

$^{159}\text{Tb}(\text{d,t})$ **1989Bu03,1970Jo22**

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

$J^\pi(^{159}\text{Tb})=3/2^+$.

(d,t) reaction with $E(\text{d})=12$ MeV ([1970Jo22](#)) and 15 MeV ([1989Bu03](#), [1984Bu30](#)); triton angular distribution measured ([1970Jo22](#),[1989Bu03](#),[1984Bu30](#)) in magnetic spectrographs. FWHM ≈ 6 keV.

 ^{158}Tb Levels

$E(\text{level})^\dagger$	$J^\pi^\ddagger$	$d\sigma/d\Omega(\mu\text{b/sr})^\#$	$E(\text{level})^\dagger$	$J^\pi^\ddagger$	$d\sigma/d\Omega(\mu\text{b/sr})^\#$
0.0@	3^-	155	638.7 ^h	2^+	700
54.8 ^a	4^+	6	650.7	≈ 26	
79.9@	4^-	66	659.7		42
109.4&	0^-	25	677.3		150
115.5&	1^-	58	699.6 ⁱ	(1^+)	340
128.7 ^a	5^+	19	719.7 ^h	3^+	74
167.4&	2^-	60	740.2		150
178.9 ^b	5^- & 1^+	61	750.0		110
207.8 ^b	3^- & 2^+	62	758.5		160
217.8 ^a	6^+	26	767.5 ⁱ	(2^+)	170
242.0 ^b	3^+	14	794.6		120
280.6		≈ 8	814.3		80
298.5 ^b	$4^+, 4^-, 6^-$	64	824.0		45
322.3 ^a	7^+	11	840.6		≈ 15
338.1		11	849.7 ⁱ	(3^+)	38
359.8 ^b	5^+	18	863.3		90
371.2&	5^-	14	874.4		52
381.1		≈ 14	881.9		55
389.2 ^c	7^-	41	900.7		60
408.1 ^d	(0^+)	88	923.8		≈ 55
419.3 ^d	(1^+)	90	944.0		78
444.4 ^b	8^+ & 6^+	38	953.5		≈ 25
460.9		≈ 10	≈ 986		≈ 79
469.7		≈ 20	1017		≈ 15
487.3 ^d	(2^+)	90	1033		≈ 15
495.4 ^f	4^- & 5^-	29	1051		≈ 10
505.9		100	1069		≈ 55
540.0 ^b	7^+	≈ 20	1094		≈ 10
590.0 ^g	3^+	180	1109		50
601.5 ^e	5^-	≈ 15	1157		≈ 60
610.1		≈ 10	1169		≈ 15

[†] From [1989Bu03](#); other: [1970Jo22](#).

[‡] J^π and band assignments are from authors ([1989Bu03](#)) and are based on the characteristic pattern of cross sections among rotational-band members ("fingerprint") based on Nilsson configurations, and on angular distributions and comparison of measured calculated cross sections for (d,t), ($^3\text{He},\alpha$), and (p, α) reactions. Several levels have multiple J^π assignments.

[#] Cross section for (d,t) reaction at 40° .

@ Band(A): $K^\pi=3^-$ band. Based on π $3/2(411)+\nu$ $3/2(521)$.

& Band(B): $K^\pi=0^-$ band. Based on π $3/2(411)-\nu$ $3/2(521)$.

Continued on next page (footnotes at end of table)

 $^{159}\text{Tb}(\text{d,t})$ [1989Bu03,1970Jo22](#) (continued)

 ^{158}Tb Levels (continued)

- ^a Band(C): $K^\pi=4^+$ band. Based on π 3/2(411)+ ν 5/2(642).
^b Band(D): $K^\pi=1^+$ band. Based on π 3/2(411)- ν 5/2(642).
^c Band(E): $K^\pi=7^-$ band. Based on π 3/2(411)+ ν 11/2(505).
^d Band(F): $K^\pi=0^+$ band. Based on π 3/2(411)- ν 3/2(402).
^e Band(G): $K^\pi=4^-$ band. Based on π 3/2(411)- ν 11/2(505).
^f Band(H): $K^\pi=5^-$ band. Based on π 5/2(532)+ ν 5/2(642).
^g Band(I): $K^\pi=3^+$ band. Based on π 3/2(411)+ ν 3/2(402).
^h Band(J): $K^\pi=2^+$ band. Based on π 3/2(411)+ ν 1/2(400).
ⁱ Band(K): $K^\pi=1^+$ band. Based on π 3/2(411)- ν 1/2(400).

$^{159}\text{Tb}(\text{d,t})$ 1989Bu03,1970Jo22Band(D): $K^\pi=1^+$ band7⁺ 540.0Band(F): $K^\pi=0^+$ band(2⁺) 487.3Band(C): $K^\pi=4^+$ band8⁺ & 6⁺ 444.4 8⁺ & 6⁺ 444.4(1⁺) 419.3(0⁺) 408.1Band(E): $K^\pi=7^-$ band7⁻ 389.2Band(B): $K^\pi=0^-$ band5⁻ 371.25⁺ 359.8Band(A): $K^\pi=3^-$ band7⁺ 322.34⁺,4⁻,6⁻ 298.54⁺,4⁻,6⁻ 298.54⁺,4⁻,6⁻ 298.53⁺ 242.03⁻ & 2⁺ 207.86⁺ 217.83⁻ & 2⁺ 207.85⁻ & 1⁺ 178.95⁻ & 1⁺ 178.92⁻ 167.45⁺ 128.71⁻ 115.5
0⁻ 109.44⁻ 79.94⁺ 54.83⁻ 0.0

$^{159}\text{Tb}(\text{d,t})$ **1989Bu03,1970Jo22 (continued)**

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

(3^+) 849.7

(2^+) 767.5

Band(J): $K^\pi=2^+$ band

3^+ 719.7

(1^+) 699.6

2^+ 638.7

Band(G): $K^\pi=4^-$ band

5^- 601.5

Band(I): $K^\pi=3^+$ band

3^+ 590.0

Band(H): $K^\pi=5^-$ band

4^- & 5^- 495.4

4^- & 5^- 495.4

$^{158}_{65}\text{Tb}_{93}$