^{142}Pm ε decay 1973Ra01

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. D. Johnson, D. Symochko(a), M. Fadil(b), and J. K. Tuli	NDS 112, 1949 (2011)	1-Jun-2010

Parent: ^{142}Pm: E=0.0; $J^\pi=1^+$; $T_{1/2}$=40.5 s *5*; Q(ε)=4870 *40*; %ε+%$β^+$ decay=100.0

Measured: Eγ, Iγ (1973Ra01,1972De23,1970Ha29,1969Ar24,1969HaZT,1968Bl13), γγ (1970Ha29), ce (1969Ar24), $β^+$ (1960Ma27), γ, K x ray (1991Fi03).

1991Fi03: %$β^+$=77.1 *27*, %ε=22.9 *27* %Iγ(1576γ)=1.96 *11*.

^{142}Nd Levels

E(level)‡	J^π†
0.0	0^+
1575.7 *4*	2^+
2217.2 *6*	0^+
2384.6 *6*	2^+
2583.2 *5*	$1^{(+)}$
2845.9 *8*	2^+
3045.7 *10*	$(2)^+$
3128.1 *7*	$(1,2^+)$
3358.0 *20*	$(2^+,1^+)$

† Adopted values.

‡ From least-squares fit to Eγ, assuming ΔEγ=1 where uncertainty not known.

ε,$β^+$ radiations

E(decay)	E(level)	I$β^+$ †	Iε†	Log *ft*	I(ε+$β^+$)†	Comments
(1.51×10^3 *4*)	3358.0	≤0.00012	≤0.030	≥6.3	≤0.0301	av Eβ=231 *18*; εK=0.8395 *10*; εL=0.1217 *3*; εM+=0.03490 *10*
(1.74×10^3 *4*)	3128.1	0.00082	0.049	6.2	4.982×10^{-2}	av Eβ=332 *18*; εK=0.830 *3*; εL=0.1195 *6*; εM+=0.03424 *16*
(1.82×10^3 *4*)	3045.7	0.00050	0.020	6.6	2.050×10^{-2}	av Eβ=368 *18*; εK=0.823 *4*; εL=0.1184 *7*; εM+=0.03390 *19*
(2.02×10^3 *4*)	2845.9	0.0041	0.0759	6.1	0.0800	av Eβ=456 *18*; εK=0.801 *6*; εL=0.1146 *10*; εM+=0.0328 *3*
(2.29×10^3 *4*)	2583.2	0.0075	0.0625	6.3	0.0700	av Eβ=572 *18*; εK=0.754 *9*; εL=0.1075 *13*; εM+=0.0307 *4*
(2.49×10^3 *4*)	2384.6	0.0213	0.109	6.2	0.130	av Eβ=660 *18*; εK=0.707 *11*; εL=0.1006 *16*; εM+=0.0288 *5*
(2.65×10^3 *4*)	2217.2	0.152	0.548	5.5	0.700	av Eβ=735 *18*; εK=0.662 *12*; εL=0.0940 *17*; εM+=0.0269 *5*
(3.29×10^3 *4*)	1575.7	1.14	1.46	5.3	2.60	av Eβ=1025 *19*; εK=0.474 *12*; εL=0.0669 *17*; εM+=0.0191 *5*
4880 *80*	0.0	76.4	20.0	4.5	96.4	av Eβ=1754 *19*; εK=0.176 *5*; εL=0.0246 *6*; εM+=0.00703 *18* E(decay): from 1983Al06; other: 4820 *+50−100* (1970Ma27).

† Absolute intensity per 100 decays.

^{142}Pm ε decay 1973Ra01 (continued)

γ(^{142}Nd)

Iγ normalization: sum of Iγ, ε+β^+ to g.s.=100; I(1576γ)/$\gamma^{\pm}$=0.0215; ε/β^+ from theory.
I($\gamma^{\pm}$)>2000 if I(1576γ)=100 (1973Ka01); I(1576γ)/I($\gamma^{\pm}$,^{142}Sm+^{142}Pm)=0.0198 *4* (1972Sc41) where I(γ+=,^{142}Sm+^{142}Pm) is the 511 keV annihilation radiation from ^{142}Pm decay. From this 1973Ra01 deduce I(1576γ)/I($\gamma^{\pm}$,^{142}Pm)=0.0215 assuming that 100% of ε decay from ^{142}Sm leads to ^{142}Pm g.s.

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	Comments
641.4 *5*	19.6 *10*	2217.2	0^+	1575.7	2^+		
809.7 *10*	0.62 *12*	2384.6	2^+	1575.7	2^+		
1007.9 *8*	0.63 *9*	2583.2	$1^{(+)}$	1575.7	2^+		
1552.2 *8*	0.94 *20*	3128.1	$(1,2^+)$	1575.7	2^+		
1575.8 *4*	100	1575.7	2^+	0.0	0^+		
1782[‡] *2*	≈0.6	3358.0	$(2^+,1^+)$	1575.7	2^+		
2219 *2*		2217.2	0^+	0.0	0^+	E0	ρ^2=17×10^{-3} *6* (1999Wo07). E_γ: from 1969Ar24. Mult.: K/L=7.5 *10* (1969Ar24), no γ observed (1970Ha29). I_γ: I(ce(K))/I(641γ)=0.08 *3* (1970Ha29).
2384.3 *6*	3.4 *3*	2384.6	2^+	0.0	0^+		
2583.0 *6*	1.4 *1*	2583.2	$1^{(+)}$	0.0	0^+		
2845.9 *8*	2.4 *2*	2845.9	2^+	0.0	0^+		
3045.7 *10*	0.65 *5*	3045.7	$(2)^+$	0.0	0^+		
3128.3 *10*	0.47 *6*	3128.1	$(1,2^+)$	0.0	0^+		
3358 *2*	0.23 *6*	3358.0	$(2^+,1^+)$	0.0	0^+		

[†] For absolute intensity per 100 decays, multiply by 0.033.
[‡] Placement of transition in the level scheme is uncertain.

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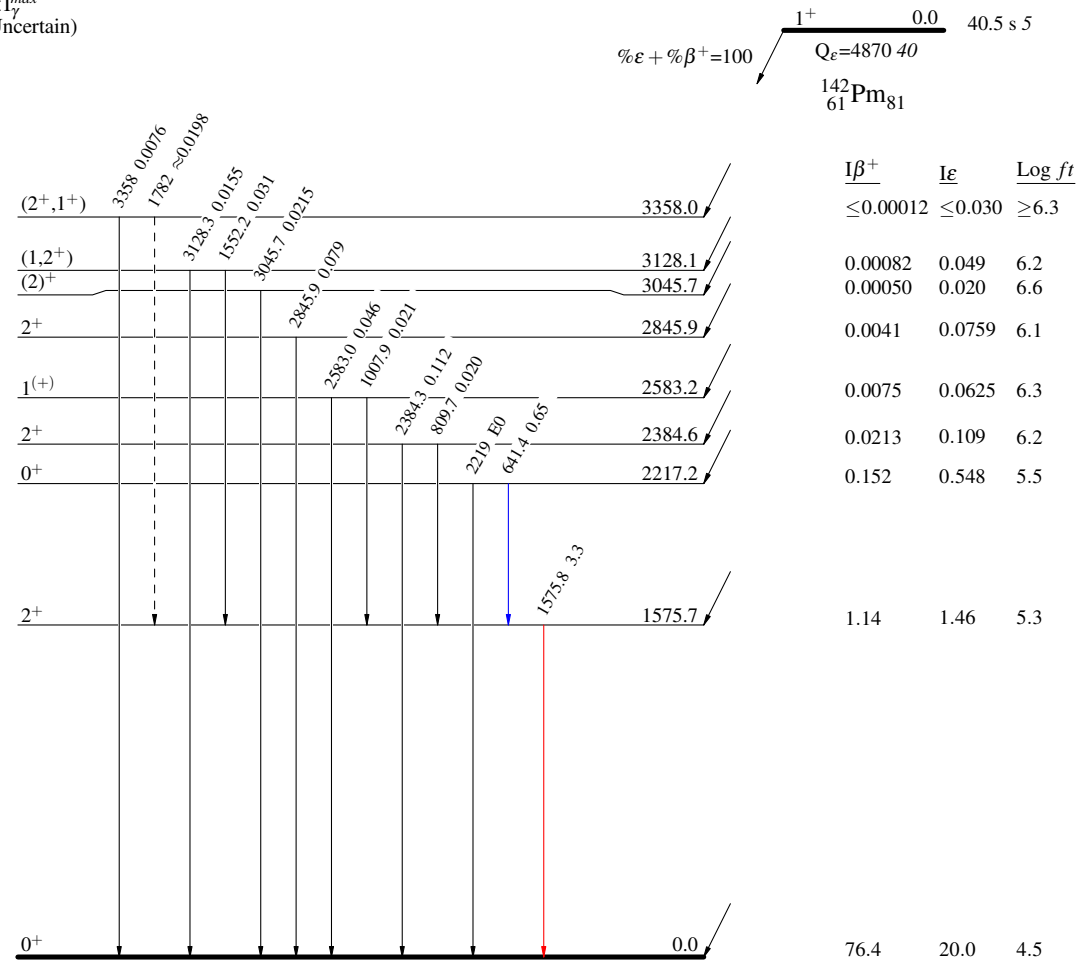
Decay Scheme

Intensities: I_γ per 100 parent decays

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)



	Iβ+	Iε	Log *ft*
3358.0	≤0.00012	≤0.030	≥6.3
3128.1	0.00082	0.049	6.2
3045.7	0.00050	0.020	6.6
2845.9	0.0041	0.0759	6.1
2583.2	0.0075	0.0625	6.3
2384.6	0.0213	0.109	6.2
2217.2	0.152	0.548	5.5
1575.7	1.14	1.46	5.3
0.0	76.4	20.0	4.5