^{150}Tb ε decay (5.8 min) 1977Ha21,1972Ha18

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	S. K. Basu, A. A. Sonzogni	NDS 114, 435 (2013)	1-Apr-2013

Parent: ^{150}Tb: E=461 *27*; $J^\pi=9^+$; $T_{1/2}$=5.8 min *2*; Q(ε)=4658 *8*; %ε+%β^+ decay=100.0
^{150}Sm(α,4nγ) reaction and ^{150}Tb ε decay data were taken.
Decay scheme is incomplete as only 81.3 % of the total $\varepsilon+\beta^+$ intensity is observed feeding levels.

^{150}Gd Levels

E(level)	J^π†	$T_{1/2}$	E(level)	J^π†	E(level)	J^π†
0	0^+	1.79×10^6 y *8*	1700.85 *16*	5^-	2392.41 *23*	7^+
638.05 *10*	2^+		1936.71 *22*	6^+	2554.44 *20*	8^+
1134.35 *14*	3^-		2116.03 *19*	6^+	2905.9 *4*	8^+
1288.50 *18*	4^+		2211.42 *21*	7^-		

† Based on angular-distribution and conversion-electron data.

ε,β^+ radiations

E(decay)	E(level)	Iβ^+ ‡	Iε‡	Log *ft*	I($\varepsilon+\beta^+$)†‡	Comments
(2.21×10^3 *3*)	2905.9	0.15 *6*	2.1 *8*	5.83 *18*	2.3 *9*	av Eβ=542 *13*; εK=0.783 *5*; εL=0.1172 *7*; εM+=0.03398 *20*
(2.56×10^3 *3*)	2554.44	11 *1*	68 *3*	4.47 *3*	79 *4*	av Eβ=698 *13*; εK=0.720 *6*; εL=0.1072 *10*; εM+=0.0310 *3*

† From I(γ+ce) balance.
‡ Absolute intensity per 100 decays.

$\gamma(^{150}Gd)$

When conversion-electron data were not available, transition multipolarities were assumed to be stretched E2′s if the angular-distribution coefficients′ ratio A_2/A_0 was > 0.3.

E_γ†	I_γ‡&	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	α@	Comments
95.5 *2*	5 *1*	2211.42	7^-	2116.03	6^+	[E1]	0.331	α(K)=0.277 *5*; α(L)=0.0421 *7*; α(M)=0.00912 *14*; α(N)=0.00206 *4*; α(N+..)=0.00238 *4*
154.1 *2*	10 *1*	1288.50	4^+	1134.35	3^-	[E1]	0.0910	α(K)=0.0769 *11*; α(L)=0.01110 *16*; α(M)=0.00240 *4*; α(N)=0.000546 *8*; α(N+..)=0.000631 *10* Mult.: assumed E1 in order to obtain multipolarity of other member of a degenerate pair.
162.0 *2*	73 *5*	2554.44	8^+	2392.41	7^+	M1	0.513	α(K)exp=0.43 *3* α(K)=0.434 *7*; α(L)=0.0622 *9*; α(M)=0.01352 *20*; α(N)=0.00311 *5*; α(N+..)=0.00363 *6* Mult.: M1 obtained by assuming unresolved 154-keV transition to be E1.
179.4 *6*	14 *7*	2116.03	6^+	1936.71	6^+	E2	0.320 *6*	α(K)exp=0.17 *9* α(K)=0.215 *4*; α(L)=0.0815 *17*; α(M)=0.0189 *4*; α(N)=0.00424 *9*; α(N+..)=0.00483 *10* Mult.: E2 obtained on assumption that an unresolved 180.9-keV transition is an E1.

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^{150}Tb ε decay (5.8 min) 1977Ha21,1972Ha18 (continued)

γ(^{150}Gd) (continued)

E_γ[†]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[@]	Comments
180.9 *3*	14 *7*	2392.41	7^+	2211.42	7^-	[E1]	0.0593	α(K)=0.0501 *8*; α(L)=0.00715 *11*; α(M)=0.001547 *23*; α(N)=0.000352 *6*; α(N+..)=0.000408 *6*
235.9[a] *3*	≈5	1936.71	6^+	1700.85	5^-	[E1]	0.0294	α(K)=0.0250 *4*; α(L)=0.00351 *5*; α(M)=0.000757 *11*; α(N)=0.0001727 *25*; α(N+..)=0.000200 *3* Eγ and Iγ are from (α,4nγ) with Iγ(235.9γ) coming from Iγ(235γ)/Iγ(648γ) in that reaction.
274.9 *3*	19 *7*	2211.42	7^-	1936.71	6^+	E1	0.0199	α(K)exp=0.030 *10* α(K)=0.01687 *24*; α(L)=0.00235 *4*; α(M)=0.000507 *8*; α(N)=0.0001158 *17* α(N+..)=0.0001344 *20*
343.07 *10*	250 *20*	2554.44	8^+	2211.42	7^-	E1	0.01142	α(K)exp=0.010 *1* α(K)=0.00972 *14*; α(L)=0.001337 *19*; α(M)=0.000288 *4*; α(N)=6.59×10^{-5} *10* α(N+..)=7.66×10^{-5} *11*
412.4 *2*	98 *6*	1700.85	5^-	1288.50	4^+	E1	0.00734	α(K)=0.00626 *9*; α(L)=0.000852 *12*; α(M)=0.000184 *3*; α(N)=4.21×10^{-5} *6*; α(N+..)=4.89×10^{-5} *7* Mult.: a (412γ)/415γ) unresolved pair gave α(K)exp=0.0059 *7* and were both designated E1.
415.3 *2*	40 *5*	2116.03	6^+	1700.85	5^-	E1	0.00722	α(K)=0.00615 *9*; α(L)=0.000838 *12*; α(M)=0.000181 *3*; α(N)=4.14×10^{-5} *6*; α(N+..)=4.81×10^{-5} *7* Mult.: a (412γ)/415γ) unresolved pair gave α(K)exp=0.0059 *7* and were both designated E1.
438.37 *10*	420 *30*	2554.44	8^+	2116.03	6^+	E2	0.0199	α(K)exp=0.017 *1* α(K)=0.01598 *23*; α(L)=0.00305 *5*; α(M)=0.000680 *10*; α(N)=0.0001546 *22* α(N+..)=0.0001783 *25*
455.7 *2*	120 *30*	2392.41	7^+	1936.71	6^+	(M1+E2)	0.025 *7*	α(K)exp=0.020 *5* α(K)=0.021 *7*; α(L)=0.0032 *6*; α(M)=0.00071 *11*; α(N)=0.00016 *3*; α(N+..)=0.00019 *4*
496.30 *10*	235 *10*	1134.35	3^-	638.05	2^+	E1	0.00479	α(K)exp=0.0039 *4* α(K)=0.00409 *6*; α(L)=0.000552 *8*; α(M)=0.0001189 *17*; α(N)=2.72×10^{-5} *4*; α(N+..)=3.17×10^{-5} *5*
510 *1*	250 *40*	2211.42	7^-	1700.85	5^-	E2	0.01324	α(K)exp=0.013 *3* α(K)=0.01079 *16*; α(L)=0.00192 *3*; α(M)=0.000425 *7*; α(N)=9.69×10^{-5} *15* α(N+..)=0.0001120 *17* Iγ: value estimated from intensity balance in the level scheme.
566.52 *10*	220 *20*	1700.85	5^-	1134.35	3^-	E2	0.01011	α(K)exp=0.0095 *10* α(K)=0.00830 *12*; α(L)=0.001414 *20*; α(M)=0.000312 *5*; α(N)=7.12×10^{-5} *10* α(N+..)=8.24×10^{-5} *12*
638.05 *10*	1000	638.05	2^+	0	0^+	E2	0.00754	α(K)=0.00624 *9*; α(L)=0.001017 *15*; α(M)=0.000224 *4*; α(N)=5.11×10^{-5} *8*; α(N+..)=5.92×10^{-5} *9*
648.4 *3*	185 *50*	1936.71	6^+	1288.50	4^+	E2	0.00726	α(K)exp=0.0061 *5* α(K)=0.00601 *9*; α(L)=0.000974 *14*; α(M)=0.000214 *3*; α(N)=4.89×10^{-5} *7*; α(N+..)=5.67×10^{-5} *8*
650.4 *3*	700 *30*	1288.50	4^+	638.05	2^+	E2	0.00720	α(K)=0.00597 *9*; α(L)=0.000966 *14*; α(M)=0.000212 *3*; α(N)=4.85×10^{-5} *7*; α(N+..)=5.62×10^{-5} *8*

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^{150}Tb ε decay (5.8 min) 1977Ha21,1972Ha18 (continued)

γ(^{150}Gd) (continued)

E_γ[†]	I_γ[‡&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	α[@]	Comments
789.9 *4*	23 *9*	2905.9	8^+	2116.03	6^+	E2	0.00459	α(K)exp=0.004 *2* α(K)=0.00384 *6*; α(L)=0.000587 *9*; α(M)=0.0001282 *18*; α(N)=2.94×10^{-5} *5*; α(N+..)=3.41×10^{-5} *5*
827.48 *10*	410 *30*	2116.03	6^+	1288.50	4^+	E2	0.00414	α(K)exp=0.0036 *3* α(K)=0.00347 *5*; α(L)=0.000524 *8*; α(M)=0.0001143 *16*; α(N)=2.62×10^{-5} *4*; α(N+..)=3.04×10^{-5} *5*

† 1977Ha21 report a single set of values for both their (α,4nγ) and their 5.8 min ε-decay experiments. If averaging data, care should be taken to use these data only once.

‡ Photon intensity is given per 1000 decays normalized to Iγ(638)=1000.

Where α(K)exp is not given mult is from adopted gammas.

@ Normalization was achieved by assuming the 638 keV to be an E2 as measured by 1971Ke06 and ce intensities are relative to that of this transition.

& For absolute intensity per 100 decays, multiply by 0.0993.

a Placement of transition in the level scheme is uncertain.

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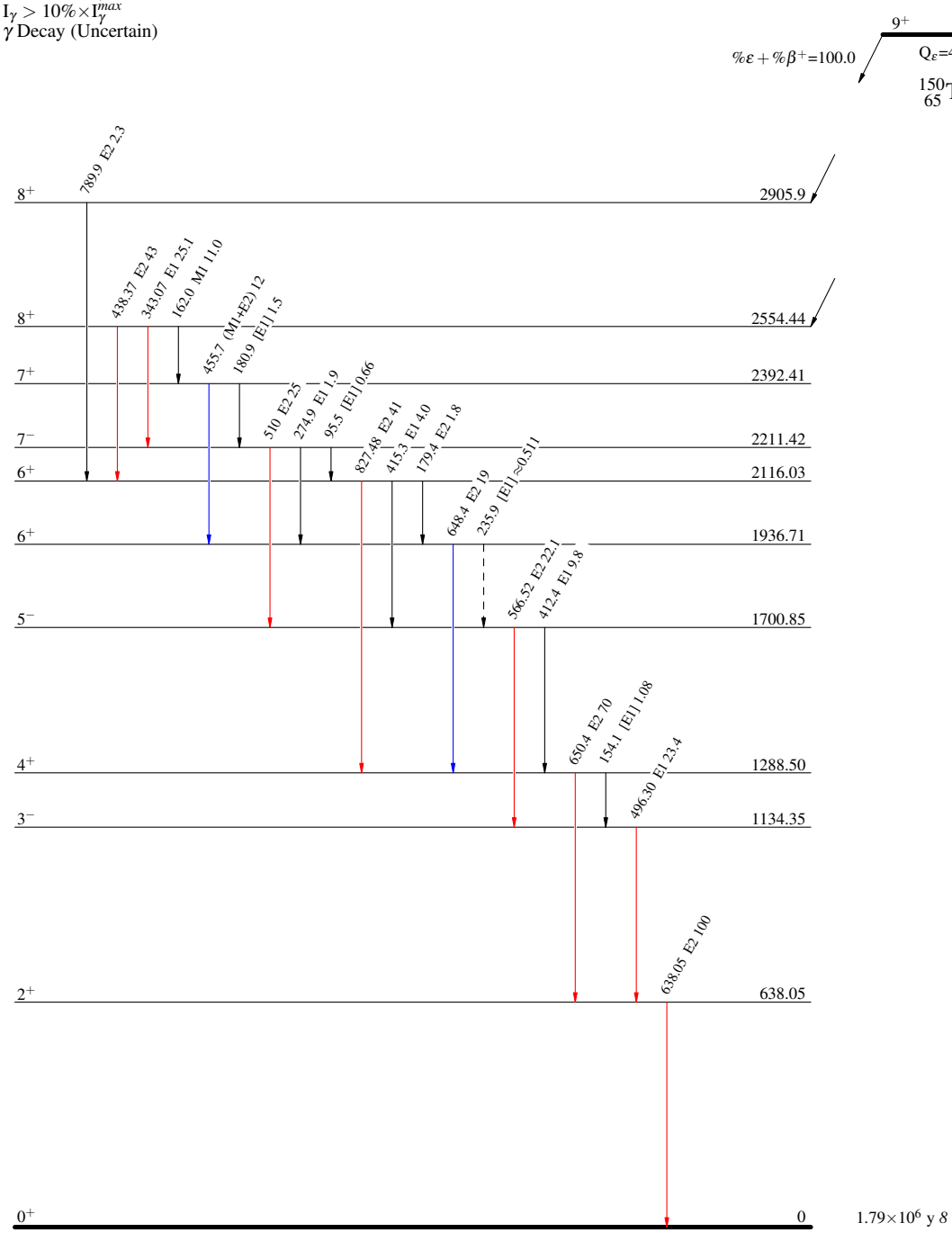
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ 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)



$^{150}_{64}Gd_{86}$