^{136}Pm ε decay:E=x,Y 1987KeZZ

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. A. Mccutchan	NDS 152, 331 (2018)	1-Apr-2018

Parent: ^{136}Pm: E=x; J^π=(2); $T_{1/2}$=300 s *50*; Q(ε)=8030 *70*; %ε+%β^+ decay=100.0
Parent: ^{136}Pm: E=y; J^π=(5$^-$); $T_{1/2}$=107 s *6*; Q(ε)=8030 *70*; %ε+%β^+ decay=100.0
1987KeZZ: ^{136}Pm activity produced by ^{92}Mo(^{48}Ti,X) and ^{112}Sn(^{28}Si,X) reactions and via the decay of ^{136}Sm. Measured Eγ, Iγ, and $\gamma\gamma$-coincidences. Decay scheme constructed from the time data, the singles, and coincidence spectra and is confirmed in independent but preliminary work of 1989BhZZ consisting of γ, ce, $\gamma\gamma$ measurements.
1989BhZZ: ^{136}Pm activity produced by ^{94}Mo(^{48}Ti,X) reaction with E(^{48}Ti)=210 MeV. Measured Eγ, Iγ, ce electrons, $\gamma\gamma$ coincidences.
Population of the 6$^+$ member of the g.s. band indicates presence of (5$^-$) isomer produced directly by the initial reaction rather than by ε decay. The ε feeding to the 2$^+$ and 4$^+$ members compared to feeding of the 6$^+$ member is substantively larger than observed by 1973PaZV in (5$^-$) ε decay indicating the presence of the (2) isomer produced following ε decay.
α: Additional information 1.

^{136}Nd Levels

Relative direct feedings (normalized to feeding of 6$^+$ level) deduced from these data and the data of 1973PaZV (^{136}Pm ε decay:E=y) are compared in the comments.

E(level)	J^π†	Comments
0.0‡	0$^+$	
373.80‡ *16*	2$^+$	2.1 *14* (1987KeZZ); 0.12 *+40−12* (1973PaZV).
862.50# *16*	2$^+$	2.5 *4* (1987KeZZ); <0.013 (1973PaZV).
976.47‡ *19*	4$^+$	1.6 *5* (1987KeZZ); 1.0 *2* (1973PaZV).
1231.04# *18*	(3)$^+$	1.0 *4* (1987KeZZ); 0.06 *+18−6* (1973PaZV).
1541.76# *20*	(4$^+$)	0.72 *8* (1987KeZZ); 0.45 *5* (1973PaZV).
1746.9‡ *3*	6$^+$	
1775.6 *3*		0.52 *5* (1987KeZZ); not observed (1973PaZV).
1817.82 *21*		0.52 *4* (1987KeZZ); not observed (1973PaZV).
1926.02 *24*		0.26 *8* (1987KeZZ); 0.66 *6* (1973PaZV).
2035.65@ *24*	(5$^-$)	0.53 *8* (1987KeZZ); 0.84 *7* (1973PaZV).
2045.60# *21*	(5$^+$)	0.72 *22* (1987KeZZ); 1.29 *14* (1973PaZV).
2181.2 *3*		0.25 *3* (1987KeZZ); not observed (1973PaZV).
2227.91 *25*	(3$^-$,4,5,6$^+$)	0.25 *2* (1987KeZZ); not observed (1973PaZV).
2346.21 *25*		1.2 *1* (1987KeZZ); 0.89 *7* (1973PaZV).
2416.7 *3*		0.52 *5* (1987KeZZ); not observed (1973PaZV).
2440.1@ *3*	(7$^-$)	0.31 *3* (1987KeZZ); 0.22 *5* (1973PaZV).
2522.9 *3*		0.36 *4* (1987KeZZ); not observed (1973PaZV).

† From the Adopted Levels. These are in agreement with those suggested by 1987KeZZ.
‡ Band(A): K^π=0$^+$ g.s. band.
# Band(B): K^π=2$^+$ γ band. Assignment is supported by comparison of the interacting-boson calculations of 1983Ma03 to the relative B(E2)(↓)′s derived by 1987KeZZ.
@ Band(C): $\pi h_{11/2}\pi g_{7/2}$, α=1.

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γ(^{136}Nd)

E_γ [†]	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult. [‡]	α	Comments
192.4[#] 2	9 2	2227.91	(3⁻,4,5,6⁺)	2035.65	(5⁻)			
254.7[#] 4	5 1	1231.04	(3)⁺	976.47	4⁺	[M1,E2]	0.097 9	α(K)=0.079 11; α(L)=0.0140 17; α(M)=0.0030 5; α(N)=0.00067 9; α(O)=9.7×10⁻⁵ 9 α(P)=4.7×10⁻⁶ 11
300.6 2	76 3	2346.21		2045.60	(5⁺)			
368.7 2	65 5	1231.04	(3)⁺	862.50	2⁺	[M1,E2]	0.034 6	α(K)=0.028 6; α(L)=0.00439 21; α(M)=0.00094 4; α(N)=0.000209 9; α(O)=3.09×10⁻⁵ 23 α(P)=1.7×10⁻⁶ 5 I_γ: 1989BhZZ report lower intensity for this transition.
371.1[#] 2	44 4	2416.7		2045.60	(5⁺)			
373.8 2	1000 20	373.80	2⁺	0.0	0⁺	E2	0.0268	α(K)=0.0217 3; α(L)=0.00400 6; α(M)=0.000870 13; α(N)=0.000192 3; α(O)=2.75×10⁻⁵ 4 α(P)=1.232×10⁻⁶ 18
404.5[#] 3	6 2	2440.1	(7⁻)	2035.65	(5⁻)	E2	0.0213	α(K)=0.01735 25; α(L)=0.00309 5; α(M)=0.000669 10; α(N)=0.0001478 21 α(O)=2.13×10⁻⁵ 3; α(P)=9.95×10⁻⁷ 14
420.2[#] 2	24 3	2346.21		1926.02				
488.7 2	186 8	862.50	2⁺	373.80	2⁺	E2+M1	0.016 4	α(K)exp=0.0095 20 (1989BhZZ) α(K)=0.013 4; α(L)=0.0020 3; α(M)=0.00042 5; α(N)=9.3×10⁻⁵ 12; α(O)=1.39×10⁻⁵ 21 α(P)=8.3×10⁻⁷ 23
503.7[#] 4	7 2	2045.60	(5⁺)	1541.76	(4⁺)	[M1,E2]	0.015 4	α(K)=0.012 3; α(L)=0.00181 25; α(M)=0.00038 5; α(N)=8.6×10⁻⁵ 12; α(O)=1.28×10⁻⁵ 20 α(P)=7.7×10⁻⁷ 21
565.2[#] 3	17 5	1541.76	(4⁺)	976.47	4⁺	[M1,E2]	0.0110 25	α(K)=0.0093 23; α(L)=0.00132 21; α(M)=0.00028 5; α(N)=6.3×10⁻⁵ 10; α(O)=9.4×10⁻⁶ 17 α(P)=5.8×10⁻⁷ 16
586.9[#] 3	22 3	1817.82		1231.04	(3)⁺			
602.7 2	384 6	976.47	4⁺	373.80	2⁺	E2	0.00723	α(K)=0.00605 9; α(L)=0.000931 13; α(M)=0.000199 3; α(N)=4.43×10⁻⁵ 7; α(O)=6.53×10⁻⁶ 10 α(P)=3.60×10⁻⁷ 5 Mult.: used for normalization α(K)exp=0.0061 8 (1989BhZZ).
679.2 2	50 5	1541.76	(4⁺)	862.50	2⁺			
693.1 3	20 3	2440.1	(7⁻)	1746.9	6⁺	E1	0.0019 3	
695.0 2	46 4	1926.02		1231.04	(3)⁺			
770.3 2	104 5	1746.9	6⁺	976.47	4⁺	E2	0.00400	α(K)=0.00338 5; α(L)=0.000488 7; α(M)=0.0001040 15; α(N)=2.32×10⁻⁵ 4; α(O)=3.45×10⁻⁶ 5 α(P)=2.03×10⁻⁷ 3
814.7 2	151 7	2045.60	(5⁺)	1231.04	(3)⁺			
857.2 2	234 5	1231.04	(3)⁺	373.80	2⁺	E2+M1	0.0040 9	α(K)exp=0.0036 6 (1989BhZZ) α(K)=0.0034 8; α(L)=0.00046 9;

Continued on next page (footnotes at end of table)

^{136}Pm ε decay:E=x,Y 1987KeZZ (continued)

γ(^{136}Nd) (continued)

E_γ †	I_γ	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	α	Comments
								α(M)=9.8×10^{-5} *18*; α(N)=2.2×10^{-5} *4*; α(O)=3.3×10^{-6} *7* α(P)=2.1×10^{-7} *6*
862.5 *2*	190 *15*	862.50	2$^+$	0.0	0$^+$	E2	0.00309	α(K)exp=0.0022 *5* (1989BhZZ) α(K)=0.00262 *4*; α(L)=0.000370 *6*; α(M)=7.87×10^{-5} *11*; α(N)=1.754×10^{-5} *25*; α(O)=2.63×10^{-6} *4* α(P)=1.584×10^{-7} *23*
955.2# *3*	22 *7*	1817.82		862.50	2$^+$			
1059.4 *3*	60 *5*	2035.65	(5$^-$)	976.47	4$^+$	D		
1069.1 *3*	24 *3*	2045.60	(5$^+$)	976.47	4$^+$			
1204.7# *3*	21 *5*	2181.2		976.47	4$^+$			
1251.3# *3*	12 *3*	2227.91	(3$^-$,4,5,6$^+$)	976.47	4$^+$			
1401.9# *3*	44 *4*	1775.6		373.80	2$^+$			
1660.4# *3*	30 *5*	2522.9		862.50	2$^+$			

† From 1987KeZZ. Iγ deduced by evaluator based on general comment in 1987KeZZ that ΔIγ ≈ 10%.
‡ From the Adopted Gammas.
# Not observed in decay of E=y isomer.

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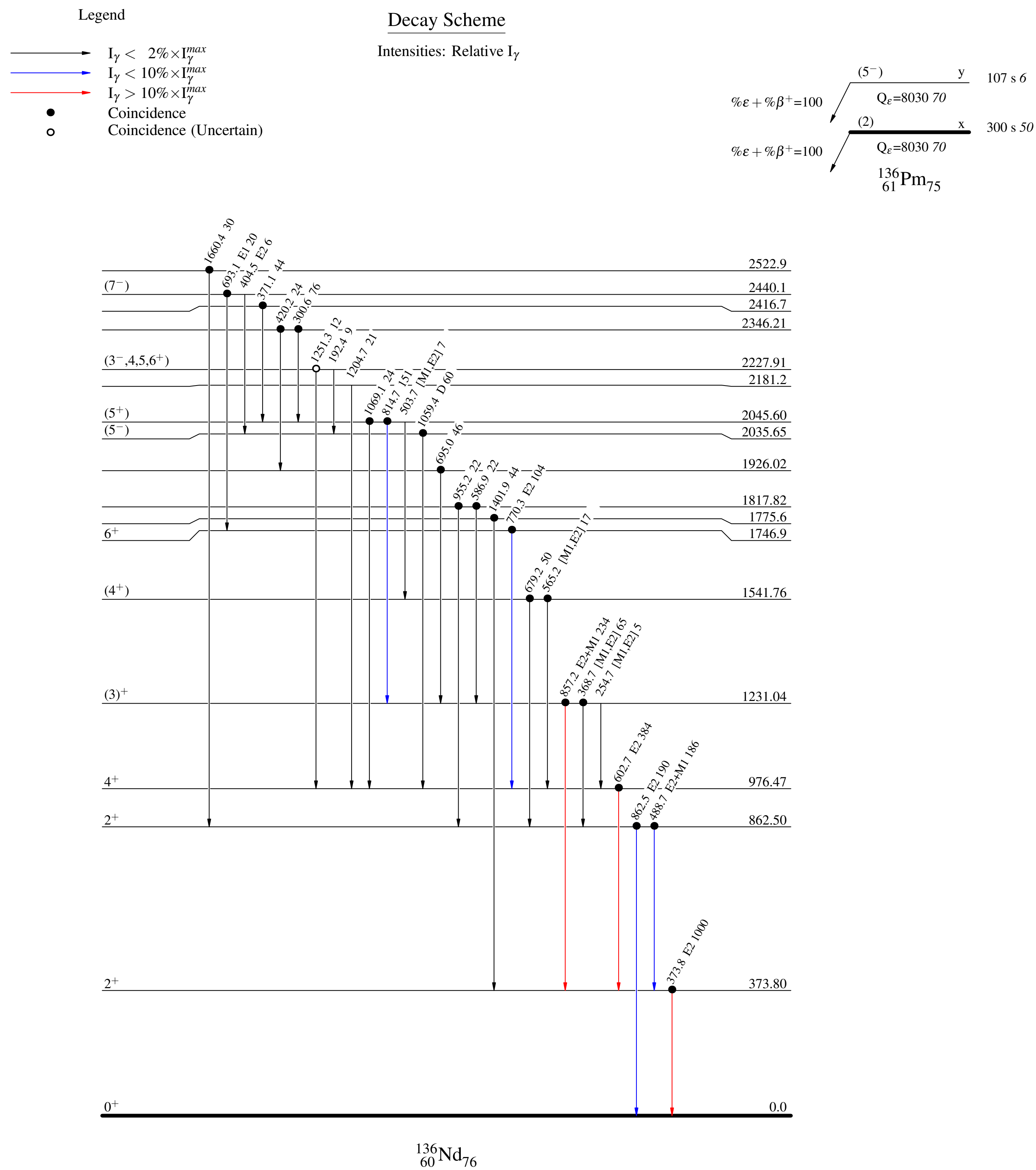

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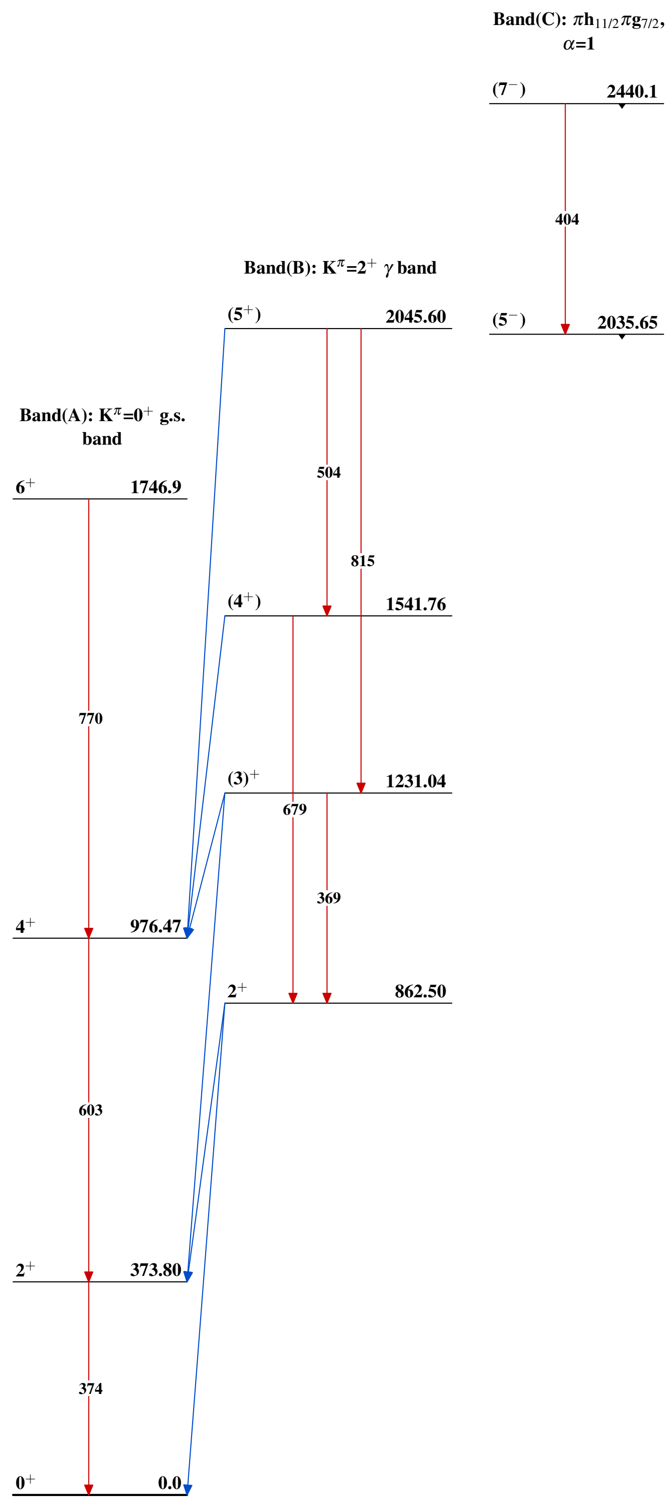

$^{136}_{60}Nd_{76}$