^{151}Tb ε decay (25 s) 1978Al15

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

Parent: ^{151}Tb: E=99.56 *6*; J^π=(11/2$^-$); $T_{1/2}$=25 s *3*; Q(ε)=2565 *4*; %ε+%$β^+$ decay=6.6 *20*

^{151}Tb-%ε+%$β^+$ decay: %ε+%$β^+$=6.6 *20*, from I(γ+ce)(22.9γ)+I(γ+ce)(72.5γ) (γ′s in ^{151}Tb from it decay) and I(γ+ce)(379γ in ^{151}Gd from ε decay).

The decay of the ^{151}Tb isomeric state was identified by observing five γ rays which belong to ^{151}Gd and are not seen in the ε decay of the ground state of ^{151}Tb: 326.1, 379.7, 504.4, 522.4 and 830.5 keV. On this basis 1978Al15 propose possible ε feeding to three states: at 705.8, 902.1 and 1210 keV. However, the 705-keV level is known to have a very strong decay branch to the ground state (see ^{151}Gd 'adopted gammas'). 1978Al15 do not observe this strong γ ray, only the much weaker 326γ. Therefore, the evaluator suggests that the 326γ does not belong to ^{151}Tb ε decay (25 s).

^{151}Gd Levels

E(level)	J^π[†]
0.0	7/2$^-$
379.7	9/2$^-$
705.8?	11/2$^-$
902.1	13/2$^-$
1210.2	11/2$^-$

[†] See 'Adopted Levels'.

ε,$β^+$ radiations

E(decay)	E(level)	Iβ$^+$ [†]	Iε[†]	Log *ft*	I(ε+$β^+$)[†]	Comments
(1454 *4*)	1210.2	0.0062 *20*	3.8 *12*	4.07 *20*	3.8 *17*	av Eβ= 208.58 *6*; εK= 0.8339; εL= 0.1274; εM+= 0.03704
(1762 *4*)	902.1	0.020 *7*	1.5 *5*	4.65 *21*	1.5 *7*	av Eβ= 344.20 *6*; εK= 0.8259; εL= 0.1249; εM+= 0.03625
(2285 *4*)	379.7	0.14 *7*	1.7 *8*	4.83 *24*	1.8 *10*	av Eβ= 573.97 *6*; εK= 0.7721; εL= 0.1154; εM+= 0.03345

[†] Absolute intensity per 100 decays.

γ(^{151}Gd)

Iγ normalization: From intensity balance assuming zero ground state feeding.

E_γ	I_γ[†‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
379.70 *6*	2.83 *15*	379.7	9/2$^-$	0.0	7/2$^-$	M1(+E2)	0.041 *11*	α(K)=0.034 *10*; α(L)=0.0055 *7*; α(M)=0.00121 *12*; α(N+..)=0.00032 *4* α(N)=0.00028 *3*; α(O)=4.2×10^{-5} *6*; α(P)=2.4×10^{-6} *9*
504.50 *20*	0.23 *7*	1210.2	11/2$^-$	705.8?	11/2$^-$			
522.40 *10*	0.68 *6*	902.1	13/2$^-$	379.7	9/2$^-$			
(705.8)		705.8?	11/2$^-$	0.0	7/2$^-$			I_γ: Iγ(706)≥Iγ (504) is expected.
830.50 *10*	1.48 *10*	1210.2	11/2$^-$	379.7	9/2$^-$			

Continued on next page (footnotes at end of table)

^{151}Tb ε decay (25 s) 1978Al15 (continued)

$\gamma(^{151}Gd)$ (continued)

† Intensity per 100 decay of ^{151}Dy.
‡ For absolute intensity per 100 decays, multiply by 2.2 *7*.
# Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

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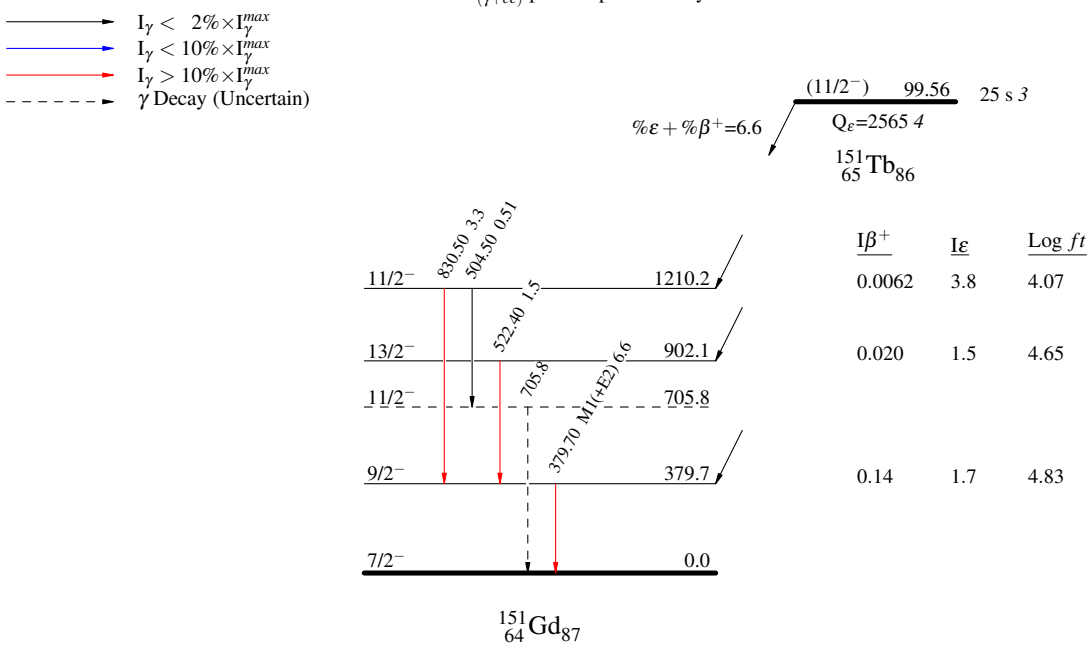
Decay Scheme

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



Iβ+	Iε	Log *ft*
0.0062	3.8	4.07
0.020	1.5	4.65
0.14	1.7	4.83