1 Half-life, Q-value and Decay mode

$T_{1/2}$	:	25.52	(1)	h
Q_{β^-}	:	391.6	(15)	keV
β^-	:	100		%

2 β^- Transitions

	Energy keV	Probability × 100	Nature	log ft
$\beta^-_{0,14}$	39.8 (15)	0.0032 (2)		7.33
$\beta^-_{0,13}$	71.4 (15)	0.066 (2)	1st forbidden	6.79
$\beta^-_{0,12}$	73.6 (15)	0.00078 (5)		8.76
$\beta^-_{0,11}$	144.3 (15)	2.7 (4)	Allowed	6.11
$\beta^-_{0,10}$	173.4 (15)	0.31 (23)		7.3
$\beta^-_{0,9}$	208.1 (15)	12.2 (15)	Allowed	5.95
$\beta^-_{0,8}$	217.4 (15)	1.36 (24)		6.96
$\beta^-_{0,6}$	289.3 (15)	13 (8)	Allowed	6.4
$\beta^-_{0,5}$	290.2 (15)	41 (16)	Allowed	5.88
$\beta^-_{0,4}$	307.4 (15)	29 (18)	Allowed	6.1
$\beta^-_{0,3}$	313.9 (15)	0.43 (2)	1st forbidden	7.97
$\beta^-_{0,2}$	333.0 (15)	0.17 (17)	1st forbidden	8.2
$\beta^-_{0,0}$	391.6 (15)	0.022 (7)	1st forbidden	9.57

3 Electron Emissions

		Energy keV	Electrons per 100 disint.	Energy keV
e_{AL}	(Pa)	5.9 - 21.0	68 (3)	
e_{AK}	(Pa)		0.038 (5)	
	KLL	70.081 - 78.822	}	
	KLX	85.989 - 95.858	}	
	KXY	101.87 - 112.59	}	
$ec_{4,2}$ L	(Pa)	4.540 - 8.912	45.3 (24)	
$ec_{5,4}$ M	(Pa)	11.8 - 13.8	31 (11)	
$ec_{9,2}$ K	(Pa)	12.320 (19)	0.01333 (41)	
$ec_{6,4}$ M	(Pa)	12.71 - 14.63	8.2 (36)	
$ec_{4,2}$ M	(Pa)	20.284 - 22.203	11.7 (6)	
$ec_{5,2}$ L	(Pa)	21.78 - 26.16	0.0507 (14)	
$ec_{10,8}$ L	(Pa)	22.98 - 27.35	0.16 (16)	
$ec_{11,7}$ K	(Pa)	23.071 (11)	0.49 (11)	
$ec_{11,5}$ K	(Pa)	33.34 (2)	0.110 (33)	
$ec_{2,0}$ L	(Pa)	37.467 - 41.839	54.5 (20)	
$ec_{5,2}$ M	(Pa)	37.53 - 39.45	0.0125 (7)	
$ec_{10,8}$ M	(Pa)	38.72 - 40.64	0.041 (40)	
$ec_{11,9}$ L	(Pa)	42.76 - 47.13	0.59 (26)	
$ec_{3,1}$ L	(Pa)	47.4 - 51.8	0.316 (9)	

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		Energy keV	Electrons per 100 disint.	Energy keV
$ec_{11,4}$ K	(Pa)	50.509 (4)	0.61 (7)	
$ec_{8,5}$ L	(Pa)	51.647 - 56.019	0.0549 (37)	
$ec_{2,0}$ M	(Pa)	53.211 - 55.130	15.0 (5)	
$ec_{11,9}$ M	(Pa)	58.50 - 60.42	0.16 (7)	
$ec_{9,6}$ L	(Pa)	60.123 - 64.495	5.5 (9)	
$ec_{9,5}$ L	(Pa)	60.982 - 65.354	2.47 (38)	
$ec_{8,0}$ K	(Pa)	61.56 (2)	0.032 (29)	
$ec_{3,1}$ M	(Pa)	63.1 - 65.1	0.0873 (28)	
$ec_{4,0}$ L	(Pa)	63.110 - 67.482	11.86 (18)	
$ec_{8,5}$ M	(Pa)	67.391 - 69.310	0.0134 (9)	
$ec_{8,4}$ L	(Pa)	68.84 - 73.22	0.1222 (42)	
$ec_{9,6}$ M	(Pa)	75.867 - 77.786	1.36 (27)	
$ec_{9,5}$ M	(Pa)	76.726 - 78.645	0.63 (13)	
$ec_{9,4}$ L	(Pa)	78.176 - 82.548	0.607 (42)	
$ec_{4,0}$ M	(Pa)	78.854 - 80.773	3.8 (7)	
$ec_{6,0}$ L	(Pa)	81.16 - 85.54	0.0379 (10)	
$ec_{8,4}$ M	(Pa)	84.59 - 86.51	0.0297 (10)	
$ec_{9,4}$ M	(Pa)	93.920 - 95.839	0.155 (12)	
$ec_{11,7}$ L	(Pa)	114.562 - 118.934	0.112 (15)	
$ec_{11,5}$ L	(Pa)	124.836 - 129.208	0.0411 (36)	
$ec_{11,7}$ M	(Pa)	130.306 - 132.225	0.0279 (48)	
$ec_{11,5}$ M	(Pa)	140.580 - 142.499	0.0107 (14)	
$ec_{11,4}$ L	(Pa)	142.000 - 146.372	0.122 (5)	
$ec_{8,0}$ L	(Pa)	153.06 - 157.43	0.0122 (10)	
$ec_{11,4}$ M	(Pa)	157.744 - 159.663	0.0296 (17)	
$\beta^-_{0,14}$	max:	39.8 (15)	0.0032 (2)	avg: 10.1 (5)
$\beta^-_{0,13}$	max:	71.4 (15)	0.066 (2)	avg: 18.3 (4)
$\beta^-_{0,12}$	max:	73.6 (15)	0.00078 (5)	avg: 18.9 (4)
$\beta^-_{0,11}$	max:	144.3 (15)	2.7 (4)	avg: 38.1 (5)
$\beta^-_{0,10}$	max:	173.4 (15)	0.31 (23)	avg: 46.2 (5)
$\beta^-_{0,9}$	max:	208.1 (15)	12.2 (15)	avg: 56.2 (5)
$\beta^-_{0,8}$	max:	217.4 (15)	1.36 (24)	avg: 58.9 (5)
$\beta^-_{0,6}$	max:	289.3 (15)	13 (8)	avg: 80.1 (5)
$\beta^-_{0,5}$	max:	290.2 (15)	41 (16)	avg: 80.4 (5)
$\beta^-_{0,4}$	max:	307.4 (15)	29 (18)	avg: 85.6 (5)
$\beta^-_{0,3}$	max:	313.9 (15)	0.43 (2)	avg: 87.6 (5)
$\beta^-_{0,2}$	max:	333.0 (15)	0.17 (17)	avg: 93.4 (5)
$\beta^-_{0,0}$	max:	391.6 (15)	0.022 (7)	avg: 111.6 (5)

4 Photon Emissions

4.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Pa)	11.3676 — 20.1126		65 (3)	
XKα_2	(Pa)	92.288		0.37 (4)	} Kα
XKα_1	(Pa)	95.869		0.59 (7)	}
XKβ_3	(Pa)	107.595	}		
XKβ_1	(Pa)	108.422	}	0.21 (2)	Kβ_1'
XKβ_5''	(Pa)	109.072	}		
XKβ_2	(Pa)	111.405	}		
XKβ_4	(Pa)	111.87	}	0.071 (8)	Kβ_2'
XKO$_{2,3}$	(Pa)	112.38	}		

4.2 Gamma Transitions and Emissions

	Energy keV	P$_{\gamma+ce}$ × 100	Multipolarity	α_T	P$_\gamma$ × 100
$\gamma_{4,2}$(Pa)	25.64 (2)	74.6 (39)	E1	4.37 (7)	13.9 (7)
$\gamma_{5,2}$(Pa)	42.86 (7)	0.1275 (34)	[E1]	1.14 (2)	0.0596 (15)
$\gamma_{10,8}$(Pa)	44.08 (17)	0.22 (23)	[M1+E2]	300 (300)	0.00074 (21)
$\gamma_{2,0}$(Pa)	58.5700 (24)	75.1 (27)	E2	155.5 (22)	0.480 (16)
$\gamma_{11,9}$(Pa)	63.86 (3)	0.82 (36)	M1+E2	34 (15)	0.0235 (21)
$\gamma_{3,1}$(Pa)	68.5 (1)	0.438 (13)	E2	73.3 (12)	0.00590 (15)
$\gamma_{8,5}$(Pa)	72.7510 (25)	0.333 (22)	[E1]	0.280 (4)	0.260 (17)
$\gamma_{3,0}$(Pa)	77.69	0.0042 (7)			0.0042 (7)
$\gamma_{9,6}$(Pa)	81.2280 (14)	8.2 (13)	M1(+E2)	8.1 (14)	0.905 (23)
$\gamma_{9,5}$(Pa)	82.0870 (13)	3.7 (6)	M1(+E2)	7.9 (13)	0.418 (13)
$\gamma_{4,0}$(Pa)	84.2140 (13)	23.4 (17)	E1	2.50 (25)	6.70 (7)
$\gamma_{8,4}$(Pa)	89.95 (2)	1.171 (35)	E1	0.1598 (22)	1.01 (3)
$\gamma_{6,1}$(Pa)	93.02 (4)	0.0459 (34)	[E1]	0.1463 (21)	0.040 (3)
$\gamma_{9,4}$(Pa)	99.278 (3)	0.96 (7)	M1+E2	6.0 (4)	0.137 (6)
$\gamma_{6,0}$(Pa)	102.2700 (13)	0.491 (12)	E1	0.1141 (16)	0.441 (11)
$\gamma_{9,3}$(Pa)	105.81 (3)	0.0087 (6)	[E1]	0.1043 (15)	0.0079 (5)
$\gamma_{10,7}$(Pa)	106.61 (3)	0.0197 (8)	[E1]	0.1023 (14)	0.0179 (7)
$\gamma_{8,2}$(Pa)	115.63 (3)	0.0121 (47)	[M1+E2]	10 (4)	0.00110 (16)
$\gamma_{10,5}$(Pa)	116.82 (2)	0.0302 (12)	E1	0.342 (5)	0.0225 (9)
$\gamma_{9,2}$(Pa)	124.914 (17)	0.0763 (20)	E1	0.294 (4)	0.0590 (15)
$\gamma_{10,4}$(Pa)	134.03 (2)	0.0318 (10)	E1	0.249 (4)	0.0255 (8)
$\gamma_{11,7}$(Pa)	135.664 (11)	0.72 (9)	M1(+E2)	8.0 (11)	0.0797 (22)
$\gamma_{13,9}$(Pa)	136.75 (7)	0.00547 (19)	[E1]	0.237 (3)	0.00442 (15)
$\gamma_{10,3}$(Pa)	140.54 (4)	0.0047 (19)	[M1+E2]	5.3 (25)	0.00074 (7)
$\gamma_{11,6}$(Pa)	145.06 (4)	0.0201 (11)	[E2]	2.46 (3)	0.0058 (3)
$\gamma_{11,5}$(Pa)	145.94 (2)	0.198 (27)	M1+E2	5.1 (8)	0.0324 (12)
$\gamma_{11,4}$(Pa)	163.101 (4)	0.92 (7)	M1(+E2)	4.9 (4)	0.156 (5)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{8,1}$(Pa)	165.00 (5)	0.00857 (35)	[E2]	1.464 (2)	0.00348 (14)
$\gamma_{11,3}$(Pa)	169.66 (3)	0.00161 (8)	[E1]	0.1421 (20)	0.00141 (7)
$\gamma_{8,0}$(Pa)	174.15 (2)	0.067 (27)	[M1+E2]	2.7 (15)	0.0180 (6)
$\gamma_{9,0}$(Pa)	183.480 (25)	0.0375 (9)	E1	0.1181 (17)	0.0335 (8)
$\gamma_{11,2}$(Pa)	188.76 (2)	0.00378 (33)	[E1]	0.1105 (15)	0.0034 (3)
$\gamma_{13,6}$(Pa)	217.94 (3)	0.0434 (9)	E1	0.0789 (11)	0.0402 (8)
$\gamma_{13,4}$(Pa)	236.01 (3)	0.01002 (32)	[E1]	0.0657 (9)	0.0094 (3)
$\gamma_{12,3}$(Pa)	240.27 (5)	0.000308 (43)	[E1]	0.0630 (9)	0.00029 (4)
$\gamma_{13,3}$(Pa)	242.50 (4)	0.0016 (6)	[M1+E2]	1.0 (7)	0.00082 (5)
$\gamma_{14,6}$(Pa)	249.60 (7)	0.00085 (7)	[E1]	0.0578 (8)	0.00080 (7)
$\gamma_{14,5}$(Pa)	250.45 (7)	0.00071 (7)	[E1]	0.0573 (8)	0.00067 (7)
$\gamma_{14,4}$(Pa)	267.62 (8)	0.00148 (15)	[E1]	0.0493 (7)	0.00141 (14)
$\gamma_{14,3}$(Pa)	274.1 (1)	0.000058 (27)	[M1+E2]	0.7 (5)	0.000034 (12)
$\gamma_{12,1}$(Pa)	308.78 (7)	0.0003748 (19)	[E1]	0.0358 (5)	0.0003618 (18)
$\gamma_{13,1}$(Pa)	311.00 (5)	0.005 (1)	M1+E2	0.6 (3)	0.00315 (14)
$\gamma_{12,0}$(Pa)	317.87 (8)	0.0001039 (5)	[E1]	0.0336 (5)	0.0001005 (5)
$\gamma_{13,0}$(Pa)	320.15 (8)	0.00022 (7)	[M1+E2]	0.5 (4)	0.00015 (3)
$\gamma_{14,0}$(Pa)	351.8 (1)	0.000090 (24)	[M1+E2]	0.35 (25)	0.000067 (13)

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1 Half-life, Q-value and Decay mode

$T_{1/2}$	:	14.02	(6)	$\times 10^9$ y
Q_α	:	4081.6	(14)	keV
α	:	100		%

2 α Emissions

	Energy keV	Probability × 100
$\alpha_{0,2}$	3810.0 (14)	0.068 (20)
$\alpha_{0,1}$	3948.5 (14)	21.0 (13)
$\alpha_{0,0}$	4011.2 (14)	78.9 (13)

3 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Ra)	5.71 - 19.09	8.18 (29)
e_{AK}	(Ra)		0.00019 (6)
	KLL	65.149 - 72.729	}
	KLX	79.721 - 88.466	}
	KXY	94.27 - 103.91	}

4 Photon Emissions

4.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Ra)	10.624 — 18.354	7.2 (3)	
$XK\alpha_2$	(Ra)	85.43	0.0017 (5)	} Kα
$XK\alpha_1$	(Ra)	88.47	0.0028 (8)	}
$XK\beta_3$	(Ra)	99.432	}	
$XK\beta_1$	(Ra)	100.13	} 0.00097 (28)	Kβ_1'
$XK\beta_5''$	(Ra)	100.738	}	
$XK\beta_2$	(Ra)	102.89	}	
$XK\beta_4$	(Ra)	103.295	} 0.00032 (10)	Kβ_2'
$XKO_{2,3}$	(Ra)	103.74	}	

4.2 Gamma Transitions and Emissions

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{1,0}$(Ra)	63.811 (10)	21.1 (13)	E2	80.4 (12)	0.259 (15)
$\gamma_{2,1}$(Ra)	140.88 (1)	0.068 (20)	E2	2.26 (4)	0.021 (6)

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1 Half-life, Q-value and Decay mode

$T_{1/2}$	:	22.15	(8)	min
Q_{β^-}	:	1243.1	(14)	keV
β^-	:	100		%

2 β^- Transitions

	Energy keV	Probability × 100	Nature	log ft
$\beta^-_{0,20}$	224.4 (14)	0.0434 (9)		6.7
$\beta^-_{0,19}$	258.3 (14)	0.205 (2)	Allowed	6.2
$\beta^-_{0,18}$	431.5 (14)	0.385 (4)	Allowed	6.6
$\beta^-_{0,17}$	478.5 (14)	1.19 (3)	Allowed	6.3
$\beta^-_{0,16}$	573.2 (14)	0.0174 (22)	1st forbidden	8.4
$\beta^-_{0,15}$	657.6 (14)	0.15 (3)	Allowed	7.6
$\beta^-_{0,14}$	689.2 (14)	1.23 (3)	Allowed	6.8
$\beta^-_{0,13}$	788.7 (14)	0.217 (13)	Allowed	7.7
$\beta^-_{0,12}$	795.3 (14)	0.821 (14)	1st forbidden	7.2
$\beta^-_{0,11}$	985.8 (14)	0.60 (3)	1st forbidden unique	8.1
$\beta^-_{0,8}$	1041.4 (14)	0.074 (8)	Allowed	8.6
$\beta^-_{0,7}$	1073.9 (14)	0.692 (12)	Allowed	7.7
$\beta^-_{0,5}$	1148.4 (14)	10.4 (4)	Allowed	6.6
$\beta^-_{0,1}$	1236.4 (14)	50 (6)	1st forbidden	6.1
$\beta^-_{0,0}$	1243.1 (14)	34 (6)	1st forbidden	6.2

3 Electron Emissions

		Energy keV	Electrons per 100 disint.	Energy keV
e_{AL}	(Pa)	5.9 - 21.6	8.6 (10)	
e_{AK}	(Pa)		0.041 (5)	
	KLL	70.081 - 78.822	}	
	KLX	88.03 - 95.56	}	
	KXY	101.78 - 112.40	}	
$ec_{1,0\ M}$	(Pa)	1.29 - 3.21	34.2 (9)	
$ec_{8,4\ K}$	(Pa)	2.54 (5)	0.013	
$ec_{9,5\ K}$	(Pa)	5.10 (2)	0.0270 (31)	
$ec_{1,0\ N}$	(Pa)	5.27 - 6.30	9.27 (26)	
$ec_{4,2\ L}$	(Pa)	8.268 - 12.640	4.97 (19)	
$ec_{8,3\ K}$	(Pa)	18.5 (1)	0.013	
$ec_{10,6\ K}$	(Pa)	21.689 (20)	0.015	
$ec_{4,2\ M}$	(Pa)	24.012 - 25.931	1.272 (49)	
$ec_{4,2\ N}$	(Pa)	27.990 - 29.018	0.332 (12)	
$ec_{10,5\ K}$	(Pa)	30.63 (2)	0.057 (16)	
$ec_{2,0\ L}$	(Pa)	36.0 - 40.4	6.39 (23)	
$ec_{10,4\ K}$	(Pa)	38.9 (2)	0.034	

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		Energy keV	Electrons per 100 disint.	Energy keV
$ec_{3,1}$ L	(Pa)	42.82 - 47.19	0.052 (22)	
$ec_{3,0}$ L	(Pa)	49.38 - 53.76	0.020 (17)	
$ec_{7,1}$ K	(Pa)	49.908 (12)	0.0206 (6)	
$ec_{11,5}$ K	(Pa)	50	0.01968 (29)	
$ec_{2,0}$ M	(Pa)	51.7 - 53.7	1.76 (6)	
$ec_{7,5}$ L	(Pa)	53.40 - 57.78	0.299 (14)	
$ec_{2,0}$ N	(Pa)	55.7 - 56.7	0.475 (16)	
$ec_{7,0}$ K	(Pa)	56.57 (1)	0.0281 (7)	
$ec_{11,4}$ K	(Pa)	58.00 (6)	0.0557 (14)	
$ec_{3,1}$ M	(Pa)	58.56 - 60.48	0.014 (6)	
$ec_{4,0}$ L	(Pa)	65.372 - 69.744	2.08 (8)	
$ec_{17,15}$ K	(Pa)	66.45 (8)	0.075 (22)	
$ec_{5,1}$ L	(Pa)	66.88 - 71.26	0.0217 (6)	
$ec_{7,5}$ M	(Pa)	69.15 - 71.07	0.0720 (34)	
$ec_{7,5}$ N	(Pa)	73.13 - 74.16	0.0193 (9)	
$ec_{5,0}$ L	(Pa)	73.54 - 77.91	0.0814 (18)	
$ec_{11,3}$ K	(Pa)	74.20 (18)	0.031 (27)	
$ec_{12,11}$ K	(Pa)	77.956 (14)	0.224 (6)	
$ec_{4,0}$ M	(Pa)	81.116 - 83.035	0.41 (7)	
$ec_{5,0}$ M	(Pa)	89.29 - 91.21	0.01992 (45)	
$ec_{17,14}$ K	(Pa)	98.07 (8)	0.020 (16)	
$ec_{13,10}$ K	(Pa)	104 (2)	0.029	
$ec_{18,15}$ K	(Pa)	113.5 (2)	0.0275 (12)	
$ec_{10,5}$ L	(Pa)	122.12 - 126.50	0.0138 (20)	
$ec_{10,4}$ L	(Pa)	130.4 - 134.8	0.011	
$ec_{13,8}$ K	(Pa)	140.18 (9)	0.014	
$ec_{11,0}$ K	(Pa)	144.70 (15)	0.031 (31)	
$ec_{11,4}$ L	(Pa)	149.5 - 153.9	0.01166 (33)	
$ec_{17,15}$ L	(Pa)	157.95 - 162.32	0.0167 (6)	
$ec_{11,3}$ L	(Pa)	165.7 - 170.1	0.0111 (5)	
$ec_{12,11}$ L	(Pa)	169.447 - 173.819	0.0430 (11)	
$ec_{13,7}$ K	(Pa)	172.64 (7)	0.017	
$ec_{12,11}$ M	(Pa)	185.191 - 187.110	0.01037 (27)	
$ec_{12,3}$ K	(Pa)	264.67 (11)	0.015	
$ec_{12,1}$ K	(Pa)	328.34 (4)	0.046 (8)	
$ec_{12,0}$ K	(Pa)	335.17 (2)	0.0240 (42)	
$ec_{14,5}$ K	(Pa)	346.626 (7)	0.227 (6)	
$ec_{12,3}$ L	(Pa)	356.2 - 360.6	0.029	
$ec_{15,5}$ K	(Pa)	378.2 (6)	0.035	
$ec_{15,4}$ K	(Pa)	386.42 (4)	0.042	
$ec_{14,5}$ L	(Pa)	438.117 - 442.489	0.043 (1)	
$ec_{17,8}$ K	(Pa)	450.33 (8)	0.01	
$ec_{14,5}$ M	(Pa)	453.861 - 455.780	0.01035 (24)	
$ec_{17,7}$ K	(Pa)	482.79 (6)	0.02	
$ec_{17,5}$ K	(Pa)	557.305 (16)	0.0423 (10)	
$\beta^-_{0,20}$	max:	224.4 (14)	0.0434 (9)	avg: 60.9 (4)
$\beta^-_{0,19}$	max:	258.3 (14)	0.205 (2)	avg: 70.8 (4)
$\beta^-_{0,18}$	max:	431.5 (14)	0.385 (4)	avg: 124.3 (5)

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		Energy keV		Electrons per 100 disint.		Energy keV
$\beta^-_{0,17}$	max:	478.5	(14)	1.19 (3)	avg:	139.5 (5)
$\beta^-_{0,16}$	max:	573.2	(14)	0.0174 (22)	avg:	170.8 (5)
$\beta^-_{0,15}$	max:	657.6	(14)	0.15 (3)	avg:	199.6 (5)
$\beta^-_{0,14}$	max:	689.2	(14)	1.23 (3)	avg:	210.5 (5)
$\beta^-_{0,13}$	max:	788.7	(14)	0.217 (13)	avg:	245.5 (5)
$\beta^-_{0,12}$	max:	795.3	(14)	0.821 (14)	avg:	247.8 (5)
$\beta^-_{0,11}$	max:	985.8	(14)	0.60 (3)	avg:	317.0 (6)
$\beta^-_{0,8}$	max:	1041.4	(14)	0.074 (8)	avg:	337.6 (6)
$\beta^-_{0,7}$	max:	1073.9	(14)	0.692 (12)	avg:	349.7 (6)
$\beta^-_{0,5}$	max:	1148.4	(14)	10.4 (4)	avg:	377.8 (6)
$\beta^-_{0,1}$	max:	1236.4	(14)	50 (6)	avg:	411.2 (6)
$\beta^-_{0,0}$	max:	1243.1	(14)	34 (6)	avg:	413.8 (6)

4 Photon Emissions

4.1 X-Ray Emissions

		Energy keV		Photons per 100 disint.	
XL	(Pa)	11.366 — 21.6		8.2 (9)	
XKα_2	(Pa)	92.288		0.39 (1)	} Kα
XKα_1	(Pa)	95.869		0.615 (13)	}
XKβ_3	(Pa)	107.595	}		
XKβ_1	(Pa)	108.422	}	0.235 (6)	Kβ'_1
XKβ''_5	(Pa)	109.072	}		
XKβ_2	(Pa)	111.405	}		
XKβ_4	(Pa)	111.87	}	0.079 (3)	Kβ'_2
XKO$_{2,3}$	(Pa)	112.38	}		

4.2 Gamma Transitions and Emissions

	Energy keV	P$_{\gamma+ce}$ × 100	Multipolarity	α_T	P$_\gamma$ × 100
$\gamma_{1,0}$(Pa)	6.65 (5)	51 (6)	(M1)	3080 (60)	0.0165 (18)
$\gamma_{4,2}$(Pa)	29.373 (10)	8.83 (31)	E1	3.07 (6)	2.17 (7)
$\gamma_{2,0}$(Pa)	57.10 (2)	8.81 (33)	E2	176 (4)	0.0498 (15)
$\gamma_{3,1}$(Pa)	63.92 (6)	0.072 (31)	(E2)	102.1 (21)	0.0007 (3)
$\gamma_{3,0}$(Pa)	70.49 (10)	0.029 (27)	[M1+E2]	40 (30)	0.0007 (4)
$\gamma_{7,5}$(Pa)	74.51 (5)	0.436 (20)	[M1]	9.85 (20)	0.0402 (17)
$\gamma_{4,0}$(Pa)	86.477 (10)	4.48 (16)	E1	1.43 (8)	1.843 (22)
$\gamma_{5,1}$(Pa)	87.99 (3)	0.1985 (24)	[E1]	0.169 (3)	0.1698 (20)
$\gamma_{5,0}$(Pa)	94.65 (5)	0.884 (11)	E1	0.140 (3)	0.775 (9)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{-1,2}$(Pa)	105.2 (1)	0.041			0.041
$\gamma_{9,6}$(Pa)	108.5 (1)	0.0027	M1+E2	3.5 (6)	0.0006
$\gamma_{8,4}$(Pa)	115.14 (5)	0.03 (8)	[M1+E2]	10 (4)	0.003 (7)
$\gamma_{9,5}$(Pa)	117.692 (20)	0.038 (4)	M1+E2	12.2 (4)	0.0029 (3)
$\gamma_{8,3}$(Pa)	131.101 (25)	0.0641 (17)	E1	0.262 (5)	0.0508 (13)
$\gamma_{10,6}$(Pa)	134.285 (20)	0.016 (5)	[M1+E2]	8.0 (14)	0.0018 (5)
$\gamma_{10,5}$(Pa)	143.23 (2)	0.088 (15)	M1+E2	6.7 (12)	0.0114 (7)
$\gamma_{-1,3}$(Pa)	147.5	0.0018 (6)			0.0018 (6)
$\gamma_{10,4}$(Pa)	151.409 (20)	0.040 (4)	[M1+E2]	4.9 (6)	0.0067 (3)
$\gamma_{11,6}$(Pa)	153.49 (18)	0.0480 (8)	[E1]	0.180 (4)	0.0407 (7)
$\gamma_{9,2}$(Pa)	155.239 (20)	0.000270 (35)	E1	0.176 (4)	0.00023 (3)
$\gamma_{11,5}$(Pa)	162.504	0.185	[E1]	0.157 (3)	0.16
$\gamma_{7,1}$(Pa)	162.504 (12)	0.194 (3)	[E1]	0.157 (3)	0.1674 (26)
$\gamma_{7,0}$(Pa)	169.162 (10)	0.287 (5)	[E1]	0.1431 (29)	0.251 (4)
$\gamma_{11,4}$(Pa)	170.60 (6)	0.578 (10)	[E1]	0.1403 (28)	0.507 (9)
$\gamma_{17,15}$(Pa)	179.05 (8)	0.125 (25)	(M1+E2)	3.5 (8)	0.0278 (7)
$\gamma_{10,2}$(Pa)	180.76 (3)	0.000123 (3)	[E1]	0.1223 (24)	0.00011 (3)
$\gamma_{11,3}$(Pa)	186.80 (18)	0.067 (27)	[M1+E2]	2.2 (13)	0.0209 (9)
$\gamma_{12,11}$(Pa)	190.552 (14)	0.367 (8)	M1	3.26 (6)	0.0861 (15)
$\gamma_{8,1}$(Pa)	194.97 (7)	0.1183 (19)	E1	0.1024 (20)	0.1073 (17)
$\gamma_{8,0}$(Pa)	201.62 (5)	0.0242 (9)	E1	0.0946 (19)	0.0221 (8)
$\gamma_{17,14}$(Pa)	210.67 (8)	0.044 (18)	[M1+E2]	1.5 (10)	0.0178 (11)
$\gamma_{-1,4}$(Pa)	211.3 (2)	0.0202 (9)			0.0202 (9)
$\gamma_{9,0}$(Pa)	212.34 (5)	0.0070 (7)	E1	0.0839 (17)	0.0065 (6)
$\gamma_{13,10}$(Pa)	216.54 (8)	0.031 (12)	(M1+E2)	1.4 (9)	0.0130 (7)
$\gamma_{18,15}$(Pa)	226.1 (2)	0.0516 (22)	M1+(E2)	2.02 (4)	0.0171 (7)
$\gamma_{10,0}$(Pa)	237.86 (6)	0.00202 (43)	[E1]	0.0645 (13)	0.0019 (4)
$\gamma_{-1,5}$(Pa)	242.3	0.0029 (6)			0.0029 (6)
$\gamma_{12,8}$(Pa)	246.14 (6)	0.0043 (6)	[E1]	0.0596 (12)	0.0041 (6)
$\gamma_{11,1}$(Pa)	250.65 (16)	0.0062 (4)	[E2]	0.317 (6)	0.0047 (3)
$\gamma_{13,8}$(Pa)	252.78 (9)	0.0152 (21)	[M1+E2]	1.3 (3)	0.0066 (3)
$\gamma_{11,0}$(Pa)	257.30 (15)	0.09 (3)	[M1+E2]	0.8 (6)	0.0524 (12)
$\gamma_{12,7}$(Pa)	278.7 (4)	0.0047 (6)			0.0047 (6)
$\gamma_{13,7}$(Pa)	285.24 (7)	0.030 (4)	[M1+E2]	0.94 (22)	0.0154 (9)
$\gamma_{-1,6}$(Pa)	309.9	0.0032 (3)			0.0032 (3)
$\gamma_{14,10}$(Pa)	316.1	0.00383 (41)	E1	0.0340 (7)	0.0037 (4)
$\gamma_{15,10}$(Pa)	347.64 (6)	0.0234 (13)	[M1]	0.613 (12)	0.0145 (8)
$\gamma_{13,5}$(Pa)	359.74 (4)	0.1355 (21)	M1	0.559 (11)	0.0869 (12)
$\gamma_{12,4}$(Pa)	361.285 (22)	0.0224 (6)	[E1]	0.0255 (5)	0.0218 (6)
$\gamma_{13,4}$(Pa)	367.92 (7)	0.0056 (11)	[M1]	0.525 (10)	0.0037 (7)
$\gamma_{12,3}$(Pa)	377.27 (11)	0.040 (3)	[M1+E2]	0.46 (8)	0.0275 (9)
$\gamma_{-1,7}$(Pa)	383.5	0.0019 (6)			0.0019 (6)
$\gamma_{19,15}$(Pa)	398.8 (5)	0.0158 (10)	[M1]	0.422 (8)	0.0111 (7)
$\gamma_{-1,8}$(Pa)	408.8 (5)	0.0005 (4)			0.0005 (4)
$\gamma_{16,11}$(Pa)	412.5 (5)	0.0115 (10)	[M1]	0.385 (8)	0.0083 (7)
$\gamma_{-1,9}$(Pa)	418.4 (5)	0.0091 (7)			0.0091 (7)
$\gamma_{19,14}$(Pa)	430.9 (4)	0.0239 (5)	(M1)	0.342 (6)	0.0178 (4)
$\gamma_{20,15}$(Pa)	433.2 (4)	0.0117 (4)			0.0117 (4)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{12,1}$(Pa)	440.94 (4)	0.249 (10)	(M1+E2)	0.30 (5)	0.1912 (23)
$\gamma_{12,0}$(Pa)	447.762 (20)	0.134 (5)	[M1+E2]	0.29 (4)	0.1043 (14)
$\gamma_{-1,10}$(Pa)	454.2 (5)	0.04			0.04
$\gamma_{14,5}$(Pa)	459.222 (7)	1.274 (17)	M1	0.288 (6)	0.989 (12)
$\gamma_{-1,11}$(Pa)	464.8	0.0026 (3)			0.0026 (3)
$\gamma_{14,4}$(Pa)	467.40 (6)	0.0167 (17)	[M1,E2]	0.16 (11)	0.0144 (4)
$\gamma_{-1,12}$(Pa)	473.9 (5)	0.0033 (7)			0.0033 (7)
$\gamma_{15,5}$(Pa)	490.80 (6)	0.1338 (21)	M1	0.241 (5)	0.1078 (16)
$\gamma_{-1,13}$(Pa)	497.1 (4)	0.0128 (4)			0.0128 (4)
$\gamma_{15,4}$(Pa)	499.02 (4)	0.1938 (27)	M1	0.230 (5)	0.1576 (21)
$\gamma_{-1,14}$(Pa)	505.5 (6)	0.0055 (3)			0.0055 (3)
$\gamma_{-1,15}$(Pa)	513.4 (4)	0.0133 (4)			0.0133 (4)
$\gamma_{-1,16}$(Pa)	517.0 (4)	0.0046 (3)			0.0046 (3)
$\gamma_{17,10}$(Pa)	526.69 (6)	0.052 (4)	[M1,E2]	0.12 (8)	0.0463 (11)
$\gamma_{-1,17}$(Pa)	531.8 (4)	0.0070 (7)			0.0070 (7)
$\gamma_{17,9}$(Pa)	552.21 (8)	0.0194 (6)	(M1)	0.1754 (35)	0.0165 (5)
$\gamma_{-1,18}$(Pa)	553.7	0.0030 (3)			0.0030 (3)
$\gamma_{-1,19}$(Pa)	554.9	0.0031 (3)			0.0031 (3)
$\gamma_{17,8}$(Pa)	562.93 (8)	0.0636 (8)	[M1]	0.167 (3)	0.0545 (7)
$\gamma_{18,10}$(Pa)	573.7 (4)	0.0384 (12)	[M1]	0.158 (3)	0.0332 (10)
$\gamma_{-1,20}$(Pa)	578.7	0.0017 (5)			0.0017 (5)
$\gamma_{-1,21}$(Pa)	583.2	0.0016 (5)			0.0016 (5)
$\gamma_{17,7}$(Pa)	595.39 (6)	0.1346 (19)	(M1)	0.143 (3)	0.1178 (16)
$\gamma_{18,9}$(Pa)	599.3 (2)	0.0335 (6)	[M1]	0.141 (3)	0.0294 (5)
$\gamma_{18,8}$(Pa)	610.0 (3)	0.0643 (14)	[M1]	0.134 (3)	0.0567 (12)
$\gamma_{18,7}$(Pa)	642.4 (2)	0.0226 (6)	[M1]	0.1171 (23)	0.0202 (5)
$\gamma_{16,1}$(Pa)	663.3 (5)	0.0041 (6)	[M1]	0.1075 (22)	0.0037 (5)
$\gamma_{16,0}$(Pa)	669.9 (5)	0.0018			0.0018
$\gamma_{17,5}$(Pa)	669.901 (16)	0.557 (7)	[M1]	0.1047 (21)	0.504 (6)
$\gamma_{17,4}$(Pa)	678.04 (10)	0.0686 (28)	[M1,E2]	0.06 (4)	0.0647 (9)
$\gamma_{-1,22}$(Pa)	681.2 (6)	0.0143 (4)			0.0143 (4)
$\gamma_{-1,23}$(Pa)	690	0.0021 (5)			0.0021 (5)
$\gamma_{-1,24}$(Pa)	698.5 (6)	0.0106 (5)			0.0106 (5)
$\gamma_{-1,25}$(Pa)	703.7 (6)	0.0091 (5)			0.0091 (5)
$\gamma_{18,6}$(Pa)	707.8 (3)	0.0093 (5)	[E2]	0.0209 (4)	0.0091 (5)
$\gamma_{18,5}$(Pa)	717.0 (2)	0.0458 (10)	(M1)	0.0874 (17)	0.0421 (9)
$\gamma_{18,4}$(Pa)	725.1 (2)	0.0687 (11)	(M1)	0.0848 (17)	0.0633 (10)
$\gamma_{-1,26}$(Pa)	727.8	0.0029 (2)			0.0029 (2)
$\gamma_{18,3}$(Pa)	741.1 (2)	0.0237 (5)	[E1]	0.00615 (12)	0.0236 (5)
$\gamma_{-1,27}$(Pa)	744.9 (5)	0.0053 (2)			0.0053 (2)
$\gamma_{-1,28}$(Pa)	751.6 (6)	0.0023 (4)			0.0023 (4)
$\gamma_{17,1}$(Pa)	757.90 (7)	0.0324 (7)			0.0324 (7)
$\gamma_{17,0}$(Pa)	764.55 (6)	0.0891 (13)			0.0891 (13)
$\gamma_{-1,29}$(Pa)	767.5	0.0032 (2)			0.0032 (2)
$\gamma_{-1,30}$(Pa)	774.0 (4)	0.0108 (5)			0.0108 (5)
$\gamma_{19,8}$(Pa)	783.2 (5)	0.00600 (32)	[M1]	0.0692 (14)	0.0056 (3)
$\gamma_{-1,31}$(Pa)	784.2 (5)	0.0022 (2)			0.0022 (2)
$\gamma_{18,1}$(Pa)	805.0 (2)	0.0215 (6)	[E1]	0.00529 (11)	0.0214 (6)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{20,9}$(Pa)	806.4 (5)	0.0123 (5)			0.0123 (5)
$\gamma_{18,0}$(Pa)	811.6 (2)	0.0060 (2)	[E1]	0.00521 (10)	0.0060 (2)
$\gamma_{19,7}$(Pa)	815.9 (4)	0.0207 (6)	[M1]	0.0621 (12)	0.0195 (6)
$\gamma_{20,8}$(Pa)	817.0 (6)	0.0095 (5)			0.0095 (5)
$\gamma_{-1,32}$(Pa)	832.0 (3)	0.0075			0.0075
$\gamma_{-1,33}$(Pa)	846.8 (7)	0.0013			0.0013
$\gamma_{20,7}$(Pa)	849.5 (5)	0.0039 (3)			0.0039 (3)
$\gamma_{-1,34}$(Pa)	870.7 (7)	0.0031 (2)			0.0031 (2)
$\gamma_{-1,35}$(Pa)	874.0 (5)	0.00120 (4)			0.00120 (4)
$\gamma_{19,6}$(Pa)	880.9 (5)	0.0098 (4)	E2	0.0135 (3)	0.0097 (4)
$\gamma_{19,5}$(Pa)	890.1 (5)	0.1104 (15)	[M1]	0.0493 (10)	0.1052 (14)
$\gamma_{19,4}$(Pa)	898.3 (5)	0.0023 (4)	[M1]	0.0481 (10)	0.0022 (4)
$\gamma_{-1,36}$(Pa)	918.9 (5)	0.006			0.006
$\gamma_{-1,37}$(Pa)	935.2 (7)	0.0369 (7)			0.0369 (7)
$\gamma_{-1,38}$(Pa)	941.9 (8)	0.0048 (3)			0.0048 (3)
$\gamma_{-1,39}$(Pa)	942.8	0.0019 (3)			0.0019 (3)
$\gamma_{20,3}$(Pa)	948.3 (5)	0.0060 (3)			0.0060 (3)
$\gamma_{-1,40}$(Pa)	955 (1)	0.0002 (3)			0.0002 (3)
$\gamma_{-1,41}$(Pa)	960.8 (8)	0.0041 (2)			0.0041 (2)
$\gamma_{-1,42}$(Pa)	962.8 (9)	0.0015 (2)			0.0015 (2)
$\gamma_{-1,43}$(Pa)	968.2 (9)	0.0083 (3)			0.0083 (3)
$\gamma_{19,1}$(Pa)	978.2 (5)	0.00582 (30)	[E1]	0.00374 (7)	0.0058 (3)
$\gamma_{19,0}$(Pa)	984.8 (5)	0.01024 (30)	[E1]	0.00369 (7)	0.0102 (3)
$\gamma_{-1,44}$(Pa)	994 (1)	0.0006 (1)			0.0006 (1)
$\gamma_{-1,45}$(Pa)	1001 (1)	0.0008 (2)			0.0008 (2)
$\gamma_{-1,46}$(Pa)	1007 (1)	0.0014 (2)			0.0014 (2)
$\gamma_{-1,47}$(Pa)	1011 (1)	0.0019 (2)			0.0019 (2)
$\gamma_{-1,48}$(Pa)	1026.5 (10)	0.0075			0.0075
$\gamma_{-1,49}$(Pa)	1092.5 (10)	0.006			0.006
$\gamma_{-1,50}$(Pa)	1132.1	0.0006 (2)			0.0006 (2)
$\gamma_{-1,51}$(Pa)	1139.1	0.0004 (1)			0.0004 (1)
$\gamma_{-1,52}$(Pa)	1144 (1)	0.0027			0.0027
$\gamma_{-1,53}$(Pa)	1201 (1)	0.006			0.006

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1 Half-life, Q-value and Decay mode

$T_{1/2}$	:	24.10	(3)	d
Q_{β^-}	:	272	(10)	keV
β^-	:	100		%

2 β^- Transitions

	Energy keV	Probability × 100	Nature	log ft
$\beta^-_{0,7}$	85 (10)	1.6 (6)	Allowed	7
$\beta^-_{0,6}$	95 (10)	0.016 (5)	1st forbidden	9.1
$\beta^-_{0,5}$	105 (10)	6.5 (7)	Allowed	6.7
$\beta^-_{0,4}$	106 (10)	14.1 (12)	1st forbidden	6.3
$\beta^-_{0,2}$	198 (10)	77.8 (15)	1st forbidden	6.4

3 Electron Emissions

		Energy keV	Electrons per 100 disint.	Energy keV
e_{AL}	(Pa)	5.9 - 21.6	7.7 (6)	
e_{AK}	(Pa)		0.0014 (9)	
	KLL	70.081 - 78.822	}	
	KLX	85.989 - 95.858	}	
	KXY	101.87 - 112.59	}	
$ec_{3,2}$ L	(Pa)	8.4 - 12.8	3.95 (45)	
$ec_{7,5}$ M	(Pa)	14.65 - 16.57	0.63 (28)	
$ec_{7,5}$ N	(Pa)	18.63 - 19.65	0.17 (8)	
$ec_{3,2}$ M	(Pa)	24.1 - 26.1	1.08 (12)	
$ec_{3,2}$ N	(Pa)	28.1 - 29.1	0.292 (34)	
$ec_{4,3}$ L	(Pa)	41.78 - 46.15	0.31 (8)	
$ec_{5,3}$ L	(Pa)	42.2 - 46.6	1.144 (31)	
$ec_{1,0}$ L	(Pa)	52.82 - 57.19	0.106 (12)	
$ec_{4,3}$ M	(Pa)	57.52 - 59.44	0.079 (20)	
$ec_{5,3}$ M	(Pa)	57.9 - 59.9	0.281 (7)	
$ec_{4,3}$ N	(Pa)	61.50 - 62.53	0.021 (5)	
$ec_{5,3}$ N	(Pa)	61.9 - 62.9	0.0739 (19)	
$ec_{1,0}$ M	(Pa)	68.56 - 70.48	0.0258 (29)	
$ec_{4,2}$ L	(Pa)	71.27 - 75.65	8.7 (8)	
$ec_{5,2}$ L	(Pa)	71.7 - 76.1	0.239 (21)	
$ec_{4,2}$ M	(Pa)	87.02 - 88.94	2.09 (18)	
$ec_{5,2}$ M	(Pa)	87.4 - 89.4	0.058 (5)	
$ec_{4,2}$ N	(Pa)	91.00 - 92.02	0.56 (5)	
$ec_{5,2}$ N	(Pa)	91.4 - 92.4	0.0154 (14)	
$ec_{7,2}$ L	(Pa)	91.70 - 96.08	0.0143 (15)	
$\beta^-_{0,7}$	max:	85 (10)	1.6 (6)	avg: 22 (3)

		Energy keV		Electrons per 100 disint.		Energy keV
$\beta^-_{0,6}$	max:	95	(10)	0.016 (5)	avg:	25 (3)
$\beta^-_{0,5}$	max:	105	(10)	6.5 (7)	avg:	27 (3)
$\beta^-_{0,4}$	max:	106	(10)	14.1 (12)	avg:	28 (3)
$\beta^-_{0,2}$	max:	198	(10)	77.8 (15)	avg:	53 (3)

4 Photon Emissions

4.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Pa)	11.3676 — 20.1126	7.1 (3)	
XKα_2	(Pa)	92.288	0.013 (9)	} Kα
XKα_1	(Pa)	95.869	0.021 (13)	}
XKβ_3	(Pa)	107.595	}	
XKβ_1	(Pa)	108.422	} 0.007 (5)	Kβ'_1
XKβ''_5	(Pa)	109.072	}	
XKβ_2	(Pa)	111.405	}	
XKβ_4	(Pa)	111.87	} 0.0025 (16)	Kβ'_2
XKO$_{2,3}$	(Pa)	112.38	}	

4.2 Gamma Transitions and Emissions

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{7,5}$(Pa)	20.01 (2)	1.2 (6)	M1+E2	240 (70)	0.0051 (21)
$\gamma_{3,2}$(Pa)	29.50 (2)	5.4 (6)	E2	4390 (70)	0.00123 (14)
$\gamma_{4,3}$(Pa)	62.88 (2)	0.43 (11)	M1+E2	25 (5)	0.0164 (28)
$\gamma_{5,3}$(Pa)	63.30 (2)	5.27 (11)	E1	0.405 (6)	3.75 (8)
$\gamma_{1,0}$(Pa)	73.92 (2)	0.154 (17)	M1+E2	10.6 (4)	0.0133 (14)
$\gamma_{7,3}$(Pa)	83.31 (5)	0.073 (6)	E1	0.196 (3)	0.061 (5)
$\gamma_{4,2}$(Pa)	92.38 (1)	13.7 (12)	M1	5.27 (8)	2.18 (19)
$\gamma_{5,2}$(Pa)	92.80 (2)	2.47 (22)	E1	0.1472 (21)	2.15 (19)
$\gamma_{6,2}$(Pa)	103.35 (10)	0.0154 (48)	M1	3.81 (6)	0.0032 (10)
$\gamma_{7,2}$(Pa)	112.81 (5)	0.264 (40)	E1	0.23 (14)	0.215 (22)

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1 Half-life, Q-value and Decay mode

$T_{1/2}$	:	32670	(260)	y
Q_α	:	5149.9	(8)	keV
α	:	100		%

2 α Emissions

	Energy keV	Probability × 100
$\alpha_{0,25}$	4415.6 (9)	0.0021 (5)
$\alpha_{0,24}$	4507.6 (8)	0.0036 (3)
$\alpha_{0,23}$	4533.0 (8)	0.00076 (20)
$\alpha_{0,22}$	4568.1 (9)	0.008 (4)
$\alpha_{0,21}$	4599.6 (8)	0.015 (7)
$\alpha_{0,20}$	4630.3 (8)	0.078 (21)
$\alpha_{0,19}$	4633.0 (8)	0.0504 (11)
$\alpha_{0,18}$	4642.5 (8)	0.080 (6)
$\alpha_{0,17}$	4680.1 (8)	1.8 (3)
$\alpha_{0,16}$	4712.3 (8)	1.20 (22)
$\alpha_{0,15}$	4736.3 (8)	8.4 (4)
$\alpha_{0,14}$	4761.2 (8)	0.0032 (9)
$\alpha_{0,12}$	4794.1 (8)	0.040 (15)
$\alpha_{0,11}$	4853.5 (8)	1.40 (15)
$\alpha_{0,8}$	4903.4 (22)	0.002 (1)
$\alpha_{0,7}$	4936.0 (8)	2.9 (3)
$\alpha_{0,6}$	4952.6 (8)	22.5 (5)
$\alpha_{0,5}$	4977.6 (8)	0.4 (1)
$\alpha_{0,4}$	4987.8 (8)	1.6 (2)
$\alpha_{0,3}$	5015.1 (8)	25.3 (5)
$\alpha_{0,2}$	5031.2 (8)	20 (2)
$\alpha_{0,1}$	5033.8 (8)	2.8 (3)
$\alpha_{0,0}$	5060.7 (8)	11.7 (5)

3 Electron Emissions

		Energy keV	Electrons per 100 disint.
e_{AL}	(Ac)	5.87 - 19.69	52.6 (15)
e_{AK}	(Ac)		0.078 (11)
	KLL	66.769 - 74.715	}
	KLX	81.775 - 90.882	}
	KXY	96.76 - 106.75	}

4 Photon Emissions

4.1 X-Ray Emissions

		Energy keV	Photons per 100 disint.	
XL	(Ac)	10.8701 — 18.9228	44.3 (13)	
$XK\alpha_2$	(Ac)	87.768	0.715 (23)	} Kα
$XK\alpha_1$	(Ac)	90.885	1.16 (4)	}
$XK\beta_3$	(Ac)	102.101	}	
$XK\beta_1$	(Ac)	102.841	} 0.410 (15)	$K\beta'_1$
$XK\beta''_5$	(Ac)	103.462	}	
$XK\beta_2$	(Ac)	105.679	}	
$XK\beta_4$	(Ac)	106.098	} 0.136 (6)	$K\beta'_2$
$XKO_{2,3}$	(Ac)	106.563	}	

4.2 Gamma Transitions and Emissions

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{3,2}$(Ac)	16.370 (14)	2.12 (9)	E1	8.58 (12)	0.221 (9)
$\gamma_{3,1}$(Ac)	18.980 (14)	42 (4)	M1	113.2 (16)	0.37 (3)
$\gamma_{11,9}$(Ac)	23.46 (6)	1.16 (15)	M1	241 (4)	0.0048 (6)
$\gamma_{16,15}$(Ac)	24.46 (4)	1.05 (21)	M1	214 (4)	0.0049 (10)
$\gamma_{6,5}$(Ac)	25.390 (22)	18.3 (14)	M1	191 (3)	0.095 (7)
$\gamma_{1,0}$(Ac)	27.37 (1)	59 (7)	E1	4.5 (6)	10.8 (4)
$\gamma_{2,0}$(Ac)	29.98 (1)	26 (3)	M1+E2	270 (30)	0.097 (4)
$\gamma_{6,4}$(Ac)	35.800 (22)	0.045 (3)	E1	1.746 (25)	0.0163 (10)
$\gamma_{5,3}$(Ac)	38.200 (14)	13 (3)	M1+E2	89 (19)	0.144 (6)
$\gamma_{4,2}$(Ac)	44.160 (14)	2.11 (16)	M1	37.4 (6)	0.055 (4)
$\gamma_{3,0}$(Ac)	46.35 (1)	0.357 (19)	E1	0.879 (13)	0.19 (1)
$\gamma_{20,17}$(Ac)	50.73 (5)	0.057 (21)	M1	24.9 (4)	0.0022 (8)
$\gamma_{7,4}$(Ac)	52.720 (22)	1.77 (10)	M1	22.2 (4)	0.076 (4)
$\gamma_{5,2}$(Ac)	54.570 (14)	0.110 (6)	E1	0.569 (8)	0.070 (4)
$\gamma_{15,13}$(Ac)	56.90 (3)	0.18 (4)	M1+E2	37 (6)	0.0047 (7)
$\gamma_{5,1}$(Ac)	57.180 (14)	4.6 (5)	E2	148.1 (21)	0.031 (3)
$\gamma_{17,15}$(Ac)	57.190 (22)	0.7 (3)	E2	148.0 (21)	0.0046 (21)
$\gamma_{9,7}$(Ac)	60.46 (4)	0.0076 (10)	E1	0.433 (7)	0.0053 (7)
$\gamma_{6,3}$(Ac)	63.590 (22)	3.99 (16)	E2	88.8 (13)	0.0446 (17)
$\gamma_{-1,1}$(Ac)	70.49 (5)	0.0051 (8)			0.0051 (8)
$\gamma_{10,7}$(Ac)	71.85 (5)	0.019 (7)	M1	8.98 (13)	0.0019 (7)
$\gamma_{12,10}$(Ac)	72.58 (7)	0.029 (7)	M1	8.71 (13)	0.0030 (7)
$\gamma_{4,0}$(Ac)	74.14 (1)	0.97 (4)	E2	42.6 (6)	0.0223 (9)
$\gamma_{9,6}$(Ac)	77.38 (4)	0.50 (4)	M1	7.23 (11)	0.061 (4)
$\gamma_{7,2}$(Ac)	96.880 (22)	1.10 (4)	E2	12.02 (17)	0.084 (3)
$\gamma_{11,6}$(Ac)	100.84 (5)	0.248 (10)	E2	9.97 (15)	0.0226 (9)
$\gamma_{9,5}$(Ac)	102.77 (3)	0.20 (4)	E2	9.12 (13)	0.019 (4)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{10,4}$(Ac)	124.57 (4)	0.0217 (20)	E2	4.04 (6)	0.0043 (4)
$\gamma_{12,7}$(Ac)	144.43 (6)	0.037 (3)	E2	2.18 (3)	0.0115 (9)
$\gamma_{13,4}$(Ac)	199.00 (3)	0.0030 (12)			0.0030 (12)
$\gamma_{14,4}$(Ac)	230.59 (5)	0.0017 (8)			0.0017 (8)
$\gamma_{-1,2}$(Ac)	242.18 (8)	0.0099 (10)			0.0099 (10)
$\gamma_{13,2}$(Ac)	243.16 (3)	0.065 (11)	M1+E2	0.80 (17)	0.036 (5)
$\gamma_{15,5}$(Ac)	245.490 (14)	0.042 (3)	M2	5.24 (8)	0.0067 (5)
$\gamma_{13,1}$(Ac)	245.77 (3)	0.013 (4)	E1	0.0570 (8)	0.012 (4)
$\gamma_{15,4}$(Ac)	255.900 (14)	0.134 (3)	E2	0.264 (4)	0.1059 (22)
$\gamma_{14,3}$(Ac)	258.38 (5)	0.0015 (4)			0.0015 (4)
$\gamma_{17,7}$(Ac)	260.37 (3)	0.282 (21)	M1+E2	0.55 (11)	0.182 (4)
$\gamma_{13,0}$(Ac)	273.14 (3)	0.101 (7)	M1+E2	0.74 (11)	0.0579 (12)
$\gamma_{17,6}$(Ac)	277.29 (3)	0.10 (6)	E1+M2	0.5 (9)	0.0680 (15)
$\gamma_{15,3}$(Ac)	283.690 (14)	1.72 (3)	E1	0.0410 (6)	1.65 (3)
$\gamma_{-1,3}$(Ac)	286.58 (10)	0.0104 (5)			0.0104 (5)
$\gamma_{15,2}$(Ac)	300.060 (14)	4.25 (10)	M1+E2	0.764 (17)	2.41 (5)
$\gamma_{15,1}$(Ac)	302.670 (14)	2.4 (3)	E1	0.0355 (5)	2.3 (3)
$\gamma_{17,5}$(Ac)	302.680 (22)	0.22 (10)	E1	0.0355 (5)	0.21 (10)
$\gamma_{-1,4}$(Ac)	310.0 (1)	0.00092 (20)			0.00092 (20)
$\gamma_{17,4}$(Ac)	313.090 (22)	0.129 (9)	M1+E2	0.31 (9)	0.0987 (20)
$\gamma_{16,1}$(Ac)	327.13 (4)	0.0372 (11)	E1	0.0298 (5)	0.0361 (11)
$\gamma_{15,0}$(Ac)	330.04 (1)	2.09 (5)	M1+E2	0.541 (19)	1.36 (3)
$\gamma_{17,3}$(Ac)	340.880 (22)	0.196 (7)	E1+M2	0.11 (3)	0.177 (4)
$\gamma_{18,4}$(Ac)	351.45 (3)	0.0029 (12)	E1	0.0255 (4)	0.0028 (12)
$\gamma_{16,0}$(Ac)	354.50 (4)	0.1094 (23)	M1+E2	0.1375 (20)	0.0962 (20)
$\gamma_{17,2}$(Ac)	357.250 (22)	0.240 (18)	M1+E2	0.43 (10)	0.168 (4)
$\gamma_{17,1}$(Ac)	359.860 (22)	0.0085 (3)			0.0085 (3)
$\gamma_{20,4}$(Ac)	363.82 (4)	0.0080 (3)			0.0080 (3)
$\gamma_{-1,5}$(Ac)	374.95 (10)	0.0045 (3)			0.0045 (3)
$\gamma_{18,3}$(Ac)	379.24 (3)	0.066 (6)	M1+E2	0.32 (11)	0.0498 (11)
$\gamma_{21,5}$(Ac)	384.69 (6)	0.00365 (22)			0.00365 (22)
$\gamma_{17,0}$(Ac)	387.23 (2)	0.00032 (11)	E2	0.0773 (11)	0.0003 (1)
$\gamma_{20,3}$(Ac)	391.61 (4)	0.00687 (22)	E1	0.0202 (3)	0.00673 (22)
$\gamma_{18,2}$(Ac)	395.61 (3)	0.00230 (22)	E1	0.0198 (3)	0.00226 (22)
$\gamma_{18,1}$(Ac)	398.22 (3)	0.0095 (3)			0.0095 (3)
$\gamma_{19,1}$(Ac)	407.820 (22)	0.0475 (11)	M1	0.334 (5)	0.0356 (8)
$\gamma_{20,1}$(Ac)	410.59 (4)	0.00183 (22)	E1	0.0183 (3)	0.00180 (22)
$\gamma_{22,4}$(Ac)	427.14 (7)	0.0007 (4)			0.0007 (4)
$\gamma_{19,0}$(Ac)	435.19 (2)	0.00294 (17)			0.00294 (17)
$\gamma_{20,0}$(Ac)	437.96 (4)	0.0045 (3)			0.0045 (3)
$\gamma_{-1,6}$(Ac)	438.72 (10)	0.0013 (4)			0.0013 (4)
$\gamma_{24,4}$(Ac)	488.66 (10)	0.00165 (17)			0.00165 (17)
$\gamma_{23,3}$(Ac)	490.65 (10)	0.0004 (1)			0.0004 (1)
$\gamma_{22,0}$(Ac)	501.28 (7)	0.00076 (18)			0.00076 (18)
$\gamma_{23,1}$(Ac)	509.63 (10)	0.00036 (17)			0.00036 (17)
$\gamma_{24,3}$(Ac)	516.45 (10)	0.00137 (15)			0.00137 (15)
$\gamma_{24,1}$(Ac)	535.43 (10)	0.00061 (12)			0.00061 (12)
$\gamma_{25,6}$(Ac)	546.5 (3)	0.00083 (13)			0.00083 (13)

	Energy keV	$P_{\gamma+ce}$ × 100	Multipolarity	α_T	P_γ × 100
$\gamma_{25,5}$(Ac)	571.9 (3)	0.00048 (20)			0.00048 (20)
$\gamma_{25,4}$(Ac)	582.3 (3)	0.00031 (17)			0.00031 (17)
$\gamma_{25,3}$(Ac)	610.1 (3)	0.0005 (4)			0.0005 (4)

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