^{150}Pr β^- decay (6.19 s) 1986Fo05,1988Ka14

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

Parent: ^{150}Pr: E=0.0; $J^\pi=(1)^-$; $T_{1/2}$=6.19 s *16*; $Q(\beta^-)$=5379 *9*; $\%\beta^-$ decay=100.0

1986Fo05: 6.1-s ^{150}Pr was mass-separated following ^{235}U(n,f) reaction with thermal neutrons using OSIRIS facility;γ-γ experiments were performed using HPGe detectors.

1988Ka14: ^{150}Pr was obtained by ^{235}U(n,f) reaction and on-line mass spearation using helium-jet coupled mass separator helios facility.

Others: 1970Wa37, 1976Sk04.

^{150}Nd Levels

E(level)[†]	J^π[a]	$T_{1/2}$	Comments
0.0[‡]	0^+	0.91×10^{19} y *7*	
130.22[‡] *8*	2^+		
381.46[‡] *11*	4^+		
675.38[#] *16*	0^+		
850.72[#] *11*	2^+		
852.91[@] *10*	1^-		
934.84[@] *11*	3^-		
1061.95[&] *10*	2^+		
1182.28 *18*	≤2	<0.5 ns	$T_{1/2}$: from 1986Fo05.
1200.64 *15*	$3^{(+)}$		
1283.81 *13*	(1^-)	<0.5 ns	$T_{1/2}$: from 1986Fo05.
1435.16 *16*	4^+		
1545.20 *21*	3^-		
1714.3 *3*			
1738.3 *4*	0^+		
1911.5 *4*	0 to 4		
1967.5 *4*			
1994.18 *18*			
2009.27 *12*	$(1^-,2,3^-)$		
2069.18 *12*	2^+		
2496.2 *10*	(1^-)		
2539.2 *10*			
2837.2 *10*			

[†] From least squares fit to all photons in decay scheme.
[‡] Band(A): Assumed member of g.s. rotational band. See Adopted Levels.
[#] Band(B): Assumed member of K=0 β band. See Adopted Levels.
[@] Band(C): Assumed member of K=0 octupole band. See Adopted Levels.
[&] Band(D): Assumed member of γ-vibrational band. See Adopted Levels.
[a] From Adopted Levels.

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β^- radiations

E(decay)	E(level)	I$\beta^{-\dagger}$	Log *ft*	Comments
(2542 *9*)	2837.2	0.10 *5*	7.00 *22*	av Eβ=1013.6 *42*
(2840 *9*)	2539.2	0.10 *5*	7.20 *22*	av Eβ=1149.6 *42*
(2883 *9*)	2496.2	0.16 *10*	7.0 *3*	av Eβ=1169.3 *42*
(3310 *9*)	2069.18	5.8 *24*	5.71 *18*	av Eβ=1365.7 *42*
(3370 *9*)	2009.27	5.8 *24*	5.74 *18*	av Eβ=1393.3 *42*
(3385 *9*)	1994.18	5.3 *22*	5.79 *18*	av Eβ=1400.3 *42*
(3412 *9*)	1967.5	0.22 *12*	7.19 *24*	av Eβ=1412.6 *42*
(3468 *9*)	1911.5	0.19 *10*	7.28 *23*	av Eβ=1438.5 *42*
(3641 *9*)	1738.3	0.22 *12*	7.31 *24*	av Eβ=1518.6 *42*
(3665 *9*)	1714.3	0.32 *15*	7.16 *21*	av Eβ=1529.7 *42*
(3834 *9*)	1545.20	0.6 *3*	6.97 *22*	av Eβ=1608.1 *42*
(3944 *9*)	1435.16	0.6 *3*	7.02 *22*	av Eβ=1659.1 *42*
(4095 *9*)	1283.81	2.1 *9*	6.54 *19*	av Eβ=1729.4 *42*
(4178 *9*)	1200.64	0.7 *3*	8.71[1u] *19*	av Eβ=1745.2 *42*
(4197 *9*)	1182.28	1.8 *8*	6.66 *20*	av Eβ=1776.5 *42*
(4317 *9*)	1061.95	1.4 *6*	6.82 *19*	av Eβ=1832.5 *42*
(4444 *9*)	934.84	1.4 *7*	6.87 *22*	av Eβ=1891.6 *42*
(4526 *9*)	852.91	2.1 *11*	6.73 *23*	av Eβ=1929.7 *42*
(4528 *9*)	850.72	3.7 *16*	6.48 *19*	av Eβ=1930.7 *42*
(4704 *9*)	675.38	2.3 *10*	6.76 *19*	av Eβ=2012.3 *42*
(4998 *9*)	381.46	0.8 *4*	7.33 *22*	av Eβ=2149.1 *42*
(5249 *9*)	130.22	33 *14*	5.81 *19*	av Eβ=2266.1 *42*
(5379 *9*)	0.0	≈30	≈5.9	av Eβ=2326.7 *42*

† Absolute intensity per 100 decays.

γ(^{150}Nd)

Iγ normalization: Based on an observation in 1986Fo05 that the g.s. transition of the ^{150}Pr β-decay probably does not exceed 50%. The authors arbitrarily assume the g.s. β-decay to be 30% in calculating log *ft* values.
Eγ, Iγ from 1986Fo05.

E_γ	I_γ[†&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[a]	Comments
130.23 *10*	100 *5*	130.22	2+	0.0	0+	[E2]	0.857	α(K)=0.552 *8*; α(L)=0.238 *4*; α(M)=0.0537 *8*; α(N)=0.01166 *17*; α(O)=0.001532 *22* α(P)=2.55×10^{-5} *4*; α(N+..)=0.01322 *19*
174.3[‡] *5*	0.20[‡] *15*	850.72	2+	675.38	0+	[E2]	0.312 *6*	α(K)=0.223 *4*; α(L)=0.0695 *13*; α(M)=0.0155 *3*; α(N)=0.00339 *7*; α(O)=0.000455 *9* α(P)=1.102×10^{-5} *18*; α(N+..)=0.00385 *7* E_γ: reported by 1986Fo05.
234.41 *15*	0.33 *7*	1435.16	4+	1200.64	3(+)			
251.24 *10*	9.5 *5*	381.46	4+	130.22	2+	[E2]	0.0922	α(K)=0.0712 *10*; α(L)=0.01646 *24*; α(M)=0.00363 *6*; α(N)=0.000795 *12* α(O)=0.0001102 *16*; α(P)=3.79×10^{-6} *6*; α(N+..)=0.000909 *13*
329.37 *15*	5.7 *4*	1182.28	≤2	852.91	1−			
349.02 *15*	2.7 *2*	1283.81	(1−)	934.84	3−			
373.44 *20*	3.0 *3*	1435.16	4+	1061.95	2+			
431.00 *15*	3.8 *2*	1283.81	(1−)	852.91	1−			
432.79[#b] *20*	1.9 *2*	1283.81	(1−)	850.72	2+			

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^{150}Pr β^- decay (6.19 s) 1986Fo05,1988Ka14 (continued)

$\gamma(^{150}Nd)$ (continued)

E_γ	I_γ [†&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α [a]	Comments
469.19 *20*	3.32 *12*	850.72	2+	381.46	4+	[E2]	0.01400	α(K)=0.01154 *17*; α(L)=0.00193 *3*; α(M)=0.000417 *6*; α(N)=9.23×10^{-5} *13*; α(O)=1.342×10^{-5} *19* α(P)=6.73×10^{-7} *10*; α(N+..)=0.0001064 *15*
545.06 *15*	7.2 *3*	675.38	0+	130.22	2+	[E2]	0.00936	α(K)=0.00779 *11*; α(L)=0.001237 *18*; α(M)=0.000266 *4*; α(N)=5.90×10^{-5} *9*; α(O)=8.65×10^{-6} *13* α(P)=4.60×10^{-7} *7*; α(N+..)=6.81×10^{-5} *10*
553.48 *15*	4.0 *3*	934.84	3−	381.46	4+			
634.1	≈0.8	2069.18	2+	1435.16	4+			E_γ: from 1988Ka14; not seen by 1985Fo05.
680.5[@] *3*	0.49 *10*	1061.95	2+	381.46	4+			
720.53 *15*	14.3 *12*	850.72	2+	130.22	2+			
722.75 *15*	21.8 *12*	852.91	1−	130.22	2+			
804.67 *15*	10.3 *5*	934.84	3−	130.22	2+			
819.10[@] *20*	0.42 *10*	1200.64	3(+)	381.46	4+			
850.5 *4*	1.4 *4*	850.72	2+	0.0	0+	[E2]	0.00319	α(K)=0.00271 *4*; α(L)=0.000383 *6*; α(M)=8.14×10^{-5} *12*; α(N)=1.81×10^{-5} *3*; α(O)=2.72×10^{-6} *4* α(P)=1.633×10^{-7} *23*; α(N+..)=2.10×10^{-5} *3*
852.91 *15*	19.0 *10*	852.91	1−	0.0	0+			
[x]912.5 *3*	0.49 *10*							
931.78 *15*	8.4 *3*	1061.95	2+	130.22	2+			
947.30 *15*	4.1 *2*	2009.27	(1−,2,3−)	1061.95	2+			
1007.16 *15*	5.4 *3*	2069.18	2+	1061.95	2+			
1061.96 *15*	8.4 *3*	1061.95	2+	0.0	0+			
1070.30 *20*	2.0 *2*	1200.64	3(+)	130.22	2+			
1074.52 *15*	7.2 *4*	2009.27	(1−,2,3−)	934.84	3−			
1141.26 *15*	16.5 *8*	1994.18		852.91	1−			
1156.1 *3*	1.8 *3*	2009.27	(1−,2,3−)	852.91	1−			
1158.56 *20*	4.3 *3*	2009.27	(1−,2,3−)	850.72	2+			
1216.27 *20*	6.4 *3*	2069.18	2+	852.91	1−			
1218.48 *20*	3.2 *3*	2069.18	2+	850.72	2+			
1414.97 *20*	1.9 *2*	1545.20	3−	130.22	2+			
1584.1 *3*	1.0 *2*	1714.3		130.22	2+			
1608.1 *4*	0.7 *2*	1738.3	0+	130.22	2+			
1781.3 *4*	0.6 *2*	1911.5	0 to 4	130.22	2+			
1837.3 *4*	0.7 *2*	1967.5		130.22	2+			
1878.9 *3*	0.70 *10*	2009.27	(1−,2,3−)	130.22	2+			
1939.0 *3*	1.7 *2*	2069.18	2+	130.22	2+			
2366.0[‡] *10*	0.5[‡] *2*	2496.2	(1−)	130.22	2+			
2409.0[‡] *10*	0.3[‡] *1*	2539.2		130.22	2+			
2707.0[‡] *10*	0.3[‡] *1*	2837.2		130.22	2+			

[†] Normalized to 100 for 2+ to 0+ 130.2-keV transition.
[‡] From γγ.
[#] Probably due to an impurity.
[@] Not seen by 1988Ka14.
[&] For absolute intensity per 100 decays, multiply by 0.326.
[a] 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.

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^{150}Pr β^- decay (6.19 s) 1986Fo05,1988Ka14 (continued)

γ(^{150}Nd) (continued)

[b] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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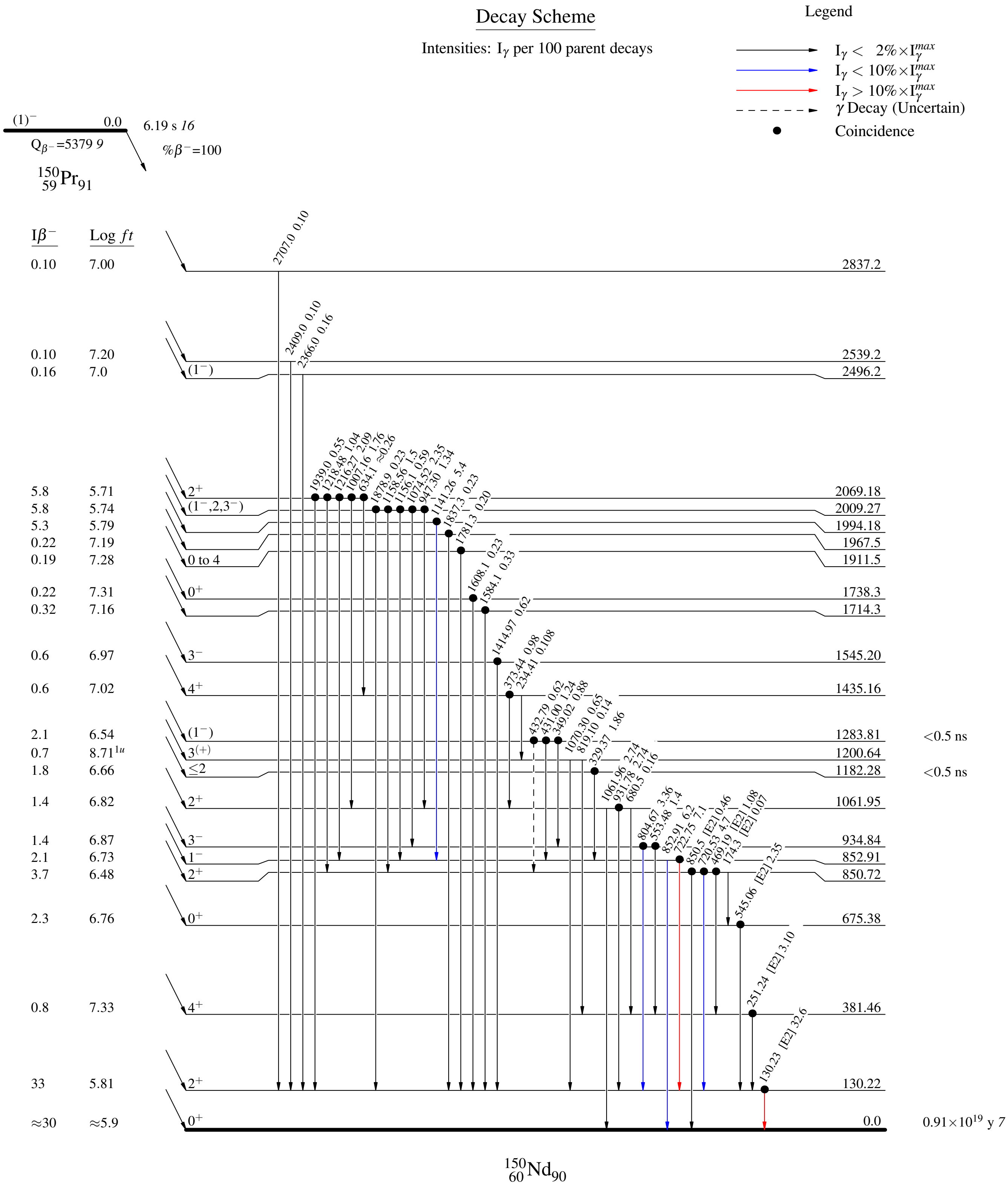

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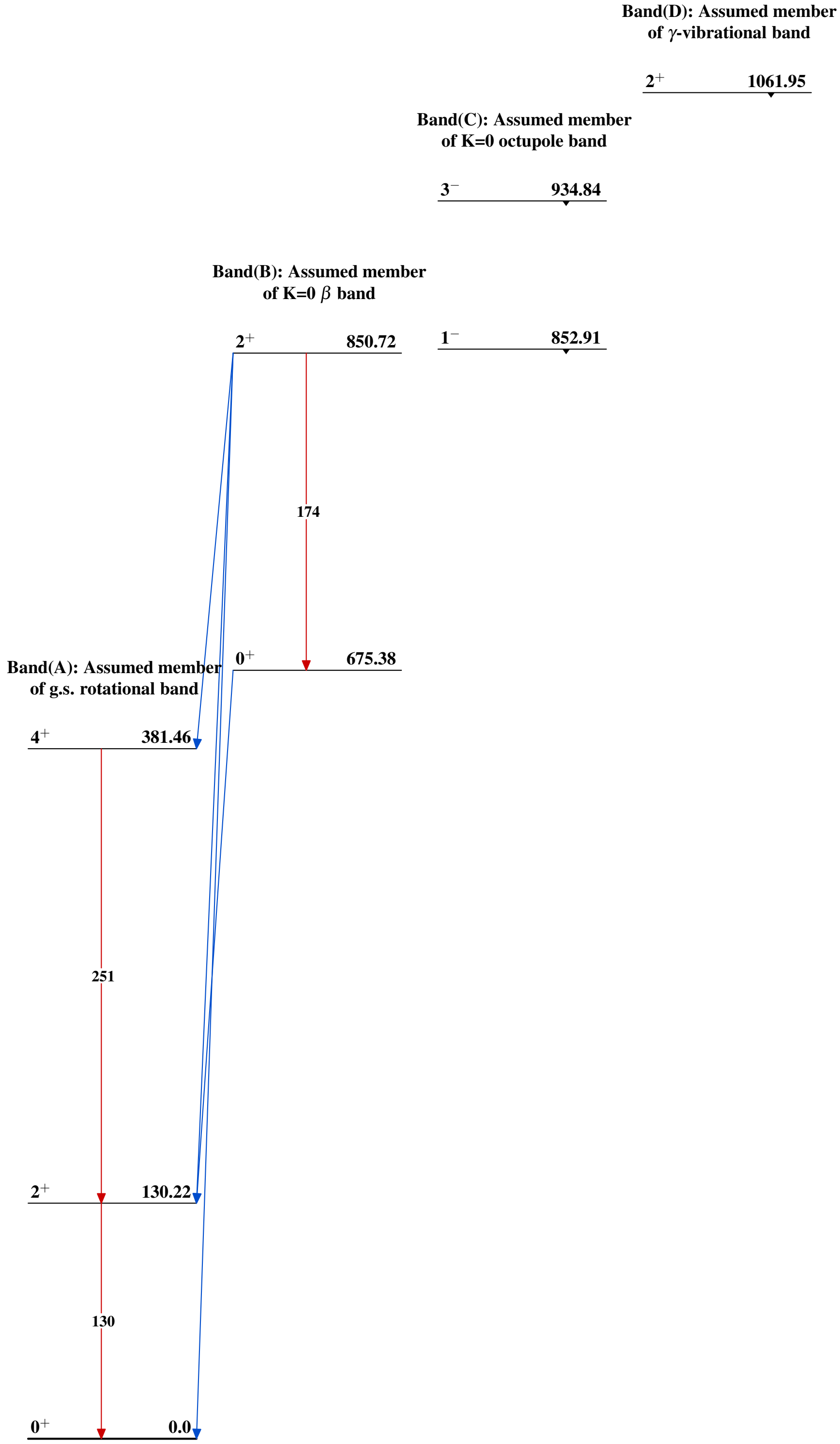

$^{150}_{60}Nd_{90}$