^{181}Pt ε decay 1992Sa03

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	S. -c. Wu	NDS 106, 367 (2005)	31-Aug-2005

Parent: ^{181}Pt: E=0.0; J$^\pi$=1/2$^-$; $T_{1/2}$=52.0 s *22*; Q(ε)=5097 *30*; %ε+%β^+ decay≈99.9

1992Sa03: ^{181}Pt activity from ε-decay of ^{181}Au, produced by 200 MeV protons on Pt; Ge(HP) detectors, Si(Li) detector with mini-orange spectrometer; measured Eγ, Iγ, I(ce), $\gamma\gamma$(t). ICC; γ-multipolarity, level J^π determined. Supersedes 1984Bo32.

Partial level scheme deduced by authors (1992Sa03).

^{181}Ir Levels

E(level)	J$^\pi$†	E(level)	J$^\pi$†	E(level)	J$^\pi$†
0.0	5/2$^-$	440.61 *19*	(3/2$^+$,5/2$^+$)	980.20 *18*	
24.9 *3*	9/2$^-$	447.57 *12*	(3/2)$^-$	1016.45? *18*	
111.97 *10*	(1/2)$^-$	492.18 *17*	(5/2$^-$,7/2,9/2$^-$)	1551.73 *14*	1/2$^-$,3/2$^-$
243.12 *11*	(3/2,5/2)$^-$	568.82? *25*		1555.2 *3*	
289.38 *19*	5/2$^+$	591.18 *12*	(1/2,3/2,5/2)$^-$	1667.68 *16*	1/2$^-$,3/2$^-$
298.92 *14*	(3/2)$^+$	645.91 *13*	(1/2$^-$,3/2$^-$,5/2$^-$)	1680.75 *15*	1/2$^-$,3/2$^-$
310.19 *20*	7/2$^-$	825.75 *23*	(1/2,3/2)$^-$	1698.90 *15*	1/2$^-$,3/2$^-$
342.13 *13*	(1/2$^+$,3/2$^+$)	829.58 *18*		1749.91 *13*	1/2$^-$,3/2$^-$
393.6 *4*	7/2$^+$	832.12 *16*		1774.2 *3*	

† From Adopted Levels.

ε,β^+ radiations

E(decay)	E(level)	Log *ft*	I($\varepsilon+\beta^+$)†‡	Comments
(3.35×10^3 *3*)	1749.91	≈5.1	12.6 *8*	
(3.40×10^3 *3*)	1698.90	≈5.3	8.9 *8*	
(3.42×10^3 *3*)	1680.75	≈5.7	3.2 *3*	
(3.43×10^3 *3*)	1667.68	≈5.5	5.4 *2*	
(3.55×10^3 *3*)	1551.73	≈5.2	12.1 *10*	
(4.81×10^3 *3*)	289.38	≈7.4^{1u}	13 *2*	Log *ft*: low log *ft* inconsistent with expected first-forbidden decay.
(4.99×10^3 *3*)	111.97	≈5.5	19 *3*	

† From intensity balance. Only intense, low log *ft* branches are reported here to determine spins of levels fed by allowed decay. Large Q(β^-) value suggests significant unplaced transition intensity.

‡ For absolute intensity per 100 decays, multiply by ≈0.9992.

γ(^{181}Ir)

E_γ	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult.†	δ†	α@	Comments
24.9 *3*		24.9	9/2⁻	0.0	5/2⁻	[E2]			
98.6 *3*	4.0 *6*	440.61	(3/2⁺,5/2⁺)	342.13	(1/2⁺,3/2⁺)	M1,E2		5.8 *8*	α(K)= 3.1 *23*; α(L)= 2.0 *11*; α(M)= 0.5 *3*; α(N+..)= 0.15 *9* Mult.: from coincidence intensities, α>4.
98.9& *3*	≈2.5	342.13	(1/2⁺,3/2⁺)	243.12	(3/2,5/2)⁻				
104.2 *3*	≈2	393.6	7/2⁺	289.38	5/2⁺				
112.2 *2*	100	111.97	(1/2)⁻	0.0	5/2⁻	E2		2.95	α(K)= 0.647; α(L)= 1.72; α(M)= 0.442; α(N+..)= 0.134 Mult.: α(L)exp=1.7 *6*.
128.3& *3*	3.8 *6*	568.82?		440.61	(3/2⁺,5/2⁺)				
131.3 *2*	16 *2*	243.12	(3/2,5/2)⁻	111.97	(1/2)⁻				
144 *1*	≈2	591.18	(1/2,3/2,5/2)⁻	447.57	(3/2)⁻				
182.1 *3*	1.4 *2*	492.18	(5/2⁻,7/2,9/2⁻)	310.19	7/2⁻				
186.8 *3*	5.6 *8*	298.92	(3/2)⁺	111.97	(1/2)⁻				
198.6 *3*	≈9‡	645.91	(1/2⁻,3/2⁻,5/2⁻)	447.57	(3/2)⁻				
204.6 *3*	1.0 *2*	447.57	(3/2)⁻	243.12	(3/2,5/2)⁻				
226.6& *3*	2.1 *3*	568.82?		342.13	(1/2⁺,3/2⁺)				
230.2 *2*	92 *14*	342.13	(1/2⁺,3/2⁺)	111.97	(1/2)⁻	(E1)			Mult.: reported as E1 from α(K)exp measurement, value not given in 1992Sa03.
243.2 *2*	61 *9*	243.12	(3/2,5/2)⁻	0.0	5/2⁻	M1+E2	0.7 *6*	0.41 *10*	α(K)= 0.32 *10*; α(L)= 0.066 *17*; α(M)= 0.016 *4*; α(N+..)= 0.00476 *12* Mult.: α(K)exp=0.33 *10*, α(L)exp=0.06 *2*.
249.1 *3*	4.6 *7*	492.18	(5/2⁻,7/2,9/2⁻)	243.12	(3/2,5/2)⁻				
285.3 *3*	5.4 *8*	310.19	7/2⁻	24.9	9/2⁻	M1(+E2)	<1.6	0.25 *11*	α(K)= 0.2 *1*; α(L)= 0.040 *17*; α(M)= 0.009 *4*; α(N+..)= 0.0029 *4* Mult.: α(K)exp=0.23 *10*.
289.4 *2*	100‡ *15*	289.38	5/2⁺	0.0	5/2⁻	E1		0.0276	α(K)= 0.0229; α(L)= 0.00365; α(M)= 0.000836; α(N+..)= 0.000249 Mult.: α(K)exp=0.022 *10*.
298.9 *2*	12 *2*	298.92	(3/2)⁺	0.0	5/2⁻	E1		0.0256	α(K)= 0.0212; α(L)= 0.00337; α(M)= 0.000772; α(N+..)= 0.000230 Mult.: α(K)exp=0.023 *10*. α(K)exp inconsistent with apparent large β feeding.
310.2 *3*	8.5 *13*	310.19	7/2⁻	0.0	5/2⁻	[M1+E2]		0.17 *9*	
335.6 *2*	28 *4*	447.57	(3/2)⁻	111.97	(1/2)⁻	(M1)		0.215	α(K)= 0.177; α(L)= 0.0286; α(M)= 0.00656; α(N+..)= 0.00200 Mult.: α(K)exp(336+impurity)=0.18 *4*.
ˣ341.6 *3*	3.7 *6*								
348.3 *2*	24 *4*	591.18	(1/2,3/2,5/2)⁻	243.12	(3/2,5/2)⁻	M1		0.194	α(K)= 0.161; α(L)= 0.0259; α(M)= 0.00593; α(N+..)= 0.00181 Mult.: α(K)exp=0.19 *6*.

γ(^{181}Ir) (continued)

Eγ	Iγ	Ei(level)	Jπi	Ef	Jπf	Mult.†	δ†	α@	Comments
370.7& 3	4.9 7	1016.45?		645.91	(1/2⁻,3/2⁻,5/2⁻)				
402.7 3	≈18‡	645.91	(1/2⁻,3/2⁻,5/2⁻)	243.12	(3/2,5/2)⁻	(M1)		0.132	α(K)= 0.109; α(L)= 0.0175; α(M)= 0.00401; α(N+..)= 0.00123 Mult.: α(L)exp(403+impurity)=0.024 7.
440.5& 3	7.0 11	440.61	(3/2⁺,5/2⁺)	0.0	5/2⁻				
447.5 2	13 2	447.57	(3/2)⁻	0.0	5/2⁻	M1+E2	<1.1	0.08 3	α(K)= 0.07 3; α(L)= 0.011 4; α(M)= 0.0026 10; α(N+..)= 0.00081 21 Mult.: α(K)exp=0.08 3.
479.2 2	26 4	591.18	(1/2,3/2,5/2)⁻	111.97	(1/2)⁻				
ˣ480.9 3	≤10‡								
489.8 3	7.5 11	832.12		342.13	(1/2⁺,3/2⁺)				
492.0& 3	≤10‡	492.18	(5/2⁻,7/2,9/2⁻)	0.0	5/2⁻				
519.3 3	4.6 7	829.58		310.19	7/2⁻				
ˣ524.2 2	12‡ 2								
533.2 2	24 4	832.12		298.92	(3/2)⁺				
533.8 2	36 5	645.91	(1/2⁻,3/2⁻,5/2⁻)	111.97	(1/2)⁻				
539.5 3	≈4	980.20		440.61	(3/2⁺,5/2⁺)				
543 1	≈3	832.12		289.38	5/2⁺				
568.8& 3	6.5 10	1016.45?		447.57	(3/2)⁻				
582.7 3	8.6 13	825.75	(1/2,3/2)⁻	243.12	(3/2,5/2)⁻	M1+E2	1.2 +12−5	0.030 5	α(K)= 0.024 4; α(L)= 0.0044 7 Mult.: α(K)exp=0.025 8.
586.4 3	4.2 6	829.58		243.12	(3/2,5/2)⁻				
591.0 2	24‡ 4	591.18	(1/2,3/2,5/2)⁻	0.0	5/2⁻	M1,E2			Mult.: α(K)exp=0.034 20.
ˣ621.9 3	4.0 6								
638.1 3	5.8 9	980.20		342.13	(1/2⁺,3/2⁺)				
691& 1	5.8 9	980.20		289.38	5/2⁺				
713.7 3	4.6 7	825.75	(1/2,3/2)⁻	111.97	(1/2)⁻	M1(+E2+E0)		0.16 6	Mult.: α(K)exp=0.12 4, inconsistent with low multipolarity, unless E0 component is present in this transition.
722.2 3	5.6 8	1551.73	1/2⁻,3/2⁻	829.58					
733.5& 2	13 2	1749.91	1/2⁻,3/2⁻	1016.45?					
ˣ738.8 3	8.9 13								
769.7 2	11 2	1749.91	1/2⁻,3/2⁻	980.20					
ˣ773.5 3	≤5								
ˣ828.8 3	2.8 4								
869.1 3	9.6 14	1698.90	1/2⁻,3/2⁻	829.58					
905.7 2	42 6	1551.73	1/2⁻,3/2⁻	645.91	(1/2⁻,3/2⁻,5/2⁻)	M1		0.0162	α(K)= 0.0134; α(L)= 0.00210 Mult.: α(K)exp=0.015 4.
917.7 2	19 3	1749.91	1/2⁻,3/2⁻	832.12					
960.6 2	29 4	1551.73	1/2⁻,3/2⁻	591.18	(1/2,3/2,5/2)⁻				

$^{181}_{77}$Ir$_{104}$-3

$\gamma(^{181}$Ir) (continued)

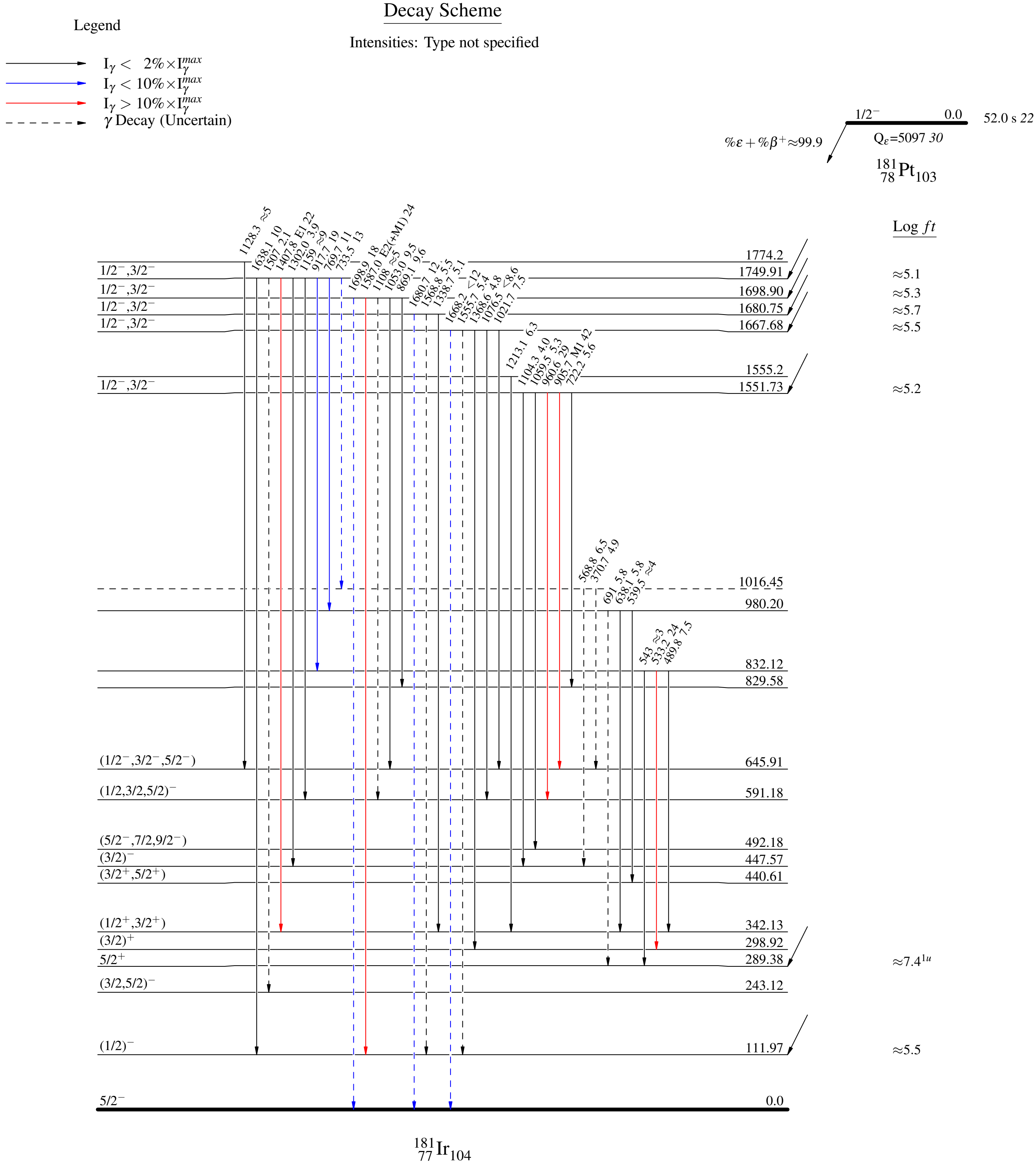
E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ[†]	α[@]	Comments
1021.7 3	7.5 11	1667.68	1/2$^-$,3/2$^-$	645.91	(1/2$^-$,3/2$^-$,5/2$^-$)				
1053.0 3	9.5 14	1698.90	1/2$^-$,3/2$^-$	645.91	(1/2$^-$,3/2$^-$,5/2$^-$)				
1059.5 3	5.3 8	1551.73	1/2$^-$,3/2$^-$	492.18	(5/2$^-$,7/2,9/2$^-$)				
1076.5 3	≤8.6	1667.68	1/2$^-$,3/2$^-$	591.18	(1/2,3/2,5/2)$^-$				
[x]1079.5 3	3.4 5								
1104.3 3	4.0 6	1551.73	1/2$^-$,3/2$^-$	447.57	(3/2)$^-$				
1108[&] 1	≈5	1698.90	1/2$^-$,3/2$^-$	591.18	(1/2,3/2,5/2)$^-$				
1128.3 3	≈5[‡]	1774.2		645.91	(1/2$^-$,3/2$^-$,5/2$^-$)				
1159 1	≈9[‡]	1749.91	1/2$^-$,3/2$^-$	591.18	(1/2,3/2,5/2)$^-$				
1213.1 3	6.3 9	1555.2		342.13	(1/2$^+$,3/2$^+$)				
1302.0 3	3.9 6	1749.91	1/2$^-$,3/2$^-$	447.57	(3/2)$^-$				
[x]1309.2 3	≤28								
1338.7 3	5.1 8	1680.75	1/2$^-$,3/2$^-$	342.13	(1/2$^+$,3/2$^+$)				
[x]1354.7 3	5.0 8								
1368.6 3	4.8 7	1667.68	1/2$^-$,3/2$^-$	298.92	(3/2)$^+$				
1407.8 2	22 3	1749.91	1/2$^-$,3/2$^-$	342.13	(1/2$^+$,3/2$^+$)	E1			Mult.: α(K)exp≈0.0012.
1507[&] 1	2.1 3	1749.91	1/2$^-$,3/2$^-$	243.12	(3/2,5/2)$^-$				
1555.7[&] 3	5.4 8	1667.68	1/2$^-$,3/2$^-$	111.97	(1/2)$^-$				
1568.8[&] 3	5.5 8	1680.75	1/2$^-$,3/2$^-$	111.97	(1/2)$^-$				
1587.0 2	24 4	1698.90	1/2$^-$,3/2$^-$	111.97	(1/2)$^-$	E2(+M1)	>0.4	0.0025 7	α(K)= 0.0025 7 Mult.: α(K)exp=0.0022 10.
1638.1 2	10 2	1749.91	1/2$^-$,3/2$^-$	111.97	(1/2)$^-$				
1668.2[#&] 3	<12[#]	1667.68	1/2$^-$,3/2$^-$	0.0	5/2$^-$				
1680.7[&] 2	12 2	1680.75	1/2$^-$,3/2$^-$	0.0	5/2$^-$				
1698.9[&] 2	18 3	1698.90	1/2$^-$,3/2$^-$	0.0	5/2$^-$				

[†] From conversion coefficients, values given in comments.
[‡] Mixed with impurity from ^{181}Au decay. Intensity derived from coincidence data.
[#] Doublet, energy and intensity separated by author.
[@] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.
[&] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{181}Pt ε decay 1992Sa03

Decay Scheme

Intensities: Type not specified



^{181}Pt ε decay 1992Sa03

Decay Scheme (continued)

Intensities: Type not specified