TABLE OF THE ISOTOPES

Norman E. Holden

This table presents an evaluated set of values for the experimental quantities that characterize the decay of radioactive nuclides. A list of the major references used in this evaluation is given below. When uncertainties are not listed, they are assumed to be five or less in the last digit quoted. If they exceed five in the last digit, the value is prefaced by an approximate sign. For quasi-stable nuclides, the measured width, Γ, of the resonance is given. To estimate the approximate half-life, the Heisenberg relationship may be used, the half-life = 4.56×10^{-22} seconds / Γ(MeV). The effective literature cutoff date for data in this edition of the Table is December, 2005.

Table Layout

Column No.	Column title	Description
1	Isotope or Element	For elements, the atomic number and chemical symbol are listed. For nuclides, the mass number and chemical symbol are listed. Isomers are indicated by the addition of m, m1, or m2.
2	Isotopic Abundance	In atom percent.
3	Atomic Mass or Atomic Weight	Atomic mass relative to ^{12}C = 12. Atomic weight of elements is given on the same scale.
4	Half-life/Resonance Width	Half-life in decimal notation. μs = microseconds; ms = milliseconds; s = seconds; m = minutes; h = hours; d = days; and y = years. For quasi-stable nuclides, the measured width at half maximum of the energy resonance is given
5	Decay Mode/Energy	Decay modes are α = alpha particle emission; β = negative beta emission; β+ = positron emission; EC = orbital electron capture; IT = isomeric transition from upper to lower isomeric state; n = neutron emission; sf = spontaneous fission; ββ = double beta decay. Total disintegration energy in MeV units.
6	Particle Energy/Intensity	End point energies of beta transitions and discrete energies of alpha particles in MeV and their intensities in percent.
7	Spin and Parity	Nuclear spin or angular momentum of the nuclides in units of $h/2\pi$; parity is positive or negative.
8	Magnetic Dipole Moment	Magnetic dipole moments in nuclear magneton units.
9	Electric Quadrupole Moment	Electric quadrupole moments in barn units (10^{-24} cm^2).
10	Gamma Ray Energy/ Intensity	Gamma ray energies in MeV and intensities in percent. Ann. rad. refers to the 511.006 keV photons emitted in the annihilation of positrons in matter.

General Nuclear Data References

The following references represent the major sources of the nuclear data presented, along with subsequent published journal articles and reports:

1. G. Audi, O. Bersillon, J. Blachot, A.H. Wapstra, *The Nubase Evaluation of Nuclear and Decay Properties,* Nuclear Physics A729, 3 (2003).
2. G. Audi, A.H. Wapstra, C. Thibault, *The AME2003 Atomic Mass Evaluation (II),* Nuclear Physics A729, 337 (2003).
3. International Commission on Atomic Weights, *Atomic Weights of the Elements - 1999*, Pure & Applied Chemistry 75, 667 (2001).
4. E.M. Baum, H.D. Knox, T.R. Miller, *Chart of the Nuclides, 16th Edition*, Knolls Atomic Power Lab. (2002)
5. N.E. Holden, *Total and Spontaneous Fission Half-lives for Uranium, Plutonium, Americium and Curium Nuclides*, Pure & Applied Chemistry 61, 1483 (1989).
6. N.E. Holden, *Half-lives of Selected Nuclides*, Pure & Applied Chemistry 62, 941 (1990).
7. N.E. Holden, *Review of Thermal Neutron Cross Sections and Isotopic Composition of the Elements*, BNL-NCS-42224 (March 1989).
8. P. Raghavan, *Table of Nuclear Moments*, Atomic Data Nuclear Data Tables 42, 189 (1989).
9. E. Brown, R. Firestone, *Radioactivity Handbook*, Wiley Interscience Press (1986).
10. J.K. Tuli, *Nuclear Wallet Cards*, Brookhaven National Laboratory (April 2005).
11. N.E. Holden, D.C. Hoffman, *Spontaneous Fission Half-lives for Ground State Nuclides*, Pure & Applied Chemistry 72 1525 (2000).
12. N. Stone, *Table of New Nuclear Moments*, private communication, www.nndc.bnl.gov/nndc/stone_moments/moments.html (Dec 2000)

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Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
$_0$n		1.008664916	614. s	β- /0.78235	0.782/100.	1/2+	-1.913043		
				β-, γ	/ < 0.069				
$_1$H		**1.00794(7)**							
^{1}H	99.9885(70)	1.007825032	> 2.8 × 10^{23} y			1/2+	+2.79285		
^{2}H	0.0115(70)	2.014101778				1+	+0.85744	+2.86 mb	
^{3}H		3.016049278	12.33 y	β-/0.01859	0.01860/100.	1/2+	+2.97896		
^{4}H		4.0278	Γ ~ 3	n/	/100	2-			
^{5}H		5.0353	Γ < 0.5	n/	/100	(1/2+)			
^{6}H		6.0449	Γ = 1.6(4)	n/		(2-)			
^{7}H		7.053	Γ ~ 20.						
$_2$He		**4.002602(2)**							
^{3}He	0.000134(3)	3.016029319				1/2+	-2.12762		
^{4}He	99.999866(3)	4.002603254				0+			
^{5}He		5.01222	Γ = 0.60(2)	n, α		3/2-			
^{6}He		6.018889	0.807 s	β-/3.508	3.510/100.	0+			
				β, d	/0.00076				
^{7}He		7.02802	Γ = 0.15(2)	n		(3/2)-			
^{8}He		8.03392	0.119 s	β-/10.65	/84.	0+			0.9807/84.
				n/	/16.				0.4776/5.
				β, t	/0.82				
^{9}He		9.04395	Γ = 0.10(6)	n	/100	(1/2-)			
^{10}He		10.0524	Γ = 0.3(2)	2n	/100	0+			
$_3$Li		**6.941(2)**							
^{4}Li		4.0272	Γ = 6.0	p/	/100	2-			
^{5}Li		5.01254	Γ = 1.2	p/α		3/2-			
^{6}Li	7.59(4)	6.01512280				1+	+0.82205	-0.8 mb	
^{7}Li	92.41(4)	7.0160046				3/2-	+3.25644	-0.0400	
^{8}Li		8.0224874	0.840 s	β-/16.004	12.5/100.	2+	+1.6536	+0.0314	
				α/	α(1.6)				
^{9}Li		9.026790	0.178 s	β-/13.606	13.5/75.	3/2-	3.4368	-0.0306	
				β-/	11/25.				
^{10}Li		10.03548	Γ = 0.11(5)	n	/7.	1+			
^{11}Li		11.04380	8.8 ms	β-/20.6	/8.3	3/2(-)	3.668	-0.031	3.368/33.
				β-, n	/85.7				0.320/7.
				β-, 2n	/4.1				2.590/8.
				β-, 3n	/1.9				5.958/3.
				β-, d	/>0.01				2.895/1.5
				β-, t	/0.02				2.811/1.1
^{12}Li		12.054	< 0.01 μs						
$_4$Be		**9.012182(3)**							
^{5}Be		5.041		p, ^{3}He		(1/2+)			
^{6}Be		6.01973	Γ = 0.092(6)	2p,α		0+			
^{7}Be		7.0169298	53.28 d	EC/0.8618		3/2-	-1.4		0.4776/10.4
^{8}Be		8.00530510	Γ = 6.8(17)eV	2α/0.046		0+			
^{9}Be	100.	9.0121822				3/2-	-1.1776	+0.0529	
^{10}Be		10.0135338	1.52 × 10^6 y	β-/0.5559	0.555/100.	0+			
^{11}Be		11.02166	13.8 s	β-, β-α/11.51	11.48/61.	1/2+			2.125/35.5
^{12}Be		12.02692	22.0 ms	β-, (n)/11.71	n//0.5	0+			(0.95 - 4.4)
^{13}Be		13.0357	Γ ~ 1.						
^{14}Be		14.0429	4.6 ms	β-/16.2		0+			3.5346/0.9
				β-, n	0.288/94.				3.6845/7.
				β-, 2n	/6.				
				β-, α	/<0.012				
				β-, t	/<0.04				
^{15}Be		15.053	< 0.2 μs	β$^-$					

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^{16}Be		16.062	< 0.2 μs	β⁻		0+			
$_5$B		**10.811(7)**							
^{7}B		7.0299	Γ = 1.4(2)	p, α		(3/2-)			
^{8}B		8.024607	0.770 s	β+, 2α/17.979	13.7(β+)/93.	2+	1.0355	0.068	ann.rad.
^{9}B		9.013329	Γ = 0.5(2) keV	p, 2α/		3/2-			
^{10}B	19.9(7)	10.0129370				3+	+1.8006	+0.085	
^{11}B	80.1(7)	11.0093054				3/2-	+2.6886	+0.0406	
^{12}B		12.014352	0.0202 s	β-/13.369		1+	+1.0027	0.0132	4.438/1.3
				β- α/1.6/					3.215/0.00065
^{13}B		13.017780	0.0174 s	β- /13.437	13.4	3/2-	+3.1778	0.037	3.68/7.6
				β- n/0.25/	2.43(n)/0.09				
					3.55(n)/0.16				
^{14}B		14.02540	14. ms	β-/20.64		2-	1.185	0.0298	6.094/90.
^{15}B		15.03110	9.9 ms	β-, (n)/19.09	n//99.7	(3/2-)	2.66	0.038	
^{16}B		16.0398	Γ < 0.1	n					
^{17}B		17.0470	5.1 ms	β-, (n)/22.7			2.54	0.039	
^{18}B		18.056	< 0.026 μs			0-			
^{19}B		19.0637	2.9 ms	β-, (n)/26.5	1n//72.	(3/2-)			
					2n//16.				
					3n// < 9.				
$_6$C		**12.0107(8)**							
^{8}C		8.03768	Γ = 0.25(4)	p		0+			
^{9}C		9.031037	127. ms	β+, p, 2α/16.498		(3/2-)	-1.391		ann.rad.
^{10}C		10.0168532	19.3 s	β+/3.648	1.865	0+			ann.rad.
									0.71829/100.
^{11}C		11.011434	20.3 m	β+, EC/1.982	0.9608/99.	3/2-	-0.964	0.0333	ann.rad.
^{12}C	98.93(8)	12.000000000				0+			
^{13}C	1.07(8)	13.003354838				½-	+0.70241		
^{14}C		14.003241989	5715. y	β-/0.15648	0.1565/100.	0+			
^{15}C		15.010599	2.45 s	β-/9.772	4.51/68.	½+	1.32		5.298/68.
					9.82/32.				(7.30−9.05)
^{16}C		16.014701	~ 0.750 s	β-/8.012	β/3.3, 4.3/84, 16	0+			
				β, n	n/0.8, 1.7/84, 16				
^{17}C		17.02259	0.19 s	β-/13.17		3/2+			1.375
				β-, n	n/1.6−3.7/11.				1.849
									1.906
^{18}C		18.02676	0.092 s	β-/11.81		0+			
				β-, n	n/0.88−4.59/21.				
^{19}C		19.0348	0.05 s	n		½+			
^{20}C		20.0403	0.02 s	β,n	1n// ~ 65.	0+			
					2n// < 19.				
^{21}C		21.049	< 0.03 μs						
^{22}C		22.057	6 ms	β-, n	1n// ~ 61.	0+			
					2n// < 37.				
$_7$N		**14.0067(2)**							
^{10}N		10.0417	Γ = 2.3(16)						
^{11}N		11.02609	Γ ~ 1.			½+			
^{12}N		12.018613	11.00 ms	β+, β+α/17.338	16.38/95.	1+	+0.457	+10. mb	ann.rad.
									4.438/2.
^{13}N		13.0057386	9.97 m	β+ /2.2204	1.190/100.	½-	0.3222		
^{14}N	99.636(20)	14.003074005				1+	+0.40376	+0.0200	
^{15}N	0.364(20)	15.00010898				½-	-0.28319		
^{16}N		16.006102	7.13 s	β- /10.419	4.27/68.	2-			6.129/68.8
					10.44/26.		1.986	18 mb	7.115/4.7
				β-, α	1.85/.0012				(0.99−8.87)
^{17}N		17.00845	4.17 s	β-, β- n/8.68	3.7/100.	½-	0.352		0.871/3.

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				0.4−1.7n/95.					2.1842/0.3
				β- α/	8.0, 8.2				
^{18}N		18.01408	0.62 s	β- /13.90	9.4/100.	1-	0.328	0.012	0.822/48.
				β-, α	/12.				1.65/47.
				β-,n	/14				1.982/77.
									(0.535−7.13)
^{19}N		19.01703	0.32 s	β-/12.53			< 0.32		(0.096−3.14)
^{20}N		20.0234	0.14 s	β- /17.97					
^{21}N		21.0271	0.08 s						
^{22}N		22.0344	0.02 s	β-,n	1n// ~ 41.				
					2n// < 13.				
^{23}N		23.0412	15. ms	β-, n	n// ~ 42.				
					2n// ~ 8.				
					3n// < 3.4				
^{24}N		24.0510	< 0.052 μs						
^{25}N		25.061	< 0.26 μs						
$_{8}$O		**15.9994(3)**							
^{12}O		12.03441	Γ = 0.51(16)	2p		0+			
^{13}O		13.02481	8.9 ms	β+, p/17.77	1.560 (p)	(3/2-)	1.389	0.011	ann.rad.
					p/(1.00 - 13.5)				4.438/0.56
^{14}O		14.0085963	70.63 s	β+ /5.1430	1.81/99.	0+			ann.rad.
									2.312/99.4
^{15}O		15.0030656	122.2 s	β+ /2.754	1.723/100.	1/2-	0.7195		ann.rad.
^{16}O	99.757(16)	15.9949146196				0+			
^{17}O	0.038(1)	16.9991317				5/2+	-1.8938	-0.026	
^{18}O	0.205(14)	17.999161				0+			
^{19}O		19.003580	26.9 s	β- /4.820	3.25/60.	5/2+	1.5320	3.7 mb	0.197/95.9
					4.60/40.				1.3569/50.4
									(0.11−4.18)
^{20}O		20.004077	13.5 s	β- /3.814		0+			1.057/100.
^{21}O		21.00866	3.4 s	β- /8.11					(0.28−4.6)
^{22}O		22.0100	2.2 s	β- /6.5		0+			0.072/100
									0.638/98
									1.862/63
									(0.918-2.499)
^{23}O		23.0157	0.08 s						
^{24}O		24.0205	~ 65. ms	β-, n	n//18.	0+			1.83/28.
									0.52/14.
									1.31/12.
^{25}O		25.0295	< 0.05 μs						
^{26}O		26.0383	< 0.04 μs			0+			
^{27}O		27.048	< 0.026 μs						
^{28}O		28.058	< 0.10 μs			0+			
$_{9}$F		**18.9984032(5)**							
^{14}F		14.0351							
^{15}F		15.0180	Γ = 0.8(3)	p		(1/2+)			
^{16}F		16.01147	Γ = 0.037(14)	p		0-			
^{17}F		17.0020952	64.5 s	β+ /2.761	1.75/	5/2+	+4.721	0.058	ann.rad.
^{18}F		18.000938	1.829 h	β+, EC/1.656	0.635/97.	1+			ann.rad.
^{19}F	100.	18.9984032				½+	+2.62887	0.072	
^{20}F		19.9999813	11.00 s	β- /7.0245	5.398/100.	2+	+2.0934	0.042	1.634/100.
									3.33/0.009
^{21}F		20.999949	4.16 s	β- /5.684	3.7/8.	5/2+	3.9		0.3507/90.
					5.0/63.				1.395/15.
					5.4/29.				(1.746−4.684)
^{22}F		22.00300	4.23 s	β- /10.82	3.48/15.	4+			1.2746/100.
					4.67/7.				2.0826/82.

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					5.50/62.				(0.82−4.37)
^{23}F		23.0036	2.2 s	β- /8.5		5/2+			1.701/48.
									2.129/34.
									(0.493−3.83)
^{24}F		24.0081	0.3 s	β- /13.5					1.9816/
^{25}F		25.0121	~ 50. ms	β-, (n)	n//14.				1.70/39.
									(0.57−2.19)
^{26}F		26.0196	10. ms	β-, (n)	n//11.				2.02/67.
									1.67/19.
^{27}F		27.0268	5.0 ms	β-, (n)	n//90.				2.02/18.
^{28}F		28.036	< 0.04 μs						
^{29}F		29.043	2.5 ms	β-, (n)	n//100.				
^{30}F		30.053	< 0.26 μs						
^{31}F		31.060	> 0.26 μs						
$_{10}$Ne		**20.1797(6)**							
^{16}Ne		16.02576	Γ = 0.12(4)	2p		0+			
^{17}Ne		17.01767	109. ms	β+, p/14.53	1.4−10.6/6.9	1/2-	0.787		ann.rad./
				β+, α	/0.014				0.495
^{18}Ne		18.0057082	1.668 s	β+ /4.446	3.416/92.	0+			ann.rad./
									1.0413/7.8
									(0.658−1.70)
^{19}Ne		19.0018802	17.22 s	β+ /3.238	2.24/99.	1/2+	-1.885		ann.rad./
									(0.11−1.55)
^{20}Ne	90.48(3)	19.992440175				0+			
^{21}Ne	0.27(1)	20.99384668				3/2+	-0.66180	+0.103	
^{22}Ne	9.25(3)	21.99138511				0+		-0.19	
^{23}Ne		22.9944669	37.2 s	β- /4.376	3.95/32.	5/2+	-1.08	+0.15	0.440/33.
					4.39/67.				(1.64−2.98)
^{24}Ne		23.9936108	3.38 m	β- /2.47	1.10/8.	0+			0.4723/100.
					1.98/92.				0.874/7.9
^{25}Ne		24.99774	0.61 s	β- /7.30	6.3/	1/2+	-1.006		0.0895/96.
					7.3/				(0.98−3.69)
^{26}Ne		26.00046	197 ms	β-, n/7.3	n//0.13	0+			0.082/100
									1.278/6
									0.233/5
									0.151/3
									1.211/1
									2.489/1
^{27}Ne		27.0076	31. ms	β-, n/12.7	n//2.	(3/2+)			
^{28}Ne		28.0121	19. ms	β-, n/12.3	n//12.	0+			2.06/19.
					2n//3.				0.86/3.
^{29}Ne		29.0194	15. ms	β-, (n)/15.4	n//29.	(3/2+)			2.92/55.
				β-, 2n	2n//4.				(0.22−1.18)
^{30}Ne		30.025	7. ms	β-, (n)	n//9.	0+			0.151/9.
^{31}Ne		31.033	3. ms						
^{32}Ne		32.040	~ 3.5 ms			0+			
^{33}Ne		33.049	< 0.26 μs						
^{34}Ne		34.057	> 1.5 μs			0+			
$_{11}$Na		**22.98976928(2)**							
^{18}Na		18.02597	Γ = 0.34(9)						
^{19}Na		19.01388	0.03 s	β+, p/11.18					
^{20}Na		20.00735	0.446 s	β+ /13.89		2+	+0.3694	~ + 0.04	ann.rad./
				α	2.15/				1.634/79.
^{21}Na		20.997655	22.48 s	β+ /3.547	2.50/95.	3/2+	+2.3863	~ +0.05	ann.rad./
									0.351/5.
^{22}Na		21.9944364	2.605 y	β+ /90/2.842	0.545/90.	3+	+1.746	+0.19	ann.rad./
				EC/10/					1.2745/99.9

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^{23}Na	100.	22.989769281				3/2+	+2.21752	+0.106	
^{24m}Na			20.2 ms	I.T., β⁻		1+			0.4723/100.
^{24}Na		23.9909628	14.96 h	β- /5.5158	1.389/>99.	4+	+1.690		1.3686/100.
									2.754/100.
									(0.997−4.238)
^{25}Na		24.989954	59.3 s	β- /3.835	2.6/7.	5/2+	+3.683	~ -0.06	0.3897/12.7
					3.15/25.				0.5850/13.
					4.0/65.				0.9747/14.9
									(0.836−2.80)
^{26}Na		25.99263	1.071 s	β- /9.31		3+	+2.851	-5.3 mb	1.809/98.9
									(0.24-7.37)
^{27}Na		26.994077	0.290 s	β- /9.01	7.95/	5/2+	+3.90	-7.2 mb	0.9847/87.4
				β-, n/					1.698/11.9
^{28}Na		27.99894	31. ms	β- /14.0	12.3/	1+	+2.42	+0.04	1.473/37.
				β-, n/					2.389/18.6
^{29}Na		29.00286	44. ms	β-, n/13.3	11.5/	3/2+	+2.46	+86. mb	2.560/36.
									(1.04−3.99)
^{30}Na		30.00898	50. ms	β-, n/17.5	n//30.	2+	+2.07		1.483/46.
^{31}Na		31.0136	17.2 ms	β-, n/15.9	n//37.	3/2-	+2.30		1.483/14.
									(0.05−3.54)
^{32}Na		32.0205	13.5 ms	β- /19.1					0.240−3.935
^{33}Na		33.027	8.0 ms	β- /20.	/ ~ 38				0.886/16
				β-, n	0.8,1.02/47(6)				0.546/6.4
				β-, 2n	/13(3)				0.050−2.55
^{34}Na		34.035	5. ms	β- /24.					
^{35}Na		35.042	1.5 ms	β- /24					
^{36}Na		36.051	< 0.26 μs						
^{37}Na		37.059	> 1.5 μs						
$_{12}$Mg		**24.3050(6)**							
^{19}Mg		19.0355	< 0.02 μs						
^{20}Mg		20.01886	96. ms	β+ /10.73	/70	0+			
				β+, p	/30				
^{21}Mg		21.01171	122. ms	β+, p/13.10		5/2+			0.332/51.
^{22}Mg		21.999574	3.876 s	β+ /4.786	3.05/	0+			0.0729/60.
									0.5820/100.
									(1.28−1.93)
^{23}Mg		22.994124	11.32 s	β+ /4.057	3.09/92.	3/2+	0.536	1.25	0.440/8.2
^{24}Mg	78.99(4)	23.98504170				0+			
^{25}Mg	10.00(1)	24.98583692				5/2+	-0.85545	+0.200	
^{26}Mg	11.01(3)	25.98259293				0+			
^{27}Mg		26.98434059	9.45 m	β- /2.6103	1.59/41.	1/2+			0.17068/0.9
					1.75/58.				0.84376/72.
					2.65/0.3				1.01443/28.
^{28}Mg		27.983877	20.9 h	β- /1.832	0.459/95.	0+			0.0306/95.
									0.4006/36.
									0.9418/36.
									1.342/54.
^{29}Mg		28.98860	1.3 s	β-/7.55	5.4/	3/2+			0.960/15.
									1.398/16.
									2.224/36.
^{30}Mg		29.99043	0.32 s	β- /7.0		0+			0.224/85.
^{31}Mg		30.99655	0.24 s	β- /11.7	8.4/29.9	(3/2+)	-0.8836		1.613/47.
									0.947/37.
									(0.666-4.640)
				β-, n	/1.7				
^{32}Mg		31.99898	0.12 s	β- /10.3		0+			2.765/25.
^{33}Mg		33.00525	91. ms	β- /13.7	/83.				1.848/
				β-, n	/17.				

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^{34}Mg		34.0095	0.02 s	β- /11.3		0+			
^{35}Mg		35.0173	0.07 s			(7/2-)			
^{36}Mg		36.023	4. ms			0+			
^{37}Mg		37.031	> 0.26 μs			(7/2-)			
^{38}Mg		38.038	> 0.26 μs			0+			
^{39}Mg		39.047	< 0.26 μs						
^{40}Mg		40.054				0+			
$_{13}$Al		**26.9815386(8)**							
^{21}Al		21.0280	< 0.035 μs						
^{22}Al		22.0195	59. ms	β+ /18.6	p/1.3/18.	4+			ann.rad./
				β+, p, 2p, α/	α/3.3/0.3				
^{23m}Al			~ 0.35 s	β+, p/0.17					0.554
									0.839
^{23}Al		23.00727	0.47 s	β+ /12.24					ann.rad./
				β+, p/					
^{24m}Al			0.129 s	I.T./0.4259					
				β+	13.3	1+			1.3686/5.3
^{24}Al		23.999939	2.07 s	β+ /13.878,p	3.40/48.	4+			1.078(2)/16.
					4.42/41.				1.368(2)/96.
					6.80/3.				2.753(2)/43.
					8.74/8.				4.315(3)/15.
									5.392(3)/20.
									7.0662(2)/41.
^{25}Al		24.9904281	7.17 s	β+ /4.277	3.27/	5/2+	3.646		ann.rad./
									1.6115(2)/100.
									0.975(2)/5.
^{26m}Al			6.345 s	β+ /	3.2/	0+			ann.rad./
^{26}Al		25.9868917	7.1×10^5 y	β+ /82/4.0042	1.16/	5+	+2.804	+0.17	ann.rad./
				EC/18					1.8087/99.8
^{27}Al	100.	26.9815386				5/2+	+3.64151	+0.140	
^{28}Al		27.9819103	2.25 m	β- /4.6422	2.865/100.	3+	3.24	0.18	1.7778(6)/100.
^{29}Al		28.980445	6.5 m	β- /3.680	1.4/30.	5/2+			1.2732(8)/89.
					2.5/70.				2.0282(8)/4.
									2.4262(8)/7.
^{30}Al		29.98296	3.68 s	β- /8.56	5.05/	3+	3.01		1.26313(3)/35.
									2.23525(5)/65.
^{31}Al		30.98395	0.64 s	β- /8.00	6.25/	5/2+			0.75223(3)/18.
									1.69473(3)/59.
									2.31664(4)/73.
^{32}Al		31.9881	33. ms	β- /13.0		1+	1.96		
^{33}Al		32.9908	41.7 ms	β- /12.0	/91.5				1.940/2.5
				β-, n	/8.5				(1.01−4.34)
^{34}Al		33.9969	56. ms	β- /17.1	4.255/44	4			0.929/57
				β-, n	/26.				(0.12−4.26)
^{35}Al		34.9999	38. ms	β-/14.3	0.974/48	5/2+			0.064/45.
				β-, n	/ 38.				(0.12−5.63)
^{36}Al		36.0062	0.09 s	β-/18.3					
				β-, n	/<31.				
^{37}Al		37.0107	11. ms	β-/16.					
^{38}Al		38.017	> 7.6 ms						
^{39}Al		39.023	> 8. ms						
^{40}Al		40.031	> 0.26 μs						
^{41}Al		41.038	> 0.26 μs						
$_{14}$Si		**28.0855(3)**							
^{22}Si		22.0345	29. ms	β+, p	1.99/20	0+			
^{23}Si		23.0255	40.7 ms	β+, p/5.9	1.32,(0.6−11.6)				
^{24}Si		24.01155	0.14 s	β+, p/10.81	1.44,3.92,1.09	0+			ann.rad./

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					(1.66−4.47)				
^{25}Si		25.00411	221 ms	β+, p/12.74	p/4.25/9.5	5/2+			ann.rad./
					p/0.40/4.75				
					p/0.56-6.80				
^{26}Si		25.992330	2.23 s	β+ /5.066	3.282/	0+			ann.rad./
									0.8294(8)/22.
^{27}Si		26.9867049	4.14 s	β+ /4.8118	3.85/100.	5/2+	-0.8554		ann.rad./
									2.211(5)/0.2
^{28}Si	92.223(19)	27.976926533				0+			
^{29}Si	4.685(8)	28.97649470				1/2+	-0.5553		
^{30}Si	3.092(11)	29.97377017				0+			
^{31}Si		30.97536323	2.62 h	β- /1.4920	1.471/99.9	3/2+			1.2662(5)/0.05
^{32}Si		31.97414808	1.6×10^2 y	β- /0.224	0.213/100.	0+			
^{33}Si		32.97800	6.1 s	β- /5.85	3.92	(3/2+)	1.21		1.4313(5)/13.
									1.8477/100.
									2.538(2)/10.
^{34}Si		33.97858	2.8 s	β- /4.60	3.09/	0+			0.42907(5)/60.
									1.17852(2)/64.
									1.60756(5)/36.
^{35}Si		34.98458	0.9 s	β- /10.50					
^{36}Si		35.9866	0.5 s	β- /7.9		0^+			
				β-, n	/~ 12.				
^{37}Si		36.9929	~ 0.09 s	β- /12.5					
				β-, n	/~ 17.				
^{38}Si		37.9956	> 1 μs	β- /10.7		0^+			
				β-, n					
^{39}Si		39.0021	48. ms	β- /14.8					
^{40}Si		40.006	33. ms			0^+			
^{41}Si		41.015	20. ms						
^{42}Si		42.020	13. ms			0^+			
^{43}Si		43.029	> 0.26 μs						
$_{15}$P		**30.973762(2)**							
^{24}P		24.034							
^{25}P		25.0203	< 0.03 μs						
^{26}P		26.0118	44. ms	β+, p/18.1	p/0.41/18.0	3+			
					p/1.98/2.4				
					p/0.78-7.49				
^{27}P		26.99923	0.3 s	β+, p/11.63	p/0.73, 0.61/0.07	1/2+			
^{28}P		27.992315	270. ms	β+ /14.332	3.94/13.	3+			ann.rad./
					5.25/13.				1.779(2)/98.
					6.96/16.				2.839(2)/2.8
					8.8/7.				3.040(2)/3.2
					11.49/52.				4.498(2)/12.
									7.537(2)/9.
^{29}P		28.981801	4.14 s	β+ /4.9431	3.945/98.	1/2+	1.2349		ann.rad./
									1.273/1.32
									2.426/0.39
^{30}P		29.9783138	2.50 m	β+ /4.2323	3.245/99.9	1+			ann.rad./
									2.230(3)/0.07
^{31}P	100.	30.9737616				1/2+	+1.13160		
^{32}P		31.9739073	14.28 d	β- /1.7106	1.710/100.	1+	-0.2524		
^{33}P		32.971726	25.3 d	β- /0.249	0.249/100.	1/2+			
^{34}P		33.973636	12.4 s	β- /5.374	3.2/15.	1+			1.78−4.1/
					5.1/85.				2.127(5)/15.
^{35}P		34.973314	47. s	β- /3.989	2.34/100.	1/2+			1.572(1)/100.
^{36}P		35.97826	5.7 s	β- /10.41					0.902/77.
									3.291/100.
^{37}P		36.97961	2.3 s	β- /7.90					0.6462/

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									1.5829/
^{38}P		37.9842	0.6 s	β- /12.4					1.2923/
				β-, n	/~ 12.				2.224/
^{39}P		38.9862	0.3 s	β- /10.5					
				β-, n	/26				
^{40}P		39.9913	0.15 s	β- /14.5					
				β-,n	/~ 30.				
^{41}P		40.9943	0.10 s	β-/~ 13.8					
				β-, n	/~ 30.				
^{42}P		42.0010	49. ms	β-/17.					
				β-, n	/ ~ 50.				
^{43}P		43.006	36. ms	β-/16.					
				β-, n	/100.				
^{44}P		44.013	19. ms						
^{45}P		45.019	> 0.2 μs						
^{46}P		46.027	> 0.2 μs						
$_{16}$S		**32.065(5)**							
^{26}S		26.0279	~ 10 ms			0^+			
^{27}S		27.0188	16. ms	β+, 2p/18.3	p/2.26, 7.80				
^{28}S		28.0044	0.13 s			0^+			
^{29}S		28.99661	0.188 s	β+ /13.79		5/2+			ann.rad./
				β+, p/					
^{30}S		29.984903	1.18 s	β+ /6.138	4.42/78.	0+			ann.rad./
					5.08/20.				0.678/79.
^{31}S		30.979555	2.56 s	β+ /5.396	4.39/99.	1/2+	0.48793		ann.rad./
									1.2662(5)/1.2
^{32}S	94.99(26)	31.9720710				0+			
^{33}S	0.75(2)	32.9714588				3/2+	+0.64382	-0.068	
^{34}S	4.25(24)	33.9678669				0+			
^{35}S		34.9690322	87.2 d	β- /0.1672	0.1674/100.	3/2+	+1.00	+0.047	
^{36}S	0.01(1)	35.9670808				0+			
^{37}S		36.9711256	5.05 m	β- /4.8653	1.64/94.	7/2-			0.9083(4)/0.06
					4.75/5.6				3.1033(2)/94.2
^{38}S		37.97116	2.84 h	β- /2.94	1.00/	0+			0.1962(4)/0.2
									1.9421(3)/84.
^{39}S		38.97513	11.5 s	β- /6.64					1.301/52.
									1.697/44.
^{40}S		39.9755	9. s	β- /4.7		0+			
^{41}S		40.9796	~ 2.6 s	β- /8.7					
				β-, n					
^{42}S		41.9810	~ 0.56 s	β- /7.8		0+			
				β-, n	/ < 4.				
^{43}S		42.9872	0.26 s	β-/12.					
				β-, n	/ ~ 40				
^{44}S		43.9902	0.10 s	β-/9.		0+			
				β-, n	/18.				
^{45}S		44.997	68. ms	β-/14.					
				β-, n	/54.				
^{46}S		46.001	0.05 s			0+			
^{47}S		47.009	> 0.2 μs						
^{48}S		48.014	> 0.2 μs			0+			
^{49}S		49.024	< 0.2 μs						
$_{17}$Cl		**35.453(2)**							
^{28}Cl		28.029							
^{29}Cl		29.0141	< 0.02 μs						
^{30}Cl		30.0048	< 0.03 μs						
^{31}Cl		30.99241	0.15 s	β+, p/11.98	0.986, 1.52/0.7	3/2+			ann.rad./

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^{32}Cl		31.98569	297. ms	β+ /12.69	9.47/50.	1+	1.11		ann.rad./
				β+, α	/0.05				2.2305/92
				β+, p	/0.026				(1.55−4.77)
^{33}Cl		32.9774519	2.511 s	β+ /5.583	4.51/98.	3/2+	+0.755		ann.rad./
									0.8409/0.52
									1.966/0.45
									2.866/0.44
^{34m}Cl			32.2 m	β+/	1.35/24.	3+			ann.rad./
					2.47/28.				
				I.T./					0.1457(8)/42.
									2.1276(5)/42.
^{34}Cl		33.9737628	1.528 s	β+ /5.4922	4.50/100.	0+			ann.rad./
^{35}Cl	75.76(10)	34.96885268				3/2+	+0.82187	-0.0825	
^{36}Cl		35.9683070	3.01×10^5 y	β- /0.7086	0.7093/98.	0+	+1.28547	-0.018	
				β+, EC/1.1421	0.115/0.002				ann.rad./
^{37}Cl	24.24(10)	36.96590259				3/2+	+0.68412	-0.0649	
^{38m}Cl			0.715 s	I.T./		5-			0.6714/100
^{38}Cl		37.9680104	37.2 m	β- /4.9168	1.11/31.	2-	2.05		1.64216(1)/33.3
					2.77/11.				2.16760(2)/44.8
					4.91/58.				
^{39}Cl		38.968008	55.6 m	β- /3.442	1.91/85.	3/2+			0.25026(1)/47.
					2.18/8.				1.26720(5)/54.
					3.45/7.				0.986−1.517
^{40}Cl		39.97042	1.38 m	β- /7.48		2-			0.6431(3)/6.
									1.4608(1)/77.
									2.8402(2)/17.
^{41}Cl		40.9707	34. s	β- /5.7	3.8/				(0.167−1.359)
^{42}Cl		41.9733	6.8 s	β- /9.4					
^{43}Cl		42.9741	3.3 s	β- /8.0					
^{44}Cl		43.9783	~ 0.43 s	β-/12.3					
				β-, n	/ < 8.				
^{45}Cl		44.9803	0.40 s	β-/11.					
				β-, n	/24.				
^{46}Cl		45.984	0.23 s	β-/14.9					
				β-, n	/ ~ 60				
^{47}Cl		46.989	0.10 s	β-/15.					
				β-, n	/ < 3.				
^{48}Cl		47.995	> 0.2 μs						
^{49}Cl		48.000	> 0.17 s						
^{50}Cl		50.008							
^{51}Cl		51.014	> 0.2 μs						
$_{18}$Ar		**39.948(1)**							
^{30}Ar		30.0216	< 0.02 μs			0+			
^{31}Ar		31.0121	~ 14.1 ms	β+ /18.4	p/2.08/100.	5/2+			
				β+, p	/55.				
				β+, 2p	/2.5				
				β+, 3p	/0.11				
^{32}Ar		31.997638	98. ms	β+ /11.2	p/3.35, 0.6−5.55	0+			ann.rad./
				β+, p	/43.				
^{33}Ar		32.9899257	174. ms	β+ /11.62	3.17,2.10	1/2+	-0.72		ann.rad./
				β+, p/	(1.32−5.72)				0.810(2)/48.
^{34}Ar		33.9802712	0.844 s	β+/6.061	5.0/95.	0+			ann.rad./
									0.6658(1)/2.5
									3.1290(1)/1.3
^{35}Ar		34.975258	1.77 s	β+/5.965	4.94/93.	3/2+	+0.633	-0.08	ann.rad./
									1.2185(5)/1.22
									1.763(1)/0.25

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									2.964(1)/0.2
^{36}Ar	0.3365(30)	35.96754511				0+			
^{37}Ar		36.9667763	35.0 d	EC/.813		3/2+	+1.15	+0.076	
^{38}Ar	0.0632(5)	37.9627324				0+			
^{39}Ar		38.964313	268. y	β-/0.565	0.565/100.	7/2-	-1.59	-0.12	
^{40}Ar	99.6003(30)	39.962383123				0+			
^{41}Ar		40.9645006	1.82 h	β-/2.492	1.198/	7/2-			1.29364(5)/99.
									1.6770(3)/0.05
^{42}Ar		41.96305	33. y	β-/0.60	0.60/100.	0+			
^{43}Ar		42.96564	5.4 m	β-/4.6					0.4791(2)/10.
									0.7380(1)/43.
									0.9752(1)/100.
									1.4400(3)/39.
^{44}Ar		43.964924	11.87 m	β-/3.55		0+			0.182−1.866
^{45}Ar		44.968040	21.5 s	β-/6.9		7/2-			0.0610/25.
									1.020/35.
									3.707/34.
^{46}Ar		45.96809	8.4 s	β-/5.70		0+			1.944/
^{47}Ar		46.9722	1.23 s	β-					0.36/100
									1.66/53
									1.74/41
									(2.02 - 4.01)
^{48}Ar		47.9745	0.48 s			0+			
^{49}Ar		48.981	0.17 s	β- ,n	n// ~ 65.				
^{50}Ar		49.984	~ 0.085 s	β- ,n	n// ~ 35.	0+			
^{51}Ar		50.992	> 0.2 μs	β-					
^{52}Ar		51.997	10 ms	β-		0+			
^{53}Ar		53.005		β-					
$_{19}$K		**39.0983(1)**							
^{32}K		32.022							
^{33}K		33.0073	< 0.025 μs						
^{34}K		33.9984	< 0.04 μs						
^{35}K		34.98801	0.19 s	β+ /11.88		3/2+			ann.rad./
				β+, p/	/0.37				1.751/14.
									2.5698/26.
									2.9827/51.
^{36}K		35.98129	0.342 s	β+ /12.81	5.3/42.	2+	+0.548		ann.rad./
					9.9/44.				1.97044(5)/82.
				β+, p	/0.048				2.20783(5)/30.
									2.43343(2)/32.
^{37}K		36.9733759	1.23 s	β+ /6.149	5.13/	3/2+	+0.2032		ann.rad./
									2.7944(8)/2.
									3.602(2)/0.05
^{38m}K			0.924 s	β+ /6.742	5.02/100.	0+			ann.rad./
^{38}K		37.9690812	7.63 m	β+ /5.913	2.60/99.8	3+	+1.37		ann.rad./
									2.1675(3)/99.8
									3.9356(5)/0.2
^{39}K	93.2581(44)	38.9637067				3/2+	+0.39146	+0.049	
^{40}K	0.0117(1)	39.9639985	1.248×10^9 y	β- /1.3111	1.312/89.	4-	-1.29810	-0.061	ann.rad./
				β+, EC/1.505	1.50/10.7				1.4608/10.5
^{41}K	6.7302(44)	40.9618258				3/2+	+0.21487	+0.060	
^{42}K		41.9624028	12.36 h	β- /3.525	1.97/19.	2-	-1.1425		0.31260(2)/0.3
					3.523/81.				1.5246(3)/18.1
^{43}K		42.96072	22.3 h	β- /1.82	0.465/8.	3/2+	+0.163		0.2211(2)/4.
					0.825/87.				0.3729(2)/88.
					1.24/3.5				0.3971(2)/11.
					1.814/1.3				0.6178(2)/81.
^{44}K		43.96156	22.1 m	β- /5.66	5.66/34.	2-	-0.856		0.36821/2.2

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									1.15700(1)/58.
									2.15079(2)/22.
^{45}K		44.96070	17.8 m	β- /4.20	1.1/23.	3/2+	+0.173		0.1743(5)/80.
					2.1/69.				1.2607(8)/7.
					4.0/8.				1.7056(6)/69.
									2.3542(5)/14.
^{46}K		45.96198	1.8 m	β- /7.72	6.3/	2-	-1.05		1.347(1)/91.
									3.700(5)/28.
^{47}K		46.96168	17.5 s	β- /6.64	4.1/99.	½+	+1.93		0.56474(3)/15.
					6.0/1.				0.58575(3)/85.
									2.0131/100
^{48}K		47.96551	6.8 s	β- /12.09	5.0/	(2-)			0.67122(1)/4.
									0.6723(5)/20.
									0.78016(1)/32.
									3.83153(7)/80.
^{49}K		48.9675	1.26 s	β- /11.0					2.025/
									2.252/
^{50}K		49.9728	0.472 s	β- /14.2					
^{51}K		50.976	0.365 s	β- /					
^{52}K		51.983	0.105 s	β-					
^{53}K		52.987	30. ms	β-		3/2+			
^{54}K		53.994	10. ms	β-					
$_{20}$Ca		**40.078(4)**							
^{34}Ca		34.0141	< 0.035 μs			0+			
^{35}Ca		35.0049	25.7 ms	β+, p/15.6	p/1.43/49				
					1.9−8.8				
^{36}Ca		35.99309	0.10 s	β+, (p)/10.99	2.52	0+			ann.rad./
				β+, n/					
^{37}Ca		36.98587	0.18 s	β+ /11.64	3.103	3/2+			ann.rad./
				β+, n/					1.369
^{38}Ca		37.976318	0.44 s	β+ /6.74		0+			ann.rad./
									1.5677(5)/25.
									3.210(2)/1.
^{39}Ca		38.970720	0.861 s	β+ /6.531	5.49/100.	3/2+	1.02168		ann.rad./
^{40}Ca	96.941(156)	39.9625910				0+			
^{41}Ca		40.9622781	1.02×10^5 y	EC/0.4214		7/2-	-1.5948	-0.090	
^{42}Ca	0.647(23)	41.9586180				0+			
^{43}Ca	0.135(10)	42.9587666				7/2-	-1.3173	-0.055	
^{44}Ca	2.086(110)	43.9554818				0+			
^{45}Ca		44.9561866	162.7 d	β- /0.257	0.257/100.	7/2-	-1.327	+0.05	
^{46}Ca	0.004(3)	45.953693	$> 0.4 \times 10^{16}$ y	β-β-		0+			
^{47}Ca		46.954546	4.536 d	β-/1.992	0.684/84.	7/2-	-1.38	+0.02	1.297/75
					1.98/16.				(0.041−1.88)
^{48}Ca	0.187(21)	47.952534	4.3×10^{19} y	β-β-		0+			
			$> 7.1 \times 10^{19}$ y	β-					
^{49}Ca		48.955674	8.72 m	β- /5.262	0.89/7.	3/2-			3.0844(1)/90.7
					1.95/92.				4.0719(1)/8.12
									(0.143 - 4.738)
^{50}Ca		49.95752	14. s	β- /4.97	3.12/	0+			0.2569/98.
									(0.0715−1.59)
^{51}Ca		50.9615	10. s	β- /7.3		(3/2-)			
^{52}Ca		51.965	4.6 s	β- /8.0		0+			
^{53}Ca		52.9701	0.09 s	β- /10.9					
^{54}Ca		53.974	> 0.3 μs			0+			
^{55}Ca		54.981	> 0.3 μs						
^{56}Ca		55.986	> 0.3 μs			0+			
$_{21}$Sc		**44.955912(6)**							

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^{36}Sc		36.0149	0.102 s						
^{37}Sc		37.0031	0.181 s						
^{38}Sc		37.9947	< 0.3 μs						
^{39}Sc		38.98479	< 0.3 μs	p					
^{40}Sc		39.977967	0.182 s	β+ /14.320	5.73/50.	4-			ann.rad./
					7.53/15.				0.752/41.
					8.76/15.				3.732/99.5
					9.58/20.				(1.12−3.92)
^{41}Sc		40.9692511	0.596 s	β+ /6.4953	5.61/100.	7/2-	+5.431	-0.156	ann.rad./
^{42m}Sc			61.6 s	β+ /	2.82/	7+			ann.rad./
									0.4375(5)/100.
									1.2270(5)/100.
									1.5245(5)/100.
^{42}Sc		41.9655164	0.682 s	β+ /6.4259	5.32/100.	0+			ann.rad./
^{43}Sc		42.961151	3.89 h	β+, EC/2.221	0.82/22.	7/2-	+4.62	-0.26	ann.rad./
					1.22/78.				0.3729(1)/22.
^{44m}Sc			58.2 h	I.T./0.27		6+	+3.88		0.27124(1)/87.
				EC/3.926					(1.00−1.16)
^{44}Sc		43.959403	3.93 h	β+, EC/3.653	1.47/	2+	+2.56	+0.10	ann.rad./
									1.157/100
^{45}Sc	100.	44.955912				7/2-	+4.75649	-0.220	
^{46m}Sc			18.7 s	I.T./0.14253		1-			0.14253(2)/62.
^{46}Sc		45.955172	83.81 d	β- /2.367	0.357/100.	4+	+3.03	+0.12	0.8893/100
									1.121/100
^{47}Sc		46.952408	3.349 d	β- /0.600	0.439/69.	7/2-	+5.34	-0.22	0.15938(1)/68.
					0.601/31.				
^{48}Sc		47.95223	43.7 h	β- /3.99	0.655/	6+			0.9835/100
									1.03750(1)/97.
									1.3121/100
^{49}Sc		48.950024	57.3 m	β- /2.006	2.00/99.9.	7/2-			1.7619(3)/0.05
^{50}Sc		49.95219	1.71 m	β- /6.89	3.05/76.	(5+)			0.5235(1)/88.
					3.60/24.				1.1210(1)/100.
									1.5537(2)/100.
^{51}Sc		50.95360	12.4 s	β- /6.51	4.4/	7/2-			1.4373(4)/52.
					5.0/				0.718−2.144
^{52}Sc		51.9567	8.2 s	β- /9.0		(3+)			
^{53}Sc		52.9596	> 3. ms	β- /8.1					
^{54m}Sc			~ 7 μs	I.T.		(5+)			0.110/IT
^{54}Sc		53.9633	0.27 s	β- /11.6					0.100/50
									1.70/40
									0.50/40
^{55}Sc		54.968	0.103 s	β- /13					0.593(1)/40
^{56m}Sc			0.06 s						1.161/21
									0.690/19
^{56}Sc		55.973	35. ms	β-		(1+)			1.129/48
^{57}Sc		56.978	13. ms	β-					
^{58}Sc		57.984	12. ms	β-					
$_{22}$Ti		**47.867(1)**							
^{38}Ti		38.0098	< 0.12 μs			0+			
^{39}Ti		39.0016	30. ms	β+ /15.4					
^{40}Ti		39.9905	54. ms	β+ /11.7	p/2.16/29	0+			
				β+, p	3.73/23				
					1.70/22				
					0.242−5.74				
^{41}Ti		40.9832	80. ms	β+, p/12.93	p/4.73/107	3/2+			ann.rad./
					3.10/67				
					3.75/39				
					0.744−6.73				

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^{42}Ti		41.97303	0.20 s	β+ /7.000	6.0/	0+			ann.rad./
									0.6107(5)/56.
^{43}Ti		42.96852	0.50 s	β+ /6.87	5.80/	7/2-	0.85		ann.rad./
^{44}Ti		43.959690	60. y	EC/0.268		0+			0.06787/91
									0.07832/97
^{45}Ti		44.958126	3.078 h	β+/86/2.062	1.04	7/2-	0.095	0.015	ann.rad./
				EC/14/					(0.36−1.66)
^{46}Ti	8.25(3)	45.952632				0+			
^{47}Ti	7.44(2)	46.951763				5/2-	-0.78848	+0.30	
^{48}Ti	73.72(3)	47.947946				0+			
^{49}Ti	5.41(2)	48.947870				7/2-	-1.10417	+0.24	
^{50}Ti	5.18(2)	49.944791				0+			
^{51}Ti		50.946615	5.76 m	β- /2.471	1.50/92.	3/2-			0.3197(2)/93.
					2.13/				0.6094−0.9291
^{52}Ti		51.94690	1.7 m	β- /1.97	1.8/100.	0+			0.0170(5)/100.
									0.1245/100
^{53}Ti		52.9497	33. s	β- /5.0	(2.2−3)/	3/2-			0.1008(1)/20.
									0.1276(1)/45.
									0.2284(1)/39.
									1.6755(5)/45.
									(1.72−2.8)/
^{54}Ti		53.9511	1.5 s	β- /4.3		0+			
^{55}Ti		54.9553	1.3 s	β- /7.4					0.672/44
									(0.32 - 1.83)
^{56}Ti		55.9582	0.20 s	β- /7.0		0+			
^{57}Ti		56.9640	98. ms	β- /11.					
^{58}Ti		57.967	53. ms	β-		0+			0.114
^{59}Ti		58.973	30. ms	β-					
^{60}Ti		59.978	22. ms	β-		0+			
^{61}Ti		60.983	> 0.3 μs						
$_{23}$V		**50.9415(1)**							
^{40}V		40.0111							
^{41}V		40.9998							
^{42}V		41.9912	< 0.055 μs						
^{43}V		42.9807	> 0.8 s	β+ /11.3					
^{44}V		43.9741	0.09 s	β+, α/13.7					ann.rad./
^{45}V		44.96578	0.54 s	β+ /7.13		7/2-			
^{46}V		45.960201	0.4223 s	β+ /7.051	6.03/100.	0+			ann.rad./
^{47}V		46.954909	32.6 m	β+, EC/2.928	1.90/99.+	3/2-			ann.rad./
									1.7949(8)/0.19
									(0.2−2.16)
^{48}V		47.952254	15.98 d	β+ /4.012	0.698/50.	4+	2.01		ann.rad./
									0.9835/100
									(1.3−2.4)
^{49}V		48.948516	337. d	EC/0.602		7/2-	4.47		
^{50}V	0.250(4)	49.947159	1.4×10^{17} y	EC	/82.7	6+	+3.34569	+0.21	
				β-	/17.3				
^{51}V	99.750(4)	50.943960				7/2-	+5.148706	-0.04	
^{52}V		51.944776	3.76 m	β- /3.976	2.47/	3+			1.4341(1)/100.
^{53}V		52.944338	1.56 m	β- /3.436	2.52/	7/2-			1.0060(5)/90.
									1.2891(3)/10.
^{54m}V			0.9 μs	I.T.		(5+)			0.108/IT
^{54}V		53.94644	49.8 s	β- /7.04	1.00/5.	3+			0.8348/97.
					2.00/12.				0.9887/80.
					2.95/45.				2.259/46.
					5.20/11.				(0.56−3.38)
^{55}V		54.9472	6.5 s	β- /6.0	6.0/	(7/2-)			0.5177/73.
									(0.224−1.21)

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^{56}V		55.9505	0.22 s	β- /9.1					1.01/30.
									0.688/26.
									(0.82 − 1.32)
^{57}V		56.9526	0.35 s	β- /8.1					0.268/52.
									0.692/20.
									(0.25 − 1.31)
^{58}V		57.9567	0.19 s	β- /11.6					0.880/62
									1.056/28
									2.217/13
									(1.04 − 1.57)
^{59}V		58.9602	97. ms	β- /9.9					0.90/80.
^{60m}V			0.12 s						
^{60}V		59.9650	0.07 s	β- /14.					0.102−0.208
^{61}V		60.9685	47. ms						(0.071-1.144)
^{62}V		61.9738	34. ms						
^{63}V		62.978	17. ms						
^{64}V		63.983	> 0.3 μs						
$_{24}$Cr		**51.9961(6)**							
^{42}Cr		42.0064	13. ms	β+, p	p/1.90/29	0+			
					p/1.50−3.7				
^{43}Cr		42.9977	21. ms	β+, p	p/3.83/18				
					p/4.29/15				
					p/1.01−4.59				
^{44}Cr		43.98555	53. ms	β+, (p)/10.3	p/0.95−3.1	0+			
^{45}Cr		44.9796	0.05 s	β+, p/12.5		7/2-			ann.rad./
^{46}Cr		45.96836	0.3 s	β+ /7.60		0+			ann.rad./
^{47}Cr		46.96290	0.51 s	β^+ /7.45		3/2-			ann.rad./
^{48}Cr		47.95403	21.6 h	EC/1.66		0+			ann.rad./
									0.116(2)/95.
									0.305(10)/100.
^{49}Cr		48.951336	42.3 m	β+, EC/2.631	1.39/	5/2-	0.476		ann.rad./
					1.45/				0.09064(1)/51.
					1.54/				0.15293(1)/27.
									(0.062-1.6)
^{50}Cr	4.345(13)	49.946044	> 1.3×10^{18} y	β+EC		0+			
^{51}Cr		50.944767	27.70 d	EC/0.7527		7/2-	-0.934		0.3201/10.2
^{52}Cr	83.789(18)	51.940508				0+			
^{53}Cr	9.501(17)	52.940649				3/2-	-0.47454	-0.15	
^{54}Cr	2.365(7)	53.938880				0+			
^{55}Cr		54.940840	3.497 m	β- /2.603	2.5/	3/2-			1.5282(2)/0.04
									(0.13−2.37)
^{56}Cr		55.940653	5.9 m	β- /1.62	1.50/100.	0+			0.026(2)/100.
									0.083(3)/100.
^{57}Cr		56.943613	21. s	β- /5.1	3.3/	3/2-	0.0834		0.850/8.
					3.5/				(0.083-2.62)
^{58}Cr		57.9444	7.0 s	β- /4.0		0+			(0.131−0.683)
^{59m}Cr			0.10 ms	I.T.		(9/2+)			0.208/IT
									0.193
									0.102
^{59}Cr		58.9486	1.0 s	β- /7.7					1.236
^{60}Cr		59.9500	0.6 s	β- /6.0		0+			
^{61}Cr		60.9547	0.26 s	β- /8.8					0.354−1.860
^{62}Cr		61.9566	0.19 s	β- /7.3		0+			(0.156-1.215)
^{63}Cr		62.9619	0.129 s	β-					(0.250-3.454)
^{64}Cr		63.9644	0.043 s	β-		0+			0.188
^{65}Cr		64.9702	0.027 s	β-					0.272, 1.368
^{66}Cr		65.973	0.01 s	β-		0+			
^{67}Cr		66.980	> 0.3 μs						

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$_{25}$Mn		**54.938045(5)**							
^{44}Mn		44.0069	< 0.105 μs						
^{45}Mn		44.9945	< 0.07 μs						
^{46}Mn		45.9867	34. ms	β+ /17.1					
				β+, p	// ~ 58				
^{47}Mn		46.9761	~ 0.1 s	β+ /12.3					
^{48}Mn		47.9685	0.15 s	β+ /13.5	5.79/58.	4+			
					4.43/10.				
^{49}Mn		48.95962	0.38 s	β+ /7.72	6.69/	5/2-			ann.rad./
^{50m}Mn			1.74 m	β+ /7.887	3.54/	5+			ann.rad./
									1.0980/94.
									0.783/91.
									(0.66−3.11)
^{50}Mn		49.954238	0.283 s	β+ /7.6330	6.61/	0+			ann.rad./
^{51}Mn		50.948211	46.2 m	β+, EC/3.208	2.2/	5/2-	3.568	0.4	ann.rad./
									0.7491(1)/0.26
									(1.148−1.164)
^{52m}Mn			21.1 m	β+ /98/5.09	2.631/	2+	0.0076		ann.rad./
				I.T./2/0.378					0.3778 (I.T.)
									1.43406(1)/98.
									(0.7−4.8)
^{52}Mn		51.945566	5.591 d	β+ /4.712	0.575/	6+	+3.063	+0.5	ann.rad./
				EC/					0.74421(1)/90.
									1.4341/100
^{53}Mn		52.941290	3.7×10^6 y	EC/0.5970		7/2-	5.024		
^{54}Mn		53.940359	312.1 d	EC/1.377		3+	+3.282	+0.33	0.8340/100
			6.7×10^8 y	β+	$//1.3 \times 10^{-7}$				
^{55}Mn	100.	54.938045				5/2-	+3.4687	+0.32	
^{56}Mn		55.938905	2.579 h	β- /3.6954	0.718/18.	3+	+3.2266		0.84675/98.9
					1.028/34.				1.81072(4)/26.3
									2.113/13.8
									(1.04 − 3.37)
^{57}Mn		56.938285	1.45 m	β- /2.691		5/2-			
^{58}Mn		57.93998	65 s	β- /6.25	3.8/	3+			0.45916(2)/20.
					5.1/				0.81076(1)/82.
									1.32309(5)/53.
^{59}Mn		58.94044	4.6 s	β- /5.19	4.5/	5/2-			0.726/
									0.473/
									0.287−2.35
^{60m}Mn			1.77 s	β- /IT	5.7/	3+			0.824/
^{60}Mn		59.9429	50. s	β- /8.6		0+			1.969/
^{61}Mn		60.9447	0.67 s	β- /7.4		(5/2)-			
^{62}Mn		61.9484	0.67 s	β- /10.4		(3+)			0.877/
									0.942−1.299
^{63}Mn		62.9502	0.28 s	β- /8.8					0.356,0.450
^{64m}Mn			> 0.1 ms						0.135/IT
^{64}Mn		63.9543	87 ms	β- /11.8					0.746
^{65}Mn		64.9563	0.092 s	β- /10.					0.366
^{66}Mn		65.9611	64 ms						0.471
^{67}Mn		66.9641	45 ms						
^{68}Mn		67.969	~ 28 ms						
^{69}Mn		68.973	14 ms						
$_{26}$Fe		**55.845(2)**							
^{45}Fe		45.0146	1.8 ms	2p /1.14	p// ~ 59.				
^{46}Fe		46.0008	11. ms	β+ /13.1	p// ~ 36.	0+			
^{47}Fe		46.9929	21.7 ms	β+ /15.6	p//87.				

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^{48}Fe		47.9805	~ 44. ms	β+ /11.2		0+			
^{49}Fe		48.9736	70. ms	β+ /13.0		(7/2-)			ann.rad./
^{50}Fe		49.9630	0.15 s	β+ /8.2		0+			0.651
^{51}Fe		50.95682	0.31 s	β+ /8.02		(5/2-)			ann.rad./
^{52m}Fe			46. s	β+ /4.4		(12+)			ann.rad./
									(0.622−2.286)/
^{52}Fe		51.94811	8.28 h	β+ /57/2.37	0.804/	0+			ann.rad./
				EC/43/					0.16868(1)/99.
				I.T./					0.377 (I.T.)/
^{53m}Fe			2.6 m	I.T./3.0407		19/2-			0.7011(1)/99.
									1.0115(1)/87.
									1.3281(1)/87.
									2.3396(1)/13.
^{53}Fe		52.945308	8.51 m	β+ /3.743	2.40/42.	7/2-			ann.rad./
					2.80/57.				0.3779(1)/42.
									(1.2−3.2)
^{54}Fe	5.845(35)	53.939611	> 3.1 × 10^{22} y	EC-EC		0+			
^{55}Fe		54.938293	2.73 y	EC/0.2314		3/2-			Mn x-ray
^{56}Fe	91.754(36)	55.934938				0+			
^{57}Fe	2.119(10)	56.935394				½-	+0.0906	0.16	
^{58}Fe	0.282(4)	57.933276				0+			
^{59}Fe		58.934876	44.51 d	β-/1.565	0.273/48.	3/2-	-0.336		1.099/57
					0.475/51.				1.292/43.
									(0.14−1.48)
^{60}Fe		59.934072	1.5 × 10^{6} y	β- /0.237	0.184/100.	0+			0.0586/100
^{61m}Fe			0.25 μs	I.T.		(9/2+)			0.654/IT
									0.207
^{61}Fe		60.93675	6.0 m	β- /3.98	2.5/13.				1.205/44.
					2.63/54.				1.028/43.
					2.80/31.				(0.12−3.37)
^{62}Fe		61.93677	68. s	β- /2.53	2.5/100.	0+			0.5061(1)/100.
^{63}Fe		62.9404	6. s	β- /6.3		5/2-			0.995/
									(1.365−1.427)
^{64}Fe		63.9412	2.0 s	β- /4.9		0+			
^{65m}Fe			0.4 μs	I.T.		(5/2-)			0.364/IT
^{65}Fe		64.9454	1.3 s	β- /7.9					
^{66}Fe		65.9468	0.44 s	β- /5.7		0+			0.471−1.425
^{67m}Fe			~ 0.04 ms	I.T.		(5/2-)			0.367/IT
^{67}Fe		66.9510	0.48 s	β- /8.8					0.189
^{68}Fe		67.954	0.19 s	β- / ~ 7.6		0+			
^{69}Fe		68.959	0.11 s						
^{70}Fe		69.961	0.10 s			0+			
^{71}Fe		70.967	> 0.3 μs						
^{72}Fe		71.970	> 0.3 μs			0+			
$_{27}$Co		**58.933195(5)**							
^{47}Co		47.0115							
^{48}Co		48.0018							
^{49}Co		48.9897	< 0.035 μs						
^{50}Co		49.9815	44. ms	β+ /17.0	2.03−2.79				
^{51}Co		50.9707	> 0.2 μs	β+ /12.8					
^{52}Co		51.9636	0.12 s	β+ /14.0					0.849−1.942
^{53m}Co			0.25 s	β+, p/		19/2-			ann.rad./
^{53}Co		52.95422	0.24 s	β+ /8.30		7/2-			ann.rad./
^{54m}Co			1.46 m	β+ /8.44	4.25/100.	7+			ann.rad./
									0.411(1)/99.
									1.130(1)/100.
									1.408(1)/100.
^{54}Co		53.948460	0.1932 s	β+ /8.2430	7.34/100.	0+			ann.rad./

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^{55}Co		54.941999	17.53 h	β+ /3.4513	0.53/	7/2-	+4.822		ann.rad./
				EC/	1.03/				0.9312/75.
					1.50/				0.4772/20.
									(0.092−3.11)
^{56}Co		55.939839	77.3 d	β+/4.566	1.459/18.	4+	3.85	+0.25	ann.rad./
				EC/					0.8468/99.9
									1.2383/68.
									(0.26−3.61)
^{57}Co		56.936291	271.8 d	EC/0.8361		7/2-	+4.72	+0.5	0.12206/86
									(0.014−0.706)
^{58m}Co			9.1 h	I.T./		5+			0.02489/0.035
^{58}Co		57.935753	70.88 d	β+ /2.307		2+	+4.04	+0.22	ann.rad./
				EC/					0.81076/99
^{59}Co	100.	58.933195				7/2-	+4.63	+0.41	
^{60m}Co			10.47 m	I.T./99.8/0.059		2+	+4.40	+0.3	0.0586/2.0
				β- /0.2/1.56					
^{60}Co		59.933817	5.271 y	β- /2.824	0.315/99.7	5+	+3.799	+0.44	1.1732/100
									1.3325/100
^{61}Co		60.932476	1.650 h	β- /1.322	1.22/95.	7/2-			0.0674/86.
									0.842−0.909
^{62m}Co			13.9 m	β- /	0.88/25.	5+			1.1635(3)/70.
					2.88/75.				1.1730(3)/98.
									2.0039(3)/19.
^{62}Co		61.93405	1.50 m	β- /5.32	1.03/10.	2+			1.1292(3)/13.
					1.76/5.				1.1730(3)/83.
					2.9/20.				1.9851(1)/3.
					4.05/60.				2.3020(1)/19.
^{63}Co		62.93361	27.5 s	β- /3.67	3.6/	7/2-			0.08713(1)/49.
									0.9817(3)/2.6
									0.156−2.17
^{64}Co		63.93581	0.30 s	β- /7.31	7.0/	1+			
^{65}Co		64.93648	1.14 s	β- /5.96		(7/2)-			
^{66m2}Co			> 0.1 ms	I.T.		(8-)			0.252/IT
									0.214
									0.175
^{66m1}Co			1.2 μs	I.T.		(5+)			0.175/IT
^{66}Co		65.9398	0.25 s	β- /10.0					(1.245−1.425)
^{67}Co		66.9409	0.43 s	β- /8.4					0.694
^{68}Co		67.9449	0.19 s	β- /11.7					
^{69}Co		68.9463	0.20 s	β- /9.3					
^{70}Co		69.951	0.12 s	β- 13.					1.26/102
									0.97/100
									(0.45 − 0.92)
^{71}Co		70.953	97. ms	β-					0.566/100
				β-,n	// > 3				(0.25 − 0.77)
^{72}Co		71.958	60. ms	β-					1.096/100
				β-,n	// > 6				0.845
									(0.455 − 1.197)
^{73}Co		72.960	41. ms	β-					0.524/100
				β-,n	// > 9				(0.24 − 0.76)
^{74}Co		73.965	30. ms	β-					0.739
				β-,n	// > 26				1.024
^{75}Co		74.968	> 0.3 μs						
$_{28}$Ni		**58.6934(2)**							
^{48}Ni		48.020	~ 2.1 ms	2p	p// ~ 25	0+			
^{49}Ni		49.0097	12. ms						
^{50}Ni		49.9959	12. ms	β+, p	p//70.	0+			
^{51}Ni		50.9877	> 0.2 μs	β+ /16.0					

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^{52}Ni		51.9757	38. ms	β+ /11.7		0+			
^{53}Ni		52.9685	0.05 s	β+, p/13.3		7/2-			ann.rad./
^{54}Ni		53.95791	0.10 s	β+ /8.80		0+			0.937
^{55}Ni		54.95133	0.20 s	β+ /8.70	7.66/	7/2-			ann.rad./
^{56}Ni		55.94213	6.08 d	EC/2.14		0+			0.15838/99
				β+ /<10^{-6}					0.81185(3)/87.
									0.2695−0.7500
^{57}Ni		56.939794	35.6 h	β+ /3.264	0.712/10.	3/2-	-0.798		ann.rad./
				EC/	0.849/76.				1.3776/78.
									(0.127−3.177)
^{58}Ni	68.0769(89)	57.935343	>4 × 10^{19} y	EC-EC		0+			
^{59}Ni		58.934347	~ 7.6 × 10^{4} y	EC/		3/2-			
^{60}Ni	26.2231(77)	59.930786				0+			
^{61}Ni	1.1399(6)	60.931056				3/2-	-0.75002	+0.16	
^{62}Ni	3.6345(17)	61.928345				0+			
^{63}Ni		62.929669	100. y	β- /0.066945	0.065/	½-			
^{64}Ni	0.9256(9)	63.927966				0+			
^{65}Ni		64.930084	2.517 h	β- /2.137	0.65/30.	5/2-	0.69		0.36627(3)/5.
					1.020/11.				1.11553(4)/16.
					2.140/58.				1.48184(5)/23.
^{66}Ni		65.929139	54.6 h	β- /0.23		0+			
^{67m}Ni			13.3 μs	I.T.		9/2+			0.313/IT
									0.694
^{67}Ni		66.931569	21. s	β- /3.56	3.8/	½-	+0.601		1.0722/100.
									1.6539/100.
									(0.10−1.98)
^{68m2}Ni			0.34 μs						0.511
^{68m1}Ni			0.86 ms	I.T.		(5-)			0.814/IT
									2.033
^{68}Ni		67.931869	29. s	β- /2.06		0+			
^{69m2}Ni			0.44 μs	I.T.		(17/2)			0.148/IT
									0.593
									1.959
^{69m1}Ni			3.5 s						
^{69}Ni		68.935610	11. s	β- /5.4					0.6807(3)/100.
									(0.207−1.213)
^{70m}Ni			0.21 μs	I.T.		(8+)			0.183/IT
									0.448
									0.970
									1.259
^{70}Ni		69.9365	6.0 s	β- /3.5		0+			
^{71}Ni		70.9407	2.56 s	β- /6.9					
^{72}Ni		71.9421	1.6 s	β- /5.2		0+			
^{73}Ni		72.9465	0.84 s	β- /9.					
^{74}Ni		73.9481	0.9 s	β- /7.		0+			
^{75}Ni		74.9529	0.34 s						
^{76}Ni		75.955	0.24 s			0+			
^{77}Ni		76.961	0.13 s						
^{78}Ni		77.963	~ 0.11 s			0+			
$_{29}$Cu		**63.546(3)**							
^{52}Cu		51.9972							
^{53}Cu		52.9856	< 0.3 μs						
^{54}Cu		53.9767	< 0.075 μs						
^{55}Cu		54.9661	> 0.2 μs	β+ /13.2					
^{56}Cu		55.9586	93. ms	β+ /15.3					0.511/233
									2.700/100
									0.9507−3.287
^{57}Cu		56.94921	196. ms	β+ /8.77		3/2-			0.77−3.01

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^{58}Cu		57.944539	3.21 s	β+ /8.563	4.5/15.	1+			ann.rad./
				EC/	7.439/83.				0.0403(4)/5.
									1.4483(2)/11.
									1.4546(2)/16.
^{59}Cu		58.939498	1.36 m	β+ /4.800	1.9/	3/2-	+ 1.89		ann.rad./
					3.75/				0.3393(1)/8.
									0.8780(1)/12.
									1.3015(1)/15.
									(0.4−2.6)
^{60}Cu		59.937365	23.7 m	β+ /6.127	2.00/69.	2+	+1.219		ann.rad./
				EC/	3.00/18.				1.3325/88.
					3.92/6.				1.7915/45.
									(0.12−5.048)
^{61}Cu		60.933458	3.35 h	β+ /2.237	0.56/3.	3/2-	+2.14		ann.rad./
					0.94/5.				0.2830/13.
					1.15/2.				0.6560/11.
					1.220/51.				(0.067−2.123)
^{62}Cu		61.932584	9.67 m	β+ /98/3.948	2.93/98.	1+	-0.380		ann.rad./
				EC/					1.17302(1)/0.6
									(0.87−3.37)
^{63}Cu	69.15(15)	62.929598				3/2-	+2.2233	-0.211	
^{64}Cu		63.929764	12.701 h	β- /38/0.579	0.578/	1+	-0.217		ann.rad./
				β+ /19/1.6751	0.65/				1.3459(3)/0.6
				EC/41/					
^{65}Cu	30.85(15)	64.927790				3/2-	+2.3817	-0.195	
^{66}Cu		65.928869	5.09 m	β- /2.642	1.65/6.	1+	-0.282		0.8330(1)/0.22
					2.7/94.				1.0392(2)/9.2
^{67}Cu		66.927730	2.580 d	β- /0.58	0.395/56.	3/2-	+ 2.54		0.09125(1)/7.
					0.484/23.				0.09325(1)/17.
					0.577/20.				0.18453(1)/47.
^{68m}Cu			3.79 m	I.T./86/		6-	+1.24		0.0843(5)/70.
				β- /14/1.8					0.1112(5)/18.
									0.5259(5)/74.
									(0.64−1.34)
^{68}Cu		67.929611	31. s	β- /4.46	3.5/40.	1+	+2.48		1.0774(5)/58.
					4.6/31.				1.2613(5)/17.
									(0.15−2.34)
^{69m}Cu			0.36 μs	I.T.		(13/2+)			0.075/IT
									0.190/IT
									0.680
									1.871
^{69}Cu		68.929429	2.8 m	β- /2.68	2.48/80.	3/2-	+2.84		0.5307(3)/3.
									0.8340(5)/6.
									1.0065(8)/10.
^{70m2}Cu			6.6 s	β/93					0.8849/100
									1.072/19
				IT/7					0.141/ IT
^{70m1}Cu			33. s	β- /52	2.52/10.	5-	+1.9		0.8848(2)/100.
				IT/48					0.9017(2)/90.
									1.2517(5)/60.
									(0.39−3.06)
^{70}Cu		69.932392	44.5 s	β- /6.60	5.42/54.	1+	+1.5		0.8848(2)/100.
					6.09/46.				0.9017/99.7
									(0.438 - 3.062)
^{71m}Cu			0.28 μs	I.T.		(19/2)			0.133/IT
									0.494
									0.939
									1.189
^{71}Cu		70.932677	20. s	β- /4.56		3/2-			0.490/
^{72m}Cu			1.76 μs	I.T.		(4-)			0.051/IT

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									0.082
									0.138
^{72}Cu		71.935820	6.6 s	β- /8.2		(1+)			0.652/
^{73}Cu		72.936675	4.2 s	β- /6.3	5.8/43				0.450/100
					6.25/42				0.307−1.559
^{74}Cu		73.93988	1.59 s	β- /9.9					
^{75}Cu		74.942	1.2 s	β- /7.9					
^{76m}Cu			1.2 s						
^{76}Cu		75.94528	0.64 s	β- /11.					
^{77}Cu		76.9479	0.46 s	β- / ~ 10.					
^{78}Cu		77.9520	0.33 s	β- /12.					
^{79}Cu		78.9546	0.19 s	β- /11.					
^{80}Cu		79.961	> 0.3 μs						
$_{30}$Zn		**69.409(4)**							
^{54}Zn		53.9930	~ 3.2 ms	2p	p//87	0+			
^{55}Zn		54.9840	> 1.6 μs						
^{56}Zn		55.9724	0.04 s			0+			
^{57}Zn		56.9648	0.04 s	β+, p/14.6		(7/2-)			ann.rad./
^{58}Zn		57.95459	0.09 s	β+		0+			
^{59}Zn		58.94926	183. ms	β+, p/9.09	8.1/	3/2-			ann.rad./
									(0.491−0.914)
^{60}Zn		59.94183	2.40 m	β+ /97/4.16		0+			ann.rad./
				EC/3/					0.669/47.
									(0.062−0.947)
^{61}Zn		60.93951	1.485 m	β+ /5.64	4.38/68.	3/2-			ann.rad./
									0.4748/17.
									(0.15−3.52)
^{62}Zn		61.93433	9.22 h	β+ /3/1.63	0.66/7.	0+			ann.rad./
				EC/93/					0.0408/25
									0.5967/26.
									(0.20−1.526)/
^{63}Zn		62.933212	38.5 m	β+ /93/3.367	1.02/	3/2-	-0.28164	+0.29	ann.rad./
				EC/7/	1.40/				0.66962(5)/8.4
					1.71/				0.96206(5)/6.6
					2.36/84.				(0.24−3.1)
^{64}Zn	48.268(321)	63.929142	> 4.3×10^{18} y	EC-β+		0+			
^{65}Zn		64.929241	244.0 d	β+ /98/1.3514	0.325/	5/2-	+0.7690	-0.023	ann.rad./
				EC/1.5/					1.1155/49.8
^{66}Zn	27.975(77)	65.926033				0+			
^{67}Zn	4.102(21)	66.927127				5/2-	+0.8755	+0.15	
^{68}Zn	19.024(123)	67.924844				0+			
^{69m}Zn			13.76 h	I.T./99+/0.439		9/2+			0.4390(2)/95.
^{69}Zn		68.926550	56. m	β- /0.906	0.905/99.9	½-			0.318/
^{70}Zn	0.631(9)	69.925319	> 1.3×10^{16} y	β-β-		0+			
^{71m}Zn			3.97 h	β- /	1.45/	9/2+			0.3864/93.
									0.4874/62.
									0.6203/57.
									(0.099−2.489)
^{71}Zn		70.92772	2.4 m	β- /2.81		½-			0.5116(1)/30.
									0.9103(1)/7.5
									(0.12−2.29)
^{72}Zn		71.92686	46.5 h	β- /0.46	0.25/14.	0+			0.0164(3)/8.
					0.30/86.				0.1447(1)/83.
									0.1915(2)/9.4
^{73m}Zn			6. s		I.T./0.196	(7/2+)			0.042
^{73}Zn		72.92978	24. s	β- /4.29	4.7/	(1/2-)			0.216(1)/100.
									0.496−0.911
^{74}Zn		73.92946	1.60 m	β- /2.3	2.1/	0+			0.0565/

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.1401/
									(0.05−0.35)
^{75}Zn		74.9329	10.2 s	β- /6.0					0.229/
^{76}Zn		75.9333	5.7 s	β- /4.2	3.6/	0+			0.119/
^{77m}Zn			1.0 s	β- /		(1/2-)			0.772
^{77}Zn		76.9370	2.1 s	β- /7.3	4.8/				0.189/
^{78m}Zn			> 0.03 ms						1.070
^{78}Zn		77.9384	1.5 s	β- /6.4		0+			0.225/
^{79}Zn		78.9427	1.0 s	β- /8.6					0.702/
^{80}Zn		79.9443	0.54 s	β- /7.3		0+			0.713/
									0.2248/
^{81}Zn		80.9505	0.29 s	β- /11.9					
^{82}Zn		81.9544	> 0.15 μs			0+			
^{83}Zn		82.9610	> 0.15 μs						
$_{31}$Ga		**69.723(1)**							
^{56}Ga		55.9949							
^{57}Ga		56.9829							
^{58}Ga		57.9743							
^{59}Ga		58.9634	< 0.043 μs						
^{60}Ga		59.9571	0.07 s	β+					1.004
				β+, p	// ~ 1.6				3.848
				β+, α	// ~ 0.02				1.555−2.559
^{61}Ga		60.9495	0.17 s	β+ /9.0		3/2-			0.088−1.362
^{62}Ga		61.94418	116.0 ms	β+ /9.17	8.3/	0+			ann.rad./
				EC/					0.954/0.0012
^{63}Ga		62.939294	32. s	β+ /5.5	4.5/				ann.rad./
				EC/					0.6271(2)/10.
									0.6370(2)/11.
									1.0652(4)/45.
^{64m}Ga			0.022 ms						0.0429
^{64}Ga		63.936839	2.63 m	β+ /7.165	2.79/	0+			ann.rad./
					6.05/				0.80785(1)/14.
									0.99152(1)/43.
									1.38727(1)/12.
									3.3659(1)/13.
^{65}Ga		64.932735	15.2 m	β+ /86/3.255	0.82/10.	3/2-			ann.rad./
				EC/	1.39/19.				0.1151(2)/55.
					2.113/56.				0.1530(2)/96.
					2.237/15.				0.2069(2)/39.
									(0.06−2.4)
^{66}Ga		65.931589	9.5 h	β+ /56/5.175	0.74/1.	0+			ann.rad./
				EC/43/	1.84/54.				1.03935(8)/38.
					4.153/51.				2.7523(1)/23.
									(0.28−5.01)
^{67}Ga		66.928202	3.261 d	EC/1.001		3/2-	+1.8507	0.20	0.09332/37.
									0.18459/20.
									0.30024/17.
									(0.091−0.89)
^{68}Ga		67.927980	1.130 h	β+ /90/2.921	1.83/	1+	0.01175	0.028	ann.rad./
				EC/10/					1.0774(1)/3.
									(0.57−2.33)/
^{69}Ga	60.108(9)	68.925574				3/2-	+2.01659	+0.17	
^{70}Ga		69.926022	21.1 m	EC/0.2/0.655		1+			0.1755(5)/0.15
				β- /99.8/1.656	1.65/99.				1.042(5)/0.48
^{71}Ga	39.892(9)	70.924701	> 2.4×10^{26} y	β-		3/2-	+2.56227	+0.11	
^{72}Ga		71.926366	14.10 h	β- /4.001	0.64/40.	3-	-0.13224	+0.5	0.8340/95.53
					1.51/9.				2.202/26.9
					2.52/8.				0.630/26.2

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					3.15/11.				(0.113−3.678)
^{73}Ga		72.925175	74.87 h	β- /1.59		3/2-			0.05344(5)/10.
									0.29732(5)/47.
									(0.01−1.00)/
^{74m}Ga			10. s	I.T./		1+			0.0565(1)/75.
^{74}Ga		73.926946	8.1 m	β- /5.4	2.6/	3-			0.5959/92.
									2.354/45.
									(0.23−3.99)
^{75}Ga		74.926500	2.10 m	β- /3.39	3.3/	3/2-			0.2529/
									0.5746/
									(0.12−2.10)
^{76}Ga		75.928828	29. s	β- /7.0		3-			0.5629/66.
									0.5455/26.
									(0.34−4.25)
^{77}Ga		76.929154	13.0 s	β- /5.3	5.2/				0.469/
									0.459/
^{78}Ga		77.931608	5.09 s	β- /8.2		3+			0.619/77.
									1.187/20.
^{79}Ga		78.9329	2.85 s	β- /7.0	4.6/				0.465/
^{80}Ga		79.9365	1.68 s	β- /10.4	10./				0.659/
^{81}Ga		80.9378	1.22 s	β- /8.3	5.1/				0.217/
^{82}Ga		81.9430	0.599 s	β- /12.6					1.348/
^{83}Ga		82.9470	0.308 s	β- /~ 11.5					
^{84}Ga		83.9527	~ 0.085 s	β- /14					
^{85}Ga		84.9570	> 0.3 μs						
^{86}Ga		85.963	> 0.3 μs						
$_{32}$Ge		**72.64(1)**							
^{58}Ge		57.9910				0+			
^{59}Ge		58.9818							
^{60}Ge		59.9702	> 0.11 μs			0+			
^{61}Ge		60.9638	0.04 s	β+ /13.6					
^{62}Ge		61.9547	0.13 s			0+			
^{63}Ge		62.9496	0.15 s	β- /9.8					
^{64}Ge		63.94165	1.06 m	β+ /4.4	3.0/	0+			ann.rad./
				EC/					0.1282(2)/11.
				β+, p					0.4270(3)/37.
									0.6671(3)/17.
^{65}Ge		64.9394	31. s	β+ /6.2	0.82/10.				ann.rad./
				EC/	1.39/19.				0.0620/27.
				EC, p	2.113/56.				0.6497/33.
					2.237/15.				0.8091/21.
				β+, p	//0.011				(0.19−3.28)
^{66}Ge		65.93384	2.26 h	β+ /27/2.10		0+			ann.rad./
				EC/73/					0.0438/29.
									0.3819/28.
									(0.022−1.77)
^{67}Ge		66.932734	19.0 m	β+ /96/4.225	1.6/	½-			ann.rad./
				EC/4/	2.3/				0.1670/84.
					3.15/				(0.25−3.73)
^{68}Ge		67.92809	270.8 d	EC/0.11		0+			Ga k x-ray/39.
^{69}Ge		68.927965	1.63 d	β+ /36/2.2273	0.70/	5/2-	0.735	0.02	ann.rad./
				EC/64/	1.2/				0.574/13.
									1.1068/36.
									(0.2−2.04)
^{70}Ge	20.38(18)	69.924247				0+			
^{71m}Ge			20.4 ms		I.T./0.0234	9/2+			0.1749
^{71}Ge		70.924951	11.2 d	EC/0.229		½-	+0.547		
^{72}Ge	27.31(26)	71.922076				0+			

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^{73}Ge	7.76(8)	72.923459	> 1.8 × 10^{23} y	β-		9/2+	-0.879467	-0.17	
^{74}Ge	36.72(15)	73.921178				0+			
^{75m}Ge			48. s	I.T./		7/2+			0.13968(3)/39.
^{75}Ge		74.922859	1.380 h	β- /1.177	1.19/	½-	+0.510		0.26461(5)/11.
									0.41931(5)/0.2
^{76}Ge	7.83(7)	75.921403	1.6 × 10^{21} y	β-β-		0+			
^{77m}Ge			53. s	I.T./20/		½-			1.605/0.22
				β- /80/2.861	2.9/				1.676/0.16
									0.195−1.482
^{77}Ge		76.923549	11.25 h	β- /2.702	0.71/23.	7/2+			0.2110/29.
					1.38/35.				0.2155/27.
					2.19/42.				0.2644/51.
									(0.15−2.35)
^{78}Ge		77.922853	1.45 h	β- /0.95	0.70/	0+			0.2773(5)/96.
									0.2939(5)/4.
^{79m}Ge			39. s	β- /IT		7/2+			
^{79}Ge		78.9254	19.1 s	β- /4.2	4.0/20.	½-			0.1096/21.
					4.3/80.				(0.10−2.59)
									0.5427(4)/15.
^{80}Ge		79.92537	29.5 s	β- /2.67	2.4/	0+			0.1104(4)/6.
									0.2656(4)/25.
^{81m}Ge			~ 7.6 s	β- /	3.75/	½+			0.3362(4)/
									0.7935(4)/
^{81}Ge		80.9288	~ 7.6 s	β- /6.2	3.44/	9/2+			0.1976(4)/21.
									0.3362(4)/100.
^{82}Ge		81.9296	4.6 s	β- /4.7	1.093/80	0+			1.093/
^{83}Ge		82.9346	1.9 s	β- /8.9					
^{84}Ge		83.9375	0.98 s	β- /7.7		0+			
^{85}Ge		84.9430	0.54 s	β- /10.					
^{86}Ge		85.9465	> 0.3 μs			0+			
^{87}Ge		86.9525	> 0.3 μs						
^{88}Ge		87.957	> 0.3 μs			0+			
^{89}Ge		88.964	> 0.3 μs						
$_{33}$As		**74.92160(2)**							
^{60}As		59.993							
^{61}As		60.981							
^{62}As		61.9732							
^{63}As		62.9637	< 0.043 μs						
^{64}As		63.9576	0.02 s						
^{65}As		64.9496	0.13 s	β+ /9.4					
^{66m2}As			8. μs						
^{66m1}As			1.1 μs						
^{66}As		65.945	95.8 ms	β+ /9.55					
^{67}As		66.9392	42. s	β+ /6.0	5.0/	5/2-			0.121/
				EC/					0.123/
									0.244/
^{68}As		67.93677	2.53 m	β+ /8.1		3+			ann.rad./
									0.652/32.
									0.762/33.
									1.016/77.
									(0.61−3.55)
^{69}As		68.93227	15.2 m	β+ /98/4.01	2.95/	5/2-	+ 1.623		ann.rad./
				EC/2/					0.0868(5)/1.5
									0.1458(3)/2.4
^{70}As		69.93092	52.6 m	β+ /84/6.22	1.44/	4+	+2.1061	+0.09	ann.rad./
				EC/16/2.14					1.0395(7)/82.
				/2.89					(0.17−4.4)/
^{71}As		70.927112	2.72 d	β+ /32/2.013		5/2-	+1.6735	-0.02	ann.rad./

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				EC/68/					0.1749(2)/84.
									1.0957(2)/4.2
^{72}As		71.926752	26.0 h	β+ /77/4.356	0.669/5.	2-	-2.1566	-0.08	ann.rad./
					1.884/12.				0.83395(5)/80.
					2.498/62.				1.0507(1)/9.6
					3.339/19.				(0.1−4.0)
^{73}As		72.923825	80.3 d	EC/0.341		3/2-			0.0133/0.1
									0.0534/10.5
									Se k x-ray/90.
^{74}As		73.923829	17.78 d	β+ /31/2.562	0.94/26.	2-	-1.597		ann.rad./
				EC/37/	1.53/3.				0.59588(1)/60.
				β- /1.353	0.71/16.				0.6084(1)/0.6
					1.35/16.				0.6348(1)/15.
^{75m}As			0.017 s						
^{75}As	100.	74.921597				3/2-	+1.43947	+0.31	
^{76}As		75.922394	26.3 h	β- /2.962	0.54/3.	2-	-0.903		0.5591(1)/45.
					1.785/8.				0.65703(5)/6.2
					2.410/36.				1.21602(1)/3.4
					2.97/51.				(0.3−2.67)
^{77}As		76.920647	38.8 h	β- /0.683	0.70/98.	3/2-	+1.295		0.2391(2)/1.6
									0.2500(3)/0.4
									0.5208/0.43
^{78}As		77.92183	1.512 h	β- /4.21	3.00/12.	2-			0.6136(3)/54.
					3.70/17.				0.6954(3)/18.
					4.42/37.				1.3088(3)/10.
^{79m}As			1.21 μs	I.T.		9/2+			0.542/IT
									0.231
^{79}As		78.92095	9.0 m	β- /2.28	1.80/95.	3/2-			0.0955(5)/16.
									0.3645(5)/1.9
^{80}As		79.92253	16. s	β- /5.64	3.38/	1+			0.6662(2)/42.
									(2.5−3.0)
^{81}As		80.92213	33. s	β- /3.856		3/2-			0.4676(2)/20.
									0.4911(2)/8.
^{82m}As			13.7 s	β- /	3.6/	5-			0.6544(1)/77.
									0.344/65.
									(0.561 − 1.894)
^{82}As		81.9245	19. s	β- /7.4	7.2/80.	(2-)			0.6544(1)/54.
									(0.755 − 3.667)
^{83}As		82.9250	13.4 s	β- /5.5					0.7345/100.
									1.1131/34.
									2.0767/28.
^{84m}As			0.6 s	β-					
^{84}As		83.9291	4. s	β-, n/7.2		1-			0.6671(2)/21.
									1.4439(5)/49.
									(0.325−5.150)
^{85}As		84.9320	2.03 s	β-, n/8.9		3/2-			0.667(1)/42.
									1.4551(2)/100.
^{86}As		85.9365	0.95 s	β-, n/11.4					0.704/
^{87}As		86.9399	0.49 s	β-, n/10.					0.704/
^{88}As		87.9449	> 0.3 μs						
^{89}As		88.9494	> 0.3 μs						
^{90}As		89.956	> 0.3 μs						
^{91}As		90.960	> 0.3 μs						
^{92}As		91.967	> 0.3 μs						
$_{34}$Se		**78.96(3)**							
^{64}Se			> 0.18 μs			0+			
^{65}Se		64.965	0.011 s	β+ /60/14.					

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				β+, p	3.55/				
^{66}Se		65.9552	0.03 s			0+			
^{67}Se		66.9501	0.13 s	β+ /10.2					ann.rad./
				β+, (p)/					0.352
^{68}Se		67.94180	36. s	β+ /4.7		0+			ann.rad./
									(0.050−0.426)
^{69}Se		68.93956	27.4 s	β+ /6.78	5.006/				ann.rad./
				EC/					0.0664(4)/27.
				β+, p	// ~ 0.045				0.0982(4)/63.
^{70}Se		69.9334	41.1 m	β+ /2.4		0+			ann.rad
									0.04951(5)/35.
									0.4262(2)/29.
^{71}Se		70.93224	4.7 m	β+ /4.4	3.4/36.	5/2-			ann.rad
				EC/					0.1472(3)/47.
									0.8309(3)/13.
									1.0960(3)/10.
^{72}Se		71.92711	8.5 d	EC/0.34		0+			0.0460(2)/57.
^{73m}Se			40. m	I.T./73/0.0257	0.85	3/2-			ann.rad.
				β+ /27/2.77	1.45/				0.0257(2)/27.
					1.70/				0.2538(1)/2.5
^{73}Se		72.92677	7.1 h	β+ /65/2.74	0.80/	9/2+	0.86		ann.rad
				EC/35/	1.32/95.				0.0670(1)/72.
					1.68/1.				0.3609(1)/97.
									(0.6−1.5)
^{74}Se	0.89(4)	73.922476				0+			
^{75}Se		74.922523	119.78 d	EC/0.864		5/2+	0.67	1.0	0.13600/55
									0.26465/58
									(0.024−0.821)
^{76}Se	9.37(29)	75.919214				0+			
^{77m}Se			17.4 s	I.T./		7/2+			0.1619(2)/52.
^{77}Se	7.63(16)	76.919914				½-	+0.53506		
^{78}Se	23.77(28)	77.917309				0+			
^{79m}Se			3.92 m	I.T./					0.09573(3)/9.5
^{79}Se		78.918499	2.9×10^5 y	β- /0.151		7/2+	-1.018	+0.8	
^{80}Se	49.61(41)	79.916521				0+			
^{81m}Se			57.3 m	I.T./99/0.1031		7/2+			0.1031(3)/9.7
									0.2602(2)/0.06
									0.2760/0.06
^{81}Se		80.917993	18.5 m	β- /1.585	1.6/98.	½-			0.2759/0.85
									0.2901/0.75
									0.8283/0.32
^{82}Se	8.73(22)	81.916699	~ 1×10^{20} y	β-β-		0+			
^{83m}Se			1.17 m	β- /3.96	2.88/	½-			0.35666(6)/17.
					3.92/				0.9879(1)/15.
									1.0305(1)/21.
									2.0514(2)/11.
									(0.19−3.1)
^{83}Se		82.919118	22.3 m	β- /3.668	0.93/	9/2+			0.22516(6)/33.
					1.51/				0.35666(6)/69.
									0.51004(8)/45.
									(0.21−2.42)
^{84}Se		83.91846	3.3 m	β- /1.83	1.41/100.	0+			0.4088(5)/100.
^{85}Se		84.92225	32. s	β- /6.18	5.9/	5/2+			0.3450(1)/22.
									0.6094(1)/41.
^{86}Se		85.92427	15. s	β- /5.10		0+			2.0124(1)/24.
									2.4433(8)/100.
									2.6619(1)/49.
^{87}Se		86.92852	5.4 s	β- /7.28		5/2+			0.468(1)/100.
				n/					1.4979(1)/23.
^{88}Se		87.93142	1.5 s	β-, n/6.85		0+			0.5346/

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^{89}Se		88.9365	0.41 s	β-, n/9.0					
^{90}Se		89.9400	> 0.3 μs			0+			
^{91}Se		90.9460	0.27 s	β-, n/8.					
^{92}Se		91.950	> 0.3 μs			0+			
^{93}Se		92.956	> 0.3 μs						
^{94}Se		93.960	> 0.3 μs			0+			
$_{35}$Br		**79.904(1)**							
^{67}Br		66.9648							
^{68}Br		67.9585	< 1.5 μs						
^{69}Br		68.9501	< 0.024 μs	β+ /9.6					
^{70m}Br			2.2 s			9+			
^{70}Br		69.9446	~ 0.08 s	β+ /10.0	/0.75				
^{71}Br		70.939	21. s	β+ /6.9					
^{72}Br		71.9366	1.31 m	β+ /8.7		3	~ 0.55		0.4547−1.3167
^{73}Br		72.93169	3.4 m	β+ /4.7	3.7/	3/2-			ann.rad
									0.065−0.700
^{74m}Br			46. m	β+ /	4.5/	4-	1.82		ann.rad
									0.6348
									0.7285
									(0.2−4.38)
^{74}Br		73.92989	25.4 m	β+ /6.91					ann.rad
									0.6341
									0.6348
									(0.2−4.7)
^{75}Br		74.92578	1.62 h	β+ /76/3.03		3/2-	+0.75		ann.rad
									0.28650
									(0.1−1.56)
^{76m}Br			1.4 s	I.T./5.05		4+			0.104548
									0.05711
^{76}Br		75.92454	16.0 h	β+ /57/4.96	1.9/	1-	0.54821	0.270	ann.rad
					3.68/				0.55911
									1.85368
									(0.4−4.6)
^{77m}Br			4.3 m	I.T./0.1059		9/2+			0.1059
^{77}Br		76.921379	2.376 d	EC/99/1.365		3/2-	0.973	+0.53	ann.rad.
									0.23898
									0.52069
									(0.08−1.2)
^{78}Br		77.921146	6.45 m	β+ /92/3.574	1.2/	1+	0.13		ann.rad.
				EC/8/	2.5/				0.61363
									(0.7−3.0)
^{79m}Br			4.86 s	I.T./0.207		9/2+			0.2072
^{79}Br	50.69(7)	78.918337				3/2-	+2.106400	+0.331	
^{80m}Br			4.42 h	I.T./0.04885		5-	+1.3177	+0.75	Br k x-ray
									0.03705/39.1
									0.04885/0.3
^{80}Br		79.918529	17.66 m	β- /92/2.004	1.38 β-/7.6	1+	0.5140	0.196	ann.rad.
				EC/5.7/1.8706	1.99 β-/82				0.6169/6.7
				β+ /2.6/	0.85 β+ /2.8				(0.64−1.45)
^{81}Br	49.31(7)	80.916291				3/2-	+2.270562	+0.276	
^{82m}Br			6.1 m	I.T./98/0.046		2-			0.046/0.24
				β- /2 /3.139					(0.62−2.66)
^{82}Br		81.916804	1.471 d	β- /3.093	0.444/	5-	+1.6270	0.751	0.5544/71
									0.61905/43
									0.77649/84
									(0.013−1.96)
^{83}Br		82.915180	2.40 h	β- /0.972	0.395/1	3/2-			0.52964
					0.925/99				(0.12−0.68)

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^{84m}Br			6.0 m	β- /4.97	2.2/100	(6-)			0.4240/100
									0.8817/98
									1.4637/101
^{84}Br		83.91648	31.8 m	β- /4.65	2.70/11	2-	2.		0.8816/41
					3.81/20				1.8976/13
					4.63/34				(0.23−4.12)
^{85}Br		84.91561	2.87 m	β- /2.87	2.57	3/2-			0.80241/2.56
									0.92463/1.6
									(0.09−2.4)
^{86}Br		85.91880	55.5 s	β- /7.63	3.3	(2-)			1.56460/64
					7.4				2.75106/21
									(0.5−6.8)
^{87}Br		86.92071	55.6 s	β- /6.85	6.1/	3/2-			1.41983
				n/					1.4762
									(0.2−6.1)
^{88m}Br			5.1 μs						
^{88}Br		87.92407	16.3 s	β- /8.96		1-			0.7649
				n/					0.7753
									0.8021
									(0.1−6.99)
^{89}Br		88.92640	4.35 s	β- /8.16		3/2-			0.7753
				n/					1.0978
^{90}Br		89.9306	1.91 s	β- /10.4	8.3/	2-			0.6555
				n/	9.8/				0.7071
									1.3626
^{91}Br		90.9340	0.54 s	β- /90 /9.80					0.263
				β- n/10 /					0.803
^{92}Br		91.93926	0.31 s	β- /12.20					0.740
				β- n/					
^{93}Br		92.9431	0.10 s	β- /11					0.117
				β- n	//11				(0.237−3.606)
^{94}Br		93.9487	0.07 s	β- n/					
^{95}Br		94.9529	> 0.3 μs						
^{96}Br		95.959	> 0.3 μs						
^{97}Br		96.963	> 0.3 μs						
$_{36}$Kr		**83.798(2)**							
^{69}Kr		68.9652	0.03 s	β+, (p)	4.07/				
^{70}Kr		69.9553	0.06 s			0+			
^{71}Kr		70.950	100. ms	β+, EC/10.1					(0.198−0.207)
^{72}Kr		71.94209	17.1 s	β+ /5.0		0+			ann.rad
				EC/					0.3099/15.3
									0.4150/12.8
									(0.305 − 3.305)
^{73}Kr		72.93929	28. s	β+ /6.7		5/2-			ann.rad.
				EC/					0.1781/66
				β+, p/	/0.25				(0.06−0.86)
^{74}Kr		73.933084	11.5 m	β+ /3.1		0+			ann.rad.
				EC/					0.08970/31
									0.2030/20
									(0.010−1.06)
^{75}Kr		74.93095	4.3 m	β+ /4.90	3.2/	5/2+	-0.531	+1.1	ann.rad.
				EC/					0.1325/68
									0.1547/21
									(0.02−1.7)
^{76}Kr		75.925910	14.8 h	EC/1.31		0+			Br k x-ray
									0.270/21
									0.3158/39
									(0.03−1.07)

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^{77}Kr		76.924670	1.24 h	β+ /80/3.06		5/2+	-0.583	+0.9	ann.rad.
				EC/20/	1.55/				0.1297/80
					1.70/				0.1465/38
					1.87/				(0.02−2.3)
^{78}Kr	0.355(3)	77.920365	> 2.3 × 10^{20} y	EC-EC		0+			
^{79m}Kr			53. s	I.T./0.1299		7/2+	-0.786	+0.40	Kr x-ray
^{79}Kr		78.920082	1.455 d	β+ /7 /1.626		½-	+0.536		ann.rad.
				EC/93 /					0.2613/13
									0.39756/19
									0.6061/8
									(0.04−1.3)
^{80}Kr	2.286(10)	79.916379				0+			
^{81m}Kr			13.1 s	I.T./0.1904		½-	+0.586		0.1904
^{81}Kr		80.916592	2.1 × 10^{5} y	EC/0.2807		7/2+	-0.908	+0.63	Br k x-ray
									0.2760
^{82}Kr	11.593(31)	81.913484				0+			
^{83m}Kr			1.86 h	I.T./0.0416		½-	+0.591		Kr k x-ray
									0.00940
									0.03216
^{83}Kr	11.500(19)	82.914136				9/2+	-0.970699	+0.259	
^{84}Kr	56.987(15)	83.911507				0+			
^{85m}Kr			4.48 h	β- /79 /	0.83/79	½-	+ 0.633		0.30487
				I.T./21 /0.305					0.15118
^{85}Kr		84.912527	10.73 y	β- /0.687	0.15/0.4	9/2+	1.005	+0.43	0.51399
^{86}Kr	17.279(41)	85.9106107				0+			
^{87}Kr		86.9133549	1.27 h	β- /3.887	1.33/8	5/2+	-1.023	-0.30	0.40258/49.6
					3.49/43				2.5548/9.2
					3.89/30				(0.13−3.31)
^{88}Kr		87.91445	2.84 h	β- /2.91		0+			0.19632/26.
									2.392/34.6
									(0.03−2.8)
^{89}Kr		88.9176	3.15 m	β- /4.99	3.8/	5/2+	-0.330	+0.16	0.19746
					4.6/				0.2209/19.9
					4.9/				0.5858/16.4
									1.4728/6.8
									(0.2−4.7)
^{90}Kr		89.91952	32.3 s	β- /4.39	2.6/77	0+			0.12182/32.9
					2.8/6				0.5395/28.6
									1.1187/36.2
									(0.1−4.2)
^{91}Kr		90.9235	8.6 s	β- /6.4	4.33/	5/2+	-0.583	+0.30	0.10878/43.5
					4.59/				0.50658/19.
									(0.2−4.4)
^{92}Kr		91.92616	1.84 s	β- /5.99		0+			0.1424/66.
				n/					(0.14−3.7)
^{93}Kr		92.9313	1.29 s	β- /8.6	7.1/	½+	-0.413		0.1820
				n/					0.2534/42.
									0.32309/24.6
									(0.057−4.03)
^{94}Kr		93.9344	0.21 s	β- /7.3		0+			0.2196/67
				n	n//1.0				0.6293/100.
									(0.098−0.985)
^{95}Kr		94.9398	0.10 s	β- /9.7	n//2.9		- 0.410		
^{96}Kr		95.9431	~ 80 ms	β- ,n	n//3.7	0+			
^{97}Kr		96.9486	0.06 s	β- ,n	n//7.				
^{98}Kr		97.952	0.05 s	β- ,n	n//7.	0+			
^{99}Kr		98.958	0.04 s	β- ,n	n// ~ 11.				
^{100}Kr		99.9611	> 0.34 μs			0+			

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$_{37}$Rb		**85.4678(3)**							
^{71}Rb		70.9653							
^{72}Rb		71.9591	< 1.5 μs						
^{73}Rb		72.9506	< 0.03 μs						
^{74}Rb		73.944265	64.8 ms	β+ /10.4					0.456/0.0025
									(0.053 − 4.244)
^{75}Rb		74.93857	19. s	β+ /7.02	2.31/				ann.rad
									0.179
^{76}Rb		75.935072	39. s	β+ /8.50	4.7/	1-	-0.372623	+0.4	ann.rad
									0.4240/92.
									(0.064−1.68)
^{77}Rb		76.93041	3.8 m	β+ /5.34	3.86/	3/2-	+0.654468	+0.70	ann.rad
									0.0665/59
									(0.04−2.82)
^{78m}Rb			5.7 m	I.T./0.1034		4-	+2.549	+0.81	ann.rad
				β+ /	3.4				0.4553/81.
				EC/					(0.103−4.01)
^{78}Rb		77.92814	17.7 m	β+ /7.22		0+			ann.rad
				EC/					0.4553/63.
									(0.42−5.57)
^{79}Rb		78.92399	23. m	β+ /84/3.65		5/2+	+0.3358	-0.10	ann.rad.
				EC/16 /					0.68812/23.
									(0.017−3.02)
^{80}Rb		79.92252	34. s	β+ /5.72	4.1/22	1+	-0.0836	+0.35	ann.rad.
					4.7/74				0.6167/25.
^{81m}Rb			30.5 m	I.T./0.85	1.4	9/2+	+5.598	-0.74	ann.rad.
				β+, EC/					(0.085−1.9)
^{81}Rb		80.91900	4.57 h	β+ /27/2.24	1.05/	3/2-	+2.060	+0.40	ann.rad./
				EC/73					0.19030/64.
									(0.05−1.9)
^{82m}Rb			6.47 h	β+/26/	0.80/	5-	+1.5100	+1.0	ann.rad./
				EC/74/					0.5544/63.
									0.7765/85.
									(0.092−2.3)
^{82}Rb		81.918209	1.258 m	β+/96/4.40	3.3/	1+	+0.554508	+0.19	ann.rad./
				EC/4/					0.7665/13.
									(0.47−3.96)
^{83}Rb		82.91511	86.2 d	EC/0.91		5/2-	+1.425	+0.20	Kr x-ray
									0.5205/46.
									(0.03−0.80)
^{84m}Rb			20.3 m	I.T./0.216		6-	+0.2129	+0.6	0.2163/34.
									0.2482/63.
									0.4645/32.
^{84}Rb		83.914385	32.9 d	β+/22/2.681	0.780/11	2-	-1.32412	-0.015	ann.rad./
				EC/75 /	1.658/11				0.8817/68.
				β-/3/0.894	0.893/				(1.02−1.9)
^{85}Rb	72.17(2)	84.91178974				5/2-	+1.353	+0.23	
^{86m}Rb			1.018 m	I.T./0.5560		6-	+1.815	+0.37	0.556/98.
^{86}Rb		85.9111674	18.65 d	β-/1.775	1.774/8.8	2-	-1.6920	+0.19	1.0768/8.8
^{87}Rb	27.83(2)	86.90918053	4.88×10^{10} y	β-/0.283	0.273/100	3/2-	+2.7512	+0.13	
^{88}Rb		87.9113156	17.7 m	β-/5.316	5.31	2-	0.508		0.8980/14.4
									1.8360/22.8
									(0.34−4.85)
^{89}Rb		88.91228	15.4 m	β-/4.50	1.26/38	3/2-	+2.304	+0.14	1.032/58.
					1.9/5				1.248/42.
					2.2/34				2.1960/13
					4.49/18				(0.12−4.09)

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^{90m}Rb			4.3 m	β-/4.50	1.7/	4-	+1.616	+0.20	0.1069(IT)
					6.5/				0.8317/94
									(0.20−5.00)
^{90}Rb		89.91480	2.6 m	β-/6.59	6.6	1-			0.8317/28.
									(0.31−5.60)
^{91}Rb		90.91654	58.0 s	β-/5.861	5.9	3/2-	+2.182	+0.15	0.0936/34.
									(0.35−4.70)
^{92}Rb		91.91073	4.48 s	β-/8.11	8.1/94	1-			0.8148/8.
									(0.1−6.1)
^{93}Rb		92.92204	5.85 s	β-/7.46	7.4/	5/2-	+1.410	+0.18	0.2134/4.8
				n/1					0.4326/12.5
									0.9861/4.9
									(0.16−5.41)
^{94}Rb		93.92641	2.71 s	β-/10.31	9.5/	3	+1.498	+0.16	0.8369/87.
				n/10					1.5775/32.
									(0.12−6.35)
^{95}Rb		94.92930	0.377 s	β-/9.30	8.6/	5/2-	+1.334	+0.21	0.352/65.
				n/8					0.680/22.
									(0.20−2.27)
^{96m}Rb			1.7 μs						0.2999
									0.4612
									0.2400
									0.093−0.369
^{96}Rb		95.93427	0.199 s	β-/11.76	10.8/	2+	+1.466	+0.25	0.815/76.
				n/13/					(0.20−5.42)
^{97}Rb		96.93735	0.169 s	β-/10.42	10.0	3/2+	+1.841	+0.58	0.167/100.
				n/27/					0.585/79.
									0.599/56.
									1.258/52.
									(0.14−2.08)
^{98}Rb		97.94179	0.107 s	β-/12.34	0.144/				
				n/13					(0.07−3.68)
^{99}Rb		98.9454	59. ms	β-/11.3					
^{100}Rb		99.9499	53. ms	β- /13.5					0.129
									(0.058−4.483)
^{101}Rb		100.9532	0.03 s	β- /11.8					
^{102}Rb		101.9589	0.09 s	β-					
$_{38}$Sr		**87.62(1)**							
^{73}Sr		72.966	> 25 ms						
^{74}Sr		73.9563	> 1.5 μs			0+			
^{75}Sr		74.9499	88. ms	β+ ,p	p//5.				0.144/4.5
^{76}Sr		75.94177	7.9 s	β+ /6.1		0+			
^{77}Sr		76.93795	9.0 s	β+ /6.9	5.6		-0.35	+1.4	0.147
				β+, p	//0.08				
^{78}Sr		77.93218	2.7 m	β+ /3.76		0+			(0.047−0.793)
^{79}Sr		78.92971	2.1 m	β+ /5.32	4.1	3/2-	-0.474	+0.74	ann.rad./
									0.039/28.
									0.105/22.
									(0.135−0.612)
^{80}Sr		79.92452	1.77 h	β+ /1.87		0+			ann.rad./
									0.174/10.
									0.589/39.
									(0.24−0.55)
^{81}Sr		80.92321	22.3 m	β+ /87/3.93	2.43/	1/2-	+0.544		ann.rad./
				EC/13/	2.68/				0.148/31.
									0.1534/35
									(0.06−1.7)
^{82}Sr		81.91840	25.36 d	EC/0.18		0+			Rb x-ray

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^{83m}Sr			5.0 s	I.T./0.2591		½-	+0.582		0.2591/87.5
^{83}Sr		82.91756	1.350 d	β+/24/2.28	0.465/	7/2+	-0.898	+0.79	ann.rad./
				EC/76/	0.803/				0.3816/12.
					1.227/				0.3816
									0.7627/30.
									(0.094−2.15)
^{84}Sr	0.56(1)	83.913425				0+			
^{85m}Sr			1.127 h	I.T./87/0.2387		½-	+0.601		0.2318/84.
				EC/13					(0.15−0.24)
^{85}Sr		84.912933	64.85 d	EC/1.065		9/2+	-1.001	+0.30	0.51399/99.3
^{86}Sr	9.86(1)	85.909260				0+			
^{87m}Sr			2.81 h	I.T./0.3884		½-	+0.63		0.3884(IT)
^{87}Sr	7.00(1)	86.908877				9/2+	-1.093	+0.34	
^{88}Sr	82.58(1)	87.905612				0+			
^{89}Sr		88.907451	50.52 d	β-/1.497	1.492/100	5/2+	-1.149	-0.3	0.9092
^{90}Sr		89.907738	29.1 y	β-/0.546	0.546/100	0+			
^{91}Sr		90.910203	9.5 h	β-/2.70	0.61/7	5/2+	-0.887	+0.044	0.5556/61.
					1.09/33				0.7498/24.
					1.36/29				1.0243/33.
					2.66/26				(0.12−2.4)
^{92}Sr		91.911038	2.71 h	β-/1.91	0.55/96	0+			1.3831/90.
					1.5/3				(0.24−1.1)
^{93}Sr		92.91403	7.4 m	β-/4.08	2.2/10	5/2+	-0.794	+0.26	0.5903/
					2.6/25				0.7104
					3.2/65				0.87573
									0.8883/
									(0.17−3.97)
^{94}Sr		93.91536	1.25 m	β-/3.511	2.1/	0+			0.6219
					3.3/				0.7043
									0.7241
									0.8064
									1.4283
^{95}Sr		94.91936	25.1 s	β-/6.08		½+	-0.5379		0.6859
					6.1/50				0.8269
									2.7173
									2.9332
^{96}Sr		95.92170	1.06 s	β-/5.37	4.2/	0+			0.1222
									0.5305
									0.8094
									0.9318
^{97}Sr		96.92615	0.42 s	β-/7.47	5.3	(1/2+)	-0.500		0.2164
									0.3071
									0.6522
									0.9538
									1.2580
									1.9050
^{98}Sr		97.92845	0.65 s	β-/5.83	5.1	0+			0.0365
									0.1190
									0.4286
									0.4447
									0.5636
^{99}Sr		98.9332	0.27 s	β-/8.0			-0.26	0.8	
^{100}Sr		99.9354	0.201 s	β-/7.1		0+			
^{101}Sr		100.9405	0.115 s	β-/9.5					
^{102}Sr		101.9430	68. ms	β-/8.8		0+			
^{103}Sr		102.9490	> 0.3 μs						
^{104}Sr		103.952	> 0.3 μs			0+			
^{105}Sr		104.959	> 0.3 μs						

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
$_{39}$**Y**		**88.90585(2)**							
^{76}Y		75.9585	> 0.2 μs						
^{77}Y		76.9497	~ 57. ms						
^{78m}Y			5.8 s			(5+)			
^{78}Y		77.9436	53 ms	β+/10.5					0.279/100
									0.504/90
									0.713/40
^{79}Y		78.9374	15. s	β+/7.1					(0.152−1.106)
^{80m}Y			4.8 s						0.2285
^{80}Y		79.9343	30. s	β+/7.0	5.5	(4-)			ann.rad./
					5.0/				0.3858/100
									0.5951/42
									0.756−1.396
^{81}Y		80.9291	1.21 m	β+/5.5	3.7/				ann.rad./
					4.2/				0.428
									0.469
^{82}Y		81.9268	9.5 s	β+/7.8	6.3/	1+			ann.rad./
									0.5736
									0.6017
									0.7375
^{83m}Y			2.85 m	β+/95/4.6	2.9	1/2-			ann.rad./
				EC/5 /					0.2591
									0.4218
									0.4945
^{83}Y		82.92235	7.1 m	β+/4.47	3.3	9/2+			ann.rad./
				EC/					0.0355
									0.4899
									0.8821
									(0.03−3.4)
^{84m}Y			4.6 s	β+/		1+			ann.rad./
				EC/					0.7930
^{84}Y		83.9204	40. m	β+/6.4	1.64/47	5-			ann.rad./
				EC/	2.24/25				0.4628
					2.64/21				0.6606
					3.15/7				0.7931
									0.9744
									1.0398
									(0.2−3.3)
^{85m}Y			4.9 h	β+/70/		9/2+	6.2		ann.rad./
				EC/30/					0.2317
									0.5356
									2.1238
									(0.1−3.1)
									0.7673
^{85}Y		84.91643	2.6 h	β+/55/3.26	1.54/	1/2-			ann.rad./
				EC/45/					0.2317
									0.5045
									0.9140
									(0.07−1.4)
^{86m}Y			48. m	I.T./99/		8+	4.8		ann.rad./
				β+/					0.0102(IT)
				EC/					0.2080
									(0.09−1.1)
^{86}Y		85.91489	14.74 h	β+/5.24		4-	<0.6		ann.rad./
				EC/					0.3070
									0.6277
									1.0766
									1.1531

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									1.9207
									(0.1−3.8)
^{87m}Y			13. h	I.T./98/		9/2+	6.1		0.3807
				β+/0.7/	1.15/0.7				
				EC/					
^{87}Y		86.910876	3.35 d	EC/99+/1.862	0.78/	1/2-			0.3880
									0.4870
^{88}Y		87.909501	106.6 d	EC/99+/3.623	0.76/	4-			ann.rad./
				β+/0.2/					0.89802
									1.83601
									2.73404
									3.2190
^{89m}Y			15.7 s	I.T./0.909		9/2+			0.9092(IT)
^{89}Y	100.	88.905848				1/2-	-0.13742		
^{90m}Y			3.24 h	I.T./99+/	0.68204	7+	5.1		0.2025
				β-/0.002/					0.4794
									0.6820
^{90}Y		89.907152	2.67 d	β-/2.282	2.28/	2-	-1.630	-0.155	
^{91m}Y			49.7 m	I.T./0.555		9/2+	5.96		0.5556(IT)
^{91}Y		90.907305	58.5 d	β-/1.544	1.545/	1/2-	0.1641		1.208
^{92}Y		91.90895	3.54 h	β-/3.63	3.64/	2-			0.4485
									0.5611
									0.9345
									1.4054
									(0.4−3.3)
^{93m}Y			0.82 s	I.T./0.759		9/2+			0.1686(IT)
									0.5902
^{93}Y		92.90958	10.2 h	β-/2.87	2.88/90	1/2-			0.2669
									0.9471
									1.9178
^{94m}Y			1.4 μs						0.4322
									0.7699
									1.2024
^{94}Y		93.91160	18.7 m	β-/4.919	4.92/	2-			0.3816
									0.9188
									1.1389
									(0.3−4.1)
^{95}Y		94.91282	10.3 m	β-/4.42		1/2-			0.4324
									0.9542
									2.1760
									3.5770
^{96m}Y			9.6 s	β-/		(3+)			0.1467
									0.6174
									0.9150
									1.1071
									1.7507
^{96}Y		95.91589	6.2 s	β- /7.09	7.12/	0-			1.594
^{97m}Y			1.21 s	β- /7.4	4.8/	9/2+			0.1614
					6.0/				0.9700
									1.1030
^{97}Y		96.91813	3.76 s	β- /6.69	6.7	1/2-			0.2969
									1.9960
									3.2876
									3.4013
^{98m}Y			2.1 s	β- /9.8	5.5/	(4-)			0.2415
									0.6205
									0.6473
									1.2228
									1.8016
^{98}Y		97.92220	0.59 s	β- /8.83	8.7/	1+			0.2131

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									1.2228
									1.5907
									2.9413
									4.4501
^{99m}Y			0.011 ms						
^{99}Y		98.92464	1.47 s	β- /7.57		1/2-			0.1218/43.8
				n	/2.5/				0.5362
									0.7242
									1.0130
^{100m}Y			0.94 s	β-, n /		3+			
^{100}Y		99.9278	0.73 s	β-, n/9.3	n/1.8/	1+			
^{101}Y		100.9303	0.43 s	β-, n/8.6	n/1.5/	(5/2+)			
^{102}Y		101.9336	0.36 s	β-, n/9.9	n/4.0/				
^{103}Y		102.9367	0.23 s	β-, n	n/8.3/				
^{104}Y		103.9411	0.18 s						
^{105}Y		104.9449	> 0.15 μs						
^{106}Y		105.950	> 0.15 μs						
^{107}Y		106.9414	> 0.15 μs						
^{108}Y		107.959	> 0.15 μs						
$_{40}$Zr		91.224(2)							
^{78}Zr		77.9552	> 0.2 μs			0+			
^{79}Zr		78.9492	0.06 s						
^{80}Zr		79.940	~ 4.5 s	β+ /8.0		0+			0.290
									0.538
^{81}Zr		80.9372	5.3 s	β+ /7.2	6.1	(3/2-)			
^{82}Zr		81.9311	32. s	β+ /4.0	3.	0+			ann.rad./
^{83m}Zr			7. s	β+ /7.0		(7/2+)			ann.rad./
^{83}Zr		82.9287	44. s	β+ /5.9	4.8	(1/2-)			ann.rad./
				EC					0.0556
									0.1050
									0.2560
									0.474
									1.525
^{84}Zr		83.9233	26. m	β+ /2.7		0+			ann.rad./
				EC/					0.0449
									0.1125
									0.3729
									0.667
^{85m}Zr			10.9 s	I.T./0.2922		½-			ann.rad./
				β+, EC/					0.2922(IT)
									0.4165
^{85}Zr		84.9215	7.9 m	β+ /4.7	3.1	7/2+			ann.rad./
				EC/					0.2663
									0.4163
									0.4543
^{86}Zr		85.91647	16.5 h	EC/1.47		0+			0.0280
									0.243
									0.612
^{87m}Zr			14.0 s	I.T./0.3362		½-	+ 0.64		0.1352(IT)
									0.2010
^{87}Zr		86.91482	1.73 h	β+ /3.67	2.26	9/2+	- 0.895	+ 0.42	ann.rad./
				EC/					0.3811
									1.228
^{88m}Zr			1.4 μs			(8+)			0.077
^{88}Zr		87.91023	83.4 d	EC/0.67		0+			0.3929
^{89m}Zr			4.18 m	I.T./94/0.5877		½-	+ 0.80		ann.rad./
				β+ /1.5/					0.5877(IT)
				EC/4.7/					1.507

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{89}Zr		88.908889	3.27 d	β+ /23/2.832	0.9/	9/2+	-1.05	+ 0.28	ann.rad./
				EC/77/					0.9092
^{90m}Zr			0.809 s	I.T./		5-	6.3		0.1326
									2.1862
									2.3189(IT)
^{90}Zr	51.45(40)	89.904704				0+			
^{91}Zr	11.22(5)	90.905646				5/2+	-1.30362	-0.18	
^{92}Zr	17.15(8)	91.905041				0+			
^{93}Zr		92.906476	1.5×10^{6} y	β- /0.091		5/2+			0.0304
^{94}Zr	17.38(28)	93.906315	$>10^{17}$ y	β-β-		0+			
^{95}Zr		94.908043	64.02 d	β- /1.125	0.366/55	5/2+	1.13	+0.29	0.7242
					0.400/44				0.7567
^{96}Zr	2.80(9)	95.908273	3×10^{19} y	β-β-		0+			
			$>1.7 \times 10^{18}$ y	β-					
^{97}Zr		96.910953	16.75 h	β- /2.658	1.91/	½-	- 0.937		0.7434
^{98}Zr		97.91274	30.7 s	β- /2.26	2.2/100	0+			
^{99}Zr		98.91651	2.2 s	β- /4.56	3.9/	½+	- 0.930		0.4692/55.2
					3.5/				0.5459/48
									0.028−1.321
^{100}Zr		99.91776	7.1 s	β- /3.34		0+			0.4006
									0.5043
^{101}Zr		100.92114	2.1 s	β- /5.49	6.2/	3/2-	- 0.27	+ 0.81	0.1194
									0.2057
									0.2089
^{102}Zr		101.92298	2.9 s	β- /4.61		0+			
^{103}Zr		102.9266	1.3 s	β- /7.0					
^{104}Zr		103.9288	1.2 s	β- /5.9		0+			
^{105}Zr		104.9331	~ 1. s	β- /8.5					
^{106}Zr		105.9359	> 0.24 μs			0+			
^{107}Zr		106.9408	> 0.24 μs						
^{108}Zr		107.944	> 0.15 μs			0+			
^{109}Zr		108.9492	> 0.15 μs						
^{110}Zr		109.953	> 0.15 μs			0+			
$_{41}$Nb		**92.90638(2)**							
^{81}Nb		80.949	<0.08 μs						
^{82}Nb		81.9431	50 ms	β+ /11.					
^{83}Nb		82.9367	4.1 s	β+ /7.5					
^{84}Nb		83.9336	10. s	β+, EC/9.6		(3+)			0.540
									(0.456-1.427)
^{85m}Nb			3. s						0.069
^{85}Nb		84.9279	21. s	β+ /6.0					
^{86m}Nb			56. s	β+					
^{86}Nb		85.9250	1.46 m	β+ /8.0					ann.rad./
									0.751
									1.003
^{87m}Nb			3.7 m	β+ /		1/2-			ann.rad./
				EC/					0.1352
									0.2010
^{87}Nb		86.92036	2.6 m	β+ /5.2/		(9/2+)			ann.rad./
				EC/					0.2010
									0.4706
									0.6165
									1.0665
									1.8842
^{88m}Nb			7.7 m	β+ /		4-			ann.rad./
				EC/					0.2625
									0.3996
									1.0569

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									1.0825
^{88}Nb		87.9183	14.3 m	β+ /7.6	3.2/	8+			ann.rad./
				EC/					1.0570
									1.0828
									(0.07−2.5)
^{89m}Nb			2.0 h	β+ /	3.3/	9/2+			0.5880/10(D)
				EC/					(0.17−4.0)
^{89}Nb		88.91342	1.10 h	β+ /74/4.29	2.8/	1/2-	+6.216		ann.rad./
				EC/26 /					0.5074
									0.5880
									0.7696
									1.2775
^{90m}Nb			18.8 s	I.T./0.1246		4-			0.002
									0.1225
^{90}Nb		89.911265	14.6 h	β/53 /6.111	0.86/5	8+	4.961		ann.rad./
				EC/47 /	1.5/92				0.1412
									1.1292
									2.1862
									2.3189
									(0.1−3.3)
^{91m}Nb			62. d	I.T./97 /		1/2-			0.1045(IT)
				EC/3 /					1.2050
^{91}Nb		90.906996	7×10^2 y	EC/1.253		9/2+			Mo k x-ray
^{92m}Nb			10.13 d	EC/99+/		2+	6.114		0.9126
									0.9345
									1.8475
^{92}Nb		91.907194	3.7×10^7 y	EC/2.006		7+			0.5611
									0.9345
^{93m}Nb			16.1 y	I.T./0.0304		1/2-			Nb x-ray
									0.0304
^{93}Nb	100.	92.906378				9/2+	+6.1705	-0.32	
^{94m}Nb			6.26 m	I.T./99+	/2.086	3+			Nb k x-ray
				β- /0.5/					0.0409
									0.87109
^{94}Nb		93.907284	2.4×10^4 y	β- /2.045	0.47/	6+			0.70263
									0.87109
^{95m}Nb			3.61 d	I.T./97.5/	0.2357	1/2-			0.2040
				β- /2.5 /					0.2356
^{95}Nb		94.906836	34.97 d	β- /0.926	0.160/	9/2+	6.141		0.76578
^{96}Nb		95.908101	23.4 h	β- /3.187	0.5/10	6+	4.976		0.7782
					0.75/90				0.2191−1.498
^{97m}Nb			58.1 s	I.T./0.7434	0.734/98	1/2-			0.7434
^{97}Nb		96.908099	1.23 h	β- /1.934	1.27/98	9/2+	6.15		0.4809
									0.6579
^{98m}Nb			51. m	β- /4.67		5+			0.7874
									0.1726−1.89
^{98}Nb		97.91033	2.9 s	β- /4.59	4.6/	1+			0.6451
									0.7874
									1.0243
^{99m}Nb			2.6 m	β- /	3.2/	1/2-			0.0978/100
									(0.138−3.010)
^{99}Nb		98.91162	15.0 s	β- /3.64	3.5/100	9/2+			0.0977
									0.1378/3.1
^{100m2}Nb			0.013 ms						
^{100m1}Nb			3.0 s	β- /6.74	5.8				Nb k x-ray
									0.159
									0.6364
									1.0637
^{100}Nb		99.91418	1.5 s	β- /6.25	6.2/				0.5354
					5.3/				0.6001−1.566

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{101}Nb		100.91525	7.1 s	β- /4.57	4.3/				0.1105−0.810
^{102m}Nb			4.3 s	β- /					
^{102}Nb		101.91804	1.3 s	β- /7.21	7.2/				0.2960−2.184
^{103}Nb		102.9191	1.5 s	β- /5.53	5.3/	5/2+			
^{104m}Nb			0.9 s	β-, n/	n/0.06				
^{104}Nb		103.9225	4.8 s	β-, n/8.1	n/0.05				
^{105}Nb		104.9239	3.0 s	β-, n/6.5	n/1.7				
^{106}Nb		105.9280	1.0 s	β-, n/9.3	n/4.5				
^{107}Nb		106.9303	0.30 s	β-, n/7.9	n/6.0				
^{108}Nb		107.9348	0.19 s	β, n/	n/6.2				(0.193−0.590)
^{109}Nb		108.9376	0.19 s	β, n/	n/31				
^{110}Nb		109.9424	0.17 s	β, n/	n/40				
^{111}Nb		110.9457	> 0.15 μs						
^{112}Nb		111.951	> 0.15 μs						
^{113}Nb		112.955	> 0.15 μs						
$_{42}$Mo		**95.94(2)**							
^{83}Mo		82.9487	~ 6. ms						
^{84}Mo		83.9401	~ 3.7 s	β+ /6.		0+			
^{85}Mo		84.9366	3.2 s	β+/8.1		½+			
^{86}Mo		85.9307	19. s	β+ /4.8		0+			
^{87}Mo		86.9273	14. s	EC, β+/6.5					(0.752−1.004)
^{88}Mo		87.92195	8.0 m	β+ /3.4		0+	+0.5		ann.rad./
				EC					0.0800
									0.1399
									0.1707
^{89m}Mo			0.19 s	I.T./0.118		½-			0.118(IT)
									0.268
^{89}Mo		88.91948	2.2 m	β+ /5.58		9/2+			ann.rad./
				EC/					0.659
									0.803
									1.155
									1.272
^{90m}Mo			1.2 μs						0.063
^{90}Mo		89.91394	5.7 h	β+ /25/2.489	1.085/	0+			ann.rad./
				EC/75 /					0.04274
									0.12237
									0.25734
^{91m}Mo			1.08 m	I.T./50/0.653		½-			ann.rad./
				β+, EC/50 /	2.5/				0.6529
					2.8/				1.2081
					4.0/				1.5080
									2.2407
^{91}Mo		90.91175	15.5 m	β+ /94/4.43	3.44/94	9/2-			ann.rad./
				EC/6/					1.6373
									2.6321
									3.0286
									(0.1−4.2)
^{92}Mo	14.77(31)	91.906811	> 3 × 10^{17} y	β+-EC		0+			
^{93m}Mo			6.9 h	I.T./99+ /2.425		21/2+	+9.21		0.26306(IT)
									0.68461
									1.47711
^{93}Mo		92.906813	3.5 × 10^{3} y	EC/0.405		5/2+			0.0304
^{94}Mo	9.23(10)	93.905088				0+			
^{95}Mo	15.90(9)	94.905842				5/2+	-0.9142	-0.02	
^{96}Mo	16.68(1)	95.904680				0+			
^{97}Mo	9.56(5)	96.906022				5/2+	-0.9335	+0.26	
^{98}Mo	24.19(26)	97.905408				0+			
^{99}Mo		98.907712	2.7476 d	β- /1.357	0.45/14	½+	0.375		0.144048

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					0.84/2				0.18109
					1.21/84				0.36644
									0.73947
^{100}Mo	9.67(20)	99.90748	~1 × 10^{19} y	β-β-		0+			
^{101}Mo		100.91035	14.6 m	β- /2.82	2.23/	1/2+			0.0063
					0.7/				0.19193
									0.5909
									(0.0809−2.405)
^{102}Mo		101.91030	11.3 m	β- /1.01	1.2/	0+			0.1493/89.
									0.2116/100.
									0.2243/32.
^{103}Mo		102.9132	1.13 m	β- /3.8		3/2+			0.1028(2)/
									0.1440(2)
									0.2511(2)
^{104}Mo		103.9138	1.00 m	β- /2.16		0+			0.0686(1)/100.
									0.4239(4)/21.
^{105}Mo		104.9170	36. s	β- /4.95		3/2+			0.0642/
									0.0856/
									0.2495/
^{106}Mo		105.91814	8.4 s	β- /3.52		0+			0.1894(2)/22.
									0.3644(2)/6.
									0.3723(2)/12.
^{107}Mo		106.9217	3.5 s	β- /6.2					
^{108}Mo		107.9235	1.1 s	β- /5.1		0+			(0.028−0.636)
^{109}Mo		108.9278	0.5 s	β- /7.2					
^{110}Mo		109.9297	0.27 s	β- /5.7		0+			Tc k x-ray
									0.142
									(0.039−0.599)
^{111}Mo		110.9344	> 0.15 μs						
^{112}Mo		111.937	> 0.15 μs			0+			
^{113}Mo		112.942	> 0.15 μs						
^{114}Mo		113.945	> 0.15 μs			0+			
^{115}Mo		114.950	> 0.15 μs						
^{116}Mo			> 0.15 μs			0+			
^{117}Mo			> 0.15 μs						
$_{43}$Tc									
^{85}Tc		84.9488	< 0.1 ms						
^{86}Tc		85.9429	0.05 s	β+ /11.9					
^{87}Tc		86.9365	2.4 s	β+ /8.6					
^{88}Tc		87.9327	5.8 s	β+ /10.1					
^{89m}Tc			13. s						
^{89}Tc		88.9272	13. s	β+ /7.5					
^{90m}Tc			49.2 s	β^+	5.3/	6+			ann.rad./
									0.9479/
									1.0542/
^{90}Tc		89.9236	8.3 s	β+ /8.9	7.0/15	1+			ann.rad./
					7.9/95.				0.9479/
^{91m}Tc			3.3 m	β+		½+			ann.rad./170.
				EC					0.8110(5)/5.
									1.6052(1)/7.8
									1.6339(1)/9.1
									1.9023(1)/6.
									2.4509(1)/13.5
^{91}Tc		90.9184	3.14 m	β+ /6.2	5.2	9/2+			ann.rad./200.
^{92}Tc		91.91526	4.4 m	β+ /7.87	4.1	8+			ann.rad./200.
				EC					0.0850/
									0.1475
									0.3293

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.7731
									1.5096
^{93m}Tc			43. m	I.T./13		½-			0.3924(IT)
				EC/20					0.9437
									2.6445
^{93}Tc		92.910249	2.73 h	β+ /13/3.201	0.81	9/2+	6.26		ann.rad./
				EC/87/					1.3629
									1.4771
									1.5203
									(0.1−3.0)
^{94m}Tc			52. m	β+ /72/4.33		2+			ann.rad./
				EC/28/					0.8710
									1.8686
^{94}Tc		93.909657	4.88 h	β+ /11/4.256		7+	5.08		ann.rad./
				EC/89/					0.4491
									0.7026
									0.8496
									0.8710
^{95m}Tc			61. d	I.T./4/		1/2-			ann.rad./
				β+ /0.3	0.5/				0.0389(IT)
				EC/96	0.7/				0.2041
									0.5821
									0.5821
									0.8351
^{95}Tc		94.90766	20.0 h	EC/100/1.691		9/2+	5.89		0.7657
									1.0738
^{96m}Tc			52. m	I.T./90/		4+			0.0342(IT)
				β+, EC/2/					0.7782
									1.2002
^{96}Tc		95.90787	4.3 d	EC/2.973		7+	+5.04		Mo k x-ray
									0.7782
									0.8125
									0.8498
									1.12168
^{97m}Tc			91. d	I.T./0.0965		1/2-			Tc k x-ray
				EC	/3.9				0.0965
^{97}Tc		96.906365	4.2×10^6 y	EC/100/0.320		9/2+			Mo k x-ray
^{98}Tc		97.907216	~ 6.6×10^6 y	β- /1.80	0.40/100	6+			0.65241
									0.74535
^{99m}Tc			6.01 h	I.T./100/0.142		1/2-			Tc k x-ray
									0.14049
									0.14261
^{99}Tc		98.906255	2.13×10^5 y	β- /0.294	0.293/100	9/2+	+5.6847	-0.129	
^{100}Tc		99.907658	15.8 s	β- /3.202	2.2/	1+			0.5396
				EC /$1.8(10)^{-3}$/	2.9/				0.5908
					3.3				(0.3 79−2.30)
^{101}Tc		100.90732	14.2 m	β- /1.61	1.32/	9/2+			0.1272
									0.1841
									0.3068
									0.5451
									(0.073−0.969)
^{102m}Tc			4.4 m	I.T./2/4.8	1.8/				0.4184
				β- /98/					0.4752
									0.6281
									0.6302
									1.0464
									1.1033
									1.6163
									2.2447
^{102}Tc		101.90922	5.3 s	β- /4.53	3.4/	1+			0.4686

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					4.2				0.4751
					2.2/				1.1055
^{103}Tc		102.90918	54. s	β- /2.66	2.0/	5/2+			0.1361
					2.2/				0.1743
									0.2104
									0.3464
									0.5629
									(0.13−1.0)
^{104m}Tc			0.005 ms						
^{104}Tc		103.91145	18.2 m	β- /5.60	5.3/	(3+)			0.3483
									0.3580
									0.5305
									0.5351
									0.8844
									0.8931
									1.6768
									(0.3−3.7)
^{105}Tc		104.9117	7.6 m	β- /3.6	3.4/	5/2+			0.1079
									0.1432
									0.3215
^{106}Tc		105.91436	36. s	β- /6.55		2+			0.2703
									0.5222
									1.9694
									2.2393
									2.7893
^{107}Tc		106.9151	21.2 s	β- /4.8					0.1027
									0.1063
									0.1770
									0.4587
^{108}Tc		107.9185	5.1 s	β- /7.72		(3)			0.2422
									0.4656
									0.7078
									0.7326
									1.5835
^{109}Tc		108.9200	1.4 s	β- /6.3	p/0.08				
^{110}Tc		109.9238	0.83 s	β- /8.8	p/0.04				0.2407
^{111}Tc		110.9257	0.30 s	β- .n/7.0	n/0.85				0.150/92.7
									0.063−1.435
^{112}Tc		111.9292	0.26 s	β, n	n/2.6				
^{113}Tc		112.9316	0.15 s	β-, n/8.	/2.1				0.0985/100
									0.0658−1.520
^{114}Tc		113.936	0.15 s	β-, n	/1.3				
^{115}Tc		114.939	> 0.15 μs						
^{116}Tc		115.943	> 0.15 μs						
^{117}Tc		116.946	> 0.15 μs						
^{118}Tc		117.951	> 0.15 μs						
$_{44}$Ru		**101.07(2)**							
^{87}Ru		86.949	> 1.5 μs						
^{88}Ru		87.9403	1.2 s			0^+			
^{89}Ru		88.9361	1.4 s	β+ .p/8.					
^{90}Ru		89.9299	12. s	β+ /5.9		0^+			ann.rad./
									0.155−1.551
^{91}Ru		90.9263	7.9 s	β+, EC/7.4		9/2+			ann.rad./
									(0.205-1.998)
^{92}Ru		91.9201	3.7 m	β+ /53/4.5		0+			ann.rad./
				EC/47/					0.1346
									0.2138
									0.2593

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{93m}Ru			10.8 s	I.T./21/		1/2-			ann.rad./
				β+, EC/79/	5.3/				0.7344
									1.1112
									1.3962
									2.0931
^{93}Ru		92.9171	1.0 m	β+ /6.3		9/2+			ann.rad./
				EC/					0.6807
									1.4349
									(0.5−4.2)weak
^{94}Ru		93.91136	52. m	EC/100/1.59		0+			0.3672
									0.5247
									0.8922
^{95}Ru		94.91041	1.64 h	EC/85/2.57	1.20/	5/2+	0.86		ann.rad./
				β+ /15/	0.91/				0.3364
									0.6268
									0.036−2.424
^{96}Ru	5.54(14)	95.90760	> 3.1×10^{16} y	β+β+		0+			
^{97}Ru		96.90756	2.89 d	EC/1.12		5/2+	-0.78		Tc k x-ray
									0.2157
									0.3245
									0.4606
^{98}Ru	1.87(3)	97.90529				0+			
^{99}Ru	12.76(14)	98.905939				5/2+	-0.6413	+0.079	
^{100}Ru	12.60(7)	99.904220				0+			
^{101}Ru	17.06(2)	100.905582				5/2+	-0.7188	+0.46	
^{102}Ru	31.55(14)	101.904349				0+			
^{103}Ru		102.906324	39.27 d	β- /0.763	0.223	3/2+	0.206	+0.62	0.05329
									0.29498
									0.4438
									0.49708
									0.55704
									0.61033
									(0.04−1.6)
^{104}Ru	18.62(27)	103.905433				0+			
^{105}Ru		104.907753	4.44 h	β- /1.917	1.11/22	3/2+	-0.3		0.12968
					1.134/13				0.1491
					1.187/49				0.2629
									0.31664
									0.46943
									0.67634
									0.72420
									(0.1−1.8)
^{106}Ru		105.90733	1.020 y	β- /0.0394	0.0394/100	0+			
^{107}Ru		106.9099	3.8 m	β- /2.9	2.1/				0.1939
					3.2/				0.3741
									0.4625
									0.8488
^{108}Ru		107.9102	4.5 m	β- /1.4	1.2/	0^+			0.0923
									0.1651
									0.4339
									0.4975
									0.6189
^{109}Ru		108.9132	34.5 s	β- /4.2					0.1164
									0.3584
^{110}Ru		109.9141	15. s	β- /2.81		0+			0.1121
									0.3737
									0.4397
									0.7967
^{111}Ru		110.9177	1.5 s	β- /5.5					
^{112}Ru		111.9190	4.5 s	β- /4.5		0+			

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{113m}Ru			0.6 s						
^{113}Ru		112.9225	0.80 s	β- /7.					0.2632
									0.048−2.418
^{114}Ru		113.9243	0.57 s	β- /6.1		0+			0.127/24
									(0.053−0.180)
^{115}Ru		114.9287	~ 0.74 s	β- /8.					
^{116}Ru		115.931	> 0.15 μs			0+			
^{117}Ru		116.936	> 0.15 μs						
^{118}Ru		117.938	> 0.15 μs			0+			
^{119}Ru		118.943	> 0.15 μs						
^{120}Ru		119.945	> 0.15 μs			0+			
$_{45}$Rh		**102.90550(2)**							
^{89}Rh		88.9488	> 0.15 μs						
^{90m}Rh			~ 12. ms						
^{90}Rh		89.9429	1.0 s						
^{91m}Rh			1.5 s	IT					0.387
^{91}Rh		90.9366	1.5 s						(0.438-0.973)
^{92m}Rh			0.5 s						0.866
^{92}Rh		91.9320	4.7 s	β+ /11.1					(0.163-0.991)
^{93}Rh		92.9257	12. s	β+ /8.1					(0.138−1.493)
^{94m}Rh			25.8 s	β+ /		8+			ann.rad./
									0.1264
									0.3117
									0.7562
									1.0752
									1.4307
^{94}Rh		93.9217	1.18 m	β+ /9.6	6.4/	3+			ann.rad./
									0.1461
									0.3117
									0.7562
									1.4307
^{95m}Rh			1.96 m	I.T./88/		½+			ann.rad./
				β+, EC/12/					0.5433(IT)
									0.7837
^{95}Rh		94.9159	5.0 m	β+ /5.1	3.2	9/2+			ann.rad./
									0.2293
									0.4103
									0.6610
									0.9416
									1.3520
									(0.2−3.8)
^{96m}Rh			1.51 m	I.T./60/0.052		2+			ann.rad./
				β+, EC/40/	4.70/				Tc,Ru x-rays
									0.8326
									1.0985
									1.6921
									(0.4−3.3)
^{96}Rh		95.91446	9.6 m	β+/6.45	3.3/	5+			ann.rad./
				EC/					0.4299
									0.6315
									0.6853
									0.7418
									0.8326
									(0.2−3.4)
^{97m}Rh			46. m	I.T./5 /	2.6/	1/2-			ann.rad./
				β+, EC/95/					0.1886
									0.4215
									2.2452

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^{97}Rh		96.91134	31.0 m	β+ /3.52	2.1/	9/2+			ann.rad./
									0.1886
									0.3892
									0.4515
									0.8398
									0.8788
									(0.2−3.5)
^{98m}Rh			3.5 m	β+ /		5+			ann.rad./
									0.6154
									0.6524
									0.7452
^{98}Rh		97.91071	8.7 m	β+ /90/5.06	3.4/	2+			ann.rad./
									0.6524
									0.7623
^{99m}Rh			4.7 h	β+ /8/	.74/	9/2+	5.67		ann.rad./
				EC/92/					0.2766/
									0.3408
									0.6178
									1.2612
^{99}Rh		98.90813	16. d	β+/4/2.10	0.54/	1/2-			ann.rad./
				EC/97/	0.68/				0.0894/
									0.3530
									0.5277
									(0.1−2.0)
^{100m}Rh			4.7 m	I.T./99/		5+			ann.rad./
				β+ /0.4/					0.0748/
									0.2647(IT)
^{100}Rh		99.90812	20.8 h	β+ /3.63	2.62/	1-			0.4462
				EC/	2.07/				0.5396
									0.5882
									0.8225
									1.5534
									2.3761
^{101m}Rh			4.35 d	EC/92/		9/2+	+5.51		Rh k x-ray
				I.T./8/0.1573					0.1272/
									0.3069
									0.5451
^{101}Rh		100.90616	3.3 y	EC/0.54		1/2-			Ru k x-ray
									0.1272
									0.1980
									0.3252
^{102m}Rh			3.74 y	EC/2.323		6^+	4.04		0.4751
				IT/0.0419					0.6313
			> 1.2 × 10^6 y	β^+	/<0.00025				0.6975
									0.7668
									1.0466
									1.1032
^{102}Rh		101.906843	207. d	EC/62			0.5		ann.rad./
				β- /19/					0.4686
				β+ /14/					0.4751
									0.5566
									0.6280
									1.1032
									(0.4−1.6)
^{103m}Rh			56.12 m	IT		7/2+	4.54		
^{103}Rh	100.	102.905504				1/2-	-0.0884		
^{104m}Rh			4.36 m	I.T./99+ /		5+			Rh k x-ray
				β^-	1.3/				0.0514
									0.0971
									0.5558

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{104}Rh		103.906656	42.3 s	β-/99+/2.441	1.88/2	1+			0.3581
				EC/0.4/1.141	2.44/98				0.5558
									1.2370
									(0.35−1.8)
^{105m}Rh			43. s	I.T./1.296		1/2-			Rh k x-ray
									0.1296
^{105}Rh		104.905694	35.4 h	β- /0.567	0.247/30	7/2+	+4.45		0.2801
					0.567/70				0.3061
									0.3189
^{106m}Rh			2.18 h	β- /	0.92/	6+			0.2217
									0.4510
									0.5119
									0.6162
									0.7173
									0.7484
									1.0458
									1.5277
^{106}Rh		105.90729	29.9 s	β- /3.54	2.4/2	1+	+2.58		0.51186/
					3.0/12				0.61612
					3.54/79				0.62187
									(0.05−3.04)
^{107}Rh		106.90675	21.7 m	β- /1.51	1.20/65	7/2+			0.2776
					1.5/17				0.3028
									0.3925
^{108m}Rh			6.0 m	β- /	1.57/				0.4339
									0.4973
									0.6189
^{108}Rh		107.9087	17. s	β- /4.5		1+			0.4046
									0.4339
									0.4973
									0.5811
									0.6146
									0.9014
									0.9471
^{109}Rh		108.90874	1.34 m	β- /2.59	2.25/	7/2+			0.1134
									0.1780
									0.2914
									0.3254
									0.3268
									0.4261
									(0.1−1.6)
^{110m}Rh			29. s	β- /	6/				0.3737
									0.4397
									0.7967
^{110}Rh		109.91114	3.1 s	β- /5.4	5.5/	1+			0.3737
									0.4400
									0.5463
									0.6877
									0.8381
									0.9045
^{111}Rh		110.91159	11. s	β- /3.7					0.275
^{112m}Rh			6.8 s	β- /					
^{112}Rh		111.9144	3.5 s	β- /6.2		1+			0.3489
^{113}Rh		112.91553	0.9 s	β- /4.9					0.1285
^{114m}Rh			1.9 s	β- /					(0.103-1.923)
^{114}Rh		113.9188	1.8 s	β- /6.5		1+			(0.276-0.783)
^{115}Rh		114.9203	0.99 s	β- /6.0					
^{116m}Rh			0.9 s	β- /					0.3405
^{116}Rh		115.9241	0.7 s	β- /8.0		1+			0.340
									0.398−1.665

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{117}Rh		116.9260	0.44 s	β- /7.					0.0346
									0.1317
^{118}Rh		117.9301	~ 0.30 ms						0.379
									0.575
									0.370−1.037
^{119}Rh		118.932	0.17 s						
^{120}Rh		119.936	0.12 s						
^{121}Rh		120.939	> 0.15 μs						
^{122}Rh		121.943							
$_{46}$Pd		**106.42(1)**							
^{91}Pd		90.949	> 1.5 μs						
^{92}Pd		91.9404	1.0 s			0+			
^{93}Pd		92.9359	1.2 s	β+, p		9/2+			0.240/81
									0.382−0.864
^{94}Pd		93.9288	9. s	EC, β+ /~ 6.6		0+			0.5582
									(0.0546−0.798)
^{95m}Pd		94.92684	13.4 s	EC, β+ /10.2		21/2+			
^{95}Pd		94.9247							
^{96}Pd		95.9182	2.03 m	EC, β+ /3.5	1.15/	0+			0.1248
									0.4995
^{97}Pd		96.9165	3.1 m	β+, EC/4.8	3.5/	5/2+			ann.rad./
									0.2653
									0.4752
									0.7927
									(0.2−3.4)
^{98}Pd		97.91272	17.7 m	β+ /1.87		0+			ann.rad./
				EC/					0.0677
									0.1125
									0.6630
									0.8379
^{99}Pd		98.91177	21.4 m	β+ /49/3.37	2.18/	5/2+			ann.rad./
				EC/51/					0.1360
									0.2636
									0.6734
									(0.2−2.85)
^{100}Pd		99.90851	3.7 d	EC/0.36		0+			0.03271
									0.0748
									0.0840
^{101}Pd		100.90829	8.4 h	β+ /5/1.980	0.776/	5/2+	-0.66		ann.rad./
				EC/95/					0.0244
									0.2963
									0.5904
^{102}Pd	1.02(1)	101.905609				0+			
^{103}Pd		102.906087	16.99 d	EC/0.543		5/2+			Rh k x-ray
									0.03975
									0.3575
									0.4971
^{104}Pd	11.14(8)	103.904036				0+			
^{105}Pd	22.33(8)	104.905085				5/2+	-0.642	+0.66	
^{106}Pd	27.33(3)	105.903486				0+			
^{107m}Pd			20.9 s	I.T./0.2149		11/2-			Pd k x-ray
									0.2149(IT)
^{107}Pd		106.905133	6.5×10^6 y	β- /0.033	0.03/	5/2+			
^{108}Pd	26.46(9)	107.903893				0+			
^{109m}Pd			4.75 m	I.T./0.1889		11/2-			Pd x-ray
									0.1889(IT)
^{109}Pd		108.905950	13.5 h	β- /1.116	1.028	5/2+			0.0880
									(0.08−1.0)

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{110}Pd	11.72(9)	109.905153				0+			
^{111m}Pd			5.5 h	I.T./73/0.172		11/2-			0.0704
				β- /27/	0.35				0.1722
					0.77				0.3912
									(0.1−1.97)
^{111}Pd		110.90767	23.4 m	β- /2.19	2.2/95	5/2+			0.0598
									0.2454
									0.5800
									0.6504
									1.3885
									1.4590
^{112}Pd		111.90731	21.04 h	β- /0.29	0.28/	0+			0.018
^{113m}Pd			1.48 m	β- /		5/2+			0.0959
^{113}Pd		112.91015	1.64 m	β- /3.34					0.0958
									0.4824
									0.6436
									0.7394
^{114}Pd		113.91036	2.48 m	β- /1.45		0+			0.1266
									0.2320
									0.5582
									0.5760
^{115m}Pd			50. s			(9/2-)			0.089
^{115}Pd		114.9137	25. s	β- /4.58		(3/2+)			0.1255
									0.2554
									0.3428
^{116}Pd		115.9142	12.7 s	β- /2.61		0+			0.1015
									0.1147
									0.1778
^{117m}Pd			19. ms			(9/2-)			0.203
^{117}Pd		116.9178	4.4 s	β- /5.7		(3/2+)			0.2473
									0.077−0.403
^{118}Pd		117.9190	2.4 s	β- /4.1		0+			0.1254
									0.028−0.596
^{119}Pd		118.9231	0.9 s	β- /6.5					0.2566
									0.070−0.326
^{120}Pd		119.9247	0.5 s	β- /5.0		0+			0.1581
									0.053−0.595
^{121}Pd		120.9289	> 0.24 μs						
^{122}Pd		121.9306	> 0.24 μs			0+			
^{123}Pd		122.935	> 0.15 μs						
^{124}Pd		123.9369				0+			
$_{47}$Ag		**107.8682(2)**							
^{93}Ag		92.950							
^{94m}Ag			0.41 s	β+	p/0.79/1.9				(0.096-1.092)
				β+,p/27.	p/1.01/2.2				
^{94}Ag		93.9428	0.60 s	β+					(0.659-0.905)
				β+,p/20.					
^{95}Ag		94.9355	2.0 s	β+, p/					(0.089−2.940)
^{96m}Ag			4.4 s	β^+		8+			
				β+, p	/8.				
^{96}Ag		95.9307	7. s	β+ /11.6		2+			ann.rad./
				EC/					0.1248
				β+, p	/18.				0.4995
									(0.1066−1.416)
^{97}Ag		96.9240	19. s	β+ /7.0					ann.rad./
				EC/					0.6862
									1.2941
									(0.352−3.294)

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{98}Ag		97.9216	47.6 s	β+ /8.4		5+			ann.rad./
				EC/	/36.				0.5711
				β+, p	/0.11				0.6786
									0.8631
									(0.153−1.185)
^{99m}Ag			11. s	I.T./100/		½-			Ag k x-ray
									0.1636(IT)
									0.3426
^{99}Ag		98.9176	2.07 m	β+ /87 5.4		9/2+			ann.rad./
				EC/13/					0.2199
									0.2645
									0.8056
									0.8323
									(0.2−3.5)
^{100m}Ag			2.3 m	β+ /		2+			ann.rad./
				EC/					0.6657
									1.6941
^{100}Ag		99.9161	2.0 m	β+/7.1	4.7/	5+			ann.rad./
				EC/					0.2807
									0.4503
									0.6657
									0.7508
									0.7732
^{101m}Ag			3.1 s	I.T./0.23		½-			Ag k x-ray
									0.0981
									0.176(IT)
^{101}Ag		100.9128	11.1 m	β+ /69/4.2	2.7/	9/2+	5.7		ann.rad./
				EC/31/					0.2610
					2.18/				0.2747
					2.73/				0.3269
					3.38/				0.4392
									0.6673
									1.1739
									(0.2−3.1)
^{102m}Ag			7.8 m	β+ /38/	3.4	2+	+4.14		ann.rad./
				EC/13/					0.5567
				I.T./49/					0.9777
									1.8347
									2.0545
									2.1594
									3.2386
^{102}Ag		101.91169	13.0 m	β+ /78/5.92	2.26/	5+	4.6		ann.rad./
				EC/22/					0.5564
									0.7193
									0.163−2.242
^{103m}Ag			5.7 s	I.T./0.134		1/2-			Ag k x-ray
									0.1344
^{103}Ag		102.90897	1.10 h	β+ /28/2.69	1.7	7/2+	+4.47		ann.rad./
				EC/72/	1.3				0.1187
									0.1482
^{104m}Ag			33. m	β+ /64/	2.71/	2+	+3.7		ann.rad./
				EC/36/					0.5558
				I.T./0.07/					0.7657
									(0.5−3.4)
^{104}Ag		103.90863	69. m	β+ /16/4.28	0.99/	5+	3.92		ann.rad./
				EC/84/					0.5558
									0.9259
									0.9416
									(0.18−2.27)
^{105m}Ag			7.2 m	I.T./98/0.0255		7/2+	+4.41		Ag x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
				EC/2 /					0.3063
									0.3192
									(0.1−1.0)
^{105}Ag		104.90653	41.3 d	EC/1.35		1/2-	0.1014		0.0640
									0.2804
									0.3445
									0.4434
^{106m}Ag			8.4 d	EC/		6+	3.71	+1.1	Pd k x-ray
									0.4510
									0.5118
									0.7173
									1.0458
^{106}Ag		105.90667	24.0 m	β+ /59/2.965	/1.96	1+	+2.85		ann.rad./
				EC/41 /					0.5119
^{107m}Ag			44.2 s	I.T./0.093		7/2+	+4.40	1.0	Ag x-ray
									0.0931
^{107}Ag	51.839(8)	106.905097				1/2-	-0.11357		
^{108m}Ag			418. y	EC/92/		6+	3.580	+1.3	Ag k x-ray
				I.T./8 /0.079					Pd k x-ray
									0.43392
									0.61427
									0.72290
^{108}Ag		107.905956	2.39 m	β- /97/1.65	1.02/1.7	1+	+2.6884		ann.rad./
				EC/2/	1.65/96				0.43392
				β- /1/1.92	0.88/0.3				0.61885
									0.63298
^{109m}Ag			39.8 s	I.T./0.088		7/2+	+4.40	+1.0	Ag k x-ray
									0.0880
^{109}Ag	48.161(8)	108.904752				1/2-	-0.13069		
^{110m}Ag			249.8 d	β- /99/	0.087	6+	+3.60	+1.4	0.65774
				I.T./1 /0.1164	0.530				0.76393
									0.88467
									0.93748
									1.38427
									(0.447−1.56)
^{110}Ag		109.906107	24.6 s	β- /2.892	2.22/5	1+	+2.7271	0.2	0.65774
					2.89/95				0.8154
									1.1257
^{111m}Ag			1.08 m	IT/99/0.0598		7/2+			Ag k x-ray
				β- /1/					0.0598
									0.2454
^{111}Ag		110.905294	7.47 d	β- /1.037	1.035/	1/2-	-0.146		0.2454
									0.3421
^{112}Ag		111.90701	3.13 h	β- /3.96	3.94/	2-	0.0547		0.6067
					3.4				0.6174
									1.3877
									(0.4−2.9)
^{113m}Ag			1.14 m	I.T./80 /0.043		7/2+			0.1422
				β- /20 /	1.5				0.2983
									0.3161
									0.3923
^{113}Ag		112.90657	5.3 h	β- /2.02	2.01/	1/2-	0.159		0.2588
									0.2986
^{114}Ag		113.90880	4.6 s	β- /5.08	4.9/	1+			0.5582
									0.5760
									1.9946
^{115m}Ag			18.7 s	β- /		7/2+			0.1134
									0.1315
									0.2288
									0.3887

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{115}Ag		114.90876	20. m	β- /3.10		1/2-			0.1316
									0.2128
									0.2291
									0.4727
									(0.13−2.49)
^{116m2}Ag			20. s	β-,IT/7	IT/0.0479				
^{116m}Ag			9.8 s	β-/92 /	3.2/	5+			0.5134
					2.9				0.7055
				I.T./8	IT/.0809				0.255−2.838
^{116}Ag		115.91136	2.68 m	β- /6.16	5.3	2-			0.5134
									0.6993
									2.4779
^{117m}Ag			5.3 s	β- /	3.2/	7/2+			0.1354
									0.2981
									0.3868
									0.1571
^{117}Ag		116.91168	1.22 m	β- /4.18	2.3	1/2-			0.1354
									0.3377
^{118m}Ag			2.8 s	β- /59/					0.1277
				I.T./41 /0.1277					0.4878
									0.6771
									0.7709
									(0.190-2.778)
^{118}Ag		117.9146	4.0 s	β- /7.1					0.4878
									0.6771
									3.2259
^{119}Ag		118.9157	2.1 s	β- /5.35		7/2+			0.0674
									0.3662
									0.3991
									0.6264
^{120m}Ag			0.40 s	β- /63.					0.2030
				I.T./37.					0.5059
									0.6978
									0.8300
									(0.115-1.644)
^{120}Ag		119.9188	1.23 s	β- /8.2					0.5059
				β-,n	n//<0.0030%				0.6978
									0.8171
									(0.442-3.044)
^{121}Ag		120.9199	0.78 s	β- /6.4					0.1150
									0.3148
									0.3537
									0.3696
									0.5007
									1.5105
									(0.11−2.5)
^{122m}Ag			1. s	β- /					
^{122}Ag		121.9235	0.44 s	β- /9.2					
^{123}Ag		122.9249	0.31 s	β- /7.4					
^{124}Ag		123.9286	0.22 s	β- /10.1					
^{125}Ag		124.9304	0.17 s	β-					
^{126}Ag		125.9345	0.11 s	β-					
^{127}Ag		126.9368	0.11 s	β-					
^{128}Ag		127.9412	58 ms	β-					
^{129m}Ag			0.16 s						
^{129}Ag		128.9437	~ 46. ms	β-, n					
^{130}Ag		129.9505	~ 35 ms						
$_{48}$Cd		**112.411(8)**							

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{95}Cd		94.950							
^{96}Cd		95.9398				0+			
^{97}Cd		96.9349	3. s	β+, (p)					
^{98}Cd		97.9274	9.2 s	β+ /5.4		0+			
				(p)	/0.025				
^{99}Cd		98.9250	16. s	β+, EC/6.9					ann.rad./
^{100}Cd		99.9203	1.1 m	β+, EC/3.9		0+			ann.rad./
									(0.090−1.043)
^{101}Cd		100.9187	1.2 m	β+ /83/5.5	4.5	5/2+			In k x-ray
				EC/17/					0.0985
									1.7225
									0.31−2.84)
^{102}Cd		101.91446	5.8 m	β+ /27/2.59		0+			ann.rad./
				EC/73					0.0974
									0.4810
									1.0366
									1.3598
^{103}Cd		102.91342	7.5 m	β+ /33/4.14		5/2+	-0.81	-0.8	ann.rad./
				EC/67/					Ag k x-ray
									1.0799
									1.4487
									1.4618
									(0.1−2.8)
^{104}Cd		103.90985	58. m	EC/1.14		0+			Ag k x-ray
									0.0835
									0.7093
^{105}Cd		104.90947	55.5 m	β+ /26/2.739	1.69/	5/2+	-0.7393	+0.43	Ag k x-ray
				EC/74/					0.3469
									0.6072
									0.9618
									1.3025
									(0.25−2.4)
^{106}Cd	1.25(6)	105.90646	> 5.8×10^{17} y	EC, EC		0+			
^{107}Cd		106.90662	6.52 h	EC/99+/1.417		5/2+	-0.615055	+0.68	Ag k x-ray
				β+ /					0.0931
									0.8289
^{108}Cd	0.89(3)	107.90418	>4.1×10^{17} y	EC EC		0+			
^{109}Cd		108.904982	462.0 d	EC/0.214		5/2+	-0.827846	+0.69	Ag k x-ray
									0.08804
^{110}Cd	12.49(18)	109.903002				0+			
^{111m}Cd			48.5 m	I.T./		11/2-			Cd k x-ray
									0.1508(IT)
									0.2454
^{111}Cd	12.80(12)	110.904178				1/2+	-0.594886		
^{112}Cd	24.13(21)	111.902758				0+			
^{113m}Cd			14.1 y	β- /99.9/0.59	0.59/99.9	11/2-	-1.087	-0.71	0.2637
^{113}Cd	12.22(12)	112.904402	8.2×10^{15} y	β-		1/2+	-0.622301		
^{114}Cd	28.73(42)	113.903359	>6.0×10^{17} y	β-β-		0+			
^{115m}Cd			44.6 d	β- /1.629	0.68/1.6	11/2-	-1.042	-0.54	0.48450
					1.62/97				0.93381
									1.29064
^{115}Cd		114.905431	2.228 d	β- /1.446	0.593/42	1/2+	-0.648426		0.23141
					1.11/58				0.26085
									0.33624
									0.49227
									0.52780
^{116}Cd	7.49(18)	115.904756	3.8×10^{19} y	β·β·		0+			
^{117m}Cd			3.4 h	β- /2.66	0.72/	11/2-			0.1586
									0.5529
									0.37−2.42

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{117}Cd		116.907219	2.49 h	β- /2.52	0.67/51	1/2+			0.2209
					2.2/10				0.2733
									0.3445
									1.3033
^{118}Cd		117.90692	50.3 m	β- /0.52		0+			
^{119m}Cd			2.20 m	β- /		11/2-			0.1056
									0.7208
									1.0250
									2.0213
^{119}Cd		118.9099	2.69 m	β- /3.8	~ 3.5/	1/2+			0.1340
									0.2929
									0.3429
^{120}Cd		119.90985	50.8 s	β- /1.76	1.5/	0+			
^{121m}Cd			8. s	β- /		11/2-			0.1008
									0.9878
									1.0209
									1.1815
									2.0594
^{121}Cd		120.9130	13.5 s	β- /4.9		(3/2+)			0.2102
									0.3242
									0.3492
									1.0403
^{122}Cd		121.91333	5.3 s	β- /3.0		0+			
^{123m}Cd			1.9 s	β- /					
^{123}Cd		122.91700	2.09 s	β- /6.12		3+			
^{124}Cd		123.9177	1.24 s	β- /4.17		0+			0.0365
									0.0628
									0.1799
^{125m}Cd			0.66 s	β- /					
^{125}Cd		124.9213	0.68 s	β- /7.16		3/2+			
^{126}Cd		125.9224	0.52 s	β- /5.49		0+			0.2601
^{127}Cd		126.9264	0.4 s	β- /8.5		3/2+			
^{128}Cd		127.9278	0.28 s	β- /7.1		0+			0.247
^{129}Cd		128.9322	0.24 s	β- /5.9					0.281
^{130}Cd		129.9339	0.162 s	β- /		0+			
				β-, n	/~ 3.5				
^{131}Cd		130.9407	68 ms						
^{132}Cd		131.9456	0.10 s	β-, n/	/60	0+			
^{133}Cd			0.06 s						
$_{49}$In		**114.818(3)**							
^{97}In		96.950							
^{98m}In			~ 0.03 s						
^{98}In		97.9421	1. s						
^{99}In		98.9342	~ 3.8 s	β+ /8.9					
^{100}In		99.9311	5.9 s	β+, (p)/10.5					(0.297-1.365)
^{101}In		100.9263	15. s	β+ /7.3					
^{102}In		101.9241	23. s	EC/8.9		(5)			0.1566
									0.7767
									(0.397−0.923)
^{103m}In			34. s						
^{103}In		102.91991	1.1 m	β+, EC/6.05	4.2	9/2+			ann.rad./
				EC	/45				0.1879
									(0.157−3.98)
^{104m}In			16. s	IT/0.0935					
^{104}In		103.9183	1.84 m	β+, EC/7.9	4.8	5+	+4.44	+0.7	ann.rad./
									0.6580
									0.8341
									0.8781

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{105m}In			43. s	I.T.		½-			In k x-ray
									0.6740
^{105}In		104.91467	5.1 m	β+, EC/4.85	3.7	9/2+	+5.675	+0.83	0.1310
									0.2600
									0.6038
^{106m}In			5.3 m	β+ /85/	4.90	3+			ann.rad./
				EC/15/					0.6326
									0.8611
									1.7164
^{106}In		105.91347	6.2 m	β+ /65/6.52	2.6	7+	+4.92	+0.97	ann.rad./
				EC/35/					0.2259
									0.6327
									0.8611
									0.9978
									1.0091
^{107m}In			51. s	I.T./0.6786		½-			In k x-ray
									0.6785
^{107}In		106.91030	32.4 m	β+ /35/3.43	2.20/	9/2+	+5.59	+0.81	ann.rad./
				E.C/65/					Cd k x-ray
									0.2050
									0.3209
									0.5055
									(0.2−2.99)
^{108m}In			57. m	β+ /53/	1.3	6+	+4.94	+0.47	ann.rad./
				EC/47/					Cd k x-ray
									0.6329
									1.9863
									3.4522
^{108}In		107.90970	40. m	β+ /33/5.15	3.49/	3+	+4.56	+1.01	ann.rad./
				EC/67/					Cd k x-ray
									0.2429
									0.6331
									0.8756
^{109m}In			1.3 m	I.T./0.650		½-			In k x-ray
									0.6498
^{109}In		108.90715	4.17 h	β+ /8/2.02	0.79/	9/2+	+5.54	+0.84	ann.rad./
				EC/92/					Cd k x-ray
									0.2035
									0.6235
^{110m}In			4.9 h	EC/		7+	+4.72	+1.00	Cd k x-ray
									0.6577
									0.8847
									0.9375
									(0.1−1.98)
^{110}In		109.90717	1.15 h	β+ /62/3.88	2.22/	2+	+4.37	+0.35	ann.rad./
				EC/38/					Cd k x-ray
									0.6577
									(0.6−3.6)
^{111m}In			7.7 m	I.T./0.537		½-	+5.53		In k x-ray
									0.537
^{111}In		110.905103	2.8049 d	EC/0.866		9/2+	+5.50	+0.80	Cd k x-ray
									0.1712
									0.2453
^{112m}In			20.8 m	I.T./0.155		4+			In k x-ray
									0.1555
^{112}In		111.90553	14.4 m	β+ /22/2.586		1+	+2.82	+0.09	ann.rad./
				EC/34/					Cd k x-ray
				β- /0.663					0.6171
^{113m}In			1.658 h	I.T./0.3917		½-	-0.210		In k x-ray
									0.3917

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{113}In	4.29(5)	112.904058				9/2+	+5.529	+0.80	
^{114m}In			49.51 d	I.T./97/0.190		5+	+4.65	+0.74	In k x-ray
				EC/3 /					0.19027
^{114}In		113.904914	1.198 m	β- /97/1.989	1.984/	1+	+2.82		Cd k x-ray
				EC/3/1.453					0.5584
									0.5727
									1.2998
^{115m}In			4.486 h	I.T./95/0.336		½-	-0.255		In k x-ray
				β- /5 /0.83					0.3362
									0.4974
^{115}In	95.71(5)	114.903878	4.4×10^{14} y	β- /0.495		9/2+	+5.541	+0.81	
^{116m2}In			2.16 s	I.T./0.162		8-	+3.22	+0.31	In k x-ray
				EC	/0.023				0.1624
^{116m1}In			54.1 m	β- /	1.0	5+	+4.43	+0.80	0.13792
									0.41688/27
									1.09723/58.5
									1.29349/85
^{116}In		115.905260	14.1 s	β- /3.274	3.3/99	1+	2.788	0.11	0.46313
									1.2526
									1.29349
^{117m}In			1.94 h	β- /53/1.769	1.77/	½-	-0.2517		In k x-ray
				I.T./47 /					0.15855
									0.31531
									0.55294
^{117}In		116.90451	44. m	β- /1.455	0.74/	9/2+	+5.52	+0.83	0.15855
									0.3966
									0.55294
^{118m2}In			8.5 s	I.T./98/		(8-)	+3.32	+0.44	In k x-ray
				β- /2/					0.1382
^{118m1}In			4.40 m	β- /	1.3	5+	+4.23	+0.80	0.2086
					2.0				0.6833
									1.2295
^{118}In		117.90635	5.0 s	β- /4.42	4.2/	1+			0.5282
									1.1734
									1.2295
									2.0432
^{119m}In			17.9 m	β- /97/	2.7/	½-	-0.32		0.3114
				I.T./3/0.311					0.7631
^{119}In		118.90585	2.3 m	β- /2.36	1.6/	9/2+	+5.52	+0.85	0.0239
									0.6495
									0.7631
									1.2149
^{120m2}In			47 s	β- /6.1		8-	+3.692	+0.53	1.171
									1.023
^{120m1}In			46. s	β- /5.8	2.2/	5+	+4.30	+0.81	1.171
									1.023
^{120}In		119.90796	3.1 s	β- /5.37	5.6/	(1+)			0.4146
					3.1/				0.5924
									0.8637
									1.0232
									1.1714
									(0.4–2.7)
^{121m}In			3.8 m	β- /99/	3.7/	1/2-	-0.36		0.0601
				I.T./1/0.313					0.3136
									0.9256
									1.0412
									1.1022
									1.1204
^{121}In		120.90785	23. s	β- /3.36	2.5	9/2+	+5.50	+0.81	0.2620
									0.6573

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.9256
^{122m}In			10. s	β- /	4.4/	8-	+3.78	+0.59	1.0014
									1.1403
^{122}In		121.91028	1.5 s	β- /6.37	5.3/	(1+)			0.2391
									1.0014
									1.1403
									1.164
									1.1903
^{123m}In			47. s	β- /	4.6/	(1/2-)	-0.40		0.1258
									1.170
									3.234
^{123}In		122.91044	6.0 s	β- /4.39	3.3/	(9/2+)	+5.49	+0.76	0.6188
									1.0197
									1.1305
^{124m}In			3.4 s	β-		8-	+3.89	+0.66	0.1029
									0.9699
									1.0729
									1.1316
^{124}In		123.91318	3.18 s	β- /7.36	5/	3+	+4.04	+0.61	0.7070
									0.9978
									1.1316
									3.2142
									(0.3−4.6)
^{125m}In			12.2 s	β- /	5.5/	1/2-	-0.43		0.1876
^{125}In		124.91360	2.33 s	β- /5.42	4.1/	9/2+	+5.50	+0.71	0.4260
									1.0318
									1.3350
^{126m}In			1.53 s		4.9/	3+	+4.03	+0.49	0.9086
									0.9696
									1.1411
^{126}In		125.91646	1.63 s	β- /8.21	4.2/	8-	+4.06		0.1118
									0.9086
									1.1411
^{127m}In			3.73 s	β- /	6.4/	(1/2-)			0.2523
									3.074
^{127}In		126.91735	1.14 s	β- /6.51	4.9/	(9/2+)	+5.52	+0.59	0.4680
									0.6461
									0.8051
									1.5977
^{128m}In			0.7 s	β- /	5.4/	(8-)			1.8670
									1.9739
									(0.1205−2.12)
^{128}In		127.92017	0.80 s	β- /8.98	5.0/	3+			0.9352
									1.1688
									3.5198
									4.2970
^{129m}In			1.23 s	β- /98/	~ 7.5/	1/2-			0.3153
				n/2/					0.9067
									1.2220
^{129}In		128.9217	0.63 s	β- /7.66	5.5/	9/2+			0.2853
									0.7693
									1.8650
									2.1180
^{130m2}In			0.53 s	β- /	8.8/	5+			0.0892
									0.7744
									1.2212
^{130m1}In			0.51 s	β- /	6.1/	10-			0.0892
									0.1298
									0.7744
									1.2212

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									1.9052
^{130}In		129.92497	0.29 s	β- /10.25	10.0/	1-			
^{131m2}In			0.3 s	β- /		(21/2+)			
^{131m1}In			0.35 s	β- /		(1/2-)			
^{131}In		130.92685	0.28 s	β- /9.18	6.4/	(9/2+)			0.3328
									2.433
^{132}In		131.9330	~ 0.206 s	β- /13.6	6.0/	(7-)			0.1320
					8.8/				0.2992
									0.3747
									4.0406
^{133}In		132.9378	0.165 s	β-, (n)					
^{134}In		133.9442	0.14 s						(0.354−2.005)
^{135}In		134.9493	0.09 s						
$_{50}$Sn		**118.710(7)**							
^{99}Sn		98.949							
^{100}Sn		99.939	1.0 s	β+ /7.3	3.4/	0+			
^{101}Sn		100.9361	3. s	β+ /9.					
^{102}Sn		101.9303	3.8 s	β+ /5.8		0+			
^{103}Sn		102.9281	7. s	β+ /7.7					1.3558
				β+,p	p//1.2				(0.351-2.813)
				EC	/ 20.				
^{104}Sn		103.9231	21. s	β+, EC/4.5		0+			
^{105}Sn		104.9214	28. s	β+ /6.3					In-x-ray
									(0.2879−3.819)
^{106}Sn		105.91688	2.0 m	β+ /20/3.18		0+			ann.rad./
				EC/80/					In k x-ray
									0.3865
									0.4772
^{107}Sn		106.9156	2.92 m	EC/5.0	1.2/				0.4218
				β+ /					0.6105
									0.6785
									1.0013
									1.1290
									1.542
^{108}Sn		107.91193	10.3 m	β+ /1/2.09	0.36/	0+			In k x-ray
				EC/99/					0.2724
									0.3965
									(0.105−1.68)
^{109}Sn		108.91128	18.0 m	β+ /9/3.85	1.52/	7/2+	-1.08	+0.3	ann.rad./
				EC/91/					In k x-ray
									0.6498
									1.0992
^{110}Sn		109.90784	4.17 h	EC/0.64		0+			In k x-ray
									0.283
^{111}Sn		110.90773	35. m	β+ /31/2.45	1.5/	7/2+	+0.61	+0.2	In k x-ray
				EC/69/					0.7620
									1.1530
									1.9147
^{112}Sn	0.97(1)	111.904818				0+			
^{113m}Sn			21.4 m	I.T./92/0.077		7/2+			Sn k x-ray
				EC/8/					In x-ray
									0.0774
^{113}Sn		112.905171	115.1 d	EC/1.036		½+	-0.879		In k x-ray
									0.25511
									0.39169
^{114}Sn	0.66(1)	113.902779				0+			
^{115}Sn	0.34(1)	114.903342				½+	-0.9188		
^{116}Sn	14.54(9)	115.901741				0+			

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{117m}Sn			14.0 d	I.T./0.3146		11/2-	-1.396	-0.4	Sn k x-ray
									0.15856
^{117}Sn	7.68(7)	116.902952				½+	-1.0010		
^{118}Sn	24.22(9)	117.901603				0+			
^{119m}Sn			293. d	I.T./0.0896		11/2-	-1.4	0.21	Sn k x-ray
									0.02387
^{119}Sn	8.59(4)	118.903308				½+	-1.0473		
^{120}Sn	32.58(9)	119.902195				0+			
^{121m}Sn			44. y	I.T./78/0.006		11/2-	-1.388	-0.14	Sn k x-ray
				β- /22/	0.354/				0.03715
^{121}Sn		120.904236	1.128 d	β- /0.388	0.383/100	3/2+	0.698	-0.02	
^{122}Sn	4.63(3)	121.903439				0+			
^{123m}Sn			40.1 m	β- /1.428	1.26/99	3/2+			0.1603
									0.3814
^{123}Sn		122.905721	129.2 d	β- /1.404	1.42/99.4	11/2-	-1.370	+0.03	0.1603
									1.0302
									1.0886
^{124}Sn	5.79(5)	123.905274	> 2.2 × 10^{18} y	β-β-		0+			
^{125m}Sn			9.51 m	β- /2.387	2.03/98	3/2+	+0.764	+0.8	0.3321
									1.4040
^{125}Sn		124.907784	9.63 d	β- /2.364	2.35/82	11/2-	-1.35	+0.1	1.0671
									(0.2−2.3)
^{126}Sn		125.90765	2.34 × 10^{5} y	β- /0.38	0.25/100	0+			0.0643
									0.0876
									0.4148
									0.6663
									0.6950
^{127m}Sn			4.15 m	β- /3.21	2.72/	3/2+	+0.757	+0.60	0.4909
									1.3480
									1.5640
^{127}Sn		126.91036	2.12 h	β- /3.20	2.42/	11/2-	-1.33	+0.3	0.8231
					3.2/				1.0956
									(0.120−2.84)
^{128m}Sn			6.5 s	IT/0.091		(7-)			
^{128}Sn		127.91054	59.1 m	β- /1.27	0.48/	0+			0.4823
					0.63/				0.5573
									0.6805
^{129m}Sn			6.9 m	β- /		11/2-	-1.30	-0.2	1.1611
^{129}Sn		128.91348	2.4 m	β- /4.0		3/2+	+0.754	+0.05	0.6456
^{130m}Sn			1.7 m	β- /		(7-)	-0.381	-0.4	0.1449
									0.8992
^{130}Sn		129.91397	3.7 m	β- /2.15	1.10/	0+			0.0700
									0.1925
									0.7798
^{131m}Sn			1.02 m	β- /	3.4/	11/2-	-1.28	+0.02	0.3043
									0.4500
									0.7985
									1.2260
									(0.08−3.21)
^{131}Sn		130.91700	39. s	β- /4.69	3.8/	3/2+	+0.747	-0.04	see ^{131m}Sn
^{132}Sn		131.91782	40. s	β- /3.12	1.8/	0+			0.0855
									0.2467
									0.3402
									0.8985
^{133}Sn		132.92383	1.44 s	β- /7.8	7.5/	7/2-			
^{134}Sn		133.9283	1.04 s	β- /6.8		0+			(0.053-2.417)
^{135}Sn		134.9347	0.53 s	β-					(0.053-0.830)
				β-,n	/21.				0.733−1.855
^{136}Sn		135.9393	0.25 s	β-, n	/30.	0+			
^{137}Sn		136.946	0.19 s	β-, n	/~ 58				

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{138}Sn			0.15 s			0+			
$_{51}$Sb		**121.760(1)**							
^{103}Sb		102.9397	> 1.5 μs						
^{104}Sb		103.9365	0.5 s						
^{105}Sb		104.9315	1.1 s	β+,p	p//<0.1				
^{106}Sb		105.9288	0.6 s	β+ /10.5					
^{107}Sb		106.9242	4.0 s	β+ /7.9					1.280
									0.1515
									0.6666
									0.553−2.046
^{108}Sb		107.9222	7.0 s	β+ /9.5					(0.151−1.280)
^{109}Sb		108.91813	17.3 s	β+ /6.38	4.42/	5/2+			0.925
				EC/	4.67/				1.062
					4.33/				0.261−2.127
^{110}Sb		109.9168	24. s	β+ /9.0	6.8/	3+			ann.rad./
				EC/					0.6365
									0.9847
									1.2117
									1.2433
^{111}Sb		110.91316	1.25 m	β+ /87/4.47	3.3/	5/2+			ann.rad./
				EC/13 /					0.1002
									0.1545
									0.4891
									1.0326
^{112}Sb		111.91240	51.4 s	β+ /90/7.06	4.75/	3+			ann.rad./
				EC/10/					0.6700
									0.9909
									1.2571
^{113}Sb		112.90937	6.7 m	β+ /65/3.91	2.42/	5/2+			ann.rad./
									(0.3−3.6)
				EC/35/					Sn k x-ray
									0.3324
									0.4980
^{114}Sb		113.90927	3.49 m	β+ /78/5.9	3.4/	3+	1.7		ann.rad./
				EC/22/					Sn k x-ray
									0.8876
									1.2999
^{115}Sb		114.90660	32.1 m	β+ /67/3.03	1.51/	5/2+	+3.46	-0.4	ann.rad./
				EC/33/					Sn k x-ray
									0.4973
^{116m}Sb			1.00 h	β+ /78/	1.16/	8-	2.6		ann.rad./
				EC/22/					Sn k x-ray
									0.4073
									0.5429
									0.9725
									1.2935
									(0.0998−1.501)
^{116}Sb		115.90679	16. m	β+ /50/4.707	1.3/	3+	2.72		ann.rad./
				EC/50/	2.3/				Sn k x-ray
									0.93180
									1.29354
									(0.138−3.903)
^{117}Sb		116.90484	2.80 h	β+ /2/1.76	0.57/	5/2+	+3.4		Sn k x-ray
				EC/98/					0.1586
^{118m}Sb			5.00 h	EC/99/		8-	2.3		Sn k x-ray
									0.25368
									1.05069
									1.22964

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{118}Sb		117.905529	3.6 m	β+ /74/3.657	2.65/	1+	2.5		ann.rad./
				EC/26/					Sn k x-ray
									1.22964
^{119}Sb		118.90394	38.1 h	EC/0.59		5/2+	+3.45	-0.4	Sn k x-ray
									0.0239
^{120m}Sb			5.76 d	EC/		8-	2.34		Sn k x-ray
									0.0898
									0.19730
									1.02301
									1.17121
^{120}Sb		119.90507	15.89 m	β+ /41/2.68	1.72/	1+	+2.3		ann.rad./
				EC/59/					Sn k x-ray
									0.7038
									1.17121
^{121}Sb	57.21(5)	120.903816				5/2+	+3.363	-0.4	
^{122m}Sb			4.19 m	I.T./0.162		8-			Sb x-ray
									0.0614
									0.0761
^{122}Sb		121.905174	2.72 d	β- /98/1.979	1.414/65	2-	-1.90	+0.9	0.56409
				β+ /2/1.620	1.980/26				0.69277
									1.14050
									1.2569
^{123}Sb	42.79(5)	122.904214				7/2+	+2.550	-0.5	
^{124m2}Sb			20.3 m	I.T./0.035		8-			
^{124m1}Sb			1.6 m	I.T./80/	1.2/	5+			0.4984
				β- /20/	1.7/				0.6027
									0.6458
									1.1010
^{124}Sb		123.905936	60.20 d	β- /2.905	0.61/52	3-	1.2	+1.9	0.60271/97.8
					2.301/23				0.64583/7.4
									0.72277/10.5
									1.69094/48.2
									(0.0274–2.808)
^{125}Sb		124.905254	2.758 y	β- /0.767	0.13/30	7/2+	+2.63		0.0355
					0.302/45				0.17632
					0.62/13				0.38044
									0.42786
									0.46336
									0.60060
									0.63595
^{126m2}Sb			11. s	I.T./		3-			L x-ray
									0.0227
^{126m1}Sb			19.0 m	β- /86 /	1.9	5+			0.4148
				I.T./14 /					0.6663
									0.6950
^{126}Sb		125.90725	12.4 d	β- /3.67	1.9	8-	1.3		0.2786
									0.4148/83.3
									0.6663/99.7
									0.6950/99
									0.7205
^{127}Sb		126.90692	3.84 d	β- /1.581	0.89/	7/2+	2.70		0.2524
					1.10/				0.2908
					1.50/				0.4121
									0.4370
									0.6857
									0.7837
^{128m}Sb			10.1 m	β- /96/	2.6/	5+			0.3140
				I.T./4/					0.5941
									0.7432
									0.7539

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{128}Sb		127.90917	9.1 h	β- /4.38	2.3/	8-	1.3		0.2148
									0.3141
									0.5265
									0.7433
									0.7540
^{129m}Sb			17.7 m	β- /					0.4338
									0.6578
									0.7598
^{129}Sb		128.90915	4.40 h	β- /2.38	0.65/	7/2-	2.82		0.0278
									0.1808
									0.3594
									0.4596
									0.5447
									0.8128
									0.9146
									1.0301
^{130m}Sb			6.5 m	β- /2.6	2.12/				0.1023
									0.7934
									0.8394
^{130}Sb		129.91166	38.4 m	β- /4.96	2.9/	8-			0.1823
									0.3309
									0.4680
									0.7394
									0.8394
^{131}Sb		130.91198	23.0 m	β- /3.20	1.31/	7/2+			0.6423
					3.0/				0.6579
									0.9331
									0.9434
^{132m}Sb			2.8 m	β- /	3.9/	4+			0.1034
									0.3538
									0.6968
									0.9739
									0.9896
^{132}Sb		131.91447	4.2 m	β- /5.49		8-			0.1034
									0.1506
									0.6968
									0.9739
^{133}Sb		132.91525	2.5 m	β- /4.00	1.20/	7/2+	3.00		0.4235
									0.6318
									0.8165
									1.0764
^{134m}Sb			10.4 s	β- /	6.1	7-			
^{134}Sb		133.92038	0.8 s	β- /8.4	8.4	0-			0.1152
									0.2970
									0.7063
									1.2791
^{135}Sb		134.9252	1.71 s	β- /8.12		7/2+			1.127
									1.279
^{136}Sb		135.9304	0.82 s	β- /9.3					
^{137}Sb		136.9353	> 0.15 μs						
^{138}Sb		137.9408	> 0.15 μs						
^{139}Sb		138.9460	> 0.15 μs						
$_{52}$Te		**127.60(3)**							
^{105}Te		104.9436							
^{106}Te		105.9375	0.07 ms	α/4.3	/100	0+			
^{107}Te		106.9350	3.1 ms	α/ 70/	3.86(1)/				(0.090-0.721)
				β+, EC/10.1					
^{108}Te		107.9294	2.1 s	α /68 /	3.314(4)/	0+			

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
				β+, EC/32 /6.8					
^{109}Te		108.9274	4.6 s	β+ EC/96 /8.7					0.7523
				α/4 /	3.107(4)/				0.287−2.045
^{110}Te		109.9224	19. s	β+, EC/4.5		0+			ann.rad./
									0.2191
									0.6059
^{111}Te		110.9211	19.3 s	β+, EC/8.0		(7/2+)			ann.rad./
									0.267
									0.322
									0.341
^{112}Te		111.9170	2.0 m	β+, EC/4.3		0+			ann.rad./
									0.2962
									0.3727
									0.4187
^{113}Te		112.9159	1.7 s	β+ /85/5.7	4.5/	(7/2+)			ann.rad./
				EC/15/					Sb k x-ray
									0.8144
									1.0181
									1.1812
^{114}Te		113.91209	15. m	β+ /40/3.2		0+			ann.rad./
				EC/60/					Sb k x-ray
									0.0838
									0.0903
^{115m}Te			6.7 m	β+ /45/		(1/2+)			ann.rad./
				EC/55/					Sb k x-ray
									0.7236
									0.7704
^{115}Te		114.91190	5.8 m	β+ /45/4.6	2.7/	7/2+			ann.rad./
				EC/55/					Sb k x-ray
									0.7236
									1.3268
									1.3806
									(0.22−2.7)
^{116}Te		115.90846	2.49 h	EC/1.5		0+			Sb k x-ray
									0.0937
^{117}Te		116.90865	1.03 h	EC/75/3.54	1.78/	½+			ann.rad./
				β+ /25/					Sb k x-ray
									0.9197
									1.7164
									2.3000
^{118}Te		117.90583	6.00 d	EC/0.28		0+			Sb k x-ray
^{119m}Te			4.69 d	EC/		11/2-	0.89		Sb k x-ray
									0.15360
									0.2705
									1.21271
^{119}Te		118.90640	16.0 h	β+ /2/2.293	0.627/	½+	0.25		ann.rad.
				EC/98/					Sb k x-ray
									0.6440
									0.6998
^{120}Te	0.09(1)	119.90402				0+			
^{121m}Te			~ 154. d	I.T. (89%)		11/2-	0.90		Te k x-ray
				EC (11%)					0.2122
^{121}Te		120.90494	16.8 d	EC/1.04		½+			Sb k x-ray
									0.5076
									0.5731
^{122}Te	2.55(12)	121.903044				0+			
^{123m}Te			119.7 d	I.T./0.247		11/2-	-0.93		Te k x-ray
									0.1590/84.1
^{123}Te	0.89(3)	122.904270	> 9.2 × 10^{16} y	EC/0.051		½+	-0.73695		
^{124}Te	4.74(14)	123.902818				0+			

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^{125m}Te			58. d	I.T./0.145		11/2-	-0.99	-0.06	Te k x-ray
									0.0355
^{125}Te	7.07(15)	124.904431				½+	-0.8885		
^{126}Te	18.84(25)	125.903312				0+			
^{127m}Te			109. d	I.T./98/0.088		11/2-	-1.04		Te k x-ray
				β- /2/0.77					0.0883
^{127}Te		126.905226	9.4 h	β- /0.698	0.696/	3/2+	0.64		0.3603
^{128}Te	31.74(8)	127.904463	2.2×10^{24} y	β-β-		0+			
^{129m}Te			33.6 d	I.T./63/0.105		11/2-	-1.09		Te k x-ray
				β- /37/	1.60/				0.45984
									0.6959
^{129}Te		128.906598	1.16 h	β- /1.498	0.99/9	3/2+	0.70	0.06	0.0278
					1.45/89				0.45984
									0.48728
^{130}Te	34.08(62)	129.906224	8×10^{20} y	β-β-		0+			
^{131m}Te			1.35 d	β- /78/2.4	0.42/	11/2-	-1.04		0.0811
				I.T./22/0.18					0.1021
									0.14973
									0.77369
									0.79375
									0.85225
^{131}Te		130.908524	25.0 m	β- /2.233	1.35/12	3/2+	0.70		0.14973
					1.69/22				0.45327
					2.14/60				0.49269
^{132}Te		131.90855	3.26 d	β- /0.51	0.215	0+			0.049725
									0.11198
									0.22830
^{133m}Te			55.4 m	β- /82/	2.4/30	11/2-			Te k x-ray
				I.T./18/0.334					0.0949
									0.1689
									0.3121
									0.3341
^{133}Te		132.91096	12.4 m	β- /2.94	2.25/25	3/2+			0.3121
					2.65				0.4079
									1.3334
^{134}Te		133.91137	42. m	β- /1.51	0.6/	0+			0.7672/29
					0.7/				0.0794–0.9255
^{135}Te		134.9165	19.0 s	β- /6.0	5.4/				0.267
					6.0				0.603
									0.870
^{136}Te		135.92010	17.5 s	β- /5.1	2.5/	0+			2.0779/25
									0.0873–3.235
^{137}Te		136.9253	2.5 s	β- /98 /6.9	6.8	7/2-			0.2436
				n/2 /					
^{138}Te		137.9292	1.4 s	β- /6.4		0+			
^{139}Te		138.9347	> 0.15 μs						
^{140}Te		139.9389	> 0.15 μs			0+			
^{141}Te		140.9447	> 0.15 μs						
^{142}Te		141.949	> 0.15 μs			0+			
$_{53}$I		**126.90447(3)**							
^{108}I		107.9435	0.04 s	α/91/4.	3.95				
^{109}I		108.9382	0.11 ms	p					0.593/100
									0.717/63
									0.496–1.057
^{110}I		109.9352	0.65 s	β+, EC/83/11.4					ann.rad./
				α/17/~ 3.6	3.457(10)/				
				p/11/					
^{111}I		110.9303	2.5 s	β+, E.C./8.5					ann.rad./

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									0.2665
									0.3215
									0.3412
^{112}I		111.9280	3.4 s	β+, EC/10.2					ann.rad./
									0.6889
									0.7869
^{113}I		112.9236	5.9 s	β+, EC/7.6					ann.rad./
									0.4625/100
									0.6224/74
									0.0550−1.422
^{114}I		113.9219	2.1 s	β+, EC/8.7					ann.rad./
									0.6826
									0.7088
^{115}I		114.9181	1.3 m	β+, EC/6.7		5/2+			ann.rad./
									0.275
									0.284
									0.460
									0.709
^{116}I		115.9168	2.9 s	β+ /97/7.8	6.7/	1+			ann.rad./
				EC/3/					0.5402
									0.6789
^{117}I		116.91365	2.22 m	β+, EC/4.7	3.2/	(5/2+)	3.1		ann.rad./
									0.2744
									0.3259
^{118m}I			8.5 m	β+, EC/	4.9/	7-	4.2		ann.rad./
				I.T.					0.104
									0.5998
									0.6052
									0.6138
^{118}I		117.91307	14. m	β+, EC/7.0		2-	2.0		ann.rad./
									0.5448
									0.6052
									1.3384
^{119}I		118.91007	19. m	β+ /54/3.5	2.4/	(5/2+)	+2.9		ann.rad./
				EC/46/					Te k x-ray
									0.2575
^{120m}I			53. m	β+ /80/	3.8		4.2		ann.rad.
				EC/20/					Te k x-ray
									0.4257
									0.5604
									0.6147
									1.3459
^{120}I		119.91005	1.35 h	β+ /56/5.62	4.03	2-	1.23		ann.rad./
				EC/	4.60				Te k x-ray
									0.5604
									0.6411
									1.5230
									(0.111−3.1)
^{121}I		120.90737	2.12 h	β+ /13/2.27	1.2/	5/2+	2.3		ann.rad./
				EC/87/					Te k x-ray
									0.2122
									(0.14−1.1)
^{122}I		121.90759	3.6 m	β+ /4.234	3.1/	1+	+0.94		ann.rad./
				EC/					Te k x-ray
									0.5641
^{123}I		122.905589	13.2 h	EC/1.242		5/2+	2.82		Te k x-ray
									0.1590
^{124}I		123.906210	4.18 d	β+ /23/3.160	1.54/	2-	1.44		ann.rad./
				EC/77/	2.14/				Te k x-ray
					0.75/				0.6027/62.9

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									0.7228/10.3
									1.6910/11.2
									(0.31−1.73)
^{125}I		124.904630	59.4 d	EC/0.1861		5/2+	2.82	-0.89	Te k x-ray
									0.0355
^{126}I		125.905624	13.0 d	EC/		2-	1.44		ann.rad./
				β+ /2.155	1.13/				Te k x-ray
				β- /1.258/47	0.87/				0.3887
					1.25/				0.6622
^{127}I	100.	126.904473				5/2+	+2.8133	-0.79	
^{128}I		127.905809	25.00 m	β- /2.118	2.13/	1+			Te k x-ray
				EC/1.251					0.44287
									0.52658
^{129}I		128.904988	1.7×10^7 y	β- /0.194	0.15/	7/2+	+2.621	-0.55	Xe k x-ray
									0.0396
^{130m}I			9.0 m	I.T./83/0.048		2+			I k x-ray
				β- /17/					0.5361
^{130}I		129.906674	12.36 h	β- /2.949	1.04/	5+	3.35		0.4180
					0.62				0.5361
									0.6685
									0.7395
^{131}I		130.906125	8.021 d	β- /0.971	0.606/	7/2+	+2.742	-0.40	0.08017
									0.28431
									0.36446
									0.63699
^{132m}I			1.39 h	IT		8-			
^{132}I		131.90800	2.28 h	β- /14/3.58	0.80/	4+	3.09	0.09	I k x-ray
				I.T./86/	1.03/				0.0980
					1.2/				0.5059
					1.6/				0.52264
					2.16/				0.63019
									0.6506
									0.66768
									0.77260
									0.95457
^{133m}I			9. s	I.T./1.63		19/2-			I Kx-ray
									0.0730
									0.6474
									0.9126
^{133}I		132.907797	20.8 h	β- /1.77	1.24/85	7/2+	+2.86	-0.27	0.51056
									0.52989
									0.87537
^{134m}I			3.7 m	I.T./98/0.316		8-			I k x-ray
				β- /2/					0.0444
									0.2719
^{134}I		133.90974	52.6 m	β- /4.05	1.2/	4+			0.1354
									0.84702
									0.88409
^{135}I		134.91005	6.57 h	β- /2.63	0.9/	7/2+	2.94		0.2884
					1.3/				0.41768
									0.52658
									1.13156
									1.26046
^{136m}I			47. s	β- /	4.7/	6-			0.1973
					5.2/				0.3468
									0.3701
									0.3814
									1.3130
									(0.16−2.36)
^{136}I		135.91465	1.39 m	β- /6.93	4.3/	2-			0.3447

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					5.6/				1.3130
									1.3211
									2.2896
									(0.3−6.1)
^{137}I		136.91787	24.5 s	β- /5.88	5.0/	(7/2+)			0.6010
									1.2180
									1.2201
									1.3026
									1.5343
									(0.25−4.4)
^{138}I		137.9224	6.5 s	β- /7.8	6.9/	2-			0.4836
					7.4/				0.5888
									0.8752
									(0.4−5.3)
^{139}I		138.92610	2.30 s	β- /6.81					0.192
				n/					0.198
									0.273
									0.382
									0.386
									0.468
									0.683
									1.313
^{140}I		139.9310	0.86 s	β- /8.8		(3)			0.372
				n/					0.377
									0.457
^{141}I		140.9350	0.45 s	β- /7.8					
^{142}I		141.9402	~ 0.2 s	β-					
^{143}I		142.9446	> 0.15 μs						
^{144}I		143.9500	> 0.15 μs						
$_{54}$Xe		**131.293(6)**							
^{110}Xe		109.9443	0.11 s	β+ /9.2		0+			
				α	/~ 64				
^{111m}Xe			0.9 s	EC, β+					
^{111}Xe		110.9416	0.7 s	EC, β+ /10.6					
				α/	3.58(1)/				
^{112}Xe		111.9356	3. s	EC, β+ /7.2	α/0.8/	0+			
^{113}Xe		112.9333	2.8 s	EC, β+ /9.1					
^{114}Xe		113.92798	10.0 s	β+, EC/5.9		0+			ann.rad./
									0.1031
									0.1616
									0.3085
									0.6826
									0.7088
^{115}Xe		114.92629	18. s	β+, EC/7.6		(5/2+)			ann.rad./
^{116}Xe		115.92158	56. s	β+, EC/4.3	3.3/	0+			ann.rad./
									0.1042
									0.1916
									0.2477
									0.3107
									0.4127
^{117}Xe		116.92036	1.02 m	β+, EC/6.5		(5/2+)	-0.594	+1.16	ann.rad./
									0.2214
									0.5190
									0.6389
									0.6613
^{118}Xe		117.91618	~ 4. m	β+, EC/3.	2.7/	0+			ann.rad./
									0.0535
									0.0600

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.1199
^{119}Xe		118.91541	5.8 m	β+, EC/5.0	3.5/	7/2+	-0.654	+1.31	0.0873
									0.1000
									0.2318
									0.4615
^{120}Xe		119.91178	40. m	β+, EC/97/1.96		0+			I k x-ray
				β+ /3/					0.0251
									0.0726
									0.1781
									(0.1−1.03)
^{121}Xe		120.91146	39. m	β+ /44/3.73	2.8/	5/2+	-0.701	+1.33	ann.rad./
				EC/56/					I k x-ray
									0.1328
									0.2527
									0.4452
									(0.1−3.1)
^{122}Xe		121.90837	20.1 h	EC/0.9		0+			I k x-ray
									0.3501
^{123}Xe		122.90848	2.00 h	β+ /23/2.68	1.51/	½+	-0.150		ann.rad./
				EC/77/					I k x-ray
									0.1489
									0.1781
									(0.1−2.1)
^{124}Xe	0.0952(3)	123.905893	> 10^{17} y	β-β-		0+			
^{125m}Xe			57. s	I.T./0.252		(9/2-)	-0.745	+0.42	Xe k x-ray
									0.1111
									0.141
^{125}Xe		124.906395	17.1 h	EC/1.653	0.47/	½+	-0.269		I k x-ray
									0.1884
									0.2434
^{126}Xe	0.0890(2)	125.90427				0+			
^{127m}Xe			1.15 m	I.T./0.297		(9/2-)	-0.884	+0.69	Xe k x-ray
									0.1246
									0.1725
^{127}Xe		126.905184	36.34 d	EC/0.662		½+	-0.504		I k x-ray
									0.1721
									0.2029
									0.3750
^{128}Xe	1.9102(8)	127.903531				0+			
^{129m}Xe			8.89 d	I.T./0.236		11/2-	-0.891	+0.64	Xe k x-ray
									0.0396
									0.1966
^{129}Xe	26.4006(82)	128.904779				½+	-0.7780		
^{130}Xe	4.0710(13)	129.903508				0+			
^{131m}Xe			11.9 d	I.T./0.164		11/2-	-0.9940	+0.73	Xe k x-ray
									0.16398
^{131}Xe	21.2324(30)	130.905082				3/2+	+0.69186	-0.12	
^{132}Xe	26.9086(33)	131.904153				0+			
^{133m}Xe			2.19 d	I.T./0.233		11/2-	-1.082	+0.77	Xe k x-ray
									0.23325
^{133}Xe		132.905911	5.243 d	β- /0.427	0.346/99	3/2+	+0.813	+0.14	Cs k x-ray
									0.080998
									0.1606
^{134}Xe	10.4357(21)	133.905394	> 1.1 × 10^{16} y	β- β-		0+			
^{135m}Xe			15.3 m	I.T./		11/2-	1.103	+0.62	Xe k x-ray
									0.52658
^{135}Xe		134.907227	9.10 h	β-/1.15	0.91/	3/2+	0.903	+0.21	0.24975
									0.60807
^{136}Xe	8.8573(44)	135.90722	> 2.4 × 10^{21} y	β-β-		0+			
^{137}Xe		136.91156	3.82 m	β- /4.17	4.1/	7/2-	-0.970	-0.49	0.45549

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					3.6/				0.8489
									0.9822
									1.2732
									1.7834
									2.8498
^{138}Xe		137.91395	14.1 m	β- /2.77	0.8/	0+			0.1538
					2.4/				0.2426
									0.2583
									0.4345
									1.76826
									2.0158
^{139}Xe		138.91879	39.7 s	β- /5.06	4.5/		-0.304	+0.40	0.1750
					5.0/				0.2186
									0.2965
									(0.1−3.37)
^{140}Xe		139.9216	13.6 s	β- /4.1	2.6	0+			0.0801
									0.6220
									0.8055
									1.4137
									(0.04−2.3)
^{141}Xe		140.9266	1.72 s	β- /6.2	6.2/	5/2+	+0.010	-0.58	0.1187
									0.9095
									(0.05−2.55)
^{142}Xe		141.9297	1.22 s	β- /5.0	3.7/	0+			0.0338
					4.2/				0.0729
									0.2038
									0.3091
									0.4145
									0.5382
									0.5718
									0.6181
									0.6448
^{143m}Xe			0.96 s	β-					
^{143}Xe		142.9351	0.30 s	β- /7.3			-0.460	+0.93	
^{144}Xe		143.9385	1.2 s	β- /6.1		0+			
^{145}Xe		144.9441	0.9 s	β-, (n)					
^{146}Xe		145.9478	> 0.15 μs			0+			
^{147}Xe		146.9536	> 0.15 μs						
$_{55}$Cs		**132.9054519(2)**							
^{112}Cs		111.9503	0.5 ms	p	0.81				
^{113}Cs		112.9445	17. μs	p	0.96				
^{114}Cs		113.9414	0.58 s	β+, EC/11.8		1+			ann.rad./
									0.6826
									0.7088
^{115}Cs		114.9359	~ 1.4 s	β+, EC/8.4					ann.rad./
^{116m}Cs			0.7 s	β, EC/					ann.rad./
									0.3935
^{116}Cs		115.9334	3.8 s	β+, EC/10.8					ann.rad./
									0.3935
									0.5243
									0.6151
									0.6223
^{117m}Cs			6.5 s	β+, EC/					
^{117}Cs		116.9287	~ 8.4 s	β+, EC/7.5					ann.rad./
^{118m}Cs			17. s	β+, EC/			5.		
^{118}Cs		117.92656	14. s	β+, EC/9.		2	+3.88	+1.4	ann.rad./
									0.3372
									0.4727

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.5865
									0.5906
^{119m}Cs			29. s			3/2	+0.84	+0.9	
^{119}Cs		118.92238	43. s	β+, EC/6.3		9/2+	+5.5	+2.8	ann.rad./
									0.169
									0.176
									0.224
									0.257
^{120m}Cs			60. s	β+, EC/					
^{120}Cs		119.92068	64. s	β+, EC/7.92		2+	+3.87	+1.45	ann.rad./
									0.3224
									0.4735
									0.5534
									(0.3−3.28)
^{121m}Cs			2.0 m	I.T./60/		(9/2+)	+5.41	+2.7	ann.rad./
				β+ /40/	4.4				0.1794
									0.1961
^{121}Cs		120.91723	2.3 m	β+, EC/5.40	4.38/	3/2+	+0.77	+0.84	ann.rad./
									0.1537
									(0.08−0.56)
^{122m2}Cs			4.4 m	β+, EC		8-	+4.77	+3.3	ann.rad./
^{122m1}Cs			0.36 s	IT					0.3311
									0.4971
									0.6385
									(0.27−2.22)
^{122}Cs		121.91611	21. s	β+, EC/7.1	5.8/	(1+)	-0.133	-0.19	ann.rad./
									0.3311
									0.5120
									0.8179
^{123m}Cs			1.6 s	I.T./		11/2-			Cs k x-ray
									0.0946
^{123}Cs		122.91300	5.87 m	β+ /75/4.20	3.0/	1/2+	+1.38		ann.rad./
				EC/25/					Xe k x-ray
									0.0974
									0.5964
^{124m}Cs			6.3 s	IT		7+			
^{124}Cs		123.91226	30. s	β+ /9 /5.92	~ 5.	1+	+0.673	-0.74	ann.rad./
				EC/8 /					Xe k x-ray
									0.3539
									0.4925
									0.9418
^{125}Cs		124.90973	45. m	β+ /40/3.09	2.06/	1/2+	+1.41		ann.rad./
				EC/60/					Xe k x-ray
									0.112
									0.526
^{126}Cs		125.90945	1.64 m.	β+ /81/4.83	3.4	1+	+0.78	-0.68	ann.rad./
				EC/19/	3.7/				Xe k x-ray
									0.3886
									0.4912
									0.9252
^{127}Cs		126.90742	6.2 h	β+ /96/2.08	0.65/	1/2+	+1.46		Xe k x-ray
				EC/4/	1.06				0.1247
									0.4119
^{128}Cs		127.90775	3.62 m	β+ /68/3.930	2.44/	1+	+0.97	-0.57	ann.rad./
				EC/32 /	2.88/				Xe k x-ray
									0.4429
^{129}Cs		128.90606	1.336 d	EC/1.195		1/2+	+1.49		Xe k x-ray
									0.3719
									0.4115
^{130m}Cs			3.5 m	IT, β+, EC		5-	+0.629	+1.45	

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{130}Cs		129.90671	29.21 m	β+ /55/2.98	1.98/	1+	+1.46	-0.06	ann.rad./
				EC/43/					Xe k x-ray
				β- /1.6/0.37	0.44/1.6				0.5361
^{131}Cs		130.90546	9.69 d	EC/0.352		5/2+	+3.54	-0.58	Xe k x-ray
^{132}Cs		131.906434	6.48 d	EC/98/		2-	+2.22	+0.51	Xe k x-ray
				β+ /0.3/2.120					0.4646
				β- / /1.280					0.6302
									0.66769
^{133}Cs	100.	132.90545193				7/2+	+2.582	-0.00355	
^{134m}Cs			2.91 h	I.T./0.139		8-	+1.098	+1.0	Cs k x-ray
									0.12749
^{134}Cs		133.90671848	2.065 y	β- /2.059	0.089/27	4+	+2.994	+0.39	0.56327
					0.658/70				0.56935
				EC/1.22					0.60473
									0.79584
^{135m}Cs			53. m	I.T./1.627		19/2-	+2.18	+0.9	0.7869
									0.8402
^{135}Cs		134.905977	2.3×10^6 y	β- /0.269	0.205/100	7/2+	+2.732	+0.05	
^{136m}Cs			19. s	I.T./		8-	+1.32	+0.7	
^{136}Cs		135.907312	13.16 d	β- /2.548	0.341/	5+	+3.71	+0.2	0.06691
									0.34057
									0.81850
									1.04807
^{137}Cs		136.907089	30.2 y	β- /1.176	0.514/95	7/2+	+2.84	+0.05	Ba k x-ray
									0.66164
^{138m}Cs			2.9 m	I.T./75	/0.080	6-	+1.71	-0.40	Cs k x-ray
				β- /25 /	3.3				0.0799
									0.1917
									0.4628
									1.43579
^{138}Cs		137.91102	32.2 m	β- /5.37	2.9/	3-	+0.700	+0.12	0.1381
									0.46269
									1.00969
									1.43579
									2.21788
^{139}Cs		138.913364	9.3 m	β- /4.213	4.21	7/2+	+2.70	-0.07	0.6272
									1.2832
									(0.4–3.66)
^{140}Cs		139.91728	1.06 m	β- /6.22	5.7/	1-	+0.13390	-0.11	0.5283
					6.21/				0.6023
									0.9084
									(0.41–3.94)
^{141}Cs		140.92005	24.9 s	β- /5.26	5.20/	7/2+	+2.44	-0.4	Ba k x-ray
									0.0485
									0.5616
									0.5887
									1.1940
									(0.05–3.33)
^{142}Cs		141.92430	1.8 s	β- /7.31	6.9/				0.3596
					7.28				0.9668
									1.1759
									1.3265
^{143}Cs		142.92735	1.78 s	β- /6.24	6.1	(3/2+)	+0.87	+0.47	0.1955
									0.2324
									0.3064
									(0.17–1.98)
^{144}Cs		143.93208	1.01 s	β- /8.47	8.46/	1	-0.546	+0.30	0.1993
					7.9/				0.5598
									0.6392
									0.7587

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^{145}Cs		144.93553	0.59 s	β- /7.89	7.4/	3/2+	+0.784	+0.6	0.1126
					7.9/				0.1755
									0.1990
^{146}Cs		145.9403	0.322 s	β-, (n)/9.38	~ 9.0	2-	-0.515	+0.22	
^{147}Cs		146.9442	0.227 s	β-, (n)/9.3					(0.024-2.2798)
^{148}Cs		147.9492	0.15 s	β-, (n)/10.5					
^{149}Cs		148.9529	> 50 ms						
^{150}Cs		149.9582	> 50 ms						
^{151}Cs		150.9622	> 50 ms						
$_{56}$Ba		**137.327(7)**							
^{114}Ba		113.9507	0.43 s	β+, (p)	p/20	0+			
				α	/0.9				
^{115}Ba		114.947	0.45 s	β+, (p)	p/<15				
^{116}Ba		115.9414	1.3 s	β+, (p)	p/3	0+			
^{117}Ba		116.9385	1.8 s	β+, (p), EC/8.4	p/16	(3/2-)			(0.0457−0.364)
^{118}Ba		117.9330	5.2 s	β+,		0+			(0.040−0.156)
^{119}Ba		118.9307	5.4 s	β+, EC/8.					
^{120}Ba		119.9260	24. s	β+, EC/5.0		0+			ann.rad./
									0.140
									(0.075−0.146)
^{121}Ba		120.9241	30. s	β+, EC/6.8		5/2+	+0.660	+1.8	ann.rad./
^{122}Ba		121.91990	2.0 m	β+, EC/3.8		0+			ann.rad./
^{123}Ba		122.91878	2.7 m	β+, EC/5.5			-0.68	+1.5	ann.rad./
									0.0306
									0.0927
									0.1161
									0.1235
^{124}Ba		123.91509	12. m	β+, EC/2.65		0+			ann.rad./
									0.1695
									0.1888
									1.2160
^{125m}Ba			8. m	β+, EC/	4.5		0.174		
^{125}Ba		124.9145	3.5 m	β+, EC/4.6	3.4	½+	+0.18		ann.rad./
									0.0550
									0.0776
									0.0854
									0.1409
^{126}Ba		125.91125	1.65 h	β+ /2/1.67		0+			Cs k x-ray
				EC/98 /					0.2179
									0.2336
									0.2576
^{127m}Ba			1.9 s	IT		7/2-	-0.723	1.6	
^{127}Ba		126.91109	12.9 m	β+ /54/3.5		1/2+	+0.083		ann.rad./
				EC/46/					Cs k x-ray
									0.1148
									0.1808
									(0.07−2.5)
^{128}Ba		127.90832	2.43 d	EC/0.52		0+			Cs k x-ray
									0.27344
^{129m}Ba			2.17 h	EC/98/		7/2+	+0.93	+1.6	Cs k x-ray
				β+ /2/					0.1769
									0.1823
									0.2023
									1.4593
^{129}Ba		128.90868	2.2 h	β+ /20/2.43	1.42/	1/2+	-0.40		ann.rad./
				EC/80/					Cs k x-ray
									0.1291
									0.2143

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.2208
^{130m}Ba			9.5 ms	I.T./2.475	/100.	8-	-0.04	+2.8	0.080−0.802
^{130}Ba	0.106(1)	129.906321	2.2×10^{21} y	β+β+		0+			
^{131m}Ba			14.6 m	I.T./0.187		9/2-	-0.87	+1.5	Ba k x-ray
									0.1085
^{131}Ba		130.906941	11.7 d	EC/1.37		1/2+	0.7081		Cs k x-ray
									0.12381/28.4
									0.21608/21.3
									0.49636/42.9
									(0.0549−1.171)
^{132}Ba	0.101(1)	131.905061	1.3×10^{21} y	EC EC		0+			
^{133m}Ba			1.621 d	I.T./0.288		11/2-	-0.91	+0.9	Ba k x-ray
									0.2761
^{133}Ba		132.906008	10.53 y	EC/0.517		1/2+	0.7717		Cs k x-ray
									0.08099
									0.35600
^{134}Ba	2.417(18)	133.904508				0+			
^{135m}Ba			1.20 d	I.T./0.2682		11/2-	-1.00	+1.0	Ba k x-ray
									0.2682
^{135}Ba	6.592(12)	134.9056886				3/2+	+0.838	+0.16	
^{136m}Ba			0.308 s	I.T./2.0305		7-			Ba k x-ray
									0.8185
									1.0481
^{136}Ba	7.854(24)	135.9045759				0+			
^{137m}Ba			2.552 m	I.T./0.6617		11/2-	-0.99	+0.8	Ba k x-ray
									0.66164
^{137}Ba	11.232(24)	136.9058274				3/2+	+0.9374	+0.245	
^{138}Ba	71.698(42)	137.9052472				0+			
^{139}Ba		138.9088412	1.396 h	β- /2.317	2.14/27	7/2-	-0.97	-0.57	0.16585
					2.27/72				1.2544
									1.42033
^{140}Ba		139.91060	12.75 d	β- /1.05	0.48	0+			0.16268
					1.0/				0.30485
					1.02/				0.53727
^{141}Ba		140.91441	18.3 m	β- /3.22	2.59/	3/2-	-0.34	+0.45	0.1903
					2.73/				0.2770
									0.3042
									(0.1−2.5)
^{142}Ba		141.91645	10.7 m	β- /2.212	1.0/	0+			0.23152
					1.10/				0.25512
									0.3090
									1.2040
^{143}Ba		142.92063	14.3 s	β- /4.24	4.2/	5/2+	+0.44	-0.88	0.1786
									0.21148
									0.7988
									(0.17−2.4)
^{144}Ba		143.92295	11.4 s	β- /3.1	2.4/	0+			La k x-ray
					2.9/				0.10386
									0.1566
									0.1728
									0.3882
									0.43048
^{145}Ba		144.9276	4.0 s	β- /4.9	4.9/	(5/2-)	-0.28	+1.22	La k x-ray
									0.0918
									0.09709
^{146}Ba		145.9302	2.20 s	β- /4.12	3.9/	0+			0.0644
									0.2513
									0.3270
									0.3329
									0.3622

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{147}Ba		146.9349	0.892 s	β- /5.75	5.5/				
^{148}Ba		147.9377	0.64 s	β-, n/5.11		0+			
^{149}Ba		148.9426	0.36 s	β-, (n)/7.3					
^{150}Ba		149.9457	0.3 s			0+			
^{151}Ba		150.9508	> 0.15 μs						
^{152}Ba		151.9543				0+			
^{153}Ba		151.960							
$_{57}$La		**138.90547(7)**							
^{117}La		116.9501	23 ms	p	0.806/	3/2+			
^{118}La		117.9467							
^{119}La		118.9410							
^{120}La		119.9381	2.8 s	EC, β+ /11.					
^{121}La		120.9330	5.3 s						
^{122}La		121.9307	9. s	EC, β+/~ 9.7					
^{123}La		122.9262	17. s	EC/7.					
^{124}La		123.9246	30. s	EC/ ~ 8.8		(7+)			
^{125m}La			0.39 s						
^{125}La		124.92082	1.2 m	β+, EC/5.6		11/2-			ann.rad./
									0.0436
									0.0676
^{126m}La			< 50. s						
^{126}La		125.9195	54. s	β+, EC/7.6					ann.rad./
									0.256
									0.455
									0.117−3.853
^{127}La		126.91638	3.8 m	β+, EC/4.7		3/2+			ann.rad./
									0.025
									0.0562
^{128}La		127.9156	5.0 m	β+ /80/6.7		(5-)			ann.rad./
				EC/20/					Ba k x-ray
									0.2841/87
									0.4793/54
									(0.315−2.212)
^{129m}La			0.56 s	IT		(11/2-)			
^{129}La		128.91269	11.6 m	β+ /58/3.72	2.42/	3/2+			ann.rad./
				EC/42/					Ba k x-ray
									0.1105
									0.2786
									(0.1−1.8)
^{130}La		129.91237	8.7 m	β+ /78/5.6		3+			ann.rad./
				EC/22/					Ba k x-ray
									0.3573/81
									0.5506/27
									(0.1965−1.989)
^{131}La		130.91007	59. m	β+ /76/3.0	1.42/	3/2+			ann.rad./
				EC/24/	1.94/				Ba k x-ray
									0.1085
									0.3658
									0.5263
^{132m}La			24. m	I.T./76/		6-			La k x-ray
				β+, EC/24/					0.1352
									0.4645
^{132}La		131.91010	4.8 h	β+ /40/4.71	2.6/	2-			ann.rad./
				EC/60/	3.2				Ba k x-ray
					3.7/				0.4645
									0.5671
^{133}La		132.90822	3.91 h	β+ /4/2.2	1.2/	5/2+			Ba k x-ray
				EC/96/					0.2788

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.2901
									0.3024
^{134}La		133.90851	6.5 m	β+ /63/3.71	2.67/	1+			ann.rad./
				EC/37/					Ba k x-ray
									0.6047
									(0.5−1.9)
^{135}La		134.90698	19.5 h	EC/1.20		5/2+			Ba k x-ray
									0.4805
^{136}La		135.9076	9.87 m	β+ /36/2.9	1.8/	1+			ann.rad./
				EC/64/					Ba k x-ray
									0.8185
^{137}La		136.90649	6×10^4 y	EC/0.60		7/2+	+2.70	+0.2	0.2836
^{138}La	0.0888(6)	137.907112	1.06×10^{11} y			5+	+3.7136	+0.4	1.4358/65
									0.7887/35
^{139}La	99.9112(6)	138.906353				7/2+	+2.7830	+0.20	
^{140}La		139.909478	1.678 d	β- /3.762	1.35	3-	+0.73	+0.09	
					1.24/				
					1.67/				
^{141}La		140.910962	3.90 h	β- /2.502	2.43/	7/2+			
^{142}La		141.91408	1.54 h	β- /4.505	2.11/	2-			
					2.98/				
					4.52/				
^{143}La		142.91606	14.1 m	β- /3.43	3.3/	7/2-			
^{144}La		143.91960	40.7 s	β- /5.5	4.1/				
^{145}La		144.9216	24. s	β- /4.1	4.1/	3/2+			
^{146m}La			10.0 s	β- /6.7	5.5/	(6)			
^{146}La		145.9258	6.3 s	β- /6.6	6.2/	(2-)			
^{147}La		146.9282	4.02 s	β- /5.0	4.6/				
^{148}La		147.9322	1.1 s	β- /7.26		2-			
^{149}La		148.9347	1.10 s	β- /5.5					0.1335
									0.009−1.709
^{150}La		149.9388	0.51 s						x-ray
									(0.097−0.209)
^{151}La		150.9417	> 0.15 μs						
^{152}La		151.9462	> 0.15 μs						
^{153}La		152.950	> 0.15 μs						
^{154}La		153.955							
^{155}La		154.958							
$_{58}$Ce		**140.116(1)**							
^{119}Ce		118.953							
^{120}Ce		119.947				0+			
^{121}Ce		120.943	1.1 s	β+, p					
^{122}Ce		121.9379				0+			
^{123}Ce		122.9354	3.8 s	β+, EC/~ 8.6					ann.rad./
^{124}Ce		123.9304	6. s	EC/~ 5.6		0+			
^{125}Ce		124.9284	9.6 s	β+, EC/7.		7/2-			ann.rad./
									0.1346
									0.1666
									0.056−1.329
^{126}Ce		125.92397	50. s	EC/4.		0+			
^{127}Ce		126.9227	29. s	β+, EC/6.1					ann.rad./
									(0.058−1.961)
^{128}Ce		127.91891	4.1 m	β+, EC/3.2		0+			ann.rad./
									(0.023−0.880)
^{129}Ce		128.91810	3.5 m	β+, EC/5.6					ann.rad./
									(0.0675−1.015)
^{130}Ce		129.91474	26. m	β+, EC/2.2		0+			ann.rad./
									La k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.047−1.431
^{131m}Ce			5. m	β+ EC					ann.rad./
									0.2304
									0.3955
									0.4213
^{131}Ce		130.91442	10. m	β+, EC/4.0	2.8/				ann.rad.
									0.119
									0.169
									0.414
^{132m}Ce			9.4 ms	IT/2.340					0.3255
									0.10−0.955
^{132}Ce		131.91146	3.5 h	EC/1.3		0+			La k x-ray
									0.1554
									0.1821
^{133m}Ce			1.6 h	β+, EC/		½+			ann.rad.
									0.0769
									0.0973
									0.5577
^{133}Ce		132.91152	5.4 h	β+/8/2.9	1.3/	9/2-			ann.rad.
				EC/92/					0.0584
									0.1308
									0.4722
									0.5104
^{134}Ce		133.90892	3.16 d	EC/0.5		0+			La k x-ray
									0.1304
									0.1623
									0.6047
^{135m}Ce			20. s	I.T./0.446		11/2-			Ce k x-ray
									0.0826
									0.1497
									0.2134
^{135}Ce		134.90915	17.7 h	β+/1 /2.026	0.8/	1/2+			La k x-ray
				EC/99 /					0.0345
									0.2656
									0.3001
									0.6068
^{136}Ce	0.185(2)	135.90717	> 0.7×10^{14} y	EC EC		0+			
^{137m}Ce			1.43 d	I.T./99 /0.254		11/2-	1.0		Ce k x-ray
				EC/0.8 /					0.1693
									0.2543
^{137}Ce		136.90781	9.0 h	β+/1.222		3/2+	0.96		La k x-ray
									0.4472
^{138}Ce	0.251(2)	137.90599	> 0.9×10^{14} y	EC EC		0+			
^{139m}Ce			56.4 s	I.T./0.7542		11/2-			Ce k x-ray
									0.7542
^{139}Ce		138.90665	137.6 d	EC/0.28		3/2+	1.06		La k x-ray
^{140}Ce	88.450(51)	139.905439				0+			0.16585
^{141}Ce		140.908276	32.50 d	β-/0.581	0.436/69	7/2-	1.1		Pr k x-ray
					0.581/31				0.14544/48.0
^{142}Ce	11.114(51)	141.909244	> 1.6×10^{17} y	β- β-		0+			
^{143}Ce		142.912386	1.38 d	β-/1.462	1.404/	3/2-	0.43		Pr k x-ray
					1.110/47				0.0574
									0.2933
^{144}Ce		143.913647	284.6 d	β-/0.319	0.185/20	0+			Pr k x-ray
					0.318/				0.0801
									0.1335
^{145}Ce		144.91723	3.00 m	β-/2.54	1.7/24	3/2-			Pr k x-ray
					1.3				0.0627
									0.7245
^{146}Ce		145.9188	13.5 m	β-/1.04	0.7/90	0+			Pr k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.0986
									0.2182
									0.3167
									0.0930
^{147}Ce		146.92267	56. s	β-/3.29	3.3/				0.2687
^{148}Ce		147.92443	56. s	β-/2.1	1.66/	0+			0.0904
									0.0985
									0.1212
									0.2918
^{149}Ce		148.9284	5.2 s	β-/4.2					0.0577
									0.0864
									0.3800
									0.1099
^{150}Ce		149.93041	4.4 s	β-/3.0		0+			0.0526
^{151}Ce		150.9340	1.0 s	β-/5.3					Pr k x-ray
^{152}Ce		151.9365	1.4 s	β-/4.4		0+			0.098
									0.115
^{153}Ce		152.9406	> 0.15 μs						
^{154}Ce		153.9434	> 0.15 μs			0+			
^{155}Ce		154.948	> 0.15 μs						
^{156}Ce		155.951				0+			
^{157}Ce		156.956							
$_{59}$Pr		**140.90765(2)**							
^{121}Pr		120.955	0.01 s	p	p/0.882				
^{122}Pr		121.9518							
^{123}Pr		122.946							
^{124}Pr		123.943	1.2 s	β+, EC/12.					ann.rad./
^{125}Pr		124.9378	~ 3.3 s	β+					ann.rad./
									0.1358
^{126}Pr		125.9353	3.1 s	β+, EC/~ 10.4					ann.rad./
									(0.170−0.985)
^{127}Pr		126.9308	4.2 s	β+ /~ 7.5					ann.rad./
									(0.028−0.8949)
^{128}Pr		127.92879	3.0 s	β+, EC/~ 9.3					ann.rad./
									0.207/100
									0.400−1.373
^{129}Pr		128.92510	32 s	β+, EC/5.8					ann.rad./
									(0.0395−1.865)
^{130}Pr		129.9236	40. s	β+, EC/8.1					ann.rad./
^{131m}Pr			5.7 s						(0.06−0.16)
^{131}Pr		130.9203	1.7 m	β+, EC/5.3				~ 5.5	ann.rad./
									(0.059−0.980)
^{132}Pr		131.9193	1.6 m	β+, EC/7.1					ann.rad./
									0.325
									0.496
									0.533
^{133m}Pr			1.1 s	IT/0.192					0.1305
									0.0617
^{133}Pr		132.91633	6.5 m	β+, EC/4.3		5/2+			ann.rad./
									0.074
									0.1343
									0.2419
									0.3156
									0.3308
									0.4650
^{134m}Pr			~ 11. m	β+, EC/					ann.rad./
									0.294
									0.460

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.495
									0.632
^{134}Pr		133.91571	17. m	β+, EC/6.2		2+			ann.rad./
									0.294
									0.495
^{135}Pr		134.91311	24. m	β+, EC/3.7	2.5/	3/2+			ann.rad./
									0.0826
									0.2135
									0.2961
									0.5832
^{136}Pr		135.91269	13.1 m	β+ /57 /5.13	2.98/	2+			ann.rad./
				EC/43					Ce k x-ray
									0.5398
									0.5522
^{137}Pr		136.91071	1.28 h	β+ /26 /2.70	1.68/	5/2+			ann.rad./
				EC/74 /					Ce k x-ray
									0.4339
									0.5140
									0.8367
									(0.16−1.8)
^{138m}Pr			2.1 h	β+ /24 /	1.65/	7-			ann.rad./
				EC/76 /					Ce k x-ray
									0.3027
									0.7887
									1.0378
									(0.07−2.0)
^{138}Pr		137.91075	1.45 m	β+ /75 /4.44	3.42/	1+			ann.rad./
				EC/25 /					Ce k x-ray
									0.7887
^{139}Pr		138.90894	4.41 h	β+ /8 /2.129	1.09/	5/2+			ann.rad./
				EC/92 /					Ce k x-ray
									0.2551
									1.3473
									1.6307
^{140}Pr		139.90908	3.39 m	β+ /51 /3.39	2.37/	1+			ann.rad./
				EC/49 /					Ce k x-ray
									0.3069
									1.5965
^{141}Pr	100.	140.907653				5/2+	+4.275	-0.08	
^{142m}Pr			14.6 m	I.T./0.004	c.e.	5-	2.2		
^{142}Pr		141.910045	19.12 h	β- /2.162	0.58/4	2-	+0.234	+0.030	0.5088
				EC/0.744	2.16/96				1.57580
^{143}Pr		142.910817	13.57 d	β- /0.934	0.933/	7/2+	+2.70	+0.8	0.7420
^{144m}Pr			7.2 m	IT/99+/0.059		3-			Pr k x-ray
				β- /					0.0590
									0.6965
									0.8142
^{144}Pr		143.913305	17.28 m	β- /2.998	0.807/1	0-			0.69649
					2.30/				1.48912
					2.996/98				2.18562
^{145}Pr		144.91451	5.98 h	β- /1.81	1.80/97	7/2+			0.0725
									0.6758
									0.7483
^{146}Pr		145.9176	24.2 m	β- /4.2	2.2/30	2-			0.4539/48
					3.7/10				1.5247
					4.2/40				
^{147}Pr		146.91900	13.4 m	β- /2.69	1.5/	3/2+			0.3146/24.
					2.1/				0.5779/16
									0.6413/19.
^{148m}Pr			2.0 m	β- /	4.0/	(4)			0.3016

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					3.8/				0.4506
									0.6975
^{148}Pr		147.92213	2.27 m	β- /4.9	4.8/	1^-			0.3017
					4.5/				
^{149}Pr		148.9237	2.3 m	β- /3.40	3.0	(5/2+)			0.1085
									0.1385
									0.1651
^{150}Pr		149.92667	6.2 s	β- /5.7		1^-			0.1302
					~ 5.5				0.8044
									0.8527
^{151}Pr		150.92832	22.4 s	β- /4.2					
^{152}Pr		151.9315	3.2 s	β- /6.7		4^+			0.0726
									0.164
									0.285
^{153}Pr		152.9338	4.3 s	β- /5.5					
^{154}Pr		153.9375	2.3 s	β- /7.9					
^{155}Pr		154.9401	> 0.3 μs						
^{156}Pr		155.9443	> 0.3 μs						
^{157}Pr		156.9474							
^{158}Pr		157.952							
^{159}Pr		158.956							
$_{60}$Nd		**144.242(3)**							
^{124}Nd		123.952				0+			
^{125}Nd		124.9489	0.6 s	β+, p					
^{126}Nd		125.9432				0+			
^{127}Nd		126.9405	1.8 s	β+, EC/9.		(5/2)			ann.rad./
^{128}Nd		127.9354	4. s	β+, EC/6.					ann.rad./
^{129}Nd		128.9332	4.9 s	β+, EC/8.		5/2(-)			ann.rad./
									(0.091−0.875)
^{130}Nd		129.92851	28. s	β+, EC/5.		0+			ann.rad./
^{131}Nd		130.92725	0.5 m	β+, EC/6.6					ann.rad./
									(0.09−0.36)
^{132}Nd		131.92332	1.5 m	β+, EC/3.7		0+			ann.rad./
									(0.099−0.567)
^{133}Nd		132.92235	1.2 m	β+, EC/5.6					ann.rad./
									(0.06−0.37)
^{134}Nd		133.91879	~ 8.5 m	β+ /17 /2.8		0+			ann.rad./
				EC/83 /					Pr k x-ray
									0.1631/58
									(0.09−1.00)
^{135m}Nd			5.5 m	β+ /					
^{135}Nd		134.91818	12. m	β+ /65 /4.8		9/2-	-0.78	+2.0	ann.rad./
				EC/35 /					Pr k x-ray
									0.0415/23.
									0.204/51.
									(0.11−1.8)
^{136}Nd		135.91498	50.6 m	EC/94 /2.21	1.04/	0+			Pr Kx-ray
				β+ /6 /					0.0401/21.
									0.1091/35.
									(0.10−0.97)
^{137m}Nd			1.6 s	I.T./0.5196		11/2-			Nd k x-ray
									0.1084
									0.1775
									0.2337
^{137}Nd		136.91457	38. m	β+ /40 /3.69	1.7/20	1/2+	-0.63		ann.rad./
				EC/60 /	2.40/20				Pr k x-ray
									0.0755
									0.5806

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{138}Nd		137.91195	5.1 h	EC/1.1		0+			Pr k x-ray
									0.1995
									0.3258
^{139m}Nd			5.5 h	I.T./12 /0.231	1.17/	11/2-			Nd k x-ray
				β+ /88 /					Pr k x-ray
									0.1139/34.
									0.7382/30.
^{139}Nd		138.91198	30. m	β+ /25 /2.79	1.77/	3/2+	0.91	+0.3	ann.rad./
				EC/75 /					Pr k x-ray
									0.4050
^{140}Nd		139.90955	3.37 d	EC /0.22		0+			Pr k x-ray
^{141m}Nd			1.04 m	IT/99+/0.756		11/2-			Nd k x-ray
									0.7565
^{141}Nd		140.909610	2.49 h	EC/98 /1.823	0.802/	3/2+	1.01	+0.3	Pr k x-ray
				β+ /2 /					(0.15−1.7)
^{142}Nd	27.153(39)	141.907723				0+			
^{143}Nd	12.173(27)	142.909814				7/2-	-1.07	-0.60	
^{144}Nd	23.798(18)	143.910087	2.1×10^{15} y	α	1.83	0+			
^{145}Nd	8.293(12)	144.912574				7/2-	-0.66	-0.31	
^{146}Nd	17.189(33)	145.913117				0+			
^{147}Nd		146.916100	10.98 d	β- /0.896	0.805/	5/2-	0.58	0.9	Pr k x-ray
									0.53102
									0.09111−0.686
^{148}Nd	5.756(21)	147.916893				0+			
^{149}Nd		148.920149	1.73 h	β- /1.691	1.03/25	5/2-	0.35	1.3	Pr k x-ray
					1.13/26				0.1143/19.
					1.42/				0.2113/27.
									(0.026−1.6)
^{150}Nd	5.638(29)	149.920891	1.4×10^{20} y	β-β-		0+			
^{151}Nd		150.923829	12.4 m	β- /2.442	1.2/	(3/2+)			Pm k x-ray
									0.1168
									0.2557
									1.1806
									(0.10−1.9)m
^{152}Nd		151.92468	11.4 m	β- /1.1		0+			0.2785/29.
									0.2501/18.
									(0.016−0.66)
^{153}Nd		152.92770	28.9 s	β- /3.6					0.418
^{154}Nd		153.9295	25.9 s	β- /2.8		0+			0.1519
									0.7998
^{155}Nd		154.9329	8.9 s	β- /5.0					0.1807
^{156}Nd		155.9350	5.5 s	β- /4.1		0+			0.0848
^{157}Nd		156.9390	> 0.3 μs						
^{158}Nd		157.9416	> 0.3 μs			0+			
^{159}Nd		158.946							
^{160}Nd		159.949				0+			
^{161}Nd		160.954							
$_{61}$Pm									
^{128}Pm		127.9484	1.0 s	β+, p					ann.rad.
^{129}Pm		128.9432	~ 2.4 s						
^{130}Pm		129.9405	2.5 s	β+, EC/11.					0.1589
									0.326−1.062
^{131}Pm		130.9359	~ 6.3 s	β+					0.185
									0.220
									0.146
^{132}Pm		131.9338	6. s	β+, EC/10.					ann.rad./
^{133}Pm		132.92978	12. s	β+, EC/~ 7.0					ann.rad./
^{134}Pm		133.9284	24. s	β+, EC/~ 8.9		(5+)			ann.rad./

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.294
									0.495
^{135}Pm		134.9249	0.8 m	β+, EC/6.0		11/2-			(0.13−0.47)
^{136}Pm		135.9236	1.8 m	β+ /89 /7.9		(3+)			ann.rad./
				EC/11 /					Nd k x-ray
									0.3735
									0.6027
^{137}Pm		136.92048	2.4 m	β+, EC/5.6		(11/2-)			ann.rad./
									0.1086
									0.1775
^{138m}Pm			3.2 m	β+ /50 /~ 7.0	3.9/	3+	3.		ann.rad./
				EC/50 /					Nd k x-ray
									0.5209
									0.7290
^{138}Pm		137.91955	10. s	β+ /6.9	6.1/	1+			ann.rad./
^{139m}Pm			0.18 s	IT/		(11/2-)			0.1887
^{139}Pm		138.91680	4.14 m	β+ /68 /4.52	3.52/	(5/2+)			ann.rad./
				EC/32 /					Nd k x-ray
									0.4028
									(0.27−2.4)
^{140m}Pm			5.87 m	β+ /70 /	3.2	7/2-			ann.rad./
				EC/30 /					Nd k x-ray
									0.4199
									0.7738
									1.0283
^{140}Pm		139.91604	9.2 s	β+ /89 /6.09	5.07/74	1+			ann.rad./
				EC/11 /					Nd k x-ray
									0.7738
									1.4898
^{141}Pm		140.91356	20.9 m	β+ /52 /3.72	2.71	5/2+			ann.rad./
				EC/48 /					Nd k x-ray
									0.8862
									1.2233
^{142m}Pm			67 μs						(0.208-0.882)
^{142}Pm		141.91287	40.5 s	β+ /86 /4.87	3.8/	1+			ann.rad./
				EC/20 /					Nd k x-ray
									0.6414
									1.5758
^{143}Pm		142.910933	265. d	EC/1.041		5/2+	3.8		Nd k x-ray
				β+ /< 6×10^{-6}/					0.7420
^{144}Pm		143.912591	360. d	EC/2.332		5-	1.7		Nd k x-ray
				β+ /7×10^{-6}/					0.6180
									0.6965
^{145}Pm		144.912749	17.7 y	EC/0.163		5/2+	+3.8	+0.2	Nd k x-ray
									0.0723
^{146}Pm		145.914696	5.53 y	EC/63 /1.472		3-			Nd k x-ray
				β- /37 /1.542	0.795/				0.4538
									0.7362
									0.7474
^{147}Pm		146.915139	2.623 y	β- /0.224	0.224/	7/2+	+2.6	+0.7	0.1213
									0.1974
^{148m}Pm			41.3 d	β- /95 /2.6	0.4/60	6-	1.8		0.5503/94.
				I.T./5 /0.137	0.5/17				0.6300/89.
					0.7/21				0.7257/33
^{148}Pm		147.91748	5.37 d	β- /2.47	1.02/	1-	+2.0	+0.2	0.5503
					2.47/				0.9149
									1.4651
^{149}Pm		148.918334	2.212 d	β- /1.071	0.78/9	7/2+	3.3		0.2859
					1.072/90				0.5909
									0.8594

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^{150}Pm		149.92098	2.68 h	β- /3.45	1.6/	(1-)			0.3339/69.
					2.3/				1.1658/16.
					1.8/				1.3245/17.
									(0.25−2.9)
^{151}Pm		150.92121	1.183 d	β- /1.187	0.84/	5/2+	+1.8	1.9	0.1677/8
									0.2751/7
									0.3401/22
^{152m2}Pm			15. m	β-, I.T./		(>6)			(0.14−1.4)
^{152m1}Pm			7.5 m	β- /		(4-)			0.1218
									0.2447
									0.3404
									1.0971
									1.4375
^{152}Pm		151.92350	4.1 m	β- /3.5	3.5/20	1+			0.1218
					3.50/60				(0.12−2.1)
^{153}Pm		152.92412	5.4 m	β- /1.90	1.7/	(5/2-)			0.0910
									0.1198
									0.1273
^{154m}Pm			2.7 m	β- /	2.0/				0.0820
									0.1848
									1.4403
^{154}Pm		153.92646	1.7 m	β- /4.1	1.9/				0.0820
									0.8396
									1.3940
									2.0589
									(0.08−2.8)
^{155}Pm		154.92810	48. s	β- /3.2		(5/2-)			(0.05−0.78)
^{156}Pm		155.93106	26.7 s	β- /5.16					
^{157}Pm		156.9330	10.9 s	β- /4.6					
^{158}Pm		157.9366	5. s	β- /6.3					
^{159}Pm		158.9390	1.5 s						(0.072-0.261)
^{160}Pm		159.9430							
^{161}Pm		160.9459							
^{162}Pm		161.950							
^{163}Pm		162.954							
$_{62}$Sm		**150.36(2)**							
^{129}Sm		128.954	~ 0.55 s	β+, p					
^{130}Sm		129.9489				0+			
^{131}Sm		130.9461	1.2 s	β+, EC/					ann.rad./
^{132}Sm		131.9407	4.0 s	β+		0+			
^{133}Sm		132.9387	2.9 s	β+, EC/~ 8.4		5/2+			ann.rad./
									0.3696
									0.0845
^{134}Sm		133.9340	11. s	β+, EC/5.		0+			ann.rad./
^{135}Sm		134.9325	10. s	β+, EC/7.		7/2+			ann.rad./
^{136}Sm		135.92828	42. s	β+, EC/4.5		0+			ann.rad./
^{137}Sm		136.92697	45. s	β+, EC/6.1					ann.rad./
^{138}Sm		137.92324	3.0 m	β+, EC/3.9		0+			ann.rad./
									0.0536
									0.0747
^{139m}Sm			10. s	I.T./94 /0.457		(11/2-)	1.1		Sm k x-ray
				β+ /6 /	4.7				0.1118
									0.1553
									0.1901
									0.2673
^{139}Sm		138.92230	2.6 m	β+ /75 /5.5	4.1/	½+	-0.53		Pm k x-ray
				EC/25 /					0.3678
									0.4028

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									(0.27−2.4)
^{140}Sm		139.91900	14.8 m	β+, EC/3.4	1.9/	0+			ann.rad./
									Pm k x-ray
									0.1396
									0.2255
									(0.07−1.7)
^{141m}Sm			22.6 m	β+ /32 /	1.6/	11/2-	-0.83	+1.6	ann.rad./
				EC/68 /	2.19/				Pm k x-ray
				I.T./0.3 /0.1758					0.1966
									0.4318
									0.7774
^{141}Sm		140.91848	10.2 m	β+ /52 /4.54	3.2/	½+	-0.74		ann.rad./
				EC/48 /					Pm k x-ray
									0.4382
^{142}Sm		141.91520	1.208 h	β+ /6 /2.10	1.0/	0+			ann.rad./
				EC/94 /					Pm k x-ray
^{143m}Sm			1.10 m	IT/99/0.7540		11/2-			Sm k x-ray
									0.7540
^{143}Sm		142.914628	8.83 m	β+ /46 /3.443	2.47/	3/2+	+1.01	+0.4	ann.rad./
				EC/54 /					Pm k x-ray
									1.0565
^{144}Sm	3.083(20)	143.911999				0+			
^{145}Sm		144.913410	340. d	EC/0.617		7/2-	-1.12	-0.60	Pm k x-ray
									0.0613
									0.4924
^{146}Sm		145.913041	1.03×10^8 y	α/	2.50/	0+			
^{147}Sm	15.017(75)	146.914898	1.06×10^{11} y	α/	2.23/	7/2-	-0.815	-0.26	
^{148}Sm	11.254(51)	147.914823	7×10^{15} y	α/	1.96/	0+			
^{149}Sm	13.830(56)	148.917185	10^{16} y	α/		7/2-	-0.672	+0.075	
^{150}Sm	7.351(36)	149.917276				0+			
^{151}Sm		150.919932	90. y	β- /0.0768	0.076/	5/2-	-0.363	+0.7	0.02154
^{152}Sm	26.735(48)	151.919732				0+			
^{153}Sm		152.922097	1.929 d	β- /0.808	0.64/	3/2+	-0.0216	+1.3	Eu k x-ray
					0.69/				0.0697/4.7
									0.10318/29
									0.075−0.714
^{154}Sm	22.730(78)	153.922209				0+			
^{155}Sm		154.924640	22.2 m	β- /1.627	1.52	3/2-		1.1	Eu k x-ray
									0.1043/75.
^{156}Sm		155.92553	9.4 h	β- /0.72	0.43/	0+			0.0872
					0.71/				0.1657
									0.2038
^{157}Sm		156.92836	8.0 m	β- /2.7	2.4/	3/2-			Eu k x-ray
									0.1964
									0.1978
									0.3942
^{158}Sm		157.9300	5.5 m	β- /2.0		0+			0.1894/100.
									0.3636/82.
^{159}Sm		158.9332	11.3 s	β- /3.8					0.1898
^{160}Sm		159.9351	9.6 s	β- /3.6		0+			0.110
^{161}Sm		160.9388	~ 4.8 s						0.264
^{162}Sm		161.941	2.4 s			0+			(0.036-0.741)
^{163}Sm		162.945							
^{164}Sm		163.948				0+			
^{165}Sm		164.953							
$_{63}$Eu		**151.964(1)**							
^{130}Eu		129.964	0.9 ms	p	1.027/				
^{131}Eu		130.9578	~ 26. ms	β+, p	p/0.95				

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^{132}Eu		131.9544							
^{133}Eu		132.9492							
^{134}Eu		133.9465	0.5 s	EC, β+					ann.rad./
^{135}Eu		134.9418	1.5 s	EC, β+ /~ 8.7					ann.rad./
^{136m}Eu			~ 3.2 s			7+			0.255
^{136}Eu		135.9396	~ 3.9 s	EC, β+ /10.		1+			ann.rad./
^{137}Eu		136.9356	11. s	EC/~ 7.5		11/2-			ann.rad./
^{138}Eu		137.93371	12. s	EC, β+ /~ 9.2		7+	5		ann.rad./
^{139}Eu		138.92979	18. s	EC, β+ /6.7			6		ann.rad./
^{140m}Eu			0.125 s	EC, β+					ann.rad./
^{140}Eu		139.9281	1.51 s	EC, β+ /8.4		1-			ann.rad./
^{141m}Eu			3.0 s	β+ /58 /		11/2-			ann.rad./
				EC/9 /					Eu k x-ray
				I.T./33 /0.0964					(0.09−1.6)
^{141}Eu		140.92493	40. s	β+ /81 /5.6		5/2+	+3.49	+0.85	ann.rad./
				EC/15 /					Sm k x-ray
									0.3845
									0.3940
^{142m}Eu			1.22 m	β+ /83 /	4.8/	8-	+2.98	+1.4	ann.rad./
				EC/17 /					Sm k x-ray
									0.5566
									0.7680
									1.0233
^{142}Eu		141.92343	2.4 s	β- /94/7.4	7.0/	1+	+1.54	+0.12	ann.rad./
				EC/6 /					0.7680
^{143}Eu		142.92030	2.62 m	β+ /72/5.17	4.1/	5/2+	+3.67	+0.51	ann.rad./
				EC/28/	5.1/				Sm k x-ray
									0.1107/7
									1.5368/3.
									1.9127/2.
^{144}Eu		143.91882	10.2 s	β+ /86 /6.33	5.31/	1+	+1.89	+0.10	ann.rad./
				EC/13 /					Sm k x-ray
									1.6601
^{145}Eu		144.916265	5.93 d	β+ /2 /2.660	0.79/	5/2+	+4.00	+0.29	ann.rad./
				EC/98 /1.71					Sm k x-ray
									0.6535
									0.8937
									1.6587
^{146}Eu		145.91721	4.57 d	β+ /5 /3.88	1.47/	4-	+1.42	-0.18	ann.rad./
				EC/95 /					Sm k x-ray
									0.6336
									0.6341
									0.7470
									(0.27−2.64)
^{147}Eu		146.916746	24.4 d	EC/99. /1.722		5/2+	+3.72	+0.53	Sm k x-ray
				β+ /0.4 /					0.12113/20.6
									0.19725/24.0
									(0.601-1.077)
^{148}Eu		147.91809	54.5 d	EC/3.11	0.92	5-	+2.34	+0.35	Sm k x-ray
									0.5503/99.
									0.6299/71.
									(0.067−2.17)
^{149}Eu		148.917931	93.1 d	EC/0.692		5/2+	+3.57	+0.75	Sm k x-ray
									0.2770/4.1
									0.3275/4.8
^{150}Eu		149.91970	36. y	EC/2.26		5-	+2.71	+1.13	Sm k x-ray
									0.3340
									0.4394
									0.5843
									(0.25−1.8)

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^{150m}Eu			12.8 h	β- /92 /	1.013/	0-			Sm k x-ray
				β+ /0.4 /	1.24/				0.3339
				EC/8 /					0.4065
^{151}Eu	47.81(6)	150.919850				5/2+	+3.472	+0.90	
^{152m2}Eu			1.60 h	I.T./0.1478		8-			Eu k x-ray
									0.0898
^{152m1}Eu			9.30 h	β- /72 /	1.85/	0-			Sm k x-ray
				EC/28 /	0.89/				0.12178
									0.84153
									0.96334
^{152}Eu		151.921745	13.5 y	EC/72 /1.874	0.69/	3-	-1.941	+2.71	Sm k x-ray
				β- /28 /1.818	1.47/				Gd k x-ray
									0.12178
									0.34427
									1.40802
									(0.252−1.528)
^{153}Eu	52.19(6)	152.921230				5/2+	+1.533	+2.41	
^{154m}Eu			46.1 m	I.T./~ 0.16		8-			Eu k x-ray
									0.0682
									0.1009
^{154}Eu		153.922979	8.59 y	β- /99.9/1.969	0.27/29	3-	-2.01	+2.8	Gd k x-ray
				EC/0.02/0.717	0.58/38				0.12299/40.
					0.84/17				0.72331/20.
					0.98/4				1.2745/36
					1.87/11				(0.059-1.90)
^{155}Eu		154.922893	4.76 y	β- /0.252	0.15/	5/2+	+1.52	+2.4	Gd k x-ray
									0.0865/30
									0.1053/20
^{156}Eu		155.92475	15.2 d	β- /2.451	0.30/11	1+	≈1.1		0.08899/9.
					0.49/30				0.64623/7.
					1.2/12				0.723441/6.
					2.45/31				0.8118/10.
^{157}Eu		156.92542	15.13 h	β- /1.36	0.98/	(5/2+)	+1.50	+2.6	Gd k x-ray
					1.30/41				0.0639/100.
									0.3705/48.
									0.4107/76.
^{158}Eu		157.9279	45.9 m	β- /3.5	2.5/	(1-)	+1.44	+0.7	0.0795
									0.8976
									0.9442
									0.9771
^{159}Eu		158.92909	18.1 m	β- /2.51	2.4/	(5/2+)	+1.38	+2.7	0.0678
					2.57/				0.0786
									0.0957
^{160}Eu		159.9320	38. s	β- /4.1	2.7/	(0-)			0.0753
					4.1/				0.1735
									0.4131
									0.5155
									0.8217
									0.9110
									0.9246
^{161}Eu		160.9337	27. s	β- /3.7					0.0719
^{162}Eu		161.9370	11. s	β- /5.6					
^{163}Eu		162.9392							
^{164}Eu		163.943							
^{165}Eu		164.946							
^{166}Eu		165.950							
^{167}Eu		166.953							
$_{64}$Gd		**157.25(3)**							

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^{135}Gd		134.953	1.1 s	β+					(0.163−0.360)
^{136}Gd		135.9473				0+			
^{137}Gd		136.9450	7. s	EC, β+ /~ 8.8					ann.rad./
^{138}Gd		137.9401	~ 4.7 s	EC, β+		0+			0.0647
^{139m}Gd			~ 4.8 s						0.1216
^{139}Gd		138.9382	5. s	EC, β+ /~ 7.7					0.104−0.323
^{140}Gd		139.93367	16. s	EC/4.8		0+			0.1748
^{141m}Gd			25. s	EC, β+ /		11/2-			ann.rad./
^{141}Gd		140.93213	21. s	β+ /7.3		½+			ann.rad./
^{142}Gd		141.92812	1.17 m	EC, β+ /4.2		0+			ann.rad./
^{143m}Gd			1.84 m	β+ /67 /		11/2-			ann.rad./
				EC/33 /					Eu k x-ray
				I.T./					0.1176
									0.2719
									0.5880
									0.6681
									0.7999
^{143}Gd		142.9268	39. s	β+ /82 /6.0		1/2+			ann.rad./
				EC/18 /					Eu k x-ray
									0.2048
									0.2588
^{144}Gd		143.92296	4.5 m	β+ /45 /4.3	3.3/	0+			ann.rad./
				EC/55 /					Eu k x-ray
									0.3332
^{145m}Gd			1.44 m	I.T./95 /0.749		11/2-	-1.0		0.0273
				β+ /4 /5.7					0.3295
									0.3866
									0.7214
^{145}Gd		144.92171	23.4 m	β+ /33 /5.05	2.5/	1/2+	-0.74		ann.rad./
				EC/67 /					Eu k x-ray
									1.7579
									1.8806
									(0.32−3.69)
^{146}Gd		145.918311	48.3 d	EC/99.9 /1.03	0.35/	0+			Eu k x-ray
				β+ /0.2					0.1147
									0.1155
									0.1546
^{147}Gd		146.919094	1.588 d	EC/99.8 /2.188	0.93/	7/2-	1.0		Eu k x-ray
				EC/0.2 /					0.2293
									0.3699
									0.3960
									0.9289
									(0.1−1.8)
^{148}Gd		147.918115	71. y	α/3.27	3.1828/	0+			
^{149}Gd		148.919341	9.3 d	EC/1.32		7/2-	0.9		Eu k x-ray
									0.1496
									0.2985
									0.3465
^{150}Gd		149.91866	1.8×10^6 y	α/2.80	2.73/	0+			
^{151}Gd		150.920348	124. d	EC/0.464		7/2-	0.8		Eu k x-ray
									0.1536
									0.2432
^{152}Gd	0.20(1)	151.919791				0+			
^{153}Gd		152.921750	240. d	EC/0.485		3/2-	0.4		Eu k x-ray
									0.09743
									0.10318
^{154}Gd	2.18(3)	153.920867				0+			
^{155}Gd	14.80(12)	154.922622				3/2-	-0.259	+1.30	
^{156}Gd	20.47(9)	155.922123				0+			
^{157}Gd	15.65(2)	156.923960				3/2-	-0.340	+1.36	

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{158}Gd	24.84(7)	157.924104				0+			
^{159}Gd		158.926389	18.6 h	β- 0.971	0.971/58	3/2-	-0.44		Tb k x-ray
					0.913/29				0.36351
					0.607/12				0.058-0.855
^{160}Gd	21.86(19)	159.927054	> 1.9 × 10^{19} y	β- β-		0+			
^{161}Gd		160.929669	3.66 m	β- /1.956	1.56/85	5/2-			Tb k x-ray
									0.1023
									0.3149
									0.3609
^{162}Gd		161.930985	8.4 m	β- /1.39	1.0/	0+			0.4030
									0.4421
^{163}Gd		162.9340	1.13 m	β- /3.1					0.2868
									0.214
									1.685
^{164}Gd		163.9359	45. s	β- /2.3		0+			
^{165}Gd		164.9394	10 s	β-					
^{166}Gd		165.942	~ 4.8 s			0+			(0.040-1.015)
^{167}Gd		166.946							
^{168}Gd		167.948				0+			
^{169}Gd		168.953							
$_{65}$Tb		**158.92535(2)**							
^{135}Tb			0.9 ms	p	p/1.179				
^{138}Tb		137.9532							
^{139}Tb		138.9483	1.6 s						0.109
									0.120
^{140}Tb		139.946	2.4 s	β+, EC/11					0.329
									0.355−0.740
^{141}Tb		140.9415	3.5 s	β+, EC/~ 8.3					
^{142m2}Tb			25 μs						
^{142m}Tb			0.30 s	β+, EC/		4-			
^{142}Tb		141.9387	0.60 s	β+, EC/10.		0+			
^{143}Tb		142.9351	12. s	β+, EC/7.4		11/2-			
^{144m}Tb			4.1 s	IT		5-			
^{144}Tb		143.93305	< 1.5 s	β+, EC/8.4		1+			
^{145m}Tb			30. s	β+, EC/~ 6.6		11/2-			ann.rad./
									0.2577
									0.5370
									0.9876
^{145}Tb		144.9293		β+, EC/6.5		½+			
^{146m}Tb			23. s	β+ /76 /		(5-)			ann.rad./
				EC/24 /					Gd k x-ray
									1.0789
									1.5795
^{146}Tb		145.92725	~ 8. s	β+ /8.1		1+			
^{147m}Tb			1.8 m	β+ /35 /		11/2-			ann.rad./
				EC/65 /					Gd k x-ray
									1.3977
									1.7978
^{147}Tb		146.92405	1.6 h	β+ /42 /4.61		5/2+	+1.70		ann.rad./
				EC/58 /					Gd k x-ray
									0.6944
									1.1522
									(0.120−3.318)
^{148m}Tb			2.3 m	β+ /25 /		9+			ann.rad./
				EC/75 /					Gd k x-ray
									0.3945
									0.6319
									0.7845

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.8824
^{148}Tb		147.92427	1.00 h	β+, EC/5.69		2-	-1.75	-0.3	ann.rad./
									Gd k x-ray
									0.4888
									0.7845
									(0.14−3.8)
^{149m}Tb			4.16 m	EC/88 /		11/2-			ann.rad./
				β+ /12 /					Gd k x-ray
									0.1650
									0.7960
^{149}Tb		148.923246	4.13 h	β+ /4 /3.636	1.8/	½+	+1.35		Gd k x-ray
				α/16/	3.97/				0.1650
									0.3522
									0.3886
									(0.1−3.2)
^{150m}Tb			6.0 m	β+ /17 /					ann.rad./
				EC/83 /					Gd k x-ray
									0.4384
									0.6380
									0.6504
									0.8275
^{150}Tb		149.92366	3.3 h	β+, EC/4.66		2-	-0.90		ann.rad./
									0.4963
									0.6380
									(0.3−4.29)
^{151m}Tb			25. s	I.T./95 /		11/2-			0.0229
				β+, EC/7 /					0.0495
									0.3797
									0.8305
^{151}Tb		150.923103	17.61 h	β+/1 /2.565	0.70/	1/2+	+0.92		Gd k x-ray
				EC/99 /					0.1083
									0.2517
									0.2870
									(0.1−1.8)
^{152m}Tb			4.3 m	I.T./79 /0.5018		(8+)			Tb k x-ray
				EC/21 /4.35					Gd k x-ray
									0.2833
									0.3443
									0.4111
^{152}Tb		151.92407	17.5 h	β+ /20 /3.99	2.5/	2-	-0.58	+0.3	ann.rad./
				EC/80 /	2.8/				Gd k x-ray
									0.3443
									(0.2−2.88)
^{153}Tb		152.923435	2.34 d	EC/1.570		5/2+	+3.44	+1.1	Gd k x-ray
									0.2119
									(0.05−1.1)
^{154m2}Tb			23.1 h	EC/98 /		(7-)	0.9		Gd k x-ray
				I.T./2 /					0.1231
									0.2479
									0.3467
									1.4199
^{154m1}Tb			9. h	β+ /78 /		(3-)	1.7	+3.	Gd k x-ray
				I.T./22 /					0.1231
									0.2479
									0.5401
									(0.12−2.57)
^{154}Tb		153.92468	21.5 h	EC/99 /3.56	1.86/	0-			Gd k x-ray
				β+ /1 /	2.45				0.1231
									1.2744
									2.1872

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									(0.12−3.14)
^{155}Tb		154.92351	5.3 d	EC/0.82		3/2+	+2.01	+1.41	Gd k x-ray
									0.08654
									0.10530
^{156m2}Tb			1.02 d	I.T./		(7-)			Tb k x-ray
									0.0496
^{156m1}Tb			5.3 h	I.T./0.0884		(0+)			Tb k x-ray
									0.0884
^{156}Tb		155.924747	5.3 d	EC/2.444		3-	~ 1.7	+2.	Gd k x-ray
									0.08896
									0.19921
									0.53435
									1.22245
^{157}Tb		156.924025	1.1 × 10^2 y	EC/0.0601		3/2+	+2.01	+1.4	Gd k x-ray
									0.0545
^{158m}Tb			10.5 s	I.T./0.11		0-			Gd k x-ray
									0.0110
^{158}Tb		157.925413	1.8 × 10^2 y	EC/80 /1.220		3-	+1.76	+2.7	Gd k x-ray
				β- /20 /0.937					0.0795
									0.9442
									0.9621
^{159}Tb	100.	158.925347				3/2+	+2.014	+1.43	
^{160}Tb		159.927168	72.3 d	β- /1.835	0.57/47	3-	+1.79	3.8	Dy k x-ray
					0.86/27				0.08678
									0.29857
									0.87936
									0.96615
^{161}Tb		160.927570	6.91 d	β- /0.593	0.46/23	3/2+	2.2	+1.2	Dy k x-ray
					0.52/66				0.02565
					0.6/10				0.04892
									0.07458
^{162}Tb		161.92949	7.6 m	β- /2.51	1.4	(1/2-)			Dy k x-ray
									0.2600
									0.8075
									0.8882
^{163}Tb		162.930648	19.5 m	β- /1.785	0.80/	3/2+			Dy k x-ray
									0.3511
									0.3897
									0.4945
^{164}Tb		163.9334	3.0 m	β- /3.9	1.7/	(5+)			Dy k x-ray
									0.1689
									0.2157
									0.6110
									0.6885
									0.7548
^{165}Tb		164.9349	2.1 m	β- /3.0		3/2+			0.5389
									1.1785
									1.2920
									1.6648
^{166}Tb		165.9380	26 s	β-/					
^{167}Tb		166.9401	19 s						0.057
									0.070
^{168}Tb		167.944	8 s						0.075−0.227
^{169}Tb		168.946							
^{170}Tb		169.950							
^{171}Tb		170.953							
$_{66}$Dy		**162.500(1)**							
^{139}Dy		138.960	0.6 s	β+, p					

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^{140}Dy		139.954				0+			
^{141}Dy		140.9514	0.9 s	EC, β+ /9.					
^{142}Dy		141.9464	2.3 s	EC, β+ /7.1		0+			
^{143}Dy		142.9438	3.9 s	EC, β+ /~ 8.8					
^{144}Dy		143.93925	9.1 s	EC, β+ /~ 6.2		0+			
^{145m}Dy		144.9365	14. s	EC, β+		11/2-			
^{146m}Dy			0.15 s	I.T.		10+			
^{146}Dy		145.93285	30. s	EC, β+ /5.2		0+			
^{147m}Dy			56. s	I.T./40 /		(11/2-)	-0.66	+0.7	Dy k x-ray
				β+, EC/60 /					0.072
									0.6787
^{147}Dy		146.93109	75. s	EC, β+ /6.37		½+	-0.92		ann.rad./
									0.1007
									0.2534
									0.3653
^{148}Dy		147.92715	3.1 m	β+ /4 /2.68	1.2/	0+			ann.rad./
				EC/96 /					Tb k x-ray
									0.6202
^{149}Dy		148.92731	4.2 m	β+, EC/3.81		(7/2-)	-0.12	-0.62	ann.rad./
									0.1008
									0.1063
									0.2534
									0.6536
									0.7894
									1.7765
									1.8062
^{150}Dy		149.925585	7.18 m	β+, EC/67 /1.79		0+			Tb k x-ray
				α/33 /	4.233/				0.3967
^{151}Dy		150.926185	17. m	β+ /5 /2.871		7/2-	-0.95	-0.30	Tb k x-ray
				EC/89 /					0.1764
				α /6 /	4.067/				0.3030
									0.3861
									0.5463
									(0.16−2.09)
^{152}Dy		151.92472	2.37 h	EC/0.60		0+			Tb k x-ray
				α /	3.63/				0.2569
^{153}Dy		152.925765	6.3 h	β+ /1 /2.171	0.89/	(7/2-)	-0.78	~-0.15	Tb k x-ray
				EC/99 /					0.0807
				α /0.01 /	3.46/				0.0997
									0.2137
									(0.08−1.66)
^{154}Dy		153.92442	3. × 10^6 y	α/2.95	2.87/	0+			
^{155}Dy		154.92575	9.9 h	β+ /2 /2.095	0.845/	3/2-	-0.385	+1.04	Tb k x-ray
				EC/98 /					0.0655
									0.2269
^{156}Dy	0.056(3)	155.92428				0+			
^{157}Dy		156.92547	8.1 h	EC/1.34		3/2-	-0.301	+1.30	Tb k x-ray
									(0.0609−1.319)
^{158}Dy	0.095(3)	157.924409				0+			
^{159}Dy		158.925739	144. d	EC/0.366		3/2-	-0.354	+1.37	Tb k x-ray
									0.3262
^{160}Dy	2.329(18)	159.925198				0+			
^{161}Dy	18.889(42)	160.926933				5/2+	-0.480	+2.51	
^{162}Dy	25.475(36)	161.926798				0+			
^{163}Dy	24.896(42)	162.928731				5/2-	+0.673	+2.65	
^{164}Dy	28.260(54)	163.929175				0+			
^{165m}Dy			1.26 m	I.T./98 /0.108		1/2-			Dy k x-ray
				β- /2 /					0.1082
									0.5155
^{165}Dy		164.931703	2.33 h	β- /1.286	1.29/	7/2+	-0.52	+3.5	Ho k x-ray

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									0.09468/3.8
^{166}Dy		165.932807	3.400 d	β- /0.486	0.40/	0+			Ho k x-ray
									0.0282
									0.0825
^{167}Dy		166.9357	6.2 m	β- /~ 2.35	1.78	(1/2-)			Ho k x-ray
									0.2593
									0.3103
									0.5697
									(0.06−1.4)
^{168}Dy		167.9371	8.5 m	β- /1.6		0+			Ho k x-ray
									0.1925
									0.4867
^{169}Dy		168.9403	~ 39. s	β- /3.2					
^{170}Dy		169.9424				0+			
^{171}Dy		170.9462							
^{172}Dy		171.9488				0+			
^{173}Dy		172.953							
$_{67}$Ho		**164.93032(2)**							
^{140}Ho		139.969	6 ms	p/	p/1.09				
^{141m}Ho			8 μs	p/	p/1.23				
^{141}Ho		140.963	4.2 ms	β+, p	p/1.71				
^{142}Ho		141.960	0.4 s	EC/β+, p					0.307
^{143}Ho		142.9546	> 0.2 μs						
^{144}Ho		143.9515	0.7 s	β+, EC/12					
^{145}Ho		144.9472	2.4 s	β+					
^{146}Ho		145.9446	3.3 s	β+, EC/10.7		(10+)			ann.rad./
^{147}Ho		146.94006	5.8 s	β+, EC/8.2		11/2-			ann.rad./
^{148m}Ho			9. s	β+, EC/		4-			ann.rad./
^{148}Ho		147.9377	2. s	β+, EC/9.4		1+			ann.rad./
									0.6615
									1.6883
^{149m}Ho			21. s	β+, EC/		11/2-			ann.rad./
									1.0733
									1.0911
^{149}Ho		148.93378	> 30. s	β+, EC/6.01		1/2+			
^{150m}Ho			25. s	β+, EC/		(9+)			ann.rad./
									0.3939
									0.5511
									0.6534
									0.8034
^{150}Ho		149.93350	1.3 m	β+, EC/6.6					ann.rad./
									0.5913
									0.6534
									0.8034
^{151m}Ho			47. s	β+, EC/87 /					ann.rad./
				α/13	4.605/				0.2102
									0.4889
									0.6948
									0.7762
^{151}Ho		150.93169	35.2 s	β+, EC/80/5.13					ann.rad./
				α/20 /	4.519/				0.3522
									0.5274
									0.9676
									1.0471
^{152m}Ho			50. s	β+, EC/90/		(9+)	+5.9	-1.	ann.rad./
				α/10/	4.453/				0.4929
									0.6138
									0.6474

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									0.6835
^{152}Ho		151.93171	2.4 m	β+, EC/88/6.47		(3+)	-1.02	+0.1	ann.rad./
				α/12/	4.387/				0.6140
									0.6476
^{153m}Ho			9.3 m	β+, EC/99+/4.12		5/2	+1.19		ann.rad./
				α/	4.01/				0.0905
									0.1089
									0.1618
									0.2302
									0.2707
									0.3659
									0.4565
^{153}Ho		152.93020	2.0 m	β+, EC/99+/4.13		11/2-	+6.8	-1.1	ann.rad./
				α/	3.91/				0.2958
									0.3346
									0.4381
									0.6383
^{154m}Ho			3.3 m	β+, EC/		(8+)	5.7	-1.0	ann.rad./
									0.3346
									0.4124
									0.4771
^{154}Ho		153.93060	12. m	β+, EC/5.75		1-	-0.64	+0.2	ann.rad./
									Dy k x-ray
									0.3346
									0.5700
									0.8734
^{155}Ho		154.92910	48. m	β+/6/3.10		(5/2+)	+3.51	+1.5	ann.rad./
				EC/94 /					Dy k x-ray
									0.0474
									0.1363
									0.3254
									(0.06−2.24)
^{156m}Ho			5.8 m	I.T./0.0352			+2.99	+2.3	ann.rad./
				β+ /25 /	1.8/				Dy k x-ray
				EC/75 /	2.9/				0.1378
									0.2666
									(0.28−2.9)
^{156}Ho		155.92984	56. m	β+, EC/4.4		(5+)			ann.rad./
									0.1378
									0.2665
^{157}Ho		156.92826	12.6 m	β+/5/2.54	1.18/	7/2-	+4.35	+3.0	ann.rad./
				EC/95/					Dy k x-ray
									0.2800
									0.3411
^{158m2}Ho			28. m	I.T./44/		2-	+2.44	+1.6	ann.rad./
				EC/56/					Dy k x-ray
									0.0989
									0.2182
^{158m1}Ho			21. m	β+, EC/		(9+)			ann.rad./
									0.0981
									0.1664
									0.2182
									0.3205
									0.4062
									0.9774
									1.0532
									0.4846
^{158}Ho		157.92894	11.3 m	β+/8/4.24	1.30/	5+	+3.77	+4.1	ann.rad./
				EC/92/					Dy k x-ray
									0.0989

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									0.2182
									0.9488
^{159m}Ho			8.3 s	IT/0.206		1/2+			Ho k x-ray
									0.1660
									0.2059
^{159}Ho		158.927712	33.0 m	EC/1.838		7/2-	+4.28	+3.2	Dy k x-ray
									0.1210
									0.1320
									0.2529
									0.3096
									(0.06−1.2)
^{160m2}Ho			3. s			1+			
^{160m}Ho			5.0 h	IT/67/0.060		2-	+2.52	+1.8	0.0868
				EC/33/3.35					0.1970
									0.6464
									0.7281
									0.8791
									0.9619
									0.9658
^{160}Ho		159.92873	25.6 m	β+, EC/3.29	0.57/	5+	+3.71	+4.0	See Ho[166m]
									0.7282
									0.8794
^{161m}Ho			6.8 s	IT/0.211					Ho k x-ray
									0.2112
^{161}Ho		160.927855	2.48 h	EC/0.859		7/2-	+4.25	+3.2	Dy k x-ray
									0.0256
									0.0592
									0.0774
									0.1031
^{162m}Ho			1.12 h	IT/61/		6-	+3.60	+4.	Dy k x-ray
				EC/39/					Ho k x-ray
									0.0807
									0.1850
									0.2828
									0.9372
									1.2200
^{162}Ho		161.929096	15. m	EC/96 /0.295		1+			Dy k x-ray
				β+ /4 /					0.0807
									1.3196
									1.3728
^{163m}Ho			1.09 s	I.T./0.298		(1/2+)			Ho k x-ray
									0.2798
^{163}Ho		162.928734	4.57×10^3 y	EC/0.00258		7/2-	+4.23	+3.6	Dy M x-rays
^{164m}Ho			38. m	I.T./0.140		(6-)			Ho k x-ray
									0.0373
									0.0566
									0.0940
^{164}Ho		163.930234	29. m	EC/58 /0.987		1+			Dy k x-ray
				β- /42 /0.963					0.0734
									0.0914
^{165}Ho	100.	164.930322				7/2-	+4.17	+3.49	
^{166m}Ho			1.2×10^3 y	β- /		7-	3.6	-3.	Er k x-ray
									0.18407
									0.71169
									0.81031
^{166}Ho		165.932284	1.117 d	β- /1.855	1.776/48	0-			Er k x-ray
					1.855/51				0.08057
									1.37943
^{167}Ho		166.93313	3.1 h	β- /1.007	0.31/43	(7/2-)			Er k x-ray
					0.61/21				0.0793

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					0.96/15				0.0835
					0.97/15				0.2379
									0.3213
									0.3465
^{168m}Ho			2.2 m	I.T./					
^{168}Ho		167.93552	3.0 m	β- /2.91	2.0/	3+			Er k x-ray
									0.7413
									0.8159
									0.8211
									(0.08−2.34)
^{169}Ho		168.93687	4.7 m	β- /2.12	1.2/	(7/2-)			
					2.0/				0.1496
									0.7610
									0.7784
									0.7884
									0.8529
^{170m}Ho			43. s	β- /		1+			0.0787
									0.8123
									1.8940
									1.9726
^{170}Ho		169.93962	2.8 m	β- /3.87		6+			Er k x-ray
									0.1816
									0.2582
									0.8902
									0.9321
									0.9414
									1.1387
^{171}Ho		170.941	53 s	β- /					
^{172}Ho		171.9448	25. s	β- /					Er k x-ray
									(0.077−1.186)
^{173}Ho		172.9473							
^{174}Ho		173.951							
^{175}Ho		174.954							
$_{68}$Er		**167.259(3)**							
^{144}Er		143.9604	> 0.2 μs			0+			
^{145}Er		144.9574	0.9 s	β+					
^{146}Er		145.9520	~ 1.7 s	β+		0+			
^{147}Er		146.9495	2.5 s	E.C, β+ /~ 9.1					
^{148}Er		147.9446	4.5 s	β+, EC/6.8		0+			
^{149m}Er			10. s	IT		11/2-			
^{149}Er		148.94231	10.7 s	ECβ+ /8.1		½+			
^{150}Er		149.93791	18. s	β+ /36 /4.11		0+			ann.rad./
				EC/64 /					Ho k x-ray
									0.4758
^{151}Er		150.93745	23. s	β+, EC/5.2		7/2-			ann.rad./
^{152}Er		151.93505	10.2 s	β+, EC/10/3.11		0+			ann.rad./
				α/90/	4.804/				
^{153}Er		152.935063	37.1 s	α/	4.674		-0.934	-0.42	0.351
				β+, EC/47/4.56	4.35/				(0.0945−1.700)
^{154}Er		153.93278	3.7 m	β+, EC/99+/2.03		0+			ann.rad./
				α/0.5/	4.166/				
^{155}Er		154.93321	5.3 m	β+, EC/47/3.84		(7/2-)	-0.669	-0.27	ann.rad./
				EC/53 /					Ho k x-ray
									0.1101
									0.2415
^{156}Er		155.93107	20. m	β+, EC/1.7		0+			ann.rad./
									0.0298
									0.0352
									0.0522
									0.1336

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{157}Er		156.93192	25. m	β+, EC/3.5		3/2-	-0.412	+0.92	ann.rad./
									0.117
									0.385
									1.320
									1.660
									1.820
									2.000
^{158}Er		157.92989	2.2 h	EC/99.5 /1.78	0.74/	0+			Ho k x-ray
				β+ /0.5 /					0.0719
									0.2486
									0.3868
^{159}Er		158.930684	36. m	β+ /7 /2.769		3/2-	-0.304	+1.17	ann.rad./
				EC/93 /					Ho k x-ray
									0.6245
									0.6493
									(0.07−2.5)
^{160}Er		159.92908	1.191 d	EC/0.33		0+			Ho k x-ray
									(0.05−0.96)
^{161}Er		160.93000	3.21 h	EC/2.00		3/2-	-0.37	+1.36	Ho k x-ray
									0.8265
									(0.07−1.74)
^{162}Er	0.139(5)	161.928778				0+			
^{163}Er		162.93003	1.25 h	EC/1.210		5/2-	+0.557	+2.55	Ho k x-ray
									0.4361
									0.4399
									1.1135
^{164}Er	1.601(3)	163.929200				0+			
^{165}Er		164.930726	10.36 h	EC/0.376		5/2-	+0.643	+2.71	Ho k x-ray
^{166}Er	33.503(36)	165.930293				0+			
^{167m}Er			2.27 s	I.T./0.208		½-			Er k x-ray
									0.2078
^{167}Er	22.869(9)	166.932048				7/2+	-0.5639	+3.57	
^{168}Er	26.978(18)	167.932370				0+			
^{169}Er		168.934590	9.40 d	β- /0.351	0.35/~ 100	½-	+0.485		Tm k x-ray
									0.1098
									0.1182
^{170}Er	14.910(36)	169.935464				0+			
^{171}Er		170.938030	7.52 h	β- /1.491		5/2-	0.66	2.9	Tm k x-ray
									0.11160
									0.29591
									0.30832
									(0.08−1.4)
^{172}Er		171.939356	2.05 d	β-/0.891	0.28/48	0+			Tm k x-ray
					0.36/46				0.0597
									0.4073
									0.6101
^{173}Er		172.9424	1.4 m	β- /2.6		(7/2-)			Tm k x-ray
									0.1928
									0.1992
									0.8952
^{174}Er		173.9442	3.1 m	β- /1.8		0+			Tm k x-ray
									(0.100−0.152)
^{175}Er		174.9478	1.2 m	β-					(0.0765−1.168)
^{176}Er		175.9501				0+			
^{177}Er		176.954							
$_{69}$Tm		**168.93421(2)**							
^{144}Tm			~ 1.9 μs	p	1.70, 1.43				
^{145}Tm		144.9701	3.1 μs	p// ~ 10	1.73/91				

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					1.4/9				
^{146m}Tm			0.198 s	β+, p	p/1.118/100				
					1.01/				
					0.89/8				
^{146}Tm		145.9664	0.08 s	β+/14.	p/1.19/100				
				p	1.01/28				
					0.94/22				
^{147m}Tm			0.4 ms	β+, p	p/1.115				
^{147}Tm		146.9610	0.56 s	EC, β+/85	~ 10.7				
				p/15/	1.052/				
^{148m}Tm		147.9578	0.7 s	β+, EC/12.					ann.rad./
^{148}Tm									
^{149}Tm		148.9527	0.9 s	β+, EC/~ 9.2		11/2-			
^{150}Tm		149.9500	2.3 s	β+, EC/~ 11.5		6-			(0.1007−2.177)
^{151}Tm		150.94548	4. s	β+, EC/7.5					ann.rad./
^{152m}Tm			8. s	β+, EC/		9+			
^{152}Tm		151.9444	5. s	β+, EC/8.8					ann.rad./
^{153}Tm		152.94201	1.6 s	β+, EC/10 /6.46					ann.rad./
				α/90 /	5.109/				
^{154m}Tm			3.3 s	β+, EC/15 /	α/5.031/100				ann.rad./
				α/	4.84/0.24				0.4605−0.7960
^{154}Tm		153.94157	8.1 s	β+, EC/56 /7.4	α/4.956/100				ann.rad./
				α/44 /	4.83/0.45				
^{155}Tm		154.93920	30. s	β+, EC/5.58					0.0315
				α/	4.46/				0.0638
									0.0881
									0.2268
									0.5320
									0.6067
^{156m}Tm			19. s	α/	4.46/				
^{156}Tm		155.93898	1.40 m	β+, EC/7.6		2-	+0.40	-0.5	ann.rad./
				α/	4.23/				0.3446
									0.4529
									0.5860
^{157}Tm		156.93697	3.6 m	β+, EC/4.5	2.6	½	+0.48		ann.rad./
				α/	3.97/				0.1104
									0.3484
									0.3855
									0.4550
									(0.1−1.58)
^{158}Tm		157.93698	4.0 m	β+, EC/74 /6.5		(2-)	+0.04	+0.7	ann.rad./
				EC/26 /					Er k x-ray
									0.1921
									0.3351
									0.6280
									1.1498
									(0.18−2.81)
^{159}Tm		158.93498	9.1 m	β+/23 /3.9		5/2+	+3.42	+1.9	ann.rad./
				EC/77 /					Er k x-ray
									0.0591
									0.0848
									0.2713
									(0.05−1.27)
^{160m}Tm			1.24 m	IT		(5)			
^{160}Tm		159.93526	9.4 m	β+/15 /5.9		1-	+0.16	+0.58	ann.rad./
				EC/85 /					Er k x-ray
									0.1264
									0.2642
									0.7285
									0.8544

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.8614
									1.3685
^{161}Tm		160.93355	31. m	β+, EC/3.2		7/2+	+2.40	+2.9	ann.rad./
									Er k x-ray
									0.0595
									0.0844
									1.6481
									(0.04−2.15)
^{162m}Tm			24. s	I.T./90 /		5+			Tm k x-ray
				β+, EC/10 /					Er k x-ray
									0.0669
									0.8115
									0.9003
^{162}Tm		161.93400	21.7 m	β+ /8 /4.81		1-	+0.07	+0.69	ann.rad./
				EC/92 /					Er k x-ray
									0.1020
									0.7987
									(0.1−3.75)
^{163}Tm		162.93265	1.81 h	EC/98 /2.439		½+	-0.082		Er k x-ray
				β+ /1 /					0.0692
									0.1043
									0.2414
^{164m}Tm			5.1 m	I.T./80 /		6-			0.0914
				β+, EC/20 /					0.1394
									0.2081
									0.2405
									0.3149
^{164}Tm		163.93356	2.0 m	β+ /36 /3.96	2.94/	1+	+2.38	+0.71	ann.rad./
				EC/64 /					Er k x-ray
									0.0914
^{165}Tm		164.932435	1.253 d	EC/1.593		½+	-0.139		Er k x-ray
									0.0472
									0.0544
									0.29728
									0.80636
^{166}Tm		165.93355	7.70 h	EC/98 /3.04		2+	+0.092	+2.14	Er k x-ray
				β+ /2 /					0.0806
									0.1844
									0.7789
									1.2734
									2.0524
^{167}Tm		166.932852	9.24 d	EC/0.748		½+	-0.197		Er k x-ray
									0.0571
									0.20778
^{168}Tm		167.934173	93.1 d	EC/1.679		3+	+0.23	+3.2	Er k x-ray
									0.19825
									0.4475
									0.81595
^{169}Tm	100	168.934213				½+	-0.232	-1.2	
^{170}Tm		169.935801	128.6 d	β- /99.8/0.968	0.883/24	1-	+0.247	+0.74	Yb k x-ray
				EC/0.2 /0.314	0.968/76				0.08425
^{171}Tm		170.936429	1.92 y	β- /0.096	0.03/2	½+	-0.230		0.06674
					0.096/98				
^{172}Tm		171.93840	2.65 d	β- /1.88	1.79/36	2-			Yb k x-ray
					1.88/29				0.07879
									1.38722
									1.46601
									1.52982
									1.60861
^{173}Tm		172.939604	8.2 h	β- /1.298	0.80/21	½+			Yb k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					0.86/71				0.3988
									0.4613
^{174m}Tm			2.29 s						
^{174}Tm		173.94217	5.4 m	β- /3.08	0.70/14	(4-)			Yb k x-ray
					1.20/83				0.07664
									0.17669
									0.27332
									0.3666
									0.99205
									(0.08−1.6)
^{175}Tm		174.94384	15.2 m	β- /2.39	0.9/36	(1/2+)			Yb k x-ray
					1.9/23				0.36396
									0.51487
									0.94125
									0.98247
^{176}Tm		175.9470	1.9 m	β-/4.2	2.0/	(4+)			Yb k x-ray
					1.2/				0.1898
									0.3819
									1.0691
^{177}Tm		176.9490	1.4 m	β-					
^{178}Tm		177.9526							
^{179}Tm		178.955							
$_{70}$Yb		**173.04(3)**							
^{148}Yb		147.967				0+			
^{149}Yb		148.964	0.7 s	β+, p	p/2.5−6.4/				0.647
^{150}Yb		149.9584	> 0.2 μs			0+			
^{151}Yb		150.9554	1.6 s	β+ /8.5					
^{152}Yb		151.9503	3.2 s	β+ EC/5.5		0+			
^{153}Yb		152.9495	4. s	β+ EC/6.7					
^{154}Yb		153.94639	0.40 s	β+ EC/7 /4.49		0+			ann.rad./
				α/93 /	5.32/				
^{155}Yb		154.9458	1.7 s	β+, EC/16 /6.0			-0.8	-1.	ann.rad./
				α/84 /	5.19/				
^{156}Yb		155.94282	26. s	β+, EC/21/3.57		0+			ann.rad./
				α/79 /	4.69/				
^{157}Yb		156.94263	39. s	β+, EC/99+/5.5			-0.64		ann.rad./
				α/0.5/	4.69/				0.231
									(0.035−0.670)
^{158}Yb		157.93987	1.5 m	β+, EC/1.9		0+			ann.rad./
									0.0741
									0.2526
^{159}Yb		158.94005	1.4 m	EC, β+/5.1			-0.37	-.022	Tm k x-ray
									0.1661
									0.1772
									0.3297
									0.3903
^{160}Yb		159.93755	4.8 m	β+, EC/2.0		0+			ann.rad./
									0.1404
									0.1737
									0.2158
^{161}Yb		160.93790	4.2 m	β+, EC/3.9		3/2-	-0.33	+1.03	ann.rad./
									Tm k x-ray
									0.0782
									0.5999
									0.6315
^{162}Yb		161.93577	18.9 m	β+, EC/1.7		0+			ann.rad./
									Tm k x-ray
									0.1188

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.1635
^{163}Yb		162.93633	11.1 m	β+ /26 /3.4	1.4/	3/2-	-0.37	+1.24	ann.rad./
									Tm k x-ray
									0.0636
									0.8603
									(0.06 −1.9)
^{164}Yb		163.93449	1.26 h	EC/1.0		0+			Tm k x-ray
									0.0914
									0.6752
^{165}Yb		164.93528	9.9 m	β+ /10 /2.76	1.58/	(5/2-)	+0.48	+2.48	ann.rad./
				EC/90 /					Tm k x-ray
									0.0801
									1.0903
^{166}Yb		165.93388	2.363 d	EC/0.30		0+			Tm k x-ray
									0.0828
									0.1844
									0.7789
									1.2734
									2.0524
^{167}Yb		166.934950	17.5 m	β+ /0.5 /1.954	0.639/	5/2-	+0.62	+2.70	Tm k x-ray
				EC/99.5 /					0.06296
									0.10616
									0.11337
									0.17633
^{168}Yb	0.13(1)	167.933897				0+			
^{169m}Yb			46. s	I.T./0.0242		1/2-			Yb L x-ray
									0.0242
^{169}Yb		168.935190	32.02 d	EC/0.909		7/2+	-0.63	+3.5	0.1979/35.9
									0.3078/10.05
									0.0207−0.2611
^{170}Yb	3.04(15)	169.934762				0+			
^{171}Yb	14.28(57)	170.936326				1/2-	+0.49367		
^{172}Yb	21.83(67)	171.936382				0+			
^{173}Yb	16.13(27)	172.938211				5/2-	-0.67989	+2.80	
^{174}Yb	31.83(92)	173.938862				0+			
^{175}Yb		174.941277	4.19 d	β- /0.470	0.466/73	7/2-	0.77		Lu k x-ray
					0.071/21				0.3963/13
					0.353/6.2				(0.114−0.28)
^{176m}Yb			11.4 s	I.T./1.051		(8-)			Yb k x-ray
									0.0961
									0.1901
									0.2929
									0.3897
^{176}Yb	12.76(41)	175.942572	10^{26} y	β-β-		0+			
^{177m}Yb			6.41 s	I.T./0.3315		1/2-			Yb k x-ray
									0.1131
									0.2084
^{177}Yb		176.945261	1.9 h	β- /1.399	1.40	9/2+			Lu k x-ray
									0.1504
^{178}Yb		177.94665	1.23 h	β- /0.65	0.25/	0+			0.1415
									0.3246
									0.3516
									0.3815
									0.6125
^{179}Yb		178.9502	8. m	β- /2.4					
^{180}Yb		179.9523	2. m	β-		0+			0.1028−0.4423
^{181}Yb		180.9562							
$_{71}$Lu		**174.967(1)**							

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{150m}Lu			0.045 ms	p/1.29					
^{150}Lu		149.973	43. ms	p					
^{151m}Lu			16 μs	p/1.31					
^{151}Lu		150.9676	0.08 s	p/1.231					
^{152}Lu		151.9641	0.7 s						
^{153}Lu		152.9588	0.9 s						
^{154}Lu		153.9575	1.0 s	β+, EC/10.8					
^{155m}Lu			2.6 ms	α/7.41					
^{155}Lu		154.95432	0.07 s	EC/8.0					
				α/	5.66/90				
^{156m}Lu			0.20 s	α/	5.57/				
^{156}Lu		155.9530	~ 0.5 s	β+, EC/9.5					ann.rad./
				α/	5.45/				
^{157m}Lu			~ 9.6 s	α	4.925/				
^{157}Lu		156.95010	4.8 s	β+, EC/94 /6.93					ann.rad./
				α/	5.00/				
^{158}Lu		157.94931	10.4 s	β+, EC/99 /8.0					ann.rad./
				α/	4.67/				0.3682
									0.4770
^{159}Lu		158.94663	12.3 s	β+, EC/6.0					ann.rad./
									0.1505
									0.1875
									0.3693
^{160}Lu		159.9460	36.1 s	β+, EC/7.3					ann.rad./
									0.2434
									0.3957
									0.5773
^{161}Lu		160.94357	1.2 m	β+, EC/5.3					ann.rad./
									0.0437
									0.0671
									0.1003
									0.1108
									0.1562
									0.2562
^{162m}Lu			~ 1.5 m	EC/		4-			
^{162}Lu		161.9433	1.37 m	β+, EC/6.9		1-			ann.rad./
									0.1666
									0.6314
^{163}Lu		162.94118	4.1 m	β+, EC/4.6					ann.rad./
									0.0539
									0.0581
									0.1504
									0.1631
									0.3717
^{164}Lu		163.94134	3.14 m	β+, EC/6.3	1.6/				0.1238
					3.8/				0.2621
									0.7404
									0.8639
									0.8804
^{165}Lu		164.93941	10.7 m	β+, EC/3.9	2.06/	1/2+			ann.rad./
									0.1206
									0.1324
									0.1742
									0.2036
									(0.04–2.0)
^{166m2}Lu			2.1 m	β+ /35 /		(0-)			ann.rad./
				EC/65 /					Yb k x-ray
									1.0673
									1.2566
									2.0986

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{166m1}Lu			1.4 m	β+, EC/58 /		(3-)			ann.rad./
				I.T./42 /0.0344					0.1024
									0.2281
									0.2861
									0.8119
									0.8301
^{166}Lu		165.93986	2.8 m	β+ /25 /5.5		(6-)			ann.rad./
				EC/75 /					Yb k x-ray
									0.1024
									0.2281
									0.3375
									0.3679
^{167}Lu		166.93827	52. m	β+ /2 /3.1	2.1/	7/2+			Yb k x-ray
				EC/98 /					0.0297
									0.2392
									(0.03−2.0)
^{168m}Lu			6.7 m	β+ /12 /		3+			ann.rad./
				EC/88 /					Yb k x-ray
				IT/<0.8					0.1988/190
									0.8960/100
									0.9792/128
									0.018−2.65
^{168}Lu		167.93874	5.5 m	β+ /6 /4.5	1.2/	(6-)			ann.rad./
				EC/94 /					Yb k x-ray
									0.1114
									0.1124
									0.2286
									0.3483
									1.4836
^{169m}Lu			2.7 m	I.T./0.0290		1/2-			Lu L x-ray
									0.0290
^{169}Lu		168.93765	1.419 d	EC/2.293	1.271/	7/2+	2.30	3.5	Yb k x-ray
									0.19121
									0.9606
									(0.08−2.1)
^{170m}Lu			0.7 s	I.T./0.0929		4-			Lu L x-ray
									0.04449
									0.0484
^{170}Lu		169.93848	2.01 d	EC/3.46	2.44/	0+			Yb k x-ray
									0.58711
									0.5908
									1.28029
									(0.1−3.38)
^{171m}Lu			1.31 m	I.T./0.0711		1/2-			Lu k x-ray
									0.07119
^{171}Lu		170.937913	8.24 d	EC/1.479	0.362/	7/2+	2.30	3.42	Yb k x-ray
									0.01939
									0.66744
									(0.02−1.3)
^{172m}Lu			3.7 m	I.T./0.0419		1-			Lu L x-rays
									0.04186
^{172}Lu		171.939086	6.64 d	EC/2.519		4-	2.90	3.80	Yb k x-ray
									0.18156
									1.09367
									(0.07−2.2)
^{173}Lu		172.938931	1.37 y	EC/0.671		7/2+	2.28	3.63	Yb k x-ray
									0.07860
									0.27198
^{174m}Lu			142. d	IT/99.3/	0.17086	6-	1.50		Lu k x-ray
				EC/0.7 /					0.067055

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{174}Lu		173.940338	3.3 y	EC/1.374		1-	1.9		Yb k x-ray
									0.07664
									1.2419
^{175}Lu	97.41(2)	174.940772				7/2+	+2.2327	+3.49	
^{176m}Lu			3.66 h	β- /1.315	1.229/	1-	+0.318	-1.47	Hf k x-ray
					1.317/				0.088372
^{176}Lu	2.59(2)	175.942686	3.73 × 10^{10} y	β- /1.192		7-	+3.169	+4.92	Hf k x-ray
				β+/ < 0.9					0.20187
									0.30691
^{177m2}Lu			6. m	β-		39/2-			0.089
^{177m}Lu			160.7 d	IT/22/0.9702		23/2-	2.33	5.4	Lu k x-ray
				β- /78					Hf k x-ray
									0.11295
									0.20836
									0.37850
									0.41853
^{177}Lu		176.943758	6.65 d	β- /0.498	0.497/	7/2+	+2.239	+3.39	0.11295
									0.20836
^{178m}Lu			23.1 m	β- /		(9-)			0.2166
									0.3317
^{178}Lu		177.945955	28.5 m	β-/2.099	2.03/	1+			Hf k x-ray
									0.0932
									1.3099
									1.3408
									(0.09−1.7)
^{179}Lu		178.94733	4.6 h	β- /1.405	1.35/	7/2+			0.2143
									0.3377
^{180}Lu		179.9499	5.7 m	β- /3.1	1.49/				0.40795/50.
									(0.07−1.9)
^{181}Lu		180.9520	3.5 m	β- /2.5		(7/2+)			0.0458
									0.2059
									0.5749
^{182}Lu		181.9550	2.0 m	β- /~ 4.1					0.0978
									0.7208
									0.8182
^{183}Lu		182.9576	58. s	β- /		7/2+			
^{184}Lu		183.9609	20 s	β-					
$_{72}$Hf		**178.49(2)**							
^{153}Hf		152.971	> 0.2 μs						
^{154}Hf		153.965	2. s	EC, β+/~ 6.7		0+			
^{155}Hf		154.9634	0.9 s	EC, β+/8.					
^{156}Hf		155.9594	25. ms	α/		0+			
^{157}Hf		156.9584	0.11 s	α/					
^{158}Hf		157.95480	2.9 s	EC/54 /5.1		0+			
				α/46 /	5.27/				
^{159}Hf		158.95400	5.6 s	β+, EC/88 /6.9					ann.rad./
				α/12 /	5.09/				
^{160}Hf		159.95068	~ 12. s	β+, EC/97 /4.9		0+			ann.rad./
				α/4.78					
^{161}Hf		160.95028	17. s	α/	4.60/				
^{162}Hf		161.94721	38. s	β+, EC/3.7		0+			ann.rad./
									0.1739
									0.1963
									0.4101
^{163}Hf		162.94709	40. s	β+, EC/5.5					ann.rad./
									0.0454
									0.0621
									0.0710

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.6882
^{164}Hf		163.94438	2.8 m	EC, β+/3.0		0+			
^{165}Hf		164.94457	1.32 m	EC/4.6		11/2-			
^{166}Hf		165.94218	6.8 m	EC/93 /2.3		0+			ann.rad./
				β+ /7 /					Lu k x-ray
									0.0788
^{167}Hf		166.94260	2.0 m	β+ /40 /4.0		(5/2-)			ann.rad./
				EC/60 /					Lu k x-ray
									0.1754
									0.3152
^{168}Hf		167.94057	25.9 m	β+, EC/1.8		0+			ann.rad./
									(0.0144−1.311)
^{169}Hf		168.94126	3.25 m	EC/85 /3.3		(5/2-)			ann.rad./
				β+ /15 /					Lu k x-ray
									0.3695
									0.4929
^{170}Hf		169.93961	16.0 h	EC/1.1		0+			Lu k x-ray
									0.0985
									0.1202
									0.1647
									0.5729
									0.6207
^{171m}Hf			30. s			(1/2-)	+0.53		
^{171}Hf		170.94049	12.2 h	EC, β+ /2.4		7/2+	-0.67	+3.46	ann.rad./
									Lu k x-ray
									0.1221
									0.6620
									1.0714
^{172}Hf		171.93945	1.87 y	EC/0.35		0+			Lu k x-ray
									0.02399
									0.12582
									(0.0818−0.123)
^{173}Hf		172.94051	23.6 h	EC/1.6		½-			Lu k x-ray
									0.12367
									0.13963
									0.29697
									0.31124
									(0.1−2.1)
^{174}Hf	0.16(1)	173.940046	2.0×10^{15} y			0+			
^{175}Hf		174.941509	71. d	EC/0.686		5/2-	-0.60	+2.7	Lu k x-ray
									0.08936
									0.34340
^{176}Hf	5.26(7)	175.941409				0+			
^{177m2}Hf			51.4 m	I.T./2.740		37/2-			Hf k x-ray
									0.2140
									0.2951
									0.3115
									0.3267
^{177m1}Hf			1.1 s	I.T./		23/2+			Hf k x-ray
									0.20836
									0.22847
									0.37851
^{177}Hf	18.60(9)	176.943221				7/2-	+0.7935	+0.337	
^{178m2}Hf			31. y	I.T./		16+	+8.16	+6.00	Hf k x-ray
									0.32555
									0.42635
									0.089−0.574
^{178m1}Hf			4.0 s	I.T./		8-			Hf k x-ray
									0.21342
									0.32555

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.42635
^{178}Hf	27.28(7)	177.943699				0+			
^{179m2}Hf			25.1 d	I.T./1.1057		25/2-	7.4		Hf k x-ray
									0.1227
									0.1461
									0.3626
									0.4537
^{179m1}Hf			18.7 s	I.T./0.375		½-			Hf k x-ray
									0.1607
									0.2141
^{179}Hf	13.62(2)	178.945816				9/2+	-0.641	+3.79	
^{180m}Hf			5.52 h	I.T./1.1416		8-	+9.	+4.6	Hf k x-ray
									0.2152
									0.3323
									0.4432
^{180}Hf	35.08(16)	179.946550				0+			
^{181m}Hf			1.5 ms	/1.738		25/2-			
^{181}Hf		180.949101	42.4 d	β- /1.027	0.408/	1/2-			Ta k x-ray
									0.13294/54
									0.48200/100
									0.3459/20
^{182m}Hf			62. m	β- /54 /1.60	0.49/43	8-			Hf k x-ray
				IT/46 /1.173	0.95/10				0.0509
									0.2244
									0.3441
									0.4558
									0.5066
									0.9428
^{182}Hf		181.95055	8.9×10^6 y	β- /0.37		0+			Ta k x-ray
									0.2704/79
									(0.098-0.270)
^{183}Hf		182.95353	1.07 h	β- /2.01	1.18/68	3/2-			Ta k x-ray
					1.54/25				0.0732
									0.4591
									0.7837
^{184}Hf		183.95545	4.1 h	β- /1.34	0.74/38	0+			Ta k x-ray
					0.85/16				0.0414
					1.10/46				0.1391
									0.3449
^{185}Hf		184.9588	~ 3.5 m	β- /					0.165
^{186}Hf		185.9609	~ 2.6 m			0+			0.738
^{187}Hf		186.9646	> 0.3 μs						
^{188}Hf		187.967	> 0.3 μs			0+			
$_{73}$Ta		**180.94788(2)**							
^{155}Ta		154.975	12 μs	p/1.77					
^{156}Ta		155.9723	0.11 s	β+ /~ 11.6					
				p/	1.02/~ 100				
^{157}Ta		156.9682	10 ms	α/	6.117				
				p/	0.927/3.4				
^{158}Ta		157.9667	37. ms	α/	6.05/100				
					5.97/100				
^{159}Ta		158.96302	0.6 s	β+, EC/20 /8.5	α/5.52/34				ann.rad./
				α/80 /	5.60/55				
^{160}Ta		159.9615	1.4 s	β+, EC/10.1					ann.rad./
				α	5.41/				
^{161}Ta		160.9584	3.16 s	β+, EC/7.5					ann.rad./
				α/	5.15				
^{162}Ta		161.9573	4. s	EC/8.6					

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{163}Ta		162.95433	10.6 s	EC/6.8					
^{164}Ta		163.95353	14.2 s	β+ /8.5		3+			ann.rad./
				α/	4.62/				0.2110
									0.3768
^{165}Ta		164.95077	31. s	ECβ+/5.9					
^{166}Ta		165.95051	34. s	β+ /82 /7.7					ann.rad./
				EC/18 /					Hf k x-ray
									0.1587
									0.3117
									0.8101
^{167}Ta		166.94809	1.4 m	β+, EC/5.6					ann.rad./
^{168}Ta		167.94805	2.4 m	β+ /77 /6.7		3+			ann.rad./
				EC/23 /					Hf k x-ray
									0.1239
									0.2615
									0.7502
^{169}Ta		168.94601	4.9 m	β+, EC/4.4					ann.rad./
									0.0288
									0.1535
									0.1924
^{170}Ta		169.94618	6.8 m	β +/70 /6.0		(3+)			ann.rad./
				EC/35 /					Hf k x-ray
									0.1008
									0.2212
^{171}Ta		170.94448	23.3 m	β+, EC/3.7		(5/2-)			0.0496
									0.5018
									0.5064
									(0.05−1.02)
^{172}Ta		171.94490	36.8 m	β+ /25 /4.9		(3-)			ann.rad./
				EC/75 /					Hf k x-ray
									0.21396
									1.10923
									(0.09 −3.8)
^{173}Ta		172.94375	3.6 h	β+ /24 /3.7		(5/2-)	1.70	-1.9	ann.rad./
				EC/76 /					Hf k x-ray
									0.06972
									0.17219
									(0.06 −2.7)
^{174}Ta		173.94445	1.12 h	β+ /27 /3.8		(3+)			ann.rad./
				EC/73 /					Hf k x-ray
									0.09089
									0.20638
									(0.09−3.64)
^{175}Ta		174.94374	10.5 h	EC/2.0		7/2+	2.27	+3.7	Hf k x-ray
									0.2077
									0.2671
									0.3487
^{176}Ta		175.94486	8.1 h	EC/3.1		1-			Hf k x-ray
									0.08837
									1.15735
^{177}Ta		176.944472	2.356 d	EC/1.166		7/2+	2.25		Hf k x-ray
									0.11295
									(0.07−1.06)
^{178m}Ta			2.4 h	EC/		(7-)			Hf k x-ray
									0.08886
									0.21342
									0.32555
									0.42635
^{178}Ta		177.94578	9.29 m	EC/99 /1.9		1+	+2.74	+0.65	ann.rad./
				β+ /1 /					Hf k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.09316
^{179}Ta		178.945930	1.8 y	EC/0.110		7/2+	2.29	3.37	Hf k x-ray
^{180m}Ta	0.0120(2)		$>1.2 \times 10^{15}$ y			(9-)	4.82		
^{180}Ta		179.947465	8.15 h	EC/87 /0.854		1+			Hf k x-ray
				β- /13 /0.708	0.61/3				W k x-ray
					0.71/10				0.09333
									0.10340
^{181}Ta	99.9880(2)	180.947996				7/2+	+2.370	+3.3	
^{182m}Ta			15.8 m	I.T./0.5198		10-			Ta k x-ray
									0.14678
									0.17157
^{182}Ta		181.950152	114.43 d	β- /1.814	0.25/30	3-	+3.02	+2.6	W k x-ray
					0.44/20				1.12127/100
					0.52/40				1.22138/79
									0.085−1.289
^{183}Ta		182.951373	5.1 d	β- /1.070	0.45/5	7/2+	+2.36		W k x-ray
					0.62/91				0.0847
									0.0991
									0.1079
									0.2461
									0.3540
^{184}Ta		183.95401	8.7 h	β- /2.87	1.11/15	(5-)			W k x-ray
					1.17/81				0.2528/44.
									0.4140/74.
									(0.09−1.4)
^{185}Ta		184.95556	49. m	β- /1.99	1.21/5	(7/2+)			W k x-ray
					1.77/81				0.0697
									0.1739
									0.1776
^{186}Ta		185.9586	10.5 m	β- /3.9	2.2/	(3-)			W k x-ray
									0.1979
									0.2149
									0.5106
									(0.09−1.5)
^{187}Ta		186.9605	> 0.3 μs						
^{188}Ta		187.9637	5 μs						0.292
^{189}Ta		188.9658	> 0.3 μs						
$_{74}$W		**183.84(1)**							
^{158m}W			0.14 ms	α	8.28(3)/				
^{158}W		157.975	1.3 ms	α/	6.433/96	0+			
^{159}W		158.9729	7. ms	α/					
^{160}W		159.9685	0.08 s	α/	5.92/	0+			
^{161}W		160.9674	0.41 s	β+, EC/18 /8.1					
				α/82 /	5.78/				
^{162}W		161.9635	1.39 s	β+, EC/54 /5.8		0+			
				α/46 /	5.54/				
^{163}W		162.9625	2.8 s	β+, EC/59 /7.5					
				α/41 /	5.38/				
^{164}W		163.95895	6. s	β+, EC/97 /5.0		0+			ann.rad./
				α/3 /	5.15/				
^{165}W		164.95828	5.1 s	β+, EC/99 /7.0					ann.rad./
				α/1 /	4.91/				
^{166}W		165.95503	16. s	β+, EC/99 /4.2		0+			ann.rad./
				α/1 /	4.74/				
^{167}W		166.95482	20. s	EC/5.6					
^{168}W		167.95181	53. s	EC/3.8		0+			ann.rad./
				α/10^{-5}/	4.40(1)				Ta k x-ray
									0.1755

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									(0.037–0.573)
^{169}W		168.95178	1.3 m	EC/5.4					ann.rad./
									Ta k x-ray
									0.123
									(0.097–0.699)
^{170}W		169.94923	2.4 m	EC/2.2		0+			ann.rad./
									Ta k x-ray
									0.3162
									(0.060–0.144)
^{171}W		170.94945	2.4 m	EC/4.6					ann.rad./
									Ta k x-ray
									0.1842
									(0.052–0.479)
^{172}W		171.94729	6.6 m	β+, EC/2.5		0+			ann.rad./
									Ta k x-ray
									0.0389
									(0.034–0.674)
^{173}W		172.94769	6.3 m	EC/4.0					ann.rad./
									Ta k x-ray
									0.4576
									(0.035–0.623)
^{174}W		173.94608	35. m	EC/1.9		0+			ann.rad./
									Ta k x-ray
									0.3287
									0.4288
									(0.056–0.429)
^{175}W		174.94672	35. m	EC/2.9		½-			(0.015–0.27)
^{176}W		175.94563	2.5 h	β+, EC/0.8		0+			0.03358
									0.06129
									0.09487
									0.10020
^{177}W		176.94664	2.21 h	EC/2.0		(1/2-)			Ta k x-ray
									0.15505
									0.18569
									0.42694
^{178}W		177.94588	21.6 d	EC/0.091		0+			Ta k x-ray
^{179m}W			6.4 m	IT/99.7/0.222		(1/2-)			W k x-ray
				EC/0.3/					0.2220
^{179}W		178.94707	38. m	EC/1.06		(7/2-)			Ta k x-ray
									0.0307
^{180}W	0.12(1)	179.946704	1.8×10^{18} y	α/		0+			
^{181}W		180.948197	121.1 d	EC/0.188		9/2+			Ta k x-ray
									0.13617
									0.15221
^{182}W	26.50(16)	181.948204	$> 7.7 \times 10^{21}$ y	α/		0+			
^{183m}W			5.15 s	I.T./		(11/2+)			W k x-ray
									0.0465
									0.0526
									0.0991
									0.1605
^{183}W	14.31(4)	182.950223	$> 4.1 \times 10^{21}$ y	α/		½-	+0.1177848		
^{184}W	30.64(2)	183.950931	$> 8.9 \times 10^{21}$ y	α/		0+			
^{185m}W			1.6 m	I.T./0.1974		11/2+			W k x-ray
									0.0659
									0.1315
									0.1737
^{185}W		184.953419	74.8 d	β- /0.433	0.433/99.9	3/2-			0.12536
^{186}W	28.43(19)	185.954364	$> 8.2 \times 10^{21}$ y	α/		0+			
^{187m}W			1.6 μs	IT	0.411	11/2+			(0.014-0.287)
^{187}W		186.957161	23.9 h	β- /1.311	0.624/66	3/2-	0.62		Re k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					1.315/16				0.68572/33
					0.081−1.18				0.134−0.773
^{188}W		187.958489	69.78 d	β- /0.349	0.349/99	0+			0.0636
									0.2271
									0.2907
^{189}W		188.9619	9.7 m	β- /2.5	1.4/	(3/2-)			0.2604
					2.5/				(0.1262-1.466)
^{190m}W			~ 0.06 ms						(0.0585-0.694)
^{190}W		189.9632	30. m	β- /1.3	0.95/	0+			Re k x-ray
									0.1576
									0.1621
^{191}W		190.9666	> 0.3 μs						
^{192}W		191.968	> 0.3 μs			0+			
$_{75}$Re		**186.207(1)**							
^{160}Re		159.9821	0.7 ms	p/	1.261(6)/91				
				α/	6.54/				
^{161}Re		160.9776	14 ms	α/	6.24				
				p	1.35				
^{162}Re		161.9760	0.10 s	α/	6.12/94				
					6.09/94				
^{163}Re		162.97208	0.26 s	β+, EC/9.0	α/5.87/32				
				α/	5.92/66				
^{164}Re		163.9703	0.9 s	β+, EC/10.7					
				α/	5.78/				
^{165m}Re			~ 2.37 s	α/	5.502/				
^{165}Re		164.96709	2.6 s	β+, EC/87 /8.1					
				α/	5.49/ < 5.				
^{166}Re		165.9658	2.5 s	β+, EC/9.4					
				α/	5.50/				
^{167m}Re			6.2 s	α, EC/					
^{167}Re		166.9626	3.4 s	β+, EC/7.4					
				α/	5.015/				
^{168}Re		167.96157	4.4 s	β+, EC/9.1					
				α/	4.833/				0.1117
^{169m}Re			8.1 s	α	4.70/				
					4.87/				
^{169}Re		168.95879	16. s						
^{170}Re		169.95822	9.2 s	β+, EC/9.0					0.1560
									0.3055
									0.4125
^{171}Re		170.95572	15.2 s	EC/~ 5.7					
^{172m}Re			55. s	β+, EC/		(2)			ann.rad./
									0.1234
									0.2537
									0.3504
^{172}Re		171.9554	15. s	β+, EC/7.3					ann.rad./
									0.1234
									0.2537
^{173}Re		172.95324	2.0 m	EC/~ 3.9					ann.rad./
^{174}Re		173.95312	2.4 m	β+, EC/5.6					ann.rad./
									0.1119
									0.2430
^{175}Re		174.95138	5.8 m	β+, EC/4.3					ann.rad./
^{176}Re		175.95162	5.3 m	β+, EC/5.6		(3+)			ann.rad./
									0.1089
									0.2406
^{177}Re		176.95033	14. m	EC/78 /3.4		(5/2-)			ann.rad./
				β+ /22 /					W k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.0797
									0.0843
									0.1968
^{178}Re		177.95099	13.2 m	β+ /11 /4.7	3.3/	(3+)			ann.rad./
				EC/89 /					W k x-ray
									0.1059
									0.2373
									0.9391
^{179m}Re			0.47 ms						
^{179}Re		178.94999	19.7 m	EC/99 /2.71	0.95/	(5/2+)	2.8		W k x-ray
				β+ /1 /					0.1199
									0.2900
									0.4154
									0.4302
									1.6803
^{180}Re		179.95079	2.45 m	EC/92 /3.80	1.76/	1-	1.6		ann.rad./
				β+ /8 /					W k x-ray
									0.1036
									0.9028
									(0.07−2.2)
^{181}Re		180.95007	20. h	EC /1.74		5/2+	3.19		W k x-ray
									0.3607
									0.3655
									0.6390
^{182m}Re			12.7 h	EC/	0.55/	2+	3.3	+1.8	W k x-ray
					1.74/				0.0677
									1.1214
									1.2215
									(0.06−2.2)
^{182}Re		181.9512	2.67 d	EC/2.8		(7+)	2.8	+4.1	W k x-ray
									0.0678
									0.2293
									1.1213
									1.2214
^{183}Re		182.95082	70. d	EC/0.56		(5/2+)	+3.17	+2.3	W k x-ray
									0.16232
^{184m}Re			165. d	I.T./75 /0.188		8+	+2.9		Re k x-ray
				EC/25 /					0.1047
									0.2165
									0.92093
									(0.10−1.1)
^{184}Re		183.952521	38. d	EC/1.48		3-	+2.53	+2.8	W k x-ray
									0.79207
									0.90328
									(0.1−1.4)
^{185}Re	37.40(2)	184.952955				5/2+	+3.1871	+2.18	
^{186m}Re			2.0×10^5 y	I.T./0.150		8+			Re k x-ray
									0.0590
^{186}Re		185.954986	3.718 d	β- /92 /1.070	0.973/21	1-	+1.739	+0.62	W k x-ray
				EC/8 /0.582	1.07/71				0.1227/0.6
									0.1372/9.5
									(0.63−0.77)
^{187}Re	62.60(2)	186.955753	4.2×10^{10} y	β- /0.00266	0.0025/	5/2+	+3.2197	+2.07	
^{188m}Re			18.6 m	I.T./0.172		(6-)			Re k x-ray
									0.0925
									0.1059
^{188}Re		187.958114	17.00 h	β- /2.120	1.962/20	1-	+1.788	+0.57	Os k x-ray
					2.118/79				0.15502
									0.309−2.022
^{189}Re		188.95923	24. h	β- /1.01	1.01/	(5/2+)			0.1471

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.2167
									0.2194
									0.2451
^{190m}Re			3.0 h	β- /51 /		(6-)			Re k x-ray
				I.T./49 /					0.1191
									0.2238
									0.6731
									(0.1−1.79)
^{190}Re		189.9618	3.0 m	β- /3.2	1.8/	(2-)			Os k x-ray
									0.1867
									0.5580
									0.6051
^{191}Re		190.96313	9.7 m	β- /2.05	1.8/				
^{192m}Re			~ 0.12 ms						(0.0606-0.146)
^{192}Re		191.9660	16. s	β- /4.2	~ 2.5/				(0.2−0.75)
^{193m}Re			~ 0.08 ms						(0.061-0.146)
^{193}Re		192.9675	> 0.3 μs						
^{194}Re		193.9704	> 0.3 μs						
$_{76}$Os		**190.23(3)**							
^{162}Os		161.984	1.8 ms	α/	6.60	0+			
^{163}Os		162.9827	5.5 ms	α/	6.51				
^{164}Os		163.9780	0.04 s	α		0+			
^{165}Os		164.9768	0.07 s	α					
^{166}Os		165.97269	0.18 s	β+, EC/28 /6.3	6.27/	0+			ann. rad./
				α/72 /	5.98/				
^{167}Os		166.9716	0.7 s	β+, EC/76 /8.2					ann.rad./
				α/24 /	5.84/				
^{168}Os		167.96780	2.2 s	β+, EC/51 /5.7		0+			ann. rad./
				α/49 /					
^{169}Os		168.96702	3.3 s	β+, EC/89 /7.7	5.57/80				ann.rad./
				α/13 /	5.51/12				
					5.54/8				
^{170}Os		169.96358	7.1 s	β+, EC/5.0		0+			ann.rad./
				α/	5.40/				(0.162−0.216)
^{171}Os		170.96319	8.4 s	β+, EC/98 /7.1	α/5.24/93.5				ann.rad./
				α/19 /	5.17/6.5				0.190−0.705
^{172}Os		171.96002	19. s	β+, EC/99 /4.5		0+			ann.rad./
				α/1.1/	5.10/				(0.063−1.120)
^{173}Os		172.95981	16. s	β+, EC/6.3					ann.rad./
				α/0.4 /	4.94/				0.142−0.299
^{174}Os		173.95706	44. s	β+, EC/3.9		0+			0.118
				α/0.02 /	4.76/				0.138 / 0.001
									0.158
									0.325
^{175}Os		174.95695	1.4 m	β+, EC/5.3					0.125
									0.181
									0.248
^{176}Os		175.95481	3.6 m	β+, EC/3.2		0+			0.8155
									0.7758
									0.8573
									1.2093
									1.2909
^{177}Os		176.95497	2.8 m	β+, EC/4.5		(1/2-)			0.0848
									0.1958
									0.3002
									1.2686
^{178}Os		177.95325	5.0 m	β+, EC/2.3		0+			ann.rad./
									0.5946

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.6850
									0.9687
									1.3311
^{179}Os		178.95382	7. m	β+, EC/3.7					ann.rad./
									0.0654
									0.2186
									0.5938
^{180}Os		179.95238	21.5 m	β+, EC/1.5		0+			Re k x-ray
									0.0202−0.7174
^{181m}Os			1.75 h	EC/		(1/2-)			ann.rad./
									0.0489
^{181}Os		180.95324	2.7 m	EC/2.9		(7/2-)			ann.rad./
									0.11794
									0.23868
									0.8267
									(0.07−2.64)
^{182}Os		181.95211	21.5 h	EC/0.9		0+			Re k x-ray
									0.1802
									0.5100
^{183m}Os			9.9 h	EC/84 /		½-			Os k x-ray
				I.T./16 /					Re k x-ray
									1.1020
									1.1080
^{183}Os		182.95313	13. h	EC/2.1		9/2+	-0.79	+3.1	Re k x-ray
									0.1144
									0.3818
^{184}Os	0.02(1)	183.952489				0+			
^{185}Os		184.954042	93.6 d	EC/1.013		½-			Re k x-ray
									0.6461
									0.8748
									0.8805
^{186}Os	1.59(3)	185.953838	2. × 10^{15} y	α/	~ 2.75/	0+			
^{187}Os	1.96(2)	186.955750				½-	+0.0646519		
^{188}Os	13.24(8)	187.955838				0+			
^{189m}Os			5.8 h	I.T./0.0308		9/2-			Os L x-ray
									0.0308
^{189}Os	16.15(5)	188.958148				3/2+	+0.65993	+0.86	
^{190m}Os			9.9 m	I.T./1.705		10-	-0.6		Os k x-ray
									0.1867
									0.3611
									0.5026
									0.6161
^{190}Os	26.26(2)	189.958447				0+			
^{191m}Os			13.1 h	I.T./0.0744		3/2-			Os k x-ray
									0.0744
^{191}Os		190.960930	15.4 d	β- /0.314	0.140/100	9/2-		+2.5	Ir k x-ray
									0.1294
^{192m}Os			6.0 s	I.T./2.0154		(10-)			Os k x-ray
									0.2058/65.9
									0.5692/70
									(0.201−1.000)
^{192}Os	40.78(19)	191.961481				0+			
^{193}Os		192.964152	30.5 h	β- /1.141	1.04/20	3/2-	+0.730	+0.47	Ir k x-ray
									0.1389
									0.4605
^{194}Os		193.965182	6.0 y	β- /0.097	0.054/33	0+			Ir L x-ray
					0.096/67				0.0429
^{195}Os		194.968	6.5 m	β- /2.0	2.0/				
^{196}Os		195.96964	34.9 m	β- /1.16	0.84/	0+			0.1262/5
									0.4079/5.9

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{197}Os			2.8 m	β-					0.2239
									(0.0412-0.406)
$_{77}$Ir		**192.217(3)**							
^{164}Ir		163.9922	0.06 ms	p	1.78				
^{165}Ir		164.9875	0.3 ms	p/87	1.71				
				α/13	6.72				
^{166m}Ir			14.3 ms	α/98.2	6.545				
				p/1.8	1.32				
^{166}Ir		165.9858	0.010 s	α/93	6.56				
				p/6.9	1.15				
^{167m}Ir			26. ms	α/48, β+	6.39/90				
				p/32	1.25/0.42				
^{167}Ir		166.98167	32. ms	α/80, β+	6.35/48				
				p/0.4	1.06/39.3				
^{168}Ir		167.9799	0.16 s	α/82					
^{169m}Ir			280. ms	α/	6.12/59				
^{169}Ir		168.97630	353. ms	α/	5.99/42				
^{170}Ir		169.9750	0.43 s	α/	6.03/				
^{171}Ir		170.97163	1.3 s	α/	5.91/				
^{172}Ir		171.9705	2.1 s	α/	5.811/				0.228
									(0.379−0.475)
^{173}Ir		172.96750	3.0 s	α/	5.665/				0.0493
									(0.092−0.296)
^{174}Ir		173.96686	4. s	α/	5.478/				0.1587
									(0.276−1.33)
^{175}Ir		174.96411	~ 4.5 s	α/	5.393/				0.1056
^{176}Ir		175.96365	8. s	EC, β+/80					0.260
				α/3.2/	5.118/				(0.135−0.415)
^{177}Ir		176.96130	30. s	EC, β+/5.7					0.184
				α/0.06/	5.011/				(0.062−0.194)
^{178}Ir		177.96108	12. s	β+, EC/6.3					
									0.1320
									0.2667
									0.3633
^{179}Ir		178.95912	4. m	EC/4.9					0.0975
									(0.045−0.220)
^{180}Ir		179.95923	1.5 m	EC/6.4					0.2765
									((0.132−1.106)
^{181}Ir		180.95763	4.9 m	β+, EC/4.1		(7/2+)			ann.rad./
									0.1076
									(0.0196−1.715)
^{182}Ir		181.95808	15. m	β+ /44 /5.6					ann.rad./
				EC/56 /					Os k x-ray
									0.1273
									0.2370
^{183}Ir		182.95685	57. m	β+, EC/3.5					ann.rad./
									0.0877
									0.2285
									0.2824
^{184}Ir		183.95748	3.0 h	β+ /12 /4.6	2.3/	5-	0.70	+2.41	ann.rad./
				EC/88 /	2.9/				Os k x-ray
									0.11968
									0.2640
									0.3904
^{185}Ir		184.95670	14. h	β+ /3 /2.4		(5/2-)	2.60	-2.1	ann.rad./
				EC/97 /					Os k x-ray
									0.2543
									1.8288

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{186m}Ir			1.7 h	EC /		(2-)	0.64	+1.46	Os k x-ray
									0.1371
									0.7675
^{186}Ir		185.95795	15.7 h	EC/98 /3.83		(5+)	3.9	-2.55	Os k x-ray
				β+ /2 /					0.1372
									0.2968
									0.4348
									(0.13−3.0)
^{187}Ir		186.95736	10.5 h	EC/1.50		3/2+		+0.94	Os k x-ray
									0.0743
									0.4009
									0.4271
									0.6109
									0.9128
^{188}Ir		187.95885	1.72 d	β+ /2.81	1.13/	(2-)	0.30	+0.48	Os k x-ray
				EC/99+ /	1.64/				0.1550
									0.4780
									0.6330
									2.2146
^{189}Ir		188.95872	13.2 d	EC/0.53		3/2+	0.13	+0.88	Os k x-ray
									0.2449
^{190m2}Ir			3.09 h	β+, EC/95 /		(11-)			0.376
				I.T./5 /					
^{190m1}Ir			1.12 h	I.T. /0.0263		7+			Ir L x-ray
^{190}Ir		189.960546	11.8 d	EC/2.0		(4+)	0.04	+2.8	Os k x-ray
									0.1867
									0.4072
									0.5186
									0.5580
									0.6051
									(0.2−1.4)
^{191m}Ir			4.93 s	I.T./0.1714		11/2-	+0.603		Ir k x-ray
									0.1294
^{191}Ir	37.3(2)	190.960594				3/2+	+0.151	+0.82	
^{192m2}Ir			241. y	I.T./0.161		(9+)			Ir k x-ray
^{192m1}Ir			1.44 m	I.T./0.0580		(1+)			Ir L x-ray
									0.0580
									0.3165
^{192}Ir		191.962605	73.83 d	β- /1.460		(4-)	+1.92	+2.15	Pt k x-ray
									0.31649/83.
									0.46806/48.
^{193m}Ir			10.53 d	I.T./0.0802		11/2-			Ir L x-ray
									0.0803
^{193}Ir	62.7(2)	192.962926				3/2+	+0.164	+0.75	
^{194m}Ir			170. d	β- /		11			Pt k x-ray
									0.3284
									0.4829
									0.5624
^{194}Ir		193.965078	19.3 h	β-/2.247	1.92/9	1-	+0.39	+0.34	0.2935
					2.25/86				0.3284
									0.6451
									(0.1−2.2)
^{195m}Ir			3.9 h	β- /	0.41/	(11/2-)			Pt k x-ray
					0.97/				0.3199/9.6
									0.3649/9.5
									0.4329/9.6
									0.6849/9.6
^{195}Ir		194.965980	2.8 h	β- /1.120	1.0/80	(3/2+)			Pt k x-ray
					1.11/13				0.0989/9.7
^{196m}Ir			1.40 h	β-/	1.16/				Pt k x-ray

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									0.3557
									0.3935
									0.4471
									0.5214
									0.6473
^{196}Ir		195.96840	52. s	β- /3.21	2.1/15	0-			0.3329
					3.2/80				0.3557
									0.7796
^{197m}Ir			8.9 m	β- /		(11/2-)			0.3465
				I.T./					see Ir[197]
^{197}Ir		196.96965	5.8 m	β- /2.16	1.5/	(3/2+)			0.0531
					2.0/				0.1351
									0.4306
									0.4697
^{198}Ir		197.9723	8. s	β- /4.1					0.4074
									0.5070
^{199}Ir		198.97380							
$_{78}$Pt		**195.084(9)**							
^{166}Pt		165.995	0.3 ms	α/	7.11/	0+			
^{167}Pt		166.930	0.9 ms	α/	6.98/				
^{168}Pt		167.9882	2.1 ms	α	6.82	0+			0.582/69
									0.594/69
									0.725/62
^{169}Pt		168.9867	7.0 ms	α	6.69				
^{170}Pt		169.98250	14.0 ms	α	6.55	0+			0.509/100
									0.662/86
									0.214−0.726
^{171}Pt		170.9812	0.05 s	α	6.45				0.4450
									(0.1564-1.208)
^{172}Pt		171.97735	0.10 s	α/	6.31/94	0+			
^{173}Pt		172.9764	0.36 s	β+, EC/8.2	6.23				
				α/	6.20/				
^{174}Pt		173.97282	0.89 s	β+, EC/17 /5.6		0+			
				α/83 /	6.040/				
^{175}Pt		174.97242	2.5 s	β+, EC/65 /7.6					0.0774
				α/35 /	5.831/5				0.1354
					5.96/54				0.2128
					6.038/				
^{176}Pt		175.96895	6.3 s	β+, EC/60 /5.1		0+			ann.rad./
				α/40 /	5.528/0.6				0.2277
					5.750/41				
^{177}Pt		176.96847	11. s	EC/91 /6.8	5.53/				0.0908
				α/9 /	5.485/3				
					5.525/6				
^{178}Pt		177.96565	21. s	EC/93 /4.5		0+			
				α/7 /	5.286/0.2				
					5.442/7				
^{179}Pt		178.96536	33. s	β+, EC/5.7			+0.43		
				α/	5.16/				
^{180}Pt		179.96303	52. s	β+, EC/99.7 /3.7	0+				
				α/0.3 /	5.140/				
^{181}Pt		180.96310	51. s	β+, EC/5.2			+0.48		
^{182}Pt		181.96117	2.7 m	β+, EC/2.9		0+			ann.rad./
									0.1360
									0.1460
									0.2100
^{183m}Pt			43. s	β+, EC/		(7/2-)	+0.78	+3.4	ann.rad./
				I.T./					0.3132/26

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									0.3164/59
									0.6296/100
									0.058−1.75
^{183}Pt		182.96160	7. m	β+, EC/4.6			+0.50		ann.rad./
									0.119/100
									0.307/93
									0.260/90
									0.058−1.377
^{184}Pt		183.95992	17.3 m	β+, EC/2.3		0+			ann.rad./
									0.1549
									0.1919
									0.5484
^{185m}Pt			33. m	β+, EC/		½-	+0.5		
^{185}Pt		184.96062	1.18 h	β+, EC/3.8		(9/2+)	-0.75	+3.7	ann.rad./
									0.1353
									0.1974
									0.2296
									0.2551
^{186}Pt		185.95935	2.0 h	β+, EC/1.38		0+			ann.rad./
									0.6115
									0.6892
^{187}Pt		186.96059	2.35 h	β+, EC/3.1		3/2-	-0.41	-1.1	ann.rad./
									Ir k x-ray
									0.1064
									0.1100
									0.2015
									0.2849
									0.7092
^{188}Pt		187.95940	10.2 d	EC/0.51		0+			Ir k x-ray
									0.1876
									0.1951
^{189}Pt		188.96083	10.9 h	β+, EC/1.97		3/2-	-0.43	-1.2	Ir k x-ray
									0.0943
									0.6076
									0.7214
									(0.09−1.47)
^{190}Pt	0.014(1)	189.95993	4.5×10^{11} y			0+			
^{191}Pt		190.961677	2.86 d	EC/1.02		(3/2-)	-0.50	-0.9	Ir k x-ray
									0.3599
									0.4094
									0.5389
^{192}Pt	0.782(7)	191.961038				0+			
^{193m}Pt			4.33 d	I.T./0.1498		13/2+	-0.75		Pt k x-ray
									0.1355
^{193}Pt		192.962988	60. y	EC/0.0566		(1/2-)	+0.60		Ir k x-rays
^{194}Pt	32.967(99)	193.962680				0+			
^{195m}Pt			4.01 d	I.T./0.2952		13/2+	-0.61	+1.4	Pt k x-ray
									0.0989
^{195}Pt	33.832(10)	194.964791				1/2-	+0.6095		
^{196}Pt	25.242(41)	195.964952				0+			
^{197m}Pt			1.590 h	I.T./97 /		13/2+			Pt k x-ray
				β- /3 /					0.0530
									0.3465
^{197}Pt		196.967340	19.9 h	β- /0.719		1/2-	0.51		Au k x-ray
									0.1914
									0.2688
^{198}Pt	7.163(55)	197.967893				0+			
^{199m}Pt			13.6 s	I.T./0.424		13/2+			Pt k x-ray
									0.3919
^{199}Pt		198.970593	30.8 m	β- /1.70	0.90/18	(5/2-)			0.3170/3.88

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					1.14/14				0.49375/4.47
									0.5430/11.7
									(0.055−1.293)
^{200}Pt		199.971441	12.5 h	β- /~ 0.66		0+			Au k x-ray
									0.13590
									0.22747
									0.24371
^{201}Pt		200.97451	2.5 m	β- /2.66		(5/2-)			0.070
									0.152
									0.222
									1.760
^{202m}Pt			0.3 ms						(0.535-0.719)
^{202}Pt		201.9757	1.8 d			0+			0.440
$_{79}$Au		**196.966569(4)**							
^{170m}Au			0.62 ms	p/58	1.74/				
				α/42	7.11/				
^{170}Au		169.9961	0.30 ms	p/89	1.46/				
				α/11	7.00/				
^{171m}Au			1.09 ms	α/66	6.995				
				p/34	1.694				
^{171}Au		170.99188	0.022 ms	p/100	1.437				
^{172}Au		171.9900	4 ms	α/7.02	6.86				
^{173m}Au			15 ms	α/92	6.732				
^{173}Au		172.98624	0.02 s	α/94	6.672				
^{174}Au		173.9848	0.14 s	α	6.54				
^{175}Au		174.98127	0.15 s	α					
^{176}Au		175.9801	0.9 s	β+, EC/10.5					
				α/	6.260/80				
					6.290/20				
^{177}Au		176.97687	1.2 s	α/	6.115/				
					6.150/				
^{178}Au		177.9760	2.6 s	α/	5.920/				
^{179}Au		178.97321	7.5 s	α/	5.85/				
^{180}Au		179.97252	8.1 s	EC/8.6	5.65				0.1522
				α/	5.61				0.2564
					5.50				0.5242
									0.6765
									0.8084
									0.8597
^{181}Au		180.97008	11.4 s	EC/97.5/6.3	5.482/				
				α/2.7/					
^{182}Au		181.96962	21. s	β+, EC/6.9					ann.rad./
				α/0.13/					0.1549
									0.2649
									(0.13−1.4)
^{183}Au		182.96759	42. s	EC/5.5			+1.97		0.1630
				α/0.8/					0.2730
									0.3625
^{184m}Au			48 s	I.T.		(2+)	+1.44	+1.9	0.069(IT)
^{184}Au		183.96745	21. s	EC, β+/7.1		(5+)	+2.07	+4.7	
				α/0.013/					
^{185m}Au			6.8 m	β+, EC/					
				I.T./0.145					
^{185}Au		184.96579	4.3 m	β+, EC/4.71		(5/2-)	+2.17	-1.1	ann.rad./
				α/0.26/					
^{186m}Au			< 2. m	β+, EC/					0.1915
^{186}Au		185.96595	10.7 m	β+, EC/6.0		3-	-1.26	+3.1	ann.rad./

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				α/8(10)$^{-4}$/					0.1915
									0.2988
^{187m}Au			2.3 s	IT		9/2-			
^{187}Au		186.96457	8.3 m	β+, EC/3.60		1/2+	+0.54		ann.rad./
									0.9152
									1.2668
									1.3321
									1.4081
^{188}Au		187.96532	8.8 m	β+, EC/5.3		(1-)	-0.07		ann.rad./
									0.2660
									0.3404
									0.6061
^{189m}Au			4.6 m	β+, EC/		11/2-	+6.19		0.1667
^{189}Au		188.96395	28.7 m	EC/96 /3.2		1/2+	+0.49		ann.rad./
				β+ /4 /					Pt k x-ray
									0.4478
									0.7133
									0.8128
^{190}Au		189.96470	43. m	β+ /2 /4.44		1-	-0.07		ann.rad./
				EC/98 /					Pt k x-ray
									0.2958
									0.3018
									0.5977
^{191m}Au			0.9 s	I.T./0.2663		(11/2-)	6.6		Au k x-ray
									0.2414
									0.2526
^{191}Au		190.96370	3.2 h	EC/1.83		3/2+	+0.137	+0.72	Pt k x-ray
									0.5864/16
									(0.088−1.30)
^{192}Au		191.96481	4.9 h	β+ /5 /3.52	2.19/	1-	-0.011	-0.23	ann.rad./
				EC/95 /	2.49/				Pt k x-ray
									0.2959
									0.3165
^{193m}Au			3.9 s	I.T./0.2901		11/2-	6.2	+1.98	Au k x-ray
									0.2580
^{193}Au		192.96415	17.6 h	EC/1.07		3/2+	+0.140	+0.66	Pt k x-ray
									0.1862
									0.2556
^{194}Au		193.96537	1.64 d	β+ /3 /2.49	1.49/	1-	+0.076	-0.24	ann.rad./
				EC/97 /					Pt k x-ray
									0.2935
									0.3284/61
^{195m}Au			30.5 s	I.T./0.3186		11/2-	6.2	+1.9	Au k x-ray
									0.2617
^{195}Au		194.965035	186.10 d	EC/0.227		3/2+	+0.149	+0.61	Pt k x-ray
^{196m2}Au			9.7 h	I.T./0.5954		12-	5.7		Au k x-ray
									0.1478
									0.1883
^{196m1}Au			8.1 s	I.T./0.0846		8+			0.0847
^{196}Au		195.966570	6.17 d	EC/92 /1.506		2-	+0.591	0.81	Pt k x-ray
^{197m}Au			7.8 s	I.T./0.4094		11/2-	+6.0	+1.7	Au k x-ray
				β- /8 /0.686					0.1302
									0.2790
^{197}Au	100.	196.966569				3/2+	+0.14575	+0.55	
^{198m}Au			2.30 d	I.T./0.812		(12-)			Au k x-ray
									0.0972
									0.1803
									0.2419
^{198}Au		197.968242	2.695 d	β- /1.372	0.290/1	2-	+0.5934	+0.64	Hg k x-ray
					0.961/99				0.411794

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^{199}Au		198.968765	3.14 d	β- /0.453	0.25/22	3/2+	+0.2715	+0.51	Hg k x-ray
					0.292/72				0.15837
					0.462/6				0.20820
^{200m}Au			18.7 h	β- /84 /1.0	0.56/	12-	5.9		Au k x-ray
				I.T./16 /					0.2559/71
									0.3680/77
									0.4978/73
									0.5793/72
									0.084−0.904)
^{200}Au		199.97073	48.4 m	β- /2.24	0.7/15	1-			0.3679/19
					2.2/77				1.2254/10.6
									(0.077−1.570)
^{201}Au		200.971657	26. m	β- /1.28	1.27/82	3/2+			(0.027−0.732)
^{202}Au		201.9738	29. s	β- /3.0		(1-)			0.4396
^{203}Au		202.975155	1.0 m	β- /2.14	~ 1.9/	3/2+			(0.04−0.37)
^{204}Au		203.9777	40. s	β- /4.5		(2-)			0.4366
									1.5113
^{205}Au		204.9799	31. s	β- /					(0.38−1.33)
$_{80}$Hg		**200.59(2)**							
^{171}Hg		171.0038	0.06 ms	α	7.49				
^{172}Hg		171.9988	0.3 ms	α	7.36	0+			
^{173}Hg		172.9972	0.8 ms	α	7.20				
^{174}Hg		173.99286	1.9 ms	α	7.07	0+			
^{175}Hg		174.9914	0.02 s	α					
^{176}Hg		175.98736	21 ms	α	6.74/94	0+			
^{177m}Hg			1.5 μs	IT					0.246
^{177}Hg		176.9863	0.13 s	α	6.58				
^{178}Hg		177.98248	0.26 s	EC/50 /6.1		0+			
				α/50 /	6.43/				
^{179}Hg		178.98183	1.05 s	EC/8.0					
				α/	6.29/				
^{180}Hg		179.97827	2.6 s	EC/5.5		0+			0.1250
				α/	6.12/33				0.3005
					5.69/.03				0.3812
^{181}Hg		180.97782	3.6 s	β+ EC/76 /~ 7.3		(1/2-)	+0.507		0.0663
				α/24 /					0.0811
									0.0924
									0.1474
									0.1587
									0.2142
									0.2398
^{182}Hg		181.97469	10.8 s	β+, EC/85/5.0		0+			0.129/122
				α/15/	5.87/8.6				0.2176/66
					5.45/0.03				0.0256−0.543
^{183}Hg		182.97445	9. s	β+, EC/77/6.3		½-	+0.524		0.0714
				α/	5.83/				0.0874
					5.91/				0.1538
^{184}Hg		183.97171	30.9 s	β+, EC/99/4.1		0+			0.1565/102
				α/1/	5.54/1.3				0.2367/100
					5.07/0.002				0.2384/18
									(0.018-0.4227)
^{185m}Hg			21. s	β+, EC, IT, α/	5.37/	13/2+	-1.02	+0.2	0.211
									0.292
^{185}Hg		184.97190	51. s	β+, EC/95/5.8		½-	+0.509		0.02−0.55
^{186}Hg		185.96936	1.4 m	β+, EC/3.3		0+			0.1119
				α	5.09/0.02				0.2518
^{187m}Hg			1.7 m	β+, EC/		13/2+	-1.04	+0.5	see Hg187
^{187}Hg		186.96981	2.4 m	β+, EC/4.9		3/2-	-0.594	-0.8	0.1034/32

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									0.2334/100
									0.2403/33
									0.27151/31
									0.3763/38
									0.5254/30
									0.10−2.18
^{188}Hg		187.96758	3.2 m	β+, EC/2.3		0+			0.0988
				α	4.61				0.1148
									0.1424
									0.1900
^{189m}Hg			8.6 m	EC/		13/2+	-1.06	+0.7	0.0780
									0.3210
									0.4345
									0.5655
									(0.08−2.170)
^{189}Hg		188.96819	7.6 m	EC/4.2		3/2-	-0.6086	-0.8	0.2005
									0.2038
									0.2386
									0.2485
^{190}Hg		189.96632	20.0 m	EC/1.5		0+			0.1296
									0.1426
^{191m}Hg			51. m	β+ /6 /		13/2+	-1.07	+0.6	ann.rad./
				EC/94 /					Au k x-ray
									0.2741
									0.4203
									0.5787
									(0.07−1.9)
^{191}Hg		190.96716	50. m	β+, EC/3.2		(3/2-)	-0.62	-0.8	0.1963
									0.2247
									0.2524
^{192}Hg		191.96563	5.0 h	EC/~ 0.5		0+			Au k x-ray
									0.1572
									0.2748
									0.3065
^{193m}Hg			11.8 h	β+, EC/91 /		13/2+	-1.05843	+0.92	Hg k x-ray
				I.T./9 /0.2901					0.1866
									0.2580
									0.4076
									0.5733
									0.9324
									(0.1−1.96)
^{193}Hg		192.96667	3.8 h	EC, B+/2.34		3/2-	-0.6276	-0.7	0.1866
									0.2580
									0.8611
^{194}Hg		193.96544	520. y	EC/0.04		0+			Au L x-rays
^{195m}Hg			1.67 d	I.T./(54)/0.3186		13/2+	-1.04465	+1.1	Hg k x-ray
				EC/(46)/					Au k x-ray
									0.2617
									0.5603
									0.7798
^{195}Hg		194.96672	10.5 h	EC/1.51		1/2-	+0.541475		Au k x-ray
									0.0614
									0.7798
^{196}Hg	0.15(1)	195.965833	>2.5 × 10^{18} y			0+			
^{197m}Hg			23.8 h	I.T./(93)/0.2989		13/2+	-1.02768	+1.2	Hg k x-ray
									Au k x-ray
									0.13398
^{197}Hg		196.967213	2.69 d	EC/0.600		1/2-	+0.527374		Au k x-ray
									0.07735
^{198}Hg	9.97(20)	197.9667690				0+			

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^{199m}Hg			42.7 m	I.T./0.532		13/2+	-1.014703	+1.2	Hg k x-ray
									0.15841
^{199}Hg	16.87(22)	198.9682799				1/2-	+0.505885		
^{200}Hg	23.10(19)	199.9683260				0+			
^{201}Hg	13.18(9)	200.970302				3/2-	-0.560226	+0.39	
^{202}Hg	29.86(26)	201.970643				0+			
^{203}Hg		202.972873	46.61 d	β- /0.492	0.213/100	5/2-	+0.8489	+0.34	Tl k x-ray
									0.279188
^{204}Hg	6.87(15)	203.9734939				0+			
^{205}Hg		204.976073	5.2 m	β- /1.531	1.33/4	1/2-	+0.6010		0.20378
									(0.2−1.4)
^{206}Hg		205.97751	8.2 m	β- /1.31	0.935/34	0+			Tl k x-ray
					1.3/63				0.3052
									0.6502
^{207}Hg		206.9826	2.9 m	β- /4.8		(9/2+)			
^{208}Hg		207.9859	41. m	β-		0+			0.474
^{209}Hg		208.9910	36 s	β-					0.324
^{210}Hg		209.9945	> 0.3 μs	β-		0+			
$_{81}$Tl		**204.3833(2)**							
^{176}Tl		176.0006	5 ms	p	1.26/~ 100				
^{177m}Tl			0.23 ms	p/51	1.95				
				α/49	7.48				
^{177}Tl		176.99643	0.017 s	α/73					
				p/27					
^{178}Tl		177.9949	0.25 s	α/	6.704				
					6.785				
					6.62				
					6.859				
^{179m}Tl			1.7 ms	α	/7.21/80				
				α	/7.10/20				
^{179}Tl		178.99109	0.3 s	α	6.57/				
^{180}Tl		179.9899	1.5 s	α//8	6.28/30				
					6.36/30				
					6.21/18				
					6.56/15				
					6.47/7				
^{181m}Tl			1.4 ms	α	6.58/100				
^{181}Tl		180.98626	3.2 ms	α/ < 10	6.19/100				
^{182}Tl		181.9857	3. s	β+, EC/10.9					0.351
									(0.26−0.41)
^{183m}Tl			53. ms	α	6.33/80	9/2-			0.0618
					6.38/16				(0.046-0.0894)
					6.46/4				
^{183}Tl		182.98219	5. s	β+, EC/7.7		½+			0.208
^{184}Tl		183.98187	11. s	β+, EC/(98)/9.2					0.2868
				α/(2)/	6.16/				0.3399
									0.3667
^{185m}Tl			1.8 s	I.T./0.453		(9/2-)			0.1688
				α/5.97	6.01				0.2840
^{185}Tl		184.9788	20. s	EC/β+/6.6					
^{186m}Tl			4. s	I.T./0.374					0.3738
^{186}Tl		185.9783	28. s	β+, EC/7.5					0.3567
									0.4026
									0.4053
^{187m}Tl			15.6 s	I.T./~ 0.33		(9/2+)	+3.8	-2.4	0.2995
^{187}Tl		186.97591	50. s	β+, EC/6.0		½+	1.6		
^{188m}Tl			1.18 m	β+, EC/		(7+)			Hg k x-ray
									0.4129

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									0.5043
									0.5921
^{188}Tl		187.97601	1.2 m	β+, EC/7.8		(2-)	+0.48	+0.13	see Tl[188m]
									0.4129
^{189m}Tl			1.4 m	β+, EC/		(9/2-)	+3.878	-2.29	0.2156
									0.2284
									0.3175
									0.4452
^{189}Tl		188.97359	2.3 m	β+, EC/5.2		(1/2+)			0.3337
									0.4510
									0.5223
									0.9422
^{190m}Tl			3.7 m	β+, EC/	4.2/	(7+)	+0.495	+0.29	0.1968
									0.4164
									0.7311
^{190}Tl		189.97388	2.6 m	β+, EC/7.0	5.7/	(2-)	+0.25	-0.33	0.4164
									0.6254
									0.6838
									1.0999
^{191m}Tl			5.2 m	β+, EC/(98)/		(9/2+)	+3.903	-2.3	0.2157
									0.2647
									0.3256
									0.3359
^{191}Tl		190.97179				(1/2)	1.59		
^{192m}Tl			10.8 m	β+, EC/		(7+)	+0.518	0.46	0.1740
									0.4228
									0.6348
									0.7863
									0.7455
^{192}Tl		191.97223	9.6 m	β+, EC/6.4		(2-)	+0.20	-0.33	0.3975
									0.4228
									0.6908
^{193m}Tl			2.1 m	I.T./(75)/		(9/2-)	+3.948	-2.2	0.3650
^{193}Tl		192.9707	22. m	β+, EC/3.6		(1/2+)	+1.591		0.2077
									0.3244
									0.3440
									0.6761
									1.0447
									1.5793
^{194m}Tl			32.8 m	β+ /(20)/~ 0.30		(7+)	+0.540	+0.61	ann.rad./
				EC/(80)/					Hg k x-ray
									0.4282
									0.6363
									0.7490
^{194}Tl		193.9712	33.0 m	β+, EC/5.3		2-	0.140	-0.28	0.4279/75.2
									0.6452/10.8
									(0.395-1.623)
^{195m}Tl			3.6 s	I.T./0.483		9/2-			Tl k x-ray
									0.0990
									0.3836
^{195}Tl		194.96977	1.16 h	EC/97/2.8		1/2+	+1.58		ann.rad./
				β+ /(3)/					Hg k x-ray
									0.2422
									0.5635
									0.8845
									1.3639
									(0.13−2.5)
^{196m}Tl			1.41 h	β+, EC/95/4.9		(7+)	0.55	+0.76	0.0840
									0.4261
									0.6353

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									0.6954
									(0.08–1.0)
^{196}Tl		195.97048	1.84 h	β+ /(15)/4.4		2-	+0.072	-0.18	ann.rad./
				EC/(85)/					Hg k x-ray
									0.4257
									0.6105
									(0.03–2.4)
^{197m}Tl			0.54 s	IT/53/0.608		9/2-			Tl k x-ray
				β+, EC/47/					0.2262
									0.4118
									0.5872
									0.6367
^{197}Tl		196.96958	2.83 h	β+ /(1)/2.18		1/2+	+1.58		Hg k x-ray
				EC/(99)/					0.1522/8.2
									0.4258
^{198m}Tl			1.87 h	β+, EC/(53)/		7+	+0.64		Hg k x-ray
				IT/47/0.5347					Tl k x-ray
									0.4118
									0.5872
									0.6367
^{198}Tl		197.9405	5.3 h	EC, β+ /(1)/3.5	1.4/	2-			Hg k x-ray
					2.1/				0.4118
					2.4/				0.6367
									0.6759
									(0.23–2.8)
^{199}Tl		198.96988	7.4 h	EC/1.4		1/2-	+1.60		Hg k x-ray
									0.2082
									0.2473
									0.4555
^{200}Tl		199.97096	1.087 d	EC/2.46	1.07/	2-	0.04		Hg k x-ray
					1.44/				0.36799
									1.2057
									(0.11–2.3)
^{201}Tl		200.97082	3.038 d	EC/0.48		1/2+	+1.605		Hg k x-ray
									0.13528
									0.16740/10.0
^{202}Tl		201.97211	12.47 d	EC/1.36		2-	0.06		Hg k x-ray
									0.43957
^{203}Tl	29.524(14)	202.972344				1/2+	+1.622258		
^{204}Tl		203.973864	3.78 y	β- /97/0.7637	0.763/97	2-	0.09		Hg k x-ray
				EC/(3)/0.347					
^{205}Tl	70.476(14)	204.974428				1/2+	+1.638215		
^{206m}Tl			3.76 m	I.T./2.644		12-			Tl k x-ray
									0.2166
									0.2661
									0.4534
									0.6866
									1.0219
^{206}Tl		205.976110	4.20 m	β- /1.533	1.53/99.9	0-			Pb k x-ray
									0.80313
^{207m}Tl			1.3 s	I.T./1.350		11/2-			Tl k x-ray
									0.3501
									1.0000
^{207}Tl		206.97742	4.77 m	β- /1.423	1.43/99.8	1/2+	+1.88		0.89723
^{208}Tl		207.982019	3.053 m	β- /5.001	1.28/23	(5+)	+0.29		Pb k x-ray
					1.52/22				0.27728
					1.796/51				0.51061
									0.58302
									2.61448
^{209}Tl		208.98536	2.16 m	β-/3.98	1.8 /100	(1/2+)			Pb k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									1.5670/100
									0.4651/95
									(0.12−1.33)
^{210}Tl		209.99007	1.30 m	β- /5.48	1.3/25	(5+)			Pb k x-ray
					1.9/56				0.081
									0.2981
									0.79788
^{211}Tl		210.9935	> 0.3 μs	β-					
^{212}Tl		211.9982	> 0.3 μs	β-					
$_{82}$Pb		**207.2(1)**							
^{178}Pb		178.00383	~ 0.2 ms			0+			
^{179}Pb		179.0022							
^{180}Pb		179.99792	5 ms	α/	7.25	0+			
^{181}Pb		180.9966	0.05 s	α/	7.07				
^{182}Pb		181.99267	55 ms	α	6.90	0+			
^{183m}Pb			0.42 s	α	6.70/82.7	13/2+			
					6.86/1.9				
^{183}Pb		182.99187	0.54 s	α/	6.57/4.3	(3/2-)			
					6.78/11.0				
^{184}Pb		183.98814	0.48 s	α/~ 80	6.63/	0+			
^{185m}Pb			4.3 s	α	6.41/100	13/2+	-1.2		
^{185}Pb		184.98761	6.3 s	α/	6.29/56	3/2-	-1.1		0.205
					6.49/44				0.269
					6.55/<1.4				
^{186}Pb		185.98424	5. s	β+, EC/95/5.5		0+			
				α/(5)/	6.32/				
					6.34/<100				
					6.01/<0.2				
^{187m}Pb			15.2 s	β+, EC/	5.99/	(1/2-)			0.0674
				α/12	6.19/				0.2080
									0.2755
									0.2995
									0.4487
									0.7477
^{187}Pb		186.98392	18.3 s	EC/7.2		13/2+			0.1930
				α/7	6.08/				0.3314
									0.3435
									0.3934
^{188}Pb		187.98087	23. s	EC/(78)/4.8		0+			0.1850
				α/(22)/	5.98/<10				0.7582
					5.61/<0.1				
^{189}Pb		188.98081	51. s	EC/6.1					
				α/	5.58/				
^{190}Pb		189.97808	1.2 m	β+ (13)/4.1		0+			ann.rad./
				EC/(86)/					Tl k x-ray
				α/(0.9)/	5.58/				0.1415
									0.1512
									0.9422
^{191m}Pb			2.2 m	β+, EC/		13/2+	-1.17	+0.085	ann.rad./
									0.3871
									0.6135
									0.7122
^{191}Pb		190.97827	1.3 m	β+, EC/5.5					ann.rad./
									0.9368
^{192}Pb		191.97579	3.5 m	β+, EC/~ 3.4		0+			ann.rad./
				α/.006/	5.11				0.1675
									0.6082
									1.1954

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{193m}Pb			5.8 m	β+, EC/		13/2+	-1.15	+0.19	ann.rad./
									0.3650
									0.3922
^{193}Pb		192.97617	~ 2. m	EC/5.2		3/2 (-)			
^{194}Pb		193.97401	10. m	β+, EC/2.7		0+			ann.rad./
				α	4.64				0.2036
^{195m}Pb			15. m	β+ /(8)/		13/2+	-1.132	+0.30	ann.rad./
				EC/(92)/					Tl k x-ray
									0.3836
									0.3942
									0.8784
^{195}Pb		194.97454	~ 15. m	β+, EC/5.8					ann.rad./
									0.3836
									0.3937
									0.7776
^{196}Pb		195.97277	37. m	β+, EC/2.1		0+			Tl k x-ray
									0.2531
									0.5021
^{197m}Pb			43. m	EC/79/		13/2+	-1.104	+0.38	Tl k x-ray
				β+ /2/					0.3079
				IT/19/0.3193					0.3877
									0.7743
									(0.2−2.2)
^{197}Pb		196.97343	~ 8. m	EC/97/3.6		(3/2-)	-1.075	-0.08	Tl k x-ray
				β+ /3/					0.3755
									0.3858
									0.7611
^{198}Pb		197.97203	2.4 h	EC/1.4		0+			Tl k x-ray
									0.1734
									0.2903
									0.3654
^{199m}Pb			12.2 m	IT/93/0.4248		13/2+			Pb k x-ray
				β+, EC/(7)/					0.4255
^{199}Pb		198.97292	1.5 h	EC/(99)/2.9		5/2-	-1.074	+0.08	Tl k x-ray
				β+ /(1)/					0.3534
									0.7202
									1.1350
									(0.22−2.4)
^{200}Pb		199.97183	21.5 h	EC/0.81		0+			Tl k x-ray
									0.14763
^{201m}Pb			1.02 m	I.T./0.6291		13/2+			Pb k x-ray
									0.6288
^{201}Pb		200.97289	9.33 h	EC/1.90		5/2-	+0.675	-0.009	Tl k x-ray
									0.33120
									0.36131
									(0.11−1.8)
^{202m}Pb			3.53 h	IT/90/2.170		9-	-0.228	+0.58	Pb k x-ray
				β+ /10/					Tl k x-ray
									0.42219
									0.78700
									0.96271
^{202}Pb		201.97216	5.3×10^4 y	EC/0.05		0+			Tl L x-ray
^{203m}Pb			6.2 s	I.T./0.8252		13/2+			Pb k x-ray
									0.8203
									0.8252
^{203}Pb		202.97339	2.163 d	EC/0.98		5/2-	+0.686	+0.10	Tl k x-ray
									0.279188
^{204m}Pb			1.13 h	I.T./2.185		9-			Pb k x-ray
									0.37481
									0.89922

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									0.91175
^{204}Pb	1.4(1)	203.973044				0+			
^{205}Pb		204.974482	1.51×10^{7} y	EC/0.0512		5/2-	+0.712	+0.23	Tl L x-ray
^{206}Pb	24.1(1)	205.974465				0+			
^{207m}Pb			0.80 s	I.T./1.632		13/2+			Pb k x-ray
									0.56915
									1.06310
^{207}Pb	22.1(1)	206.975897				1/2-	+0.59258		
^{208}Pb	52.4(1)	207.976652	$> 2 \times 10^{19}$ y	sf		0+			
^{209}Pb		208.981090	3.25 h	β- /0.644	0.645/100	9/2+	-1.474	-0.3	
^{210}Pb		209.984189	22.6 y	β- /0.0635	0.017/81	0+			
					0.061/19				
				α	3.72				
^{211}Pb		210.988737	36.1 m	β- /1.37	0.57/5	(9/2+)	-1.404	+0.09	0.40486
					1.36/92				0.42700
									0.83186
									(0.09−1.27)
^{212}Pb		211.991898	10.64 h	β- /0.574	0.28/83	0+			Bi k x-ray
					0.57/12				0.23858
^{213}Pb		212.99658	10.2 m	β- /2.1					
^{214}Pb		213.999805	26.9 m	β- /1.0	0.67/48	0+			Bi k x-ray
					0.73/42				0.24192
									0.29509
									0.35187
^{215}Pb		215.0048	36 s						
$_{83}$Bi		**208.98040(1)**							
^{184m}Bi			0.007 s	α	(7.22-7.85)				0.449
^{184}Bi		184.0011	13. ms	α					0.124
^{185}Bi		184.9976	60. μs	p/90	1.55				
				α/10	8.03				
^{186m}Bi			15. ms	α	7.07-7.23				(0.087-0.520)
				p/<0.5					
^{186}Bi		185.9966	9.8 ms	α	7.26				0.1085
					7.37				
^{187m}Bi			~ 8. ms	α/12					
^{187}Bi		186.99316	32. ms	α/7	7.00/88.3				
					7.61/8.0				
					7.37/3.7				
^{188}Bi		187.99227	0.271 s	α	6.81				(0.071-0.320)
^{189m}Bi			7.0 ms	α	7.30				
^{189}Bi		188.9892	0.68 s	α					
^{190m}Bi			5.7 s	α/90	6.43				(0.105-0.314)
					(6.23-6.72)				
^{190}Bi		189.9883	~ 5.9 s	β+, EC/(30)/8.7	α/6.45				(0.089-0.374)
				α/70	(6.39-6.82)				
^{191m}Bi			0.12 ms	α/	6.87/100				
^{191}Bi		190.98579	12.4 s	β+, EC/(60)/7.3					
				α/(40)/	6.31				
^{192}Bi		191.98546	40. s	β+, EC/(80)/9.0					
				α/(20)/	6.06/				
^{193m}Bi			3.2 s	β+, EC/		1/2+			
				α/	6.48/				
^{193}Bi		192.98296	1.11 m	β+, EC/40/7.1		9/2+			
				α/(60)/	5.91/				
^{194}Bi		193.98283	1.8 m	β+, EC/99.9/8.2		(10-)			0.1661
				α/0.1/					0.1740
									0.2802
									0.421

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									0.5754
									0.9650
^{195m}Bi			1.45 m	β+, EC/(94)/					
				α/(6)/	6.11/				
^{195}Bi		194.98065	2.9 m	β+, EC/99.8/5.8		3/2-			
				α/(0.2)	5.45/				
^{196}Bi		195.98067	5. m	EC/~ 7.4					0.1376
									0.3720
									0.6880
									1.0486
^{197}Bi		196.97886	5. m	β+, EC/5.2		1/2+			
^{198m}Bi			7.7 s	I.T./0.2485		(10-)			0.2485
^{198}Bi		197.97921	11.8 m	β+, EC/6.6		(7+)			0.0900
									0.1976
									0.5624
									1.0635
^{199m}Bi			24.7 m	β+, EC/					ann.rad./
^{199}Bi		198.97767	27. m	β+, EC/4.3		9/2-	4.6		0.7203
									0.8374
									0.8417
									0.9460
									1.0528
									1.3056
									(0.12−3.2)
^{200m}Bi			31. m	β+, EC/		(2+)			0.2453
									0.4198
									0.4624
									1.0265
^{200}Bi		199.97813	36. m	EC/(90)/5.9		7+			ann.rad./
				β+ /(10)/					Pb k x-ray
									0.4198
									0.4623
									1.0265
^{201m}Bi			59.1 m	I.T./0.846		(1/2+)			Bi k x-ray
				β+, EC/					0.8464
^{201}Bi		200.97701	1.8 h	EC/3.84		9/2-	4.8		Pb k x-ray
									0.6288
									0.9357
									1.0138
									(0.13−2.4)
^{202}Bi		201.97774	1.72 h	β+ /(3)/5.16		5+	+4.26	-0.72	ann.rad./
				EC/(97)/					Pb k x-ray
									0.57860
									0.92734
									(0.08−3.5)
^{203}Bi		202.97688	11.8 h	EC/99.8/3.25		9/2-	+4.02	-0.69	Pb k x-ray
				β+ /(0.2)/	1.35/				0.1865
									0.8203
									0.8969
									1.8475
									(0.1−2.9)
^{204}Bi		203.97781	11.2 h	EC/4.44		6+	+4.32	-0.43	Pb k x-ray
									0.37481
									0.89922
									0.98409
^{205}Bi		204.97739	15.31 d	EC/2.71		9/2-	+4.07	-0.59	Pb k x-ray
									0.70347
									1.76435
^{206}Bi		205.97850	6.243 d	EC/3.76		6+	+4.36	-0.39	Pb k x-ray
									0.51619

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.80313
									0.88100
^{207}Bi		206.978471	31.55 y	EC/2.399		9/2-	4.08	-0.6	Pb k x-ray
									0.56915
									1.06310
^{208}Bi		207.979742	3.68×10^5 y	EC/2.880		5+	4.63	-0.64	Pb k x-ray
									2.61435
^{209}Bi	100.	208.980399	1.9×10^{19} y	α	3.13	9/2-	+4.111	-0.37	
^{210m}Bi			3.0×10^6 y	α/	4.420(3)/0.29	9-	+2.73	-0.47	Tl k x-ray
					4.569(3)/3.9				0.2661
					4.584(3)/1.4				0.3052
					4.908(4)/39				0.6502
					4.946(3)/55				
^{210}Bi		209.984120	5.01 d	β- /1.163	1.16/99	1-	-0.0445	+0.136	0.2661
									0.3.52
^{211}Bi		210.98727	2.14 m	α/(99.7)/	6.279/16	9/2-			Tl k x-ray
				β- /(0.3)/0.58	6.623/84				0.3501
^{212m2}Bi			7. m	β- /		(15-)			
^{212m1}Bi			25.0 m	α/(93)/	6.300/40	(9-)			0.120
				β- /(7)/	6.340/53				0.233
									0.275
									0.404
									0.727
^{212}Bi		211.991286	1.009 h	β- /(64)/2.254		(1-)	+0.32	+0.1	Tl k x-ray
				α/(36)/	6.051/25				Po k x-ray
					6.090/9.6				0.2881
									0.72725
									0.78551
									1.62066
^{213}Bi		212.994385	45.6 m	β- /(98)/1.43	1.02/31	9/2-	+3.72	-0.60	Po k x-ray
				α/(2)/	1.42/66				0.4404
					5.549/0.16				(0.15−1.328)
					5.869/2.0				
									1.10006
^{214}Bi		213.99871	19.7 m	β- /3.27					0.60931
									1.12027
									1.76449
									(0.19−3.2)
^{215m}Bi			37. s	β					(0.158-0.498)
^{215}Bi		215.00177	7.7 m	β- /2.3					0.2937/35.2
									(0.271−1.399)
^{216}Bi		216.00631	2.3 m	β-/4.0					0.5498
									0.4192
^{217}Bi		217.0095	98 s	β/					0.2646/100
									(0.254-1.017)
^{218}Bi		218.0143	33. s	β-					0.5097/134
									0.3857/100
									(0.174-0.703)
$_{84}$Po									
^{188}Po		187.99942	0.27 ms	α	7.91/80	0+			
					7.320				
^{189}Po		188.99848	5 ms	α	7.532/8				
					7.259/80				
					7.309/12				
^{190}Po		189.99510	2.4 ms	α/	7.53/96.4	0+			
					7.01/3.3				
^{191m}Po			93. ms	α	7.376/50				
					6.888/46				

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^{191}Po		190.99457	22 ms	α/	7.334/77				
					6.97/8				
^{192}Po		191.99134	32. ms	α/8.5	7.17/98.6	0+			
					6.59/1.4				
^{193m}Po			~ 0.07 s	α/	7.00				
^{193}Po		192.99103	0.45 s	α/	6.95				
^{194}Po		193.98819	0.2 s	α/	6.84/93	0+			
					6.19/0.22				
^{195m}Po			~ 2.8 s	α/	6.70/				
^{195}Po		194.98811	~ 3.9 s	α/	6.62/				
^{196}Po		195.98554	5. s	α/(95)/	6.53/94	0+			
				β+, EC/(5)/~4.6	5.77/0.02				
^{197m}Po			25.8 s	α/(84)/	6.385(3)/55	13/2+			
				β+, EC/(16)/					
^{197}Po		196.98566	53. s	α/(44)/	6.282(4)/76	(3/2-)			
				β+, EC/(56)/6.2					
^{198}Po		197.98339	1.76 m	α/(70)/	6.18/57	0+			
				β+, EC/(30)/4.0	$5.27/7.6 \times 10^{-4}$				
^{199m}Po			4.2 m	β+, EC/(51)/		13/2+	0.99		ann.rad./
				α/(39)/	6.059/24				0.2745
									0.4998
									1.0020
^{199}Po		198.98367	5.2 m	β+, EC/(88)/7.		(3/2-)			Bi k x-ray
				α/(12)/	5.952/7.5				0.1877
									0.3616
									1.0214
									1.0344
^{200}Po		199.981780	11.5 m	β+, EC/85/3.4		0+			0.14748
				α/(15)/	5.863/11.1				0.32792
									0.6176
									0.6709
^{201m}Po			8.9 m	β+, EC/(57)/		13/2+	1.00		Bi k x-ray
				IT/40/0.418					Po k x-ray
				α/(3)/	5.786/~ 3.				0.2726
									0.4123
									0.4179
									0.9670
^{201}Po		200.98226	15.3 m	β+, EC/98/4.9		3/2-	0.94		Bi k x-ray
				α/(2)/	5.683(3)/1.1				0.2056
									0.2250
									0.8483
									0.9048
^{202}Po		201.98076	45. m	β+, EC/98/2.8		0+			0.0410
				α/(2)/	5.588/1.9				0.1656
									0.3158
									0.6884
^{203m}Po			1.2 m	IT/96/0.6414		13/2+			Bi k x-ray
				β-EC/(4)/					Po k x-ray
									0.6414
^{203}Po		202.98142	35. m	β+, EC/4.2		5/2-	+0.74		0.17516
									0.21477
									0.89350
									0.90863
									1.09095
^{204}Po		203.98032	3.53 h	EC/2.34		0+			Bi k x-ray
				α	5.377/0.66				0.2702
									0.8844
									1.0162
									(0.11−1.9)
^{205}Po		204.98120	1.7 h	β+, EC/3.53		5/2-	+0.76	+0.17	Bi k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
									0.83681
									0.84983
									0.87241
									1.00124
									(0.12−2.7)
^{206}Po		205.98048	8.8 d	EC/(95)/1.85		0+			Bi k x-ray
				α/(5)/	5.223/5.5				0.28644
									0.31156
									0.51134
									0.80737
									1.03228
									(0.11−1.5)
^{207m}Po			2.8 s	I.T./1.383		19/2-			Po k x-ray
									0.2682
									0.30074
									0.81448
^{207}Po		206.98159	5.80 h	EC, β+/2.91		5/2-	+0.79	+0.28	Bi k x-ray
									0.74263
									0.91176
									0.99225
^{208}Po		207.981246	2.898 y	α/5.213	4.233/0.0002	0+			
					5.1158/100				
^{209}Po		208.982430	102. y	α/4.976	4.624/0.56	1/2-	~ +0.77		0.26049
					4.879/99.2				0.8964
^{210}Po		209.982874	138.4 d	α/5.407	4.516/0.001	0+			0.80313
					5.304/100				
^{211m}Po			25.2 s	α/	7.273/91	25/2+			Pb k x-ray
					7.994/1.7				0.32808
					8.316/0.25				0.56915
					8.875/7.0				0.89723
									1.06310
^{211}Po		210.986653	0.516 s	α/7.594	6.570/0.54	9/2+			0.56915
					6.892/0.55				0.89723
					7.450/98.9				
^{212m}Po			45. s	α/	8.514/2.0	16+			
					9.086/1.0				
					11.650/97				
^{212}Po		211.988868	0.298 μs	α/8.953	8.784/100	0+			
^{213}Po		212.992857	3.7 μs	α/8.537	7.614/0.003	9/2+			
					8.375/100				
^{214}Po		213.995201	163.7 μs	α/7.833	6.904/0.01	0+			0.7995
					7.686/99.99				0.298
^{215}Po		214.999420	1.780 ms	α/7.526	6.950/0.02	(9/2+)			
					6.957/0.03				
					7.386/100				
^{216}Po		216.001915	0.145 s	α/6.906	5.895/0.002	0+			
					6.778/99.99				
^{217}Po		217.00634	1.53 s	α/6.662	6.539/				
^{218}Po		218.008973	3.04 m	α/6.114	6.003/99.999	0+			
					5.181/0.11				
^{219}Po		219.0137	~ 2 m						
^{220}Po		220.0166	> 0.3 μs			0+			
$_{85}$At									
^{191m}At			2.1 ms	α	7.65/98				
					7.72/2				
^{191}At			~ 1.7 ms	α	7.55/100				
^{193m}At			21 ms	α	7.33/98				
					7.42/2				

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{193}At		192.9998	28 ms	α/	7.24/100				
^{194}At		193.9987	40 ms	α/					
^{195m}At			147 ms	α	7.07-7.22				
^{195}At		194.99627	0.33 s	α/	6.95				
^{196m}At			8 μs						0.158
^{196}At		195.9958	0.39 s	α/	7.05/				
^{197m}At			2.0 s	α	6.707	(1/2+)			
^{197}At		196.99319	0.39 s	β+, EC/7.8		(9/2-)			
				α/	6.960/				
^{198m}At			1.0 s	β+, EC/(75)/					
				α/(25)/	6.856/86				
^{198}At		197.99284	4.1 s	α/	6.755/94				
^{199}At		198.99053	6.9 s	β+, EC/8/5.6		9/2-			
				α/(92)/	6.643/				
^{200m2}At			47. s	α	6.411/				
^{200m}At			3.5 s	β+, EC/(80)		10-			
				α/(20)/	6.538/12				
^{200}At		199.99035	43. s	β+, EC/65/~ 8.0		5+			
				α/(35)/	6.412/44				
					6.465/57				
^{201}At		200.98842	1.48 m	β+, EC/29/5.9		9/2-			
				α/(71)/6.474	6.344/				
^{202m}At			0.46 s	I.T./0.391					
^{202}At		201.98863	3.02 m	β+, EC/88/7.2		5+			ann.rad./
				α/(12)/	6.135/7.7				0.4413
					6.225/4.3				0.5697
									0.6753
^{203}At		202.98694	7.4 m	β+, EC/69/5.1		9/2-			0.1458
				α/(31)/6.210	6.088/				0.2459
									0.6414
									1.0020
									1.0340
^{204}At		203.98725	9.1 m	β+, EC/95/6.5		(5+)			Po k x-ray
				α/(5)/	5.951/				0.3271
									0.4254
									0.5156
									0.6837
^{205}At		204.98607	26. m	β+, EC/90/4.54		(9/2-)			Po k x-ray
				α/(10)/6.020	5.902/				0.1543
									0.6696
									0.7194
^{206}At		205.98667	29.4 m	β+, EC/99/5.72		5+			Po k x-ray
				α/(1)/5.881	5.703/				0.20186
									0.39561
									0.47716
									0.70071
^{207}At		206.98578	1.81 h	β+, EC/90/3.91		9/2-			Po k x-ray
				α/(10)/5.873	5.758/				0.16801
									0.58842
									0.81448
^{208}At		207.98650	1.63 h	β+, EC/99/4.97		(6+)			Po k x-ray
				α/(1)/5.752	5.626/0.01				0.1770
					5.641/0.53				0.2060
									0.6601
									0.6852
									0.8450
									1.0281
^{209}At		208.98617	5.4 h	β+, EC/96/3.49		(6+)			Po k x-ray
				α/(4)/5.757	5.647/4.1				0.10422
									0.54503

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									0.78189
									0.79020
									(0.1−2.6)
^{210}At		209.98715	8.1 h	EC/99.8/3.98		5+			Po k x-ray
				α/(0.2)/5.632	5.361/0.05				0.24535
					5.442/0.05				0.52758
									1.18143
									1.43678
									1.48335
									(0.04−2.4)
^{211}At		210.987496	7.21 h	EC/(58)/0.787		9/2-			Po k x-ray
				α/(42)/5.980	5.211/0.004				0.66956
					5.868/42				0.6870
									0.74263
^{212m}At			0.119 s	α/	7.837/65	(9-)			
					7.897/33				
^{212}At		211.99075	0.314 s	α/7.828	7.058/0.4	(1-)			
					7.088/0.6				
					7.618/15				
					7.681/84				
^{213}At		212.992937	0.11 μs	α/9.254	9.080/	9/2-			
^{214m}At			0.76 μs	α/8.762		(9-)			
^{214}At		213.996372	0.56 μs	α/8.987	8.819/100	(1-)			
^{215}At		214.99865	0.10 ms	α/8.178	7.626/0.045	(9/2-)			0.40486
					8.023/99.9				
^{216}At		216.002423	0.30 ms	α/7.947	7.595/0.2	(1-)			
					7.697/2.1				
					7.800/97				
^{217}At		217.004719	32. ms	α/7.202	6.812/0.06	(9/2-)			0.2595
					7.067/99.9				0.3345
									0.5940
^{218}At		218.00869	1.6 s	α/6.883	6.654/6				
					6.695/90				
					6.748/4				
^{219}At		219.011162	50. s	α/6.390	6.275/				
^{220}At		220.0154	3.71 m	β- /3.7					(0.24−0.70)
^{221}At		221.0181	2.3 m	β					
^{222}At		222.0223	0.9 m	β					
^{223}At		223.0252	50. s	β					
$_{86}$Rn									
^{195m}Rn			5 ms	α	7.56				
^{195}Rn		195.00544	6 ms	α	7.54				
^{196}Rn		196.00212	4. ms	α/	7.46	0+			
^{197m}Rn			0.02 s	α	7.36				
^{197}Rn		197.0016	0.07 s	α/	7.26				
^{198}Rn		197.99868	64. ms	α	7.205	0+			
^{199m}Rn			0.32 s	α	7.060	(13/2+)			
^{199}Rn		198.9984	0.62 s	α/	6.989	3/2-			
^{200}Rn		199.99570	1.06 s	α/(98)/	6.901/	0+			0.4329
				EC/(2)/5.					0.5043
^{201m}Rn			3.8 s	EC/(10)/		13/2+			
				α/(90)/	6.773/				
^{201}Rn		200.9956	7.0 s	α/(80)/	6.725/	(3/2-)			
				EC/(20)/	α/6.778				
^{202}Rn		201.99326	9.9 s	α/(12)/	6.641/	0+			0.5695
				EC/(88)/					0.2876−0.6255
^{203m}Rn			28. s	α/	6.551	13/2+	-0.96	+1.3	

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^{203}Rn		202.99339	45. s	α/(66)/6.629	6.499/	3/2-			
				EC/(34)/~ 7.4					
^{204}Rn		203.99143	1.24 m	α/(68)/	6.420/	0+			
				EC/(32)/3.8					
^{205}Rn		204.99172	2.8 m	α/(23)/6.390	6.123(3)/0.02	(5/2-)	+0.80	+0.06	0.2652
				EC/(77)/5.2	6.262(3)/23				0.3553
									0.4648
									0.6205
									0.6753
									0.7300
^{206}Rn		205.99021	5.7 m	α/(68)/6.384	6.258(3)/	0+			0.06170
				EC/(32)/3.3					0.0968
									0.3245
									0.3862
									0.4822
									0.4973
									0.7728
^{207}Rn		206.99073	9.3 m	β+, EC/77/4.6		5/2-	+0.82	+0.22	At k x-ray
				α/(23)/6.252	5.995(4)/0.02				0.32947
					6.068(3)/0.15				0.34455
					6.126(3)/22.8				0.36767
									0.40267
									0.74723
									(0.18−1.4)
^{208}Rn		207.98964	24.3 m	α/(60)/6.260	5.469(2)/0.003	0+			
				EC/(40)/2.85	6.140(2)/60				
^{209}Rn		208.99042	29. m	β+ /(83)/3.93	2.16/2.3	5/2-	+0.8388	+0.31	At k x-ray
				α/(17)/	5.887(3)/0.04				0.27933
					5.898(3)/0.02				0.33753
					6.039(2)/16.9				0.40841
									0.68942
									0.74594
									(0.18−3.2)
^{210}Rn		209.98970	2.4 h	α/(96)/6.157	5.351(2)/0.005	0+			At k x-ray
				EC/(4)/2.37	6.039(2)/96				0.19625
									0.45824
									0.57104
									0.64868
									(0.14−1.7)
^{211}Rn		210.99060	14.6 h	β+, EC/74/2.89		1/2-	+0.60		At k x-ray
				α/(26)/5.964	5.619(1)/0.7				0.16877
					5.784(1)/16.4				0.25022
					5.851(1)/8.8				0.37049
									0.67412
									0.67839
									1.36298
									(0.11−2.7)
^{212}Rn		211.990704	24. m	α/6.385	5.587(4)/0.05	0+			
					6.260(4)/99.95				
^{213}Rn		212.99388	19. ms	α/8.243	7.552(8)/1.0	9/2+			0.540
					8.087(8)/98.2				
					7.254/0.8				
^{214}Rn		213.99536	0.27 μs	α/9.209	9.037(9)/	0+			
^{215}Rn		214.99875	2.3 μs	α/8.840	8.674(8)/	(9/2+)			
^{216}Rn		216.00027	45. μs	α		0+			
^{217}Rn		217.003928	0.6 ms	α/7.885	7.500/0.1	9/2+			
					7.742(4)/100				
^{218}Rn		218.005601	35. ms	α/7.267	6.534(1)/0.16	0+			0.6093
					7.133(1)/99.8				0.6653
^{219}Rn		219.009480	3.96 s	α/6.946(1)	6.3130(5)/0.05	(5/2+)	-0.44	+0.93	Po k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					6.425(3)/7.5				0.13057
					6.5309(4)/0.12				0.27113
					6.5531(3)/12.2				0.40170
					6.8193(3)/81				(0.1−1.05)
^{220}Rn		220.011394	55.6 s	α/6.404	5.7486(5)/0.07	0+			
					6.2883(1)/99.9				
^{221}Rn		221.01554	25. m	α/(22)/6.148	5.778(3)/1.8	7/2+	-0.020	-0.38	Fr L x-ray
				β- /(78)/1.2	5.788(3)/2.2				0.07384
					6.037(3)/18				0.08323
									0.0610
									0.18639
^{222}Rn		222.017578	3.823 d	α/5.590	4.987(1)/0.08	0+			0.510
					5.4897(3)/99.9				
^{223}Rn		223.0218	23. m	β- /			-0.78	+0.80	
^{224}Rn		224.0241	1.8 h	β- /		0+			0.1085
									0.2601
									0.2655
^{225}Rn		225.0284	4.5 m	β- /		7/2-	-0.70	+0.84	
^{226}Rn		226.0309	7.4 m	β- /		0+			
^{227}Rn		227.0354	2. s	β- /					
^{228}Rn		228.0380	65. s	β- /		0+			
$_{87}$Fr									
^{199}Fr		199.00726	12 s	α	7.66				
^{200}Fr		200.0066	49 ms	α	7.47				
^{201m}Fr			~ 0.02 s	α/	7.454				
^{201}Fr		201.0039	~ 60 ms	α/	7.36/	(9/2-)			
^{202m}Fr			0.29 s	α	7.236/				
^{202}Fr		202.00337	0.30 s	α/7.590	7.24/100				
^{203}Fr		203.00093	0.54 s	α/7.280	7.132(5)/	(9/2-)			
^{204m2}Fr			0.8 s	α	7.01				
^{204m1}Fr			2. s	α	6.97				
^{204}Fr		204.00065	1.8 s	α/	7.03/96				
					6.97/90				
					7.01/74				
^{205}Fr		204.99859	3.9 s	α/7.050	6.914(5)/	(9/2-)			
^{206m}Fr			0.7 s	α/	6.93				0.531(IT)
^{206}Fr		205.99867	16.0 s	α/7.416	6.792(5)/84				
^{207}Fr		206.99695	14.8 s	α/6.900	6.766(5)/	9/2-	+3.9	-0.16	
^{208}Fr		207.99714	59.1 s	α/(77)/6.770	6.636(5)/	7+	-4.8	+0.004	
				EC/(23)/6.99					
^{209}Fr		208.99595	50.0 s	α/(89)/5.1	6.646(3)/	9/2-	+3.9	-0.24	0.7978
				EC/(11)/5.16					(0.1103−1.384)
^{210}Fr		209.99641	3.2 m	α/6.670/71	6.543(5)/99.87	6+	+4.4	+0.19	0.2030
				EC/6.26	(5.90-6.42)				0.6438
									0.8175
									0.9008
^{211}Fr		210.99554	3.10 m	α/6.660/87	6.534(5)/99.94	9/2-	+4.0	-0.19	0.220
				EC/4.61	(5.87-6.20)				0.2799
									0.5389
									0.9169
^{212}Fr		211.99620	20. m	EC/(57)/5.12	6.261(1)/16	(5+)	+4.6	-0.10	Rn x-ray
				α/(43)/6.529	6.335(1)/4				0.08107
					6.335(1)/4				0.08378
					6.343(1)/1.3				0.2277
					6.383(1)/10				1.1856
					6.406(1)/9.5				1.2748
					6.08−6.18				0.014−1.178
^{213}Fr		212.99619	34.6 s	α/6.905	8.476(4)/51	9/2-	+4.0	-0.14	(0.408-0.577)

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^{214m}Fr			3.4 ms	α/	8.547(4)/46	9-			
					6.775−8.046				
^{214}Fr		213.99897	5.0 ms	α/8.587	7.409(3)/0.3	(1-)			(0.073-0.966)
					7.605(8)/1.0				
					7.940(3)/1.0				
					8.355(3)/4.7				
					8.427(3)/93				
^{215}Fr		215.00034	0.12 μs	α/9.537	9.360(8)/	(9/2-)			
^{216}Fr		216.00320	0.70 μs	α/9.175	9.005(10)/95				(0.045−0.160)
^{217}Fr		217.00463	0.016 ms	α/8.471	8.315(8)/	(9/2-)			
^{218m}Fr			22. ms	α					
^{218}Fr		218.007578	1. ms	α/8.014	7.384(10)/0.5	(1-)			
					7.542(15)/1.0				
					7.572(10)/5				
					7.732(10)/0.5				
					7.867(2)/93				
^{219}Fr		219.00925	21. ms	α/8.132	6.802(2)/0.25	(9/2-)			
					6.967(2)/0.6				
					7.146(2)/0.25				
					7.313(2)/99				
^{220}Fr		220.012327	27.4 s	α/6.800	6.582(1)/10	1+	-0.67	+0.47	0.0450
					6.630(2)/6				0.061
					6.641(1)/12				0.1060
					6.686(1)/61				0.1539
					6.39−6.58				0.1617
^{221}Fr		221.014255	4.8 m	α/6.457	5.9393(7)/0.17	(5/2-)	+1.58	-1.0	At k x-ray
					5.9797(7)/0.49				0.0995
					6.0751(7)/0.15				0.21798
					6.1270(7)/				0.4091
					6.2433(3)/1.3				
					6.3410(7)/83.4				
^{222}Fr		222.01755	14.3 m	β- /2.03	1.78/	2-	+0.63	+0.51	
				α/5.850					
^{223}Fr		223.019736	22.0 m	β- /1.149	α/5.291	(3/2+)	+1.17	+1.17	0.1509
				α//0.006	5.314				0.0589
					5.403				0.1453
^{224}Fr		224.02325	3.0 m	β- /2.82		1-	+0.40	+0.517	0.13150
									0.21575
									0.8367
									(0.1−2.21)
^{225}Fr		225.02557	3.9 m	β- /1.87		3/2	+1.07	+1.3	
^{226}Fr		226.0294	49. s	β- /3.6		1	+0.071	-1.35	0.18606
									0.25373
^{227}Fr		227.0318	2.48 m	β- /2.5		1/2	+1.50		
^{228}Fr		228.0357	39. s	β- /~ 3.5		2-	-0.76	+2.4	
^{229}Fr		229.03845	50. s	β- /					
^{230}Fr		230.0425	19. s	β- /		(3)			
^{231}Fr		231.0454	17. s	β- /					
^{232}Fr		232.050	5. s	β- /					(0.0545-0.721)
$_{88}$Ra									
^{201}Ra			~ 1.6 ms	α	7.91/				
^{202}Ra		202.0099	~ 0.02 ms	α	7.74	0+			
^{203m}Ra			24 ms	α	7.61				
^{203}Ra		203.0093	~ 31 ms	α	7.59				
^{204}Ra		204.0065	0.06 s	α	7.48	0+			
^{205m}Ra			~ 0.17 s						
^{205}Ra		205.0063	0.22 s	α	7.34				
^{206}Ra		206.00383	0.4 s	α/7.416	7.272(5)/	0+			

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^{207}Ra		207.0038	1.3 s	α/7.270	7.133(5)/				
^{208}Ra		208.00184	1.4 s	α/7.273	7.133(5)/	0+			
^{209}Ra		209.00199	4.6 s	α/7.150	(6.50-7.14)	5/2-	+0.87	+0.40	(0.387-0.634)
^{210m}Ra			2.4 μs						(0.0967-0.775)
^{210}Ra		210.00050	3.7 s	α/7.610	7.020(5)/	0+			574.9
^{211m}Ra			3.9 μs						(0.396-0.802)
^{211}Ra		211.00090	13. s	α/7.046	6.907/99.	(5/2-)	+0.878	+0.48	
				EC/5.0	(6.26-6.79)				(0.120-0.665)
^{212m}Ra			8.3 μs						(0.440-0.824)
^{212}Ra		211.99979	13.0 s	α/7.033	6.901(2)/	0+			
^{213m}Ra			2.1 ms	IT					
									(0.160-1.061)
^{213}Ra		213.00038	2.7 m	EC/(20)/3.88		(1/2-)	+0.613		0.1024
				α/(80)/6.860	6.521(3)/4.8				0.11010
					6.622(3)/39				0.2125
					6.730(3)/36				
^{214m}Ra			> 0.015 ms						(0.181-1.382)
^{214}Ra		214.00011	2.46 s	α/7.272	7.14/99.8/	0+			0.642
					6.51/0.2				
^{215m}Ra			7.6 μs						(0.196-1.048)
^{215}Ra		215.00272	1.64 ms	α/8.864	7.883(6)/2.8	(9/2+)			0.773/100
					8.171(3)/1.4				0.852/74
					8.700(3)/95.9				0.055−1.048
^{216}Ra		216.00353	0.18 μs	α/9.526	9.349(8)/	0+			
^{217}Ra		217.00632	1.6 μs	α/9.161	8.992(8)/	9/2-			
^{218}Ra		218.00714	26. μs	α/8.547	8.390(8)/	0+			
^{219}Ra		219.01009	0.010 s	α/8.132	7.680(10)/65				
					7.982(9)/35				
^{220}Ra		220.01103	18. ms	α/7.593	7.39/5	0+			0.465
					7.45/95				
^{221}Ra		221.013917	29. s	α/6.879	6.254(10)/0.7	5/2+	-0.180	+1.9	
					6.578(5)/3				
					6.585(3)/8				
					6.608(3)/35				
					6.669(3)/21				
					6.758(3)/31				
^{222}Ra		222.015375	36.2 s	α/5.590	6.237(2)/3.0	0+			0.324
					6.556(2)/97				0.1448−0.8402
^{223}Ra		223.018502	11.43 d	α/5.979	5.287(1)/0.15	(3/2+)	+0.271	+1.25	Rn k x-ray
					5.338(1)/0.13				0.12231
					5.365(1)/0.13				0.14418
					5.433(5)/2.3				0.15418
					5.502(1)/1.0				0.15859
					5.540(1)/9.2				0.26939
					5.607(3)/24				0.32388
					5.716(3)/52				0.33328
					5.747(1)/9				0.44494
					5.857(1)/0.32				(0.10−0.7)
					5.872(1)/0.85				
^{224}Ra		224.020212	3.66 d	α/5.789	5.034(10)/0.003	0+			Rn k x-ray
					5.047(1)/0.007				0.2407
					5.164(5)/0.007				0.4093
					5.449(2)/4.9				0.6501
					5.685(2)/95				
^{225}Ra		225.023612	14.9 d	β- /0.36	0.32/100	(3/2+)	-0.734		Ac k x-ray
				α	5.01×10^{-5}				0.0434
					4.98×10^{-6}				
^{226}Ra		226.025410	1599. y	α/4.870	4.194(1)/0.001	0+			Rn k x-ray
			$> 4 \times 10^{18}$ y	sf/4×10^{-14}	4.343(1)/0.006				0.1861/3.64
					4.601(1)/6.16				0.2624

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					4.784(1)/93.8				0.053−2.448
^{227}Ra		227.029178	42. m	β- /1.325	1.03/	(3/2+)	-0.404	+1.5	Ac L x-ray
					1.30/				Ac k x-ray
									0.02739
^{228}Ra		228.031070	5.76 y	β- /0.046	0.039/50	0+			0.0135
					0.014/30				(0.006−0.0306)
					0.026/20				
^{229}Ra		229.03496	4.0 m	β- /1.76	1.76/	(3/2+)	+0.503	+3.1	0.0145−0.1715
^{230}Ra		230.03706	1.5 h	β- /1.0	0.7/	0+			0.0631
									0.0720
									0.2028
									0.4698
									0.4787
^{231}Ra		231.0412	1.7 m	β-					
^{232}Ra		232.0436	4. m	β-		0+			
^{233}Ra		233.0481	30. s	β-					
^{234}Ra		234.051	~ 30. s	β-/		0+			
$_{89}$Ac									
^{206m}Ac			0.04 s	α	7.79				
^{206}Ac		206.0145	~ 26 ms	α	7.75				
^{207}Ac		207.0120	27 ms	α/	7.69				
^{208m}Ac			~ 25. ms	α/	7.72				
^{208}Ac		208.0116	~ 0.1 s	α/	7.62				
^{209}Ac		209.00949	~ 0.10 s	α/	7.58				
^{210}Ac		210.0094	0.34 s	α/7.610	7.462(8)/				
^{211}Ac		211.0077	0.20 s	α/7.620	7.480(8)/				
^{212}Ac		212.0078	0.9 s	α/7.520	7.379(8)/				
^{213}Ac		213.0066	0.73 s	α/7.500	7.364(8)/	(9/2-)			
^{214}Ac		214.00690	8.2 s	α/(86)/7.350	7.215/54	(5+)			(0.0626-0.754)
				EC/(14)/6.34	7.081/42				
					(6.48-7.15)				
^{215}Ac		215.00645	0.17 s	α/7.750	7.60/99.57	(9/2-)			0.399
					7.21/0.46				0.582
					7.03/0.20				0.654
					6.96/0.14				
^{216m}Ac			0.44 ms	α/	8.198(8)/1.7	(9-)			(0.0826-1.375)
					8.283(8)/2.5				
					9.028(5)/49				
					9.106(5)/46				
^{216}Ac		216.00872	44. ms	α/9.241	8.990(2)/10	(1-)			
					9.070(8)/90				
^{217m}Ac			0.7 μs	α/	10.540/100				
^{217}Ac		217.00935	0.07 μs	α/9.832	9.650(10)/100	9/2-			
^{218}Ac		218.01164	1.1 μs	α/9.380	9.205(15)/				
^{219}Ac		219.01242	0.012 ms	α/8.830	8.664(10)/	(9/2-)			
^{220}Ac		220.01476	26. ms	α/8.350	7.610(20)/23				
					4.680(20)/21				
					7.790(10)/13				
					7.850(10)/24				
					7.985(10)/4				
					8.005(10)/5				
					8.060(10)/6				
					8.195(10)/3				
^{221}Ac		221.01559	52. ms	α/7.790	7.170(10)/2				
					7.375(10)/10				
					7.440(15)/20				
					7.645(10)/70				
^{222m}Ac			63. s	α/(>89)/	6.710(20)/7				

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				EC/(1)/	6.750(20)/13				
				I.T./(<10)/	6.810(20)/24				
					6.840(20)/9				
					6.890(20)/13				
					6.970(20)/7				
					7.000(20)/13				
^{222}Ac		222.01784	5. s	α/7.141	6.967(10)/6	1-			
					7.013(2)/94				
^{223}Ac		223.01914	2.1 m	α/(99)/6.783	6.131(2)/0.12	(5/2-)			0.0725
				EC/(1)/0.59	6.177(2)/0.94				0.0839
					6.293(1)/0.47				0.0927
					6.326(1)/0.3				0.0990
					6.332(2)/0.14				0.1917
					6.360(1)/0.22				0.2158
					6.397(1)/0.13				0.3588
					6.448(1)/0.2				0.4768
					6.473(1)/3.1				
					6.523(2)/0.6				
					6.528(1)/3.1				
					6.563(1)/13.6				
					6.582(3)/0.3				
					6.646(1)/44				
					6.661(1)/31				
^{224}Ac		224.021723	2.7 h	EC/(90)/1.403	5.841(1)/0.5	0-			Ra L x-ray
				α/(10)/6.323	5.860(1)/0.75				Ra k x-ray
					5.875(1)/1.7				0.08426
					5.941(1)/4.4				0.13150
					6.000(1)/6.7				0.1571
					6.013(1)/1.4				0.21575
					6.056(1)/22				0.2619
					6.138(1)/26				(0.03−0.3)
					6.154(1)/1.0				
					6.204(1)/12				
					6.210(1)/20				
^{225}Ac		225.023230	10.0 d	α/5.935	5.286(1)/0.2	3/2			Fr k x-ray
					5.444(3)/0.1				0.06296/0.48
					5.554(1)/0.1				0.09982/1.36
					5.608(1)/1.1				0.1084
					5.636(1)/4.5				0.1116
					5.681(1)/1.4				0.1451
					5.722(1)/2.9				0.150.02/0.691
					5.731(1)/10				0.15724
					5.791(1)/9				0.18795/0.54
					5.793(1)/18				0.0075−0.8085
^{226}Ac		226.026098	1.224 d	EC/(17)/0.640		(1-)			Ra k x-ray
				β- /(83)/1.116					Th k x-ray
				α/(0.006)/5.51	5.399(5)/0.006				0.07218
									0.15816
									0.23034
^{227}Ac		227.027752	21.77 y	β- /98.6/0.045	0.045/54	(3/2-)	+1.1	+1.7	0.0838/23.
				α/(1.4)/5.043	4.869(1)/0.09				0.0811/14.
					4.938(1)/0.52				0.2696/13.
					4.951(1)/0.65				(0.044−1.27)
^{228}Ac		228.031021	6.15 h	β- /2.127	1.11/32	(3+)			Th L x-ray
					1.85/12				Th k x-ray
					2.18/11				0.12903
									0.33842
									0.91116
									0.96897
									(0.2−1.96)

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
^{229}Ac		229.03302	1.04 h	β- /1.10	1.1/	(3/2+)			0.09335/2.43
									0.16451/2.61
									0.56916/2.24
									0.0111−0.898
^{230}Ac		230.0363	2.03 m	β- /2.7	1.4/	1+			Th k x-ray
				β-, sf	/0.000119				0.45497
									0.50820
									(0.12−2.5)
^{231}Ac		231.0386	7.5 m	β- /2.1	2.1/100	(1/2+)			0.14379
									0.18574
									0.22140
									0.28250
									0.3070
^{232}Ac		232.0420	2.0 m	β- /3.7		(2-)			
^{233}Ac		233.0446	2.4 m	β- /		(1/2+)			
^{234}Ac		234.0484	40. s	β- /		(1+)			
$_{90}$Th		**232.03806(2)**							
^{209}Th		209.0177	~ 0.01 s	α	8.08				
^{210}Th		210.0158	~ 9 ms	α	7.90	0+			
^{211}Th		211.0149	0.04 s	α	7.79				
^{212}Th		212.01298	~ 30. ms	α/	7.80/	0+			
^{213}Th		213.0130	0.14 s	α/7.840	7.692(10)/				
^{214}Th		214.01150	0.10 s	α/7.825	7.677(10)/	0+			
^{215}Th		215.01173	1.2 s	α/7.660	7.33(10)/8	(1/2-)			0.134
					7.395(8)/52				0.192
					7.524(8)/40				(0.069-0.295)
^{216m}Th			0.14 ms	α	9.93/74				(0.0905-1.478)
					8.00, 9.31				
^{216}Th		216.01106	27. ms	α/8.071	7.92/99.46	0+			0.628
					7.30/0.54				
^{217}Th		217.01311	0.25 ms	α/9.424	9.27/94.6				(0.546-0.822)
					8.46/3.8				
					8.73/1.6				
^{218}Th		218.01328	0.11 μs	α/9.847	9.665(10)/	0+			
^{219}Th		219.01554	1.05 μs	α/9.510	9.340(20)/				
^{220}Th		220.01575	10. μs	α/8.953	8.790(20)/	0+			
^{221}Th		221.01818	2. ms	α/8.628	7.732/7				
					8.142/72				
					8.469/21				
^{222}Th		222.01847	2.24 ms	α/8.129	7.980/97.7	0+			
					7.599/2.3				
^{223}Th		223.02081	0.60 s	α/7.454	7.29(1)/41(5)				
					7.32(1)/29(5)				
					7.350(15)/20(5)				
					7.390(15)/10(4)				
^{224}Th		224.02147	1.05 s	α/7.305	6.768(5)/1.2	0+			
					6.997(5)/19				
					7.170(5)/7				
^{225}Th		225.023951	8.72 m	EC/(10)/0.68		(3/2+)			
				α/(90)/6.920	6.441(2)/15				
					6.479(2)/43				
					6.501(3)/14				
					6.627(3)/3				
					6.650(5)/3				
					6.700(5)/2				
					6.743(3)/7				
					6.796(2)/9				
^{226}Th		226.024903	30.83 m	α/6.454	6.026(1)/0.2	0+			Ra k x-ray

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ-Energy / Intensity (MeV/%)
					6.041(1)/0.19				0.1112
					6.098(1)/1.3				0.2421
					6.2283(4)/23				0.1310
					6.3375(4)/75				0.1733−0.9295
^{227}Th		227.027704	18.72 d	α/6.146		(3/2+)			Ra L x-ray
									Ra k x-ray
									0.05014
									0.23597
									0.25624
									(0.02−1.0)
^{228}Th		228.028741	1.913 y	α/5.520	5.1770(2)/0.18	0+			
					5.2114(1)/0.4				
					5.3405(1)/26.7				
					5.4233(1)/73				
^{229m}Th			13.9 h	α	4.83-5.08				
^{229}Th		229.031762	7.9×10^3 y	α/5.168	4.814/9.3	5/2+	+0.46	+4.	0.1935/4.3
					4.845(5)/56				0.21089/277
					4.9008(5)/10.2				0.13697/1.21
					4.689−5.077				0.0111−0.6036
^{230}Th		230.033134	7.54×10^4 y	α/4.771	4.4383(6)/0.03	0+			0.0677/0.46
					4.4798(6)/0.12				0.1439/0.078
			$> 2 \times 10^{18}$ y	sf/$< 4 \times 10^{-12}$	4.6211(6)/23.4				
					4.6876(6)/76.3				
^{231}Th		231.036304	1.063 d	β- /0.390	0.138/22	5/2+			Pa L x-ray
					0.218/20				Pa k x-ray
					0.305/52				0.02564
									0.084203/
									(0.02−0.3)
^{232}Th	100.	232.038055	1.40×10^{10} y	α/4.081	3.830(10)/0.2	0+			0.0590
			1.2×10^{21} y	sf/1.1×10^{-9}	3.952(5)/23				0.124
					4.010(5)/77				
^{233}Th		233.041582	22.3 m	β-/1.245	1.245/	½+			Pa L x-ray
									Pa k x-ray
									0.02938
									0.08653
									0.45930
									(0.02−1.2)
^{234}Th		234.043601	24.10 d	β- /0.273	0.102/20	0+			Pa L x-ray
					0.198/72				0.06329/4.1
									0.09235/2.4
									0.09278/2.4
^{235}Th		235.04751	7.2 m	β- /1.9					0.4162
									0.6594
									0.7272
									0.747
									0.9318
^{236}Th		236.0499	37.5 m	β- /~ 1.0		0+			Pa k x-ray
									0.1107
^{237}Th		237.0539	5.0 m	β-					
^{238}Th		238.0565	9.4 m			0+			0.0890
$_{91}$Pa		**231.03588(2)**							
^{212}Pa		212.0232	~ 5 ms	α	8.27				
^{213}Pa		213.0211	7 ms	α	8.24				
^{214}Pa		214.0209	17 ms	α	8.12				
^{215}Pa		215.0192	15. ms	α	8.08/100				
^{216}Pa		216.0191	0.19 s	α/	7.95/51				0.134
					7.82/45				
					7.79/4				

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^{217m}Pa			1.08 ms	α/	10.16/72				0.4504–0.8208
					8.306/11				
					9.55/6				
					9.69/2				
^{217}Pa		217.0183	3.8 ms	α/8.490	8.337/99				0.0466–0.634
					7.873/0.4				
					7.728/0.3				
					7.710/0.3				
^{218}Pa		218.02004	0.12 ms	α/	9.54/31				0.092
					9.61/69				
^{219}Pa		219.0199	0.05 μs	α					
^{220}Pa		220.0219	0.8 μs	α					
^{221}Pa		221.0219	6. μs	α	9.08(3)				
^{222}Pa		222.0237	~ 4.3 ms	α/8.700	8.180/50				
					8.330/20				
					8.540/30				
^{223}Pa		223.0240	~ 6.5 ms	α/8.340	8.006(10)/55				
					8.196(10)/45				
^{224}Pa		224.02563	0.84 s	α/7.630	7.555(10)/75(3)				0.1945
					7.46(1)/25(3)				(0.028–0.412)
^{225}Pa		225.0261	1.8 s	α/7.380	7.195(10)/30				
					7.245(10)/70				
^{226}Pa		226.02795	1.8 m	α/(74)/6.987	6.728(10)/0.7				
				EC/(26)/2.83	6.823(10)/35				
					6.863(10)/39				
^{227}Pa		227.02881	38.3 m	α/(85)/6.582	6.357(4)/7	(5/2-)			0.0649
				EC/(15)/1.02	6.376(10)/2.2				0.0669
					6.401(4)/8				0.1100
					6.416(4)/13				
					6.423(10)/10				
					6.465(4)/43				
^{228}Pa		228.031051	22. h	EC/(98)/2.111		(3+)	+3.5		Th k x-ray
				α/(2)	5.779/0.23				0.409/100
					5.805/0.15				0.4631/222
					6.078/0.4				0.91116/242
					6.105/0.25				0.96464/120
					6.118/0.22				0.96897/149
									0.058–1.96
^{229}Pa		229.032097	1.5 d	EC/(99.8)/0.32		(5/2+)			0.04244
				α/(0.2)/5.836	5.536(2)/0.02				(0.024–0.18)
					5.579(2)/0.09				
					5.668(2)/0.05				
^{230}Pa		230.034541	17.4 d	EC/(90)/1.310	0.51/	(2-)	2.0		Th L x-ray
				β-/(10)/0.563					Th k x-ray
									0.4437
									0.45477
									0.89876
									0.91856
									0.95199
									(0.053–1.07)
^{231}Pa		231.035884	3.25×10^4 y	α/5.148	4.6781(5)/1.5	3/2-	2.01	-1.7	Ac L x-ray
					4.7102(5)/1.0				Ac k x-ray
			$> 2 \times 10^{17}$ y	sf/$< 1.6 \times 10^{-15}$	4.7343(5)/8.4				0.01899
					4.8513(5)/1.4				0.027396
					4.9339(5)/3				0.03823
					4.9505(5)/22.8				0.04639
					4.9858(5)/1.4				0.25586
					5.0131(5)/25.4				0.26029
					5.0292(5)/20				0.28367
					5.0318(5)/2.5				0.30007

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					5.0587(5)/11				0.30264
									0.33007
									(0.02−0.61)
^{232}Pa		232.03859	1.31 d	β- /1.34		(2-)			U k x-ray
									0.10900
									0.15009
									0.89439
									0.96934
									(0.10−1.17)
^{233}Pa		233.040247	27.0 d	β-/0.571	0.15/40	3/2-	+4.0	-3.0	U L x-ray
					0.256/60				U k x-ray
									0.30017
									0.31201/38.4
									(0.0286-0.456)
^{234m}Pa			1.17 m	β- /99.9/2.29		(0-)			U k x-ray
				IT/0.13/					0.25818/0.07
									0.76641/0.32
									1.0009/0.86
									(0.06−1.96)
^{234}Pa		234.043308	6.69 h	β- /2.197	0.51/	(4+)			U L x-ray
									U k x-ray
									0.1312/0.03
									0.5695/0.02
									0.9256/0.02
									(0.02−1.99)
^{235}Pa		235.04544	24.4 m	β- /1.41	1.4/97	(3/2-)			0.0308−0.65893
^{236}Pa		236.0487	9.1 m	β- /2.9	1.1/40	(1-)			U k x-ray
					2.0/50				0.64235
					3.1/10				0.68759
									1.7630
									(0.04−2.18)
^{237}Pa		237.0512	8.7 m	β- /2.3	1.1/60	(1/2+)			0.4986
					1.6/30				0.5293
					2.3/10				0.5407
									0.8536
									0.8650
									(0.04−1.4)
^{238}Pa		238.0545	2.3 m	β- /3.5	1.2/	(3-)			0.10350
					1.7/				0.1785
									0.4484
									0.6350
									0.6800
									1.01446
									(0.04−2.5)
^{239}Pa		239.0573	1.8 h						
$_{92}$U		**238.02891(3)**							
^{217}U		217.0244	~ 0.2 ms	α	8.02				
^{218m}U			~ 0.56 ms	α	10.68				
^{218}U		218.02354	0.5 ms	α	8.61	0+			
^{219}U		219.0249	~ 0.08 ms	α	9.68(4)/				
^{222}U		222.0261	~ 1.μs	α		0+			
^{223}U		223.0277	0.02 s	α/	8.78(4)/				
^{224}U		224.02761	~ 1. ms	α/	8.46/100	0+			
^{225}U		225.02939	84. ms	α/	7.87/83				
					7.82/15				
					7.63/2				
^{226}U		226.02934	0.26 s	α/7.560	7.56/86	0+			
					7.38/14				

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^{227}U		227.03116	1.1 m	α/7.200	6.870/				
^{228}U		228.03137	9.1 m	α/6.803	6.404(6)/0.6	0+			0.095
					6.440(5)/0.7				0.152
					6.589(5)/29				0.187
					6.681(6)/70				0.246
^{229}U		229.03351	58. m	EC/(80)/1.31	6.223/3	(3/2+)			
				α/(20)/6.473	6.297(3)/11				
					6.332(3)/20				
					6.360(3)/64				
^{230}U		230.033940	20.8 d	α/5.992	5.5866(3)/0.01	0+			Th L x-ray
			> 4×10^{10} y	sf/< 10^{-10}	5.6624(3)/0.26				0.07218
					5.6663(3)/0.38				0.15421
					5.8178(3)/32				0.23034
					5.8887(3)/67				(0.081−0.8565)
^{231}U		231.036294	4.2 d	EC/0.36		(5/2-)			Pa L x-ray
				α/(10^{-3})	5.46/1.6 × 10^{-3}				Pa k x-ray
					5.47/1.4 × 10^{-3}				0.02564
					5.40/1. × 10^{-3}				0.08420
^{232}U		232.037156	70. y	α/5.414	4.9979(1)/0.003	0+			
			2.6×10^{15} y	sf/2.7 × 10^{-12}	5.1367(1)/0.3				
					5.2635(1)/31				
					5.3203(1)/69				
^{233}U		233.039635	1.592 × 10^{5} y	α/4.909	4.7830(8)/13.2	5/2+	+0.59	3.66	Th L x-ray
			> 2.7 × 10^{17} y	sf/6 × 10^{-11}	4.8247(8)/84.4				0.04244
					4.510−4.804				0.09714
									(0.0252−1.119)
^{234}U	0.0054(5)	234.040952	2.455 × 10^{5} y	α/4.856	4.604(1)/0.24	0+			0.05323/0.156
			1.5 × 10^{16} y	sf/1.6 × 10^{-9}	4.7231(1)/27.5				0.12091
					4.776(1)/72.5				
^{235m}U			26. m	IT/0.0007		1/2+			
^{235}U	0.7204(6)	235.043930	7.04 × 10^{8} y	α/4.6793	4.1525(9)/0.9	7/2-	-0.38	4.9	Th L x-ray
			1.0 × 10^{19} y	sf/7 × 10^{-9}	4.2157(9)/6.				Th k x-ray
					4.3237(9)/4.6				0.10917
					4.3641(9)/19.				0.14378
					4.370(4)/6				0.16338
					4.3952(9)/57.				0.18574
					4.4144(9)/2.1				0.20213
					4.5025(9)/1.7				0.20533
					4.5558(9)/4.2				0.22140
					4.5970(9)/4.8				(0.03−0.79)
^{236}U		236.045568	2.342 × 10^{7} y	α/4.569	4.332(8)/0.26	0+			Th L x-ray
			2.5 × 10^{16} y	sf/9 × 10^{-8}	4.445(5)/26				0.04946/100
					4.494(3)/74				0.11279/24.1
									0.17115/0.080
^{237}U		237.048730	6.75 d	β- /0.519	0.24/	1/2+			Np L x-ray
					0.25/				Np k x-ray
									0.05953
									0.20801
^{238}U	99.2742(10)	238.050788	4.47 × 10^{9} y	α	4.0395/0.23	0+			Th L x-ray
			8.2 × 10^{15}y	sf/5 × 10^{-5}	4.147(5)/23				0.04955/.06
					4.196(5)/77				0.1135/.01
^{239}U		239.054293	23.5 m	β- /1.265	1.2/	5/2+			(0.522−0.681)
					1.3/				
^{240}U		240.05659	14.1 h	β- /0.39	0.36/	0+			Np L x-ray
									0.04410
									0.05558
									0.06760
^{242}U		242.0629	16.8 m	β- /~ 1.2		0+			

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$_{93}$Np									
^{225}Np		225.0339	> 2 μs						
^{226}Np		226.0352	0.03 s	α/	8.04(2)/				
^{227}Np		227.0350	0.51 s	α/	7.65(2)/				
					7.68(1)/				
^{228}Np		228.0362	61. s	EC/60(7)/					
				α/40(7)/, sf					
^{229}Np		229.0363	4.0 m	α/7.010	6.890(20)				
^{230}Np		230.0378	4.6 m	EC/97 /3.6					
				α/3	6.660(20)				
^{231}Np		231.03825	48.8 m	EC/98 /1.8		5/2			0.2629
				α/2 /6.368	6.280/2				0.3475
									0.3703
^{232}Np		232.0401	14.7 m	EC/99 /2.7		(4-)			U L x-ray
									U k x-ray
									0.3268
									0.81925
									0.86683
^{233}Np		233.04074	36.2 m	EC/1.2		(5/2+)			U L x-ray
									U k x-ray
									0.29887
									0.31201
^{234}Np		234.04290	4.4 d	β+, EC/1.81	0.79/	(0+)			U L x-ray
									U k x-ray
									1.5272
									1.5587
									1.6022
^{235}Np		235.044063	1.085 y	EC/99.9 /0.124		5/2+			U k x-ray
				α/0.001/5.191					
^{236m}Np			22.5 h	EC/52 /		(1-)			U L x-ray
				β- /48 /					Pu L x-ray
									U k x-ray
									0.64235
									0.68759
^{236}Np		236.04657	1.55×10^5 y	EC/91 /0.94		(6-)			U L x-ray
				β- /9 /0.49					U k x-ray
									0.10423
									0.16031
^{237}Np		237.048173	2.14×10^6 y	α/4.957	4.6395(5)/6.5	5/2+	+3.14	+3.89	Pa L x-ray
			1×10^{18} y	sf/2.1×10^{-10}	4.766(5)/9.7				Pa k x-ray
					4.7715(5)/22.7				0.029378/15
					4.7884(5)/47.8				0.08653/12
					4.558−4.873				(0.03−0.28)
^{238}Np		238.050946	2.117 d	β- /1.292	1.2/	2+			Pu L x-ray
									Pu k x-ray
									0.98447/25.2
									1.02855/18.3
									(.044−1.026)
^{239}Np		239.052939	2.355 d	β- /0.722	0.341/30	5/2+			Pu L x-ray
					0.438/48				Pu k x-ray
									0.10613
									0.228186/11
									0.27760/15
									(0.04−0.50)
^{240m}Np			7.22 m	β- /99.9 /	2.18/	(1+)			0.25143
				IT/0.1 /					0.26333
									0.55454
									0.59735

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^{240}Np		240.05616	1.032 h	β- /2.20	0.89/	5+			0.1471/
									0.5664
									0.6008
^{241}Np		241.0583	13.9 m	β- /1.3	1.3/	5/2+			0.1330/
									0.1740
									0.280
^{242m}Np			2.2 m	β- /		(1+)			0.15910
									0.2651/
									0.78570
									0.9448/
^{242}Np		242.0616	5.5 m	β- /2.7	2.7/	6+			0.6209
									0.73620
									0.78074
									1.47340
									(0.04–2.37)
^{243}Np		243.06428	1.9 m						
^{244}Np		244.0679	2.3 m						
$_{94}$Pu									
^{228}Pu		228.03874	~ 1.1 s	α/	7.81(2)/	0+			
^{229}Pu		229.0402	~ 1.5 m	α/	7.46/				
^{230}Pu		230.03965	1.7 m	α/	7.06/81	0+			
					7.00/19				
^{231}Pu		231.04110	8.6 m	EC/90					
				α/10	6.72				
^{232}Pu		232.04119	34. m	EC/>80/1.1		0+			
				α/<20/6.716	6.542(10)/38				
					6.600(10)/62				
^{233}Pu		233.04300	20.9 m	EC(99.9)/1.9					0.1503
				α/0.1 /6.416	6.300(20)/0.1				0.1804
									0.2353
									0.5002
									0.5346/
									1.0352/
^{234}Pu		234.04332	8.8 h	EC/94 /0.39		0+			
				α/6 /6.310	6.035(3)/0.024				
					6.149(3)/1.9				
					6.200(3)/4.				
^{235}Pu		235.04529	25.3 m	EC/99+ /1.2		(5/2+)			
				α/0.003/5.957	5.850(20)/0.003				
^{236m}Pu			1.2 μs						
^{236}Pu		236.046058	2.87 y	α/5.867	5.611/0.21	0+			0.0476/0.07
			1.5×10^9 y	sf/1.9×10^{-7}	5.7210/30.5				0.109/0.02
					5.7677(1)/69.3				(0.17–0.97)
^{237}Pu		237.048410	45.7 d	EC/99.9 /0.220		7/2-			Np L x-ray
				α/0.003 /5.747	5.334(4)/0.0015				Np k x-ray
					5.356(4)/0.0006				0.026344
					5.650(4)/0.0007				0.03319
									0.05954
									(0.03–0.5)
^{238}Pu		238.049560	87.7 y	α/5.593	5.3583(1)/0.10	0+			U k x-ray
			4.75×10^{10} y	sf/1.8×10^{-7}	5.465(1)/28.3				0.04347
					5.4992(1)/71.6				(0.04–1.1)
^{239}Pu		239.052163	2.410×10^4 y	α/5.244	5.055/0.047	1/2+	+0.203		U k x-ray
			$8. \times 10^{15}$ y	sf/3×10^{-10}	5.076/0.078				0.05162
					5.106/11.9				0.05682
					5.144/17.1				0.12928
					5.157/70.8				0.37502
					(4.74 –5.03)				0.41369

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^{240}Pu		240.053814	6.56×10^{3} y	α/5.255	5.0212(1)/0.07	0+			U L x-ray
			1.14×10^{11} y	sf/5.7×10^{-6}	5.1237(1)/26.4				0.04524
					5.1681(1)/73.5				0.10423
									(0.04–0.97)
^{241}Pu		241.056852	14.3 y	β-/99+/0.0208	$4.853/3 \times 10^{-4}$	5/2+	-0.683	+6.	0.14854
				α/0.002 /5.139	4.897/0.002				0.1600
			< 6×10^{16} y	sf/> 2.4×10^{-14}					
^{242}Pu		242.058743	3.75×10^{5} y	α/4.983	4.7546(7)/0.098	0+			U L x-ray
			6.77×10^{10} y	sf/5.5×10^{-4}	4.8564(7)/22.4				0.04491
					4.9006(7)/78				0.10350
^{243}Pu		243.062003	4.956 h	β- /0.582	0.49/21	7/2+			Am L x-ray
					0.58/60				0.0417
									0.0839
^{244}Pu		244.064204	8.00×10^{7} y	α/99.9/4.665	4.546(1)/19.4	0+			U L x-ray
			6.6×10^{10} y	sf/0.12	4.589(1)/80.5				0.0439
^{245}Pu		245.06775	10.5 h	β- /1.21	0.93/57	(9/2-)			Am L x-ray
					1.21/11				Am k x-ray
									0.2804 /
									0.30832
									0.32752
									0.56014
									(0.03–1.2)
^{246}Pu		246.07021	10.85 d	β- /0.40	0.150/85	0+			Am L x-ray
					0.35/10				Am k x-ray
									0.04379
									0.22371
^{247}Pu		247.0741	2.3 d						
$_{95}$Am									
^{232}Am		232.0466	0.9 m	EC/~ 5.0					
^{233}Am		233.0464	~ 3.2 m	α	6.78				
^{234}Am		234.0478	2.3 m	EC/4.2					
^{235}Am		235.0480	10.3 m	EC					Pu K x-ray
				α	6.46/0.4				0.291/100
									(0.170-0.828)
^{236m}Am			2.9 m			(1-)			(0.583-0.713)
^{236}Am		236.0496	3.6 m	EC		(5-)			(0.158-1.038)
^{237}Am		237.0500	1.22 h	EC/99.98 /1.7		(5/2-)			Pu k x-ray
				α/0.02 /6.20	6.042(5)/0.02				0.14559
									0.28026
									0.43845
^{238}Am		238.05198	1.63 h	EC/2.26		1+			Pu L x-ray
				α/0.0001 /6.04	5.940/0.0001				Pu k x-ray
									0.91870
									0.96278
^{239}Am		239.053025	11.9 h	EC/99.99/0.803		5/2-			Pu L x-ray
				α/0.01/5.924	5.734(2)/0.001				Pu k x-ray
					5.776(2)/0.008				0.18172
									0.22818
									0.27760
^{240}Am		240.05530	2.12 d	EC/1.38		(3-)			Pu L x-ray
				α/5.592	$5.378(1)/16 \times 10^{-4}$				Pu k x-ray
									0.88878
									0.98764
									(0.1–1.3)
^{241}Am		241.056829	432.7 y	α/5.637	5.2443(1)/0.002	5/2-	+1.58	+3.1	Np L x-ray
			1.2×10^{14} y	sf/3.6×10^{-10}	5.3221(1)/0.015				0.02634 /.024
					5.3884(1)/1.4				0.03319/.00126
					5.4431(1)/12.8				0.05954/0.359

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					5.4857(1)/85.2				(0.03–1.128)
					5.5116(1)/0.20				
					5.5442(1)/0.34				
^{242m}Am			141. y	IT/99.5/0.048		5-	+1.0	+6.5	Am L x-ray
				α/0.5/5.62	5.141(4)/0.026				0.04863
			> 3 × 10^{12} y	sf/< 4.7 × 10^{-9}	5.2070(2)/0.4				0.08648
									0.10944
									0.16304
^{242}Am		242.059549	16.02 h	β- /83 /0.665	0.63/46	1-	+0.388	-2.4	Pu L x-ray
				EC/17 /0.750	0.67/37				Cm L x-ray
									Pu k x-ray
									0.0422
									0.04453
^{243}Am		243.061381	7.37 × 10^{3} y	α/5.438	5.1798(5)/1.1	5/2-	+1.5	+2.9	0.04354
			2. × 10^{14} y	sf/3.7 × 10^{-9}	5.2343(5)/11				0.07467
					5.2766(5)/88				0.08657
					5.394(5)/0.12				0.11770
					5.3500(5)/0.16				0.14197
^{244m}Am			~ 26. m	β- /1.498		(1-)			0.0429
^{244}Am		244.064285	10.1 h	β- /1.428					Am L x-ray
									Cm k x-ray
									0.7460
									0.9000
^{245}Am		245.066452	2.05 h	β- /0.894	0.65/19	(5/2+)			Cm L x-ray
					0.90/77				Cm k x-ray
									0.25299
^{246m}Am			25.0 m	β- /	1.3/79.	2-			Cm L x-ray
					1.60/14				Cm k x-ray
					2.1/7				0.27002
									0.79881
									1.06201
									1.07885
									(0.04–2.29)
^{246}Am		246.06978	39. m	β- /2.38	1.2/	(7-)			Cm L x-ray
									Cm k x-ray
									0.1529
									0.2046
									0.6786
^{247}Am		247.0721	22. m	β- /1.7					Cm L x-ray
									Cm k x-ray
									0.2267 /
									0.2853 /
$_{96}$Cm									
^{233}Cm		233.0508		α/	7.34/				
^{234}Cm		234.05016	~ 51. s	α	7.24/	0+			
^{235}Cm		235.0514							
^{236}Cm		236.0514		EC/1.7		0+			
^{237}Cm		237.0529		EC/2.5					
^{238}Cm		238.05303	2.4 h	EC/>90 /0.97		0+			
				α/<10 /6.632	6.520(50)/<10				
^{239}Cm		239.0550	~ 3. h	EC/1.7					
									0.0407
									0.1466
									0.1874
^{240}Cm		240.055530	27. d	α/6.397	5.989/0.014	0+			
					6.147/0.05				
			1.9 × 10^{6} y	sf/3.9 × 10^{-6}	6.2478(6) /28.8				
					6.2906(6) /70.6				

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^{241}Cm		241.057653	32.8 d	EC/99 /0.768		1/2+			Am k x-ray
				α/1 /6.184	5.8842(4)/0.12				0.13241
					5.9291(4)/0.18				0.16505
					5.9389(4)/0.69				0.18028
									0.43063
									0.47181
^{242}Cm		242.058836	162.8 d	α/6.216	5.9694(1)/0.035	0+			Pu L x-ray
					6.069(1)/25				0.04408
			7.0×10^{6} y	sf/6.4×10^{-6}	6.1129(1)/74				0.10189
									(0.04–1.2)
^{243}Cm		243.061389	29.1 y	α/6.167	5.6815(5) /0.2	5/2+	0.41		Pu L x-ray
					5.6856(5)/1.6				Pu k x-ray
			5.5×10^{11} y	sf/5.3×10^{-9}	5.7420(5)/10.6				0.10612
					5.7859(5)/73.3				0.20975
					5.9922(5)/6.5				0.22819
					6.0103(5)/1.0				0.27760
					6.0589(5)/5				0.28546
					6.0666(5)/1.5				0.33431
									(0.04–0.7)
^{244}Cm		244.062753	18.1 y	α/5.902	5.6656/0.02	0+			Pu L x-ray
					5.7528/23				0.04282
			1.32×10^{7} y	sf/1.4×10^{-4}	5.8050/77				0.09885
					5.515/0.004				0.15262
^{245}Cm		245.065491	8.48×10^{3} y	α/5.623	5.235(10)/0.3	7/2+	0.5		Pu L x-ray
					5.3038(10)/5.0				Pu k x-ray
			1.4×10^{12} y	sf/6.1×10^{-7}	5.3620(7)/93				0.04195
					5.4927(11)/0.8				0.13299
					5.5331(11)/0.6				0.13606
									0.17494
^{246}Cm		246.067224	4.76×10^{3} y	α/5.476	5.343(3)/21	0+			Pu L x-ray
			1.8×10^{7} y	sf/0.026	5.386(3)/79				0.04453
^{247}Cm		247.070354	1.56×10^{7} y	α/5.352	4.818(4)/4.7	9/2-	0.37		Pu k x-ray
					4.8690(20)/71				0.2792
					4.941(4)/1.6				0.2886
					4.9820(20)/2.0				0.3471
					5.1436(20)/1.2				0.4035
					5.2104(20)/5.7				
					5.2659(20)/13.8				
^{248}Cm		248.072349	3.48×10^{5} y	α/99.92 /5.162	4.931(5)/0.07	0+			
					5.0349(2)/16.5				
			4.15×10^{6} y	sf/8.38	5.0784(2)/(75)/1				
^{249}Cm		249.075953	64.15 m	β- /0.900	0.9/	1/2+			Bk k x-ray
									0.56039/0.84
									0.63431/1.5
									(0.085-0.653)
^{250}Cm		250.07836	~ 9.7×10^{3} y	sf/85.8		0+			
				α/5.27					
^{251}Cm		251.08229	16.8 m	β- /1.42	0.90/16	(1/2+)			0.3896 /
									0.5299
									0.5425
^{252}Cm		252.0849	< 2 d			0+			
$_{97}$Bk									
^{238}Bk		238.0583	2.4 m	EC/5.0					
^{239}Bk		239.0583							
^{240}Bk		240.0598	~ 4.8 m						
^{241}Bk		241.0602	4.6 m	EC					(0.152-0.262)
^{242}Bk		242.0620	7.0 m	EC/3.0					
^{243}Bk		243.063008	4.5 h	EC/99.8 /1.508	6.542(4)/0.03	(3/2-)			0.1466

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				α/0.15 /6.871	6.5738(2)/0.04				0.1874
					6.7180(22)/0.02				0.755
					6.7581(20)/0.02				0.840
									0.946
^{244}Bk		244.06518	4.4 h	EC/99.99 /2.26		(4-)			0.1445
				α/0.01 /6.778	6.625(4)/0.003				0.1876
					6.667(4)/0.003				0.2176
									0.9815
									0.9215/
^{245}Bk		245.066362	4.94 d	EC/99.9 /0.810		3/2-			Cm L x-ray
				α/0.1 /6.453	5.8851(5)/0.03				Cm k x-ray
					6.1176(9)/0.01				0.25299
					6.1467(5)/0.02				0.3809
					6.3087(5)/0.014				0.3851
					6.3492(5)/0.018				
^{246}Bk		246.0687	1.80 d	EC/1.35		(2-)			Cm L x-ray
									Cm k x-ray
									0.79881
									1.08142
^{247}Bk		247.07031	1.4×10^3 y	α/5.889	5.465(5)/1.5	(3/2-)			0.04175
					5.501(5)/7				0.0839
					5.532(5)/45				0.268
					5.6535(20)/5.5				
					5.678(2)/13				
					5.712(2)/17				
					5.753(2)/4.3				
					5.794(2)/5.5				
^{248}Bk		248.07310	23.7 h	β- /70 /0.87	0.86/	(1-)			Cm L x-ray
				EC/30 /0.72					Cf L x-ray
									Cm k x-ray
									Cf k x-ray
									0.5507
^{249}Bk		249.074987	320. d	β- /0.125	0.125/100	7/2+	2.0		$0.327/10^{-5}$
				α/0.001 /5.525	5.390(1)/0.0002				$0.308/10^{-6}$
			1.8×10^9 y	sf/4.9×10^{-8}	5.4174(6)/0.001				
^{250}Bk		250.078317	3.217 h	β- /1.780	0.74/	2-			Cf L x-ray
									Cf k x-ray
									0.98912
									1.03184
									(0.04–1.6)
^{251}Bk		251.08076	56. m	β- /1.09		(3/2-)			0.02481
									0.1528
									0.1776
^{252}Bk		252.0843	1.8 m						
$_{98}$Cf									
^{237}Cf		237.062	2.1 s	α, sf/10					
^{238}Cf		238.0614	21 ms	sf/~ 100		0+			
				α/~ 0.2					
^{239}Cf		239.0624	~ 0.7 m	α					
^{240}Cf		240.0623	1.1 m	α/7.719	7.590(10)/	0+			
				sf/ ~ 2.1					
^{241}Cf		241.0637	4. m	EC/3.3					
				α/7.60	7.335(5)/				
^{242}Cf		242.06370	3.5 m	α/7.509	7.351(6)/20	0+			
				sf/<0.014	7.385(4)/80				
^{243}Cf		243.0654	11. m	EC/86 /2.2	7.060(6)/20	(1/2+)			
				α/14 /7.40	7.170/4				
^{244}Cf		244.066001	20. m	α/7.328	7.168(5)/25	0+			

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					7.210(5)/75				
^{245}Cf		245.068049	44. m	α/36 /7.255	7.14/91.7				Cm K x-ray
				EC/64 /1.569	6.983/0.31				0.5709
					7.09/7				0.6014
					7.065/0.68				0.6163
^{246}Cf		246.068805	1.49 d	α/6.869	6.6156(10)/0.18	0+			Cm L x-ray
					6.7086(7)/21.8				0.04221
			1.8×10^3 y	sf/2.3×10^{-4}	6.7501(7)/78.0				0.0945
									0.147
^{247}Cf		247.07100	3.11 h	EC/99.96 /0.65		7/2+			Bk k x-ray
				α/0.04 /6.55	6.301(5)/				0.2941
									0.4778
^{248}Cf		248.07219	334. d	α/6.369	6.220(5)/17	0+			
			3.2×10^4 y	sf/0.0029	6.262(5)/83				
^{249}Cf		249.074854	351. y	α/6.295	5.758/3.7	9/2-			Cm L x-ray
					5.812/85.7				Cm k x-ray
			$8. \times 10^{10}$ y	sf/4.4×10^{-7}	5.8488(2)/1.0				0.25299/2.5
					5.9029(2)/2.8				0.33351/13.6
					5.9451(2)/4.0				0.38832/63.6
					6.1401(2)/1.1				(0.0376−1.103)
					6.1940(2)/2.2				
^{250}Cf		250.076406	13.1 y	α/6.129	5.8913(4)/0.3	0+			Cm L x-ray
			1.7×10^4 y	sf/0.077	5.9889(4)/15				0.04285
					6.0310(4)/84.5				
^{251m}Cf			26.3 μs						
^{251}Cf		251.079587	9.0×10^2 y	α/6.172	5.56448(7)/1.5	1/2+			0.109/19.8
					5.632(1)/4.5				0.1775/17.3
					5.648(1)/3.5				(0.0385-0.354)
					5.6773(6)/35				
					5.762(3)/3.8				
					5.7937(7)/2.0				
					5.8124(8)/4.2				
					5.8514(6)/27				
					6.0140(7)/11.6				
					6.0744(7)/2.7				
^{252}Cf		252.081626	2.65 y	α/96.9 /6.217	5.7977(1)/0.23	0+			Cm L x-ray
			86. y	sf/3.1/	6.0756(4)/15.2				0.04339
					6.1184(4)/81.6				0.1002
^{253}Cf		253.08513	17.8 d	β- /99.7 /0.29	0.27/100	(7/2+)			
				α/0.3 /6.126	5.921(5)/0.02				
^{254}Cf		254.08732	60.5 d	sf/99.7/		0+			
				α/0.3/5.930	5.792(5)/0.05				
					5.834(5)/0.26				
^{255}Cf		255.0911	1.4 h	β- /0.7					
^{256}Cf		256.0934	12. m	sf		0+			
$_{99}$Es									
^{241}Es		241.0685	~ 8 s	α	8.11				
^{242}Es		242.0698	16 s	α	7.92				
^{243}Es		243.0696	21. s	α/>30 /	7.89/>30				
				EC/<70 /4.0					
^{244}Es		244.0709	37. s	EC/76 /4.6					
				α/4 /	7.57/4				
^{245}Es		245.0713	1.3 m	α/40 /7.858	7.74				
				EC/60 /3.1					
^{246}Es		246.0729	7.7 m	EC/90 /3.9					
				α/10 /	7.35				
^{247}Es		247.07366	4.8 m	EC/93 /2.48					
				α/7 /	7.32				

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^{248}Es		248.0755	26. m	EC/99.7 /3.1					
				α/0.3 /	6.87				
^{249}Es		249.07641	1.70 h	EC/99.4 /1.45		(7/2+)			0.3795
				α/0.6 /	6.77				0.8132
^{250m}Es			2.2 h	EC/		(1-)			Cf L x-ray
				β+					Cf k x-ray
									0.9891
									1.0319
^{250}Es		250.0786	8.6 h	EC/2.1		(6+)			Cf L x-ray
									Cf k x-ray
									0.30339
									0.34948
									0.82883
^{251}Es		251.07999	1.38 d	EC/99.5 /0.38		(3/2-)			
				α/0.5 /	6.462/0.05				
					6.492/0.4				
^{252}Es		252.08298	1.29 y	α/76 /	6.632/61.0	(5-)			
				EC/24 /1.26	6.562/10.3				
^{253}Es		253.084825	20.47 d	α/	6.633/89.8	7/2+	+4.10	7.	0.04180/5.6
			6.3×10^5 y	sf/8.9×10^{-6}	6.5916/6.6				0.3892/2.7
									(0.0309-1.106)
^{254m}Es			1.64 d	β- /99.6 /	0.475	2+	2.9	3.7	Fm L x-ray
				α/0.3 /6.67	6.382	2+			Fm k x-ray
			> 10. y	sf/0.045					0.6488
									0.6938
^{254}Es		254.088022	276. d	α/	6.429	(7+)			0.064
			$> 2.5 \times 10^7$ y	sf/$< 3 \times 10^{-6}$					
^{255}Es		255.09027	40. d	β- /92 /0.29		(7/2+)			
				α/8 /	6.26				
			2.6×10^3 y	sf/0.0042	6.300				
^{256m}Es			7.6 h	β- /		(8+)			0.218
									0.232
									0.862
^{256}Es		256.0936	25. m	β-/1.7		(1+)			
^{257}Es		257.0960	7.7 d	β-					
$_{100}$Fm									
^{242}Fm		242.0734	0.8 ms	sf/> 96		0+			
^{243}Fm		243.0744	0.2 s	α/	8.55				
				sf/< 0.4					
^{244}Fm		244.0741	3.3 ms	sf/> 97		0+			
^{245}Fm		245.0754	4. s	α/	8.15/				
				sf/<0.1					
^{246}Fm		246.07530	1.2 s	α/85/	8.24/	0+			
				sf/15/					
^{247m}Fm			4.3 s	α/	8.17/				
^{247}Fm		247.0769	29. s	α/8.20	7.87/70				
				EC/2.9	7.93/30				
^{248}Fm		248.07720	33. s	α/99.9 /8.001	7.83/20	0+			
				sf/0.1/	7.87/80				
^{249}Fm		249.0790	1.6 m	EC/2.4		(7/2+)			
				α/	7.57				
^{250m}Fm			1.8 s	IT/					
				sf/$<8 \times 10^{-5}$					
^{250}Fm		250.07952	30. m	α/	7.43/	0+			
				EC/0.8					
				sf/0.007					
^{251}Fm		251.08158	5.3 h	EC/98 /1.47		(9/2-)			
				α/2 /	6.833				

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^{252}Fm		252.08247	1.058 d	α/7.154	6.998/15	0+			
				sf/0.0023	7.039/85				
^{253}Fm		253.085185	3.0 d	EC/88/0.333	6.676/	½+			Es k x-ray
				α/12 /	6.943/				0.2719
^{254}Fm		254.086854	3.240 h	α/	7.150	0+			
				sf/0.059	7.192				
^{255}Fm		255.089962	20.1 h	α/	6.9635(5)/5.0	7/2+			0.08148/1.
			1.0×10^4 y	sf/2.3×10^{-5}	7.0225(5)/93.4				(0.041-0.900)
^{256}Fm		256.09177	2.63 h	sf/91		0+			
				α/19	6.92/				
^{257}Fm		257.09511	100.5 d	α/99.79	6.519	(9/2+)			0.1794
				sf/0.21					0.2410
^{258}Fm		258.0971	0.37 ms	sf/		0+			
^{259}Fm		259.1006	1.5 s	sf/					
^{260}Fm		260.103	~ 4 ms	sf/		0+			
$_{101}$Md									
^{245m}Md			~ 0.4 s	α	8.64, 8.68				
^{245}Md		245.0808	0.9 ms	sf					
^{246}Md		246.0819	1.0 s	α	8.74				
					8.50−8.56				
^{247m}Md			~ 0.2 s	sf/					
^{247}Md		247.0816	3. s	α	8.43				
^{248}Md		248.0828	7. s	EC/80 /5.3	8.32/15				
				α/20 /	8.36/5				
				sf/<0.05					
^{249}Md		249.0830	24. s	EC>/<80 /3.7					
				α/>20 /8.46	8.030(20)/				
^{250}Md		250.0844	50. s	EC/94 /4.6	7.75/4				
				α/6 /8.25	7.83/2				
^{251}Md		251.0848	4.0 m	EC/>94 /3.1					
				α/<6 /	7.55/				
^{252}Md		252.0866	2. m	EC/>50 /3.9					
				α/<50 /	7.73/				
^{253}Md		253.0873	~ 6 m	EC/2.0					
^{254m}Md			30. m	EC/					
^{254}Md		254.0897	10. m	EC/2.7					
^{255}Md		255.09108	27. m	EC/92 /1.04	α/7.33/93	(7/2-)			0.121/100
				α/8 /	7.27/5				0.115/65
				sf/< 0.15	7.75/1				0.136/35
					7.71/1				0.141−0.453
^{256}Md		256.0941	1.30 h	EC/89 /2.13	7.21/71				Fm k x-ray
				α/11 /	7.14/22				0.121/409
				sf/< 2.6	7.68/2.5				0.115/266
					7.25/2.5				0.136/143
					7.64/2.1				0.634/119
									0.141−1.37
^{257}Md		257.095541	5.5 h	EC/85 /0.41	7.074	(7/2-)			Fm k x-ray
				α/15, sf/< 1	7.014				(0.181−0.389)
^{258m}Md			57. m	EC/		(1-)			Fm k x-ray
				sf/< 30					
^{258}Md		258.098431	51.5 d	α/7.40	6.718(2)/	(8-)			0.3678
				sf/< 0.003	6.763(4)/				0.057−0.448
^{259}Md		259.1005	1.64 h	sf/>98.7		7/2+			
				α/<1.3					
^{260}Md		260.1037	~ 27.8 d	sf/ 73−100					
$_{102}$No									
^{248}No		248.0866	< 1.0 μs	sf		0+			

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^{249}No		249.0878	0.05 ms	sf					
				α/ < 20					
^{250}No		250.0875	6. μs	sf/		0+			
				α/ < 10					
^{251m}No			0.9 s	α	8.67				
^{251}No		251.0890	0.78 s	α/91	8.62/96				
				sf/0.26	8.58/4				
^{252}No		252.08898	2.44 s	α/75/8.551	8.42	0+			
				sf/24/	8.37				
				EC, β+/<1.6					
^{253}No		253.0907	1.7 m	α/	8.00	(9/2-)			0.222/100
				EC/3.2					(0.151-0.280)
^{254m}No			0.28 s	I.T./					
				sf/< .2					
^{254}No		254.09096	49. s	α/	8.09	0+			0.102
				EC/1.1					0.152
				sf/0.17					
^{255}No		255.09324	3.1 m	α/62 /	8.12/	½+			0.187
				EC/38/2.01	7.93				
					8.08				
^{256}No		256.09428	2.9 s	α/	8.43	0+			
				sf/0.5					
^{257}No		257.09688	24.5 s	α/	8.222/83	(7/2+)			0.0770
				sf/<1.5	8.27				0.1018
					8.323/17				0.1241
^{258}No		258.0982	~ 1.2 ms	sf/		0+			
^{259}No		259.1010	58. m	α/78 /7.794	7.52	(9/2+)			
				EC/22/0.5	7.55				
				sf/<9.7					
^{260}No		260.1026	0.11 s	sf/		0+			
^{262}No		262.1073	~ 8. ms	sf/		0+			
$_{103}$Lr									
^{251}Lr		251.0944	39 m	sf					
^{252}Lr		252.0954	~ 0.36 s	α	9.02/73				
				sf/<1	8.97/27				
^{253m}Lr			~ 0.57 s	α	8.79				
				sf/1.3					
^{253}Lr		253.0952	1.5 s	α/	8.72				
				sf/8					
^{254}Lr		254.0965	13. s	α/	8.45				
				EC/5.2					
				sf/<0.1					
^{255}Lr		255.09669	22. s	α/	8.37/60				
				EC/3.2	8.43/40				
				sf/< 0.1					
^{256}Lr		256.0986	27. s	α/99.7 /8.554	8.43/				
				EC/4.2	8.39				
				sf/< 0.03					
^{257}Lr		257.0996	0.65 s	α/	8.80	7/2+			
				EC/2.5					
				sf/< 0.03					
^{258}Lr		258.1018	3.9 s	α/	8.60/46				
				EC/3.4	8.62/25				
				sf/< 5	8.56/20				
					8.65/9				
^{259}Lr		259.1029	6.1 s	α/80	8.44(1)				
				sf/20					
^{260}Lr		260.1055	3. m	α/	8.03				

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^{261}Lr		261.1069	40. m	sf					
^{262}Lr		262.1096	3.6 h	EC/2.					
				sf/<10					
$_{104}$Rf									
^{253}Rf		253.1007	~ 48. μs	sf					
				α/<10					
^{254}Rf		254.1002	23. μs	sf/>98.5		0+			
				α/<1.5					
^{255}Rf		255.1013	1.6 s	α	8.72/<0.05				0.203
				sf/52	8.77/94				0.142
					8.67/<0.05				
					8.58/<0.05				
					8.92/<0.05				
^{256}Rf		256.10117	6.2 ms	sf/99.68		0+			
				α/0.32	8.81				
^{257}Rf		257.1030	4.7 s	α/9.22	8.77				0.117
				EC/11	9.01				
				sf/<1.4	8.95				
					8.62				
^{258}Rf		258.1035	12. ms	sf/87		0+			
				α/13					
^{259}Rf		259.1056	3.4 s	α/9.09/93	8.77(2)/				
				sf/7	8.86/				
^{260}Rf		260.1064	20. ms	sf/		0+			
^{261m}Rf			1.3 m	α	8.28				
^{261}Rf		261.10877	5. s	α/60, sf/40	8.52/				
^{262}Rf		262.1099	2.1 s	sf/>99.2		0+			
^{263}Rf		263.1126	10. m	sf, α					
^{265}Rf		265.1167	~ 13 h	α					
^{267}Rf		267.122	~ 0.1 d	sf					
$_{105}$Db									
^{255}Db		255.1074	~ 1.5 s	α,					
				sf/~ 20					
^{256}Db		256.1081	1.6 s	α/64	9.02/67				
				EC/35	8.89/11				
				sf/0.05	9.08/11				
					9.12/11				
^{257m}Db			0.8 s	α	9.16				
				sf/<13					
^{257}Db		257.1077	1.5 s	α/	8.97/33				
				sf/<6	9.07/38				
					9.12/5.5				
					8.94/9				
					9.02/9				
					8.89/5.5				
^{258}Db		258.1092	4.2 s	α/	9.30/				
				EC/5.3	9.17/				
				sf/<33	9.08/				
^{259}Db		259.1096	~ 0.51 s	sf/					
				α/	9.47/				
^{260m}Db			0.3 m						
^{260}Db		260.1113	1.5 s	α/	9.05/				
				sf/<9.6	9.08/				
					9.13/				
^{261}Db		261.1121	1.8 s	α/	8.93/				
				sf/<18					
^{262}Db		262.1141	0.5 m	sf/<33					

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				α/	8.45/				
					8.53/				
					8.67/				
^{263}Db		263.1150	~ 0.45 m	sf/57	8.36/				
				α/41	8.41/				
				EC/3					
^{267}Db		267.1224	1.2 h	sf					
^{268}Db		268.125	1.2 d	sf, EC					
$_{106}$Sg									
^{258}Sg		258.1132	~ 2.9 ms	sf		0+			
				α/<20					
^{259}Sg		259.1145	0.5 s	α/	9.62				
				sf/<20	9.35				
					9.03				
^{260}Sg		260.11442	4. ms	α/50	9.76	0+			
				sf/50	9.72				
					9.81				
^{261}Sg		261.1161	0.3 s	α, sf/<10	9.56				
^{262}Sg		262.1164	0.007 s	sf		0+			
				α/<22					
^{263m}Sg			0.3 s	α	9.2				
^{263}Sg		263.1183	0.8 s	α	9.06				
				sf/<30	9.25				
^{265}Sg		265.1211	8. s	α/>65	8.84/46				
				sf/<35	8.76/23				
					8.94/23				
					8.69/8				
^{266}Sg		266.1221	~ 21. s	α/	8.77/66	0+			
				sf/<82	8.52/33				
^{271}Sg		271.133	~ 0.04 h	α/50	8.53				
				sf/50					
$_{107}$Bh									
^{260}Bh		260.122		α					
^{261}Bh		261.1217	12. ms	α/, sf <10	10.40				
					10.10				
					10.03				
^{262m}Bh			8. ms	α/	10.37				
				sf/<12	10.24				
^{262}Bh		262.1229	0.10 s	α/	10.06				
				sf/<12	9.91				
					9.74				
^{264}Bh		264.1246	1.0 s	α/	9.3 − 9.8				
				sf/					
^{265}Bh		265.1252	0.9 s	α	9.24				
^{266}Bh		266.1269	~ 2 s	α	9.08				
^{267}Bh		267.1277	~ 17 s	α	8.83				
$_{108}$Hs									
^{263}Hs		263.1286		α/					
^{264}Hs		264.12839	~ 0.08 ms	α/, sf/~ 50	11.0	0+			
^{265m}Hs			~ 0.75 ms	α	10.57/63				
					10.73				
					10.52				
					10.34				
^{265}Hs		265.1301	2.0 ms	α/	10.30/90				
				sf/<1	10.43				
					10.37				

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					10.25				
^{266}Hs		266.1301	~ 2.3 ms	α	10.2	0+			
^{267m}Hs			~ 0.8 s						
^{267}Hs		267.1318	0.05 s	α/>88	9.88				
					9.83				
					9.75				
^{269}Hs		269.1341	~ 14 s	α	9.23				
					9.18				
^{270}Hs		270.1347	~ 3.6 s	α	9.16	0+			
^{275}Hs		275.146	~ 0.15 s	α	9.3				
^{277}Hs		277.150	~ 11 m	sf					
$_{109}$Mt									
^{266m}Mt			~ 1.2 ms	α	10.46−10.81				
^{266}Mt		266.1373	~ 0.7 ms	α	10.48−11.31				
^{267}Mt		267.137	19 ms	α					
^{268}Mt		268.1387	~ 0.03 s	α/>68	10.3 - 10.8				
^{270}Mt		270.141	5 ms	α	10.0				
^{275}Mt		275.149	0.01 s	α	10.3				
^{276}Mt		276.151	~ 0.7 s	α	9.7				
$_{110}$Ds									
^{267}Ds		267.1443	~ 3 μs	α/>32	11.6				
^{269}Ds		269.1451	0.17 ms	α/>75	11.11				
^{270m}Ds			~ 6 ms	α	10.95				
					11.15				
					12.15				
^{270}Ds		270.1447	0.1 ms	α	11.03	0+			
^{271m}Ds			0.07 s	α	9.9				
^{271}Ds		271.1461	1.6 ms	α	10.8				
^{273m}Ds			0.076 ms	α	11.8				
^{273}Ds		273.1489	118 ms	α/	9.73				
^{279}Ds		279.159	0.18 s	sf/90					
				α/10	9.7				
^{280}Ds		280.160	~ 7.6 s	sf/		0+			
^{281}Ds		281.162	10. s	sf					
^{282}Ds			0.5 ms	sf					
$_{111}$Rg									
^{272}Rg		272.1536	~ 2 ms	α/>68	10.82				
^{274}Rg		274.156	~ 65 ms	α	11.2				
^{279}Rg		279.162	~ 0.17 s	α	10.4				
^{280}Rg		280.164	~ 3.6 s	α	~ 9.75				
$_{112}$112									
^{277}112		277.1639	~ 0.24 ms	α	11.45				
					11.65				
^{283}112		283.172	~ 4. s	sf/< 10					
				α/~ 100	9.5				
^{284}112		284.172	0.10 s	sf					
^{285}112		285.174	~ 34. s	α	9.16				
$_{113}$113									
^{278}113			0.24 ms	α	11.7				
^{283}113		283.176	~ 0.1 s	α	10.1				
^{284}113		284.178	~ 0.5 s	α	10.0				

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$_{114}$114									
^{286}114		286.184	0.16 s	α/40	10.2				
				sf/60					
^{287}114		287.186	0.5 s	α	10.0				
^{288}114		288.186	0.8 s	α	9.95				
^{289}114		289.187	~ 2.7 s	α	9.82				
$_{115}$115									
^{287}115		287.191	~ 0.03 s	α	10.6				
^{288}115		288.192	~ 0.09 s	α	10.5				
$_{116}$116									
^{290}116		290.199	~ 15 ms	α	10.9				
^{291}116		291.200	~ 6. ms	α	~ 10.74				
^{292}116		292.200	~ 18. ms	α	~ 10.66				
^{293}116			~ 0.05 s	α	10.5				
$_{118}$118									
^{294}118			~ 2.0 ms	α	11.7				