08	1015.1	Th-227	->	Ra-223	
9.16E-08	909.85	Th-227	->	Ra-223	
7.32E-08	920.06	Th-227	->	Ra-223	
7.25E-08	828.53	Fr-223	->	Ra-223,	Th-227 -> Ra-223
7.10E-08	11.349	Tl-207	->	Pb-207	
6.10E-08	971.28	Th-227	->	Ra-223	
6.10E-08	938.34	Th-227	->	Ra-223	
4.27E-08	994.9	Th-227	->	Ra-223	
1.05E-08	793.11	Fr-223	->	Ra-223	

U-236 100% Aged 5 years

312 lines computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays			
keV	ph/s/gm				
8.953	3.30E-08	Bi-212	->	Tl-208	
9.185	1.43E-08	Tl-208	->	Pb-208	
9.419	2.08E-07	Pb-212	->	Bi-212	
9.658	8.23E-10	Bi-212	->	Po-212	
10.137	4.47E-09	Ra-224	->	Rn-220	
10.259	6.68E-07	Bi-212	->	Tl-208	
10.541	2.86E-07	Tl-208	->	Pb-208	
10.622	1.11E-07	Th-228	->	Ra-224	
10.828	4.04E-06	Pb-212	->	Bi-212	
10.994	6.22E-09	Bi-212	->	Tl-208	
11.118	4.79E+03	Ac-228	->	Th-228,	U-236 -> Th-232
11.119	1.61E-08	Bi-212	->	Po-212	
11.349	3.83E-09	Tl-208	->	Pb-208	
11.712	5.32E-08	Pb-212	->	Bi-212	
11.713	7.96E-08	Ra-224	->	Rn-220	
12.085	2.43E-10	Bi-212	->	Po-212	
12.282	7.69E-07	Bi-212	->	Tl-208	
12.325	1.91E-06	Th-228	->	Ra-224	
12.701	2.68E-07	Tl-208	->	Pb-208	

12.76	2.79E-05	Ra-228	->	Ac-228	
12.855	2.08E-09	Ra-224	->	Rn-220	
12.952	8.14E+04	Ac-228	->	Th-228,	U-236 -> Th-232
13.099	3.67E-06	Pb-212	->	Bi-212	
13.5	1.47E-04	Ra-228	->	Ac-228	
13.501	1.61E-08	Bi-212	->	Po-212	
13.662	5.80E-08	Th-228	->	Ra-224	
14.336	1.10E-07	Ra-224	->	Rn-220	
14.511	2.27E+03	Ac-228	->	Th-228,	U-236 -> Th-232
14.563	1.80E-07	Bi-212	->	Tl-208	
14.884	4.92E-08	Tl-208	->	Pb-208	
15.15	1.47E-05	Ra-228	->	Ac-228	
15.23	2.90E-06	Th-228	->	Ra-224	
15.376	6.91E-07	Pb-212	->	Bi-212	
15.869	3.13E-09	Bi-212	->	Po-212	
16.154	2.93E-05	Ac-228	->	Th-228	
16.161	1.12E+05	U-236	->	Th-232	
16.18	6.60E-05	Ra-228	->	Ac-228	
16.881	2.39E-08	Ra-224	->	Rn-220	
17.952	6.54E-07	Th-228	->	Ra-224	
18.8	1.91E-05	Ra-228	->	Ac-228	
19.094	2.51E+04	U-236	->	Th-232	
19.113	6.75E-06	Ac-228	->	Th-228	
19.4	1.32E-06	Ra-228	->	Ac-228	
39.846	2.42E-07	Bi-212	->	Tl-208	
49.369	1.87E+03	U-236	->	Th-232	
57.81	7.70E-07	Ac-228	->	Th-228	
59	1.12E-06	Th-232	->	Ra-228	
70.832	1.65E-08	Bi-212	->	Tl-208	
72.803	4.70E-07	Tl-208	->	Pb-208	
72.873	2.79E-08	Bi-212	->	Tl-208	
74.814	6.42E-06	Pb-212	->	Bi-212	
74.969	7.91E-07	Tl-208	->	Pb-208	
76.858	2.35E-08	Bi-212	->	Po-212	
77.107	1.08E-05	Pb-212	->	Bi-212	
79.29	3.92E-08	Bi-212	->	Po-212	
81.067	7.35E-08	Ra-224	->	Rn-220	
82.434	9.89E-09	Bi-212	->	Tl-208	
83.787	1.22E-07	Ra-224	->	Rn-220	
84.26	7.46E-07	Th-228	->	Ra-224	
84.789	2.79E-07	Tl-208	->	Pb-208	
85.185	2.75E-09	Bi-212	->	Tl-208	
85.429	1.08E-08	Th-228	->	Ra-224	
87.19	3.84E-06	Pb-212	->	Bi-212	
87.632	8.07E-08	Tl-208	->	Pb-208	
88.471	1.78E-08	Th-228	->	Ra-224	
89.639	1.37E-08	Bi-212	->	Po-212	
89.955	4.99E-06	Ac-228	->	Th-228	
90.128	1.14E-06	Pb-212	->	Bi-212	
92.673	4.31E-09	Bi-212	->	Po-212	

93.35	8.21E-06	Ac-228	->	Th-228
94.677	4.41E-08	Ra-224	->	Rn-220
97.907	1.41E-08	Ra-224	->	Rn-220
99.55	1.91E-06	Ac-228	->	Th-228
99.915	6.35E-09	Th-228	->	Ra-224
103.341	2.07E-09	Th-228	->	Ra-224
105.362	2.93E-06	Ac-228	->	Th-228
108.99	9.83E-07	Ac-228	->	Th-228
112.75	4.55E+02	U-236	->	Th-232
115.122	3.62E-07	Pb-212	->	Bi-212
124	2.54E-07	Th-232	->	Ra-228
129.03	4.25E-06	Ac-228	->	Th-228
131.5	7.89E-08	Th-228	->	Ra-224
135.68	2.49E-08	Ac-228	->	Th-228
141.19	7.19E-08	Ac-228	->	Th-228
143.99	2.20E-09	Bi-212	->	Tl-208
146.06	4.25E-07	Ac-228	->	Th-228
153.89	1.23E-06	Ac-228	->	Th-228
164	1.10E-09	Bi-212	->	Tl-208
164.15	3.06E-09	Pb-212	->	Bi-212
166.43	5.06E-08	Th-228	->	Ra-224
174.18	4.69E-08	Ac-228	->	Th-228
176.577	3.12E-08	Pb-212	->	Bi-212
184.72	2.05E-07	Ac-228	->	Th-228
191.29	1.76E-07	Ac-228	->	Th-228
199.54	4.11E-07	Ac-228	->	Th-228
204.37	2.30E-07	Ac-228	->	Th-228
205.75	1.73E-08	Th-228	->	Ra-224
209.39	6.01E-06	Ac-228	->	Th-228
210.76	3.37E-07	Ac-228	->	Th-228
211.31	3.74E-08	Tl-208	->	Pb-208
215.75	1.71E-07	Th-228	->	Ra-224
216.24	1.17E-06	Ac-228	->	Th-228
220.49	2.05E-08	Ac-228	->	Th-228
223.72	9.68E-08	Ac-228	->	Th-228
232.3	8.80E-08	Ac-228	->	Th-228
233.32	6.81E-08	Tl-208	->	Pb-208
238.578	2.67E-05	Pb-212	->	Bi-212
240.76	2.39E-06	Ra-224	->	Rn-220
252.45	1.76E-07	Tl-208	->	Pb-208
257.29	4.69E-08	Ac-228	->	Th-228
263.57	8.51E-08	Ac-228	->	Th-228
270.26	5.57E-06	Ac-228	->	Th-228
277.28	1.49E-06	Tl-208	->	Pb-208
279.3	3.37E-07	Ac-228	->	Th-228
282.02	1.31E-07	Ac-228	->	Th-228
288.08	7.50E-08	Bi-212	->	Tl-208
290	5.51E-09	Ra-224	->	Rn-220
300.034	2.04E-06	Pb-212	->	Bi-212
321.9	3.67E-07	Ac-228	->	Th-228

327.67	1.91E-07	Ac-228	->	Th-228	
327.93	3.01E-08	Bi-212	->	Tl-208	
328.07	5.13E-06	Ac-228	->	Th-228	
332.48	6.89E-07	Ac-228	->	Th-228	
338.42	1.82E-05	Ac-228	->	Th-228	
340.94	7.63E-07	Ac-228	->	Th-228	
356.83	2.93E-08	Ac-228	->	Th-228	
372.3	1.32E-08	Ac-228	->	Th-228	
388.9	2.20E-08	Ac-228	->	Th-228	
396.9	4.69E-08	Ac-228	->	Th-228	
399.2	5.43E-08	Ac-228	->	Th-228	
409.3	2.45E-09	Ra-224	->	Rn-220	
409.62	3.23E-06	Ac-228	->	Th-228	
415.156	1.71E-08	Pb-212	->	Bi-212	
416.2	2.49E-08	Ac-228	->	Th-228	
419.23	3.81E-08	Ac-228	->	Th-228	
433.51	3.08E-09	Bi-212	->	Tl-208	
440.49	2.20E-07	Ac-228	->	Th-228	
449.57	9.53E-08	Ac-228	->	Th-228	
452.77	7.98E-08	Bi-212	->	Tl-208	
460.84	7.33E-08	Ac-228	->	Th-228	
463.1	6.75E-06	Ac-228	->	Th-228	
471.4	5.13E-08	Ac-228	->	Th-228	
473.36	1.10E-08	Bi-212	->	Tl-208	
474.32	4.25E-08	Ac-228	->	Th-228	
478.2	3.52E-07	Ac-228	->	Th-228	
481.8	1.32E-08	Ac-228	->	Th-228	
485.78	1.10E-08	Tl-208	->	Pb-208	
492.36	2.93E-08	Ac-228	->	Th-228	
492.62	1.34E-09	Bi-212	->	Tl-208	
498.26	6.31E-08	Ac-228	->	Th-228	
503.7	3.08E-07	Ac-228	->	Th-228	
509.17	7.19E-07	Ac-228	->	Th-228	
510.606	4.75E-06	Tl-208	->	Pb-208	
515.2	6.31E-08	Ac-228	->	Th-228	
519.97	1.14E-07	Ac-228	->	Th-228	
523.18	1.76E-07	Ac-228	->	Th-228	
540.5	4.25E-08	Ac-228	->	Th-228	
546.36	3.23E-07	Ac-228	->	Th-228	
549.7	4.29E-08	Rn-220	->	Po-216	
555.3	7.19E-08	Ac-228	->	Th-228	
562.65	1.48E-06	Ac-228	->	Th-228	
570.2	2.79E-07	Ac-228	->	Th-228	
572.5	2.79E-07	Ac-228	->	Th-228	
580.4	1.74E-10	Bi-212	->	Tl-208	
583.022	1.97E-05	Tl-208	->	Pb-208,	Po-212 -> Pb-208
583.28	2.20E-07	Ac-228	->	Th-228	
587.82	8.79E-09	Tl-208	->	Pb-208	
615.9	1.32E-07	Ac-228	->	Th-228	
619.88	1.61E-07	Ac-228	->	Th-228	

620.3	7.91E-10	Bi-212	->	Tl-208
629.93	7.33E-08	Ac-228	->	Th-228
640.7	8.95E-08	Ac-228	->	Th-228
649.19	6.31E-08	Ac-228	->	Th-228
650.1	4.29E-09	Ra-224	->	Rn-220
650.14	7.91E-09	Tl-208	->	Pb-208
651.44	1.48E-07	Ac-228	->	Th-228
666.4	6.75E-08	Ac-228	->	Th-228
673.86	1.47E-07	Ac-228	->	Th-228
677.07	1.32E-06	Ac-228	->	Th-228
692.5	4.99E-09	Ac-228	->	Th-228
701.8	2.79E-07	Ac-228	->	Th-228
705.24	4.84E-09	Tl-208	->	Pb-208
707.49	2.20E-07	Ac-228	->	Th-228
721.91	4.46E-08	Tl-208	->	Pb-208
726.63	1.28E-06	Ac-228	->	Th-228
727.25	2.61E-06	Bi-212	->	Po-212
737.7	6.01E-08	Ac-228	->	Th-228
748.58	9.45E-09	Tl-208	->	Pb-208
755.28	1.94E-06	Ac-228	->	Th-228
763.06	3.61E-07	Tl-208	->	Pb-208
772.28	1.60E-06	Ac-228	->	Th-228
774	1.32E-07	Ac-228	->	Th-228
782.12	8.65E-07	Ac-228	->	Th-228
785.51	4.34E-07	Bi-212	->	Po-212
791.05	3.08E-08	Ac-228	->	Th-228
791.2	4.25E-08	Ac-228	->	Th-228
794.79	6.75E-06	Ac-228	->	Th-228
804.9	1.10E-09	Po-216	->	Pb-212
816.62	5.13E-08	Ac-228	->	Th-228
821.14	8.79E-09	Tl-208	->	Pb-208
825.3	8.51E-08	Ac-228	->	Th-228
830.59	9.24E-07	Ac-228	->	Th-228
835.6	2.51E-06	Ac-228	->	Th-228
840.44	1.38E-06	Ac-228	->	Th-228
853.6	2.05E-08	Ac-228	->	Th-228
860.3	2.64E-06	Tl-208	->	Pb-208
870.47	9.68E-08	Ac-228	->	Th-228
874.43	1.23E-07	Ac-228	->	Th-228
877.65	2.93E-08	Ac-228	->	Th-228
883.27	6.81E-09	Tl-208	->	Pb-208
884	1.47E-07	Ac-228	->	Th-228
887.46	2.93E-08	Ac-228	->	Th-228
893.42	1.44E-07	Bi-212	->	Po-212
904.29	1.31E-06	Ac-228	->	Th-228
911.16	4.25E-05	Ac-228	->	Th-228
919.19	4.11E-08	Ac-228	->	Th-228
922.28	3.08E-08	Ac-228	->	Th-228
927.42	2.75E-08	Tl-208	->	Pb-208
931.1	2.20E-08	Ac-228	->	Th-228

943.9	1.57E-07	Ac-228	->	Th-228
948.4	1.79E-07	Ac-228	->	Th-228
952.17	6.90E-08	Bi-212	->	Po-212
958.3	4.55E-07	Ac-228	->	Th-228
964.64	8.51E-06	Ac-228	->	Th-228
968.97	2.55E-05	Ac-228	->	Th-228
979.7	3.37E-08	Ac-228	->	Th-228
982.52	4.33E-08	Tl-208	->	Pb-208
987.87	4.99E-07	Ac-228	->	Th-228
987.94	2.79E-07	Ac-228	->	Th-228
1016.12	3.67E-08	Ac-228	->	Th-228
1019.7	3.67E-08	Ac-228	->	Th-228
1033.32	2.27E-07	Ac-228	->	Th-228
1039.97	8.07E-08	Ac-228	->	Th-228
1041.35	4.69E-08	Ac-228	->	Th-228
1054.3	4.69E-08	Ac-228	->	Th-228
1065.05	2.51E-07	Ac-228	->	Th-228
1074.1	6.27E-09	Bi-212	->	Po-212
1078.69	2.10E-07	Bi-212	->	Po-212
1093.63	8.13E-08	Tl-208	->	Pb-208
1095.87	1.94E-07	Ac-228	->	Th-228
1104.01	2.49E-08	Ac-228	->	Th-228
1110.7	5.68E-07	Ac-228	->	Th-228
1116.97	8.95E-08	Ac-228	->	Th-228
1125.6	1.10E-09	Tl-208	->	Pb-208
1135.39	1.76E-08	Ac-228	->	Th-228
1142.7	1.47E-08	Ac-228	->	Th-228
1153.69	2.33E-07	Ac-228	->	Th-228
1160.55	2.42E-09	Tl-208	->	Pb-208
1163.6	1.10E-07	Ac-228	->	Th-228
1174.79	4.25E-08	Ac-228	->	Th-228
1185.1	3.74E-09	Tl-208	->	Pb-208
1216.4	3.81E-08	Ac-228	->	Th-228
1245.23	1.32E-07	Ac-228	->	Th-228
1246.6	8.36E-07	Ac-228	->	Th-228
1249.81	8.80E-08	Ac-228	->	Th-228
1277.5	2.93E-08	Ac-228	->	Th-228
1282.7	1.14E-08	Tl-208	->	Pb-208
1286.6	1.75E-07	Ac-228	->	Th-228
1309.6	3.08E-08	Ac-228	->	Th-228
1314.76	3.08E-08	Ac-228	->	Th-228
1347.6	1.91E-08	Ac-228	->	Th-228
1357.6	4.25E-08	Ac-228	->	Th-228
1374.26	2.93E-08	Ac-228	->	Th-228
1381	1.54E-09	Tl-208	->	Pb-208
1415.7	3.81E-08	Ac-228	->	Th-228
1431	4.69E-08	Ac-228	->	Th-228
1451.2	2.64E-08	Ac-228	->	Th-228
1459.19	1.55E-06	Ac-228	->	Th-228
1468.8	2.93E-08	Ac-228	->	Th-228

1481.2	2.93E-08	Ac-228	->	Th-228
1496	1.54E-06	Ac-228	->	Th-228
1501.44	8.51E-07	Ac-228	->	Th-228
1503.87	4.25E-08	Ac-228	->	Th-228
1512.75	1.23E-07	Bi-212	->	Po-212
1528.9	9.83E-08	Ac-228	->	Th-228
1537.4	7.19E-08	Ac-228	->	Th-228
1548.5	6.31E-08	Ac-228	->	Th-228
1557	2.93E-07	Ac-228	->	Th-228
1572.03	7.33E-08	Ac-228	->	Th-228
1573.3	8.07E-08	Ac-228	->	Th-228
1580.3	1.04E-06	Ac-228	->	Th-228
1588.23	5.28E-06	Ac-228	->	Th-228
1620.66	5.92E-07	Bi-212	->	Po-212
1625.1	4.69E-07	Ac-228	->	Th-228
1630.47	2.86E-06	Ac-228	->	Th-228
1638.1	7.92E-07	Ac-228	->	Th-228
1647.4	4.40E-10	Tl-208	->	Pb-208
1666.43	2.93E-07	Ac-228	->	Th-228
1677.9	9.83E-08	Ac-228	->	Th-228
1679.42	2.66E-08	Bi-212	->	Po-212
1686	1.53E-07	Ac-228	->	Th-228
1702.3	9.83E-08	Ac-228	->	Th-228
1706.07	2.05E-08	Ac-228	->	Th-228
1713.25	6.89E-09	Ac-228	->	Th-228
1739.1	2.85E-08	Ac-228	->	Th-228
1741.2	2.20E-08	Ac-228	->	Th-228
1743.57	4.40E-10	Tl-208	->	Pb-208
1750.9	1.32E-08	Ac-228	->	Th-228
1757.88	6.07E-08	Ac-228	->	Th-228
1784.5	1.41E-08	Ac-228	->	Th-228
1805.93	4.35E-08	Bi-212	->	Po-212
1823.47	7.48E-08	Ac-228	->	Th-228
1835.1	6.01E-08	Ac-228	->	Th-228
1842.29	7.04E-08	Ac-228	->	Th-228
1871.2	3.81E-08	Ac-228	->	Th-228
1886.92	1.73E-07	Ac-228	->	Th-228
1900.1	6.75E-09	Ac-228	->	Th-228
1907.5	6.89E-08	Ac-228	->	Th-228
1930.3	3.67E-08	Ac-228	->	Th-228
1952.5	1.06E-07	Ac-228	->	Th-228
1965.3	3.52E-08	Ac-228	->	Th-228
2614.35	2.30E-05	Tl-208	->	Pb-208, Po-212 -> Pb-208

U236	Aged 5 years	Sorted by Intensity
Intensity	Energy	Initial Isotopes and Decays
ph/s/gm	keV	

1.12E+05	16.161	U-236	->	Th-232		
8.14E+04	12.952	Ac-228	->	Th-228,	U-236	-> Th-232
2.51E+04	19.094	U-236	->	Th-232		
4.79E+03	11.118	Ac-228	->	Th-228,	U-236	-> Th-232
2.27E+03	14.511	Ac-228	->	Th-228,	U-236	-> Th-232
1.87E+03	49.369	U-236	->	Th-232		
4.55E+02	112.75	U-236	->	Th-232		
1.47E-04	13.5	Ra-228	->	Ac-228		
6.60E-05	16.18	Ra-228	->	Ac-228		
4.25E-05	911.16	Ac-228	->	Th-228		
2.93E-05	16.154	Ac-228	->	Th-228		
2.79E-05	12.76	Ra-228	->	Ac-228		
2.67E-05	238.578	Pb-212	->	Bi-212		
2.55E-05	968.97	Ac-228	->	Th-228		
2.30E-05	2614.35	Tl-208	->	Pb-208,	Po-212	-> Pb-208
1.97E-05	583.022	Tl-208	->	Pb-208,	Po-212	-> Pb-208
1.91E-05	18.8	Ra-228	->	Ac-228		
1.82E-05	338.42	Ac-228	->	Th-228		
1.47E-05	15.15	Ra-228	->	Ac-228		
1.08E-05	77.107	Pb-212	->	Bi-212		
8.51E-06	964.64	Ac-228	->	Th-228		
8.21E-06	93.35	Ac-228	->	Th-228		
6.75E-06	463.1	Ac-228	->	Th-228		
6.75E-06	19.113	Ac-228	->	Th-228		
6.75E-06	794.79	Ac-228	->	Th-228		
6.42E-06	74.814	Pb-212	->	Bi-212		
6.01E-06	209.39	Ac-228	->	Th-228		
5.57E-06	270.26	Ac-228	->	Th-228		
5.28E-06	1588.23	Ac-228	->	Th-228		
5.13E-06	328.07	Ac-228	->	Th-228		
4.99E-06	89.955	Ac-228	->	Th-228		
4.75E-06	510.606	Tl-208	->	Pb-208		
4.25E-06	129.03	Ac-228	->	Th-228		
4.04E-06	10.828	Pb-212	->	Bi-212		
3.84E-06	87.19	Pb-212	->	Bi-212		
3.67E-06	13.099	Pb-212	->	Bi-212		
3.23E-06	409.62	Ac-228	->	Th-228		
2.93E-06	105.362	Ac-228	->	Th-228		
2.90E-06	15.23	Th-228	->	Ra-224		
2.86E-06	1630.47	Ac-228	->	Th-228		
2.64E-06	860.3	Tl-208	->	Pb-208		
2.61E-06	727.25	Bi-212	->	Po-212		
2.51E-06	835.6	Ac-228	->	Th-228		
2.39E-06	240.76	Ra-224	->	Rn-220		
2.04E-06	300.034	Pb-212	->	Bi-212		
1.94E-06	755.28	Ac-228	->	Th-228		
1.91E-06	12.325	Th-228	->	Ra-224		
1.91E-06	99.55	Ac-228	->	Th-228		
1.60E-06	772.28	Ac-228	->	Th-228		
1.55E-06	1459.19	Ac-228	->	Th-228		

1.54E-06	1496	Ac-228	->	Th-228
1.49E-06	277.28	Tl-208	->	Pb-208
1.48E-06	562.65	Ac-228	->	Th-228
1.38E-06	840.44	Ac-228	->	Th-228
1.32E-06	19.4	Ra-228	->	Ac-228
1.32E-06	677.07	Ac-228	->	Th-228
1.31E-06	904.29	Ac-228	->	Th-228
1.28E-06	726.63	Ac-228	->	Th-228
1.23E-06	153.89	Ac-228	->	Th-228
1.17E-06	216.24	Ac-228	->	Th-228
1.14E-06	90.128	Pb-212	->	Bi-212
1.12E-06	59	Th-232	->	Ra-228
1.04E-06	1580.3	Ac-228	->	Th-228
9.83E-07	108.99	Ac-228	->	Th-228
9.24E-07	830.59	Ac-228	->	Th-228
8.65E-07	782.12	Ac-228	->	Th-228
8.51E-07	1501.44	Ac-228	->	Th-228
8.36E-07	1246.6	Ac-228	->	Th-228
7.92E-07	1638.1	Ac-228	->	Th-228
7.91E-07	74.969	Tl-208	->	Pb-208
7.70E-07	57.81	Ac-228	->	Th-228
7.69E-07	12.282	Bi-212	->	Tl-208
7.63E-07	340.94	Ac-228	->	Th-228
7.46E-07	84.26	Th-228	->	Ra-224
7.19E-07	509.17	Ac-228	->	Th-228
6.91E-07	15.376	Pb-212	->	Bi-212
6.89E-07	332.48	Ac-228	->	Th-228
6.68E-07	10.259	Bi-212	->	Tl-208
6.54E-07	17.952	Th-228	->	Ra-224
5.92E-07	1620.66	Bi-212	->	Po-212
5.68E-07	1110.7	Ac-228	->	Th-228
4.99E-07	987.87	Ac-228	->	Th-228
4.70E-07	72.803	Tl-208	->	Pb-208
4.69E-07	1625.1	Ac-228	->	Th-228
4.55E-07	958.3	Ac-228	->	Th-228
4.34E-07	785.51	Bi-212	->	Po-212
4.25E-07	146.06	Ac-228	->	Th-228
4.11E-07	199.54	Ac-228	->	Th-228
3.67E-07	321.9	Ac-228	->	Th-228
3.62E-07	115.122	Pb-212	->	Bi-212
3.61E-07	763.06	Tl-208	->	Pb-208
3.52E-07	478.2	Ac-228	->	Th-228
3.37E-07	279.3	Ac-228	->	Th-228
3.37E-07	210.76	Ac-228	->	Th-228
3.23E-07	546.36	Ac-228	->	Th-228
3.08E-07	503.7	Ac-228	->	Th-228
2.93E-07	1666.43	Ac-228	->	Th-228
2.93E-07	1557	Ac-228	->	Th-228
2.86E-07	10.541	Tl-208	->	Pb-208
2.79E-07	84.789	Tl-208	->	Pb-208

2.79E-07	701.8	Ac-228	->	Th-228
2.79E-07	572.5	Ac-228	->	Th-228
2.79E-07	987.94	Ac-228	->	Th-228
2.79E-07	570.2	Ac-228	->	Th-228
2.68E-07	12.701	Tl-208	->	Pb-208
2.54E-07	124	Th-232	->	Ra-228
2.51E-07	1065.05	Ac-228	->	Th-228
2.42E-07	39.846	Bi-212	->	Tl-208
2.33E-07	1153.69	Ac-228	->	Th-228
2.30E-07	204.37	Ac-228	->	Th-228
2.27E-07	1033.32	Ac-228	->	Th-228
2.20E-07	440.49	Ac-228	->	Th-228
2.20E-07	707.49	Ac-228	->	Th-228
2.20E-07	583.28	Ac-228	->	Th-228
2.10E-07	1078.69	Bi-212	->	Po-212
2.08E-07	9.419	Pb-212	->	Bi-212
2.05E-07	184.72	Ac-228	->	Th-228
1.94E-07	1095.87	Ac-228	->	Th-228
1.91E-07	327.67	Ac-228	->	Th-228
1.80E-07	14.563	Bi-212	->	Tl-208
1.79E-07	948.4	Ac-228	->	Th-228
1.76E-07	191.29	Ac-228	->	Th-228
1.76E-07	523.18	Ac-228	->	Th-228
1.76E-07	252.45	Tl-208	->	Pb-208
1.75E-07	1286.6	Ac-228	->	Th-228
1.73E-07	1886.92	Ac-228	->	Th-228
1.71E-07	215.75	Th-228	->	Ra-224
1.61E-07	619.88	Ac-228	->	Th-228
1.57E-07	943.9	Ac-228	->	Th-228
1.53E-07	1686	Ac-228	->	Th-228
1.48E-07	651.44	Ac-228	->	Th-228
1.47E-07	673.86	Ac-228	->	Th-228
1.47E-07	884	Ac-228	->	Th-228
1.44E-07	893.42	Bi-212	->	Po-212
1.32E-07	774	Ac-228	->	Th-228
1.32E-07	1245.23	Ac-228	->	Th-228
1.32E-07	615.9	Ac-228	->	Th-228
1.31E-07	282.02	Ac-228	->	Th-228
1.23E-07	874.43	Ac-228	->	Th-228
1.23E-07	1512.75	Bi-212	->	Po-212
1.22E-07	83.787	Ra-224	->	Rn-220
1.14E-07	519.97	Ac-228	->	Th-228
1.11E-07	10.622	Th-228	->	Ra-224
1.10E-07	14.336	Ra-224	->	Rn-220
1.10E-07	1163.6	Ac-228	->	Th-228
1.06E-07	1952.5	Ac-228	->	Th-228
9.83E-08	1528.9	Ac-228	->	Th-228
9.83E-08	1677.9	Ac-228	->	Th-228
9.83E-08	1702.3	Ac-228	->	Th-228
9.68E-08	870.47	Ac-228	->	Th-228

9.68E-08	223.72	Ac-228	->	Th-228
9.53E-08	449.57	Ac-228	->	Th-228
8.95E-08	640.7	Ac-228	->	Th-228
8.95E-08	1116.97	Ac-228	->	Th-228
8.80E-08	232.3	Ac-228	->	Th-228
8.80E-08	1249.81	Ac-228	->	Th-228
8.51E-08	263.57	Ac-228	->	Th-228
8.51E-08	825.3	Ac-228	->	Th-228
8.13E-08	1093.63	Tl-208	->	Pb-208
8.07E-08	87.632	Tl-208	->	Pb-208
8.07E-08	1573.3	Ac-228	->	Th-228
8.07E-08	1039.97	Ac-228	->	Th-228
7.98E-08	452.77	Bi-212	->	Tl-208
7.96E-08	11.713	Ra-224	->	Rn-220
7.89E-08	131.5	Th-228	->	Ra-224
7.50E-08	288.08	Bi-212	->	Tl-208
7.48E-08	1823.47	Ac-228	->	Th-228
7.35E-08	81.067	Ra-224	->	Rn-220
7.33E-08	460.84	Ac-228	->	Th-228
7.33E-08	1572.03	Ac-228	->	Th-228
7.33E-08	629.93	Ac-228	->	Th-228
7.19E-08	555.3	Ac-228	->	Th-228
7.19E-08	141.19	Ac-228	->	Th-228
7.19E-08	1537.4	Ac-228	->	Th-228
7.04E-08	1842.29	Ac-228	->	Th-228
6.90E-08	952.17	Bi-212	->	Po-212
6.89E-08	1907.5	Ac-228	->	Th-228
6.81E-08	233.32	Tl-208	->	Pb-208
6.75E-08	666.4	Ac-228	->	Th-228
6.31E-08	1548.5	Ac-228	->	Th-228
6.31E-08	498.26	Ac-228	->	Th-228
6.31E-08	515.2	Ac-228	->	Th-228
6.31E-08	649.19	Ac-228	->	Th-228
6.07E-08	1757.88	Ac-228	->	Th-228
6.01E-08	1835.1	Ac-228	->	Th-228
6.01E-08	737.7	Ac-228	->	Th-228
5.80E-08	13.662	Th-228	->	Ra-224
5.43E-08	399.2	Ac-228	->	Th-228
5.32E-08	11.712	Pb-212	->	Bi-212
5.13E-08	471.4	Ac-228	->	Th-228
5.13E-08	816.62	Ac-228	->	Th-228
5.06E-08	166.43	Th-228	->	Ra-224
4.92E-08	14.884	Tl-208	->	Pb-208
4.69E-08	1431	Ac-228	->	Th-228
4.69E-08	1041.35	Ac-228	->	Th-228
4.69E-08	174.18	Ac-228	->	Th-228
4.69E-08	1054.3	Ac-228	->	Th-228
4.69E-08	396.9	Ac-228	->	Th-228
4.69E-08	257.29	Ac-228	->	Th-228
4.46E-08	721.91	Tl-208	->	Pb-208

4.41E-08	94.677	Ra-224	->	Rn-220
4.35E-08	1805.93	Bi-212	->	Po-212
4.33E-08	982.52	Tl-208	->	Pb-208
4.29E-08	549.7	Rn-220	->	Po-216
4.25E-08	1503.87	Ac-228	->	Th-228
4.25E-08	1357.6	Ac-228	->	Th-228
4.25E-08	1174.79	Ac-228	->	Th-228
4.25E-08	540.5	Ac-228	->	Th-228
4.25E-08	791.2	Ac-228	->	Th-228
4.25E-08	474.32	Ac-228	->	Th-228
4.11E-08	919.19	Ac-228	->	Th-228
3.92E-08	79.29	Bi-212	->	Po-212
3.81E-08	1871.2	Ac-228	->	Th-228
3.81E-08	1415.7	Ac-228	->	Th-228
3.81E-08	1216.4	Ac-228	->	Th-228
3.81E-08	419.23	Ac-228	->	Th-228
3.74E-08	211.31	Tl-208	->	Pb-208
3.67E-08	1930.3	Ac-228	->	Th-228
3.67E-08	1016.12	Ac-228	->	Th-228
3.67E-08	1019.7	Ac-228	->	Th-228
3.52E-08	1965.3	Ac-228	->	Th-228
3.37E-08	979.7	Ac-228	->	Th-228
3.30E-08	8.953	Bi-212	->	Tl-208
3.12E-08	176.577	Pb-212	->	Bi-212
3.08E-08	1309.6	Ac-228	->	Th-228
3.08E-08	1314.76	Ac-228	->	Th-228
3.08E-08	922.28	Ac-228	->	Th-228
3.08E-08	791.05	Ac-228	->	Th-228
3.01E-08	327.93	Bi-212	->	Tl-208
2.93E-08	356.83	Ac-228	->	Th-228
2.93E-08	1277.5	Ac-228	->	Th-228
2.93E-08	1374.26	Ac-228	->	Th-228
2.93E-08	1468.8	Ac-228	->	Th-228
2.93E-08	1481.2	Ac-228	->	Th-228
2.93E-08	887.46	Ac-228	->	Th-228
2.93E-08	492.36	Ac-228	->	Th-228
2.93E-08	877.65	Ac-228	->	Th-228
2.85E-08	1739.1	Ac-228	->	Th-228
2.79E-08	72.873	Bi-212	->	Tl-208
2.75E-08	927.42	Tl-208	->	Pb-208
2.66E-08	1679.42	Bi-212	->	Po-212
2.64E-08	1451.2	Ac-228	->	Th-228
2.49E-08	135.68	Ac-228	->	Th-228
2.49E-08	1104.01	Ac-228	->	Th-228
2.49E-08	416.2	Ac-228	->	Th-228
2.39E-08	16.881	Ra-224	->	Rn-220
2.35E-08	76.858	Bi-212	->	Po-212
2.20E-08	931.1	Ac-228	->	Th-228
2.20E-08	388.9	Ac-228	->	Th-228
2.20E-08	1741.2	Ac-228	->	Th-228

2.05E-08	853.6	Ac-228	->	Th-228
2.05E-08	220.49	Ac-228	->	Th-228
2.05E-08	1706.07	Ac-228	->	Th-228
1.91E-08	1347.6	Ac-228	->	Th-228
1.78E-08	88.471	Th-228	->	Ra-224
1.76E-08	1135.39	Ac-228	->	Th-228
1.73E-08	205.75	Th-228	->	Ra-224
1.71E-08	415.156	Pb-212	->	Bi-212
1.65E-08	70.832	Bi-212	->	Tl-208
1.61E-08	13.501	Bi-212	->	Po-212
1.61E-08	11.119	Bi-212	->	Po-212
1.47E-08	1142.7	Ac-228	->	Th-228
1.43E-08	9.185	Tl-208	->	Pb-208
1.41E-08	97.907	Ra-224	->	Rn-220
1.41E-08	1784.5	Ac-228	->	Th-228
1.37E-08	89.639	Bi-212	->	Po-212
1.32E-08	372.3	Ac-228	->	Th-228
1.32E-08	1750.9	Ac-228	->	Th-228
1.32E-08	481.8	Ac-228	->	Th-228
1.14E-08	1282.7	Tl-208	->	Pb-208
1.10E-08	473.36	Bi-212	->	Tl-208
1.10E-08	485.78	Tl-208	->	Pb-208
1.08E-08	85.429	Th-228	->	Ra-224
9.89E-09	82.434	Bi-212	->	Tl-208
9.45E-09	748.58	Tl-208	->	Pb-208
8.79E-09	587.82	Tl-208	->	Pb-208
8.79E-09	821.14	Tl-208	->	Pb-208
7.91E-09	650.14	Tl-208	->	Pb-208
6.89E-09	1713.25	Ac-228	->	Th-228
6.81E-09	883.27	Tl-208	->	Pb-208
6.75E-09	1900.1	Ac-228	->	Th-228
6.35E-09	99.915	Th-228	->	Ra-224
6.27E-09	1074.1	Bi-212	->	Po-212
6.22E-09	10.994	Bi-212	->	Tl-208
5.51E-09	290	Ra-224	->	Rn-220
4.99E-09	692.5	Ac-228	->	Th-228
4.84E-09	705.24	Tl-208	->	Pb-208
4.47E-09	10.137	Ra-224	->	Rn-220
4.31E-09	92.673	Bi-212	->	Po-212
4.29E-09	650.1	Ra-224	->	Rn-220
3.83E-09	11.349	Tl-208	->	Pb-208
3.74E-09	1185.1	Tl-208	->	Pb-208
3.13E-09	15.869	Bi-212	->	Po-212
3.08E-09	433.51	Bi-212	->	Tl-208
3.06E-09	164.15	Pb-212	->	Bi-212
2.75E-09	85.185	Bi-212	->	Tl-208
2.45E-09	409.3	Ra-224	->	Rn-220
2.42E-09	1160.55	Tl-208	->	Pb-208
2.20E-09	143.99	Bi-212	->	Tl-208
2.08E-09	12.855	Ra-224	->	Rn-220

2.07E-09	103.341	Th-228	->	Ra-224
1.54E-09	1381	Tl-208	->	Pb-208
1.34E-09	492.62	Bi-212	->	Tl-208
1.10E-09	804.9	Po-216	->	Pb-212
1.10E-09	164	Bi-212	->	Tl-208
1.10E-09	1125.6	Tl-208	->	Pb-208
8.23E-10	9.658	Bi-212	->	Po-212
7.91E-10	620.3	Bi-212	->	Tl-208
4.40E-10	1743.57	Tl-208	->	Pb-208
4.40E-10	1647.4	Tl-208	->	Pb-208
2.43E-10	12.085	Bi-212	->	Po-212
1.74E-10	580.4	Bi-212	->	Tl-208

U-238 100% Aged 5 years

651 lines computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays			
keV	ph/s/gm				
8.953	1.60E-19	Hg-206	->	Tl-206	
9.185	2.34E-15	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
9.419	8.35E-12	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
9.658	5.43E-13	Bi-214	->	Po-214	
10.137	3.93E-13	Ra-226	->	Rn-222	
10.259	3.33E-18	Hg-206	->	Tl-206	
10.541	4.73E-14	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
10.828	1.67E-10	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
10.994	4.21E-20	Hg-206	->	Tl-206	
11.118	2.24E+01	U-238	->	Th-234	
11.119	1.04E-11	Bi-214	->	Po-214	
11.349	1.14E-15	Tl-210	->	Pb-210	
11.372	2.88E+01	Th-234	->	Pa-234m,	Pa-234m -> U-234
11.439	4.69E-22	Tl-206	->	Pb-206	
11.62	1.39E+00	Pa-234	->	U-234,	Pa-234m -> U-234
11.712	1.95E-12	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
11.713	7.28E-12	Ra-226	->	Rn-222	
12.085	1.49E-13	Bi-214	->	Po-214	
12.313	2.88E-18	Hg-206	->	Tl-206	
12.678	6.27E-14	Tl-210	->	Pb-210	
12.71	2.95E-20	Tl-206	->	Pb-206	
12.855	2.01E-13	Ra-226	->	Rn-222	
12.952	3.73E+02	U-238	->	Th-234	
13.066	1.04E-11	Pb-210	->	Bi-210	
13.088	1.55E-10	Pb-214	->	Bi-214	

13.274	4.85E+02	Th-234	->	Pa-234m		
13.275	2.88E+00	Pa-234m	->	U-234		
13.502	1.00E-11	Bi-214	->	Po-214		
13.6	2.27E+01	Pa-234	->	U-234,	Pa-234m	-> U-234
14.336	1.05E-11	Ra-226	->	Rn-222		
14.407	5.32E-19	Hg-206	->	Tl-206		
14.511	1.03E+01	U-238	->	Th-234		
14.836	1.25E-14	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
14.953	6.12E+00	Th-234	->	Pa-234m,	Pa-234m	-> U-234
15.4	3.67E-01	Pa-234	->	U-234,	Pa-234m	-> U-234
15.439	3.15E-11	Pb-214	->	Bi-214		
15.537	2.50E-12	Pb-210	->	Bi-210		
15.874	1.93E-12	Bi-214	->	Po-214		
16.161	5.10E+02	U-238	->	Th-234		
16.547	3.34E+00	Pa-234m	->	U-234		
16.572	5.47E+02	Th-234	->	Pa-234m		
16.874	2.31E-12	Ra-226	->	Rn-222		
17.069	1.46E+01	Pa-234m	->	U-234		
17.12	8.41E+00	Pa-234	->	U-234		
19.094	1.16E+02	U-238	->	Th-234		
19.839	1.34E+02	Th-234	->	Pa-234m		
19.891	3.97E-01	Pa-234m	->	U-234		
20.019	1.24E+00	Th-234	->	Pa-234m		
20.309	1.91E+00	Pa-234	->	U-234		
20.366	3.18E+00	Pa-234m	->	U-234		
29.49	1.82E-01	Th-234	->	Pa-234m		
34.37	5.82E-04	Pa-234	->	U-234		
43.47	1.94E-02	Pa-234	->	U-234		
45.28	1.78E-03	Pa-234	->	U-234		
46.52	4.06E-12	Pb-210	->	Bi-210		
49.55	8.71E+00	U-238	->	Th-234		
53.172	2.99E-11	Pb-214	->	Bi-214		
53.23	2.05E-04	U-234	->	Th-230		
57.75	6.22E-01	Th-234	->	Pa-234m		
58.31	1.46E-03	Pa-234	->	U-234		
62.78	9.62E-01	Pa-234	->	U-234,	Pa-234m	-> U-234
62.862	2.36E+00	Th-234	->	Pa-234m		
63.288	4.48E+02	Th-234	->	Pa-234m		
67.22	9.38E-03	Pa-234	->	U-234		
67.6758	1.46E-08	Th-230	->	Ra-226		
69.9	3.72E-02	Pa-234	->	U-234		
70.832	5.54E-18	Hg-206	->	Tl-206		
72.803	1.60E-14	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
72.873	9.31E-18	Hg-206	->	Tl-206		
73.9	1.76E-03	Pa-234m	->	Pa-234		
74	5.30E+00	Th-234	->	Pa-234m		

74.814	1.77E-10	Pb-214	->	Bi-214		
74.969	2.62E-14	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
76.838	1.57E-11	Bi-214	->	Po-214		
77.107	2.99E-10	Pb-214	->	Bi-214		
79.29	2.63E-11	Bi-214	->	Po-214		
79.65	4.37E-02	Pa-234	->	U-234		
81	1.14E-14	Tl-210	->	Pb-210		
81.067	4.83E-12	Ra-226	->	Rn-222		
82.434	3.33E-18	Hg-206	->	Tl-206		
83.31	8.71E+00	Th-234	->	Pa-234m		
83.787	8.02E-12	Ra-226	->	Rn-222		
84.789	9.35E-15	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
85.185	9.31E-19	Hg-206	->	Tl-206		
87.02	9.08E-01	Th-234	->	Pa-234m		
87.19	1.05E-10	Pb-214	->	Bi-214		
87.632	2.68E-15	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
89.639	9.37E-12	Bi-214	->	Po-214		
90.128	3.12E-11	Pb-214	->	Bi-214		
92.279	9.95E-01	Th-234	->	Pa-234m		
92.35	3.38E+02	Th-234	->	Pa-234m		
92.673	2.85E-12	Bi-214	->	Po-214		
92.78	3.35E+02	Th-234	->	Pa-234m		
94.651	2.16E+01	Pa-234	->	U-234,	Pa-234m	-> U-234
94.677	2.83E-12	Ra-226	->	Rn-222		
95	2.28E-14	Tl-210	->	Pb-210		
95.863	1.62E+00	Th-234	->	Pa-234m		
97.907	9.04E-13	Ra-226	->	Rn-222		
98.434	3.43E+01	Pa-234	->	U-234,	Pa-234m	-> U-234
99.852	8.35E-01	Pa-234	->	U-234,	Pa-234m	-> U-234
103.35	4.35E-01	Th-234	->	Pa-234m		
103.7	1.94E-02	Pa-234	->	U-234		
103.71	7.46E-01	Th-234	->	Pa-234m		
108	7.34E-01	Th-234	->	Pa-234m		
108.166	6.22E-01	Th-234	->	Pa-234m		
109.97	2.29E-12	Th-230	->	Ra-226		
110.5	2.99E+00	U-238	->	Th-234		
111.025	1.26E+01	Pa-234	->	U-234,	Pa-234m	-> U-234
111.897	1.99E-01	Th-234	->	Pa-234m		
112.8	3.01E+01	Th-234	->	Pa-234m		
114.866	4.32E+00	Pa-234	->	U-234,	Pa-234m	-> U-234
120.912	7.06E-05	U-234	->	Th-230		
125.53	1.62E-01	Pa-234	->	U-234		
131.31	3.56E+00	Pa-234	->	U-234		
134.3	3.40E-02	Pa-234	->	U-234		
137.4	1.60E-12	Pb-214	->	Bi-214		

137.7	2.43E-02	Pa-234	->	U-234	
140.15	2.89E-01	Pa-234	->	U-234,	Pa-234m -> U-234
141.3	1.06E-12	Pb-214	->	Bi-214	
143.876	1.89E-09	Th-230	->	Ra-226	
143.9	5.66E-02	Pa-234	->	U-234	
150	3.23E-02	Pa-234	->	U-234	
152.76	1.03E+00	Pa-234	->	U-234	
157.96	1.13E-01	Pa-234	->	U-234	
165.8	1.46E-02	Pa-234	->	U-234	
170.75	8.08E-02	Pa-234	->	U-234	
174.52	3.23E-02	Pa-234	->	U-234	
184.6	1.91E-01	Pa-234m	->	U-234	
184.8	1.49E+00	Th-234	->	Pa-234m	
185.92	3.23E-01	Pa-234	->	U-234	
186.057	3.42E-10	Th-230	->	Ra-226	
186.11	9.01E-11	Ra-226	->	Rn-222	
192.74	8.57E-03	Pa-234m	->	U-234	
193.4	6.99E-02	Pa-234m	->	U-234	
193.55	9.70E-02	Pa-234	->	U-234	
196.3	1.33E-12	Pb-214	->	Bi-214	
196.43	1.13E-02	Pa-234	->	U-234	
199.46	1.41E-01	Pa-234	->	U-234,	Pa-234m -> U-234
200.96	1.78E-01	Pa-234	->	U-234	
203.12	3.36E-01	Pa-234	->	U-234,	Pa-234m -> U-234
205.1	1.94E-13	Th-230	->	Ra-226	
210.6	1.46E-01	Pa-234m	->	U-234	
210.7	8.08E-03	Pa-234	->	U-234	
219.8	3.23E-02	Pa-234	->	U-234	
226.95	2.01E+00	Pa-234	->	U-234	
235.01	3.14E-13	Th-230	->	Ra-226	
236.03	4.72E-03	Pa-234m	->	U-234	
241.92	2.03E-10	Pb-214	->	Bi-214	
243.5	5.56E-01	Pa-234m	->	U-234	
245.16	1.46E-01	Pa-234	->	U-234	
247.7	8.29E-02	Pa-234m	->	U-234	
248.94	3.52E-01	Pa-234	->	U-234	
253.732	4.31E-10	Th-230	->	Ra-226	
253.84	3.30E-11	Th-230	->	Ra-226	
258.26	9.07E+00	Pa-234m	->	U-234	
258.94	1.49E-11	Pb-214	->	Bi-214	
262.41	1.48E-13	Ra-226	->	Rn-222	
266.15	5.21E-23	Bi-210	->	Tl-206	
267.1	2.75E-02	Pa-234	->	U-234	
272.2	2.24E-01	Pa-234	->	U-234	
273.7	4.89E-12	Bi-214	->	Po-214	
274.45	8.83E-02	Pa-234	->	U-234,	Pa-234m -> U-234

274.56	8.69E-12	Pb-214	->	Bi-214	
276.83	7.69E-02	Pa-234	->	U-234,	Pa-234m -> U-234
278.1	1.13E-02	Pa-234	->	U-234	
280.93	2.20E-12	Bi-214	->	Po-214	
286.4	2.26E-02	Pa-234	->	U-234	
286.9	8.69E-13	Bi-214	->	Po-214	
289.25	1.78E-02	Pa-234	->	U-234	
293.874	6.09E-01	Pa-234	->	U-234	
295.091	5.22E-10	Pb-214	->	Bi-214	
298.1	4.52E-13	Tl-210	->	Pb-210,	Po-214 -> Pb-210
299.08	6.99E-02	Pa-234m	->	U-234	
302.25	5.99E-17	Hg-206	->	Tl-206	
304.42	9.23E-13	Bi-214	->	Po-214	
305.5	6.25E-13	Pb-214	->	Bi-214	
309.6	1.62E-02	Pa-234	->	U-234	
311	5.73E-02	Pa-234m	->	U-234	
313.83	4.85E-02	Pa-234	->	U-234	
314.2	2.15E-12	Pb-214	->	Bi-214	
316.29	3.53E-02	Pa-234	->	U-234,	Pa-234m -> U-234
320.7	1.94E-02	Pa-234	->	U-234	
324.3	5.43E-13	Pb-214	->	Bi-214	
330	4.85E-02	Pa-234	->	U-234	
330.62	9.70E-02	Pa-234	->	U-234	
333.6	2.58E-12	Bi-214	->	Po-214	
334.9	1.55E-12	Bi-214	->	Po-214	
338.4	1.26E-01	Pa-234m	->	U-234	
338.5	1.06E-12	Bi-214	->	Po-214	
344.96	1.15E-18	Hg-206	->	Tl-206	
347.1	1.63E-12	Bi-214	->	Po-214	
351.87	1.01E-09	Pb-214	->	Bi-214	
352.16	9.70E-02	Pa-234	->	U-234	
354	2.28E-14	Tl-210	->	Pb-210	
357.9	8.89E-02	Pa-234m	->	U-234	
360.8	7.63E-02	Pa-234m	->	U-234	
364.2	1.71E-13	Bi-214	->	Po-214	
369.52	5.47E-01	Pa-234	->	U-234	
372.02	2.86E-01	Pa-234	->	U-234	
376.6	1.33E-13	Bi-214	->	Po-214	
380	1.71E-14	Tl-210	->	Pb-210	
384.06	8.43E-21	Hg-206	->	Tl-206	
386.834	9.77E-12	Bi-214	->	Po-214	
387.8	1.11E-01	Pa-234m	->	U-234	
387.87	4.77E-02	Pa-234m	->	U-234	
388.95	1.11E-11	Bi-214	->	Po-214	
394	2.44E-13	Bi-214	->	Po-214	
396	8.15E-13	Bi-214	->	Po-214	
405.73	4.53E-12	Bi-214	->	Po-214	
409.8	6.47E-02	Pa-234	->	U-234	

414.72	1.07E-14	Ra-226	->	Rn-222
416	1.62E-02	Pa-234	->	U-234
426.5	2.99E-12	Bi-214	->	Po-214
426.8	9.70E-02	Pa-234	->	U-234
432.8	1.78E-03	Pa-234	->	U-234
440.4	7.87E-13	Bi-214	->	Po-214
446.1	1.94E-02	Pa-234	->	U-234
449.5	7.42E-15	Ra-226	->	Rn-222
450.96	3.35E-01	Pa-234m	->	U-234
453.58	2.36E-01	Pa-234m	->	U-234
454.832	8.63E-12	Bi-214	->	Po-214
454.97	4.48E-08	U-234	->	Th-230
456.5	7.95E-02	Pa-234m	->	U-234
458.63	2.49E-01	Pa-234	->	U-234
461.3	2.59E-02	Pa-234	->	U-234
462.05	4.62E-12	Pb-214	->	Bi-214
467.5	5.66E-02	Pa-234	->	U-234
468.21	2.29E-01	Pa-234m	->	U-234
469.76	3.61E-12	Bi-214	->	Po-214
470.8	2.72E-13	Pb-214	->	Bi-214
472.32	3.88E-02	Pa-234	->	U-234
473.5	2.91E-02	Pa-234	->	U-234
474.51	3.20E-12	Bi-214	->	Po-214
475.75	2.86E-01	Pa-234m	->	U-234
478	1.14E-14	Tl-210	->	Pb-210
478.7	4.85E-02	Pa-234	->	U-234
480.32	9.18E-12	Pb-214	->	Bi-214
480.4	6.47E-02	Pa-234	->	U-234
482.5	4.85E-02	Pa-234	->	U-234
487.13	1.19E-11	Pb-214	->	Bi-214
494.6	2.44E-13	Bi-214	->	Po-214
498.8	1.62E-02	Pa-234	->	U-234
502.2	4.89E-13	Bi-214	->	Po-214
503.53	1.72E-09	U-234	->	Th-230
506.69	2.60E-01	Pa-234	->	U-234
507.3	1.75E-01	Pa-234m	->	U-234
508.2	2.53E-08	U-234	->	Th-230
509.11	2.38E-01	Pa-234m	->	U-234
510	1.90E-12	Rn-222	->	Po-218
511	7.88E-13	Pb-214	->	Bi-214
513.6	2.10E-01	Pa-234	->	U-234
516.8	1.86E-03	Pa-234m	->	U-234
520.2	9.70E-02	Pa-234	->	U-234
520.4	1.55E-13	Bi-214	->	Po-214
521.09	1.46E-01	Pa-234	->	U-234
525	4.34E-13	Bi-214	->	Po-214
527.04	9.70E-02	Pa-234	->	U-234
533.2	3.23E-02	Pa-234	->	U-234
533.5	5.16E-12	Pb-214	->	Bi-214
536.93	1.93E-12	Bi-214	->	Po-214

537.1	2.59E-02	Pa-234	->	U-234
538.7	1.33E-13	Pb-214	->	Bi-214
542.84	2.31E-12	Bi-214	->	Po-214
543.91	6.25E-13	Pb-214	->	Bi-214
543.98	4.47E-01	Pa-234m	->	U-234
547.1	8.69E-13	Bi-214	->	Po-214
551.8	3.92E-14	Th-230	->	Ra-226
557.3	7.95E-02	Pa-234m	->	U-234
557.7	4.47E-03	Pa-234m	->	U-234
557.78	4.20E-02	Pa-234	->	U-234
565.2	2.26E-01	Pa-234	->	U-234
569.3	2.52E+00	Pa-234	->	U-234
570.5	1.16E-13	Th-230	->	Ra-226
572	9.69E-02	Pa-234m	->	U-234
572.67	2.23E-12	Bi-214	->	Po-214
574.8	3.23E-01	Pa-234	->	U-234
580.06	9.89E-12	Pb-214	->	Bi-214
581.78	2.07E-08	U-234	->	Th-230
585.8	2.43E-02	Pa-234	->	U-234
596	3.26E-13	Bi-214	->	Po-214
600.83	1.68E-14	Ra-226	->	Rn-222
602.1	1.46E-01	Pa-234	->	U-234
609.311	1.25E-09	Bi-214	->	Po-214
611.5	1.29E-01	Pa-234	->	U-234
615.77	1.90E-12	Bi-214	->	Po-214
617	3.23E-02	Pa-234	->	U-234
617.1	9.23E-13	Bi-214	->	Po-214
620	3.92E-14	Th-230	->	Ra-226
624.31	1.29E-01	Pa-234	->	U-234
624.44	1.38E-09	U-234	->	Th-230
625.5	1.59E-01	Pa-234m	->	U-234
626.4	1.33E-13	Bi-214	->	Po-214
627.5	1.29E-01	Pa-234	->	U-234
631.2	4.62E-13	Bi-214	->	Po-214
632	6.47E-02	Pa-234	->	U-234
633.14	1.63E-12	Bi-214	->	Po-214
634.4	4.85E-02	Pa-234	->	U-234
639.36	8.42E-13	Bi-214	->	Po-214
639.7	3.23E-02	Pa-234	->	U-234
643.2	3.23E-02	Pa-234	->	U-234
646.84	4.85E-02	Pa-234	->	U-234
647.7	1.75E-01	Pa-234m	->	U-234
649.1	1.19E-01	Pa-234m	->	U-234
649.18	1.60E-12	Bi-214	->	Po-214
650.21	5.54E-18	Hg-206	->	Tl-206
653.57	1.00E-01	Pa-234	->	U-234
655	6.69E-02	Pa-234	->	U-234
655.1	1.06E-01	Pa-234m	->	U-234
658	1.46E-01	Pa-234	->	U-234
660.6	4.85E-02	Pa-234	->	U-234

660.75	1.17E-12	Bi-214	->	Po-214	
664.8	2.10E-01	Pa-234	->	U-234	
665.442	4.24E-11	Bi-214	->	Po-214	
666.42	1.87E-01	Pa-234	->	U-234	
668	1.14E-14	Tl-210	->	Pb-210	
669.64	2.11E-01	Pa-234	->	U-234	
674.24	7.15E-02	Pa-234m	->	U-234	
677.67	1.72E-09	U-234	->	Th-230	
683	6.36E-02	Pa-234m	->	U-234	
683.21	2.14E-12	Bi-214	->	Po-214	
683.3	3.88E-02	Pa-234	->	U-234	
687.7	1.63E-13	Bi-214	->	Po-214	
688.08	4.53E-02	Pa-234	->	U-234	
691.08	1.12E+00	Pa-234m	->	U-234	
692.7	2.43E-01	Pa-234	->	U-234	
693.3	1.63E-13	Bi-214	->	Po-214	
695.9	1.75E-01	Pa-234m	->	U-234	
697.89	1.00E-12	Bi-214	->	Po-214	
698.85	6.55E-01	Pa-234	->	U-234	
700.4	7.84E-02	Pa-234m	->	U-234	
702.05	8.82E-01	Pa-234m	->	U-234	
703.07	1.28E-11	Bi-214	->	Po-214	
705.9	8.08E-01	Pa-234	->	U-234,	Pa-234m -> U-234
708.4	1.28E-01	Pa-234	->	U-234,	Pa-234m -> U-234
710.84	2.03E-12	Bi-214	->	Po-214	
711.2	3.23E-02	Pa-234	->	U-234	
713.8	2.59E-02	Pa-234	->	U-234	
718.94	3.85E-03	Pa-234m	->	U-234	
719.856	1.09E-11	Bi-214	->	Po-214	
721.33	3.60E-03	Pa-234m	->	U-234	
723.32	1.22E-12	Bi-214	->	Po-214	
727.8	4.26E-13	Bi-214	->	Po-214	
732.7	1.45E-01	Pa-234m	->	U-234	
733.38	1.43E+00	Pa-234	->	U-234	
733.64	1.28E-12	Bi-214	->	Po-214	
738.88	2.61E-01	Pa-234	->	U-234	
739.95	1.47E+00	Pa-234m	->	U-234	
740.87	1.06E-12	Bi-214	->	Po-214	
742.817	1.18E+01	Pa-234	->	U-234,	Pa-234m -> U-234
746.5	2.10E-02	Pa-234	->	U-234	
750.5	2.24E-03	Pa-234m	->	U-234	
752.843	3.61E-12	Bi-214	->	Po-214	
755	2.61E-01	Pa-234	->	U-234	
760.1	2.59E-02	Pa-234	->	U-234	
760.3	1.75E-01	Pa-234m	->	U-234	
765.9	2.15E-12	Pb-214	->	Bi-214	
766.369	4.85E-02	Pa-234	->	U-234	

766.412	4.00E+01	Pa-234	->	U-234,	Pa-234m	->	U-234
768.35	1.32E-10	Bi-214	->	Po-214			
768.5	9.05E-02	Pa-234	->	U-234			
777.9	3.23E-02	Pa-234	->	U-234			
780.4	1.78E-01	Pa-234	->	U-234			
782.8	8.42E-01	Pa-234m	->	U-234			
783.38	8.87E-02	Pa-234	->	U-234,	Pa-234m	->	U-234
785.827	2.96E-11	Pb-214	->	Bi-214			
786.287	6.88E+00	Pa-234	->	U-234,	Pa-234m	->	U-234
786.42	8.42E-12	Bi-214	->	Po-214			
793.6	2.43E-01	Pa-234	->	U-234			
796.42	6.72E-01	Pa-234	->	U-234			
797.88	8.46E-13	Tl-210	->	Pb-210,	Po-214	->	Pb-210
799.75	1.11E-12	Bi-214	->	Po-214			
803.13	6.76E-16	Tl-206	->	Pb-206,	Po-210	->	Pb-206
804.52	6.47E-02	Pa-234	->	U-234			
805.74	1.09E+00	Pa-234	->	U-234,	Pa-234m	->	U-234
806.155	3.34E-11	Bi-214	->	Po-214			
808.2	3.23E-01	Pa-234	->	U-234,	Pa-234m	->	U-234
812.5	8.08E-02	Pa-234	->	U-234			
814.87	1.09E-12	Bi-214	->	Po-214			
818	1.11E-01	Pa-234m	->	U-234			
819.21	4.60E-01	Pa-234	->	U-234			
821.166	4.07E-12	Bi-214	->	Po-214			
824.94	8.46E-01	Pa-234	->	U-234			
826.08	1.57E-01	Pa-234m	->	U-234			
826.44	2.50E-12	Bi-214	->	Po-214			
831.39	9.70E-01	Pa-234	->	U-234			
832.34	6.24E-13	Bi-214	->	Po-214			
838.999	1.59E-11	Pb-214	->	Bi-214			
842.4	2.26E-02	Pa-234	->	U-234			
844.4	2.02E-01	Pa-234	->	U-234,	Pa-234m	->	U-234
847.2	4.62E-13	Bi-214	->	Po-214			
851.57	8.70E-01	Pa-234	->	U-234,	Pa-234m	->	U-234
860	3.93E-14	Tl-210	->	Pb-210			
866.98	1.19E-01	Pa-234m	->	U-234			
873.4	1.94E-02	Pa-234	->	U-234			
875.94	5.22E-01	Pa-234	->	U-234			
880.45	2.64E+00	Pa-234	->	U-234			
881.1	4.29E-01	Pa-234m	->	U-234			
882.5	2.07E-01	Pa-234m	->	U-234			
883.22	2.62E+00	Pa-234	->	U-234,	Pa-234m	->	U-234
887.28	8.82E-01	Pa-234m	->	U-234			

898.52	7.34E-01	Pa-234	->	U-234	
904.33	2.85E-12	Bi-214	->	Po-214	
904.38	8.08E-02	Pa-234	->	U-234	
908	1.71E-14	Tl-210	->	Pb-210	
915.8	6.24E-13	Bi-214	->	Po-214	
920	6.47E-02	Pa-234	->	U-234	
921.7	1.58E+00	Pa-234m	->	U-234	
924.98	1.77E+00	Pa-234	->	U-234	
926.61	2.39E+00	Pa-234	->	U-234,	Pa-234m -> U-234
934.039	8.58E-11	Bi-214	->	Po-214	
936.8	2.07E-01	Pa-234m	->	U-234	
941.94	3.11E-01	Pa-234m	->	U-234	
943.3	4.62E-13	Bi-214	->	Po-214	
945.9	4.16E+00	Pa-234	->	U-234,	Pa-234m -> U-234
948	1.29E+00	Pa-234	->	U-234	
959.8	9.54E-02	Pa-234m	->	U-234	
960	1.62E-02	Pa-234	->	U-234	
964.07	1.04E-11	Bi-214	->	Po-214	
967.33	9.70E-02	Pa-234	->	U-234	
976.2	6.24E-13	Bi-214	->	Po-214	
978.8	1.62E-01	Pa-234	->	U-234	
980.42	5.60E-01	Pa-234	->	U-234	
984.12	3.07E-01	Pa-234	->	U-234	
989.2	3.26E-13	Bi-214	->	Po-214	
994.93	7.08E-01	Pa-234m	->	U-234	
1000.99	1.04E+02	Pa-234m	->	U-234	
1013.4	2.72E-13	Bi-214	->	Po-214	
1020.5	3.26E-13	Bi-214	->	Po-214	
1022.23	9.70E-02	Pa-234	->	U-234	
1029.03	1.29E-01	Pa-234	->	U-234	
1032.22	2.61E-12	Bi-214	->	Po-214	
1038	4.62E-13	Bi-214	->	Po-214	
1041.7	1.49E-01	Pa-234m	->	U-234	
1044.9	8.08E-02	Pa-234	->	U-234	
1045.4	7.87E-13	Bi-214	->	Po-214	
1051.95	8.55E-12	Bi-214	->	Po-214	
1059.72	1.22E-01	Pa-234m	->	U-234	
1061.86	2.86E-01	Pa-234m	->	U-234	
1067.3	7.87E-13	Bi-214	->	Po-214	
1068	6.84E-14	Tl-210	->	Pb-210	
1070.02	7.74E-12	Bi-214	->	Po-214	
1074.6	4.04E-02	Pa-234	->	U-234	
1084.25	1.49E-01	Pa-234	->	U-234,	Pa-234m -> U-234
1085.37	5.56E-02	Pa-234m	->	U-234	
1103.7	2.72E-12	Bi-214	->	Po-214	
1104.766	2.17E-12	Bi-214	->	Po-214	
1108.5	4.85E-02	Pa-234	->	U-234	

1110	3.93E-14	Tl-210	->	Pb-210	
1120.273	4.07E-10	Bi-214	->	Po-214	
1120.5	1.91E-01	Pa-234m	->	U-234	
1122.09	8.08E-02	Pa-234	->	U-234	
1124.93	5.22E-01	Pa-234m	->	U-234	
1126.17	2.36E-01	Pa-234	->	U-234,	Pa-234m -> U-234
1130.6	1.22E-12	Bi-214	->	Po-214	
1133.65	6.92E-12	Bi-214	->	Po-214	
1153.6	4.85E-02	Pa-234	->	U-234	
1155.183	4.59E-11	Bi-214	->	Po-214	
1171.3	3.88E-02	Pa-234	->	U-234	
1172.93	1.57E-12	Bi-214	->	Po-214	
1173.04	1.57E-12	Bi-214	->	Po-214	
1174.1	2.13E-01	Pa-234m	->	U-234	
1193.69	1.68E+00	Pa-234m	->	U-234	
1207.764	1.25E-11	Bi-214	->	Po-214	
1208	4.85E-02	Tl-210	->	Pb-210,	Pa-234 -> U-234
1216.4	5.98E-02	Pa-234	->	U-234	
1220.37	1.12E-01	Pa-234m	->	U-234	
1226.8	7.33E-13	Bi-214	->	Po-214	
1229	4.85E-02	Pa-234	->	U-234	
1230.84	5.97E-13	Bi-214	->	Po-214	
1237.24	6.58E-01	Pa-234m	->	U-234	
1238.107	1.61E-10	Bi-214	->	Po-214	
1241.4	8.08E-02	Pa-234	->	U-234	
1251	4.85E-02	Pa-234	->	U-234	
1277.4	3.23E-02	Pa-234	->	U-234	
1280.952	3.99E-11	Bi-214	->	Po-214	
1292.66	1.12E-01	Pa-234	->	U-234	
1303.76	3.29E-12	Bi-214	->	Po-214	
1314	1.20E-13	Tl-210	->	Pb-210	
1317.02	2.34E-12	Bi-214	->	Po-214	
1330	2.99E-13	Bi-214	->	Po-214	
1341.5	6.24E-13	Bi-214	->	Po-214	
1352.85	1.88E-01	Pa-234	->	U-234	
1353	4.79E-02	Bi-214	->	Po-214,	Pa-234m -> U-234
1358.5	1.94E-02	Pa-234	->	U-234	
1377.659	1.09E-10	Bi-214	->	Po-214	
1385.295	2.12E-11	Bi-214	->	Po-214	
1392	2.86E-01	Pa-234m	->	U-234	
1392.5	5.16E-13	Bi-214	->	Po-214	
1393.57	4.85E-01	Pa-234	->	U-234	
1399.7	3.72E-02	Pa-234	->	U-234	
1401.48	3.77E-11	Bi-214	->	Po-214	
1407.97	6.73E-11	Bi-214	->	Po-214	
1408	2.79E-14	Tl-210	->	Pb-210	
1413.88	2.86E-01	Pa-234m	->	U-234	
1419.7	1.38E-13	Bi-214	->	Po-214	

1427.33	3.23E-02	Pa-234	->	U-234
1434.13	1.20E+00	Pa-234m	->	U-234
1445.7	6.47E-02	Pa-234	->	U-234
1452.63	1.49E-01	Pa-234	->	U-234
1457.4	2.07E-01	Pa-234m	->	U-234
1460	4.85E-02	Pa-234	->	U-234
1471.1	3.26E-13	Bi-214	->	Po-214
1479.19	1.87E-12	Bi-214	->	Po-214
1493.94	3.23E-02	Pa-234	->	U-234
1500.9	1.43E-01	Pa-234m	->	U-234
1509.22	5.95E-11	Bi-214	->	Po-214
1510.2	1.60E+00	Pa-234m	->	U-234
1516	6.47E-02	Pa-234	->	U-234
1527.27	2.98E-01	Pa-234m	->	U-234
1538	1.14E-14	Tl-210	->	Pb-210
1538.49	1.11E-11	Bi-214	->	Po-214
1543.347	9.50E-12	Bi-214	->	Po-214
1548.12	1.74E-01	Pa-234m	->	U-234
1549.4	1.62E-02	Pa-234	->	U-234
1553.74	1.01E+00	Pa-234m	->	U-234
1558.7	8.58E-02	Pa-234m	->	U-234
1570.67	1.37E-01	Pa-234m	->	U-234
1580.02	2.75E-02	Pa-234	->	U-234
1583.22	1.95E-11	Bi-214	->	Po-214
1585.3	4.04E-02	Pa-234	->	U-234
1588	1.14E-14	Tl-210	->	Pb-210
1591.65	2.36E-01	Pa-234m	->	U-234
1593.88	3.36E-01	Pa-234	->	U-234
1594.78	7.20E-12	Bi-214	->	Po-214
1599.3	9.07E-12	Bi-214	->	Po-214
1602.2	4.61E-02	Pa-234m	->	U-234
1627.9	2.43E-02	Pa-234	->	U-234
1636.6	5.16E-13	Bi-214	->	Po-214
1637.37	1.90E-12	Bi-214	->	Po-214
1638	6.47E-02	Pa-234	->	U-234
1648	1.14E-14	Tl-210	->	Pb-210
1656	2.43E-02	Pa-234	->	U-234
1661.258	3.12E-11	Bi-214	->	Po-214
1667.3	9.22E-02	Pa-234m	->	U-234
1668.44	1.49E-01	Pa-234	->	U-234
1683.99	6.41E-12	Bi-214	->	Po-214
1686.2	8.08E-02	Pa-234	->	U-234
1693.7	5.08E-02	Pa-234m	->	U-234
1694.08	1.62E-01	Pa-234	->	U-234
1699.8	2.43E-02	Pa-234	->	U-234
1719.5	3.23E-03	Pa-234	->	U-234
1720.5	3.65E-02	Pa-234m	->	U-234
1729.58	8.28E-11	Bi-214	->	Po-214
1732.2	2.07E-01	Pa-234m	->	U-234
1737.73	2.63E+00	Pa-234m	->	U-234

1738	1.62E-02	Pa-234	->	U-234
1741.7	1.62E-02	Pa-234	->	U-234
1750.1	8.08E-03	Pa-234	->	U-234
1756	4.04E-02	Pa-234	->	U-234
1759.81	1.74E-01	Pa-234m	->	U-234
1764.49	4.32E-10	Bi-214	->	Po-214
1765.44	1.08E+00	Pa-234m	->	U-234
1768	9.70E-03	Pa-234	->	U-234
1772.3	1.62E-02	Pa-234	->	U-234
1782.1	4.34E-13	Bi-214	->	Po-214
1796.2	3.49E-02	Pa-234m	->	U-234
1797.3	4.85E-02	Pa-234	->	U-234
1809.04	4.60E-01	Pa-234m	->	U-234
1814.01	3.26E-13	Bi-214	->	Po-214
1819.69	1.12E-01	Pa-234m	->	U-234
1828	4.85E-03	Pa-234	->	U-234
1831.36	2.14E+00	Pa-234m	->	U-234
1837.9	9.70E-03	Pa-234	->	U-234
1838.37	1.04E-11	Bi-214	->	Po-214
1847.41	5.76E-11	Bi-214	->	Po-214
1850	8.08E-03	Pa-234	->	U-234
1863.09	1.49E-01	Pa-234m	->	U-234
1867.68	1.14E+00	Pa-234m	->	U-234
1872.8	1.13E-02	Pa-234	->	U-234
1873.112	6.14E-12	Bi-214	->	Po-214
1874.85	1.02E+00	Pa-234m	->	U-234
1877.21	2.05E-01	Pa-234m	->	U-234
1890.1	3.07E-02	Pa-234	->	U-234
1890.259	2.42E-12	Bi-214	->	Po-214
1893.5	2.73E-01	Pa-234m	->	U-234
1896.28	4.81E-12	Bi-214	->	Po-214
1897.1	2.43E-02	Pa-234	->	U-234
1898.9	1.71E-12	Bi-214	->	Po-214
1905	4.53E-02	Pa-234	->	U-234
1911.17	7.83E-01	Pa-234m	->	U-234
1926	3.86E-02	Pa-234	->	U-234
1926.4	2.36E-02	Pa-234m	->	U-234
1935.8	1.38E-12	Bi-214	->	Po-214
1937.01	3.60E-01	Pa-234m	->	U-234
1937.7	8.08E-03	Pa-234	->	U-234
1959	1.62E-04	Pa-234	->	U-234
1969.9	6.20E-02	Pa-234m	->	U-234
1988	3.23E-04	Pa-234	->	U-234
1994.7	1.36E-13	Bi-214	->	Po-214
1998	1.62E-04	Pa-234	->	U-234
2004.5	7.87E-14	Bi-214	->	Po-214
2008	3.93E-14	Tl-210	->	Pb-210
2010.79	1.33E-12	Bi-214	->	Po-214
2021.7	5.16E-13	Bi-214	->	Po-214
2052.93	1.90E-12	Bi-214	->	Po-214

2085	2.72E-13	Bi-214	->	Po-214
2088	2.79E-14	Tl-210	->	Pb-210
2089.55	1.52E-12	Bi-214	->	Po-214
2109.91	2.36E-12	Bi-214	->	Po-214
2118.53	3.29E-11	Bi-214	->	Po-214
2147.8	4.34E-13	Bi-214	->	Po-214
2192.52	1.66E-12	Bi-214	->	Po-214
2204.09	1.35E-10	Bi-214	->	Po-214
2251.2	1.90E-13	Bi-214	->	Po-214
2259.7	2.44E-13	Bi-214	->	Po-214
2266.67	4.89E-13	Bi-214	->	Po-214
2268	1.71E-14	Tl-210	->	Pb-210
2270	7.87E-14	Bi-214	->	Po-214
2284.4	1.38E-13	Bi-214	->	Po-214
2293.29	8.80E-12	Bi-214	->	Po-214
2324.8	5.16E-14	Bi-214	->	Po-214
2331.2	5.97E-13	Bi-214	->	Po-214
2358	4.56E-14	Tl-210	->	Pb-210
2360.9	5.16E-14	Bi-214	->	Po-214
2369.3	7.87E-14	Bi-214	->	Po-214
2376.99	3.20E-13	Bi-214	->	Po-214
2390.9	5.43E-14	Bi-214	->	Po-214
2423.32	1.60E-13	Bi-214	->	Po-214
2428	5.13E-14	Tl-210	->	Pb-210
2447.68	4.21E-11	Bi-214	->	Po-214
2482.417	5.70E-14	Bi-214	->	Po-214
2505.58	1.60E-13	Bi-214	->	Po-214
2551	1.06E-14	Bi-214	->	Po-214
2604.5	1.22E-14	Bi-214	->	Po-214
2631	2.44E-14	Bi-214	->	Po-214
2662.23	7.87E-15	Bi-214	->	Po-214
2694.67	8.80E-13	Bi-214	->	Po-214
2698.86	7.60E-14	Bi-214	->	Po-214
2719.21	4.89E-14	Bi-214	->	Po-214
2769.99	6.95E-13	Bi-214	->	Po-214
2786.09	1.60E-13	Bi-214	->	Po-214
2827	6.79E-14	Bi-214	->	Po-214
2860.9	9.23E-15	Bi-214	->	Po-214
2880.4	2.50E-13	Bi-214	->	Po-214
2893.59	1.74E-13	Bi-214	->	Po-214
2922.09	4.26E-13	Bi-214	->	Po-214
2928.7	3.26E-14	Bi-214	->	Po-214
2934.9	1.55E-14	Bi-214	->	Po-214
2940.5	4.62E-14	Bi-214	->	Po-214
2978.79	3.99E-13	Bi-214	->	Po-214
2988.7	2.99E-14	Bi-214	->	Po-214
2999.99	2.39E-13	Bi-214	->	Po-214
3053.89	6.14E-13	Bi-214	->	Po-214
3081.7	1.17E-13	Bi-214	->	Po-214
3093.9	1.38E-14	Bi-214	->	Po-214

3136.3	9.23E-15	Bi-214	->	Po-214
3142.6	4.34E-14	Bi-214	->	Po-214
3160.5	1.38E-14	Bi-214	->	Po-214
3183.6	4.07E-14	Bi-214	->	Po-214
3233.3	5.43E-15	Bi-214	->	Po-214
3269.7	2.72E-15	Bi-214	->	Po-214

U238		Aged 5 years		Sorted by Intensity			
Intensity	Energy	Initial Isotopes and Decays					
ph/s/gm	keV						
5.47E+02	16.572	Th-234	->	Pa-234m			
5.10E+02	16.161	U-238	->	Th-234			
4.85E+02	13.274	Th-234	->	Pa-234m			
4.48E+02	63.288	Th-234	->	Pa-234m			
3.73E+02	12.952	U-238	->	Th-234			
3.38E+02	92.35	Th-234	->	Pa-234m			
3.35E+02	92.78	Th-234	->	Pa-234m			
1.34E+02	19.839	Th-234	->	Pa-234m			
1.16E+02	19.094	U-238	->	Th-234			
1.04E+02	1000.99	Pa-234m	->	U-234			
4.00E+01	766.412	Pa-234	->	U-234,	Pa-234m	->	U-234
3.43E+01	98.434	Pa-234	->	U-234,	Pa-234m	->	U-234
3.01E+01	112.8	Th-234	->	Pa-234m			
2.88E+01	11.372	Th-234	->	Pa-234m,	Pa-234m	->	U-234
2.27E+01	13.6	Pa-234	->	U-234,	Pa-234m	->	U-234
2.24E+01	11.118	U-238	->	Th-234			
2.16E+01	94.651	Pa-234	->	U-234,	Pa-234m	->	U-234
1.46E+01	17.069	Pa-234m	->	U-234			
1.26E+01	111.025	Pa-234	->	U-234,	Pa-234m	->	U-234
1.18E+01	742.817	Pa-234	->	U-234,	Pa-234m	->	U-234
1.03E+01	14.511	U-238	->	Th-234			
9.07E+00	258.26	Pa-234m	->	U-234			
8.71E+00	83.31	Th-234	->	Pa-234m			
8.71E+00	49.55	U-238	->	Th-234			
8.41E+00	17.12	Pa-234	->	U-234			
6.88E+00	786.287	Pa-234	->	U-234,	Pa-234m	->	U-234
6.12E+00	14.953	Th-234	->	Pa-234m,	Pa-234m	->	U-234
5.30E+00	74	Th-234	->	Pa-234m			
4.32E+00	114.866	Pa-234	->	U-234,	Pa-	->	U-234

4.16E+00	945.9	Pa-234	->	U-234,	234m Pa- 234m	->	U-234
3.56E+00	131.31	Pa-234	->	U-234			
3.34E+00	16.547	Pa-234m	->	U-234			
3.18E+00	20.366	Pa-234m	->	U-234			
2.99E+00	110.5	U-238	->	Th-234			
2.88E+00	13.275	Pa-234m	->	U-234			
2.64E+00	880.45	Pa-234	->	U-234			
2.63E+00	1737.73	Pa-234m	->	U-234			
2.62E+00	883.22	Pa-234	->	U-234,	Pa- 234m	->	U-234
2.52E+00	569.3	Pa-234	->	U-234			
2.39E+00	926.61	Pa-234	->	U-234,	Pa- 234m	->	U-234
2.36E+00	62.862	Th-234	->	Pa-234m			
2.14E+00	1831.36	Pa-234m	->	U-234			
2.01E+00	226.95	Pa-234	->	U-234			
1.91E+00	20.309	Pa-234	->	U-234			
1.77E+00	924.98	Pa-234	->	U-234			
1.68E+00	1193.69	Pa-234m	->	U-234			
1.62E+00	95.863	Th-234	->	Pa-234m			
1.60E+00	1510.2	Pa-234m	->	U-234			
1.58E+00	921.7	Pa-234m	->	U-234			
1.49E+00	184.8	Th-234	->	Pa-234m			
1.47E+00	739.95	Pa-234m	->	U-234			
1.43E+00	733.38	Pa-234	->	U-234			
1.39E+00	11.62	Pa-234	->	U-234,	Pa- 234m	->	U-234
1.29E+00	948	Pa-234	->	U-234			
1.24E+00	20.019	Th-234	->	Pa-234m			
1.20E+00	1434.13	Pa-234m	->	U-234			
1.14E+00	1867.68	Pa-234m	->	U-234			
1.12E+00	691.08	Pa-234m	->	U-234			
1.09E+00	805.74	Pa-234	->	U-234,	Pa- 234m	->	U-234
1.08E+00	1765.44	Pa-234m	->	U-234			
1.03E+00	152.76	Pa-234	->	U-234			
1.02E+00	1874.85	Pa-234m	->	U-234			
1.01E+00	1553.74	Pa-234m	->	U-234			
9.95E-01	92.279	Th-234	->	Pa-234m			
9.70E-01	831.39	Pa-234	->	U-234			
9.62E-01	62.78	Pa-234	->	U-234,	Pa- 234m	->	U-234
9.08E-01	87.02	Th-234	->	Pa-234m			
8.82E-01	702.05	Pa-234m	->	U-234			
8.82E-01	887.28	Pa-234m	->	U-234			
8.70E-01	851.57	Pa-234	->	U-234,	Pa- 234m	->	U-234
8.46E-01	824.94	Pa-234	->	U-234			

8.42E-01	782.8	Pa-234m	->	U-234	
8.35E-01	99.852	Pa-234	->	U-234,	Pa-234m -> U-234
8.08E-01	705.9	Pa-234	->	U-234,	Pa-234m -> U-234
7.83E-01	1911.17	Pa-234m	->	U-234	
7.46E-01	103.71	Th-234	->	Pa-234m	
7.34E-01	108	Th-234	->	Pa-234m	
7.34E-01	898.52	Pa-234	->	U-234	
7.08E-01	994.93	Pa-234m	->	U-234	
6.72E-01	796.42	Pa-234	->	U-234	
6.58E-01	1237.24	Pa-234m	->	U-234	
6.55E-01	698.85	Pa-234	->	U-234	
6.22E-01	108.166	Th-234	->	Pa-234m	
6.22E-01	57.75	Th-234	->	Pa-234m	
6.09E-01	293.874	Pa-234	->	U-234	
5.60E-01	980.42	Pa-234	->	U-234	
5.56E-01	243.5	Pa-234m	->	U-234	
5.47E-01	369.52	Pa-234	->	U-234	
5.22E-01	875.94	Pa-234	->	U-234	
5.22E-01	1124.93	Pa-234m	->	U-234	
4.85E-01	1393.57	Pa-234	->	U-234	
4.60E-01	819.21	Pa-234	->	U-234	
4.60E-01	1809.04	Pa-234m	->	U-234	
4.47E-01	543.98	Pa-234m	->	U-234	
4.35E-01	103.35	Th-234	->	Pa-234m	
4.29E-01	881.1	Pa-234m	->	U-234	
3.97E-01	19.891	Pa-234m	->	U-234	
3.67E-01	15.4	Pa-234	->	U-234,	Pa-234m -> U-234
3.60E-01	1937.01	Pa-234m	->	U-234	
3.52E-01	248.94	Pa-234	->	U-234	
3.36E-01	1593.88	Pa-234	->	U-234	
3.36E-01	203.12	Pa-234	->	U-234,	Pa-234m -> U-234
3.35E-01	450.96	Pa-234m	->	U-234	
3.23E-01	574.8	Pa-234	->	U-234	
3.23E-01	185.92	Pa-234	->	U-234	
3.23E-01	808.2	Pa-234	->	U-234,	Pa-234m -> U-234
3.11E-01	941.94	Pa-234m	->	U-234	
3.07E-01	984.12	Pa-234	->	U-234	
2.98E-01	1527.27	Pa-234m	->	U-234	
2.89E-01	140.15	Pa-234	->	U-234,	Pa-234m -> U-234
2.86E-01	1392	Pa-234m	->	U-234	
2.86E-01	372.02	Pa-234	->	U-234	
2.86E-01	475.75	Pa-234m	->	U-234	
2.86E-01	1061.86	Pa-234m	->	U-234	
2.86E-01	1413.88	Pa-234m	->	U-234	

2.73E-01	1893.5	Pa-234m	->	U-234	
2.61E-01	738.88	Pa-234	->	U-234	
2.61E-01	755	Pa-234	->	U-234	
2.60E-01	506.69	Pa-234	->	U-234	
2.49E-01	458.63	Pa-234	->	U-234	
2.43E-01	692.7	Pa-234	->	U-234	
2.43E-01	793.6	Pa-234	->	U-234	
2.38E-01	509.11	Pa-234m	->	U-234	
2.36E-01	453.58	Pa-234m	->	U-234	
2.36E-01	1591.65	Pa-234m	->	U-234	
2.36E-01	1126.17	Pa-234	->	U-234,	Pa-234m -> U-234
2.29E-01	468.21	Pa-234m	->	U-234	
2.26E-01	565.2	Pa-234	->	U-234	
2.24E-01	272.2	Pa-234	->	U-234	
2.13E-01	1174.1	Pa-234m	->	U-234	
2.11E-01	669.64	Pa-234	->	U-234	
2.10E-01	664.8	Pa-234	->	U-234	
2.10E-01	513.6	Pa-234	->	U-234	
2.07E-01	882.5	Pa-234m	->	U-234	
2.07E-01	936.8	Pa-234m	->	U-234	
2.07E-01	1457.4	Pa-234m	->	U-234	
2.07E-01	1732.2	Pa-234m	->	U-234	
2.05E-01	1877.21	Pa-234m	->	U-234	
2.02E-01	844.4	Pa-234	->	U-234,	Pa-234m -> U-234
1.99E-01	111.897	Th-234	->	Pa-234m	
1.91E-01	184.6	Pa-234m	->	U-234	
1.91E-01	1120.5	Pa-234m	->	U-234	
1.88E-01	1352.85	Pa-234	->	U-234	
1.87E-01	666.42	Pa-234	->	U-234	
1.82E-01	29.49	Th-234	->	Pa-234m	
1.78E-01	200.96	Pa-234	->	U-234	
1.78E-01	780.4	Pa-234	->	U-234	
1.75E-01	507.3	Pa-234m	->	U-234	
1.75E-01	647.7	Pa-234m	->	U-234	
1.75E-01	695.9	Pa-234m	->	U-234	
1.75E-01	760.3	Pa-234m	->	U-234	
1.74E-01	1548.12	Pa-234m	->	U-234	
1.74E-01	1759.81	Pa-234m	->	U-234	
1.62E-01	978.8	Pa-234	->	U-234	
1.62E-01	1694.08	Pa-234	->	U-234	
1.62E-01	125.53	Pa-234	->	U-234	
1.59E-01	625.5	Pa-234m	->	U-234	
1.57E-01	826.08	Pa-234m	->	U-234	
1.49E-01	1452.63	Pa-234	->	U-234	
1.49E-01	1668.44	Pa-234	->	U-234	
1.49E-01	1084.25	Pa-234	->	U-234,	Pa-234m -> U-234
1.49E-01	1863.09	Pa-234m	->	U-234	

1.49E-01	1041.7	Pa-234m	->	U-234	
1.46E-01	210.6	Pa-234m	->	U-234	
1.46E-01	602.1	Pa-234	->	U-234	
1.46E-01	658	Pa-234	->	U-234	
1.46E-01	245.16	Pa-234	->	U-234	
1.46E-01	521.09	Pa-234	->	U-234	
1.45E-01	732.7	Pa-234m	->	U-234	
1.43E-01	1500.9	Pa-234m	->	U-234	
1.41E-01	199.46	Pa-234	->	U-234,	Pa-234m -> U-234
1.37E-01	1570.67	Pa-234m	->	U-234	
1.29E-01	624.31	Pa-234	->	U-234	
1.29E-01	627.5	Pa-234	->	U-234	
1.29E-01	611.5	Pa-234	->	U-234	
1.29E-01	1029.03	Pa-234	->	U-234	
1.28E-01	708.4	Pa-234	->	U-234,	Pa-234m -> U-234
1.26E-01	338.4	Pa-234m	->	U-234	
1.22E-01	1059.72	Pa-234m	->	U-234	
1.19E-01	649.1	Pa-234m	->	U-234	
1.19E-01	866.98	Pa-234m	->	U-234	
1.13E-01	157.96	Pa-234	->	U-234	
1.12E-01	1292.66	Pa-234	->	U-234	
1.12E-01	1819.69	Pa-234m	->	U-234	
1.12E-01	1220.37	Pa-234m	->	U-234	
1.11E-01	387.8	Pa-234m	->	U-234	
1.11E-01	818	Pa-234m	->	U-234	
1.06E-01	655.1	Pa-234m	->	U-234	
1.00E-01	653.57	Pa-234	->	U-234	
9.70E-02	1022.23	Pa-234	->	U-234	
9.70E-02	426.8	Pa-234	->	U-234	
9.70E-02	527.04	Pa-234	->	U-234	
9.70E-02	352.16	Pa-234	->	U-234	
9.70E-02	520.2	Pa-234	->	U-234	
9.70E-02	330.62	Pa-234	->	U-234	
9.70E-02	967.33	Pa-234	->	U-234	
9.70E-02	193.55	Pa-234	->	U-234	
9.69E-02	572	Pa-234m	->	U-234	
9.54E-02	959.8	Pa-234m	->	U-234	
9.22E-02	1667.3	Pa-234m	->	U-234	
9.05E-02	768.5	Pa-234	->	U-234	
8.89E-02	357.9	Pa-234m	->	U-234	
8.87E-02	783.38	Pa-234	->	U-234,	Pa-234m -> U-234
8.83E-02	274.45	Pa-234	->	U-234,	Pa-234m -> U-234
8.58E-02	1558.7	Pa-234m	->	U-234	
8.29E-02	247.7	Pa-234m	->	U-234	
8.08E-02	812.5	Pa-234	->	U-234	
8.08E-02	904.38	Pa-234	->	U-234	

8.08E-02	1044.9	Pa-234	->	U-234	
8.08E-02	1122.09	Pa-234	->	U-234	
8.08E-02	170.75	Pa-234	->	U-234	
8.08E-02	1241.4	Pa-234	->	U-234	
8.08E-02	1686.2	Pa-234	->	U-234	
7.95E-02	456.5	Pa-234m	->	U-234	
7.95E-02	557.3	Pa-234m	->	U-234	
7.84E-02	700.4	Pa-234m	->	U-234	
7.69E-02	276.83	Pa-234	->	U-234,	Pa-234m -> U-234
7.63E-02	360.8	Pa-234m	->	U-234	
7.15E-02	674.24	Pa-234m	->	U-234	
6.99E-02	193.4	Pa-234m	->	U-234	
6.99E-02	299.08	Pa-234m	->	U-234	
6.69E-02	655	Pa-234	->	U-234	
6.47E-02	632	Pa-234	->	U-234	
6.47E-02	409.8	Pa-234	->	U-234	
6.47E-02	920	Pa-234	->	U-234	
6.47E-02	480.4	Pa-234	->	U-234	
6.47E-02	1638	Pa-234	->	U-234	
6.47E-02	804.52	Pa-234	->	U-234	
6.47E-02	1516	Pa-234	->	U-234	
6.47E-02	1445.7	Pa-234	->	U-234	
6.36E-02	683	Pa-234m	->	U-234	
6.20E-02	1969.9	Pa-234m	->	U-234	
5.98E-02	1216.4	Pa-234	->	U-234	
5.73E-02	311	Pa-234m	->	U-234	
5.66E-02	143.9	Pa-234	->	U-234	
5.66E-02	467.5	Pa-234	->	U-234	
5.56E-02	1085.37	Pa-234m	->	U-234	
5.08E-02	1693.7	Pa-234m	->	U-234	
4.85E-02	1208	Tl-210	->	Pb-210,	Pa-234 -> U-234
4.85E-02	1229	Pa-234	->	U-234	
4.85E-02	313.83	Pa-234	->	U-234	
4.85E-02	1251	Pa-234	->	U-234	
4.85E-02	766.369	Pa-234	->	U-234	
4.85E-02	330	Pa-234	->	U-234	
4.85E-02	1153.6	Pa-234	->	U-234	
4.85E-02	660.6	Pa-234	->	U-234	
4.85E-02	1460	Pa-234	->	U-234	
4.85E-02	1797.3	Pa-234	->	U-234	
4.85E-02	1108.5	Pa-234	->	U-234	
4.85E-02	634.4	Pa-234	->	U-234	
4.85E-02	482.5	Pa-234	->	U-234	
4.85E-02	646.84	Pa-234	->	U-234	
4.85E-02	478.7	Pa-234	->	U-234	
4.79E-02	1353	Bi-214	->	Po-214,	Pa-234m -> U-234
4.77E-02	387.87	Pa-234m	->	U-234	
4.61E-02	1602.2	Pa-234m	->	U-234	

4.53E-02	1905	Pa-234	->	U-234	
4.53E-02	688.08	Pa-234	->	U-234	
4.37E-02	79.65	Pa-234	->	U-234	
4.20E-02	557.78	Pa-234	->	U-234	
4.04E-02	1585.3	Pa-234	->	U-234	
4.04E-02	1756	Pa-234	->	U-234	
4.04E-02	1074.6	Pa-234	->	U-234	
3.88E-02	472.32	Pa-234	->	U-234	
3.88E-02	1171.3	Pa-234	->	U-234	
3.88E-02	683.3	Pa-234	->	U-234	
3.86E-02	1926	Pa-234	->	U-234	
3.72E-02	69.9	Pa-234	->	U-234	
3.72E-02	1399.7	Pa-234	->	U-234	
3.65E-02	1720.5	Pa-234m	->	U-234	
3.53E-02	316.29	Pa-234	->	U-234,	Pa-234m -> U-234
3.49E-02	1796.2	Pa-234m	->	U-234	
3.40E-02	134.3	Pa-234	->	U-234	
3.23E-02	643.2	Pa-234	->	U-234	
3.23E-02	1493.94	Pa-234	->	U-234	
3.23E-02	617	Pa-234	->	U-234	
3.23E-02	219.8	Pa-234	->	U-234	
3.23E-02	777.9	Pa-234	->	U-234	
3.23E-02	1427.33	Pa-234	->	U-234	
3.23E-02	639.7	Pa-234	->	U-234	
3.23E-02	533.2	Pa-234	->	U-234	
3.23E-02	711.2	Pa-234	->	U-234	
3.23E-02	174.52	Pa-234	->	U-234	
3.23E-02	1277.4	Pa-234	->	U-234	
3.23E-02	150	Pa-234	->	U-234	
3.07E-02	1890.1	Pa-234	->	U-234	
2.91E-02	473.5	Pa-234	->	U-234	
2.75E-02	1580.02	Pa-234	->	U-234	
2.75E-02	267.1	Pa-234	->	U-234	
2.59E-02	713.8	Pa-234	->	U-234	
2.59E-02	760.1	Pa-234	->	U-234	
2.59E-02	461.3	Pa-234	->	U-234	
2.59E-02	537.1	Pa-234	->	U-234	
2.43E-02	1656	Pa-234	->	U-234	
2.43E-02	1897.1	Pa-234	->	U-234	
2.43E-02	585.8	Pa-234	->	U-234	
2.43E-02	1699.8	Pa-234	->	U-234	
2.43E-02	137.7	Pa-234	->	U-234	
2.43E-02	1627.9	Pa-234	->	U-234	
2.36E-02	1926.4	Pa-234m	->	U-234	
2.26E-02	842.4	Pa-234	->	U-234	
2.26E-02	286.4	Pa-234	->	U-234	
2.10E-02	746.5	Pa-234	->	U-234	
1.94E-02	43.47	Pa-234	->	U-234	
1.94E-02	1358.5	Pa-234	->	U-234	

1.94E-02	103.7	Pa-234	->	U-234
1.94E-02	446.1	Pa-234	->	U-234
1.94E-02	873.4	Pa-234	->	U-234
1.94E-02	320.7	Pa-234	->	U-234
1.78E-02	289.25	Pa-234	->	U-234
1.62E-02	416	Pa-234	->	U-234
1.62E-02	960	Pa-234	->	U-234
1.62E-02	1772.3	Pa-234	->	U-234
1.62E-02	309.6	Pa-234	->	U-234
1.62E-02	1741.7	Pa-234	->	U-234
1.62E-02	1738	Pa-234	->	U-234
1.62E-02	498.8	Pa-234	->	U-234
1.62E-02	1549.4	Pa-234	->	U-234
1.46E-02	165.8	Pa-234	->	U-234
1.13E-02	278.1	Pa-234	->	U-234
1.13E-02	196.43	Pa-234	->	U-234
1.13E-02	1872.8	Pa-234	->	U-234
9.70E-03	1768	Pa-234	->	U-234
9.70E-03	1837.9	Pa-234	->	U-234
9.38E-03	67.22	Pa-234	->	U-234
8.57E-03	192.74	Pa-234m	->	U-234
8.08E-03	1937.7	Pa-234	->	U-234
8.08E-03	1750.1	Pa-234	->	U-234
8.08E-03	210.7	Pa-234	->	U-234
8.08E-03	1850	Pa-234	->	U-234
4.85E-03	1828	Pa-234	->	U-234
4.72E-03	236.03	Pa-234m	->	U-234
4.47E-03	557.7	Pa-234m	->	U-234
3.85E-03	718.94	Pa-234m	->	U-234
3.60E-03	721.33	Pa-234m	->	U-234
3.23E-03	1719.5	Pa-234	->	U-234
2.24E-03	750.5	Pa-234m	->	U-234
1.86E-03	516.8	Pa-234m	->	U-234
1.78E-03	432.8	Pa-234	->	U-234
1.78E-03	45.28	Pa-234	->	U-234
1.76E-03	73.9	Pa-234m	->	Pa-234
1.46E-03	58.31	Pa-234	->	U-234
5.82E-04	34.37	Pa-234	->	U-234
3.23E-04	1988	Pa-234	->	U-234
2.05E-04	53.23	U-234	->	Th-230
1.62E-04	1959	Pa-234	->	U-234
1.62E-04	1998	Pa-234	->	U-234
7.06E-05	120.912	U-234	->	Th-230
4.48E-08	454.97	U-234	->	Th-230
2.53E-08	508.2	U-234	->	Th-230
2.07E-08	581.78	U-234	->	Th-230
1.46E-08	67.6758	Th-230	->	Ra-226
1.89E-09	143.876	Th-230	->	Ra-226
1.72E-09	503.53	U-234	->	Th-230
1.72E-09	677.67	U-234	->	Th-230

1.38E-09	624.44	U-234	->	Th-230	
1.25E-09	609.311	Bi-214	->	Po-214	
1.01E-09	351.87	Pb-214	->	Bi-214	
5.22E-10	295.091	Pb-214	->	Bi-214	
4.32E-10	1764.49	Bi-214	->	Po-214	
4.31E-10	253.732	Th-230	->	Ra-226	
4.07E-10	1120.273	Bi-214	->	Po-214	
3.42E-10	186.057	Th-230	->	Ra-226	
2.99E-10	77.107	Pb-214	->	Bi-214	
2.03E-10	241.92	Pb-214	->	Bi-214	
1.77E-10	74.814	Pb-214	->	Bi-214	
1.67E-10	10.828	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
1.61E-10	1238.107	Bi-214	->	Po-214	
1.55E-10	13.088	Pb-214	->	Bi-214	
1.35E-10	2204.09	Bi-214	->	Po-214	
1.32E-10	768.35	Bi-214	->	Po-214	
1.09E-10	1377.659	Bi-214	->	Po-214	
1.05E-10	87.19	Pb-214	->	Bi-214	
9.01E-11	186.11	Ra-226	->	Rn-222	
8.58E-11	934.039	Bi-214	->	Po-214	
8.28E-11	1729.58	Bi-214	->	Po-214	
6.73E-11	1407.97	Bi-214	->	Po-214	
5.95E-11	1509.22	Bi-214	->	Po-214	
5.76E-11	1847.41	Bi-214	->	Po-214	
4.59E-11	1155.183	Bi-214	->	Po-214	
4.24E-11	665.442	Bi-214	->	Po-214	
4.21E-11	2447.68	Bi-214	->	Po-214	
3.99E-11	1280.952	Bi-214	->	Po-214	
3.77E-11	1401.48	Bi-214	->	Po-214	
3.34E-11	806.155	Bi-214	->	Po-214	
3.30E-11	253.84	Th-230	->	Ra-226	
3.29E-11	2118.53	Bi-214	->	Po-214	
3.15E-11	15.439	Pb-214	->	Bi-214	
3.12E-11	90.128	Pb-214	->	Bi-214	
3.12E-11	1661.258	Bi-214	->	Po-214	
2.99E-11	53.172	Pb-214	->	Bi-214	
2.96E-11	785.827	Pb-214	->	Bi-214	
2.63E-11	79.29	Bi-214	->	Po-214	
2.12E-11	1385.295	Bi-214	->	Po-214	
1.95E-11	1583.22	Bi-214	->	Po-214	
1.59E-11	838.999	Pb-214	->	Bi-214	
1.57E-11	76.838	Bi-214	->	Po-214	
1.49E-11	258.94	Pb-214	->	Bi-214	
1.28E-11	703.07	Bi-214	->	Po-214	
1.25E-11	1207.764	Bi-214	->	Po-214	
1.19E-11	487.13	Pb-214	->	Bi-214	
1.11E-11	388.95	Bi-214	->	Po-214	
1.11E-11	1538.49	Bi-214	->	Po-214	
1.09E-11	719.856	Bi-214	->	Po-214	
1.05E-11	14.336	Ra-226	->	Rn-222	

1.04E-11	13.066	Pb-210	->	Bi-210	
1.04E-11	964.07	Bi-214	->	Po-214	
1.04E-11	1838.37	Bi-214	->	Po-214	
1.04E-11	11.119	Bi-214	->	Po-214	
1.00E-11	13.502	Bi-214	->	Po-214	
9.89E-12	580.06	Pb-214	->	Bi-214	
9.77E-12	386.834	Bi-214	->	Po-214	
9.50E-12	1543.347	Bi-214	->	Po-214	
9.37E-12	89.639	Bi-214	->	Po-214	
9.18E-12	480.32	Pb-214	->	Bi-214	
9.07E-12	1599.3	Bi-214	->	Po-214	
8.80E-12	2293.29	Bi-214	->	Po-214	
8.69E-12	274.56	Pb-214	->	Bi-214	
8.63E-12	454.832	Bi-214	->	Po-214	
8.55E-12	1051.95	Bi-214	->	Po-214	
8.42E-12	786.42	Bi-214	->	Po-214	
8.35E-12	9.419	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
8.02E-12	83.787	Ra-226	->	Rn-222	
7.74E-12	1070.02	Bi-214	->	Po-214	
7.28E-12	11.713	Ra-226	->	Rn-222	
7.20E-12	1594.78	Bi-214	->	Po-214	
6.92E-12	1133.65	Bi-214	->	Po-214	
6.41E-12	1683.99	Bi-214	->	Po-214	
6.14E-12	1873.112	Bi-214	->	Po-214	
5.16E-12	533.5	Pb-214	->	Bi-214	
4.89E-12	273.7	Bi-214	->	Po-214	
4.83E-12	81.067	Ra-226	->	Rn-222	
4.81E-12	1896.28	Bi-214	->	Po-214	
4.62E-12	462.05	Pb-214	->	Bi-214	
4.53E-12	405.73	Bi-214	->	Po-214	
4.07E-12	821.166	Bi-214	->	Po-214	
4.06E-12	46.52	Pb-210	->	Bi-210	
3.61E-12	469.76	Bi-214	->	Po-214	
3.61E-12	752.843	Bi-214	->	Po-214	
3.29E-12	1303.76	Bi-214	->	Po-214	
3.20E-12	474.51	Bi-214	->	Po-214	
2.99E-12	426.5	Bi-214	->	Po-214	
2.85E-12	904.33	Bi-214	->	Po-214	
2.85E-12	92.673	Bi-214	->	Po-214	
2.83E-12	94.677	Ra-226	->	Rn-222	
2.72E-12	1103.7	Bi-214	->	Po-214	
2.61E-12	1032.22	Bi-214	->	Po-214	
2.58E-12	333.6	Bi-214	->	Po-214	
2.50E-12	15.537	Pb-210	->	Bi-210	
2.50E-12	826.44	Bi-214	->	Po-214	
2.42E-12	1890.259	Bi-214	->	Po-214	
2.36E-12	2109.91	Bi-214	->	Po-214	
2.34E-12	1317.02	Bi-214	->	Po-214	
2.31E-12	542.84	Bi-214	->	Po-214	
2.31E-12	16.874	Ra-226	->	Rn-222	

2.29E-12	109.97	Th-230	->	Ra-226	
2.23E-12	572.67	Bi-214	->	Po-214	
2.20E-12	280.93	Bi-214	->	Po-214	
2.17E-12	1104.766	Bi-214	->	Po-214	
2.15E-12	765.9	Pb-214	->	Bi-214	
2.15E-12	314.2	Pb-214	->	Bi-214	
2.14E-12	683.21	Bi-214	->	Po-214	
2.03E-12	710.84	Bi-214	->	Po-214	
1.95E-12	11.712	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
1.93E-12	15.874	Bi-214	->	Po-214	
1.93E-12	536.93	Bi-214	->	Po-214	
1.90E-12	510	Rn-222	->	Po-218	
1.90E-12	1637.37	Bi-214	->	Po-214	
1.90E-12	2052.93	Bi-214	->	Po-214	
1.90E-12	615.77	Bi-214	->	Po-214	
1.87E-12	1479.19	Bi-214	->	Po-214	
1.71E-12	1898.9	Bi-214	->	Po-214	
1.66E-12	2192.52	Bi-214	->	Po-214	
1.63E-12	633.14	Bi-214	->	Po-214	
1.63E-12	347.1	Bi-214	->	Po-214	
1.60E-12	137.4	Pb-214	->	Bi-214	
1.60E-12	649.18	Bi-214	->	Po-214	
1.57E-12	1173.04	Bi-214	->	Po-214	
1.57E-12	1172.93	Bi-214	->	Po-214	
1.55E-12	334.9	Bi-214	->	Po-214	
1.52E-12	2089.55	Bi-214	->	Po-214	
1.38E-12	1935.8	Bi-214	->	Po-214	
1.33E-12	196.3	Pb-214	->	Bi-214	
1.33E-12	2010.79	Bi-214	->	Po-214	
1.28E-12	733.64	Bi-214	->	Po-214	
1.22E-12	1130.6	Bi-214	->	Po-214	
1.22E-12	723.32	Bi-214	->	Po-214	
1.17E-12	660.75	Bi-214	->	Po-214	
1.11E-12	799.75	Bi-214	->	Po-214	
1.09E-12	814.87	Bi-214	->	Po-214	
1.06E-12	141.3	Pb-214	->	Bi-214	
1.06E-12	740.87	Bi-214	->	Po-214	
1.06E-12	338.5	Bi-214	->	Po-214	
1.00E-12	697.89	Bi-214	->	Po-214	
9.23E-13	304.42	Bi-214	->	Po-214	
9.23E-13	617.1	Bi-214	->	Po-214	
9.04E-13	97.907	Ra-226	->	Rn-222	
8.80E-13	2694.67	Bi-214	->	Po-214	
8.69E-13	286.9	Bi-214	->	Po-214	
8.69E-13	547.1	Bi-214	->	Po-214	
8.46E-13	797.88	Tl-210	->	Pb-210,	Po-214 -> Pb-210
8.42E-13	639.36	Bi-214	->	Po-214	
8.15E-13	396	Bi-214	->	Po-214	
7.88E-13	511	Pb-214	->	Bi-214	
7.87E-13	440.4	Bi-214	->	Po-214	

7.87E-13	1045.4	Bi-214	->	Po-214	
7.87E-13	1067.3	Bi-214	->	Po-214	
7.33E-13	1226.8	Bi-214	->	Po-214	
6.95E-13	2769.99	Bi-214	->	Po-214	
6.25E-13	543.91	Pb-214	->	Bi-214	
6.25E-13	305.5	Pb-214	->	Bi-214	
6.24E-13	1341.5	Bi-214	->	Po-214	
6.24E-13	832.34	Bi-214	->	Po-214	
6.24E-13	976.2	Bi-214	->	Po-214	
6.24E-13	915.8	Bi-214	->	Po-214	
6.14E-13	3053.89	Bi-214	->	Po-214	
5.97E-13	1230.84	Bi-214	->	Po-214	
5.97E-13	2331.2	Bi-214	->	Po-214	
5.43E-13	324.3	Pb-214	->	Bi-214	
5.43E-13	9.658	Bi-214	->	Po-214	
5.16E-13	1636.6	Bi-214	->	Po-214	
5.16E-13	2021.7	Bi-214	->	Po-214	
5.16E-13	1392.5	Bi-214	->	Po-214	
4.89E-13	2266.67	Bi-214	->	Po-214	
4.89E-13	502.2	Bi-214	->	Po-214	
4.62E-13	943.3	Bi-214	->	Po-214	
4.62E-13	847.2	Bi-214	->	Po-214	
4.62E-13	631.2	Bi-214	->	Po-214	
4.62E-13	1038	Bi-214	->	Po-214	
4.52E-13	298.1	Tl-210	->	Pb-210,	Po-214 -> Pb-210
4.34E-13	2147.8	Bi-214	->	Po-214	
4.34E-13	525	Bi-214	->	Po-214	
4.34E-13	1782.1	Bi-214	->	Po-214	
4.26E-13	2922.09	Bi-214	->	Po-214	
4.26E-13	727.8	Bi-214	->	Po-214	
3.99E-13	2978.79	Bi-214	->	Po-214	
3.93E-13	10.137	Ra-226	->	Rn-222	
3.26E-13	1814.01	Bi-214	->	Po-214	
3.26E-13	989.2	Bi-214	->	Po-214	
3.26E-13	1471.1	Bi-214	->	Po-214	
3.26E-13	1020.5	Bi-214	->	Po-214	
3.26E-13	596	Bi-214	->	Po-214	
3.20E-13	2376.99	Bi-214	->	Po-214	
3.14E-13	235.01	Th-230	->	Ra-226	
2.99E-13	1330	Bi-214	->	Po-214	
2.72E-13	470.8	Pb-214	->	Bi-214	
2.72E-13	2085	Bi-214	->	Po-214	
2.72E-13	1013.4	Bi-214	->	Po-214	
2.50E-13	2880.4	Bi-214	->	Po-214	
2.44E-13	494.6	Bi-214	->	Po-214	
2.44E-13	394	Bi-214	->	Po-214	
2.44E-13	2259.7	Bi-214	->	Po-214	
2.39E-13	2999.99	Bi-214	->	Po-214	
2.01E-13	12.855	Ra-226	->	Rn-222	
1.94E-13	205.1	Th-230	->	Ra-226	

1.90E-13	2251.2	Bi-214	->	Po-214	
1.74E-13	2893.59	Bi-214	->	Po-214	
1.71E-13	364.2	Bi-214	->	Po-214	
1.63E-13	693.3	Bi-214	->	Po-214	
1.63E-13	687.7	Bi-214	->	Po-214	
1.60E-13	2505.58	Bi-214	->	Po-214	
1.60E-13	2423.32	Bi-214	->	Po-214	
1.60E-13	2786.09	Bi-214	->	Po-214	
1.55E-13	520.4	Bi-214	->	Po-214	
1.49E-13	12.085	Bi-214	->	Po-214	
1.48E-13	262.41	Ra-226	->	Rn-222	
1.38E-13	2284.4	Bi-214	->	Po-214	
1.38E-13	1419.7	Bi-214	->	Po-214	
1.36E-13	1994.7	Bi-214	->	Po-214	
1.33E-13	538.7	Pb-214	->	Bi-214	
1.33E-13	626.4	Bi-214	->	Po-214	
1.33E-13	376.6	Bi-214	->	Po-214	
1.20E-13	1314	Tl-210	->	Pb-210	
1.17E-13	3081.7	Bi-214	->	Po-214	
1.16E-13	570.5	Th-230	->	Ra-226	
7.87E-14	2004.5	Bi-214	->	Po-214	
7.87E-14	2369.3	Bi-214	->	Po-214	
7.87E-14	2270	Bi-214	->	Po-214	
7.60E-14	2698.86	Bi-214	->	Po-214	
6.84E-14	1068	Tl-210	->	Pb-210	
6.79E-14	2827	Bi-214	->	Po-214	
6.27E-14	12.678	Tl-210	->	Pb-210	
5.70E-14	2482.417	Bi-214	->	Po-214	
5.43E-14	2390.9	Bi-214	->	Po-214	
5.16E-14	2324.8	Bi-214	->	Po-214	
5.16E-14	2360.9	Bi-214	->	Po-214	
5.13E-14	2428	Tl-210	->	Pb-210	
4.89E-14	2719.21	Bi-214	->	Po-214	
4.73E-14	10.541	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
4.62E-14	2940.5	Bi-214	->	Po-214	
4.56E-14	2358	Tl-210	->	Pb-210	
4.34E-14	3142.6	Bi-214	->	Po-214	
4.07E-14	3183.6	Bi-214	->	Po-214	
3.93E-14	2008	Tl-210	->	Pb-210	
3.93E-14	1110	Tl-210	->	Pb-210	
3.93E-14	860	Tl-210	->	Pb-210	
3.92E-14	551.8	Th-230	->	Ra-226	
3.92E-14	620	Th-230	->	Ra-226	
3.26E-14	2928.7	Bi-214	->	Po-214	
2.99E-14	2988.7	Bi-214	->	Po-214	
2.79E-14	2088	Tl-210	->	Pb-210	
2.79E-14	1408	Tl-210	->	Pb-210	
2.62E-14	74.969	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
2.44E-14	2631	Bi-214	->	Po-214	
2.28E-14	95	Tl-210	->	Pb-210	

2.28E-14	354	Tl-210	->	Pb-210	
1.71E-14	2268	Tl-210	->	Pb-210	
1.71E-14	908	Tl-210	->	Pb-210	
1.71E-14	380	Tl-210	->	Pb-210	
1.68E-14	600.83	Ra-226	->	Rn-222	
1.60E-14	72.803	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
1.55E-14	2934.9	Bi-214	->	Po-214	
1.38E-14	3093.9	Bi-214	->	Po-214	
1.38E-14	3160.5	Bi-214	->	Po-214	
1.25E-14	14.836	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
1.22E-14	2604.5	Bi-214	->	Po-214	
1.14E-14	81	Tl-210	->	Pb-210	
1.14E-14	478	Tl-210	->	Pb-210	
1.14E-14	668	Tl-210	->	Pb-210	
1.14E-14	1538	Tl-210	->	Pb-210	
1.14E-14	1588	Tl-210	->	Pb-210	
1.14E-14	1648	Tl-210	->	Pb-210	
1.07E-14	414.72	Ra-226	->	Rn-222	
1.06E-14	2551	Bi-214	->	Po-214	
9.35E-15	84.789	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
9.23E-15	3136.3	Bi-214	->	Po-214	
9.23E-15	2860.9	Bi-214	->	Po-214	
7.87E-15	2662.23	Bi-214	->	Po-214	
7.42E-15	449.5	Ra-226	->	Rn-222	
5.43E-15	3233.3	Bi-214	->	Po-214	
2.72E-15	3269.7	Bi-214	->	Po-214	
2.68E-15	87.632	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
2.34E-15	9.185	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
1.14E-15	11.349	Tl-210	->	Pb-210	
6.76E-16	803.13	Tl-206	->	Pb-206,	Po-210 -> Pb-206
5.99E-17	302.25	Hg-206	->	Tl-206	
9.31E-18	72.873	Hg-206	->	Tl-206	
5.54E-18	70.832	Hg-206	->	Tl-206	
5.54E-18	650.21	Hg-206	->	Tl-206	
3.33E-18	82.434	Hg-206	->	Tl-206	
3.33E-18	10.259	Hg-206	->	Tl-206	
2.88E-18	12.313	Hg-206	->	Tl-206	
1.15E-18	344.96	Hg-206	->	Tl-206	
9.31E-19	85.185	Hg-206	->	Tl-206	
5.32E-19	14.407	Hg-206	->	Tl-206	
1.60E-19	8.953	Hg-206	->	Tl-206	
4.21E-20	10.994	Hg-206	->	Tl-206	
2.95E-20	12.71	Tl-206	->	Pb-206	
8.43E-21	384.06	Hg-206	->	Tl-206	
4.69E-22	11.439	Tl-206	->	Pb-206	
5.21E-23	266.15	Bi-210	->	Tl-206	

Np-237

100%

Aged 5 years

371 lines computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays		
keV	ph/s/gm			
8.953	6.12E-09	Bi-213	->	Tl-209
9.185	5.06E-06	Tl-209	->	Pb-209
9.658	3.11E-05	Bi-213	->	Po-213
9.897	5.17E-05	Fr-221	->	At-217
10.259	1.33E-07	Bi-213	->	Tl-209
10.381	5.30E-04	Ac-225	->	Fr-221
10.541	9.84E-05	Tl-209	->	Pb-209
10.871	4.01E-04	Ra-225	->	Ac-225
10.994	1.60E-09	Bi-213	->	Tl-209
11.118	8.33E-01	U-233	->	Th-229
11.119	5.97E-04	Bi-213	->	Po-213
11.349	1.36E-06	Tl-209	->	Pb-209
11.372	3.00E+05	Np-237	->	Pa-233
11.414	9.73E-04	Fr-221	->	At-217
11.62	2.79E+05	Pa-233	->	U-233
12.017	9.61E-03	Ac-225	->	Fr-221
12.085	8.07E-06	Bi-213	->	Po-213
12.311	1.06E-07	Bi-213	->	Tl-209
12.466	2.06E-05	Fr-221	->	At-217
12.636	6.89E-03	Ra-225	->	Ac-225
12.703	9.31E-05	Tl-209	->	Pb-209
12.952	1.44E+01	U-233	->	Th-229
13.255	1.97E-04	Ac-225	->	Fr-221
13.274	5.01E+06	Np-237	->	Pa-233
13.504	5.54E-04	Bi-213	->	Po-213
13.6	4.69E+06	Pa-233	->	U-233
13.911	1.18E-03	Fr-221	->	At-217
14.082	1.14E-04	Ra-225	->	Ac-225
14.402	2.13E-08	Bi-213	->	Tl-209
14.511	3.16E-01	U-233	->	Th-229
14.772	1.18E-02	Ac-225	->	Fr-221
14.871	1.68E-05	Tl-209	->	Pb-209
14.953	1.23E+05	Np-237	->	Pa-233
15.4	6.00E+04	Pa-233	->	U-233
15.662	7.64E-03	Ra-225	->	Ac-225
15.878	1.06E-04	Bi-213	->	Po-213
16.141	1.83E+01	U-233	->	Th-229
16.361	2.45E-04	Fr-221	->	At-217
16.632	6.52E+06	Np-237	->	Pa-233
17.058	4.96E+06	Pa-233	->	U-233
17.269	9.39E+02	Pa-233	->	U-233

17.349	2.18E-04	Th-229	->	Ra-225
17.449	2.59E-03	Ac-225	->	Fr-221
18.593	1.75E-03	Ra-225	->	Ac-225
19.148	4.44E+00	U-233	->	Th-229
19.718	1.51E+06	Np-237	->	Pa-233
20.42	1.17E+06	Pa-233	->	U-233
25.304	6.72E-03	U-233	->	Th-229
25.373	4.62E-05	Th-229	->	Ra-225
25.98	1.85E-06	Ac-225	->	Fr-221
28.578	1.70E+04	Pa-233	->	U-233
29.191	3.78E-02	U-233	->	Th-229
29.378	3.36E+06	Np-237	->	Pa-233
31.24	1.50E-03	U-233	->	Th-229
31.37	5.26E-03	Th-229	->	Ra-225
32.27	5.50E-03	U-233	->	Th-229
36.65	1.85E-05	Ac-225	->	Fr-221
37.85	2.00E-03	U-233	->	Th-229
38.51	1.11E-05	Ac-225	->	Fr-221
40.34	3.63E-02	Ra-225	->	Ac-225
40.415	9.39E+03	Pa-233	->	U-233
41.718	3.39E+03	Pa-233	->	U-233
42.441	3.33E-01	U-233	->	Th-229
42.722	2.05E-04	Th-229	->	Ra-225
46.57	3.47E+04	Np-237	->	Pa-233
49.2	1.33E-05	Ac-225	->	Fr-221
52.613	1.39E-03	U-233	->	Th-229
53.559	2.39E-02	U-233	->	Th-229
53.82	2.34E-05	Ac-225	->	Fr-221
54.702	7.77E-02	U-233	->	Th-229
56.58	4.23E-04	Th-229	->	Ra-225
57.149	1.02E+05	Np-237	->	Pa-233
57.77	5.17E-06	Ac-225	->	Fr-221
62.66	3.13E+03	Np-237	->	Pa-233
62.93	6.78E-04	Ac-225	->	Fr-221
63.69	1.83E-04	U-233	->	Th-229
63.95	4.17E+03	Np-237	->	Pa-233
64.23	6.90E-05	Ac-225	->	Fr-221
66.11	4.66E-03	U-233	->	Th-229
67.96	1.78E-03	U-233	->	Th-229
68.14	1.28E-04	Th-229	->	Ra-225
68.88	1.41E-04	Th-229	->	Ra-225
68.97	6.00E-04	U-233	->	Th-229
69.85	6.28E-06	Ac-225	->	Fr-221
70.35	3.33E-03	U-233	->	Th-229
70.62	4.17E+03	Np-237	->	Pa-233
70.832	2.13E-07	Bi-213	->	Tl-209
70.92	1.23E-05	Ac-225	->	Fr-221
71.71	1.81E-05	Ac-225	->	Fr-221
71.847	1.50E-02	U-233	->	Th-229
72.803	1.60E-04	Tl-209	->	Pb-209

72.821	3.28E-03	U-233	->	Th-229
72.873	3.46E-07	Bi-213	->	Tl-209
73.6	2.09E-05	Ac-225	->	Fr-221
73.84	3.99E-04	Ac-225	->	Fr-221
74.46	2.89E+03	Np-237	->	Pa-233
74.5	8.33E-03	U-233	->	Th-229
74.9	4.44E-05	Ac-225	->	Fr-221
74.969	2.69E-04	Tl-209	->	Pb-209
75.17	6.41E-04	Th-229	->	Ra-225
75.343	3.05E+05	Pa-233	->	U-233
76.32	2.17E-03	U-233	->	Th-229
76.858	9.40E-04	Bi-213	->	Po-213
77.1	4.00E-03	U-233	->	Th-229
78.41	3.33E-04	U-233	->	Th-229
78.947	1.05E-03	Fr-221	->	At-217
79.29	1.55E-03	Bi-213	->	Po-213
81.517	1.74E-03	Fr-221	->	At-217
82.434	1.33E-07	Bi-213	->	Tl-209
82.9	1.85E-04	Ac-225	->	Fr-221
82.957	9.99E-04	U-233	->	Th-229
83.229	1.55E-03	Ac-225	->	Fr-221
84.27	4.16E-04	U-233	->	Th-229
84.789	9.58E-05	Tl-209	->	Pb-209
85.185	3.46E-08	Bi-213	->	Tl-209
85.402	1.05E-03	U-233	->	Th-229
86.105	2.56E-03	Ac-225	->	Fr-221
86.23	4.87E-04	Th-229	->	Ra-225
86.44	3.85E-03	Th-229	->	Ra-225
86.5	3.65E+06	Np-237	->	Pa-233
86.652	4.59E+05	Pa-233	->	U-233
86.74	7.22E-04	U-233	->	Th-229
87.24	1.05E-03	U-233	->	Th-229
87.39	3.57E-04	Ac-225	->	Fr-221
87.632	2.74E-05	Tl-209	->	Pb-209
88.05	4.69E+04	Np-237	->	Pa-233
88.43	2.44E-03	U-233	->	Th-229
89.639	5.53E-04	Bi-213	->	Po-213
89.957	5.77E-02	U-233	->	Th-229
90.994	1.83E-03	U-233	->	Th-229
92.136	6.16E-04	Fr-221	->	At-217
92.282	4.15E+05	Np-237	->	Pa-233
92.673	1.69E-04	Bi-213	->	Po-213
93.36	9.38E-02	U-233	->	Th-229
94.66	2.66E+06	Pa-233	->	U-233
94.723	1.98E+05	Np-237	->	Pa-233
94.87	1.97E-04	Ac-225	->	Fr-221
95.265	1.91E-04	Fr-221	->	At-217
95.858	7.56E+05	Np-237	->	Pa-233
96.17	3.70E-05	Ac-225	->	Fr-221
96.215	7.77E-03	U-233	->	Th-229

97.143	1.22E-01	U-233	->	Th-229
97.2	2.34E-05	Fr-221	->	At-217
97.272	9.24E-04	Ac-225	->	Fr-221
98.443	4.17E+06	Pa-233	->	U-233
99.58	7.76E-04	Ac-225	->	Fr-221
99.82	2.07E-03	Ac-225	->	Fr-221
100.008	3.05E-04	U-233	->	Th-229
100.599	2.96E-04	Ac-225	->	Fr-221
100.88	7.39E-05	Ac-225	->	Fr-221
101.8	5.00E-04	U-233	->	Th-229
103.375	5.55E-04	U-233	->	Th-229
103.44	1.11E-05	Ac-225	->	Fr-221
103.921	1.80E+05	Pa-233	->	U-233
105.362	3.39E-02	U-233	->	Th-229
106.13	1.46E+04	Np-237	->	Pa-233
107.16	1.03E-03	Th-229	->	Ra-225
108.166	2.45E+05	Np-237	->	Pa-233
108.36	3.33E-04	Ac-225	->	Fr-221
108.69	1.90E+04	Np-237	->	Pa-233
108.99	1.13E-02	U-233	->	Th-229
109.47	1.72E-03	U-233	->	Th-229
111.298	1.56E+06	Pa-233	->	U-233
111.56	4.03E-04	Ac-225	->	Fr-221
111.897	8.08E+04	Np-237	->	Pa-233
111.935	2.61E-03	U-233	->	Th-229
114.28	1.39E-03	U-233	->	Th-229
114.445	5.22E+05	Pa-233	->	U-233
115.19	6.52E+02	Np-237	->	Pa-233
116.26	1.17E-03	U-233	->	Th-229
117	2.16E-03	Tl-209	->	Pb-209
117.155	1.55E-02	U-233	->	Th-229
117.689	4.20E+04	Np-237	->	Pa-233
118.47	4.31E-05	Fr-221	->	At-217
118.97	1.78E-02	U-233	->	Th-229
119.92	7.39E-05	Ac-225	->	Fr-221
120.81	1.17E-02	U-233	->	Th-229
123.76	2.34E-04	Ac-225	->	Fr-221
123.91	3.61E-03	U-233	->	Th-229
124.51	1.28E-03	Th-229	->	Ra-225
124.72	7.70E-04	Th-229	->	Ra-225
124.81	6.16E-05	Ac-225	->	Fr-221
125.398	3.61E-04	U-233	->	Th-229
126.23	1.72E-05	Ac-225	->	Fr-221
129.19	5.30E-06	Ac-225	->	Fr-221
129.2	3.89E-04	U-233	->	Th-229
131.09	2.22E+04	Np-237	->	Pa-233
131.2	1.83E-04	U-233	->	Th-229
131.92	4.23E-04	Th-229	->	Ra-225
134.23	1.75E+04	Np-237	->	Pa-233
135.01	4.93E-05	Ac-225	->	Fr-221

135.328	1.22E-02	U-233	->	Th-229
137.02	2.05E-03	Th-229	->	Ra-225
138.2	2.46E-05	Ac-225	->	Fr-221
138.5	1.11E-04	U-233	->	Th-229
139.76	5.83E-04	U-233	->	Th-229
140.61	4.69E+03	Np-237	->	Pa-233
142.98	5.52E-04	Th-229	->	Ra-225
143.227	1.02E+05	Np-237	->	Pa-233
144.52	1.67E-03	U-233	->	Th-229
145.15	1.55E-04	Ac-225	->	Fr-221
145.286	8.88E-03	U-233	->	Th-229
146.347	3.50E-02	U-233	->	Th-229
148.15	2.00E-03	U-233	->	Th-229
148.37	1.28E-03	Th-229	->	Ra-225
149.8	7.05E-04	U-233	->	Th-229
149.99	8.62E-05	Fr-221	->	At-217
150.08	8.25E-04	Ac-225	->	Fr-221
151.423	6.26E+04	Np-237	->	Pa-233
152.64	4.56E-05	Ac-225	->	Fr-221
153.31	3.05E-04	U-233	->	Th-229
153.72	1.80E+03	Np-237	->	Pa-233
153.93	1.88E-04	Ac-225	->	Fr-221
154.37	8.98E-04	Th-229	->	Ra-225
154.69	8.33E-04	U-233	->	Th-229
155.263	2.40E+04	Np-237	->	Pa-233
155.989	3.22E-04	U-233	->	Th-229
156.46	1.28E-03	Th-229	->	Ra-225
157.24	3.82E-04	Ac-225	->	Fr-221
162.51	9.65E+03	Np-237	->	Pa-233
162.52	4.16E-04	U-233	->	Th-229
164.512	3.66E-02	U-233	->	Th-229
165.493	2.17E-03	U-233	->	Th-229
168.98	3.72E-04	U-233	->	Th-229
169.18	1.88E+04	Np-237	->	Pa-233
170.67	4.96E+03	Np-237	->	Pa-233
170.794	7.77E-04	U-233	->	Th-229
170.91	1.11E-05	Ac-225	->	Fr-221
171.29	8.62E-05	Fr-221	->	At-217
172.35	1.94E-04	U-233	->	Th-229
172.56	1.77E+03	Np-237	->	Pa-233
172.9	2.82E-04	Th-229	->	Ra-225
174.162	1.28E-03	U-233	->	Th-229
176.09	5.22E+03	Np-237	->	Pa-233
176.1	2.39E-04	U-233	->	Th-229
177.78	1.11E-04	U-233	->	Th-229
178.39	1.97E-05	Ac-225	->	Fr-221
179.74	6.54E-04	Th-229	->	Ra-225
180.801	6.00E+03	Np-237	->	Pa-233
183.96	2.95E-04	Th-229	->	Ra-225
184.17	1.39E-04	U-233	->	Th-229

185.782	2.22E-04	U-233	->	Th-229
186.12	2.46E-05	Ac-225	->	Fr-221
186.7	1.75E+03	Np-237	->	Pa-233
187.942	1.11E-02	U-233	->	Th-229
187.99	5.67E-04	Ac-225	->	Fr-221
191.46	7.04E+03	Np-237	->	Pa-233
192.12	2.22E-04	U-233	->	Th-229
193.29	1.33E+04	Np-237	->	Pa-233
193.59	5.90E-03	Th-229	->	Ra-225
194.74	1.28E+04	Np-237	->	Pa-233
195.04	5.24E+04	Np-237	->	Pa-233
195.75	1.79E-04	Ac-225	->	Fr-221
196.89	6.52E+03	Np-237	->	Pa-233
198.72	2.46E-05	Ac-225	->	Fr-221
200.17	9.13E+02	Np-237	->	Pa-233
200.67	5.55E-06	U-233	->	Th-229
201.72	1.10E+04	Np-237	->	Pa-233
202.85	9.39E+02	Np-237	->	Pa-233
205.99	3.61E-04	U-233	->	Th-229
208.149	1.39E-02	U-233	->	Th-229
209.19	4.04E+03	Np-237	->	Pa-233
210.94	4.23E-03	Th-229	->	Ra-225
212.29	7.77E-04	U-233	->	Th-229
212.412	3.96E+04	Np-237	->	Pa-233
214.08	1.10E+04	Np-237	->	Pa-233
216.08	3.66E-03	U-233	->	Th-229
216.2	4.19E-04	Ac-225	->	Fr-221
216.86	5.17E-04	Ac-225	->	Fr-221
217.133	1.94E-02	U-233	->	Th-229
217.61	2.78E-04	U-233	->	Th-229
217.98	1.34E-02	Fr-221	->	At-217
218.15	1.80E-04	Th-229	->	Ra-225
219.424	8.33E-04	U-233	->	Th-229
223.357	1.83E-04	U-233	->	Th-229
224.64	9.86E-05	Ac-225	->	Fr-221
225	5.55E-05	U-233	->	Th-229
226.74	5.55E-05	U-233	->	Th-229
228.07	1.11E-04	U-233	->	Th-229
229.98	3.42E+03	Np-237	->	Pa-233
230.086	3.72E-04	U-233	->	Th-229
236.32	4.62E-05	Th-229	->	Ra-225
236.39	2.78E-04	U-233	->	Th-229
237.95	1.67E+04	Np-237	->	Pa-233
240.364	2.11E-03	U-233	->	Th-229
240.76	1.60E-05	Ac-225	->	Fr-221
245.294	1.94E-02	U-233	->	Th-229
248.25	1.41E+04	Pa-233	->	U-233
248.661	2.50E-02	U-233	->	Th-229
248.7	2.46E-05	Ac-225	->	Fr-221
248.91	1.25E+03	Np-237	->	Pa-233

252.5	2.11E-04	U-233	->	Th-229
253.51	1.23E-04	Ac-225	->	Fr-221
255.92	2.39E-04	U-233	->	Th-229
256.98	1.75E+03	Np-237	->	Pa-233
258.46	1.41E+03	Pa-233	->	U-233
259.3	9.99E-04	U-233	->	Th-229
260.4	6.00E-04	U-233	->	Th-229
261.88	1.72E-03	U-233	->	Th-229
262.41	1.75E+03	Np-237	->	Pa-233
268.619	1.39E-03	U-233	->	Th-229
271.597	7.30E+04	Pa-233	->	U-233
272.27	3.50E-04	U-233	->	Th-229
274.692	2.61E-03	U-233	->	Th-229
278.059	6.77E-03	U-233	->	Th-229
279.27	4.31E-05	Ac-225	->	Fr-221
282.54	1.11E-05	Fr-221	->	At-217
284.22	5.55E-05	U-233	->	Th-229
285.5	1.23E-05	Ac-225	->	Fr-221
287.949	6.00E-03	U-233	->	Th-229
291.317	2.89E-02	U-233	->	Th-229
292.79	5.30E-04	Bi-213	->	Po-213
293.923	7.77E-04	U-233	->	Th-229
295.2	1.28E-04	U-233	->	Th-229
298.87	6.60E+03	Pa-233	->	U-233
300.175	1.62E+06	Pa-233	->	U-233
302.84	3.89E-04	U-233	->	Th-229
309.37	4.05E-04	U-233	->	Th-229
311.38	1.55E-04	U-233	->	Th-229
311.9	9.91E+06	Pa-233	->	U-233
317.133	4.89E-02	U-233	->	Th-229
320.508	1.72E-02	U-233	->	Th-229
323.321	4.66E-03	U-233	->	Th-229
323.81	4.92E-06	Bi-213	->	Tl-209
324.1	2.09E-05	Fr-221	->	At-217
328.69	3.61E-04	U-233	->	Th-229
336.579	3.28E-03	U-233	->	Th-229
339.64	4.16E-05	U-233	->	Th-229
340.59	1.10E+06	Pa-233	->	U-233
351.782	2.50E-04	U-233	->	Th-229
354	3.22E-04	U-233	->	Th-229
359.09	4.31E-05	Fr-221	->	At-217
365.762	4.55E-03	U-233	->	Th-229
375.518	1.51E+05	Pa-233	->	U-233
382.05	4.31E-05	Fr-221	->	At-217
383.4	5.27E-04	U-233	->	Th-229
384	1.11E-04	U-233	->	Th-229
394.34	4.16E-05	U-233	->	Th-229
396.65	4.61E-05	U-233	->	Th-229
398.663	3.10E+05	Pa-233	->	U-233
402.37	4.61E-05	U-233	->	Th-229

406.7	2.94E-05	U-233	->	Th-229
409.1	1.60E-04	Fr-221	->	At-217
415.932	3.94E+05	Pa-233	->	U-233
416.4	5.55E-05	U-233	->	Th-229
436.78	2.78E-05	U-233	->	Th-229
440.34	1.99E-02	Bi-213	->	Po-213
449.6	5.55E-05	U-233	->	Th-229
452.43	1.36E-04	Ac-225	->	Fr-221
459.77	4.61E-05	U-233	->	Th-229
467	2.16E-03	Tl-209	->	Pb-209
471.3	8.33E-05	U-233	->	Th-229
479	8.33E-05	U-233	->	Th-229
480.5	3.70E-05	Ac-225	->	Fr-221
484.05	2.39E-05	U-233	->	Th-229
513.5	1.23E-05	Ac-225	->	Fr-221
526.03	1.23E-05	Ac-225	->	Fr-221
540.27	2.94E-05	U-233	->	Th-229
545.1	1.33E-05	U-233	->	Th-229
569.37	2.11E-05	U-233	->	Th-229
578.47	2.78E-05	U-233	->	Th-229
620.87	1.28E-05	U-233	->	Th-229
656.97	1.67E-05	U-233	->	Th-229
659.72	1.05E-04	Bi-213	->	Po-213
707.47	1.50E-05	U-233	->	Th-229
807.27	3.15E-04	Bi-213	->	Po-213
867.9	1.17E-05	U-233	->	Th-229
1003	4.61E-05	U-233	->	Th-229
1100.06	3.40E-04	Bi-213	->	Po-213
1119	4.61E-05	U-233	->	Th-229
1566	2.61E-03	Tl-209	->	Pb-209

Np237	Aged 5 years	Sorted by Intensity		
Intensity	Energy	Initial Isotopes and Decays		
ph/s/gm	keV			
9.91E+06	311.9	Pa-233	->	U-233
6.52E+06	16.632	Np-237	->	Pa-233
5.01E+06	13.274	Np-237	->	Pa-233
4.96E+06	17.058	Pa-233	->	U-233
4.69E+06	13.6	Pa-233	->	U-233
4.17E+06	98.443	Pa-233	->	U-233
3.65E+06	86.5	Np-237	->	Pa-233
3.36E+06	29.378	Np-237	->	Pa-233
2.66E+06	94.66	Pa-233	->	U-233
1.62E+06	300.175	Pa-233	->	U-233
1.56E+06	111.298	Pa-233	->	U-233
1.51E+06	19.718	Np-237	->	Pa-233

1.17E+06	20.42	Pa-233	->	U-233
1.10E+06	340.59	Pa-233	->	U-233
7.56E+05	95.858	Np-237	->	Pa-233
5.22E+05	114.445	Pa-233	->	U-233
4.59E+05	86.652	Pa-233	->	U-233
4.15E+05	92.282	Np-237	->	Pa-233
3.94E+05	415.932	Pa-233	->	U-233
3.10E+05	398.663	Pa-233	->	U-233
3.05E+05	75.343	Pa-233	->	U-233
3.00E+05	11.372	Np-237	->	Pa-233
2.79E+05	11.62	Pa-233	->	U-233
2.45E+05	108.166	Np-237	->	Pa-233
1.98E+05	94.723	Np-237	->	Pa-233
1.80E+05	103.921	Pa-233	->	U-233
1.51E+05	375.518	Pa-233	->	U-233
1.23E+05	14.953	Np-237	->	Pa-233
1.02E+05	143.227	Np-237	->	Pa-233
1.02E+05	57.149	Np-237	->	Pa-233
8.08E+04	111.897	Np-237	->	Pa-233
7.30E+04	271.597	Pa-233	->	U-233
6.26E+04	151.423	Np-237	->	Pa-233
6.00E+04	15.4	Pa-233	->	U-233
5.24E+04	195.04	Np-237	->	Pa-233
4.69E+04	88.05	Np-237	->	Pa-233
4.20E+04	117.689	Np-237	->	Pa-233
3.96E+04	212.412	Np-237	->	Pa-233
3.47E+04	46.57	Np-237	->	Pa-233
2.40E+04	155.263	Np-237	->	Pa-233
2.22E+04	131.09	Np-237	->	Pa-233
1.90E+04	108.69	Np-237	->	Pa-233
1.88E+04	169.18	Np-237	->	Pa-233
1.75E+04	134.23	Np-237	->	Pa-233
1.70E+04	28.578	Pa-233	->	U-233
1.67E+04	237.95	Np-237	->	Pa-233
1.46E+04	106.13	Np-237	->	Pa-233
1.41E+04	248.25	Pa-233	->	U-233
1.33E+04	193.29	Np-237	->	Pa-233
1.28E+04	194.74	Np-237	->	Pa-233
1.10E+04	201.72	Np-237	->	Pa-233
1.10E+04	214.08	Np-237	->	Pa-233
9.65E+03	162.51	Np-237	->	Pa-233
9.39E+03	40.415	Pa-233	->	U-233
7.04E+03	191.46	Np-237	->	Pa-233
6.60E+03	298.87	Pa-233	->	U-233
6.52E+03	196.89	Np-237	->	Pa-233
6.00E+03	180.801	Np-237	->	Pa-233
5.22E+03	176.09	Np-237	->	Pa-233
4.96E+03	170.67	Np-237	->	Pa-233
4.69E+03	140.61	Np-237	->	Pa-233
4.17E+03	63.95	Np-237	->	Pa-233

4.17E+03	70.62	Np-237	->	Pa-233
4.04E+03	209.19	Np-237	->	Pa-233
3.42E+03	229.98	Np-237	->	Pa-233
3.39E+03	41.718	Pa-233	->	U-233
3.13E+03	62.66	Np-237	->	Pa-233
2.89E+03	74.46	Np-237	->	Pa-233
1.80E+03	153.72	Np-237	->	Pa-233
1.77E+03	172.56	Np-237	->	Pa-233
1.75E+03	262.41	Np-237	->	Pa-233
1.75E+03	256.98	Np-237	->	Pa-233
1.75E+03	186.7	Np-237	->	Pa-233
1.41E+03	258.46	Pa-233	->	U-233
1.25E+03	248.91	Np-237	->	Pa-233
9.39E+02	17.269	Pa-233	->	U-233
9.39E+02	202.85	Np-237	->	Pa-233
9.13E+02	200.17	Np-237	->	Pa-233
6.52E+02	115.19	Np-237	->	Pa-233
1.83E+01	16.141	U-233	->	Th-229
1.44E+01	12.952	U-233	->	Th-229
4.44E+00	19.148	U-233	->	Th-229
8.33E-01	11.118	U-233	->	Th-229
3.33E-01	42.441	U-233	->	Th-229
3.16E-01	14.511	U-233	->	Th-229
1.22E-01	97.143	U-233	->	Th-229
9.38E-02	93.36	U-233	->	Th-229
7.77E-02	54.702	U-233	->	Th-229
5.77E-02	89.957	U-233	->	Th-229
4.89E-02	317.133	U-233	->	Th-229
3.78E-02	29.191	U-233	->	Th-229
3.66E-02	164.512	U-233	->	Th-229
3.63E-02	40.34	Ra-225	->	Ac-225
3.50E-02	146.347	U-233	->	Th-229
3.39E-02	105.362	U-233	->	Th-229
2.89E-02	291.317	U-233	->	Th-229
2.50E-02	248.661	U-233	->	Th-229
2.39E-02	53.559	U-233	->	Th-229
1.99E-02	440.34	Bi-213	->	Po-213
1.94E-02	245.294	U-233	->	Th-229
1.94E-02	217.133	U-233	->	Th-229
1.78E-02	118.97	U-233	->	Th-229
1.72E-02	320.508	U-233	->	Th-229
1.55E-02	117.155	U-233	->	Th-229
1.50E-02	71.847	U-233	->	Th-229
1.39E-02	208.149	U-233	->	Th-229
1.34E-02	217.98	Fr-221	->	At-217
1.22E-02	135.328	U-233	->	Th-229
1.18E-02	14.772	Ac-225	->	Fr-221
1.17E-02	120.81	U-233	->	Th-229
1.13E-02	108.99	U-233	->	Th-229
1.11E-02	187.942	U-233	->	Th-229

9.61E-03	12.017	Ac-225	->	Fr-221
8.88E-03	145.286	U-233	->	Th-229
8.33E-03	74.5	U-233	->	Th-229
7.77E-03	96.215	U-233	->	Th-229
7.64E-03	15.662	Ra-225	->	Ac-225
6.89E-03	12.636	Ra-225	->	Ac-225
6.77E-03	278.059	U-233	->	Th-229
6.72E-03	25.304	U-233	->	Th-229
6.00E-03	287.949	U-233	->	Th-229
5.90E-03	193.59	Th-229	->	Ra-225
5.50E-03	32.27	U-233	->	Th-229
5.26E-03	31.37	Th-229	->	Ra-225
4.66E-03	323.321	U-233	->	Th-229
4.66E-03	66.11	U-233	->	Th-229
4.55E-03	365.762	U-233	->	Th-229
4.23E-03	210.94	Th-229	->	Ra-225
4.00E-03	77.1	U-233	->	Th-229
3.85E-03	86.44	Th-229	->	Ra-225
3.66E-03	216.08	U-233	->	Th-229
3.61E-03	123.91	U-233	->	Th-229
3.33E-03	70.35	U-233	->	Th-229
3.28E-03	336.579	U-233	->	Th-229
3.28E-03	72.821	U-233	->	Th-229
2.61E-03	111.935	U-233	->	Th-229
2.61E-03	274.692	U-233	->	Th-229
2.61E-03	1566	Tl-209	->	Pb-209
2.59E-03	17.449	Ac-225	->	Fr-221
2.56E-03	86.105	Ac-225	->	Fr-221
2.44E-03	88.43	U-233	->	Th-229
2.17E-03	165.493	U-233	->	Th-229
2.17E-03	76.32	U-233	->	Th-229
2.16E-03	467	Tl-209	->	Pb-209
2.16E-03	117	Tl-209	->	Pb-209
2.11E-03	240.364	U-233	->	Th-229
2.07E-03	99.82	Ac-225	->	Fr-221
2.05E-03	137.02	Th-229	->	Ra-225
2.00E-03	148.15	U-233	->	Th-229
2.00E-03	37.85	U-233	->	Th-229
1.83E-03	90.994	U-233	->	Th-229
1.78E-03	67.96	U-233	->	Th-229
1.75E-03	18.593	Ra-225	->	Ac-225
1.74E-03	81.517	Fr-221	->	At-217
1.72E-03	261.88	U-233	->	Th-229
1.72E-03	109.47	U-233	->	Th-229
1.67E-03	144.52	U-233	->	Th-229
1.55E-03	79.29	Bi-213	->	Po-213
1.55E-03	83.229	Ac-225	->	Fr-221
1.50E-03	31.24	U-233	->	Th-229
1.39E-03	268.619	U-233	->	Th-229
1.39E-03	52.613	U-233	->	Th-229

1.39E-03	114.28	U-233	->	Th-229
1.28E-03	148.37	Th-229	->	Ra-225
1.28E-03	156.46	Th-229	->	Ra-225
1.28E-03	124.51	Th-229	->	Ra-225
1.28E-03	174.162	U-233	->	Th-229
1.18E-03	13.911	Fr-221	->	At-217
1.17E-03	116.26	U-233	->	Th-229
1.05E-03	87.24	U-233	->	Th-229
1.05E-03	85.402	U-233	->	Th-229
1.05E-03	78.947	Fr-221	->	At-217
1.03E-03	107.16	Th-229	->	Ra-225
9.99E-04	82.957	U-233	->	Th-229
9.99E-04	259.3	U-233	->	Th-229
9.73E-04	11.414	Fr-221	->	At-217
9.40E-04	76.858	Bi-213	->	Po-213
9.24E-04	97.272	Ac-225	->	Fr-221
8.98E-04	154.37	Th-229	->	Ra-225
8.33E-04	219.424	U-233	->	Th-229
8.33E-04	154.69	U-233	->	Th-229
8.25E-04	150.08	Ac-225	->	Fr-221
7.77E-04	170.794	U-233	->	Th-229
7.77E-04	212.29	U-233	->	Th-229
7.77E-04	293.923	U-233	->	Th-229
7.76E-04	99.58	Ac-225	->	Fr-221
7.70E-04	124.72	Th-229	->	Ra-225
7.22E-04	86.74	U-233	->	Th-229
7.05E-04	149.8	U-233	->	Th-229
6.78E-04	62.93	Ac-225	->	Fr-221
6.54E-04	179.74	Th-229	->	Ra-225
6.41E-04	75.17	Th-229	->	Ra-225
6.16E-04	92.136	Fr-221	->	At-217
6.00E-04	68.97	U-233	->	Th-229
6.00E-04	260.4	U-233	->	Th-229
5.97E-04	11.119	Bi-213	->	Po-213
5.83E-04	139.76	U-233	->	Th-229
5.67E-04	187.99	Ac-225	->	Fr-221
5.55E-04	103.375	U-233	->	Th-229
5.54E-04	13.504	Bi-213	->	Po-213
5.53E-04	89.639	Bi-213	->	Po-213
5.52E-04	142.98	Th-229	->	Ra-225
5.30E-04	292.79	Bi-213	->	Po-213
5.30E-04	10.381	Ac-225	->	Fr-221
5.27E-04	383.4	U-233	->	Th-229
5.17E-04	216.86	Ac-225	->	Fr-221
5.00E-04	101.8	U-233	->	Th-229
4.87E-04	86.23	Th-229	->	Ra-225
4.23E-04	56.58	Th-229	->	Ra-225
4.23E-04	131.92	Th-229	->	Ra-225
4.19E-04	216.2	Ac-225	->	Fr-221
4.16E-04	84.27	U-233	->	Th-229

4.16E-04	162.52	U-233	->	Th-229
4.05E-04	309.37	U-233	->	Th-229
4.03E-04	111.56	Ac-225	->	Fr-221
4.01E-04	10.871	Ra-225	->	Ac-225
3.99E-04	73.84	Ac-225	->	Fr-221
3.89E-04	302.84	U-233	->	Th-229
3.89E-04	129.2	U-233	->	Th-229
3.82E-04	157.24	Ac-225	->	Fr-221
3.72E-04	230.086	U-233	->	Th-229
3.72E-04	168.98	U-233	->	Th-229
3.61E-04	205.99	U-233	->	Th-229
3.61E-04	125.398	U-233	->	Th-229
3.61E-04	328.69	U-233	->	Th-229
3.57E-04	87.39	Ac-225	->	Fr-221
3.50E-04	272.27	U-233	->	Th-229
3.40E-04	1100.06	Bi-213	->	Po-213
3.33E-04	78.41	U-233	->	Th-229
3.33E-04	108.36	Ac-225	->	Fr-221
3.22E-04	155.989	U-233	->	Th-229
3.22E-04	354	U-233	->	Th-229
3.15E-04	807.27	Bi-213	->	Po-213
3.05E-04	100.008	U-233	->	Th-229
3.05E-04	153.31	U-233	->	Th-229
2.96E-04	100.599	Ac-225	->	Fr-221
2.95E-04	183.96	Th-229	->	Ra-225
2.82E-04	172.9	Th-229	->	Ra-225
2.78E-04	217.61	U-233	->	Th-229
2.78E-04	236.39	U-233	->	Th-229
2.69E-04	74.969	Tl-209	->	Pb-209
2.50E-04	351.782	U-233	->	Th-229
2.45E-04	16.361	Fr-221	->	At-217
2.39E-04	255.92	U-233	->	Th-229
2.39E-04	176.1	U-233	->	Th-229
2.34E-04	123.76	Ac-225	->	Fr-221
2.22E-04	185.782	U-233	->	Th-229
2.22E-04	192.12	U-233	->	Th-229
2.18E-04	17.349	Th-229	->	Ra-225
2.11E-04	252.5	U-233	->	Th-229
2.05E-04	42.722	Th-229	->	Ra-225
1.97E-04	13.255	Ac-225	->	Fr-221
1.97E-04	94.87	Ac-225	->	Fr-221
1.94E-04	172.35	U-233	->	Th-229
1.91E-04	95.265	Fr-221	->	At-217
1.88E-04	153.93	Ac-225	->	Fr-221
1.85E-04	82.9	Ac-225	->	Fr-221
1.83E-04	223.357	U-233	->	Th-229
1.83E-04	131.2	U-233	->	Th-229
1.83E-04	63.69	U-233	->	Th-229
1.80E-04	218.15	Th-229	->	Ra-225
1.79E-04	195.75	Ac-225	->	Fr-221

1.69E-04	92.673	Bi-213	->	Po-213
1.60E-04	409.1	Fr-221	->	At-217
1.60E-04	72.803	Tl-209	->	Pb-209
1.55E-04	311.38	U-233	->	Th-229
1.55E-04	145.15	Ac-225	->	Fr-221
1.41E-04	68.88	Th-229	->	Ra-225
1.39E-04	184.17	U-233	->	Th-229
1.36E-04	452.43	Ac-225	->	Fr-221
1.28E-04	68.14	Th-229	->	Ra-225
1.28E-04	295.2	U-233	->	Th-229
1.23E-04	253.51	Ac-225	->	Fr-221
1.14E-04	14.082	Ra-225	->	Ac-225
1.11E-04	228.07	U-233	->	Th-229
1.11E-04	138.5	U-233	->	Th-229
1.11E-04	177.78	U-233	->	Th-229
1.11E-04	384	U-233	->	Th-229
1.06E-04	15.878	Bi-213	->	Po-213
1.05E-04	659.72	Bi-213	->	Po-213
9.86E-05	224.64	Ac-225	->	Fr-221
9.84E-05	10.541	Tl-209	->	Pb-209
9.58E-05	84.789	Tl-209	->	Pb-209
9.31E-05	12.703	Tl-209	->	Pb-209
8.62E-05	171.29	Fr-221	->	At-217
8.62E-05	149.99	Fr-221	->	At-217
8.33E-05	471.3	U-233	->	Th-229
8.33E-05	479	U-233	->	Th-229
7.39E-05	119.92	Ac-225	->	Fr-221
7.39E-05	100.88	Ac-225	->	Fr-221
6.90E-05	64.23	Ac-225	->	Fr-221
6.16E-05	124.81	Ac-225	->	Fr-221
5.55E-05	416.4	U-233	->	Th-229
5.55E-05	284.22	U-233	->	Th-229
5.55E-05	226.74	U-233	->	Th-229
5.55E-05	225	U-233	->	Th-229
5.55E-05	449.6	U-233	->	Th-229
5.17E-05	9.897	Fr-221	->	At-217
4.93E-05	135.01	Ac-225	->	Fr-221
4.62E-05	236.32	Th-229	->	Ra-225
4.62E-05	25.373	Th-229	->	Ra-225
4.61E-05	396.65	U-233	->	Th-229
4.61E-05	1119	U-233	->	Th-229
4.61E-05	402.37	U-233	->	Th-229
4.61E-05	1003	U-233	->	Th-229
4.61E-05	459.77	U-233	->	Th-229
4.56E-05	152.64	Ac-225	->	Fr-221
4.44E-05	74.9	Ac-225	->	Fr-221
4.31E-05	279.27	Ac-225	->	Fr-221
4.31E-05	382.05	Fr-221	->	At-217
4.31E-05	359.09	Fr-221	->	At-217
4.31E-05	118.47	Fr-221	->	At-217

4.16E-05	394.34	U-233	->	Th-229
4.16E-05	339.64	U-233	->	Th-229
3.70E-05	480.5	Ac-225	->	Fr-221
3.70E-05	96.17	Ac-225	->	Fr-221
3.11E-05	9.658	Bi-213	->	Po-213
2.94E-05	406.7	U-233	->	Th-229
2.94E-05	540.27	U-233	->	Th-229
2.78E-05	578.47	U-233	->	Th-229
2.78E-05	436.78	U-233	->	Th-229
2.74E-05	87.632	Tl-209	->	Pb-209
2.46E-05	248.7	Ac-225	->	Fr-221
2.46E-05	186.12	Ac-225	->	Fr-221
2.46E-05	198.72	Ac-225	->	Fr-221
2.46E-05	138.2	Ac-225	->	Fr-221
2.39E-05	484.05	U-233	->	Th-229
2.34E-05	53.82	Ac-225	->	Fr-221
2.34E-05	97.2	Fr-221	->	At-217
2.11E-05	569.37	U-233	->	Th-229
2.09E-05	73.6	Ac-225	->	Fr-221
2.09E-05	324.1	Fr-221	->	At-217
2.06E-05	12.466	Fr-221	->	At-217
1.97E-05	178.39	Ac-225	->	Fr-221
1.85E-05	36.65	Ac-225	->	Fr-221
1.81E-05	71.71	Ac-225	->	Fr-221
1.72E-05	126.23	Ac-225	->	Fr-221
1.68E-05	14.871	Tl-209	->	Pb-209
1.67E-05	656.97	U-233	->	Th-229
1.60E-05	240.76	Ac-225	->	Fr-221
1.50E-05	707.47	U-233	->	Th-229
1.33E-05	545.1	U-233	->	Th-229
1.33E-05	49.2	Ac-225	->	Fr-221
1.28E-05	620.87	U-233	->	Th-229
1.23E-05	513.5	Ac-225	->	Fr-221
1.23E-05	70.92	Ac-225	->	Fr-221
1.23E-05	526.03	Ac-225	->	Fr-221
1.23E-05	285.5	Ac-225	->	Fr-221
1.17E-05	867.9	U-233	->	Th-229
1.11E-05	38.51	Ac-225	->	Fr-221
1.11E-05	103.44	Ac-225	->	Fr-221
1.11E-05	170.91	Ac-225	->	Fr-221
1.11E-05	282.54	Fr-221	->	At-217
8.07E-06	12.085	Bi-213	->	Po-213
6.28E-06	69.85	Ac-225	->	Fr-221
5.55E-06	200.67	U-233	->	Th-229
5.30E-06	129.19	Ac-225	->	Fr-221
5.17E-06	57.77	Ac-225	->	Fr-221
5.06E-06	9.185	Tl-209	->	Pb-209
4.92E-06	323.81	Bi-213	->	Tl-209
1.85E-06	25.98	Ac-225	->	Fr-221
1.36E-06	11.349	Tl-209	->	Pb-209

3.46E-07	72.873	Bi-213	->	Tl-209
2.13E-07	70.832	Bi-213	->	Tl-209
1.33E-07	82.434	Bi-213	->	Tl-209
1.33E-07	10.259	Bi-213	->	Tl-209
1.06E-07	12.311	Bi-213	->	Tl-209
3.46E-08	85.185	Bi-213	->	Tl-209
2.13E-08	14.402	Bi-213	->	Tl-209
6.12E-09	8.953	Bi-213	->	Tl-209
1.60E-09	10.994	Bi-213	->	Tl-209

Pu-238 100% Age: 5 years

347 lines computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays			
(keV)	(ph/s/gm)				
8.953	8.66E-12	Hg-206	->	Tl-206	
9.185	1.25E-07	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
9.419	4.47E-04	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
9.658	2.91E-05	Bi-214	->	Po-214	
10.137	2.10E-05	Ra-226	->	Rn-222	
10.259	1.80E-10	Hg-206	->	Tl-206	
10.541	2.53E-06	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
10.828	8.93E-03	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
10.994	2.28E-12	Hg-206	->	Tl-206	
11.119	5.56E-04	Bi-214	->	Po-214	
11.349	6.10E-08	Tl-210	->	Pb-210	
11.439	2.68E-14	Tl-206	->	Pb-206	
11.62	1.52E+09	Pu-238	->	U-234	
11.712	1.05E-04	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
11.713	3.89E-04	Ra-226	->	Rn-222	
12.085	7.99E-06	Bi-214	->	Po-214	
12.313	1.56E-10	Hg-206	->	Tl-206	
12.678	3.36E-06	Tl-210	->	Pb-210	
12.71	1.68E-12	Tl-206	->	Pb-206	
12.855	1.07E-05	Ra-226	->	Rn-222	
13.066	5.69E-04	Pb-210	->	Bi-210	
13.088	8.28E-03	Pb-214	->	Bi-214	
13.502	5.38E-04	Bi-214	->	Po-214	
13.6	2.56E+10	Pu-238	->	U-234	
14.336	5.62E-04	Ra-226	->	Rn-222	
14.407	2.89E-11	Hg-206	->	Tl-206	
14.836	6.71E-07	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
15.4	6.21E+08	Pu-238	->	U-234	
15.439	1.69E-03	Pb-214	->	Bi-214	
15.537	1.37E-04	Pb-210	->	Bi-210	

15.874	1.03E-04	Bi-214	->	Po-214	
16.874	1.23E-04	Ra-226	->	Rn-222	
17.128	3.17E+10	Pu-238	->	U-234	
20.292	7.00E+09	Pu-238	->	U-234	
43.498	2.41E+08	Pu-238	->	U-234	
46.52	2.21E-04	Pb-210	->	Bi-210	
53.172	1.60E-03	Pb-214	->	Bi-214	
53.23	1.04E+04	U-234	->	Th-230	
62.78	2.44E+02	Pu-238	->	U-234	
67.6758	7.62E-01	Th-230	->	Ra-226	
70.832	3.01E-10	Hg-206	->	Tl-206	
72.803	8.54E-07	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
72.873	5.05E-10	Hg-206	->	Tl-206	
74.814	9.47E-03	Pb-214	->	Bi-214	
74.969	1.40E-06	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
76.838	8.43E-04	Bi-214	->	Po-214	
77.107	1.60E-02	Pb-214	->	Bi-214	
79.29	1.41E-03	Bi-214	->	Po-214	
81	6.10E-07	Tl-210	->	Pb-210	
81.067	2.58E-04	Ra-226	->	Rn-222	
82.434	1.80E-10	Hg-206	->	Tl-206	
83.787	4.28E-04	Ra-226	->	Rn-222	
84.789	5.00E-07	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
85.185	5.05E-11	Hg-206	->	Tl-206	
87.19	5.64E-03	Pb-214	->	Bi-214	
87.632	1.43E-07	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
89.639	5.01E-04	Bi-214	->	Po-214	
90.128	1.67E-03	Pb-214	->	Bi-214	
92.673	1.53E-04	Bi-214	->	Po-214	
94.66	7.00E+05	Pu-238	->	U-234	
94.677	1.51E-04	Ra-226	->	Rn-222	
95	1.22E-06	Tl-210	->	Pb-210	
97.907	4.82E-05	Ra-226	->	Rn-222	
98.441	1.13E+06	Pu-238	->	U-234	
99.864	4.32E+07	Pu-238	->	U-234	
109.97	1.20E-04	Th-230	->	Ra-226	
110.421	1.22E+05	Pu-238	->	U-234	
111.3	2.37E+05	Pu-238	->	U-234	
114.333	2.37E+05	Pu-238	->	U-234	
114.561	9.62E+04	Pu-238	->	U-234	
120.912	3.59E+03	U-234	->	Th-230	
137.4	8.57E-05	Pb-214	->	Bi-214	
141.3	5.67E-05	Pb-214	->	Bi-214	
143.876	9.85E-02	Th-230	->	Ra-226	
152.68	5.82E+06	Pu-238	->	U-234	
174.52	3.04E+01	Pu-238	->	U-234	
186.057	1.78E-02	Th-230	->	Ra-226	
186.11	4.81E-03	Ra-226	->	Rn-222	
196.3	7.12E-05	Pb-214	->	Bi-214	
200.98	2.50E+04	Pu-238	->	U-234	

203.2	6.09E+01	Pu-238	->	U-234	
205.1	1.01E-05	Th-230	->	Ra-226	
235.01	1.64E-05	Th-230	->	Ra-226	
236.03	6.09E+01	Pu-238	->	U-234	
241.92	1.08E-02	Pb-214	->	Bi-214	
253.732	2.25E-02	Th-230	->	Ra-226	
253.84	1.72E-03	Th-230	->	Ra-226	
258.18	7.25E+02	Pu-238	->	U-234	
258.94	7.99E-04	Pb-214	->	Bi-214	
262.41	7.92E-06	Ra-226	->	Rn-222	
266.15	2.84E-15	Bi-210	->	Tl-206	
273.7	2.61E-04	Bi-214	->	Po-214	
274.56	4.65E-04	Pb-214	->	Bi-214	
280.93	1.18E-04	Bi-214	->	Po-214	
286.9	4.65E-05	Bi-214	->	Po-214	
295.091	2.79E-02	Pb-214	->	Bi-214	
298.1	2.42E-05	Tl-210	->	Pb-210,	Po-214 -> Pb-210
299.08	7.92E+02	Pu-238	->	U-234	
302.25	3.25E-09	Hg-206	->	Tl-206	
304.42	4.94E-05	Bi-214	->	Po-214	
305.5	3.34E-05	Pb-214	->	Bi-214	
314.2	1.15E-04	Pb-214	->	Bi-214	
324.3	2.91E-05	Pb-214	->	Bi-214	
333.6	1.38E-04	Bi-214	->	Po-214	
334.9	8.28E-05	Bi-214	->	Po-214	
338.5	5.67E-05	Bi-214	->	Po-214	
344.96	6.25E-11	Hg-206	->	Tl-206	
347.1	8.72E-05	Bi-214	->	Po-214	
351.87	5.39E-02	Pb-214	->	Bi-214	
354	1.22E-06	Tl-210	->	Pb-210	
364.2	9.15E-06	Bi-214	->	Po-214	
376.6	7.12E-06	Bi-214	->	Po-214	
380	9.15E-07	Tl-210	->	Pb-210	
384.06	4.57E-13	Hg-206	->	Tl-206	
386.834	5.23E-04	Bi-214	->	Po-214	
388.95	5.96E-04	Bi-214	->	Po-214	
394	1.31E-05	Bi-214	->	Po-214	
396	4.36E-05	Bi-214	->	Po-214	
405.73	2.43E-04	Bi-214	->	Po-214	
414.72	5.72E-07	Ra-226	->	Rn-222	
426.5	1.60E-04	Bi-214	->	Po-214	
440.4	4.21E-05	Bi-214	->	Po-214	
449.5	3.96E-07	Ra-226	->	Rn-222	
454.832	4.62E-04	Bi-214	->	Po-214	
454.97	2.28E+00	U-234	->	Th-230	
462.05	2.47E-04	Pb-214	->	Bi-214	
469.76	1.93E-04	Bi-214	->	Po-214	
470.8	1.45E-05	Pb-214	->	Bi-214	
474.51	1.71E-04	Bi-214	->	Po-214	
478	6.10E-07	Tl-210	->	Pb-210	

480.32	4.91E-04	Pb-214	->	Bi-214
487.13	6.38E-04	Pb-214	->	Bi-214
494.6	1.31E-05	Bi-214	->	Po-214
502.2	2.61E-05	Bi-214	->	Po-214
503.53	8.77E-02	U-234	->	Th-230
508.2	1.29E+00	U-234	->	Th-230
510	1.02E-04	Rn-222	->	Po-218
511	4.21E-05	Pb-214	->	Bi-214
520.4	8.28E-06	Bi-214	->	Po-214
525	2.32E-05	Bi-214	->	Po-214
533.5	2.76E-04	Pb-214	->	Bi-214
536.93	1.03E-04	Bi-214	->	Po-214
538.7	7.12E-06	Pb-214	->	Bi-214
542.84	1.23E-04	Bi-214	->	Po-214
543.91	3.34E-05	Pb-214	->	Bi-214
547.1	4.65E-05	Bi-214	->	Po-214
551.8	2.05E-06	Th-230	->	Ra-226
570.5	6.08E-06	Th-230	->	Ra-226
572.67	1.19E-04	Bi-214	->	Po-214
580.06	5.29E-04	Pb-214	->	Bi-214
581.78	1.05E+00	U-234	->	Th-230
596	1.74E-05	Bi-214	->	Po-214
600.83	8.94E-07	Ra-226	->	Rn-222
609.311	6.70E-02	Bi-214	->	Po-214
615.77	1.02E-04	Bi-214	->	Po-214
617.1	4.94E-05	Bi-214	->	Po-214
620	2.05E-06	Th-230	->	Ra-226
624.44	7.01E-02	U-234	->	Th-230
626.4	7.12E-06	Bi-214	->	Po-214
631.2	2.47E-05	Bi-214	->	Po-214
633.14	8.72E-05	Bi-214	->	Po-214
639.36	4.50E-05	Bi-214	->	Po-214
649.18	8.57E-05	Bi-214	->	Po-214
650.21	3.01E-10	Hg-206	->	Tl-206
660.75	6.25E-05	Bi-214	->	Po-214
665.442	2.27E-03	Bi-214	->	Po-214
668	6.10E-07	Tl-210	->	Pb-210
677.67	8.77E-02	U-234	->	Th-230
683.21	1.15E-04	Bi-214	->	Po-214
687.7	8.72E-06	Bi-214	->	Po-214
693.3	8.72E-06	Bi-214	->	Po-214
697.89	5.38E-05	Bi-214	->	Po-214
703.07	6.86E-04	Bi-214	->	Po-214
706.02	9.19E+02	Pu-238	->	U-234
708.4	2.31E+03	Pu-238	->	U-234
710.84	1.09E-04	Bi-214	->	Po-214
719.856	5.85E-04	Bi-214	->	Po-214
723.32	6.54E-05	Bi-214	->	Po-214
727.8	2.28E-05	Bi-214	->	Po-214
733.64	6.83E-05	Bi-214	->	Po-214

740.87	5.67E-05	Bi-214	->	Po-214	
742.817	4.75E+04	Pu-238	->	U-234	
752.843	1.93E-04	Bi-214	->	Po-214	
765.9	1.15E-04	Pb-214	->	Bi-214	
766.412	2.01E+05	Pu-238	->	U-234	
768.35	7.09E-03	Bi-214	->	Po-214	
783.38	2.80E+02	Pu-238	->	U-234	
785.827	1.58E-03	Pb-214	->	Bi-214	
786.287	2.86E+04	Pu-238	->	U-234	
786.42	4.50E-04	Bi-214	->	Po-214	
797.88	4.53E-05	Tl-210	->	Pb-210,	Po-214 -> Pb-210
799.75	5.96E-05	Bi-214	->	Po-214	
803.13	3.87E-08	Tl-206	->	Pb-206,	Po-210 -> Pb-206
805.87	1.05E+03	Pu-238	->	U-234	
806.155	1.79E-03	Bi-214	->	Po-214	
808.25	6.45E+03	Pu-238	->	U-234	
814.87	5.81E-05	Bi-214	->	Po-214	
821.166	2.18E-04	Bi-214	->	Po-214	
826.44	1.34E-04	Bi-214	->	Po-214	
832.34	3.34E-05	Bi-214	->	Po-214	
838.999	8.53E-04	Pb-214	->	Bi-214	
847.2	2.47E-05	Bi-214	->	Po-214	
851.72	1.24E+04	Pu-238	->	U-234	
860	2.11E-06	Tl-210	->	Pb-210	
880.53	1.40E+03	Pu-238	->	U-234	
883.24	6.76E+03	Pu-238	->	U-234	
904.33	1.53E-04	Bi-214	->	Po-214	
904.38	6.09E+02	Pu-238	->	U-234	
908	9.15E-07	Tl-210	->	Pb-210	
915.8	3.34E-05	Bi-214	->	Po-214	
926.71	4.99E+03	Pu-238	->	U-234	
934.039	4.59E-03	Bi-214	->	Po-214	
942.05	3.90E+03	Pu-238	->	U-234	
943.3	2.47E-05	Bi-214	->	Po-214	
946.02	7.92E+02	Pu-238	->	U-234	
964.07	5.56E-04	Bi-214	->	Po-214	
976.2	3.34E-05	Bi-214	->	Po-214	
980.39	4.87E+02	Pu-238	->	U-234	
989.2	1.74E-05	Bi-214	->	Po-214	
1001	8.34E+03	Pu-238	->	U-234	
1013.4	1.45E-05	Bi-214	->	Po-214	
1020.5	1.74E-05	Bi-214	->	Po-214	
1032.22	1.39E-04	Bi-214	->	Po-214	
1038	2.47E-05	Bi-214	->	Po-214	
1041.9	1.76E+03	Pu-238	->	U-234	
1045.4	4.21E-05	Bi-214	->	Po-214	
1051.95	4.58E-04	Bi-214	->	Po-214	
1067.3	4.21E-05	Bi-214	->	Po-214	
1068	3.66E-06	Tl-210	->	Pb-210	
1070.02	4.14E-04	Bi-214	->	Po-214	

1085.37	6.39E+02	Pu-238	->	U-234
1103.7	1.45E-04	Bi-214	->	Po-214
1104.766	1.16E-04	Bi-214	->	Po-214
1110	2.11E-06	Tl-210	->	Pb-210
1120.273	2.18E-02	Bi-214	->	Po-214
1130.6	6.54E-05	Bi-214	->	Po-214
1133.65	3.70E-04	Bi-214	->	Po-214
1155.183	2.46E-03	Bi-214	->	Po-214
1172.93	8.43E-05	Bi-214	->	Po-214
1173.04	8.43E-05	Bi-214	->	Po-214
1207.764	6.68E-04	Bi-214	->	Po-214
1208	5.19E-06	Tl-210	->	Pb-210
1226.8	3.92E-05	Bi-214	->	Po-214
1230.84	3.20E-05	Bi-214	->	Po-214
1238.107	8.60E-03	Bi-214	->	Po-214
1280.952	2.14E-03	Bi-214	->	Po-214
1303.76	1.76E-04	Bi-214	->	Po-214
1314	6.41E-06	Tl-210	->	Pb-210
1317.02	1.25E-04	Bi-214	->	Po-214
1330	1.60E-05	Bi-214	->	Po-214
1341.5	3.34E-05	Bi-214	->	Po-214
1353	6.54E-06	Bi-214	->	Po-214
1377.659	5.84E-03	Bi-214	->	Po-214
1385.295	1.13E-03	Bi-214	->	Po-214
1392.5	2.76E-05	Bi-214	->	Po-214
1401.48	2.02E-03	Bi-214	->	Po-214
1407.97	3.60E-03	Bi-214	->	Po-214
1408	1.50E-06	Tl-210	->	Pb-210
1419.7	7.41E-06	Bi-214	->	Po-214
1471.1	1.74E-05	Bi-214	->	Po-214
1479.19	1.00E-04	Bi-214	->	Po-214
1509.22	3.18E-03	Bi-214	->	Po-214
1538	6.10E-07	Tl-210	->	Pb-210
1538.49	5.96E-04	Bi-214	->	Po-214
1543.347	5.08E-04	Bi-214	->	Po-214
1583.22	1.05E-03	Bi-214	->	Po-214
1588	6.10E-07	Tl-210	->	Pb-210
1594.78	3.85E-04	Bi-214	->	Po-214
1599.3	4.85E-04	Bi-214	->	Po-214
1636.6	2.76E-05	Bi-214	->	Po-214
1637.37	1.02E-04	Bi-214	->	Po-214
1648	6.10E-07	Tl-210	->	Pb-210
1661.258	1.67E-03	Bi-214	->	Po-214
1683.99	3.43E-04	Bi-214	->	Po-214
1729.58	4.43E-03	Bi-214	->	Po-214
1764.49	2.31E-02	Bi-214	->	Po-214
1782.1	2.32E-05	Bi-214	->	Po-214
1814.01	1.74E-05	Bi-214	->	Po-214
1838.37	5.56E-04	Bi-214	->	Po-214
1847.41	3.08E-03	Bi-214	->	Po-214

1873.112	3.28E-04	Bi-214	->	Po-214
1890.259	1.29E-04	Bi-214	->	Po-214
1896.28	2.57E-04	Bi-214	->	Po-214
1898.9	9.15E-05	Bi-214	->	Po-214
1935.8	7.41E-05	Bi-214	->	Po-214
1994.7	7.26E-06	Bi-214	->	Po-214
2004.5	4.21E-06	Bi-214	->	Po-214
2008	2.11E-06	Tl-210	->	Pb-210
2010.79	7.12E-05	Bi-214	->	Po-214
2021.7	2.76E-05	Bi-214	->	Po-214
2052.93	1.02E-04	Bi-214	->	Po-214
2085	1.45E-05	Bi-214	->	Po-214
2088	1.50E-06	Tl-210	->	Pb-210
2089.55	8.14E-05	Bi-214	->	Po-214
2109.91	1.26E-04	Bi-214	->	Po-214
2118.53	1.76E-03	Bi-214	->	Po-214
2147.8	2.32E-05	Bi-214	->	Po-214
2192.52	8.86E-05	Bi-214	->	Po-214
2204.09	7.25E-03	Bi-214	->	Po-214
2251.2	1.02E-05	Bi-214	->	Po-214
2259.7	1.31E-05	Bi-214	->	Po-214
2266.67	2.61E-05	Bi-214	->	Po-214
2268	9.15E-07	Tl-210	->	Pb-210
2270	4.21E-06	Bi-214	->	Po-214
2284.4	7.41E-06	Bi-214	->	Po-214
2293.29	4.71E-04	Bi-214	->	Po-214
2324.8	2.76E-06	Bi-214	->	Po-214
2331.2	3.20E-05	Bi-214	->	Po-214
2358	2.44E-06	Tl-210	->	Pb-210
2360.9	2.76E-06	Bi-214	->	Po-214
2369.3	4.21E-06	Bi-214	->	Po-214
2376.99	1.71E-05	Bi-214	->	Po-214
2390.9	2.91E-06	Bi-214	->	Po-214
2423.32	8.57E-06	Bi-214	->	Po-214
2428	2.75E-06	Tl-210	->	Pb-210
2447.68	2.25E-03	Bi-214	->	Po-214
2482.417	3.05E-06	Bi-214	->	Po-214
2505.58	8.57E-06	Bi-214	->	Po-214
2551	5.67E-07	Bi-214	->	Po-214
2604.5	6.54E-07	Bi-214	->	Po-214
2631	1.31E-06	Bi-214	->	Po-214
2662.23	4.21E-07	Bi-214	->	Po-214
2694.67	4.71E-05	Bi-214	->	Po-214
2698.86	4.07E-06	Bi-214	->	Po-214
2719.21	2.61E-06	Bi-214	->	Po-214
2769.99	3.72E-05	Bi-214	->	Po-214
2786.09	8.57E-06	Bi-214	->	Po-214
2827	3.63E-06	Bi-214	->	Po-214
2860.9	4.94E-07	Bi-214	->	Po-214
2880.4	1.34E-05	Bi-214	->	Po-214

2893.59	9.30E-06	Bi-214	->	Po-214
2922.09	2.28E-05	Bi-214	->	Po-214
2928.7	1.74E-06	Bi-214	->	Po-214
2934.9	8.28E-07	Bi-214	->	Po-214
2940.5	2.47E-06	Bi-214	->	Po-214
2978.79	2.14E-05	Bi-214	->	Po-214
2988.7	1.60E-06	Bi-214	->	Po-214
2999.99	1.28E-05	Bi-214	->	Po-214
3053.89	3.28E-05	Bi-214	->	Po-214
3081.7	6.25E-06	Bi-214	->	Po-214
3093.9	7.41E-07	Bi-214	->	Po-214
3136.3	4.94E-07	Bi-214	->	Po-214
3142.6	2.32E-06	Bi-214	->	Po-214
3160.5	7.41E-07	Bi-214	->	Po-214
3183.6	2.18E-06	Bi-214	->	Po-214
3233.3	2.91E-07	Bi-214	->	Po-214
3269.7	1.45E-07	Bi-214	->	Po-214

Pu238 Aged 5 years		Sorted by Intensity		
Intensity	Energy	Initial Isotopes and Decays		
(ph/s/gm)	(keV)			
3.17E+10	17.128	Pu-238	->	U-234
2.56E+10	13.6	Pu-238	->	U-234
7.00E+09	20.292	Pu-238	->	U-234
1.52E+09	11.62	Pu-238	->	U-234
6.21E+08	15.4	Pu-238	->	U-234
2.41E+08	43.498	Pu-238	->	U-234
4.32E+07	99.864	Pu-238	->	U-234
5.82E+06	152.68	Pu-238	->	U-234
1.13E+06	98.441	Pu-238	->	U-234
7.00E+05	94.66	Pu-238	->	U-234
2.37E+05	111.3	Pu-238	->	U-234
2.37E+05	114.333	Pu-238	->	U-234
2.01E+05	766.412	Pu-238	->	U-234
1.22E+05	110.421	Pu-238	->	U-234
9.62E+04	114.561	Pu-238	->	U-234
4.75E+04	742.817	Pu-238	->	U-234
2.86E+04	786.287	Pu-238	->	U-234
2.50E+04	200.98	Pu-238	->	U-234
1.24E+04	851.72	Pu-238	->	U-234
1.04E+04	53.23	U-234	->	Th-230
8.34E+03	1001	Pu-238	->	U-234
6.76E+03	883.24	Pu-238	->	U-234
6.45E+03	808.25	Pu-238	->	U-234
4.99E+03	926.71	Pu-238	->	U-234
3.90E+03	942.05	Pu-238	->	U-234

3.59E+03	120.912	U-234	->	Th-230	
2.31E+03	708.4	Pu-238	->	U-234	
1.76E+03	1041.9	Pu-238	->	U-234	
1.40E+03	880.53	Pu-238	->	U-234	
1.05E+03	805.87	Pu-238	->	U-234	
9.19E+02	706.02	Pu-238	->	U-234	
7.92E+02	946.02	Pu-238	->	U-234	
7.92E+02	299.08	Pu-238	->	U-234	
7.25E+02	258.18	Pu-238	->	U-234	
6.39E+02	1085.37	Pu-238	->	U-234	
6.09E+02	904.38	Pu-238	->	U-234	
4.87E+02	980.39	Pu-238	->	U-234	
2.80E+02	783.38	Pu-238	->	U-234	
2.44E+02	62.78	Pu-238	->	U-234	
6.09E+01	236.03	Pu-238	->	U-234	
6.09E+01	203.2	Pu-238	->	U-234	
3.04E+01	174.52	Pu-238	->	U-234	
2.28E+00	454.97	U-234	->	Th-230	
1.29E+00	508.2	U-234	->	Th-230	
1.05E+00	581.78	U-234	->	Th-230	
7.62E-01	67.6758	Th-230	->	Ra-226	
9.85E-02	143.876	Th-230	->	Ra-226	
8.77E-02	677.67	U-234	->	Th-230	
8.77E-02	503.53	U-234	->	Th-230	
7.01E-02	624.44	U-234	->	Th-230	
6.70E-02	609.311	Bi-214	->	Po-214	
5.39E-02	351.87	Pb-214	->	Bi-214	
2.79E-02	295.091	Pb-214	->	Bi-214	
2.31E-02	1764.49	Bi-214	->	Po-214	
2.25E-02	253.732	Th-230	->	Ra-226	
2.18E-02	1120.273	Bi-214	->	Po-214	
1.78E-02	186.057	Th-230	->	Ra-226	
1.60E-02	77.107	Pb-214	->	Bi-214	
1.08E-02	241.92	Pb-214	->	Bi-214	
9.47E-03	74.814	Pb-214	->	Bi-214	
8.93E-03	10.828	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
8.60E-03	1238.107	Bi-214	->	Po-214	
8.28E-03	13.088	Pb-214	->	Bi-214	
7.25E-03	2204.09	Bi-214	->	Po-214	
7.09E-03	768.35	Bi-214	->	Po-214	
5.84E-03	1377.659	Bi-214	->	Po-214	
5.64E-03	87.19	Pb-214	->	Bi-214	
4.81E-03	186.11	Ra-226	->	Rn-222	
4.59E-03	934.039	Bi-214	->	Po-214	
4.43E-03	1729.58	Bi-214	->	Po-214	
3.60E-03	1407.97	Bi-214	->	Po-214	
3.18E-03	1509.22	Bi-214	->	Po-214	
3.08E-03	1847.41	Bi-214	->	Po-214	
2.46E-03	1155.183	Bi-214	->	Po-214	
2.27E-03	665.442	Bi-214	->	Po-214	

2.25E-03	2447.68	Bi-214	->	Po-214	
2.14E-03	1280.952	Bi-214	->	Po-214	
2.02E-03	1401.48	Bi-214	->	Po-214	
1.79E-03	806.155	Bi-214	->	Po-214	
1.76E-03	2118.53	Bi-214	->	Po-214	
1.72E-03	253.84	Th-230	->	Ra-226	
1.69E-03	15.439	Pb-214	->	Bi-214	
1.67E-03	90.128	Pb-214	->	Bi-214	
1.67E-03	1661.258	Bi-214	->	Po-214	
1.60E-03	53.172	Pb-214	->	Bi-214	
1.58E-03	785.827	Pb-214	->	Bi-214	
1.41E-03	79.29	Bi-214	->	Po-214	
1.13E-03	1385.295	Bi-214	->	Po-214	
1.05E-03	1583.22	Bi-214	->	Po-214	
8.53E-04	838.999	Pb-214	->	Bi-214	
8.43E-04	76.838	Bi-214	->	Po-214	
7.99E-04	258.94	Pb-214	->	Bi-214	
6.86E-04	703.07	Bi-214	->	Po-214	
6.68E-04	1207.764	Bi-214	->	Po-214	
6.38E-04	487.13	Pb-214	->	Bi-214	
5.96E-04	1538.49	Bi-214	->	Po-214	
5.96E-04	388.95	Bi-214	->	Po-214	
5.85E-04	719.856	Bi-214	->	Po-214	
5.69E-04	13.066	Pb-210	->	Bi-210	
5.62E-04	14.336	Ra-226	->	Rn-222	
5.56E-04	964.07	Bi-214	->	Po-214	
5.56E-04	11.119	Bi-214	->	Po-214	
5.56E-04	1838.37	Bi-214	->	Po-214	
5.38E-04	13.502	Bi-214	->	Po-214	
5.29E-04	580.06	Pb-214	->	Bi-214	
5.23E-04	386.834	Bi-214	->	Po-214	
5.08E-04	1543.347	Bi-214	->	Po-214	
5.01E-04	89.639	Bi-214	->	Po-214	
4.91E-04	480.32	Pb-214	->	Bi-214	
4.85E-04	1599.3	Bi-214	->	Po-214	
4.71E-04	2293.29	Bi-214	->	Po-214	
4.65E-04	274.56	Pb-214	->	Bi-214	
4.62E-04	454.832	Bi-214	->	Po-214	
4.58E-04	1051.95	Bi-214	->	Po-214	
4.50E-04	786.42	Bi-214	->	Po-214	
4.47E-04	9.419	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
4.28E-04	83.787	Ra-226	->	Rn-222	
4.14E-04	1070.02	Bi-214	->	Po-214	
3.89E-04	11.713	Ra-226	->	Rn-222	
3.85E-04	1594.78	Bi-214	->	Po-214	
3.70E-04	1133.65	Bi-214	->	Po-214	
3.43E-04	1683.99	Bi-214	->	Po-214	
3.28E-04	1873.112	Bi-214	->	Po-214	
2.76E-04	533.5	Pb-214	->	Bi-214	
2.61E-04	273.7	Bi-214	->	Po-214	

2.58E-04	81.067	Ra-226	->	Rn-222	
2.57E-04	1896.28	Bi-214	->	Po-214	
2.47E-04	462.05	Pb-214	->	Bi-214	
2.43E-04	405.73	Bi-214	->	Po-214	
2.21E-04	46.52	Pb-210	->	Bi-210	
2.18E-04	821.166	Bi-214	->	Po-214	
1.93E-04	469.76	Bi-214	->	Po-214	
1.93E-04	752.843	Bi-214	->	Po-214	
1.76E-04	1303.76	Bi-214	->	Po-214	
1.71E-04	474.51	Bi-214	->	Po-214	
1.60E-04	426.5	Bi-214	->	Po-214	
1.53E-04	92.673	Bi-214	->	Po-214	
1.53E-04	904.33	Bi-214	->	Po-214	
1.51E-04	94.677	Ra-226	->	Rn-222	
1.45E-04	1103.7	Bi-214	->	Po-214	
1.39E-04	1032.22	Bi-214	->	Po-214	
1.38E-04	333.6	Bi-214	->	Po-214	
1.37E-04	15.537	Pb-210	->	Bi-210	
1.34E-04	826.44	Bi-214	->	Po-214	
1.29E-04	1890.259	Bi-214	->	Po-214	
1.26E-04	2109.91	Bi-214	->	Po-214	
1.25E-04	1317.02	Bi-214	->	Po-214	
1.23E-04	542.84	Bi-214	->	Po-214	
1.23E-04	16.874	Ra-226	->	Rn-222	
1.20E-04	109.97	Th-230	->	Ra-226	
1.19E-04	572.67	Bi-214	->	Po-214	
1.18E-04	280.93	Bi-214	->	Po-214	
1.16E-04	1104.766	Bi-214	->	Po-214	
1.15E-04	765.9	Pb-214	->	Bi-214	
1.15E-04	314.2	Pb-214	->	Bi-214	
1.15E-04	683.21	Bi-214	->	Po-214	
1.09E-04	710.84	Bi-214	->	Po-214	
1.05E-04	11.712	Pb-210	->	Bi-210,	Pb-214 -> Bi-214
1.03E-04	15.874	Bi-214	->	Po-214	
1.03E-04	536.93	Bi-214	->	Po-214	
1.02E-04	510	Rn-222	->	Po-218	
1.02E-04	1637.37	Bi-214	->	Po-214	
1.02E-04	2052.93	Bi-214	->	Po-214	
1.02E-04	615.77	Bi-214	->	Po-214	
1.00E-04	1479.19	Bi-214	->	Po-214	
9.15E-05	1898.9	Bi-214	->	Po-214	
8.86E-05	2192.52	Bi-214	->	Po-214	
8.72E-05	347.1	Bi-214	->	Po-214	
8.72E-05	633.14	Bi-214	->	Po-214	
8.57E-05	137.4	Pb-214	->	Bi-214	
8.57E-05	649.18	Bi-214	->	Po-214	
8.43E-05	1173.04	Bi-214	->	Po-214	
8.43E-05	1172.93	Bi-214	->	Po-214	
8.28E-05	334.9	Bi-214	->	Po-214	
8.14E-05	2089.55	Bi-214	->	Po-214	

7.41E-05	1935.8	Bi-214	->	Po-214	
7.12E-05	196.3	Pb-214	->	Bi-214	
7.12E-05	2010.79	Bi-214	->	Po-214	
6.83E-05	733.64	Bi-214	->	Po-214	
6.54E-05	1130.6	Bi-214	->	Po-214	
6.54E-05	723.32	Bi-214	->	Po-214	
6.25E-05	660.75	Bi-214	->	Po-214	
5.96E-05	799.75	Bi-214	->	Po-214	
5.81E-05	814.87	Bi-214	->	Po-214	
5.67E-05	141.3	Pb-214	->	Bi-214	
5.67E-05	740.87	Bi-214	->	Po-214	
5.67E-05	338.5	Bi-214	->	Po-214	
5.38E-05	697.89	Bi-214	->	Po-214	
4.94E-05	304.42	Bi-214	->	Po-214	
4.94E-05	617.1	Bi-214	->	Po-214	
4.82E-05	97.907	Ra-226	->	Rn-222	
4.71E-05	2694.67	Bi-214	->	Po-214	
4.65E-05	547.1	Bi-214	->	Po-214	
4.65E-05	286.9	Bi-214	->	Po-214	
4.53E-05	797.88	Tl-210	->	Pb-210,	Po-214 -> Pb-210
4.50E-05	639.36	Bi-214	->	Po-214	
4.36E-05	396	Bi-214	->	Po-214	
4.21E-05	511	Pb-214	->	Bi-214	
4.21E-05	1045.4	Bi-214	->	Po-214	
4.21E-05	440.4	Bi-214	->	Po-214	
4.21E-05	1067.3	Bi-214	->	Po-214	
3.92E-05	1226.8	Bi-214	->	Po-214	
3.72E-05	2769.99	Bi-214	->	Po-214	
3.34E-05	543.91	Pb-214	->	Bi-214	
3.34E-05	305.5	Pb-214	->	Bi-214	
3.34E-05	1341.5	Bi-214	->	Po-214	
3.34E-05	832.34	Bi-214	->	Po-214	
3.34E-05	976.2	Bi-214	->	Po-214	
3.34E-05	915.8	Bi-214	->	Po-214	
3.28E-05	3053.89	Bi-214	->	Po-214	
3.20E-05	2331.2	Bi-214	->	Po-214	
3.20E-05	1230.84	Bi-214	->	Po-214	
2.91E-05	324.3	Pb-214	->	Bi-214	
2.91E-05	9.658	Bi-214	->	Po-214	
2.76E-05	2021.7	Bi-214	->	Po-214	
2.76E-05	1636.6	Bi-214	->	Po-214	
2.76E-05	1392.5	Bi-214	->	Po-214	
2.61E-05	2266.67	Bi-214	->	Po-214	
2.61E-05	502.2	Bi-214	->	Po-214	
2.47E-05	631.2	Bi-214	->	Po-214	
2.47E-05	1038	Bi-214	->	Po-214	
2.47E-05	943.3	Bi-214	->	Po-214	
2.47E-05	847.2	Bi-214	->	Po-214	
2.42E-05	298.1	Tl-210	->	Pb-210,	Po-214 -> Pb-210
2.32E-05	525	Bi-214	->	Po-214	

2.32E-05	1782.1	Bi-214	->	Po-214
2.32E-05	2147.8	Bi-214	->	Po-214
2.28E-05	727.8	Bi-214	->	Po-214
2.28E-05	2922.09	Bi-214	->	Po-214
2.14E-05	2978.79	Bi-214	->	Po-214
2.10E-05	10.137	Ra-226	->	Rn-222
1.74E-05	989.2	Bi-214	->	Po-214
1.74E-05	1814.01	Bi-214	->	Po-214
1.74E-05	1471.1	Bi-214	->	Po-214
1.74E-05	596	Bi-214	->	Po-214
1.74E-05	1020.5	Bi-214	->	Po-214
1.71E-05	2376.99	Bi-214	->	Po-214
1.64E-05	235.01	Th-230	->	Ra-226
1.60E-05	1330	Bi-214	->	Po-214
1.45E-05	470.8	Pb-214	->	Bi-214
1.45E-05	2085	Bi-214	->	Po-214
1.45E-05	1013.4	Bi-214	->	Po-214
1.34E-05	2880.4	Bi-214	->	Po-214
1.31E-05	494.6	Bi-214	->	Po-214
1.31E-05	2259.7	Bi-214	->	Po-214
1.31E-05	394	Bi-214	->	Po-214
1.28E-05	2999.99	Bi-214	->	Po-214
1.07E-05	12.855	Ra-226	->	Rn-222
1.02E-05	2251.2	Bi-214	->	Po-214
1.01E-05	205.1	Th-230	->	Ra-226
9.30E-06	2893.59	Bi-214	->	Po-214
9.15E-06	364.2	Bi-214	->	Po-214
8.72E-06	687.7	Bi-214	->	Po-214
8.72E-06	693.3	Bi-214	->	Po-214
8.57E-06	2423.32	Bi-214	->	Po-214
8.57E-06	2505.58	Bi-214	->	Po-214
8.57E-06	2786.09	Bi-214	->	Po-214
8.28E-06	520.4	Bi-214	->	Po-214
7.99E-06	12.085	Bi-214	->	Po-214
7.92E-06	262.41	Ra-226	->	Rn-222
7.41E-06	1419.7	Bi-214	->	Po-214
7.41E-06	2284.4	Bi-214	->	Po-214
7.26E-06	1994.7	Bi-214	->	Po-214
7.12E-06	538.7	Pb-214	->	Bi-214
7.12E-06	626.4	Bi-214	->	Po-214
7.12E-06	376.6	Bi-214	->	Po-214
6.54E-06	1353	Bi-214	->	Po-214
6.41E-06	1314	Tl-210	->	Pb-210
6.25E-06	3081.7	Bi-214	->	Po-214
6.08E-06	570.5	Th-230	->	Ra-226
5.19E-06	1208	Tl-210	->	Pb-210
4.21E-06	2004.5	Bi-214	->	Po-214
4.21E-06	2270	Bi-214	->	Po-214
4.21E-06	2369.3	Bi-214	->	Po-214
4.07E-06	2698.86	Bi-214	->	Po-214

3.66E-06	1068	Tl-210	->	Pb-210	
3.63E-06	2827	Bi-214	->	Po-214	
3.36E-06	12.678	Tl-210	->	Pb-210	
3.05E-06	2482.417	Bi-214	->	Po-214	
2.91E-06	2390.9	Bi-214	->	Po-214	
2.76E-06	2360.9	Bi-214	->	Po-214	
2.76E-06	2324.8	Bi-214	->	Po-214	
2.75E-06	2428	Tl-210	->	Pb-210	
2.61E-06	2719.21	Bi-214	->	Po-214	
2.53E-06	10.541	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
2.47E-06	2940.5	Bi-214	->	Po-214	
2.44E-06	2358	Tl-210	->	Pb-210	
2.32E-06	3142.6	Bi-214	->	Po-214	
2.18E-06	3183.6	Bi-214	->	Po-214	
2.11E-06	1110	Tl-210	->	Pb-210	
2.11E-06	2008	Tl-210	->	Pb-210	
2.11E-06	860	Tl-210	->	Pb-210	
2.05E-06	620	Th-230	->	Ra-226	
2.05E-06	551.8	Th-230	->	Ra-226	
1.74E-06	2928.7	Bi-214	->	Po-214	
1.60E-06	2988.7	Bi-214	->	Po-214	
1.50E-06	2088	Tl-210	->	Pb-210	
1.50E-06	1408	Tl-210	->	Pb-210	
1.40E-06	74.969	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
1.31E-06	2631	Bi-214	->	Po-214	
1.22E-06	95	Tl-210	->	Pb-210	
1.22E-06	354	Tl-210	->	Pb-210	
9.15E-07	2268	Tl-210	->	Pb-210	
9.15E-07	380	Tl-210	->	Pb-210	
9.15E-07	908	Tl-210	->	Pb-210	
8.94E-07	600.83	Ra-226	->	Rn-222	
8.54E-07	72.803	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
8.28E-07	2934.9	Bi-214	->	Po-214	
7.41E-07	3093.9	Bi-214	->	Po-214	
7.41E-07	3160.5	Bi-214	->	Po-214	
6.71E-07	14.836	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
6.54E-07	2604.5	Bi-214	->	Po-214	
6.10E-07	1538	Tl-210	->	Pb-210	
6.10E-07	1588	Tl-210	->	Pb-210	
6.10E-07	668	Tl-210	->	Pb-210	
6.10E-07	1648	Tl-210	->	Pb-210	
6.10E-07	478	Tl-210	->	Pb-210	
6.10E-07	81	Tl-210	->	Pb-210	
5.72E-07	414.72	Ra-226	->	Rn-222	
5.67E-07	2551	Bi-214	->	Po-214	
5.00E-07	84.789	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
4.94E-07	2860.9	Bi-214	->	Po-214	
4.94E-07	3136.3	Bi-214	->	Po-214	
4.21E-07	2662.23	Bi-214	->	Po-214	
3.96E-07	449.5	Ra-226	->	Rn-222	

2.91E-07	3233.3	Bi-214	->	Po-214		
1.45E-07	3269.7	Bi-214	->	Po-214		
1.43E-07	87.632	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
1.25E-07	9.185	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
6.10E-08	11.349	Tl-210	->	Pb-210		
3.87E-08	803.13	Tl-206	->	Pb-206,	Po-210	-> Pb-206
3.25E-09	302.25	Hg-206	->	Tl-206		
5.05E-10	72.873	Hg-206	->	Tl-206		
3.01E-10	70.832	Hg-206	->	Tl-206		
3.01E-10	650.21	Hg-206	->	Tl-206		
1.80E-10	82.434	Hg-206	->	Tl-206		
1.80E-10	10.259	Hg-206	->	Tl-206		
1.56E-10	12.313	Hg-206	->	Tl-206		
6.25E-11	344.96	Hg-206	->	Tl-206		
5.05E-11	85.185	Hg-206	->	Tl-206		
2.89E-11	14.407	Hg-206	->	Tl-206		
8.66E-12	8.953	Hg-206	->	Tl-206		
2.28E-12	10.994	Hg-206	->	Tl-206		
1.68E-12	12.71	Tl-206	->	Pb-206		
4.57E-13	384.06	Hg-206	->	Tl-206		
2.68E-14	11.439	Tl-206	->	Pb-206		
2.84E-15	266.15	Bi-210	->	Tl-206		

Pu-239 100% Age: 5 years

751 lines computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays				
(keV)	(ph/s/gm)					
8.953	6.10E-09	Bi-211	->	Tl-207		
9.185	1.27E-11	Tl-207	->	Pb-207		
9.3	3.89E-11	Ac-227	->	Th-227		
9.419	5.38E-09	Pb-211	->	Bi-211		
9.658	5.97E-09	Rn-219	->	Po-215		
10.137	1.56E-07	Ra-223	->	Rn-219		
10.259	1.24E-07	Bi-211	->	Tl-207		
10.541	2.54E-10	Tl-207	->	Pb-207		
10.622	2.85E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
10.828	1.05E-07	Pb-211	->	Bi-211		
10.871	7.15E-06	Pa-231	->	Ac-227		
10.994	1.61E-09	Bi-211	->	Tl-207		
11.118	1.13E-01	Ac-227	->	Th-227,	U-235	-> Th-231
11.119	1.16E-07	Rn-219	->	Po-215		
11.349	3.30E-12	Tl-207	->	Pb-207		
11.372	3.39E-01	Th-231	->	Pa-231		
11.712	1.70E-09	Pb-211	->	Bi-211		

11.713	2.89E-06	Ra-223	->	Rn-219		
12.085	2.12E-09	Rn-219	->	Po-215		
12.313	1.13E-07	Bi-211	->	Tl-207		
12.325	4.94E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
12.636	1.31E-04	Pa-231	->	Ac-227		
12.703	2.32E-10	Tl-207	->	Pb-207		
12.855	4.11E-08	Ra-223	->	Rn-219		
12.952	2.49E+00	Ac-227	->	Th-227,	U-235	-> Th-231
13.082	1.16E-07	Pb-211	->	Bi-211		
13.495	1.27E-07	Rn-219	->	Po-215		
13.662	1.04E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
13.724	5.53E+00	Th-231	->	Pa-231		
14.082	2.21E-06	Pa-231	->	Ac-227		
14.341	2.78E-06	Ra-223	->	Rn-219		
14.407	2.06E-08	Bi-211	->	Tl-207		
14.511	2.49E-02	Ac-227	->	Th-227,	U-235	-> Th-231
14.886	4.24E-11	Tl-207	->	Pb-207		
14.953	4.52E-02	Th-231	->	Pa-231		
15.2	1.05E-08	Ac-227	->	Th-227		
15.213	7.96E-08	Fr-223	->	Ra-223		
15.218	6.02E-06	Th-227	->	Ra-223		
15.397	2.55E-08	Pb-211	->	Bi-211		
15.69	1.49E-04	Pa-231	->	Ac-227		
15.856	2.58E-08	Rn-219	->	Po-215		
16.074	4.49E-08	Ac-227	->	Th-227		
16.119	1.69E+00	U-235	->	Th-231		
16.397	2.27E-06	Pa-231	->	Ac-227		
16.559	4.18E+00	Th-231	->	Pa-231		
16.918	5.49E-07	Ra-223	->	Rn-219		
17.187	2.48E-02	Th-231	->	Pa-231		
17.997	1.38E-06	Th-227	->	Ra-223		
18.016	1.80E-08	Fr-223	->	Ra-223		
18.607	3.52E-05	Pa-231	->	Ac-227		
18.998	1.97E-06	Pa-231	->	Ac-227		
19.118	2.94E-01	U-235	->	Th-231		
19.308	1.20E-08	Ac-227	->	Th-227		
19.811	8.35E-01	Th-231	->	Pa-231		
20.27	6.07E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
23.55	1.01E-09	Pa-231	->	Ac-227		
24.5	1.05E-09	Ac-227	->	Th-227		
24.56	1.79E-07	Pa-231	->	Ac-227		
25.464	5.37E-07	Pa-231	->	Ac-227		
25.642	1.65E+00	Th-231	->	Pa-231		
27.396	5.54E-05	Pa-231	->	Ac-227		
29.58	1.83E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223
29.869	2.88E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
29.996	5.48E-07	Pa-231	->	Ac-227		
30.08	2.41E+03	Pu-239	->	U-235		
31.04	5.37E-08	Pa-231	->	Ac-227		
31.566	2.29E-08	Th-227	->	Ra-223		

31.58	4.17E-08	Pa-231	->	Ac-227	
31.585	1.81E-03	U-235	->	Th-231	
31.87	2.83E-11	Ra-223	->	Rn-219	
33.52	4.01E-09	Th-227	->	Ra-223	
35.884	9.54E-08	Pa-231	->	Ac-227	
38.235	8.88E-07	Pa-231	->	Ac-227	
38.66	2.41E+05	Pu-239	->	U-235	
39.61	8.35E-09	Pa-231	->	Ac-227	
40.006	7.15E-08	Pa-231	->	Ac-227	
40.16	5.73E-09	Th-227	->	Ra-223	
40.41	3.72E+03	Pu-239	->	U-235	
41.13	3.39E-03	U-235	->	Th-231	
41.88	1.15E-08	Th-227	->	Ra-223	
41.96	6.78E-03	U-235	->	Th-231	
42.06	3.79E+03	Pu-239	->	U-235	
42.52	3.58E-08	Pa-231	->	Ac-227	
42.828	6.55E-03	Th-231	->	Pa-231	
43.09	4.17E-08	Pa-231	->	Ac-227	
43.53	1.43E-08	Th-227	->	Ra-223	
43.73	6.60E-08	Fr-223	->	Ra-223,	Th-227 -> Ra-223
44.06	7.90E-05	Th-231	->	Pa-231	
44.08	2.01E-09	Th-227	->	Ra-223	
44.213	3.58E-07	Pa-231	->	Ac-227	
44.37	3.73E-09	Th-227	->	Ra-223	
46.13	5.87E-12	Ac-227	->	Fr-223	
46.218	1.69E+04	Pu-239	->	U-235	
46.393	1.24E-06	Pa-231	->	Ac-227	
46.69	1.33E+03	Pu-239	->	U-235	
47.52	6.66E+02	Pu-239	->	U-235	
48.27	2.87E-09	Fr-223	->	Ra-223,	Th-227 -> Ra-223
49.85	6.07E-08	Fr-223	->	Ra-223,	Th-227 -> Ra-223
50.14	2.58E-06	Fr-223	->	Ra-223,	Th-227 -> Ra-223
50.82	4.59E-09	Th-227	->	Ra-223	
50.97	8.35E-09	Pa-231	->	Ac-227	
51.179	2.26E-03	U-235	->	Th-231	
51.29	8.60E-10	Fr-223	->	Ra-223,	Th-227 -> Ra-223
51.624	6.22E+05	Pu-239	->	U-235	
52.763	5.07E-07	Pa-231	->	Ac-227	
54.02	3.88E+03	Pu-239	->	U-235	
54.18	2.29E-09	Fr-223	->	Ra-223,	Th-227 -> Ra-223
54.632	4.83E-07	Pa-231	->	Ac-227	
56.03	1.43E-09	Th-227	->	Ra-223	
56.63	2.01E-09	Th-227	->	Ra-223	
56.8	3.58E-08	Pa-231	->	Ac-227	
56.825	2.59E+04	Pu-239	->	U-235	
56.9	6.56E-08	Pa-231	->	Ac-227	
57.2	8.94E-08	Pa-231	->	Ac-227	
57.233	1.49E-07	Pa-231	->	Ac-227	
58.562	5.42E-02	Th-231	->	Pa-231	
59.5	2.58E-09	Th-227	->	Ra-223	

60.526	4.17E-08	Pa-231	->	Ac-227	
61.435	2.29E-08	Th-227	->	Ra-223	
62.05	5.73E-10	Th-227	->	Ra-223	
62.36	6.88E-08	Th-227	->	Ra-223	
62.54	2.58E-09	Th-227	->	Ra-223	
63.7	2.98E-07	Pa-231	->	Ac-227	
63.834	2.60E-03	Th-231	->	Pa-231	
64.348	2.26E-03	U-235	->	Th-231	
64.37	8.03E-09	Th-227	->	Ra-223	
65.516	2.18E-08	Pb-211	->	Bi-211	
65.7	7.58E+02	Pu-239	->	U-235	
66.1	1.72E-09	Th-227	->	Ra-223	
66.3	2.01E-09	Th-227	->	Ra-223	
67.69	3.26E+03	Pu-239	->	U-235	
68.5	6.43E-04	Th-231	->	Pa-231	
68.7	1.63E-09	Th-227	->	Ra-223	
68.73	2.75E+03	Pu-239	->	U-235	
68.75	1.15E-08	Th-227	->	Ra-223	
69.13	2.31E-11	Ac-227	->	Fr-223	
69.65	2.58E-09	Th-227	->	Ra-223	
69.83	7.12E-11	Ac-227	->	Fr-223	
70.54	4.17E-08	Pa-231	->	Ac-227	
70.832	2.12E-07	Bi-211	->	Tl-207	
71.92	1.19E-08	Pa-231	->	Ac-227	
72.57	2.38E-08	Pa-231	->	Ac-227	
72.71	1.24E-02	U-235	->	Th-231	
72.767	2.83E-02	Th-231	->	Pa-231	
72.8	8.03E-09	Th-227	->	Ra-223	
72.803	4.24E-10	Tl-207	->	Pb-207	
72.873	3.59E-07	Bi-211	->	Tl-207	
73.66	5.45E-09	Th-227	->	Ra-223	
74.209	1.49E-07	Pa-231	->	Ac-227	
74.8	6.78E-03	U-235	->	Th-231	
74.814	7.25E-08	Pb-211	->	Bi-211	
74.89	8.72E+02	Pu-239	->	U-235	
74.969	7.06E-10	Tl-207	->	Pb-207	
75.1	2.58E-09	Th-227	->	Ra-223	
76.858	1.47E-07	Rn-219	->	Po-215	
77.107	1.22E-07	Pb-211	->	Bi-211	
77.405	4.05E-07	Pa-231	->	Ac-227	
77.593	9.80E+03	Pu-239	->	U-235	
78.37	3.88E+03	Pu-239	->	U-235	
79.29	2.46E-07	Rn-219	->	Po-215	
79.72	6.39E-07	Fr-223	->	Ra-223,	Th-227 -> Ra-223
81	1.27E-08	Pb-211	->	Bi-211	
81.067	4.30E-06	Ra-223	->	Rn-219	
81.229	1.02E-01	Th-231	->	Pa-231	
82.434	1.26E-07	Bi-211	->	Tl-207	
83.787	7.14E-06	Ra-223	->	Rn-219	
83.81	1.61E-08	Pb-211	->	Bi-211	

84.203	7.45E-01	Th-231	->	Pa-231		
84.979	2.51E-10	Tl-207	->	Pb-207		
85.185	3.56E-08	Bi-211	->	Tl-207		
85.429	5.46E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
87.19	4.30E-08	Pb-211	->	Bi-211		
87.632	7.34E-11	Tl-207	->	Pb-207		
87.673	2.84E-06	Pa-231	->	Ac-227		
88.2	4.81E-09	Pb-211	->	Bi-211		
88.471	9.00E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
89.639	8.78E-08	Rn-219	->	Po-215		
89.85	9.75E-10	Th-227	->	Ra-223		
89.954	1.06E-01	Th-231	->	Pa-231		
89.955	3.80E-01	U-235	->	Th-231		
90.128	1.27E-08	Pb-211	->	Bi-211		
90.886	4.65E-06	Pa-231	->	Ac-227		
92.279	4.40E-02	Th-231	->	Pa-231		
92.673	2.66E-08	Rn-219	->	Po-215		
93.07	5.53E-03	Th-231	->	Pa-231		
93.36	6.21E-01	U-235	->	Th-231		
93.93	4.01E-07	Th-227	->	Ra-223		
94.3	3.11E-09	Pb-211	->	Bi-211		
94.66	9.64E+04	Pu-239	->	U-235		
94.677	2.52E-06	Ra-223	->	Rn-219		
94.89	5.10E-09	Pb-211	->	Bi-211		
94.9	3.44E-09	Th-227	->	Ra-223		
95.863	7.11E-02	Th-231	->	Pa-231		
96.06	1.72E-08	Th-227	->	Ra-223		
96.154	9.72E-03	U-235	->	Th-231		
96.16	8.45E+02	Pu-239	->	U-235		
96.979	5.25E-07	Pa-231	->	Ac-227		
97.3	3.26E-09	Pb-211	->	Bi-211		
97.907	8.04E-07	Ra-223	->	Rn-219		
98.441	1.57E+05	Pu-239	->	U-235		
98.79	2.80E+04	Pu-239	->	U-235		
99.28	1.35E-02	Th-231	->	Pa-231		
99.56	3.73E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223
99.64	5.73E-10	Th-227	->	Ra-223		
99.7	1.34E-10	Ac-227	->	Fr-223		
99.915	3.21E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
100.31	2.89E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
100.96	1.91E-07	Pa-231	->	Ac-227		
102.255	4.63E-02	Th-231	->	Pa-231		
102.45	3.44E-10	Th-227	->	Ra-223		
102.613	1.67E-06	Pa-231	->	Ac-227		
103.035	4.87E+03	Pu-239	->	U-235		
103.341	1.05E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
103.85	4.81E-09	Ra-223	->	Rn-219		
104.9	1.15E-08	Th-227	->	Ra-223		
105.362	2.24E-01	U-235	->	Th-231		
105.803	8.02E-04	Th-231	->	Pa-231		

106.1	5.87E-12	Ac-227	->	Fr-223	
106.137	5.48E-07	Pa-231	->	Ac-227	
106.581	1.92E-03	Th-231	->	Pa-231	
106.66	6.23E-09	Ra-223	->	Rn-219	
107.92	2.01E-09	Th-227	->	Ra-223	
108.166	2.57E-02	Th-231	->	Pa-231	
108.99	7.46E-02	U-235	->	Th-231	
109.1	1.72E-09	Th-227	->	Ra-223	
109.16	1.74E-01	U-235	->	Th-231	
110.421	1.83E+04	Pu-239	->	U-235	
110.58	1.43E-09	Th-227	->	Ra-223	
110.8	1.36E-08	Ra-223	->	Rn-219	
111.3	3.56E+04	Pu-239	->	U-235	
111.89	7.05E+02	Pu-239	->	U-235	
111.897	8.58E-03	Th-231	->	Pa-231	
112.54	2.29E-09	Th-227	->	Ra-223	
113.12	4.30E-08	Th-227	->	Ra-223	
113.19	1.61E-07	Th-227	->	Ra-223	
114.333	1.44E+04	Pu-239	->	U-235	
114.5	2.55E-09	Ra-223	->	Rn-219	
115.3	9.34E-10	Rn-219	->	Po-215	
115.38	1.49E+04	Pu-239	->	U-235	
115.595	1.13E-04	Th-231	->	Pa-231	
116.11	7.91E-03	U-235	->	Th-231	
116.266	1.37E+04	Pu-239	->	U-235	
116.827	2.34E-03	Th-231	->	Pa-231	
117.17	4.87E-08	Th-227	->	Ra-223	
117.3	3.44E-09	Th-227	->	Ra-223	
119.98	2.94E-03	U-235	->	Th-231	
120.9	2.31E-11	Ac-227	->	Fr-223	
122.31	3.37E-07	Ra-223	->	Rn-219	
122.34	6.89E+01	Pu-239	->	U-235	
123.55	2.29E-09	Th-227	->	Ra-223	
123.62	4.52E+02	Pu-239	->	U-235	
124.48	1.43E-09	Th-227	->	Ra-223	
124.51	1.41E+03	Pu-239	->	U-235	
124.6	8.60E-10	Th-227	->	Ra-223	
124.69	2.98E-08	Pa-231	->	Ac-227	
124.922	6.32E-03	Th-231	->	Pa-231	
125.21	1.63E+03	Pu-239	->	U-235	
129.296	1.44E+05	Pu-239	->	U-235	
130.57	3.57E-08	Rn-219	->	Po-215	
131.1	1.42E-09	Ra-223	->	Rn-219	
133.8	1.17E-11	Ac-227	->	Fr-223	
134.014	2.71E-03	Th-231	->	Pa-231	
134.5	9.57E-09	Fr-223	->	Ra-223,	Th-227 -> Ra-223
135.681	8.81E-03	Th-231	->	Pa-231	
136.705	4.74E-04	Th-231	->	Pa-231	
136.72	1.36E-03	U-235	->	Th-231	
140.33	9.18E-09	Th-227	->	Ra-223	

140.537	8.02E-05	Th-231	->	Pa-231	
140.76	2.49E-02	U-235	->	Th-231	
141.44	3.73E-08	Th-227	->	Ra-223	
141.657	7.35E+02	Pu-239	->	U-235	
143.35	3.97E+02	Pu-239	->	U-235	
143.76	1.24E+00	U-235	->	Th-231	
144.18	9.23E-07	Ra-223	->	Rn-219	
144.201	6.97E+03	Pu-239	->	U-235	
144.5	2.38E-08	Pa-231	->	Ac-227	
145.063	6.55E-04	Th-231	->	Pa-231	
145.927	3.61E-03	Th-231	->	Pa-231	
146.094	2.73E+03	Pu-239	->	U-235	
147.2	3.48E-11	Ac-227	->	Fr-223	
150.02	2.87E-09	Th-227	->	Ra-223	
150.93	9.04E-03	U-235	->	Th-231	
154.18	1.58E-06	Ra-223	->	Rn-219	
158.59	1.95E-07	Ra-223	->	Rn-219	
160.19	1.42E+02	Pu-239	->	U-235	
161.482	2.82E+03	Pu-239	->	U-235	
162.18	2.01E-09	Th-227	->	Ra-223	
163.114	1.75E-02	Th-231	->	Pa-231	
163.33	5.74E-01	U-235	->	Th-231	
164.97	4.40E-04	Th-231	->	Pa-231	
165.5	1.42E-09	Ra-223	->	Rn-219	
167.81	6.73E+01	Pu-239	->	U-235	
168.19	4.01E-09	Th-227	->	Ra-223	
169.637	1.35E-04	Th-231	->	Pa-231	
169.98	8.60E-10	Th-227	->	Ra-223	
171.21	2.87E-10	Th-227	->	Ra-223	
171.393	2.53E+03	Pu-239	->	U-235	
171.4	1.72E-11	Ac-227	->	Fr-223	
172.27	1.13E-03	U-235	->	Th-231	
173.38	4.92E-09	Fr-223	->	Ra-223,	Th-227 -> Ra-223
173.7	9.18E+01	Pu-239	->	U-235	
174.157	2.07E-03	Th-231	->	Pa-231	
175.23	5.16E-09	Th-227	->	Ra-223	
175.55	4.81E-09	Ra-223	->	Rn-219	
176.8	1.13E-09	Ra-223	->	Rn-219	
177.35	1.33E-08	Ra-223	->	Rn-219	
179.22	1.52E+03	Pu-239	->	U-235	
179.28	5.73E-10	Th-227	->	Ra-223	
179.69	4.33E-08	Ra-223	->	Rn-219	
182.61	3.84E-02	U-235	->	Th-231	
183.483	3.71E-03	Th-231	->	Pa-231	
184.55	4.87E+01	Pu-239	->	U-235	
184.68	1.13E-08	Fr-223	->	Ra-223,	Th-227 -> Ra-223
185.72	6.46E+00	U-235	->	Th-231	
188.23	2.50E+02	Pu-239	->	U-235	
188.756	3.61E-04	Th-231	->	Pa-231	
189.36	1.91E+03	Pu-239	->	U-235	

194.94	7.12E-02	U-235	->	Th-231		
195.679	2.46E+03	Pu-239	->	U-235		
196.87	8.49E+01	Pu-239	->	U-235		
197.61	3.44E-09	Th-227	->	Ra-223		
198.9	4.75E-03	U-235	->	Th-231		
198.96	3.34E-08	Pa-231	->	Ac-227		
199.43	8.50E-10	Ra-223	->	Rn-219		
200.48	5.73E-09	Th-227	->	Ra-223		
201.64	5.73E-09	Th-227	->	Ra-223		
202.11	1.22E-01	U-235	->	Th-231		
202.4	1.72E-09	Th-227	->	Ra-223		
203.54	1.29E+04	Pu-239	->	U-235		
204.2	6.60E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
204.95	4.32E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
205.31	5.66E-01	U-235	->	Th-231		
206.04	6.60E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
210.58	3.24E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
212.56	2.01E-08	Th-227	->	Ra-223		
212.69	4.87E-09	Th-227	->	Ra-223		
215.305	3.05E-03	U-235	->	Th-231		
217.934	4.52E-03	Th-231	->	Pa-231		
218.45	2.30E+01	Pu-239	->	U-235		
218.77	1.72E-08	Th-227	->	Ra-223		
218.94	1.15E-08	Th-227	->	Ra-223		
220.2	1.43E-09	Pa-231	->	Ac-227		
220.38	9.34E-09	Ra-223	->	Rn-219		
221.38	1.36E-02	U-235	->	Th-231		
221.9	8.50E-09	Rn-219	->	Po-215		
224.68	4.30E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223
225.39	3.74E+02	Pu-239	->	U-235		
226.77	1.55E-08	Pa-231	->	Ac-227		
228.16	1.43E-09	Pa-231	->	Ac-227		
228.77	9.04E-04	U-235	->	Th-231		
230.17	2.01E-10	Th-227	->	Ra-223		
233.5	3.28E-03	U-235	->	Th-231		
234.82	1.42E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
235.97	3.21E-06	Fr-223	->	Ra-223,	Th-227	-> Ra-223
235.985	1.04E-03	Th-231	->	Pa-231		
237.75	3.44E+02	Pu-239	->	U-235		
240.25	3.16E-05	Th-231	->	Pa-231		
240.85	6.10E-03	U-235	->	Th-231		
242	4.77E-08	Pa-231	->	Ac-227		
242.12	1.91E+02	Pu-239	->	U-235		
242.508	9.48E-05	Th-231	->	Pa-231		
243.17	2.80E-07	Pa-231	->	Ac-227		
243.36	5.33E+02	Pu-239	->	U-235		
244.86	1.19E+02	Pu-239	->	U-235		
245.19	2.55E-09	Ra-223	->	Rn-219		
245.438	4.17E-08	Pa-231	->	Ac-227		
245.77	4.11E-08	Pa-231	->	Ac-227		

246.07	3.15E-09	Th-227	->	Ra-223	
246.84	5.99E-03	U-235	->	Th-231	
248.88	1.72E+02	Pu-239	->	U-235	
249.36	2.01E-09	Th-227	->	Ra-223	
249.49	1.05E-08	Ra-223	->	Rn-219	
249.56	8.81E-05	Th-231	->	Pa-231	
250.12	1.06E-07	Fr-223	->	Ra-223,	Th-227 -> Ra-223
250.33	3.73E-08	Th-227	->	Ra-223	
250.43	7.34E-05	Th-231	->	Pa-231	
251.12	9.91E-09	Ra-223	->	Rn-219	
251.58	8.78E-09	Ra-223	->	Rn-219	
252.46	3.15E-08	Th-227	->	Ra-223	
254.66	2.29E-07	Fr-223	->	Ra-223,	Th-227 -> Ra-223
254.98	9.06E-09	Ra-223	->	Rn-219	
255.384	1.84E+03	Pu-239	->	U-235	
255.74	1.42E-09	Ra-223	->	Rn-219	
255.858	5.96E-07	Pa-231	->	Ac-227	
256.24	1.92E-06	Fr-223	->	Ra-223,	Th-227 -> Ra-223
258.43	1.37E-08	Pa-231	->	Ac-227	
260.29	1.08E-06	Pa-231	->	Ac-227	
260.4	1.70E-09	Ra-223	->	Rn-219	
262.72	2.87E-08	Fr-223	->	Ra-223,	Th-227 -> Ra-223
263.9	5.85E+02	Pu-239	->	U-235	
265.81	6.89E+01	Pu-239	->	U-235	
266.3	7.17E-10	Th-227	->	Ra-223	
266.483	6.78E-04	U-235	->	Th-231	
267.62	1.31E-04	Th-231	->	Pa-231	
267.82	2.87E-09	Th-227	->	Ra-223	
269.39	3.85E-06	Ra-223	->	Rn-219	
270.34	2.29E-09	Th-227	->	Ra-223	
270.76	9.18E-09	Th-227	->	Ra-223	
271.13	2.80E-06	Rn-219	->	Po-215	
272.95	1.41E-07	Fr-223	->	Ra-223,	Th-227 -> Ra-223
273.17	3.40E-07	Pa-231	->	Ac-227	
274.14	3.39E-06	Th-231	->	Pa-231	
275.2	4.30E-10	Th-227	->	Ra-223	
275.47	5.54E-04	U-235	->	Th-231	
277.17	3.70E-07	Pa-231	->	Ac-227	
277.43	1.97E-08	Pa-231	->	Ac-227	
279.7	2.01E-08	Fr-223	->	Ra-223,	Th-227 -> Ra-223
281	2.01E-09	Th-227	->	Ra-223	
281.12	4.82E+01	Pu-239	->	U-235	
281.31	4.59E-08	Th-227	->	Ra-223	
281.45	6.78E-04	U-235	->	Th-231	
282.98	5.65E-04	U-235	->	Th-231	
283.673	9.48E-06	Pa-231	->	Ac-227	
284.24	1.43E-08	Fr-223	->	Ra-223,	Th-227 -> Ra-223
285.27	3.44E+01	Pu-239	->	U-235	
285.48	1.58E-08	Th-227	->	Ra-223	
286.11	4.56E-07	Fr-223	->	Ra-223,	Th-227 -> Ra-223

288.15	4.36E-08	Ra-223	->	Rn-219		
289.5	2.58E-09	Th-227	->	Ra-223		
289.57	7.91E-04	U-235	->	Th-231		
289.6	4.20E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223
291.72	1.58E-03	U-235	->	Th-231		
292.3	1.72E-08	Fr-223	->	Ra-223,	Th-227	-> Ra-223
293.8	1.84E-08	Rn-219	->	Po-215		
296.54	1.23E-07	Th-227	->	Ra-223		
297.46	1.14E+03	Pu-239	->	U-235		
299.97	6.02E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
300.07	1.42E-05	Pa-231	->	Ac-227		
300.34	5.73E-08	Th-227	->	Ra-223		
301.72	5.65E-04	U-235	->	Th-231		
302.638	3.82E-06	Pa-231	->	Ac-227		
302.671	1.02E-05	Pa-231	->	Ac-227		
302.89	1.31E+02	Pu-239	->	U-235		
304.51	3.13E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
307.82	1.42E+02	Pu-239	->	U-235		
307.89	4.98E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
308.49	4.30E-09	Th-227	->	Ra-223		
308.75	4.40E-05	Th-231	->	Pa-231		
310.19	8.35E-09	Pa-231	->	Ac-227		
310.71	4.52E-04	U-235	->	Th-231		
311	3.27E-04	Th-231	->	Pa-231		
311.78	5.92E+02	Pu-239	->	U-235		
312.57	1.35E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
313.058	6.74E-07	Pa-231	->	Ac-227		
313.39	4.59E+01	Pu-239	->	U-235		
313.85	8.78E-09	Pb-211	->	Bi-211		
314.78	8.60E-09	Th-227	->	Ra-223		
314.82	1.32E-07	Th-227	->	Ra-223		
316.4	3.24E+02	Pu-239	->	U-235		
317.12	1.13E-04	U-235	->	Th-231		
317.93	9.03E-06	Th-231	->	Pa-231		
318.1	1.19E-08	Pa-231	->	Ac-227		
318.58	1.72E-09	Th-227	->	Ra-223		
319.18	9.14E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223
320.188	1.24E-05	Th-231	->	Pa-231		
323.77	1.24E+03	Pu-239	->	U-235		
323.88	1.10E-06	Ra-223	->	Rn-219		
325.08	1.72E-09	Th-227	->	Ra-223		
326.12	1.43E-09	Th-227	->	Ra-223		
327.23	1.79E-07	Pa-231	->	Ac-227		
328.08	4.26E-10	Tl-207	->	Pb-207,	Po-211	-> Pb-207
328.49	5.61E-08	Ra-223	->	Rn-219		
329.84	7.83E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
330.066	7.87E-06	Pa-231	->	Ac-227		
332.853	1.16E+04	Pu-239	->	U-235		
333.87	2.80E-08	Ra-223	->	Rn-219		
334.38	2.84E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223

336.116	2.61E+03	Pu-239	->	U-235		
338.28	7.87E-07	Ra-223	->	Rn-219		
339.1	4.01E-10	Th-227	->	Ra-223	Th-227	-> Ra-223
339.45	1.14E-09	Fr-223	->	Ra-223,		
340.873	1.04E-06	Pa-231	->	Ac-227		
341.17	1.31E-07	Pa-231	->	Ac-227		
341.526	1.52E+03	Pu-239	->	U-235		
342.44	1.09E-07	Fr-223	->	Ra-223,	Th-227	-> Ra-223
342.9	5.66E-08	Ra-223	->	Rn-219		
343.02	9.63E-09	Pb-211	->	Bi-211		
343.78	3.39E-04	U-235	->	Th-231		
345.014	1.28E+04	Pu-239	->	U-235		
345.921	3.28E-03	U-235	->	Th-231		
346.39	2.15E-09	Th-227	->	Ra-223		
348.4	1.72E-09	Th-227	->	Ra-223		
350.1	3.61E-06	Bi-211	->	Tl-207		
350.48	3.15E-08	Th-227	->	Ra-223		
351.82	7.90E-06	Th-231	->	Pa-231		
352.57	2.87E-09	Th-227	->	Ra-223		
354.02	1.84E+01	Pu-239	->	U-235		
354.63	4.77E-07	Pa-231	->	Ac-227		
356.068	5.65E-04	U-235	->	Th-231		
357.2	9.18E-07	Pa-231	->	Ac-227		
359.51	5.37E-08	Pa-231	->	Ac-227		
361.8	1.22E-08	Ra-223	->	Rn-219		
361.84	2.69E+02	Pu-239	->	U-235		
362.55	1.43E-09	Th-227	->	Ra-223		
364.03	4.41E-08	Pa-231	->	Ac-227		
367.048	1.99E+03	Pu-239	->	U-235		
368.543	2.07E+03	Pu-239	->	U-235		
368.78	2.27E-09	Ra-223	->	Rn-219		
369.32	1.82E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223
369.48	5.66E-09	Ra-223	->	Rn-219		
370.85	2.01E-09	Th-227	->	Ra-223		
371.8	1.39E-07	Ra-223	->	Rn-219		
372.47	4.82E+01	Pu-239	->	U-235		
374.93	4.01E-10	Th-227	->	Ra-223		
375.039	3.60E+04	Pu-239	->	U-235		
376.26	1.72E-09	Th-227	->	Ra-223		
376.9	1.98E-09	Rn-219	->	Po-215		
379.05	2.41E+01	Pu-239	->	U-235		
379.4	2.74E-07	Rn-219	->	Po-215,	Pa-231	-> Ac-227
380.16	7.00E+03	Pu-239	->	U-235		
382.15	1.72E-09	Th-227	->	Ra-223		
382.732	5.95E+03	Pu-239	->	U-235		
383.12	1.13E-09	Ra-223	->	Rn-219		
383.47	1.38E-08	Th-227	->	Ra-223		
384.97	2.44E-08	Pa-231	->	Ac-227		
387.267	2.98E-09	Pa-231	->	Ac-227		
387.874	4.29E-04	U-235	->	Th-231		

387.9	1.13E-10	Rn-219	->	Po-215	
388.3	3.96E-09	Ra-223	->	Rn-219	
388.98	6.38E-09	Pa-231	->	Ac-227	
390.32	1.13E-04	U-235	->	Th-231	
391	8.50E-10	Ra-223	->	Rn-219	
391.85	4.05E-08	Pa-231	->	Ac-227	
392.24	2.58E-09	Th-227	->	Ra-223	
392.914	1.27E+04	Pu-239	->	U-235	
395.8	1.55E-08	Pa-231	->	Ac-227	
398.4	5.54E-08	Pa-231	->	Ac-227	
398.6	2.58E-09	Th-227	->	Ra-223	
399.46	1.40E+02	Pu-239	->	U-235	
401.7	1.88E-06	Rn-219	->	Po-215	
402.42	3.44E-09	Th-227	->	Ra-223	
404.86	1.08E-06	Pb-211	->	Bi-211,	At-215 -> Bi-211
407.98	2.03E-07	Pa-231	->	Ac-227	
410.269	3.39E-04	U-235	->	Th-231	
410.84	1.13E-08	Pa-231	->	Ac-227	
410.94	1.84E+02	Pu-239	->	U-235	
412.83	4.59E-01	Pu-239	->	U-235	
413.713	3.37E+04	Pu-239	->	U-235	
415.09	4.87E-10	Th-227	->	Ra-223	
422.598	2.80E+03	Pu-239	->	U-235	
426.64	5.26E+02	Pu-239	->	U-235	
427	4.87E-07	Pb-211	->	Bi-211	
430.16	1.12E+02	Pu-239	->	U-235	
430.26	1.81E-09	Pb-211	->	Bi-211	
430.53	5.38E-09	Ra-223	->	Rn-219	
432.29	1.43E-09	Th-227	->	Ra-223	
432.34	9.34E-09	Ra-223	->	Rn-219	
435.38	1.97E-08	Pa-231	->	Ac-227	
438.24	2.44E-08	Pa-231	->	Ac-227	
438.8	1.13E-08	Po-215	->	Pb-211	
444.94	3.60E-07	Ra-223	->	Rn-219	
445.81	2.02E+02	Pu-239	->	U-235	
448	4.68E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
448.42	1.13E-04	U-235	->	Th-231	
451.481	4.35E+03	Pu-239	->	U-235	
452.52	3.71E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
455.12	9.04E-05	U-235	->	Th-231	
457.07	2.59E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
457.57	3.54E+01	Pu-239	->	U-235	
461.25	4.59E+01	Pu-239	->	U-235	
461.9	1.43E-11	Th-227	->	Ra-223	
463.8	3.67E+00	Pu-239	->	U-235	
466.2	1.43E-11	Th-227	->	Ra-223	
471.33	8.94E-10	Pa-231	->	Ac-227	
474.26	2.07E+00	Pu-239	->	U-235	
478	3.68E-09	Pb-211	->	Bi-211	
478.22	4.59E-10	Pa-231	->	Ac-227	

480.25	9.11E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
481.1	7.36E-09	Pb-211	->	Bi-211			
481.78	1.06E+02	Pu-239	->	U-235			
482.14	4.77E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
486.99	5.74E+00	Pu-239	->	U-235			
487.59	2.83E-09	Ra-223	->	Rn-219			
492	3.96E-09	Pb-211	->	Bi-211			
493.15	1.67E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
493.25	2.02E+01	Pu-239	->	U-235			
500.4	3.11E-09	Pb-211	->	Bi-211			
501.33	3.58E-09	Pa-231	->	Ac-227			
504.33	4.25E-09	Pb-211	->	Bi-211			
507.64	1.28E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
515.7	1.13E-08	Rn-219	->	Po-215			
515.96	6.13E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
516.45	7.75E-09	Pa-231	->	Ac-227			
517.2	4.52E-05	U-235	->	Th-231			
524.02	5.10E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
527.3	2.01E-08	Ra-223	->	Rn-219			
534.9	2.87E-11	Th-227	->	Ra-223			
535.45	3.34E-09	Pa-231	->	Ac-227			
536.88	3.34E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
538.9	6.89E+00	Pu-239	->	U-235			
540.1	1.70E-09	Rn-219	->	Po-215			
546.9	2.98E-09	Pa-231	->	Ac-227			
550.6	9.18E+00	Pu-239	->	U-235			
552.09	8.52E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
555.91	7.02E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
557.7	1.38E+00	Pu-239	->	U-235			
568.76	3.27E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
569.15	4.13E-10	Po-211	->	Pb-207			
572.3	2.98E-09	Pa-231	->	Ac-227			
575.8	1.59E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
578.2	4.44E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
586.27	3.21E+00	Pu-239	->	U-235			
588.17	1.82E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
596.44	1.21E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
598.69	2.55E-08	Ra-223	->	Rn-219			
606.9	3.44E+00	Pu-239	->	U-235			
607.2	5.75E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
608.5	1.13E-09	Rn-219	->	Po-215			
609.08	1.78E-08	Ra-223	->	Rn-219			
609.62	6.51E-09	Pb-211	->	Bi-211			
612.93	1.86E+01	Pu-239	->	U-235			
617.43	4.68E+01	Pu-239	->	U-235			
618.94	5.60E+01	Pu-239	->	U-235			
621.92	1.88E-11	Fr-223	->	Ra-223,	Th-227	->	Ra-223
623.38	2.27E-09	Ra-223	->	Rn-219			
623.52	4.59E-11	Th-227	->	Ra-223			
624.8	9.18E+00	Pu-239	->	U-235			

633.15	5.81E+01	Pu-239	->	U-235		
633.2	3.73E-11	Th-227	->	Ra-223		
637.862	5.88E+01	Pu-239	->	U-235		
640.096	1.88E+02	Pu-239	->	U-235		
641.45	5.73E-12	Th-227	->	Ra-223		
643.93	2.57E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
645.969	3.42E+02	Pu-239	->	U-235		
647.296	4.36E+00	Pu-239	->	U-235		
648.43	6.07E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
649.377	1.63E+01	Pu-239	->	U-235		
650.529	5.97E+00	Pu-239	->	U-235		
652.052	1.50E+02	Pu-239	->	U-235		
654.89	5.17E+01	Pu-239	->	U-235		
658.919	2.27E+02	Pu-239	->	U-235		
662.8	1.72E-11	Th-227	->	Ra-223		
664.587	3.80E+01	Pu-239	->	U-235		
675.33	1.81E-09	Pb-211	->	Bi-211		
676.4	1.70E-09	Rn-219	->	Po-215		
686.16	2.04E+01	Pu-239	->	U-235		
690.85	1.26E+01	Pu-239	->	U-235		
691.46	4.92E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
703.8	8.91E+01	Pu-239	->	U-235		
704.19	4.14E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
704.51	1.36E-07	Pb-211	->	Bi-211		
707.18	1.48E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
711.2	9.91E-10	Ra-223	->	Rn-219		
714.58	2.07E+00	Pu-239	->	U-235		
718	6.43E+01	Pu-239	->	U-235		
718.22	9.61E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
722.6	2.14E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
723.86	4.35E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
727.84	2.50E+01	Pu-239	->	U-235		
733.9	5.80E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
734.6	5.43E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
736.76	2.59E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
742.52	4.52E-05	U-235	->	Th-231		
746.24	1.27E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
748.56	1.53E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
753.44	5.47E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
754.17	5.63E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
756.42	7.74E+01	Pu-239	->	U-235		
756.79	1.12E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
757.03	2.91E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
762.3	8.29E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
764.52	4.17E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
766.35	2.01E-07	Pb-211	->	Bi-211		
766.6	6.31E-02	Pu-239	->	U-235		
769.19	2.73E+02	Pu-239	->	U-235		
772.85	3.94E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
775.82	2.11E-09	Fr-223	->	Ra-223,	Th-227	-> Ra-223

779.46	3.05E+00	Pu-239	->	U-235		
780.59	1.02E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
784.04	5.63E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
786.9	3.89E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
787.3	1.93E+00	Pu-239	->	U-235		
788.36	1.15E-11	Th-227	->	Ra-223		
792.6	1.15E-11	Th-227	->	Ra-223		
793	5.74E-01	Pu-239	->	U-235		
793.11	5.03E-13	Fr-223	->	Ra-223		
793.12	8.60E-12	Th-227	->	Ra-223		
794.72	6.78E-05	U-235	->	Th-231		
796.5	7.35E-01	Pu-239	->	U-235		
796.96	2.69E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
803.3	1.01E+00	Pu-239	->	U-235		
803.58	5.15E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
808.2	3.37E+00	Pu-239	->	U-235		
808.26	1.69E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
812.15	8.32E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
813.9	1.42E+00	Pu-239	->	U-235		
817.31	4.96E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
818.23	8.60E-12	Th-227	->	Ra-223		
821.1	1.17E+00	Pu-239	->	U-235		
822.99	7.59E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
825.96	2.64E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
825.97	5.45E-12	Fr-223	->	Ra-223		
828.31	6.24E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
828.53	3.41E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
828.8	3.17E+00	Pu-239	->	U-235		
831.86	1.08E-06	Pb-211	->	Bi-211		
831.93	5.74E-01	Pu-239	->	U-235		
834.2	2.83E-10	Rn-219	->	Po-215		
837.36	1.43E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
839	9.18E-01	Pu-239	->	U-235		
842.02	1.98E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
843.8	3.67E+00	Pu-239	->	U-235		
846.56	1.93E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
848.88	3.10E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
854.2	2.01E-11	Th-227	->	Ra-223		
857.89	1.88E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
858.4	8.18E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
863.2	1.41E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
865.81	1.81E-09	Pb-211	->	Bi-211		
867.23	2.54E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
876.14	2.23E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
878.16	3.47E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
879	1.15E+00	Pu-239	->	U-235		
887.7	4.25E-10	Rn-219	->	Po-215		
891	1.41E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
891.1	1.77E+00	Pu-239	->	U-235		
892.8	9.18E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223

896.41	1.03E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
897.23	6.82E-08	Tl-207	->	Pb-207,	Po-211	->	Pb-207
908.03	6.57E-10	Fr-223	->	Ra-223,	Th-227	->	Ra-223
909.85	4.30E-12	Th-227	->	Ra-223			
920.06	3.44E-12	Th-227	->	Ra-223			
926.28	8.71E-12	Fr-223	->	Ra-223,	Th-227	->	Ra-223
938.34	2.87E-12	Th-227	->	Ra-223			
940.1	9.64E-01	Pu-239	->	U-235			
941.41	2.06E-11	Th-227	->	Ra-223			
951	6.23E-09	Pb-211	->	Bi-211			
956.4	1.29E+00	Pu-239	->	U-235			
958.6	1.78E-11	Th-227	->	Ra-223			
969.91	8.60E-12	Th-227	->	Ra-223			
971.28	2.87E-12	Th-227	->	Ra-223			
979.52	5.28E-01	Pu-239	->	U-235			
986.7	2.75E-01	Pu-239	->	U-235			
990.2	1.00E-11	Th-227	->	Ra-223			
992.47	5.28E-01	Pu-239	->	U-235			
994.9	2.01E-12	Th-227	->	Ra-223			
999.78	8.60E-12	Th-227	->	Ra-223			
1005.63	2.75E-01	Pu-239	->	U-235			
1014.48	5.07E-09	Pb-211	->	Bi-211			
1015.1	4.30E-12	Th-227	->	Ra-223			
1020	5.73E-12	Th-227	->	Ra-223			
1024.8	4.30E-12	Th-227	->	Ra-223			
1055.8	1.70E-10	Rn-219	->	Po-215			
1057.32	1.03E+00	Pu-239	->	U-235			
1080.19	4.33E-09	Pb-211	->	Bi-211			
1090.5	7.36E-10	Pb-211	->	Bi-211			
1103.4	1.44E-09	Pb-211	->	Bi-211			
1109.37	4.16E-08	Pb-211	->	Bi-211			
1196.61	3.62E-09	Pb-211	->	Bi-211			
1234.3	3.68E-10	Pb-211	->	Bi-211			
1270.67	2.52E-09	Pb-211	->	Bi-211			

Pu239	Aged 5 years	Sorted by Intensity	
Intensity	Energy	Initial Isotopes and Decays	
(ph/s/gm)	(keV)		
6.22E+05	51.624	Pu-239	-> U-235
2.41E+05	38.66	Pu-239	-> U-235
1.57E+05	98.441	Pu-239	-> U-235
1.44E+05	129.296	Pu-239	-> U-235
9.64E+04	94.66	Pu-239	-> U-235
3.60E+04	375.039	Pu-239	-> U-235
3.56E+04	111.3	Pu-239	-> U-235
3.37E+04	413.713	Pu-239	-> U-235

2.80E+04	98.79	Pu-239	->	U-235
2.59E+04	56.825	Pu-239	->	U-235
1.83E+04	110.421	Pu-239	->	U-235
1.69E+04	46.218	Pu-239	->	U-235
1.49E+04	115.38	Pu-239	->	U-235
1.44E+04	114.333	Pu-239	->	U-235
1.37E+04	116.266	Pu-239	->	U-235
1.29E+04	203.54	Pu-239	->	U-235
1.28E+04	345.014	Pu-239	->	U-235
1.27E+04	392.914	Pu-239	->	U-235
1.16E+04	332.853	Pu-239	->	U-235
9.80E+03	77.593	Pu-239	->	U-235
7.00E+03	380.16	Pu-239	->	U-235
6.97E+03	144.201	Pu-239	->	U-235
5.95E+03	382.732	Pu-239	->	U-235
4.87E+03	103.035	Pu-239	->	U-235
4.35E+03	451.481	Pu-239	->	U-235
3.88E+03	78.37	Pu-239	->	U-235
3.88E+03	54.02	Pu-239	->	U-235
3.79E+03	42.06	Pu-239	->	U-235
3.72E+03	40.41	Pu-239	->	U-235
3.26E+03	67.69	Pu-239	->	U-235
2.82E+03	161.482	Pu-239	->	U-235
2.80E+03	422.598	Pu-239	->	U-235
2.75E+03	68.73	Pu-239	->	U-235
2.73E+03	146.094	Pu-239	->	U-235
2.61E+03	336.116	Pu-239	->	U-235
2.53E+03	171.393	Pu-239	->	U-235
2.46E+03	195.679	Pu-239	->	U-235
2.41E+03	30.08	Pu-239	->	U-235
2.07E+03	368.543	Pu-239	->	U-235
1.99E+03	367.048	Pu-239	->	U-235
1.91E+03	189.36	Pu-239	->	U-235
1.84E+03	255.384	Pu-239	->	U-235
1.63E+03	125.21	Pu-239	->	U-235
1.52E+03	341.526	Pu-239	->	U-235
1.52E+03	179.22	Pu-239	->	U-235
1.41E+03	124.51	Pu-239	->	U-235
1.33E+03	46.69	Pu-239	->	U-235
1.24E+03	323.77	Pu-239	->	U-235
1.14E+03	297.46	Pu-239	->	U-235
8.72E+02	74.89	Pu-239	->	U-235
8.45E+02	96.16	Pu-239	->	U-235
7.58E+02	65.7	Pu-239	->	U-235
7.35E+02	141.657	Pu-239	->	U-235
7.05E+02	111.89	Pu-239	->	U-235
6.66E+02	47.52	Pu-239	->	U-235
5.92E+02	311.78	Pu-239	->	U-235
5.85E+02	263.9	Pu-239	->	U-235
5.33E+02	243.36	Pu-239	->	U-235

5.26E+02	426.64	Pu-239	->	U-235
4.52E+02	123.62	Pu-239	->	U-235
3.97E+02	143.35	Pu-239	->	U-235
3.74E+02	225.39	Pu-239	->	U-235
3.44E+02	237.75	Pu-239	->	U-235
3.42E+02	645.969	Pu-239	->	U-235
3.24E+02	316.4	Pu-239	->	U-235
2.73E+02	769.19	Pu-239	->	U-235
2.69E+02	361.84	Pu-239	->	U-235
2.50E+02	188.23	Pu-239	->	U-235
2.27E+02	658.919	Pu-239	->	U-235
2.02E+02	445.81	Pu-239	->	U-235
1.91E+02	242.12	Pu-239	->	U-235
1.88E+02	640.096	Pu-239	->	U-235
1.84E+02	410.94	Pu-239	->	U-235
1.72E+02	248.88	Pu-239	->	U-235
1.50E+02	652.052	Pu-239	->	U-235
1.42E+02	160.19	Pu-239	->	U-235
1.42E+02	307.82	Pu-239	->	U-235
1.40E+02	399.46	Pu-239	->	U-235
1.31E+02	302.89	Pu-239	->	U-235
1.19E+02	244.86	Pu-239	->	U-235
1.12E+02	430.16	Pu-239	->	U-235
1.06E+02	481.78	Pu-239	->	U-235
9.18E+01	173.7	Pu-239	->	U-235
8.91E+01	703.8	Pu-239	->	U-235
8.49E+01	196.87	Pu-239	->	U-235
7.74E+01	756.42	Pu-239	->	U-235
6.89E+01	265.81	Pu-239	->	U-235
6.89E+01	122.34	Pu-239	->	U-235
6.73E+01	167.81	Pu-239	->	U-235
6.43E+01	718	Pu-239	->	U-235
5.88E+01	637.862	Pu-239	->	U-235
5.81E+01	633.15	Pu-239	->	U-235
5.60E+01	618.94	Pu-239	->	U-235
5.17E+01	654.89	Pu-239	->	U-235
4.87E+01	184.55	Pu-239	->	U-235
4.82E+01	281.12	Pu-239	->	U-235
4.82E+01	372.47	Pu-239	->	U-235
4.68E+01	617.43	Pu-239	->	U-235
4.59E+01	461.25	Pu-239	->	U-235
4.59E+01	313.39	Pu-239	->	U-235
3.80E+01	664.587	Pu-239	->	U-235
3.54E+01	457.57	Pu-239	->	U-235
3.44E+01	285.27	Pu-239	->	U-235
2.50E+01	727.84	Pu-239	->	U-235
2.41E+01	379.05	Pu-239	->	U-235
2.30E+01	218.45	Pu-239	->	U-235
2.04E+01	686.16	Pu-239	->	U-235
2.02E+01	493.25	Pu-239	->	U-235

1.86E+01	612.93	Pu-239	->	U-235	
1.84E+01	354.02	Pu-239	->	U-235	
1.63E+01	649.377	Pu-239	->	U-235	
1.26E+01	690.85	Pu-239	->	U-235	
9.18E+00	624.8	Pu-239	->	U-235	
9.18E+00	550.6	Pu-239	->	U-235	
6.89E+00	538.9	Pu-239	->	U-235	
6.46E+00	185.72	U-235	->	Th-231	
5.97E+00	650.529	Pu-239	->	U-235	
5.74E+00	486.99	Pu-239	->	U-235	
5.53E+00	13.724	Th-231	->	Pa-231	
4.36E+00	647.296	Pu-239	->	U-235	
4.18E+00	16.559	Th-231	->	Pa-231	
3.67E+00	843.8	Pu-239	->	U-235	
3.67E+00	463.8	Pu-239	->	U-235	
3.44E+00	606.9	Pu-239	->	U-235	
3.37E+00	808.2	Pu-239	->	U-235	
3.21E+00	586.27	Pu-239	->	U-235	
3.17E+00	828.8	Pu-239	->	U-235	
3.05E+00	779.46	Pu-239	->	U-235	
2.49E+00	12.952	Ac-227	->	Th-227,	U-235 -> Th-231
2.07E+00	714.58	Pu-239	->	U-235	
2.07E+00	474.26	Pu-239	->	U-235	
1.93E+00	787.3	Pu-239	->	U-235	
1.77E+00	891.1	Pu-239	->	U-235	
1.69E+00	16.119	U-235	->	Th-231	
1.65E+00	25.642	Th-231	->	Pa-231	
1.42E+00	813.9	Pu-239	->	U-235	
1.38E+00	557.7	Pu-239	->	U-235	
1.29E+00	956.4	Pu-239	->	U-235	
1.24E+00	143.76	U-235	->	Th-231	
1.17E+00	821.1	Pu-239	->	U-235	
1.15E+00	879	Pu-239	->	U-235	
1.03E+00	1057.32	Pu-239	->	U-235	
1.01E+00	803.3	Pu-239	->	U-235	
9.64E-01	940.1	Pu-239	->	U-235	
9.18E-01	839	Pu-239	->	U-235	
8.35E-01	19.811	Th-231	->	Pa-231	
7.45E-01	84.203	Th-231	->	Pa-231	
7.35E-01	796.5	Pu-239	->	U-235	
6.21E-01	93.36	U-235	->	Th-231	
5.74E-01	163.33	U-235	->	Th-231	
5.74E-01	831.93	Pu-239	->	U-235	
5.74E-01	793	Pu-239	->	U-235	
5.66E-01	205.31	U-235	->	Th-231	
5.28E-01	992.47	Pu-239	->	U-235	
5.28E-01	979.52	Pu-239	->	U-235	
4.59E-01	412.83	Pu-239	->	U-235	
3.80E-01	89.955	U-235	->	Th-231	
3.39E-01	11.372	Th-231	->	Pa-231	

2.94E-01	19.118	U-235	->	Th-231	
2.75E-01	986.7	Pu-239	->	U-235	
2.75E-01	1005.63	Pu-239	->	U-235	
2.24E-01	105.362	U-235	->	Th-231	
1.74E-01	109.16	U-235	->	Th-231	
1.22E-01	202.11	U-235	->	Th-231	
1.13E-01	11.118	Ac-227	->	Th-227,	U-235 -> Th-231
1.06E-01	89.954	Th-231	->	Pa-231	
1.02E-01	81.229	Th-231	->	Pa-231	
7.46E-02	108.99	U-235	->	Th-231	
7.12E-02	194.94	U-235	->	Th-231	
7.11E-02	95.863	Th-231	->	Pa-231	
6.31E-02	766.6	Pu-239	->	U-235	
5.42E-02	58.562	Th-231	->	Pa-231	
4.63E-02	102.255	Th-231	->	Pa-231	
4.52E-02	14.953	Th-231	->	Pa-231	
4.40E-02	92.279	Th-231	->	Pa-231	
3.84E-02	182.61	U-235	->	Th-231	
2.83E-02	72.767	Th-231	->	Pa-231	
2.57E-02	108.166	Th-231	->	Pa-231	
2.49E-02	14.511	Ac-227	->	Th-227,	U-235 -> Th-231
2.49E-02	140.76	U-235	->	Th-231	
2.48E-02	17.187	Th-231	->	Pa-231	
1.75E-02	163.114	Th-231	->	Pa-231	
1.36E-02	221.38	U-235	->	Th-231	
1.35E-02	99.28	Th-231	->	Pa-231	
1.24E-02	72.71	U-235	->	Th-231	
9.72E-03	96.154	U-235	->	Th-231	
9.04E-03	150.93	U-235	->	Th-231	
8.81E-03	135.681	Th-231	->	Pa-231	
8.58E-03	111.897	Th-231	->	Pa-231	
7.91E-03	116.11	U-235	->	Th-231	
6.78E-03	74.8	U-235	->	Th-231	
6.78E-03	41.96	U-235	->	Th-231	
6.55E-03	42.828	Th-231	->	Pa-231	
6.32E-03	124.922	Th-231	->	Pa-231	
6.10E-03	240.85	U-235	->	Th-231	
5.99E-03	246.84	U-235	->	Th-231	
5.53E-03	93.07	Th-231	->	Pa-231	
4.75E-03	198.9	U-235	->	Th-231	
4.52E-03	217.934	Th-231	->	Pa-231	
3.71E-03	183.483	Th-231	->	Pa-231	
3.61E-03	145.927	Th-231	->	Pa-231	
3.39E-03	41.13	U-235	->	Th-231	
3.28E-03	345.921	U-235	->	Th-231	
3.28E-03	233.5	U-235	->	Th-231	
3.05E-03	215.305	U-235	->	Th-231	
2.94E-03	119.98	U-235	->	Th-231	
2.71E-03	134.014	Th-231	->	Pa-231	
2.60E-03	63.834	Th-231	->	Pa-231	

2.34E-03	116.827	Th-231	->	Pa-231
2.26E-03	51.179	U-235	->	Th-231
2.26E-03	64.348	U-235	->	Th-231
2.07E-03	174.157	Th-231	->	Pa-231
1.92E-03	106.581	Th-231	->	Pa-231
1.81E-03	31.585	U-235	->	Th-231
1.58E-03	291.72	U-235	->	Th-231
1.36E-03	136.72	U-235	->	Th-231
1.13E-03	172.27	U-235	->	Th-231
1.04E-03	235.985	Th-231	->	Pa-231
9.04E-04	228.77	U-235	->	Th-231
8.02E-04	105.803	Th-231	->	Pa-231
7.91E-04	289.57	U-235	->	Th-231
6.78E-04	266.483	U-235	->	Th-231
6.78E-04	281.45	U-235	->	Th-231
6.55E-04	145.063	Th-231	->	Pa-231
6.43E-04	68.5	Th-231	->	Pa-231
5.65E-04	301.72	U-235	->	Th-231
5.65E-04	356.068	U-235	->	Th-231
5.65E-04	282.98	U-235	->	Th-231
5.54E-04	275.47	U-235	->	Th-231
4.74E-04	136.705	Th-231	->	Pa-231
4.52E-04	310.71	U-235	->	Th-231
4.40E-04	164.97	Th-231	->	Pa-231
4.29E-04	387.874	U-235	->	Th-231
3.61E-04	188.756	Th-231	->	Pa-231
3.39E-04	410.269	U-235	->	Th-231
3.39E-04	343.78	U-235	->	Th-231
3.27E-04	311	Th-231	->	Pa-231
1.49E-04	15.69	Pa-231	->	Ac-227
1.35E-04	169.637	Th-231	->	Pa-231
1.31E-04	12.636	Pa-231	->	Ac-227
1.31E-04	267.62	Th-231	->	Pa-231
1.13E-04	390.32	U-235	->	Th-231
1.13E-04	448.42	U-235	->	Th-231
1.13E-04	317.12	U-235	->	Th-231
1.13E-04	115.595	Th-231	->	Pa-231
9.48E-05	242.508	Th-231	->	Pa-231
9.04E-05	455.12	U-235	->	Th-231
8.81E-05	249.56	Th-231	->	Pa-231
8.02E-05	140.537	Th-231	->	Pa-231
7.90E-05	44.06	Th-231	->	Pa-231
7.34E-05	250.43	Th-231	->	Pa-231
6.78E-05	794.72	U-235	->	Th-231
5.54E-05	27.396	Pa-231	->	Ac-227
4.52E-05	517.2	U-235	->	Th-231
4.52E-05	742.52	U-235	->	Th-231
4.40E-05	308.75	Th-231	->	Pa-231
3.52E-05	18.607	Pa-231	->	Ac-227
3.16E-05	240.25	Th-231	->	Pa-231

1.42E-05	300.07	Pa-231	->	Ac-227		
1.24E-05	320.188	Th-231	->	Pa-231		
1.02E-05	302.671	Pa-231	->	Ac-227		
9.48E-06	283.673	Pa-231	->	Ac-227		
9.03E-06	317.93	Th-231	->	Pa-231		
7.90E-06	351.82	Th-231	->	Pa-231		
7.87E-06	330.066	Pa-231	->	Ac-227		
7.15E-06	10.871	Pa-231	->	Ac-227		
7.14E-06	83.787	Ra-223	->	Rn-219		
6.02E-06	15.218	Th-227	->	Ra-223		
4.94E-06	12.325	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.65E-06	90.886	Pa-231	->	Ac-227		
4.30E-06	81.067	Ra-223	->	Rn-219		
3.85E-06	269.39	Ra-223	->	Rn-219		
3.82E-06	302.638	Pa-231	->	Ac-227		
3.61E-06	350.1	Bi-211	->	Tl-207		
3.39E-06	274.14	Th-231	->	Pa-231		
3.21E-06	235.97	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.89E-06	11.713	Ra-223	->	Rn-219		
2.84E-06	87.673	Pa-231	->	Ac-227		
2.80E-06	271.13	Rn-219	->	Po-215		
2.78E-06	14.341	Ra-223	->	Rn-219		
2.58E-06	50.14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.52E-06	94.677	Ra-223	->	Rn-219		
2.27E-06	16.397	Pa-231	->	Ac-227		
2.21E-06	14.082	Pa-231	->	Ac-227		
1.97E-06	18.998	Pa-231	->	Ac-227		
1.92E-06	256.24	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.88E-06	401.7	Rn-219	->	Po-215		
1.67E-06	102.613	Pa-231	->	Ac-227		
1.58E-06	154.18	Ra-223	->	Rn-219		
1.38E-06	17.997	Th-227	->	Ra-223		
1.24E-06	46.393	Pa-231	->	Ac-227		
1.10E-06	323.88	Ra-223	->	Rn-219		
1.08E-06	260.29	Pa-231	->	Ac-227		
1.08E-06	404.86	Pb-211	->	Bi-211,	At-215	-> Bi-211
1.08E-06	831.86	Pb-211	->	Bi-211		
1.04E-06	340.873	Pa-231	->	Ac-227		
9.23E-07	144.18	Ra-223	->	Rn-219		
9.18E-07	357.2	Pa-231	->	Ac-227		
9.00E-07	88.471	Fr-223	->	Ra-223,	Th-227	-> Ra-223
8.88E-07	38.235	Pa-231	->	Ac-227		
8.04E-07	97.907	Ra-223	->	Rn-219		
7.87E-07	338.28	Ra-223	->	Rn-219		
7.83E-07	329.84	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.74E-07	313.058	Pa-231	->	Ac-227		
6.39E-07	79.72	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.02E-07	299.97	Fr-223	->	Ra-223,	Th-227	-> Ra-223
5.96E-07	255.858	Pa-231	->	Ac-227		
5.49E-07	16.918	Ra-223	->	Rn-219		

5.48E-07	106.137	Pa-231	->	Ac-227		
5.48E-07	29.996	Pa-231	->	Ac-227		
5.46E-07	85.429	Fr-223	->	Ra-223,	Th-227	-> Ra-223
5.37E-07	25.464	Pa-231	->	Ac-227		
5.25E-07	96.979	Pa-231	->	Ac-227		
5.07E-07	52.763	Pa-231	->	Ac-227		
4.87E-07	427	Pb-211	->	Bi-211		
4.83E-07	54.632	Pa-231	->	Ac-227		
4.77E-07	354.63	Pa-231	->	Ac-227		
4.56E-07	286.11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.05E-07	77.405	Pa-231	->	Ac-227		
4.01E-07	93.93	Th-227	->	Ra-223		
3.70E-07	277.17	Pa-231	->	Ac-227		
3.60E-07	444.94	Ra-223	->	Rn-219		
3.59E-07	72.873	Bi-211	->	Tl-207		
3.58E-07	44.213	Pa-231	->	Ac-227		
3.40E-07	273.17	Pa-231	->	Ac-227		
3.37E-07	122.31	Ra-223	->	Rn-219		
3.24E-07	210.58	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.21E-07	99.915	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.13E-07	304.51	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.98E-07	63.7	Pa-231	->	Ac-227		
2.85E-07	10.622	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.84E-07	334.38	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.80E-07	243.17	Pa-231	->	Ac-227		
2.74E-07	379.4	Rn-219	->	Po-215,	Pa-231	-> Ac-227
2.46E-07	79.29	Rn-219	->	Po-215		
2.29E-07	254.66	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.12E-07	70.832	Bi-211	->	Tl-207		
2.03E-07	407.98	Pa-231	->	Ac-227		
2.01E-07	766.35	Pb-211	->	Bi-211		
1.95E-07	158.59	Ra-223	->	Rn-219		
1.91E-07	100.96	Pa-231	->	Ac-227		
1.79E-07	327.23	Pa-231	->	Ac-227		
1.79E-07	24.56	Pa-231	->	Ac-227		
1.61E-07	113.19	Th-227	->	Ra-223		
1.56E-07	10.137	Ra-223	->	Rn-219		
1.49E-07	74.209	Pa-231	->	Ac-227		
1.49E-07	57.233	Pa-231	->	Ac-227		
1.47E-07	76.858	Rn-219	->	Po-215		
1.42E-07	234.82	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.41E-07	272.95	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.39E-07	371.8	Ra-223	->	Rn-219		
1.36E-07	704.51	Pb-211	->	Bi-211		
1.35E-07	312.57	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.32E-07	314.82	Th-227	->	Ra-223		
1.31E-07	341.17	Pa-231	->	Ac-227		
1.27E-07	13.495	Rn-219	->	Po-215		
1.26E-07	82.434	Bi-211	->	Tl-207		
1.24E-07	10.259	Bi-211	->	Tl-207		

1.23E-07	296.54	Th-227	->	Ra-223		
1.22E-07	77.107	Pb-211	->	Bi-211		
1.16E-07	11.119	Rn-219	->	Po-215		
1.16E-07	13.082	Pb-211	->	Bi-211		
1.13E-07	12.313	Bi-211	->	Tl-207		
1.09E-07	342.44	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.06E-07	250.12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.05E-07	103.341	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.05E-07	10.828	Pb-211	->	Bi-211		
1.04E-07	13.662	Fr-223	->	Ra-223,	Th-227	-> Ra-223
9.54E-08	35.884	Pa-231	->	Ac-227		
8.94E-08	57.2	Pa-231	->	Ac-227		
8.78E-08	89.639	Rn-219	->	Po-215		
7.96E-08	15.213	Fr-223	->	Ra-223		
7.25E-08	74.814	Pb-211	->	Bi-211		
7.15E-08	40.006	Pa-231	->	Ac-227		
6.88E-08	62.36	Th-227	->	Ra-223		
6.82E-08	897.23	Tl-207	->	Pb-207,	Po-211	-> Pb-207
6.60E-08	204.2	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.60E-08	43.73	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.60E-08	206.04	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.56E-08	56.9	Pa-231	->	Ac-227		
6.07E-08	49.85	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.07E-08	20.27	Fr-223	->	Ra-223,	Th-227	-> Ra-223
5.73E-08	300.34	Th-227	->	Ra-223		
5.66E-08	342.9	Ra-223	->	Rn-219		
5.61E-08	328.49	Ra-223	->	Rn-219		
5.54E-08	398.4	Pa-231	->	Ac-227		
5.37E-08	359.51	Pa-231	->	Ac-227		
5.37E-08	31.04	Pa-231	->	Ac-227		
4.87E-08	117.17	Th-227	->	Ra-223		
4.77E-08	242	Pa-231	->	Ac-227		
4.59E-08	281.31	Th-227	->	Ra-223		
4.49E-08	16.074	Ac-227	->	Th-227		
4.41E-08	364.03	Pa-231	->	Ac-227		
4.36E-08	288.15	Ra-223	->	Rn-219		
4.33E-08	179.69	Ra-223	->	Rn-219		
4.32E-08	204.95	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.30E-08	87.19	Pb-211	->	Bi-211		
4.30E-08	113.12	Th-227	->	Ra-223		
4.17E-08	31.58	Pa-231	->	Ac-227		
4.17E-08	43.09	Pa-231	->	Ac-227		
4.17E-08	60.526	Pa-231	->	Ac-227		
4.17E-08	70.54	Pa-231	->	Ac-227		
4.17E-08	245.438	Pa-231	->	Ac-227		
4.16E-08	1109.37	Pb-211	->	Bi-211		
4.11E-08	245.77	Pa-231	->	Ac-227		
4.11E-08	12.855	Ra-223	->	Rn-219		
4.05E-08	391.85	Pa-231	->	Ac-227		
3.73E-08	141.44	Th-227	->	Ra-223		

3.73E-08	250.33	Th-227	->	Ra-223	
3.58E-08	42.52	Pa-231	->	Ac-227	
3.58E-08	56.8	Pa-231	->	Ac-227	
3.57E-08	130.57	Rn-219	->	Po-215	
3.56E-08	85.185	Bi-211	->	Tl-207	
3.34E-08	198.96	Pa-231	->	Ac-227	
3.15E-08	350.48	Th-227	->	Ra-223	
3.15E-08	252.46	Th-227	->	Ra-223	
2.98E-08	124.69	Pa-231	->	Ac-227	
2.89E-08	100.31	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.88E-08	29.869	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.87E-08	262.72	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.80E-08	333.87	Ra-223	->	Rn-219	
2.66E-08	92.673	Rn-219	->	Po-215	
2.58E-08	15.856	Rn-219	->	Po-215	
2.55E-08	598.69	Ra-223	->	Rn-219	
2.55E-08	15.397	Pb-211	->	Bi-211	
2.44E-08	438.24	Pa-231	->	Ac-227	
2.44E-08	384.97	Pa-231	->	Ac-227	
2.38E-08	72.57	Pa-231	->	Ac-227	
2.38E-08	144.5	Pa-231	->	Ac-227	
2.29E-08	61.435	Th-227	->	Ra-223	
2.29E-08	31.566	Th-227	->	Ra-223	
2.18E-08	65.516	Pb-211	->	Bi-211	
2.06E-08	14.407	Bi-211	->	Tl-207	
2.01E-08	527.3	Ra-223	->	Rn-219	
2.01E-08	279.7	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.01E-08	212.56	Th-227	->	Ra-223	
1.97E-08	435.38	Pa-231	->	Ac-227	
1.97E-08	277.43	Pa-231	->	Ac-227	
1.84E-08	293.8	Rn-219	->	Po-215	
1.80E-08	18.016	Fr-223	->	Ra-223	
1.78E-08	609.08	Ra-223	->	Rn-219	
1.72E-08	292.3	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.72E-08	96.06	Th-227	->	Ra-223	
1.72E-08	218.77	Th-227	->	Ra-223	
1.61E-08	83.81	Pb-211	->	Bi-211	
1.58E-08	285.48	Th-227	->	Ra-223	
1.55E-08	226.77	Pa-231	->	Ac-227	
1.55E-08	395.8	Pa-231	->	Ac-227	
1.43E-08	284.24	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.43E-08	43.53	Th-227	->	Ra-223	
1.38E-08	383.47	Th-227	->	Ra-223	
1.37E-08	258.43	Pa-231	->	Ac-227	
1.36E-08	110.8	Ra-223	->	Rn-219	
1.33E-08	177.35	Ra-223	->	Rn-219	
1.27E-08	81	Pb-211	->	Bi-211	
1.27E-08	90.128	Pb-211	->	Bi-211	
1.22E-08	361.8	Ra-223	->	Rn-219	
1.20E-08	19.308	Ac-227	->	Th-227	

1.19E-08	318.1	Pa-231	->	Ac-227		
1.19E-08	71.92	Pa-231	->	Ac-227		
1.15E-08	104.9	Th-227	->	Ra-223		
1.15E-08	218.94	Th-227	->	Ra-223		
1.15E-08	41.88	Th-227	->	Ra-223		
1.15E-08	68.75	Th-227	->	Ra-223		
1.13E-08	515.7	Rn-219	->	Po-215		
1.13E-08	438.8	Po-215	->	Pb-211		
1.13E-08	410.84	Pa-231	->	Ac-227		
1.13E-08	184.68	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.05E-08	15.2	Ac-227	->	Th-227		
1.05E-08	249.49	Ra-223	->	Rn-219		
9.91E-09	251.12	Ra-223	->	Rn-219		
9.63E-09	343.02	Pb-211	->	Bi-211		
9.57E-09	134.5	Fr-223	->	Ra-223,	Th-227	-> Ra-223
9.34E-09	432.34	Ra-223	->	Rn-219		
9.34E-09	220.38	Ra-223	->	Rn-219		
9.18E-09	270.76	Th-227	->	Ra-223		
9.18E-09	140.33	Th-227	->	Ra-223		
9.14E-09	319.18	Fr-223	->	Ra-223,	Th-227	-> Ra-223
9.06E-09	254.98	Ra-223	->	Rn-219		
8.78E-09	251.58	Ra-223	->	Rn-219		
8.78E-09	313.85	Pb-211	->	Bi-211		
8.60E-09	314.78	Th-227	->	Ra-223		
8.50E-09	221.9	Rn-219	->	Po-215		
8.35E-09	39.61	Pa-231	->	Ac-227		
8.35E-09	310.19	Pa-231	->	Ac-227		
8.35E-09	50.97	Pa-231	->	Ac-227		
8.03E-09	64.37	Th-227	->	Ra-223		
8.03E-09	72.8	Th-227	->	Ra-223		
7.75E-09	516.45	Pa-231	->	Ac-227		
7.36E-09	481.1	Pb-211	->	Bi-211		
6.51E-09	609.62	Pb-211	->	Bi-211		
6.38E-09	388.98	Pa-231	->	Ac-227		
6.23E-09	106.66	Ra-223	->	Rn-219		
6.23E-09	951	Pb-211	->	Bi-211		
6.10E-09	8.953	Bi-211	->	Tl-207		
5.97E-09	9.658	Rn-219	->	Po-215		
5.73E-09	200.48	Th-227	->	Ra-223		
5.73E-09	201.64	Th-227	->	Ra-223		
5.73E-09	40.16	Th-227	->	Ra-223		
5.66E-09	369.48	Ra-223	->	Rn-219		
5.45E-09	73.66	Th-227	->	Ra-223		
5.38E-09	430.53	Ra-223	->	Rn-219		
5.38E-09	9.419	Pb-211	->	Bi-211		
5.16E-09	175.23	Th-227	->	Ra-223		
5.10E-09	94.89	Pb-211	->	Bi-211		
5.07E-09	1014.48	Pb-211	->	Bi-211		
4.92E-09	173.38	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.87E-09	212.69	Th-227	->	Ra-223		

4.81E-09	175.55	Ra-223	->	Rn-219		
4.81E-09	103.85	Ra-223	->	Rn-219		
4.81E-09	88.2	Pb-211	->	Bi-211		
4.59E-09	50.82	Th-227	->	Ra-223		
4.33E-09	1080.19	Pb-211	->	Bi-211		
4.30E-09	224.68	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.30E-09	308.49	Th-227	->	Ra-223		
4.25E-09	504.33	Pb-211	->	Bi-211		
4.20E-09	289.6	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.01E-09	33.52	Th-227	->	Ra-223		
4.01E-09	168.19	Th-227	->	Ra-223		
3.96E-09	388.3	Ra-223	->	Rn-219		
3.96E-09	492	Pb-211	->	Bi-211		
3.73E-09	99.56	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.73E-09	44.37	Th-227	->	Ra-223		
3.68E-09	478	Pb-211	->	Bi-211		
3.62E-09	1196.61	Pb-211	->	Bi-211		
3.58E-09	501.33	Pa-231	->	Ac-227		
3.44E-09	197.61	Th-227	->	Ra-223		
3.44E-09	402.42	Th-227	->	Ra-223		
3.44E-09	94.9	Th-227	->	Ra-223		
3.44E-09	117.3	Th-227	->	Ra-223		
3.34E-09	535.45	Pa-231	->	Ac-227		
3.26E-09	97.3	Pb-211	->	Bi-211		
3.15E-09	246.07	Th-227	->	Ra-223		
3.11E-09	500.4	Pb-211	->	Bi-211		
3.11E-09	94.3	Pb-211	->	Bi-211		
2.98E-09	546.9	Pa-231	->	Ac-227		
2.98E-09	387.267	Pa-231	->	Ac-227		
2.98E-09	572.3	Pa-231	->	Ac-227		
2.87E-09	48.27	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.87E-09	150.02	Th-227	->	Ra-223		
2.87E-09	352.57	Th-227	->	Ra-223		
2.87E-09	267.82	Th-227	->	Ra-223		
2.83E-09	487.59	Ra-223	->	Rn-219		
2.58E-09	59.5	Th-227	->	Ra-223		
2.58E-09	62.54	Th-227	->	Ra-223		
2.58E-09	69.65	Th-227	->	Ra-223		
2.58E-09	75.1	Th-227	->	Ra-223		
2.58E-09	398.6	Th-227	->	Ra-223		
2.58E-09	392.24	Th-227	->	Ra-223		
2.58E-09	289.5	Th-227	->	Ra-223		
2.55E-09	245.19	Ra-223	->	Rn-219		
2.55E-09	114.5	Ra-223	->	Rn-219		
2.52E-09	1270.67	Pb-211	->	Bi-211		
2.29E-09	54.18	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.29E-09	112.54	Th-227	->	Ra-223		
2.29E-09	123.55	Th-227	->	Ra-223		
2.29E-09	270.34	Th-227	->	Ra-223		
2.27E-09	368.78	Ra-223	->	Rn-219		

2.27E-09	623.38	Ra-223	->	Rn-219		
2.15E-09	346.39	Th-227	->	Ra-223		
2.12E-09	12.085	Rn-219	->	Po-215		
2.11E-09	775.82	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.01E-09	370.85	Th-227	->	Ra-223		
2.01E-09	56.63	Th-227	->	Ra-223		
2.01E-09	107.92	Th-227	->	Ra-223		
2.01E-09	66.3	Th-227	->	Ra-223		
2.01E-09	281	Th-227	->	Ra-223		
2.01E-09	44.08	Th-227	->	Ra-223		
2.01E-09	249.36	Th-227	->	Ra-223		
2.01E-09	162.18	Th-227	->	Ra-223		
1.98E-09	376.9	Rn-219	->	Po-215		
1.83E-09	29.58	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.82E-09	369.32	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.81E-09	675.33	Pb-211	->	Bi-211		
1.81E-09	430.26	Pb-211	->	Bi-211		
1.81E-09	865.81	Pb-211	->	Bi-211		
1.72E-09	318.58	Th-227	->	Ra-223		
1.72E-09	382.15	Th-227	->	Ra-223		
1.72E-09	325.08	Th-227	->	Ra-223		
1.72E-09	348.4	Th-227	->	Ra-223		
1.72E-09	376.26	Th-227	->	Ra-223		
1.72E-09	202.4	Th-227	->	Ra-223		
1.72E-09	66.1	Th-227	->	Ra-223		
1.72E-09	109.1	Th-227	->	Ra-223		
1.70E-09	540.1	Rn-219	->	Po-215		
1.70E-09	676.4	Rn-219	->	Po-215		
1.70E-09	260.4	Ra-223	->	Rn-219		
1.70E-09	11.712	Pb-211	->	Bi-211		
1.63E-09	68.7	Th-227	->	Ra-223		
1.61E-09	10.994	Bi-211	->	Tl-207		
1.44E-09	1103.4	Pb-211	->	Bi-211		
1.43E-09	110.58	Th-227	->	Ra-223		
1.43E-09	56.03	Th-227	->	Ra-223		
1.43E-09	362.55	Th-227	->	Ra-223		
1.43E-09	432.29	Th-227	->	Ra-223		
1.43E-09	124.48	Th-227	->	Ra-223		
1.43E-09	326.12	Th-227	->	Ra-223		
1.43E-09	220.2	Pa-231	->	Ac-227		
1.43E-09	228.16	Pa-231	->	Ac-227		
1.42E-09	165.5	Ra-223	->	Rn-219		
1.42E-09	131.1	Ra-223	->	Rn-219		
1.42E-09	255.74	Ra-223	->	Rn-219		
1.14E-09	339.45	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.13E-09	608.5	Rn-219	->	Po-215		
1.13E-09	176.8	Ra-223	->	Rn-219		
1.13E-09	383.12	Ra-223	->	Rn-219		
1.05E-09	24.5	Ac-227	->	Th-227		
1.01E-09	23.55	Pa-231	->	Ac-227		

9.91E-10	711.2	Ra-223	->	Rn-219		
9.75E-10	89.85	Th-227	->	Ra-223		
9.34E-10	115.3	Rn-219	->	Po-215		
8.94E-10	471.33	Pa-231	->	Ac-227		
8.60E-10	51.29	Fr-223	->	Ra-223,	Th-227	-> Ra-223
8.60E-10	169.98	Th-227	->	Ra-223		
8.60E-10	124.6	Th-227	->	Ra-223		
8.50E-10	199.43	Ra-223	->	Rn-219		
8.50E-10	391	Ra-223	->	Rn-219		
8.32E-10	812.15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
7.59E-10	822.99	Fr-223	->	Ra-223,	Th-227	-> Ra-223
7.36E-10	1090.5	Pb-211	->	Bi-211		
7.17E-10	266.3	Th-227	->	Ra-223		
7.06E-10	74.969	Tl-207	->	Pb-207		
6.57E-10	908.03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
5.73E-10	99.64	Th-227	->	Ra-223		
5.73E-10	62.05	Th-227	->	Ra-223		
5.73E-10	179.28	Th-227	->	Ra-223		
5.15E-10	803.58	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.98E-10	307.89	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.87E-10	415.09	Th-227	->	Ra-223		
4.59E-10	478.22	Pa-231	->	Ac-227		
4.35E-10	723.86	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.30E-10	275.2	Th-227	->	Ra-223		
4.26E-10	328.08	Tl-207	->	Pb-207,	Po-211	-> Pb-207
4.25E-10	887.7	Rn-219	->	Po-215		
4.24E-10	72.803	Tl-207	->	Pb-207		
4.17E-10	764.52	Fr-223	->	Ra-223,	Th-227	-> Ra-223
4.13E-10	569.15	Po-211	->	Pb-207		
4.01E-10	374.93	Th-227	->	Ra-223		
4.01E-10	339.1	Th-227	->	Ra-223		
3.68E-10	1234.3	Pb-211	->	Bi-211		
3.44E-10	102.45	Th-227	->	Ra-223		
3.34E-10	536.88	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.27E-10	568.76	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.91E-10	757.03	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.87E-10	171.21	Th-227	->	Ra-223		
2.83E-10	834.2	Rn-219	->	Po-215		
2.69E-10	796.96	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.64E-10	825.96	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.54E-10	10.541	Tl-207	->	Pb-207		
2.51E-10	84.979	Tl-207	->	Pb-207		
2.32E-10	12.703	Tl-207	->	Pb-207		
2.23E-10	876.14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.14E-10	722.6	Fr-223	->	Ra-223,	Th-227	-> Ra-223
2.01E-10	230.17	Th-227	->	Ra-223		
1.98E-10	842.02	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.93E-10	846.56	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.70E-10	1055.8	Rn-219	->	Po-215		
1.67E-10	493.15	Fr-223	->	Ra-223,	Th-227	-> Ra-223

1.59E-10	575.8	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.53E-10	748.56	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.43E-10	837.36	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.34E-10	99.7	Ac-227	->	Fr-223			
1.28E-10	507.64	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.27E-10	746.24	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.13E-10	387.9	Rn-219	->	Po-215			
1.12E-10	756.79	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.03E-10	896.41	Fr-223	->	Ra-223,	Th-227	->	Ra-223
1.02E-10	780.59	Fr-223	->	Ra-223,	Th-227	->	Ra-223
9.11E-11	480.25	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.52E-11	552.09	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.29E-11	762.3	Fr-223	->	Ra-223,	Th-227	->	Ra-223
8.18E-11	858.4	Fr-223	->	Ra-223,	Th-227	->	Ra-223
7.34E-11	87.632	Tl-207	->	Pb-207			
7.12E-11	69.83	Ac-227	->	Fr-223			
7.02E-11	555.91	Fr-223	->	Ra-223,	Th-227	->	Ra-223
6.24E-11	828.31	Fr-223	->	Ra-223,	Th-227	->	Ra-223
6.13E-11	515.96	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.80E-11	733.9	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.75E-11	607.2	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.63E-11	754.17	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.63E-11	784.04	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.47E-11	753.44	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.43E-11	734.6	Fr-223	->	Ra-223,	Th-227	->	Ra-223
5.10E-11	524.02	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.96E-11	817.31	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.92E-11	691.46	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.77E-11	482.14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.68E-11	448	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.59E-11	623.52	Th-227	->	Ra-223			
4.44E-11	578.2	Fr-223	->	Ra-223,	Th-227	->	Ra-223
4.24E-11	14.886	Tl-207	->	Pb-207			
4.14E-11	704.19	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.94E-11	772.85	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.89E-11	9.3	Ac-227	->	Th-227			
3.89E-11	786.9	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.73E-11	633.2	Th-227	->	Ra-223			
3.71E-11	452.52	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.48E-11	147.2	Ac-227	->	Fr-223			
3.47E-11	878.16	Fr-223	->	Ra-223,	Th-227	->	Ra-223
3.10E-11	848.88	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.87E-11	534.9	Th-227	->	Ra-223			
2.83E-11	31.87	Ra-223	->	Rn-219			
2.59E-11	457.07	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.59E-11	736.76	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.57E-11	643.93	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.54E-11	867.23	Fr-223	->	Ra-223,	Th-227	->	Ra-223
2.31E-11	69.13	Ac-227	->	Fr-223			
2.31E-11	120.9	Ac-227	->	Fr-223			

2.06E-11	941.41	Th-227	->	Ra-223		
2.01E-11	854.2	Th-227	->	Ra-223		
1.88E-11	621.92	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.88E-11	857.89	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.82E-11	588.17	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.78E-11	958.6	Th-227	->	Ra-223		
1.72E-11	662.8	Th-227	->	Ra-223		
1.72E-11	171.4	Ac-227	->	Fr-223		
1.69E-11	808.26	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.48E-11	707.18	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.43E-11	466.2	Th-227	->	Ra-223		
1.43E-11	461.9	Th-227	->	Ra-223		
1.41E-11	863.2	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.41E-11	891	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.27E-11	9.185	Tl-207	->	Pb-207		
1.21E-11	596.44	Fr-223	->	Ra-223,	Th-227	-> Ra-223
1.17E-11	133.8	Ac-227	->	Fr-223		
1.15E-11	788.36	Th-227	->	Ra-223		
1.15E-11	792.6	Th-227	->	Ra-223		
1.00E-11	990.2	Th-227	->	Ra-223		
9.61E-12	718.22	Fr-223	->	Ra-223,	Th-227	-> Ra-223
9.18E-12	892.8	Fr-223	->	Ra-223,	Th-227	-> Ra-223
8.71E-12	926.28	Fr-223	->	Ra-223,	Th-227	-> Ra-223
8.60E-12	999.78	Th-227	->	Ra-223		
8.60E-12	969.91	Th-227	->	Ra-223		
8.60E-12	793.12	Th-227	->	Ra-223		
8.60E-12	818.23	Th-227	->	Ra-223		
6.07E-12	648.43	Fr-223	->	Ra-223,	Th-227	-> Ra-223
5.87E-12	46.13	Ac-227	->	Fr-223		
5.87E-12	106.1	Ac-227	->	Fr-223		
5.73E-12	1020	Th-227	->	Ra-223		
5.73E-12	641.45	Th-227	->	Ra-223		
5.45E-12	825.97	Fr-223	->	Ra-223		
4.30E-12	1015.1	Th-227	->	Ra-223		
4.30E-12	1024.8	Th-227	->	Ra-223		
4.30E-12	909.85	Th-227	->	Ra-223		
3.44E-12	920.06	Th-227	->	Ra-223		
3.41E-12	828.53	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.30E-12	11.349	Tl-207	->	Pb-207		
2.87E-12	971.28	Th-227	->	Ra-223		
2.87E-12	938.34	Th-227	->	Ra-223		
2.01E-12	994.9	Th-227	->	Ra-223		
5.03E-13	793.11	Fr-223	->	Ra-223		

Pu-240

100%

Age: 5 years

325

lines

computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays		
8.953	4.75E-12	Bi-212	->	Tl-208
9.185	2.06E-12	Tl-208	->	Pb-208
9.419	2.99E-11	Pb-212	->	Bi-212
9.658	1.18E-13	Bi-212	->	Po-212
10.137	6.44E-13	Ra-224	->	Rn-220
10.259	9.62E-11	Bi-212	->	Tl-208
10.541	4.11E-11	Tl-208	->	Pb-208
10.622	1.60E-11	Th-228	->	Ra-224
10.828	5.81E-10	Pb-212	->	Bi-212
10.994	8.96E-13	Bi-212	->	Tl-208
11.118	2.48E+00	Ac-228	->	Th-228,
11.119	2.31E-12	Bi-212	->	Po-212
11.349	5.51E-13	Tl-208	->	Pb-208
11.712	7.66E-12	Pb-212	->	Bi-212
11.713	1.15E-11	Ra-224	->	Rn-220
12.085	3.50E-14	Bi-212	->	Po-212
12.282	1.11E-10	Bi-212	->	Tl-208
12.325	2.76E-10	Th-228	->	Ra-224
12.701	3.86E-11	Tl-208	->	Pb-208
12.76	5.05E-09	Ra-228	->	Ac-228
12.855	3.00E-13	Ra-224	->	Rn-220
12.952	4.22E+01	Ac-228	->	Th-228,
13.099	5.28E-10	Pb-212	->	Bi-212
13.5	2.66E-08	Ra-228	->	Ac-228
13.501	2.31E-12	Bi-212	->	Po-212
13.662	8.37E-12	Th-228	->	Ra-224
14.336	1.59E-11	Ra-224	->	Rn-220
14.511	1.18E+00	Ac-228	->	Th-228,
14.563	2.60E-11	Bi-212	->	Tl-208
14.884	7.09E-12	Tl-208	->	Pb-208
15.15	2.66E-09	Ra-228	->	Ac-228
15.23	4.19E-10	Th-228	->	Ra-224
15.376	9.95E-11	Pb-212	->	Bi-212
15.869	4.51E-13	Bi-212	->	Po-212
16.154	5.32E-09	Ac-228	->	Th-228
16.161	5.83E+01	U-236	->	Th-232
16.18	1.20E-08	Ra-228	->	Ac-228
16.881	3.44E-12	Ra-224	->	Rn-220
17.952	9.44E-11	Th-228	->	Ra-224
18.8	3.46E-09	Ra-228	->	Ac-228
19.094	1.30E+01	U-236	->	Th-232
19.113	1.22E-09	Ac-228	->	Th-228
19.4	2.39E-10	Ra-228	->	Ac-228
39.846	3.48E-11	Bi-212	->	Tl-208
45.244	3.78E+06	Pu-240	->	U-236

U-236 -> Th-232

U-236 -> Th-232

U-236 -> Th-232

49.369	9.68E-01	U-236	->	Th-232
57.81	1.40E-10	Ac-228	->	Th-228
59	2.91E-10	Th-232	->	Ra-228
70.832	2.37E-12	Bi-212	->	Tl-208
72.803	6.77E-11	Tl-208	->	Pb-208
72.873	4.02E-12	Bi-212	->	Tl-208
74.814	9.25E-10	Pb-212	->	Bi-212
74.969	1.14E-10	Tl-208	->	Pb-208
76.858	3.38E-12	Bi-212	->	Po-212
77.107	1.56E-09	Pb-212	->	Bi-212
79.29	5.64E-12	Bi-212	->	Po-212
81.067	1.06E-11	Ra-224	->	Rn-220
82.434	1.42E-12	Bi-212	->	Tl-208
83.787	1.76E-11	Ra-224	->	Rn-220
84.26	1.08E-10	Th-228	->	Ra-224
84.789	4.02E-11	Tl-208	->	Pb-208
85.185	3.96E-13	Bi-212	->	Tl-208
85.429	1.56E-12	Th-228	->	Ra-224
87.19	5.52E-10	Pb-212	->	Bi-212
87.632	1.16E-11	Tl-208	->	Pb-208
88.471	2.57E-12	Th-228	->	Ra-224
89.639	1.97E-12	Bi-212	->	Po-212
89.955	9.04E-10	Ac-228	->	Th-228
90.128	1.64E-10	Pb-212	->	Bi-212
92.673	6.21E-13	Bi-212	->	Po-212
93.35	1.49E-09	Ac-228	->	Th-228
94.66	5.71E+03	Pu-240	->	U-236
94.677	6.35E-12	Ra-224	->	Rn-220
97.907	2.03E-12	Ra-224	->	Rn-220
98.441	8.39E+03	Pu-240	->	U-236
99.55	3.46E-10	Ac-228	->	Th-228
99.915	9.18E-13	Th-228	->	Ra-224
103.341	2.99E-13	Th-228	->	Ra-224
104.244	5.84E+05	Pu-240	->	U-236
105.362	5.32E-10	Ac-228	->	Th-228
108.99	1.78E-10	Ac-228	->	Th-228
110.421	9.90E+02	Pu-240	->	U-236
111.3	3.02E+03	Pu-240	->	U-236
112.75	2.36E-01	U-236	->	Th-232
114.866	8.39E+02	Pu-240	->	U-236
115.122	5.20E-11	Pb-212	->	Bi-212
124	6.58E-11	Th-232	->	Ra-228
129.03	7.71E-10	Ac-228	->	Th-228
131.5	1.14E-11	Th-228	->	Ra-224
135.68	4.52E-12	Ac-228	->	Th-228
141.19	1.30E-11	Ac-228	->	Th-228
143.99	3.16E-13	Bi-212	->	Tl-208
146.06	7.71E-11	Ac-228	->	Th-228
153.89	2.23E-10	Ac-228	->	Th-228
160.28	3.52E+04	Pu-240	->	U-236

164	1.58E-13	Bi-212	->	Tl-208
164.15	4.40E-13	Pb-212	->	Bi-212
166.43	7.31E-12	Th-228	->	Ra-224
174.18	8.51E-12	Ac-228	->	Th-228
176.577	4.49E-12	Pb-212	->	Bi-212
184.72	3.72E-11	Ac-228	->	Th-228
191.29	3.19E-11	Ac-228	->	Th-228
199.54	7.44E-11	Ac-228	->	Th-228
204.37	4.17E-11	Ac-228	->	Th-228
205.75	2.49E-12	Th-228	->	Ra-224
209.39	1.09E-09	Ac-228	->	Th-228
210.76	6.11E-11	Ac-228	->	Th-228
211.31	5.38E-12	Tl-208	->	Pb-208
212.46	2.52E+03	Pu-240	->	U-236
215.75	2.47E-11	Th-228	->	Ra-224
216.24	2.13E-10	Ac-228	->	Th-228
220.49	3.72E-12	Ac-228	->	Th-228
223.72	1.75E-11	Ac-228	->	Th-228
232.3	1.59E-11	Ac-228	->	Th-228
233.32	9.81E-12	Tl-208	->	Pb-208
238.578	3.84E-09	Pb-212	->	Bi-212
240.76	3.44E-10	Ra-224	->	Rn-220
252.45	2.53E-11	Tl-208	->	Pb-208
257.29	8.51E-12	Ac-228	->	Th-228
263.57	1.54E-11	Ac-228	->	Th-228
270.26	1.01E-09	Ac-228	->	Th-228
277.28	2.15E-10	Tl-208	->	Pb-208
279.3	6.11E-11	Ac-228	->	Th-228
282.02	2.37E-11	Ac-228	->	Th-228
288.08	1.08E-11	Bi-212	->	Tl-208
290	7.94E-13	Ra-224	->	Rn-220
300.034	2.94E-10	Pb-212	->	Bi-212
321.9	6.65E-11	Ac-228	->	Th-228
327.67	3.46E-11	Ac-228	->	Th-228
327.93	4.34E-12	Bi-212	->	Tl-208
328.07	9.30E-10	Ac-228	->	Th-228
332.48	1.25E-10	Ac-228	->	Th-228
338.42	3.30E-09	Ac-228	->	Th-228
340.94	1.38E-10	Ac-228	->	Th-228
356.83	5.32E-12	Ac-228	->	Th-228
372.3	2.39E-12	Ac-228	->	Th-228
388.9	3.99E-12	Ac-228	->	Th-228
396.9	8.51E-12	Ac-228	->	Th-228
399.2	9.84E-12	Ac-228	->	Th-228
409.3	3.53E-13	Ra-224	->	Rn-220
409.62	5.85E-10	Ac-228	->	Th-228
415.156	2.47E-12	Pb-212	->	Bi-212
416.2	4.52E-12	Ac-228	->	Th-228
419.23	6.91E-12	Ac-228	->	Th-228
433.51	4.43E-13	Bi-212	->	Tl-208

440.49	3.99E-11	Ac-228	->	Th-228	
449.57	1.73E-11	Ac-228	->	Th-228	
452.77	1.15E-11	Bi-212	->	Tl-208	
460.84	1.33E-11	Ac-228	->	Th-228	
463.1	1.22E-09	Ac-228	->	Th-228	
471.4	9.30E-12	Ac-228	->	Th-228	
473.36	1.58E-12	Bi-212	->	Tl-208	
474.32	7.71E-12	Ac-228	->	Th-228	
478.2	6.38E-11	Ac-228	->	Th-228	
481.8	2.39E-12	Ac-228	->	Th-228	
485.78	1.58E-12	Tl-208	->	Pb-208	
492.36	5.32E-12	Ac-228	->	Th-228	
492.62	1.93E-13	Bi-212	->	Tl-208	
498.26	1.14E-11	Ac-228	->	Th-228	
503.7	5.58E-11	Ac-228	->	Th-228	
509.17	1.30E-10	Ac-228	->	Th-228	
510.606	6.84E-10	Tl-208	->	Pb-208	
515.2	1.14E-11	Ac-228	->	Th-228	
519.97	2.07E-11	Ac-228	->	Th-228	
523.18	3.19E-11	Ac-228	->	Th-228	
538.11	1.01E+01	Pu-240	->	U-236	
540.5	7.71E-12	Ac-228	->	Th-228	
546.36	5.85E-11	Ac-228	->	Th-228	
549.7	6.17E-12	Rn-220	->	Po-216	
555.3	1.30E-11	Ac-228	->	Th-228	
562.65	2.68E-10	Ac-228	->	Th-228	
570.2	5.05E-11	Ac-228	->	Th-228	
572.5	5.05E-11	Ac-228	->	Th-228	
580.4	2.50E-14	Bi-212	->	Tl-208	
583.022	2.83E-09	Tl-208	->	Pb-208,	Po-212 -> Pb-208
583.28	3.99E-11	Ac-228	->	Th-228	
587.82	1.27E-12	Tl-208	->	Pb-208	
615.9	2.39E-11	Ac-228	->	Th-228	
619.88	2.92E-11	Ac-228	->	Th-228	
620.3	1.14E-13	Bi-212	->	Tl-208	
629.93	1.33E-11	Ac-228	->	Th-228	
640.7	1.62E-11	Ac-228	->	Th-228	
642.5	1.06E+03	Pu-240	->	U-236	
649.19	1.14E-11	Ac-228	->	Th-228	
650.1	6.17E-13	Ra-224	->	Rn-220	
650.14	1.14E-12	Tl-208	->	Pb-208	
651.44	2.68E-11	Ac-228	->	Th-228	
666.4	1.22E-11	Ac-228	->	Th-228	
673.86	2.66E-11	Ac-228	->	Th-228	
677.07	2.39E-10	Ac-228	->	Th-228	
687.59	2.27E+02	Pu-240	->	U-236	
692.5	9.04E-13	Ac-228	->	Th-228	
701.8	5.05E-11	Ac-228	->	Th-228	
705.24	6.96E-13	Tl-208	->	Pb-208	
707.49	3.99E-11	Ac-228	->	Th-228	

721.91	6.42E-12	Tl-208	->	Pb-208
726.63	2.31E-10	Ac-228	->	Th-228
727.25	3.75E-10	Bi-212	->	Po-212
737.7	1.09E-11	Ac-228	->	Th-228
748.58	1.36E-12	Tl-208	->	Pb-208
755.28	3.51E-10	Ac-228	->	Th-228
763.06	5.19E-11	Tl-208	->	Pb-208
772.28	2.90E-10	Ac-228	->	Th-228
774	2.39E-11	Ac-228	->	Th-228
782.12	1.57E-10	Ac-228	->	Th-228
785.51	6.24E-11	Bi-212	->	Po-212
791.05	5.58E-12	Ac-228	->	Th-228
791.2	7.71E-12	Ac-228	->	Th-228
794.79	1.22E-09	Ac-228	->	Th-228
804.9	1.59E-13	Po-216	->	Pb-212
816.62	9.30E-12	Ac-228	->	Th-228
821.14	1.27E-12	Tl-208	->	Pb-208
825.3	1.54E-11	Ac-228	->	Th-228
830.59	1.67E-10	Ac-228	->	Th-228
835.6	4.55E-10	Ac-228	->	Th-228
840.44	2.50E-10	Ac-228	->	Th-228
853.6	3.72E-12	Ac-228	->	Th-228
860.3	3.80E-10	Tl-208	->	Pb-208
870.47	1.75E-11	Ac-228	->	Th-228
873.94	4.87E+01	Pu-240	->	U-236
874.43	2.23E-11	Ac-228	->	Th-228
877.65	5.32E-12	Ac-228	->	Th-228
883.27	9.81E-13	Tl-208	->	Pb-208
884	2.66E-11	Ac-228	->	Th-228
887.46	5.32E-12	Ac-228	->	Th-228
893.42	2.07E-11	Bi-212	->	Po-212
904.29	2.37E-10	Ac-228	->	Th-228
911.16	7.71E-09	Ac-228	->	Th-228
919.19	7.44E-12	Ac-228	->	Th-228
922.28	5.58E-12	Ac-228	->	Th-228
927.42	3.96E-12	Tl-208	->	Pb-208
931.1	3.99E-12	Ac-228	->	Th-228
943.9	2.84E-11	Ac-228	->	Th-228
948.4	3.24E-11	Ac-228	->	Th-228
952.17	9.93E-12	Bi-212	->	Po-212
958.3	8.24E-11	Ac-228	->	Th-228
964.64	1.54E-09	Ac-228	->	Th-228
968.97	4.63E-09	Ac-228	->	Th-228
979.7	6.11E-12	Ac-228	->	Th-228
982.52	6.23E-12	Tl-208	->	Pb-208
987.87	9.04E-11	Ac-228	->	Th-228
987.94	5.05E-11	Ac-228	->	Th-228
1016.12	6.65E-12	Ac-228	->	Th-228
1019.7	6.65E-12	Ac-228	->	Th-228
1033.32	4.12E-11	Ac-228	->	Th-228

1039.97	1.46E-11	Ac-228	->	Th-228
1041.35	8.51E-12	Ac-228	->	Th-228
1054.3	8.51E-12	Ac-228	->	Th-228
1065.05	4.55E-11	Ac-228	->	Th-228
1074.1	9.03E-13	Bi-212	->	Po-212
1078.69	3.02E-11	Bi-212	->	Po-212
1093.63	1.17E-11	Tl-208	->	Pb-208
1095.87	3.51E-11	Ac-228	->	Th-228
1104.01	4.52E-12	Ac-228	->	Th-228
1110.7	1.03E-10	Ac-228	->	Th-228
1116.97	1.62E-11	Ac-228	->	Th-228
1125.6	1.58E-13	Tl-208	->	Pb-208
1135.39	3.19E-12	Ac-228	->	Th-228
1142.7	2.66E-12	Ac-228	->	Th-228
1153.69	4.23E-11	Ac-228	->	Th-228
1160.55	3.48E-13	Tl-208	->	Pb-208
1163.6	1.99E-11	Ac-228	->	Th-228
1174.79	7.71E-12	Ac-228	->	Th-228
1185.1	5.38E-13	Tl-208	->	Pb-208
1216.4	6.91E-12	Ac-228	->	Th-228
1245.23	2.39E-11	Ac-228	->	Th-228
1246.6	1.52E-10	Ac-228	->	Th-228
1249.81	1.59E-11	Ac-228	->	Th-228
1277.5	5.32E-12	Ac-228	->	Th-228
1282.7	1.65E-12	Tl-208	->	Pb-208
1286.6	3.16E-11	Ac-228	->	Th-228
1309.6	5.58E-12	Ac-228	->	Th-228
1314.76	5.58E-12	Ac-228	->	Th-228
1347.6	3.46E-12	Ac-228	->	Th-228
1357.6	7.71E-12	Ac-228	->	Th-228
1374.26	5.32E-12	Ac-228	->	Th-228
1381	2.22E-13	Tl-208	->	Pb-208
1415.7	6.91E-12	Ac-228	->	Th-228
1431	8.51E-12	Ac-228	->	Th-228
1451.2	4.78E-12	Ac-228	->	Th-228
1459.19	2.82E-10	Ac-228	->	Th-228
1468.8	5.32E-12	Ac-228	->	Th-228
1481.2	5.32E-12	Ac-228	->	Th-228
1496	2.79E-10	Ac-228	->	Th-228
1501.44	1.54E-10	Ac-228	->	Th-228
1503.87	7.71E-12	Ac-228	->	Th-228
1512.75	1.77E-11	Bi-212	->	Po-212
1528.9	1.78E-11	Ac-228	->	Th-228
1537.4	1.30E-11	Ac-228	->	Th-228
1548.5	1.14E-11	Ac-228	->	Th-228
1557	5.32E-11	Ac-228	->	Th-228
1572.03	1.33E-11	Ac-228	->	Th-228
1573.3	1.46E-11	Ac-228	->	Th-228
1580.3	1.89E-10	Ac-228	->	Th-228
1588.23	9.57E-10	Ac-228	->	Th-228

1620.66	8.52E-11	Bi-212	->	Po-212
1625.1	8.51E-11	Ac-228	->	Th-228
1630.47	5.18E-10	Ac-228	->	Th-228
1638.1	1.44E-10	Ac-228	->	Th-228
1647.4	6.33E-14	Tl-208	->	Pb-208
1666.43	5.32E-11	Ac-228	->	Th-228
1677.9	1.78E-11	Ac-228	->	Th-228
1679.42	3.84E-12	Bi-212	->	Po-212
1686	2.76E-11	Ac-228	->	Th-228
1702.3	1.78E-11	Ac-228	->	Th-228
1706.07	3.72E-12	Ac-228	->	Th-228
1713.25	1.25E-12	Ac-228	->	Th-228
1739.1	5.16E-12	Ac-228	->	Th-228
1741.2	3.99E-12	Ac-228	->	Th-228
1743.57	6.33E-14	Tl-208	->	Pb-208
1750.9	2.39E-12	Ac-228	->	Th-228
1757.88	1.10E-11	Ac-228	->	Th-228
1784.5	2.55E-12	Ac-228	->	Th-228
1805.93	6.26E-12	Bi-212	->	Po-212
1823.47	1.36E-11	Ac-228	->	Th-228
1835.1	1.09E-11	Ac-228	->	Th-228
1842.29	1.28E-11	Ac-228	->	Th-228
1871.2	6.91E-12	Ac-228	->	Th-228
1886.92	3.14E-11	Ac-228	->	Th-228
1900.1	1.22E-12	Ac-228	->	Th-228
1907.5	1.25E-11	Ac-228	->	Th-228
1930.3	6.65E-12	Ac-228	->	Th-228
1952.5	1.91E-11	Ac-228	->	Th-228
1965.3	6.38E-12	Ac-228	->	Th-228
2614.35	3.30E-09	Tl-208	->	Pb-208, Po-212 -> Pb-208

Pu240 Aged 5 years		Sorted by Intensity		
Intensity	Energy	Initial Isotopes and Decays		
3.78E+06	45.244	Pu-240	->	U-236
5.84E+05	104.244	Pu-240	->	U-236
3.52E+04	160.28	Pu-240	->	U-236
8.39E+03	98.441	Pu-240	->	U-236
5.71E+03	94.66	Pu-240	->	U-236
3.02E+03	111.3	Pu-240	->	U-236
2.52E+03	212.46	Pu-240	->	U-236
1.06E+03	642.5	Pu-240	->	U-236
9.90E+02	110.421	Pu-240	->	U-236
8.39E+02	114.866	Pu-240	->	U-236
2.27E+02	687.59	Pu-240	->	U-236
5.83E+01	16.161	U-236	->	Th-232
4.87E+01	873.94	Pu-240	->	U-236
4.22E+01	12.952	Ac-228	->	Th-228, U-236 -> Th-232

1.30E+01	19.094	U-236	->	Th-232		
1.01E+01	538.11	Pu-240	->	U-236		
2.48E+00	11.118	Ac-228	->	Th-228,	U-236	-> Th-232
1.18E+00	14.511	Ac-228	->	Th-228,	U-236	-> Th-232
9.68E-01	49.369	U-236	->	Th-232		
2.36E-01	112.75	U-236	->	Th-232		
2.66E-08	13.5	Ra-228	->	Ac-228		
1.20E-08	16.18	Ra-228	->	Ac-228		
7.71E-09	911.16	Ac-228	->	Th-228		
5.32E-09	16.154	Ac-228	->	Th-228		
5.05E-09	12.76	Ra-228	->	Ac-228		
4.63E-09	968.97	Ac-228	->	Th-228		
3.84E-09	238.578	Pb-212	->	Bi-212		
3.46E-09	18.8	Ra-228	->	Ac-228		
3.30E-09	2614.35	Tl-208	->	Pb-208,	Po-212	-> Pb-208
3.30E-09	338.42	Ac-228	->	Th-228		
2.83E-09	583.022	Tl-208	->	Pb-208,	Po-212	-> Pb-208
2.66E-09	15.15	Ra-228	->	Ac-228		
1.56E-09	77.107	Pb-212	->	Bi-212		
1.54E-09	964.64	Ac-228	->	Th-228		
1.49E-09	93.35	Ac-228	->	Th-228		
1.22E-09	463.1	Ac-228	->	Th-228		
1.22E-09	794.79	Ac-228	->	Th-228		
1.22E-09	19.113	Ac-228	->	Th-228		
1.09E-09	209.39	Ac-228	->	Th-228		
1.01E-09	270.26	Ac-228	->	Th-228		
9.57E-10	1588.23	Ac-228	->	Th-228		
9.30E-10	328.07	Ac-228	->	Th-228		
9.25E-10	74.814	Pb-212	->	Bi-212		
9.04E-10	89.955	Ac-228	->	Th-228		
7.71E-10	129.03	Ac-228	->	Th-228		
6.84E-10	510.606	Tl-208	->	Pb-208		
5.85E-10	409.62	Ac-228	->	Th-228		
5.81E-10	10.828	Pb-212	->	Bi-212		
5.52E-10	87.19	Pb-212	->	Bi-212		
5.32E-10	105.362	Ac-228	->	Th-228		
5.28E-10	13.099	Pb-212	->	Bi-212		
5.18E-10	1630.47	Ac-228	->	Th-228		
4.55E-10	835.6	Ac-228	->	Th-228		
4.19E-10	15.23	Th-228	->	Ra-224		
3.80E-10	860.3	Tl-208	->	Pb-208		
3.75E-10	727.25	Bi-212	->	Po-212		
3.51E-10	755.28	Ac-228	->	Th-228		
3.46E-10	99.55	Ac-228	->	Th-228		
3.44E-10	240.76	Ra-224	->	Rn-220		
2.94E-10	300.034	Pb-212	->	Bi-212		
2.91E-10	59	Th-232	->	Ra-228		
2.90E-10	772.28	Ac-228	->	Th-228		
2.82E-10	1459.19	Ac-228	->	Th-228		
2.79E-10	1496	Ac-228	->	Th-228		

2.76E-10	12.325	Th-228	->	Ra-224
2.68E-10	562.65	Ac-228	->	Th-228
2.50E-10	840.44	Ac-228	->	Th-228
2.39E-10	19.4	Ra-228	->	Ac-228
2.39E-10	677.07	Ac-228	->	Th-228
2.37E-10	904.29	Ac-228	->	Th-228
2.31E-10	726.63	Ac-228	->	Th-228
2.23E-10	153.89	Ac-228	->	Th-228
2.15E-10	277.28	Tl-208	->	Pb-208
2.13E-10	216.24	Ac-228	->	Th-228
1.89E-10	1580.3	Ac-228	->	Th-228
1.78E-10	108.99	Ac-228	->	Th-228
1.67E-10	830.59	Ac-228	->	Th-228
1.64E-10	90.128	Pb-212	->	Bi-212
1.57E-10	782.12	Ac-228	->	Th-228
1.54E-10	1501.44	Ac-228	->	Th-228
1.52E-10	1246.6	Ac-228	->	Th-228
1.44E-10	1638.1	Ac-228	->	Th-228
1.40E-10	57.81	Ac-228	->	Th-228
1.38E-10	340.94	Ac-228	->	Th-228
1.30E-10	509.17	Ac-228	->	Th-228
1.25E-10	332.48	Ac-228	->	Th-228
1.14E-10	74.969	Tl-208	->	Pb-208
1.11E-10	12.282	Bi-212	->	Tl-208
1.08E-10	84.26	Th-228	->	Ra-224
1.03E-10	1110.7	Ac-228	->	Th-228
9.95E-11	15.376	Pb-212	->	Bi-212
9.62E-11	10.259	Bi-212	->	Tl-208
9.44E-11	17.952	Th-228	->	Ra-224
9.04E-11	987.87	Ac-228	->	Th-228
8.52E-11	1620.66	Bi-212	->	Po-212
8.51E-11	1625.1	Ac-228	->	Th-228
8.24E-11	958.3	Ac-228	->	Th-228
7.71E-11	146.06	Ac-228	->	Th-228
7.44E-11	199.54	Ac-228	->	Th-228
6.77E-11	72.803	Tl-208	->	Pb-208
6.65E-11	321.9	Ac-228	->	Th-228
6.58E-11	124	Th-232	->	Ra-228
6.38E-11	478.2	Ac-228	->	Th-228
6.24E-11	785.51	Bi-212	->	Po-212
6.11E-11	279.3	Ac-228	->	Th-228
6.11E-11	210.76	Ac-228	->	Th-228
5.85E-11	546.36	Ac-228	->	Th-228
5.58E-11	503.7	Ac-228	->	Th-228
5.32E-11	1557	Ac-228	->	Th-228
5.32E-11	1666.43	Ac-228	->	Th-228
5.20E-11	115.122	Pb-212	->	Bi-212
5.19E-11	763.06	Tl-208	->	Pb-208
5.05E-11	701.8	Ac-228	->	Th-228
5.05E-11	570.2	Ac-228	->	Th-228

5.05E-11	572.5	Ac-228	->	Th-228
5.05E-11	987.94	Ac-228	->	Th-228
4.55E-11	1065.05	Ac-228	->	Th-228
4.23E-11	1153.69	Ac-228	->	Th-228
4.17E-11	204.37	Ac-228	->	Th-228
4.12E-11	1033.32	Ac-228	->	Th-228
4.11E-11	10.541	Tl-208	->	Pb-208
4.02E-11	84.789	Tl-208	->	Pb-208
3.99E-11	440.49	Ac-228	->	Th-228
3.99E-11	707.49	Ac-228	->	Th-228
3.99E-11	583.28	Ac-228	->	Th-228
3.86E-11	12.701	Tl-208	->	Pb-208
3.72E-11	184.72	Ac-228	->	Th-228
3.51E-11	1095.87	Ac-228	->	Th-228
3.48E-11	39.846	Bi-212	->	Tl-208
3.46E-11	327.67	Ac-228	->	Th-228
3.24E-11	948.4	Ac-228	->	Th-228
3.19E-11	523.18	Ac-228	->	Th-228
3.19E-11	191.29	Ac-228	->	Th-228
3.16E-11	1286.6	Ac-228	->	Th-228
3.14E-11	1886.92	Ac-228	->	Th-228
3.02E-11	1078.69	Bi-212	->	Po-212
2.99E-11	9.419	Pb-212	->	Bi-212
2.92E-11	619.88	Ac-228	->	Th-228
2.84E-11	943.9	Ac-228	->	Th-228
2.76E-11	1686	Ac-228	->	Th-228
2.68E-11	651.44	Ac-228	->	Th-228
2.66E-11	673.86	Ac-228	->	Th-228
2.66E-11	884	Ac-228	->	Th-228
2.60E-11	14.563	Bi-212	->	Tl-208
2.53E-11	252.45	Tl-208	->	Pb-208
2.47E-11	215.75	Th-228	->	Ra-224
2.39E-11	774	Ac-228	->	Th-228
2.39E-11	1245.23	Ac-228	->	Th-228
2.39E-11	615.9	Ac-228	->	Th-228
2.37E-11	282.02	Ac-228	->	Th-228
2.23E-11	874.43	Ac-228	->	Th-228
2.07E-11	519.97	Ac-228	->	Th-228
2.07E-11	893.42	Bi-212	->	Po-212
1.99E-11	1163.6	Ac-228	->	Th-228
1.91E-11	1952.5	Ac-228	->	Th-228
1.78E-11	1702.3	Ac-228	->	Th-228
1.78E-11	1677.9	Ac-228	->	Th-228
1.78E-11	1528.9	Ac-228	->	Th-228
1.77E-11	1512.75	Bi-212	->	Po-212
1.76E-11	83.787	Ra-224	->	Rn-220
1.75E-11	870.47	Ac-228	->	Th-228
1.75E-11	223.72	Ac-228	->	Th-228
1.73E-11	449.57	Ac-228	->	Th-228
1.62E-11	1116.97	Ac-228	->	Th-228

1.62E-11	640.7	Ac-228	->	Th-228
1.60E-11	10.622	Th-228	->	Ra-224
1.59E-11	232.3	Ac-228	->	Th-228
1.59E-11	1249.81	Ac-228	->	Th-228
1.59E-11	14.336	Ra-224	->	Rn-220
1.54E-11	825.3	Ac-228	->	Th-228
1.54E-11	263.57	Ac-228	->	Th-228
1.46E-11	1573.3	Ac-228	->	Th-228
1.46E-11	1039.97	Ac-228	->	Th-228
1.36E-11	1823.47	Ac-228	->	Th-228
1.33E-11	460.84	Ac-228	->	Th-228
1.33E-11	1572.03	Ac-228	->	Th-228
1.33E-11	629.93	Ac-228	->	Th-228
1.30E-11	555.3	Ac-228	->	Th-228
1.30E-11	141.19	Ac-228	->	Th-228
1.30E-11	1537.4	Ac-228	->	Th-228
1.28E-11	1842.29	Ac-228	->	Th-228
1.25E-11	1907.5	Ac-228	->	Th-228
1.22E-11	666.4	Ac-228	->	Th-228
1.17E-11	1093.63	Tl-208	->	Pb-208
1.16E-11	87.632	Tl-208	->	Pb-208
1.15E-11	452.77	Bi-212	->	Tl-208
1.15E-11	11.713	Ra-224	->	Rn-220
1.14E-11	1548.5	Ac-228	->	Th-228
1.14E-11	649.19	Ac-228	->	Th-228
1.14E-11	498.26	Ac-228	->	Th-228
1.14E-11	515.2	Ac-228	->	Th-228
1.14E-11	131.5	Th-228	->	Ra-224
1.10E-11	1757.88	Ac-228	->	Th-228
1.09E-11	737.7	Ac-228	->	Th-228
1.09E-11	1835.1	Ac-228	->	Th-228
1.08E-11	288.08	Bi-212	->	Tl-208
1.06E-11	81.067	Ra-224	->	Rn-220
9.93E-12	952.17	Bi-212	->	Po-212
9.84E-12	399.2	Ac-228	->	Th-228
9.81E-12	233.32	Tl-208	->	Pb-208
9.30E-12	471.4	Ac-228	->	Th-228
9.30E-12	816.62	Ac-228	->	Th-228
8.51E-12	174.18	Ac-228	->	Th-228
8.51E-12	1041.35	Ac-228	->	Th-228
8.51E-12	396.9	Ac-228	->	Th-228
8.51E-12	1431	Ac-228	->	Th-228
8.51E-12	1054.3	Ac-228	->	Th-228
8.51E-12	257.29	Ac-228	->	Th-228
8.37E-12	13.662	Th-228	->	Ra-224
7.71E-12	1174.79	Ac-228	->	Th-228
7.71E-12	1503.87	Ac-228	->	Th-228
7.71E-12	1357.6	Ac-228	->	Th-228
7.71E-12	540.5	Ac-228	->	Th-228
7.71E-12	791.2	Ac-228	->	Th-228

7.71E-12	474.32	Ac-228	->	Th-228
7.66E-12	11.712	Pb-212	->	Bi-212
7.44E-12	919.19	Ac-228	->	Th-228
7.31E-12	166.43	Th-228	->	Ra-224
7.09E-12	14.884	Tl-208	->	Pb-208
6.91E-12	1216.4	Ac-228	->	Th-228
6.91E-12	419.23	Ac-228	->	Th-228
6.91E-12	1415.7	Ac-228	->	Th-228
6.91E-12	1871.2	Ac-228	->	Th-228
6.65E-12	1019.7	Ac-228	->	Th-228
6.65E-12	1016.12	Ac-228	->	Th-228
6.65E-12	1930.3	Ac-228	->	Th-228
6.42E-12	721.91	Tl-208	->	Pb-208
6.38E-12	1965.3	Ac-228	->	Th-228
6.35E-12	94.677	Ra-224	->	Rn-220
6.26E-12	1805.93	Bi-212	->	Po-212
6.23E-12	982.52	Tl-208	->	Pb-208
6.17E-12	549.7	Rn-220	->	Po-216
6.11E-12	979.7	Ac-228	->	Th-228
5.64E-12	79.29	Bi-212	->	Po-212
5.58E-12	922.28	Ac-228	->	Th-228
5.58E-12	1309.6	Ac-228	->	Th-228
5.58E-12	1314.76	Ac-228	->	Th-228
5.58E-12	791.05	Ac-228	->	Th-228
5.38E-12	211.31	Tl-208	->	Pb-208
5.32E-12	356.83	Ac-228	->	Th-228
5.32E-12	887.46	Ac-228	->	Th-228
5.32E-12	877.65	Ac-228	->	Th-228
5.32E-12	1277.5	Ac-228	->	Th-228
5.32E-12	1374.26	Ac-228	->	Th-228
5.32E-12	492.36	Ac-228	->	Th-228
5.32E-12	1468.8	Ac-228	->	Th-228
5.32E-12	1481.2	Ac-228	->	Th-228
5.16E-12	1739.1	Ac-228	->	Th-228
4.78E-12	1451.2	Ac-228	->	Th-228
4.75E-12	8.953	Bi-212	->	Tl-208
4.52E-12	416.2	Ac-228	->	Th-228
4.52E-12	1104.01	Ac-228	->	Th-228
4.52E-12	135.68	Ac-228	->	Th-228
4.49E-12	176.577	Pb-212	->	Bi-212
4.34E-12	327.93	Bi-212	->	Tl-208
4.02E-12	72.873	Bi-212	->	Tl-208
3.99E-12	388.9	Ac-228	->	Th-228
3.99E-12	931.1	Ac-228	->	Th-228
3.99E-12	1741.2	Ac-228	->	Th-228
3.96E-12	927.42	Tl-208	->	Pb-208
3.84E-12	1679.42	Bi-212	->	Po-212
3.72E-12	1706.07	Ac-228	->	Th-228
3.72E-12	220.49	Ac-228	->	Th-228
3.72E-12	853.6	Ac-228	->	Th-228

3.46E-12	1347.6	Ac-228	->	Th-228
3.44E-12	16.881	Ra-224	->	Rn-220
3.38E-12	76.858	Bi-212	->	Po-212
3.19E-12	1135.39	Ac-228	->	Th-228
2.66E-12	1142.7	Ac-228	->	Th-228
2.57E-12	88.471	Th-228	->	Ra-224
2.55E-12	1784.5	Ac-228	->	Th-228
2.49E-12	205.75	Th-228	->	Ra-224
2.47E-12	415.156	Pb-212	->	Bi-212
2.39E-12	372.3	Ac-228	->	Th-228
2.39E-12	1750.9	Ac-228	->	Th-228
2.39E-12	481.8	Ac-228	->	Th-228
2.37E-12	70.832	Bi-212	->	Tl-208
2.31E-12	13.501	Bi-212	->	Po-212
2.31E-12	11.119	Bi-212	->	Po-212
2.06E-12	9.185	Tl-208	->	Pb-208
2.03E-12	97.907	Ra-224	->	Rn-220
1.97E-12	89.639	Bi-212	->	Po-212
1.65E-12	1282.7	Tl-208	->	Pb-208
1.58E-12	473.36	Bi-212	->	Tl-208
1.58E-12	485.78	Tl-208	->	Pb-208
1.56E-12	85.429	Th-228	->	Ra-224
1.42E-12	82.434	Bi-212	->	Tl-208
1.36E-12	748.58	Tl-208	->	Pb-208
1.27E-12	587.82	Tl-208	->	Pb-208
1.27E-12	821.14	Tl-208	->	Pb-208
1.25E-12	1713.25	Ac-228	->	Th-228
1.22E-12	1900.1	Ac-228	->	Th-228
1.14E-12	650.14	Tl-208	->	Pb-208
9.81E-13	883.27	Tl-208	->	Pb-208
9.18E-13	99.915	Th-228	->	Ra-224
9.04E-13	692.5	Ac-228	->	Th-228
9.03E-13	1074.1	Bi-212	->	Po-212
8.96E-13	10.994	Bi-212	->	Tl-208
7.94E-13	290	Ra-224	->	Rn-220
6.96E-13	705.24	Tl-208	->	Pb-208
6.44E-13	10.137	Ra-224	->	Rn-220
6.21E-13	92.673	Bi-212	->	Po-212
6.17E-13	650.1	Ra-224	->	Rn-220
5.51E-13	11.349	Tl-208	->	Pb-208
5.38E-13	1185.1	Tl-208	->	Pb-208
4.51E-13	15.869	Bi-212	->	Po-212
4.43E-13	433.51	Bi-212	->	Tl-208
4.40E-13	164.15	Pb-212	->	Bi-212
3.96E-13	85.185	Bi-212	->	Tl-208
3.53E-13	409.3	Ra-224	->	Rn-220
3.48E-13	1160.55	Tl-208	->	Pb-208
3.16E-13	143.99	Bi-212	->	Tl-208
3.00E-13	12.855	Ra-224	->	Rn-220
2.99E-13	103.341	Th-228	->	Ra-224

2.22E-13	1381	Tl-208	->	Pb-208
1.93E-13	492.62	Bi-212	->	Tl-208
1.59E-13	804.9	Po-216	->	Pb-212
1.58E-13	164	Bi-212	->	Tl-208
1.58E-13	1125.6	Tl-208	->	Pb-208
1.18E-13	9.658	Bi-212	->	Po-212
1.14E-13	620.3	Bi-212	->	Tl-208
6.33E-14	1743.57	Tl-208	->	Pb-208
6.33E-14	1647.4	Tl-208	->	Pb-208
3.50E-14	12.085	Bi-212	->	Po-212
2.50E-14	580.4	Bi-212	->	Tl-208

Pu-241 100% Aged: 5 years

538 lines computed.

Sorted by energy

Energy	Intensity	Initial Isotopes and Decays		
(keV)	(ph/s/gm)			
8.953	8.60E-13	Bi-213	->	Tl-209
9.185	7.11E-10	Tl-209	->	Pb-209
9.658	4.37E-09	Bi-213	->	Po-213
9.897	7.27E-09	Fr-221	->	At-217
10.259	1.87E-11	Bi-213	->	Tl-209
10.381	7.45E-08	Ac-225	->	Fr-221
10.541	1.38E-08	Tl-209	->	Pb-209
10.871	5.72E-08	Ra-225	->	Ac-225
10.994	2.24E-13	Bi-213	->	Tl-209
11.118	2.39E-04	U-233	->	Th-229
11.119	8.38E-08	Bi-213	->	Po-213
11.349	1.91E-10	Tl-209	->	Pb-209
11.372	2.63E+02	Np-237	->	Pa-233
11.414	1.37E-07	Fr-221	->	At-217
11.62	2.35E+02	Pa-233	->	U-233
11.871	2.20E+08	U-237	->	Np-237, Am-241 -> Np-237
12.017	1.35E-06	Ac-225	->	Fr-221
12.085	1.13E-09	Bi-213	->	Po-213
12.311	1.50E-11	Bi-213	->	Tl-209
12.466	2.89E-09	Fr-221	->	At-217
12.636	9.83E-07	Ra-225	->	Ac-225
12.703	1.31E-08	Tl-209	->	Pb-209
12.952	4.15E-03	U-233	->	Th-229
13.255	2.77E-08	Ac-225	->	Fr-221
13.274	4.39E+03	Np-237	->	Pa-233
13.504	7.79E-08	Bi-213	->	Po-213
13.6	3.95E+03	Pa-233	->	U-233

13.804	7.30E+04	U-237	->	Np-237		
13.911	1.66E-07	Fr-221	->	At-217		
13.927	3.53E+09	U-237	->	Np-237,	Am-241	-> Np-237
14.082	1.63E-08	Ra-225	->	Ac-225		
14.402	2.99E-12	Bi-213	->	Tl-209		
14.511	9.10E-05	U-233	->	Th-229		
14.772	1.66E-06	Ac-225	->	Fr-221		
14.871	2.36E-09	Tl-209	->	Pb-209		
14.953	1.08E+02	Np-237	->	Pa-233		
15.4	5.05E+01	Pa-233	->	U-233		
15.662	1.09E-06	Ra-225	->	Ac-225		
15.861	8.94E+07	U-237	->	Np-237,	Am-241	-> Np-237
15.878	1.49E-08	Bi-213	->	Po-213		
16.141	5.27E-03	U-233	->	Th-229		
16.361	3.45E-08	Fr-221	->	At-217		
16.632	5.72E+03	Np-237	->	Pa-233		
17.058	4.17E+03	Pa-233	->	U-233		
17.269	7.91E-01	Pa-233	->	U-233		
17.349	3.18E-08	Th-229	->	Ra-225		
17.449	3.64E-07	Ac-225	->	Fr-221		
17.592	2.17E+07	U-237	->	Np-237		
17.611	5.45E+09	Am-241	->	Np-237		
18.593	2.50E-07	Ra-225	->	Ac-225		
19.148	1.28E-03	U-233	->	Th-229		
19.718	1.33E+03	Np-237	->	Pa-233		
20.42	9.88E+02	Pa-233	->	U-233		
20.99	5.21E+06	U-237	->	Np-237		
20.997	1.40E+09	Am-241	->	Np-237		
25.304	1.93E-06	U-233	->	Th-229		
25.373	6.74E-09	Th-229	->	Ra-225		
25.98	2.60E-10	Ac-225	->	Fr-221		
26.3445	6.49E+08	U-237	->	Np-237,	Am-241	-> Np-237
28.578	1.43E+01	Pa-233	->	U-233		
29.191	1.09E-05	U-233	->	Th-229		
29.378	2.95E+03	Np-237	->	Pa-233		
31.24	4.31E-07	U-233	->	Th-229		
31.37	7.68E-07	Th-229	->	Ra-225		
32.2	4.70E+06	Am-241	->	Np-237		
32.27	1.58E-06	U-233	->	Th-229		
33.192	3.25E+07	U-237	->	Np-237,	Am-241	-> Np-237
36.65	2.60E-09	Ac-225	->	Fr-221		
37.85	5.75E-07	U-233	->	Th-229		
38.51	1.56E-09	Ac-225	->	Fr-221		
38.57	6.93E+00	Pu-241	->	U-237		
40.34	5.19E-06	Ra-225	->	Ac-225		
40.415	7.91E+00	Pa-233	->	U-233		
41.718	2.86E+00	Pa-233	->	U-233		
42.441	9.58E-05	U-233	->	Th-229		
42.64	2.70E+05	Am-241	->	Np-237		
42.722	3.00E-08	Th-229	->	Ra-225		

43.415	1.97E+07	U-237	->	Np-237,	Am-241	->	Np-237
44.2	3.02E+00	Pu-241	->	U-237			
44.86	6.04E-01	Pu-241	->	U-237			
46.57	3.04E+01	Np-237	->	Pa-233			
49.2	1.87E-09	Ac-225	->	Fr-221			
51.013	1.51E+05	U-237	->	Np-237,	Am-241	->	Np-237
52.613	3.99E-07	U-233	->	Th-229			
53.559	6.86E-06	U-233	->	Th-229			
53.82	3.29E-09	Ac-225	->	Fr-221			
54.04	1.62E+05	Am-241	->	Np-237			
54.702	2.23E-05	U-233	->	Th-229			
55.528	5.40E+06	Am-241	->	Np-237			
56.32	1.81E+00	Pu-241	->	U-237			
56.58	6.18E-08	Th-229	->	Ra-225			
56.76	7.04E-01	Pu-241	->	U-237			
57.149	8.92E+01	Np-237	->	Pa-233			
57.77	7.28E-10	Ac-225	->	Fr-221			
59.536	9.71E+09	U-237	->	Np-237,	Am-241	->	Np-237
62.66	2.75E+00	Np-237	->	Pa-233			
62.93	9.53E-08	Ac-225	->	Fr-221			
63.69	5.27E-08	U-233	->	Th-229			
63.95	3.66E+00	Np-237	->	Pa-233			
64.23	9.70E-09	Ac-225	->	Fr-221			
64.817	8.77E+05	U-237	->	Np-237,	Am-241	->	Np-237
66.11	1.34E-06	U-233	->	Th-229			
67.46	1.19E+05	Am-241	->	Np-237			
67.96	5.11E-07	U-233	->	Th-229			
68.14	1.87E-08	Th-229	->	Ra-225			
68.88	2.06E-08	Th-229	->	Ra-225			
68.97	1.72E-07	U-233	->	Th-229			
69.76	6.48E+06	Am-241	->	Np-237			
69.85	8.83E-10	Ac-225	->	Fr-221			
70.35	9.58E-07	U-233	->	Th-229			
70.62	3.66E+00	Np-237	->	Pa-233			
70.832	2.99E-11	Bi-213	->	Tl-209			
70.92	1.73E-09	Ac-225	->	Fr-221			
71.6	2.02E+00	Pu-241	->	U-237			
71.71	2.55E-09	Ac-225	->	Fr-221			
71.847	4.31E-06	U-233	->	Th-229			
72.803	2.24E-08	Tl-209	->	Pb-209			
72.821	9.42E-07	U-233	->	Th-229			
72.873	4.86E-11	Bi-213	->	Tl-209			
73.6	2.94E-09	Ac-225	->	Fr-221			
73.84	5.61E-08	Ac-225	->	Fr-221			
74.46	2.54E+00	Np-237	->	Pa-233			
74.5	2.39E-06	U-233	->	Th-229			
74.9	6.24E-09	Ac-225	->	Fr-221			
74.969	3.78E-08	Tl-209	->	Pb-209			
75.17	9.36E-08	Th-229	->	Ra-225			
75.343	2.57E+02	Pa-233	->	U-233			

75.83	2.97E+04	Am-241	->	Np-237		
76.32	6.23E-07	U-233	->	Th-229		
76.858	1.32E-07	Bi-213	->	Po-213		
77.1	1.57E+01	U-233	->	Th-229,	Pu-241	-> U-237
78.41	9.58E-08	U-233	->	Th-229		
78.947	1.47E-07	Fr-221	->	At-217		
79.29	2.19E-07	Bi-213	->	Po-213		
81.517	2.44E-07	Fr-221	->	At-217		
82.434	1.87E-11	Bi-213	->	Tl-209		
82.9	2.60E-08	Ac-225	->	Fr-221		
82.957	2.87E-07	U-233	->	Th-229		
83.229	2.18E-07	Ac-225	->	Fr-221		
84.27	1.20E-07	U-233	->	Th-229		
84.789	1.35E-08	Tl-209	->	Pb-209		
85.185	4.86E-12	Bi-213	->	Tl-209		
85.402	3.03E-07	U-233	->	Th-229		
86.105	3.60E-07	Ac-225	->	Fr-221		
86.23	7.12E-08	Th-229	->	Ra-225		
86.44	5.62E-07	Th-229	->	Ra-225		
86.5	3.20E+03	Np-237	->	Pa-233		
86.652	3.87E+02	Pa-233	->	U-233		
86.74	2.08E-07	U-233	->	Th-229		
87.24	3.03E-07	U-233	->	Th-229		
87.39	5.02E-08	Ac-225	->	Fr-221		
87.632	3.85E-09	Tl-209	->	Pb-209		
88.05	4.12E+01	Np-237	->	Pa-233		
88.43	7.02E-07	U-233	->	Th-229		
89.639	7.77E-08	Bi-213	->	Po-213		
89.957	1.66E-05	U-233	->	Th-229		
90.994	5.27E-07	U-233	->	Th-229		
92.136	8.66E-08	Fr-221	->	At-217		
92.282	3.64E+02	Np-237	->	Pa-233		
92.673	2.37E-08	Bi-213	->	Po-213		
93.36	2.70E-05	U-233	->	Th-229		
94.66	2.46E+03	Pa-233	->	U-233,	Pu-241	-> U-237
94.723	1.74E+02	Np-237	->	Pa-233		
94.87	2.77E-08	Ac-225	->	Fr-221		
95.265	2.68E-08	Fr-221	->	At-217		
95.858	6.64E+02	Np-237	->	Pa-233		
96.17	5.20E-09	Ac-225	->	Fr-221		
96.215	2.23E-06	U-233	->	Th-229		
96.67	1.27E+04	Am-241	->	Np-237		
97.071	1.19E+07	U-237	->	Np-237,	Am-241	-> Np-237
97.143	3.51E-05	U-233	->	Th-229		
97.2	3.29E-09	Fr-221	->	At-217		
97.272	1.30E-07	Ac-225	->	Fr-221		
98.441	3.50E+02	Pu-241	->	U-237		
98.443	3.51E+03	Pa-233	->	U-233		
98.951	5.48E+06	Am-241	->	Np-237		
99.58	1.09E-07	Ac-225	->	Fr-221		

99.82	2.91E-07	Ac-225	->	Fr-221		
100.008	8.78E-08	U-233	->	Th-229		
100.599	4.16E-08	Ac-225	->	Fr-221		
100.88	1.04E-08	Ac-225	->	Fr-221		
101.066	1.88E+07	U-237	->	Np-237,	Am-241	-> Np-237
101.8	1.44E-07	U-233	->	Th-229		
102.966	5.25E+06	Am-241	->	Np-237		
103.375	1.60E-07	U-233	->	Th-229		
103.44	1.56E-09	Ac-225	->	Fr-221		
103.68	7.11E+01	Pu-241	->	U-237		
103.921	1.52E+02	Pa-233	->	U-233		
105.362	9.74E-06	U-233	->	Th-229		
106.13	1.28E+01	Np-237	->	Pa-233		
107.16	1.50E-07	Th-229	->	Ra-225		
108.166	2.15E+02	Np-237	->	Pa-233		
108.36	4.68E-08	Ac-225	->	Fr-221		
108.69	1.67E+01	Np-237	->	Pa-233		
108.99	3.24E-06	U-233	->	Th-229		
109.47	4.95E-07	U-233	->	Th-229		
110.421	4.26E+01	Pu-241	->	U-237		
111.298	1.32E+03	Pa-233	->	U-233		
111.3	1.16E+02	Pu-241	->	U-237		
111.56	5.66E-08	Ac-225	->	Fr-221		
111.89	2.39E+00	Pu-241	->	U-237		
111.897	7.09E+01	Np-237	->	Pa-233		
111.935	7.50E-07	U-233	->	Th-229		
113.3	2.26E+06	U-237	->	Np-237,	Am-241	-> Np-237
114.23	4.36E+06	U-237	->	Np-237,	Am-241	-> Np-237
114.28	3.99E-07	U-233	->	Th-229		
114.333	1.16E+01	Pu-241	->	U-237		
114.445	4.39E+02	Pa-233	->	U-233		
114.561	2.63E+01	Pu-241	->	U-237		
114.95	2.42E+05	U-237	->	Np-237		
115.19	5.72E-01	Np-237	->	Pa-233		
115.4	9.68E+00	Pu-241	->	U-237		
116.26	3.35E-07	U-233	->	Th-229		
117	3.03E-07	Tl-209	->	Pb-209		
117.155	4.47E-06	U-233	->	Th-229		
117.34	5.71E+05	U-237	->	Np-237		
117.58	1.19E+06	U-237	->	Np-237,	Am-241	-> Np-237
117.689	3.68E+01	Np-237	->	Pa-233		
118.43	5.95E+05	U-237	->	Np-237		
118.47	6.06E-09	Fr-221	->	At-217		
118.97	5.11E-06	U-233	->	Th-229		
119.92	1.04E-08	Ac-225	->	Fr-221		
120.81	3.35E-06	U-233	->	Th-229		
121.2	4.84E-01	Pu-241	->	U-237		
122.994	2.70E+05	Am-241	->	Np-237		
123.76	3.29E-08	Ac-225	->	Fr-221		
123.91	1.04E-06	U-233	->	Th-229		

124.51	1.87E-07	Th-229	->	Ra-225
124.72	1.12E-07	Th-229	->	Ra-225
124.81	8.66E-09	Ac-225	->	Fr-221
125.292	1.10E+06	Am-241	->	Np-237
125.398	1.04E-07	U-233	->	Th-229
126.23	2.43E-09	Ac-225	->	Fr-221
129.19	7.45E-10	Ac-225	->	Fr-221
129.2	1.12E-07	U-233	->	Th-229
131.09	1.94E+01	Np-237	->	Pa-233
131.2	5.27E-08	U-233	->	Th-229
131.92	6.18E-08	Th-229	->	Ra-225
134.23	1.53E+01	Np-237	->	Pa-233
135.01	6.93E-09	Ac-225	->	Fr-221
135.328	3.51E-06	U-233	->	Th-229
137.02	3.00E-07	Th-229	->	Ra-225
138.2	3.46E-09	Ac-225	->	Fr-221
138.5	3.19E-08	U-233	->	Th-229
139.53	1.44E+03	Am-241	->	Np-237
139.76	1.68E-07	U-233	->	Th-229
140.61	4.12E+00	Np-237	->	Pa-233
142.98	8.05E-08	Th-229	->	Ra-225
143.227	8.92E+01	Np-237	->	Pa-233
144.52	4.79E-07	U-233	->	Th-229
145.15	2.18E-08	Ac-225	->	Fr-221
145.286	2.55E-06	U-233	->	Th-229
146.347	1.01E-05	U-233	->	Th-229
146.557	1.24E+05	Am-241	->	Np-237
148.15	5.75E-07	U-233	->	Th-229
148.37	1.87E-07	Th-229	->	Ra-225
148.567	1.32E+02	Pu-241	->	U-237
149.8	2.03E-07	U-233	->	Th-229
149.99	1.21E-08	Fr-221	->	At-217
150.08	1.16E-07	Ac-225	->	Fr-221
150.11	2.16E+04	Am-241	->	Np-237
151.423	5.49E+01	Np-237	->	Pa-233
152.64	6.41E-09	Ac-225	->	Fr-221
153.31	8.78E-08	U-233	->	Th-229
153.72	1.58E+00	Np-237	->	Pa-233
153.93	2.65E-08	Ac-225	->	Fr-221
154.37	1.31E-07	Th-229	->	Ra-225
154.4	2.16E+03	Am-241	->	Np-237
154.69	2.39E-07	U-233	->	Th-229
155.263	2.11E+01	Np-237	->	Pa-233
155.989	9.26E-08	U-233	->	Th-229
156.4	3.24E+03	Am-241	->	Np-237
156.46	1.87E-07	Th-229	->	Ra-225
157.24	5.37E-08	Ac-225	->	Fr-221
158.48	3.78E+02	Am-241	->	Np-237
159.955	4.77E+00	Pu-241	->	U-237
161.7	2.43E+03	Am-241	->	Np-237

162.51	8.47E+00	Np-237	->	Pa-233		
162.52	1.20E-07	U-233	->	Th-229		
164.512	1.05E-05	U-233	->	Th-229		
164.58	1.35E+06	U-237	->	Np-237,	Am-241	-> Np-237
165.493	6.23E-07	U-233	->	Th-229		
165.92	6.48E+03	Am-241	->	Np-237		
168.98	1.07E-07	U-233	->	Th-229		
169.18	1.65E+01	Np-237	->	Pa-233		
169.56	4.53E+04	Am-241	->	Np-237		
170.67	4.35E+00	Np-237	->	Pa-233		
170.794	2.23E-07	U-233	->	Th-229		
170.91	1.56E-09	Ac-225	->	Fr-221		
171.29	1.21E-08	Fr-221	->	At-217		
172.35	5.59E-08	U-233	->	Th-229		
172.56	1.56E+00	Np-237	->	Pa-233		
172.9	4.12E-08	Th-229	->	Ra-225		
174.162	3.67E-07	U-233	->	Th-229		
175.09	4.86E+03	Am-241	->	Np-237		
176.09	4.58E+00	Np-237	->	Pa-233		
176.1	6.86E-08	U-233	->	Th-229		
177.78	3.19E-08	U-233	->	Th-229		
178.39	2.77E-09	Ac-225	->	Fr-221		
179.74	9.55E-08	Th-229	->	Ra-225		
180.801	5.26E+00	Np-237	->	Pa-233		
183.96	4.31E-08	Th-229	->	Ra-225		
184.17	3.99E-08	U-233	->	Th-229		
185.782	6.38E-08	U-233	->	Th-229		
186.12	3.46E-09	Ac-225	->	Fr-221		
186.7	1.53E+00	Np-237	->	Pa-233		
187.942	3.19E-06	U-233	->	Th-229		
187.99	7.97E-08	Ac-225	->	Fr-221		
190.4	5.94E+02	Am-241	->	Np-237		
191.46	6.18E+00	Np-237	->	Pa-233		
191.9	5.83E+01	Am-241	->	Np-237		
192.12	6.38E-08	U-233	->	Th-229		
193.29	1.17E+01	Np-237	->	Pa-233		
193.59	8.62E-07	Th-229	->	Ra-225		
194.74	1.12E+01	Np-237	->	Pa-233		
195.04	4.60E+01	Np-237	->	Pa-233		
195.75	2.51E-08	Ac-225	->	Fr-221		
196.89	5.72E+00	Np-237	->	Pa-233		
197	3.51E+03	Am-241	->	Np-237		
198.72	3.46E-09	Ac-225	->	Fr-221		
200.17	8.01E-01	Np-237	->	Pa-233		
200.67	1.60E-09	U-233	->	Th-229		
201.72	9.61E+00	Np-237	->	Pa-233		
202.85	8.24E-01	Np-237	->	Pa-233		
203.9	7.83E+02	Am-241	->	Np-237		
205.99	1.04E-07	U-233	->	Th-229		
208	1.59E+07	U-237	->	Np-237,	Am-241	-> Np-237

208.149	3.99E-06	U-233	->	Th-229
209.19	3.55E+00	Np-237	->	Pa-233
210.94	6.18E-07	Th-229	->	Ra-225
212.29	2.23E-07	U-233	->	Th-229
212.412	3.48E+01	Np-237	->	Pa-233
214.08	9.61E+00	Np-237	->	Pa-233
216.08	1.05E-06	U-233	->	Th-229
216.2	5.89E-08	Ac-225	->	Fr-221
216.86	7.28E-08	Ac-225	->	Fr-221
217.133	5.59E-06	U-233	->	Th-229
217.61	7.98E-08	U-233	->	Th-229
217.98	1.89E-06	Fr-221	->	At-217
218.15	2.62E-08	Th-229	->	Ra-225
219.424	2.39E-07	U-233	->	Th-229
221.45	1.13E+04	Am-241	->	Np-237
221.73	1.53E+04	U-237	->	Np-237
223.357	5.27E-08	U-233	->	Th-229
224.64	1.39E-08	Ac-225	->	Fr-221
225	1.60E-08	U-233	->	Th-229
226.74	1.60E-08	U-233	->	Th-229
228.07	3.19E-08	U-233	->	Th-229
229.98	3.00E+00	Np-237	->	Pa-233
230.086	1.07E-07	U-233	->	Th-229
232.86	1.24E+03	Am-241	->	Np-237
234.24	1.40E+04	U-237	->	Np-237
234.352	1.89E+02	Am-241	->	Np-237
236.32	6.74E-09	Th-229	->	Ra-225
236.39	7.98E-08	U-233	->	Th-229
237.95	1.46E+01	Np-237	->	Pa-233
240.364	6.07E-07	U-233	->	Th-229
240.76	2.25E-09	Ac-225	->	Fr-221
242.4	8.10E+03	Am-241	->	Np-237
245	8.10E+03	Am-241	->	Np-237
245.294	5.59E-06	U-233	->	Th-229
246.66	6.48E+02	Am-241	->	Np-237
248.25	1.19E+01	Pa-233	->	U-233
248.661	7.18E-06	U-233	->	Th-229
248.7	3.46E-09	Ac-225	->	Fr-221
248.91	1.10E+00	Np-237	->	Pa-233
249.1	1.08E+03	Am-241	->	Np-237
252.5	6.07E-08	U-233	->	Th-229
253.51	1.73E-08	Ac-225	->	Fr-221
255.92	6.86E-08	U-233	->	Th-229
256.98	1.53E+00	Np-237	->	Pa-233
258.46	1.19E+00	Pa-233	->	U-233
259.3	2.87E-07	U-233	->	Th-229
260.4	1.72E-07	U-233	->	Th-229
260.9	2.70E+02	Am-241	->	Np-237
261.88	4.95E-07	U-233	->	Th-229
262.41	1.53E+00	Np-237	->	Pa-233

264.87	2.43E+03	Am-241	->	Np-237		
267.54	5.22E+05	U-237	->	Np-237,	Am-241	-> Np-237
268.619	3.99E-07	U-233	->	Th-229		
271.58	1.73E+02	Am-241	->	Np-237		
271.597	6.15E+01	Pa-233	->	U-233		
272.27	1.01E-07	U-233	->	Th-229		
274.692	7.50E-07	U-233	->	Th-229		
275.68	1.78E+03	Am-241	->	Np-237		
278.059	1.95E-06	U-233	->	Th-229		
279.27	6.06E-09	Ac-225	->	Fr-221		
282.54	1.56E-09	Fr-221	->	At-217		
284.22	1.60E-08	U-233	->	Th-229		
285.5	1.73E-09	Ac-225	->	Fr-221		
287.949	1.72E-06	U-233	->	Th-229		
291.21	8.37E+02	Am-241	->	Np-237		
291.317	8.30E-06	U-233	->	Th-229		
292.76	5.68E+03	U-237	->	Np-237,	Am-241	-> Np-237
292.79	7.45E-08	Bi-213	->	Po-213		
293.923	2.23E-07	U-233	->	Th-229		
294.9	1.48E+04	Am-241	->	Np-237		
295.2	3.67E-08	U-233	->	Th-229		
298.87	5.56E+00	Pa-233	->	U-233		
300.175	1.36E+03	Pa-233	->	U-233		
302.84	1.12E-07	U-233	->	Th-229		
304.2	2.70E+02	Am-241	->	Np-237		
309.37	1.17E-07	U-233	->	Th-229		
310.3	4.05E+03	Am-241	->	Np-237		
311.38	4.47E-08	U-233	->	Th-229		
311.9	8.35E+03	Pa-233	->	U-233		
317.133	1.40E-05	U-233	->	Th-229		
320.508	4.95E-06	U-233	->	Th-229		
322.54	4.10E+04	Am-241	->	Np-237		
323.321	1.34E-06	U-233	->	Th-229		
323.81	6.92E-10	Bi-213	->	Tl-209		
324.1	2.94E-09	Fr-221	->	At-217		
328.69	1.04E-07	U-233	->	Th-229		
332.354	8.68E+05	U-237	->	Np-237		
332.39	3.99E+04	Am-241	->	Np-237		
335.405	7.01E+04	U-237	->	Np-237		
335.43	1.33E+05	Am-241	->	Np-237		
336.579	9.42E-07	U-233	->	Th-229		
337.727	1.13E+03	Am-241	->	Np-237		
337.75	6.22E+03	U-237	->	Np-237		
339.64	1.20E-08	U-233	->	Th-229		
340.45	1.19E+03	U-237	->	Np-237		
340.59	9.23E+02	Pa-233	->	U-233		
349.46	3.24E+02	Am-241	->	Np-237		
351.782	7.18E-08	U-233	->	Th-229		
354	9.26E-08	U-233	->	Th-229		
358.36	3.24E+02	Am-241	->	Np-237		

359.09	6.06E-09	Fr-221	->	At-217
365.762	1.31E-06	U-233	->	Th-229
368.605	3.10E+04	U-237	->	Np-237
368.61	5.85E+04	Am-241	->	Np-237
370.933	1.42E+04	Am-241	->	Np-237
370.934	7.98E+04	U-237	->	Np-237
375.518	1.27E+02	Pa-233	->	U-233
376.6	3.79E+04	Am-241	->	Np-237
382.05	6.06E-09	Fr-221	->	At-217
383.4	1.52E-07	U-233	->	Th-229
383.744	7.61E+03	Am-241	->	Np-237
384	3.19E-08	U-233	->	Th-229
390.6	1.59E+03	Am-241	->	Np-237
394.34	1.20E-08	U-233	->	Th-229
396.65	1.32E-08	U-233	->	Th-229
398.663	2.61E+02	Pa-233	->	U-233
402.37	1.32E-08	U-233	->	Th-229
406.4	3.78E+02	Am-241	->	Np-237
406.7	8.46E-09	U-233	->	Th-229
409.1	2.25E-08	Fr-221	->	At-217
415.932	3.32E+02	Pa-233	->	U-233
416.4	1.60E-08	U-233	->	Th-229
419.22	7.56E+03	Am-241	->	Np-237
426.39	6.64E+03	Am-241	->	Np-237
429.8	2.70E+02	Am-241	->	Np-237
435.3	5.40E+02	Am-241	->	Np-237
436.78	7.98E-09	U-233	->	Th-229
440.34	2.79E-06	Bi-213	->	Po-213
442.75	9.45E+02	Am-241	->	Np-237
449.6	1.60E-08	U-233	->	Th-229
452.41	6.48E+02	Am-241	->	Np-237
452.43	1.91E-08	Ac-225	->	Fr-221
454.67	2.62E+03	Am-241	->	Np-237
459.58	9.72E+02	Am-241	->	Np-237
459.77	1.32E-08	U-233	->	Th-229
467	3.03E-07	Tl-209	->	Pb-209
468	7.83E+02	Am-241	->	Np-237
471.3	2.39E-08	U-233	->	Th-229
479	2.39E-08	U-233	->	Th-229
480.5	5.20E-09	Ac-225	->	Fr-221
484.05	6.86E-09	U-233	->	Th-229
486.3	2.70E+02	Am-241	->	Np-237
512	3.10E+02	Am-241	->	Np-237
513.5	1.73E-09	Ac-225	->	Fr-221
514.2	7.02E+02	Am-241	->	Np-237
522	2.43E+02	Am-241	->	Np-237
526.03	1.73E-09	Ac-225	->	Fr-221
540.27	8.46E-09	U-233	->	Th-229
545.1	3.83E-09	U-233	->	Th-229
569.37	6.07E-09	U-233	->	Th-229

574.05	2.70E+02	Am-241	->	Np-237
578.47	7.98E-09	U-233	->	Th-229
582.6	5.40E+01	Am-241	->	Np-237
586.5	3.51E+02	Am-241	->	Np-237
590.3	7.56E+02	Am-241	->	Np-237
597.41	2.54E+03	Am-241	->	Np-237
619.011	1.59E+04	Am-241	->	Np-237
620.87	3.67E-09	U-233	->	Th-229
627.2	1.51E+02	Am-241	->	Np-237
633	3.40E+02	Am-241	->	Np-237
641.436	1.92E+03	Am-241	->	Np-237
652.99	1.02E+04	Am-241	->	Np-237
656.97	4.79E-09	U-233	->	Th-229
659.72	1.47E-08	Bi-213	->	Po-213
662.456	9.91E+04	Am-241	->	Np-237
669.9	1.03E+02	Am-241	->	Np-237
675.8	1.73E+02	Am-241	->	Np-237
680.06	8.37E+02	Am-241	->	Np-237
688.77	8.10E+03	Am-241	->	Np-237
693.5	9.99E+02	Am-241	->	Np-237
696.36	1.35E+03	Am-241	->	Np-237
707.47	4.31E-09	U-233	->	Th-229
710.95	1.73E+03	Am-241	->	Np-237
721.962	1.62E+04	Am-241	->	Np-237
722.7	3.51E+04	Am-241	->	Np-237
729.5	3.51E+02	Am-241	->	Np-237
731.5	1.27E+02	Am-241	->	Np-237
737.3	2.16E+03	Am-241	->	Np-237
755.89	2.05E+03	Am-241	->	Np-237
759.5	4.59E+02	Am-241	->	Np-237
763.4	5.34E+01	Am-241	->	Np-237
766.79	1.35E+03	Am-241	->	Np-237
770.49	1.35E+03	Am-241	->	Np-237
772.1	7.18E+02	Am-241	->	Np-237
777.2	1.62E+01	Am-241	->	Np-237
780.5	6.75E+01	Am-241	->	Np-237
788.8	1.05E+02	Am-241	->	Np-237
801.9	3.51E+02	Am-241	->	Np-237
807.27	4.42E-08	Bi-213	->	Po-213
811.8	1.62E+02	Am-241	->	Np-237
819.3	1.08E+02	Am-241	->	Np-237
822.6	5.94E+01	Am-241	->	Np-237
828.5	6.48E+01	Am-241	->	Np-237
851.5	1.03E+02	Am-241	->	Np-237
854.7	5.40E+01	Am-241	->	Np-237
859.2	2.27E+01	Am-241	->	Np-237
862.6	1.43E+02	Am-241	->	Np-237
867.9	3.35E-09	U-233	->	Th-229
872.7	1.89E+02	Am-241	->	Np-237
887.5	5.94E+01	Am-241	->	Np-237

898.4	1.89E+01	Am-241	->	Np-237
902.5	8.10E+01	Am-241	->	Np-237
912.4	6.75E+01	Am-241	->	Np-237
922.2	5.13E+01	Am-241	->	Np-237
928.8	1.35E+01	Am-241	->	Np-237
945.7	1.35E+01	Am-241	->	Np-237
955.7	1.57E+02	Am-241	->	Np-237
1003	1.32E-08	U-233	->	Th-229
1100.06	4.78E-08	Bi-213	->	Po-213
1119	1.32E-08	U-233	->	Th-229
1566	3.67E-07	Tl-209	->	Pb-209

Pu241 Aged 5 years Sorted by Intensity

Intensity	Energy	Initial Isotopes and Decays			
(ph/s/gm)	(keV)				
9.71E+09	59.536	U-237	->	Np-237,	Am-241 -> Np-237
5.45E+09	17.611	Am-241	->	Np-237	
3.53E+09	13.927	U-237	->	Np-237,	Am-241 -> Np-237
1.40E+09	20.997	Am-241	->	Np-237	
6.49E+08	26.3445	U-237	->	Np-237,	Am-241 -> Np-237
2.20E+08	11.871	U-237	->	Np-237,	Am-241 -> Np-237
8.94E+07	15.861	U-237	->	Np-237,	Am-241 -> Np-237
3.25E+07	33.192	U-237	->	Np-237,	Am-241 -> Np-237
2.17E+07	17.592	U-237	->	Np-237	
1.97E+07	43.415	U-237	->	Np-237,	Am-241 -> Np-237
1.88E+07	101.066	U-237	->	Np-237,	Am-241 -> Np-237
1.59E+07	208	U-237	->	Np-237,	Am-241 -> Np-237
1.19E+07	97.071	U-237	->	Np-237,	Am-241 -> Np-237
6.48E+06	69.76	Am-241	->	Np-237	
5.48E+06	98.951	Am-241	->	Np-237	
5.40E+06	55.528	Am-241	->	Np-237	
5.25E+06	102.966	Am-241	->	Np-237	
5.21E+06	20.99	U-237	->	Np-237	
4.70E+06	32.2	Am-241	->	Np-237	
4.36E+06	114.23	U-237	->	Np-237,	Am-241 -> Np-237
2.26E+06	113.3	U-237	->	Np-237,	Am-241 -> Np-237
1.35E+06	164.58	U-237	->	Np-237,	Am-241 -> Np-237
1.19E+06	117.58	U-237	->	Np-237,	Am-241 -> Np-237
1.10E+06	125.292	Am-241	->	Np-237	
8.77E+05	64.817	U-237	->	Np-237,	Am-241 -> Np-237
8.68E+05	332.354	U-237	->	Np-237	
5.95E+05	118.43	U-237	->	Np-237	
5.71E+05	117.34	U-237	->	Np-237	
5.22E+05	267.54	U-237	->	Np-237,	Am-241 -> Np-237
2.70E+05	42.64	Am-241	->	Np-237	

2.70E+05	122.994	Am-241	->	Np-237	
2.42E+05	114.95	U-237	->	Np-237	
1.62E+05	54.04	Am-241	->	Np-237	
1.51E+05	51.013	U-237	->	Np-237,	Am-241 -> Np-237
1.33E+05	335.43	Am-241	->	Np-237	
1.24E+05	146.557	Am-241	->	Np-237	
1.19E+05	67.46	Am-241	->	Np-237	
9.91E+04	662.456	Am-241	->	Np-237	
7.98E+04	370.934	U-237	->	Np-237	
7.30E+04	13.804	U-237	->	Np-237	
7.01E+04	335.405	U-237	->	Np-237	
5.85E+04	368.61	Am-241	->	Np-237	
4.53E+04	169.56	Am-241	->	Np-237	
4.10E+04	322.54	Am-241	->	Np-237	
3.99E+04	332.39	Am-241	->	Np-237	
3.79E+04	376.6	Am-241	->	Np-237	
3.51E+04	722.7	Am-241	->	Np-237	
3.10E+04	368.605	U-237	->	Np-237	
2.97E+04	75.83	Am-241	->	Np-237	
2.16E+04	150.11	Am-241	->	Np-237	
1.62E+04	721.962	Am-241	->	Np-237	
1.59E+04	619.011	Am-241	->	Np-237	
1.53E+04	221.73	U-237	->	Np-237	
1.48E+04	294.9	Am-241	->	Np-237	
1.42E+04	370.933	Am-241	->	Np-237	
1.40E+04	234.24	U-237	->	Np-237	
1.27E+04	96.67	Am-241	->	Np-237	
1.13E+04	221.45	Am-241	->	Np-237	
1.02E+04	652.99	Am-241	->	Np-237	
8.35E+03	311.9	Pa-233	->	U-233	
8.10E+03	688.77	Am-241	->	Np-237	
8.10E+03	242.4	Am-241	->	Np-237	
8.10E+03	245	Am-241	->	Np-237	
7.61E+03	383.744	Am-241	->	Np-237	
7.56E+03	419.22	Am-241	->	Np-237	
6.64E+03	426.39	Am-241	->	Np-237	
6.48E+03	165.92	Am-241	->	Np-237	
6.22E+03	337.75	U-237	->	Np-237	
5.72E+03	16.632	Np-237	->	Pa-233	
5.68E+03	292.76	U-237	->	Np-237,	Am-241 -> Np-237
4.86E+03	175.09	Am-241	->	Np-237	
4.39E+03	13.274	Np-237	->	Pa-233	
4.17E+03	17.058	Pa-233	->	U-233	
4.05E+03	310.3	Am-241	->	Np-237	
3.95E+03	13.6	Pa-233	->	U-233	
3.51E+03	98.443	Pa-233	->	U-233	
3.51E+03	197	Am-241	->	Np-237	
3.24E+03	156.4	Am-241	->	Np-237	
3.20E+03	86.5	Np-237	->	Pa-233	
2.95E+03	29.378	Np-237	->	Pa-233	

2.62E+03	454.67	Am-241	->	Np-237		
2.54E+03	597.41	Am-241	->	Np-237		
2.46E+03	94.66	Pa-233	->	U-233,	Pu-241	-> U-237
2.43E+03	264.87	Am-241	->	Np-237		
2.43E+03	161.7	Am-241	->	Np-237		
2.16E+03	737.3	Am-241	->	Np-237		
2.16E+03	154.4	Am-241	->	Np-237		
2.05E+03	755.89	Am-241	->	Np-237		
1.92E+03	641.436	Am-241	->	Np-237		
1.78E+03	275.68	Am-241	->	Np-237		
1.73E+03	710.95	Am-241	->	Np-237		
1.59E+03	390.6	Am-241	->	Np-237		
1.44E+03	139.53	Am-241	->	Np-237		
1.36E+03	300.175	Pa-233	->	U-233		
1.35E+03	696.36	Am-241	->	Np-237		
1.35E+03	770.49	Am-241	->	Np-237		
1.35E+03	766.79	Am-241	->	Np-237		
1.33E+03	19.718	Np-237	->	Pa-233		
1.32E+03	111.298	Pa-233	->	U-233		
1.24E+03	232.86	Am-241	->	Np-237		
1.19E+03	340.45	U-237	->	Np-237		
1.13E+03	337.727	Am-241	->	Np-237		
1.08E+03	249.1	Am-241	->	Np-237		
9.99E+02	693.5	Am-241	->	Np-237		
9.88E+02	20.42	Pa-233	->	U-233		
9.72E+02	459.58	Am-241	->	Np-237		
9.45E+02	442.75	Am-241	->	Np-237		
9.23E+02	340.59	Pa-233	->	U-233		
8.37E+02	291.21	Am-241	->	Np-237		
8.37E+02	680.06	Am-241	->	Np-237		
7.83E+02	468	Am-241	->	Np-237		
7.83E+02	203.9	Am-241	->	Np-237		
7.56E+02	590.3	Am-241	->	Np-237		
7.18E+02	772.1	Am-241	->	Np-237		
7.02E+02	514.2	Am-241	->	Np-237		
6.64E+02	95.858	Np-237	->	Pa-233		
6.48E+02	246.66	Am-241	->	Np-237		
6.48E+02	452.41	Am-241	->	Np-237		
5.94E+02	190.4	Am-241	->	Np-237		
5.40E+02	435.3	Am-241	->	Np-237		
4.59E+02	759.5	Am-241	->	Np-237		
4.39E+02	114.445	Pa-233	->	U-233		
3.87E+02	86.652	Pa-233	->	U-233		
3.78E+02	406.4	Am-241	->	Np-237		
3.78E+02	158.48	Am-241	->	Np-237		
3.64E+02	92.282	Np-237	->	Pa-233		
3.51E+02	729.5	Am-241	->	Np-237		
3.51E+02	586.5	Am-241	->	Np-237		
3.51E+02	801.9	Am-241	->	Np-237		
3.50E+02	98.441	Pu-241	->	U-237		

3.40E+02	633	Am-241	->	Np-237
3.32E+02	415.932	Pa-233	->	U-233
3.24E+02	349.46	Am-241	->	Np-237
3.24E+02	358.36	Am-241	->	Np-237
3.10E+02	512	Am-241	->	Np-237
2.70E+02	304.2	Am-241	->	Np-237
2.70E+02	260.9	Am-241	->	Np-237
2.70E+02	429.8	Am-241	->	Np-237
2.70E+02	574.05	Am-241	->	Np-237
2.70E+02	486.3	Am-241	->	Np-237
2.63E+02	11.372	Np-237	->	Pa-233
2.61E+02	398.663	Pa-233	->	U-233
2.57E+02	75.343	Pa-233	->	U-233
2.43E+02	522	Am-241	->	Np-237
2.35E+02	11.62	Pa-233	->	U-233
2.15E+02	108.166	Np-237	->	Pa-233
1.89E+02	234.352	Am-241	->	Np-237
1.89E+02	872.7	Am-241	->	Np-237
1.74E+02	94.723	Np-237	->	Pa-233
1.73E+02	271.58	Am-241	->	Np-237
1.73E+02	675.8	Am-241	->	Np-237
1.62E+02	811.8	Am-241	->	Np-237
1.57E+02	955.7	Am-241	->	Np-237
1.52E+02	103.921	Pa-233	->	U-233
1.51E+02	627.2	Am-241	->	Np-237
1.43E+02	862.6	Am-241	->	Np-237
1.32E+02	148.567	Pu-241	->	U-237
1.27E+02	375.518	Pa-233	->	U-233
1.27E+02	731.5	Am-241	->	Np-237
1.16E+02	111.3	Pu-241	->	U-237
1.08E+02	819.3	Am-241	->	Np-237
1.08E+02	14.953	Np-237	->	Pa-233
1.05E+02	788.8	Am-241	->	Np-237
1.03E+02	851.5	Am-241	->	Np-237
1.03E+02	669.9	Am-241	->	Np-237
8.92E+01	57.149	Np-237	->	Pa-233
8.92E+01	143.227	Np-237	->	Pa-233
8.10E+01	902.5	Am-241	->	Np-237
7.11E+01	103.68	Pu-241	->	U-237
7.09E+01	111.897	Np-237	->	Pa-233
6.75E+01	912.4	Am-241	->	Np-237
6.75E+01	780.5	Am-241	->	Np-237
6.48E+01	828.5	Am-241	->	Np-237
6.15E+01	271.597	Pa-233	->	U-233
5.94E+01	887.5	Am-241	->	Np-237
5.94E+01	822.6	Am-241	->	Np-237
5.83E+01	191.9	Am-241	->	Np-237
5.49E+01	151.423	Np-237	->	Pa-233
5.40E+01	582.6	Am-241	->	Np-237
5.40E+01	854.7	Am-241	->	Np-237

5.34E+01	763.4	Am-241	->	Np-237	
5.13E+01	922.2	Am-241	->	Np-237	
5.05E+01	15.4	Pa-233	->	U-233	
4.60E+01	195.04	Np-237	->	Pa-233	
4.26E+01	110.421	Pu-241	->	U-237	
4.12E+01	88.05	Np-237	->	Pa-233	
3.68E+01	117.689	Np-237	->	Pa-233	
3.48E+01	212.412	Np-237	->	Pa-233	
3.04E+01	46.57	Np-237	->	Pa-233	
2.63E+01	114.561	Pu-241	->	U-237	
2.27E+01	859.2	Am-241	->	Np-237	
2.11E+01	155.263	Np-237	->	Pa-233	
1.94E+01	131.09	Np-237	->	Pa-233	
1.89E+01	898.4	Am-241	->	Np-237	
1.67E+01	108.69	Np-237	->	Pa-233	
1.65E+01	169.18	Np-237	->	Pa-233	
1.62E+01	777.2	Am-241	->	Np-237	
1.57E+01	77.1	U-233	->	Th-229,	Pu-241 -> U-237
1.53E+01	134.23	Np-237	->	Pa-233	
1.46E+01	237.95	Np-237	->	Pa-233	
1.43E+01	28.578	Pa-233	->	U-233	
1.35E+01	945.7	Am-241	->	Np-237	
1.35E+01	928.8	Am-241	->	Np-237	
1.28E+01	106.13	Np-237	->	Pa-233	
1.19E+01	248.25	Pa-233	->	U-233	
1.17E+01	193.29	Np-237	->	Pa-233	
1.16E+01	114.333	Pu-241	->	U-237	
1.12E+01	194.74	Np-237	->	Pa-233	
9.68E+00	115.4	Pu-241	->	U-237	
9.61E+00	201.72	Np-237	->	Pa-233	
9.61E+00	214.08	Np-237	->	Pa-233	
8.47E+00	162.51	Np-237	->	Pa-233	
7.91E+00	40.415	Pa-233	->	U-233	
6.93E+00	38.57	Pu-241	->	U-237	
6.18E+00	191.46	Np-237	->	Pa-233	
5.72E+00	196.89	Np-237	->	Pa-233	
5.56E+00	298.87	Pa-233	->	U-233	
5.26E+00	180.801	Np-237	->	Pa-233	
4.77E+00	159.955	Pu-241	->	U-237	
4.58E+00	176.09	Np-237	->	Pa-233	
4.35E+00	170.67	Np-237	->	Pa-233	
4.12E+00	140.61	Np-237	->	Pa-233	
3.66E+00	70.62	Np-237	->	Pa-233	
3.66E+00	63.95	Np-237	->	Pa-233	
3.55E+00	209.19	Np-237	->	Pa-233	
3.02E+00	44.2	Pu-241	->	U-237	
3.00E+00	229.98	Np-237	->	Pa-233	
2.86E+00	41.718	Pa-233	->	U-233	
2.75E+00	62.66	Np-237	->	Pa-233	
2.54E+00	74.46	Np-237	->	Pa-233	

2.39E+00	111.89	Pu-241	->	U-237
2.02E+00	71.6	Pu-241	->	U-237
1.81E+00	56.32	Pu-241	->	U-237
1.58E+00	153.72	Np-237	->	Pa-233
1.56E+00	172.56	Np-237	->	Pa-233
1.53E+00	186.7	Np-237	->	Pa-233
1.53E+00	262.41	Np-237	->	Pa-233
1.53E+00	256.98	Np-237	->	Pa-233
1.19E+00	258.46	Pa-233	->	U-233
1.10E+00	248.91	Np-237	->	Pa-233
8.24E-01	202.85	Np-237	->	Pa-233
8.01E-01	200.17	Np-237	->	Pa-233
7.91E-01	17.269	Pa-233	->	U-233
7.04E-01	56.76	Pu-241	->	U-237
6.04E-01	44.86	Pu-241	->	U-237
5.72E-01	115.19	Np-237	->	Pa-233
4.84E-01	121.2	Pu-241	->	U-237
5.27E-03	16.141	U-233	->	Th-229
4.15E-03	12.952	U-233	->	Th-229
1.28E-03	19.148	U-233	->	Th-229
2.39E-04	11.118	U-233	->	Th-229
9.58E-05	42.441	U-233	->	Th-229
9.10E-05	14.511	U-233	->	Th-229
3.51E-05	97.143	U-233	->	Th-229
2.70E-05	93.36	U-233	->	Th-229
2.23E-05	54.702	U-233	->	Th-229
1.66E-05	89.957	U-233	->	Th-229
1.40E-05	317.133	U-233	->	Th-229
1.09E-05	29.191	U-233	->	Th-229
1.05E-05	164.512	U-233	->	Th-229
1.01E-05	146.347	U-233	->	Th-229
9.74E-06	105.362	U-233	->	Th-229
8.30E-06	291.317	U-233	->	Th-229
7.18E-06	248.661	U-233	->	Th-229
6.86E-06	53.559	U-233	->	Th-229
5.59E-06	217.133	U-233	->	Th-229
5.59E-06	245.294	U-233	->	Th-229
5.19E-06	40.34	Ra-225	->	Ac-225
5.11E-06	118.97	U-233	->	Th-229
4.95E-06	320.508	U-233	->	Th-229
4.47E-06	117.155	U-233	->	Th-229
4.31E-06	71.847	U-233	->	Th-229
3.99E-06	208.149	U-233	->	Th-229
3.51E-06	135.328	U-233	->	Th-229
3.35E-06	120.81	U-233	->	Th-229
3.24E-06	108.99	U-233	->	Th-229
3.19E-06	187.942	U-233	->	Th-229
2.79E-06	440.34	Bi-213	->	Po-213
2.55E-06	145.286	U-233	->	Th-229
2.39E-06	74.5	U-233	->	Th-229

2.23E-06	96.215	U-233	->	Th-229
1.95E-06	278.059	U-233	->	Th-229
1.93E-06	25.304	U-233	->	Th-229
1.89E-06	217.98	Fr-221	->	At-217
1.72E-06	287.949	U-233	->	Th-229
1.66E-06	14.772	Ac-225	->	Fr-221
1.58E-06	32.27	U-233	->	Th-229
1.35E-06	12.017	Ac-225	->	Fr-221
1.34E-06	66.11	U-233	->	Th-229
1.34E-06	323.321	U-233	->	Th-229
1.31E-06	365.762	U-233	->	Th-229
1.09E-06	15.662	Ra-225	->	Ac-225
1.05E-06	216.08	U-233	->	Th-229
1.04E-06	123.91	U-233	->	Th-229
9.83E-07	12.636	Ra-225	->	Ac-225
9.58E-07	70.35	U-233	->	Th-229
9.42E-07	336.579	U-233	->	Th-229
9.42E-07	72.821	U-233	->	Th-229
8.62E-07	193.59	Th-229	->	Ra-225
7.68E-07	31.37	Th-229	->	Ra-225
7.50E-07	111.935	U-233	->	Th-229
7.50E-07	274.692	U-233	->	Th-229
7.02E-07	88.43	U-233	->	Th-229
6.23E-07	165.493	U-233	->	Th-229
6.23E-07	76.32	U-233	->	Th-229
6.18E-07	210.94	Th-229	->	Ra-225
6.07E-07	240.364	U-233	->	Th-229
5.75E-07	37.85	U-233	->	Th-229
5.75E-07	148.15	U-233	->	Th-229
5.62E-07	86.44	Th-229	->	Ra-225
5.27E-07	90.994	U-233	->	Th-229
5.11E-07	67.96	U-233	->	Th-229
4.95E-07	109.47	U-233	->	Th-229
4.95E-07	261.88	U-233	->	Th-229
4.79E-07	144.52	U-233	->	Th-229
4.31E-07	31.24	U-233	->	Th-229
3.99E-07	52.613	U-233	->	Th-229
3.99E-07	114.28	U-233	->	Th-229
3.99E-07	268.619	U-233	->	Th-229
3.67E-07	174.162	U-233	->	Th-229
3.67E-07	1566	Tl-209	->	Pb-209
3.64E-07	17.449	Ac-225	->	Fr-221
3.60E-07	86.105	Ac-225	->	Fr-221
3.35E-07	116.26	U-233	->	Th-229
3.03E-07	87.24	U-233	->	Th-229
3.03E-07	85.402	U-233	->	Th-229
3.03E-07	467	Tl-209	->	Pb-209
3.03E-07	117	Tl-209	->	Pb-209
3.00E-07	137.02	Th-229	->	Ra-225
2.91E-07	99.82	Ac-225	->	Fr-221

2.87E-07	82.957	U-233	->	Th-229
2.87E-07	259.3	U-233	->	Th-229
2.50E-07	18.593	Ra-225	->	Ac-225
2.44E-07	81.517	Fr-221	->	At-217
2.39E-07	154.69	U-233	->	Th-229
2.39E-07	219.424	U-233	->	Th-229
2.23E-07	212.29	U-233	->	Th-229
2.23E-07	293.923	U-233	->	Th-229
2.23E-07	170.794	U-233	->	Th-229
2.19E-07	79.29	Bi-213	->	Po-213
2.18E-07	83.229	Ac-225	->	Fr-221
2.08E-07	86.74	U-233	->	Th-229
2.03E-07	149.8	U-233	->	Th-229
1.87E-07	156.46	Th-229	->	Ra-225
1.87E-07	148.37	Th-229	->	Ra-225
1.87E-07	124.51	Th-229	->	Ra-225
1.72E-07	260.4	U-233	->	Th-229
1.72E-07	68.97	U-233	->	Th-229
1.68E-07	139.76	U-233	->	Th-229
1.66E-07	13.911	Fr-221	->	At-217
1.60E-07	103.375	U-233	->	Th-229
1.52E-07	383.4	U-233	->	Th-229
1.50E-07	107.16	Th-229	->	Ra-225
1.47E-07	78.947	Fr-221	->	At-217
1.44E-07	101.8	U-233	->	Th-229
1.37E-07	11.414	Fr-221	->	At-217
1.32E-07	76.858	Bi-213	->	Po-213
1.31E-07	154.37	Th-229	->	Ra-225
1.30E-07	97.272	Ac-225	->	Fr-221
1.20E-07	162.52	U-233	->	Th-229
1.20E-07	84.27	U-233	->	Th-229
1.17E-07	309.37	U-233	->	Th-229
1.16E-07	150.08	Ac-225	->	Fr-221
1.12E-07	124.72	Th-229	->	Ra-225
1.12E-07	129.2	U-233	->	Th-229
1.12E-07	302.84	U-233	->	Th-229
1.09E-07	99.58	Ac-225	->	Fr-221
1.07E-07	230.086	U-233	->	Th-229
1.07E-07	168.98	U-233	->	Th-229
1.04E-07	125.398	U-233	->	Th-229
1.04E-07	328.69	U-233	->	Th-229
1.04E-07	205.99	U-233	->	Th-229
1.01E-07	272.27	U-233	->	Th-229
9.58E-08	78.41	U-233	->	Th-229
9.55E-08	179.74	Th-229	->	Ra-225
9.53E-08	62.93	Ac-225	->	Fr-221
9.36E-08	75.17	Th-229	->	Ra-225
9.26E-08	354	U-233	->	Th-229
9.26E-08	155.989	U-233	->	Th-229
8.78E-08	153.31	U-233	->	Th-229

8.78E-08	100.008	U-233	->	Th-229
8.66E-08	92.136	Fr-221	->	At-217
8.38E-08	11.119	Bi-213	->	Po-213
8.05E-08	142.98	Th-229	->	Ra-225
7.98E-08	217.61	U-233	->	Th-229
7.98E-08	236.39	U-233	->	Th-229
7.97E-08	187.99	Ac-225	->	Fr-221
7.79E-08	13.504	Bi-213	->	Po-213
7.77E-08	89.639	Bi-213	->	Po-213
7.45E-08	292.79	Bi-213	->	Po-213
7.45E-08	10.381	Ac-225	->	Fr-221
7.28E-08	216.86	Ac-225	->	Fr-221
7.18E-08	351.782	U-233	->	Th-229
7.12E-08	86.23	Th-229	->	Ra-225
6.86E-08	255.92	U-233	->	Th-229
6.86E-08	176.1	U-233	->	Th-229
6.38E-08	185.782	U-233	->	Th-229
6.38E-08	192.12	U-233	->	Th-229
6.18E-08	131.92	Th-229	->	Ra-225
6.18E-08	56.58	Th-229	->	Ra-225
6.07E-08	252.5	U-233	->	Th-229
5.89E-08	216.2	Ac-225	->	Fr-221
5.72E-08	10.871	Ra-225	->	Ac-225
5.66E-08	111.56	Ac-225	->	Fr-221
5.61E-08	73.84	Ac-225	->	Fr-221
5.59E-08	172.35	U-233	->	Th-229
5.37E-08	157.24	Ac-225	->	Fr-221
5.27E-08	63.69	U-233	->	Th-229
5.27E-08	131.2	U-233	->	Th-229
5.27E-08	223.357	U-233	->	Th-229
5.02E-08	87.39	Ac-225	->	Fr-221
4.78E-08	1100.06	Bi-213	->	Po-213
4.68E-08	108.36	Ac-225	->	Fr-221
4.47E-08	311.38	U-233	->	Th-229
4.42E-08	807.27	Bi-213	->	Po-213
4.31E-08	183.96	Th-229	->	Ra-225
4.16E-08	100.599	Ac-225	->	Fr-221
4.12E-08	172.9	Th-229	->	Ra-225
3.99E-08	184.17	U-233	->	Th-229
3.78E-08	74.969	Tl-209	->	Pb-209
3.67E-08	295.2	U-233	->	Th-229
3.45E-08	16.361	Fr-221	->	At-217
3.29E-08	123.76	Ac-225	->	Fr-221
3.19E-08	228.07	U-233	->	Th-229
3.19E-08	384	U-233	->	Th-229
3.19E-08	138.5	U-233	->	Th-229
3.19E-08	177.78	U-233	->	Th-229
3.18E-08	17.349	Th-229	->	Ra-225
3.00E-08	42.722	Th-229	->	Ra-225
2.77E-08	94.87	Ac-225	->	Fr-221

2.77E-08	13.255	Ac-225	->	Fr-221
2.68E-08	95.265	Fr-221	->	At-217
2.65E-08	153.93	Ac-225	->	Fr-221
2.62E-08	218.15	Th-229	->	Ra-225
2.60E-08	82.9	Ac-225	->	Fr-221
2.51E-08	195.75	Ac-225	->	Fr-221
2.39E-08	471.3	U-233	->	Th-229
2.39E-08	479	U-233	->	Th-229
2.37E-08	92.673	Bi-213	->	Po-213
2.25E-08	409.1	Fr-221	->	At-217
2.24E-08	72.803	Tl-209	->	Pb-209
2.18E-08	145.15	Ac-225	->	Fr-221
2.06E-08	68.88	Th-229	->	Ra-225
1.91E-08	452.43	Ac-225	->	Fr-221
1.87E-08	68.14	Th-229	->	Ra-225
1.73E-08	253.51	Ac-225	->	Fr-221
1.63E-08	14.082	Ra-225	->	Ac-225
1.60E-08	226.74	U-233	->	Th-229
1.60E-08	225	U-233	->	Th-229
1.60E-08	284.22	U-233	->	Th-229
1.60E-08	416.4	U-233	->	Th-229
1.60E-08	449.6	U-233	->	Th-229
1.49E-08	15.878	Bi-213	->	Po-213
1.47E-08	659.72	Bi-213	->	Po-213
1.39E-08	224.64	Ac-225	->	Fr-221
1.38E-08	10.541	Tl-209	->	Pb-209
1.35E-08	84.789	Tl-209	->	Pb-209
1.32E-08	459.77	U-233	->	Th-229
1.32E-08	1119	U-233	->	Th-229
1.32E-08	1003	U-233	->	Th-229
1.32E-08	396.65	U-233	->	Th-229
1.32E-08	402.37	U-233	->	Th-229
1.31E-08	12.703	Tl-209	->	Pb-209
1.21E-08	149.99	Fr-221	->	At-217
1.21E-08	171.29	Fr-221	->	At-217
1.20E-08	394.34	U-233	->	Th-229
1.20E-08	339.64	U-233	->	Th-229
1.04E-08	100.88	Ac-225	->	Fr-221
1.04E-08	119.92	Ac-225	->	Fr-221
9.70E-09	64.23	Ac-225	->	Fr-221
8.66E-09	124.81	Ac-225	->	Fr-221
8.46E-09	406.7	U-233	->	Th-229
8.46E-09	540.27	U-233	->	Th-229
7.98E-09	578.47	U-233	->	Th-229
7.98E-09	436.78	U-233	->	Th-229
7.27E-09	9.897	Fr-221	->	At-217
6.93E-09	135.01	Ac-225	->	Fr-221
6.86E-09	484.05	U-233	->	Th-229
6.74E-09	25.373	Th-229	->	Ra-225
6.74E-09	236.32	Th-229	->	Ra-225

6.41E-09	152.64	Ac-225	->	Fr-221
6.24E-09	74.9	Ac-225	->	Fr-221
6.07E-09	569.37	U-233	->	Th-229
6.06E-09	279.27	Ac-225	->	Fr-221
6.06E-09	382.05	Fr-221	->	At-217
6.06E-09	359.09	Fr-221	->	At-217
6.06E-09	118.47	Fr-221	->	At-217
5.20E-09	480.5	Ac-225	->	Fr-221
5.20E-09	96.17	Ac-225	->	Fr-221
4.79E-09	656.97	U-233	->	Th-229
4.37E-09	9.658	Bi-213	->	Po-213
4.31E-09	707.47	U-233	->	Th-229
3.85E-09	87.632	Tl-209	->	Pb-209
3.83E-09	545.1	U-233	->	Th-229
3.67E-09	620.87	U-233	->	Th-229
3.46E-09	186.12	Ac-225	->	Fr-221
3.46E-09	198.72	Ac-225	->	Fr-221
3.46E-09	248.7	Ac-225	->	Fr-221
3.46E-09	138.2	Ac-225	->	Fr-221
3.35E-09	867.9	U-233	->	Th-229
3.29E-09	53.82	Ac-225	->	Fr-221
3.29E-09	97.2	Fr-221	->	At-217
2.94E-09	73.6	Ac-225	->	Fr-221
2.94E-09	324.1	Fr-221	->	At-217
2.89E-09	12.466	Fr-221	->	At-217
2.77E-09	178.39	Ac-225	->	Fr-221
2.60E-09	36.65	Ac-225	->	Fr-221
2.55E-09	71.71	Ac-225	->	Fr-221
2.43E-09	126.23	Ac-225	->	Fr-221
2.36E-09	14.871	Tl-209	->	Pb-209
2.25E-09	240.76	Ac-225	->	Fr-221
1.87E-09	49.2	Ac-225	->	Fr-221
1.73E-09	70.92	Ac-225	->	Fr-221
1.73E-09	285.5	Ac-225	->	Fr-221
1.73E-09	526.03	Ac-225	->	Fr-221
1.73E-09	513.5	Ac-225	->	Fr-221
1.60E-09	200.67	U-233	->	Th-229
1.56E-09	38.51	Ac-225	->	Fr-221
1.56E-09	103.44	Ac-225	->	Fr-221
1.56E-09	170.91	Ac-225	->	Fr-221
1.56E-09	282.54	Fr-221	->	At-217
1.13E-09	12.085	Bi-213	->	Po-213
8.83E-10	69.85	Ac-225	->	Fr-221
7.45E-10	129.19	Ac-225	->	Fr-221
7.28E-10	57.77	Ac-225	->	Fr-221
7.11E-10	9.185	Tl-209	->	Pb-209
6.92E-10	323.81	Bi-213	->	Tl-209
2.60E-10	25.98	Ac-225	->	Fr-221
1.91E-10	11.349	Tl-209	->	Pb-209
4.86E-11	72.873	Bi-213	->	Tl-209

2.99E-11	70.832	Bi-213	->	Tl-209
1.87E-11	82.434	Bi-213	->	Tl-209
1.87E-11	10.259	Bi-213	->	Tl-209
1.50E-11	12.311	Bi-213	->	Tl-209
4.86E-12	85.185	Bi-213	->	Tl-209
2.99E-12	14.402	Bi-213	->	Tl-209
8.60E-13	8.953	Bi-213	->	Tl-209
2.24E-13	10.994	Bi-213	->	Tl-209

Pu-242 100% Aged 5 years

656 lines computed.

Sorted by Energy:

Energy	Intensity	Initial Isotopes and Decays					
(keV)	ph/s/gm						
8.953	1.50E-20	Hg-206	->	Tl-206			
9.185	4.32E-21	Tl-206	->	Pb-206,	Tl-210	->	Pb-210
9.419	1.88E-21	Pb-210	->	Bi-210,	Pb-214	->	Bi-214
9.658	3.57E-19	Bi-214	->	Po-214			
10.137	0.00E+00	Ra-226	->	Rn-222			
10.259	3.11E-19	Hg-206	->	Tl-206			
10.541	8.73E-20	Tl-206	->	Pb-206,	Tl-210	->	Pb-210
10.828	3.68E-20	Pb-210	->	Bi-210,	Pb-214	->	Bi-214
10.994	3.95E-21	Hg-206	->	Tl-206			
11.118	2.03E-04	U-238	->	Th-234			
11.119	6.83E-18	Bi-214	->	Po-214			
11.349	2.07E-21	Tl-210	->	Pb-210			
11.372	2.56E-04	Th-234	->	Pa-234m,	Pa-234m	->	U-234
11.439	2.30E-23	Tl-206	->	Pb-206			
11.62	2.90E+05	Pa-234	->	U-234,	Pa-234m	->	U-234, Pu-242 - U-238
							>
11.712	3.16E-22	Pb-210	->	Bi-210,	Pb-214	->	Bi-214
11.713	0.00E+00	Ra-226	->	Rn-222			
12.085	9.80E-20	Bi-214	->	Po-214			
12.313	2.70E-19	Hg-206	->	Tl-206			
12.678	1.14E-19	Tl-210	->	Pb-210			
12.71	1.45E-21	Tl-206	->	Pb-206			
12.855	0.00E+00	Ra-226	->	Rn-222			
12.952	3.38E-03	U-238	->	Th-234			
13.066	4.16E-20	Pb-210	->	Bi-210			
13.088	0.00E+00	Pb-214	->	Bi-214			
13.274	4.31E-03	Th-234	->	Pa-234m			
13.275	2.55E-05	Pa-234m	->	U-234			
13.502	6.60E-18	Bi-214	->	Po-214			
13.6	4.79E+06	Pa-234	->	U-234,	Pa-234m	->	U-234, Pu-242 - U-238
							>

14.336	0.00E+00	Ra-226	->	Rn-222					
14.407	4.98E-20	Hg-206	->	Tl-206					
14.511	9.34E-05	U-238	->	Th-234					
14.836	2.30E-20	Tl-206	->	Pb-206,	TI-210	->	Pb-210		
14.953	5.44E-05	Th-234	->	Pa-234m,	Pa-234m	->	U-234		
15.4	1.18E+05	Pa-234	->	U-234,	Pa-234m	->	U-234,	Pu-242	- U-238
									>
15.439	0.00E+00	Pb-214	->	Bi-214					
15.537	9.99E-21	Pb-210	->	Bi-210					
15.874	1.27E-18	Bi-214	->	Po-214					
16.161	4.62E-03	U-238	->	Th-234					
16.547	2.96E-05	Pa-234m	->	U-234					
16.572	4.86E-03	Th-234	->	Pa-234m					
16.874	0.00E+00	Ra-226	->	Rn-222					
17.069	1.30E-04	Pa-234m	->	U-234					
17.12	7.46E-05	Pa-234	->	U-234					
17.128	5.95E+06	Pu-242	->	U-238					
19.094	1.05E-03	U-238	->	Th-234					
19.839	1.19E-03	Th-234	->	Pa-234m					
19.891	3.53E-06	Pa-234m	->	U-234					
20.019	1.10E-05	Th-234	->	Pa-234m					
20.292	1.32E+06	Pu-242	->	U-238					
20.309	1.69E-05	Pa-234	->	U-234					
20.366	2.82E-05	Pa-234m	->	U-234					
29.49	1.61E-06	Th-234	->	Pa-234m					
34.37	5.17E-09	Pa-234	->	U-234					
43.47	1.72E-07	Pa-234	->	U-234					
44.915	5.23E+04	Pu-242	->	U-238					
45.28	1.58E-08	Pa-234	->	U-234					
46.52	1.62E-20	Pb-210	->	Bi-210					
49.55	7.88E-05	U-238	->	Th-234					
53.172	0.00E+00	Pb-214	->	Bi-214					
53.23	9.10E-10	U-234	->	Th-230					
57.75	5.52E-06	Th-234	->	Pa-234m					
58.31	1.29E-08	Pa-234	->	U-234					
62.78	8.54E-06	Pa-234	->	U-234,	Pa-234m	->	U-234		
62.862	2.10E-05	Th-234	->	Pa-234m					
63.288	3.98E-03	Th-234	->	Pa-234m					
67.22	8.33E-08	Pa-234	->	U-234					
67.6758	4.97E-14	Th-230	->	Ra-226					
69.9	3.30E-07	Pa-234	->	U-234					
70.832	5.19E-19	Hg-206	->	Tl-206					
72.803	3.22E-20	Tl-206	->	Pb-206,	TI-210	->	Pb-210		
72.873	8.72E-19	Hg-206	->	Tl-206					
73.9	1.56E-08	Pa-234m	->	Pa-234					
74	4.70E-05	Th-234	->	Pa-234m					
74.814	0.00E+00	Pb-214	->	Bi-214					
74.969	5.29E-20	Tl-206	->	Pb-206,	TI-210	->	Pb-210		
76.838	1.03E-17	Bi-214	->	Po-214					
77.107	0.00E+00	Pb-214	->	Bi-214					

79.29	1.73E-17	Bi-214	->	Po-214		
79.65	3.88E-07	Pa-234	->	U-234		
81	2.07E-20	Tl-210	->	Pb-210		
81.067	0.00E+00	Ra-226	->	Rn-222		
82.434	3.11E-19	Hg-206	->	Tl-206		
83.31	7.73E-05	Th-234	->	Pa-234m		
83.787	0.00E+00	Ra-226	->	Rn-222		
84.789	1.89E-20	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
85.185	8.72E-20	Hg-206	->	Tl-206		
87.02	8.06E-06	Th-234	->	Pa-234m		
87.19	0.00E+00	Pb-214	->	Bi-214		
87.632	5.41E-21	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
89.639	6.15E-18	Bi-214	->	Po-214		
90.128	0.00E+00	Pb-214	->	Bi-214		
92.279	8.83E-06	Th-234	->	Pa-234m		
92.35	3.00E-03	Th-234	->	Pa-234m		
92.673	1.87E-18	Bi-214	->	Po-214		
92.78	2.97E-03	Th-234	->	Pa-234m		
94.651	1.92E-04	Pa-234	->	U-234,	Pa-234m	-> U-234
94.677	0.00E+00	Ra-226	->	Rn-222		
95	4.13E-20	Tl-210	->	Pb-210		
95.863	1.44E-05	Th-234	->	Pa-234m		
97.907	0.00E+00	Ra-226	->	Rn-222		
98.434	3.04E-04	Pa-234	->	U-234,	Pa-234m	-> U-234
99.852	7.41E-06	Pa-234	->	U-234,	Pa-234m	-> U-234
103.35	3.87E-06	Th-234	->	Pa-234m		
103.5	1.13E+04	Pu-242	->	U-238		
103.7	1.72E-07	Pa-234	->	U-234		
103.71	6.63E-06	Th-234	->	Pa-234m		
108	6.52E-06	Th-234	->	Pa-234m		
108.166	5.52E-06	Th-234	->	Pa-234m		
109.97	7.80E-18	Th-230	->	Ra-226		
110.5	2.70E-05	U-238	->	Th-234		
111.025	1.12E-04	Pa-234	->	U-234,	Pa-234m	-> U-234
111.897	1.77E-06	Th-234	->	Pa-234m		
112.8	2.67E-04	Th-234	->	Pa-234m		
114.866	3.83E-05	Pa-234	->	U-234,	Pa-234m	-> U-234
120.912	3.14E-10	U-234	->	Th-230		
125.53	1.44E-06	Pa-234	->	U-234		
131.31	3.16E-05	Pa-234	->	U-234		
134.3	3.01E-07	Pa-234	->	U-234		
137.4	0.00E+00	Pb-214	->	Bi-214		
137.7	2.15E-07	Pa-234	->	U-234		
140.15	2.56E-06	Pa-234	->	U-234,	Pa-234m	-> U-234
141.3	0.00E+00	Pb-214	->	Bi-214		
143.876	6.42E-15	Th-230	->	Ra-226		
143.9	5.02E-07	Pa-234	->	U-234		
150	2.87E-07	Pa-234	->	U-234		
152.76	9.16E-06	Pa-234	->	U-234		
157.96	1.00E-06	Pa-234	->	U-234		

158.8	6.54E+02	Pu-242	->	U-238		
165.8	1.29E-07	Pa-234	->	U-234		
170.75	7.18E-07	Pa-234	->	U-234		
174.52	2.87E-07	Pa-234	->	U-234		
184.6	1.69E-06	Pa-234m	->	U-234		
184.8	1.33E-05	Th-234	->	Pa-234m		
185.92	2.87E-06	Pa-234	->	U-234		
186.057	1.16E-15	Th-230	->	Ra-226		
186.11	0.00E+00	Ra-226	->	Rn-222		
192.74	7.61E-08	Pa-234m	->	U-234		
193.4	6.21E-07	Pa-234m	->	U-234		
193.55	8.61E-07	Pa-234	->	U-234		
196.3	0.00E+00	Pb-214	->	Bi-214		
196.43	1.00E-07	Pa-234	->	U-234		
199.46	1.25E-06	Pa-234	->	U-234,	Pa-234m	-> U-234
200.96	1.58E-06	Pa-234	->	U-234		
203.12	2.98E-06	Pa-234	->	U-234,	Pa-234m	-> U-234
205.1	6.61E-19	Th-230	->	Ra-226		
210.6	1.30E-06	Pa-234m	->	U-234		
210.7	7.18E-08	Pa-234	->	U-234		
219.8	2.87E-07	Pa-234	->	U-234		
226.95	1.79E-05	Pa-234	->	U-234		
235.01	1.07E-18	Th-230	->	Ra-226		
236.03	4.19E-08	Pa-234m	->	U-234		
241.92	0.00E+00	Pb-214	->	Bi-214		
243.5	4.94E-06	Pa-234m	->	U-234		
245.16	1.29E-06	Pa-234	->	U-234		
247.7	7.36E-07	Pa-234m	->	U-234		
248.94	3.13E-06	Pa-234	->	U-234		
253.732	1.47E-15	Th-230	->	Ra-226		
253.84	1.12E-16	Th-230	->	Ra-226		
258.26	8.05E-05	Pa-234m	->	U-234		
258.94	0.00E+00	Pb-214	->	Bi-214		
262.41	0.00E+00	Ra-226	->	Rn-222		
266.15	4.80E-31	Bi-210	->	Tl-206		
267.1	2.44E-07	Pa-234	->	U-234		
272.2	1.99E-06	Pa-234	->	U-234		
273.7	3.21E-18	Bi-214	->	Po-214		
274.45	7.84E-07	Pa-234	->	U-234,	Pa-234m	-> U-234
274.56	0.00E+00	Pb-214	->	Bi-214		
276.83	6.83E-07	Pa-234	->	U-234,	Pa-234m	-> U-234
278.1	1.00E-07	Pa-234	->	U-234		
280.93	1.44E-18	Bi-214	->	Po-214		
286.4	2.01E-07	Pa-234	->	U-234		
286.9	5.70E-19	Bi-214	->	Po-214		
289.25	1.58E-07	Pa-234	->	U-234		
293.874	5.41E-06	Pa-234	->	U-234		
295.091	0.00E+00	Pb-214	->	Bi-214		
298.1	8.16E-19	Tl-210	->	Pb-210,	Po-214	-> Pb-210
299.08	6.21E-07	Pa-234m	->	U-234		

302.25	5.61E-18	Hg-206	->	Tl-206	
304.42	6.06E-19	Bi-214	->	Po-214	
305.5	0.00E+00	Pb-214	->	Bi-214	
309.6	1.44E-07	Pa-234	->	U-234	
311	5.08E-07	Pa-234m	->	U-234	
313.83	4.31E-07	Pa-234	->	U-234	
314.2	0.00E+00	Pb-214	->	Bi-214	
316.29	3.13E-07	Pa-234	->	U-234,	Pa-234m -> U-234
320.7	1.72E-07	Pa-234	->	U-234	
324.3	0.00E+00	Pb-214	->	Bi-214	
330	4.31E-07	Pa-234	->	U-234	
330.62	8.61E-07	Pa-234	->	U-234	
333.6	1.69E-18	Bi-214	->	Po-214	
334.9	1.02E-18	Bi-214	->	Po-214	
338.4	1.12E-06	Pa-234m	->	U-234	
338.5	6.95E-19	Bi-214	->	Po-214	
344.96	1.08E-19	Hg-206	->	Tl-206	
347.1	1.07E-18	Bi-214	->	Po-214	
351.87	0.00E+00	Pb-214	->	Bi-214	
352.16	8.61E-07	Pa-234	->	U-234	
354	4.13E-20	Tl-210	->	Pb-210	
357.9	7.90E-07	Pa-234m	->	U-234	
360.8	6.77E-07	Pa-234m	->	U-234	
364.2	1.12E-19	Bi-214	->	Po-214	
369.52	4.86E-06	Pa-234	->	U-234	
372.02	2.54E-06	Pa-234	->	U-234	
376.6	8.73E-20	Bi-214	->	Po-214	
380	3.10E-20	Tl-210	->	Pb-210	
384.06	7.89E-22	Hg-206	->	Tl-206	
386.834	6.42E-18	Bi-214	->	Po-214	
387.8	9.88E-07	Pa-234m	->	U-234	
387.87	4.24E-07	Pa-234m	->	U-234	
388.95	7.31E-18	Bi-214	->	Po-214	
394	1.60E-19	Bi-214	->	Po-214	
396	5.35E-19	Bi-214	->	Po-214	
405.73	2.98E-18	Bi-214	->	Po-214	
409.8	5.74E-07	Pa-234	->	U-234	
414.72	0.00E+00	Ra-226	->	Rn-222	
416	1.44E-07	Pa-234	->	U-234	
426.5	1.96E-18	Bi-214	->	Po-214	
426.8	8.61E-07	Pa-234	->	U-234	
432.8	1.58E-08	Pa-234	->	U-234	
440.4	5.17E-19	Bi-214	->	Po-214	
446.1	1.72E-07	Pa-234	->	U-234	
449.5	0.00E+00	Ra-226	->	Rn-222	
450.96	2.98E-06	Pa-234m	->	U-234	
453.58	2.10E-06	Pa-234m	->	U-234	
454.832	5.67E-18	Bi-214	->	Po-214	
454.97	1.99E-13	U-234	->	Th-230	
456.5	7.06E-07	Pa-234m	->	U-234	

458.63	2.21E-06	Pa-234	->	U-234
461.3	2.30E-07	Pa-234	->	U-234
462.05	0.00E+00	Pb-214	->	Bi-214
467.5	5.02E-07	Pa-234	->	U-234
468.21	2.03E-06	Pa-234m	->	U-234
469.76	2.37E-18	Bi-214	->	Po-214
470.8	0.00E+00	Pb-214	->	Bi-214
472.32	3.44E-07	Pa-234	->	U-234
473.5	2.58E-07	Pa-234	->	U-234
474.51	2.10E-18	Bi-214	->	Po-214
475.75	2.54E-06	Pa-234m	->	U-234
478	2.07E-20	Tl-210	->	Pb-210
478.7	4.31E-07	Pa-234	->	U-234
480.32	0.00E+00	Pb-214	->	Bi-214
480.4	5.74E-07	Pa-234	->	U-234
482.5	4.31E-07	Pa-234	->	U-234
487.13	0.00E+00	Pb-214	->	Bi-214
494.6	1.60E-19	Bi-214	->	Po-214
498.8	1.44E-07	Pa-234	->	U-234
502.2	3.21E-19	Bi-214	->	Po-214
503.53	7.65E-15	U-234	->	Th-230
506.69	2.31E-06	Pa-234	->	U-234
507.3	1.56E-06	Pa-234m	->	U-234
508.2	1.12E-13	U-234	->	Th-230
509.11	2.12E-06	Pa-234m	->	U-234
510	0.00E+00	Rn-222	->	Po-218
511	0.00E+00	Pb-214	->	Bi-214
513.6	1.87E-06	Pa-234	->	U-234
516.8	1.65E-08	Pa-234m	->	U-234
520.2	8.61E-07	Pa-234	->	U-234
520.4	1.02E-19	Bi-214	->	Po-214
521.09	1.29E-06	Pa-234	->	U-234
525	2.85E-19	Bi-214	->	Po-214
527.04	8.61E-07	Pa-234	->	U-234
533.2	2.87E-07	Pa-234	->	U-234
533.5	0.00E+00	Pb-214	->	Bi-214
536.93	1.27E-18	Bi-214	->	Po-214
537.1	2.30E-07	Pa-234	->	U-234
538.7	0.00E+00	Pb-214	->	Bi-214
542.84	1.52E-18	Bi-214	->	Po-214
543.91	0.00E+00	Pb-214	->	Bi-214
543.98	3.97E-06	Pa-234m	->	U-234
547.1	5.70E-19	Bi-214	->	Po-214
551.8	1.33E-19	Th-230	->	Ra-226
557.3	7.06E-07	Pa-234m	->	U-234
557.7	3.97E-08	Pa-234m	->	U-234
557.78	3.73E-07	Pa-234	->	U-234
565.2	2.01E-06	Pa-234	->	U-234
569.3	2.24E-05	Pa-234	->	U-234
570.5	3.96E-19	Th-230	->	Ra-226

572	8.60E-07	Pa-234m	->	U-234
572.67	1.46E-18	Bi-214	->	Po-214
574.8	2.87E-06	Pa-234	->	U-234
580.06	0.00E+00	Pb-214	->	Bi-214
581.78	9.18E-14	U-234	->	Th-230
585.8	2.15E-07	Pa-234	->	U-234
596	2.14E-19	Bi-214	->	Po-214
600.83	0.00E+00	Ra-226	->	Rn-222
602.1	1.29E-06	Pa-234	->	U-234
609.311	8.22E-16	Bi-214	->	Po-214
611.5	1.15E-06	Pa-234	->	U-234
615.77	1.25E-18	Bi-214	->	Po-214
617	2.87E-07	Pa-234	->	U-234
617.1	6.06E-19	Bi-214	->	Po-214
620	1.33E-19	Th-230	->	Ra-226
624.31	1.15E-06	Pa-234	->	U-234
624.44	6.12E-15	U-234	->	Th-230
625.5	1.41E-06	Pa-234m	->	U-234
626.4	8.73E-20	Bi-214	->	Po-214
627.5	1.15E-06	Pa-234	->	U-234
631.2	3.03E-19	Bi-214	->	Po-214
632	5.74E-07	Pa-234	->	U-234
633.14	1.07E-18	Bi-214	->	Po-214
634.4	4.31E-07	Pa-234	->	U-234
639.36	5.53E-19	Bi-214	->	Po-214
639.7	2.87E-07	Pa-234	->	U-234
643.2	2.87E-07	Pa-234	->	U-234
646.84	4.31E-07	Pa-234	->	U-234
647.7	1.55E-06	Pa-234m	->	U-234
649.1	1.06E-06	Pa-234m	->	U-234
649.18	1.05E-18	Bi-214	->	Po-214
650.21	5.19E-19	Hg-206	->	Tl-206
653.57	8.90E-07	Pa-234	->	U-234
655	5.94E-07	Pa-234	->	U-234
655.1	9.44E-07	Pa-234m	->	U-234
658	1.29E-06	Pa-234	->	U-234
660.6	4.31E-07	Pa-234	->	U-234
660.75	7.67E-19	Bi-214	->	Po-214
664.8	1.87E-06	Pa-234	->	U-234
665.442	2.78E-17	Bi-214	->	Po-214
666.42	1.66E-06	Pa-234	->	U-234
668	2.07E-20	Tl-210	->	Pb-210
669.64	1.88E-06	Pa-234	->	U-234
674.24	6.35E-07	Pa-234m	->	U-234
677.67	7.65E-15	U-234	->	Th-230
683	5.65E-07	Pa-234m	->	U-234
683.21	1.41E-18	Bi-214	->	Po-214
683.3	3.44E-07	Pa-234	->	U-234
687.7	1.07E-19	Bi-214	->	Po-214
688.08	4.02E-07	Pa-234	->	U-234

691.08	9.93E-06	Pa-234m	->	U-234		
692.7	2.15E-06	Pa-234	->	U-234		
693.3	1.07E-19	Bi-214	->	Po-214		
695.9	1.55E-06	Pa-234m	->	U-234		
697.89	6.60E-19	Bi-214	->	Po-214		
698.85	5.82E-06	Pa-234	->	U-234		
700.4	6.96E-07	Pa-234m	->	U-234		
702.05	7.83E-06	Pa-234m	->	U-234		
703.07	8.41E-18	Bi-214	->	Po-214		
705.9	7.17E-06	Pa-234	->	U-234,	Pa-234m	-> U-234
708.4	1.14E-06	Pa-234	->	U-234,	Pa-234m	-> U-234
710.84	1.33E-18	Bi-214	->	Po-214		
711.2	2.87E-07	Pa-234	->	U-234		
713.8	2.30E-07	Pa-234	->	U-234		
718.94	3.42E-08	Pa-234m	->	U-234		
719.856	7.18E-18	Bi-214	->	Po-214		
721.33	3.20E-08	Pa-234m	->	U-234		
723.32	8.02E-19	Bi-214	->	Po-214		
727.8	2.80E-19	Bi-214	->	Po-214		
732.7	1.28E-06	Pa-234m	->	U-234		
733.38	1.27E-05	Pa-234	->	U-234		
733.64	8.38E-19	Bi-214	->	Po-214		
738.88	2.32E-06	Pa-234	->	U-234		
739.95	1.30E-05	Pa-234m	->	U-234		
740.87	6.95E-19	Bi-214	->	Po-214		
742.817	1.04E-04	Pa-234	->	U-234,	Pa-234m	-> U-234
746.5	1.87E-07	Pa-234	->	U-234		
750.5	1.99E-08	Pa-234m	->	U-234		
752.843	2.37E-18	Bi-214	->	Po-214		
755	2.32E-06	Pa-234	->	U-234		
760.1	2.30E-07	Pa-234	->	U-234		
760.3	1.55E-06	Pa-234m	->	U-234		
765.9	0.00E+00	Pb-214	->	Bi-214		
766.369	4.31E-07	Pa-234	->	U-234		
766.412	3.55E-04	Pa-234	->	U-234,	Pa-234m	-> U-234
768.35	8.70E-17	Bi-214	->	Po-214		
768.5	8.04E-07	Pa-234	->	U-234		
777.9	2.87E-07	Pa-234	->	U-234		
780.4	1.58E-06	Pa-234	->	U-234		
782.8	7.48E-06	Pa-234m	->	U-234		
783.38	7.87E-07	Pa-234	->	U-234,	Pa-234m	-> U-234
785.827	0.00E+00	Pb-214	->	Bi-214		
786.287	6.11E-05	Pa-234	->	U-234,	Pa-234m	-> U-234
786.42	5.53E-18	Bi-214	->	Po-214		
793.6	2.15E-06	Pa-234	->	U-234		
796.42	5.96E-06	Pa-234	->	U-234		
797.88	1.02E-18	Tl-210	->	Pb-210,	Po-214	-> Pb-210
799.75	7.31E-19	Bi-214	->	Po-214		
803.13	9.19E-22	Tl-206	->	Pb-206,	Po-210	-> Pb-206
804.52	5.74E-07	Pa-234	->	U-234		

805.74	9.71E-06	Pa-234	->	U-234,	Pa-234m	->	U-234
806.155	2.19E-17	Bi-214	->	Po-214			
808.2	2.87E-06	Pa-234	->	U-234,	Pa-234m	->	U-234
812.5	7.18E-07	Pa-234	->	U-234			
814.87	7.13E-19	Bi-214	->	Po-214			
818	9.88E-07	Pa-234m	->	U-234			
819.21	4.09E-06	Pa-234	->	U-234			
821.166	2.67E-18	Bi-214	->	Po-214			
824.94	7.51E-06	Pa-234	->	U-234			
826.08	1.40E-06	Pa-234m	->	U-234			
826.44	1.64E-18	Bi-214	->	Po-214			
831.39	8.61E-06	Pa-234	->	U-234			
832.34	4.10E-19	Bi-214	->	Po-214			
838.999	0.00E+00	Pb-214	->	Bi-214			
842.4	2.01E-07	Pa-234	->	U-234			
844.4	1.79E-06	Pa-234	->	U-234,	Pa-234m	->	U-234
847.2	3.03E-19	Bi-214	->	Po-214			
851.57	7.72E-06	Pa-234	->	U-234,	Pa-234m	->	U-234
860	7.12E-20	Tl-210	->	Pb-210			
866.98	1.06E-06	Pa-234m	->	U-234			
873.4	1.72E-07	Pa-234	->	U-234			
875.94	4.64E-06	Pa-234	->	U-234			
880.45	2.34E-05	Pa-234	->	U-234			
881.1	3.81E-06	Pa-234m	->	U-234			
882.5	1.83E-06	Pa-234m	->	U-234			
883.22	2.33E-05	Pa-234	->	U-234,	Pa-234m	->	U-234
887.28	7.83E-06	Pa-234m	->	U-234			
898.52	6.51E-06	Pa-234	->	U-234			
904.33	1.87E-18	Bi-214	->	Po-214			
904.38	7.18E-07	Pa-234	->	U-234			
908	3.10E-20	Tl-210	->	Pb-210			
915.8	4.10E-19	Bi-214	->	Po-214			
920	5.74E-07	Pa-234	->	U-234			
921.7	1.40E-05	Pa-234m	->	U-234			
924.98	1.57E-05	Pa-234	->	U-234			
926.61	2.12E-05	Pa-234	->	U-234,	Pa-234m	->	U-234
934.039	5.63E-17	Bi-214	->	Po-214			
936.8	1.83E-06	Pa-234m	->	U-234			
941.94	2.76E-06	Pa-234m	->	U-234			
943.3	3.03E-19	Bi-214	->	Po-214			
945.9	3.70E-05	Pa-234	->	U-234,	Pa-234m	->	U-234
948	1.15E-05	Pa-234	->	U-234			
959.8	8.47E-07	Pa-234m	->	U-234			
960	1.44E-07	Pa-234	->	U-234			
964.07	6.83E-18	Bi-214	->	Po-214			
967.33	8.61E-07	Pa-234	->	U-234			
976.2	4.10E-19	Bi-214	->	Po-214			
978.8	1.44E-06	Pa-234	->	U-234			
980.42	4.97E-06	Pa-234	->	U-234			
984.12	2.73E-06	Pa-234	->	U-234			

989.2	2.14E-19	Bi-214	->	Po-214	
994.93	6.29E-06	Pa-234m	->	U-234	
1000.99	9.25E-04	Pa-234m	->	U-234	
1013.4	1.78E-19	Bi-214	->	Po-214	
1020.5	2.14E-19	Bi-214	->	Po-214	
1022.23	8.61E-07	Pa-234	->	U-234	
1029.03	1.15E-06	Pa-234	->	U-234	
1032.22	1.71E-18	Bi-214	->	Po-214	
1038	3.03E-19	Bi-214	->	Po-214	
1041.7	1.32E-06	Pa-234m	->	U-234	
1044.9	7.18E-07	Pa-234	->	U-234	
1045.4	5.17E-19	Bi-214	->	Po-214	
1051.95	5.62E-18	Bi-214	->	Po-214	
1059.72	1.09E-06	Pa-234m	->	U-234	
1061.86	2.54E-06	Pa-234m	->	U-234	
1067.3	5.17E-19	Bi-214	->	Po-214	
1068	1.24E-19	Tl-210	->	Pb-210	
1070.02	5.08E-18	Bi-214	->	Po-214	
1074.6	3.59E-07	Pa-234	->	U-234	
1084.25	1.32E-06	Pa-234	->	U-234,	Pa-234m -> U-234
1085.37	4.94E-07	Pa-234m	->	U-234	
1103.7	1.78E-18	Bi-214	->	Po-214	
1104.766	1.43E-18	Bi-214	->	Po-214	
1108.5	4.31E-07	Pa-234	->	U-234	
1110	7.12E-20	Tl-210	->	Pb-210	
1120.273	2.67E-16	Bi-214	->	Po-214	
1120.5	1.69E-06	Pa-234m	->	U-234	
1122.09	7.18E-07	Pa-234	->	U-234	
1124.93	4.63E-06	Pa-234m	->	U-234	
1126.17	2.09E-06	Pa-234	->	U-234,	Pa-234m -> U-234
1130.6	8.02E-19	Bi-214	->	Po-214	
1133.65	4.55E-18	Bi-214	->	Po-214	
1153.6	4.31E-07	Pa-234	->	U-234	
1155.183	3.01E-17	Bi-214	->	Po-214	
1171.3	3.44E-07	Pa-234	->	U-234	
1172.93	1.03E-18	Bi-214	->	Po-214	
1173.04	1.03E-18	Bi-214	->	Po-214	
1174.1	1.89E-06	Pa-234m	->	U-234	
1193.69	1.49E-05	Pa-234m	->	U-234	
1207.764	8.20E-18	Bi-214	->	Po-214	
1208	4.31E-07	Tl-210	->	Pb-210,	Pa-234 -> U-234
1216.4	5.31E-07	Pa-234	->	U-234	
1220.37	9.93E-07	Pa-234m	->	U-234	
1226.8	4.81E-19	Bi-214	->	Po-214	
1229	4.31E-07	Pa-234	->	U-234	
1230.84	3.92E-19	Bi-214	->	Po-214	
1237.24	5.85E-06	Pa-234m	->	U-234	
1238.107	1.06E-16	Bi-214	->	Po-214	
1241.4	7.18E-07	Pa-234	->	U-234	
1251	4.31E-07	Pa-234	->	U-234	

1277.4	2.87E-07	Pa-234	->	U-234	
1280.952	2.62E-17	Bi-214	->	Po-214	
1292.66	9.93E-07	Pa-234	->	U-234	
1303.76	2.16E-18	Bi-214	->	Po-214	
1314	2.17E-19	Tl-210	->	Pb-210	
1317.02	1.53E-18	Bi-214	->	Po-214	
1330	1.96E-19	Bi-214	->	Po-214	
1341.5	4.10E-19	Bi-214	->	Po-214	
1352.85	1.67E-06	Pa-234	->	U-234	
1353	4.26E-07	Bi-214	->	Po-214,	Pa-234m -> U-234
1358.5	1.72E-07	Pa-234	->	U-234	
1377.659	7.17E-17	Bi-214	->	Po-214	
1385.295	1.39E-17	Bi-214	->	Po-214	
1392	2.54E-06	Pa-234m	->	U-234	
1392.5	3.39E-19	Bi-214	->	Po-214	
1393.57	4.31E-06	Pa-234	->	U-234	
1399.7	3.30E-07	Pa-234	->	U-234	
1401.48	2.48E-17	Bi-214	->	Po-214	
1407.97	4.42E-17	Bi-214	->	Po-214	
1408	5.06E-20	Tl-210	->	Pb-210	
1413.88	2.54E-06	Pa-234m	->	U-234	
1419.7	9.09E-20	Bi-214	->	Po-214	
1427.33	2.87E-07	Pa-234	->	U-234	
1434.13	1.07E-05	Pa-234m	->	U-234	
1445.7	5.74E-07	Pa-234	->	U-234	
1452.63	1.32E-06	Pa-234	->	U-234	
1457.4	1.83E-06	Pa-234m	->	U-234	
1460	4.31E-07	Pa-234	->	U-234	
1471.1	2.14E-19	Bi-214	->	Po-214	
1479.19	1.23E-18	Bi-214	->	Po-214	
1493.94	2.87E-07	Pa-234	->	U-234	
1500.9	1.27E-06	Pa-234m	->	U-234	
1509.22	3.90E-17	Bi-214	->	Po-214	
1510.2	1.42E-05	Pa-234m	->	U-234	
1516	5.74E-07	Pa-234	->	U-234	
1527.27	2.65E-06	Pa-234m	->	U-234	
1538	2.07E-20	Tl-210	->	Pb-210	
1538.49	7.31E-18	Bi-214	->	Po-214	
1543.347	6.24E-18	Bi-214	->	Po-214	
1548.12	1.54E-06	Pa-234m	->	U-234	
1549.4	1.44E-07	Pa-234	->	U-234	
1553.74	8.93E-06	Pa-234m	->	U-234	
1558.7	7.62E-07	Pa-234m	->	U-234	
1570.67	1.21E-06	Pa-234m	->	U-234	
1580.02	2.44E-07	Pa-234	->	U-234	
1583.22	1.28E-17	Bi-214	->	Po-214	
1585.3	3.59E-07	Pa-234	->	U-234	
1588	2.07E-20	Tl-210	->	Pb-210	
1591.65	2.10E-06	Pa-234m	->	U-234	
1593.88	2.98E-06	Pa-234	->	U-234	

1594.78	4.72E-18	Bi-214	->	Po-214
1599.3	5.95E-18	Bi-214	->	Po-214
1602.2	4.09E-07	Pa-234m	->	U-234
1627.9	2.15E-07	Pa-234	->	U-234
1636.6	3.39E-19	Bi-214	->	Po-214
1637.37	1.25E-18	Bi-214	->	Po-214
1638	5.74E-07	Pa-234	->	U-234
1648	2.07E-20	Tl-210	->	Pb-210
1656	2.15E-07	Pa-234	->	U-234
1661.258	2.05E-17	Bi-214	->	Po-214
1667.3	8.18E-07	Pa-234m	->	U-234
1668.44	1.32E-06	Pa-234	->	U-234
1683.99	4.21E-18	Bi-214	->	Po-214
1686.2	7.18E-07	Pa-234	->	U-234
1693.7	4.51E-07	Pa-234m	->	U-234
1694.08	1.44E-06	Pa-234	->	U-234
1699.8	2.15E-07	Pa-234	->	U-234
1719.5	2.87E-08	Pa-234	->	U-234
1720.5	3.24E-07	Pa-234m	->	U-234
1729.58	5.44E-17	Bi-214	->	Po-214
1732.2	1.83E-06	Pa-234m	->	U-234
1737.73	2.34E-05	Pa-234m	->	U-234
1738	1.44E-07	Pa-234	->	U-234
1741.7	1.44E-07	Pa-234	->	U-234
1750.1	7.18E-08	Pa-234	->	U-234
1756	3.59E-07	Pa-234	->	U-234
1759.81	1.54E-06	Pa-234m	->	U-234
1764.49	2.83E-16	Bi-214	->	Po-214
1765.44	9.60E-06	Pa-234m	->	U-234
1768	8.61E-08	Pa-234	->	U-234
1772.3	1.44E-07	Pa-234	->	U-234
1782.1	2.85E-19	Bi-214	->	Po-214
1796.2	3.10E-07	Pa-234m	->	U-234
1797.3	4.31E-07	Pa-234	->	U-234
1809.04	4.08E-06	Pa-234m	->	U-234
1814.01	2.14E-19	Bi-214	->	Po-214
1819.69	9.93E-07	Pa-234m	->	U-234
1828	4.31E-08	Pa-234	->	U-234
1831.36	1.90E-05	Pa-234m	->	U-234
1837.9	8.61E-08	Pa-234	->	U-234
1838.37	6.83E-18	Bi-214	->	Po-214
1847.41	3.78E-17	Bi-214	->	Po-214
1850	7.18E-08	Pa-234	->	U-234
1863.09	1.32E-06	Pa-234m	->	U-234
1867.68	1.01E-05	Pa-234m	->	U-234
1872.8	1.00E-07	Pa-234	->	U-234
1873.112	4.03E-18	Bi-214	->	Po-214
1874.85	9.04E-06	Pa-234m	->	U-234
1877.21	1.82E-06	Pa-234m	->	U-234
1890.1	2.73E-07	Pa-234	->	U-234

1890.259	1.59E-18	Bi-214	->	Po-214
1893.5	2.43E-06	Pa-234m	->	U-234
1896.28	3.16E-18	Bi-214	->	Po-214
1897.1	2.15E-07	Pa-234	->	U-234
1898.9	1.12E-18	Bi-214	->	Po-214
1905	4.02E-07	Pa-234	->	U-234
1911.17	6.95E-06	Pa-234m	->	U-234
1926	3.43E-07	Pa-234	->	U-234
1926.4	2.10E-07	Pa-234m	->	U-234
1935.8	9.09E-19	Bi-214	->	Po-214
1937.01	3.20E-06	Pa-234m	->	U-234
1937.7	7.18E-08	Pa-234	->	U-234
1959	1.44E-09	Pa-234	->	U-234
1969.9	5.50E-07	Pa-234m	->	U-234
1988	2.87E-09	Pa-234	->	U-234
1994.7	8.91E-20	Bi-214	->	Po-214
1998	1.44E-09	Pa-234	->	U-234
2004.5	5.17E-20	Bi-214	->	Po-214
2008	7.12E-20	Tl-210	->	Pb-210
2010.79	8.73E-19	Bi-214	->	Po-214
2021.7	3.39E-19	Bi-214	->	Po-214
2052.93	1.25E-18	Bi-214	->	Po-214
2085	1.78E-19	Bi-214	->	Po-214
2088	5.06E-20	Tl-210	->	Pb-210
2089.55	9.98E-19	Bi-214	->	Po-214
2109.91	1.55E-18	Bi-214	->	Po-214
2118.53	2.16E-17	Bi-214	->	Po-214
2147.8	2.85E-19	Bi-214	->	Po-214
2192.52	1.09E-18	Bi-214	->	Po-214
2204.09	8.90E-17	Bi-214	->	Po-214
2251.2	1.25E-19	Bi-214	->	Po-214
2259.7	1.60E-19	Bi-214	->	Po-214
2266.67	3.21E-19	Bi-214	->	Po-214
2268	3.10E-20	Tl-210	->	Pb-210
2270	5.17E-20	Bi-214	->	Po-214
2284.4	9.09E-20	Bi-214	->	Po-214
2293.29	5.78E-18	Bi-214	->	Po-214
2324.8	3.39E-20	Bi-214	->	Po-214
2331.2	3.92E-19	Bi-214	->	Po-214
2358	8.26E-20	Tl-210	->	Pb-210
2360.9	3.39E-20	Bi-214	->	Po-214
2369.3	5.17E-20	Bi-214	->	Po-214
2376.99	2.10E-19	Bi-214	->	Po-214
2390.9	3.57E-20	Bi-214	->	Po-214
2423.32	1.05E-19	Bi-214	->	Po-214
2428	9.29E-20	Tl-210	->	Pb-210
2447.68	2.76E-17	Bi-214	->	Po-214
2482.417	3.74E-20	Bi-214	->	Po-214
2505.58	1.05E-19	Bi-214	->	Po-214
2551	6.95E-21	Bi-214	->	Po-214

2604.5	8.02E-21	Bi-214	->	Po-214
2631	1.60E-20	Bi-214	->	Po-214
2662.23	5.17E-21	Bi-214	->	Po-214
2694.67	5.78E-19	Bi-214	->	Po-214
2698.86	4.99E-20	Bi-214	->	Po-214
2719.21	3.21E-20	Bi-214	->	Po-214
2769.99	4.56E-19	Bi-214	->	Po-214
2786.09	1.05E-19	Bi-214	->	Po-214
2827	4.46E-20	Bi-214	->	Po-214
2860.9	6.06E-21	Bi-214	->	Po-214
2880.4	1.64E-19	Bi-214	->	Po-214
2893.59	1.14E-19	Bi-214	->	Po-214
2922.09	2.80E-19	Bi-214	->	Po-214
2928.7	2.14E-20	Bi-214	->	Po-214
2934.9	1.02E-20	Bi-214	->	Po-214
2940.5	3.03E-20	Bi-214	->	Po-214
2978.79	2.62E-19	Bi-214	->	Po-214
2988.7	1.96E-20	Bi-214	->	Po-214
2999.99	1.57E-19	Bi-214	->	Po-214
3053.89	4.03E-19	Bi-214	->	Po-214
3081.7	7.67E-20	Bi-214	->	Po-214
3093.9	9.09E-21	Bi-214	->	Po-214
3136.3	6.06E-21	Bi-214	->	Po-214
3142.6	2.85E-20	Bi-214	->	Po-214
3160.5	9.09E-21	Bi-214	->	Po-214
3183.6	2.67E-20	Bi-214	->	Po-214
3233.3	3.57E-21	Bi-214	->	Po-214
3269.7	1.78E-21	Bi-214	->	Po-214

Pu242	Aged 5 years	Sorted by	Intensity:							
Intensity	Energy	Initial Isotopes and Decays								
(ph/s/gm)	(kev)									
5.95E+06	17.128	Pu-242	->	U-238						
4.79E+06	13.6	Pa-234	->	U-234,	Pa-234m	->	U-234,	Pu-242	-	U-238
1.32E+06	20.292	Pu-242	->	U-238						
2.90E+05	11.62	Pa-234	->	U-234,	Pa-234m	->	U-234,	Pu-242	-	U-238
1.18E+05	15.4	Pa-234	->	U-234,	Pa-234m	->	U-234,	Pu-242	-	U-238
5.23E+04	44.915	Pu-242	->	U-238						
1.13E+04	103.5	Pu-242	->	U-238						
6.54E+02	158.8	Pu-242	->	U-238						
4.86E-03	16.572	Th-234	->	Pa-234m						
4.62E-03	16.161	U-238	->	Th-234						
4.31E-03	13.274	Th-234	->	Pa-234m						
3.98E-03	63.288	Th-234	->	Pa-234m						

3.38E-03	12.952	U-238	->	Th-234		
3.00E-03	92.35	Th-234	->	Pa-234m		
2.97E-03	92.78	Th-234	->	Pa-234m		
1.19E-03	19.839	Th-234	->	Pa-234m		
1.05E-03	19.094	U-238	->	Th-234		
9.25E-04	1000.99	Pa-234m	->	U-234		
3.55E-04	766.412	Pa-234	->	U-234,	Pa-234m	-> U-234
3.04E-04	98.434	Pa-234	->	U-234,	Pa-234m	-> U-234
2.67E-04	112.8	Th-234	->	Pa-234m		
2.56E-04	11.372	Th-234	->	Pa-234m,	Pa-234m	-> U-234
2.03E-04	11.118	U-238	->	Th-234		
1.92E-04	94.651	Pa-234	->	U-234,	Pa-234m	-> U-234
1.30E-04	17.069	Pa-234m	->	U-234		
1.12E-04	111.025	Pa-234	->	U-234,	Pa-234m	-> U-234
1.04E-04	742.817	Pa-234	->	U-234,	Pa-234m	-> U-234
9.34E-05	14.511	U-238	->	Th-234		
8.05E-05	258.26	Pa-234m	->	U-234		
7.88E-05	49.55	U-238	->	Th-234		
7.73E-05	83.31	Th-234	->	Pa-234m		
7.46E-05	17.12	Pa-234	->	U-234		
6.11E-05	786.287	Pa-234	->	U-234,	Pa-234m	-> U-234
5.44E-05	14.953	Th-234	->	Pa-234m,	Pa-234m	-> U-234
4.70E-05	74	Th-234	->	Pa-234m		
3.83E-05	114.866	Pa-234	->	U-234,	Pa-234m	-> U-234
3.70E-05	945.9	Pa-234	->	U-234,	Pa-234m	-> U-234
3.16E-05	131.31	Pa-234	->	U-234		
2.96E-05	16.547	Pa-234m	->	U-234		
2.82E-05	20.366	Pa-234m	->	U-234		
2.70E-05	110.5	U-238	->	Th-234		
2.55E-05	13.275	Pa-234m	->	U-234		
2.34E-05	880.45	Pa-234	->	U-234		
2.34E-05	1737.73	Pa-234m	->	U-234		
2.33E-05	883.22	Pa-234	->	U-234,	Pa-234m	-> U-234
2.24E-05	569.3	Pa-234	->	U-234		
2.12E-05	926.61	Pa-234	->	U-234,	Pa-234m	-> U-234
2.10E-05	62.862	Th-234	->	Pa-234m		
1.90E-05	1831.36	Pa-234m	->	U-234		
1.79E-05	226.95	Pa-234	->	U-234		
1.69E-05	20.309	Pa-234	->	U-234		
1.57E-05	924.98	Pa-234	->	U-234		
1.49E-05	1193.69	Pa-234m	->	U-234		
1.44E-05	95.863	Th-234	->	Pa-234m		
1.42E-05	1510.2	Pa-234m	->	U-234		
1.40E-05	921.7	Pa-234m	->	U-234		
1.33E-05	184.8	Th-234	->	Pa-234m		
1.30E-05	739.95	Pa-234m	->	U-234		
1.27E-05	733.38	Pa-234	->	U-234		
1.15E-05	948	Pa-234	->	U-234		
1.10E-05	20.019	Th-234	->	Pa-234m		
1.07E-05	1434.13	Pa-234m	->	U-234		

1.01E-05	1867.68	Pa-234m	->	U-234	
9.93E-06	691.08	Pa-234m	->	U-234	
9.71E-06	805.74	Pa-234	->	U-234,	Pa-234m -> U-234
9.60E-06	1765.44	Pa-234m	->	U-234	
9.16E-06	152.76	Pa-234	->	U-234	
9.04E-06	1874.85	Pa-234m	->	U-234	
8.93E-06	1553.74	Pa-234m	->	U-234	
8.83E-06	92.279	Th-234	->	Pa-234m	
8.61E-06	831.39	Pa-234	->	U-234	
8.54E-06	62.78	Pa-234	->	U-234,	Pa-234m -> U-234
8.06E-06	87.02	Th-234	->	Pa-234m	
7.83E-06	887.28	Pa-234m	->	U-234	
7.83E-06	702.05	Pa-234m	->	U-234	
7.72E-06	851.57	Pa-234	->	U-234,	Pa-234m -> U-234
7.51E-06	824.94	Pa-234	->	U-234	
7.48E-06	782.8	Pa-234m	->	U-234	
7.41E-06	99.852	Pa-234	->	U-234,	Pa-234m -> U-234
7.17E-06	705.9	Pa-234	->	U-234,	Pa-234m -> U-234
6.95E-06	1911.17	Pa-234m	->	U-234	
6.63E-06	103.71	Th-234	->	Pa-234m	
6.52E-06	108	Th-234	->	Pa-234m	
6.51E-06	898.52	Pa-234	->	U-234	
6.29E-06	994.93	Pa-234m	->	U-234	
5.96E-06	796.42	Pa-234	->	U-234	
5.85E-06	1237.24	Pa-234m	->	U-234	
5.82E-06	698.85	Pa-234	->	U-234	
5.52E-06	108.166	Th-234	->	Pa-234m	
5.52E-06	57.75	Th-234	->	Pa-234m	
5.41E-06	293.874	Pa-234	->	U-234	
4.97E-06	980.42	Pa-234	->	U-234	
4.94E-06	243.5	Pa-234m	->	U-234	
4.86E-06	369.52	Pa-234	->	U-234	
4.64E-06	875.94	Pa-234	->	U-234	
4.63E-06	1124.93	Pa-234m	->	U-234	
4.31E-06	1393.57	Pa-234	->	U-234	
4.09E-06	819.21	Pa-234	->	U-234	
4.08E-06	1809.04	Pa-234m	->	U-234	
3.97E-06	543.98	Pa-234m	->	U-234	
3.87E-06	103.35	Th-234	->	Pa-234m	
3.81E-06	881.1	Pa-234m	->	U-234	
3.53E-06	19.891	Pa-234m	->	U-234	
3.20E-06	1937.01	Pa-234m	->	U-234	
3.13E-06	248.94	Pa-234	->	U-234	
2.98E-06	1593.88	Pa-234	->	U-234	
2.98E-06	203.12	Pa-234	->	U-234,	Pa-234m -> U-234
2.98E-06	450.96	Pa-234m	->	U-234	
2.87E-06	574.8	Pa-234	->	U-234	
2.87E-06	185.92	Pa-234	->	U-234	
2.87E-06	808.2	Pa-234	->	U-234,	Pa-234m -> U-234
2.76E-06	941.94	Pa-234m	->	U-234	

2.73E-06	984.12	Pa-234	->	U-234	
2.65E-06	1527.27	Pa-234m	->	U-234	
2.56E-06	140.15	Pa-234	->	U-234,	Pa-234m -> U-234
2.54E-06	1392	Pa-234m	->	U-234	
2.54E-06	372.02	Pa-234	->	U-234	
2.54E-06	1413.88	Pa-234m	->	U-234	
2.54E-06	1061.86	Pa-234m	->	U-234	
2.54E-06	475.75	Pa-234m	->	U-234	
2.43E-06	1893.5	Pa-234m	->	U-234	
2.32E-06	738.88	Pa-234	->	U-234	
2.32E-06	755	Pa-234	->	U-234	
2.31E-06	506.69	Pa-234	->	U-234	
2.21E-06	458.63	Pa-234	->	U-234	
2.15E-06	793.6	Pa-234	->	U-234	
2.15E-06	692.7	Pa-234	->	U-234	
2.12E-06	509.11	Pa-234m	->	U-234	
2.10E-06	453.58	Pa-234m	->	U-234	
2.10E-06	1591.65	Pa-234m	->	U-234	
2.09E-06	1126.17	Pa-234	->	U-234,	Pa-234m -> U-234
2.03E-06	468.21	Pa-234m	->	U-234	
2.01E-06	565.2	Pa-234	->	U-234	
1.99E-06	272.2	Pa-234	->	U-234	
1.89E-06	1174.1	Pa-234m	->	U-234	
1.88E-06	669.64	Pa-234	->	U-234	
1.87E-06	664.8	Pa-234	->	U-234	
1.87E-06	513.6	Pa-234	->	U-234	
1.83E-06	1457.4	Pa-234m	->	U-234	
1.83E-06	882.5	Pa-234m	->	U-234	
1.83E-06	936.8	Pa-234m	->	U-234	
1.83E-06	1732.2	Pa-234m	->	U-234	
1.82E-06	1877.21	Pa-234m	->	U-234	
1.79E-06	844.4	Pa-234	->	U-234,	Pa-234m -> U-234
1.77E-06	111.897	Th-234	->	Pa-234m	
1.69E-06	1120.5	Pa-234m	->	U-234	
1.69E-06	184.6	Pa-234m	->	U-234	
1.67E-06	1352.85	Pa-234	->	U-234	
1.66E-06	666.42	Pa-234	->	U-234	
1.61E-06	29.49	Th-234	->	Pa-234m	
1.58E-06	780.4	Pa-234	->	U-234	
1.58E-06	200.96	Pa-234	->	U-234	
1.56E-06	507.3	Pa-234m	->	U-234	
1.55E-06	647.7	Pa-234m	->	U-234	
1.55E-06	695.9	Pa-234m	->	U-234	
1.55E-06	760.3	Pa-234m	->	U-234	
1.54E-06	1759.81	Pa-234m	->	U-234	
1.54E-06	1548.12	Pa-234m	->	U-234	
1.44E-06	1694.08	Pa-234	->	U-234	
1.44E-06	125.53	Pa-234	->	U-234	
1.44E-06	978.8	Pa-234	->	U-234	
1.41E-06	625.5	Pa-234m	->	U-234	

1.40E-06	826.08	Pa-234m	->	U-234	
1.32E-06	1452.63	Pa-234	->	U-234	
1.32E-06	1668.44	Pa-234	->	U-234	
1.32E-06	1084.25	Pa-234	->	U-234,	Pa-234m -> U-234
1.32E-06	1863.09	Pa-234m	->	U-234	
1.32E-06	1041.7	Pa-234m	->	U-234	
1.30E-06	210.6	Pa-234m	->	U-234	
1.29E-06	521.09	Pa-234	->	U-234	
1.29E-06	658	Pa-234	->	U-234	
1.29E-06	602.1	Pa-234	->	U-234	
1.29E-06	245.16	Pa-234	->	U-234	
1.28E-06	732.7	Pa-234m	->	U-234	
1.27E-06	1500.9	Pa-234m	->	U-234	
1.25E-06	199.46	Pa-234	->	U-234,	Pa-234m -> U-234
1.21E-06	1570.67	Pa-234m	->	U-234	
1.15E-06	1029.03	Pa-234	->	U-234	
1.15E-06	627.5	Pa-234	->	U-234	
1.15E-06	624.31	Pa-234	->	U-234	
1.15E-06	611.5	Pa-234	->	U-234	
1.14E-06	708.4	Pa-234	->	U-234,	Pa-234m -> U-234
1.12E-06	338.4	Pa-234m	->	U-234	
1.09E-06	1059.72	Pa-234m	->	U-234	
1.06E-06	649.1	Pa-234m	->	U-234	
1.06E-06	866.98	Pa-234m	->	U-234	
1.00E-06	157.96	Pa-234	->	U-234	
9.93E-07	1292.66	Pa-234	->	U-234	
9.93E-07	1220.37	Pa-234m	->	U-234	
9.93E-07	1819.69	Pa-234m	->	U-234	
9.88E-07	818	Pa-234m	->	U-234	
9.88E-07	387.8	Pa-234m	->	U-234	
9.44E-07	655.1	Pa-234m	->	U-234	
8.90E-07	653.57	Pa-234	->	U-234	
8.61E-07	967.33	Pa-234	->	U-234	
8.61E-07	1022.23	Pa-234	->	U-234	
8.61E-07	330.62	Pa-234	->	U-234	
8.61E-07	426.8	Pa-234	->	U-234	
8.61E-07	352.16	Pa-234	->	U-234	
8.61E-07	520.2	Pa-234	->	U-234	
8.61E-07	527.04	Pa-234	->	U-234	
8.61E-07	193.55	Pa-234	->	U-234	
8.60E-07	572	Pa-234m	->	U-234	
8.47E-07	959.8	Pa-234m	->	U-234	
8.18E-07	1667.3	Pa-234m	->	U-234	
8.04E-07	768.5	Pa-234	->	U-234	
7.90E-07	357.9	Pa-234m	->	U-234	
7.87E-07	783.38	Pa-234	->	U-234,	Pa-234m -> U-234
7.84E-07	274.45	Pa-234	->	U-234,	Pa-234m -> U-234
7.62E-07	1558.7	Pa-234m	->	U-234	
7.36E-07	247.7	Pa-234m	->	U-234	
7.18E-07	1044.9	Pa-234	->	U-234	

7.18E-07	1241.4	Pa-234	->	U-234	
7.18E-07	812.5	Pa-234	->	U-234	
7.18E-07	1686.2	Pa-234	->	U-234	
7.18E-07	1122.09	Pa-234	->	U-234	
7.18E-07	170.75	Pa-234	->	U-234	
7.18E-07	904.38	Pa-234	->	U-234	
7.06E-07	557.3	Pa-234m	->	U-234	
7.06E-07	456.5	Pa-234m	->	U-234	
6.96E-07	700.4	Pa-234m	->	U-234	
6.83E-07	276.83	Pa-234	->	U-234,	Pa-234m -> U-234
6.77E-07	360.8	Pa-234m	->	U-234	
6.35E-07	674.24	Pa-234m	->	U-234	
6.21E-07	193.4	Pa-234m	->	U-234	
6.21E-07	299.08	Pa-234m	->	U-234	
5.94E-07	655	Pa-234	->	U-234	
5.74E-07	632	Pa-234	->	U-234	
5.74E-07	409.8	Pa-234	->	U-234	
5.74E-07	1638	Pa-234	->	U-234	
5.74E-07	1516	Pa-234	->	U-234	
5.74E-07	480.4	Pa-234	->	U-234	
5.74E-07	1445.7	Pa-234	->	U-234	
5.74E-07	804.52	Pa-234	->	U-234	
5.74E-07	920	Pa-234	->	U-234	
5.65E-07	683	Pa-234m	->	U-234	
5.50E-07	1969.9	Pa-234m	->	U-234	
5.31E-07	1216.4	Pa-234	->	U-234	
5.08E-07	311	Pa-234m	->	U-234	
5.02E-07	467.5	Pa-234	->	U-234	
5.02E-07	143.9	Pa-234	->	U-234	
4.94E-07	1085.37	Pa-234m	->	U-234	
4.51E-07	1693.7	Pa-234m	->	U-234	
4.31E-07	1208	Tl-210	->	Pb-210,	Pa-234 -> U-234
4.31E-07	1797.3	Pa-234	->	U-234	
4.31E-07	660.6	Pa-234	->	U-234	
4.31E-07	313.83	Pa-234	->	U-234	
4.31E-07	766.369	Pa-234	->	U-234	
4.31E-07	1108.5	Pa-234	->	U-234	
4.31E-07	1251	Pa-234	->	U-234	
4.31E-07	1460	Pa-234	->	U-234	
4.31E-07	1229	Pa-234	->	U-234	
4.31E-07	646.84	Pa-234	->	U-234	
4.31E-07	1153.6	Pa-234	->	U-234	
4.31E-07	634.4	Pa-234	->	U-234	
4.31E-07	330	Pa-234	->	U-234	
4.31E-07	478.7	Pa-234	->	U-234	
4.31E-07	482.5	Pa-234	->	U-234	
4.26E-07	1353	Bi-214	->	Po-214,	Pa-234m -> U-234
4.24E-07	387.87	Pa-234m	->	U-234	
4.09E-07	1602.2	Pa-234m	->	U-234	
4.02E-07	1905	Pa-234	->	U-234	

4.02E-07	688.08	Pa-234	->	U-234	
3.88E-07	79.65	Pa-234	->	U-234	
3.73E-07	557.78	Pa-234	->	U-234	
3.59E-07	1756	Pa-234	->	U-234	
3.59E-07	1585.3	Pa-234	->	U-234	
3.59E-07	1074.6	Pa-234	->	U-234	
3.44E-07	683.3	Pa-234	->	U-234	
3.44E-07	1171.3	Pa-234	->	U-234	
3.44E-07	472.32	Pa-234	->	U-234	
3.43E-07	1926	Pa-234	->	U-234	
3.30E-07	1399.7	Pa-234	->	U-234	
3.30E-07	69.9	Pa-234	->	U-234	
3.24E-07	1720.5	Pa-234m	->	U-234	
3.13E-07	316.29	Pa-234	->	U-234,	Pa-234m -> U-234
3.10E-07	1796.2	Pa-234m	->	U-234	
3.01E-07	134.3	Pa-234	->	U-234	
2.87E-07	777.9	Pa-234	->	U-234	
2.87E-07	617	Pa-234	->	U-234	
2.87E-07	711.2	Pa-234	->	U-234	
2.87E-07	639.7	Pa-234	->	U-234	
2.87E-07	643.2	Pa-234	->	U-234	
2.87E-07	1277.4	Pa-234	->	U-234	
2.87E-07	174.52	Pa-234	->	U-234	
2.87E-07	219.8	Pa-234	->	U-234	
2.87E-07	150	Pa-234	->	U-234	
2.87E-07	1427.33	Pa-234	->	U-234	
2.87E-07	533.2	Pa-234	->	U-234	
2.87E-07	1493.94	Pa-234	->	U-234	
2.73E-07	1890.1	Pa-234	->	U-234	
2.58E-07	473.5	Pa-234	->	U-234	
2.44E-07	267.1	Pa-234	->	U-234	
2.44E-07	1580.02	Pa-234	->	U-234	
2.30E-07	760.1	Pa-234	->	U-234	
2.30E-07	537.1	Pa-234	->	U-234	
2.30E-07	461.3	Pa-234	->	U-234	
2.30E-07	713.8	Pa-234	->	U-234	
2.15E-07	1699.8	Pa-234	->	U-234	
2.15E-07	1627.9	Pa-234	->	U-234	
2.15E-07	137.7	Pa-234	->	U-234	
2.15E-07	1656	Pa-234	->	U-234	
2.15E-07	585.8	Pa-234	->	U-234	
2.15E-07	1897.1	Pa-234	->	U-234	
2.10E-07	1926.4	Pa-234m	->	U-234	
2.01E-07	842.4	Pa-234	->	U-234	
2.01E-07	286.4	Pa-234	->	U-234	
1.87E-07	746.5	Pa-234	->	U-234	
1.72E-07	873.4	Pa-234	->	U-234	
1.72E-07	1358.5	Pa-234	->	U-234	
1.72E-07	320.7	Pa-234	->	U-234	
1.72E-07	446.1	Pa-234	->	U-234	

1.72E-07	103.7	Pa-234	->	U-234
1.72E-07	43.47	Pa-234	->	U-234
1.58E-07	289.25	Pa-234	->	U-234
1.44E-07	498.8	Pa-234	->	U-234
1.44E-07	1741.7	Pa-234	->	U-234
1.44E-07	1772.3	Pa-234	->	U-234
1.44E-07	960	Pa-234	->	U-234
1.44E-07	1738	Pa-234	->	U-234
1.44E-07	309.6	Pa-234	->	U-234
1.44E-07	1549.4	Pa-234	->	U-234
1.44E-07	416	Pa-234	->	U-234
1.29E-07	165.8	Pa-234	->	U-234
1.00E-07	1872.8	Pa-234	->	U-234
1.00E-07	196.43	Pa-234	->	U-234
1.00E-07	278.1	Pa-234	->	U-234
8.61E-08	1837.9	Pa-234	->	U-234
8.61E-08	1768	Pa-234	->	U-234
8.33E-08	67.22	Pa-234	->	U-234
7.61E-08	192.74	Pa-234m	->	U-234
7.18E-08	210.7	Pa-234	->	U-234
7.18E-08	1850	Pa-234	->	U-234
7.18E-08	1937.7	Pa-234	->	U-234
7.18E-08	1750.1	Pa-234	->	U-234
4.31E-08	1828	Pa-234	->	U-234
4.19E-08	236.03	Pa-234m	->	U-234
3.97E-08	557.7	Pa-234m	->	U-234
3.42E-08	718.94	Pa-234m	->	U-234
3.20E-08	721.33	Pa-234m	->	U-234
2.87E-08	1719.5	Pa-234	->	U-234
1.99E-08	750.5	Pa-234m	->	U-234
1.65E-08	516.8	Pa-234m	->	U-234
1.58E-08	45.28	Pa-234	->	U-234
1.58E-08	432.8	Pa-234	->	U-234
1.56E-08	73.9	Pa-234m	->	Pa-234
1.29E-08	58.31	Pa-234	->	U-234
5.17E-09	34.37	Pa-234	->	U-234
2.87E-09	1988	Pa-234	->	U-234
1.44E-09	1959	Pa-234	->	U-234
1.44E-09	1998	Pa-234	->	U-234
9.10E-10	53.23	U-234	->	Th-230
3.14E-10	120.912	U-234	->	Th-230
1.99E-13	454.97	U-234	->	Th-230
1.12E-13	508.2	U-234	->	Th-230
9.18E-14	581.78	U-234	->	Th-230
4.97E-14	67.6758	Th-230	->	Ra-226
7.65E-15	503.53	U-234	->	Th-230
7.65E-15	677.67	U-234	->	Th-230
6.42E-15	143.876	Th-230	->	Ra-226
6.12E-15	624.44	U-234	->	Th-230
1.47E-15	253.732	Th-230	->	Ra-226

1.16E-15	186.057	Th-230	->	Ra-226
8.22E-16	609.311	Bi-214	->	Po-214
2.83E-16	1764.49	Bi-214	->	Po-214
2.67E-16	1120.273	Bi-214	->	Po-214
1.12E-16	253.84	Th-230	->	Ra-226
1.06E-16	1238.107	Bi-214	->	Po-214
8.90E-17	2204.09	Bi-214	->	Po-214
8.70E-17	768.35	Bi-214	->	Po-214
7.17E-17	1377.659	Bi-214	->	Po-214
5.63E-17	934.039	Bi-214	->	Po-214
5.44E-17	1729.58	Bi-214	->	Po-214
4.42E-17	1407.97	Bi-214	->	Po-214
3.90E-17	1509.22	Bi-214	->	Po-214
3.78E-17	1847.41	Bi-214	->	Po-214
3.01E-17	1155.183	Bi-214	->	Po-214
2.78E-17	665.442	Bi-214	->	Po-214
2.76E-17	2447.68	Bi-214	->	Po-214
2.62E-17	1280.952	Bi-214	->	Po-214
2.48E-17	1401.48	Bi-214	->	Po-214
2.19E-17	806.155	Bi-214	->	Po-214
2.16E-17	2118.53	Bi-214	->	Po-214
2.05E-17	1661.258	Bi-214	->	Po-214
1.73E-17	79.29	Bi-214	->	Po-214
1.39E-17	1385.295	Bi-214	->	Po-214
1.28E-17	1583.22	Bi-214	->	Po-214
1.03E-17	76.838	Bi-214	->	Po-214
8.41E-18	703.07	Bi-214	->	Po-214
8.20E-18	1207.764	Bi-214	->	Po-214
7.80E-18	109.97	Th-230	->	Ra-226
7.31E-18	1538.49	Bi-214	->	Po-214
7.31E-18	388.95	Bi-214	->	Po-214
7.18E-18	719.856	Bi-214	->	Po-214
6.83E-18	11.119	Bi-214	->	Po-214
6.83E-18	1838.37	Bi-214	->	Po-214
6.83E-18	964.07	Bi-214	->	Po-214
6.60E-18	13.502	Bi-214	->	Po-214
6.42E-18	386.834	Bi-214	->	Po-214
6.24E-18	1543.347	Bi-214	->	Po-214
6.15E-18	89.639	Bi-214	->	Po-214
5.95E-18	1599.3	Bi-214	->	Po-214
5.78E-18	2293.29	Bi-214	->	Po-214
5.67E-18	454.832	Bi-214	->	Po-214
5.62E-18	1051.95	Bi-214	->	Po-214
5.61E-18	302.25	Hg-206	->	Tl-206
5.53E-18	786.42	Bi-214	->	Po-214
5.08E-18	1070.02	Bi-214	->	Po-214
4.72E-18	1594.78	Bi-214	->	Po-214
4.55E-18	1133.65	Bi-214	->	Po-214
4.21E-18	1683.99	Bi-214	->	Po-214
4.03E-18	1873.112	Bi-214	->	Po-214

3.21E-18	273.7	Bi-214	->	Po-214	
3.16E-18	1896.28	Bi-214	->	Po-214	
2.98E-18	405.73	Bi-214	->	Po-214	
2.67E-18	821.166	Bi-214	->	Po-214	
2.37E-18	752.843	Bi-214	->	Po-214	
2.37E-18	469.76	Bi-214	->	Po-214	
2.16E-18	1303.76	Bi-214	->	Po-214	
2.10E-18	474.51	Bi-214	->	Po-214	
1.96E-18	426.5	Bi-214	->	Po-214	
1.87E-18	92.673	Bi-214	->	Po-214	
1.87E-18	904.33	Bi-214	->	Po-214	
1.78E-18	1103.7	Bi-214	->	Po-214	
1.71E-18	1032.22	Bi-214	->	Po-214	
1.69E-18	333.6	Bi-214	->	Po-214	
1.64E-18	826.44	Bi-214	->	Po-214	
1.59E-18	1890.259	Bi-214	->	Po-214	
1.55E-18	2109.91	Bi-214	->	Po-214	
1.53E-18	1317.02	Bi-214	->	Po-214	
1.52E-18	542.84	Bi-214	->	Po-214	
1.46E-18	572.67	Bi-214	->	Po-214	
1.44E-18	280.93	Bi-214	->	Po-214	
1.43E-18	1104.766	Bi-214	->	Po-214	
1.41E-18	683.21	Bi-214	->	Po-214	
1.33E-18	710.84	Bi-214	->	Po-214	
1.27E-18	15.874	Bi-214	->	Po-214	
1.27E-18	536.93	Bi-214	->	Po-214	
1.25E-18	615.77	Bi-214	->	Po-214	
1.25E-18	2052.93	Bi-214	->	Po-214	
1.25E-18	1637.37	Bi-214	->	Po-214	
1.23E-18	1479.19	Bi-214	->	Po-214	
1.12E-18	1898.9	Bi-214	->	Po-214	
1.09E-18	2192.52	Bi-214	->	Po-214	
1.07E-18	235.01	Th-230	->	Ra-226	
1.07E-18	347.1	Bi-214	->	Po-214	
1.07E-18	633.14	Bi-214	->	Po-214	
1.05E-18	649.18	Bi-214	->	Po-214	
1.03E-18	1172.93	Bi-214	->	Po-214	
1.03E-18	1173.04	Bi-214	->	Po-214	
1.02E-18	797.88	Tl-210	->	Pb-210,	Po-214 -> Pb-210
1.02E-18	334.9	Bi-214	->	Po-214	
9.98E-19	2089.55	Bi-214	->	Po-214	
9.09E-19	1935.8	Bi-214	->	Po-214	
8.73E-19	2010.79	Bi-214	->	Po-214	
8.72E-19	72.873	Hg-206	->	Tl-206	
8.38E-19	733.64	Bi-214	->	Po-214	
8.16E-19	298.1	Tl-210	->	Pb-210,	Po-214 -> Pb-210
8.02E-19	1130.6	Bi-214	->	Po-214	
8.02E-19	723.32	Bi-214	->	Po-214	
7.67E-19	660.75	Bi-214	->	Po-214	
7.31E-19	799.75	Bi-214	->	Po-214	

7.13E-19	814.87	Bi-214	->	Po-214
6.95E-19	338.5	Bi-214	->	Po-214
6.95E-19	740.87	Bi-214	->	Po-214
6.61E-19	205.1	Th-230	->	Ra-226
6.60E-19	697.89	Bi-214	->	Po-214
6.06E-19	304.42	Bi-214	->	Po-214
6.06E-19	617.1	Bi-214	->	Po-214
5.78E-19	2694.67	Bi-214	->	Po-214
5.70E-19	286.9	Bi-214	->	Po-214
5.70E-19	547.1	Bi-214	->	Po-214
5.53E-19	639.36	Bi-214	->	Po-214
5.35E-19	396	Bi-214	->	Po-214
5.19E-19	650.21	Hg-206	->	Tl-206
5.19E-19	70.832	Hg-206	->	Tl-206
5.17E-19	440.4	Bi-214	->	Po-214
5.17E-19	1067.3	Bi-214	->	Po-214
5.17E-19	1045.4	Bi-214	->	Po-214
4.81E-19	1226.8	Bi-214	->	Po-214
4.56E-19	2769.99	Bi-214	->	Po-214
4.10E-19	1341.5	Bi-214	->	Po-214
4.10E-19	976.2	Bi-214	->	Po-214
4.10E-19	915.8	Bi-214	->	Po-214
4.10E-19	832.34	Bi-214	->	Po-214
4.03E-19	3053.89	Bi-214	->	Po-214
3.96E-19	570.5	Th-230	->	Ra-226
3.92E-19	2331.2	Bi-214	->	Po-214
3.92E-19	1230.84	Bi-214	->	Po-214
3.57E-19	9.658	Bi-214	->	Po-214
3.39E-19	2021.7	Bi-214	->	Po-214
3.39E-19	1636.6	Bi-214	->	Po-214
3.39E-19	1392.5	Bi-214	->	Po-214
3.21E-19	2266.67	Bi-214	->	Po-214
3.21E-19	502.2	Bi-214	->	Po-214
3.11E-19	10.259	Hg-206	->	Tl-206
3.11E-19	82.434	Hg-206	->	Tl-206
3.03E-19	631.2	Bi-214	->	Po-214
3.03E-19	847.2	Bi-214	->	Po-214
3.03E-19	943.3	Bi-214	->	Po-214
3.03E-19	1038	Bi-214	->	Po-214
2.85E-19	1782.1	Bi-214	->	Po-214
2.85E-19	2147.8	Bi-214	->	Po-214
2.85E-19	525	Bi-214	->	Po-214
2.80E-19	2922.09	Bi-214	->	Po-214
2.80E-19	727.8	Bi-214	->	Po-214
2.70E-19	12.313	Hg-206	->	Tl-206
2.62E-19	2978.79	Bi-214	->	Po-214
2.17E-19	1314	Tl-210	->	Pb-210
2.14E-19	1020.5	Bi-214	->	Po-214
2.14E-19	989.2	Bi-214	->	Po-214
2.14E-19	1814.01	Bi-214	->	Po-214

2.14E-19	596	Bi-214	->	Po-214	
2.14E-19	1471.1	Bi-214	->	Po-214	
2.10E-19	2376.99	Bi-214	->	Po-214	
1.96E-19	1330	Bi-214	->	Po-214	
1.78E-19	2085	Bi-214	->	Po-214	
1.78E-19	1013.4	Bi-214	->	Po-214	
1.64E-19	2880.4	Bi-214	->	Po-214	
1.60E-19	494.6	Bi-214	->	Po-214	
1.60E-19	2259.7	Bi-214	->	Po-214	
1.60E-19	394	Bi-214	->	Po-214	
1.57E-19	2999.99	Bi-214	->	Po-214	
1.33E-19	551.8	Th-230	->	Ra-226	
1.33E-19	620	Th-230	->	Ra-226	
1.25E-19	2251.2	Bi-214	->	Po-214	
1.24E-19	1068	Tl-210	->	Pb-210	
1.14E-19	2893.59	Bi-214	->	Po-214	
1.14E-19	12.678	Tl-210	->	Pb-210	
1.12E-19	364.2	Bi-214	->	Po-214	
1.08E-19	344.96	Hg-206	->	Tl-206	
1.07E-19	693.3	Bi-214	->	Po-214	
1.07E-19	687.7	Bi-214	->	Po-214	
1.05E-19	2505.58	Bi-214	->	Po-214	
1.05E-19	2423.32	Bi-214	->	Po-214	
1.05E-19	2786.09	Bi-214	->	Po-214	
1.02E-19	520.4	Bi-214	->	Po-214	
9.80E-20	12.085	Bi-214	->	Po-214	
9.29E-20	2428	Tl-210	->	Pb-210	
9.09E-20	2284.4	Bi-214	->	Po-214	
9.09E-20	1419.7	Bi-214	->	Po-214	
8.91E-20	1994.7	Bi-214	->	Po-214	
8.73E-20	10.541	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
8.73E-20	626.4	Bi-214	->	Po-214	
8.73E-20	376.6	Bi-214	->	Po-214	
8.72E-20	85.185	Hg-206	->	Tl-206	
8.26E-20	2358	Tl-210	->	Pb-210	
7.67E-20	3081.7	Bi-214	->	Po-214	
7.12E-20	2008	Tl-210	->	Pb-210	
7.12E-20	1110	Tl-210	->	Pb-210	
7.12E-20	860	Tl-210	->	Pb-210	
5.29E-20	74.969	Tl-206	->	Pb-206,	Tl-210 -> Pb-210
5.17E-20	2270	Bi-214	->	Po-214	
5.17E-20	2369.3	Bi-214	->	Po-214	
5.17E-20	2004.5	Bi-214	->	Po-214	
5.06E-20	1408	Tl-210	->	Pb-210	
5.06E-20	2088	Tl-210	->	Pb-210	
4.99E-20	2698.86	Bi-214	->	Po-214	
4.98E-20	14.407	Hg-206	->	Tl-206	
4.46E-20	2827	Bi-214	->	Po-214	
4.16E-20	13.066	Pb-210	->	Bi-210	
4.13E-20	354	Tl-210	->	Pb-210	

4.13E-20	95	Tl-210	->	Pb-210		
3.74E-20	2482.417	Bi-214	->	Po-214		
3.68E-20	10.828	Pb-210	->	Bi-210,	Pb-214	-> Bi-214
3.57E-20	2390.9	Bi-214	->	Po-214		
3.39E-20	2324.8	Bi-214	->	Po-214		
3.39E-20	2360.9	Bi-214	->	Po-214		
3.22E-20	72.803	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
3.21E-20	2719.21	Bi-214	->	Po-214		
3.10E-20	2268	Tl-210	->	Pb-210		
3.10E-20	908	Tl-210	->	Pb-210		
3.10E-20	380	Tl-210	->	Pb-210		
3.03E-20	2940.5	Bi-214	->	Po-214		
2.85E-20	3142.6	Bi-214	->	Po-214		
2.67E-20	3183.6	Bi-214	->	Po-214		
2.30E-20	14.836	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
2.14E-20	2928.7	Bi-214	->	Po-214		
2.07E-20	478	Tl-210	->	Pb-210		
2.07E-20	1538	Tl-210	->	Pb-210		
2.07E-20	1588	Tl-210	->	Pb-210		
2.07E-20	668	Tl-210	->	Pb-210		
2.07E-20	1648	Tl-210	->	Pb-210		
2.07E-20	81	Tl-210	->	Pb-210		
1.96E-20	2988.7	Bi-214	->	Po-214		
1.89E-20	84.789	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
1.62E-20	46.52	Pb-210	->	Bi-210		
1.60E-20	2631	Bi-214	->	Po-214		
1.50E-20	8.953	Hg-206	->	Tl-206		
1.02E-20	2934.9	Bi-214	->	Po-214		
9.99E-21	15.537	Pb-210	->	Bi-210		
9.09E-21	3160.5	Bi-214	->	Po-214		
9.09E-21	3093.9	Bi-214	->	Po-214		
8.02E-21	2604.5	Bi-214	->	Po-214		
6.95E-21	2551	Bi-214	->	Po-214		
6.06E-21	3136.3	Bi-214	->	Po-214		
6.06E-21	2860.9	Bi-214	->	Po-214		
5.41E-21	87.632	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
5.17E-21	2662.23	Bi-214	->	Po-214		
4.32E-21	9.185	Tl-206	->	Pb-206,	Tl-210	-> Pb-210
3.95E-21	10.994	Hg-206	->	Tl-206		
3.57E-21	3233.3	Bi-214	->	Po-214		
2.07E-21	11.349	Tl-210	->	Pb-210		
1.88E-21	9.419	Pb-210	->	Bi-210,	Pb-214	-> Bi-214
1.78E-21	3269.7	Bi-214	->	Po-214		
1.45E-21	12.71	Tl-206	->	Pb-206		
9.19E-22	803.13	Tl-206	->	Pb-206,	Po-210	-> Pb-206
7.89E-22	384.06	Hg-206	->	Tl-206		
3.16E-22	11.712	Pb-210	->	Bi-210,	Pb-214	-> Bi-214
2.30E-23	11.439	Tl-206	->	Pb-206		
4.80E-31	266.15	Bi-210	->	Tl-206		
0.00E+00	87.19	Pb-214	->	Bi-214		

0.00E+00	83.787	Ra-226	->	Rn-222
0.00E+00	81.067	Ra-226	->	Rn-222
0.00E+00	12.855	Ra-226	->	Rn-222
0.00E+00	10.137	Ra-226	->	Rn-222
0.00E+00	77.107	Pb-214	->	Bi-214
0.00E+00	74.814	Pb-214	->	Bi-214
0.00E+00	53.172	Pb-214	->	Bi-214
0.00E+00	16.874	Ra-226	->	Rn-222
0.00E+00	15.439	Pb-214	->	Bi-214
0.00E+00	14.336	Ra-226	->	Rn-222
0.00E+00	11.713	Ra-226	->	Rn-222
0.00E+00	13.088	Pb-214	->	Bi-214
0.00E+00	838.999	Pb-214	->	Bi-214
0.00E+00	785.827	Pb-214	->	Bi-214
0.00E+00	765.9	Pb-214	->	Bi-214
0.00E+00	600.83	Ra-226	->	Rn-222
0.00E+00	580.06	Pb-214	->	Bi-214
0.00E+00	543.91	Pb-214	->	Bi-214
0.00E+00	538.7	Pb-214	->	Bi-214
0.00E+00	533.5	Pb-214	->	Bi-214
0.00E+00	511	Pb-214	->	Bi-214
0.00E+00	510	Rn-222	->	Po-218
0.00E+00	487.13	Pb-214	->	Bi-214
0.00E+00	480.32	Pb-214	->	Bi-214
0.00E+00	470.8	Pb-214	->	Bi-214
0.00E+00	462.05	Pb-214	->	Bi-214
0.00E+00	449.5	Ra-226	->	Rn-222
0.00E+00	414.72	Ra-226	->	Rn-222
0.00E+00	351.87	Pb-214	->	Bi-214
0.00E+00	324.3	Pb-214	->	Bi-214
0.00E+00	314.2	Pb-214	->	Bi-214
0.00E+00	305.5	Pb-214	->	Bi-214
0.00E+00	295.091	Pb-214	->	Bi-214
0.00E+00	274.56	Pb-214	->	Bi-214
0.00E+00	262.41	Ra-226	->	Rn-222
0.00E+00	258.94	Pb-214	->	Bi-214
0.00E+00	241.92	Pb-214	->	Bi-214
0.00E+00	196.3	Pb-214	->	Bi-214
0.00E+00	186.11	Ra-226	->	Rn-222
0.00E+00	141.3	Pb-214	->	Bi-214
0.00E+00	137.4	Pb-214	->	Bi-214
0.00E+00	97.907	Ra-226	->	Rn-222
0.00E+00	94.677	Ra-226	->	Rn-222
0.00E+00	90.128	Pb-214	->	Bi-214

Am-241 100% Aged 5 years

507 lines computed

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays		
kev	ph/s/gm			
8.953	1.54E-11	Bi-213	->	Tl-209
9.185	1.27E-08	Tl-209	->	Pb-209
9.658	7.82E-08	Bi-213	->	Po-213
9.897	1.30E-07	Fr-221	->	At-217
10.259	3.34E-10	Bi-213	->	Tl-209
10.381	1.33E-06	Ac-225	->	Fr-221
10.541	2.47E-07	Tl-209	->	Pb-209
10.871	1.02E-06	Ra-225	->	Ac-225
10.994	4.01E-12	Bi-213	->	Tl-209
11.118	3.20E-03	U-233	->	Th-229
11.119	1.50E-06	Bi-213	->	Po-213
11.349	3.41E-09	Tl-209	->	Pb-209
11.372	2.35E+03	Np-237	->	Pa-233
11.414	2.45E-06	Fr-221	->	At-217
11.62	2.14E+03	Pa-233	->	U-233
11.871	1.02E+09	Am-241	->	Np-237
12.017	2.42E-05	Ac-225	->	Fr-221
12.085	2.03E-08	Bi-213	->	Po-213
12.311	2.68E-10	Bi-213	->	Tl-209
12.466	5.17E-08	Fr-221	->	At-217
12.636	1.75E-05	Ra-225	->	Ac-225
12.703	2.34E-07	Tl-209	->	Pb-209
12.952	5.55E-02	U-233	->	Th-229
13.255	4.96E-07	Ac-225	->	Fr-221
13.274	3.92E+04	Np-237	->	Pa-233
13.504	1.39E-06	Bi-213	->	Po-213
13.6	3.60E+04	Pa-233	->	U-233
13.911	2.97E-06	Fr-221	->	At-217
13.927	1.64E+10	Am-241	->	Np-237
14.082	2.89E-07	Ra-225	->	Ac-225
14.402	5.35E-11	Bi-213	->	Tl-209
14.511	1.22E-03	U-233	->	Th-229
14.772	2.97E-05	Ac-225	->	Fr-221
14.871	4.21E-08	Tl-209	->	Pb-209
14.953	9.61E+02	Np-237	->	Pa-233
15.4	4.60E+02	Pa-233	->	U-233
15.662	1.94E-05	Ra-225	->	Ac-225
15.861	4.15E+08	Am-241	->	Np-237
15.878	2.67E-07	Bi-213	->	Po-213
16.141	7.04E-02	U-233	->	Th-229
16.361	6.16E-07	Fr-221	->	At-217
16.632	5.11E+04	Np-237	->	Pa-233
17.058	3.80E+04	Pa-233	->	U-233

17.269	7.20E+00	Pa-233	->	U-233
17.349	5.59E-07	Th-229	->	Ra-225
17.449	6.50E-06	Ac-225	->	Fr-221
17.611	2.54E+10	Am-241	->	Np-237
18.593	4.44E-06	Ra-225	->	Ac-225
19.148	1.71E-02	U-233	->	Th-229
19.718	1.19E+04	Np-237	->	Pa-233
20.42	9.00E+03	Pa-233	->	U-233
20.997	6.54E+09	Am-241	->	Np-237
25.304	2.58E-05	U-233	->	Th-229
25.373	1.18E-07	Th-229	->	Ra-225
25.98	4.65E-09	Ac-225	->	Fr-221
26.3445	3.02E+09	Am-241	->	Np-237
28.578	1.30E+02	Pa-233	->	U-233
29.191	1.45E-04	U-233	->	Th-229
29.378	2.64E+04	Np-237	->	Pa-233
31.24	5.76E-06	U-233	->	Th-229
31.37	1.35E-05	Th-229	->	Ra-225
32.2	2.19E+07	Am-241	->	Np-237
32.27	2.11E-05	U-233	->	Th-229
33.192	1.51E+08	Am-241	->	Np-237
36.65	4.65E-08	Ac-225	->	Fr-221
37.85	7.68E-06	U-233	->	Th-229
38.51	2.79E-08	Ac-225	->	Fr-221
40.34	9.20E-05	Ra-225	->	Ac-225
40.415	7.20E+01	Pa-233	->	U-233
41.718	2.60E+01	Pa-233	->	U-233
42.441	1.28E-03	U-233	->	Th-229
42.64	1.26E+06	Am-241	->	Np-237
42.722	5.26E-07	Th-229	->	Ra-225
43.415	9.18E+07	Am-241	->	Np-237
46.57	2.72E+02	Np-237	->	Pa-233
49.2	3.35E-08	Ac-225	->	Fr-221
51.013	3.14E+04	Am-241	->	Np-237
52.613	5.33E-06	U-233	->	Th-229
53.559	9.17E-05	U-233	->	Th-229
53.82	5.88E-08	Ac-225	->	Fr-221
54.04	7.55E+05	Am-241	->	Np-237
54.702	2.99E-04	U-233	->	Th-229
55.528	2.52E+07	Am-241	->	Np-237
56.58	1.09E-06	Th-229	->	Ra-225
57.149	7.97E+02	Np-237	->	Pa-233
57.77	1.30E-08	Ac-225	->	Fr-221
59.536	4.52E+10	Am-241	->	Np-237
62.66	2.45E+01	Np-237	->	Pa-233
62.93	1.70E-06	Ac-225	->	Fr-221
63.69	7.04E-07	U-233	->	Th-229
63.95	3.27E+01	Np-237	->	Pa-233
64.23	1.73E-07	Ac-225	->	Fr-221
64.817	1.76E+05	Am-241	->	Np-237

66.11	1.79E-05	U-233	->	Th-229
67.46	5.53E+05	Am-241	->	Np-237
67.96	6.83E-06	U-233	->	Th-229
68.14	3.29E-07	Th-229	->	Ra-225
68.88	3.62E-07	Th-229	->	Ra-225
68.97	2.30E-06	U-233	->	Th-229
69.76	3.02E+07	Am-241	->	Np-237
69.85	1.58E-08	Ac-225	->	Fr-221
70.35	1.28E-05	U-233	->	Th-229
70.62	3.27E+01	Np-237	->	Pa-233
70.832	5.35E-10	Bi-213	->	Tl-209
70.92	3.10E-08	Ac-225	->	Fr-221
71.71	4.55E-08	Ac-225	->	Fr-221
71.847	5.76E-05	U-233	->	Th-229
72.803	4.01E-07	Tl-209	->	Pb-209
72.821	1.26E-05	U-233	->	Th-229
72.873	8.70E-10	Bi-213	->	Tl-209
73.6	5.27E-08	Ac-225	->	Fr-221
73.84	1.00E-06	Ac-225	->	Fr-221
74.46	2.27E+01	Np-237	->	Pa-233
74.5	3.20E-05	U-233	->	Th-229
74.9	1.12E-07	Ac-225	->	Fr-221
74.969	6.76E-07	Tl-209	->	Pb-209
75.17	1.64E-06	Th-229	->	Ra-225
75.343	2.34E+03	Pa-233	->	U-233
75.83	1.38E+05	Am-241	->	Np-237
76.32	8.32E-06	U-233	->	Th-229
76.858	2.36E-06	Bi-213	->	Po-213
77.1	1.54E-05	U-233	->	Th-229
78.41	1.28E-06	U-233	->	Th-229
78.947	2.63E-06	Fr-221	->	At-217
79.29	3.91E-06	Bi-213	->	Po-213
81.517	4.37E-06	Fr-221	->	At-217
82.434	3.34E-10	Bi-213	->	Tl-209
82.9	4.65E-07	Ac-225	->	Fr-221
82.957	3.84E-06	U-233	->	Th-229
83.229	3.90E-06	Ac-225	->	Fr-221
84.27	1.60E-06	U-233	->	Th-229
84.789	2.41E-07	Tl-209	->	Pb-209
85.185	8.70E-11	Bi-213	->	Tl-209
85.402	4.05E-06	U-233	->	Th-229
86.105	6.44E-06	Ac-225	->	Fr-221
86.23	1.25E-06	Th-229	->	Ra-225
86.44	9.87E-06	Th-229	->	Ra-225
86.5	2.86E+04	Np-237	->	Pa-233
86.652	3.52E+03	Pa-233	->	U-233
86.74	2.77E-06	U-233	->	Th-229
87.24	4.05E-06	U-233	->	Th-229
87.39	8.98E-07	Ac-225	->	Fr-221
87.632	6.89E-08	Tl-209	->	Pb-209

88.05	3.68E+02	Np-237	->	Pa-233
88.43	9.39E-06	U-233	->	Th-229
89.639	1.39E-06	Bi-213	->	Po-213
89.957	2.22E-04	U-233	->	Th-229
90.994	7.04E-06	U-233	->	Th-229
92.136	1.55E-06	Fr-221	->	At-217
92.282	3.25E+03	Np-237	->	Pa-233
92.673	4.24E-07	Bi-213	->	Po-213
93.36	3.61E-04	U-233	->	Th-229
94.66	2.04E+04	Pa-233	->	U-233
94.723	1.55E+03	Np-237	->	Pa-233
94.87	4.96E-07	Ac-225	->	Fr-221
95.265	4.80E-07	Fr-221	->	At-217
95.858	5.93E+03	Np-237	->	Pa-233
96.17	9.29E-08	Ac-225	->	Fr-221
96.215	2.99E-05	U-233	->	Th-229
96.67	5.91E+04	Am-241	->	Np-237
97.071	1.48E+06	Am-241	->	Np-237
97.143	4.69E-04	U-233	->	Th-229
97.2	5.88E-08	Fr-221	->	At-217
97.272	2.32E-06	Ac-225	->	Fr-221
98.443	3.20E+04	Pa-233	->	U-233
98.951	2.55E+07	Am-241	->	Np-237
99.58	1.95E-06	Ac-225	->	Fr-221
99.82	5.20E-06	Ac-225	->	Fr-221
100.008	1.17E-06	U-233	->	Th-229
100.599	7.43E-07	Ac-225	->	Fr-221
100.88	1.86E-07	Ac-225	->	Fr-221
101.066	2.48E+06	Am-241	->	Np-237
101.8	1.92E-06	U-233	->	Th-229
102.966	2.45E+07	Am-241	->	Np-237
103.375	2.13E-06	U-233	->	Th-229
103.44	2.79E-08	Ac-225	->	Fr-221
103.921	1.38E+03	Pa-233	->	U-233
105.362	1.30E-04	U-233	->	Th-229
106.13	1.14E+02	Np-237	->	Pa-233
107.16	2.63E-06	Th-229	->	Ra-225
108.166	1.92E+03	Np-237	->	Pa-233
108.36	8.36E-07	Ac-225	->	Fr-221
108.69	1.49E+02	Np-237	->	Pa-233
108.99	4.33E-05	U-233	->	Th-229
109.47	6.61E-06	U-233	->	Th-229
111.298	1.20E+04	Pa-233	->	U-233
111.56	1.01E-06	Ac-225	->	Fr-221
111.897	6.34E+02	Np-237	->	Pa-233
111.935	1.00E-05	U-233	->	Th-229
113.3	2.98E+05	Am-241	->	Np-237
114.23	5.94E+05	Am-241	->	Np-237
114.28	5.33E-06	U-233	->	Th-229
114.445	4.00E+03	Pa-233	->	U-233

115.19	5.11E+00	Np-237	->	Pa-233
116.26	4.48E-06	U-233	->	Th-229
117	5.42E-06	Tl-209	->	Pb-209
117.155	5.97E-05	U-233	->	Th-229
117.58	2.89E+05	Am-241	->	Np-237
117.689	3.29E+02	Np-237	->	Pa-233
118.47	1.08E-07	Fr-221	->	At-217
118.97	6.83E-05	U-233	->	Th-229
119.92	1.86E-07	Ac-225	->	Fr-221
120.81	4.48E-05	U-233	->	Th-229
122.994	1.26E+06	Am-241	->	Np-237
123.76	5.88E-07	Ac-225	->	Fr-221
123.91	1.39E-05	U-233	->	Th-229
124.51	3.29E-06	Th-229	->	Ra-225
124.72	1.97E-06	Th-229	->	Ra-225
124.81	1.55E-07	Ac-225	->	Fr-221
125.292	5.13E+06	Am-241	->	Np-237
125.398	1.39E-06	U-233	->	Th-229
126.23	4.34E-08	Ac-225	->	Fr-221
129.19	1.33E-08	Ac-225	->	Fr-221
129.2	1.49E-06	U-233	->	Th-229
131.09	1.74E+02	Np-237	->	Pa-233
131.2	7.04E-07	U-233	->	Th-229
131.92	1.09E-06	Th-229	->	Ra-225
134.23	1.37E+02	Np-237	->	Pa-233
135.01	1.24E-07	Ac-225	->	Fr-221
135.328	4.69E-05	U-233	->	Th-229
137.02	5.26E-06	Th-229	->	Ra-225
138.2	6.19E-08	Ac-225	->	Fr-221
138.5	4.27E-07	U-233	->	Th-229
139.53	6.72E+03	Am-241	->	Np-237
139.76	2.24E-06	U-233	->	Th-229
140.61	3.68E+01	Np-237	->	Pa-233
142.98	1.41E-06	Th-229	->	Ra-225
143.227	7.97E+02	Np-237	->	Pa-233
144.52	6.40E-06	U-233	->	Th-229
145.15	3.90E-07	Ac-225	->	Fr-221
145.286	3.41E-05	U-233	->	Th-229
146.347	1.34E-04	U-233	->	Th-229
146.557	5.79E+05	Am-241	->	Np-237
148.15	7.68E-06	U-233	->	Th-229
148.37	3.29E-06	Th-229	->	Ra-225
149.8	2.71E-06	U-233	->	Th-229
149.99	2.17E-07	Fr-221	->	At-217
150.08	2.08E-06	Ac-225	->	Fr-221
150.11	1.01E+05	Am-241	->	Np-237
151.423	4.91E+02	Np-237	->	Pa-233
152.64	1.15E-07	Ac-225	->	Fr-221
153.31	1.17E-06	U-233	->	Th-229
153.72	1.41E+01	Np-237	->	Pa-233

153.93	4.74E-07	Ac-225	->	Fr-221
154.37	2.30E-06	Th-229	->	Ra-225
154.4	1.01E+04	Am-241	->	Np-237
154.69	3.20E-06	U-233	->	Th-229
155.263	1.88E+02	Np-237	->	Pa-233
155.989	1.24E-06	U-233	->	Th-229
156.4	1.51E+04	Am-241	->	Np-237
156.46	3.29E-06	Th-229	->	Ra-225
157.24	9.60E-07	Ac-225	->	Fr-221
158.48	1.76E+03	Am-241	->	Np-237
161.7	1.13E+04	Am-241	->	Np-237
162.51	7.56E+01	Np-237	->	Pa-233
162.52	1.60E-06	U-233	->	Th-229
164.512	1.41E-04	U-233	->	Th-229
164.58	8.39E+04	Am-241	->	Np-237
165.493	8.32E-06	U-233	->	Th-229
165.92	3.02E+04	Am-241	->	Np-237
168.98	1.43E-06	U-233	->	Th-229
169.18	1.47E+02	Np-237	->	Pa-233
169.56	2.11E+05	Am-241	->	Np-237
170.67	3.88E+01	Np-237	->	Pa-233
170.794	2.99E-06	U-233	->	Th-229
170.91	2.79E-08	Ac-225	->	Fr-221
171.29	2.17E-07	Fr-221	->	At-217
172.35	7.47E-07	U-233	->	Th-229
172.56	1.39E+01	Np-237	->	Pa-233
172.9	7.24E-07	Th-229	->	Ra-225
174.162	4.91E-06	U-233	->	Th-229
175.09	2.26E+04	Am-241	->	Np-237
176.09	4.09E+01	Np-237	->	Pa-233
176.1	9.17E-07	U-233	->	Th-229
177.78	4.27E-07	U-233	->	Th-229
178.39	4.96E-08	Ac-225	->	Fr-221
179.74	1.68E-06	Th-229	->	Ra-225
180.801	4.70E+01	Np-237	->	Pa-233
183.96	7.56E-07	Th-229	->	Ra-225
184.17	5.33E-07	U-233	->	Th-229
185.782	8.53E-07	U-233	->	Th-229
186.12	6.19E-08	Ac-225	->	Fr-221
186.7	1.37E+01	Np-237	->	Pa-233
187.942	4.27E-05	U-233	->	Th-229
187.99	1.42E-06	Ac-225	->	Fr-221
190.4	2.77E+03	Am-241	->	Np-237
191.46	5.52E+01	Np-237	->	Pa-233
191.9	2.72E+02	Am-241	->	Np-237
192.12	8.53E-07	U-233	->	Th-229
193.29	1.04E+02	Np-237	->	Pa-233
193.59	1.51E-05	Th-229	->	Ra-225
194.74	1.00E+02	Np-237	->	Pa-233
195.04	4.11E+02	Np-237	->	Pa-233

195.75	4.49E-07	Ac-225	->	Fr-221
196.89	5.11E+01	Np-237	->	Pa-233
197	1.64E+04	Am-241	->	Np-237
198.72	6.19E-08	Ac-225	->	Fr-221
200.17	7.15E+00	Np-237	->	Pa-233
200.67	2.13E-08	U-233	->	Th-229
201.72	8.58E+01	Np-237	->	Pa-233
202.85	7.36E+00	Np-237	->	Pa-233
203.9	3.65E+03	Am-241	->	Np-237
205.99	1.39E-06	U-233	->	Th-229
208	9.95E+05	Am-241	->	Np-237
208.149	5.33E-05	U-233	->	Th-229
209.19	3.17E+01	Np-237	->	Pa-233
210.94	1.09E-05	Th-229	->	Ra-225
212.29	2.99E-06	U-233	->	Th-229
212.412	3.11E+02	Np-237	->	Pa-233
214.08	8.58E+01	Np-237	->	Pa-233
216.08	1.41E-05	U-233	->	Th-229
216.2	1.05E-06	Ac-225	->	Fr-221
216.86	1.30E-06	Ac-225	->	Fr-221
217.133	7.47E-05	U-233	->	Th-229
217.61	1.07E-06	U-233	->	Th-229
217.98	3.38E-05	Fr-221	->	At-217
218.15	4.60E-07	Th-229	->	Ra-225
219.424	3.20E-06	U-233	->	Th-229
221.45	5.28E+04	Am-241	->	Np-237
223.357	7.04E-07	U-233	->	Th-229
224.64	2.48E-07	Ac-225	->	Fr-221
225	2.13E-07	U-233	->	Th-229
226.74	2.13E-07	U-233	->	Th-229
228.07	4.27E-07	U-233	->	Th-229
229.98	2.68E+01	Np-237	->	Pa-233
230.086	1.43E-06	U-233	->	Th-229
232.86	5.79E+03	Am-241	->	Np-237
234.352	8.80E+02	Am-241	->	Np-237
236.32	1.18E-07	Th-229	->	Ra-225
236.39	1.07E-06	U-233	->	Th-229
237.95	1.31E+02	Np-237	->	Pa-233
240.364	8.11E-06	U-233	->	Th-229
240.76	4.03E-08	Ac-225	->	Fr-221
242.4	3.77E+04	Am-241	->	Np-237
245	3.77E+04	Am-241	->	Np-237
245.294	7.47E-05	U-233	->	Th-229
246.66	3.02E+03	Am-241	->	Np-237
248.25	1.08E+02	Pa-233	->	U-233
248.661	9.60E-05	U-233	->	Th-229
248.7	6.19E-08	Ac-225	->	Fr-221
248.91	9.81E+00	Np-237	->	Pa-233
249.1	5.03E+03	Am-241	->	Np-237
252.5	8.11E-07	U-233	->	Th-229

253.51	3.10E-07	Ac-225	->	Fr-221
255.92	9.17E-07	U-233	->	Th-229
256.98	1.37E+01	Np-237	->	Pa-233
258.46	1.08E+01	Pa-233	->	U-233
259.3	3.84E-06	U-233	->	Th-229
260.4	2.30E-06	U-233	->	Th-229
260.9	1.26E+03	Am-241	->	Np-237
261.88	6.61E-06	U-233	->	Th-229
262.41	1.37E+01	Np-237	->	Pa-233
264.87	1.13E+04	Am-241	->	Np-237
267.54	3.31E+04	Am-241	->	Np-237
268.619	5.33E-06	U-233	->	Th-229
271.58	8.07E+02	Am-241	->	Np-237
271.597	5.60E+02	Pa-233	->	U-233
272.27	1.34E-06	U-233	->	Th-229
274.692	1.00E-05	U-233	->	Th-229
275.68	8.30E+03	Am-241	->	Np-237
278.059	2.60E-05	U-233	->	Th-229
279.27	1.08E-07	Ac-225	->	Fr-221
282.54	2.79E-08	Fr-221	->	At-217
284.22	2.13E-07	U-233	->	Th-229
285.5	3.10E-08	Ac-225	->	Fr-221
287.949	2.30E-05	U-233	->	Th-229
291.21	3.90E+03	Am-241	->	Np-237
291.317	1.11E-04	U-233	->	Th-229
292.76	1.74E+04	Am-241	->	Np-237
292.79	1.33E-06	Bi-213	->	Po-213
293.923	2.99E-06	U-233	->	Th-229
294.9	6.92E+04	Am-241	->	Np-237
295.2	4.91E-07	U-233	->	Th-229
298.87	5.06E+01	Pa-233	->	U-233
300.175	1.24E+04	Pa-233	->	U-233
302.84	1.49E-06	U-233	->	Th-229
304.2	1.26E+03	Am-241	->	Np-237
309.37	1.56E-06	U-233	->	Th-229
310.3	1.89E+04	Am-241	->	Np-237
311.38	5.97E-07	U-233	->	Th-229
311.9	7.60E+04	Pa-233	->	U-233
317.133	1.88E-04	U-233	->	Th-229
320.508	6.61E-05	U-233	->	Th-229
322.54	1.91E+05	Am-241	->	Np-237
323.321	1.79E-05	U-233	->	Th-229
323.81	1.24E-08	Bi-213	->	Tl-209
324.1	5.27E-08	Fr-221	->	At-217
328.69	1.39E-06	U-233	->	Th-229
332.39	1.86E+05	Am-241	->	Np-237
335.43	6.21E+05	Am-241	->	Np-237
336.579	1.26E-05	U-233	->	Th-229
337.727	5.28E+03	Am-241	->	Np-237
339.64	1.60E-07	U-233	->	Th-229

340.59	8.40E+03	Pa-233	->	U-233
349.46	1.51E+03	Am-241	->	Np-237
351.782	9.60E-07	U-233	->	Th-229
354	1.24E-06	U-233	->	Th-229
358.36	1.51E+03	Am-241	->	Np-237
359.09	1.08E-07	Fr-221	->	At-217
365.762	1.75E-05	U-233	->	Th-229
368.61	2.73E+05	Am-241	->	Np-237
370.933	6.60E+04	Am-241	->	Np-237
375.518	1.16E+03	Pa-233	->	U-233
376.6	1.77E+05	Am-241	->	Np-237
382.05	1.08E-07	Fr-221	->	At-217
383.4	2.03E-06	U-233	->	Th-229
383.744	3.55E+04	Am-241	->	Np-237
384	4.27E-07	U-233	->	Th-229
390.6	7.42E+03	Am-241	->	Np-237
394.34	1.60E-07	U-233	->	Th-229
396.65	1.77E-07	U-233	->	Th-229
398.663	2.38E+03	Pa-233	->	U-233
402.37	1.77E-07	U-233	->	Th-229
406.4	1.76E+03	Am-241	->	Np-237
406.7	1.13E-07	U-233	->	Th-229
409.1	4.03E-07	Fr-221	->	At-217
415.932	3.02E+03	Pa-233	->	U-233
416.4	2.13E-07	U-233	->	Th-229
419.22	3.52E+04	Am-241	->	Np-237
426.39	3.09E+04	Am-241	->	Np-237
429.8	1.26E+03	Am-241	->	Np-237
435.3	2.52E+03	Am-241	->	Np-237
436.78	1.07E-07	U-233	->	Th-229
440.34	5.00E-05	Bi-213	->	Po-213
442.75	4.40E+03	Am-241	->	Np-237
449.6	2.13E-07	U-233	->	Th-229
452.41	3.02E+03	Am-241	->	Np-237
452.43	3.41E-07	Ac-225	->	Fr-221
454.67	1.22E+04	Am-241	->	Np-237
459.58	4.53E+03	Am-241	->	Np-237
459.77	1.77E-07	U-233	->	Th-229
467	5.42E-06	Tl-209	->	Pb-209
468	3.65E+03	Am-241	->	Np-237
471.3	3.20E-07	U-233	->	Th-229
479	3.20E-07	U-233	->	Th-229
480.5	9.29E-08	Ac-225	->	Fr-221
484.05	9.17E-08	U-233	->	Th-229
486.3	1.26E+03	Am-241	->	Np-237
512	1.45E+03	Am-241	->	Np-237
513.5	3.10E-08	Ac-225	->	Fr-221
514.2	3.27E+03	Am-241	->	Np-237
522	1.13E+03	Am-241	->	Np-237
526.03	3.10E-08	Ac-225	->	Fr-221

540.27	1.13E-07	U-233	->	Th-229
545.1	5.12E-08	U-233	->	Th-229
569.37	8.11E-08	U-233	->	Th-229
574.05	1.26E+03	Am-241	->	Np-237
578.47	1.07E-07	U-233	->	Th-229
582.6	2.52E+02	Am-241	->	Np-237
586.5	1.64E+03	Am-241	->	Np-237
590.3	3.52E+03	Am-241	->	Np-237
597.41	1.18E+04	Am-241	->	Np-237
619.011	7.42E+04	Am-241	->	Np-237
620.87	4.91E-08	U-233	->	Th-229
627.2	7.04E+02	Am-241	->	Np-237
633	1.58E+03	Am-241	->	Np-237
641.436	8.93E+03	Am-241	->	Np-237
652.99	4.74E+04	Am-241	->	Np-237
656.97	6.40E-08	U-233	->	Th-229
659.72	2.64E-07	Bi-213	->	Po-213
662.456	4.62E+05	Am-241	->	Np-237
669.9	4.78E+02	Am-241	->	Np-237
675.8	8.05E+02	Am-241	->	Np-237
680.06	3.90E+03	Am-241	->	Np-237
688.77	3.77E+04	Am-241	->	Np-237
693.5	4.65E+03	Am-241	->	Np-237
696.36	6.29E+03	Am-241	->	Np-237
707.47	5.76E-08	U-233	->	Th-229
710.95	8.05E+03	Am-241	->	Np-237
721.962	7.55E+04	Am-241	->	Np-237
722.7	1.64E+05	Am-241	->	Np-237
729.5	1.64E+03	Am-241	->	Np-237
731.5	5.91E+02	Am-241	->	Np-237
737.3	1.01E+04	Am-241	->	Np-237
755.89	9.56E+03	Am-241	->	Np-237
759.5	2.14E+03	Am-241	->	Np-237
763.4	2.49E+02	Am-241	->	Np-237
766.79	6.29E+03	Am-241	->	Np-237
770.49	6.29E+03	Am-241	->	Np-237
772.1	3.35E+03	Am-241	->	Np-237
777.2	7.55E+01	Am-241	->	Np-237
780.5	3.14E+02	Am-241	->	Np-237
788.8	4.91E+02	Am-241	->	Np-237
801.9	1.64E+03	Am-241	->	Np-237
807.27	7.91E-07	Bi-213	->	Po-213
811.8	7.55E+02	Am-241	->	Np-237
819.3	5.03E+02	Am-241	->	Np-237
822.6	2.77E+02	Am-241	->	Np-237
828.5	3.02E+02	Am-241	->	Np-237
851.5	4.78E+02	Am-241	->	Np-237
854.7	2.52E+02	Am-241	->	Np-237
859.2	1.06E+02	Am-241	->	Np-237
862.6	6.67E+02	Am-241	->	Np-237

867.9	4.48E-08	U-233	->	Th-229
872.7	8.80E+02	Am-241	->	Np-237
887.5	2.77E+02	Am-241	->	Np-237
898.4	8.80E+01	Am-241	->	Np-237
902.5	3.77E+02	Am-241	->	Np-237
912.4	3.14E+02	Am-241	->	Np-237
922.2	2.39E+02	Am-241	->	Np-237
928.8	6.29E+01	Am-241	->	Np-237
945.7	6.29E+01	Am-241	->	Np-237
955.7	7.29E+02	Am-241	->	Np-237
1003	1.77E-07	U-233	->	Th-229
1100.06	8.54E-07	Bi-213	->	Po-213
1119	1.77E-07	U-233	->	Th-229
1566	6.56E-06	Tl-209	->	Pb-209

Am241	Aged 5 years	Sorted by Intensity		
Intensity	Energy	Initial Isotopes and Decays		
ph/s/gm	keV			
4.52E+10	59.536	Am-241	->	Np-237
2.54E+10	17.611	Am-241	->	Np-237
1.64E+10	13.927	Am-241	->	Np-237
6.54E+09	20.997	Am-241	->	Np-237
3.02E+09	26.3445	Am-241	->	Np-237
1.02E+09	11.871	Am-241	->	Np-237
4.15E+08	15.861	Am-241	->	Np-237
1.51E+08	33.192	Am-241	->	Np-237
9.18E+07	43.415	Am-241	->	Np-237
3.02E+07	69.76	Am-241	->	Np-237
2.55E+07	98.951	Am-241	->	Np-237
2.52E+07	55.528	Am-241	->	Np-237
2.45E+07	102.966	Am-241	->	Np-237
2.19E+07	32.2	Am-241	->	Np-237
5.13E+06	125.292	Am-241	->	Np-237
2.48E+06	101.066	Am-241	->	Np-237
1.48E+06	97.071	Am-241	->	Np-237
1.26E+06	42.64	Am-241	->	Np-237
1.26E+06	122.994	Am-241	->	Np-237
9.95E+05	208	Am-241	->	Np-237
7.55E+05	54.04	Am-241	->	Np-237
6.21E+05	335.43	Am-241	->	Np-237
5.94E+05	114.23	Am-241	->	Np-237
5.79E+05	146.557	Am-241	->	Np-237
5.53E+05	67.46	Am-241	->	Np-237
4.62E+05	662.456	Am-241	->	Np-237
2.98E+05	113.3	Am-241	->	Np-237
2.89E+05	117.58	Am-241	->	Np-237
2.73E+05	368.61	Am-241	->	Np-237

2.11E+05	169.56	Am-241	->	Np-237
1.91E+05	322.54	Am-241	->	Np-237
1.86E+05	332.39	Am-241	->	Np-237
1.77E+05	376.6	Am-241	->	Np-237
1.76E+05	64.817	Am-241	->	Np-237
1.64E+05	722.7	Am-241	->	Np-237
1.38E+05	75.83	Am-241	->	Np-237
1.01E+05	150.11	Am-241	->	Np-237
8.39E+04	164.58	Am-241	->	Np-237
7.60E+04	311.9	Pa-233	->	U-233
7.55E+04	721.962	Am-241	->	Np-237
7.42E+04	619.011	Am-241	->	Np-237
6.92E+04	294.9	Am-241	->	Np-237
6.60E+04	370.933	Am-241	->	Np-237
5.91E+04	96.67	Am-241	->	Np-237
5.28E+04	221.45	Am-241	->	Np-237
5.11E+04	16.632	Np-237	->	Pa-233
4.74E+04	652.99	Am-241	->	Np-237
3.92E+04	13.274	Np-237	->	Pa-233
3.80E+04	17.058	Pa-233	->	U-233
3.77E+04	688.77	Am-241	->	Np-237
3.77E+04	245	Am-241	->	Np-237
3.77E+04	242.4	Am-241	->	Np-237
3.60E+04	13.6	Pa-233	->	U-233
3.55E+04	383.744	Am-241	->	Np-237
3.52E+04	419.22	Am-241	->	Np-237
3.31E+04	267.54	Am-241	->	Np-237
3.20E+04	98.443	Pa-233	->	U-233
3.14E+04	51.013	Am-241	->	Np-237
3.09E+04	426.39	Am-241	->	Np-237
3.02E+04	165.92	Am-241	->	Np-237
2.86E+04	86.5	Np-237	->	Pa-233
2.64E+04	29.378	Np-237	->	Pa-233
2.26E+04	175.09	Am-241	->	Np-237
2.04E+04	94.66	Pa-233	->	U-233
1.89E+04	310.3	Am-241	->	Np-237
1.74E+04	292.76	Am-241	->	Np-237
1.64E+04	197	Am-241	->	Np-237
1.51E+04	156.4	Am-241	->	Np-237
1.24E+04	300.175	Pa-233	->	U-233
1.22E+04	454.67	Am-241	->	Np-237
1.20E+04	111.298	Pa-233	->	U-233
1.19E+04	19.718	Np-237	->	Pa-233
1.18E+04	597.41	Am-241	->	Np-237
1.13E+04	161.7	Am-241	->	Np-237
1.13E+04	264.87	Am-241	->	Np-237
1.01E+04	154.4	Am-241	->	Np-237
1.01E+04	737.3	Am-241	->	Np-237
9.56E+03	755.89	Am-241	->	Np-237
9.00E+03	20.42	Pa-233	->	U-233

8.93E+03	641.436	Am-241	->	Np-237
8.40E+03	340.59	Pa-233	->	U-233
8.30E+03	275.68	Am-241	->	Np-237
8.05E+03	710.95	Am-241	->	Np-237
7.42E+03	390.6	Am-241	->	Np-237
6.72E+03	139.53	Am-241	->	Np-237
6.29E+03	770.49	Am-241	->	Np-237
6.29E+03	766.79	Am-241	->	Np-237
6.29E+03	696.36	Am-241	->	Np-237
5.93E+03	95.858	Np-237	->	Pa-233
5.79E+03	232.86	Am-241	->	Np-237
5.28E+03	337.727	Am-241	->	Np-237
5.03E+03	249.1	Am-241	->	Np-237
4.65E+03	693.5	Am-241	->	Np-237
4.53E+03	459.58	Am-241	->	Np-237
4.40E+03	442.75	Am-241	->	Np-237
4.00E+03	114.445	Pa-233	->	U-233
3.90E+03	680.06	Am-241	->	Np-237
3.90E+03	291.21	Am-241	->	Np-237
3.65E+03	468	Am-241	->	Np-237
3.65E+03	203.9	Am-241	->	Np-237
3.52E+03	590.3	Am-241	->	Np-237
3.52E+03	86.652	Pa-233	->	U-233
3.35E+03	772.1	Am-241	->	Np-237
3.27E+03	514.2	Am-241	->	Np-237
3.25E+03	92.282	Np-237	->	Pa-233
3.02E+03	415.932	Pa-233	->	U-233
3.02E+03	452.41	Am-241	->	Np-237
3.02E+03	246.66	Am-241	->	Np-237
2.77E+03	190.4	Am-241	->	Np-237
2.52E+03	435.3	Am-241	->	Np-237
2.38E+03	398.663	Pa-233	->	U-233
2.35E+03	11.372	Np-237	->	Pa-233
2.34E+03	75.343	Pa-233	->	U-233
2.14E+03	11.62	Pa-233	->	U-233
2.14E+03	759.5	Am-241	->	Np-237
1.92E+03	108.166	Np-237	->	Pa-233
1.76E+03	158.48	Am-241	->	Np-237
1.76E+03	406.4	Am-241	->	Np-237
1.64E+03	801.9	Am-241	->	Np-237
1.64E+03	729.5	Am-241	->	Np-237
1.64E+03	586.5	Am-241	->	Np-237
1.58E+03	633	Am-241	->	Np-237
1.55E+03	94.723	Np-237	->	Pa-233
1.51E+03	349.46	Am-241	->	Np-237
1.51E+03	358.36	Am-241	->	Np-237
1.45E+03	512	Am-241	->	Np-237
1.38E+03	103.921	Pa-233	->	U-233
1.26E+03	429.8	Am-241	->	Np-237
1.26E+03	486.3	Am-241	->	Np-237

1.26E+03	260.9	Am-241	->	Np-237
1.26E+03	304.2	Am-241	->	Np-237
1.26E+03	574.05	Am-241	->	Np-237
1.16E+03	375.518	Pa-233	->	U-233
1.13E+03	522	Am-241	->	Np-237
9.61E+02	14.953	Np-237	->	Pa-233
8.80E+02	234.352	Am-241	->	Np-237
8.80E+02	872.7	Am-241	->	Np-237
8.07E+02	271.58	Am-241	->	Np-237
8.05E+02	675.8	Am-241	->	Np-237
7.97E+02	57.149	Np-237	->	Pa-233
7.97E+02	143.227	Np-237	->	Pa-233
7.55E+02	811.8	Am-241	->	Np-237
7.29E+02	955.7	Am-241	->	Np-237
7.04E+02	627.2	Am-241	->	Np-237
6.67E+02	862.6	Am-241	->	Np-237
6.34E+02	111.897	Np-237	->	Pa-233
5.91E+02	731.5	Am-241	->	Np-237
5.60E+02	271.597	Pa-233	->	U-233
5.03E+02	819.3	Am-241	->	Np-237
4.91E+02	788.8	Am-241	->	Np-237
4.91E+02	151.423	Np-237	->	Pa-233
4.78E+02	851.5	Am-241	->	Np-237
4.78E+02	669.9	Am-241	->	Np-237
4.60E+02	15.4	Pa-233	->	U-233
4.11E+02	195.04	Np-237	->	Pa-233
3.77E+02	902.5	Am-241	->	Np-237
3.68E+02	88.05	Np-237	->	Pa-233
3.29E+02	117.689	Np-237	->	Pa-233
3.14E+02	912.4	Am-241	->	Np-237
3.14E+02	780.5	Am-241	->	Np-237
3.11E+02	212.412	Np-237	->	Pa-233
3.02E+02	828.5	Am-241	->	Np-237
2.77E+02	822.6	Am-241	->	Np-237
2.77E+02	887.5	Am-241	->	Np-237
2.72E+02	46.57	Np-237	->	Pa-233
2.72E+02	191.9	Am-241	->	Np-237
2.52E+02	582.6	Am-241	->	Np-237
2.52E+02	854.7	Am-241	->	Np-237
2.49E+02	763.4	Am-241	->	Np-237
2.39E+02	922.2	Am-241	->	Np-237
1.88E+02	155.263	Np-237	->	Pa-233
1.74E+02	131.09	Np-237	->	Pa-233
1.49E+02	108.69	Np-237	->	Pa-233
1.47E+02	169.18	Np-237	->	Pa-233
1.37E+02	134.23	Np-237	->	Pa-233
1.31E+02	237.95	Np-237	->	Pa-233
1.30E+02	28.578	Pa-233	->	U-233
1.14E+02	106.13	Np-237	->	Pa-233
1.08E+02	248.25	Pa-233	->	U-233

1.06E+02	859.2	Am-241	->	Np-237
1.04E+02	193.29	Np-237	->	Pa-233
1.00E+02	194.74	Np-237	->	Pa-233
8.80E+01	898.4	Am-241	->	Np-237
8.58E+01	214.08	Np-237	->	Pa-233
8.58E+01	201.72	Np-237	->	Pa-233
7.56E+01	162.51	Np-237	->	Pa-233
7.55E+01	777.2	Am-241	->	Np-237
7.20E+01	40.415	Pa-233	->	U-233
6.29E+01	945.7	Am-241	->	Np-237
6.29E+01	928.8	Am-241	->	Np-237
5.52E+01	191.46	Np-237	->	Pa-233
5.11E+01	196.89	Np-237	->	Pa-233
5.06E+01	298.87	Pa-233	->	U-233
4.70E+01	180.801	Np-237	->	Pa-233
4.09E+01	176.09	Np-237	->	Pa-233
3.88E+01	170.67	Np-237	->	Pa-233
3.68E+01	140.61	Np-237	->	Pa-233
3.27E+01	70.62	Np-237	->	Pa-233
3.27E+01	63.95	Np-237	->	Pa-233
3.17E+01	209.19	Np-237	->	Pa-233
2.68E+01	229.98	Np-237	->	Pa-233
2.60E+01	41.718	Pa-233	->	U-233
2.45E+01	62.66	Np-237	->	Pa-233
2.27E+01	74.46	Np-237	->	Pa-233
1.41E+01	153.72	Np-237	->	Pa-233
1.39E+01	172.56	Np-237	->	Pa-233
1.37E+01	256.98	Np-237	->	Pa-233
1.37E+01	186.7	Np-237	->	Pa-233
1.37E+01	262.41	Np-237	->	Pa-233
1.08E+01	258.46	Pa-233	->	U-233
9.81E+00	248.91	Np-237	->	Pa-233
7.36E+00	202.85	Np-237	->	Pa-233
7.20E+00	17.269	Pa-233	->	U-233
7.15E+00	200.17	Np-237	->	Pa-233
5.11E+00	115.19	Np-237	->	Pa-233
7.04E-02	16.141	U-233	->	Th-229
5.55E-02	12.952	U-233	->	Th-229
1.71E-02	19.148	U-233	->	Th-229
3.20E-03	11.118	U-233	->	Th-229
1.28E-03	42.441	U-233	->	Th-229
1.22E-03	14.511	U-233	->	Th-229
4.69E-04	97.143	U-233	->	Th-229
3.61E-04	93.36	U-233	->	Th-229
2.99E-04	54.702	U-233	->	Th-229
2.22E-04	89.957	U-233	->	Th-229
1.88E-04	317.133	U-233	->	Th-229
1.45E-04	29.191	U-233	->	Th-229
1.41E-04	164.512	U-233	->	Th-229
1.34E-04	146.347	U-233	->	Th-229

1.30E-04	105.362	U-233	->	Th-229
1.11E-04	291.317	U-233	->	Th-229
9.60E-05	248.661	U-233	->	Th-229
9.20E-05	40.34	Ra-225	->	Ac-225
9.17E-05	53.559	U-233	->	Th-229
7.47E-05	217.133	U-233	->	Th-229
7.47E-05	245.294	U-233	->	Th-229
6.83E-05	118.97	U-233	->	Th-229
6.61E-05	320.508	U-233	->	Th-229
5.97E-05	117.155	U-233	->	Th-229
5.76E-05	71.847	U-233	->	Th-229
5.33E-05	208.149	U-233	->	Th-229
5.00E-05	440.34	Bi-213	->	Po-213
4.69E-05	135.328	U-233	->	Th-229
4.48E-05	120.81	U-233	->	Th-229
4.33E-05	108.99	U-233	->	Th-229
4.27E-05	187.942	U-233	->	Th-229
3.41E-05	145.286	U-233	->	Th-229
3.38E-05	217.98	Fr-221	->	At-217
3.20E-05	74.5	U-233	->	Th-229
2.99E-05	96.215	U-233	->	Th-229
2.97E-05	14.772	Ac-225	->	Fr-221
2.60E-05	278.059	U-233	->	Th-229
2.58E-05	25.304	U-233	->	Th-229
2.42E-05	12.017	Ac-225	->	Fr-221
2.30E-05	287.949	U-233	->	Th-229
2.11E-05	32.27	U-233	->	Th-229
1.94E-05	15.662	Ra-225	->	Ac-225
1.79E-05	66.11	U-233	->	Th-229
1.79E-05	323.321	U-233	->	Th-229
1.75E-05	365.762	U-233	->	Th-229
1.75E-05	12.636	Ra-225	->	Ac-225
1.54E-05	77.1	U-233	->	Th-229
1.51E-05	193.59	Th-229	->	Ra-225
1.41E-05	216.08	U-233	->	Th-229
1.39E-05	123.91	U-233	->	Th-229
1.35E-05	31.37	Th-229	->	Ra-225
1.28E-05	70.35	U-233	->	Th-229
1.26E-05	336.579	U-233	->	Th-229
1.26E-05	72.821	U-233	->	Th-229
1.09E-05	210.94	Th-229	->	Ra-225
1.00E-05	111.935	U-233	->	Th-229
1.00E-05	274.692	U-233	->	Th-229
9.87E-06	86.44	Th-229	->	Ra-225
9.39E-06	88.43	U-233	->	Th-229
8.32E-06	76.32	U-233	->	Th-229
8.32E-06	165.493	U-233	->	Th-229
8.11E-06	240.364	U-233	->	Th-229
7.68E-06	37.85	U-233	->	Th-229
7.68E-06	148.15	U-233	->	Th-229

7.04E-06	90.994	U-233	->	Th-229
6.83E-06	67.96	U-233	->	Th-229
6.61E-06	109.47	U-233	->	Th-229
6.61E-06	261.88	U-233	->	Th-229
6.56E-06	1566	Tl-209	->	Pb-209
6.50E-06	17.449	Ac-225	->	Fr-221
6.44E-06	86.105	Ac-225	->	Fr-221
6.40E-06	144.52	U-233	->	Th-229
5.76E-06	31.24	U-233	->	Th-229
5.42E-06	117	Tl-209	->	Pb-209
5.42E-06	467	Tl-209	->	Pb-209
5.33E-06	114.28	U-233	->	Th-229
5.33E-06	268.619	U-233	->	Th-229
5.33E-06	52.613	U-233	->	Th-229
5.26E-06	137.02	Th-229	->	Ra-225
5.20E-06	99.82	Ac-225	->	Fr-221
4.91E-06	174.162	U-233	->	Th-229
4.48E-06	116.26	U-233	->	Th-229
4.44E-06	18.593	Ra-225	->	Ac-225
4.37E-06	81.517	Fr-221	->	At-217
4.05E-06	87.24	U-233	->	Th-229
4.05E-06	85.402	U-233	->	Th-229
3.91E-06	79.29	Bi-213	->	Po-213
3.90E-06	83.229	Ac-225	->	Fr-221
3.84E-06	259.3	U-233	->	Th-229
3.84E-06	82.957	U-233	->	Th-229
3.29E-06	148.37	Th-229	->	Ra-225
3.29E-06	156.46	Th-229	->	Ra-225
3.29E-06	124.51	Th-229	->	Ra-225
3.20E-06	219.424	U-233	->	Th-229
3.20E-06	154.69	U-233	->	Th-229
2.99E-06	293.923	U-233	->	Th-229
2.99E-06	212.29	U-233	->	Th-229
2.99E-06	170.794	U-233	->	Th-229
2.97E-06	13.911	Fr-221	->	At-217
2.77E-06	86.74	U-233	->	Th-229
2.71E-06	149.8	U-233	->	Th-229
2.63E-06	78.947	Fr-221	->	At-217
2.63E-06	107.16	Th-229	->	Ra-225
2.45E-06	11.414	Fr-221	->	At-217
2.36E-06	76.858	Bi-213	->	Po-213
2.32E-06	97.272	Ac-225	->	Fr-221
2.30E-06	260.4	U-233	->	Th-229
2.30E-06	68.97	U-233	->	Th-229
2.30E-06	154.37	Th-229	->	Ra-225
2.24E-06	139.76	U-233	->	Th-229
2.13E-06	103.375	U-233	->	Th-229
2.08E-06	150.08	Ac-225	->	Fr-221
2.03E-06	383.4	U-233	->	Th-229
1.97E-06	124.72	Th-229	->	Ra-225

1.95E-06	99.58	Ac-225	->	Fr-221
1.92E-06	101.8	U-233	->	Th-229
1.70E-06	62.93	Ac-225	->	Fr-221
1.68E-06	179.74	Th-229	->	Ra-225
1.64E-06	75.17	Th-229	->	Ra-225
1.60E-06	84.27	U-233	->	Th-229
1.60E-06	162.52	U-233	->	Th-229
1.56E-06	309.37	U-233	->	Th-229
1.55E-06	92.136	Fr-221	->	At-217
1.50E-06	11.119	Bi-213	->	Po-213
1.49E-06	302.84	U-233	->	Th-229
1.49E-06	129.2	U-233	->	Th-229
1.43E-06	168.98	U-233	->	Th-229
1.43E-06	230.086	U-233	->	Th-229
1.42E-06	187.99	Ac-225	->	Fr-221
1.41E-06	142.98	Th-229	->	Ra-225
1.39E-06	13.504	Bi-213	->	Po-213
1.39E-06	89.639	Bi-213	->	Po-213
1.39E-06	328.69	U-233	->	Th-229
1.39E-06	125.398	U-233	->	Th-229
1.39E-06	205.99	U-233	->	Th-229
1.34E-06	272.27	U-233	->	Th-229
1.33E-06	292.79	Bi-213	->	Po-213
1.33E-06	10.381	Ac-225	->	Fr-221
1.30E-06	216.86	Ac-225	->	Fr-221
1.28E-06	78.41	U-233	->	Th-229
1.25E-06	86.23	Th-229	->	Ra-225
1.24E-06	155.989	U-233	->	Th-229
1.24E-06	354	U-233	->	Th-229
1.17E-06	100.008	U-233	->	Th-229
1.17E-06	153.31	U-233	->	Th-229
1.09E-06	56.58	Th-229	->	Ra-225
1.09E-06	131.92	Th-229	->	Ra-225
1.07E-06	217.61	U-233	->	Th-229
1.07E-06	236.39	U-233	->	Th-229
1.05E-06	216.2	Ac-225	->	Fr-221
1.02E-06	10.871	Ra-225	->	Ac-225
1.01E-06	111.56	Ac-225	->	Fr-221
1.00E-06	73.84	Ac-225	->	Fr-221
9.60E-07	157.24	Ac-225	->	Fr-221
9.60E-07	351.782	U-233	->	Th-229
9.17E-07	255.92	U-233	->	Th-229
9.17E-07	176.1	U-233	->	Th-229
8.98E-07	87.39	Ac-225	->	Fr-221
8.54E-07	1100.06	Bi-213	->	Po-213
8.53E-07	185.782	U-233	->	Th-229
8.53E-07	192.12	U-233	->	Th-229
8.36E-07	108.36	Ac-225	->	Fr-221
8.11E-07	252.5	U-233	->	Th-229
7.91E-07	807.27	Bi-213	->	Po-213

7.56E-07	183.96	Th-229	->	Ra-225
7.47E-07	172.35	U-233	->	Th-229
7.43E-07	100.599	Ac-225	->	Fr-221
7.24E-07	172.9	Th-229	->	Ra-225
7.04E-07	223.357	U-233	->	Th-229
7.04E-07	131.2	U-233	->	Th-229
7.04E-07	63.69	U-233	->	Th-229
6.76E-07	74.969	Tl-209	->	Pb-209
6.16E-07	16.361	Fr-221	->	At-217
5.97E-07	311.38	U-233	->	Th-229
5.88E-07	123.76	Ac-225	->	Fr-221
5.59E-07	17.349	Th-229	->	Ra-225
5.33E-07	184.17	U-233	->	Th-229
5.26E-07	42.722	Th-229	->	Ra-225
4.96E-07	94.87	Ac-225	->	Fr-221
4.96E-07	13.255	Ac-225	->	Fr-221
4.91E-07	295.2	U-233	->	Th-229
4.80E-07	95.265	Fr-221	->	At-217
4.74E-07	153.93	Ac-225	->	Fr-221
4.65E-07	82.9	Ac-225	->	Fr-221
4.60E-07	218.15	Th-229	->	Ra-225
4.49E-07	195.75	Ac-225	->	Fr-221
4.27E-07	228.07	U-233	->	Th-229
4.27E-07	177.78	U-233	->	Th-229
4.27E-07	138.5	U-233	->	Th-229
4.27E-07	384	U-233	->	Th-229
4.24E-07	92.673	Bi-213	->	Po-213
4.03E-07	409.1	Fr-221	->	At-217
4.01E-07	72.803	Tl-209	->	Pb-209
3.90E-07	145.15	Ac-225	->	Fr-221
3.62E-07	68.88	Th-229	->	Ra-225
3.41E-07	452.43	Ac-225	->	Fr-221
3.29E-07	68.14	Th-229	->	Ra-225
3.20E-07	479	U-233	->	Th-229
3.20E-07	471.3	U-233	->	Th-229
3.10E-07	253.51	Ac-225	->	Fr-221
2.89E-07	14.082	Ra-225	->	Ac-225
2.67E-07	15.878	Bi-213	->	Po-213
2.64E-07	659.72	Bi-213	->	Po-213
2.48E-07	224.64	Ac-225	->	Fr-221
2.47E-07	10.541	Tl-209	->	Pb-209
2.41E-07	84.789	Tl-209	->	Pb-209
2.34E-07	12.703	Tl-209	->	Pb-209
2.17E-07	149.99	Fr-221	->	At-217
2.17E-07	171.29	Fr-221	->	At-217
2.13E-07	416.4	U-233	->	Th-229
2.13E-07	226.74	U-233	->	Th-229
2.13E-07	449.6	U-233	->	Th-229
2.13E-07	225	U-233	->	Th-229
2.13E-07	284.22	U-233	->	Th-229

1.86E-07	100.88	Ac-225	->	Fr-221
1.86E-07	119.92	Ac-225	->	Fr-221
1.77E-07	1003	U-233	->	Th-229
1.77E-07	396.65	U-233	->	Th-229
1.77E-07	402.37	U-233	->	Th-229
1.77E-07	1119	U-233	->	Th-229
1.77E-07	459.77	U-233	->	Th-229
1.73E-07	64.23	Ac-225	->	Fr-221
1.60E-07	339.64	U-233	->	Th-229
1.60E-07	394.34	U-233	->	Th-229
1.55E-07	124.81	Ac-225	->	Fr-221
1.30E-07	9.897	Fr-221	->	At-217
1.24E-07	135.01	Ac-225	->	Fr-221
1.18E-07	236.32	Th-229	->	Ra-225
1.18E-07	25.373	Th-229	->	Ra-225
1.15E-07	152.64	Ac-225	->	Fr-221
1.13E-07	406.7	U-233	->	Th-229
1.13E-07	540.27	U-233	->	Th-229
1.12E-07	74.9	Ac-225	->	Fr-221
1.08E-07	279.27	Ac-225	->	Fr-221
1.08E-07	359.09	Fr-221	->	At-217
1.08E-07	382.05	Fr-221	->	At-217
1.08E-07	118.47	Fr-221	->	At-217
1.07E-07	578.47	U-233	->	Th-229
1.07E-07	436.78	U-233	->	Th-229
9.29E-08	96.17	Ac-225	->	Fr-221
9.29E-08	480.5	Ac-225	->	Fr-221
9.17E-08	484.05	U-233	->	Th-229
8.11E-08	569.37	U-233	->	Th-229
7.82E-08	9.658	Bi-213	->	Po-213
6.89E-08	87.632	Tl-209	->	Pb-209
6.40E-08	656.97	U-233	->	Th-229
6.19E-08	248.7	Ac-225	->	Fr-221
6.19E-08	138.2	Ac-225	->	Fr-221
6.19E-08	186.12	Ac-225	->	Fr-221
6.19E-08	198.72	Ac-225	->	Fr-221
5.88E-08	53.82	Ac-225	->	Fr-221
5.88E-08	97.2	Fr-221	->	At-217
5.76E-08	707.47	U-233	->	Th-229
5.27E-08	73.6	Ac-225	->	Fr-221
5.27E-08	324.1	Fr-221	->	At-217
5.17E-08	12.466	Fr-221	->	At-217
5.12E-08	545.1	U-233	->	Th-229
4.96E-08	178.39	Ac-225	->	Fr-221
4.91E-08	620.87	U-233	->	Th-229
4.65E-08	36.65	Ac-225	->	Fr-221
4.55E-08	71.71	Ac-225	->	Fr-221
4.48E-08	867.9	U-233	->	Th-229
4.34E-08	126.23	Ac-225	->	Fr-221
4.21E-08	14.871	Tl-209	->	Pb-209

4.03E-08	240.76	Ac-225	->	Fr-221
3.35E-08	49.2	Ac-225	->	Fr-221
3.10E-08	285.5	Ac-225	->	Fr-221
3.10E-08	513.5	Ac-225	->	Fr-221
3.10E-08	526.03	Ac-225	->	Fr-221
3.10E-08	70.92	Ac-225	->	Fr-221
2.79E-08	38.51	Ac-225	->	Fr-221
2.79E-08	170.91	Ac-225	->	Fr-221
2.79E-08	103.44	Ac-225	->	Fr-221
2.79E-08	282.54	Fr-221	->	At-217
2.13E-08	200.67	U-233	->	Th-229
2.03E-08	12.085	Bi-213	->	Po-213
1.58E-08	69.85	Ac-225	->	Fr-221
1.33E-08	129.19	Ac-225	->	Fr-221
1.30E-08	57.77	Ac-225	->	Fr-221
1.27E-08	9.185	Tl-209	->	Pb-209
1.24E-08	323.81	Bi-213	->	Tl-209
4.65E-09	25.98	Ac-225	->	Fr-221
3.41E-09	11.349	Tl-209	->	Pb-209
8.70E-10	72.873	Bi-213	->	Tl-209
5.35E-10	70.832	Bi-213	->	Tl-209
3.34E-10	82.434	Bi-213	->	Tl-209
3.34E-10	10.259	Bi-213	->	Tl-209
2.68E-10	12.311	Bi-213	->	Tl-209
8.70E-11	85.185	Bi-213	->	Tl-209
5.35E-11	14.402	Bi-213	->	Tl-209
1.54E-11	8.953	Bi-213	->	Tl-209
4.01E-12	10.994	Bi-213	->	Tl-209

Am-243 100% Aged 5 years

811 lines computed.

Sorted by Energy

Energy	Intensity	Initial Isotopes and Decays		
keV	ph/s/gm			
8.953	6.65E-13	Bi-211	->	Tl-207
9.185	1.36E-15	Tl-207	->	Pb-207
9.3	4.48E-15	Ac-227	->	Th-227
9.419	5.89E-13	Pb-211	->	Bi-211
9.658	6.70E-13	Rn-219	->	Po-215
10.137	1.73E-11	Ra-223	->	Rn-219
10.259	1.35E-11	Bi-211	->	Tl-207
10.541	2.73E-14	Tl-207	->	Pb-207
10.622	3.27E-11	Fr-223	->	Ra-223,
10.828	1.15E-11	Pb-211	->	Bi-211

Th-227 -> Ra-223

10.871	1.09E-09	Pa-231	->	Ac-227	
10.994	1.75E-13	Bi-211	->	Tl-207	
11.118	2.60E-05	Ac-227	->	Th-227,	U-235 -> Th-231
11.119	1.30E-11	Rn-219	->	Po-215	
11.349	3.54E-16	Tl-207	->	Pb-207	
11.372	7.78E-05	Th-231	->	Pa-231	
11.712	1.86E-13	Pb-211	->	Bi-211	
11.713	3.20E-10	Ra-223	->	Rn-219	
12.085	2.38E-13	Rn-219	->	Po-215	
12.124	1.09E+08	Np-239	->	Pu-239	
12.313	1.23E-11	Bi-211	->	Tl-207	
12.325	5.68E-10	Fr-223	->	Ra-223,	Th-227 -> Ra-223
12.636	2.00E-08	Pa-231	->	Ac-227	
12.703	2.48E-14	Tl-207	->	Pb-207	
12.855	4.55E-12	Ra-223	->	Rn-219	
12.952	5.71E-04	Ac-227	->	Th-227,	U-235 -> Th-231
13.082	1.27E-11	Pb-211	->	Bi-211	
13.495	1.43E-11	Rn-219	->	Po-215	
13.662	1.20E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
13.724	1.27E-03	Th-231	->	Pa-231	
14.082	3.37E-10	Pa-231	->	Ac-227	
14.262	1.74E+09	Np-239	->	Pu-239	
14.341	3.08E-10	Ra-223	->	Rn-219	
14.407	2.25E-12	Bi-211	->	Tl-207	
14.511	5.71E-06	Ac-227	->	Th-227,	U-235 -> Th-231
14.886	4.54E-15	Tl-207	->	Pb-207	
14.953	1.04E-05	Th-231	->	Pa-231	
15.2	1.21E-12	Ac-227	->	Th-227	
15.213	8.80E-12	Fr-223	->	Ra-223	
15.218	6.92E-10	Th-227	->	Ra-223	
15.397	2.79E-12	Pb-211	->	Bi-211	
15.69	2.28E-08	Pa-231	->	Ac-227	
15.856	2.89E-12	Rn-219	->	Po-215	
16.074	5.17E-12	Ac-227	->	Th-227	
16.119	3.90E-04	U-235	->	Th-231	
16.333	2.80E+07	Np-239	->	Pu-239	
16.397	3.46E-10	Pa-231	->	Ac-227	
16.559	9.59E-04	Th-231	->	Pa-231	
16.918	6.09E-11	Ra-223	->	Rn-219	
17.187	5.70E-06	Th-231	->	Pa-231	
17.997	1.58E-10	Th-227	->	Ra-223	
18.016	1.99E-12	Fr-223	->	Ra-223	
18.08	1.84E+09	Np-239	->	Pu-239	
18.607	5.38E-09	Pa-231	->	Ac-227	
18.998	3.01E-10	Pa-231	->	Ac-227	
19.118	6.75E-05	U-235	->	Th-231	
19.308	1.38E-12	Ac-227	->	Th-227	
19.811	1.92E-04	Th-231	->	Pa-231	
20.27	6.96E-12	Fr-223	->	Ra-223,	Th-227 -> Ra-223
21.622	4.13E+08	Np-239	->	Pu-239	

23.55	1.55E-13	Pa-231	->	Ac-227	
24.5	1.21E-13	Ac-227	->	Th-227	
24.56	2.73E-11	Pa-231	->	Ac-227	
25.464	8.20E-11	Pa-231	->	Ac-227	
25.642	3.79E-04	Th-231	->	Pa-231	
27.396	8.48E-09	Pa-231	->	Ac-227	
29.58	2.09E-13	Fr-223	->	Ra-223,	Th-227 -> Ra-223
29.869	3.31E-12	Fr-223	->	Ra-223,	Th-227 -> Ra-223
29.996	8.38E-11	Pa-231	->	Ac-227	
30.08	1.11E+00	Pu-239	->	U-235	
31.04	8.20E-12	Pa-231	->	Ac-227	
31.136	4.87E+06	Am-243	->	Np-239	
31.566	2.64E-12	Th-227	->	Ra-223	
31.58	6.38E-12	Pa-231	->	Ac-227	
31.585	4.16E-07	U-235	->	Th-231	
31.87	3.14E-15	Ra-223	->	Rn-219	
33.52	4.61E-13	Th-227	->	Ra-223	
35.884	1.46E-11	Pa-231	->	Ac-227	
38.235	1.36E-10	Pa-231	->	Ac-227	
38.66	1.11E+02	Pu-239	->	U-235	
39.61	1.28E-12	Pa-231	->	Ac-227	
40.006	1.09E-11	Pa-231	->	Ac-227	
40.16	6.59E-13	Th-227	->	Ra-223	
40.41	1.71E+00	Pu-239	->	U-235	
41.13	7.79E-07	U-235	->	Th-231	
41.88	1.32E-12	Th-227	->	Ra-223	
41.96	1.56E-06	U-235	->	Th-231	
42.06	1.74E+00	Pu-239	->	U-235	
42.52	5.47E-12	Pa-231	->	Ac-227	
42.828	1.50E-06	Th-231	->	Pa-231	
43.03	4.28E+06	Am-243	->	Np-239	
43.09	6.38E-12	Pa-231	->	Ac-227	
43.53	1.65E-12	Th-227	->	Ra-223	
43.537	3.76E+08	Am-243	->	Np-239	
43.73	7.58E-12	Fr-223	->	Ra-223,	Th-227 -> Ra-223
44.06	1.82E-08	Th-231	->	Pa-231	
44.08	2.31E-13	Th-227	->	Ra-223	
44.213	5.47E-11	Pa-231	->	Ac-227	
44.37	4.29E-13	Th-227	->	Ra-223	
44.665	7.67E+06	Np-239	->	Pu-239	
46.13	6.75E-16	Ac-227	->	Fr-223	
46.218	7.79E+00	Pu-239	->	U-235	
46.393	1.90E-10	Pa-231	->	Ac-227	
46.69	6.13E-01	Pu-239	->	U-235	
47.52	3.07E-01	Pu-239	->	U-235	
48.27	3.30E-13	Fr-223	->	Ra-223,	Th-227 -> Ra-223
49.4152	7.74E+06	Np-239	->	Pu-239	
49.85	6.96E-12	Fr-223	->	Ra-223,	Th-227 -> Ra-223
50.14	2.95E-10	Fr-223	->	Ra-223,	Th-227 -> Ra-223
50.8	1.92E+05	Am-243	->	Np-239	

50.82	5.27E-13	Th-227	->	Ra-223	
50.97	1.28E-12	Pa-231	->	Ac-227	
51.179	5.19E-07	U-235	->	Th-231	
51.29	9.89E-14	Fr-223	->	Ra-223,	Th-227 -> Ra-223
51.624	2.87E+02	Pu-239	->	U-235	
52.763	7.75E-11	Pa-231	->	Ac-227	
54.02	1.79E+00	Pu-239	->	U-235	
54.18	2.64E-13	Fr-223	->	Ra-223,	Th-227 -> Ra-223
54.632	7.38E-11	Pa-231	->	Ac-227	
55.4	6.78E+05	Am-243	->	Np-239	
56.03	1.65E-13	Th-227	->	Ra-223	
56.63	2.31E-13	Th-227	->	Ra-223	
56.8	5.47E-12	Pa-231	->	Ac-227	
56.825	1.19E+01	Pu-239	->	U-235	
56.9	1.00E-11	Pa-231	->	Ac-227	
57.2	1.37E-11	Pa-231	->	Ac-227	
57.233	2.28E-11	Pa-231	->	Ac-227	
57.2759	1.09E+07	Np-239	->	Pu-239	
57.278	4.42E+05	Np-239	->	Pu-239	
58.562	1.24E-05	Th-231	->	Pa-231	
59.5	2.97E-13	Th-227	->	Ra-223	
60.526	6.38E-12	Pa-231	->	Ac-227	
61.435	2.64E-12	Th-227	->	Ra-223	
61.462	7.08E+07	Np-239	->	Pu-239	
62.05	6.59E-14	Th-227	->	Ra-223	
62.36	7.91E-12	Th-227	->	Ra-223	
62.54	2.97E-13	Th-227	->	Ra-223	
63.7	4.56E-11	Pa-231	->	Ac-227	
63.834	5.96E-07	Th-231	->	Pa-231	
64.348	5.19E-07	U-235	->	Th-231	
64.37	9.23E-13	Th-227	->	Ra-223	
65.516	2.39E-12	Pb-211	->	Bi-211	
65.7	3.49E-01	Pu-239	->	U-235	
66.1	1.98E-13	Th-227	->	Ra-223	
66.3	2.31E-13	Th-227	->	Ra-223	
67.69	1.50E+00	Pu-239	->	U-235	
67.8462	6.63E+06	Np-239	->	Pu-239	
68.5	1.48E-07	Th-231	->	Pa-231	
68.7	1.88E-13	Th-227	->	Ra-223	
68.73	1.27E+00	Pu-239	->	U-235	
68.75	1.32E-12	Th-227	->	Ra-223	
69.13	2.65E-15	Ac-227	->	Fr-223	
69.65	2.97E-13	Th-227	->	Ra-223	
69.83	8.20E-15	Ac-227	->	Fr-223	
70.54	6.38E-12	Pa-231	->	Ac-227	
70.832	2.31E-11	Bi-211	->	Tl-207	
71.92	1.82E-12	Pa-231	->	Ac-227	
72.57	3.65E-12	Pa-231	->	Ac-227	
72.71	2.86E-06	U-235	->	Th-231	
72.767	6.51E-06	Th-231	->	Pa-231	

72.8	9.23E-13	Th-227	->	Ra-223	
72.803	4.54E-14	Tl-207	->	Pb-207	
72.873	3.91E-11	Bi-211	->	Tl-207	
73.66	6.26E-13	Th-227	->	Ra-223	
74.209	2.28E-11	Pa-231	->	Ac-227	
74.672	4.42E+09	Am-243	->	Np-239	
74.8	1.56E-06	U-235	->	Th-231	
74.814	7.94E-12	Pb-211	->	Bi-211	
74.89	4.02E-01	Pu-239	->	U-235	
74.969	7.57E-14	Tl-207	->	Pb-207	
75.1	2.97E-13	Th-227	->	Ra-223	
76.858	1.65E-11	Rn-219	->	Po-215	
77.107	1.33E-11	Pb-211	->	Bi-211	
77.405	6.20E-11	Pa-231	->	Ac-227	
77.593	4.52E+00	Pu-239	->	U-235	
78.37	1.79E+00	Pu-239	->	U-235	
79.29	2.76E-11	Rn-219	->	Po-215	
79.72	7.33E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
81	1.40E-12	Pb-211	->	Bi-211	
81.067	4.77E-10	Ra-223	->	Rn-219	
81.229	2.33E-05	Th-231	->	Pa-231	
82.434	1.38E-11	Bi-211	->	Tl-207	
83.787	7.91E-10	Ra-223	->	Rn-219	
83.81	1.77E-12	Pb-211	->	Bi-211	
84.203	1.71E-04	Th-231	->	Pa-231	
84.979	2.70E-14	Tl-207	->	Pb-207	
85.185	3.88E-12	Bi-211	->	Tl-207	
85.429	6.28E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
86.57	2.21E+07	Am-243	->	Np-239	
87.19	4.72E-12	Pb-211	->	Bi-211	
87.632	7.88E-15	Tl-207	->	Pb-207	
87.673	4.34E-10	Pa-231	->	Ac-227	
88.057	4.35E+05	Np-239	->	Pu-239	
88.2	5.27E-13	Pb-211	->	Bi-211	
88.471	1.03E-10	Fr-223	->	Ra-223,	Th-227 -> Ra-223
89.639	9.84E-12	Rn-219	->	Po-215	
89.85	1.12E-13	Th-227	->	Ra-223	
89.954	2.44E-05	Th-231	->	Pa-231	
89.955	8.73E-05	U-235	->	Th-231	
90.128	1.40E-12	Pb-211	->	Bi-211	
90.886	7.11E-10	Pa-231	->	Ac-227	
92.279	1.01E-05	Th-231	->	Pa-231	
92.673	2.98E-12	Rn-219	->	Po-215	
93.07	1.27E-06	Th-231	->	Pa-231	
93.36	1.43E-04	U-235	->	Th-231	
93.93	4.61E-11	Th-227	->	Ra-223	
94.3	3.41E-13	Pb-211	->	Bi-211	
94.66	4.44E+01	Pu-239	->	U-235	
94.677	2.79E-10	Ra-223	->	Rn-219	
94.89	5.58E-13	Pb-211	->	Bi-211	

94.9	3.96E-13	Th-227 ->	Ra-223	
95.863	1.63E-05	Th-231 ->	Pa-231	
96.06	1.98E-12	Th-227 ->	Ra-223	
96.154	2.23E-06	U-235 ->	Th-231	
96.16	3.89E-01	Pu-239 ->	U-235	
96.979	8.02E-11	Pa-231 ->	Ac-227	
97.3	3.57E-13	Pb-211 ->	Bi-211	
97.907	8.92E-11	Ra-223 ->	Rn-219	
98.43	5.90E+05	Am-243 ->	Np-239	
98.441	7.21E+01	Pu-239 ->	U-235	
98.79	1.29E+01	Pu-239 ->	U-235	
99.28	3.11E-06	Th-231 ->	Pa-231	
99.522	1.11E+09	Np-239 ->	Pu-239	
99.56	4.29E-13	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
99.64	6.59E-14	Th-227 ->	Ra-223	
99.7	1.54E-14	Ac-227 ->	Fr-223	
99.915	3.69E-11	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
100.31	3.30E-12	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
100.96	2.92E-11	Pa-231 ->	Ac-227	
101.943	5.16E+04	Np-239 ->	Pu-239	
102.255	1.06E-05	Th-231 ->	Pa-231	
102.45	3.96E-14	Th-227 ->	Ra-223	
102.613	2.55E-10	Pa-231 ->	Ac-227	
103.035	2.24E+00	Pu-239 ->	U-235	
103.341	1.21E-11	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
103.734	1.76E+09	Np-239 ->	Pu-239	
103.85	5.34E-13	Ra-223 ->	Rn-219	
104.9	1.32E-12	Th-227 ->	Ra-223	
105.362	5.14E-05	U-235 ->	Th-231	
105.803	1.84E-07	Th-231 ->	Pa-231	
106.1	6.75E-16	Ac-227 ->	Fr-223	
106.1272	1.67E+09	Np-239 ->	Pu-239	
106.137	8.38E-11	Pa-231 ->	Ac-227	
106.488	3.54E+06	Np-239 ->	Pu-239	
106.581	4.41E-07	Th-231 ->	Pa-231	
106.66	6.91E-13	Ra-223 ->	Rn-219	
107.92	2.31E-13	Th-227 ->	Ra-223	
108.166	5.91E-06	Th-231 ->	Pa-231	
108.99	1.71E-05	U-235 ->	Th-231	
109.1	1.98E-13	Th-227 ->	Ra-223	
109.16	4.00E-05	U-235 ->	Th-231	
110.421	8.41E+00	Pu-239 ->	U-235	
110.58	1.65E-13	Th-227 ->	Ra-223	
110.8	1.51E-12	Ra-223 ->	Rn-219	
111.3	1.64E+01	Pu-239 ->	U-235	
111.89	3.25E-01	Pu-239 ->	U-235	
111.897	1.97E-06	Th-231 ->	Pa-231	
112.54	2.64E-13	Th-227 ->	Ra-223	
113.12	4.94E-12	Th-227 ->	Ra-223	
113.19	1.85E-11	Th-227 ->	Ra-223	

114.333	6.64E+00	Pu-239	->	U-235	
114.5	2.83E-13	Ra-223	->	Rn-219	
115.3	1.05E-13	Rn-219	->	Po-215	
115.38	6.86E+00	Pu-239	->	U-235	
115.595	2.59E-08	Th-231	->	Pa-231	
116.11	1.82E-06	U-235	->	Th-231	
116.266	6.30E+00	Pu-239	->	U-235	
116.827	5.37E-07	Th-231	->	Pa-231	
116.93	6.34E+08	Np-239	->	Pu-239	
117.17	5.60E-12	Th-227	->	Ra-223	
117.3	3.96E-13	Th-227	->	Ra-223	
117.7	4.05E+07	Am-243	->	Np-239	
119.98	6.75E-07	U-235	->	Th-231	
120.9	2.65E-15	Ac-227	->	Fr-223	
120.974	2.20E+08	Np-239	->	Pu-239	
122.31	3.74E-11	Ra-223	->	Rn-219	
122.34	3.17E-02	Pu-239	->	U-235	
123.55	2.64E-13	Th-227	->	Ra-223	
123.62	2.08E-01	Pu-239	->	U-235	
124.439	7.67E+05	Np-239	->	Pu-239	
124.48	1.65E-13	Th-227	->	Ra-223	
124.51	6.48E-01	Pu-239	->	U-235	
124.6	9.89E-14	Th-227	->	Ra-223	
124.69	4.56E-12	Pa-231	->	Ac-227	
124.922	1.45E-06	Th-231	->	Pa-231	
125.21	7.52E-01	Pu-239	->	U-235	
129.296	6.62E+01	Pu-239	->	U-235	
130.57	4.00E-12	Rn-219	->	Po-215	
131.1	1.57E-13	Ra-223	->	Rn-219	
133.8	1.35E-15	Ac-227	->	Fr-223	
134.014	6.22E-07	Th-231	->	Pa-231	
134.5	1.09E-12	Fr-223	->	Ra-223,	Th-227 -> Ra-223
135.681	2.02E-06	Th-231	->	Pa-231	
136.705	1.09E-07	Th-231	->	Pa-231	
136.72	3.12E-07	U-235	->	Th-231	
140.33	1.05E-12	Th-227	->	Ra-223	
140.537	1.84E-08	Th-231	->	Pa-231	
140.76	5.71E-06	U-235	->	Th-231	
141.44	4.29E-12	Th-227	->	Ra-223	
141.657	3.38E-01	Pu-239	->	U-235	
141.97	8.40E+06	Am-243	->	Np-239	
143.35	1.83E-01	Pu-239	->	U-235	
143.76	2.85E-04	U-235	->	Th-231	
144.18	1.02E-10	Ra-223	->	Rn-219	
144.201	3.21E+00	Pu-239	->	U-235	
144.5	3.65E-12	Pa-231	->	Ac-227	
145.063	1.50E-07	Th-231	->	Pa-231	
145.927	8.30E-07	Th-231	->	Pa-231	
146.094	1.26E+00	Pu-239	->	U-235	
147.2	4.00E-15	Ac-227	->	Fr-223	

150.02	3.30E-13	Th-227 ->	Ra-223	
150.93	2.08E-06	U-235 ->	Th-231	
154.18	1.76E-10	Ra-223 ->	Rn-219	
158.59	2.16E-11	Ra-223 ->	Rn-219	
160.19	6.56E-02	Pu-239 ->	U-235	
161.482	1.30E+00	Pu-239 ->	U-235	
162.18	2.31E-13	Th-227 ->	Ra-223	
163.114	4.02E-06	Th-231 ->	Pa-231	
163.33	1.32E-04	U-235 ->	Th-231	
164.97	1.01E-07	Th-231 ->	Pa-231	
165.5	1.57E-13	Ra-223 ->	Rn-219	
166.364	1.25E+06	Np-239 ->	Pu-239	
167.81	3.10E-02	Pu-239 ->	U-235	
168.19	4.61E-13	Th-227 ->	Ra-223	
169.637	3.11E-08	Th-231 ->	Pa-231	
169.98	9.89E-14	Th-227 ->	Ra-223	
170.14	8.85E+04	Am-243 ->	Np-239	
171.21	3.30E-14	Th-227 ->	Ra-223	
171.393	1.16E+00	Pu-239 ->	U-235	
171.4	1.98E-15	Ac-227 ->	Fr-223	
172.27	2.60E-07	U-235 ->	Th-231	
173.38	5.64E-13	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
173.7	4.23E-02	Pu-239 ->	U-235	
174.157	4.75E-07	Th-231 ->	Pa-231	
175.23	5.93E-13	Th-227 ->	Ra-223	
175.55	5.34E-13	Ra-223 ->	Rn-219	
176.8	1.26E-13	Ra-223 ->	Rn-219	
177.35	1.48E-12	Ra-223 ->	Rn-219	
179.22	6.98E-01	Pu-239 ->	U-235	
179.28	6.59E-14	Th-227 ->	Ra-223	
179.69	4.80E-12	Ra-223 ->	Rn-219	
181.716	8.18E+06	Np-239 ->	Pu-239	
182.61	8.83E-06	U-235 ->	Th-231	
183.483	8.53E-07	Th-231 ->	Pa-231	
184.55	2.24E-02	Pu-239 ->	U-235	
184.68	1.29E-12	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
185.72	1.49E-03	U-235 ->	Th-231	
188.23	1.15E-01	Pu-239 ->	U-235	
188.756	8.30E-08	Th-231 ->	Pa-231	
189.36	8.78E-01	Pu-239 ->	U-235	
194.94	1.64E-05	U-235 ->	Th-231	
195.3	6.19E+04	Am-243 ->	Np-239	
195.679	1.13E+00	Pu-239 ->	U-235	
196.87	3.91E-02	Pu-239 ->	U-235	
197.61	3.96E-13	Th-227 ->	Ra-223	
198.9	1.09E-06	U-235 ->	Th-231	
198.96	5.10E-12	Pa-231 ->	Ac-227	
199.43	9.42E-14	Ra-223 ->	Rn-219	
200.48	6.59E-13	Th-227 ->	Ra-223	
201.64	6.59E-13	Th-227 ->	Ra-223	

202.11	2.81E-05	U-235	->	Th-231		
202.4	1.98E-13	Th-227	->	Ra-223		
203.54	5.92E+00	Pu-239	->	U-235		
204.2	7.58E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
204.95	4.94E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
205.31	1.30E-04	U-235	->	Th-231		
206.04	7.58E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
209.7554	2.45E+08	Np-239	->	Pu-239		
210.58	3.73E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
212.56	2.31E-12	Th-227	->	Ra-223		
212.69	5.60E-13	Th-227	->	Ra-223		
215.305	7.01E-07	U-235	->	Th-231		
217.934	1.04E-06	Th-231	->	Pa-231		
218.45	1.06E-02	Pu-239	->	U-235		
218.77	1.98E-12	Th-227	->	Ra-223		
218.94	1.32E-12	Th-227	->	Ra-223		
220.2	2.19E-13	Pa-231	->	Ac-227		
220.38	1.04E-12	Ra-223	->	Rn-219		
221.38	3.12E-06	U-235	->	Th-231		
221.9	9.52E-13	Rn-219	->	Po-215		
224.68	4.94E-13	Fr-223	->	Ra-223,	Th-227	-> Ra-223
225.39	1.72E-01	Pu-239	->	U-235		
226.382	2.51E+07	Np-239	->	Pu-239		
226.77	2.37E-12	Pa-231	->	Ac-227		
228.16	2.19E-13	Pa-231	->	Ac-227		
228.1865	7.89E+08	Np-239	->	Pu-239		
228.77	2.08E-07	U-235	->	Th-231		
230.17	2.31E-14	Th-227	->	Ra-223		
233.5	7.53E-07	U-235	->	Th-231		
234.82	1.62E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
235.97	3.69E-10	Fr-223	->	Ra-223,	Th-227	-> Ra-223
235.985	2.39E-07	Th-231	->	Pa-231		
237.75	1.59E-01	Pu-239	->	U-235		
240.25	7.26E-09	Th-231	->	Pa-231		
240.85	1.40E-06	U-235	->	Th-231		
242	7.29E-12	Pa-231	->	Ac-227		
242.12	8.78E-02	Pu-239	->	U-235		
242.508	2.18E-08	Th-231	->	Pa-231		
243.17	4.28E-11	Pa-231	->	Ac-227		
243.36	2.45E-01	Pu-239	->	U-235		
244.86	5.50E-02	Pu-239	->	U-235		
245.19	2.83E-13	Ra-223	->	Rn-219		
245.438	6.38E-12	Pa-231	->	Ac-227		
245.77	6.29E-12	Pa-231	->	Ac-227		
246.07	3.63E-13	Th-227	->	Ra-223		
246.84	1.38E-06	U-235	->	Th-231		
248.88	7.93E-02	Pu-239	->	U-235		
249.36	2.31E-13	Th-227	->	Ra-223		
249.49	1.16E-12	Ra-223	->	Rn-219		
249.56	2.02E-08	Th-231	->	Pa-231		

250.12	1.22E-11	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
250.33	4.29E-12	Th-227 ->	Ra-223		
250.43	1.69E-08	Th-231 ->	Pa-231		
251.12	1.10E-12	Ra-223 ->	Rn-219		
251.58	9.73E-13	Ra-223 ->	Rn-219		
252.46	3.63E-12	Th-227 ->	Ra-223		
254.421	7.30E+06	Np-239 ->	Pu-239		
254.66	2.64E-11	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
254.98	1.00E-12	Ra-223 ->	Rn-219		
255.384	8.46E-01	Pu-239 ->	U-235		
255.74	1.57E-13	Ra-223 ->	Rn-219		
255.858	9.11E-11	Pa-231 ->	Ac-227		
256.24	2.21E-10	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
258.43	2.10E-12	Pa-231 ->	Ac-227		
260.29	1.66E-10	Pa-231 ->	Ac-227		
260.4	1.88E-13	Ra-223 ->	Rn-219		
262.72	3.30E-12	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
263.9	2.70E-01	Pu-239 ->	U-235		
265.81	3.17E-02	Pu-239 ->	U-235		
266.3	8.24E-14	Th-227 ->	Ra-223		
266.483	1.56E-07	U-235 ->	Th-231		
267.62	3.01E-08	Th-231 ->	Pa-231		
267.82	3.30E-13	Th-227 ->	Ra-223		
269.39	4.27E-10	Ra-223 ->	Rn-219		
270.34	2.64E-13	Th-227 ->	Ra-223		
270.76	1.05E-12	Th-227 ->	Ra-223		
271.13	3.14E-10	Rn-219 ->	Po-215		
272.852	5.53E+06	Np-239 ->	Pu-239		
272.95	1.62E-11	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
273.17	5.19E-11	Pa-231 ->	Ac-227		
274.14	7.78E-10	Th-231 ->	Pa-231		
275.2	4.94E-14	Th-227 ->	Ra-223		
275.47	1.27E-07	U-235 ->	Th-231		
277.17	5.65E-11	Pa-231 ->	Ac-227		
277.43	3.01E-12	Pa-231 ->	Ac-227		
277.6016	1.05E+09	Np-239 ->	Pu-239		
279.7	2.31E-12	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
281	2.31E-13	Th-227 ->	Ra-223		
281.12	2.22E-02	Pu-239 ->	U-235		
281.31	5.27E-12	Th-227 ->	Ra-223		
281.45	1.56E-07	U-235 ->	Th-231		
282.98	1.30E-07	U-235 ->	Th-231		
283.673	1.45E-09	Pa-231 ->	Ac-227		
284.24	1.65E-12	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
285.27	1.59E-02	Pu-239 ->	U-235		
285.4624	5.45E+07	Np-239 ->	Pu-239		
285.48	1.81E-12	Th-227 ->	Ra-223		
286.11	5.24E-11	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
288.15	4.83E-12	Ra-223 ->	Rn-219		
289.5	2.97E-13	Th-227 ->	Ra-223		

289.57	1.82E-07	U-235	->	Th-231		
289.6	4.78E-13	Fr-223	->	Ra-223,	Th-227	-> Ra-223
291.72	3.64E-07	U-235	->	Th-231		
292.3	1.98E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
293.8	2.06E-12	Rn-219	->	Po-215		
296.54	1.42E-11	Th-227	->	Ra-223		
297.46	5.27E-01	Pu-239	->	U-235		
299.97	6.92E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
300.07	2.17E-09	Pa-231	->	Ac-227		
300.34	6.59E-12	Th-227	->	Ra-223		
301.72	1.30E-07	U-235	->	Th-231		
302.638	5.83E-10	Pa-231	->	Ac-227		
302.671	1.56E-09	Pa-231	->	Ac-227		
302.89	6.03E-02	Pu-239	->	U-235		
304.51	3.59E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
307.82	6.56E-02	Pu-239	->	U-235		
307.89	5.67E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
308.49	4.94E-13	Th-227	->	Ra-223		
308.75	1.01E-08	Th-231	->	Pa-231		
310.19	1.28E-12	Pa-231	->	Ac-227		
310.71	1.04E-07	U-235	->	Th-231		
311	7.52E-08	Th-231	->	Pa-231		
311.698	1.03E+05	Np-239	->	Pu-239		
311.78	2.73E-01	Pu-239	->	U-235		
312.57	1.55E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
313.058	1.03E-10	Pa-231	->	Ac-227		
313.39	2.11E-02	Pu-239	->	U-235		
313.85	9.62E-13	Pb-211	->	Bi-211		
314.78	9.89E-13	Th-227	->	Ra-223		
314.82	1.52E-11	Th-227	->	Ra-223		
315.8825	1.17E+08	Np-239	->	Pu-239		
316.4	1.49E-01	Pu-239	->	U-235		
317.12	2.60E-08	U-235	->	Th-231		
317.93	2.07E-09	Th-231	->	Pa-231		
318.1	1.82E-12	Pa-231	->	Ac-227		
318.58	1.98E-13	Th-227	->	Ra-223		
319.18	1.04E-12	Fr-223	->	Ra-223,	Th-227	-> Ra-223
320.188	2.85E-09	Th-231	->	Pa-231		
322.267	4.20E+05	Np-239	->	Pu-239		
323.77	5.70E-01	Pu-239	->	U-235		
323.88	1.22E-10	Ra-223	->	Rn-219		
325.08	1.98E-13	Th-227	->	Ra-223		
326.12	1.65E-13	Th-227	->	Ra-223		
327.23	2.74E-11	Pa-231	->	Ac-227		
328.08	4.57E-14	Tl-207	->	Pb-207,	Po-211	-> Pb-207
328.49	6.22E-12	Ra-223	->	Rn-219		
329.84	9.00E-11	Fr-223	->	Ra-223,	Th-227	-> Ra-223
330.066	1.20E-09	Pa-231	->	Ac-227		
332.853	5.33E+00	Pu-239	->	U-235		
333.87	3.11E-12	Ra-223	->	Rn-219		

334.3136	1.51E+08	Np-239	->	Pu-239	
334.38	3.26E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
336.116	1.20E+00	Pu-239	->	U-235	
338.28	8.73E-11	Ra-223	->	Rn-219	
339.1	4.61E-14	Th-227	->	Ra-223	
339.45	1.29E-13	Fr-223	->	Ra-223,	Th-227 -> Ra-223
340.873	1.59E-10	Pa-231	->	Ac-227	
341.17	2.00E-11	Pa-231	->	Ac-227	
341.526	7.00E-01	Pu-239	->	U-235	
342.44	1.25E-11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
342.9	6.28E-12	Ra-223	->	Rn-219	
343.02	1.05E-12	Pb-211	->	Bi-211	
343.78	7.79E-08	U-235	->	Th-231	
345.014	5.91E+00	Pu-239	->	U-235	
345.921	7.53E-07	U-235	->	Th-231	
346.39	2.47E-13	Th-227	->	Ra-223	
348.4	1.98E-13	Th-227	->	Ra-223	
350.1	3.94E-10	Bi-211	->	Tl-207	
350.48	3.63E-12	Th-227	->	Ra-223	
351.82	1.82E-09	Th-231	->	Pa-231	
352.57	3.30E-13	Th-227	->	Ra-223	
354.02	8.46E-03	Pu-239	->	U-235	
354.63	7.29E-11	Pa-231	->	Ac-227	
356.068	1.30E-07	U-235	->	Th-231	
357.2	1.40E-10	Pa-231	->	Ac-227	
359.51	8.20E-12	Pa-231	->	Ac-227	
361.8	1.35E-12	Ra-223	->	Rn-219	
361.84	1.24E-01	Pu-239	->	U-235	
362.55	1.65E-13	Th-227	->	Ra-223	
364.03	6.74E-12	Pa-231	->	Ac-227	
367.048	9.17E-01	Pu-239	->	U-235	
368.543	9.52E-01	Pu-239	->	U-235	
368.78	2.51E-13	Ra-223	->	Rn-219	
369.32	2.08E-13	Fr-223	->	Ra-223,	Th-227 -> Ra-223
369.48	6.28E-13	Ra-223	->	Rn-219	
370.85	2.31E-13	Th-227	->	Ra-223	
371.8	1.54E-11	Ra-223	->	Rn-219	
372.47	2.22E-02	Pu-239	->	U-235	
374.93	4.61E-14	Th-227	->	Ra-223	
375.039	1.66E+01	Pu-239	->	U-235	
376.26	1.98E-13	Th-227	->	Ra-223	
376.9	2.22E-13	Rn-219	->	Po-215	
379.05	1.11E-02	Pu-239	->	U-235	
379.4	4.19E-11	Rn-219	->	Po-215,	Pa-231 -> Ac-227
380.16	3.23E+00	Pu-239	->	U-235	
382.15	1.98E-13	Th-227	->	Ra-223	
382.732	2.74E+00	Pu-239	->	U-235	
383.12	1.26E-13	Ra-223	->	Rn-219	
383.47	1.58E-12	Th-227	->	Ra-223	
384.97	3.74E-12	Pa-231	->	Ac-227	

387.267	4.56E-13	Pa-231	->	Ac-227	
387.874	9.87E-08	U-235	->	Th-231	
387.9	1.27E-14	Rn-219	->	Po-215	
388.3	4.40E-13	Ra-223	->	Rn-219	
388.98	9.75E-13	Pa-231	->	Ac-227	
390.32	2.60E-08	U-235	->	Th-231	
391	9.42E-14	Ra-223	->	Rn-219	
391.85	6.20E-12	Pa-231	->	Ac-227	
392.24	2.97E-13	Th-227	->	Ra-223	
392.3	1.18E+05	Np-239	->	Pu-239	
392.914	5.85E+00	Pu-239	->	U-235	
395.8	2.37E-12	Pa-231	->	Ac-227	
398.4	8.48E-12	Pa-231	->	Ac-227	
398.6	2.97E-13	Th-227	->	Ra-223	
399.46	6.45E-02	Pu-239	->	U-235	
401.7	2.11E-10	Rn-219	->	Po-215	
402.42	3.96E-13	Th-227	->	Ra-223	
404.86	1.19E-10	Pb-211	->	Bi-211,	At-215 -> Bi-211
407.98	3.10E-11	Pa-231	->	Ac-227	
410.269	7.79E-08	U-235	->	Th-231	
410.84	1.73E-12	Pa-231	->	Ac-227	
410.94	8.46E-02	Pu-239	->	U-235	
412.83	2.11E-04	Pu-239	->	U-235	
413.713	1.55E+01	Pu-239	->	U-235	
415.09	5.60E-14	Th-227	->	Ra-223	
422.598	1.29E+00	Pu-239	->	U-235	
426.64	2.42E-01	Pu-239	->	U-235	
427	5.34E-11	Pb-211	->	Bi-211	
429.87	2.73E+05	Np-239	->	Pu-239	
430.16	5.18E-02	Pu-239	->	U-235	
430.26	1.99E-13	Pb-211	->	Bi-211	
430.53	5.97E-13	Ra-223	->	Rn-219	
432.29	1.65E-13	Th-227	->	Ra-223	
432.34	1.04E-12	Ra-223	->	Rn-219	
434.9	9.07E+05	Np-239	->	Pu-239	
435.38	3.01E-12	Pa-231	->	Ac-227	
436.137	6.12E+04	Np-239	->	Pu-239	
438.24	3.74E-12	Pa-231	->	Ac-227	
438.8	1.26E-12	Po-215	->	Pb-211	
444.94	3.99E-11	Ra-223	->	Rn-219	
445.81	9.31E-02	Pu-239	->	U-235	
448	5.36E-15	Fr-223	->	Ra-223,	Th-227 -> Ra-223
448.3	1.84E+04	Np-239	->	Pu-239	
448.42	2.60E-08	U-235	->	Th-231	
451.481	2.00E+00	Pu-239	->	U-235	
452.52	4.22E-15	Fr-223	->	Ra-223,	Th-227 -> Ra-223
454.568	9.14E+04	Np-239	->	Pu-239	
455.12	2.08E-08	U-235	->	Th-231	
457.07	2.96E-15	Fr-223	->	Ra-223,	Th-227 -> Ra-223
457.57	1.63E-02	Pu-239	->	U-235	

461.25	2.11E-02	Pu-239	->	U-235		
461.9	1.18E+05	Th-227	->	Ra-223,	Np-239	-> Pu-239
463.8	1.69E-03	Pu-239	->	U-235		
466.2	1.65E-15	Th-227	->	Ra-223		
469.7	7.81E+04	Np-239	->	Pu-239		
471.33	1.37E-13	Pa-231	->	Ac-227		
474.26	9.52E-04	Pu-239	->	U-235		
478	4.03E-13	Pb-211	->	Bi-211		
478.22	7.02E-14	Pa-231	->	Ac-227		
480.25	1.04E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
481.1	8.07E-13	Pb-211	->	Bi-211		
481.78	4.86E-02	Pu-239	->	U-235		
482.14	5.45E-15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
484.3	7.59E+04	Np-239	->	Pu-239		
486.99	2.64E-03	Pu-239	->	U-235		
487.59	3.14E-13	Ra-223	->	Rn-219		
492	4.34E-13	Pb-211	->	Bi-211		
492.2	4.35E+05	Np-239	->	Pu-239		
493.15	1.91E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
493.25	9.31E-03	Pu-239	->	U-235		
497.71	2.36E+05	Np-239	->	Pu-239		
498.8	2.29E+05	Np-239	->	Pu-239		
500.4	3.41E-13	Pb-211	->	Bi-211		
501.33	5.47E-13	Pa-231	->	Ac-227		
503.983	1.03E+05	Np-239	->	Pu-239		
504.33	4.65E-13	Pb-211	->	Bi-211		
507.64	1.46E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
515.7	1.27E-12	Rn-219	->	Po-215		
515.96	7.00E-15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
516.45	1.18E-12	Pa-231	->	Ac-227		
517.2	1.04E-08	U-235	->	Th-231		
524.02	5.82E-15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
527.3	2.23E-12	Ra-223	->	Rn-219		
534.9	3.30E-15	Th-227	->	Ra-223		
535.45	5.10E-13	Pa-231	->	Ac-227		
536.88	3.83E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
538.9	3.17E-03	Pu-239	->	U-235		
540.1	1.90E-13	Rn-219	->	Po-215		
544.55	1.25E+03	Am-243	->	Np-239		
546.9	4.56E-13	Pa-231	->	Ac-227		
550.6	4.23E-03	Pu-239	->	U-235		
552.09	9.71E-15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
555.91	8.04E-15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
557.7	6.34E-04	Pu-239	->	U-235		
568.76	3.69E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
569.15	4.49E-14	Po-211	->	Pb-207		
572.3	4.56E-13	Pa-231	->	Ac-227		
575.8	1.77E-14	Fr-223	->	Ra-223,	Th-227	-> Ra-223
578.2	5.07E-15	Fr-223	->	Ra-223,	Th-227	-> Ra-223
586.27	1.48E-03	Pu-239	->	U-235		

588.17	2.09E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
596.44	1.35E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
598.69	2.83E-12	Ra-223 ->	Rn-219		
606.9	1.59E-03	Pu-239 ->	U-235		
607.2	6.58E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
608.5	1.27E-13	Rn-219 ->	Po-215		
609.08	1.98E-12	Ra-223 ->	Rn-219		
609.62	7.14E-13	Pb-211 ->	Bi-211		
612.93	8.57E-03	Pu-239 ->	U-235		
617.43	2.16E-02	Pu-239 ->	U-235		
618.94	2.58E-02	Pu-239 ->	U-235		
621.92	2.15E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
623.38	2.51E-13	Ra-223 ->	Rn-219		
623.52	5.27E-15	Th-227 ->	Ra-223		
624.8	4.23E-03	Pu-239 ->	U-235		
631.116	2.43E+04	Am-243 ->	Np-239		
633.15	2.68E-02	Pu-239 ->	U-235		
633.2	4.29E-15	Th-227 ->	Ra-223		
637.862	2.71E-02	Pu-239 ->	U-235		
640.096	8.67E-02	Pu-239 ->	U-235		
641.45	6.59E-16	Th-227 ->	Ra-223		
643.93	2.90E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
645.969	1.57E-01	Pu-239 ->	U-235		
647.296	2.01E-03	Pu-239 ->	U-235		
648.43	6.96E-16	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
649.377	7.53E-03	Pu-239 ->	U-235		
650.529	2.75E-03	Pu-239 ->	U-235		
652.052	6.93E-02	Pu-239 ->	U-235		
654.89	2.38E-02	Pu-239 ->	U-235		
658.919	1.05E-01	Pu-239 ->	U-235		
662.251	7.00E+04	Am-243 ->	Np-239		
662.8	1.98E-15	Th-227 ->	Ra-223		
664.587	1.75E-02	Pu-239 ->	U-235		
675.33	1.99E-13	Pb-211 ->	Bi-211		
676.4	1.90E-13	Rn-219 ->	Po-215		
686.16	9.41E-03	Pu-239 ->	U-235		
690.85	5.82E-03	Pu-239 ->	U-235		
691.46	5.49E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
703.8	4.10E-02	Pu-239 ->	U-235		
704.19	4.68E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
704.51	1.49E-11	Pb-211 ->	Bi-211		
707.18	1.69E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
711.2	1.10E-13	Ra-223 ->	Rn-219		
714.58	9.52E-04	Pu-239 ->	U-235		
718	2.96E-02	Pu-239 ->	U-235		
718.22	1.10E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
722.6	2.41E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
723.86	4.91E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
727.84	1.15E-02	Pu-239 ->	U-235		
733.9	6.54E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223

734.6	6.20E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
736.76	2.96E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
742.52	1.04E-08	U-235 ->	Th-231		
746.24	1.41E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
748.56	1.73E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
753.44	6.17E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
754.17	6.35E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
756.42	3.56E-02	Pu-239 ->	U-235		
756.79	1.26E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
757.03	3.31E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
762.3	9.50E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
764.52	4.65E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
766.35	2.20E-11	Pb-211 ->	Bi-211		
766.6	2.91E-05	Pu-239 ->	U-235		
769.19	1.26E-01	Pu-239 ->	U-235		
772.85	4.52E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
775.82	2.36E-13	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
779.46	1.41E-03	Pu-239 ->	U-235		
780.59	1.17E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
784.04	6.35E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
786.9	4.43E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
787.3	8.88E-04	Pu-239 ->	U-235		
788.36	1.32E-15	Th-227 ->	Ra-223		
792.6	1.32E-15	Th-227 ->	Ra-223		
793	2.64E-04	Pu-239 ->	U-235		
793.11	5.56E-17	Fr-223 ->	Ra-223		
793.12	9.89E-16	Th-227 ->	Ra-223		
794.72	1.56E-08	U-235 ->	Th-231		
796.5	3.38E-04	Pu-239 ->	U-235		
796.96	3.07E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
803.3	4.65E-04	Pu-239 ->	U-235		
803.58	5.82E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
808.2	1.55E-03	Pu-239 ->	U-235		
808.26	1.93E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
812.15	9.53E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
813.9	6.56E-04	Pu-239 ->	U-235		
817.31	5.61E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
818.23	9.89E-16	Th-227 ->	Ra-223		
821.1	5.39E-04	Pu-239 ->	U-235		
822.99	8.70E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
825.96	2.94E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
825.97	6.02E-16	Fr-223 ->	Ra-223		
828.31	7.15E-15	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
828.53	3.90E-16	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
828.8	1.46E-03	Pu-239 ->	U-235		
831.86	1.18E-10	Pb-211 ->	Bi-211		
831.93	2.64E-04	Pu-239 ->	U-235		
834.2	3.17E-14	Rn-219 ->	Po-215		
837.36	1.63E-14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
839	4.23E-04	Pu-239 ->	U-235		

842.02	2.27E-14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
843.8	1.69E-03	Pu-239	->	U-235			
846.56	2.15E-14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
848.88	3.51E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
854.2	2.31E-15	Th-227	->	Ra-223			
857.89	2.15E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
858.4	9.35E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
863.2	1.59E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
865.81	1.99E-13	Pb-211	->	Bi-211			
867.23	2.90E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
876.14	2.49E-14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
878.16	3.97E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
879	5.29E-04	Pu-239	->	U-235			
887.7	4.76E-14	Rn-219	->	Po-215			
891	1.59E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
891.1	8.14E-04	Pu-239	->	U-235			
892.8	1.03E-15	Fr-223	->	Ra-223,	Th-227	->	Ra-223
896.41	1.15E-14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
897.23	7.31E-12	Tl-207	->	Pb-207,	Po-211	->	Pb-207
908.03	7.52E-14	Fr-223	->	Ra-223,	Th-227	->	Ra-223
909.85	4.94E-16	Th-227	->	Ra-223			
920.06	3.96E-16	Th-227	->	Ra-223			
926.28	9.72E-16	Fr-223	->	Ra-223,	Th-227	->	Ra-223
938.34	3.30E-16	Th-227	->	Ra-223			
940.1	4.44E-04	Pu-239	->	U-235			
941.41	2.37E-15	Th-227	->	Ra-223			
951	6.83E-13	Pb-211	->	Bi-211			
956.4	5.92E-04	Pu-239	->	U-235			
958.6	2.04E-15	Th-227	->	Ra-223			
969.91	9.89E-16	Th-227	->	Ra-223			
971.28	3.30E-16	Th-227	->	Ra-223			
979.52	2.43E-04	Pu-239	->	U-235			
986.7	1.27E-04	Pu-239	->	U-235			
990.2	1.15E-15	Th-227	->	Ra-223			
992.47	2.43E-04	Pu-239	->	U-235			
994.9	2.31E-16	Th-227	->	Ra-223			
999.78	9.89E-16	Th-227	->	Ra-223			
1005.63	1.27E-04	Pu-239	->	U-235			
1014.48	5.55E-13	Pb-211	->	Bi-211			
1015.1	4.94E-16	Th-227	->	Ra-223			
1020	6.59E-16	Th-227	->	Ra-223			
1024.8	4.94E-16	Th-227	->	Ra-223			
1055.8	1.90E-14	Rn-219	->	Po-215			
1057.32	4.76E-04	Pu-239	->	U-235			
1080.19	4.75E-13	Pb-211	->	Bi-211			
1090.5	8.07E-14	Pb-211	->	Bi-211			
1103.4	1.58E-13	Pb-211	->	Bi-211			
1109.37	4.56E-12	Pb-211	->	Bi-211			
1196.61	3.97E-13	Pb-211	->	Bi-211			
1234.3	4.03E-14	Pb-211	->	Bi-211			

1270.67 2.76E-13 Pb-211 -> Bi-211

Am243 Aged 5 years Sorted by Intensity

Intensity	Energy	Initial Isotopes and Decays
ph/s/gm	keV	
4.42E+09	74.672	Am-243 -> Np-239
1.84E+09	18.08	Np-239 -> Pu-239
1.76E+09	103.734	Np-239 -> Pu-239
1.74E+09	14.262	Np-239 -> Pu-239
1.67E+09	106.1272	Np-239 -> Pu-239
1.11E+09	99.522	Np-239 -> Pu-239
1.05E+09	277.6016	Np-239 -> Pu-239
7.89E+08	228.1865	Np-239 -> Pu-239
6.34E+08	116.93	Np-239 -> Pu-239
4.13E+08	21.622	Np-239 -> Pu-239
3.76E+08	43.537	Am-243 -> Np-239
2.45E+08	209.7554	Np-239 -> Pu-239
2.20E+08	120.974	Np-239 -> Pu-239
1.51E+08	334.3136	Np-239 -> Pu-239
1.17E+08	315.8825	Np-239 -> Pu-239
1.09E+08	12.124	Np-239 -> Pu-239
7.08E+07	61.462	Np-239 -> Pu-239
5.45E+07	285.4624	Np-239 -> Pu-239
4.05E+07	117.7	Am-243 -> Np-239
2.80E+07	16.333	Np-239 -> Pu-239
2.51E+07	226.382	Np-239 -> Pu-239
2.21E+07	86.57	Am-243 -> Np-239
1.09E+07	57.2759	Np-239 -> Pu-239
8.40E+06	141.97	Am-243 -> Np-239
8.18E+06	181.716	Np-239 -> Pu-239
7.74E+06	49.4152	Np-239 -> Pu-239
7.67E+06	44.665	Np-239 -> Pu-239
7.30E+06	254.421	Np-239 -> Pu-239
6.63E+06	67.8462	Np-239 -> Pu-239
5.53E+06	272.852	Np-239 -> Pu-239
4.87E+06	31.136	Am-243 -> Np-239
4.28E+06	43.03	Am-243 -> Np-239
3.54E+06	106.488	Np-239 -> Pu-239
1.25E+06	166.364	Np-239 -> Pu-239
9.07E+05	434.9	Np-239 -> Pu-239
7.67E+05	124.439	Np-239 -> Pu-239
6.78E+05	55.4	Am-243 -> Np-239
5.90E+05	98.43	Am-243 -> Np-239
4.42E+05	57.278	Np-239 -> Pu-239
4.35E+05	492.2	Np-239 -> Pu-239
4.35E+05	88.057	Np-239 -> Pu-239

4.20E+05	322.267	Np-239	->	Pu-239	
2.73E+05	429.87	Np-239	->	Pu-239	
2.36E+05	497.71	Np-239	->	Pu-239	
2.29E+05	498.8	Np-239	->	Pu-239	
1.92E+05	50.8	Am-243	->	Np-239	
1.18E+05	461.9	Th-227	->	Ra-223,	Np-239 -> Pu-239
1.18E+05	392.3	Np-239	->	Pu-239	
1.03E+05	503.983	Np-239	->	Pu-239	
1.03E+05	311.698	Np-239	->	Pu-239	
9.14E+04	454.568	Np-239	->	Pu-239	
8.85E+04	170.14	Am-243	->	Np-239	
7.81E+04	469.7	Np-239	->	Pu-239	
7.59E+04	484.3	Np-239	->	Pu-239	
7.00E+04	662.251	Am-243	->	Np-239	
6.19E+04	195.3	Am-243	->	Np-239	
6.12E+04	436.137	Np-239	->	Pu-239	
5.16E+04	101.943	Np-239	->	Pu-239	
2.43E+04	631.116	Am-243	->	Np-239	
1.84E+04	448.3	Np-239	->	Pu-239	
1.25E+03	544.55	Am-243	->	Np-239	
2.87E+02	51.624	Pu-239	->	U-235	
1.11E+02	38.66	Pu-239	->	U-235	
7.21E+01	98.441	Pu-239	->	U-235	
6.62E+01	129.296	Pu-239	->	U-235	
4.44E+01	94.66	Pu-239	->	U-235	
1.66E+01	375.039	Pu-239	->	U-235	
1.64E+01	111.3	Pu-239	->	U-235	
1.55E+01	413.713	Pu-239	->	U-235	
1.29E+01	98.79	Pu-239	->	U-235	
1.19E+01	56.825	Pu-239	->	U-235	
8.41E+00	110.421	Pu-239	->	U-235	
7.79E+00	46.218	Pu-239	->	U-235	
6.86E+00	115.38	Pu-239	->	U-235	
6.64E+00	114.333	Pu-239	->	U-235	
6.30E+00	116.266	Pu-239	->	U-235	
5.92E+00	203.54	Pu-239	->	U-235	
5.91E+00	345.014	Pu-239	->	U-235	
5.85E+00	392.914	Pu-239	->	U-235	
5.33E+00	332.853	Pu-239	->	U-235	
4.52E+00	77.593	Pu-239	->	U-235	
3.23E+00	380.16	Pu-239	->	U-235	
3.21E+00	144.201	Pu-239	->	U-235	
2.74E+00	382.732	Pu-239	->	U-235	
2.24E+00	103.035	Pu-239	->	U-235	
2.00E+00	451.481	Pu-239	->	U-235	
1.79E+00	78.37	Pu-239	->	U-235	
1.79E+00	54.02	Pu-239	->	U-235	
1.74E+00	42.06	Pu-239	->	U-235	
1.71E+00	40.41	Pu-239	->	U-235	
1.50E+00	67.69	Pu-239	->	U-235	

1.30E+00	161.482	Pu-239	->	U-235
1.29E+00	422.598	Pu-239	->	U-235
1.27E+00	68.73	Pu-239	->	U-235
1.26E+00	146.094	Pu-239	->	U-235
1.20E+00	336.116	Pu-239	->	U-235
1.16E+00	171.393	Pu-239	->	U-235
1.13E+00	195.679	Pu-239	->	U-235
1.11E+00	30.08	Pu-239	->	U-235
9.52E-01	368.543	Pu-239	->	U-235
9.17E-01	367.048	Pu-239	->	U-235
8.78E-01	189.36	Pu-239	->	U-235
8.46E-01	255.384	Pu-239	->	U-235
7.52E-01	125.21	Pu-239	->	U-235
7.00E-01	341.526	Pu-239	->	U-235
6.98E-01	179.22	Pu-239	->	U-235
6.48E-01	124.51	Pu-239	->	U-235
6.13E-01	46.69	Pu-239	->	U-235
5.70E-01	323.77	Pu-239	->	U-235
5.27E-01	297.46	Pu-239	->	U-235
4.02E-01	74.89	Pu-239	->	U-235
3.89E-01	96.16	Pu-239	->	U-235
3.49E-01	65.7	Pu-239	->	U-235
3.38E-01	141.657	Pu-239	->	U-235
3.25E-01	111.89	Pu-239	->	U-235
3.07E-01	47.52	Pu-239	->	U-235
2.73E-01	311.78	Pu-239	->	U-235
2.70E-01	263.9	Pu-239	->	U-235
2.45E-01	243.36	Pu-239	->	U-235
2.42E-01	426.64	Pu-239	->	U-235
2.08E-01	123.62	Pu-239	->	U-235
1.83E-01	143.35	Pu-239	->	U-235
1.72E-01	225.39	Pu-239	->	U-235
1.59E-01	237.75	Pu-239	->	U-235
1.57E-01	645.969	Pu-239	->	U-235
1.49E-01	316.4	Pu-239	->	U-235
1.26E-01	769.19	Pu-239	->	U-235
1.24E-01	361.84	Pu-239	->	U-235
1.15E-01	188.23	Pu-239	->	U-235
1.05E-01	658.919	Pu-239	->	U-235
9.31E-02	445.81	Pu-239	->	U-235
8.78E-02	242.12	Pu-239	->	U-235
8.67E-02	640.096	Pu-239	->	U-235
8.46E-02	410.94	Pu-239	->	U-235
7.93E-02	248.88	Pu-239	->	U-235
6.93E-02	652.052	Pu-239	->	U-235
6.56E-02	160.19	Pu-239	->	U-235
6.56E-02	307.82	Pu-239	->	U-235
6.45E-02	399.46	Pu-239	->	U-235
6.03E-02	302.89	Pu-239	->	U-235
5.50E-02	244.86	Pu-239	->	U-235

5.18E-02	430.16	Pu-239	->	U-235
4.86E-02	481.78	Pu-239	->	U-235
4.23E-02	173.7	Pu-239	->	U-235
4.10E-02	703.8	Pu-239	->	U-235
3.91E-02	196.87	Pu-239	->	U-235
3.56E-02	756.42	Pu-239	->	U-235
3.17E-02	265.81	Pu-239	->	U-235
3.17E-02	122.34	Pu-239	->	U-235
3.10E-02	167.81	Pu-239	->	U-235
2.96E-02	718	Pu-239	->	U-235
2.71E-02	637.862	Pu-239	->	U-235
2.68E-02	633.15	Pu-239	->	U-235
2.58E-02	618.94	Pu-239	->	U-235
2.38E-02	654.89	Pu-239	->	U-235
2.24E-02	184.55	Pu-239	->	U-235
2.22E-02	372.47	Pu-239	->	U-235
2.22E-02	281.12	Pu-239	->	U-235
2.16E-02	617.43	Pu-239	->	U-235
2.11E-02	313.39	Pu-239	->	U-235
2.11E-02	461.25	Pu-239	->	U-235
1.75E-02	664.587	Pu-239	->	U-235
1.63E-02	457.57	Pu-239	->	U-235
1.59E-02	285.27	Pu-239	->	U-235
1.15E-02	727.84	Pu-239	->	U-235
1.11E-02	379.05	Pu-239	->	U-235
1.06E-02	218.45	Pu-239	->	U-235
9.41E-03	686.16	Pu-239	->	U-235
9.31E-03	493.25	Pu-239	->	U-235
8.57E-03	612.93	Pu-239	->	U-235
8.46E-03	354.02	Pu-239	->	U-235
7.53E-03	649.377	Pu-239	->	U-235
5.82E-03	690.85	Pu-239	->	U-235
4.23E-03	624.8	Pu-239	->	U-235
4.23E-03	550.6	Pu-239	->	U-235
3.17E-03	538.9	Pu-239	->	U-235
2.75E-03	650.529	Pu-239	->	U-235
2.64E-03	486.99	Pu-239	->	U-235
2.01E-03	647.296	Pu-239	->	U-235
1.69E-03	843.8	Pu-239	->	U-235
1.69E-03	463.8	Pu-239	->	U-235
1.59E-03	606.9	Pu-239	->	U-235
1.55E-03	808.2	Pu-239	->	U-235
1.49E-03	185.72	U-235	->	Th-231
1.48E-03	586.27	Pu-239	->	U-235
1.46E-03	828.8	Pu-239	->	U-235
1.41E-03	779.46	Pu-239	->	U-235
1.27E-03	13.724	Th-231	->	Pa-231
9.59E-04	16.559	Th-231	->	Pa-231
9.52E-04	474.26	Pu-239	->	U-235
9.52E-04	714.58	Pu-239	->	U-235

8.88E-04	787.3	Pu-239	->	U-235	
8.14E-04	891.1	Pu-239	->	U-235	
6.56E-04	813.9	Pu-239	->	U-235	
6.34E-04	557.7	Pu-239	->	U-235	
5.92E-04	956.4	Pu-239	->	U-235	
5.71E-04	12.952	Ac-227	->	Th-227,	U-235 -> Th-231
5.39E-04	821.1	Pu-239	->	U-235	
5.29E-04	879	Pu-239	->	U-235	
4.76E-04	1057.32	Pu-239	->	U-235	
4.65E-04	803.3	Pu-239	->	U-235	
4.44E-04	940.1	Pu-239	->	U-235	
4.23E-04	839	Pu-239	->	U-235	
3.90E-04	16.119	U-235	->	Th-231	
3.79E-04	25.642	Th-231	->	Pa-231	
3.38E-04	796.5	Pu-239	->	U-235	
2.85E-04	143.76	U-235	->	Th-231	
2.64E-04	793	Pu-239	->	U-235	
2.64E-04	831.93	Pu-239	->	U-235	
2.43E-04	992.47	Pu-239	->	U-235	
2.43E-04	979.52	Pu-239	->	U-235	
2.11E-04	412.83	Pu-239	->	U-235	
1.92E-04	19.811	Th-231	->	Pa-231	
1.71E-04	84.203	Th-231	->	Pa-231	
1.43E-04	93.36	U-235	->	Th-231	
1.32E-04	163.33	U-235	->	Th-231	
1.30E-04	205.31	U-235	->	Th-231	
1.27E-04	1005.63	Pu-239	->	U-235	
1.27E-04	986.7	Pu-239	->	U-235	
8.73E-05	89.955	U-235	->	Th-231	
7.78E-05	11.372	Th-231	->	Pa-231	
6.75E-05	19.118	U-235	->	Th-231	
5.14E-05	105.362	U-235	->	Th-231	
4.00E-05	109.16	U-235	->	Th-231	
2.91E-05	766.6	Pu-239	->	U-235	
2.81E-05	202.11	U-235	->	Th-231	
2.60E-05	11.118	Ac-227	->	Th-227,	U-235 -> Th-231
2.44E-05	89.954	Th-231	->	Pa-231	
2.33E-05	81.229	Th-231	->	Pa-231	
1.71E-05	108.99	U-235	->	Th-231	
1.64E-05	194.94	U-235	->	Th-231	
1.63E-05	95.863	Th-231	->	Pa-231	
1.24E-05	58.562	Th-231	->	Pa-231	
1.06E-05	102.255	Th-231	->	Pa-231	
1.04E-05	14.953	Th-231	->	Pa-231	
1.01E-05	92.279	Th-231	->	Pa-231	
8.83E-06	182.61	U-235	->	Th-231	
6.51E-06	72.767	Th-231	->	Pa-231	
5.91E-06	108.166	Th-231	->	Pa-231	
5.71E-06	14.511	Ac-227	->	Th-227,	U-235 -> Th-231
5.71E-06	140.76	U-235	->	Th-231	

5.70E-06	17.187	Th-231	->	Pa-231
4.02E-06	163.114	Th-231	->	Pa-231
3.12E-06	221.38	U-235	->	Th-231
3.11E-06	99.28	Th-231	->	Pa-231
2.86E-06	72.71	U-235	->	Th-231
2.23E-06	96.154	U-235	->	Th-231
2.08E-06	150.93	U-235	->	Th-231
2.02E-06	135.681	Th-231	->	Pa-231
1.97E-06	111.897	Th-231	->	Pa-231
1.82E-06	116.11	U-235	->	Th-231
1.56E-06	41.96	U-235	->	Th-231
1.56E-06	74.8	U-235	->	Th-231
1.50E-06	42.828	Th-231	->	Pa-231
1.45E-06	124.922	Th-231	->	Pa-231
1.40E-06	240.85	U-235	->	Th-231
1.38E-06	246.84	U-235	->	Th-231
1.27E-06	93.07	Th-231	->	Pa-231
1.09E-06	198.9	U-235	->	Th-231
1.04E-06	217.934	Th-231	->	Pa-231
8.53E-07	183.483	Th-231	->	Pa-231
8.30E-07	145.927	Th-231	->	Pa-231
7.79E-07	41.13	U-235	->	Th-231
7.53E-07	345.921	U-235	->	Th-231
7.53E-07	233.5	U-235	->	Th-231
7.01E-07	215.305	U-235	->	Th-231
6.75E-07	119.98	U-235	->	Th-231
6.22E-07	134.014	Th-231	->	Pa-231
5.96E-07	63.834	Th-231	->	Pa-231
5.37E-07	116.827	Th-231	->	Pa-231
5.19E-07	51.179	U-235	->	Th-231
5.19E-07	64.348	U-235	->	Th-231
4.75E-07	174.157	Th-231	->	Pa-231
4.41E-07	106.581	Th-231	->	Pa-231
4.16E-07	31.585	U-235	->	Th-231
3.64E-07	291.72	U-235	->	Th-231
3.12E-07	136.72	U-235	->	Th-231
2.60E-07	172.27	U-235	->	Th-231
2.39E-07	235.985	Th-231	->	Pa-231
2.08E-07	228.77	U-235	->	Th-231
1.84E-07	105.803	Th-231	->	Pa-231
1.82E-07	289.57	U-235	->	Th-231
1.56E-07	281.45	U-235	->	Th-231
1.56E-07	266.483	U-235	->	Th-231
1.50E-07	145.063	Th-231	->	Pa-231
1.48E-07	68.5	Th-231	->	Pa-231
1.30E-07	301.72	U-235	->	Th-231
1.30E-07	356.068	U-235	->	Th-231
1.30E-07	282.98	U-235	->	Th-231
1.27E-07	275.47	U-235	->	Th-231
1.09E-07	136.705	Th-231	->	Pa-231

1.04E-07	310.71	U-235	->	Th-231	
1.01E-07	164.97	Th-231	->	Pa-231	
9.87E-08	387.874	U-235	->	Th-231	
8.30E-08	188.756	Th-231	->	Pa-231	
7.79E-08	410.269	U-235	->	Th-231	
7.79E-08	343.78	U-235	->	Th-231	
7.52E-08	311	Th-231	->	Pa-231	
3.11E-08	169.637	Th-231	->	Pa-231	
3.01E-08	267.62	Th-231	->	Pa-231	
2.60E-08	448.42	U-235	->	Th-231	
2.60E-08	317.12	U-235	->	Th-231	
2.60E-08	390.32	U-235	->	Th-231	
2.59E-08	115.595	Th-231	->	Pa-231	
2.28E-08	15.69	Pa-231	->	Ac-227	
2.18E-08	242.508	Th-231	->	Pa-231	
2.08E-08	455.12	U-235	->	Th-231	
2.02E-08	249.56	Th-231	->	Pa-231	
2.00E-08	12.636	Pa-231	->	Ac-227	
1.84E-08	140.537	Th-231	->	Pa-231	
1.82E-08	44.06	Th-231	->	Pa-231	
1.69E-08	250.43	Th-231	->	Pa-231	
1.56E-08	794.72	U-235	->	Th-231	
1.04E-08	517.2	U-235	->	Th-231	
1.04E-08	742.52	U-235	->	Th-231	
1.01E-08	308.75	Th-231	->	Pa-231	
8.48E-09	27.396	Pa-231	->	Ac-227	
7.26E-09	240.25	Th-231	->	Pa-231	
5.38E-09	18.607	Pa-231	->	Ac-227	
2.85E-09	320.188	Th-231	->	Pa-231	
2.17E-09	300.07	Pa-231	->	Ac-227	
2.07E-09	317.93	Th-231	->	Pa-231	
1.82E-09	351.82	Th-231	->	Pa-231	
1.56E-09	302.671	Pa-231	->	Ac-227	
1.45E-09	283.673	Pa-231	->	Ac-227	
1.20E-09	330.066	Pa-231	->	Ac-227	
1.09E-09	10.871	Pa-231	->	Ac-227	
7.91E-10	83.787	Ra-223	->	Rn-219	
7.78E-10	274.14	Th-231	->	Pa-231	
7.11E-10	90.886	Pa-231	->	Ac-227	
6.92E-10	15.218	Th-227	->	Ra-223	
5.83E-10	302.638	Pa-231	->	Ac-227	
5.68E-10	12.325	Fr-223	->	Ra-223,	Th-227 -> Ra-223
4.77E-10	81.067	Ra-223	->	Rn-219	
4.34E-10	87.673	Pa-231	->	Ac-227	
4.27E-10	269.39	Ra-223	->	Rn-219	
3.94E-10	350.1	Bi-211	->	Tl-207	
3.69E-10	235.97	Fr-223	->	Ra-223,	Th-227 -> Ra-223
3.46E-10	16.397	Pa-231	->	Ac-227	
3.37E-10	14.082	Pa-231	->	Ac-227	
3.20E-10	11.713	Ra-223	->	Rn-219	

3.14E-10	271.13	Rn-219	->	Po-215	
3.08E-10	14.341	Ra-223	->	Rn-219	
3.01E-10	18.998	Pa-231	->	Ac-227	
2.95E-10	50.14	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.79E-10	94.677	Ra-223	->	Rn-219	
2.55E-10	102.613	Pa-231	->	Ac-227	
2.21E-10	256.24	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.11E-10	401.7	Rn-219	->	Po-215	
1.90E-10	46.393	Pa-231	->	Ac-227	
1.76E-10	154.18	Ra-223	->	Rn-219	
1.66E-10	260.29	Pa-231	->	Ac-227	
1.59E-10	340.873	Pa-231	->	Ac-227	
1.58E-10	17.997	Th-227	->	Ra-223	
1.40E-10	357.2	Pa-231	->	Ac-227	
1.36E-10	38.235	Pa-231	->	Ac-227	
1.22E-10	323.88	Ra-223	->	Rn-219	
1.19E-10	404.86	Pb-211	->	Bi-211,	At-215 -> Bi-211
1.18E-10	831.86	Pb-211	->	Bi-211	
1.03E-10	88.471	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.03E-10	313.058	Pa-231	->	Ac-227	
1.02E-10	144.18	Ra-223	->	Rn-219	
9.11E-11	255.858	Pa-231	->	Ac-227	
9.00E-11	329.84	Fr-223	->	Ra-223,	Th-227 -> Ra-223
8.92E-11	97.907	Ra-223	->	Rn-219	
8.73E-11	338.28	Ra-223	->	Rn-219	
8.38E-11	106.137	Pa-231	->	Ac-227	
8.38E-11	29.996	Pa-231	->	Ac-227	
8.20E-11	25.464	Pa-231	->	Ac-227	
8.02E-11	96.979	Pa-231	->	Ac-227	
7.75E-11	52.763	Pa-231	->	Ac-227	
7.38E-11	54.632	Pa-231	->	Ac-227	
7.33E-11	79.72	Fr-223	->	Ra-223,	Th-227 -> Ra-223
7.29E-11	354.63	Pa-231	->	Ac-227	
6.92E-11	299.97	Fr-223	->	Ra-223,	Th-227 -> Ra-223
6.28E-11	85.429	Fr-223	->	Ra-223,	Th-227 -> Ra-223
6.20E-11	77.405	Pa-231	->	Ac-227	
6.09E-11	16.918	Ra-223	->	Rn-219	
5.65E-11	277.17	Pa-231	->	Ac-227	
5.47E-11	44.213	Pa-231	->	Ac-227	
5.34E-11	427	Pb-211	->	Bi-211	
5.24E-11	286.11	Fr-223	->	Ra-223,	Th-227 -> Ra-223
5.19E-11	273.17	Pa-231	->	Ac-227	
4.61E-11	93.93	Th-227	->	Ra-223	
4.56E-11	63.7	Pa-231	->	Ac-227	
4.28E-11	243.17	Pa-231	->	Ac-227	
4.19E-11	379.4	Rn-219	->	Po-215,	Pa-231 -> Ac-227
3.99E-11	444.94	Ra-223	->	Rn-219	
3.91E-11	72.873	Bi-211	->	Tl-207	
3.74E-11	122.31	Ra-223	->	Rn-219	
3.73E-11	210.58	Fr-223	->	Ra-223,	Th-227 -> Ra-223

3.69E-11	99.915	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.59E-11	304.51	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.27E-11	10.622	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.26E-11	334.38	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.10E-11	407.98	Pa-231 ->	Ac-227		
2.92E-11	100.96	Pa-231 ->	Ac-227		
2.76E-11	79.29	Rn-219 ->	Po-215		
2.74E-11	327.23	Pa-231 ->	Ac-227		
2.73E-11	24.56	Pa-231 ->	Ac-227		
2.64E-11	254.66	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.31E-11	70.832	Bi-211 ->	Tl-207		
2.28E-11	74.209	Pa-231 ->	Ac-227		
2.28E-11	57.233	Pa-231 ->	Ac-227		
2.20E-11	766.35	Pb-211 ->	Bi-211		
2.16E-11	158.59	Ra-223 ->	Rn-219		
2.00E-11	341.17	Pa-231 ->	Ac-227		
1.85E-11	113.19	Th-227 ->	Ra-223		
1.73E-11	10.137	Ra-223 ->	Rn-219		
1.65E-11	76.858	Rn-219 ->	Po-215		
1.62E-11	234.82	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.62E-11	272.95	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.55E-11	312.57	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.54E-11	371.8	Ra-223 ->	Rn-219		
1.52E-11	314.82	Th-227 ->	Ra-223		
1.49E-11	704.51	Pb-211 ->	Bi-211		
1.46E-11	35.884	Pa-231 ->	Ac-227		
1.43E-11	13.495	Rn-219 ->	Po-215		
1.42E-11	296.54	Th-227 ->	Ra-223		
1.38E-11	82.434	Bi-211 ->	Tl-207		
1.37E-11	57.2	Pa-231 ->	Ac-227		
1.35E-11	10.259	Bi-211 ->	Tl-207		
1.33E-11	77.107	Pb-211 ->	Bi-211		
1.30E-11	11.119	Rn-219 ->	Po-215		
1.27E-11	13.082	Pb-211 ->	Bi-211		
1.25E-11	342.44	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.23E-11	12.313	Bi-211 ->	Tl-207		
1.22E-11	250.12	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.21E-11	103.341	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.20E-11	13.662	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.15E-11	10.828	Pb-211 ->	Bi-211		
1.09E-11	40.006	Pa-231 ->	Ac-227		
1.00E-11	56.9	Pa-231 ->	Ac-227		
9.84E-12	89.639	Rn-219 ->	Po-215		
8.80E-12	15.213	Fr-223 ->	Ra-223		
8.48E-12	398.4	Pa-231 ->	Ac-227		
8.20E-12	31.04	Pa-231 ->	Ac-227		
8.20E-12	359.51	Pa-231 ->	Ac-227		
7.94E-12	74.814	Pb-211 ->	Bi-211		
7.91E-12	62.36	Th-227 ->	Ra-223		
7.58E-12	204.2	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223

7.58E-12	206.04	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
7.58E-12	43.73	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
7.31E-12	897.23	Tl-207 ->	Pb-207,	Po-211 ->	Pb-207
7.29E-12	242	Pa-231 ->	Ac-227		
6.96E-12	20.27	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
6.96E-12	49.85	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
6.74E-12	364.03	Pa-231 ->	Ac-227		
6.59E-12	300.34	Th-227 ->	Ra-223		
6.38E-12	245.438	Pa-231 ->	Ac-227		
6.38E-12	43.09	Pa-231 ->	Ac-227		
6.38E-12	60.526	Pa-231 ->	Ac-227		
6.38E-12	31.58	Pa-231 ->	Ac-227		
6.38E-12	70.54	Pa-231 ->	Ac-227		
6.29E-12	245.77	Pa-231 ->	Ac-227		
6.28E-12	342.9	Ra-223 ->	Rn-219		
6.22E-12	328.49	Ra-223 ->	Rn-219		
6.20E-12	391.85	Pa-231 ->	Ac-227		
5.60E-12	117.17	Th-227 ->	Ra-223		
5.47E-12	42.52	Pa-231 ->	Ac-227		
5.47E-12	56.8	Pa-231 ->	Ac-227		
5.27E-12	281.31	Th-227 ->	Ra-223		
5.17E-12	16.074	Ac-227 ->	Th-227		
5.10E-12	198.96	Pa-231 ->	Ac-227		
4.94E-12	113.12	Th-227 ->	Ra-223		
4.94E-12	204.95	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
4.83E-12	288.15	Ra-223 ->	Rn-219		
4.80E-12	179.69	Ra-223 ->	Rn-219		
4.72E-12	87.19	Pb-211 ->	Bi-211		
4.56E-12	1109.37	Pb-211 ->	Bi-211		
4.56E-12	124.69	Pa-231 ->	Ac-227		
4.55E-12	12.855	Ra-223 ->	Rn-219		
4.29E-12	250.33	Th-227 ->	Ra-223		
4.29E-12	141.44	Th-227 ->	Ra-223		
4.00E-12	130.57	Rn-219 ->	Po-215		
3.88E-12	85.185	Bi-211 ->	Tl-207		
3.74E-12	438.24	Pa-231 ->	Ac-227		
3.74E-12	384.97	Pa-231 ->	Ac-227		
3.65E-12	144.5	Pa-231 ->	Ac-227		
3.65E-12	72.57	Pa-231 ->	Ac-227		
3.63E-12	252.46	Th-227 ->	Ra-223		
3.63E-12	350.48	Th-227 ->	Ra-223		
3.31E-12	29.869	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.30E-12	262.72	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.30E-12	100.31	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.11E-12	333.87	Ra-223 ->	Rn-219		
3.01E-12	435.38	Pa-231 ->	Ac-227		
3.01E-12	277.43	Pa-231 ->	Ac-227		
2.98E-12	92.673	Rn-219 ->	Po-215		
2.89E-12	15.856	Rn-219 ->	Po-215		
2.83E-12	598.69	Ra-223 ->	Rn-219		

2.79E-12	15.397	Pb-211	->	Bi-211	
2.64E-12	31.566	Th-227	->	Ra-223	
2.64E-12	61.435	Th-227	->	Ra-223	
2.39E-12	65.516	Pb-211	->	Bi-211	
2.37E-12	226.77	Pa-231	->	Ac-227	
2.37E-12	395.8	Pa-231	->	Ac-227	
2.31E-12	279.7	Fr-223	->	Ra-223,	Th-227 -> Ra-223
2.31E-12	212.56	Th-227	->	Ra-223	
2.25E-12	14.407	Bi-211	->	Tl-207	
2.23E-12	527.3	Ra-223	->	Rn-219	
2.10E-12	258.43	Pa-231	->	Ac-227	
2.06E-12	293.8	Rn-219	->	Po-215	
1.99E-12	18.016	Fr-223	->	Ra-223	
1.98E-12	292.3	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.98E-12	609.08	Ra-223	->	Rn-219	
1.98E-12	218.77	Th-227	->	Ra-223	
1.98E-12	96.06	Th-227	->	Ra-223	
1.82E-12	318.1	Pa-231	->	Ac-227	
1.82E-12	71.92	Pa-231	->	Ac-227	
1.81E-12	285.48	Th-227	->	Ra-223	
1.77E-12	83.81	Pb-211	->	Bi-211	
1.73E-12	410.84	Pa-231	->	Ac-227	
1.65E-12	284.24	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.65E-12	43.53	Th-227	->	Ra-223	
1.58E-12	383.47	Th-227	->	Ra-223	
1.51E-12	110.8	Ra-223	->	Rn-219	
1.48E-12	177.35	Ra-223	->	Rn-219	
1.40E-12	90.128	Pb-211	->	Bi-211	
1.40E-12	81	Pb-211	->	Bi-211	
1.38E-12	19.308	Ac-227	->	Th-227	
1.35E-12	361.8	Ra-223	->	Rn-219	
1.32E-12	41.88	Th-227	->	Ra-223	
1.32E-12	104.9	Th-227	->	Ra-223	
1.32E-12	218.94	Th-227	->	Ra-223	
1.32E-12	68.75	Th-227	->	Ra-223	
1.29E-12	184.68	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.28E-12	50.97	Pa-231	->	Ac-227	
1.28E-12	39.61	Pa-231	->	Ac-227	
1.28E-12	310.19	Pa-231	->	Ac-227	
1.27E-12	515.7	Rn-219	->	Po-215	
1.26E-12	438.8	Po-215	->	Pb-211	
1.21E-12	15.2	Ac-227	->	Th-227	
1.18E-12	516.45	Pa-231	->	Ac-227	
1.16E-12	249.49	Ra-223	->	Rn-219	
1.10E-12	251.12	Ra-223	->	Rn-219	
1.09E-12	134.5	Fr-223	->	Ra-223,	Th-227 -> Ra-223
1.05E-12	343.02	Pb-211	->	Bi-211	
1.05E-12	140.33	Th-227	->	Ra-223	
1.05E-12	270.76	Th-227	->	Ra-223	
1.04E-12	319.18	Fr-223	->	Ra-223,	Th-227 -> Ra-223

1.04E-12	220.38	Ra-223	->	Rn-219	
1.04E-12	432.34	Ra-223	->	Rn-219	
1.00E-12	254.98	Ra-223	->	Rn-219	
9.89E-13	314.78	Th-227	->	Ra-223	
9.75E-13	388.98	Pa-231	->	Ac-227	
9.73E-13	251.58	Ra-223	->	Rn-219	
9.62E-13	313.85	Pb-211	->	Bi-211	
9.52E-13	221.9	Rn-219	->	Po-215	
9.23E-13	72.8	Th-227	->	Ra-223	
9.23E-13	64.37	Th-227	->	Ra-223	
8.07E-13	481.1	Pb-211	->	Bi-211	
7.14E-13	609.62	Pb-211	->	Bi-211	
6.91E-13	106.66	Ra-223	->	Rn-219	
6.83E-13	951	Pb-211	->	Bi-211	
6.70E-13	9.658	Rn-219	->	Po-215	
6.65E-13	8.953	Bi-211	->	Tl-207	
6.59E-13	201.64	Th-227	->	Ra-223	
6.59E-13	200.48	Th-227	->	Ra-223	
6.59E-13	40.16	Th-227	->	Ra-223	
6.28E-13	369.48	Ra-223	->	Rn-219	
6.26E-13	73.66	Th-227	->	Ra-223	
5.97E-13	430.53	Ra-223	->	Rn-219	
5.93E-13	175.23	Th-227	->	Ra-223	
5.89E-13	9.419	Pb-211	->	Bi-211	
5.64E-13	173.38	Fr-223	->	Ra-223,	Th-227 -> Ra-223
5.60E-13	212.69	Th-227	->	Ra-223	
5.58E-13	94.89	Pb-211	->	Bi-211	
5.55E-13	1014.48	Pb-211	->	Bi-211	
5.47E-13	501.33	Pa-231	->	Ac-227	
5.34E-13	175.55	Ra-223	->	Rn-219	
5.34E-13	103.85	Ra-223	->	Rn-219	
5.27E-13	88.2	Pb-211	->	Bi-211	
5.27E-13	50.82	Th-227	->	Ra-223	
5.10E-13	535.45	Pa-231	->	Ac-227	
4.94E-13	224.68	Fr-223	->	Ra-223,	Th-227 -> Ra-223
4.94E-13	308.49	Th-227	->	Ra-223	
4.78E-13	289.6	Fr-223	->	Ra-223,	Th-227 -> Ra-223
4.75E-13	1080.19	Pb-211	->	Bi-211	
4.65E-13	504.33	Pb-211	->	Bi-211	
4.61E-13	168.19	Th-227	->	Ra-223	
4.61E-13	33.52	Th-227	->	Ra-223	
4.56E-13	387.267	Pa-231	->	Ac-227	
4.56E-13	546.9	Pa-231	->	Ac-227	
4.56E-13	572.3	Pa-231	->	Ac-227	
4.40E-13	388.3	Ra-223	->	Rn-219	
4.34E-13	492	Pb-211	->	Bi-211	
4.29E-13	99.56	Fr-223	->	Ra-223,	Th-227 -> Ra-223
4.29E-13	44.37	Th-227	->	Ra-223	
4.03E-13	478	Pb-211	->	Bi-211	
3.97E-13	1196.61	Pb-211	->	Bi-211	

3.96E-13	197.61	Th-227 ->	Ra-223	
3.96E-13	402.42	Th-227 ->	Ra-223	
3.96E-13	94.9	Th-227 ->	Ra-223	
3.96E-13	117.3	Th-227 ->	Ra-223	
3.63E-13	246.07	Th-227 ->	Ra-223	
3.57E-13	97.3	Pb-211 ->	Bi-211	
3.41E-13	94.3	Pb-211 ->	Bi-211	
3.41E-13	500.4	Pb-211 ->	Bi-211	
3.30E-13	48.27	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
3.30E-13	267.82	Th-227 ->	Ra-223	
3.30E-13	150.02	Th-227 ->	Ra-223	
3.30E-13	352.57	Th-227 ->	Ra-223	
3.14E-13	487.59	Ra-223 ->	Rn-219	
2.97E-13	392.24	Th-227 ->	Ra-223	
2.97E-13	59.5	Th-227 ->	Ra-223	
2.97E-13	398.6	Th-227 ->	Ra-223	
2.97E-13	62.54	Th-227 ->	Ra-223	
2.97E-13	69.65	Th-227 ->	Ra-223	
2.97E-13	289.5	Th-227 ->	Ra-223	
2.97E-13	75.1	Th-227 ->	Ra-223	
2.83E-13	114.5	Ra-223 ->	Rn-219	
2.83E-13	245.19	Ra-223 ->	Rn-219	
2.76E-13	1270.67	Pb-211 ->	Bi-211	
2.64E-13	54.18	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.64E-13	123.55	Th-227 ->	Ra-223	
2.64E-13	270.34	Th-227 ->	Ra-223	
2.64E-13	112.54	Th-227 ->	Ra-223	
2.51E-13	368.78	Ra-223 ->	Rn-219	
2.51E-13	623.38	Ra-223 ->	Rn-219	
2.47E-13	346.39	Th-227 ->	Ra-223	
2.38E-13	12.085	Rn-219 ->	Po-215	
2.36E-13	775.82	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.31E-13	370.85	Th-227 ->	Ra-223	
2.31E-13	44.08	Th-227 ->	Ra-223	
2.31E-13	107.92	Th-227 ->	Ra-223	
2.31E-13	56.63	Th-227 ->	Ra-223	
2.31E-13	281	Th-227 ->	Ra-223	
2.31E-13	249.36	Th-227 ->	Ra-223	
2.31E-13	162.18	Th-227 ->	Ra-223	
2.31E-13	66.3	Th-227 ->	Ra-223	
2.22E-13	376.9	Rn-219 ->	Po-215	
2.19E-13	228.16	Pa-231 ->	Ac-227	
2.19E-13	220.2	Pa-231 ->	Ac-227	
2.09E-13	29.58	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.08E-13	369.32	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.99E-13	675.33	Pb-211 ->	Bi-211	
1.99E-13	865.81	Pb-211 ->	Bi-211	
1.99E-13	430.26	Pb-211 ->	Bi-211	
1.98E-13	66.1	Th-227 ->	Ra-223	
1.98E-13	348.4	Th-227 ->	Ra-223	

1.98E-13	325.08	Th-227 ->	Ra-223	
1.98E-13	318.58	Th-227 ->	Ra-223	
1.98E-13	109.1	Th-227 ->	Ra-223	
1.98E-13	376.26	Th-227 ->	Ra-223	
1.98E-13	382.15	Th-227 ->	Ra-223	
1.98E-13	202.4	Th-227 ->	Ra-223	
1.90E-13	540.1	Rn-219 ->	Po-215	
1.90E-13	676.4	Rn-219 ->	Po-215	
1.88E-13	260.4	Ra-223 ->	Rn-219	
1.88E-13	68.7	Th-227 ->	Ra-223	
1.86E-13	11.712	Pb-211 ->	Bi-211	
1.75E-13	10.994	Bi-211 ->	Tl-207	
1.65E-13	362.55	Th-227 ->	Ra-223	
1.65E-13	56.03	Th-227 ->	Ra-223	
1.65E-13	110.58	Th-227 ->	Ra-223	
1.65E-13	432.29	Th-227 ->	Ra-223	
1.65E-13	326.12	Th-227 ->	Ra-223	
1.65E-13	124.48	Th-227 ->	Ra-223	
1.58E-13	1103.4	Pb-211 ->	Bi-211	
1.57E-13	255.74	Ra-223 ->	Rn-219	
1.57E-13	131.1	Ra-223 ->	Rn-219	
1.57E-13	165.5	Ra-223 ->	Rn-219	
1.55E-13	23.55	Pa-231 ->	Ac-227	
1.37E-13	471.33	Pa-231 ->	Ac-227	
1.29E-13	339.45	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.27E-13	608.5	Rn-219 ->	Po-215	
1.26E-13	176.8	Ra-223 ->	Rn-219	
1.26E-13	383.12	Ra-223 ->	Rn-219	
1.21E-13	24.5	Ac-227 ->	Th-227	
1.12E-13	89.85	Th-227 ->	Ra-223	
1.10E-13	711.2	Ra-223 ->	Rn-219	
1.05E-13	115.3	Rn-219 ->	Po-215	
9.89E-14	51.29	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
9.89E-14	169.98	Th-227 ->	Ra-223	
9.89E-14	124.6	Th-227 ->	Ra-223	
9.53E-14	812.15	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
9.42E-14	391	Ra-223 ->	Rn-219	
9.42E-14	199.43	Ra-223 ->	Rn-219	
8.70E-14	822.99	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
8.24E-14	266.3	Th-227 ->	Ra-223	
8.07E-14	1090.5	Pb-211 ->	Bi-211	
7.57E-14	74.969	Tl-207 ->	Pb-207	
7.52E-14	908.03	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
7.02E-14	478.22	Pa-231 ->	Ac-227	
6.59E-14	62.05	Th-227 ->	Ra-223	
6.59E-14	179.28	Th-227 ->	Ra-223	
6.59E-14	99.64	Th-227 ->	Ra-223	
5.82E-14	803.58	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
5.67E-14	307.89	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
5.60E-14	415.09	Th-227 ->	Ra-223	

4.94E-14	275.2	Th-227 ->	Ra-223	
4.91E-14	723.86	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
4.76E-14	887.7	Rn-219 ->	Po-215	
4.65E-14	764.52	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
4.61E-14	339.1	Th-227 ->	Ra-223	
4.61E-14	374.93	Th-227 ->	Ra-223	
4.57E-14	328.08	Tl-207 ->	Pb-207,	Po-211 -> Pb-207
4.54E-14	72.803	Tl-207 ->	Pb-207	
4.49E-14	569.15	Po-211 ->	Pb-207	
4.03E-14	1234.3	Pb-211 ->	Bi-211	
3.96E-14	102.45	Th-227 ->	Ra-223	
3.83E-14	536.88	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
3.69E-14	568.76	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
3.31E-14	757.03	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
3.30E-14	171.21	Th-227 ->	Ra-223	
3.17E-14	834.2	Rn-219 ->	Po-215	
3.07E-14	796.96	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.94E-14	825.96	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.73E-14	10.541	Tl-207 ->	Pb-207	
2.70E-14	84.979	Tl-207 ->	Pb-207	
2.49E-14	876.14	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.48E-14	12.703	Tl-207 ->	Pb-207	
2.41E-14	722.6	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.31E-14	230.17	Th-227 ->	Ra-223	
2.27E-14	842.02	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
2.15E-14	846.56	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.91E-14	493.15	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.90E-14	1055.8	Rn-219 ->	Po-215	
1.77E-14	575.8	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.73E-14	748.56	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.63E-14	837.36	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.54E-14	99.7	Ac-227 ->	Fr-223	
1.46E-14	507.64	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.41E-14	746.24	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.27E-14	387.9	Rn-219 ->	Po-215	
1.26E-14	756.79	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.17E-14	780.59	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.15E-14	896.41	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
1.04E-14	480.25	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
9.71E-15	552.09	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
9.50E-15	762.3	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
9.35E-15	858.4	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
8.20E-15	69.83	Ac-227 ->	Fr-223	
8.04E-15	555.91	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
7.88E-15	87.632	Tl-207 ->	Pb-207	
7.15E-15	828.31	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
7.00E-15	515.96	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
6.58E-15	607.2	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
6.54E-15	733.9	Fr-223 ->	Ra-223,	Th-227 -> Ra-223
6.35E-15	754.17	Fr-223 ->	Ra-223,	Th-227 -> Ra-223

6.35E-15	784.04	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
6.20E-15	734.6	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
6.17E-15	753.44	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
5.82E-15	524.02	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
5.61E-15	817.31	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
5.49E-15	691.46	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
5.45E-15	482.14	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
5.36E-15	448	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
5.27E-15	623.52	Th-227 ->	Ra-223		
5.07E-15	578.2	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
4.68E-15	704.19	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
4.54E-15	14.886	Tl-207 ->	Pb-207		
4.52E-15	772.85	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
4.48E-15	9.3	Ac-227 ->	Th-227		
4.43E-15	786.9	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
4.29E-15	633.2	Th-227 ->	Ra-223		
4.22E-15	452.52	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
4.00E-15	147.2	Ac-227 ->	Fr-223		
3.97E-15	878.16	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.51E-15	848.88	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
3.30E-15	534.9	Th-227 ->	Ra-223		
3.14E-15	31.87	Ra-223 ->	Rn-219		
2.96E-15	457.07	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.96E-15	736.76	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.90E-15	643.93	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.90E-15	867.23	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.65E-15	120.9	Ac-227 ->	Fr-223		
2.65E-15	69.13	Ac-227 ->	Fr-223		
2.37E-15	941.41	Th-227 ->	Ra-223		
2.31E-15	854.2	Th-227 ->	Ra-223		
2.15E-15	857.89	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.15E-15	621.92	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.09E-15	588.17	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
2.04E-15	958.6	Th-227 ->	Ra-223		
1.98E-15	171.4	Ac-227 ->	Fr-223		
1.98E-15	662.8	Th-227 ->	Ra-223		
1.93E-15	808.26	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.69E-15	707.18	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.65E-15	466.2	Th-227 ->	Ra-223		
1.59E-15	863.2	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.59E-15	891	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.36E-15	9.185	Tl-207 ->	Pb-207		
1.35E-15	133.8	Ac-227 ->	Fr-223		
1.35E-15	596.44	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.32E-15	788.36	Th-227 ->	Ra-223		
1.32E-15	792.6	Th-227 ->	Ra-223		
1.15E-15	990.2	Th-227 ->	Ra-223		
1.10E-15	718.22	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
1.03E-15	892.8	Fr-223 ->	Ra-223,	Th-227 ->	Ra-223
9.89E-16	818.23	Th-227 ->	Ra-223		

9.89E-16	793.12	Th-227	->	Ra-223		
9.89E-16	999.78	Th-227	->	Ra-223		
9.89E-16	969.91	Th-227	->	Ra-223		
9.72E-16	926.28	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.96E-16	648.43	Fr-223	->	Ra-223,	Th-227	-> Ra-223
6.75E-16	106.1	Ac-227	->	Fr-223		
6.75E-16	46.13	Ac-227	->	Fr-223		
6.59E-16	1020	Th-227	->	Ra-223		
6.59E-16	641.45	Th-227	->	Ra-223		
6.02E-16	825.97	Fr-223	->	Ra-223		
4.94E-16	1015.1	Th-227	->	Ra-223		
4.94E-16	1024.8	Th-227	->	Ra-223		
4.94E-16	909.85	Th-227	->	Ra-223		
3.96E-16	920.06	Th-227	->	Ra-223		
3.90E-16	828.53	Fr-223	->	Ra-223,	Th-227	-> Ra-223
3.54E-16	11.349	Tl-207	->	Pb-207		
3.30E-16	938.34	Th-227	->	Ra-223		
3.30E-16	971.28	Th-227	->	Ra-223		
2.31E-16	994.9	Th-227	->	Ra-223		
5.56E-17	793.11	Fr-223	->	Ra-223		

Cm-244

100%

Aged: 5 years

344 lines computed.

Sorted by		Energy:				
Energy	Intensity	Initial Isotopes and Decays				
keV	ph/s/gm					
8.953	1.86E-13	Bi-212	->	Tl-208		
9.185	8.02E-14	Tl-208	->	Pb-208		
9.419	1.17E-12	Pb-212	->	Bi-212		
9.658	4.63E-15	Bi-212	->	Po-212		
10.137	2.51E-14	Ra-224	->	Rn-220		
10.259	3.76E-12	Bi-212	->	Tl-208		
10.541	1.60E-12	Tl-208	->	Pb-208		
10.622	6.28E-13	Th-228	->	Ra-224		
10.828	2.27E-11	Pb-212	->	Bi-212		
10.994	3.50E-14	Bi-212	->	Tl-208		
11.118	2.19E-01	Ac-228	->	Th-228,	U-236	-> Th-232
11.119	9.05E-14	Bi-212	->	Po-212		
11.349	2.15E-14	Tl-208	->	Pb-208		
11.712	2.99E-13	Pb-212	->	Bi-212		
11.713	4.48E-13	Ra-224	->	Rn-220		
12.085	1.37E-15	Bi-212	->	Po-212		
12.124	5.69E+09	Cm-244	->	Pu-240		

12.282	4.33E-12	Bi-212	->	Tl-208	
12.325	1.08E-11	Th-228	->	Ra-224	
12.701	1.50E-12	Tl-208	->	Pb-208	
12.76	2.35E-10	Ra-228	->	Ac-228	
12.855	1.17E-14	Ra-224	->	Rn-220	
12.952	3.73E+00	Ac-228	->	Th-228,	U-236 -> Th-232
13.099	2.06E-11	Pb-212	->	Bi-212	
13.5	1.24E-09	Ra-228	->	Ac-228	
13.501	9.05E-14	Bi-212	->	Po-212	
13.662	3.28E-13	Th-228	->	Ra-224	
14.262	9.89E+10	Cm-244	->	Pu-240	
14.336	6.20E-13	Ra-224	->	Rn-220	
14.511	1.04E-01	Ac-228	->	Th-228,	U-236 -> Th-232
14.563	1.01E-12	Bi-212	->	Tl-208	
14.884	2.76E-13	Tl-208	->	Pb-208	
15.15	1.24E-10	Ra-228	->	Ac-228	
15.23	1.64E-11	Th-228	->	Ra-224	
15.376	3.89E-12	Pb-212	->	Bi-212	
15.869	1.76E-14	Bi-212	->	Po-212	
16.154	2.48E-10	Ac-228	->	Th-228	
16.161	5.15E+00	U-236	->	Th-232	
16.18	5.57E-10	Ra-228	->	Ac-228	
16.333	2.22E+09	Cm-244	->	Pu-240	
16.881	1.34E-13	Ra-224	->	Rn-220	
17.952	3.70E-12	Th-228	->	Ra-224	
18.135	9.89E+10	Cm-244	->	Pu-240	
18.8	1.61E-10	Ra-228	->	Ac-228	
19.094	1.15E+00	U-236	->	Th-232	
19.113	5.69E-11	Ac-228	->	Th-228	
19.4	1.11E-11	Ra-228	->	Ac-228	
21.554	2.47E+10	Cm-244	->	Pu-240	
39.846	1.36E-12	Bi-212	->	Tl-208	
42.817	6.18E+08	Cm-244	->	Pu-240	
45.244	6.47E+05	Pu-240	->	U-236	
49.369	8.55E-02	U-236	->	Th-232	
57.81	6.50E-12	Ac-228	->	Th-228	
59	1.74E-11	Th-232	->	Ra-228	
70.832	9.28E-14	Bi-212	->	Tl-208	
72.803	2.64E-12	Tl-208	->	Pb-208	
72.873	1.57E-13	Bi-212	->	Tl-208	
74.814	3.61E-11	Pb-212	->	Bi-212	
74.969	4.44E-12	Tl-208	->	Pb-208	
76.858	1.32E-13	Bi-212	->	Po-212	
77.107	6.09E-11	Pb-212	->	Bi-212	
79.29	2.21E-13	Bi-212	->	Po-212	
81.067	4.13E-13	Ra-224	->	Rn-220	
82.434	5.57E-14	Bi-212	->	Tl-208	
83.787	6.89E-13	Ra-224	->	Rn-220	
84.26	4.22E-12	Th-228	->	Ra-224	
84.789	1.57E-12	Tl-208	->	Pb-208	

85.185	1.55E-14	Bi-212	->	Tl-208
85.429	6.11E-14	Th-228	->	Ra-224
87.19	2.16E-11	Pb-212	->	Bi-212
87.632	4.53E-13	Tl-208	->	Pb-208
88.471	1.01E-13	Th-228	->	Ra-224
89.639	7.72E-14	Bi-212	->	Po-212
89.955	4.21E-11	Ac-228	->	Th-228
90.128	6.40E-12	Pb-212	->	Bi-212
92.673	2.43E-14	Bi-212	->	Po-212
93.35	6.93E-11	Ac-228	->	Th-228
94.66	9.77E+02	Pu-240	->	U-236
94.677	2.48E-13	Ra-224	->	Rn-220
97.907	7.92E-14	Ra-224	->	Rn-220
98.441	1.44E+03	Pu-240	->	U-236
98.855	3.71E+07	Cm-244	->	Pu-240
99.55	1.61E-11	Ac-228	->	Th-228
99.915	3.60E-14	Th-228	->	Ra-224
103.341	1.17E-14	Th-228	->	Ra-224
104.244	1.00E+05	Pu-240	->	U-236
105.362	2.48E-11	Ac-228	->	Th-228
108.99	8.29E-12	Ac-228	->	Th-228
110.421	1.70E+02	Pu-240	->	U-236
111.3	5.17E+02	Pu-240	->	U-236
112.75	2.08E-02	U-236	->	Th-232
114.866	1.44E+02	Pu-240	->	U-236
115.122	2.03E-12	Pb-212	->	Bi-212
124	3.94E-12	Th-232	->	Ra-228
129.03	3.59E-11	Ac-228	->	Th-228
131.5	4.47E-13	Th-228	->	Ra-224
135.68	2.10E-13	Ac-228	->	Th-228
141.19	6.06E-13	Ac-228	->	Th-228
143.99	1.24E-14	Bi-212	->	Tl-208
146.06	3.59E-12	Ac-228	->	Th-228
152.622	2.42E+07	Cm-244	->	Pu-240
153.89	1.04E-11	Ac-228	->	Th-228
160.28	6.04E+03	Pu-240	->	U-236
164	6.19E-15	Bi-212	->	Tl-208
164.15	1.72E-14	Pb-212	->	Bi-212
166.43	2.86E-13	Th-228	->	Ra-224
174.18	3.96E-13	Ac-228	->	Th-228
176.577	1.75E-13	Pb-212	->	Bi-212
184.72	1.73E-12	Ac-228	->	Th-228
191.29	1.49E-12	Ac-228	->	Th-228
199.54	3.47E-12	Ac-228	->	Th-228
204.37	1.94E-12	Ac-228	->	Th-228
205.75	9.77E-14	Th-228	->	Ra-224
209.39	5.07E-11	Ac-228	->	Th-228
210.76	2.85E-12	Ac-228	->	Th-228
211.31	2.10E-13	Tl-208	->	Pb-208
212.46	4.31E+02	Pu-240	->	U-236

215.75	9.67E-13	Th-228	->	Ra-224
216.24	9.90E-12	Ac-228	->	Th-228
220.49	1.73E-13	Ac-228	->	Th-228
223.72	8.17E-13	Ac-228	->	Th-228
232.3	7.43E-13	Ac-228	->	Th-228
233.32	3.82E-13	Tl-208	->	Pb-208
238.578	1.50E-10	Pb-212	->	Bi-212
240.76	1.34E-11	Ra-224	->	Rn-220
251.43	2.99E+05	Cm-244	->	Pu-240
252.45	9.87E-13	Tl-208	->	Pb-208
257.29	3.96E-13	Ac-228	->	Th-228
263.33	1.41E+06	Cm-244	->	Pu-240
263.57	7.18E-13	Ac-228	->	Th-228
270.26	4.70E-11	Ac-228	->	Th-228
277.28	8.39E-12	Tl-208	->	Pb-208
279.3	2.85E-12	Ac-228	->	Th-228
282.02	1.10E-12	Ac-228	->	Th-228
288.08	4.22E-13	Bi-212	->	Tl-208
290	3.10E-14	Ra-224	->	Rn-220
300.034	1.15E-11	Pb-212	->	Bi-212
302.96	3.81E+05	Cm-244	->	Pu-240
321.9	3.09E-12	Ac-228	->	Th-228
327.67	1.61E-12	Ac-228	->	Th-228
327.93	1.70E-13	Bi-212	->	Tl-208
328.07	4.33E-11	Ac-228	->	Th-228
332.48	5.82E-12	Ac-228	->	Th-228
338.42	1.53E-10	Ac-228	->	Th-228
340.94	6.44E-12	Ac-228	->	Th-228
356.83	2.48E-13	Ac-228	->	Th-228
372.3	1.11E-13	Ac-228	->	Th-228
388.9	1.86E-13	Ac-228	->	Th-228
396.9	3.96E-13	Ac-228	->	Th-228
399.2	4.58E-13	Ac-228	->	Th-228
409.3	1.38E-14	Ra-224	->	Rn-220
409.62	2.72E-11	Ac-228	->	Th-228
415.156	9.63E-14	Pb-212	->	Bi-212
416.2	2.10E-13	Ac-228	->	Th-228
419.23	3.22E-13	Ac-228	->	Th-228
433.51	1.73E-14	Bi-212	->	Tl-208
440.49	1.86E-12	Ac-228	->	Th-228
449.57	8.05E-13	Ac-228	->	Th-228
452.77	4.49E-13	Bi-212	->	Tl-208
460.84	6.19E-13	Ac-228	->	Th-228
463.1	5.69E-11	Ac-228	->	Th-228
471.4	4.33E-13	Ac-228	->	Th-228
473.36	6.19E-14	Bi-212	->	Tl-208
474.32	3.59E-13	Ac-228	->	Th-228
478.2	2.97E-12	Ac-228	->	Th-228
481.8	1.11E-13	Ac-228	->	Th-228
485.78	6.17E-14	Tl-208	->	Pb-208

492.36	2.48E-13	Ac-228	->	Th-228	
492.62	7.55E-15	Bi-212	->	Tl-208	
498.26	5.32E-13	Ac-228	->	Th-228	
503.7	2.60E-12	Ac-228	->	Th-228	
507.22	1.88E+05	Cm-244	->	Pu-240	
509.17	6.06E-12	Ac-228	->	Th-228	
510.606	2.66E-11	Tl-208	->	Pb-208	
515.2	5.32E-13	Ac-228	->	Th-228	
519.97	9.65E-13	Ac-228	->	Th-228	
523.18	1.49E-12	Ac-228	->	Th-228	
538.11	1.72E+00	Pu-240	->	U-236	
540.5	3.59E-13	Ac-228	->	Th-228	
546.36	2.72E-12	Ac-228	->	Th-228	
549.7	2.41E-13	Rn-220	->	Po-216	
554.54	1.95E+06	Cm-244	->	Pu-240	
555.3	6.06E-13	Ac-228	->	Th-228	
562.65	1.25E-11	Ac-228	->	Th-228	
570.2	2.35E-12	Ac-228	->	Th-228	
572.5	2.35E-12	Ac-228	->	Th-228	
580.4	9.78E-16	Bi-212	->	Tl-208	
583.022	1.10E-10	Tl-208	->	Pb-208,	Po-212 -> Pb-208
583.28	1.86E-12	Ac-228	->	Th-228	
587.82	4.93E-14	Tl-208	->	Pb-208	
597.35	1.11E+06	Cm-244	->	Pu-240	
606.07	1.78E+05	Cm-244	->	Pu-240	
615.9	1.11E-12	Ac-228	->	Th-228	
619.88	1.36E-12	Ac-228	->	Th-228	
620.3	4.46E-15	Bi-212	->	Tl-208	
629.93	6.19E-13	Ac-228	->	Th-228	
640.7	7.55E-13	Ac-228	->	Th-228	
642.5	1.81E+02	Pu-240	->	U-236	
649.19	5.32E-13	Ac-228	->	Th-228	
650.1	2.41E-14	Ra-224	->	Rn-220	
650.14	4.44E-14	Tl-208	->	Pb-208	
651.44	1.25E-12	Ac-228	->	Th-228	
666.4	5.69E-13	Ac-228	->	Th-228	
673.86	1.24E-12	Ac-228	->	Th-228	
677.07	1.11E-11	Ac-228	->	Th-228	
687.59	3.88E+01	Pu-240	->	U-236	
692.5	4.21E-14	Ac-228	->	Th-228	
701.8	2.35E-12	Ac-228	->	Th-228	
705.24	2.71E-14	Tl-208	->	Pb-208	
707.49	1.86E-12	Ac-228	->	Th-228	
721.91	2.50E-13	Tl-208	->	Pb-208	
726.63	1.08E-11	Ac-228	->	Th-228	
727.25	1.47E-11	Bi-212	->	Po-212	
737.7	5.07E-13	Ac-228	->	Th-228	
748.58	5.30E-14	Tl-208	->	Pb-208	
755.28	1.63E-11	Ac-228	->	Th-228	
758.64	3.78E+05	Cm-244	->	Pu-240	

763.06	2.02E-12	Tl-208	->	Pb-208
772.28	1.35E-11	Ac-228	->	Th-228
774	1.11E-12	Ac-228	->	Th-228
782.12	7.30E-12	Ac-228	->	Th-228
785.51	2.44E-12	Bi-212	->	Po-212
791.05	2.60E-13	Ac-228	->	Th-228
791.2	3.59E-13	Ac-228	->	Th-228
794.79	5.69E-11	Ac-228	->	Th-228
804.9	6.21E-15	Po-216	->	Pb-212
816.62	4.33E-13	Ac-228	->	Th-228
817.87	1.66E+06	Cm-244	->	Pu-240
821.14	4.93E-14	Tl-208	->	Pb-208
825.3	7.18E-13	Ac-228	->	Th-228
830.59	7.80E-12	Ac-228	->	Th-228
835.6	2.12E-11	Ac-228	->	Th-228
840.44	1.16E-11	Ac-228	->	Th-228
853.6	1.73E-13	Ac-228	->	Th-228
857.5	1.51E+05	Cm-244	->	Pu-240
860.3	1.48E-11	Tl-208	->	Pb-208
870.47	8.17E-13	Ac-228	->	Th-228
873.94	8.34E+00	Pu-240	->	U-236
874.43	1.04E-12	Ac-228	->	Th-228
877.65	2.48E-13	Ac-228	->	Th-228
883.27	3.82E-14	Tl-208	->	Pb-208
884	1.24E-12	Ac-228	->	Th-228
887.46	2.48E-13	Ac-228	->	Th-228
893.42	8.10E-13	Bi-212	->	Po-212
900.31	4.20E+04	Cm-244	->	Pu-240
904.29	1.10E-11	Ac-228	->	Th-228
911.16	3.59E-10	Ac-228	->	Th-228
919.19	3.47E-13	Ac-228	->	Th-228
922.28	2.60E-13	Ac-228	->	Th-228
927.42	1.54E-13	Tl-208	->	Pb-208
931.1	1.86E-13	Ac-228	->	Th-228
943.9	1.32E-12	Ac-228	->	Th-228
948.4	1.51E-12	Ac-228	->	Th-228
952.17	3.88E-13	Bi-212	->	Po-212
958.3	3.84E-12	Ac-228	->	Th-228
964.64	7.18E-11	Ac-228	->	Th-228
968.97	2.15E-10	Ac-228	->	Th-228
979.7	2.85E-13	Ac-228	->	Th-228
982.52	2.43E-13	Tl-208	->	Pb-208
987.87	4.21E-12	Ac-228	->	Th-228
987.94	2.35E-12	Ac-228	->	Th-228
1016.12	3.09E-13	Ac-228	->	Th-228
1019.7	3.09E-13	Ac-228	->	Th-228
1033.32	1.92E-12	Ac-228	->	Th-228
1039.97	6.81E-13	Ac-228	->	Th-228
1041.35	3.96E-13	Ac-228	->	Th-228
1054.3	3.96E-13	Ac-228	->	Th-228

1065.05	2.12E-12	Ac-228	->	Th-228
1074.1	3.53E-14	Bi-212	->	Po-212
1078.69	1.18E-12	Bi-212	->	Po-212
1093.63	4.56E-13	Tl-208	->	Pb-208
1095.87	1.63E-12	Ac-228	->	Th-228
1104.01	2.10E-13	Ac-228	->	Th-228
1110.7	4.79E-12	Ac-228	->	Th-228
1116.97	7.55E-13	Ac-228	->	Th-228
1125.6	6.17E-15	Tl-208	->	Pb-208
1135.39	1.49E-13	Ac-228	->	Th-228
1142.7	1.24E-13	Ac-228	->	Th-228
1153.69	1.97E-12	Ac-228	->	Th-228
1160.55	1.36E-14	Tl-208	->	Pb-208
1163.6	9.28E-13	Ac-228	->	Th-228
1174.79	3.59E-13	Ac-228	->	Th-228
1185.1	2.10E-14	Tl-208	->	Pb-208
1216.4	3.22E-13	Ac-228	->	Th-228
1245.23	1.11E-12	Ac-228	->	Th-228
1246.6	7.05E-12	Ac-228	->	Th-228
1249.81	7.43E-13	Ac-228	->	Th-228
1277.5	2.48E-13	Ac-228	->	Th-228
1282.7	6.41E-14	Tl-208	->	Pb-208
1286.6	1.47E-12	Ac-228	->	Th-228
1309.6	2.60E-13	Ac-228	->	Th-228
1314.76	2.60E-13	Ac-228	->	Th-228
1347.6	1.61E-13	Ac-228	->	Th-228
1357.6	3.59E-13	Ac-228	->	Th-228
1374.26	2.48E-13	Ac-228	->	Th-228
1381	8.64E-15	Tl-208	->	Pb-208
1415.7	3.22E-13	Ac-228	->	Th-228
1431	3.96E-13	Ac-228	->	Th-228
1451.2	2.23E-13	Ac-228	->	Th-228
1459.19	1.31E-11	Ac-228	->	Th-228
1468.8	2.48E-13	Ac-228	->	Th-228
1481.2	2.48E-13	Ac-228	->	Th-228
1496	1.30E-11	Ac-228	->	Th-228
1501.44	7.18E-12	Ac-228	->	Th-228
1503.87	3.59E-13	Ac-228	->	Th-228
1512.75	6.91E-13	Bi-212	->	Po-212
1528.9	8.29E-13	Ac-228	->	Th-228
1537.4	6.06E-13	Ac-228	->	Th-228
1548.5	5.32E-13	Ac-228	->	Th-228
1557	2.48E-12	Ac-228	->	Th-228
1572.03	6.19E-13	Ac-228	->	Th-228
1573.3	6.81E-13	Ac-228	->	Th-228
1580.3	8.79E-12	Ac-228	->	Th-228
1588.23	4.46E-11	Ac-228	->	Th-228
1620.66	3.33E-12	Bi-212	->	Po-212
1625.1	3.96E-12	Ac-228	->	Th-228
1630.47	2.41E-11	Ac-228	->	Th-228

1638.1	6.68E-12	Ac-228	->	Th-228	
1647.4	2.47E-15	Tl-208	->	Pb-208	
1666.43	2.48E-12	Ac-228	->	Th-228	
1677.9	8.29E-13	Ac-228	->	Th-228	
1679.42	1.50E-13	Bi-212	->	Po-212	
1686	1.29E-12	Ac-228	->	Th-228	
1702.3	8.29E-13	Ac-228	->	Th-228	
1706.07	1.73E-13	Ac-228	->	Th-228	
1713.25	5.82E-14	Ac-228	->	Th-228	
1739.1	2.40E-13	Ac-228	->	Th-228	
1741.2	1.86E-13	Ac-228	->	Th-228	
1743.57	2.47E-15	Tl-208	->	Pb-208	
1750.9	1.11E-13	Ac-228	->	Th-228	
1757.88	5.12E-13	Ac-228	->	Th-228	
1784.5	1.19E-13	Ac-228	->	Th-228	
1805.93	2.45E-13	Bi-212	->	Po-212	
1823.47	6.31E-13	Ac-228	->	Th-228	
1835.1	5.07E-13	Ac-228	->	Th-228	
1842.29	5.94E-13	Ac-228	->	Th-228	
1871.2	3.22E-13	Ac-228	->	Th-228	
1886.92	1.46E-12	Ac-228	->	Th-228	
1900.1	5.69E-14	Ac-228	->	Th-228	
1907.5	5.82E-13	Ac-228	->	Th-228	
1930.3	3.09E-13	Ac-228	->	Th-228	
1952.5	8.91E-13	Ac-228	->	Th-228	
1965.3	2.97E-13	Ac-228	->	Th-228	
2614.35	1.29E-10	Tl-208	->	Pb-208,	Po-212 -> Pb-208

Cm244		Aged 5 years		Sorted by Intensity	
Intensity	Energy	Initial Isotopes and Decays			
ph/s/gm	keV				
9.89E+10	14.262	Cm-244	->	Pu-240	
9.89E+10	18.135	Cm-244	->	Pu-240	
2.47E+10	21.554	Cm-244	->	Pu-240	
5.69E+09	12.124	Cm-244	->	Pu-240	
2.22E+09	16.333	Cm-244	->	Pu-240	
6.18E+08	42.817	Cm-244	->	Pu-240	
3.71E+07	98.855	Cm-244	->	Pu-240	
2.42E+07	152.622	Cm-244	->	Pu-240	
1.95E+06	554.54	Cm-244	->	Pu-240	
1.66E+06	817.87	Cm-244	->	Pu-240	
1.41E+06	263.33	Cm-244	->	Pu-240	
1.11E+06	597.35	Cm-244	->	Pu-240	
6.47E+05	45.244	Pu-240	->	U-236	
3.81E+05	302.96	Cm-244	->	Pu-240	
3.78E+05	758.64	Cm-244	->	Pu-240	
2.99E+05	251.43	Cm-244	->	Pu-240	

1.88E+05	507.22	Cm-244	->	Pu-240			
1.78E+05	606.07	Cm-244	->	Pu-240			
1.51E+05	857.5	Cm-244	->	Pu-240			
1.00E+05	104.244	Pu-240	->	U-236			
4.20E+04	900.31	Cm-244	->	Pu-240			
6.04E+03	160.28	Pu-240	->	U-236			
1.44E+03	98.441	Pu-240	->	U-236			
9.77E+02	94.66	Pu-240	->	U-236			
5.17E+02	111.3	Pu-240	->	U-236			
4.31E+02	212.46	Pu-240	->	U-236			
1.81E+02	642.5	Pu-240	->	U-236			
1.70E+02	110.421	Pu-240	->	U-236			
1.44E+02	114.866	Pu-240	->	U-236			
3.88E+01	687.59	Pu-240	->	U-236			
8.34E+00	873.94	Pu-240	->	U-236			
5.15E+00	16.161	U-236	->	Th-232			
3.73E+00	12.952	Ac-228	->	Th-228,	U-236	->	Th-232
1.72E+00	538.11	Pu-240	->	U-236			
1.15E+00	19.094	U-236	->	Th-232			
2.19E-01	11.118	Ac-228	->	Th-228,	U-236	->	Th-232
1.04E-01	14.511	Ac-228	->	Th-228,	U-236	->	Th-232
8.55E-02	49.369	U-236	->	Th-232			
2.08E-02	112.75	U-236	->	Th-232			
1.24E-09	13.5	Ra-228	->	Ac-228			
5.57E-10	16.18	Ra-228	->	Ac-228			
3.59E-10	911.16	Ac-228	->	Th-228			
2.48E-10	16.154	Ac-228	->	Th-228			
2.35E-10	12.76	Ra-228	->	Ac-228			
2.15E-10	968.97	Ac-228	->	Th-228			
1.61E-10	18.8	Ra-228	->	Ac-228			
1.53E-10	338.42	Ac-228	->	Th-228			
1.50E-10	238.578	Pb-212	->	Bi-212			
1.29E-10	2614.35	Tl-208	->	Pb-208,	Po-212	->	Pb-208
1.24E-10	15.15	Ra-228	->	Ac-228			
1.10E-10	583.022	Tl-208	->	Pb-208,	Po-212	->	Pb-208
7.18E-11	964.64	Ac-228	->	Th-228			
6.93E-11	93.35	Ac-228	->	Th-228			
6.09E-11	77.107	Pb-212	->	Bi-212			
5.69E-11	19.113	Ac-228	->	Th-228			
5.69E-11	794.79	Ac-228	->	Th-228			
5.69E-11	463.1	Ac-228	->	Th-228			
5.07E-11	209.39	Ac-228	->	Th-228			
4.70E-11	270.26	Ac-228	->	Th-228			
4.46E-11	1588.23	Ac-228	->	Th-228			
4.33E-11	328.07	Ac-228	->	Th-228			
4.21E-11	89.955	Ac-228	->	Th-228			
3.61E-11	74.814	Pb-212	->	Bi-212			
3.59E-11	129.03	Ac-228	->	Th-228			
2.72E-11	409.62	Ac-228	->	Th-228			
2.66E-11	510.606	Tl-208	->	Pb-208			

2.48E-11	105.362	Ac-228	->	Th-228
2.41E-11	1630.47	Ac-228	->	Th-228
2.27E-11	10.828	Pb-212	->	Bi-212
2.16E-11	87.19	Pb-212	->	Bi-212
2.12E-11	835.6	Ac-228	->	Th-228
2.06E-11	13.099	Pb-212	->	Bi-212
1.74E-11	59	Th-232	->	Ra-228
1.64E-11	15.23	Th-228	->	Ra-224
1.63E-11	755.28	Ac-228	->	Th-228
1.61E-11	99.55	Ac-228	->	Th-228
1.48E-11	860.3	Tl-208	->	Pb-208
1.47E-11	727.25	Bi-212	->	Po-212
1.35E-11	772.28	Ac-228	->	Th-228
1.34E-11	240.76	Ra-224	->	Rn-220
1.31E-11	1459.19	Ac-228	->	Th-228
1.30E-11	1496	Ac-228	->	Th-228
1.25E-11	562.65	Ac-228	->	Th-228
1.16E-11	840.44	Ac-228	->	Th-228
1.15E-11	300.034	Pb-212	->	Bi-212
1.11E-11	677.07	Ac-228	->	Th-228
1.11E-11	19.4	Ra-228	->	Ac-228
1.10E-11	904.29	Ac-228	->	Th-228
1.08E-11	12.325	Th-228	->	Ra-224
1.08E-11	726.63	Ac-228	->	Th-228
1.04E-11	153.89	Ac-228	->	Th-228
9.90E-12	216.24	Ac-228	->	Th-228
8.79E-12	1580.3	Ac-228	->	Th-228
8.39E-12	277.28	Tl-208	->	Pb-208
8.29E-12	108.99	Ac-228	->	Th-228
7.80E-12	830.59	Ac-228	->	Th-228
7.30E-12	782.12	Ac-228	->	Th-228
7.18E-12	1501.44	Ac-228	->	Th-228
7.05E-12	1246.6	Ac-228	->	Th-228
6.68E-12	1638.1	Ac-228	->	Th-228
6.50E-12	57.81	Ac-228	->	Th-228
6.44E-12	340.94	Ac-228	->	Th-228
6.40E-12	90.128	Pb-212	->	Bi-212
6.06E-12	509.17	Ac-228	->	Th-228
5.82E-12	332.48	Ac-228	->	Th-228
4.79E-12	1110.7	Ac-228	->	Th-228
4.44E-12	74.969	Tl-208	->	Pb-208
4.33E-12	12.282	Bi-212	->	Tl-208
4.22E-12	84.26	Th-228	->	Ra-224
4.21E-12	987.87	Ac-228	->	Th-228
3.96E-12	1625.1	Ac-228	->	Th-228
3.94E-12	124	Th-232	->	Ra-228
3.89E-12	15.376	Pb-212	->	Bi-212
3.84E-12	958.3	Ac-228	->	Th-228
3.76E-12	10.259	Bi-212	->	Tl-208
3.70E-12	17.952	Th-228	->	Ra-224

3.59E-12	146.06	Ac-228	->	Th-228
3.47E-12	199.54	Ac-228	->	Th-228
3.33E-12	1620.66	Bi-212	->	Po-212
3.09E-12	321.9	Ac-228	->	Th-228
2.97E-12	478.2	Ac-228	->	Th-228
2.85E-12	279.3	Ac-228	->	Th-228
2.85E-12	210.76	Ac-228	->	Th-228
2.72E-12	546.36	Ac-228	->	Th-228
2.64E-12	72.803	Tl-208	->	Pb-208
2.60E-12	503.7	Ac-228	->	Th-228
2.48E-12	1557	Ac-228	->	Th-228
2.48E-12	1666.43	Ac-228	->	Th-228
2.44E-12	785.51	Bi-212	->	Po-212
2.35E-12	701.8	Ac-228	->	Th-228
2.35E-12	570.2	Ac-228	->	Th-228
2.35E-12	572.5	Ac-228	->	Th-228
2.35E-12	987.94	Ac-228	->	Th-228
2.12E-12	1065.05	Ac-228	->	Th-228
2.03E-12	115.122	Pb-212	->	Bi-212
2.02E-12	763.06	Tl-208	->	Pb-208
1.97E-12	1153.69	Ac-228	->	Th-228
1.94E-12	204.37	Ac-228	->	Th-228
1.92E-12	1033.32	Ac-228	->	Th-228
1.86E-12	440.49	Ac-228	->	Th-228
1.86E-12	583.28	Ac-228	->	Th-228
1.86E-12	707.49	Ac-228	->	Th-228
1.73E-12	184.72	Ac-228	->	Th-228
1.63E-12	1095.87	Ac-228	->	Th-228
1.61E-12	327.67	Ac-228	->	Th-228
1.60E-12	10.541	Tl-208	->	Pb-208
1.57E-12	84.789	Tl-208	->	Pb-208
1.51E-12	948.4	Ac-228	->	Th-228
1.50E-12	12.701	Tl-208	->	Pb-208
1.49E-12	191.29	Ac-228	->	Th-228
1.49E-12	523.18	Ac-228	->	Th-228
1.47E-12	1286.6	Ac-228	->	Th-228
1.46E-12	1886.92	Ac-228	->	Th-228
1.36E-12	619.88	Ac-228	->	Th-228
1.36E-12	39.846	Bi-212	->	Tl-208
1.32E-12	943.9	Ac-228	->	Th-228
1.29E-12	1686	Ac-228	->	Th-228
1.25E-12	651.44	Ac-228	->	Th-228
1.24E-12	673.86	Ac-228	->	Th-228
1.24E-12	884	Ac-228	->	Th-228
1.18E-12	1078.69	Bi-212	->	Po-212
1.17E-12	9.419	Pb-212	->	Bi-212
1.11E-12	1245.23	Ac-228	->	Th-228
1.11E-12	774	Ac-228	->	Th-228
1.11E-12	615.9	Ac-228	->	Th-228
1.10E-12	282.02	Ac-228	->	Th-228

1.04E-12	874.43	Ac-228	->	Th-228
1.01E-12	14.563	Bi-212	->	Tl-208
9.87E-13	252.45	Tl-208	->	Pb-208
9.67E-13	215.75	Th-228	->	Ra-224
9.65E-13	519.97	Ac-228	->	Th-228
9.28E-13	1163.6	Ac-228	->	Th-228
8.91E-13	1952.5	Ac-228	->	Th-228
8.29E-13	1677.9	Ac-228	->	Th-228
8.29E-13	1702.3	Ac-228	->	Th-228
8.29E-13	1528.9	Ac-228	->	Th-228
8.17E-13	870.47	Ac-228	->	Th-228
8.17E-13	223.72	Ac-228	->	Th-228
8.10E-13	893.42	Bi-212	->	Po-212
8.05E-13	449.57	Ac-228	->	Th-228
7.55E-13	640.7	Ac-228	->	Th-228
7.55E-13	1116.97	Ac-228	->	Th-228
7.43E-13	232.3	Ac-228	->	Th-228
7.43E-13	1249.81	Ac-228	->	Th-228
7.18E-13	825.3	Ac-228	->	Th-228
7.18E-13	263.57	Ac-228	->	Th-228
6.91E-13	1512.75	Bi-212	->	Po-212
6.89E-13	83.787	Ra-224	->	Rn-220
6.81E-13	1039.97	Ac-228	->	Th-228
6.81E-13	1573.3	Ac-228	->	Th-228
6.31E-13	1823.47	Ac-228	->	Th-228
6.28E-13	10.622	Th-228	->	Ra-224
6.20E-13	14.336	Ra-224	->	Rn-220
6.19E-13	1572.03	Ac-228	->	Th-228
6.19E-13	460.84	Ac-228	->	Th-228
6.19E-13	629.93	Ac-228	->	Th-228
6.06E-13	141.19	Ac-228	->	Th-228
6.06E-13	555.3	Ac-228	->	Th-228
6.06E-13	1537.4	Ac-228	->	Th-228
5.94E-13	1842.29	Ac-228	->	Th-228
5.82E-13	1907.5	Ac-228	->	Th-228
5.69E-13	666.4	Ac-228	->	Th-228
5.32E-13	1548.5	Ac-228	->	Th-228
5.32E-13	515.2	Ac-228	->	Th-228
5.32E-13	498.26	Ac-228	->	Th-228
5.32E-13	649.19	Ac-228	->	Th-228
5.12E-13	1757.88	Ac-228	->	Th-228
5.07E-13	1835.1	Ac-228	->	Th-228
5.07E-13	737.7	Ac-228	->	Th-228
4.58E-13	399.2	Ac-228	->	Th-228
4.56E-13	1093.63	Tl-208	->	Pb-208
4.53E-13	87.632	Tl-208	->	Pb-208
4.49E-13	452.77	Bi-212	->	Tl-208
4.48E-13	11.713	Ra-224	->	Rn-220
4.47E-13	131.5	Th-228	->	Ra-224
4.33E-13	471.4	Ac-228	->	Th-228

4.33E-13	816.62	Ac-228	->	Th-228
4.22E-13	288.08	Bi-212	->	Tl-208
4.13E-13	81.067	Ra-224	->	Rn-220
3.96E-13	257.29	Ac-228	->	Th-228
3.96E-13	174.18	Ac-228	->	Th-228
3.96E-13	396.9	Ac-228	->	Th-228
3.96E-13	1431	Ac-228	->	Th-228
3.96E-13	1041.35	Ac-228	->	Th-228
3.96E-13	1054.3	Ac-228	->	Th-228
3.88E-13	952.17	Bi-212	->	Po-212
3.82E-13	233.32	Tl-208	->	Pb-208
3.59E-13	540.5	Ac-228	->	Th-228
3.59E-13	791.2	Ac-228	->	Th-228
3.59E-13	1357.6	Ac-228	->	Th-228
3.59E-13	1503.87	Ac-228	->	Th-228
3.59E-13	474.32	Ac-228	->	Th-228
3.59E-13	1174.79	Ac-228	->	Th-228
3.47E-13	919.19	Ac-228	->	Th-228
3.28E-13	13.662	Th-228	->	Ra-224
3.22E-13	419.23	Ac-228	->	Th-228
3.22E-13	1415.7	Ac-228	->	Th-228
3.22E-13	1216.4	Ac-228	->	Th-228
3.22E-13	1871.2	Ac-228	->	Th-228
3.09E-13	1930.3	Ac-228	->	Th-228
3.09E-13	1019.7	Ac-228	->	Th-228
3.09E-13	1016.12	Ac-228	->	Th-228
2.99E-13	11.712	Pb-212	->	Bi-212
2.97E-13	1965.3	Ac-228	->	Th-228
2.86E-13	166.43	Th-228	->	Ra-224
2.85E-13	979.7	Ac-228	->	Th-228
2.76E-13	14.884	Tl-208	->	Pb-208
2.60E-13	922.28	Ac-228	->	Th-228
2.60E-13	1309.6	Ac-228	->	Th-228
2.60E-13	1314.76	Ac-228	->	Th-228
2.60E-13	791.05	Ac-228	->	Th-228
2.50E-13	721.91	Tl-208	->	Pb-208
2.48E-13	94.677	Ra-224	->	Rn-220
2.48E-13	887.46	Ac-228	->	Th-228
2.48E-13	877.65	Ac-228	->	Th-228
2.48E-13	1277.5	Ac-228	->	Th-228
2.48E-13	492.36	Ac-228	->	Th-228
2.48E-13	1481.2	Ac-228	->	Th-228
2.48E-13	356.83	Ac-228	->	Th-228
2.48E-13	1468.8	Ac-228	->	Th-228
2.48E-13	1374.26	Ac-228	->	Th-228
2.45E-13	1805.93	Bi-212	->	Po-212
2.43E-13	982.52	Tl-208	->	Pb-208
2.41E-13	549.7	Rn-220	->	Po-216
2.40E-13	1739.1	Ac-228	->	Th-228
2.23E-13	1451.2	Ac-228	->	Th-228

2.21E-13	79.29	Bi-212	->	Po-212
2.10E-13	416.2	Ac-228	->	Th-228
2.10E-13	135.68	Ac-228	->	Th-228
2.10E-13	1104.01	Ac-228	->	Th-228
2.10E-13	211.31	Tl-208	->	Pb-208
1.86E-13	388.9	Ac-228	->	Th-228
1.86E-13	1741.2	Ac-228	->	Th-228
1.86E-13	931.1	Ac-228	->	Th-228
1.86E-13	8.953	Bi-212	->	Tl-208
1.75E-13	176.577	Pb-212	->	Bi-212
1.73E-13	220.49	Ac-228	->	Th-228
1.73E-13	853.6	Ac-228	->	Th-228
1.73E-13	1706.07	Ac-228	->	Th-228
1.70E-13	327.93	Bi-212	->	Tl-208
1.61E-13	1347.6	Ac-228	->	Th-228
1.57E-13	72.873	Bi-212	->	Tl-208
1.54E-13	927.42	Tl-208	->	Pb-208
1.50E-13	1679.42	Bi-212	->	Po-212
1.49E-13	1135.39	Ac-228	->	Th-228
1.34E-13	16.881	Ra-224	->	Rn-220
1.32E-13	76.858	Bi-212	->	Po-212
1.24E-13	1142.7	Ac-228	->	Th-228
1.19E-13	1784.5	Ac-228	->	Th-228
1.11E-13	481.8	Ac-228	->	Th-228
1.11E-13	1750.9	Ac-228	->	Th-228
1.11E-13	372.3	Ac-228	->	Th-228
1.01E-13	88.471	Th-228	->	Ra-224
9.77E-14	205.75	Th-228	->	Ra-224
9.63E-14	415.156	Pb-212	->	Bi-212
9.28E-14	70.832	Bi-212	->	Tl-208
9.05E-14	13.501	Bi-212	->	Po-212
9.05E-14	11.119	Bi-212	->	Po-212
8.02E-14	9.185	Tl-208	->	Pb-208
7.92E-14	97.907	Ra-224	->	Rn-220
7.72E-14	89.639	Bi-212	->	Po-212
6.41E-14	1282.7	Tl-208	->	Pb-208
6.19E-14	473.36	Bi-212	->	Tl-208
6.17E-14	485.78	Tl-208	->	Pb-208
6.11E-14	85.429	Th-228	->	Ra-224
5.82E-14	1713.25	Ac-228	->	Th-228
5.69E-14	1900.1	Ac-228	->	Th-228
5.57E-14	82.434	Bi-212	->	Tl-208
5.30E-14	748.58	Tl-208	->	Pb-208
4.93E-14	587.82	Tl-208	->	Pb-208
4.93E-14	821.14	Tl-208	->	Pb-208
4.44E-14	650.14	Tl-208	->	Pb-208
4.21E-14	692.5	Ac-228	->	Th-228
3.82E-14	883.27	Tl-208	->	Pb-208
3.60E-14	99.915	Th-228	->	Ra-224
3.53E-14	1074.1	Bi-212	->	Po-212

3.50E-14	10.994	Bi-212	->	Tl-208
3.10E-14	290	Ra-224	->	Rn-220
2.71E-14	705.24	Tl-208	->	Pb-208
2.51E-14	10.137	Ra-224	->	Rn-220
2.43E-14	92.673	Bi-212	->	Po-212
2.41E-14	650.1	Ra-224	->	Rn-220
2.15E-14	11.349	Tl-208	->	Pb-208
2.10E-14	1185.1	Tl-208	->	Pb-208
1.76E-14	15.869	Bi-212	->	Po-212
1.73E-14	433.51	Bi-212	->	Tl-208
1.72E-14	164.15	Pb-212	->	Bi-212
1.55E-14	85.185	Bi-212	->	Tl-208
1.38E-14	409.3	Ra-224	->	Rn-220
1.36E-14	1160.55	Tl-208	->	Pb-208
1.24E-14	143.99	Bi-212	->	Tl-208
1.17E-14	103.341	Th-228	->	Ra-224
1.17E-14	12.855	Ra-224	->	Rn-220
8.64E-15	1381	Tl-208	->	Pb-208
7.55E-15	492.62	Bi-212	->	Tl-208
6.21E-15	804.9	Po-216	->	Pb-212
6.19E-15	164	Bi-212	->	Tl-208
6.17E-15	1125.6	Tl-208	->	Pb-208
4.63E-15	9.658	Bi-212	->	Po-212
4.46E-15	620.3	Bi-212	->	Tl-208
2.47E-15	1647.4	Tl-208	->	Pb-208
2.47E-15	1743.57	Tl-208	->	Pb-208
1.37E-15	12.085	Bi-212	->	Po-212
9.78E-16	580.4	Bi-212	->	Tl-208