

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 191,1 (2023)	22-Aug-2023

Q(β^-)=4028 4; S(n)=6145.6 24; S(p)=8801.1 25; Q(α)=-1734.2 21 [2021Wa16](#)

S(2n)=11436.9 25, S(2p)=19732 6 ([2021Wa16](#)).

[1999As03](#): ¹⁶⁷Tb produced and identified in ²³⁸U(p,F),E=20 MeV, followed by mass separation using the on-line isotope separator at Japan Atomic Energy Research Institute (present Japan Atomic Energy agency) tandem accelerator. ¹⁶⁷Tb identified through genetic relationship to known γ rays from the decay of daughter activity ¹⁶⁷Dy. Measured half-life of the decay of ¹⁶⁷Tb and γ radiation.

[2017Wu04](#): ¹⁶⁷Tb produced and identified in ⁹Be(²³⁸U,F) reaction at E(²³⁸U)=345 MeV/nucleon, followed by separation in mass and charge using BigRIPS separator and the ZeroDegree Spectrometer at RIBF-RIKEN facility by TOF-B ρ - Δ E method and the ions of interest were implanted into the beta-counting system WAS3ABi, surrounded by the EURICA array of 84 HPGe detectors. Measured half-life of the decay of ¹⁶⁷Tb by (ion) $\beta^-(t)$, (ion) $\beta^-\gamma(t)$ and (ions) $\gamma(t)$ correlations.

[2019No05](#): theory: calculated neutron and proton pairing residual interaction strength, binding energy, and moments of inertia using self-consistent Hartree-Fock plus BCS framework, with self-consistent blocking and Skyrme SIII parametrization.

[1995Go25](#): calculated quadrupole moment quadratic expansion coefficient versus temperature; deduced oblate or a prolate shape.

[Additional information 1](#).

¹⁶⁷Tb Levels

Cross Reference (XREF) Flags

A ¹⁶⁷Tb IT decay (2.1 μ s)

E(level)	J $^\pi$	T _{1/2}	XREF	Comments
0 $\frac{3}{2}^+$	(3/2 ⁺)	18.9 s 20	A	<p>%β^-=100 Only the β^- decay mode is possible, and has been detected by 1999As03, thus 100% β^- is assigned by inference. J$^\pi$: tentative 3/2⁺, analogous to known J$^\pi$=3/2⁺ and π3/2[411] Nilsson orbital assignments for ground states in Z=65 isotopes: ¹⁶¹Tb, ¹⁵⁹Tb and ¹⁵⁷Tb. 3/2⁺ proposed by 1999As03 and 2017Au03 from systematics, and also in 2019Mo01 from theory. T_{1/2}: from weighted average of 18.6 s 20 (2017Wu04, fit to the (implanted ion)$\beta^-(t)$ correlated decay curve using the least-squares and maximum-likelihood methods, including contributions from the decays of the parent, daughter and the ground-daughter, and a constant background); and 19.4 s 27 (1999As03, weighted average of 20 s 4, 19 s 4 from Kα x ray decay curves and 19 s 7 from Kβ_1 x ray decay curve). Other: T_{1/2}<20 s (1999As03) from decay curves for 57- and 70-keV γ rays in ¹⁶⁷Dy, emitted in the decay of ¹⁶⁷Tb.</p>
53 $\frac{3}{2}^+$ 4	(5/2 ⁺) [†]		A	
126 $\frac{3}{2}^+$ 6	(7/2 ⁺) [†]		A	
200 6	(7/2 ⁻)	2.1 μ s 1	A	<p>%IT=100 J$^\pi$: possible π7/2[523] orbital (2017Gu08). T_{1/2}: From (ion)$\gamma(t)$ (2017Gu08), authors' weighted average of six values: 2.2 μs 6 for 73γ and 2.3 μs 4 for 147γ for fully-stripped ions with setting centered on transmission of ¹⁷⁰Dy ions; 2.7 μs 7 for 73γ and 2.2 μs 3 for 147γ for fully-stripped ions with setting centered at ¹⁷²Dy; 2.0 μs 2 for 73γ and 2.1 μs 3 for 147γ for hydrogen-like ions with setting centered at ¹⁷²Dy. In each case, the decay curve was fitted to a single exponential. Other: 2.45 μs 18 (2014YoZZ).</p>

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued)

^{167}Tb Levels (continued)

† Possible member of $\pi 3/2[411]$ band.

‡ Band(A): Possible $\pi 3/2[411]$ band. Band assignment by 2017Gu08.

$E_i(\text{level})$	J_i^π	E_γ	I_γ	E_f	J_f^π	Mult.	α^\dagger	Comments
53	(5/2 ⁺)	53 4	100	0	(3/2 ⁺)	[M1]	14 11	E_γ : 52 in 2014YoZZ.
126	(7/2 ⁺)	73 ‡ 4	100 ‡	53	(5/2 ⁺)	[M1]	5.4 10	
200	(7/2 ⁻)	73 ‡ 4	40 ‡ 5	126	(7/2 ⁺)	[E1]	0.69 12	B(E1)(W.u.)= 6.1×10^{-8} +16-12 E_γ : 73.6 in 2014YoZZ.
		147 4	100 17	53	(5/2 ⁺)	[E1]	0.107 9	B(E1)(W.u.)= 1.88×10^{-8} +25-23 E_γ : 147.4 in 2014YoZZ.

† Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ -ray energies, assigned multiplicities, and mixing ratios, unless otherwise specified.

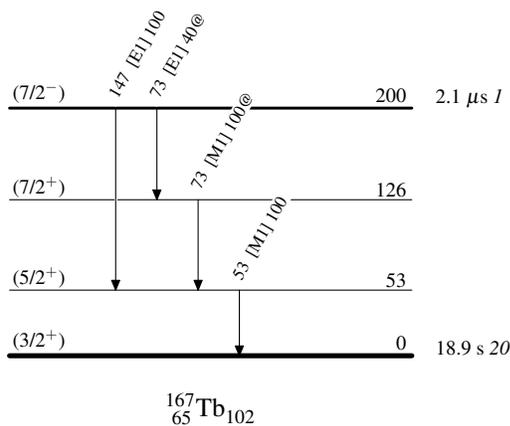
‡ Multiply placed with intensity suitably divided.

Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level

@ Multiply placed: intensity suitably divided



Adopted Levels, Gammas