^{165}Tb β^- decay (2.11 min) 1983Gr02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 194,460 (2024)	31-Oct-2022

Parent: ^{165}Tb: E=0.0; J^π=(3/2$^+$); $T_{1/2}$=2.11 min *10*; Q(β^-)=3023.4 *17*; %β^- decay=100

^{165}Tb-Q(β^-): From 2021Wa16.

1983Gr02: ^{165}Tb source was produced in ^{252}Cf SF at the Idaho ESOL (Elemental Separation On-Line) facility. γ rays were detected with a coaxial Ge(Li) detector. Measured Eγ, Iγ, γ(t). Deduced levels, J, π, parent $T_{1/2}$, β-decay branching ratios, log*ft*.

Due to a large gap between the highest level and the Q-value as well as a considerable amount of unplaced transitions, the decay scheme is considered incomplete and no Iβ and logft values can be deduced.

^{165}Dy Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[‡]	E(level)[†]	J^π[‡]
0.0	7/2$^+$[#]	2.331 h *4*	574.2? *4*	(3/2)$^-$[*b*]
108.31 *10*	1/2$^-$[@]	1.257 min *6*	1337.23 *19*	(1/2$^+$,3/2$^+$)
158.69 *14*	(3/2)$^-$[@]	1.8 ns *10*	1400.36 *19*	(3/2$^+$)
181.2 *4*	(5/2)$^-$[@]	2.5 ns *10*	1773.33 *19*	(1/2,3/2,5/2$^-$)
184.08 *15*	5/2$^-$[&]	1.0 ns *1*	1813.9? *5*	(3/2)
538.72 *18*	3/2$^+$[*a*]			

[†] From a least-squares fit to γ-ray energies.
[‡] From Adopted Levels.
[#] Configuration=ν7/2[633].
[@] Configuration=ν1/2[521].
[&] Configuration=ν5/2[512].
[*a*] K^π=3/2$^+$, K-2 γ vibration built on ν7/2[633], where K=7/2.
[*b*] Configuration=ν3/2[521], taken from Adopted Levels. 1983Gr02 assigned this level as K^π=3/2$^+$ based on 3/2[521]+(K−2 γ vibration built on ν1/2[521]; K=1/2).

$\gamma(^{165}Dy)$

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α#	Comments
50.37 *12*	88 *15*	158.69	(3/2)$^-$	108.31	1/2$^-$	M1+E2	0.40 *+15−18*	8 *4*	α(L)=6.2 *28*; α(M)=1.5 *7* α(N)=0.33 *15*; α(O)=0.041 *17*; α(P)=0.00082 *7*
108.28 *10*		108.31	1/2$^-$	0.0	7/2$^+$	E3		30.8	α(K)=3.24 *5*; α(L)=21.0 *4*; α(M)=5.28 *8* α(N)=1.191 *18*; α(O)=0.1401 *21*; α(P)=0.000206 *3*
184.08 *15*	95 *20*	184.08	5/2$^-$	0.0	7/2$^+$	E1		0.0605	α(K)=0.0510 *8*; α(L)=0.00744 *11*; α(M)=0.001626 *23* α(N)=0.000372 *6*; α(O)=5.22×10^{-5} *8*; α(P)=2.56×10^{-6} *4*
465.4@ *3*	49 *15*	574.2?	(3/2)$^-$	108.31	1/2$^-$	M1(+E2)	<0.7	0.0328 *29*	α(K)=0.0277 *26*; α(L)=0.00406 *24*; α(M)=0.00089 *5* α(N)=0.000206 *12*; α(O)=3.00×10^{-5} *20*; α(P)=1.68×10^{-6} *17*
x509.2† *3*	25 *4*								
x535.5 *3*	36 *4*								
538.85 *20*	113 *10*	538.72	3/2$^+$	0.0	7/2$^+$	E2		0.01252 *1*	α(K)=0.01015 *14*; α(L)=0.001847 *26*; α(M)=0.000414 *6* α(N)=9.49×10^{-5} *13*; α(O)=1.317×10^{-5} *18*; α(P)=5.71×10^{-7} *8*
826.20 *25*	57 *10*	1400.36	(3/2$^+$)	574.2?	(3/2)$^-$				
x1038.85† *25*	16 *4*								
1178.53 *15*	207 *10*	1337.23	(1/2$^+$,3/2$^+$)	158.69	(3/2)$^-$				
1219.2 *3*	40 *6*	1400.36	(3/2$^+$)	181.2	(5/2)$^-$				
1228.95 *30*	19 *5*	1337.23	(1/2$^+$,3/2$^+$)	108.31	1/2$^-$				
1234.9 *3*	23 *4*	1773.33	(1/2,3/2,5/2$^-$)	538.72	3/2$^+$				
1241.65 *25*	48 *4*	1400.36	(3/2$^+$)	158.69	(3/2)$^-$				
x1287.65 *30*	50 *5*								
1292.05 *20*	110 *10*	1400.36	(3/2$^+$)	108.31	1/2$^-$				
x1391.83 *25*	69 *5*								
x1396.45 *30*	22 *4*								
x1439.7† *4*	26 *6*								
x1590.6† *4*	16 *4*								
1614.65 *30*	42 *5*	1773.33	(1/2,3/2,5/2$^-$)	158.69	(3/2)$^-$				
1632.74 *30*	27 *4*	1813.9?	(3/2)	181.2	(5/2)$^-$				
1664.80 *25*	100 *5*	1773.33	(1/2,3/2,5/2$^-$)	108.31	1/2$^-$				
1705.5@ *4*	15 *3*	1813.9?	(3/2)	108.31	1/2$^-$				

† Tentative γ ray.
‡ From Adopted Gammas.

$^{165}_{66}Dy_{99}$-2

^{165}Tb β^- decay (2.11 min) 1983Gr02 (continued)

$\gamma(^{165}Dy)$ (continued)

[#] 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.
[@] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{165}_{66}Dy_{99}$-3

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Decay Scheme

Intensities: Relative I_γ