^{200}At ε decay (43.1 s+47 s) 1998Bi06,1992Hu04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 192,1 (2023)	1-Aug-2023

Parent: ^{200}At: E=0; $J^\pi=(3^+)$; $T_{1/2}$=43.1 s *8*; Q(ε)=7954 *26*; %ε+%β^+ decay=48 *4*

Parent: ^{200}At: E=112.9 *29*; $J^\pi=(7^+)$; $T_{1/2}$=47 s *1*; Q(ε)=7954 *26*; %ε+%β^+ decay=57 *7*

1998Bi06: mass separated source produced using nat Re(^{20}Ne,xnγ) reaction at E(^{20}Ne)=200 MeV; Detectors: HPGE, LEPS, Si(Li); Measured: Eγ, Iγ, ce, γ, x and ce singles, γγ(t), γX(t), γce(t) and Xce(γ). Other: 1995Bi17.

1992Hu04: mass separated source produced using nat Re(^{20}Ne,xnγ) reaction; Detectors: Ge(Li), Si(Li), surface barrier detectors; Measured: Eγ, Iγ, ce, Eα, Iα, γ-ray singles.

The data of 1998Bi06 and 1992Hu04 are consistent with each other, except that the level reported at 1842 keV in 1992Hu04 was not confirmed in 1998Bi06.

The decay data for the ground state and the isomer cannot be separated, and no log *ft* values and absolute γ-ray emission probabilities are reported.

^{200}Po Levels

E(level)†	J^π‡	$T_{1/2}$	Comments
0	0^+	11.54 min *9*	$T_{1/2}$: From Adopted Levels.
665.90 *17*	2^+	2.01 ps *11*	$T_{1/2}$: From Adopted Levels.
1136.50 *20*	0^+		
1276.8 *3*	4^+		
1392.30 *17*	2^+		
1652.0 *3*	$(1,2,3)^+$		
1761.3 *3*	6^+		
1772.9 *4*	$(3,4,5)^+$		
1773.6 *4*	8^+	61 ns *3*	$T_{1/2}$: From Adopted Levels.
1776.2 *3*			
1791.4 *4*			
1811.2 *3*	5^-		
1850.5 *4*			
1883.1 *4*	$(3,4,5)^+$		
2085.5 *8*	$(6)^+$		J^π: From Adopted Levels.
2135.1 *4*	7^-		
2220.5 *4*	$(4,5,6)^-$		
2261.2 *4*	9^-	<2 ns	$T_{1/2}$: From Adopted Levels.
2329.7 *5*			
2337.5 *4*	$(7,8,9)^+$		
2360.5 *5*			
2414.4 *4*	$(5)^-$		
2461.6 *4*	$(5,6,7)^+$		
2462.0 *4*	$(4,5,6)^-$		

† From least-squares fit to Eγ.

‡ From 1998Bi06 (same as in Adopted Levels), unless otherwise stated.

γ(^{200}Po)

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α&	Comments
(12.3 *3*)		1773.6	8^+	1761.3	6^+	[E2]	4.9×10^4 *9*	α(M)=3.7×10^4 *7* α(N)=9.5×10^3 *17*; α(O)=1.80×10^3 *32*; α(P)=156 *28* E_γ: From adopted gammas.
125.7 *3*	0.3 *2*	2261.2	9^-	2135.1	7^-	E2@	2.77 *5*	α(K)=0.391 *6*; α(L)=1.761 *31*; α(M)=0.470 *8* α(N)=0.1203 *21*; α(O)=0.0229 *4*; α(P)=0.00208 *4* E_γ,I_γ: From adopted gammas.

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^{200}At ε decay (43.1 s+47 s) 1998Bi06,1992Hu04 (continued)

γ(^{200}Po) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
x264.8[#] 2	0.6[#] 1							
323.8 2	2.4 6	2135.1	7⁻	1811.2	5⁻	E2	0.1007 14	α(K)=0.0564 8; α(L)=0.0330 5; α(M)=0.00854 12 α(N)=0.002193 31; α(O)=0.000429 6; α(P)=4.34×10⁻⁵ 6 Mult.: α(K)exp=0.23 6, α(L)exp=0.047 13.
361.5 2	0.7 2	2135.1	7⁻	1773.6	8⁺	(E1)[@]	0.02057 29	α(K)=0.01683 24; α(L)=0.00286 4; α(M)=0.000671 9 α(N)=0.0001713 24; α(O)=3.52×10⁻⁵ 5; α(P)=4.30×10⁻⁶ 6
373.8 2	7.1 7	2135.1	7⁻	1761.3	6⁺	E1	0.01911 27	α(K)=0.01564 22; α(L)=0.00265 4; α(M)=0.000621 9 α(N)=0.0001586 22; α(O)=3.26×10⁻⁵ 5; α(P)=3.99×10⁻⁶ 6 Mult.: α(K)exp<0.09.
409.3 2	2.5 4	2220.5	(4,5,6)⁻	1811.2	5⁻	M1+E2	0.14 8	α(K)=0.11 7; α(L)=0.023 8; α(M)=0.0054 18 α(N)=0.0014 5; α(O)=2.9×10⁻⁴ 10; α(P)=3.5×10⁻⁵ 15 Mult.: α(K)exp=0.15 5.
484.4 2	48 4	1761.3	6⁺	1276.8	4⁺	E2	0.0346 5	α(K)=0.02365 33; α(L)=0.00826 12; α(M)=0.002081 29 α(N)=0.000534 8; α(O)=0.0001065 15; α(P)=1.162×10⁻⁵ 16 Mult.: α(K)exp=0.0239, α(L)exp=0.00838.
488.4 2	1.8 6	2261.2	9⁻	1773.6	8⁺	(E1)[@]	0.01078 15	α(K)=0.00887 12; α(L)=0.001460 20; α(M)=0.000342 5 α(N)=8.73×10⁻⁵ 12; α(O)=1.802×10⁻⁵ 25; α(P)=2.236×10⁻⁶ 31
496.3 2	2.2 6	1772.9	(3,4,5)⁺	1276.8	4⁺	M1(+E2)	0.08 5	α(K)=0.06 4; α(L)=0.013 5; α(M)=0.0031 12 α(N)=8.0×10⁻⁴ 31; α(O)=1.7×10⁻⁴ 7; α(P)=2.0×10⁻⁵ 10 Mult.: α(K)exp=0.11 4.
514.6 2	4.5 6	1791.4		1276.8	4⁺			
518.5 3	1.5 4	2329.7		1811.2	5⁻			
534.3 2	16 3	1811.2	5⁻	1276.8	4⁺	E1	0.00896 13	α(K)=0.00738 10; α(L)=0.001206 17; α(M)=0.000282 4 α(N)=7.20×10⁻⁵ 10; α(O)=1.488×10⁻⁵ 21; α(P)=1.855×10⁻⁶ 26 Mult.: α(K)exp=0.0075 14; Other: α(K)exp in 1992Hu04.
549.3 3	0.7 3	2360.5		1811.2	5⁻			
564.6 2	13 3	2337.5	(7,8,9)⁺	1773.6	8⁺	M1	0.0924 13	α(K)=0.0754 11; α(L)=0.01296 18; α(M)=0.00305 4 α(N)=0.000784 11; α(O)=0.0001642 23; α(P)=2.126×10⁻⁵ 30 Mult.: α(K)exp=0.09 2, α(L)exp=0.014 3; Other: α(K)exp in 1992Hu04. E_γ: This transition is observed to be delayed with $T_{1/2}$≈72 ns using 564.6γ(t) (1998Bi06).
573.7 2	0.9 3	1850.5		1276.8	4⁺			

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^{200}At ε decay (43.1 s+47 s) 1998Bi06,1992Hu04 (continued)

γ(^{200}Po) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[&]	Comments
603.2 *2*	0.6 *2*	2414.4	$(5)^-$	1811.2	5^-	E0+M1+E2		Mult.: α(K)exp=0.15 *4*, α(L)exp=0.08 *3*.
606.3 *2*	1.1 *4*	1883.1	$(3,4,5)^+$	1276.8	4^+	M1+E2	0.049 *28*	α(K)=0.039 *24*; α(L)=0.0075 *33*; α(M)=0.0018 *7* α(N)=4.6×10^{-4} *19*; α(O)=9.E−5 *4*; α(P)=1.2×10^{-5} *6* Mult.: α(K)exp=0.06 *2*.
610.9 *2*	84 *8*	1276.8	4^+	665.90	2^+	E2	0.02027 *28*	α(K)=0.01480 *21*; α(L)=0.00413 *6*; α(M)=0.001022 *14* α(N)=0.000263 *4*; α(O)=5.29×10^{-5} *7*; α(P)=6.02×10^{-6} *8* Mult.: α(L)exp=0.00418; Other: α(K)exp in 1992Hu04.
650.8 *2*	1.2 *2*	2462.0	$(4,5,6)^-$	1811.2	5^-	M1+E2	0.041 *23*	α(K)=0.032 *19*; α(L)=0.0062 *27*; α(M)=0.0015 *6* α(N)=3.8×10^{-4} *16*; α(O)=7.8×10^{-5} *34*; α(P)=1.0×10^{-5} *5* Mult.: α(K)exp=0.033 *7*.
[x]659.6[#] *3*	0.3[#] *1*							
665.9 *2*	100	665.90	2^+	0	0^+	E2	0.01680 *24*	α(K)=0.01250 *18*; α(L)=0.00325 *5*; α(M)=0.000800 *11* α(N)=0.0002054 *29*; α(O)=4.15×10^{-5} *6*; α(P)=4.79×10^{-6} *7* Mult.: α(K)exp=0.0126, α(L)exp=0.00329; Other: α(K)exp in 1992Hu04.
700.3 *2*	1.0 *6*	2461.6	$(5,6,7)^+$	1761.3	6^+	M1	0.0524 *7*	α(K)=0.0429 *6*; α(L)=0.00732 *10*; α(M)=0.001721 *24* α(N)=0.000443 *6*; α(O)=9.27×10^{-5} *13*; α(P)=1.201×10^{-5} *17* Mult.: α(K)exp=0.09 *5*.
726.4 *2*	1.4 *2*	1392.30	2^+	665.90	2^+	E0+M1+E2		Mult.: α(K)exp=0.11 *3*.
808.7 *7*	2.9 *4*	2085.5	$(6)^+$	1276.8	4^+	E2	0.01120 *16*	α(K)=0.00862 *12*; α(L)=0.001957 *28*; α(M)=0.000476 *7* α(N)=0.0001222 *17*; α(O)=2.492×10^{-5} *35*; α(P)=2.96×10^{-6} *4* Mult.: α(K)exp=0.009 *2*.
986.1 *2*	3.0 *6*	1652.0	$(1,2,3)^+$	665.90	2^+	M1+E2	0.015 *7*	α(K)=0.012 *6*; α(L)=0.0021 *9*; α(M)=5.0×10^{-4} *20* α(N)=1.3×10^{-4} *5*; α(O)=2.7×10^{-5} *11*; α(P)=3.4×10^{-6} *15* Mult.: α(K)exp=0.011 *3*.
1110.3 *2*	1.1 *2*	1776.2		665.90	2^+			
(1136.5 *2*)		1136.50	0^+	0	0^+	E0		E_γ: No γ ray was observed. The energy determined from the observed ce-K line in 1998Bi06. Mult.: α(K)exp>0.08.
[x]1177.1[#] *5*	1.4[#] *2*							
1392.3 *2*	1.2 *4*	1392.30	2^+	0	0^+	[E2]	0.00397 *6*	α(K)=0.00318 *4*; α(L)=0.000572 *8*; α(M)=0.0001355 *19* α(N)=3.48×10^{-5} *5*;

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^{200}At ε decay (43.1 s+47 s) 1998Bi06,1992Hu04 (continued)

γ(^{200}Po) (continued)

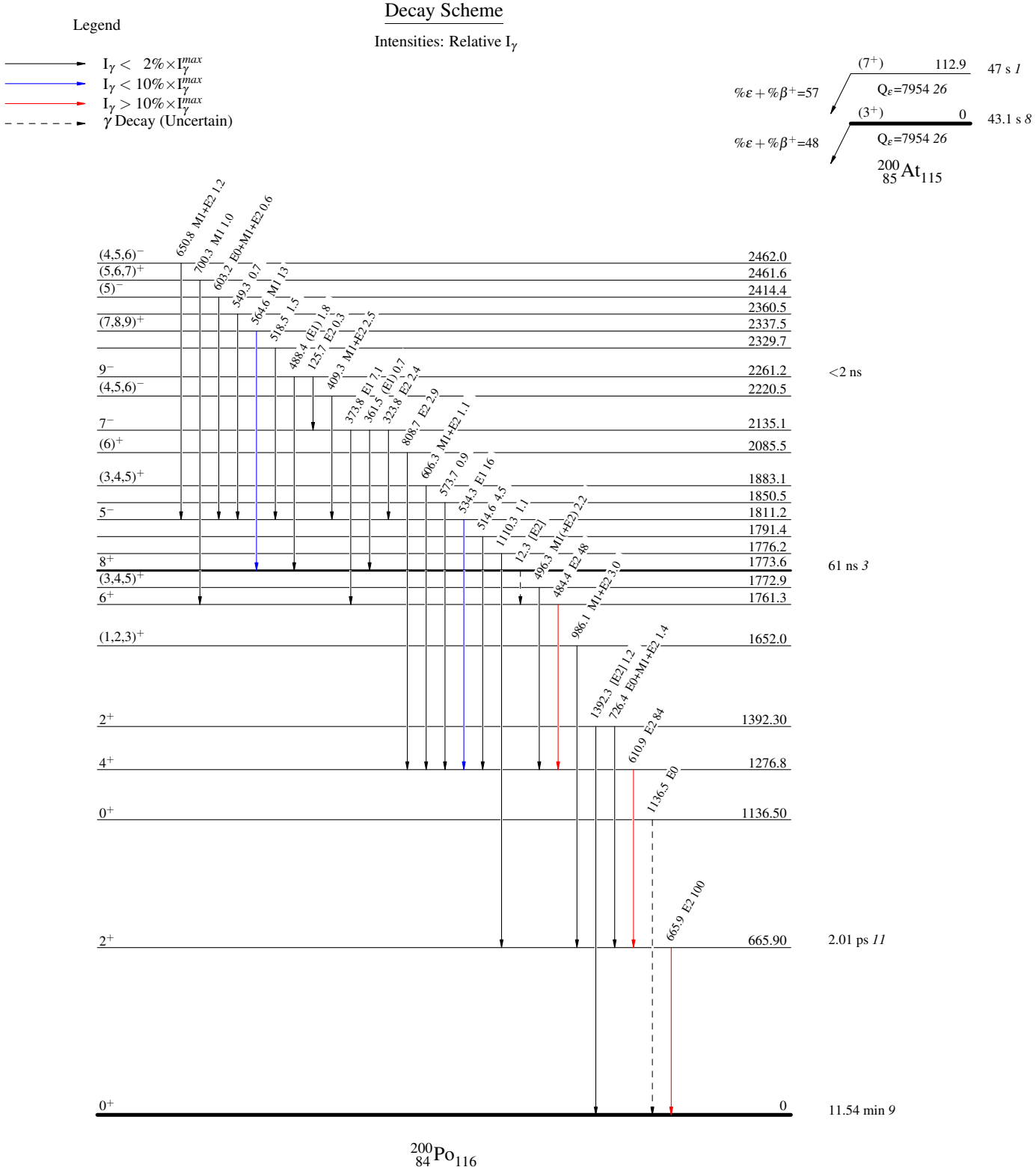
E_γ [†]	E_i(level)	Comments
		α(O)=7.21×10^{-6} *10*; α(P)=9.04×10^{-7} *13*; α(IPF)=3.32×10^{-5} *5*

† From 1998Bi06, unless otherwise stated. Iγ are a mixture of the ^{200}At g.s. (J^π=(3$^+$)) and ^{200}At isomer (J^π=(7$^+$)) ε decay intensities and, hence, no unambiguous normalization of the decay scheme can be achieved.
‡ From α(K)exp and α(L)exp in 1998Bi06.
# From 1992Hu04, but not reported in 1998Bi06.
@ From adopted gammas.
& Additional information 1.
x γ ray not placed in level scheme.

^{200}At ε decay (43.1 s+47 s) 1998Bi06,1992Hu04

Decay Scheme

Intensities: Relative I_γ



$^{200}_{84}Po_{116}$