^{136}Pm ε decay:E=Y 1973PaZV

History

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

Parent: ^{136}Pm: E=y; J$^{\pi}$=(5^{-}); $T_{1/2}$=107 s *6*; Q(ε)=8030 *70*; %ε+%β^{+} decay=100.0

^{136}Pm produced in the ^{121}Sb(^{20}Ne,5n) reaction. Measured Eγ, Iγ, $\gamma\gamma$-coincidences, $\gamma(\theta)$, and γ(t). Assignment based on coincidences with known transitions in ^{136}Nd from ^{120}Sn(^{20}Ne,4nγ) and γ(t). The evaluator considers this decay scheme to be partial from comparison of the maximum level energy of 2.4 MeV to the Q value of 8.0 MeV. It appears that only the high-spin isomer was populated, as all lines measured with γ(t) exhibit a $T_{1/2}$ between 90 and 150 s. See also ε decay E=x,y.

Other: 1983Al06.

^{136}Nd Levels

E(level)†	J$^{\pi}$‡	E(level)†	J$^{\pi}$‡	E(level)†	J$^{\pi}$‡	E(level)†	J$^{\pi}$‡
0.0	0^{+}	976.4 *4*	4^{+}	1746.8 *5*	6^{+}	2046.6 *4*	(5^{+})
373.6 *3*	2^{+}	1231.6 *4*	(3)$^{+}$	1927.6 *11*		2349.4 *7*	
861.8 *3*	2^{+}	1539.8 *9*	(4^{+})	2035.9 *6*	(5^{-})	2440.4 *6*	(7^{-})

† From a least-squares fit to Eγ, by evaluator.
‡ From the Adopted Levels.

ε,β^{+} radiations

Iβ and Iε calculated using y=0 for excitation energy of the isomer.
Eβ+=4732 *70* from 1983Al06 (preliminary).

E(decay)	E(level)	Iβ^{+} ‡	Iε‡	Log *ft*	I($\varepsilon+\beta^{+}$)†‡	Comments
(5.59×10^{3} *7*)	2440.4	3.0 *4*	0.48 *7*	6.65 *8*	3.5 *5*	av Eβ=2093 *34*; εK=0.116 *5*; εL=0.0162 *7*; εM+=0.00461 *19*
(5.68×10^{3} *7*)	2349.4	11.9 *7*	1.78 *13*	6.10 *5*	13.7 *8*	av Eβ=2136 *34*; εK=0.110 *5*; εL=0.0154 *6*; εM+=0.00439 *18*
(5.98×10^{3} *7*)	2046.6	17.6 *17*	2.19 *23*	6.05 *6*	19.8 *19*	av Eβ=2280 *34*; εK=0.094 *4*; εL=0.0131 *5*; εM+=0.00373 *14*
(5.99×10^{3} *7*)	2035.9	11.5 *9*	1.42 *12*	6.24 *5*	12.9 *10*	av Eβ=2285 *34*; εK=0.093 *4*; εL=0.0130 *5*; εM+=0.00371 *14*
(6.10×10^{3} *7*)	1927.6	9.1 *6*	1.05 *8*	6.39 *5*	10.1 *7*	av Eβ=2336 *34*; εK=0.088 *4*; εL=0.0123 *5*; εM+=0.00351 *13*
(6.28×10^{3} *7*)	1746.8	13.9 *12*	1.45 *13*	6.27 *5*	15.3 *13*	av Eβ=2422 *34*; εK=0.080 *3*; εL=0.0112 *4*; εM+=0.00320 *12*
(6.49×10^{3} *7*)	1539.8	6.3 *6*	0.59 *6*	6.69 *6*	6.9 *7*	av Eβ=2521 *34*; εK=0.073 *3*; εL=0.0101 *4*; εM+=0.00289 *10*
(6.80×10^{3}# *7*)	1231.6	<2	<0.1	>7.3	<2	av Eβ=2668 *34*; εK=0.0627 *21*; εL=0.0087 *3*; εM+=0.00249 *9*
(7.05×10^{3} *7*)	976.4	14 *4*	1.0 *3*	6.54 *12*	15 *4*	av Eβ=2791 *34*; εK=0.0558 *18*; εL=0.0078 *3*; εM+=0.00222 *8*

† See Levels from ^{136}Pm ε decay E=x,y for a comparison of the direct feedings obtained in the two experiments.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

^{136}Pm ε decay:E=Y 1973PaZV (continued)

γ(^{136}Nd)

Iγ normalization: from ΣIγ(1+α)(to g.s.)=100%, assuming no direct feeding of g.s. (ΔJ=5).

E_γ	I_γ [#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[†]	α[@]	Comments
302.8 *5*	730 *30*	2349.4		2046.6	(5$^+$)			
370.0 *5*	540 *50*	1231.6	(3)$^+$	861.8	2$^+$	[M1,E2]	0.034 *6*	α(K)=0.028 *6*; α(L)=0.00435 *22*; α(M)=0.00093 *4*; α(N)=0.000207 *9*; α(O)=3.06×10^{-5} *23* α(P)=1.7×10^{-6} *5*
373.5 *3*	4.80×10^3 *20*	373.6	2$^+$	0.0	0$^+$	E2	0.0269	α(K)=0.0218 *3*; α(L)=0.00401 *6*; α(M)=0.000872 *13*; α(N)=0.000192 *3*; α(O)=2.75×10^{-5} *4* α(P)=1.235×10^{-6} *18*
(404.5[‡] *2*)	44[‡] *9*	2440.4	(7$^-$)	2035.9	(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*
488.0 *5*	490 *50*	861.8	2$^+$	373.6	2$^+$	E2+M1	0.016 *4*	α(K)=0.014 *4*; α(L)=0.0020 *3*; α(M)=0.00042 *5*; α(N)=9.4×10^{-5} *12*; α(O)=1.40×10^{-5} *21* α(P)=8.3×10^{-7} *23*
602.7 *3*	2.66×10^3 *15*	976.4	4$^+$	373.6	2$^+$	E2	0.00723	α(K)=0.00605 *9*; α(L)=0.000931 *14*; 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*
678.0 *8*	370 *30*	1539.8	(4$^+$)	861.8	2$^+$			
693.0 *10*	140 *20*	2440.4	(7$^-$)	1746.8	6$^+$	[E1]	0.00193	α(K)=0.001662 *24*; α(L)=0.000213 *3*; α(M)=4.49×10^{-5} *7*; α(N)=1.002×10^{-5} *15* α(O)=1.516×10^{-6} *22*; α(P)=9.76×10^{-8} *14*
696.0 *10*	540 *30*	1927.6		1231.6	(3)$^+$			
770.4 *3*	960 *45*	1746.8	6$^+$	976.4	4$^+$	E2	0.00400	α(K)=0.00338 *5*; α(L)=0.000488 *7*; α(M)=0.0001039 *15*; α(N)=2.31×10^{-5} *4*; α(O)=3.45×10^{-6} *5* α(P)=2.03×10^{-7} *3*
815.0 *3*	1650 *80*	2046.6	(5$^+$)	1231.6	(3)$^+$	Q		
858.0 *3*	1.68×10^3 *10*	1231.6	(3)$^+$	373.6	2$^+$	E2+M1	0.0040 *9*	α(K)=0.0034 *8*; α(L)=0.00046 *9*; 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*
862.1 *5*	415 *80*	861.8	2$^+$	0.0	0$^+$	E2	0.00310	α(K)=0.00263 *4*; α(L)=0.000371 *6*; α(M)=7.88×10^{-5} *11*; α(N)=1.756×10^{-5} *25*; α(O)=2.63×10^{-6} *4* α(P)=1.585×10^{-7} *23*
1059.7 *5*	735 *40*	2035.9	(5$^-$)	976.4	4$^+$	D		
1070.0 *8*	140 *20*	2046.6	(5$^+$)	976.4	4$^+$			

† From the Adopted Gammas.
‡ From E=x,y ε decay.
# For absolute intensity per 100 decays, multiply by 0.0187 *8*.
@ 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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