^{158}Tb β^- decay 1986Go25,1970Pa01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 141, 1 (2017)	1-Feb-2017

Parent: ^{158}Tb: E=0; $J^\pi=3^-$; $T_{1/2}$=180 y *11*; Q(β^-)=936.2 *25*; %β^- decay=16.6 *7*

^{158}Tb-%β^- decay: from sum of the $I_\gamma(1+\alpha)$ to the ground states in β- and $\varepsilon+\beta+$ decays=100, which gives %β-=16.6 *7*.

^{158}Tb has been produced by Gd(p,n) reaction with chemical separation and by ^{156}Dy(n,γ)^{157}Dy(ε)^{157}Tb(n,γ). E_γ and I_γ data are given by 1962Bh05, 1965Sc10, 1968Sc04, 1970Pa01, 1986Go25, 1987Br33; level half-life by 1966Fu03; and β- energies by 1985Vo03.

^{158}Dy Levels

E(level)	J^π[†]	$T_{1/2}$[‡]	Comments
0.0	0^+	stable	
98.9180 *10*	2^+	1.69 ns *6*	$T_{1/2}$: Weighted average of 1.64 ns *8* (1966Fu03) and 1.76 ns *10* (1968Sc04).
317.139 *5*	4^+		

[†] From ^{158}Dy Adopted Levels.

[‡] From this decay mode only, see ^{158}Dy Adopted Levels for all measurements.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
630 *7*	317.139	1.1 *1*	12.74 *5*	av Eβ=193.04 *91* E(decay): weighted average of 628 *7* (1985Vo03) and 648 *20* (1968Sc04) compared to 619.6 *24* from adopted decay energy.
842 *2*	98.9180	15.5 *8*	12.05 *4*	av Eβ=274.45 *96* E(decay): from 1985Vo03 from $\beta\gamma$ coin.; others: 853 *10* (1968Sc04 $\beta\gamma$-coin), 861 *20* (1968Sc04 scin), 857 *27* (1965Sc10 s) and 845 *10* (1962Na01) all with allowed shape. With unique 1st forbidden shape, 1985Vo03 obtained 917.5 *20*. From adopted decay energy, value is 847.8 *24*.

[†] From %β-=16.6 *7* and γ intensity balances.

[‡] Absolute intensity per 100 decays.

γ(^{158}Dy)

Iγ normalization: from $I_\gamma(98)(1+\alpha)$=100% of the β- decays.

1968Sc04 report γ's of 236, 619, 720, and 930 keV which have not been confirmed and, therefore, are not included here.

E_γ[‡]	I_γ[#&]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[@]	α[†]	Comments
98.918 *1*	9.8 *3*	98.9180	2^+	0.0	0^+	E2	2.82	α(K)=1.153 *17*; α(L)=1.285 *18*; α(M)=0.308 *5*; α(N+..)=0.0774 *11* α(N)=0.0690 *10*; α(O)=0.00829 *12*; α(P)=4.78×10^{-5} *7* %Iγ=4.35 *19*.
218.221 *4*	2.13 *4*	317.139	4^+	98.9180	2^+	E2	0.1771	α(K)=0.1225 *18*; α(L)=0.0422 *6*; α(M)=0.00986 *14*; α(N+..)=0.00252 *4* α(N)=0.00223 *4*; α(O)=0.000284 *4*; α(P)=5.97×10^{-6} *9* %Iγ=0.94 *6*.

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$\gamma(^{158}Dy)$ (continued)

† Additional information 1.
‡ From 1986Go25 (1987Br33 has same values).
# From 1986Go25 normalized to $I_\gamma(944)=100$ in $\varepsilon+\beta+$ decay.
@ From ^{158}Dy Adopted γ's. In this decay, 1962Bh05 and 1965Sc10 give ce data which imply 98 γ is E2.
& For absolute intensity per 100 decays, multiply by 0.443 *24*.

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Decay Scheme

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