

Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	V. S. Shirley	NDS 75,377 (1995)	1-Oct-1993

$Q(\beta^-)=1298.5$; $S(n)=6951.8$; $S(p)=7059.6$; $Q(\alpha)=118.21$ [2012Wa38](#)

Note: Current evaluation has used the following Q record 1298 56950 77058 6120 21 [1993Au05](#).

 ^{173}Tm LevelsCross Reference (XREF) Flags

A $^{173}\text{Er } \beta^-$ decay
B $^{176}\text{Yb}(p,\alpha)$

E(level) [†]	J ^π	T _{1/2}	XREF	Comments
0.0 [‡]	(1/2 ⁺)	8.24 h 8	AB	$\% \beta^- = 100$ J ^π : 1/2[411] Nilsson state assigned to 69th proton as for other odd-mass Tm nuclei. log ft to ^{173}Yb and L=0 component in (p,α) angular distribution for g.s. + 2.46 unresolved levels are consistent with 1/2 ⁺ . T _{1/2} : from 1963Or01 . Other values: 8.2 h I (1963Ku22), 8.3 h I (1966Wi04). Other: 1961Ku10 .
2.46 [‡] 14	(3/2 ⁺)		AB	J ^π : L=2 component evident in (p,α) angular distribution for g.s. + 2.46 unresolved levels. 3/2 ⁺ consistent with proposed band structure and multipolarities from $^{173}\text{Er } \beta^-$ decay.
118.60 [‡] 14	(5/2 ⁺)		AB	J ^π : L=2 component evident in (p,α) angular distribution for unresolved 118 + 124 levels. 5/2 ⁺ consistent with proposed band structure and multipolarities from $^{173}\text{Er } \beta^-$ decay.
124.86 [‡] 15	(7/2 ⁺)		AB	J ^π : L=4 component evident in (p,α) angular distribution for unresolved 118 + 124 levels. 7/2 ⁺ consistent with proposed band structure and multipolarities from $^{173}\text{Er } \beta^-$ decay.
317.73 [#] 20	(7/2 ⁻)	10 μs 3	AB	J ^π : (M1) γ from (9/2 ⁻); (E1) γ to (5/2 ⁺). 7/2[523] Nilsson assignment based on consistency of Weisskopf hindrances for 192.8γ (=7.1×10 ⁸) and 199.2γ (=7.6×10 ⁸) with E1, ΔK=3 deexcitation. T _{1/2} : γβ(t) in $^{173}\text{Er } \beta^-$ decay (1972Pu02).
339.8 25			B	See comment with 319.0 level in $^{176}\text{Yb}(p,\alpha)$ for possible interpretation of this state as the unresolved 9/2 ⁺ and 11/2 ⁺ members of the g.s. band (expected at 333.8 and 343.5 keV, respectively).
411.9 [#] 3	(9/2 ⁻)		AB	J ^π : L=5 in $^{176}\text{Yb}(p,\alpha)$; 9/2 ⁻ consistent with strong feeding in $^{173}\text{Er } \beta^-$ decay.
526.0 [#] 18	(11/2 ⁻)		B	J ^π : L=5 in $^{176}\text{Yb}(p,\alpha)$; 11/2 ⁻ consistent with expected position (=527.0) for 11/2 ⁻ 7/2[523] state.
609.5 17	(1/2 ⁻)		B	J ^π : L=1 in $^{176}\text{Yb}(p,\alpha)$.
669.5 [#] 17	(13/2 ⁻)		B	J ^π : L=7 in $^{176}\text{Yb}(p,\alpha)$. Strength in $^{176}\text{Yb}(p,\alpha)$ and general shape of the angular distribution fit L=2; however, the fit is improved by a mixture of 30% L=7. J ^π =13/2 ⁻ consistent with expected position (=663.0) for 13/2 ⁻ 7/2[523] state.
749.8 18			B	
817.9 18			B	
856.1 18			B	
983.0 18			B	
1137.0 22			B	
1186.9 31			B	
1212.9 4	(9/2 ⁻)		AB	J ^π : log ft=4.5 from (7/2 ⁻) suggests 9/2[514] Nilsson assignment; decays of other N=105 nuclei have similar 7/2[514] to 9/2[514] transitions.
1243.5 27			B	
1335.6 18			B	

Continued on next page (footnotes at end of table)

Adopted Levels, Gammas (continued) ^{173}Tm Levels (continued)

<u>E(level)[†]</u>	<u>XREF</u>	<u>E(level)[†]</u>	<u>XREF</u>	<u>E(level)[†]</u>	<u>XREF</u>	<u>E(level)[†]</u>	<u>XREF</u>
1361.5 29	B	1588.2 18	B	2005.9 25	B	2126.7 23	B
1414.1 18	B	1672.2 18	B	2038.5 25	B	2150.6 25	B
1439.4 29	B	1703.3 26	B	2069.0 23	B	2192.0 28	B
1514.4 25	B	1901.2 18	B	2095.8 23	B		

[†] From ^{173}Er β^- decay, unless seen only in $^{176}\text{Yb}(p,\alpha)$.

[‡] Band(A): 1/2(411) band; $\alpha=12.0$, $\beta=3.7$, $a=-0.93$ (J=1/2, 3/2, 5/2, 7/2 levels).

[#] Band(B): 7/2(523) band; $\alpha=10.5$, $\beta=-4.5$ (J=7/2, 9/2, 11/2 levels).

 $\gamma(^{173}\text{Tm})$

<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>	<u>Mult.[†]</u>	<u>δ</u>	<u>α[#]</u>	<u>Comments</u>
2.46	(3/2 ⁺)	(2.46 20)	100	0.0	(1/2 ⁺)				
118.60	(5/2 ⁺)	116.14 4	100 15	2.46	(3/2 ⁺)	(M1+E2)	0.5 +11-5	2.01 15	
		118.6 2	14 3	0.0	(1/2 ⁺)	[E2]		1.64	
124.86	(7/2 ⁺)	122.40 4	100	2.46	(3/2 ⁺)	(E2)		1.46	
317.73	(7/2 ⁻)	192.8 2	97 10	124.86	(7/2 ⁺)	(E1)		0.0594	B(E1)(W.u.)=1.4×10 ⁻⁹ 5
		199.2 2	100	118.60	(5/2 ⁺)	(E1)		0.0545	B(E1)(W.u.)=1.3×10 ⁻⁹ 4
		315.2		2.46	(3/2 ⁺)				I _γ : not reported, but expected to be weak.
411.9	(9/2 ⁻)	94.2 2	100	317.73	(7/2 ⁻)	(M1)		3.78	
1212.9	(9/2 ⁻)	800.8 6	18 6	411.9	(9/2 ⁻)				
		895.2 4	100 7	317.73	(7/2 ⁻)				

[†] From ^{173}Er β^- decay.

[‡] Relative photon branching from each level.

[#] 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.

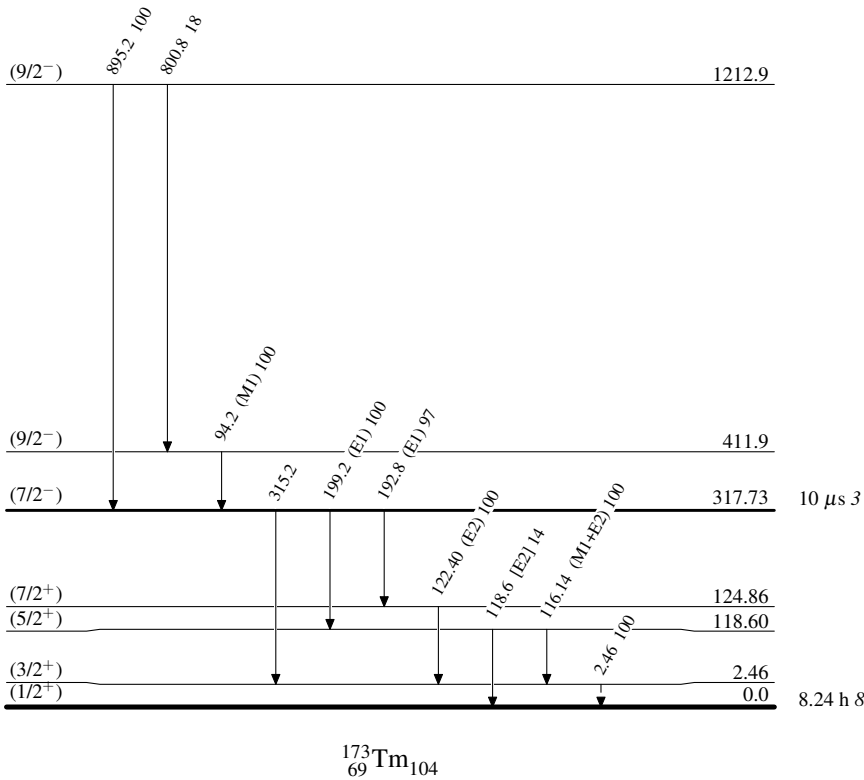
Adopted Levels, Gammas

Legend

Level Scheme

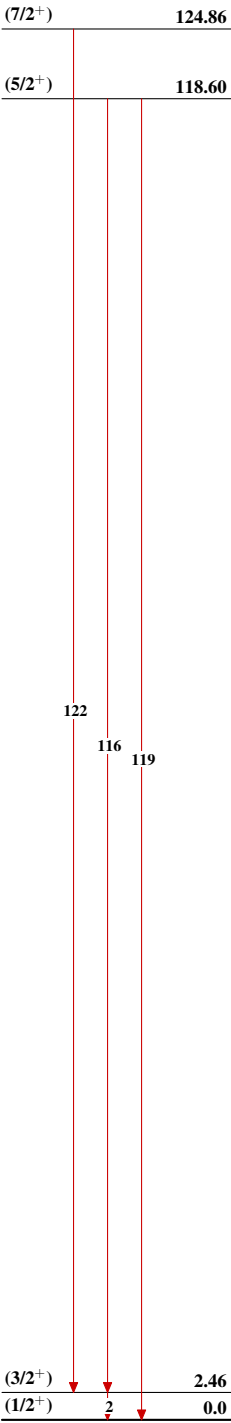
Intensities: Relative photon branching from each level

-----> γ Decay (Uncertain)



Adopted Levels, Gammas

Band(A): 1/2(411) band; $\alpha=12.0$,
 $\beta=3.7$, $a=-0.93$ ($J=1/2, 3/2, 5/2, 7/2$ levels)



¹⁷³Tm₁₀₄

Adopted Levels, Gammas (continued)

Band(B): 7/2(523) band;
 $\alpha=10.5, \beta=-4.5$ (J=7/2,
9/2, 11/2 levels)

(13/2⁻) 669.5

(11/2⁻) 526.0

(9/2⁻) 411.9

94

(7/2⁻) 317.73

$^{173}_{69}\text{Tm}_{104}$