

Adopted Levels, Gammas

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	C. W. Reich, Balraj Singh	NDS 111,1211 (2010)		12-Apr-2010

$Q(\beta^-)=1785$ 4; $S(n)=6.99\times 10^3$ 4; $S(p)=7604$ 6; $Q(\alpha)=-977$ 6 [2012Wa38](#)

Note: Current evaluation has used the following Q record 1785 4 6990 40 7603 6 -973 8 [2009AuZZ,2003Au03](#).

[Additional information 1](#).

Structure calculations: [1996Du06](#).

A 6.5-h activity was assigned to ^{163}Tb from fission of uranium ([1960Al33](#)) and $^{164}\text{Dy}(\gamma,p)$ ([1962Ta12](#)). [1957Fa48](#) tentatively assigned an activity of ≈ 8 h to ^{163}Tb from the $^{160}\text{Gd}(\alpha,p)$ reaction. [1962Ta12](#) also report eight γ rays and four β transitions populating levels at 25, 74, 235, 335, and 510 in ^{163}Dy . These results have not been confirmed in the later studies of [1966Fu08](#) and [1971Ka22](#) using the $^{164}\text{Dy}(\gamma,p)$ and $^{163}\text{Dy}(n,p)$ reactions. Thus, the assignment of a 6.5-h activity to ^{163}Tb is considered by the evaluators as doubtful.

 ^{163}Tb LevelsCross Reference (XREF) Flags

- A** ^{163}Gd β^- decay (68 s)
B $^{164}\text{Dy}(d,^3\text{He})$
C $^{164}\text{Dy}(t,\alpha)$

E(level) [†]	J^π [‡]	$T_{1/2}$	XREF	Comments
0.0@	3/2 ⁺	19.5 min 3	ABC	$\% \beta^- = 100$ $T_{1/2}$: weighted average of 19.5 min 3 (1971Ka22) and 19.5 min 5 (1966Fu08). Others: 1951Bu25 , 1964Ma16 . J^π : log $ft=5.0$ to $1/2^+$ and log $ft=5.7$ to $5/2^+$.
54@ 2	5/2 ⁺		ABC	
128@ 5	7/2 ⁺		ABC	
223@ 2	9/2 ⁺		BC	XREF: B(235).
344& 5	7/2 ⁻		ABC	
373b 5	5/2 ⁺		ABC	XREF: B(388).
422& 5	9/2 ⁻ #		BC	XREF: B(437).
452b 2	7/2 ⁺		BC	XREF: B(465).
522& 2	11/2 ⁻		BC	XREF: B(537).
552b 5	9/2 ⁺ #		bC	XREF: b(574).
552?a	(5/2 ⁻)		bC	XREF: b(574).
640?e 10	(3/2 ⁺)		bC	XREF: b(674).
662a 5	7/2 ⁻ #		bC	XREF: b(674).
678?e 10	(5/2 ⁺)		BC	E(level): 7/2 ⁻ member of 5/2[532] is assigned at 574 in (d, ^3He). XREF: B(709).
771a 5	9/2 ⁻ #		BC	XREF: B(789).
890a 2	11/2 ⁻		BC	
960d 5	(1/2 ⁺)		bC	XREF: b(994).
987d 2	(3/2 ⁺)		bC	XREF: b(994).
1065d 2	(5/2 ⁺)#		BC	E(level): the 5/2 ⁺ member of $K^\pi=1/2^+$ band from 1/2[411]+ [3/2[411]-Q ₂₂ , 5/2[413]-Q ₂₂] is assigned at 1110 in (d, ^3He).
1112d 5	(7/2 ⁺)#		BC	E(level): the 5/2 ⁺ member of $K^\pi=1/2^+$ band from 1/2[411]+ [3/2[411]-Q ₂₂ , 5/2[413]-Q ₂₂] is assigned at 1184 in (d, ^3He).
1186 5			BC	J^π : (7/2 ⁺) from L(d, ^3He)=(4). No assignment made in (t, α).
1219f 2	(1/2 ⁺)		BC	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{163}Tb Levels (continued)

<u>E(level)[†]</u>	<u>J^π[‡]</u>	<u>XREF</u>	<u>Comments</u>
1281 ^f 2	3/2 ⁺ & 5/2 ⁺	BC	E(level): doublet.
1351 ^d 5	(9/2 ⁺)	BC	J ^π : from (d, ^3He).
1428 ^f 2	7/2 ⁺ & 9/2 ⁺	BC	E(level): doublet.
1498 5		BC	Additional information 2.
1549 5		BC	
1815 ^c 2	(7/2) ^{-#}	BC	
1902 5		BC	
1982 ^c 2	(11/2) ^{-#}	BC	
2204 5		C	
2334 5		C	
2432 5		C	

[†] From (t, α).[‡] From (t, α), based primarily on relative cross sections of band members ("finger-print" method) and consistency of L-transfer for several levels. Parentheses in selected cases are by the evaluators.# See $^{164}\text{Dy}(d, ^3\text{He})$ for a different assignment to a level near this energy (within ≈ 20 keV).@ Band(A): $\pi 3/2[411]$ band. A=11.2 (1992Ga15).& Band(B): $\pi 7/2[523]$ band.^a Band(C): $\pi 5/2[532]$ band.^b Band(D): $\pi 5/2[413]$ band.^c Band(E): $\pi 3/2[541]$ band.^d Band(F): $K^\pi=1/2^+$ band. Configuration= $\pi 1/2[411] + [3/2[411]-Q_{22}, 5/2[413]-Q_{22}]$ (upper fragment). A=11.5, a=-0.39 (1992Ga15).^e Band(G): $K^\pi=1/2^+$ band. Configuration= $\pi 1/2[411] + [3/2[411]-Q_{22}, 5/2[413]-Q_{22}]$ (lower fragment).^f Band(H): $\pi 1/2[420]$ band. $\gamma(^{163}\text{Tb})$ See $^{163}\text{Gd} \beta^-$ decay (68 s) for nine other γ rays assigned to the decay of ^{163}Gd .

<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_γ</u>	<u>I_γ</u>	<u>E_f</u>	<u>J_f^π</u>
344	7/2 ⁻	214.0 [†] 2	46 3	128	7/2 ⁺
		287.79 [†] 8	100	54	5/2 ⁺
373	5/2 ⁺	373.37 [†] 15	100	0.0	3/2 ⁺

[†] Placement of transition in the level scheme is uncertain.

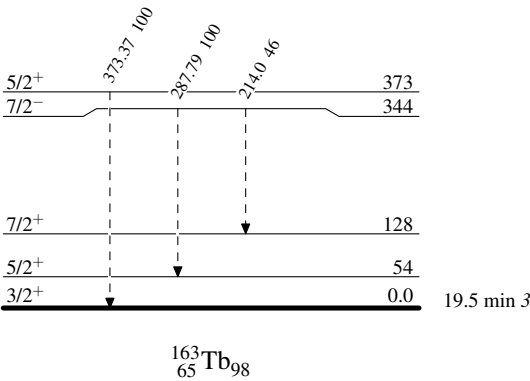
Adopted Levels, Gammas

Legend

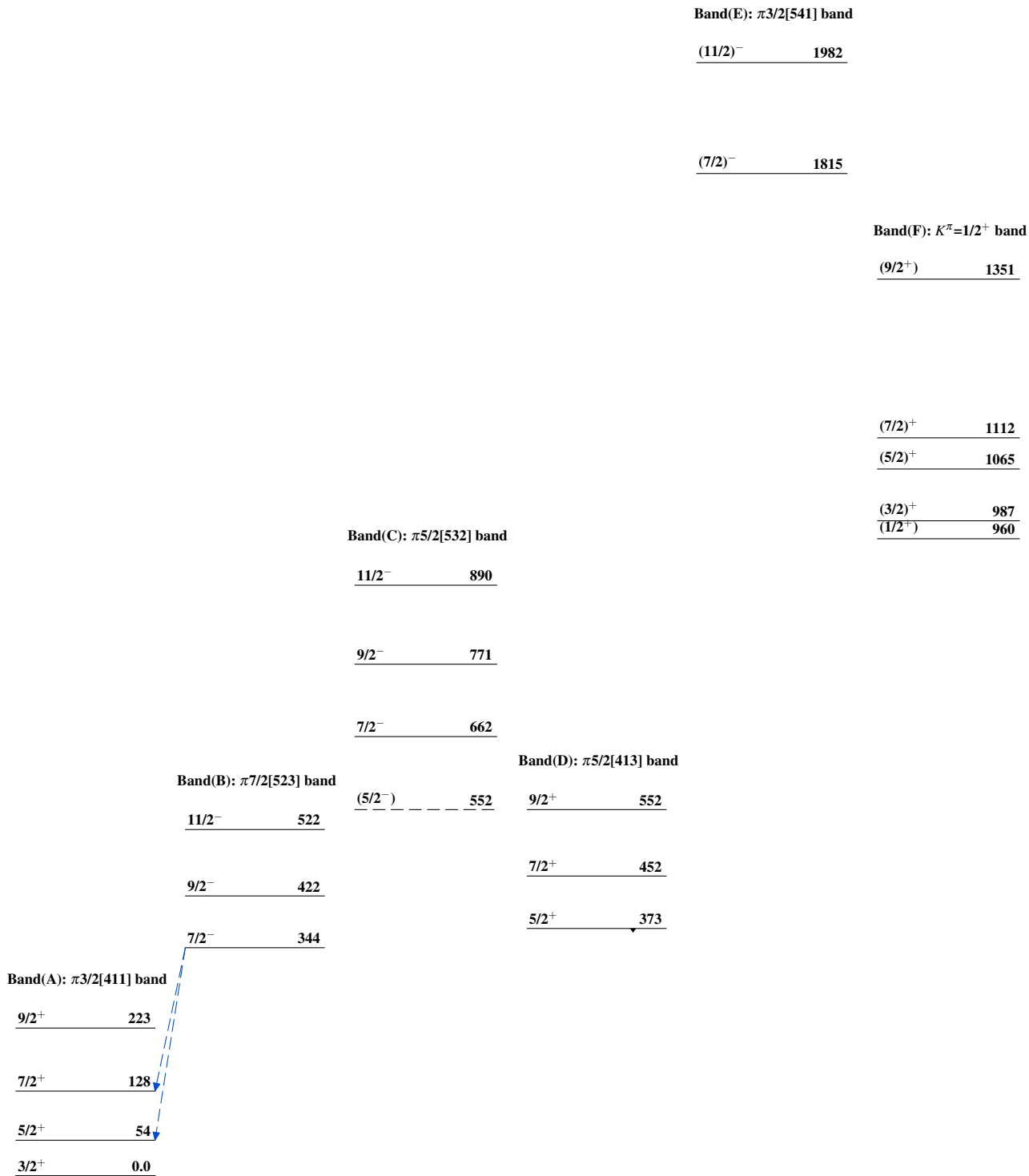
Level Scheme

Intensities: Relative photon branching from each level

-----► γ Decay (Uncertain)



Adopted Levels, Gammas



Adopted Levels, Gammas (continued)

Band(H): $\pi 1/2[420]$ band

7/2⁺ & 9/2⁺ 1428

3/2⁺ & 5/2⁺ 1281

(1/2⁺) 1219

Band(G): $K^\pi=1/2^+$ band

(5/2⁺) 678

(3/2⁺) 640