

¹⁶⁹Tm(⁹Be,4n γ) **1992Ho10,1987Kr17**

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, Huo Junde		NDS 87, 15 (1999)	1-Nov-1998

Additional information 1.

1992Ho10: E=40-65 MeV, measured E γ , I γ , $\gamma\gamma$ coin, $\gamma(\theta)$. Detectors: 2 \geq , one of them Compton suppressed.

1987Kr17: E=40-60 MeV, measured E γ , I γ , $\gamma\gamma$ coin, $\gamma(\theta)$. Detectors: 2 \geq , one of them Compton suppressed.

All of the γ rays presented here (except for the 48.5-keV γ ray) were also observed in the ¹⁶⁰Gd(¹⁹F,5n γ) reaction

(**1998Ba20,1997Ba45**). Their placement in the level scheme, however, agree for those that belong to the g.s. rotational band only.

Consequently, levels other than the members of this band observed in ¹⁶⁹Tm(⁹Be,4n γ), have not been adopted.

¹⁷⁴Ta Levels

E(level)	J π &	T _{1/2}	E(level)	J π &	E(level)	J π &
0.0 [†]	3 ⁺	1.05 h 3	290.7 [#] 9	(8 ⁻)	935.6 [‡] 11	(11 ⁺)
0.0+x [@]		250 ns	369.8 [‡] 10	(8 ⁺)	936.6 [#] 13	(12 ⁻)
76.1 [†] 6	5 ⁺		391.3+x [@] 9	(10 ⁻)	1170.3 [‡] 11	(12 ⁺)
83.1 10	(5 ⁺)		407.2 [#] 10	(9 ⁻)	1256.6 [†] 13	13 ⁺
92.2+x [@] 7	(8 ⁻)		492.6 [†] 10	9 ⁺	1423.6 [‡] 11	(13 ⁺)
97.5 [#] 7	(6 ⁻)		533.3 [‡] 10	(9 ⁺)	1694.1 [‡] 12	(14 ⁺)
131.3 [‡] 10	(6 ⁺)		568.9 [#] 11	(10 ⁻)	1759.7 [†] 15	15 ⁺
180.2 [#] 9	(7 ⁻)		585.3+x [@] 10	(11 ⁻)	2278.2 [‡] 13	(16 ⁺)
225.8+x [@] 9	(9 ⁻)		718.6 [#] 11	(11 ⁻)	2337.6 [†] 16	17 ⁺
235.9 [‡] 9	(7 ⁺)		722.9 [‡] 10	(10 ⁺)		
239.8 [†] 9	7 ⁺		832.6 [†] 12	11 ⁺		

[†] Band(A): doubly decoupled g.s. rotational band. Configuration=(π 1/2-(541))+(ν 1/2-(521)).

[‡] Band(B): compressed band, Configuration=(π 5/2+(402))+(ν 7/2+(633)).

[#] Band(C): staggered semidecoupled band, Configuration=(π 1/2+(541))+(ν 7/2+(633)).

[@] Band(D): compressed band, Configuration=(π 9/2-(514))+(ν 7/2+(633)).

& J π assignments are based on rotational structure and γ -ray multiplicities.

$\gamma(^{174}\text{Ta})$

E γ [†]	I γ [†]	E _i (level)	J π _i	E _f	J π _f	Mult. ^{†‡}	Comments
48.5		131.3	(6 ⁺)	83.1	(5 ⁺)		
76.1	32.2	76.1	5 ⁺	0.0	3 ⁺	E2	Mult.: A ₂ =0.188 18.
82.4	14.6	180.2	(7 ⁻)	97.5	(6 ⁻)	D+Q	Mult.: A ₂ =-0.477 45.
92.2	32.5	92.2+x	(8 ⁻)	0.0+x		E2,D+Q	Mult.: A ₂ =0.034 30.
97.5	100	97.5	(6 ⁻)	0.0+x		D,Q	Mult.: A ₂ =0.003 17.
104.5	6.2	235.9	(7 ⁺)	131.3	(6 ⁺)	D+Q	Mult.: A ₂ =0.49 22.
110.2	29.4	290.7	(8 ⁻)	180.2	(7 ⁻)		
116.3	19.6	407.2	(9 ⁻)	290.7	(8 ⁻)	D+Q	Mult.: A ₂ =-0.53 8.
133.6	83.0	225.8+x	(9 ⁻)	92.2+x	(8 ⁻)	D+Q	Mult.: A ₂ =0.183 9.
133.6	23.5	369.8	(8 ⁺)	235.9	(7 ⁺)	D+Q	Mult.: A ₂ =0.183 9.
149.7	12.2	718.6	(11 ⁻)	568.9	(10 ⁻)		
152.5		235.9	(7 ⁺)	83.1	(5 ⁺)	E2	
159.6	35.7	235.9	(7 ⁺)	76.1	5 ⁺	E2	Mult.: A ₂ =0.27 6.
161.5	31.0	568.9	(10 ⁻)	407.2	(9 ⁻)		
163.5	10.9	533.3	(9 ⁺)	369.8	(8 ⁺)	M1+E2	Mult.: A ₂ =0.337 30.
163.9	49.3	239.8	7 ⁺	76.1	5 ⁺	E2	Mult.: A ₂ =0.337 30.

Continued on next page (footnotes at end of table)

$^{169}\text{Tm}(^9\text{Be},4n\gamma)$ **1992Ho10,1987Kr17 (continued)** $\gamma(^{174}\text{Ta})$ (continued)

E_γ †	I_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. †‡	Comments
165.3	92.7	391.3+x	(10 ⁻)	225.8+x	(9 ⁻)	D+Q	Mult.: $A_2=0.125$ 20.
189.9	6.2	722.9	(10 ⁺)	533.3	(9 ⁺)		
193.5	6.4	290.7	(8 ⁻)	97.5	(6 ⁻)		
193.9	41.0	585.3+x	(11 ⁻)	391.3+x	(10 ⁻)		
213.2	9.8	935.6	(11 ⁺)	722.9	(10 ⁺)		
221.9#	7.9	936.6?	(12 ⁻)	718.6	(11 ⁻)		
226.9	9.5	407.2	(9 ⁻)	180.2	(7 ⁻)	E2	
234.5		1170.3	(12 ⁺)	935.6	(11 ⁺)		
238.5	14.9	369.8	(8 ⁺)	131.3	(6 ⁺)	E2	Mult.: $A_2=0.45$ 13.
253.0	53.6	492.6	9 ⁺	239.8	7 ⁺	E2	Mult.: $A_2=0.249$ 33.
278.5	26.5	568.9	(10 ⁻)	290.7	(8 ⁻)	E2	Mult.: $A_2=0.37$ 6.
297.6	26.3	533.3	(9 ⁺)	235.9	(7 ⁺)	E2	M $A_2=0.26$ 9.
299.1	43.4	391.3+x	(10 ⁻)	92.2+x	(8 ⁻)		
311.4	9.5	718.6	(11 ⁻)	407.2	(9 ⁻)		
340.4	31.4	832.6	11 ⁺	492.6	9 ⁺		
353.7	38.8	722.9	(10 ⁺)	369.8	(8 ⁺)	E2	Mult.: $A_2=0.35$ 7.
359.5	24.9	585.3+x	(11 ⁻)	225.8+x	(9 ⁻)		
370.3		936.6?	(12 ⁻)	568.9	(10 ⁻)		
402.7	20.6	935.6	(11 ⁺)	533.3	(9 ⁺)		
424.1	20.9	1256.6	13 ⁺	832.6	11 ⁺		
447.8	30.5	1170.3	(12 ⁺)	722.9	(10 ⁺)	E2	Mult.: $A_2=0.21$ 20.
488.4	9.8	1423.6	(13 ⁺)	935.6	(11 ⁺)		
503.6	13.0	1759.7	15 ⁺	1256.6	13 ⁺		
524.0	12.5	1694.1	(14 ⁺)	1170.3	(12 ⁺)		
578.1	13.4	2337.6	17 ⁺	1759.7	15 ⁺		
584.5	8.3	2278.2	(16 ⁺)	1694.1	(14 ⁺)		

† From **1992Ho10**, except as noted, $0.1 \geq \Delta E \leq 0.3$ keV, $10\% \geq \Delta I_\gamma \leq 30\%$.

‡ Transition-intensity balance suggests E2 multipolarity. Stretched character from $\gamma(\theta)$. But no $\gamma(\theta)$ for some cases. The authors probably "ASSUMED" the mult for these cases.

Placement of transition in the level scheme is uncertain.

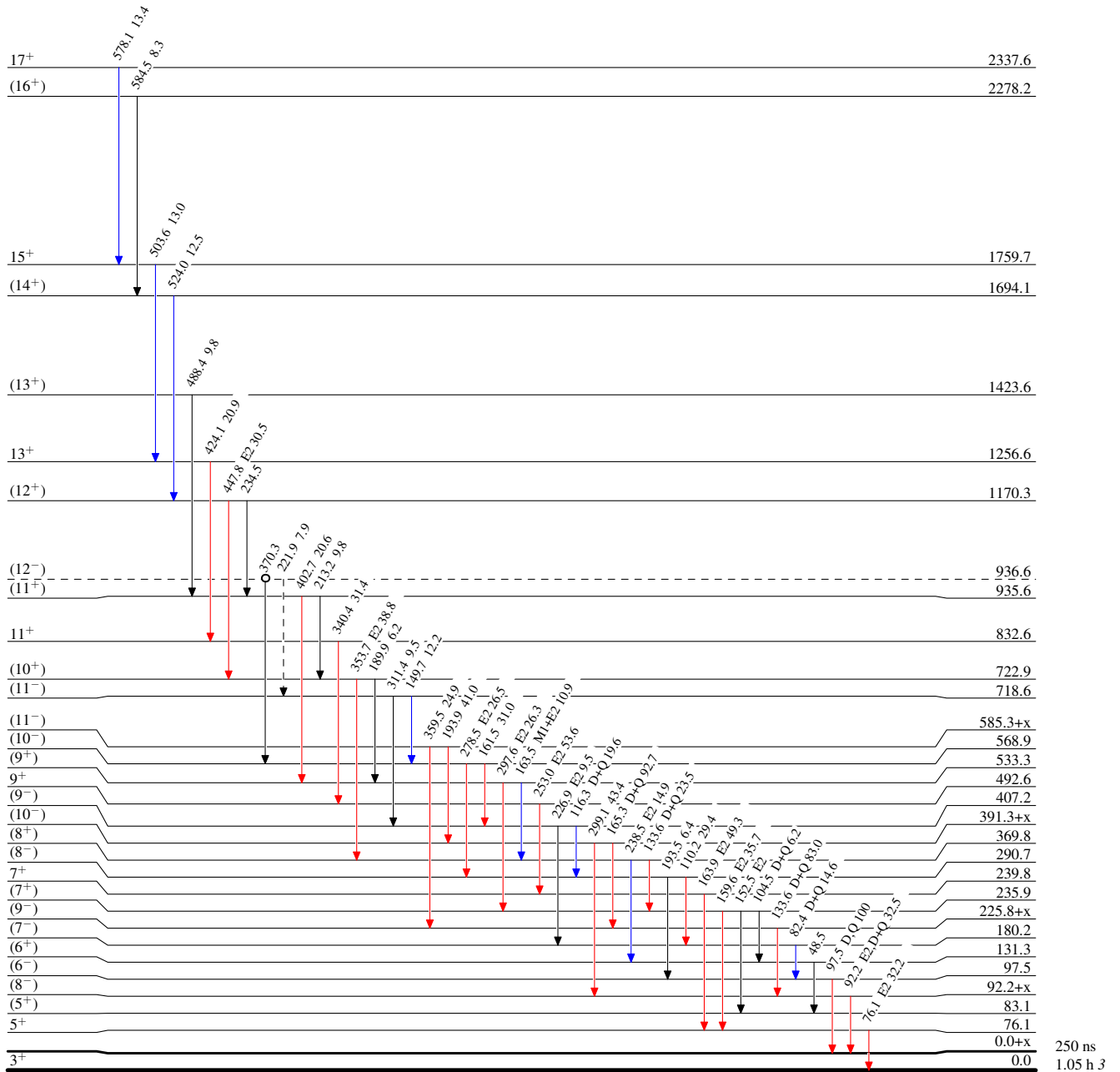
$^{169}\text{Tm}(\text{}^9\text{Be}, 4n\gamma)$ 1992Ho10, 1987Kr17

Level Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - - γ Decay (Uncertain)
- Coincidence
- Coincidence (Uncertain)



$^{174}_{73}\text{Ta}_{101}$

250 ns
1.05 h 3

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