^{142}Eu ε decay (2.34 s) 1991Fi03,1975Ke08

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}Eu: E=0.0; $J^\pi=1^+$; $T_{1/2}$=2.34 s *12*; Q(ε)=7670 *30*; %ε+%$β^+$ decay=100.0

Measured: γ, $β^+$ (1975Ke08); others: 1973VaYZ, 1987FiZW.

Decay scheme is given by 1991Fi03 based on earlier work of 1975Ke08.

1991Fi03 obtained source in ^{142}Gd decay and measured x-ray, γ, γ(t). From two component fit to 768γ(t), assuming $T_{1/2}(^{142}Gd)$=70.2 s *6*, they determined $T_{1/2}(^{142}Eu$ g.s.)=2.34 s *12*. I(ε+$β^+$) values of 1991Fi03 determined from I$β^+$/I(768γ)=8.8 *6* (1991Fi03) are given. Other: I$β^+$/I(768γ)=8.4 *11* (1975Ke08).

^{142}Sm Levels

E(level)†	J^π‡	E(level)†	J^π‡	E(level)†	J^π‡	E(level)†	J^π‡
0.0	0^+	1657.90 *8*	$(2)^+$	2353.7 *3*	(2^+)	2522.24 *12*	(0^+)
768.11 *8*	2^+	2055.52 *13*	2^+	2373.9 *3*	(2^+)	3031.8 *4*	(0^+)
1451.11 *13*	(0^+)	2173.52 *13*	0^+	2439.4 *10*	(0^+)	3187.83 *22*	(0^+)

† From least-squares fit to Eγ.

‡ Adopted values.

ε,$β^+$ radiations

Eβ+=7000 *300* (1975Ke08), 6651 *30* (1994Po26).

E(decay)	E(level)	I$β^+$ †	Iε†	Log *ft*	I(ε+$β^+$)†	Comments
(4.48×10^3 *3*)	3187.83	0.17	0.071	5.7	0.24	av Eβ=1572 *14*; εK=0.251 *5*; εL=0.0360 *7*; εM+=0.01035 *19*
(4.64×10^3 *3*)	3031.8	0.36	0.14	5.4	0.50	av Eβ=1645 *14*; εK=0.229 *5*; εL=0.0328 *6*; εM+=0.00942 *17*
(5.15×10^3 *3*)	2522.24	1.25	0.316	5.2	1.57	av Eβ=1883 *14*; εK=0.170 *3*; εL=0.0243 *5*; εM+=0.00699 *12*
(5.23×10^3 *3*)	2439.4	1.04	0.248	5.3	1.29	av Eβ=1922 *15*; εK=0.162 *3*; εL=0.0232 *4*; εM+=0.00667 *12*
(5.30×10^3 *3*)	2373.9	0.63	0.14	5.5	0.77	av Eβ=1953 *15*; εK=0.157 *3*; εL=0.0224 *4*; εM+=0.00643 *11*
(5.32×10^3 *3*)	2353.7	0.43	0.097	5.7	0.53	av Eβ=1962 *15*; εK=0.155 *3*; εL=0.0221 *4*; εM+=0.00636 *11*
(5.50×10^3 *3*)	2173.52	0.34	0.068	5.9	0.41	av Eβ=2047 *15*; εK=0.1403 *23*; εL=0.0200 *4*; εM+=0.00575 *10*
(5.61×10^3 *3*)	2055.52	1.36	0.251	5.3	1.61	av Eβ=2103 *15*; εK=0.1316 *22*; εL=0.0188 *3*; εM+=0.00540 *9*
(6.01×10^3 *3*)	1657.90	2.39	0.347	5.3	2.74	av Eβ=2291 *15*; εK=0.1070 *17*; εL=0.01525 *24*; εM+=0.00438 *7*
(6.22×10^3 *3*)	1451.11	0.5	0.07	6.0	0.6	av Eβ=2389 *15*; εK=0.0965 *15*; εL=0.01375 *21*; εM+=0.00395 *6*
(6.90×10^3 *3*)	768.11	3.4	0.31	5.4	3.7	av Eβ=2715 *15*; εK=0.0699 *10*; εL=0.00995 *14*; εM+=0.00286 *4*
(7.67×10^3 *3*)	0.0	81.0	5.12	4.3	86.1	av Eβ=3083 *15*; εK=0.0503 *7*; εL=0.00715 *9*; εM+=0.00205 *3*

† Absolute intensity per 100 decays.

γ(^{142}Sm)

E_γ	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α†	Comments
683.0 *1*	4.1 *4*	1451.11	(0^+)	768.11	2^+			
768.1 *1*	100	768.11	2^+	0.0	0^+	E2	0.00444 *7*	α=0.00444 *7*; α(K)=0.00373 *6*; α(L)=0.000556 *8*; α(M)=0.0001201 *17*; α(N+..)=3.13×10^{-5} *5* α(N)=2.71×10^{-5} *4*; α(O)=3.97×10^{-6} *6*; α(P)=2.20×10^{-7} *3* Mult.: from adopted gammas.

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γ(^{142}Sm) (continued)

E_γ	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	$I_{(\gamma+ce)}$[‡]	Comments
864.4 *2*	0.84 *18*	2522.24	(0^+)	1657.90	$(2)^+$			
889.8 *1*	10.4 *7*	1657.90	$(2)^+$	768.11	2^+			
1287.4 *1*	11.4 *8*	2055.52	2^+	768.11	2^+			
1405.4 *1*	4.0 *4*	2173.52	0^+	768.11	2^+			
(1451.1)		1451.11	(0^+)	0.0	0^+	(E0)	≈2	Transition not observed. I(γ+ce) from excess I(K x ray).
1657.9 *1*	17.2 *13*	1657.90	$(2)^+$	0.0	0^+			
1671.3	12.6	2439.4	(0^+)	768.11	2^+			
1754.1 *1*	14.6 *12*	2522.24	(0^+)	768.11	2^+			
2055.8 *20*	4.4 *4*	2055.52	2^+	0.0	0^+			
2263.7 *4*	4.9 *11*	3031.8	(0^+)	768.11	2^+			
2353.7 *3*	5.2 *10*	2353.7	(2^+)	0.0	0^+			
2373.9 *3*	7.5 *9*	2373.9	(2^+)	0.0	0^+			
2419.7 *2*	2.4 *9*	3187.83	(0^+)	768.11	2^+			

† Additional information 1.
‡ For absolute intensity per 100 decays, multiply by 0.102 *7*.

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Decay Scheme

Intensities: I_γ per 100 parent decays