^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 113, 715 (2012)	31-May-2011

Parent: ^{143}Gd: E=152.6; J^π=(11/2$^-$); $T_{1/2}$=110.0 s *14*; Q(ε)=6.01×10^3 *20*; %ε+%β^+ decay=100.0

Other: 1973VaYZ.

Measured: γ rays, $\gamma\gamma$ (1978Fi02,1976Wi09), ce (1976Wi09),

γ(t) (1978Fi02). With Q(ε)>6 MeV and the highest level reported at 2610, the decay scheme may not be complete.

Observed delayed protons and/or α particles. Delayed proton or α emission probability ≤1.0×10^{-3}% (1978Fi02).

^{143}Eu Levels

E(level)	J^π[†]	$T_{1/2}$	Comments
0.0	5/2$^+$		
271.93 *3*	7/2$^+$		
389.53 *4*	11/2$^-$	50.0[‡] μs *5*	
906.94 *6*	9/2$^+$		
977.49 *4*	(9/2)$^-$		
1057.33 *6*	11/2$^+$		
1057.65 *5*	13/2$^-$		
1088.3 *1*			
1188.43 *5*	11/2$^-$		
1214.0 *1*	11/2$^-$		
1256.87 *6*	11/2$^+$		
1306.09 *6*	15/2$^-$		No ε feeding is expected from ^{143}Gd(J^π=11/2$^-$).
1331.2 *1*	11/2$^+$		
1405.6 *2*			
1497.7 *2*			
1565.2 *2*			
1602.61 *7*			
1676.49 *8*			
1754.24 *8*	$^-$		
1761.7 *2*			
1893.20 *8*	15/2$^-$		
1903.6 *2*			
1970.6 *3*			
2018.73 *5*	(9/2$^-$)		
2065.07 *6*	(9/2$^-$)		
2092.15 *7*			
2196.71 *5*	(11/2$^-$)		
2209.3 *3*			
2254.2 *1*			
2275.6 *1*			
2331.9 *2*			
2351.1 *1*			
2417.6 *6*			
2600.7 *1*			
2610.8 *5*			

[†] From Adopted Levels.

[‡] From 1978Fi02.

^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09 (continued)

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ †	Iε†	Log *ft*	I(ε+β^+)†	Comments
(3.55×10^3 *20*)	2610.8	0.1	0.2 *1*	6.8 *2*	0.3 *1*	av Eβ=1143 *92*; εK=0.46 *6*; εL=0.066 *8*; εM+=0.0191 *22*
(3.56×10^3 *20*)	2600.7	0.60 *9*	0.70 *10*	6.2 *1*	1.3 *1*	av Eβ=1147 *92*; εK=0.45 *6*; εL=0.066 *8*; εM+=0.0190 *22*
(3.75×10^3 *20*)	2417.6	0.2 *1*	0.1 *1*	6.9 *2*	0.3 *1*	av Eβ=1231 *92*; εK=0.41 *5*; εL=0.059 *8*; εM+=0.0171 *21*
(3.81×10^3 *20*)	2351.1	1.1 *1*	0.93 *13*	6.1 *1*	2.0 *1*	av Eβ=1262 *92*; εK=0.39 *5*; εL=0.057 *7*; εM+=0.0165 *20*
(3.83×10^3 *20*)	2331.9	0.3 *1*	0.2 *1*	6.8 *1*	0.5 *1*	av Eβ=1271 *92*; εK=0.39 *5*; εL=0.056 *7*; εM+=0.0163 *20*
(3.89×10^3 *20*)	2275.6	1.1 *2*	0.89 *15*	6.2 *1*	2.0 *2*	av Eβ=1296 *93*; εK=0.38 *5*; εL=0.055 *7*; εM+=0.0158 *20*
(3.91×10^3 *20*)	2254.2	0.67 *9*	0.53 *8*	6.4 *1*	1.2 *1*	av Eβ=1306 *93*; εK=0.37 *5*; εL=0.054 *7*; εM+=0.0156 *20*
(3.95×10^3 *20*)	2209.3	0.4 *1*	0.3 *1*	6.7 *1*	0.7 *1*	av Eβ=1327 *93*; εK=0.36 *5*; εL=0.053 *7*; εM+=0.0152 *19*
(3.97×10^3 *20*)	2196.71	10.8 *12*	8.1 *11*	5.2 *1*	18.9 *8*	av Eβ=1333 *93*; εK=0.36 *5*; εL=0.052 *7*; εM+=0.0151 *19*
(4.07×10^3 *20*)	2092.15	2.6 *3*	1.8 *3*	5.9 *1*	4.4 *3*	av Eβ=1381 *93*; εK=0.34 *5*; εL=0.049 *7*; εM+=0.0142 *18*
(4.10×10^3 *20*)	2065.07	2.9 *3*	1.9 *3*	5.9 *1*	4.8 *3*	av Eβ=1393 *93*; εK=0.33 *5*; εL=0.048 *6*; εM+=0.0139 *18*
(4.14×10^3 *20*)	2018.73	4.2 *4*	2.6 *4*	5.8 *1*	6.8 *4*	av Eβ=1415 *93*; εK=0.32 *4*; εL=0.047 *6*; εM+=0.0136 *17*
(4.19×10^3 *20*)	1970.6	0.31 *4*	0.19 *3*	6.9 *1*	0.50 *5*	av Eβ=1437 *93*; εK=0.32 *4*; εL=0.046 *6*; εM+=0.0132 *17*
(4.26×10^3 *20*)	1903.6	0.5 *1*	0.3 *1*	6.8 *1*	0.8 *1*	av Eβ=1468 *93*; εK=0.30 *4*; εL=0.044 *6*; εM+=0.0127 *16*
(4.27×10^3 *20*)	1893.20	0.4 *1*	0.3 *1*	6.8 *2*	0.7 *2*	av Eβ=1473 *93*; εK=0.30 *4*; εL=0.044 *6*; εM+=0.0126 *16*
(4.40×10^3 *20*)	1761.7	0.5 *1*	0.2	6.9 *1*	0.7 *1*	av Eβ=1534 *93*; εK=0.28 *4*; εL=0.040 *5*; εM+=0.0116 *15*
(4.41×10^3 *20*)	1754.24	1.0 *1*	0.49 *7*	6.6 *1*	1.5 *1*	av Eβ=1537 *93*; εK=0.28 *4*; εL=0.040 *5*; εM+=0.0116 *15*
(4.49×10^3 *20*)	1676.49	2.1 *2*	0.94 *16*	6.3 *1*	3.0 *3*	av Eβ=1573 *93*; εK=0.27 *4*; εL=0.038 *5*; εM+=0.0111 *14*
(4.56×10^3 *20*)	1602.61	1.3 *2*	0.54 *9*	6.5 *1*	1.8 *2*	av Eβ=1608 *94*; εK=0.25 *4*; εL=0.037 *5*; εM+=0.0106 *14*
(4.60×10^3 *20*)	1565.2	0.6 *1*	0.3	6.9 *1*	0.9 *1*	av Eβ=1625 *94*; εK=0.25 *3*; εL=0.036 *5*; εM+=0.0104 *13*
(4.66×10^3 *20*)	1497.7	0.4 *1*	0.2 *1*	7.1 *2*	0.6 *2*	av Eβ=1657 *94*; εK=0.24 *3*; εL=0.035 *5*; εM+=0.0100 *13*
(4.76×10^3 *20*)	1405.6	0.2 *1*	0.08 *3*	7.4 *2*	0.3 *1*	av Eβ=1700 *94*; εK=0.23 *3*; εL=0.033 *4*; εM+=0.0095 *12*
(4.83×10^3 *20*)	1331.2	0.7 *1*	0.2	6.9 *1*	0.9 *1*	av Eβ=1734 *94*; εK=0.22 *3*; εL=0.031 *4*; εM+=0.0091 *12*
(4.91×10^3 *20*)	1256.87	1.1 *2*	0.35 *7*	6.8 *1*	1.4 *2*	av Eβ=1769 *94*; εK=0.21 *3*; εL=0.030 *4*; εM+=0.0087 *11*
(4.95×10^3 *20*)	1214.0	3.0 *3*	0.96 *16*	6.4 *1*	4.0 *4*	av Eβ=1789 *94*; εK=0.203 *25*; εL=0.029 *4*; εM+=0.0085 *11*
(4.97×10^3 *20*)	1188.43	7.4 *7*	2.3 *3*	6.0 *1*	9.7 *8*	av Eβ=1801 *94*; εK=0.200 *25*; εL=0.029 *4*; εM+=0.0083 *11*
(5.07×10^3 *20*)	1088.3	≈0.08	≈0.02	≈8.0	≈0.1	av Eβ=1848 *94*; εK=0.189 *23*; εL=0.027 *4*; εM+=0.0079 *10*
(5.10×10^3 *20*)	1057.65	7.3 *6*	2.1 *3*	6.1 *1*	9.4 *7*	av Eβ=1862 *94*; εK=0.186 *23*; εL=0.027 *4*; εM+=0.0078 *10*
(5.11×10^3 *20*)	1057.33	2.6 *4*	0.73 *14*	6.5 *1*	3.3 *5*	av Eβ=1862 *94*; εK=0.186 *23*; εL=0.027 *4*; εM+=0.0078 *10*
(5.19×10^3 *20*)	977.49	0.08	0.02	8.1	0.1	av Eβ=1900 *94*; εK=0.178 *21*; εL=0.026 *3*; εM+=0.0074 *9*
(5.26×10^3 *20*)	906.94	1.0 *3*	0.24 *9*	7.0 *2*	1.2 *4*	av Eβ=1933 *94*; εK=0.171 *20*; εL=0.025 *3*; εM+=0.0071 *9*
(5.77×10^3 *20*)	389.53	14 *5*	2.5 *10*	6.1 *2*	16 *6*	av Eβ=2177 *95*; εK=0.130 *15*; εL=0.0187 *21*; εM+=0.0054 *6*

† Absolute intensity per 100 decays.

γ(^{143}Eu)

Iγ normalization: From ΣI(γ+ce)(g.s.)=100. No g.s. transition is assumed, 11/2$^-$ to 7/2$^+$.

α(K)exp were deduced from Iγ (1978Fi02), ce (1976Wi09) and normalized to α(K)=8.0×10^{-3} for 803γ E2 in ^{206}Bi. K/L ratios are from 1976Wi09.

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^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09 (continued)

γ(^{143}Eu) (continued)

E_{γ}[‡]	I_{γ}[‡#]	E_i(level)	J^{π}_i	E_f	J^{π}_f	Mult.	α[†]	Comments
117.57 *5*	7.7 *6*	389.53	$11/2^-$	271.93	$7/2^+$	M2	9.84	α(K)=7.56 *11*; α(L)=1.771 *25*; α(M)=0.405 *6*; α(N+..)=0.1086 *16* α(N)=0.0930 *14*; α(O)=0.01437 *21*; α(P)=0.001239 *18* Mult.: α(K)exp=5.7 *25*; α(L)exp=2.6 *5* (1978Fi02,1976Wi09); K/L=3.2 *10* (1973VaYZ).
131.1 *1*	0.44 *7*	1188.43	$11/2^-$	1057.33	$11/2^+$			
210.9 *1*	1.3 *1*	1188.43	$11/2^-$	977.49	$(9/2)^-$	M1	0.227	α(K)=0.193 *3*; α(L)=0.0272 *4*; α(M)=0.00588 *9*; α(N+..)=0.001581 *23* α(N)=0.001346 *19*; α(O)=0.000214 *3*; α(P)=2.12×10^{-5} *3* Mult.: α(K)exp=0.27 *4*.
271.94 *3*	100	271.93	$7/2^+$	0.0	$5/2^+$	M1	0.1143	α(K)=0.0970 *14*; α(L)=0.01360 *19*; α(M)=0.00293 *5*; α(N+..)=0.000789 *11* α(N)=0.000672 *10*; α(O)=0.0001067 *15*; α(P)=1.064×10^{-5} *15* Mult.: α(K)exp=0.10 *7*; K/L=7.9 *8* (1978Fi02,1976Wi09); K/L=6.7 *15* (1973VaYZ).
304.2 *2*	1.2 *1*	2196.71	$(11/2^-)$	1893.20	$15/2^-$	(E2)	0.0558	α(K)=0.0431 *6*; α(L)=0.00985 *14*; α(M)=0.00221 *4*; α(N+..)=0.000575 *9* α(N)=0.000498 *7*; α(O)=7.31×10^{-5} *11*; α(P)=4.02×10^{-6} *6* Mult.: α(K)exp=0.062 *19*, ΔJ.
389.47 *5*	4.1 *3*	389.53	$11/2^-$	0.0	$5/2^+$	E3	0.0885	α(K)=0.0603 *9*; α(L)=0.0218 *3*; α(M)=0.00505 *7*; α(N+..)=0.001305 *19* α(N)=0.001135 *16*; α(O)=0.0001632 *23*; α(P)=6.25×10^{-6} *9* Mult.: α(K)exp=5.2×10^{-2} *8*, K/L=2.7 *5*.
428.1 *2*	0.3 *1*	1405.6		977.49	$(9/2)^-$			
497.3 *1*	0.7 *1*	1754.24	$^-$	1256.87	$11/2^+$			
545.3 *1*	0.7 *1*	1602.61		1057.33	$11/2^+$			
588.00 *3*	18.6 *13*	977.49	$(9/2)^-$	389.53	$11/2^-$	M1+E2	0.012 *4*	α(K)=0.010 *3*; α(L)=0.0015 *3*; α(M)=0.00033 *7*; α(N+..)=8.7×10^{-5} *18* α(N)=7.4×10^{-5} *15*; α(O)=1.2×10^{-5} *3*; α(P)=1.1×10^{-6} *4* Mult.: α(K)exp=0.011 *1*.
590.8 *2*	0.4 *2*	1497.7		906.94	$9/2^+$			
594.3 *1*	0.69 *6*	2196.71	$(11/2^-)$	1602.61				
625.23 *8*	1.4 *1*	1602.61		977.49	$(9/2)^-$			
668.10 *3*	11.5 *8*	1057.65	$13/2^-$	389.53	$11/2^-$	M1+E2	0.0089 *25*	α=0.0089 *25*; α(K)=0.0075 *22*; α(L)=0.00108 *24*; α(M)=0.00023 *5*; α(N+..)=6.2×10^{-5} *14* α(N)=5.3×10^{-5} *12*; α(O)=8.4×10^{-6} *19*; α(P)=7.9×10^{-7} *25* Mult.: α(K)exp=0.0079 *10*, α(K)=0.00979(M1), α(K)=0.00539 (E2).
698.8 *1*	0.45 *6*	1088.3		389.53	$11/2^-$			
776.8 *1*	1.0 *1*	1754.24	$^-$	977.49	$(9/2)^-$	M1	0.00780 *11*	α=0.00780 *11*; α(K)=0.00666 *10*; α(L)=0.000901 *13*; α(M)=0.000194 *3*; α(N+..)=5.22×10^{-5} *8* α(N)=4.44×10^{-5} *7*; α(O)=7.07×10^{-6} *10*; α(P)=7.17×10^{-7} *10* Mult.: α(K)exp=0.0064 *3*.

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^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09 (continued)

γ(^{143}Eu) (continued)

E_γ[‡]	I_γ[‡#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[†]	Comments
785.56 6	6.5 5	1057.33	11/2$^+$	271.93	7/2$^+$	E2	0.00443 7	α=0.00443 7; α(K)=0.00371 6; α(L)=0.000559 8; α(M)=0.0001215 17; α(N+..)=3.24$\times10^{-5}$ 5 α(N)=2.77$\times10^{-5}$ 4; α(O)=4.31$\times10^{-6}$ 6; α(P)=3.80$\times10^{-7}$ 6 Mult.: α(K)exp=0.0032 5.
798.89 6	12.7 9	1188.43	11/2$^-$	389.53	11/2$^-$	E2	0.00426 6	α=0.00426 6; α(K)=0.00358 5; α(L)=0.000537 8; α(M)=0.0001165 17; α(N+..)=3.10$\times10^{-5}$ 5 α(N)=2.65$\times10^{-5}$ 4; α(O)=4.13$\times10^{-6}$ 6; α(P)=3.66$\times10^{-7}$ 6 Mult.: α(K)exp=0.0032 5.
824.43 9	5.9 4	1214.0	11/2$^-$	389.53	11/2$^-$	(E2)	0.00397 6	α=0.00397 6; α(K)=0.00334 5; α(L)=0.000497 7; α(M)=0.0001078 15; α(N+..)=2.87$\times10^{-5}$ 4 α(N)=2.46$\times10^{-5}$ 4; α(O)=3.83$\times10^{-6}$ 6; α(P)=3.42$\times10^{-7}$ 5 Mult.: α(K)exp=0.0034 5.
830.1 1	0.64 6	2018.73	(9/2$^-$)	1188.43	11/2$^-$			
836.3 1	0.66 6	1893.20	15/2$^-$	1057.33	11/2$^+$			
845.5 2	0.3 1	1903.6		1057.65	13/2$^-$			
890.52 9	2.1 2	2196.71	(11/2$^-$)	1306.09	15/2$^-$			Mult.: α(K)exp=0.0042 10.
906.96 6	2.5 3	906.94	9/2$^+$	0.0	5/2$^+$	E2	0.00322 5	α=0.00322 5; α(K)=0.00272 4; α(L)=0.000396 6; α(M)=8.57$\times10^{-5}$ 12; α(N+..)=2.29$\times10^{-5}$ 4 α(N)=1.95$\times10^{-5}$ 3; α(O)=3.06$\times10^{-6}$ 5; α(P)=2.79$\times10^{-7}$ 4 Mult.: α(K)exp=0.0024 8.
916.53 5	5.1 4	1306.09	15/2$^-$	389.53	11/2$^-$	E2	0.00315 5	α=0.00315 5; α(K)=0.00266 4; α(L)=0.000386 6; α(M)=8.36$\times10^{-5}$ 12; α(N+..)=2.23$\times10^{-5}$ 4 α(N)=1.91$\times10^{-5}$ 3; α(O)=2.98$\times10^{-6}$ 5; α(P)=2.73$\times10^{-7}$ 4 Mult.: α(K)exp=0.0026 4.
926.6 2	0.65 9	1903.6		977.49	(9/2)$^-$			
984.93 5	2.4 2	1256.87	11/2$^+$	271.93	7/2$^+$	E2	0.00270 4	α=0.00270 4; α(K)=0.00228 4; α(L)=0.000327 5; α(M)=7.07$\times10^{-5}$ 10; α(N+..)=1.89$\times10^{-5}$ 3 α(N)=1.614$\times10^{-5}$ 23; α(O)=2.53$\times10^{-6}$ 4; α(P)=2.35$\times10^{-7}$ 4 Mult.: α(K)exp=0.0055 11.
993.1 3	0.55 6	1970.6		977.49	(9/2)$^-$			
1008.28 5	1.6 1	2196.71	(11/2$^-$)	1188.43	11/2$^-$	M1	0.00416 6	α=0.00416 6; α(K)=0.00355 5; α(L)=0.000477 7; α(M)=0.0001024 15; α(N+..)=2.76$\times10^{-5}$ 4 α(N)=2.35$\times10^{-5}$ 4; α(O)=3.74$\times10^{-6}$ 6; α(P)=3.81$\times10^{-7}$ 6 Mult.: α(K)exp=0.0041 15.
1041.35 5	3.6 3	2018.73	(9/2$^-$)	977.49	(9/2)$^-$			
1059.3 1	1.0 1	1331.2	11/2$^+$	271.93	7/2$^+$			
1087.3 1	0.9 2	2065.07	(9/2$^-$)	977.49	(9/2)$^-$			
1087.3 1	1.0 2	2275.6		1188.43	11/2$^-$			
1138.9 1	0.96 9	2196.71	(11/2$^-$)	1057.65	13/2$^-$			
^{x}1144.22 29	0.9 3							

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^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09 (continued)

γ(^{143}Eu) (continued)

E_γ[‡]	I_γ[‡#]	E_i(level)	J^π_i	E_f	J^π_f
1158.2 *1*	0.66 *9*	2065.07	$(9/2^-)$	906.94	$9/2^+$
1162.8 *2*	0.9 *1*	2351.1		1188.43	$11/2^-$
1196.9 *1*	1.06 *9*	2254.2		1057.33	$11/2^+$
1213.1 *3*	0.66 *9*	1602.61		389.53	$11/2^-$
1219.21 *7*	4.9 *4*	2196.71	$(11/2^-)$	977.49	$(9/2)^-$
1225.8 *5*	0.3 *1*	1497.7		271.93	$7/2^+$
1231.8 *3*	0.8 *1*	2209.3		977.49	$(9/2)^-$
1276.9 *5*	0.3 *1*	2254.2		977.49	$(9/2)^-$
1293.3 *2*	1.0 *1*	1565.2		271.93	$7/2^+$
1297.6 *2*	0.42 *7*	2275.6		977.49	$(9/2)^-$
1329.3 *5*	0.3 *1*	2417.6		1088.3	
1354.4 *2*	0.6 *1*	2331.9		977.49	$(9/2)^-$
1373.6 *1*	1.3 *1*	2351.1		977.49	$(9/2)^-$
1386.69 *7*	1.5 *1*	2600.7		1214.0	$11/2^-$
1404.56 *7*	3.4 *3*	1676.49		271.93	$7/2^+$
1489.8 *2*	0.78 *9*	1761.7		271.93	$7/2^+$
1503.4 *1*	1.4 *1*	1893.20	$15/2^-$	389.53	$11/2^-$
1629.3 *1*	2.3 *2*	2018.73	$(9/2^-)$	389.53	$11/2^-$
1633.3 *6*	0.10 *5*	2610.8		977.49	$(9/2)^-$
1675.9 *3*	0.57 *9*	2065.07	$(9/2^-)$	389.53	$11/2^-$
1702.5 *1*	1.3 *1*	2092.15		389.53	$11/2^-$
1746.4 *1*	0.9 *1*	2018.73	$(9/2^-)$	271.93	$7/2^+$
1793.21 *7*	3.1 *2*	2065.07	$(9/2^-)$	271.93	$7/2^+$
1807.14 *7*	9.1 *7*	2196.71	$(11/2^-)$	389.53	$11/2^-$
1820.27 *7*	3.6 *3*	2092.15		271.93	$7/2^+$
1886.0 *2*	0.9 *1*	2275.6		389.53	$11/2^-$
2338.9 *8*	0.3 *1*	2610.8		271.93	$7/2^+$

[†] Additional information 1.

[‡] From 1978Fi02, except where noted.

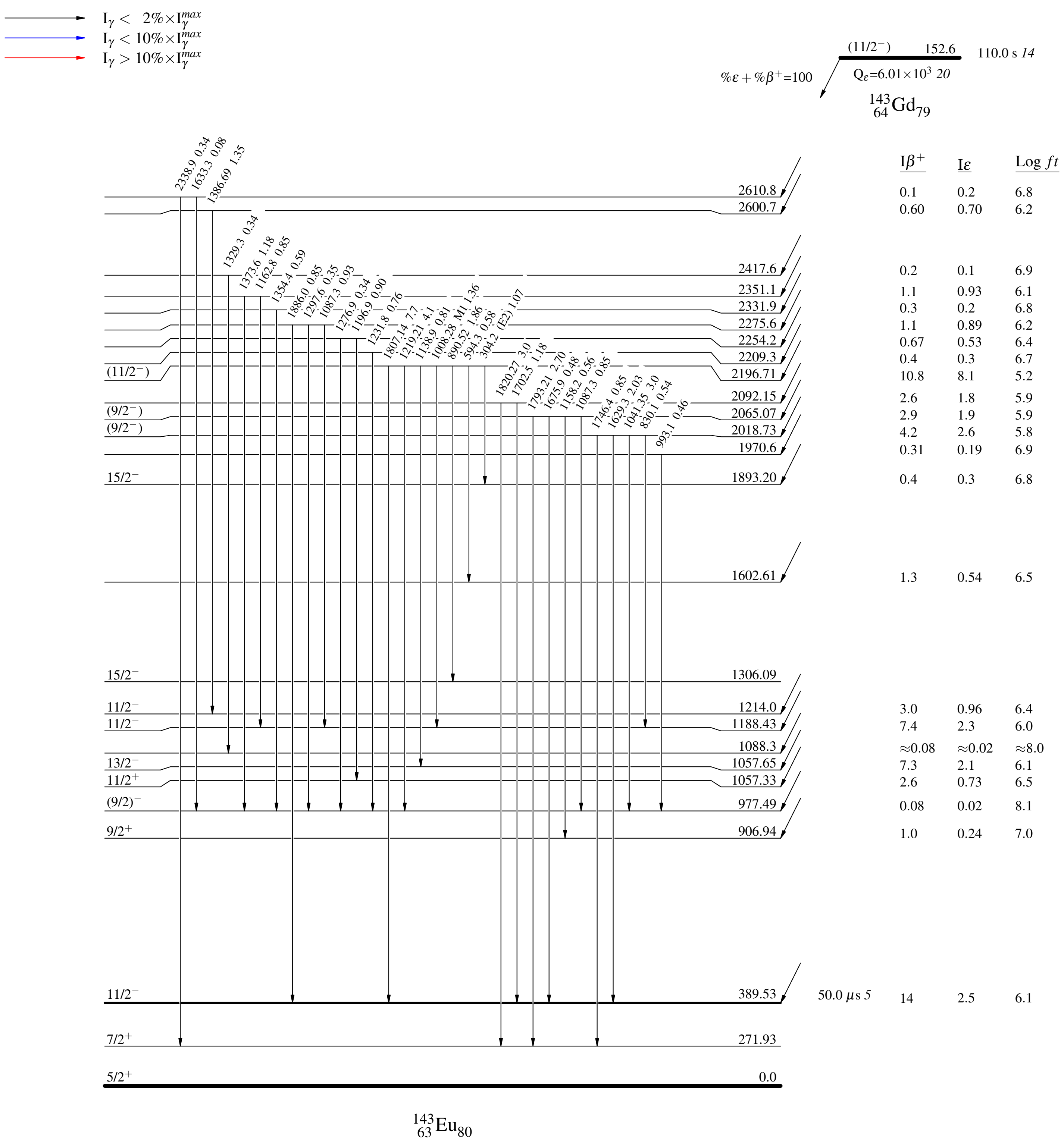
[#] For absolute intensity per 100 decays, multiply by 0.845 *4*.

[x] γ ray not placed in level scheme.

^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays

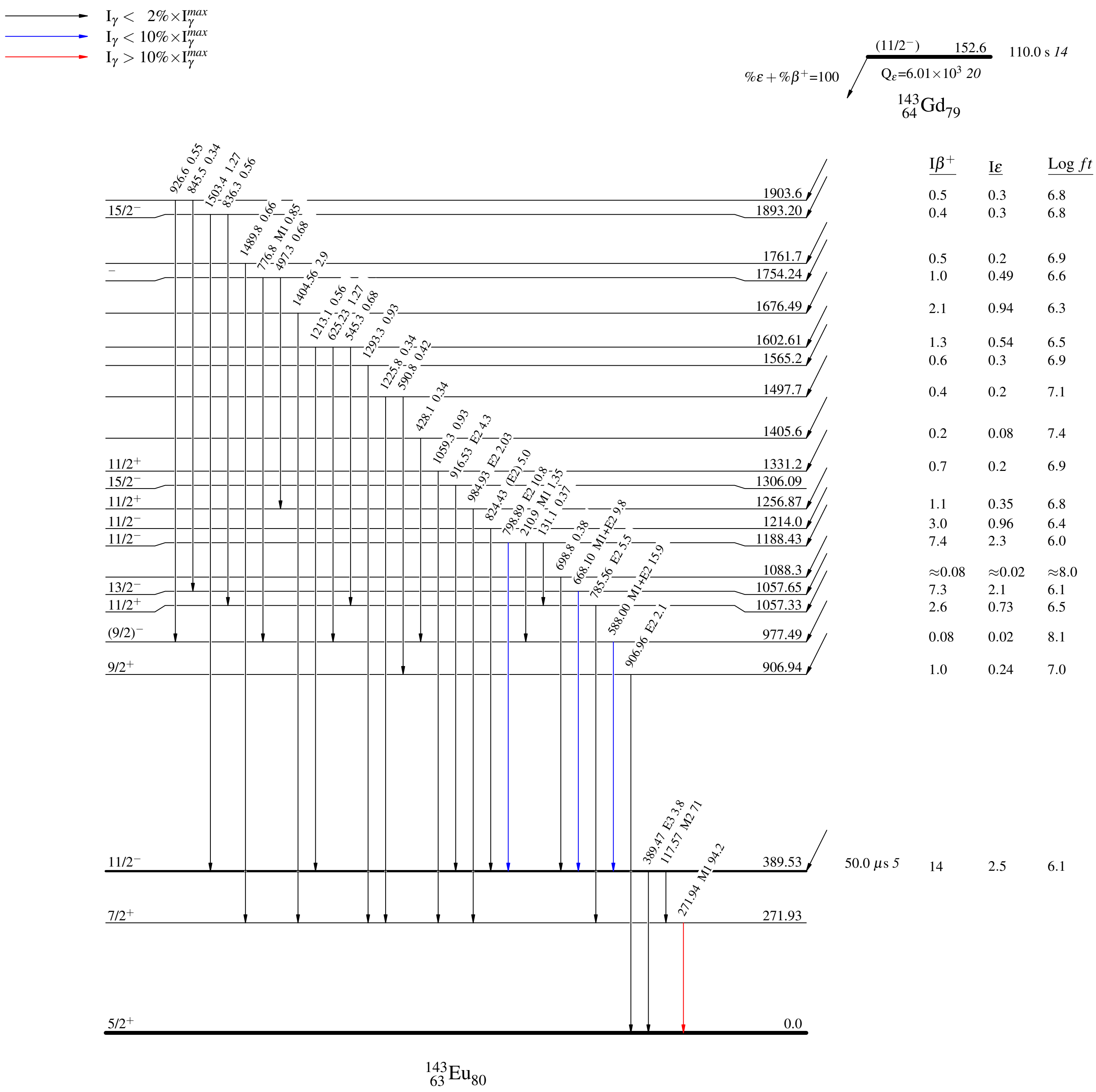


^{143}Gd ε decay (110.0 s) 1978Fi02,1976Wi09

Decay Scheme (continued)

Legend

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays



	Iβ$^+$	Iε	Log *ft*
1903.6	0.5	0.3	6.8
1893.20	0.4	0.3	6.8
1761.7	0.5	0.2	6.9
1754.24	1.0	0.49	6.6
1676.49	2.1	0.94	6.3
1602.61	1.3	0.54	6.5
1565.2	0.6	0.3	6.9
1497.7	0.4	0.2	7.1
1405.6	0.2	0.08	7.4
1331.2	0.7	0.2	6.9
1256.87	1.1	0.35	6.8
1214.0	3.0	0.96	6.4
1188.43	7.4	2.3	6.0
1088.3	≈0.08	≈0.02	≈8.0
1057.65	7.3	2.1	6.1
1057.33	2.6	0.73	6.5
977.49	0.08	0.02	8.1
906.94	1.0	0.24	7.0
389.53	14	2.5	6.1