

TABLE OF THE ISOTOPES

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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 nu-

clides, 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 / $\Gamma(\text{MeV})$. 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 $^{12}\text{C} = 12$. 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; $\beta\beta$ = 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 $\hbar/2\pi$; 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 β^- , γ	0.782/100. / < 0.069	1/2+	-1.913043		
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	$\Gamma \sim 3$	n/	/100	2-			
⁵ H		5.0353	$\Gamma < 0.5$	n/	/100	(1/2+)			
⁶ H		6.0449	$\Gamma = 1.6(4)$	n/		(2-)			
⁷ H		7.053	$\Gamma \sim 20.$						
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	$\Gamma = 0.60(2)$	n, α		3/2-			
⁶ He		6.018889	0.807 s	β^- /3.508 β , d	3.510/100. /0.00076	0+			
⁷ He		7.02802	$\Gamma = 0.15(2)$	n		(3/2)-			
⁸ He		8.03392	0.119 s	β^- /10.65 n/ β , t	/84. /16. /0.82	0+			0.9807/84. 0.4776/5.
⁹ He		9.04395	$\Gamma = 0.10(6)$	n	/100	(1/2-)			
¹⁰ He		10.0524	$\Gamma = 0.3(2)$	2n	/100	0+			
³ Li		6.941(2)							
⁴ Li		4.0272	$\Gamma = 6.0$	p/	/100	2-			
⁵ Li		5.01254	$\Gamma = 1.2$	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 α /	12.5/100. α (1.6)	2+	+1.6536	+0.0314	
⁹ Li		9.026790	0.178 s	β^- /13.606 β^- /	13.5/75. 11/25.	3/2-	3.4368	-0.0306	
¹⁰ Li		10.03548	$\Gamma = 0.11(5)$	n	/7.	1+			
¹¹ Li		11.04380	8.8 ms	β^- /20.6 β^- , n β^- , 2n β^- , 3n β^- , d β^- , t	/8.3 /85.7 /4.1 /1.9 />0.01 /0.02	3/2(-)	3.668	-0.031	3.368/33. 0.320/7. 2.590/8. 5.958/3. 2.895/1.5 2.811/1.1
¹² Li		12.054	< 0.01 μ s						
⁴ Be		9.012182(3)							
⁵ Be		5.041		p, ³ He		(1/2+)			
⁶ Be		6.01973	$\Gamma = 0.092(6)$	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	$\Gamma = 6.8(17)$ eV	2 α /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	$\Gamma \sim 1.$						
¹⁴ Be		14.0429	4.6 ms	β^- /16.2 β^- , n β^- , 2n β^- , α β^- , t	 0.288/94. /6. /<0.012 /<0.04	0+			3.5346/0.9 3.6845/7.
¹⁵ Be		15.053	< 0.2 μ s	β^-					

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¹⁶ Be		16.062	< 0.2 μ s	β^-		0+			
₅B		10.811(7)							
⁷ B		7.0299	$\Gamma = 1.4(2)$	p, α		(3/2-)			
⁸ B		8.024607	0.770 s	β^+ , 2 α /17.979	13.7(β^+)/93.	2+	1.0355	0.068	ann.rad.
⁹ B		9.013329	$\Gamma = 0.5(2)$ keV	p, 2 α /		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	$\Gamma < 0.1$	n					
¹⁷ B		17.0470	5.1 ms	β^- , (n)/22.7			2.54	0.039	
¹⁸ B		18.056	< 0.026 μ s			0-			
¹⁹ B		19.0637	2.9 ms	β^- , (n)/26.5	1n//72.	(3/2-)			
					2n//16.				
					3n// < 9.				
₆C		12.0107(8)							
⁸ C		8.03768	$\Gamma = 0.25(4)$	p		0+			
⁹ C		9.031037	127. ms	β^+ , p, 2 α /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				$\frac{1}{2}-$	+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.	$\frac{1}{2}+$	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		$\frac{1}{2}+$			
²⁰ C		20.0403	0.02 s	β ,n	1n// ~ 65 .	0+			
					2n// < 19.				
²¹ C		21.049	< 0.03 μ s						
²² C		22.057	6 ms	β^- , n	1n// ~ 61 .	0+			
					2n// < 37.				
₇N		14.0067(2)							
¹⁰ N		10.0417	$\Gamma = 2.3(16)$						
¹¹ N		11.02609	$\Gamma \sim 1$.			$\frac{1}{2}+$			
¹² N		12.018613	11.00 ms	β^+ , $\beta^+\alpha$ /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.	$\frac{1}{2}-$	0.3222		
¹⁴ N	99.636(20)	14.003074005				1+	+0.40376	+0.0200	
¹⁵ N	0.364(20)	15.00010898				$\frac{1}{2}-$	-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.	$\frac{1}{2}-$	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 μ s						
²⁵ N		25.061	< 0.26 μ s						
₈O		15.9994(3)							
¹² O		12.03441	$\Gamma = 0.51(16)$	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 μ s						
²⁶ O		26.0383	< 0.04 μ s			0+			
²⁷ O		27.048	< 0.026 μ s						
²⁸ O		28.058	< 0.10 μ s			0+			
₉F		18.9984032(5)							
¹⁴ F		14.0351							
¹⁵ F		15.0180	$\Gamma = 0.8(3)$	p		(1/2+)			
¹⁶ F		16.01147	$\Gamma = 0.037(14)$	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				$\frac{1}{2}+$	+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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²³ F		23.0036	2.2 s	β^- /8.5	5.50/62.	5/2+			(0.82–4.37) 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 μ s						
²⁹ F		29.043	2.5 ms	β^- , (n)	n//100.				
³⁰ F		30.053	< 0.26 μ s						
³¹ F		31.060	> 0.26 μ s						
¹⁰Ne		20.1797(6)							
¹⁶ Ne		16.02576	$\Gamma = 0.12(4)$	2p		0+			
¹⁷ Ne		17.01767	109. ms	β^+ , p/14.53	1.4–10.6/6.9	1/2-	0.787		ann.rad./ 0.495
				β^+ , α	/0.014				
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. 4.39/67.	5/2+	-1.08	+0.15	0.440/33. (1.64–2.98)
²⁴ Ne		23.9936108	3.38 m	β^- /2.47	1.10/8. 1.98/92.	0+			0.4723/100. 0.874/7.9
²⁵ Ne		24.99774	0.61 s	β^- /7.30	6.3/ 7.3/	1/2+	-1.006		0.0895/96. (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. 2n//3.	0+			2.06/19. 0.86/3.
²⁹ Ne		29.0194	15. ms	β^- , (n)/15.4	n//29.	(3/2+)			2.92/55. (0.22–1.18)
				β^- , 2n	2n//4.				
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 μ s						
³⁴ Ne		34.057	> 1.5 μ s			0+			
¹¹Na		22.98976928(2)							
¹⁸ Na		18.02597	$\Gamma = 0.34(9)$						
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./ 1.634/79.
				α	2.15/				
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./ 1.2745/99.9
				EC/10/					

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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 μ s						
³⁷ Na		37.059	> 1.5 μ s						
¹² Mg		24.3050(6)							
¹⁹ Mg		19.0355	< 0.02 μ s						
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 μ s			(7/2-)			
³⁸ Mg		38.038	> 0.26 μ s			0+			
³⁹ Mg		39.047	< 0.26 μ s						
⁴⁰ Mg		40.054				0+			
₁₃Al		26.9815386(8)							
²¹ Al		21.0280	< 0.035 μ s						
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 $\times 10^5$ 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 μ s						
⁴¹ Al		41.038	> 0.26 μ s						
₁₄Si		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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²⁵ Si		25.00411	221 ms	β^+ , p/12.74	(1.66–4.47) 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 μ s	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 μ s						
₁₅P		30.973762(2)							
²⁴ P		24.034							
²⁵ P		25.0203	< 0.03 μ s						
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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³⁸ P		37.9842	0.6 s	β^- /12.4					1.5829/ 1.2923/ 2.224/
				β^- , n	/~ 12.				
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 μ s						
⁴⁶ P		46.027	> 0.2 μ s						
₁₆S		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 μ s						
⁴⁸ S		48.014	> 0.2 μ s			0+			
⁴⁹ S		49.024	< 0.2 μ s						
₁₇Cl		35.453(2)							
²⁸ Cl		28.029							
²⁹ Cl		29.0141	< 0.02 μ s						
³⁰ Cl		30.0048	< 0.03 μ s						
³¹ Cl		30.99241	0.15 s	β^+ , p/11.98	0.986, 1.52/0.7	3/2+			ann.rad./

[illegible]

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³⁶ Ar	0.3365(30)	35.96754511				0+			2.964(1)/0.2
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 μ s	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 μ s						
³⁴ K		33.9984	< 0.04 μ s						
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 $\times 10^9$ 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 μ s			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 $\times 10^5$ 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 $\times 10^{19}$ 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 μ s			0+			
⁵⁵ Ca		54.981	> 0.3 μ s						
⁵⁶ Ca		55.986	> 0.3 μ s			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 μ s						
³⁹ Sc		38.98479	< 0.3 μ s	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			$\sim 7\ \mu$ s	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^-					
²²Ti 47.867(1)									
^{38m} Ti		38.0098	< 0.12 μ s			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 EC/14/	1.04	7/2-	0.095	0.015	ann.rad./ (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. 2.13/	3/2-			0.3197(2)/93. 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 μ s						
²³ V		50.9415(1)							
⁴⁰ V		40.0111							
⁴¹ V		40.9998							
⁴² V		41.9912	< 0.055 μ s						
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 $\times 10^{17}$ y	EC β^-	/82.7 /17.3	6+	+3.34569	+0.21	
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 μ s	I.T.		(5+)			0.108/IT
⁵⁴ V		53.94644	49.8 s	β^- /7.04	1.00/5. 2.00/12. 2.95/45. 5.20/11.	3+			0.8348/97. 0.9887/80. 2.259/46. (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 μ s						
²⁴Cr		51.9961(6)							
⁴² Cr		42.0064	13. ms	β^+ , p	p/1.90/29 p/1.50–3.7	0+			
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/ 1.45/ 1.54/	5/2-	0.476		ann.rad./ 0.09064(1)/51. 0.15293(1)/27. (0.062-1.6)
⁵⁰ Cr	4.345(13)	49.946044	> 1.3 $\times 10^{18}$ 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/ 3.5/	3/2-	0.0834		0.850/8. (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 μ s						

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²⁵ Mn		54.938045(5)							
⁴⁴ Mn		44.0069	< 0.105 μ s						
⁴⁵ Mn		44.9945	< 0.07 μ s						
⁴⁶ Mn		45.9867	34. ms	$\beta+$ /17.1					
				$\beta+$, p	// ~ 58				
⁴⁷ Mn		46.9761	~ 0.1 s	$\beta+$ /12.3					
⁴⁸ Mn		47.9685	0.15 s	$\beta+$ /13.5	5.79/58. 4.43/10.	4+			
⁴⁹ Mn		48.95962	0.38 s	$\beta+$ /7.72	6.69/	5/2-			ann.rad./
^{50m} Mn			1.74 m	$\beta+$ /7.887	3.54/	5+			ann.rad./ 1.0980/94. 0.783/91. (0.66–3.11)
⁵⁰ Mn		49.954238	0.283 s	$\beta+$ /7.6330	6.61/	0+			ann.rad./
⁵¹ Mn		50.948211	46.2 m	$\beta+$, 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	$\beta+$ /98/5.09 I.T./2/0.378	2.631/	2+	0.0076		ann.rad./ 0.3778 (I.T.) 1.43406(1)/98. (0.7–4.8)
⁵² Mn		51.945566	5.591 d	$\beta+$ /4.712 EC/	0.575/	6+	+3.063	+0.5	ann.rad./ 0.74421(1)/90. 1.4341/100
⁵³ Mn		52.941290	3.7 $\times 10^6$ 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 $\times 10^8$ y	$\beta+$	//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. 1.028/34.	3+	+3.2266		0.84675/98.9 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/ 5.1/	3+			0.45916(2)/20. 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	$\beta+$ /13.1	p// ~ 36.	0+			
⁴⁷ Fe		46.9929	21.7 ms	$\beta+$ /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 $\times 10^{22}$ 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 $\times 10^6$ y	β^- /0.237	0.184/100.	0+			0.0586/100
^{61m} Fe			0.25 μ s	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 μ s	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 μ s						
⁷² Fe		71.970	> 0.3 μ s			0+			
²⁷ Co		58.933195(5)							
⁴⁷ Co		47.0115							
⁴⁸ Co		48.0018							
⁴⁹ Co		48.9897	< 0.035 μ s						
⁵⁰ Co		49.9815	44. ms	β^+ /17.0	2.03–2.79				
⁵¹ Co		50.9707	> 0.2 μ s	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 EC/	0.53/ 1.03/ 1.50/	7/2-	+4.822		ann.rad./ 0.9312/75. 0.4772/20. (0.092–3.11)
⁵⁶ Co		55.939839	77.3 d	β^+ /4.566 EC/	1.459/18.	4+	3.85	+0.25	ann.rad./ 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 EC/		2+	+4.04	+0.22	ann.rad./ 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 β^- /0.2/1.56		2+	+4.40	+0.3	0.0586/2.0
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. 2.88/75.	5+			1.1635(3)/70. 1.1730(3)/98. 2.0039(3)/19.
⁶² Co		61.93405	1.50 m	β^- /5.32	1.03/10. 1.76/5. 2.9/20. 4.05/60.	2+			1.1292(3)/13. 1.1730(3)/83. 1.9851(1)/3. 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 μ s	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^- β^- ,n	// > 3				0.566/100 (0.25 – 0.77)
⁷² Co		71.958	60. ms	β^- β^- ,n	// > 6				1.096/100 0.845 (0.455 – 1.197)
⁷³ Co		72.960	41. ms	β^- β^- ,n	// > 9				0.524/100 (0.24 – 0.76)
⁷⁴ Co		73.965	30. ms	β^- β^- ,n	// > 26				0.739 1.024
⁷⁵ Co		74.968	> 0.3 μ s						
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 μ s	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 μ s	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 μ s						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 μ s	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 μ s	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+			
₂₉Cu		63.546(3)							
⁵² Cu		51.9972							
⁵³ Cu		52.9856	< 0.3 μ s						
⁵⁴ Cu		53.9767	< 0.075 μ s						
⁵⁵ Cu		54.9661	> 0.2 μ s	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 EC/	4.5/15. 7.439/83.	1+			ann.rad./ 0.0403(4)/5. 1.4483(2)/11. 1.4546(2)/16.
⁵⁹ Cu		58.939498	1.36 m	β^+ /4.800	1.9/ 3.75/	3/2-	+ 1.89		ann.rad./ 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 EC/	2.00/69. 3.00/18. 3.92/6.	2+	+1.219		ann.rad./ 1.3325/88. 1.7915/45. (0.12–5.048)
⁶¹ Cu		60.933458	3.35 h	β^+ /2.237	0.56/3. 0.94/5. 1.15/2. 1.220/51.	3/2-	+2.14		ann.rad./ 0.2830/13. 0.6560/11. (0.067–2.123)
⁶² Cu		61.932584	9.67 m	β^+ /98/3.948 EC/	2.93/98.	1+	-0.380		ann.rad./ 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 β^+ /19/1.6751 EC/41/	0.578/ 0.65/	1+	-0.217		ann.rad./ 1.3459(3)/0.6
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. 2.7/94.	1+	-0.282		0.8330(1)/0.22 1.0392(2)/9.2
⁶⁷ Cu		66.927730	2.580 d	β^- /0.58	0.395/56. 0.484/23. 0.577/20.	3/2-	+ 2.54		0.09125(1)/7. 0.09325(1)/17. 0.18453(1)/47.
^{68m} Cu			3.79 m	I.T./86/ β^- /14/1.8		6-	+1.24		0.0843(5)/70. 0.1112(5)/18. 0.5259(5)/74. (0.64–1.34)
⁶⁸ Cu		67.929611	31. s	β^- /4.46	3.5/40. 4.6/31.	1+	+2.48		1.0774(5)/58. 1.2613(5)/17. (0.15–2.34)
^{69m} Cu			0.36 μ s	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 IT/7					0.8849/100 1.072/19 0.141/ IT
^{70m1} Cu			33. s	β^- /52 IT/48	2.52/10.	5-	+1.9		0.8848(2)/100. 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. 6.09/46.	1+	+1.5		0.8848(2)/100. 0.9017/99.7 (0.438 - 3.062)
^{71m} Cu			0.28 μ s	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 μ s	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 μ s						
₃₀Zn		69.409(4)							
⁵⁴ Zn		53.9930	~ 3.2 ms	2p	p/87	0+			
⁵⁵ Zn		54.9840	> 1.6 μ s						
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 $\times 10^{18}$ 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	$\frac{1}{2}-$			0.318/
⁷⁰ Zn	0.631(9)	69.925319	> 1.3 $\times 10^{16}$ y	$\beta^-\beta^-$		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		$\frac{1}{2}-$			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/

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									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 μ s			0+			
⁸³ Zn		82.9610	> 0.15 μ s						
₃₁Ga		69.723(1)							
⁵⁶ Ga		55.9949							
⁵⁷ Ga		56.9829							
⁵⁸ Ga		57.9743							
⁵⁹ Ga		58.9634	< 0.043 μ s						
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 $\times 10^{26}$ 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

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⁷³ Ga		72.925175	74.87 h	β^- /1.59	3.15/11.	3/2-			(0.113–3.678)
									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 μ s						
⁸⁶ Ga		85.963	> 0.3 μ s						
³²Ge		72.64(1)							
⁵⁸ Ge		57.9910				0+			
⁵⁹ Ge		58.9818							
⁶⁰ Ge		59.9702	> 0.11 μ s			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/	$\frac{1}{2}$ -			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		$\frac{1}{2}$ -	+0.547		
⁷² Ge	27.31(26)	71.922076				0+			

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⁷³ Ge	7.76(8)	72.923459	$> 1.8 \times 10^{23}$ 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	$\beta-\beta^-$		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. 4.3/80.	½-			0.1096/21. (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	$> 0.3 \mu\text{s}$			0+			
⁸⁷ Ge		86.9525	$> 0.3 \mu\text{s}$						
⁸⁸ Ge		87.957	$> 0.3 \mu\text{s}$			0+			
⁸⁹ Ge		88.964	$> 0.3 \mu\text{s}$						
³³ As		74.92160(2)							
⁶⁰ As		59.993							
⁶¹ As		60.981							
⁶² As		61.9732							
⁶³ As		62.9637	$< 0.043 \mu\text{s}$						
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/ 0.123/ 0.244/
				EC/					
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./ 0.0868(5)/1.5 0.1458(3)/2.4
				EC/2/					
⁷⁰ As		69.93092	52.6 m	β^+ /84/6.22	1.44/	4+	+2.1061	+0.09	ann.rad./ 1.0395(7)/82. (0.17–4.4)/
				EC/16/2.14					
				/2.89					
⁷¹ As		70.927112	2.72 d	β^+ /32/2.013		5/2-	+1.6735	-0.02	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 ($h/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ -Energy / Intensity (MeV/%)
				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 μ s	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 μ s						
⁸⁹ As		88.9494	> 0.3 μ s						
⁹⁰ As		89.956	> 0.3 μ s						
⁹¹ As		90.960	> 0.3 μ s						
⁹² As		91.967	> 0.3 μ s						
³⁴ Se		78.96(3)							
⁶⁴ Se			> 0.18 μ s			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 μ s			0+			
⁹¹ Se		90.9460	0.27 s	β^- , n/8.					
⁹² Se		91.950	> 0.3 μ s			0+			
⁹³ Se		92.956	> 0.3 μ s						
⁹⁴ Se		93.960	> 0.3 μ s			0+			
₃₅Br		79.904(1)							
⁶⁷ Br		66.9648							
⁶⁸ Br		67.9585	< 1.5 μ s						
⁶⁹ Br		68.9501	< 0.024 μ s	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 μ s								
⁸⁸ Br	87.92407	16.3 s	β^- /8.96			1-			0.7649	
			n/				0.7753			
							0.8021			
⁸⁹ Br	88.92640	4.35 s	β^- /8.16			3/2-			(0.1–6.99)	
			n/				0.7753			
							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 μ s								
⁹⁶ Br	95.959	> 0.3 μ s								
⁹⁷ Br	96.963	> 0.3 μ s								
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			
⁷³ Kr	72.93929	28. s	β^+ /6.7			5/2-			(0.305 – 3.305)	
			EC/				ann.rad.			
			β^+ , p/	/0.25			0.1781/66			
⁷⁴ Kr	73.933084	11.5 m	β^+ /3.1			0+			(0.06–0.86)	
			EC/				ann.rad.			
							0.08970/31			
⁷⁵ Kr	74.93095	4.3 m	β^+ /4.90	3.2/		5/2+	-0.531	+1.1	0.2030/20	
			EC/				(0.010–1.06)			
⁷⁶ Kr	75.925910	14.8 h	EC/1.31			0+			ann.rad.	
								0.1325/68		
								0.1547/21		
⁷⁶ Kr									(0.02–1.7)	
										Br k x-ray
										0.270/21
⁷⁶ Kr									0.3158/39	
										(0.03–1.07)

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/%)
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	$> 2.3 \times 10^{20}$ 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	$> 0.34 \mu\text{s}$			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/%)
³⁷ Rb		85.4678(3)							
⁷¹ Rb		70.9653							
⁷² Rb		71.9591	< 1.5 μ s						
⁷³ Rb		72.9506	< 0.03 μ s						
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 0.4553/81. (0.103–4.01)
⁷⁸ Rb		77.92814	17.7 m	β^+ /7.22 EC/	3.4	0+			ann.rad 0.4553/63. (0.42–5.57)
⁷⁹ Rb		78.92399	23. m	β^+ /84/3.65 EC/16 /		5/2+	+0.3358	-0.10	ann.rad. 0.68812/23. (0.017–3.02)
⁸⁰ Rb		79.92252	34. s	β^+ /5.72	4.1/22 4.7/74	1+	-0.0836	+0.35	ann.rad. 0.6167/25.
^{81m} Rb			30.5 m	I.T./0.85	1.4	9/2+	+5.598	-0.74	ann.rad. (0.085–1.9)
⁸¹ Rb		80.91900	4.57 h	β^+ /27/2.24 EC/73	1.05/	3/2-	+2.060	+0.40	ann.rad./ 0.19030/64. (0.05–1.9)
^{82m} Rb			6.47 h	β^+ /26/ EC/74/	0.80/	5-	+1.5100	+1.0	ann.rad./ 0.5544/63. 0.7765/85. (0.092–2.3)
⁸² Rb		81.918209	1.258 m	β^+ /96/4.40 EC/4/	3.3/	1+	+0.554508	+0.19	ann.rad./ 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 EC/75 / β^- /3/0.894	0.780/11 1.658/11 0.893/	2-	-1.32412	-0.015	ann.rad./ 0.8817/68. (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 $\times 10^{10}$ 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 1.9/5 2.2/34 4.49/18	3/2-	+2.304	+0.14	1.032/58. 1.248/42. 2.1960/13 (0.12–4.09)

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/%)
^{90m} Rb			4.3 m	β^- /4.50	1.7/ 6.5/	4-	+1.616	+0.20	0.1069(IT) 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 n/1	7.4/	5/2-	+1.410	+0.18	0.2134/4.8 0.4326/12.5 0.9861/4.9 (0.16–5.41)
⁹⁴ Rb	93.92641		2.71 s	β^- /10.31 n/10	9.5/	3	+1.498	+0.16	0.8369/87. 1.5775/32. (0.12–6.35)
⁹⁵ Rb	94.92930		0.377 s	β^- /9.30 n/8	8.6/	5/2-	+1.334	+0.21	0.352/65. 0.680/22. (0.20–2.27)
^{96m} Rb			1.7 μ s						0.2999 0.4612 0.2400 0.093–0.369
⁹⁶ Rb	95.93427		0.199 s	β^- /11.76 n/13/	10.8/	2+	+1.466	+0.25	0.815/76. (0.20–5.42)
⁹⁷ Rb	96.93735		0.169 s	β^- /10.42 n/27/	10.0	3/2+	+1.841	+0.58	0.167/100. 0.585/79. 0.599/56. 1.258/52. (0.14–2.08)
⁹⁸ Rb	97.94179		0.107 s	β^- /12.34 n/13	0.144/				(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 μ s			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 β^+ , p	5.6 //0.08		-0.35	+1.4	0.147
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 EC/13/	2.43/ 2.68/	1/2-	+0.544		ann.rad./ 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						

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									1.9207
									(0.1–3.8)
^{87m} Y			13. h	I.T./98/ $\beta^+ / 0.7 /$ EC/	1.15/0.7	9/2+	6.1		0.3807
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./
				$\beta^+ / 0.2 /$					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+/ $\beta^- / 0.002 /$	0.68204	7+	5.1		0.2025
									0.4794
									0.6820
⁹⁰ Y		89.907152	2.67 d	$\beta^- / 2.282$	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	$\beta^- / 1.544$	1.545/	1/2-	0.1641		1.208
⁹² Y		91.90895	3.54 h	$\beta^- / 3.63$	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	$\beta^- / 2.87$	2.88/90	1/2-			0.2669
									0.9471
									1.9178
^{94m} Y			1.4 μ s						0.4322
									0.7699
									1.2024
⁹⁴ Y		93.91160	18.7 m	$\beta^- / 4.919$	4.92/	2-			0.3816
									0.9188
									1.1389
									(0.3–4.1)
⁹⁵ Y		94.91282	10.3 m	$\beta^- / 4.42$		1/2-			0.4324
									0.9542
									2.1760
									3.5770
^{96m} Y			9.6 s	$\beta^- /$		(3+)			0.1467
									0.6174
									0.9150
									1.1071
									1.7507
⁹⁶ Y		95.91589	6.2 s	$\beta^- / 7.09$	7.12/	0-			1.594
^{97m} Y			1.21 s	$\beta^- / 7.4$	4.8/ 6.0/	9/2+			0.1614
									0.9700
									1.1030
⁹⁷ Y		96.91813	3.76 s	$\beta^- / 6.69$	6.7	1/2-			0.2969
									1.9960
									3.2876
									3.4013
^{98m} Y			2.1 s	$\beta^- / 9.8$	5.5/	(4-)			0.2415
									0.6205
									0.6473
									1.2228
									1.8016
⁹⁸ Y		97.92220	0.59 s	$\beta^- / 8.83$	8.7/	1+			0.2131

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									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 μ s						
¹⁰⁶ Y	105.950		> 0.15 μ s						
¹⁰⁷ Y	106.9414		> 0.15 μ s						
¹⁰⁸ Y	107.959		> 0.15 μ s						
⁴⁰ Zr	91.224(2)								
⁷⁸ Zr	77.9552		> 0.2 μ s			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		$\frac{1}{2}$ -			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		$\frac{1}{2}$ -	+ 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 μ s			(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		$\frac{1}{2}$ -	+ 0.80		ann.rad./
				β^+ /1.5/					0.5877(IT)
				EC/4.7/					1.507

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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/%)
⁸⁸ Nb		87.9183	14.3 m	β^+ /7.6 EC/	3.2/	8+			1.0825 ann.rad./
									1.0570
									1.0828 (0.07–2.5)
^{89m} Nb			2.0 h	β^+ / EC/	3.3/	9/2+			0.5880/10(D) (0.17–4.0)
⁸⁹ Nb		88.91342	1.10 h	β^+ /74/4.29 EC/26 /	2.8/	1/2-	+6.216		ann.rad./
									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 EC/47 /	0.86/5 1.5/92	8+	4.961		ann.rad./
									0.1412
									1.1292
									2.1862
									2.3189 (0.1–3.3)
^{91m} Nb			62. d	I.T./97 / EC/3 /		1/2-			0.1045(IT) 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+ β^- /0.5/	/2.086	3+			Nb k x-ray
									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/ β^- /2.5 /	0.2357	1/2-			0.2040
									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/ 5.3/				0.5354 0.6001–1.566

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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 μ s						
¹¹² Nb		111.951	> 0.15 μ s						
¹¹³ Nb		112.955	> 0.15 μ s						
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		$\frac{1}{2}^+$			
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		$\frac{1}{2}^-$			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 μ s						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		$\frac{1}{2}^-$			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 $\times$ 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 $\times$ 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	$\frac{1}{2}^+$	0.375		0.144048

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					0.84/2				0.18109
					1.21/84				0.36644
									0.73947
¹⁰⁰ Mo	9.67(20)	99.90748	$\sim 1 \times 10^{19}$ y	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 μ s						
¹¹² Mo		111.937	> 0.15 μ s			0+			
¹¹³ Mo		112.942	> 0.15 μ s						
¹¹⁴ Mo		113.945	> 0.15 μ s			0+			
¹¹⁵ Mo		114.950	> 0.15 μ s						
¹¹⁶ Mo			> 0.15 μ s			0+			
¹¹⁷ Mo			> 0.15 μ s						
⁴³Tc									
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^+		$\frac{1}{2}+$			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.
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									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

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^{93m} Ru			10.8 s	I.T./21/ β^+ , EC/79/	5.3/	1/2-			ann.rad./ 0.7344 1.1112 1.3962 2.0931
⁹³ Ru		92.9171	1.0 m	β^+ /6.3 EC/		9/2+			ann.rad./ 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 β^+ /15/	1.20/ 0.91/	5/2+	0.86		ann.rad./ 0.3364 0.6268 0.036–2.424
⁹⁶ Ru	5.54(14)	95.90760	$> 3.1 \times 10^{16}$ y	$\beta^+\beta^+$		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 1.134/13 1.187/49	3/2+	-0.3		0.12968 0.1491 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/ 3.2/				0.1939 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+			

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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/ EC/92/	.74/	9/2+	5.67		ann.rad./ 0.2766/ 0.3408 0.6178 1.2612
⁹⁹ Rh		98.90813	16. d	β^+ /4/2.10 EC/97/	0.54/ 0.68/	1/2-			ann.rad./ 0.0894/ 0.3530 0.5277 (0.1–2.0)
^{100m} Rh			4.7 m	I.T./99/ β^+ /0.4/		5+			ann.rad./ 0.0748/ 0.2647(IT)
¹⁰⁰ Rh		99.90812	20.8 h	β^+ /3.63 EC/	2.62/ 2.07/	1-			0.4462 0.5396 0.5882 0.8225 1.5534 2.3761
^{101m} Rh			4.35 d	EC/92/ I.T./8/0.1573		9/2+	+5.51		Rh k x-ray 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 > 1.2 × 10 ⁶ y	EC/2.323 IT/0.0419 β^+		6 ⁺	4.04		0.4751 0.6313 0.6975 0.7668 1.0466 1.1032
¹⁰² Rh		101.906843	207. d	EC/62 β^- /19/ β^+ /14/			0.5		ann.rad./ 0.4686 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+ / β^-		5+			Rh k x-ray 0.0514 0.0971 0.5558

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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/%)
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/		$\frac{1}{2}-$			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		$\frac{1}{2}-$			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

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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/%)
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 ($\hbar/2\pi$)	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 (p)	/0.025	0+			
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 EC/17/	4.5	5/2+			In k x-ray 0.0985 1.7225 0.31–2.84)
¹⁰² Cd		101.91446	5.8 m	β^+ /27/2.59 EC/73		0+			ann.rad./ 0.0974 0.4810 1.0366 1.3598
¹⁰³ Cd		102.91342	7.5 m	β^+ /33/4.14 EC/67/		5/2+	-0.81	-0.8	ann.rad./ 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 EC/74/	1.69/	5/2+	-0.7393	+0.43	Ag k x-ray 0.3469 0.6072 0.9618 1.3025 (0.25–2.4)
¹⁰⁶ Cd	1.25(6)	105.90646	$> 5.8 \times 10^{17}$ y	EC, EC		0+			
¹⁰⁷ Cd		106.90662	6.52 h	EC/99+/1.417 β^+ /		5/2+	-0.615055	+0.68	Ag k x-ray 0.0931 0.8289
¹⁰⁸ Cd	0.89(3)	107.90418	$>4.1 \times 10^{17}$ 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	$>6.0 \times 10^{17}$ y	β^- - β^-		0+			
^{115m} Cd			44.6 d	β^- /1.629	0.68/1.6 1.62/97	11/2-	-1.042	-0.54	0.48450 0.93381 1.29064
¹¹⁵ Cd		114.905431	2.228 d	β^- /1.446	0.593/42 1.11/58	1/2+	-0.648426		0.23141 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 2.2/10	1/2+			0.2209 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	$\sim$ 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			$\sim$ 0.03 s						
⁹⁸ In		97.9421	1. s						
⁹⁹ In		98.9342	$\sim$ 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 EC	4.2 /45	9/2+			ann.rad./ 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

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^{105m} In			43. s	I.T.		$\frac{1}{2}^-$			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/ EC/15/	4.90	3+			ann.rad./ 0.6326 0.8611 1.7164
¹⁰⁶ In	105.91347		6.2 m	β^+ /65/6.52 EC/35/	2.6	7+	+4.92	+0.97	ann.rad./ 0.2259 0.6327 0.8611 0.9978 1.0091
^{107m} In			51. s	I.T./0.6786		$\frac{1}{2}^-$			In k x-ray 0.6785
¹⁰⁷ In	106.91030		32.4 m	β^+ /35/3.43 E.C/65/	2.20/	9/2+	+5.59	+0.81	ann.rad./ Cd k x-ray 0.2050 0.3209 0.5055 (0.2–2.99)
^{108m} In			57. m	β^+ /53/ EC/47/	1.3	6+	+4.94	+0.47	ann.rad./ Cd k x-ray 0.6329 1.9863 3.4522
¹⁰⁸ In	107.90970		40. m	β^+ /33/5.15 EC/67/	3.49/	3+	+4.56	+1.01	ann.rad./ Cd k x-ray 0.2429 0.6331 0.8756
^{109m} In			1.3 m	I.T./0.650		$\frac{1}{2}^-$			In k x-ray 0.6498
¹⁰⁹ In	108.90715		4.17 h	β^+ /8/2.02 EC/92/	0.79/	9/2+	+5.54	+0.84	ann.rad./ 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 EC/38/	2.22/	2+	+4.37	+0.35	ann.rad./ Cd k x-ray 0.6577 (0.6–3.6)
^{111m} In			7.7 m	I.T./0.537		$\frac{1}{2}^-$	+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 EC/34/ β^- /0.663		1+	+2.82	+0.09	ann.rad./ Cd k x-ray 0.6171
^{113m} In			1.658 h	I.T./0.3917		$\frac{1}{2}^-$	-0.210		In k x-ray 0.3917

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¹¹³ In	4.29(5)	112.904058				9/2+	+5.529	+0.80	
^{114m} In			49.51 d	I.T./97/0.190 EC/3 /		5+	+4.65	+0.74	In k x-ray 0.19027
¹¹⁴ In		113.904914	1.198 m	β^- /97/1.989 EC/3/1.453	1.984/	1+	+2.82		Cd k x-ray 0.5584 0.5727 1.2998
^{115m} In			4.486 h	I.T./95/0.336 β^- /5 /0.83		½-	-0.255		In k x-ray 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 EC	/0.023	8-	+3.22	+0.31	In k x-ray 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 I.T./47 /	1.77/	½-	-0.2517		In k x-ray 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/ β^- /2/		(8-)	+3.32	+0.44	In k x-ray 0.1382
^{118m1} In			4.40 m	β^- /	1.3 2.0	5+	+4.23	+0.80	0.2086 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/ I.T./3/0.311	2.7/	½-	-0.32		0.3114 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 I.T./1/0.313	5.6/ 3.1/	(1+)			0.4146 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 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

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^{122m} In			10. s	β^- /	4.4/	8-	+3.78	+0.59	0.9256 1.0014
¹²² In	121.91028	1.5 s	β^- /6.37	5.3/	(1+)				1.1403 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/ n/2/	~ 7.5/	1/2-				0.3153 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/%)
¹³⁰ In		129.92497	0.29 s	β^- /10.25	10.0/	1-			1.9052
^{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		$\frac{1}{2}^+$	-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				$\frac{1}{2}^+$	-0.9188		
¹¹⁶ Sn	14.54(9)	115.901741				0+			

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^{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 0.03715
				β- /22/	0.354/				
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				

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¹¹⁸ Sb		117.905529	3.6 m	β^+ /74/3.657 EC/26/	2.65/	1+	2.5		ann.rad./ 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 EC/59/	1.72/	1+	+2.3		ann.rad./ 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 β^+ /2/1.620	1.414/65 1.980/26	2-	-1.90	+0.9	0.56409 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/ β^- /20/	1.2/ 1.7/	5+			0.4984 0.6027 0.6458 1.1010
¹²⁴ Sb		123.905936	60.20 d	β^- /2.905	0.61/52 2.301/23	3-	1.2	+1.9	0.60271/97.8 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 0.302/45 0.62/13	7/2+	+2.63		0.0355 0.17632 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 / I.T./14 /	1.9	5+			0.4148 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/ 1.10/ 1.50/	7/2+	2.70		0.2524 0.2908 0.4121 0.4370 0.6857 0.7837
^{128m} Sb			10.1 m	β^- /96/ I.T./4/	2.6/	5+			0.3140 0.5941 0.7432 0.7539

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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 μ s						
¹³⁸ Sb		137.9408	> 0.15 μ s						
¹³⁹ Sb		138.9460	> 0.15 μ s						
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+			

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¹⁰⁹ Te		108.9274	4.6 s	β^+ , EC/32 /6.8 β^+ EC/96 /8.7					0.7523 0.287–2.045
¹¹⁰ Te		109.9224	19. s	α /4 / β^+ , EC/4.5	3.107(4)/	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 EC/15/	4.5/	(7/2+)			ann.rad./ Sb k x-ray 0.8144 1.0181 1.1812
¹¹⁴ Te		113.91209	15. m	β^+ /40/3.2 EC/60/		0+			ann.rad./ Sb k x-ray 0.0838 0.0903
^{115m} Te			6.7 m	β^+ /45/ EC/55/		(1/2+)			ann.rad./ Sb k x-ray 0.7236 0.7704
¹¹⁵ Te		114.91190	5.8 m	β^+ /45/4.6 EC/55/	2.7/	7/2+			ann.rad./ 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 β^+ /25/	1.78/	$\frac{1}{2}+$			ann.rad./ 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 EC/98/	0.627/	$\frac{1}{2}+$	0.25		ann.rad. Sb k x-ray 0.6440 0.6998
¹²⁰ Te	0.09(1)	119.90402				0+			
^{121m} Te			~ 154. d	I.T. (89%) EC (11%)		11/2-	0.90		Te k x-ray 0.2122
¹²¹ Te		120.90494	16.8 d	EC/1.04		$\frac{1}{2}+$			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 $\times 10^{16}$ y	EC/0.051		$\frac{1}{2}+$	-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 β- /2/0.77		11/2-	-1.04		Te k x-ray 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 β- /37/	1.60/	11/2-	-1.09		Te k x-ray 0.45984 0.6959
¹²⁹ Te		128.906598	1.16 h	β- /1.498	0.99/9 1.45/89	3/2+	0.70	0.06	0.0278 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 I.T./22/0.18	0.42/	11/2-	-1.04		0.0811 0.1021 0.14973 0.77369 0.79375 0.85225
¹³¹ Te		130.908524	25.0 m	β- /2.233	1.35/12 1.69/22 2.14/60	3/2+	0.70		0.14973 0.45327 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/ I.T./18/0.334	2.4/30	11/2-			Te k x-ray 0.0949 0.1689 0.3121 0.3341
¹³³ Te		132.91096	12.4 m	β- /2.94	2.25/25 2.65	3/2+			0.3121 0.4079 1.3334
¹³⁴ Te		133.91137	42. m	β- /1.51	0.6/ 0.7/	0+			0.7672/29 0.0794–0.9255
¹³⁵ Te		134.9165	19.0 s	β- /6.0	5.4/ 6.0				0.267 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 n/2 /	6.8	7/2-			0.2436
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 α/17/~ 3.6 p/11/	3.457(10)/				ann.rad./
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 EC/3/	6.7/	1+			ann.rad./
									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/ I.T.	4.9/	7-	4.2		ann.rad./
									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 EC/46/	2.4/	(5/2+)	+2.9		ann.rad./
									Te k x-ray
									0.2575
^{120m} I			53. m	β^+ /80/ EC/20/	3.8		4.2		ann.rad.
									Te k x-ray
									0.4257
									0.5604
									0.6147
									1.3459
¹²⁰ I		119.91005	1.35 h	β^+ /56/5.62 EC/	4.03 4.60	2-	1.23		ann.rad./
									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 EC/87/	1.2/	5/2+	2.3		ann.rad./
									Te k x-ray
									0.2122
									(0.14–1.1)
¹²² I		121.90759	3.6 m	β^+ /4.234 EC/	3.1/	1+	+0.94		ann.rad./
									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 EC/77/	1.54/ 2.14/	2-	1.44		ann.rad./
									Te k x-ray
					0.75/				0.6027/62.9

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin ($\hbar/2\pi$)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ -Energy / Intensity (MeV/%)
									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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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/%)
¹¹⁹ Xe		118.91541	5.8 m	β^+ , EC/5.0	3.5/	7/2+	-0.654	+1.31	0.1199 0.0873
									0.1000 0.2318 0.4615
¹²⁰ Xe		119.91178	40. m	β^+ , EC/97/1.96 β^+ /3/		0+			I k x-ray 0.0251 0.0726 0.1781 (0.1–1.03)
¹²¹ Xe		120.91146	39. m	β^+ /44/3.73 EC/56/	2.8/	5/2+	-0.701	+1.33	ann.rad./ 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 EC/77/	1.51/	$\frac{1}{2}^+$	-0.150		ann.rad./ I k x-ray 0.1489 0.1781 (0.1–2.1)
¹²⁴ Xe	0.0952(3)	123.905893	$> 10^{17}$ y	$\beta^-\beta^-$		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/	$\frac{1}{2}^+$	-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		$\frac{1}{2}^+$	-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				$\frac{1}{2}^+$	-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	$> 1.1 \times 10^{16}$ 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	$> 2.4 \times 10^{21}$ y	β^- β^-		0+			
¹³⁷ Xe		136.91156	3.82 m	β^- /4.17	4.1/	7/2-	-0.970	-0.49	0.45549

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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 ($h/2\pi$)	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	

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¹³⁰ Cs		129.90671	29.21 m	β^+ /55/2.98 EC/43/	1.98/ 0.44/1.6	1+	+1.46	-0.06	ann.rad./ Xe k x-ray 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/ β^+ /0.3/2.120 β^- / /1.280		2-	+2.22	+0.51	Xe k x-ray 0.4646 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 0.658/70	4+	+2.994	+0.39	0.56327 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 β^- /25 /	/0.080 3.3	6-	+1.71	-0.40	Cs k x-ray 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/ 6.21/	1-	+0.13390	-0.11	0.5283 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/ 7.28				0.3596 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/ 7.9/	1	-0.546	+0.30	0.1993 0.5598 0.6392 0.7587

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¹⁴⁵ Cs		144.93553	0.59 s	β^- /7.89	7.4/ 7.9/	3/2+	+0.784	+0.6	0.1126 0.1755 0.1990
¹⁴⁶ Cs		145.9403	0.322 s	β^- , (n)/9.38	$\sim$ 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						
⁵⁶Ba		137.327(7)							
¹¹⁴ Ba		113.9507	0.43 s	β^+ , (p) α	p/20 /0.9	0+			
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	$\frac{1}{2}+$	+0.18		ann.rad./ 0.0550 0.0776 0.0854 0.1409
¹²⁶ Ba		125.91125	1.65 h	β^+ /2/1.67 EC/98 /		0+			Cs k x-ray 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 EC/46/		1/2+	+0.083		ann.rad./ 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/ β^+ /2/		7/2+	+0.93	+1.6	Cs k x-ray 0.1769 0.1823 0.2023 1.4593
¹²⁹ Ba		128.90868	2.2 h	β^+ /20/2.43 EC/80/	1.42/	1/2+	-0.40		ann.rad./ 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/%)
^{130m} Ba			9.5 ms	I.T./2.475	/100.	8-	-0.04	+2.8	0.2208 0.080–0.802
¹³⁰ Ba	0.106(1)	129.906321	2.2×10^{21} y	$\beta^+\beta^+$		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 2.27/72	7/2-	-0.97	-0.57	0.16585 1.2544 1.42033
¹⁴⁰ Ba		139.91060	12.75 d	β^- /1.05	0.48 1.0/ 1.02/	0+			0.16268 0.30485 0.53727
¹⁴¹ Ba		140.91441	18.3 m	β^- /3.22	2.59/ 2.73/	3/2-	-0.34	+0.45	0.1903 0.2770 0.3042 (0.1–2.5)
¹⁴² Ba		141.91645	10.7 m	β^- /2.212	1.0/ 1.10/	0+			0.23152 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/ 2.9/	0+			La k x-ray 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 ($\hbar/2\pi$)	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 μ s						
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 EC/20/		(5-)			ann.rad./ 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 EC/42/	2.42/	3/2+			ann.rad./ Ba k x-ray 0.1105 0.2786 (0.1–1.8)
¹³⁰ La		129.91237	8.7 m	β^+ /78/5.6 EC/22/		3+			ann.rad./ Ba k x-ray 0.3573/81 0.5506/27 (0.1965–1.989)
¹³¹ La		130.91007	59. m	β^+ /76/3.0 EC/24/	1.42/ 1.94/	3/2+			ann.rad./ Ba k x-ray 0.1085 0.3658 0.5263
^{132m} La			24. m	I.T./76/ β^+ , EC/24/		6-			La k x-ray 0.1352 0.4645
¹³² La		131.91010	4.8 h	β^+ /40/4.71 EC/60/	2.6/ 3.2 3.7/	2-			ann.rad./ Ba k x-ray 0.4645 0.5671
¹³³ La		132.90822	3.91 h	β^+ /4/2.2 EC/96/	1.2/	5/2+			Ba k x-ray 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 (<i>h</i> /2 π)	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)			
^{146l} La		145.9258	6.3 s	β- /6.6	6.2/	(2-)			
¹⁴⁷ La		146.9282	4.02 s	β- /5.0	4.6/				
^{148l} 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

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^{131m} Ce			5. m	β^+ EC					0.047–1.431 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/		$\frac{1}{2}+$			ann.rad.
									0.0769
									0.0973
									0.5577
¹³³ Ce		132.91152	5.4 h	β^+ /8/2.9 EC/92/	1.3/	9/2-			ann.rad.
									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	IT./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 EC/99 /	0.8/	1/2+			La k x-ray
									0.0345
									0.2656
									0.3001
									0.6068
¹³⁶ Ce	0.185(2)	135.90717	$> 0.7 \times 10^{14}$ y	EC EC		0+			
^{137m} Ce			1.43 d	IT./99 /0.254 EC/0.8 /		11/2-	1.0		Ce k x-ray
									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	$> 0.9 \times 10^{14}$ y	EC EC		0+			
^{139m} Ce			56.4 s	IT./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 0.581/31	7/2-	1.1		Pr k x-ray
									0.14544/48.0
¹⁴² Ce	11.114(51)	141.909244	$> 1.6 \times 10^{17}$ y	β^- β^-		0+			
¹⁴³ Ce		142.912386	1.38 d	β^- /1.462	1.404/ 1.110/47	3/2-	0.43		Pr k x-ray
									0.0574
									0.2933
¹⁴⁴ Ce		143.913647	284.6 d	β^- /0.319	0.185/20 0.318/	0+			Pr k x-ray
									0.0801
									0.1335
¹⁴⁵ Ce		144.91723	3.00 m	β^- /2.54	1.7/24 1.3	3/2-			Pr k x-ray
									0.0627
									0.7245
¹⁴⁶ Ce		145.9188	13.5 m	β^- /1.04	0.7/90	0+			Pr k x-ray

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									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 EC/43	2.98/	2+			ann.rad./
									Ce k x-ray
									0.5398
									0.5522
¹³⁷ Pr		136.91071	1.28 h	β^+ /26 /2.70 EC/74 /	1.68/	5/2+			ann.rad./
									Ce k x-ray
									0.4339
									0.5140
									0.8367
									(0.16–1.8)
^{138m} Pr			2.1 h	β^+ /24 / EC/76 /	1.65/	7-			ann.rad./
									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 EC/25 /	3.42/	1+			ann.rad./
									Ce k x-ray
									0.7887
¹³⁹ Pr		138.90894	4.41 h	β^+ /8 /2.129 EC/92 /	1.09/	5/2+			ann.rad./
									Ce k x-ray
									0.2551
									1.3473
									1.6307
¹⁴⁰ Pr		139.90908	3.39 m	β^+ /51 /3.39 EC/49 /	2.37/	1+			ann.rad./
									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 EC/0.744	0.58/4 2.16/96	2-	+0.234	+0.030	0.5088
									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 β^- /		3-			Pr k x-ray
									0.0590
									0.6965
									0.8142
¹⁴⁴ Pr		143.913305	17.28 m	β^- /2.998	0.807/1 2.30/	0-			0.69649
					2.996/98				1.48912
									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 3.7/10 4.2/40	2-			0.4539/48
									1.5247
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

[illegible]

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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 β^+ /88 /	1.17/	11/2-			Nd k x-ray Pr k x-ray 0.1139/34. 0.7382/30.
¹³⁹ Nd		138.91198	30. m	β^+ /25 /2.79 EC/75 /	1.77/	3/2+	0.91	+0.3	ann.rad./ 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 β^+ /2 /	0.802/	3/2+	1.01	+0.3	Pr k x-ray (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 1.13/26 1.42/	5/2-	0.35	1.3	Pr k x-ray 0.1143/19. 0.2113/27. (0.026–1.6)
¹⁵⁰ Nd	5.638(29)	149.920891	1.4×10^{20} y	$\beta^-\beta^-$		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 μ s						
¹⁵⁸ Nd		157.9416	> 0.3 μ s			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./

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¹⁵⁰ Pm		149.92098	2.68 h	β^- /3.45	1.6/ 2.3/ 1.8/	(1-)			0.3339/69. 1.1658/16. 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 3.50/60	1+			0.1218 (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							
⁶²Sm		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 β^+ /6 /	4.7	(11/2-)	1.1		Sm k x-ray 0.1118 0.1553 0.1901 0.2673
¹³⁹ Sm		138.92230	2.6 m	β^+ /75 /5.5 EC/25 /	4.1/	½+	-0.53		Pm k x-ray 0.3678 0.4028

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¹⁴⁰ Sm		139.91900	14.8 m	β^+ , EC/3.4	1.9/	0+			(0.27–2.4) 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/	$\frac{1}{2}+$	-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 / EC/9 / I.T./33 /0.0964		11/2-			ann.rad./ Eu k x-ray (0.09–1.6)
¹⁴¹ Eu		140.92493	40. s	β^+ /81 /5.6 EC/15 /		5/2+	+3.49	+0.85	ann.rad./ Sm k x-ray 0.3845 0.3940
^{142m} Eu			1.22 m	β^+ /83 / EC/17 /	4.8/	8-	+2.98	+1.4	ann.rad./ Sm k x-ray 0.5566 0.7680 1.0233
¹⁴² Eu		141.92343	2.4 s	β^- /94/7.4 EC/6 /	7.0/	1+	+1.54	+0.12	ann.rad./ 0.7680
¹⁴³ Eu		142.92030	2.62 m	β^+ /72/5.17 EC/28/	4.1/ 5.1/	5/2+	+3.67	+0.51	ann.rad./ Sm k x-ray 0.1107/7 1.5368/3. 1.9127/2.
¹⁴⁴ Eu		143.91882	10.2 s	β^+ /86 /6.33 EC/13 /	5.31/	1+	+1.89	+0.10	ann.rad./ Sm k x-ray 1.6601
¹⁴⁵ Eu		144.916265	5.93 d	β^+ /2 /2.660 EC/98 /1.71	0.79/	5/2+	+4.00	+0.29	ann.rad./ Sm k x-ray 0.6535 0.8937 1.6587
¹⁴⁶ Eu		145.91721	4.57 d	β^+ /5 /3.88 EC/95 /	1.47/	4-	+1.42	-0.18	ann.rad./ 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 β^+ /0.4 /		5/2+	+3.72	+0.53	Sm k x-ray 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+	$\approx$ 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	$\beta+$					(0.163–0.360)
¹³⁶ Gd		135.9473				0+			
¹³⁷ Gd		136.9450	7. s	EC, $\beta+$ /~ 8.8					ann.rad./
¹³⁸ Gd		137.9401	~ 4.7 s	EC, $\beta+$		0+			0.0647
^{139m} Gd			~ 4.8 s						0.1216
¹³⁹ Gd		138.9382	5. s	EC, $\beta+$ /~ 7.7					0.104–0.323
¹⁴⁰ Gd		139.93367	16. s	EC/4.8		0+			0.1748
^{141m} Gd			25. s	EC, $\beta+$ /		11/2-			ann.rad./
¹⁴¹ Gd		140.93213	21. s	$\beta+$ /7.3		$\frac{1}{2}+$			ann.rad./
¹⁴² Gd		141.92812	1.17 m	EC, $\beta+$ /4.2		0+			ann.rad./
^{143m} Gd			1.84 m	$\beta+$ /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	$\beta+$ /82 /6.0		1/2+			ann.rad./
				EC/18 /					Eu k x-ray
									0.2048
									0.2588
¹⁴⁴ Gd		143.92296	4.5 m	$\beta+$ /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
				$\beta+$ /4 /5.7					0.3295
									0.3866
									0.7214
¹⁴⁵ Gd		144.92171	23.4 m	$\beta+$ /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
				$\beta+$ /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	

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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	$> 1.9 \times 10^{19}$ 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 μ s						
^{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		$\frac{1}{2}^+$			
^{146m} Tb			23. s	β^+ /76 / EC/24 /		(5-)			ann.rad./
									Gd k x-ray
									1.0789
									1.5795
¹⁴⁶ Tb	145.92725		$\sim 8.$ s	β^+ /8.1		1+			
^{147m} Tb			1.8 m	β^+ /35 / EC/65 /		11/2-			ann.rad./
									Gd k x-ray
									1.3977
									1.7978
¹⁴⁷ Tb	146.92405		1.6 h	β^+ /42 /4.61 EC/58 /		5/2+	+1.70		ann.rad./
									Gd k x-ray
									0.6944
									1.1522
									(0.120–3.318)
^{148m} Tb			2.3 m	β^+ /25 / EC/75 /		9+			ann.rad./
									Gd k x-ray
									0.3945
									0.6319
									0.7845

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¹⁴⁸ Tb	147.92427		1.00 h	β+, EC/5.69		2-	-1.75	-0.3	0.8824
									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./
									Gd k x-ray
									0.1650
									0.7960
¹⁴⁹ Tb	148.923246	4.13 h	β+ /4 /3.636	α/16/	1.8/	½+	+1.35		Gd k x-ray
									0.1650
									0.3522
									0.3886
									(0.1–3.2)
									ann.rad./
^{150m} Tb		6.0 m	β+ /17 /	EC/83 /					Gd k x-ray
									0.4384
									0.6380
									0.6504
									0.8275
									ann.rad./
¹⁵⁰ Tb	149.92366	3.3 h	β+, EC/4.66			2-	-0.90		ann.rad./
									0.4963
									0.6380
									(0.3–4.29)
									0.0229
									0.0495
^{151m} Tb		25. s	I.T./95 /	β+, EC/7 /		11/2-			0.3797
									0.8305
									Gd k x-ray
									0.1083
									0.2517
									0.2870
¹⁵¹ Tb	150.923103	17.61 h	β+/1 /2.565	EC/99 /	0.70/	1/2+	+0.92		Gd k x-ray
									0.1083
									0.2517
									0.2870
									(0.1–1.8)
									Tb k x-ray
^{152m} Tb		4.3 m	I.T./79 /0.5018	EC/21 /4.35		(8+)			Gd k x-ray
									0.2833
									0.3443
									0.4111
									ann.rad./
									Gd k x-ray
¹⁵² Tb	151.92407	17.5 h	β+ /20 /3.99	EC/80 /	2.5/	2-	-0.58	+0.3	ann.rad./
									Gd k x-ray
									0.3443
									(0.2–2.88)
									Gd k x-ray
									0.2119
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)
									Gd k x-ray
									0.1231
									0.2479
^{154m2} Tb		23.1 h	EC/98 /	I.T./2 /		(7-)	0.9		Gd k x-ray
									0.1231
									0.2479
									0.3467
									1.4199
									Gd k x-ray
^{154m1} Tb		9. h	β+ /78 /	I.T./22 /		(3-)	1.7	+3.	Gd k x-ray
									0.1231
									0.2479
									0.5401
									(0.12–2.57)
									Gd k x-ray
¹⁵⁴ Tb	153.92468	21.5 h	EC/99 /3.56	β+ /1 /	1.86/	0-			0.1231
									1.2744
									2.1872

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¹⁵⁵ Tb		154.92351	5.3 d	EC/0.82		3/2+	+2.01	+1.41	(0.12–3.14) 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					

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/%)
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 / β^+ , EC/60 /		(11/2-)	-0.66	+0.7	Dy k x-ray 0.072 0.6787
¹⁴⁷ Dy		146.93109	75. s	EC, β^+ /6.37		$\frac{1}{2}+$	-0.92		ann.rad./ 0.1007 0.2534 0.3653
¹⁴⁸ Dy		147.92715	3.1 m	β^+ /4 /2.68 EC/96 /	1.2/	0+			ann.rad./ 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 α /33 /	4.233/	0+			Tb k x-ray 0.3967
¹⁵¹ Dy		150.926185	17. m	β^+ /5 /2.871 EC/89 / α /6 /	4.067/	7/2-	-0.95	-0.30	Tb k x-ray 0.1764 0.3030 0.3861 0.5463 (0.16–2.09)
¹⁵² Dy		151.92472	2.37 h	EC/0.60 α /	3.63/	0+			Tb k x-ray 0.2569
¹⁵³ Dy		152.925765	6.3 h	β^+ /1 /2.171 EC/99 / α /0.01 /	0.89/ 3.46/	(7/2-)	-0.78	~-0.15	Tb k x-ray 0.0807 0.0997 0.2137 (0.08–1.66)
¹⁵⁴ Dy		153.92442	$3. \times 10^6$ y	α /2.95	2.87/	0+			
¹⁵⁵ Dy		154.92575	9.9 h	β^+ /2 /2.095 EC/98 /	0.845/	3/2-	-0.385	+1.04	Tb k x-ray 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 β^- /2 /		1/2-			Dy k x-ray 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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¹⁶⁶ Dy		165.932807	3.400 d	β^- /0.486	0.40/	0+			0.09468/3.8 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							
⁶⁷Ho		164.93032(2)							
¹⁴⁰ Ho		139.969	6 ms	p/	p/1.09				
^{141m} Ho			8 μ s	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 μ s						
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 / α /13	4.605/				ann.rad./
									0.2102 0.4889 0.6948 0.7762
¹⁵¹ Ho		150.93169	35.2 s	β^+ , EC/80/5.13 α /20 /	4.519/				ann.rad./
									0.3522 0.5274 0.9676 1.0471
^{152m} Ho			50. s	β^+ , EC/90/ α /10/	4.453/	(9+)	+5.9	-1.	ann.rad./
									0.4929 0.6138 0.6474

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin <i>(ħ/2 π)</i>	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	y-Energy / Intensity (MeV/%)
¹⁵² Ho	151.93171		2.4 m	β+, EC/88/6.47 α/12/		(3+)	-1.02	+0.1	0.6835
									ann.rad./
									0.6140
									0.6476
^{153m} Ho			9.3 m	β+, EC/99+/4.12 α/		5/2	+1.19		ann.rad./
									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 α/		11/2-	+6.8	-1.1	ann.rad./
									0.2958
									0.3346
									0.4381
^{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 EC/94 /		(5/2+)	+3.51	+1.5	ann.rad./
									Dy k x-ray
									0.0474
									0.1363
									0.3254
^{156m} Ho			5.8 m	I.T./0.0352 β+ /25 / EC/75 /			+2.99	+2.3	ann.rad./
									Dy k x-ray
									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 EC/95/	1.18/	7/2-	+4.35	+3.0	ann.rad./
									Dy k x-ray
									0.2800
									0.3411
^{158m2} Ho			28. m	I.T./44/ EC/56/		2-	+2.44	+1.6	ann.rad./
									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 EC/92/	1.30/	5+	+3.77	+4.1	ann.rad./
									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

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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 β^+ /0.5 /	0.74/	0+			Ho k x-ray 0.0719 0.2486 0.3868
¹⁵⁹ Er		158.930684	36. m	β^+ /7 /2.769 EC/93 /		3/2-	-0.304	+1.17	ann.rad./ 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		$\frac{1}{2}$ -			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	$\frac{1}{2}$ -	+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 0.36/46	0+			Tm k x-ray 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 μ s	p	1.70, 1.43				
¹⁴⁵ Tm		144.9701	3.1 μ s	p// ~ 10	1.73/91				

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^{146m} Tm			0.198 s	β^+ , p	1.4/9 p/1.118/100 1.01/ 0.89/8				
¹⁴⁶ Tm	145.9664	0.08 s	β^+ /14. p	p/1.19/100 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 p/15/	~ 10.7 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 α /90 /	5.109/					ann.rad./
^{154m} Tm		3.3 s	β^+ , EC/15 / α /	α /5.031/100 4.84/0.24					ann.rad./ 0.4605–0.7960
¹⁵⁴ Tm	153.94157	8.1 s	β^+ , EC/56 /7.4 α /44 /	α /4.956/100 4.83/0.45					ann.rad./
¹⁵⁵ Tm	154.93920	30. s	β^+ , EC/5.58 α /	4.46/					0.0315 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 α /	4.23/		2-	+0.40	-0.5	ann.rad./ 0.3446 0.4529 0.5860
¹⁵⁷ Tm	156.93697	3.6 m	β^+ , EC/4.5 α /	2.6 3.97/		$\frac{1}{2}$	+0.48		ann.rad./ 0.1104 0.3484 0.3855 0.4550 (0.1–1.58)
¹⁵⁸ Tm	157.93698	4.0 m	β^+ , EC/74 /6.5 EC/26 /			(2-)	+0.04	+0.7	ann.rad./ 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 EC/77 /			5/2+	+3.42	+1.9	ann.rad./ 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 EC/85 /			1-	+0.16	+0.58	ann.rad./ Er k x-ray 0.1264 0.2642 0.7285 0.8544

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									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

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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/%)
¹⁶³ Yb		162.93633	11.1 m	β^+ /26 /3.4	1.4/	3/2-	-0.37	+1.24	0.1635 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 EC/90 /	1.58/	(5/2-)	+0.48	+2.48	ann.rad./ 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 EC/99.5 /	0.639/	5/2-	+0.62	+2.70	Tm k x-ray 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 0.071/21 0.353/6.2	7/2-	0.77		Lu k x-ray 0.3963/13 (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	$\beta^-\beta^-$		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)							

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^{166m1} Lu			1.4 m	β^+ , EC/58 / I.T./42 /0.0344		(3-)			ann.rad./ 0.1024 0.2281 0.2861 0.8119 0.8301
¹⁶⁶ Lu	165.93986	2.8 m		β^+ /25 /5.5 EC/75 /		(6-)			ann.rad./ Yb k x-ray 0.1024 0.2281 0.3375 0.3679
¹⁶⁷ Lu	166.93827	52. m		β^+ /2 /3.1 EC/98 /	2.1/	7/2+			Yb k x-ray 0.0297 0.2392 (0.03–2.0)
^{168m1} Lu		6.7 m		β^+ /12 / EC/88 / IT/<0.8		3+			ann.rad./ Yb k x-ray 0.1988/190 0.8960/100 0.9792/128 0.018–2.65
¹⁶⁸ Lu	167.93874	5.5 m		β^+ /6 /4.5 EC/94 /	1.2/	(6-)			ann.rad./ Yb k x-ray 0.1114 0.1124 0.2286 0.3483 1.4836
^{169m1} 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)
^{170m1} 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)
^{171m1} 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)
^{172m1} 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
^{174m1} Lu		142. d		IT/99.3/ EC/0.7 /	0.17086	6-	1.50		Lu k x-ray 0.067055

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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/%)
¹⁷⁸ Hf	27.28(7)	177.943699				0+			0.42635
^{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					

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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	EC β^+ /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

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									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 μ s						
¹⁸⁸ Ta		187.9637	5 μ s						0.292
¹⁸⁹ Ta		188.9658	> 0.3 μ s						
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

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¹⁶⁹ W		168.95178	1.3 m	EC/5.4					(0.037–0.573) 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		$\frac{1}{2}^-$			(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
¹⁷⁹ W		178.94707	38. m	EC/0.3/ EC/1.06		(7/2-)			0.2220 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 /		$\frac{1}{2}^-$	+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 μ s	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

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					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 μ s						
¹⁹² W		191.968	> 0.3 μ s			0+			
₇₅Re		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 ($\hbar/2\pi$)	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 EC/89 /	3.3/	(3+)			ann.rad./ 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 β^+ /1 /	0.95/	(5/2+)	2.8		W k x-ray
									0.1199
									0.2900
									0.4154
									0.4302
									1.6803
¹⁸⁰ Re		179.95079	2.45 m	EC/92 /3.80 β^+ /8 /	1.76/	1-	1.6		ann.rad./ 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/ 1.74/	2+	3.3	+1.8	W k x-ray
									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 EC/25 /		8+	+2.9		Re k x-ray
									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 EC/8 /0.582	0.973/21 1.07/71	1-	+1.739	+0.62	W k x-ray
									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 2.118/79	1-	+1.788	+0.57	Os k x-ray
									0.15502
									0.309–2.022
¹⁸⁹ Re		188.95923	24. h	β^- /1.01	1.01/	(5/2+)			0.1471

[illegible]

[illegible]

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^{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 β^+ /2 /		(5+)	3.9	-2.55	Os k x-ray 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 EC/99+ /	1.13/ 1.64/	(2-)	0.30	+0.48	Os k x-ray 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 / I.T./5 /		(11-)			0.376
^{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 2.25/86	1-	+0.39	+0.34	0.2935 0.3284 0.6451 (0.1–2.2)
^{195m} Ir			3.9 h	β^- /	0.41/ 0.97/	(11/2-)			Pt k x-ray 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 1.11/13	(3/2+)			Pt k x-ray 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 3.2/80	0-			0.3329 0.3557 0.7796
^{197m} Ir			8.9 m	β^- / I.T./		(11/2-)			0.3465 see Ir[197]
¹⁹⁷ Ir		196.96965	5.8 m	β^- /2.16	1.5/ 2.0/	(3/2+)			0.0531 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 α /	6.23 6.20/				
¹⁷⁴ Pt		173.97282	0.89 s	β^+ , EC/17 /5.6 α /83 /	 6.040/	0+			
¹⁷⁵ Pt		174.97242	2.5 s	β^+ , EC/65 /7.6 α /35 /	 5.831/5 5.96/54 6.038/				0.0774 0.1354 0.2128
¹⁷⁶ Pt		175.96895	6.3 s	β^+ , EC/60 /5.1 α /40 /	 5.528/0.6 5.750/41	0+			ann.rad./ 0.2277
¹⁷⁷ Pt		176.96847	11. s	EC/91 /6.8 α /9 /	5.53/ 5.485/3 5.525/6				0.0908
¹⁷⁸ Pt		177.96565	21. s	EC/93 /4.5 α /7 /	 5.286/0.2 5.442/7	0+			
¹⁷⁹ Pt		178.96536	33. s	β^+ , EC/5.7 α /	 5.16/		+0.43		
¹⁸⁰ Pt		179.96303	52. s	β^+ , EC/99.7 /3.7 α /0.3 /	0+ 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/ I.T./		(7/2-)	+0.78	+3.4	ann.rad./ 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/		$\frac{1}{2}^-$	+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 / β^- /3 /		13/2+			Pt k x-ray
									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

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					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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				$\alpha/8(10)^{-4}/$					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

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/%)
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
									(0.38–1.33)
²⁰⁵ Au		204.9799	31. s	β^- /					
⁸⁰Hg		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 μ s	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 / EC/94 /		13/2+	-1.07	+0.6	ann.rad./ 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 / I.T./9 /0.2901		13/2+	-1.05843	+0.92	Hg k x-ray
									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 EC/(46)/		13/2+	-1.04465	+1.1	Hg k x-ray
									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 1.3/63	0+			Tl k x-ray 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 μ s	β^-		0+			
⁸¹ Tl		204.3833(2)							
¹⁷⁶ Tl		176.0006	5 ms	p	1.26/~ 100				
^{177m} Tl			0.23 ms	p/51 α /49	1.95 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 /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 6.38/16 6.46/4	9/2-			0.0618 (0.046-0.0894)
¹⁸³ Tl		182.98219	5. s	β^+ , EC/7.7		$\frac{1}{2}+$			0.208
¹⁸⁴ Tl		183.98187	11. s	β^+ , EC/(98)/9.2 α /(2)/	6.16/				0.2868 0.3399 0.3667
^{185m} Tl			1.8 s	I.T./0.453 α /5.97		(9/2-)			0.1688 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 α /5.97	6.01	(9/2+)	+3.8	-2.4	0.2995
¹⁸⁷ Tl		186.97591	50. s	β^+ , EC/6.0		$\frac{1}{2}+$	1.6		
^{188m} Tl			1.18 m	β^+ , EC/		(7+)			Hg k x-ray 0.4129

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									0.6954 (0.08–1.0)
¹⁹⁶ Tl		195.97048	1.84 h	β^+ /(15)/4.4 EC/(85)/		2-	+0.072	-0.18	ann.rad./ Hg k x-ray
									0.4257 0.6105 (0.03–2.4)
^{197m1} Tl			0.54 s	IT/53/0.608 β^+ , EC/47/		9/2-			Tl k x-ray
									0.2262 0.4118 0.5872 0.6367
¹⁹⁷ Tl		196.96958	2.83 h	β^+ /(1)/2.18 EC/(99)/		1/2+	+1.58		Hg k x-ray
									0.1522/8.2 0.4258
^{198m1} Tl			1.87 h	β^+ , EC/(53)/ IT/47/0.5347		7+	+0.64		Hg k x-ray
									Tl k x-ray
									0.4118 0.5872 0.6367
¹⁹⁸ Tl		197.9405	5.3 h	EC, β^+ /(1)/3.5	1.4/ 2.1/ 2.4/	2-			Hg k x-ray
									0.4118 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/ 1.44/	2-	0.04		Hg k x-ray
									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 EC/(3)/0.347	0.763/97	2-	0.09		Hg k x-ray
²⁰⁵ Tl	70.476(14)	204.974428				1/2+	+1.638215		
^{206m1} 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
^{207m1} 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 1.52/22 1.796/51	(5+)	+0.29		Pb k x-ray
									0.27728 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

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^{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./ 0.2036
				α	4.64				
^{195m} Pb			15. m	β^+ /(8)/ EC/(92)/		13/2+	-1.132	+0.30	ann.rad./ 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/ β^+ /2/ IT/19/0.3193		13/2+	-1.104	+0.38	Tl k x-ray 0.3079 0.3877 0.7743 (0.2–2.2)
¹⁹⁷ Pb		196.97343	~ 8. m	EC/97/3.6 β^+ /3/		(3/2-)	-1.075	-0.08	Tl k x-ray 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 β^+ , EC/(7)/		13/2+			Pb k x-ray 0.4255
¹⁹⁹ Pb		198.97292	1.5 h	EC/(99)/2.9 β^+ /(1)/		5/2-	-1.074	+0.08	Tl k x-ray 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 β^+ /10/		9-	-0.228	+0.58	Pb k x-ray 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 $\times 10^7$ 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. μ s	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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									0.80313
									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 6.59/1.4	0+			
^{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 6.19/0.22	0+			
^{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)/ β +, EC/(5)/ ~ 4.6	6.53/94 5.77/0.02	0+			
^{197m} Po			25.8 s	α /(84)/ β +, EC/(16)/	6.385(3)/55	13/2+			
¹⁹⁷ Po		196.98566	53. s	α /(44)/ β +, EC/(56)/6.2	6.282(4)/76	(3/2-)			
¹⁹⁸ Po		197.98339	1.76 m	α /(70)/ β +, EC/(30)/4.0	6.18/57 5.27/7.6 $\times 10^{-4}$	0+			
^{199m} Po			4.2 m	β +, EC/(51)/ α /(39)/		13/2+	0.99		ann.rad./ 0.2745 0.4998 1.0020
¹⁹⁹ Po		198.98367	5.2 m	β +, EC/(88)/7. α /(12)/		(3/2-)			Bi k x-ray 0.1877 0.3616 1.0214 1.0344
²⁰⁰ Po		199.981780	11.5 m	β +, EC/85/3.4 α /(15)/		0+			0.14748 0.32792 0.6176 0.6709
^{201m} Po			8.9 m	β +, EC/(57)/ IT/40/0.418 α /(3)/		13/2+	1.00		Bi k x-ray Po k x-ray 0.2726 0.4123 0.4179 0.9670
²⁰¹ Po		200.98226	15.3 m	β +, EC/98/4.9 α /(2)/		3/2-	0.94		Bi k x-ray 0.2056 0.2250 0.8483 0.9048
²⁰² Po		201.98076	45. m	β +, EC/98/2.8 α /(2)/		0+			0.0410 0.1656 0.3158 0.6884
^{203m} Po			1.2 m	IT/96/0.6414 β -EC/(4)/		13/2+			Bi k x-ray 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 α		0+			Bi k x-ray 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

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									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-	$\sim +0.77$		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 μ s	α /8.953	8.784/100	0+			
²¹³ Po		212.992857	3.7 μ s	α /8.537	7.614/0.003	9/2+			
					8.375/100				
²¹⁴ Po		213.995201	163.7 μ s	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	$> 0.3 \mu$ s			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 (<i>h</i> /2 π)	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 μ s						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/ $\sim$ 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 μ s	α /9.254	9.080/	9/2-			
^{214m} At			0.76 μ s	α /8.762		(9-)			
²¹⁴ At		213.996372	0.56 μ s	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					
⁸⁶Rn									
^{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	$\alpha/(66)/6.629$ EC/(34)/~ 7.4	6.499/	3/2-			
²⁰⁴ Rn		203.99143	1.24 m	$\alpha/(68)/$ EC/(32)/3.8	6.420/	0+			
²⁰⁵ Rn		204.99172	2.8 m	$\alpha/(23)/6.390$ EC/(77)/5.2	6.123(3)/0.02 6.262(3)/23	(5/2-)	+0.80	+0.06	0.2652 0.3553 0.4648 0.6205 0.6753 0.7300
²⁰⁶ Rn		205.99021	5.7 m	$\alpha/(68)/6.384$ EC/(32)/3.3	6.258(3)/	0+			0.06170 0.0968 0.3245 0.3862 0.4822 0.4973 0.7728
²⁰⁷ Rn		206.99073	9.3 m	$\beta+$, EC/77/4.6 $\alpha/(23)/6.252$		5/2-	+0.82	+0.22	At k x-ray 0.32947 0.34455 0.36767 0.40267 0.74723 (0.18–1.4)
²⁰⁸ Rn		207.98964	24.3 m	$\alpha/(60)/6.260$ EC/(40)/2.85	5.469(2)/0.003 6.140(2)/60	0+			
²⁰⁹ Rn		208.99042	29. m	$\beta+$ /(83)/3.93 $\alpha/(17)/$	2.16/2.3 5.887(3)/0.04 5.898(3)/0.02 6.039(2)/16.9	5/2-	+0.8388	+0.31	At k x-ray 0.27933 0.33753 0.40841 0.68942 0.74594 (0.18–3.2)
²¹⁰ Rn		209.98970	2.4 h	$\alpha/(96)/6.157$ EC/(4)/2.37	5.351(2)/0.005 6.039(2)/96	0+			At k x-ray 0.19625 0.45824 0.57104 0.64868 (0.14–1.7)
²¹¹ Rn		210.99060	14.6 h	$\beta+$, EC/74/2.89 $\alpha/(26)/5.964$		1/2-	+0.60		At k x-ray 0.16877 0.25022 0.37049 0.67412 0.67839 1.36298 (0.11–2.7)
²¹² Rn		211.990704	24. m	$\alpha/6.385$	5.587(4)/0.05 6.260(4)/99.95	0+			
²¹³ Rn		212.99388	19. ms	$\alpha/8.243$	7.552(8)/1.0 8.087(8)/98.2 7.254/0.8	9/2+			0.540
²¹⁴ Rn		213.99536	0.27 μ s	$\alpha/9.209$	9.037(9)/	0+			
²¹⁵ Rn		214.99875	2.3 μ s	$\alpha/8.840$	8.674(8)/	(9/2+)			
²¹⁶ Rn		216.00027	45. μ s	α		0+			
²¹⁷ Rn		217.003928	0.6 ms	$\alpha/7.885$	7.500/0.1 7.742(4)/100	9/2+			
²¹⁸ Rn		218.005601	35. ms	$\alpha/7.267$	6.534(1)/0.16 7.133(1)/99.8	0+			0.6093 0.6653
²¹⁹ Rn		219.009480	3.96 s	$\alpha/6.946(1)$	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 ($\hbar/2\pi$)	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+				
⁸⁷Fr									
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)

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/%)
^{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 μ s	α /9.537	9.360(8)/	(9/2-)			
²¹⁶ Fr		216.00320	0.70 μ s	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)
⁸⁸Ra									
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 μ s						(0.0967-0.775)
²¹⁰ Ra		210.00050	3.7 s	α /7.610	7.020(5)/	0+			574.9
^{211m} Ra			3.9 μ s						(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 μ s						(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 μ s						(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 μ s	α /9.526	9.349(8)/	0+			
²¹⁷ Ra		217.00632	1.6 μ s	α /9.161	8.992(8)/	9/2-			
²¹⁸ Ra		218.00714	26. μ s	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
			> 4×10^{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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²²⁷ Ra		227.029178	42. m	β^- /1.325	4.784(1)/93.8	(3/2+)	-0.404	+1.5	0.053–2.448
					1.03/				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
²³¹ Ra		231.0412	1.7 m	β^-					0.4787
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 μ s	α /	10.540/100				
²¹⁷ Ac		217.00935	0.07 μ s	α /9.832	9.650(10)/100	9/2-			
²¹⁸ Ac		218.01164	1.1 μ s	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				

[illegible]

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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 β^- , sf	1.4/ /0.000119	1+			Th k x-ray 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 0.192 (0.069-0.295)
^{216m} Th			0.14 ms	α	9.93/74				(0.0905-1.478)
²¹⁶ Th		216.01106	27. ms	α /8.071	8.00, 9.31 7.92/99.46 7.30/0.54	0+			0.628
²¹⁷ Th		217.01311	0.25 ms	α /9.424	9.27/94.6 8.46/3.8 8.73/1.6				(0.546-0.822)
²¹⁸ Th		218.01328	0.11 μ s	α /9.847	9.665(10)/	0+			
²¹⁹ Th		219.01554	1.05 μ s	α /9.510	9.340(20)/				
²²⁰ Th		220.01575	10. μ s	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 7.599/2.3	0+			
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 6.997(5)/19 7.170(5)/7	0+			
²²⁵ Th		225.023951	8.72 m	EC/(10)/0.68 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	(3/2+)			
²²⁶ Th		226.024903	30.83 m	α /6.454	6.026(1)/0.2	0+			Ra k x-ray

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					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/< 4×10^{-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/	$\frac{1}{2}+$			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 μ s	α					
²²⁰ Pa	220.0219		0.8 μ s	α					
²²¹ Pa	221.0219		6. μ s	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

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/%)
					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
			$> 4 \times 10^{10}$ 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/ $1. \times 10^{-3}$				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
			$> 2.7 \times 10^{17}$ 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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⁹³Np									
²²⁵ Np		225.0339	> 2 μ s						
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 α /2 /6.368	5/2 6.280/2				0.2629 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 α /0.001/5.191	5/2+				U k x-ray
^{236m} Np			22.5 h	EC/52 / β - /48 /	(1-)				U L x-ray 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 β - /9 /0.49	(6-)				U L x-ray U k x-ray 0.10423 0.16031
²³⁷ Np		237.048173	2.14×10^6 y 1×10^{18} y	α /4.957 sf/2.1 $\times 10^{-10}$	4.6395(5)/6.5 4.766(5)/9.7 4.7715(5)/22.7 4.7884(5)/47.8 4.558–4.873	5/2+	+3.14	+3.89	Pa L x-ray Pa k x-ray 0.029378/15 0.08653/12 (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 0.438/48	5/2+			Pu L x-ray Pu k x-ray 0.10613 0.228186/11 0.27760/15 (0.04–0.50)
^{240m} Np			7.22 m	β - /99.9 / IT/0.1 /	2.18/	(1+)			0.25143 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						
⁹⁴Pu									
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 7.00/19	0+			
²³¹ Pu		231.04110	8.6 m	EC/90 α /10	6.72				
²³² Pu		232.04119	34. m	EC/>80/1.1 α / <20 /6.716	6.542(10)/38 6.600(10)/62	0+			
²³³ Pu		233.04300	20.9 m	EC(99.9)/1.9 α /0.1 /6.416	6.300(20)/0.1				0.1503 0.1804 0.2353 0.5002 0.5346/ 1.0352/
²³⁴ Pu		234.04332	8.8 h	EC/94 /0.39 α /6 /6.310	6.035(3)/0.024 6.149(3)/1.9 6.200(3)/4.	0+			
²³⁵ Pu		235.04529	25.3 m	EC/99+ /1.2 α /0.003/5.957	5.850(20)/0.003	(5/2+)			
^{236m} Pu			1.2 μ s						
²³⁶ Pu		236.046058	2.87 y 1.5 $\times 10^9$ y	α /5.867 sf/1.9 $\times 10^{-7}$	5.611/0.21 5.7210/30.5 5.7677(1)/69.3	0+			0.0476/0.07 0.109/0.02 (0.17–0.97)
²³⁷ Pu		237.048410	45.7 d	EC/99.9 /0.220 α /0.003 /5.747	5.334(4)/0.0015 5.356(4)/0.0006 5.650(4)/0.0007	7/2-			Np L x-ray Np k x-ray 0.026344 0.03319 0.05954 (0.03–0.5)
²³⁸ Pu		238.049560	87.7 y 4.75 $\times 10^{10}$ y	α /5.593 sf/1.8 $\times 10^{-7}$	5.3583(1)/0.10 5.465(1)/28.3 5.4992(1)/71.6	0+			U k x-ray 0.04347 (0.04–1.1)
²³⁹ Pu		239.052163	2.410 $\times 10^4$ y 8. $\times 10^{15}$ y	α /5.244 sf/3 $\times 10^{-10}$	5.055/0.047 5.076/0.078 5.106/11.9 5.144/17.1 5.157/70.8 (4.74 –5.03)	1/2+ +0.203			U k x-ray 0.05162 0.05682 0.12928 0.37502 0.41369

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²⁴⁰ Pu	240.053814	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	241.056852	14.3 y	β-/99+/0.0208	4.853/3 × 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	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	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	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	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	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	247.0741	2.3 d							
⁹⁵ Am										
²³² Am	232.0466	232.0466	0.9 m	EC/~ 5.0						
²³³ Am	233.0464	233.0464	~ 3.2 m	α	6.78					
²³⁴ Am	234.0478	234.0478	2.3 m	EC/4.2						
²³⁵ Am	235.0480	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	236.0496	3.6 m	EC		(5-)			(0.158-1.038)	
²³⁷ Am	237.0500	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	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	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	240.05530	2.12 d	EC/1.38		(3-)			Pu L x-ray	
				α/5.592	5.378(1)/16 × 10 ⁻⁴				Pu k x-ray	
									0.88878	
									0.98764	
									(0.1–1.3)	
²⁴¹ Am	241.056829	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 /0.24	
					5.3884(1)/1.4				0.03319/0.0126	
					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
			$> 3 \times 10^{12}$ y	sf/< 4.7 $\times 10^{-9}$	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
			$2. \times 10^{14}$ y	sf/3.7 $\times 10^{-9}$	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 /
⁹⁶Cm									
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 $\times 10^{-6}$	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 α /1 /6.184	5.8842(4)/0.12 5.9291(4)/0.18 5.9389(4)/0.69	1/2+			Am k x-ray 0.13241 0.16505 0.18028 0.43063 0.47181
²⁴² Cm		242.058836	162.8 d 7.0×10^6 y	α /6.216 sf/6.4 $\times 10^{-6}$	5.9694(1)/0.035 6.069(1)/25 6.1129(1)/74	0+			Pu L x-ray 0.04408 0.10189 (0.04–1.2)
²⁴³ Cm		243.061389	29.1 y 5.5×10^{11} y	α /6.167 sf/5.3 $\times 10^{-9}$	5.6815(5) /0.2 5.6856(5)/1.6 5.7420(5)/10.6 5.7859(5)/73.3 5.9922(5)/6.5 6.0103(5)/1.0 6.0589(5)/5 6.0666(5)/1.5	5/2+	0.41		Pu L x-ray Pu k x-ray 0.10612 0.20975 0.22819 0.27760 0.28546 0.33431 (0.04–0.7)
²⁴⁴ Cm		244.062753	18.1 y 1.32×10^7 y	α /5.902 sf/1.4 $\times 10^{-4}$	5.6656/0.02 5.7528/23 5.8050/77 5.515/0.004	0+			Pu L x-ray 0.04282 0.09885 0.15262
²⁴⁵ Cm		245.065491	8.48×10^3 y 1.4×10^{12} y	α /5.623 sf/6.1 $\times 10^{-7}$	5.235(10)/0.3 5.3038(10)/5.0 5.3620(7)/93 5.4927(11)/0.8 5.5331(11)/0.6	7/2+	0.5		Pu L x-ray Pu k x-ray 0.04195 0.13299 0.13606 0.17494
²⁴⁶ Cm		246.067224	4.76×10^3 y 1.8×10^7 y	α /5.476 sf/0.026	5.343(3)/21 5.386(3)/79	0+			Pu L x-ray 0.04453
²⁴⁷ Cm		247.070354	1.56×10^7 y	α /5.352	4.818(4)/4.7 4.8690(20)/71 4.941(4)/1.6 4.9820(20)/2.0 5.1436(20)/1.2 5.2104(20)/5.7 5.2659(20)/13.8	9/2-	0.37		Pu k x-ray 0.2792 0.2886 0.3471 0.4035
²⁴⁸ Cm		248.072349	3.48×10^5 y 4.15×10^6 y	α /99.92 /5.162 sf/8.38	4.931(5)/0.07 5.0349(2)/16.5 5.0784(2)/(75)/1	0+			
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	$\sim 9.7 \times 10^3$ y	sf/85.8 α /5.27		0+			
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+			
₉₇Bk									
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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				$\alpha/0.15$ /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
			$\alpha/0.01$ /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
			$\alpha/0.1$ /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	$\alpha/5.889$		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		$0.327/10^{-5}$
			$\alpha/0.001$ /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+			
			$\alpha/\sim 0.2$						
²³⁹ Cf	239.0624	~ 0.7 m	α						
²⁴⁰ Cf	240.0623	1.1 m	$\alpha/7.719$		7.590(10)/	0+			
			sf/ ~ 2.1						
²⁴¹ Cf	241.0637	4. m	EC/3.3						
			$\alpha/7.60$		7.335(5)/				
²⁴² Cf	242.06370	3.5 m	$\alpha/7.509$		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+)			
			$\alpha/14$ /7.40		7.170/4				
²⁴⁴ Cf	244.066001	20. m	$\alpha/7.328$		7.168(5)/25	0+			

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²⁴⁵ Cf		245.068049	44. m	α /36 /7.255	7.210(5)/75				Cm K x-ray
				EC/64 /1.569	7.14/91.7				0.5709
					6.983/0.31				0.6014
					7.09/7				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 μ s						
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+			
₉₉Es									
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 $\times 10^5$ y	sf/8.9 $\times 10^{-6}$	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 $\times 10^3$ 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 -					
¹⁰⁰Fm									
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 sf/0.0023	6.998/15 7.039/85	0+			
²⁵³ Fm		253.085185	3.0 d	EC/88/0.333 α /12 /	6.676/ 6.943/	$\frac{1}{2}$ +			Es k x-ray 0.2719
²⁵⁴ Fm		254.086854	3.240 h	α / sf/0.059	7.150 7.192	0+			
²⁵⁵ Fm		255.089962	20.1 h 1.0 $\times 10^4$ y	α / sf/2.3 $\times 10^{-5}$	6.9635(5)/5.0 7.0225(5)/93.4	7/2+			0.08148/1. (0.041-0.900)
²⁵⁶ Fm		256.09177	2.63 h	sf/91 α /19		0+			
²⁵⁷ Fm		257.09511	100.5 d	α /99.79 sf/0.21	6.519	(9/2+)			0.1794 0.2410
²⁵⁸ Fm		258.0971	0.37 ms	sf/		0+			
²⁵⁹ Fm		259.1006	1.5 s	sf/					
²⁶⁰ Fm		260.103	$\sim$ 4 ms	sf/		0+			
¹⁰¹ Md									
^{245m} Md			$\sim$ 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			$\sim$ 0.2 s	sf/					
²⁴⁷ Md		247.0816	3. s	α	8.43				
²⁴⁸ Md		248.0828	7. s	EC/80 /5.3 α /20 /	8.32/15 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 α /6 /8.25	7.75/4 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	$\sim$ 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 /8 / sf/< 0.15	α /7.33/93 7.27/5 7.75/1	(7/2-)			0.121/100 0.115/65 0.136/35
					7.71/1				0.141–0.453
²⁵⁶ Md		256.0941	1.30 h	EC/89 /2.13 α /11 / sf/< 2.6	7.21/71 7.14/22 7.68/2.5				Fm k x-ray 0.121/409 0.115/266
					7.25/2.5 7.64/2.1				0.136/143 0.634/119
									0.141–1.37
²⁵⁷ Md		257.095541	5.5 h	EC/85 /0.41 α /15, sf/< 1	7.074 7.014	(7/2-)			Fm k x-ray (0.181–0.389)
^{258m} Md			57. m	EC/ sf/< 30		(1-)			Fm k x-ray
²⁵⁸ Md		258.098431	51.5 d	α /7.40 sf/< 0.003	6.718(2)/ 6.763(4)/	(8-)			0.3678 0.057–0.448
²⁵⁹ Md		259.1005	1.64 h	sf/>98.7 α <1.3		7/2+			
²⁶⁰ Md		260.1037	$\sim$ 27.8 d	sf/ 73–100					
¹⁰² No									
²⁴⁸ No		248.0866	< 1.0 μ s	sf		0+			

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²⁴⁹ No		249.0878	0.05 ms	sf					
				$\alpha/ < 20$					
²⁵⁰ No		250.0875	6. μ s	sf/		0+			
				$\alpha/ < 10$					
^{251m} No			0.9 s	α	8.67				
²⁵¹ No		251.0890	0.78 s	$\alpha/91$	8.62/96				
				sf/0.26	8.58/4				
²⁵² No		252.08898	2.44 s	$\alpha/75/8.551$	8.42	0+			
				sf/24/	8.37				
				EC, $\beta+ / < 1.6$					
²⁵³ No		253.0907	1.7 m	$\alpha/$	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	$\alpha/$	8.09	0+			0.102
				EC/1.1					0.152
				sf/0.17					
²⁵⁵ No		255.09324	3.1 m	$\alpha/62 /$	8.12/	$\frac{1}{2}+$			0.187
				EC/38/2.01	7.93				
					8.08				
²⁵⁶ No		256.09428	2.9 s	$\alpha/$	8.43	0+			
				sf/0.5					
²⁵⁷ No		257.09688	24.5 s	$\alpha/$	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	$\alpha/78 / 7.794$	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+			
¹⁰³Lr									
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	$\alpha/$	8.72				
				sf/8					
²⁵⁴ Lr		254.0965	13. s	$\alpha/$	8.45				
				EC/5.2					
				sf/ < 0.1					
²⁵⁵ Lr		255.09669	22. s	$\alpha/$	8.37/60				
				EC/3.2	8.43/40				
				sf/ < 0.1					
²⁵⁶ Lr		256.0986	27. s	$\alpha/99.7 / 8.554$	8.43/				
				EC/4.2	8.39				
				sf/ < 0.03					
²⁵⁷ Lr		257.0996	0.65 s	$\alpha/$	8.80	7/2+			
				EC/2.5					
				sf/ < 0.03					
²⁵⁸ Lr		258.1018	3.9 s	$\alpha/$	8.60/46				
				EC/3.4	8.62/25				
				sf/ < 5	8.56/20				
					8.65/9				
²⁵⁹ Lr		259.1029	6.1 s	$\alpha/80$	8.44(1)				
				sf/20					
²⁶⁰ Lr		260.1055	3. m	$\alpha/$	8.03				

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/%)
²⁶¹ Lr		261.1069	40. m	sf					
²⁶² Lr		262.1096	3.6 h	EC/2.					
				sf/<10					
¹⁰⁴Rf									
²⁵³ Rf		253.1007	~ 48. μ s	sf					
				α / α <10					
²⁵⁴ Rf		254.1002	23. μ s	sf/>98.5		0+			
				α / 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					
¹⁰⁵Db									
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					

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/%)
				α /	8.45/ 8.53/ 8.67/ 8.36/ 8.41/ EC/3				
²⁶³ Db		263.1150	~ 0.45 m	sf/57					
				α /41					
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 / sf/ <20	9.62 9.35 9.03				
²⁶⁰ Sg		260.11442	4. ms	α /50 sf/50	9.76 9.72 9.81	0+			
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 9.25				
²⁶⁵ Sg		265.1211	8. s	α / >65 sf/ <35	8.84/46 8.76/23 8.94/23 8.69/8				
²⁶⁶ Sg		266.1221	~ 21. s	α / sf/ <82	8.77/66 8.52/33	0+			
²⁷¹ Sg		271.133	~ 0.04 h	α /50 sf/50	8.53				
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 / sf/ <12	10.37 10.24				
²⁶² Bh		262.1229	0.10 s	α / sf/ <12	10.06 9.91 9.74				
²⁶⁴ Bh		264.1246	1.0 s	α / sf/	9.3 – 9.8				
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 / sf/ <1	10.30/90 10.43 10.37				

Elem. or Isot.	Natural Abundance (Atom %)	Atomic Mass or Weight	Half-life/ Resonance Width (MeV)	Decay Mode/ Energy (/MeV)	Particle Energy/ Intensity (MeV/%)	Spin (<i>h</i> /2 π)	Nuclear Magnetic Mom. (nm)	Elect. Quadr. Mom. (b)	γ -Energy / Intensity (MeV/%)
					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					
¹⁰⁹Mt									
^{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				
¹¹⁰Ds									
²⁶⁷ Ds		267.1443	~ 3 μ s	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					
¹¹¹Rg									
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				
¹¹²112									
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				
¹¹³113									
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				

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/%)
¹¹⁴ 114									
²⁸⁶ 114		286.184	0.16 s	$\alpha/40$	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				