^{152}Ho ε decay (161.8 s) 1989Ga11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 114, 1497 (2013)	31-Aug-2013

Parent: ^{152}Ho: E=0.0; $J^\pi=2^-$; $T_{1/2}$=161.8 s *3*; Q(ε)=6519 *14*; %ε+%β^+ decay=88 *3*
^{152}Ho-%ε+%β^+ decay: %ε+%β^+=88 *3* (from %α=12 *3* (1977Ha48)).
1989Ga11: measured γ, ce, $\gamma\gamma$, γX; Ge detectors for γ, mag spect with Si(Li) detector for ce.
1982Ba75: measured γ, ce.
1979To09: measured γ.

^{152}Dy Levels

The proposed decay scheme is from 1989Ga11; it disagrees with the earlier decay scheme proposed by 1982Ba75. 1989Ga11 suggest that this is only a partial decay scheme, that the allowed ε decay proceeds through unobserved 4 quasiparticle states above 3.5 MeV excitation. log *ft* for such a transition would be >4.3.
Q(ε)=6.27 *9* MeV from total γ-absorption spectroscopy (1993Al03).

E(level)[†]	J^π[‡]	E(level)[†]	J^π[‡]	E(level)[†]	J^π[‡]	E(level)[†]	J^π[‡]
0.0	0^+	1261.0	4^+	1452.7	$1^+,2^+$	1840.6?	$1^-,2^-,3^-$
613.8	2^+	1313.7	(2^+)	1697.9	1^-	≥3500?	
1226.8	3^-	1448.2	(2^+)	1750.6	4^+		

[†] From a least-squares fit to the Eγ data. The authors give no uncertainties so the output is based on the assumption that the uncertainties are the same for each transition.
[‡] From Adopted Levels.

ε,β^+ radiations

Since it is probable that the levels shown are fed by additional gammas from unobserved higher levels, the I(ε+β^+) calculated from intensity balance are upper limits and the log *ft* are thus lower limits.

E(decay)	E(level)	Iβ^+[†]	Iε[†]	Log *ft*	I($\varepsilon+\beta^+$)[†]	Comments
(3019 *14*)	≥3500?	<23	<77	>4.3	<100	
(4678 *14*)	1840.6?	<1.1	<0.53	>6.8	<1.6	av Eβ=1661.2 *65*; εK=0.2801 *21*; εL=0.0418 *4*; εM+=0.01225 *10*
(4768 *14*)	1750.6	<2.4	<2.9	>8.1[1u]	<5.3	av Eβ=1682.2 *63*; εK=0.4527 *25*; εL=0.0688 *4*; εM+=0.02025 *12*
(4821 *14*)	1697.9	<1.7	<0.77	>6.7	<2.5	av Eβ=1727.5 *66*; εK=0.2596 *20*; εL=0.0387 *3*; εM+=0.01135 *9*
(5066 *14*)	1452.7	<5.5	<2.1	>6.3	<7.6	av Eβ=1841.8 *66*; εK=0.2281 *17*; εL=0.0339 *3*; εM+=0.00996 *8*
(5071 *14*)	1448.2	<1.0	<0.38	>7.1	<1.4	av Eβ=1843.9 *66*; εK=0.2275 *17*; εL=0.0339 *3*; εM+=0.00993 *8*
(5205 *14*)	1313.7	<10	<3.5	>6.1	<14	av Eβ=1906.7 *66*; εK=0.2121 *16*; εL=0.03155 *24*; εM+=0.00926 *7*
(5258 *14*)	1261.0	<6.1	<4.9	>8.0[1u]	<11	av Eβ=1903.3 *64*; εK=0.3713 *22*; εL=0.0562 *4*; εM+=0.01654 *10*
(5292 *14*)	1226.8	<7	<2	>6.3	<9	av Eβ=1947.3 *66*; εK=0.2028 *15*; εL=0.03015 *22*; εM+=0.00885 *7*
(5905 *14*)	613.8	<32	<6.9	>5.9	<39	av Eβ=2235.4 *66*; εK=0.1491 *11*; εL=0.02213 *16*; εM+=0.00649 *5*

[†] Absolute intensity per 100 decays.

^{152}Ho ε decay (161.8 s) 1989Ga11 (continued)

$\gamma(^{152}Dy)$

Iγ normalization: Σ(I(γ+ce) to g.s.)=100 (assuming no ε to ^{152}Dy g.s.). log $f^{1u}t$≥8.5 gives an ε+β^+ branch to g.s. of ≤16%; other similar 2^- to 0^+ transitions in this region (^{148}Tb, ^{150}Tb, ^{150}Tm) have log $f^{1u}t$=8.8 to 9.9.

E_γ[‡]	I_γ[#&]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[@]	α[†]	Comments
437.0	2	1750.6	4+	1313.7	(2+)			
489.5	39	1750.6	4+	1261.0	4+	M1	0.0314	α(K)=0.0266 *4*; α(L)=0.00376 *6*; α(M)=0.000824 *12*; α(N+..)=0.000220 *3* α(N)=0.000191 *3*; α(O)=2.80×10^{-5} *4*; α(P)=1.624×10^{-6} *23*
613	96	1226.8	3−	613.8	2+			
613.9	884	613.8	2+	0.0	0+	E2	0.00905	α(K)=0.00742 *11*; α(L)=0.001277 *18*; α(M)=0.000285 *4*; α(N+..)=7.50×10^{-5} *11* α(N)=6.54×10^{-5} *10*; α(O)=9.17×10^{-6} *13*; α(P)=4.21×10^{-7} *6*
647.2	159	1261.0	4+	613.8	2+	E2	0.00798	α(K)=0.00656 *10*; α(L)=0.001106 *16*; α(M)=0.000247 *4*; α(N+..)=6.49×10^{-5} *9* α(N)=5.66×10^{-5} *8*; α(O)=7.96×10^{-6} *12*; α(P)=3.74×10^{-7} *6* α(L)=0.00111
700.0	109	1313.7	(2+)	613.8	2+	(E2)	0.00664	α(K)=0.00548 *8*; α(L)=0.000900 *13*; α(M)=0.000200 *3*; α(N+..)=5.27×10^{-5} *8* α(N)=4.59×10^{-5} *7*; α(O)=6.49×10^{-6} *9*; α(P)=3.14×10^{-7} *5*
839.1	63	1452.7	1+,2+	613.8	2+	E2	0.00442	α(K)=0.00369 *6*; α(L)=0.000572 *8*; α(M)=0.0001265 *18*; α(N+..)=3.35×10^{-5} *5* α(N)=2.91×10^{-5} *4*; α(O)=4.16×10^{-6} *6*; α(P)=2.12×10^{-7} *3*
1136.8	16	1750.6	4+	613.8	2+			
1226.8	17	1840.6?	1−,2−,3−	613.8	2+	E1	8.95×10^{-4}	α(K)=0.000737 *11*; α(L)=9.70×10^{-5} *14*; α(M)=2.10×10^{-5} *3*; α(N+..)=4.05×10^{-5} *6* α(N)=4.85×10^{-6} *7*; α(O)=7.10×10^{-7} *10*; α(P)=4.12×10^{-8} *6*; α(IPF)=3.49×10^{-5} *5*
1313.7	47	1313.7	(2+)	0.0	0+			
1448.2	15	1448.2	(2+)	0.0	0+	(E2)	1.51×10^{-3}	α(K)=0.001236 *18*; α(L)=0.0001728 *25*; α(M)=3.77×10^{-5} *6*; α(N+..)=6.67×10^{-5} *10* α(N)=8.71×10^{-6} *13*; α(O)=1.269×10^{-6} *18*; α(P)=7.14×10^{-8} *10*; α(IPF)=5.66×10^{-5} *8*
1452.6	20	1452.7	1+,2+	0.0	0+			
1697.9	27	1697.9	1−	0.0	0+	E1	8.41×10^{-4}	α(K)=0.000423 *6*; α(L)=5.51×10^{-5} *8*; α(M)=1.192×10^{-5} *17*; α(N+..)=0.000351 *5* α(N)=2.75×10^{-6} *4*; α(O)=4.04×10^{-7} *6*; α(P)=2.38×10^{-8} *4*; α(IPF)=0.000347 *5*

† Additional information 1.
‡ From 1989Ga11.
# From 1989Ga11. 1989Ga11 measured Iγ, but quoted "total transition intensities" in level scheme. The evaluator has deduced Iγ, based on the multipolarities given in 1989Ga11.
@ From 1989Ga11; based on ce data, measurements not given.
& For absolute intensity per 100 decays, multiply by 0.088 *3*.

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Decay Scheme

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