^{166}Tb β^- decay 1996As05,1996Ic01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 109, 1103 (2008)	1-Mar-2008

Parent: ^{166}Tb: E=0.0; J$^\pi$=(2$^-$); $T_{1/2}$=25.1 s *21*; Q(β^-)=4695 *70*; %β^- decay=100.0

1996As05: ^{166}Tb produced from ^{238}U(p,F), E(p)=16 MeV; on-line isotope separator coupled to gas-jet transport system; plastic scintillator β detector, low-energy photon spectrometer (FWHM=0.61 keV At 122 keV), HPGE detector (FWHM=1.8 keV AT1.33 MeV); measured Eγ, Iγ, singles β and γ spectra, β-γ coin, $\gamma\gamma$ coin, $T_{1/2}$ from β(t), γ(t), β-gated K x ray(Dy)(t). See 1996Ic01 for preliminary report of these data.

^{166}Dy Levels

E(level)†	J$^\pi$‡
0.0	0$^+$
76.58 *6*	2$^+$
253.71 *22*	4$^+$
856.99 *19*	(2)$^+$
928.48 *20*	(3)$^+$
1029.76 *20*	(2$^-$)
1094.6 *3*	(3$^-$)
2069.6 *4*	($\leq$3$^-$)

† From least-squares fit to Eγ.
‡ From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-‡	Log *ft*	Comments
(2.63×10^3 *7*)	2069.6	25 *15*	5.4 *3*	av Eβ=1039 *32*
(3.60×10^3 *7*)	1094.6	12 *7*	6.3 *3*	av Eβ=1481 *32*
(4.44×10^3 *7*)	253.71	9 *5*	8.46^{1u} *25*	av Eβ=1840 *32*
(4.62×10^3 *7*)	76.58	41 *24*	6.2 *3*	av Eβ=1948 *33*
(4.70×10^3# *7*)	0.0	<57†	>6.1	av Eβ=1983 *33*

† 7% +50-7 (1996As05).
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

γ(^{166}Dy)

Iγ normalization: from %(173γ)=26 *13* (1996As05).

E$_\gamma$	I$_\gamma$†#	E$_i$(level)	J$^\pi_i$	E$_f$	J$^\pi_f$	Mult.‡	α@	Comments
76.58 *6*	33 *5*	76.58	2$^+$	0.0	0$^+$	E2	7.52	α(K)=2.01 *3*; α(L)=4.24 *7*; α(M)=1.018 *15*; α(N+..)=0.255 *4* α(N)=0.228 *4*; α(O)=0.0271 *4*; α(P)=8.59×10^{-5} *13*
101.29 *11*	13 *4*	1029.76	(2$^-$)	928.48	(3)$^+$	[E1]	0.298	α(K)=0.249 *4*; α(L)=0.0386 *6*; α(M)=0.00846 *13*; α(N+..)=0.00219 *4* α(N)=0.00192 *3*; α(O)=0.000262 *4*; α(P)=1.150×10^{-5} *17*

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^{166}Tb β^- decay 1996As05,1996Ic01 (continued)

γ(^{166}Dy) (continued)

E_γ	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α [@]	Comments
166.04 *17*	17 *6*	1094.6	(3⁻)	928.48	(3)⁺	[E1]	0.0795	α(K)=0.0669 *10*; α(L)=0.00984 *14*; α(M)=0.00215 *3*; α(N+..)=0.000564 *8* α(N)=0.000492 *7*; α(O)=6.87×10^{-5} *10*; α(P)=3.31×10^{-6} *5*
172.75 *11*	100 *13*	1029.76	(2⁻)	856.99	(2)⁺	[E1]	0.0716	α(K)=0.0603 *9*; α(L)=0.00884 *13*; α(M)=0.00193 *3*; α(N+..)=0.000506 *8* α(N)=0.000442 *7*; α(O)=6.18×10^{-5} *9*; α(P)=3.00×10^{-6} *5* %Iγ=26 *13* (1996As05); the activity In the mass 165 fraction for a ^{165}Tb γ of known absolute intensity was used to deduce the total separation efficiency and, from this and the production cross sections for ^{165}Tb and ^{166}Tb, the emission probability for the I(173γ) In the 166 mass fraction was calculated.
177.13 *21*	25 *7*	253.71	4⁺	76.58	2⁺	E2	0.356	α(K)=0.227 *4*; α(L)=0.0989 *15*; α(M)=0.0233 *4*; α(N+..)=0.00592 *9* α(N)=0.00526 *8*; α(O)=0.000658 *10*; α(P)=1.054×10^{-5} *16*
238.2 *5*	27 *12*	1094.6	(3⁻)	856.99	(2)⁺	[E1]	0.0309	α(K)=0.0261 *4*; α(L)=0.00374 *6*; α(M)=0.000817 *13*; α(N+..)=0.000215 *4* α(N)=0.000187 *3*; α(O)=2.65×10^{-5} *4*; α(P)=1.346×10^{-6} *20*
780.5 *3*	65 *15*	856.99	(2)⁺	76.58	2⁺	M1(+E2)	0.0074 *23*	
851.8 *3*	23 *9*	928.48	(3)⁺	76.58	2⁺	E2(+M1)	0.0061 *18*	
857.0 *3*	74 *20*	856.99	(2)⁺	0.0	0⁺	[E2]	0.00422	
1039.8 *3*	97 *26*	2069.6	(≤3⁻)	1029.76	(2⁻)			

† Photon intensity relative to I(173γ)=100 *13*. on this scale,I(Dy K x ray)=69 *5* (1996As05).

‡ From Adopted Gammas.

\# For absolute intensity per 100 decays, multiply by 0.26 *13*.

@ 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