^{142}Eu ε decay (1.223 min) 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+x; $J^\pi=8^-$; $T_{1/2}$=1.223 min *8*; Q(ε)=7670 *30*; %ε+%$β^+$ decay=100.0

Measured: γ, γγ, Xγ, ce, $β^+$, βγ(t) (1975Ke08).

Other measurements: 1987FiZW, 1983Al06, 1973VaYZ, 1972Ha23, 1966Ma15, 1966At04.

Decay scheme is from 1975Ke08.

The level feedings have been deduced from Iγ balance, assuming no ε decay to g.s. and no IT decay.

$T_{1/2}$ from total γ absorption (1993Al03).

E(parent)=520 *50* (1997Au04) based on Q(ε)(^{142}Eu 8^-)=8150 *60*, Q(ε)(^{142}Eu,1^+)=7670 *30* (1994Po26). Others: Q(ε)(^{142}Eu 8^-)=8175 *50* (1983Al06), 7480 *100* (1993Al03) Q(ε)(^{142}Eu,1^+)=8000 *300* (1975Ke08).

^{142}Sm Levels

E(level)	J^π†	$T_{1/2}$	E(level)	J^π†	E(level)	J^π†
0.0	0^+		2912.1 *4*	7^-	3798.8 *4*	
768.00 *20*	2^+		3113.1 *4*	8^-	4072.2 *4*	(7^-)
1784.1 *3*	3^-		3220.0? *5*		4210.6 *5*	
1791.3 *3*	4^+		3326.4 *4*	8^+	4309.2 *4*	(7^-)
2347.8 *3*	5^-		3386.7 *5*	9^-	4630.4 *4*	
2372.0 *4*	7^-	170 ns *2*	3570.9 *4*			
2420.0 *3*	6^+	<2 ns	3713.9 *4*			

† Adopted values.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ+ †	Iε†	Log *ft*	I(ε+β+)†	Comments
(3.04×10^3 *3*)	4630.4	0.304	0.336	6.3	0.640	av Eβ=1134 *27*; εK=0.443 *15*; εL=0.0638 *22*; εM+=0.0184 *7*
(3.36×10^3 *3*)	4309.2	0.509	0.391	6.3	0.900	av Eβ=1282 *27*; εK=0.367 *13*; εL=0.0527 *19*; εM+=0.0152 *6*
(3.46×10^3 *3*)	4210.6	0.260	0.180	6.7	0.440	av Eβ=1327 *27*; εK=0.346 *13*; εL=0.0496 *18*; εM+=0.0143 *6*
(3.60×10^3 *3*)	4072.2	0.773	0.467	6.3	1.240	av Eβ=1391 *27*; εK=0.318 *12*; εL=0.0456 *17*; εM+=0.0131 *5*
(3.87×10^3 *3*)	3798.8	1.001	0.469	6.3	1.470	av Eβ=1518 *27*; εK=0.270 *10*; εL=0.0386 *14*; εM+=0.0111 *4*
(3.96×10^3 *3*)	3713.9	2.09	0.91	6.1	3.00	av Eβ=1557 *27*; εK=0.256 *9*; εL=0.0367 *13*; εM+=0.0105 *4*
(4.10×10^3 *3*)	3570.9	0.534	0.206	6.8	0.740	av Eβ=1624 *27*; εK=0.235 *9*; εL=0.0337 *12*; εM+=0.0097 *4*
(4.28×10^3 *3*)	3386.7	1.463	0.487	6.4	1.950	av Eβ=1710 *27*; εK=0.211 *8*; εL=0.0302 *11*; εM+=0.0087 *3*
(4.34×10^3 *3*)	3326.4	0.638	0.202	6.8	0.840	av Eβ=1738 *27*; εK=0.203 *7*; εL=0.0291 *10*; εM+=0.0084 *3*
(4.45×10^3‡ *3*)	3220.0?	0.309	0.091	7.2	0.400	av Eβ=1788 *27*; εK=0.191 *7*; εL=0.0274 *10*; εM+=0.0079 *3*
(4.56×10^3 *3*)	3113.1	1.259	0.341	6.6	1.600	av Eβ=1838 *28*; εK=0.180 *6*; εL=0.0257 *9*; εM+=0.0074 *3*
(4.76×10^3 *3*)	2912.1	2.106	0.494	6.5	2.600	av Eβ=1932 *28*; εK=0.161 *6*; εL=0.0229 *8*; εM+=0.00659 *22*
(5.25×10^3 *3*)	2420.0	1.9	0.77	8.5[1u]	2.7	av Eβ=2136 *27*; εK=0.242 *7*; εL=0.0350 *10*; εM+=0.0101 *3*
5804 *50*	2372.0	69.5	11.5	5.2	81.0	av Eβ=2187 *28*; εK=0.120 *4*; εL=0.0171 *6*; εM+=0.00491 *16*
						E(decay): Eβ+=4782 *50* (1983Al06); others: 4760 *100* (1975Ke08), 4756 *60* (1994Po26).

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^{142}Eu ε decay (1.223 min) 1975Ke08 (continued)

ε,β+ radiations (continued)

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{142}Sm)

E_γ	I_γ#	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α†	$I_{(\gamma+ce)}$#	Comments
24.1 *3*		2372.0	7−	2347.8	5−	E2	1.11×10^3 *8*	95	B(E2)(W.u.)=8.2 *6* ce(L)/(γ+ce)=0.78 *4*; ce(M)/(γ+ce)=0.179 *16*; ce(N+)/(γ+ce)=0.044 *4* ce(N)/(γ+ce)=0.039 *4*; ce(O)/(γ+ce)=0.0047 *5*; ce(P)/(γ+ce)=1.06×10^{-6} *10* Transition seen in ce spectrum, L1/L2=0.20 *35*, L2/L3=1.25 *25*. I(γ+ce)=121 *40* from L x ray, I(γ+ce)=95 from intensity balance (1975Ke08).
200.9 *5*	1.1 *2*	3113.1	8−	2912.1	7−	E2,M1	0.222 *17*		α(K)=0.18 *3*; α(L)=0.037 *9*; α(M)=0.0081 *21*; α(N+..)=0.0021 *5* α(N)=0.0018 *5*; α(O)=0.00025 *5*; α(P)=1.0×10^{-5} *3* Mult.: α(K)exp=0.19 *6*.
273.8 *5*	1.2 *2*	3386.7	9−	3113.1	8−	E2,M1	0.089 *15*		α(K)=0.073 *16*; α(L)=0.0129 *8*; α(M)=0.00282 *22*; α(N+..)=0.00073 *5* α(N)=0.00063 *5*; α(O)=9.05×10^{-5} *21*; α(P)=4.3×10^{-6} *13* Mult.: α(K)exp=0.10 *4*. Mult.: α(K)exp=0.10 *4*.
474.4 *5*	0.75 *10*	3386.7	9−	2912.1	7−				
540.0 *2*	5.0 *4*	2912.1	7−	2372.0	7−	M1	0.01773		α(K)=0.01512 *22*; α(L)=0.00205 *3*; α(M)=0.000439 *7*; α(N+..)=0.0001156 *17* α(N)=9.96×10^{-5} *14*; α(O)=1.499×10^{-5} *21*; α(P)=9.46×10^{-7} *14* Mult.: α(K)exp=0.0156 *31*.
556.6 *2*	86.6 *30*	2347.8	5−	1791.3	4+	E1	0.00340 *5*		α=0.00340 *5*; α(K)=0.00291 *4*; α(L)=0.000383 *6*; α(M)=8.17×10^{-5} *12*; α(N+..)=2.13×10^{-5} *3* α(N)=1.84×10^{-5} *3*; α(O)=2.74×10^{-6} *4*; α(P)=1.658×10^{-7} *24* Mult.: α(K)exp=0.0020 *4*.
563.7 *2*	8.3 *4*	2347.8	5−	1784.1	3−	E2,M1	0.013 *4*		α(K)=0.011 *3*; α(L)=0.0016 *3*; α(M)=0.00034 *6*; α(N+..)=8.8×10^{-5} *16* α(N)=7.6×10^{-5} *14*; α(O)=1.12×10^{-5} *23*; α(P)=6.5×10^{-7} *20* Mult.: α(K)exp=0.0110 *32*.

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^{142}Eu ε decay (1.223 min) 1975Ke08 (continued)

γ(^{142}Sm) (continued)

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[†]	Comments
580.7[@] *4*	0.44 *10*	2372.0	7^-	1791.3	4^+			
628.7 *2*	4.1 *2*	2420.0	6^+	1791.3	4^+	[E2]	0.00714 *10*	B(E2)(W.u.)>0.065 α=0.00714 *10*; α(K)=0.00594 *9*; α(L)=0.000937 *14*; α(M)=0.000203 *3*; α(N+..)=5.28×10^{-5} *8* α(N)=4.58×10^{-5} *7*; α(O)=6.65×10^{-6} *10*; α(P)=3.48×10^{-7} *5* Mult.: α(K)exp=0.0069 *62*, E2 or D.
741.2 *2*	1.7 *2*	3113.1	8^-	2372.0	7^-			
768.0 *2*	100	768.00	2^+	0.0	0^+	[E2]	0.00444 *7*	α=0.00444 *7*; α(K)=0.00373 *6*; α(L)=0.000557 *8*; α(M)=0.0001202 *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*
[x]832.6 *2*	0.42 *9*							
848.0 *3*	0.40 *8*	3220.0?		2372.0	7^-			
886.7 *2*	0.69 *7*	3798.8		2912.1	7^-			
906.4 *3*	0.50 *12*	3326.4	8^+	2420.0	6^+			
954.3 *2*	0.58 *8*	3326.4	8^+	2372.0	7^-			
982.0 *5*	0.24 *5*	4309.2	(7^-)	3326.4	8^+			
1016.1 *2*	11.0 *6*	1784.1	3^-	768.00	2^+	(E1)	0.001001 *14*	α=0.001001 *14*; α(K)=0.000861 *12*; α(L)=0.0001106 *16*; α(M)=2.35×10^{-5} *4*; α(N+..)=6.16×10^{-6} α(N)=5.31×10^{-6} *8*; α(O)=7.96×10^{-7} *12*; α(P)=4.99×10^{-8} *7* Mult.: α(K)exp=0.0008 *16*.
1023.3 *2*	92.0 *30*	1791.3	4^+	768.00	2^+	E2	0.00237 *4*	α=0.00237 *4*; α(K)=0.00201 *3*; α(L)=0.000282 *4*; α(M)=6.06×10^{-5} *9*; α(N+..)=1.583×10^{-5} *23* α(N)=1.368×10^{-5} *20*; α(O)=2.03×10^{-6} *3*; α(P)=1.195×10^{-7} *17* Mult.: α(K)exp=0.0018 *3*.
1151.0 *3*	0.35 *7*	3570.9		2420.0	6^+			
1198.8 *3*	0.39 *10*	3570.9		2372.0	7^-			
[x]1212.0 *3*	0.47 *10*							
1341.9 *2*	2.98 *14*	3713.9		2372.0	7^-			
1426.8 *3*	0.78 *15*	3798.8		2372.0	7^-			
1652.1 *3*	0.29 *6*	4072.2	(7^-)	2420.0	6^+			
1700.1 *3*	0.83 *7*	4072.2	(7^-)	2372.0	7^-			
1724.5 *4*	0.12 *4*	4072.2	(7^-)	2347.8	5^-			
[x]1728.5 *3*	0.20 *5*							
1838.6 *3*	0.44 *5*	4210.6		2372.0	7^-			
1889.0 *4*	0.15 *3*	4309.2	(7^-)	2420.0	6^+			
1937.6 *3*	0.51 *6*	4309.2	(7^-)	2372.0	7^-			
2258.4 *2*	0.64 *6*	4630.4		2372.0	7^-			

[†] Additional information 1.
[‡] α(K)exp were normalized to α(K)(768γ)=0.0037 (E2).
[#] Absolute intensity per 100 decays.
[@] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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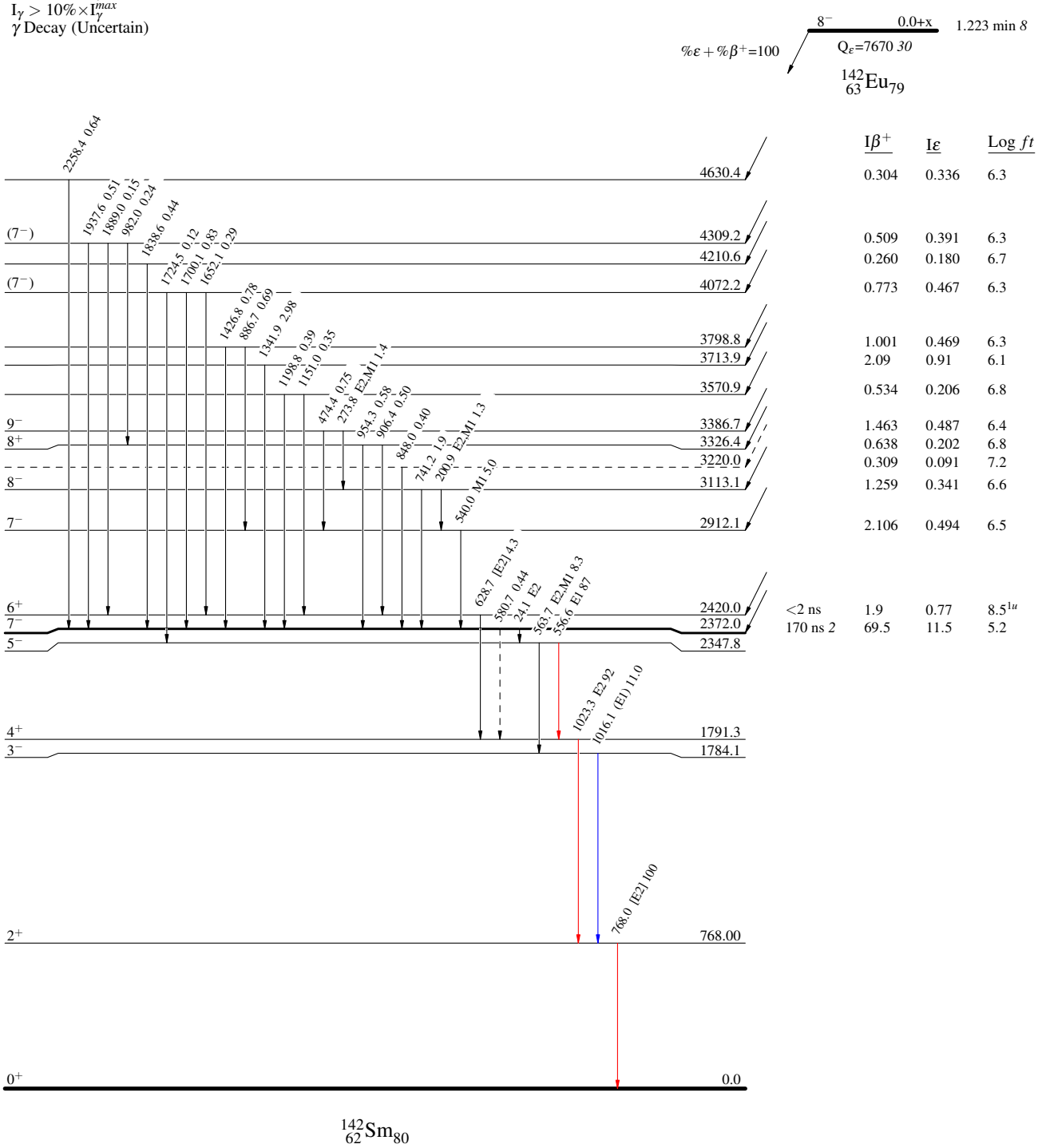
Decay Scheme

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)



$^{142}_{62}Sm_{80}$