^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. M. Baglin[1], E. A. Mccutchan[2], S. Basunia[1]	NDS 153, 1 (2018)	1-Oct-2018

Target $J^\pi=1/2^+$. σ_n=105 b *2* (2006MuZX).
This dataset includes ^{169}Tm(d,pγ).
For data from (n,γ) E=thermal: two-photon cascade measurements, see separate data set.
For average resonance capture data, see ^{169}Tm(n,γ) E=2, 24 keV dataset.
For neutron resonance parameters, see ^{169}Tm(n,γ) E=res dataset.
Others: 1970Bh03 [(n,γ) E=res].
2007ChZX: evaluation of (n,γ) E=thermal data which include new elemental cross section measurements.
1996Ho12: ^{169}Tm(n,γ) E=thermal; GAMS1 and GAMS2/3 curved-crystal spectrometers, FWHM<$5.6\times10^{-6}E_\gamma^2$ for first-order diffraction; BILL β spectrometer; Ge and x-ray detectors for $\gamma\gamma$ coin measurements; natural Tm oxide and metal targets; measured secondary γ (≈570 transitions) Eγ, Iγ, Ice, $\gamma\gamma$ coin. These data supersede most data from 1994HoZZ and 1995HoZZ.
1989Du03: ^{169}Tm(n,γ) E=thermal; Si(Li) detector, FWHM=0.35 keV at 30 keV.
1968Lo09: ^{169}Tm(n,γ) E≤136 eV (resonant and nonresonant); measured primary Eγ, Iγ; deduced S(n)=6593.8 *14* (cf. 6591.96 *17* (2017Wa10)).
1967An04: ^{169}Tm(d,pγ) E=9 MeV, ^{169}Tm(n,γ) E=thermal; measured $T_{1/2}$, Ice, Iγ, $\gamma\gamma$-delayed coin; deduced conversion coefficients assuming E2-theory value for α(L)exp(115γ).
1967Ba17: ^{169}Tm(n,γ) E=thermal, double-focusing β spectrometer; measured E(ce), Ice.
1966Sh03: ^{169}Tm(n,γ) E=thermal; measured Eγ, Iγ for primary transitions and Eγ, Iγ, Ice for secondary transitions. Assigned nuclear configurations.
For neutron resonance parameters and thermal n cross section, see 2006MuZX.
The level scheme is based on that from 1996Ho12.
Nuclear band configurations: see 1966Sh03, 1996Ho12.

^{170}Tm Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0[@]	1^-		
38.7135[@] *5*	2^-		
114.5438[@] *6*	3^-		
149.7180[#] *6*	0^-		
183.1928[@] *6*	4^-		
183.1930[k] *7*	$(3)^+$	4.12 μs *13*	$T_{1/2}$: from γ(t) in (d,pγ) and (n,γ) E=thermal (1967An04). Other: 3.2 μs *3* (delayed spectrum, 1970Bh03).
204.4484[b] *7*	2^-	<1 ns	$T_{1/2}$: from absence of delayed ce or γ from level (1967An04).
219.7060[#] *6*	2^-		
237.2395[#] *6*	1^-		
247.1485[k] *17*	$(4)^+$		
270.5465[b] *8*	$(3)^-$		
319.3260[@] *12*	5^-		
349.7332[#] *8*	3^-		
355.0482 *9*	$(4)^+$		J^π: probable configuration=(π 1/2[411])+(ν 7/2[633]) bandhead (1996Ho12).
358.1166[b] *9*	$(4)^-$		
381.4262[#] *8*	$(4)^-$		
402.7281 *19*	$(3,4)^-$		
447.0706[d] *8*	$(3)^-$		
467.8607[b] *12*	$(5)^-$		
539.7220[d] *17*	$(4)^-$		

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^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

^{170}Tm Levels (continued)

E(level)†	Jπ‡	Comments
544.050 *8*	(3^+)	
550.7480# *16*	5^-	
590.2290& *17*	1^-	
603.9903f *14*	1^+	
607.8865f *16*	3^+	
637.9060& *21*	2^-	
648.7469h *14*	1^-	
650.3732f *14*	2^+	
655.598d *20*	(5^-)	
661.8555l *13*	1^+	
683.569j *3*	$(0)^-$	
693.2868h *13*	2^-	
703.6295l *14*	2^+	
708.372& *4*	3^-	
709.476 *4*	$(1,2,3)^-$	
715.6202a *16*	$(3)^-$	
719.2626g *23*	1^+	
733.8130j *21*	$(2)^-$	
749.8484h *16*	$(3)^-$	
756.211a *4*	$(4)^-$	
758.3290 *17*	$(2)^+$	Jπ: possible configuration=(π 1/2[541])-(ν 5/2[512]) bandhead (1996Ho12).
775.2305c *14*	$(0)^+$	
782.1521j *22*	$(1)^-$	
806.4276 *24*	$(4)^-$	Jπ: possible configuration=((π 3/2[411])+(ν 5/2[512])) bandhead (1996Ho12).
818.5088c *15*	$(2)^+$	
822.3949g *15*	2^+	
839.131 *4*	$(3)^-$	
854.337i *4*	2^-	
860.486c *3*	1^+	
862.7761j *20*	$(3)^-$	
863.366e *5*	$(1)^-$	
908.452e *5*	(2^-)	
925.2719i *22*	$(3)^-$	
959.218 *8*	$(3)^-$	
964.475 *7*	$(3,4)^-$	
979.929e *4*	$(3)^-$	
984.981 *7*	$(3,4,5)^-$	
1064.4586 *14*	$(1)^+$	
1070.975 *6*	$(2)^-$	
1078.8498 *15*	$(1)^+$	
1091.586 *3*	(1,2)	Jπ: not 0 based on presence of E2 942γ to $(0)^-$ 150 level; note that multipolarities of γ-rays deexciting level are not mutually consistent.
1101.999 *4*	(2^+)	
1139.954 *4*	$(2)^-$	
1147.975 *4*	$(1,2)^-$	
1160.598 *3*	$(1)^-$	
1168.780 *5*	$(2)^-$	Jπ: (0^-,2^-) based on primary γ feeding from 1^+, but not from 0^+ resonances (1968Lo09).
1178.909 *3*	$(2)^-$	
1192.830 *10*	2^-	
1210.679 *11*	(2^+)	Jπ: 1^- favored based on primary γ feeding intensities from 0^+ and 1^+ resonances (1968Lo09).
1238.145 *10*	$(0,1,2)^-$	Jπ: 1^- favored based on primary γ feeding intensities from 0^+ and 1^+ resonances (1968Lo09).

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^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

^{170}Tm Levels (continued)

E(level)[†]	Jπ[‡]	Comments
1265.076 *12*	(0,1,2)$^-$	
1299.108 *13*	(2)$^-$	
1354.73? *7*	(1,2)$^-$	
1374.8 *6*	(1$^-$)	
1433.5 *4*	(1$^-$)	
1442.5 *4*	(1$^-$)	
1467.5 *3*	(1$^-$)	
1515 *3*	(0$^-$,2$^-$)	
1530.0 *5*		
1538.0 *6*	(1$^-$)	
1604.6 *4*	(0$^-$,1$^-$,2$^-$)	
1642 *3*	(1$^-$)	
1669.5 *3*	(1$^-$)	
1791 *3*	(1$^-$)	
1817.5 *5*	(0$^-$,1$^-$,2$^-$)	
1844 *3*	(1$^-$)	
1859.06 *23*	(1$^-$)	
1942 *3*	(0$^-$,2$^-$)	
1950.2 *3*	(0$^-$,1$^-$,2$^-$)	
(6591.76 *6*)	0$^+$,1$^+$	E(level): cf. S(n)=6591.96 *17* (2017Wa10). Jπ: L=0 neutron capture by Jπ=1/2$^+$ target.

[†] From least-squares fit to Eγ, omitting multiply-placed γ-rays and the 960.6γ which fits its placement poorly (reduced χ^2: 1.81 cf. critical value of 1.21).

[‡] For E<1380: from Adopted Levels. For E≥1380: based on primary transition intensities to state from various 0$^+$ and 1$^+$ resonances corresponding to E(n)≤136 eV, assuming mult=E1 for observed primary transitions (1968Lo09). The latter assumption implies J≤2$^-$ for all final states observed by 1968Lo09, limits J to 1 for levels fed from J=0 resonances, and suggests J≠1 for levels fed from J=1 but not from J=0 resonances. Note that J=0 for the 17.5-eV resonance (1970Bh03); this differs from the value used in 1968Lo09, and the evaluator has modified those authors' Jπ conclusions accordingly.

[#] Band(A): Kπ=0$^-$ band. Configuration=(π 1/2[411])-(ν 1/2[521]).

[@] Band(B): Kπ=1$^-$ g.s. band. Configuration=(π 1/2[411])+(ν 1/2[521]).

[&] Band(C): Kπ=1$^-$ band. Configuration=(π 3/2[411])-(ν 1/2[521]) plus (π 7/2[404])-(ν 5/2[512]).

[a] Band(D): Kπ=3$^-$ band. Configuration=(π 1/2[541])-(ν 7/2[633]).

[b] Band(E): Kπ=2$^-$ band. Configuration=(π 1/2[411])-(ν 5/2[512]).

[c] Band(F): Kπ=0$^+$ band. Configuration=(π 7/2[404])-(ν 7/2[633]).

[d] Band(G): Kπ=3$^-$ band. Configuration=(π 1/2[411])+(ν 5/2[512]).

[e] Band(H): Kπ=1$^-$ band. Configuration=(π 3/2[411])-(ν 5/2[512]) plus (π 1/2[411])+(ν 1/2[510]) plus ((π 1/2[411])-(ν 5/2[512])-γ vibration).

[f] Band(I): Kπ=1$^+$ band. Configuration=(π 1/2[541])+(ν 1/2[521]).

[g] Band(J): Kπ=0$^+$ band. Configuration=(π 1/2[541])-(ν 1/2[521]).

[h] Band(K): Kπ=1$^-$ band. Configuration=(π 1/2[411])-(ν 3/2[521]) plus (π 7/2[404])-(ν 5/2[512]) plus (π 3/2[411])-(ν 1/2[521]).

[i] Band(L): Kπ=2$^-$ band. Configuration=(π 1/2[411])+(ν 3/2[521]) plus (π 3/2[411])+(ν 1/2[521]) plus ((π 1/2[411])+(ν 1/2[521])-γ vibration).

[j] Band(M): Kπ=0$^-$ band. Configuration=(π 7/2[523])-(ν 7/2[633]).

[k] Band(N): Kπ=3$^+$ band. Configuration=(π 1/2[411])-(ν 7/2[633]).

[l] Band(a): Kπ=1$^+$ band. Configuration=(π 7/2[523])-(ν 5/2[512]).

$\gamma(^{170}Tm)$

Iγ normalization: from 1996Ho12, based on Σ(I(γ+ce) feeding g.s.)=92%, which assumes that≈33% of unplaced γ-rays feed the g.s.; consistent with data from 1966Sh03. However, note that Iγ normalization=1.79 based on I(38.7γ)=0.35 *1* per 100 n captures from 1989Du03; source of discrepancy not understood. σ_n=105 b *2* (2006MuZX).

Conversion electron data are from 1994HoZZ and 1996Ho12, unless indicated otherwise.

E_γ[†]	I_γ[‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
17.554 *8*	0.012[&] *1*	237.2395	1$^-$	219.7060	2$^-$	(M1(+E2))[b]	≤0.23[b]	3.3×10^2 *25*	E_γ: from 1989Du03.
31.713 *9*	0.013[&] *1*	381.4262	(4)$^-$	349.7332	3$^-$	(M1(+E2))[c]	≤0.82[c]	1.2×10^2 *10*	E_γ: from 1989Du03.
38.714 *1*	0.196 *21*	38.7135	2$^-$	0.0	1$^-$	E2+M1	1.43 *6*	132 *4*	α(L2)exp=68 *7*; L1:L2:L3:M1:M2:M3:M4:M5=5.80 *12*:67.6 *14*:82.8 *17*: 0.979 *20*:17.5 *4*:22.4 *4*:0.300 *18*:0.311 *12*. Data from 1996Ho12 are consistent with other L1:L2:L3=100 *15*:1160 *90*:1450 *110* (1967Ba17). Mult.,δ: from subshell ratios (χ^2=23 for fit). However, δ>3 from α(L2)exp. Other δ: 1.01 *+11−8* from 1967Ba17. E_γ: others: 38.713 *2* (1966Sh03), 38.712 *6* (1989Du03). I_γ: others: 0.170 *17* (1966Sh03); 0.35 *1* (1989Du03).
41.775 *9*	0.028[&] *3*	703.6295	2$^+$	661.8555	1$^+$	(M1(+E2))[d]	<1.1[d]	4.×10^1 *4*	E_γ: weighted average of 41.786 *12* (1989Du03) and 41.768 *10* (1966Sh03).
[x]46.202 *3*	0.031 *14*								
[x]47.017 *5*	0.017 *8*								
[x]47.043 *2*	0.038 *12*								
[x]56.279 *3*	0.090 *6*								
63.959[n] *4*	0.177[na] *23*	247.1485	(4)$^+$	183.1930	(3)$^+$	M1+E2[a]	0.65	13.38	E_γ: other: 63.92 *22* (2007ChZX). I_γ: other: 0.16 *8* (2007ChZX). For doublet: α(L1)exp=0.93 *11*; L1:L2:L3:M1:M2:M3= 0.930 *19*:1.60 *3*:1.99 *4*:0.172 *3*:0.355 *7*:0.372 *7*. δ: from authors′ analysis (1996Ho12). Evaluator obtains 0.65 *5* from subshell ratios. δ=0.73 *+17−16* from α(L1)exp.
63.959[n] *4*	0.027[na] *4*	247.1485	(4)$^+$	183.1928	4$^-$	E1[a]		1.063	For doublet ce data, see comment on 64.0γ to 183.197 level.
66.098 *1*	0.39 *4*	270.5465	(3)$^-$	204.4484	2$^-$	M1(+E2)	0.305 *24*	10.71 *17*	E_γ: other: 66.06 *10* (2007CHZX). I_γ: other: 0.49 *10* (2007ChZX). α(L1)exp=1.42 *14*; L1:L2:L3:M1:M2:M3= 1.42 *3*:0.575 *12*:0.573 *11*:0.275 *6*:0.157 *3*:0.155 *3*. δ: from subshell ratios; however, α(L1)exp exceeds α(L1)(E2 theory).

$^{170}_{69}Tm_{101}$-4

γ(^{170}Tm) (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
68.6491[n] *4*	0.008[na] *4*	183.1928	4$^-$	114.5438	3$^-$	E2[a]		13.73	E_γ: from 1994HoZZ. Others: 68.649 *0* (1996Ho12), 68.54 *6* (2007ChZX). I_γ: other: 1.67 *22* (2007ChZX). For 144γ-ray doublet: α(L1)exp=0.074 *4*; L1:L2:L3:M1:M2:M3= 0.0738 *15*:0.0422 *8*:0.0519 *10*:0.0131 *10*:0.0107 *3*:0.0137 *4*.
68.6491[n] *4*	2.08[na] *10*	183.1930	(3)$^+$	114.5438	3$^-$	E1[a]		0.890	E_γ: from 1994HoZZ. Other: 68.649 *0* in 1996Ho12. For doublet ce data, see comment on 68.6γ from 183.190 level.
69.988 *1*	0.146 *21*	219.7060	2$^-$	149.7180	0$^-$	E2		12.67	α(L2)exp=4.0 *6*; L1:L2:L3:M1:M2:M3= 0.261 *10*:3.95 *8*:4.00 *8*:0.053 *5*:0.885 *18*:0.992 *20*.
75.831 *1*	0.81 *7*	114.5438	3$^-$	38.7135	2$^-$	M1+E2	0.84 *5*	7.80 *13*	E_γ: other: 75.23 *9* (2007ChZX). I_γ: other: 0.89 *8* (2007ChZX). α(L2)exp=1.18 *11*; L1:L2:L3:M1:M2:M3= 0.585 *12*:1.180 *24*:1.180 *24*:0.1070 *21*:0.269 *5*:0.284 *6*. Other: L1:L2:L3=100 *10*:197 *20*:200 *14* (1967Ba17). δ: from subshell ratios. Other δ: 0.80 *6* (1967Ba17).
87.5[h]		270.5465	(3)$^-$	183.1928	4$^-$				E_γ: presumably differs from 87.521γ and 87.571γ seen In singles spectrum and placed elsewhere.
87.521 *1*	1.29 *3*	237.2395	1$^-$	149.7180	0$^-$	M1		4.55	E_γ: other: 87.44 *5* (2007ChZX). I_γ: other: 1.23 *3* (2007ChZX). α(K)exp=3.98 *20*; K:L1:L2:M1:M2= 3.98 *8*:0.577 *17*:0.0600 *24*:0.103 *3*:0.0171 *14*.
87.571 *2*	0.219 *6*	358.1166	(4)$^-$	270.5465	(3)$^-$	M1+E2	0.27 *5*	4.58	α(L3)exp=0.103 *6*; L3:M2:M3=0.103 *5*:0.051 *11*:0.049 *6* (1994HoZZ). δ: from subshell ratios.
88.954 *1*	0.035 *7*	447.0706	(3)$^-$	358.1166	(4)$^-$	M1		4.34	α(L1)exp=1.02 *20*; L1:M1:M2=1.02 *4*:0.21 *3*:0.139 *13* (1994HoZZ).
89.906 *3*	0.056 *6*	204.4484	2$^-$	114.5438	3$^-$	M1		4.21	E_γ: other: 89.73 *11* (2007ChZX). I_γ: other: 0.110 *20* (2007ChZX). α(K)exp=4.4 *4*; K:L1:L2=4.44 *9*:0.388 *12*:0.081 *8*. Mult.: M1 from α(K)exp; however, L subshell data indicate some E2 admixture.
92.654 *3*	0.073 *5*	539.7220	(4)$^-$	447.0706	(3)$^-$	M1+E2	0.22 *16*	3.87	E_γ: other: 92.62 *21* (2007ChZX). I_γ: other: 0.039 *15* (2007ChZX). α(K)exp=3.38 *20*; K:L1:L2=3.38 *7*:0.412 *8*:0.085 *12*. δ: from subshell ratios.
98.583 *2*	0.059 *7*	782.1521	(1)$^-$	683.569	(0)$^-$	M1		3.23	α(K)exp=2.8 *3*; K:L1:L2=2.80 *6*:0.50 *3*:0.099 *14*. Mult.: α(L1)exp consistent with pure M1, but cannot rule out small E2 admixture.
99.639 *2*	0.062 *4*	703.6295	2$^+$	603.9903	1$^+$	M1+E2	0.68 *13*	3.13	E_γ: other: 99.19 *17* (2007ChZX). I_γ: other: 0.063 *12* (2007ChZX). α(K)exp=2.13 *13*; K:L1:M1=2.13 *4*:0.169 *19*:0.044 *10* (1994HoZZ). δ: from α(K)exp. δ=0.9 *7* from subshell ratios.
105.162 *1*	1.002 *10*	219.7060	2$^-$	114.5438	3$^-$	M1+E2	0.4 *3*	2.66 *5*	E_γ: other: 105.11 *6* (2007ChZX).

$^{170}_{69}$Tm$_{101}$-5

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ †	I_γ ‡ k	E_i(level)	J_i^π	E_f	J_f^π	Mult. #	δ #	α l	Comments
									I_γ: other: 0.743 *22* (2007ChZX). α(K)exp=1.84 *9*; K:L1:L2:L3:M1:M2:M3= 1.84 *4*:0.236 *5*:0.0333 *7*:0.0213 *9*:0.0676 *14*:0.0147 *13*:0.0101 *15*. δ: based on 0.67 *11* from α(K)exp, 0.25 *2* from M subshell data, and 0.10 *2* to 0.74 *9* from L subshell data.
107.901 *2*	0.038 *3*	355.0482	$(4)^+$	247.1485	$(4)^+$	E2+M1	1.21 *+35−25*	2.38 *5*	α(K)exp=1.37 *14*.
107.956 *1*	0.116 *6*	758.3290	$(2)^+$	650.3732	2^+	M1		2.49	E_γ: other: 107.95 *12* (2007ChZX). I_γ: other: 0.105 *12* (2007ChZX). α(K)exp=2.36 *12*; K:L1:L2=2.36 *5*:0.329 *7*:0.031 *3*.
109.744 *3*	0.021 *4*	467.8607	$(5)^-$	358.1166	$(4)^-$				
111.005 *1*	0.356 *16*	149.7180	0^-	38.7135	2^-	E2		2.07	E_γ: other: 110.95 *6* (2007ChZX). I_γ: other: 0.311 *15* (2007ChZX). α(K)exp=0.59 *3*; K:L1:L2:L3:M1:M2:M3= 0.588 *12*:0.0637 *13*:0.369 *7*:0.604 *12*:0.0136 *10*:0.0866 *17*:0.0892 *18*.
112.494 *2*	0.033 *3*	349.7332	3^-	237.2395	1^-	E2		1.97	α(K)exp=0.80 *7*; K:L3:M2=0.80 *3*:0.48 *3*:0.112 *16* (1994HoZZ).
114.544 *1*	4.016 *18*	114.5438	3^-	0.0	1^-	E2		1.84	E_γ: other: 114.50 *5* (2007ChZX). I_γ: other: 3.04 *6* (2007ChZX). α(K)exp=0.63 *6*; K:L1:L2:L3:M1:M2:M3= 0.63 *6*:0.0702 *21*:0.305 *6*:0.280 *6*:0.0133 *3*:0.112 *2*:0.0725 *15*.
x117.057 *2*	0.018 *3*								
x119.313 *1*	0.041 *2*					E2+M1	2.0 *+9−4*	1.64 *4*	α(K)exp=0.86 *8*.
x124.875 *1*	0.056 *3*					M1+E2	0.77 *+18−16*	1.52 *4*	α(K)exp=1.09 *8*.
x129.065 *7*	0.015 *4*								
x129.376 *1*	0.40 *5*					E1		0.1688	α(K)exp=0.029 *4*.
130.027 *1*	1.02 *3*	349.7332	3^-	219.7060	2^-	M1+E2	0.55 *9*	1.39 *3*	E_γ: from 1994HoZZ. Others: 130.027 *0* (1996Ho12), 129.99 *5* (2007ChZX). I_γ: other: 0.895 *24* (2007ChZX). α(K)exp=1.09 *5*; K:L1:L2:M1:M2= 1.090 *22*:0.145 *3*:0.0163 *3*:0.0313 *6*:0.0040 *5*. δ: from α(L1)exp and α(K)exp; α(L2)exp inconsistent.
x138.170 *6*	0.016 *4*								
144.480 n *1*	0.94 na *11*	183.1928	4^-	38.7135	2^-	E2 a		0.795	E_γ: 144.480 *1* for doublet. E_γ: other: 144.43 *5* (2007ChZX). I_γ: other: 5.67 *10* (2007ChZX). For 144γ-ray doublet ce data, see comment on 144.5γ from 183.197 level.
144.480 n *1*	5.0 na *3*	183.1930	$(3)^+$	38.7135	2^-	E1 a		0.1260	For doublet, α(K)exp=0.157 *9*; K:L1:L2:L3:M1:M2:M3= 0.157 *3*:0.0150 *3*:0.0232 *5*:0.0204 *4*:0.00377 *15*:0.00629 *13*:0.00615 *25*.
144.861 *1*	0.036 *4*	854.337	2^-	709.476	$(1,2,3)^-$	E2+M1	1.6 *5*	0.87 *6*	α(K)exp=0.61 *9*; K:L2:L3=0.62 *5*:0.128 *10*:0.150 *12*. δ: from subshell ratios.
145 h		349.7332	3^-	204.4484	2^-				
149.718 *1*	6.5 *5*	149.7180	0^-	0.0	1^-	M1		0.983	E_γ: other: 149.66 *5* (2007ChZX).

$^{170}_{69}Tm_{101}$-6

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									I_γ: other: 6.77 *10* (2007ChZX). α(K)exp=0.80 *6*; K:L1:L2:L3:M1:M2= 0.795 *16*:0.1020 *20*:0.00882 *18*:0.00121 *5*:0.0225 *5*:0.00233 *14*.
153.667 *1*	0.101 *8*	358.1166	(4)$^-$	204.4484	2$^-$	E2		0.640	E_γ: other: 153.70 *10* (2007ChZX). I_γ: other: 0.093 *14* (2007ChZX). α(K)exp=0.350 *25*; K:L1=0.350 *7*:0.084 *14* (1994HoZZ). Mult.: α(K)exp consistent with pure E2 (expected from placement); α(L1)exp implies δ(E2,M1)=0.7 *3* suggesting ce line contamination.
156.003 *1*	0.116 *9*	270.5465	(3)$^-$	114.5438	3$^-$	M1+E2	0.32 *7*	0.850 *16*	E_γ: other: 156.03 *10* (2007ChZX). I_γ: other: 0.113 *16* (2007ChZX). α(K)exp=0.45 *4*; K:L1:L2:M1= 0.45 *3*:0.097 *3*:0.0170 *26*:0.027 *3*. δ: from α(L2)exp; α(K)exp and α(M1)exp not consistent.
161.721 *1*	0.228 *11*	381.4262	(4)$^-$	219.7060	2$^-$	E2		0.536	E_γ: other: 161.67 *6* (2007ChZX). I_γ: other: 0.257 *16* (2007ChZX). α(L2)exp=0.067 *4*; L1:L2:L3= 0.0314 *16*:0.067 *3*:0.0629 *13*. L1/K=0.033 *2* (1996Ho12). Mult.,δ: E2(+M1), $\delta\geq$2.2 from (n,γ) consistent with pure E2 as required by placement.
165.735 *1*	2.87 *16*	204.4484	2$^-$	38.7135	2$^-$	M1(+E2)	≤0.7	0.70 *5*	E_γ: other: 165.69 *5* (2007ChZX). I_γ: other: 3.13 *6* (2007ChZX). α(K)exp=0.62 *3*; K:L1:L2:L3:M1:M2:M3= 0.616 *12*:0.0772 *15*:0.00760 *15*:0.00214 *15*:0.0159 *5*:0.00183 *9*:0.00064 *10*. δ: subshell data not mutually consistent; deduced δ values range from 0 to 0.6 *1*.
169.321 *2*	0.022 *3*	550.7480	5$^-$	381.4262	(4)$^-$	M1+E2	0.6 *4*	0.63 *6*	E_γ: other: 169.43 *15* (2007ChZX). I_γ: other: 0.049 *10* (2007ChZX). α(K)exp=0.49 *7*.
[x]169.494 *1*	0.045 *3*					M1+E2	0.63 *15*	0.626 *25*	α(K)exp=0.49 *3*; K:L1=0.492 *10*:0.095 *13* (1994HoZZ). δ: from α(K)exp. However, α(L1)exp implies pure M1.
171.855[n] *1*	0.056[na] *9*	355.0482	(4)$^+$	183.1928	4$^-$	E1[a]		0.0798	E_γ: other: 171.81 *6* (2007ChZX). I_γ: other: 0.372 *17* (2007ChZX). For 171γ-ray doublet ce data, see comment on 171.9γ to 183.197 level.
171.855[n] *1*	0.27[na] *3*	355.0482	(4)$^+$	183.1930	(3)$^+$	M1(+E2)[a]	0.20	0.658	For 171γ-ray doublet: α(K)exp=1.38 *12* (1994HoZZ,1996Ho12); K:L1:L2:M1:M2= 1.38 *3*:0.0741 *15*:0.0103 *11*:0.0152 *8*:0.0052 *10* (1994HoZZ). However, α(K)exp appears to be too high and is inconsistent with L1/K=0.17 *3* In 1966Ho12; the latter implies α(K)exp≈0.44 based on α(L1)exp=0.0741 *15* In 1994HoZZ. δ: from authors' analysis (1996Ho12).
174.927 *2*	0.028 *3*	358.1166	(4)$^-$	183.1928	4$^-$	M1+E2		0.52 *12*	α(K)exp=0.40 *4*: K:L1=0.403 *12*:0.081 *10* (1994HoZZ).

$^{170}_{69}Tm_{101}$-7

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ[†]	I_γ[‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									E_γ: other: 175.2 *3* (2007ChZX). I_γ: other: 0.047 *17* (2007ChZX). δ: 0.9 *3* from α(K)exp;≤0.4 from α(L1)exp.
175.894 *4*	0.015 *1*	715.6202	(3)$^-$	539.7220	(4)$^-$	E2(+M1)	≥1.9	0.43 *3*	α(K)exp=0.27 *3*.
176.525 *1*	0.294 *9*	447.0706	(3)$^-$	270.5465	(3)$^-$	M1+E2	0.60 *12*	0.560 *19*	E_γ: other: 176.49 *9* (2007ChZX). I_γ: other: 0.32 *3* (2007ChZX). α(K)exp=0.443 *22*; K:L1:L2:L3:M1= 0.443 *9*:0.0530 *11*:0.0133 *12*:0.0075 *9*:0.0092 *9*. δ: from α(K)exp; however, subshell ratios do not give an internally consistent value for δ.
180.994 *1*	3.5 *3*	219.7060	2$^-$	38.7135	2$^-$	M1+E2	0.27 *3*	0.563 *9*	E_γ: other: 180.92 *5* (2007ChZX). I_γ: other: 3.67 *13* (2007ChZX). α(K)exp=0.44 *4*; K:L1:L2:M1:M2:M3= 0.443 *9*:0.0564 *11*:0.00745 *15*:0.01240 *25*:0.00184 *18*:0.00102 *9*. Other: K:L1:L2=800 *120*:100 *7*:32 *6* (1967Ba17). δ: from subshell ratios. Other δ: 0.58 *+12−7* (1967Ba17).
[x]184.259 *3*	0.024 *2*								
185.006 *3*	0.016 *2*	775.2305	(0)$^+$	590.2290	1$^-$				
192.633 *3*	0.016 *1*	550.7480	5$^-$	358.1166	(4)$^-$	M1		0.486	α(K)exp=0.47 *4*.
[x]195.306 *2*	0.011 *1*								
[x]196.744 *5*	0.013 *1*								
197.314 *1*	0.028 *3*	467.8607	(5)$^-$	270.5465	(3)$^-$	E2		0.272	α(K)exp=0.17 *3*.
198.237 *2*	0.071 *4*	381.4262	(4)$^-$	183.1928	4$^-$	E2+M1	1.18 *+13−12*	0.343 *11*	δ: from K/L1 subshell ratio. α(K)exp=0.255 *18*; K:L1=0.255 *10*:0.045 *4* (1994HoZZ).
198.524 *1*	0.569 *15*	237.2395	1$^-$	38.7135	2$^-$	M1		0.447	E_γ: other: 198.46 *5* (2007ChZX). I_γ: other: 0.91 *3* (2007ChZX). α(K)exp=0.411 *21*; K:L1:L2:M1:M2= 0.411 *8*:0.0544 *11*:0.0035 *6*:0.0174 *10*:0.0024 *5*.
203.970 *4*	0.034 *2*	1064.4586	(1)$^+$	860.486	1$^+$				
204.448 *1*	6.58 *4*	204.4484	2$^-$	0.0	1$^-$	M1		0.412	E_γ: other: 204.41 *5* (2007ChZX). I_γ: other: 8.30 *18* (2007ChZX). α(K)exp=0.341 *17*; K:L1:L2:L3:M1:M2= 0.341 *7*:0.0466 *9*:0.00410 *16*:0.00063 *8*:0.01060 *21*:0.00119 *14*.
204.782 *1*	0.188 *18*	319.3260	5$^-$	114.5438	3$^-$	E2		0.240	E_γ: other: 205.05 *10* (2007ChZX). α(K)exp=0.127 *17*; K:L2=0.127 *11*:0.0269 *13* (1994HoZZ).
[x]205.750 *3*	0.069 *2*								
[x]207.590 *2*	0.022 *3*					M1(+E2)	0.5 *+4−5*	0.36 *5*	α(K)exp=0.29 *5*.
[x]209.547 *4*	0.014 *3*					M1(+E2)		0.30 *9*	α(K)exp=0.27 *6*.
214.517 *4*	0.024 *2*	818.5088	(2)$^+$	603.9903	1$^+$	M1+E2	0.5 *+3−4*	0.33 *3*	α(K)exp=0.27 *3*.
218.409 *4*	0.013 *2*	822.3949	2$^+$	603.9903	1$^+$	M1(+E2)	0.2 *+6−3*	0.34 *6*	α(K)exp=0.28 *6*.
219.705 *1*	2.701 *22*	219.7060	2$^-$	0.0	1$^-$	E2+M1	1.18 *+17−14*	0.252 *10*	E_γ: other: 219.65 *5* (2007ChZX). I_γ: other: 3.47 *6* (2007ChZX). α(K)exp=0.191 *10*; K:L1:L2:L3:M1:M2:M3= 0.191 *4*:0.0240 *5*:0.0157 *3*:0.01150 *23*:0.0060 *4*:0.0041 *3*:0.00280 *25*. Other: K:L1:L2:L3=630 *60*:100 *10*:65 *10*:45 *10*

$^{170}_{69}Tm_{101}$-8

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									(1967Ba17). Other δ: 1.32 *+26−16* (1967Ba17).
226.468 *4*	0.012 *2*	607.8865	3^+	381.4262	$(4)^-$				
231.099 *1*	0.065 *6*	1091.586	(1,2)	860.486	1^+	M1+E2	1.07 *+29−22*	0.223 *16*	α(K)exp=0.173 *16*.
231.418 *6*	0.010 *1*	550.7480	5^-	319.3260	5^-				
231.499 *4*	0.021 *3*	1139.954	$(2)^-$	908.452	(2^-)	E2+M1	1.3 *+10−5*	0.21 *4*	α(K)exp=0.16 *3*.
231.834 *2*	0.392 *24*	270.5465	$(3)^-$	38.7135	2^-	M1		0.291	E_γ: other: 231.71 *6* (2007ChZX). I_γ: other: 0.57 *3* (2007ChZX). α(K)exp=0.254 *15*; K:L1:M1=0.254 *5*:0.0349 *7*:0.0092 *8* (1994HoZZ).
235.193 *2*	0.942 *24*	349.7332	3^-	114.5438	3^-	M1		0.280	E_γ: other: 235.12 *5* (2007ChZX). I_γ: other: 1.12 *4* (2007ChZX). α(K)exp=0.249 *12*; K:L1:L2=662 *18*:100:7.4 *10* (1996Ho12).
237.241 *1*	4.08 *8*	237.2395	1^-	0.0	1^-	M1		0.274	E_γ: other: 237.19 *5* (2007ChZX). I_γ: other: 5.26 10 (2007ChZX). α(L1)exp=0.238 *12*; K:L1:L2:L3:M1:M2= 0.238 *5*:0.0342 *7*:0.00241 *17*:0.00063 *11*:0.00658 *26*:0.00071 *8*.
242.064 *3*	0.055 *8*	1064.4586	$(1)^+$	822.3949	2^+	M1+E2	0.7 *+4−3*	0.212 *25*	α(K)exp=0.175 *25*.
242.623 *1*	0.910 *16*	447.0706	$(3)^-$	204.4484	2^-	M1(+E2)	0.23 *+17−23*	0.251 *11*	E_γ: other: 242.58 *5* (2007ChZX). I_γ: other: 1.22 *4* (2007ChZX). α(K)exp=0.210 *11*; K:L1:L2:L3:M1= 0.210 *4*:0.0303 *9*:0.0073 *8*:0.0020 *3*:0.0074 *3*.
243.573 *3*	0.036 *5*	358.1166	$(4)^-$	114.5438	3^-	M1+E2	0.9 *+4−3*	0.202 *22*	α(K)exp=0.166 *23*.
245.947 *3*	0.054 *7*	1064.4586	$(1)^+$	818.5088	$(2)^+$	M1(+E2)	≤0.8	0.225 *23*	E_γ: other: 246.02 *17* (2007ChZX). I_γ: other: 0.063 *14* (2007ChZX). α(K)exp=0.19 *3*.
252.149 *5*	0.015 *1*	1160.598	$(1)^-$	908.452	(2^-)	M1		0.232	α(K)exp=0.22 *3*.
256.455 *1*	0.091 *12*	1078.8498	$(1)^+$	822.3949	2^+	M1+E2	1.0 *+4−3*	0.169 *19*	E_γ: other: 256.53 *15* (2007ChZX). I_γ: other: 0.091 *14* (2007ChZX). α(K)exp=0.135 *18*.
[x]257.586 *4*	0.011 *1*					M1		0.219	α(K)exp=0.20 *3*.
260.341 *1*	0.078 *9*	1078.8498	$(1)^+$	818.5088	$(2)^+$	M1+E2	0.5 *3*	0.192 *20*	E_γ: other: 260.49 *13* (2007ChZX). I_γ: other: 0.098 *13* (2007ChZX). α(K)exp=0.155 *19*.
263.877 *5*	0.016 *1*	447.0706	$(3)^-$	183.1928	4^-				E_γ: other: 263.99 *25* (2007ChZX). I_γ: other: 0.31 *12* (2007ChZX).
266.881 *1*	0.130 *14*	381.4262	$(4)^-$	114.5438	3^-	M1+E2	0.87 *+30−24*	0.157 *15*	E_γ: other: 266.81 *11* (2007ChZX). I_γ: other: 0.128 *14* (2007ChZX). α(K)exp=0.126 *14*; K:L1:L2:M1=0.126 *4*:0.0176 *23*:0.0050 *23*:0.0063 *19* (1994HoZZ).
268.551 *2*	0.139 *16*	715.6202	$(3)^-$	447.0706	$(3)^-$	M1+E2	0.86 *+30−24*	0.155 *15*	E_γ: other: 268.69 *9* (2007ChZX). I_γ: other: 0.200 *16* (2007ChZX). α(K)exp=0.124 *14*; K:L1=0.124 *4*:0.0240 *19* (1994HoZZ).
[x]268.991 *6*	0.018 *1*								

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
269.173 *2*	0.063 *8*	539.7220	(4)$^-$	270.5465	(3)$^-$	M1+E2	0.9 *+4−3*	0.152 *18*	α(K)exp=0.121 *16*; K:L1=0.121 *5*:0.024 *4* (1994HoZZ).
x270.411 *3*	0.024 *1*								
x275.571 *3*	0.017 *1*					M1		0.182	α(K)exp=0.21 *4*.
276.592 *5*	0.007 *1*	1139.954	(2)$^-$	863.366	(1)$^-$				E$_\gamma$: other: 275.6 *3* (2007ChZX). I$_\gamma$: other: 0.032 *12* (2007ChZX).
x281.897 *3*	0.030 *4*					M1(+E2)	≤0.7	0.157 *15*	α(K)exp=0.138 *19*.
288.185 *2*	0.095 *8*	402.7281	(3,4)$^-$	114.5438	3$^-$	M1+E2	0.60 *20*	0.140 *11*	E$_\gamma$: other: 288.34 *8* (2007ChZX). I$_\gamma$: other: 0.164 *10* (2007ChZX). α(K)exp=0.115 *10*; K:L1=0.115 *5*:0.016 *3* (1994HoZZ).
289.229 *1*	0.035 *3*	1064.4586	(1)$^+$	775.2305	(0)$^+$	M1		0.1599	α(K)exp=0.129 *12*. Mult.: M1(+E2) (δ≤0.6) from α(K)exp; feeds J=(0) state.
x292.147 *10*	0.005 *1*								
x296.311 *12*	0.006 *1*								
297.222 *11*	0.008 *1*	1160.598	(1)$^-$	863.366	(1)$^-$				
300.642 *2*	0.036 *4*	650.3732	2$^+$	349.7332	3$^-$				
303.617 *2*	0.123 *13*	1078.8498	(1)$^+$	775.2305	(0)$^+$	M1		0.1403	E$_\gamma$: other: 303.59 *8* (2007ChZX). I$_\gamma$: other: 0.130 *12* (2007ChZX). α(K)exp=0.110 *12*. Mult.: M1(+E2) (δ≤0.7) from α(K)exp; feeds J=(0) state.
x308.641 *5*	0.068 *5*					M1		0.1343	α(K)exp=0.115 *12*.
311.018 *2*	2.01 *8*	349.7332	3$^-$	38.7135	2$^-$	M1(+E2)	0.28 *+14−28*	0.127 *6*	E$_\gamma$: other: 310.97 *5* (2007ChZX). I$_\gamma$: other: 2.38 *5* (2007ChZX). α(K)exp=0.106 *5*; K:L1:L2:M1=0.1060 *21*:0.0157 *3*:0.0035:0.00348 *14*.
x315.100 *9*	0.006 *1*								
x317.766 *8*	0.008 *1*								
x324.009 *7*	0.009 *2*								
x326.963 *2*	0.019 *1*					M1+E2	1.0 *+6−4*	0.085 *15*	α(K)exp=0.070 *13*.
x329.574 *4*	0.012 *1*					M1		0.1127	α(K)exp=0.099 *21*.
332.522 *5*	0.035 *1*	447.0706	(3)$^-$	114.5438	3$^-$	M1(+E2)	≤0.55	0.103 *7*	E$_\gamma$: other: 332.91 *22* (2007ChZX). I$_\gamma$: other: 0.043 *10* (2007ChZX). α(K)exp=0.088 *8*.
x333.078 *6*	0.016 *3*								
x333.570 *2*	0.035 *5*								
335.274 *8*	0.012 *2*	539.7220	(4)$^-$	204.4484	2$^-$				
x337.099 *2*	0.019 *1*								
x338.945 *4*	0.013 *1*					M1(+E2)	≤1.5	0.085 *20*	α(K)exp=0.074 *21*.
342.711 *4*	0.106 *5*	381.4262	(4)$^-$	38.7135	2$^-$	E2		0.0481	α(K)exp=0.0309 *25*.
343.553 *2*	0.178 *8*	693.2868	2$^-$	349.7332	3$^-$	M1(+E2)	0.29 *+14−29*	0.097 *5*	E$_\gamma$: other: 343.29 *6* (2007ChZX). I$_\gamma$: other: 0.343 *15* (2007ChZX). α(K)exp=0.081 *4*; K:L1=0.0809 *16*:0.0103 *12* (1994HoZZ).
345.192 *9*	0.0227 *4*	1064.4586	(1)$^+$	719.2626	1$^+$				I$_\gamma$: from 1994HoZZ. Other: 0.023 *0* (1996Ho12).
x346.018 *4*	0.011 *1*								

$^{170}_{69}Tm_{101}$-10

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
[x]351.136 *6*	0.012 *1*								
[x]351.921 *14*	0.024 *2*								
352.997 *9*	0.46 *3*	590.2290	1^-	237.2395	1^-	M1+E2	0.59 *14*	0.080 *5*	E_γ: other: 352.91 *6* (2007ChZX). I_γ: other: 0.521 *22* (2007ChZX). α(K)exp=0.067 *4*; K:L1=0.0673 *13*:0.0096 *5* (1994HoZZ).
[x]355.380 *3*	0.041 *3*					M1		0.0922	α(K)exp=0.087 *9*.
[x]356.722 *7*	0.009 *1*								
[x]358.653 *2*	0.084 *4*					M1+E2	0.42 *+14−17*	0.083 *5*	α(K)exp=0.069 *4*.
359.359 *3*	0.066 *4*	806.4276	$(4)^-$	447.0706	$(3)^-$				E_γ: other: 358.80 *13* (2007ChZX). I_γ: other: 0.13 *3* (2007ChZX).
360.825 *3*	0.061 *1*	1064.4586	$(1)^+$	703.6295	2^+				E_γ: other: 360.57 *17* (2007ChZX). I_γ: other: 0.085 *23* (2007ChZX).
[x]362.375 *8*	0.016 *2*								
364.012 *4*	0.014 *1*	402.7281	$(3,4)^-$	38.7135	2^-				
365.887 *6*	0.011 *2*	715.6202	$(3)^-$	349.7332	3^-				
[x]367.138 *4*	0.019 *1*								
367.556 *4*	0.084 *4*	550.7480	5^-	183.1928	4^-	M1(+E2)	0.28 *+17−28*	0.081 *5*	E_γ: other: 367.80 *10* (2007ChZX). I_γ: other: 0.176 *17* (2007ChZX). α(K)exp=0.068 *4*.
368.424 *2*	0.061 *2*	749.8484	$(3)^-$	381.4262	$(4)^-$	M1		0.0838	α(K)exp=0.070 *6*.
[x]369.357 *2*	0.0240 *4*								I_γ: from 1994HoZZ; Iγ=0.024 *0* In 1996Ho12.
370.530 *4*	0.088 *4*	590.2290	1^-	219.7060	2^-	M1(+E2)	0.38 *+15−25*	0.077 *5*	E_γ: other: 370.31 *11* (2007ChZX). I_γ: other: 0.15 *3* (2007ChZX). α(K)exp=0.066 *4*.
371.171 *3*	0.0240 *4*	1064.4586	$(1)^+$	693.2868	2^-				E_γ: other: 372.57 *11* (2007ChZX). I_γ: from 1994HoZZ. Others: 0.024 (1996Ho12), 0.146 *21* (2007ChZX).
[x]372.724 *2*	0.100 *3*					M1(+E2)	0.19 *+21−19*	0.080 *5*	α(K)exp=0.067 *4*.
[x]377.417 *5*	0.012 *1*								
378.203 *4*	0.020 *1*	648.7469	1^-	270.5465	$(3)^-$				E_γ: other: 378.1 *3* (2007ChZX). I_γ: other: 0.103 *21* (2007ChZX).
382.737 *3*	0.022 *4*	1101.999	(2^+)	719.2626	1^+				
384.079 *3*	1.56 *12*	733.8130	$(2)^-$	349.7332	3^-	M1+E2	0.62 *17*	0.064 *5*	E_γ: other: 384.04 *5* (2007ChZX). I_γ: other: 1.86 *5* (2007ChZX). α(K)exp=0.053 *4*; K:L1=0.0531 *11*:0.00796 *16* (1994HoZZ).
384.287 *5*	0.141 *2*	603.9903	1^+	219.7060	2^-				
388.177 *2*	0.082 *1*	607.8865	3^+	219.7060	2^-				E_γ: other: 388.01 *13* (2007ChZX). I_γ: other: 0.094 *15* (2007ChZX).
396.739 *8*	0.012 *1*	1178.909	$(2)^-$	782.1521	$(1)^-$				E_γ: other: 397.61 *11* (2007ChZX). I_γ: other: 0.094 *10* (2007ChZX).
[x]397.942 *3*	0.069 *7*					M1+E2	0.78 *+28−23*	0.054 *6*	α(K)exp=0.045 *5*.
[x]399.623 *8*	0.020 *7*								
400.113 *2*	0.431 *17*	749.8484	$(3)^-$	349.7332	3^-	M1+E2	0.54 *12*	0.059 *3*	E_γ: other: 400.21 *5* (2007ChZX).

$^{170}_{69}Tm_{101}$-11

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									I_γ: other: 0.683 *18* (2007ChZX). α(K)exp=0.0494 *25*; K:L1=0.0494 *10*:0.0062 *8* (1994HoZZ).
400.668 *5*	0.148 *11*	637.9060	2^-	237.2395	1^-	M1(+E2)	0.40 *+23−40*	0.062 *6*	α(K)exp=0.052 *5*; K:L1=0.052 *4*:0.0080 *15* (1994HoZZ).
[x]407.827 *5*	0.043 *1*								
408.348 *3*	0.143 *2*	447.0706	$(3)^-$	38.7135	2^-	M1+E2	0.41 *+13−15*	0.059 *3*	E_γ: other: 408.28 *6* (2007ChZX). I_γ: other: 0.228 *12* (2007ChZX). α(K)exp=0.0493 *25*.
[x]408.844 *8*	0.027 *10*								
409[h]		758.3290	$(2)^+$	349.7332	3^-				
411.506 *2*	2.01 *7*	648.7469	1^-	237.2395	1^-	M1+E2	0.47 *+12−13*	0.057 *3*	E_γ: other: 411.46 *5* (2007ChZX). I_γ: other: 2.26 *5* (2007ChZX). α(K)exp=0.0473 *24*; K:L1:M1=0.0473 *9*:0.00663 *13*:0.00220 *22* (1994HoZZ).
413.131 *3*	0.080 *2*	650.3732	2^+	237.2395	1^-	(E1)[i]			E_γ: other: 413.18 *10* (2007ChZX). I_γ: other: 0.154 *16* (2007ChZX).
[x]414.133 *3*	0.026 *1*								
415.703 *3*	0.037 *1*	862.7761	$(3)^-$	447.0706	$(3)^-$				E_γ: other: 415.62 *14* (2007ChZX). I_γ: other: 0.061 *10* (2007ChZX).
416.301 *8*	0.012 *1*	863.366	$(1)^-$	447.0706	$(3)^-$				
[x]416.974 *6*	0.016 *1*								
[x]417.277 *11*	0.010 *1*								
418.197 *3*	0.057 *2*	637.9060	2^-	219.7060	2^-	M1+E2	0.5 *3*	0.054 *7*	E_γ: other: 417.86 *13* (2007ChZX). I_γ: other: 0.074 *11* (2007ChZX). α(K)exp=0.044 *5*.
422.224 *10*	0.013 *1*	1070.975	$(2)^-$	648.7469	1^-				
[x]423.614 *13*	0.011 *3*								
[x]424.063 *5*	0.030 *1*					M1		0.0580	α(K)exp=0.050 *7*.
424.692 *6*	0.381 *8*	607.8865	3^+	183.1928	4^-	E1			E_γ: other: 424.61 *5* (2007ChZX). I_γ: other: 0.529 *24* (2007ChZX). α(K)exp=0.0089 *9*.
426.782 *4*	0.147 *2*	1160.598	$(1)^-$	733.8130	$(2)^-$	M1+E2	0.33 *+14−20*	0.054 *3*	E_γ: other: 426.73 *9* (2007ChZX). I_γ: other: 0.177 *17* (2007ChZX). α(K)exp=0.0452 *23*.
429.037 *3*	0.237 *2*	648.7469	1^-	219.7060	2^-	M1+E2	0.50 *+12−13*	0.050 *3*	E_γ: other: 429.03 *6* (2007ChZX). I_γ: other: 0.293 *23* (2007ChZX). α(K)exp=0.0419 *21*.
433.082 *3*	0.076 *2*	703.6295	2^+	270.5465	$(3)^-$	(E1)[i]			E_γ: other: 433.03 *16* (2007ChZX). I_γ: other: 0.071 *13* (2007ChZX).
[x]435.133 *4*	0.032 *1*					M1		0.0542	α(K)exp=0.057 *10*.
[x]435.617 *9*	0.016 *2*								
[x]436.945 *13*	0.017 *2*								
438.62 *4*	0.0093 *13*	1299.108	$(2)^-$	860.486	1^+				
[x]439.260 *10*	0.024 *11*								
[x]440.167 *3*	0.047 *1*								

$^{170}_{69}Tm_{101}$-12

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
440.516 *5*	0.048 *3*	590.2290	1^-	149.7180	0^-	M1		0.0525	E_γ: other: 440.5 *3* (2007ChZX). I_γ: other: 0.12 *3* (2007ChZX). α(K)exp=0.051 *9*.
[x]441.051 *2*	0.072 *1*					(E1)[i]			
442.148 *2*	0.391 *6*	661.8555	1^+	219.7060	2^-	E1			E_γ: other: 442.06 *8* (2007ChZX). I_γ: other: 0.49 *4* (2007ChZX). α(K)exp=0.0053 *6*.
446.333 *9*	1.332 *17*	683.569	$(0)^-$	237.2395	1^-	M1		0.0507	E_γ: other: 446.31 *4* (2007ChZX). I_γ: other: 1.54 *4* (2007ChZX). α(K)exp=0.0421 *21*; K:L1:M1=0.0421 *8*:0.00611 *24*:0.00159 *16* (1994HoZZ).
448.308 *5*	0.082 *2*	806.4276	$(4)^-$	358.1166	$(4)^-$	E2		0.0228	E_γ: other: 448.24 *25* (2007ChZX). I_γ: other: 0.063 *17* (2007ChZX). α(K)exp=0.017 *4*.
[x]450.361 *15*	0.009 *2*								
[x]451.725 *5*	0.023 *1*								
[x]453.931 *8*	0.024 *3*								
454.276 *3*	0.208 *4*	603.9903	1^+	149.7180	0^-	E1			E_γ: other: 454.22 *9* (2007ChZX). I_γ: other: 0.281 *19* (2007ChZX). α(K)exp=0.0088 *11*.
454.684 *6*	0.029 *1*	1147.975	$(1,2)^-$	693.2868	2^-	M1		0.0483	α(K)exp=0.041 *8*.
456.045 *2*	1.010 *10*	693.2868	2^-	237.2395	1^-	M1+E2	0.38 *+13−16*	0.0447 *22*	E_γ: other: 455.96 *6* (2007ChZX). I_γ: other: 1.10 *4* (2007ChZX). α(K)exp=0.0374 *19*.
457.410 *2*	0.36[e] *3*	661.8555	1^+	204.4484	2^-	E1			Iγ=0.403 *7*, α(K)exp=0.0069 *7* for doublet dominated by transition from 662 level.
457.410 *2*	0.04[e] *3*	925.2719	$(3)^-$	467.8607	$(5)^-$	[E2]		0.0216	E_γ: other: 457.23 *11* (2007ChZX). I_γ: other: 0.530 *24* (2007ChZX).
[x]458.263 *3*	0.044 *3*					M1+E2	0.7 *+5−4*	0.039 *7*	α(K)exp=0.032 *6*.
[x]459.055 *3*	0.051 *3*					E2		0.0214	α(K)exp=0.017 *4*.
460.464 *3*	0.075 *2*	1064.4586	$(1)^+$	603.9903	1^+	E2+M1	1.2 *+12−5*	0.032 *7*	E_γ: other: 460.6 *3* (2007ChZX). I_γ: other: 0.058 *18* (2007ChZX). α(K)exp=0.026 *6*.
463.286 *5*	0.024 *1*	1178.909	$(2)^-$	715.6202	$(3)^-$				
464.36 *5*	0.008 *1*	1147.975	$(1,2)^-$	683.569	$(0)^-$				
[x]465.451 *20*	0.014 *1*								
466.393 *4*	0.040 *3*	703.6295	2^+	237.2395	1^-				E_γ: other: 466.6 *4* (2007ChZX). I_γ: other: 0.066 *19* (2007ChZX).
467.317 *7*	0.016 *3*	1160.598	$(1)^-$	693.2868	2^-				
[x]468.026 *9*	0.019 *2*								
468.473 *5*	0.071 *3*	715.6202	$(3)^-$	247.1485	$(4)^+$				E_γ: other: 468.62 *7* (2007ChZX). I_γ: other: 0.43 *4* (2007ChZX).
468.777 *4*	0.310 *10*	818.5088	$(2)^+$	349.7332	3^-				α(L1)exp=0.0027 *2* implies mult=M1+E2, but placement requires E1; possible ce line contamination (1994HoZZ).

$^{170}_{69}Tm_{101}$-13

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
472.663 *3*	0.342 *8*	822.3949	2^+	349.7332	3^-	E1			E_γ: other: 472.94 *8* (2007ChZX). I_γ: other: 0.57 *5* (2007ChZX). α(K)exp=0.0051 *7*.
473.605 *8*	0.263 *19*	693.2868	2^-	219.7060	2^-	M1+E2	0.53 *+22−24*	0.038 *4*	E_γ: other: 474.04 *5* (2007ChZX). I_γ: other: 0.14 *4* (2007ChZX). α(K)exp=0.032 *3*; K:L1=0.0320 *10*:0.0037 *3* (1994HoZZ).
[x]474.97 *6*	0.009 *1*								
475[h]		590.2290	1^-	114.5438	3^-				
477.030 *7*	0.077 *6*	1160.598	$(1)^-$	683.569	$(0)^-$	M1		0.0427	E_γ: other: 477.19 *8* (2007ChZX). I_γ: other: 0.228 *24* (2007ChZX). α(K)exp=0.030 *6* implies mult=M1(+E2); E2 component inconsistent with placement.
[x]477.257 *5*	0.151 *10*					M1(+E2)	0.32 *+24−32*	0.040 *4*	α(K)exp=0.034 *3*.
[x]477.976 *14*	0.020 *1*								
[x]480.512 *9*	0.022 *5*								
481.349 *3*	0.109 *3*	862.7761	$(3)^-$	381.4262	$(4)^-$	M1(+E2)	0.5 *+3−5*	0.037 *5*	E_γ: other: 481.48 *18* (2007ChZX). I_γ: other: 0.104 *21* (2007ChZX). α(K)exp=0.0043 *6*.
[x]482.093 *20*	0.011 *1*								
[x]482.678 *15*	0.010 *3*								
483.926 *4*	0.056 *1*	703.6295	2^+	219.7060	2^-				
485.210 *4*	0.136 *5*	1168.780	$(2)^-$	683.569	$(0)^-$	(E2)		0.0185	E_γ: other: 485.07 *13* (2007ChZX). I_γ: other: 0.133 *23* (2007ChZX). α(K)exp=0.0305 *18*. Mult.,δ: M1+E2 (δ=0.50 *+14−15*) from α(K)exp; inconsistent with ΔJ=2 placement to $(0)^-$ state.
487.773 *7*	0.028 *2*	758.3290	$(2)^+$	270.5465	$(3)^-$				
[x]488.389 *12*	0.020 *1*								
489[h]		693.2868	2^-	204.4484	2^-				
[x]490.026 *8*	0.024 *3*								
491.206 *9*	0.017 *1*	1139.954	$(2)^-$	648.7469	1^-				
[x]492.531 *14*	0.010 *1*								
493.344 *4*	0.049 *2*	607.8865	3^+	114.5438	3^-				
494.124 *22*	0.011 *1*	1101.999	(2^+)	607.8865	3^+				E_γ: other: 494.0 *3* (2007ChZX). I_γ: other: 0.057 *20* (2007ChZX).
[x]495.036 *4*	0.068 *4*					M1(+E2)	0.4 *4*	0.036 *6*	α(K)exp=0.030 *5*.
496.572 *3*	0.712 *12*	733.8130	$(2)^-$	237.2395	1^-	M1+E2	0.34 *+14−19*	0.0363 *19*	E_γ: other: 496.52 *5* (2007ChZX). I_γ: other: 0.76 *3* (2007ChZX). α(K)exp=0.0305 *15*; K:L1=0.0305 *6*:0.00426 *26* (1994HoZZ).
[x]497.294 *6*	0.044 *6*								
499[h]		703.6295	2^+	204.4484	2^-				
499.040 *4*	0.300 *4*	648.7469	1^-	149.7180	0^-	M1		0.0380	α(K)exp=0.0253 *13*; α(L1)exp=0.0040 *5* (1994HoZZ). Mult.: α(L1)exp consistent with pure M1.

$^{170}_{69}Tm_{101}$-14

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
499.559 *4*	0.510 *9*	719.2626	1^+	219.7060	2^-	E1			E_γ: other: 499.32 *5* (2007ChZX). I_γ: other: 0.84 *3* (2007ChZX). α(K)exp=0.0067 *5*; α(L1)exp=0.00137 *18* (1994HoZZ).
[x]501.495 *7*	0.028 *1*								
[x]502.834 *14*	0.015 *1*								
504.325 *24*	0.028 *1*	1238.145	$(0,1,2)^-$	733.8130	$(2)^-$				
505.010 *10*	0.720 *22*	709.476	$(1,2,3)^-$	204.4484	2^-	M1+E2	0.59 *11*	0.0316 *15*	E_γ: other: 505.00 *6* (2007ChZX). I_γ: other: 0.86 *3* (2007ChZX). α(K)exp=0.0264 *13*.
505.344 *15*	0.106 *7*	544.050	(3^+)	38.7135	2^-				E_γ: other: 506.61 *6* (2007ChZX). I_γ: other: 0.80 *3* (2007ChZX).
[x]506.630 *3*	0.681 *12*					E1			α(K)exp=0.0040 *3*.
510[h]		693.2868	2^-	183.1928	4^-				E_γ: presumably the Eγ=510.43 *11*, Iγ=0.58 *3* line from 2007ChZX which those authors placed from the 662 level, apparently In error.
512.133 *3*	1.22 *3*	661.8555	1^+	149.7180	0^-	E1			E_γ: other: 512.01 *5* (2007ChZX). I_γ: other: 1.87 *5* (2007ChZX). α(K)exp=0.0036 *2*; K:L1=0.00361 *14*:0.00050 *6* (1994HoZZ).
512.620 *24*	0.044 *3*	749.8484	$(3)^-$	237.2395	1^-				E_γ: other: 514.09 *22* (2007ChZX). I_γ: other: 0.103 *21* (2007ChZX).
[x]514.093 *4*	0.049 *4*					M1		0.0352	α(K)exp=0.034 *5*.
[x]515.48 *3*	0.024 *3*								
517.059 *4*	0.112 *4*	1178.909	$(2)^-$	661.8555	1^+				
517.428 *16*	0.022 *2*	964.475	$(3,4)^-$	447.0706	$(3)^-$	E2(+M1)	≥1.5	0.019 *3*	E_γ: other: 517.55 *25* (2007ChZX). I_γ: other: 0.048 *23* (2007ChZX). α(K)exp=0.015 *3*.
[x]518.069 *9*	0.021 *1*					M1		0.0345	α(K)exp=0.040 *3*.
[x]520.35 *5*	0.012 *1*								
[x]521.247 *10*	0.024 *1*					M1		0.0340	α(K)exp=0.026 *3*.
523.358 *4*	0.424 *9*	637.9060	2^-	114.5438	3^-	M1+E2	0.64 *12*	0.0283 *15*	E_γ: other: 523.32 *7* (2007ChZX). I_γ: other: 0.46 *3* (2007ChZX). α(K)exp=0.0236 *12*.
525.180 *5*	0.063 *1*	708.372	3^-	183.1928	4^-	M1+E2	0.88 *+21−18*	0.0254 *20*	E_γ: other: 524.9 *3* (2007ChZX). I_γ: other: 0.07 *3* (2007ChZX). α(K)exp=0.0211 *17*.
526.89 *3*	0.017 *1*	1070.975	$(2)^-$	544.050	(3^+)				
[x]529.325 *23*	0.014 *1*								
[x]531.967 *7*	0.070 *4*					M1+E2	0.6 *3*	0.028 *4*	α(K)exp=0.023 *3*.
532.421 *4*	0.355 *10*	715.6202	$(3)^-$	183.1930	$(3)^+$	E1			E_γ: other: 532.39 *6* (2007ChZX). I_γ: other: 0.56 *3* (2007ChZX). α(K)exp=0.0041 *2*.
532.860 *4*	0.094 *4*	979.929	$(3)^-$	447.0706	$(3)^-$				

$^{170}_{69}Tm_{101}$-15

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
533[h]		648.7469	1^-	114.5438	3^-				
535.831 *3*	1.078 *19*	650.3732	2^+	114.5438	3^-	E1			E_γ: other: 535.78 *5* (2007ChZX). I_γ: other: 1.12 *4* (2007ChZX). α(K)exp=0.0034 *2*.
[x]536.73 *4*	0.018 *1*					M1+E2	0.7 *7*	0.026 *6*	α(K)exp=0.022 *5*.
537.992 *3*	0.870 *14*	775.2305	$(0)^+$	237.2395	1^-	E1			E_γ: other: 537.97 *6* (2007ChZX). I_γ: other: 0.95 *4* (2007ChZX). α(K)exp=0.0034 *2*.
538.622 *7*	0.063 *3*	758.3290	$(2)^+$	219.7060	2^-				
[x]539.025 *16*	0.036 *1*					M1+E2	1.1 *+4−3*	0.022 *3*	α(K)exp=0.0182 *22*.
541.053 *20*	0.017 *1*	655.598	(5^-)	114.5438	3^-				
544.043 *11*	0.060 *3*	544.050	(3^+)	0.0	1^-				E_γ: other: 543.58 *25* (2007ChZX). I_γ: other: 0.066 *20* (2007ChZX). α(K)exp=0.0187 *21*. Mult.,δ: E2+M1 (δ=1.0 *+4−3*) from α(K)exp is inconsistent with placement; either the γ is misplaced or the mult is incorrect.
[x]545.68 *6*	0.007 *1*								
[x]546.899 *20*	0.014 *1*								
[x]549.127 *15*	0.025 *1*					M1(+E2)		0.022 *9*	α(K)exp=0.022 *4*.
551.514 *3*	0.973 *15*	590.2290	1^-	38.7135	2^-	M1+E2	0.65 *11*	0.0246 *12*	α(K)exp=0.0206 *10*; K:L1=0.0206 *4*:0.00302 *6* (1994HoZZ).
552[h]		822.3949	2^+	270.5465	$(3)^-$				
[x]553.892 *4*	0.065 *2*					M1		0.0291	α(K)exp=0.025 *4*.
554[h]		758.3290	$(2)^+$	204.4484	2^-				
[x]554.850 *18*	0.018 *1*								
[x]556.387 *4*	0.078 *3*								
557.749 *5*	0.091 *1*	1147.975	$(1,2)^-$	590.2290	1^-	M1+E2	1.46 *+19−16*	0.0180 *9*	E_γ: other: 557.7 *3* (2007ChZX). I_γ: other: 0.065 *20* (2007ChZX). α(K)exp=0.0148 *7*.
[x]561.323 *13*	0.049 *4*								
561.753 *13*	0.027 *3*	964.475	$(3,4)^-$	402.7281	$(3,4)^-$				
562.444 *3*	0.771 *15*	782.1521	$(1)^-$	219.7060	2^-	M1+E2	0.55 *12*	0.0244 *13*	E_γ: other: 562.39 *5* (2007ChZX). I_γ: other: 0.81 *3* (2007ChZX). α(K)exp=0.0205 *10*.
[x]563.00 *3*	0.040 *3*								
565.268 *4*	1.428 *23*	603.9903	1^+	38.7135	2^-	E1			E_γ: other: 565.22 *5* (2007ChZX). I_γ: other: 1.50 *4* (2007ChZX). α(K)exp=0.0034 *2*.
[x]565.896 *9*	0.080 *2*					E2+M1	1.6 *+6−3*	0.0168 *17*	α(K)exp=0.0138 *14*.
[x]567.554 *11*	0.032 *2*								
569.177 *5*	0.715 *20*	607.8865	3^+	38.7135	2^-	E1			E_γ: other: 569.25 *5* (2007ChZX).

$^{170}_{69}Tm_{101}$-16

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									I_γ: other: 1.04 *3* (2007ChZX). α(K)exp=0.0040 *3*.
569.549 *8*	0.329 *8*	719.2626	1^+	149.7180	0^-	E1			α(K)exp=0.0029 *3*.
x571.063 *9*	0.082 *3*					M1+E2	0.6 *3*	0.023 *3*	α(K)exp=0.0189 *21*.
x572.405 *5*	0.081 *3*								
573.017 *4*	0.292 *5*	756.211	$(4)^-$	183.1930	$(3)^+$	E1			E_γ: other: 573.16 *20* (2007ChZX). I_γ: other: 0.29 *9* (2007ChZX). α(K)exp=0.0045 *4*.
x574.106 *6*	0.083 *3*					E2+M1	0.98 *+27−21*	0.0195 *18*	α(K)exp=0.0162 *15*.
575.115 *17*	0.026 *1*	758.3290	$(2)^+$	183.1930	$(3)^+$				
x575.674 *12*	0.042 *3*								
576[h]		925.2719	$(3)^-$	349.7332	3^-				
x578.701 *7*	0.109 *6*					M1+E2	0.78 *+22−19*	0.0207 *18*	α(K)exp=0.0172 *15*.
x580.607 *8*	0.042 *5*								
581.268 *5*	0.398 *11*	818.5088	$(2)^+$	237.2395	1^-	E1			E_γ: other: 580.97 *14* (2007ChZX). I_γ: other: 0.30 *7* (2007ChZX). α(K)exp=0.0034 *2*.
582.258 *11*	0.038 *10*	984.981	$(3,4,5)^-$	402.7281	$(3,4)^-$				
x582.444 *15*	0.073 *2*					E2+M1	1.2 *+4−3*	0.0174 *20*	α(K)exp=0.0144 *16*.
585.152 *4*	0.576 *13*	822.3949	2^+	237.2395	1^-	E1			E_γ: other: 585.09 *6* (2007ChZX). I_γ: other: 0.57 *4* (2007ChZX). α(K)exp=0.0046 *2*.
589.085 *7*	0.552 *9*	703.6295	2^+	114.5438	3^-	E1			E_γ: other: 589.13 *10* (2007ChZX). I_γ: other: 0.55 *10* (2007ChZX). α(K)exp=0.0027 *2*.
590.226 *6*	1.21 *3*	590.2290	1^-	0.0	1^-	M1(+E2)		0.018 *7*	E_γ: other: 590.18 *7* (2007ChZX). I_γ: other: 1.21 *10* (2007ChZX). α(K)exp=0.0188 *9*; K:L1=0.0188 *4*:0.00336 *24* (1994HoZZ). δ: 0.52 *12* from α(K)exp; however, α(L1)exp indicates pure M1.
x591.42 *3*	0.037 *1*								
x592.937 *13*	0.043 *1*					M1		0.0244	α(K)exp=0.020 *3*.
593.93 *7*	0.012 *1*	708.372	3^-	114.5438	3^-				
x595.869 *12*	0.035 *1*					M1+E2		0.018 *7*	α(K)exp=0.016 *3*.
x597.155 *21*	0.017 *2*								
x598.047 *20*	0.037 *3*								
x598.472 *17*	0.030 *1*								
599.206 *6*	0.128 *7*	637.9060	2^-	38.7135	2^-	M1+E2	0.81 *+15−14*	0.0187 *12*	E_γ: other: 599.00 *14* (2007ChZX). I_γ: other: 0.148 *24* (2007ChZX). α(K)exp=0.0162 *10*.
x599.479 *19*	0.033 *7*								
601.974 *5*	0.168 *4*	806.4276	$(4)^-$	204.4484	2^-				E_γ: other: 601.64 *19* (2007ChZX). I_γ: other: 0.12 *3* (2007ChZX).

$^{170}_{69}Tm_{101}$-17

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

γ(^{170}Tm) (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
602.598 *14*	0.034 *3*	1192.830	2⁻	590.2290	1⁻				
603.978 *6*	1.077 *20*	603.9903	1⁺	0.0	1⁻	E1			E_γ: other: 603.91 *5* (2007ChZX). I_γ: other: 1.33 *5* (2007ChZX). α(K)exp=0.0035 *2*.
606.346 *10*	0.058 *4*	964.475	(3,4)⁻	358.1166	(4)⁻	M1+E2	0.76 *+27−23*	0.0185 *19*	E_γ: other: 607.0 *4* (2007ChZX). I_γ: other: 0.041 *22* (2007ChZX). α(K)exp=0.0155 *16*.
[x]608.168 *14*	0.035 *12*								
[x]609.394 *12*	0.048 *3*								
610.032 *6*	0.147 *6*	648.7469	1⁻	38.7135	2⁻	M1(+E2)	≤0.45	0.0217 *11*	E_γ: other: 609.80 *23* (2007ChZX). I_γ: other: 0.17 *4* (2007ChZX). α(K)exp=0.0183 *9*.
[x]611.304 *10*	0.086 *6*					M1(+E2)		0.017 *7*	α(K)exp=0.0165 *18*.
611.659 *5*	0.533 *17*	650.3732	2⁺	38.7135	2⁻				E_γ: other: 611.80 *8* (2007ChZX). I_γ: other: 0.79 *4* (2007ChZX). α(K)exp=0.0079 *8* implies mult=E2, but placement requires E1; possible contamination of ce line (1994HoZZ).
[x]612.619 *7*	0.209 *5*					E1			α(K)exp=0.0051 *6*.
[x]614.45 *4*	0.028 *7*								
[x]616.938 *12*	0.059 *2*					(E1)			α(K)exp=0.0060 *11*.
617[h]		854.337	2⁻	237.2395	1⁻				
619.423 *5*	0.209 *5*	839.131	(3)⁻	219.7060	2⁻	M1+E2	0.47 *+12−13*	0.0197 *10*	E_γ: other: 619.44 *10* (2007ChZX). I_γ: other: 0.22 *4* (2007ChZX). α(K)exp=0.0166 *8*.
[x]620.639 *6*	0.09 *3*								
621.805 *8*	0.093 *5*	979.929	(3)⁻	358.1166	(4)⁻	E2		0.01002	α(K)exp=0.0073 *14*.
623.144 *5*	0.178 *5*	661.8555	1⁺	38.7135	2⁻	(E1)			E_γ: other: 622.63 *11* (2007ChZX). I_γ: other: 0.58 *3* (2007ChZX). α(K)exp=0.0047 *4*.
626[h]		863.366	(1)⁻	237.2395	1⁻				
626.857 *9*	0.049 *1*	984.981	(3,4,5)⁻	358.1166	(4)⁻				
[x]628.04 *6*	0.011 *1*								
632.430 *4*	0.704 *13*	782.1521	(1)⁻	149.7180	0⁻				E_γ: other: 632.37 *6* (2007ChZX). I_γ: other: 0.70 *3* (2007ChZX). α(K)exp=0.0141 *7*. Mult.,δ: M1+E2 (δ=0.78 *12*) from α(K)exp in (n,γ); inconsistent with transition to J=0.
[x]633.648 *9*	0.074 *2*					M1		0.0207	α(K)exp=0.0147 *10*.
634.661 *18*	0.043 *2*	839.131	(3)⁻	204.4484	2⁻				
635[h]		854.337	2⁻	219.7060	2⁻				
[x]635.44 *6*	0.019 *2*					M1		0.0205	α(K)exp=0.029 *7*.
637.899[m] *4*	1.360[m] *23*	637.9060	2⁻	0.0	1⁻				α(K)exp=0.0142 *7*, mult=M1+E2 for doublet.

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

γ(^{170}Tm) (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
637.899[m] *4*	1.360[m] *23*	908.452	(2⁻)	270.5465	(3)⁻				E_γ: other: 637.75 *4* (2007ChZX). I_γ: other: 1.19 *4* (2007ChZX). α(K)exp=0.0142 *7*, mult=M1+E2 for doublet.
[x]639.077 *10*	1.105 *17*								
640.774 *5*	0.636 *12*	860.486	1⁺	219.7060	2⁻	E1			E_γ: other: 640.56 *8* (2007ChZX). I_γ: other: 0.67 *3* (2007ChZX). α(K)exp=0.0029 *2*.
[x]643.055 *6*	0.279 *3*					E2			α(K)exp=0.0035 *5*.
644[h]		863.366	(1)⁻	219.7060	2⁻				
[x]644.442 *11*	0.036 *12*								
648.731 *6*	0.324 *6*	648.7469	1⁻	0.0	1⁻	M1+E2	0.70 *+13−12*	0.0160 *9*	E_γ: other: 648.38 *22* (2007ChZX). I_γ: other: 0.23 *4* (2007ChZX). α(K)exp=0.0135 *7*.
650[h]		854.337	2⁻	204.4484	2⁻				
650.366 *4*	1.350 *14*	650.3732	2⁺	0.0	1⁻	E1			E_γ: other: 650.21 *6* (2007ChZX). I_γ: other: 1.38 *5* (2007ChZX). α(K)exp=0.0029 *2*.
[x]653.066 *6*	0.152 *4*					M1+E2	0.70 *+13−12*	0.0158 *9*	α(K)exp=0.0132 *7*.
[x]654.16 *3*	0.032 *2*					M1		0.0191	α(K)exp=0.0157 *22*.
[x]655.472 *17*	0.044 *2*					M1		0.0190	α(K)exp=0.0186 *17*.
[x]656.816 *8*	0.152 *2*					E1			α(K)exp=0.0035 *5*.
658[h]		862.7761	(3)⁻	204.4484	2⁻				
658.91 *4*	1.50 *4*	863.366	(1)⁻	204.4484	2⁻	M1+E2	0.69 *13*	0.0155 *9*	E_γ: other: 658.85 *5* (2007ChZX). I_γ: other: 1.49 *5* (2007ChZX). α(K)exp=0.0130 *7*.
[x]660.347 *20*	0.064 *2*					M1		0.0186	α(K)exp=0.0170 *10*.
[x]664.33 *6*	0.028 *9*								
664.897 *5*	0.281 *5*	703.6295	2⁺	38.7135	2⁻	(E1)			E_γ: other: 664.96 *12* (2007ChZX). I_γ: other: 0.29 *4* (2007ChZX). α(K)exp=0.0015 *3*.
[x]666.157 *15*	0.051 *4*								
666.627 *11*	0.060 *2*	1210.679	(2⁺)	544.050	(3⁺)	M1+E2	1.3 *+6−4*	0.0121 *18*	α(K)exp=0.0102 *14*.
669.654 *5*	0.329 *3*	708.372	3⁻	38.7135	2⁻	M1+E2	1.03 *+13−12*	0.0131 *7*	E_γ: other: 669.55 *13* (2007ChZX). I_γ: other: 0.30 *4* (2007ChZX). α(K)exp=0.0109 *5*.
670.760[o] *9*	0.14 *7*	709.476	(1,2,3)⁻	38.7135	2⁻				E_γ: other: 671.2 *3* (2007ChZX). I_γ: other: 0.11 *4* (2007ChZX). E_γ: also placed by 1994Sc51 In ^{171}Tm (the product of double neutron capture).
679.584 *6*	0.117 *2*	862.7761	(3)⁻	183.1930	(3)⁺				
680.543 *4*	0.452 *12*	719.2626	1⁺	38.7135	2⁻	E1			E_γ: other: 680.23 *9* (2007ChZX). I_γ: other: 0.39 *3* (2007ChZX). α(K)exp=0.0025 *2*.

$^{170}_{69}Tm_{101}$-19

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
[x]685.047 *13*	0.050 *3*					M1+E2	0.7 *+6−5*	0.014 *3*	α(K)exp=0.0116 *23*.
[x]687.65 *3*	0.042 *2*					M1+E2	0.6 *4*	0.0145 *21*	α(K)exp=0.0120 *17*.
[x]688.349 *13*	0.064 *2*								
[x]692.220 *17*	0.044 *2*					M1		0.01653	α(K)exp=0.0136 *18*.
693.287 *5*	0.40 *3*	693.2868	2^-	0.0	1^-	M1+E2	1.06 *+19−16*	0.0119 *8*	E_γ: other: 693.19 *9* (2007ChZX). I_γ: other: 0.29 *3* (2007ChZX). α(K)exp=0.0099 *6*. E_γ: placed by 1994Sc51 In ^{171}Tm also (the product of double neutron capture).
694.100 *21*	0.09 *7*	1238.145	$(0,1,2)^-$	544.050	(3^+)				
695.16 *3*	0.065 *3*	1299.108	$(2)^-$	603.9903	1^+				E_γ: other: 696.77 *24* (2007ChZX). I_γ: other: 0.082 *20* (2007ChZX).
[x]695.66 *3*	0.040 *2*								
[x]696.54 *3*	0.044 *7*					M1(+E2)	0.4 *+5−4*	0.015 *3*	α(K)exp=0.0126 *23*.
[x]697.790 *13*	0.084 *2*								
703.626 *6*	0.888 *25*	703.6295	2^+	0.0	1^-	E1			E_γ: other: 703.71 *5* (2007ChZX). I_γ: other: 1.26 *4* (2007ChZX). α(K)exp=0.0020 *1*.
703.975[m] *12*	0.96[mf] *3*	818.5088	$(2)^+$	114.5438	3^-				α(K)exp=0.0054 *3*, K:L1=540 *11*:70 *8* for doublet (1994HoZZ).
703.975[m] *12*	0.96[mf] *3*	908.452	(2^-)	204.4484	2^-				α(K)exp=0.0054 *3*, K:L1=540 *11*:70 *8* for doublet (1994HoZZ).
[x]706.977 *7*	0.252 *4*					M1+E2	1.17 *+19−15*	0.0109 *6*	α(K)exp=0.0091 *5*.
707.849 *5*	0.380 *4*	822.3949	2^+	114.5438	3^-	(E1)			α(K)exp=0.0012 *2*.
[x]708.701 *8*	0.236 *4*								
709[h]		708.372	3^-	0.0	1^-				
709.377 *14*	0.081 *2*	979.929	$(3)^-$	270.5465	$(3)^-$				
710.772 *6*	0.628 *13*	860.486	1^+	149.7180	0^-	E1			E_γ: other: 710.70 *7* (2007ChZX). I_γ: other: 0.57 *3* (2007ChZX). α(K)exp=0.0017 *4*.
711.127 *7*	0.246 *14*	749.8484	$(3)^-$	38.7135	2^-	M1+E2	1.07 *+33−24*	0.0111 *11*	α(K)exp=0.0093 *9*.
713.505 *23*	0.048 *3*	1160.598	$(1)^-$	447.0706	$(3)^-$				
714.438 *13*	0.067 *4*	984.981	$(3,4,5)^-$	270.5465	$(3)^-$	E2(+M1)		0.011 *4*	α(K)exp=0.0069 *13*.
[x]717.363 *6*	0.199 *5*					M1+E2	1.20 *+16−13*	0.0104 *5*	α(K)exp=0.0087 *4*.
[x]718.105 *8*	0.144 *2*					E1,E2			α(K)exp=0.0033 *6*.
719.262 *5*	1.21 *3*	719.2626	1^+	0.0	1^-	E1			E_γ: other: 719.12 *8* (2007ChZX). I_γ: other: 0.96 *3* (2007ChZX). α(K)exp=0.0022 *1*.
720.803 *12*	0.640 *5*	925.2719	$(3)^-$	204.4484	2^-				E_γ: other: 720.61 *8* (2007ChZX). I_γ: other: 0.54 *3* (2007ChZX). α(K)exp=0.0021 *3*. Mult.: E1 from α(K)exp; inconsistent with placement.
724.588 *5*	0.907 *18*	839.131	$(3)^-$	114.5438	3^-	M1+E2	0.89 *+14−13*	0.0113 *6*	E_γ: other: 724.48 *5* (2007ChZX).

$^{170}_{69}Tm_{101}$-20

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									I_γ: other: 0.65 *3* (2007ChZX). α(K)exp=0.0095 *5*; K:L1=0.0095 *5*:0.00146 *7* (1994HoZZ). δ: from α(K)exp; 0.60 *11* from α(L1)exp.
x729.10 *4*	0.024 *4*					M1		0.01452	α(K)exp=0.013 *4*.
x731.11 *3*	0.032 *2*								
x732.269 *7*	0.13 *4*								
733.79 *3*	0.040 *2*	733.8130	(2)$^-$	0.0	1$^-$				
x735.07 *3*	0.051 *3*								
x735.865 *8*	0.159 *4*					E2+M1	1.28 *+19−16*		α(K)exp=0.0080 *4*.
739.800 *7*	0.221 *4*	854.337	2$^-$	114.5438	3$^-$	M1+E2	1.30 *+19−16*		E_γ: other:: 739.76 *14* (2007ChZX). I_γ: other: 0.103 *17* (2007ChZX). α(K)exp=0.0080 *4*.
x742.02 *3*	0.070 *3*					E2			α(K)exp=0.0046 *13*.
x743.49 *3*	0.079 *3*					M1+E2	0.90 *+26−22*	0.0106 *10*	α(K)exp=0.0089 *8*.
744.747 *15*	0.112 *8*	964.475	(3,4)$^-$	219.7060	2$^-$				E_γ: other: 744.00 *16* (2007ChZX). I_γ: other: 0.118 *18* (2007ChZX).
745[h]		860.486	1$^+$	114.5438	3$^-$				
748.240 *14*	0.077 *2*	862.7761	(3)$^-$	114.5438	3$^-$				
x751.278 *18*	0.056 *2*					E2(+M1)			α(K)exp=0.0066 *16*.
x752.61 *3*	0.044 *2*					E2(+M1)			α(K)exp=0.0068 *17*.
x757.071 *21*	0.070 *3*					M1(+E2)			α(K)exp=0.0088 *25*.
760.05 *3*	0.035 *2*	964.475	(3,4)$^-$	204.4484	2$^-$				
x764.285 *25*	0.035 *2*					M1+E2			α(K)exp=0.0081 *19*.
x771.055 *21*	0.044 *6*								
x772.113 *25*	0.044 *5*					M1+E2			α(K)exp=0.0073 *20*.
x772.864 *18*	0.072 *3*					E2+M1			α(K)exp=0.0063 *10*.
x774.86 *4*	0.024 *11*								
x776.207 *16*	0.067 *3*								
x777.58 *4*	0.031 *2*								
779.775 *16*	0.062 *4*	818.5088	(2)$^+$	38.7135	2$^-$				
x780.61 *4*	0.063 *2*								
781.299 *25*	0.143 *2*	964.475	(3,4)$^-$	183.1928	4$^-$	E2+M1	1.7 *+7−4*		E_γ: other: 780.97 *18* (2007ChZX). I_γ: other: 0.19 *4* (2007ChZX). α(K)exp=0.0063 *6*.
781.83 *3*	0.068 *4*	1139.954	(2)$^-$	358.1166	(4)$^-$	(E2)			E_γ: other: 783.41 *15* (2007ChZX). I_γ: other: 0.17 *4* (2007ChZX). α(K)exp=0.0079 *17*. Mult.,δ: M1+E2 with δ=0.9 *+9−4* from α(K)exp; M1 component inconsistent with ΔJ=2 placement.
x783.656 *7*	0.244 *6*					E2+M1	1.7 *+4−3*		α(K)exp=0.0062 *4*.
x786.204 *14*	0.077 *3*								
x788.391 *18*	0.112 *2*								
790.200 *15*	0.192 *3*	1139.954	(2)$^-$	349.7332	3$^-$	M1+E2	1.17 *+27−20*		E_γ: other: 790.02 *15* (2007ChZX).

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

γ(^{170}Tm) (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	α[l]	Comments
									I_γ: other: 0.16 *3* (2007ChZX). α(K)exp=0.0070 *5*.
792[h]		908.452	(2⁻)	114.5438	3⁻				
x792.03 *4*	0.032 *4*								
x793.953 *14*	0.122 *5*					E2+M1	2.4 *+31−7*		α(K)exp=0.0055 *6*.
x799.74 *5*	0.038 *4*								
800.406[m] *18*	0.097[m] *3*	839.131	(3)⁻	38.7135	2⁻				α(K)exp=0.0072 *9*, mult=M1+E2 for doublet.
800.406[m] *18*	0.097[m] *3*	1070.975	(2)⁻	270.5465	(3)⁻				E_γ: other: 800.43 *18* (2007ChZX). I_γ: other: 0.116 *22* (2007ChZX). α(K)exp=0.0072 *9*, mult=M1+E2 for doublet.
x803.53 *4*	0.032 *3*					M1		0.01139	α(K)exp=0.0092 *20*.
x809.06 *5*	0.039 *5*					M1+E2	1.1 *+25−7*		α(K)exp=0.0068 *19*.
810.730 *8*	0.250 *4*	925.2719	(3)⁻	114.5438	3⁻	M1+E2	1.27 *+18−15*		E_γ: other: 810.55 *11* (2007ChZX). I_γ: other: 0.149 *20* (2007ChZX). α(K)exp=0.0064 *3*.
815.621 *7*	1.092 *7*	854.337	2⁻	38.7135	2⁻	M1+E2	1.12 *+15−13*		E_γ: other: 815.56 *5* (2007ChZX). I_γ: other: 0.73 *3* (2007ChZX). α(K)exp=0.0066 *3*; K:L1=0.00654 *13*:0.00095 *6* (1994HoZZ).
818.502 *9*	0.315 *4*	818.5088	(2)⁺	0.0	1⁻	(E1)[i]			E_γ: other: 818.64 *9* (2007ChZX). I_γ: other: 0.222 *19* (2007ChZX).
x819.31 *7*	0.066 *10*								
x819.88 *9*	0.044 *9*					M1		0.01084	α(K)exp=0.012 *3*.
x822.345 *9*	0.263 *4*					E1			α(K)exp=0.0019 *2*.
824.067 *7*	0.378 *6*	862.7761	(3)⁻	38.7135	2⁻				E_γ: other: 824.19 *10* (2007ChZX). I_γ: other: 0.303 *21* (2007ChZX). α(K)exp=0.0016 *2*. Mult.: E1 from α(K)exp; inconsistent with placement.
x826.12 *3*	0.093 *3*					E1,E2			α(K)exp=0.0029 *7*.
x828.76 *7*	0.028 *4*								
x831.03 *6*	0.043 *9*								
x831.87 *3*	0.049 *3*								
x835.649 *15*	0.420 *8*					M1+E2	1.14 *+17−14*		α(K)exp=0.0062 *3*.
844.682 *12*	0.166 *3*	959.218	(3)⁻	114.5438	3⁻				E_γ: other: 844.87 *13* (2007ChZX). I_γ: other: 0.76 *21* (2007ChZX).
x845.55 *3*	0.063 *4*					E2(+M1)			α(K)exp=0.0052 *13*.
x851.58 *6*	0.044 *4*					M1+E2			α(K)exp=0.0060 *16*.
x852.870 *19*	0.150 *3*					E2			α(K)exp=0.0039 *7*.
854.336 *6*	1.90 *3*	854.337	2⁻	0.0	1⁻	M1+E2	0.98 *+18−15*		E_γ: other: 854.23 *5* (2007ChZX). I_γ: other: 1.34 *4* (2007ChZX). α(K)exp=0.0059 *3*; K:L1=0.00589 *12*:0.00085 *3* (1994HoZZ). E_γ: also consistent with placement from 1092 to 237 level.
x856.575 *15*	0.270 *5*					E2+M1	1.8 *+5−3*		α(K)exp=0.0050 *3*. E_γ: placed from 1092 level in 1996Ho12, but Eγ does not fit that placement.

$\gamma(^{170}Tm)$ (continued)

E_γ †	I_γ ‡k	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ#	Comments
x859.707 *18*	0.132 *3*					M1+E2	1.14 *+34−25*	α(K)exp=0.0058 *5*.
x861.69 *3*	0.064 *3*					E2		α(K)exp=0.0041 *12*.
x863.62 *4*	0.082 *4*					E2		α(K)exp=0.0043 *10*.
865h		979.929	(3)$^-$	114.5438	3$^-$			
866.531 *9*	0.488 *8*	1070.975	(2)$^-$	204.4484	2$^-$	E2+M1	1.41 *+27−21*	E_γ: other: 866.44 *8* (2007ChZX). I_γ: other: 0.336 *23* (2007ChZX). α(K)exp=0.0053 *3*.
868h		908.452	(2$^-$)	38.7135	2$^-$			
x868.444 *12*	0.273 *6*					E1,E2		α(K)exp=0.0025 *2*.
869.417 *14*	0.185 *6*	1139.954	(2)$^-$	270.5465	(3)$^-$	(E2)		E_γ: other: 868.67 *11* (2007ChZX). I_γ: other: 0.224 *22* (2007ChZX). Mult.: E1,E2 from α(K)exp=0.0028 *4*; $\Delta\pi$=(no) from level scheme.
x872.44 *4*	0.098 *4*					E2+M1		α(K)exp=0.0044 *7*.
x873.596 *9*	0.827 *17*					M1+E2	1.20 *+21−17*	α(K)exp=0.0055 *3*.
x877.33 *3*	0.124 *6*							
x878.32 *3*	0.084 *3*					E2(+M1)		α(K)exp=0.0045 *8*.
886.583 *12*	0.246 *5*	925.2719	(3)$^-$	38.7135	2$^-$	M1+E2	2.48 *24*	E_γ: other: 886.50 *11* (2007ChZX). I_γ: other: 0.219 *23* (2007ChZX). α(K)exp=0.0056 *3*.
890.02 *3*	0.132 *4*	1160.598	(1)$^-$	270.5465	(3)$^-$			
x895.376 *19*	0.123 *6*					M1+E2	0.77 *+25−21*	α(K)exp=0.0060 *5*.
x897.21 *4*	0.037 *7*							
x899.137 *20*	0.085 *7*							
x902.752 *11*	0.403 *5*							
x903.40 *10*	0.056 *10*							
x912.52 *5*	0.069 *4*							
914.75 *6*	0.036 *8*	1064.4586	(1)$^+$	149.7180	0$^-$			E_γ: other: 915.9 *3* (2007ChZX). I_γ: other: 0.76 *21* (2007ChZX).
x916.139 *15*	0.168 *4*							
920.53 *3*	0.104 *4*	959.218	(3)$^-$	38.7135	2$^-$	E2(+M1)	≥1.2	E_γ: other: 919.84 *17* (2007ChZX). I_γ: other: 0.108 *23* (2007ChZX). α(K)exp=0.0040 *9*.
x924.06 *11*	0.039 *4*							
928.270 *18*	0.534 *8*	1147.975	(1,2)$^-$	219.7060	2$^-$	M1+E2	1.26 *+18−15*	E_γ: other: 928.13 *8* (2007ChZX). I_γ: other: 0.35 *5* (2007ChZX). α(K)exp=0.0047 *2*.
x931.496 *13*	0.317 *5*					E2+M1	1.41 *+35−25*	α(K)exp=0.0045 *3*.
x933.63 *7*	0.040 *11*							
x935.69 *6*	0.128 *4*					E2		α(K)exp=0.0035 *7*.
x936.26 *4*	0.081 *13*							
x938.40 *5*	0.088 *5*							
x939.66 *3*	0.110 *4*					E2		α(K)exp=0.0037 *6*.
940.94 *3*	0.090 *8*	1299.108	(2)$^-$	358.1166	(4)$^-$	(E2)		α(K)exp=0.0049 *10*.

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ †	I_γ ‡k	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ#	Comments
								Mult.: M1+E2 from α(K)exp; M1 component inconsistent with placement.
941.85 *5*	0.096 *11*	1091.586	(1,2)	149.7180	0^-	E2		α(K)exp=0.0044 *10* implies E2(+M1), but γ feeds J=(0) level.
943.514 *14*	0.312 *5*	1147.975	$(1,2)^-$	204.4484	2^-	E2		E_γ: other: 943.29 *13* (2007ChZX). I_γ: other: 0.23 *3* (2007ChZX). α(K)exp=0.0027 *3*.
x945.97 *4*	0.055 *9*							
x947.80 *3*	0.074 *5*							
x950.71 *4*	0.068 *4*							
x953.40 *9*	0.037 *5*							
956.144 *12*	0.446 *10*	1160.598	$(1)^-$	204.4484	2^-	(E2)		E_γ: other: 956.13 10 (2007CHZX). I_γ: other: 0.31 *6* (2007ChZX). Mult.: E1,E2 from α(K)exp=0.0021 *3*; $\Delta\pi$=(no) from level scheme.
x957.80 *6*	0.070 *5*					M1(+E2)		α(K)exp=0.0053 *10*.
959.202 *11*	0.343 *5*	959.218	$(3)^-$	0.0	1^-	E2		α(K)exp=0.0033 *2*.
960.567 *24*	0.124 *4*	1178.909	$(2)^-$	219.7060	2^-	M1+E2	1.0 *+4−3*	E_γ: other: 959.17 *17* (2007ChZX). I_γ: other: 0.27 *3* (2007ChZX). α(K)exp=0.0047 *5*.
964.329 *18*	0.141 *4*	1168.780	$(2)^-$	204.4484	2^-			E_γ: other: 964.6 *4* (2007ChZX). I_γ: other: 0.076 *29* (2007ChZX).
x967.280 *15*	0.245 *7*					E1		α(K)exp=0.0018 *3*.
973.087 *19*	0.160 *5*	1192.830	2^-	219.7060	2^-	E2+M1	1.6 *+9−4*	E_γ: other: 972.9 *3* (2007ChZX). I_γ: other: 0.10 *4* (2007ChZX). α(K)exp=0.0039 *4*.
x980.02 *4*	0.083 *5*							
x981.39 *4*	0.135 *7*							
x982.925 *22*	0.192 *6*							
987.443 *11*	0.372 *6*	1101.999	(2^+)	114.5438	3^-			E_γ: other: 987.38 *11* (2007ChZX). I_γ: other: 0.29 *3* (2007ChZX).
x988.98 *8*	0.074 *6*							
x991.79 *7*	0.063 *5*							
x994.24 *10*	0.059 *5*							
995.71 *6*	0.101 *10*	1178.909	$(2)^-$	183.1928	4^-	(E2)		E_γ: other: 995.3 *4* (2007ChZX). I_γ: other: 0.101 *22* (2007ChZX). α(K)exp=0.0037 *7*. Mult.,δ: E2+M1, δ=1.6 *+77−7* from α(K)exp; M1 component inconsistent with other branching information for 1179 level.
x996.58 *7*	0.091 *10*							
998.248 *14*	0.255 *4*	1147.975	$(1,2)^-$	149.7180	0^-			E_γ: other: 997.81 *21* (2007ChZX). I_γ: other: 0.190 *24* (2007ChZX).
1000.891 *14*	0.299 *7*	1238.145	$(0,1,2)^-$	237.2395	1^-	M1+E2	0.98 *+25−20*	E_γ: other: 1000.80 *14* (2007ChZX). I_γ: other: 0.22 *4* (2007ChZX). α(K)exp=0.0043 *3*.
x1004.041 *21*	0.158 *11*					M1+E2	1.1 *+8−4*	α(K)exp=0.0041 *6*.

$^{170}_{69}Tm_{101}$-24

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]	δ[#]	Comments
[x]1009.296 *10*	0.538 *6*							
[x]1013.64 *3*	0.223 *8*					E2		α(K)exp=0.0022 *3*.
1018.49 *3*	0.209 *8*	1238.145	$(0,1,2)^-$	219.7060	2^-	E2		α(K)exp=0.0031 *3*.
[x]1021.111 *21*	0.239 *9*					E2		α(K)exp=0.0030 *3*.
[x]1025.85 *7*	0.082 *5*							
1027.820 *13*	0.465 *16*	1265.076	$(0,1,2)^-$	237.2395	1^-			E_γ: other: 1027.61 *13* (2007ChZX). I_γ: other: 0.25 *4* (2007ChZX).
[x]1032.03 *4*	0.100 *4*					M1+E2	≤0.5	α(K)exp=0.0047 *9*.
[x]1035.251 *20*	0.214 *8*					E2		α(K)exp=0.0021 *3*.
[x]1036.51 *5*	0.086 *5*					E2(+M1)	≥1.0	α(K)exp=0.0033 *7*.
1040.142 *19*	0.417 *10*	1078.8498	$(1)^+$	38.7135	2^-	E1		E_γ: other: 1040.35 *15* (2007ChZX). I_γ: other: 0.24 *7* (2007ChZX). α(K)exp=0.0011 *2*.
[x]1041.20 *9*	0.060 *16*							
[x]1041.80 *9*	0.076 *22*							
1043.144 *22*	0.285 *8*	1192.830	2^-	149.7180	0^-	E2		E_γ: other: 1043.19 *22* (2007ChZX). I_γ: other: 0.18 *4* (2007ChZX). α(K)exp=0.0030 *2*.
1045.44 *3*	0.136 *5*	1265.076	$(0,1,2)^-$	219.7060	2^-	E2(+M1)	1.7 *+29−6*	α(K)exp=0.0033 *5*.
[x]1048.08 *9*	0.064 *5*							
[x]1050.08 *5*	0.087 *8*							
[x]1055.55 *5*	0.143 *6*					E2		α(K)exp=0.0028 *6*.
[x]1058.22 *4*	0.098 *5*					M1		α(K)exp=0.0061 *9*.
1061.869 *19*	0.372 *16*	1299.108	$(2)^-$	237.2395	1^-	E2		α(K)exp=0.0027 *3*.
[x]1064.504 *25*	0.170 *5*							
1070.971 *16*	0.230 *7*	1070.975	$(2)^-$	0.0	1^-	E2+M1	2.0 *+19−6*	α(K)exp=0.0030 *3*.
[x]1074.87 *6*	0.112 *7*							
[x]1077.47 *4*	0.156 *7*							
[x]1079.154 *15*	0.516 *20*					E2		α(K)exp=0.0026 *1*.
[x]1082.52 *4*	0.33 *4*					E2		α(K)exp=0.0023 *3*.
[x]1083.07 *3*	0.35 *9*					E2(+M1)	≥0.6	α(K)exp=0.0032 *8*.
[x]1087.83 *12*	0.070 *7*							
1091.51 *3*	0.205 *5*	1091.586	(1,2)	0.0	1^-	E2		α(K)exp=0.0021 *3*.
[x]1095.01 *8*	0.096 *5*							
[x]1097.43 *4*	0.168 *8*							
1101.95[g] *4*	0.155 *6*	1101.999	(2^+)	0.0	1^-			E_γ: other: 1102.4 *3* (2007ChZX). I_γ: other: 0.10 *3* (2007ChZX).
[x]1103.72 *6*	0.120 *7*							
[x]1105.368 *14*	0.469 *12*							
[x]1112.81 *7*	0.119 *5*							
[x]1117.36 *3*	0.216 *7*							
[x]1124.83 *15*	0.068 *13*							
[x]1126.72 *6*	0.159 *9*							
[x]1127.09 *16*	0.094 *8*							

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡k]	E_i(level)	J_i^π	E_f	J_f^π	Comments
x1128.11 *9*	0.108 *17*					
x1130.83 *3*	0.267 *10*					
x1134.21 *3*	0.221 *5*					
x1138.61 *3*	0.302 *7*					
1140.191[g] *15*	0.472 *14*	1178.909	$(2)^-$	38.7135	2^-	
x1142.27 *6*	0.118 *6*					
x1144.47 *8*	0.082 *6*					
x1151.37 *7*	0.125 *12*					
1154.19[g] *6*	0.136 *9*	1192.830	2^-	38.7135	2^-	
x1156.56 *13*	0.11 *4*					
x1157.53 *12*	0.146 *8*					
x1162.16 *4*	0.143 *6*					
x1164.73 *3*	0.277 *7*					
x1167.51 *3*	0.220 *10*					
1171.93[g] *3*	0.197 *8*	1210.679	(2^+)	38.7135	2^-	E_γ: other: 1172.3 *3* (2007ChZX). I_γ: other: 0.13 *3* (2007ChZX).
x1173.43 *7*	0.206 *20*					
1178.887[g] *25*	0.89 *3*	1178.909	$(2)^-$	0.0	1^-	E_γ: other: 1178.65 *9* (2007ChZX). I_γ: other: 0.53 *4* (2007ChZX).
1184.55[g] *4*	0.296 *23*	1299.108	$(2)^-$	114.5438	3^-	E_γ: other: 1184.74 *19* (2007ChZX). I_γ: other: 0.19 *3* (2007ChZX).
x1192.45 *6*	0.453 *12*					
x1195.63 *5*	0.255 *11*					
x1196.82 *6*	0.174 *11*					
x1198.92 *3*	0.279 *9*					
x1204.43 *10*	0.322 *15*					
x1208.71 *5*	0.188 *10*					
1210.687[g] *19*	0.561 *9*	1210.679	(2^+)	0.0	1^-	E_γ: other: 1210.54 *13* (2007ChZX). I_γ: other: 0.34 *7* (2007ChZX).
x1212.99 *5*	0.148 *8*					
x1216.33 *6*	0.133 *9*					
x1222.75 *4*	0.293 *10*					
1226.30[g] *6*	0.233 *8*	1265.076	$(0,1,2)^-$	38.7135	2^-	E_γ: other: 1225.97 *24* (2007ChZX). I_γ: other: 0.114 *21* (2007ChZX).
x1228.23 *4*	0.40 *6*					
x1230.51 *10*	0.403 *12*					
x1231.02 *6*	0.250 *23*					
x1234.32 *5*	0.304 *11*					
1238.05[g] *9*	0.108 *17*	1238.145	$(0,1,2)^-$	0.0	1^-	E_γ: other: 1238.98 *17* (2007ChZX). I_γ: other: 0.102 *20* (2007ChZX).
x1239.44 *7*	0.159 *19*					
x1246.76 *11*	0.086 *8*					
x1250.24 *4*	0.279 *23*					

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

γ(^{170}Tm) (continued)

E_γ †	I_γ ‡ k	E_i(level)	J_i^π	E_f	J_f^π	Comments
x1255.44 9	0.121 10					
x1258.57 4	0.226 10					
1265.13 g 10	0.166 23	1265.076	(0,1,2)$^-$	0.0	1$^-$	E_γ: other: 1265.85 16 (2007ChZX). I_γ: other: 0.200 23 (2007ChZX).
x1266.22 4	0.247 18					
x1280.10 9	0.164 19					
x1317.50 5	0.262 22					
x1334.25 13	0.147 23					
1354.72 go 7	0.21 4	1354.73?	(1,2)$^-$	0.0	1$^-$	E_γ: other: 1354.51 23 (2007ChZX). Note that a 1354.7γ deexcites a a 1395 level in (n,γ) E=thermal:γ coin. I_γ: other: 0.122 22 (2007ChZX).
x1367.06 4	0.298 19					
x1393.38 9	0.147 17					
x1425.29 10	0.153 21					
x1431.81 14	0.16 5					
x1464.93 11	0.16 8					
x1473.02 5	0.33 5					
x1561.63 9	0.25 3					
x1590.42 17	0.21 3					
x1622.37 12	0.25 3					
x1632.04 14	0.21 3					
x1658.65 13	0.23 3					
4641.48 j 25	0.30 j 3	(6591.76)	0$^+$,1$^+$	1950.2	(0$^-$,1$^-$,2$^-$)	E_γ: other: 4639 3 (1968Lo09) for apparent doublet; second component unidentified.
4650 @ 3		(6591.76)	0$^+$,1$^+$	1942	(0$^-$,2$^-$)	
4732.63 22	0.55 5	(6591.76)	0$^+$,1$^+$	1859.06	(1$^-$)	E_γ: other: 4733 3 (1968Lo09).
4748 @ 3		(6591.76)	0$^+$,1$^+$	1844	(1$^-$)	
4774.2 5	0.15 3	(6591.76)	0$^+$,1$^+$	1817.5	(0$^-$,1$^-$,2$^-$)	E_γ: other: 4771 3 (1968Lo09).
4801 @ 3		(6591.76)	0$^+$,1$^+$	1791	(1$^-$)	
4922.2 3	0.25 3	(6591.76)	0$^+$,1$^+$	1669.5	(1$^-$)	E_γ: other: 4918 3 (1968Lo09) for apparent doublet; second component unidentified.
4950 @ 3		(6591.76)	0$^+$,1$^+$	1642	(1$^-$)	
4987.1 4	0.15 3	(6591.76)	0$^+$,1$^+$	1604.6	(0$^-$,1$^-$,2$^-$)	E_γ: other: 4782 3 (1968Lo09).
5053.7 6	0.098 21	(6591.76)	0$^+$,1$^+$	1538.0	(1$^-$)	E_γ: other: 5051 3 (1968Lo09) for apparent doublet; second component unidentified.
5061.7 5	0.098 20	(6591.76)	0$^+$,1$^+$	1530.0		
5077 3	0.37 4	(6591.76)	0$^+$,1$^+$	1515	(0$^-$,2$^-$)	E_γ: other: 5077 3 (1968Lo09). I_γ: other: 0.210 6 (1968Lo09).
5124.2 3	0.27 4	(6591.76)	0$^+$,1$^+$	1467.5	(1$^-$)	E_γ: other: 5122 3 (1968Lo09). I_γ: other: 0.19 2 (1968Lo09).
5149.2 4	0.30 4	(6591.76)	0$^+$,1$^+$	1442.5	(1$^-$)	E_γ: other: 5149 3 (1968Lo09).
5158.2 4	0.45 5	(6591.76)	0$^+$,1$^+$	1433.5	(1$^-$)	E_γ: other: 5159 3 (1968Lo09). I_γ: other: 0.68 3 (1968Lo09).
5216.9 6	0.088 24	(6591.76)	0$^+$,1$^+$	1374.8	(1$^-$)	E_γ: other: 5213 3 (1968Lo09).
5325.7 3	0.17 3	(6591.76)	0$^+$,1$^+$	1265.076	(0,1,2)$^-$	E_γ: other: 5326 6 (1968Lo09) for apparent doublet; second component unidentified. I_γ: other: 0.14 5 (1968Lo09) for apparent doublet; second component unidentified.

$^{170}_{69}Tm_{101}$-27

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ[†]	I_γ[‡ k]	E_i(level)	J_i^π	E_f	J_f^π	Comments
5353.5 *4*	0.18 *3*	(6591.76)	$0^+,1^+$	1238.145	$(0,1,2)^-$	E_γ: other: 5360 *6* (1968Lo09) for apparent doublet; second component unidentified. I_γ: other: 0.076 *19* (1968Lo09) for apparent doublet; second component unidentified.
5381.4 *3*	0.17 *3*	(6591.76)	$0^+,1^+$	1210.679	(2^+)	E_γ: other: 5383 *3* (1968Lo09). I_γ: other: 0.064 *22* (1968Lo09).
5398.0 *4*	0.136 *24*	(6591.76)	$0^+,1^+$	1192.830	2^-	E_γ: other: 5398 *3* (1968Lo09). I_γ: other: 0.180 *17* (1968Lo09).
5412.47 *24*	0.37 *5*	(6591.76)	$0^+,1^+$	1178.909	$(2)^-$	E_γ: other: 5416 *3* (1968Lo09). I_γ: other: 0.310 *17* (1968Lo09).
5422.9 *3*	0.23 *3*	(6591.76)	$0^+,1^+$	1168.780	$(2)^-$	
5431.9 *3*	0.22 *3*	(6591.76)	$0^+,1^+$	1160.598	$(1)^-$	E_γ: other: 5428 *5* (1968Lo09) for apparent doublet; second component unidentified. I_γ: other: 0.180 *16* (1968Lo09) for apparent doublet; second component unidentified.
5443.5 *3*	0.143 *24*	(6591.76)	$0^+,1^+$	1147.975	$(1,2)^-$	I_γ: 0.036 *15* for (5447γ+5453γ) doublet In 1968Lo09.
5451.4 *4*	0.141 *24*	(6591.76)	$0^+,1^+$	1139.954	$(2)^-$	I_γ: see comment on 5443γ.
5518 *6*	0.120 *16*	(6591.76)	$0^+,1^+$	1070.975	$(2)^-$	E_γ: absent in 2007ChZX.
5682.6 *4*	0.049 *20*	(6591.76)	$0^+,1^+$	908.452	(2^-)	E_γ: other: 5684 *3* (1968Lo09). I_γ: other: 0.060 *15* (1968Lo09).
5728.6 *3*	0.25 *3*	(6591.76)	$0^+,1^+$	860.486	1^+	E_γ: others: 5730 *3* (1968Lo09), 5727 *2* (1966Sh03). I_γ: others: 0.14 *4* (1966Sh03).
5737.50 *20*	1.35 *7*	(6591.76)	$0^+,1^+$	854.337	2^-	E_γ: others: 5737 *3* (1968Lo09), 5737 *2* (1966Sh03). I_γ: others: 0.880 *17* (1968Lo09), 0.82 *16* (1966Sh03).
5771[@] *3*		(6591.76)	$0^+,1^+$	822.3949	2^+	E_γ: other: 5771 (1968Lo09).
5809.5 *4*	0.140 *19*	(6591.76)	$0^+,1^+$	782.1521	$(1)^-$	E_γ: others: 5809 *3* (1968Lo09), 5807 *3* (1966Sh03). I_γ: other: 0.050 *15* (1966Sh03).
5858.3 *3*	0.39 *4*	(6591.76)	$0^+,1^+$	733.8130	$(2)^-$	E_γ: others: 5858 *3* (1968Lo09), 5860.9 *10* (1966Sh03). I_γ: others: 0.230 *14* (1968Lo09), 0.29 *6* (1966Sh03).
5898.3 *3*	0.33 *4*	(6591.76)	$0^+,1^+$	693.2868	2^-	E_γ: others: 5900 *3* (1968Lo09), 5900 *3* (1966Sh03). I_γ: others: 0.320 *15* (1968Lo09), 0.26 *6* (1966Sh03).
5908.3 *3*	0.47 *4*	(6591.76)	$0^+,1^+$	683.569	$(0)^-$	E_γ: others: 5911 *3* (1968Lo09), 5910 *3* (1966Sh03). I_γ: others: 0.310 *17* (1968Lo09), 0.29 *6* (1966Sh03).
5943.14 *20*	1.44 *7*	(6591.76)	$0^+,1^+$	648.7469	1^-	E_γ: others: 5945 *3* (1968Lo09), 5945.0 *5* (1966Sh03). I_γ: 0.780 *15* (1968Lo09), 0.79 *16* (1966Sh03).
6001.51 *22*	0.94 *10*	(6591.76)	$0^+,1^+$	590.2290	1^-	E_γ: others: 6003 *3* (1968Lo09); 6003.8 *5* (1966Sh03). I_γ: 0.600 *15* (1968Lo09), 0.62 *13* (1966Sh03).
6354.5 *3*	0.40 *4*	(6591.76)	$0^+,1^+$	237.2395	1^-	E_γ: others: 6356 *3* (1968Lo09); 6356 *2* (1966Sh03). I_γ: others: 0.190 *12* (1968Lo09), 0.22 *5* (1966Sh03).
6371.5 *4*	0.081 *18*	(6591.76)	$0^+,1^+$	219.7060	2^-	E_γ: others: 6375 *3* (1968Lo09), 6376 *4* (1966Sh03). I_γ: other: 0.079 *16* (1966Sh03).
6387.49 *22*	1.41 *7*	(6591.76)	$0^+,1^+$	204.4484	2^-	E_γ: others: 6387.49 *22* (1968Lo09); 6389 *2* (1966Sh03). I_γ: others: 0.800 *14* (1968Lo09), 0.80 *16* (1966Sh03).
6442.19 *23*	0.45 *3*	(6591.76)	$0^+,1^+$	149.7180	0^-	E_γ: other: 6444.2 *10* (1966Sh03). I_γ: others: 0.200 *11* (1968Lo09), 0.22 *5* (1966Sh03).
6556.4 *5*	0.490 *15*	(6591.76)	$0^+,1^+$	38.7135	2^-	E_γ: from 1966Sh03. Not reported by 2007ChZX. I_γ: other: 0.46 *9* (1966Sh03).

$^{170}_{69}Tm_{101}$-28

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)

$\gamma(^{170}Tm)$ (continued)

E_γ [†]	I_γ [‡ k]	E_i(level)	J_i^π	E_f	J_f^π	Comments
6594 *3*	0.021 *10*	(6591.76)	$0^+,1^+$	0.0	1^-	I_γ: other: 0.014 *4* (1966Sh03).

[†] Secondary transitions: from curved-crystal spectrometer data of 1996Ho12, except as noted; calibrated assuming E=50.7416 for Tm Kα_1 x ray line. From 2007ChZX for primary transitions, except as noted. Primary γ data from 1966Sh03 and 1968Lo09 are given In comments for comparison.

[‡] Photon intensities/100 thermal n captures; from 1996Ho12 for secondary transitions, except as noted, and from 2007ChZX for primary transitions, except as noted (data from 1966Sh03 are given In comments for comparison). Primary transition Iγ data are also available from 1968Lo09 for resonant capture (3.92, 14.4, 17.5, 29.1, 34.8, 38.0, 44.8, 50.7, 54+59.2, 63.0+65.8, 83.4, 93.5+94.0, 115, 125+132+136 eV resonances). Note that significant discrepancies between Iγ data from 1996Ho12 and 2007ChZX exist In a number cases for the secondary transitions.

[#] Based on ce data from 1996Ho12.

[@] Not reported in thermal n capture.

[&] Absolute Iγ from 1989Du03, scaled by a factor of 0.56 so I(38γ)=0.196 as reported in 1996Ho12; includes 4% uncertainty in absolute Iγ in 1989Du03 but not the 11% uncertainty in I(38γ) in 1996Ho12.

[a] Divided intensity and mult for both components of doublet deduced by 1996Ho12 from subshell ratios for doublet, assuming any E1 component to be pure. In the case of the 144.5γ, the E2 component was also assumed to be pure.

[b] Based on $\alpha\leq$566 from intensity balance at 220 level.

[c] Based on $\alpha\leq$215 from intensity balance at 350 level.

[d] Based on $\alpha\leq$76 from intensity balance at 662 level.

[e] Based on Iγ=0.403 *7*, α(K)exp=0.0069 *7* for the doubly-placed transition and mult as indicated.

[f] Placements in level scheme require mult=E1 for 818 level and mult=M1,E2 for 908 level. From I(ce) and Iγ one can deduce Iγ(E1)=0.70 *5*, Iγ(M1)=0.26 *6* for E1-M1, and Iγ(E1)=0.21 *10*, Iγ(E2)=0.75 *11* for E1-E2.

[g] Placed by evaluator based on Eγ; unplaced In 1996Ho12.

[h] From fig. 5 of 1996Ho12; observed in $\gamma\gamma$ coin only.

[i] Nonobservance of ce(K) line accompanied by significant Iγ suggests mult=E1.

[j] From 2007ChZX.

[k] For intensity per 100 neutron captures, multiply by 1.00 *3*.

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

[m] Multiply placed with undivided intensity.

[n] Multiply placed with intensity suitably divided.

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

[x] γ ray not placed in level scheme.

$^{170}_{69}Tm_{101}$-29

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme

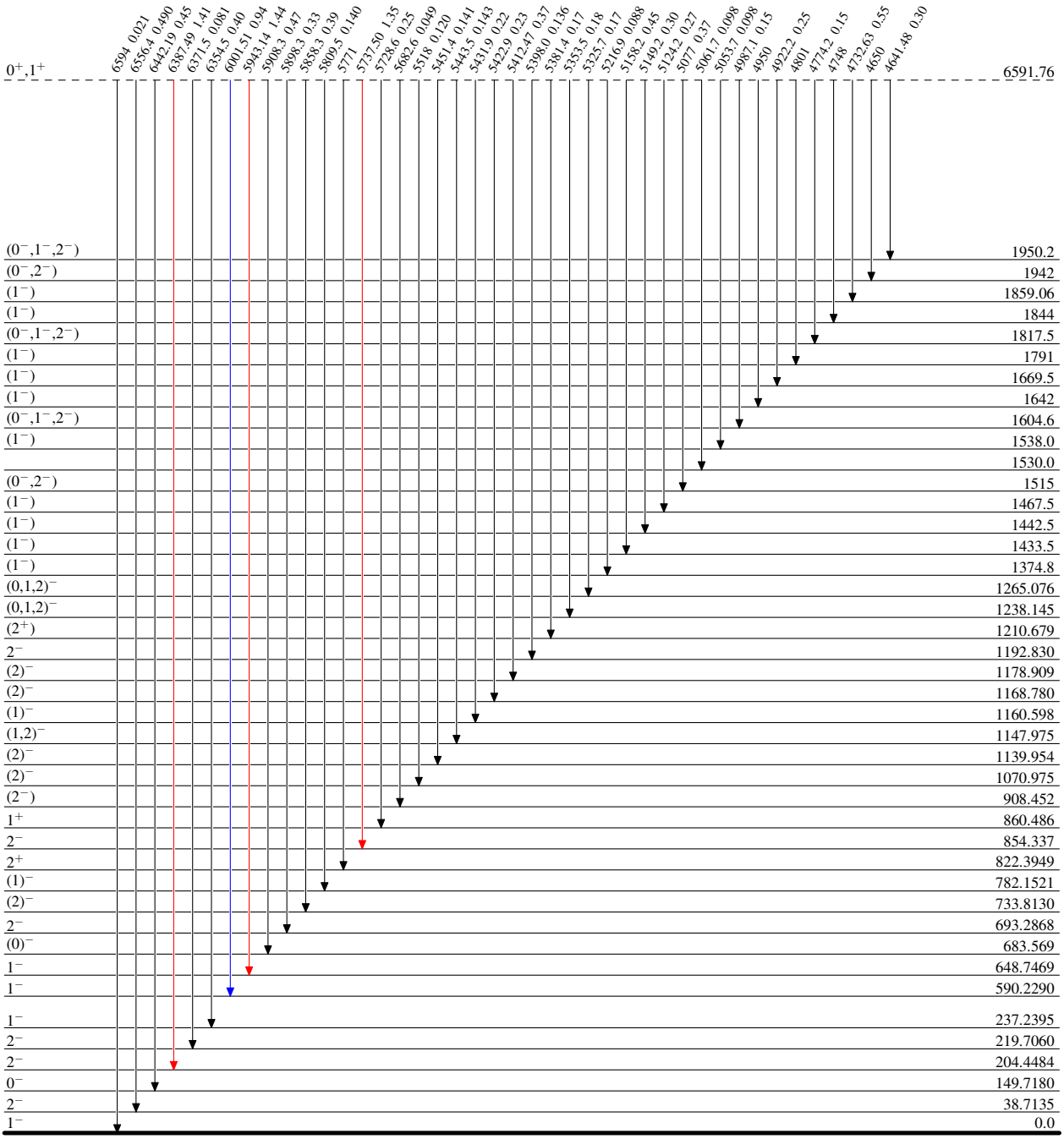
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{170}_{69}Tm_{101}$

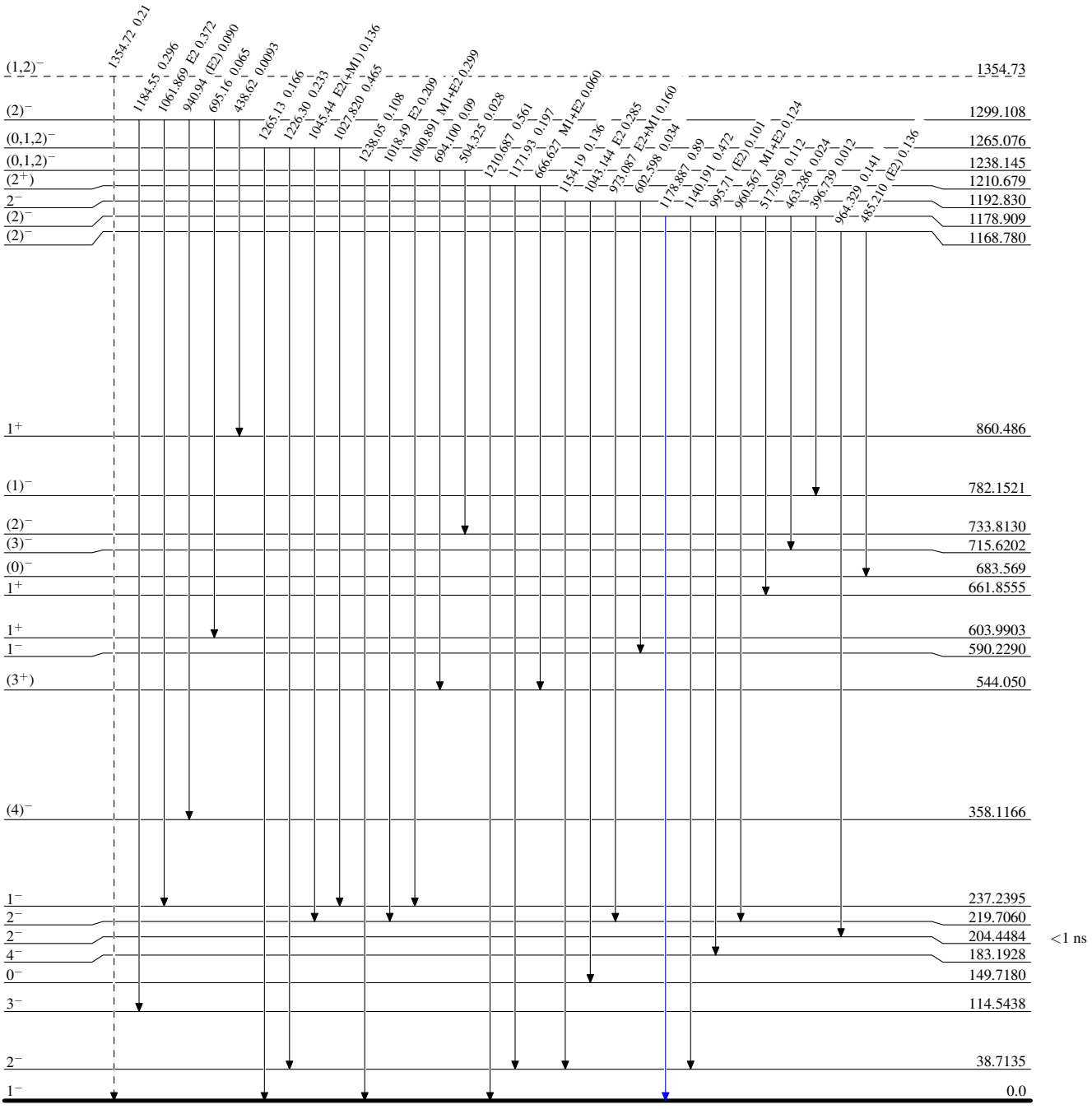
^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Legend

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

Level Scheme (continued)

Intensities: Relative I_γ



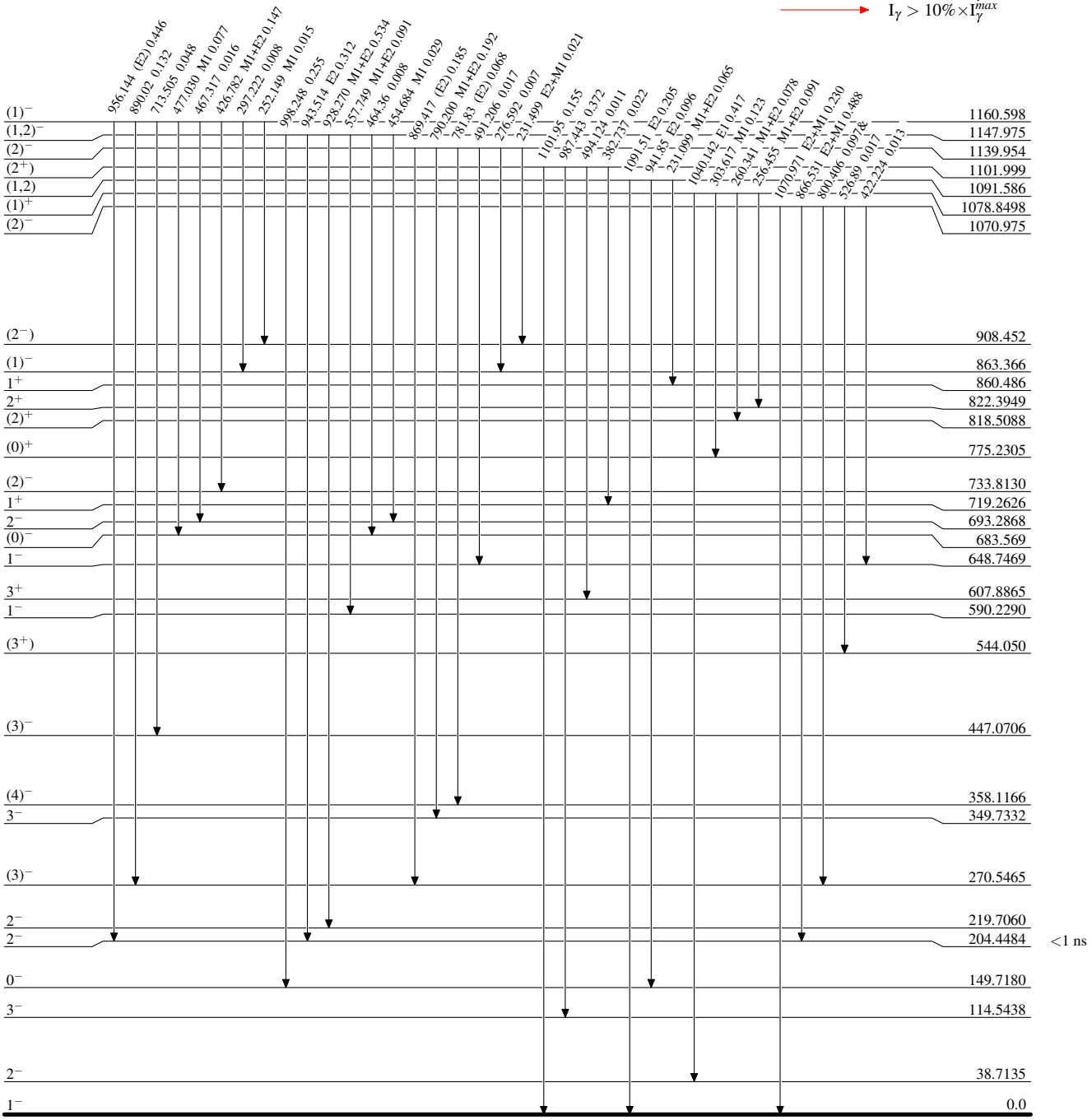
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



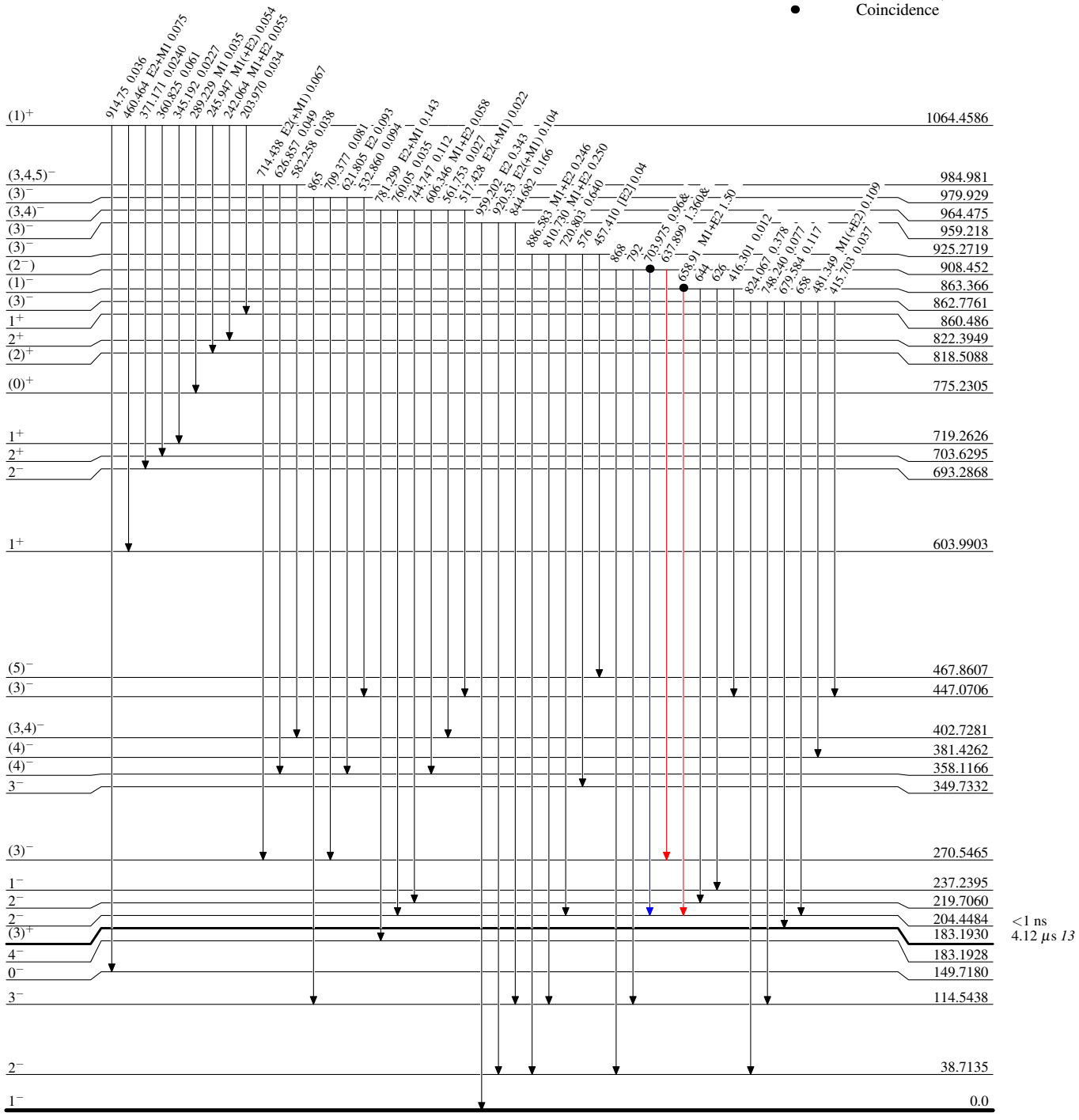
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence



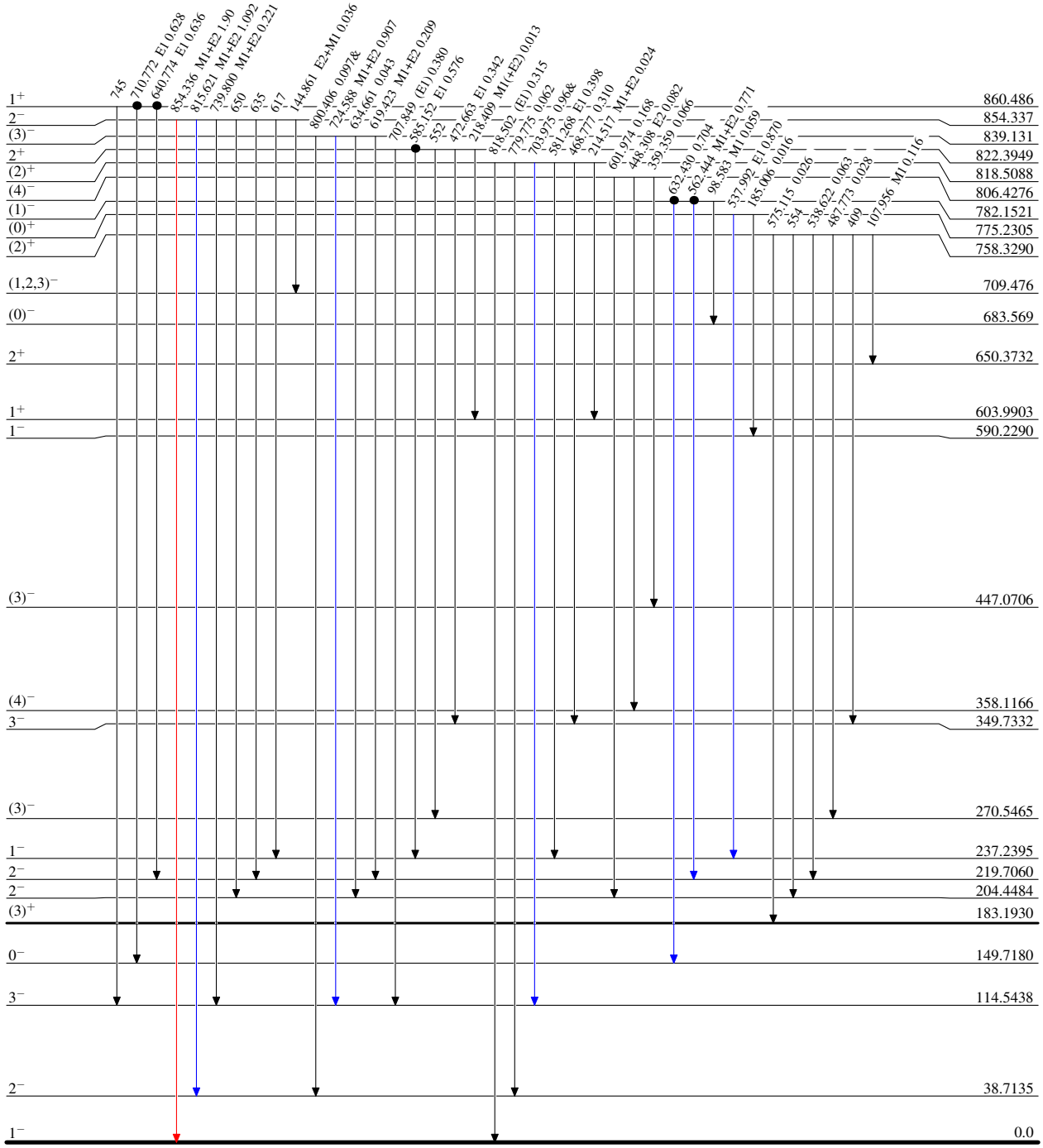
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence



$^{170}_{69}Tm_{101}$

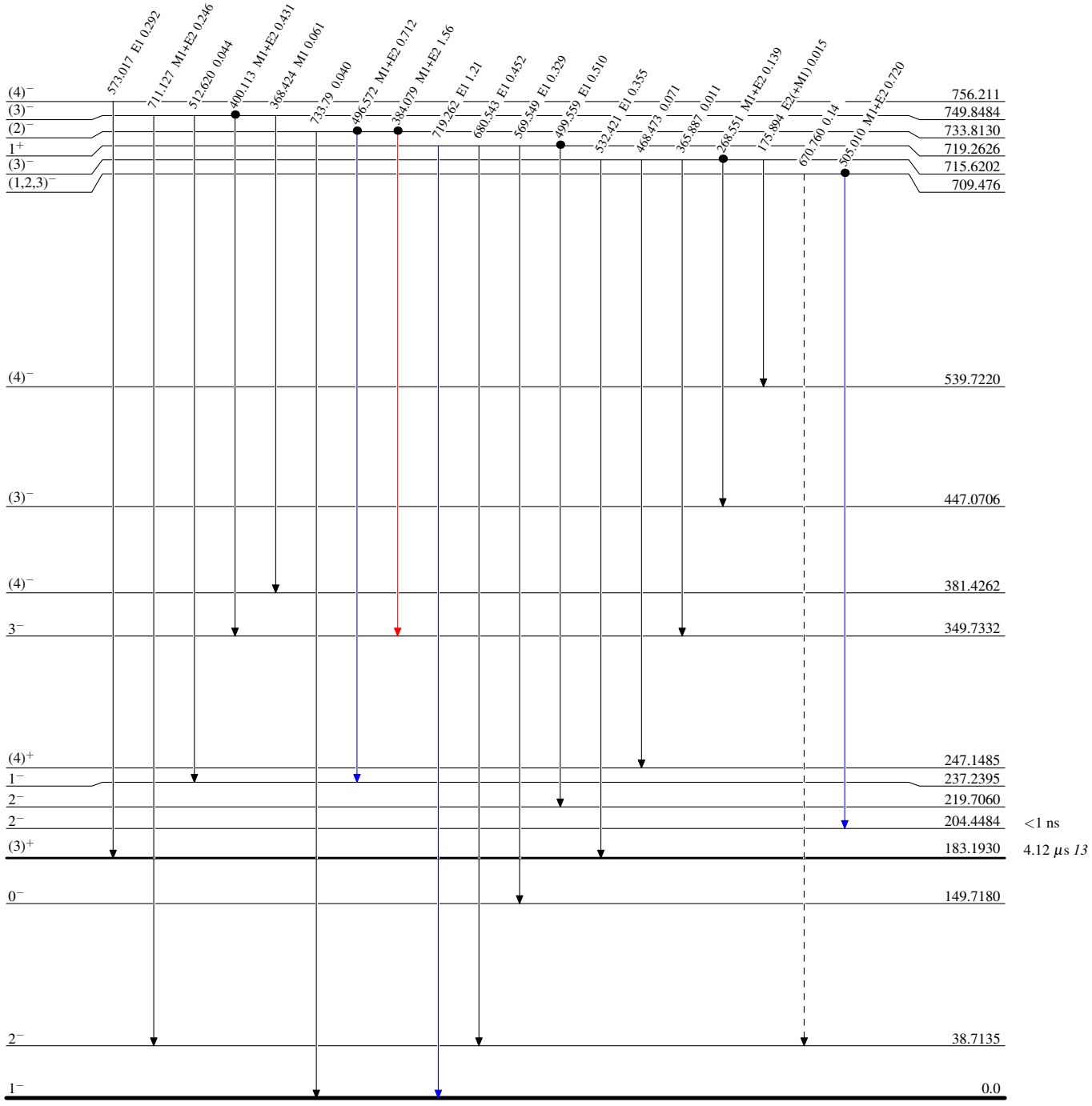
^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Legend

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

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



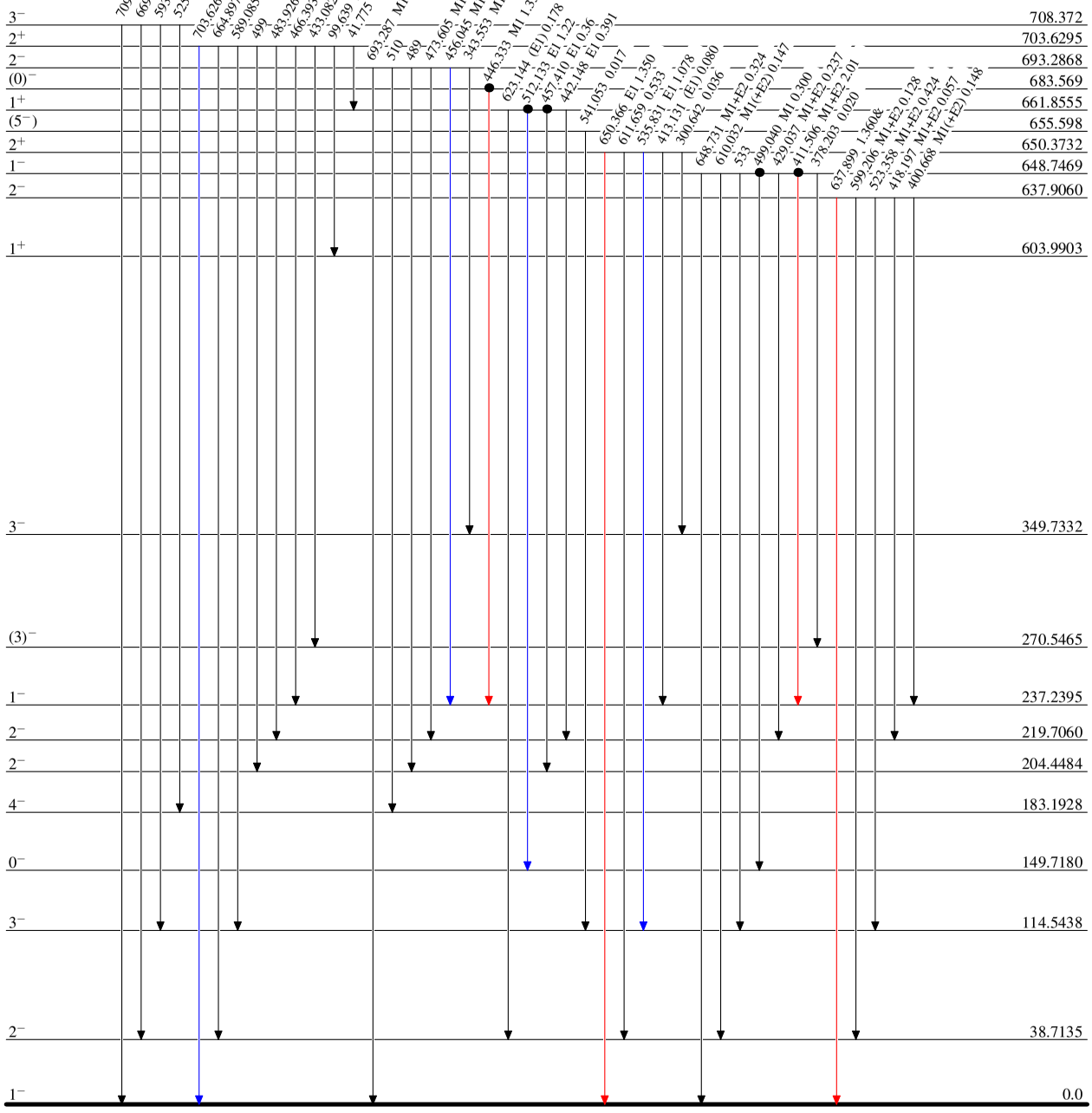
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence



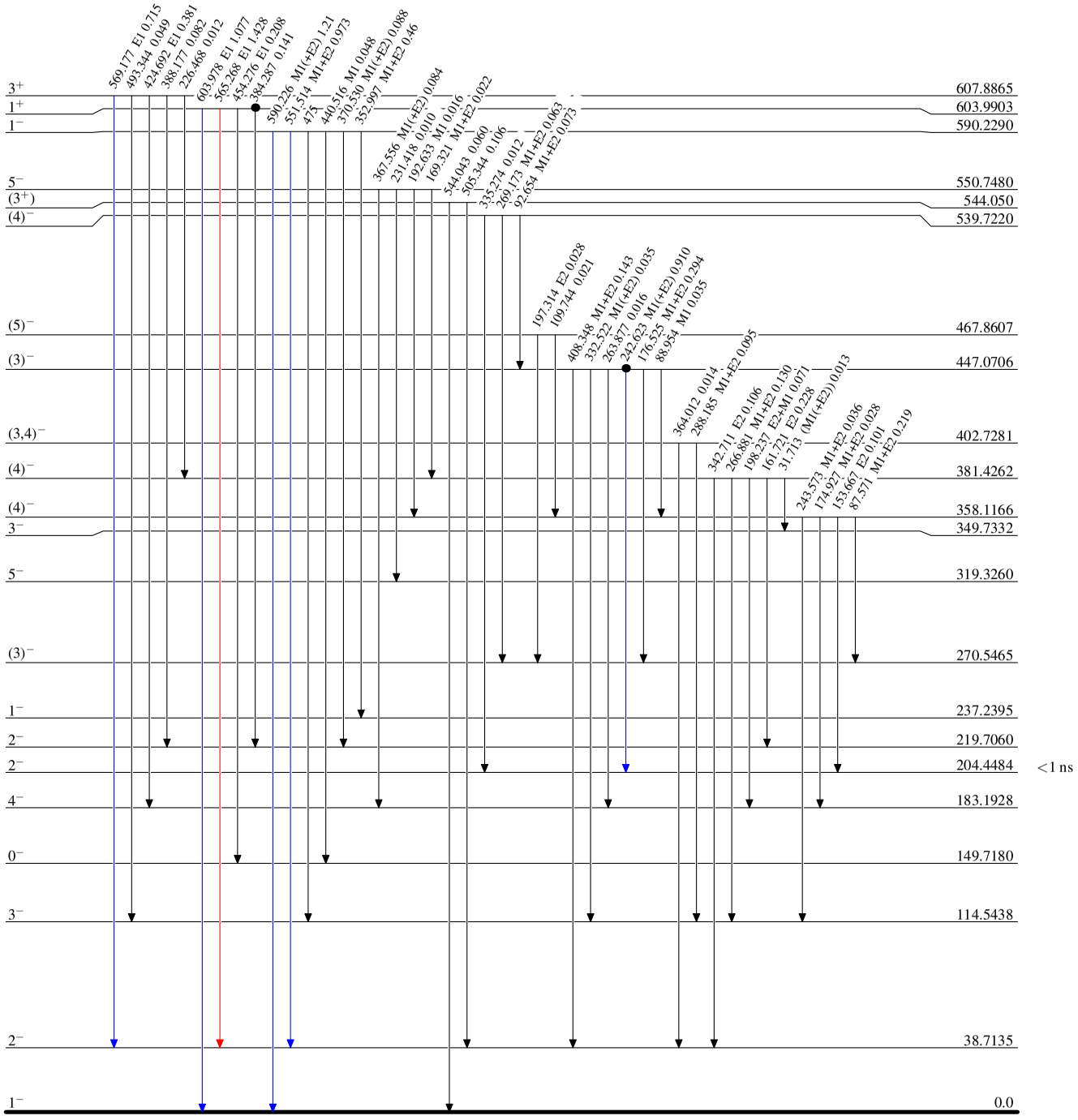
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme (continued)

Intensities: Relative I_γ
& Multiply placed: undivided intensity given

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence



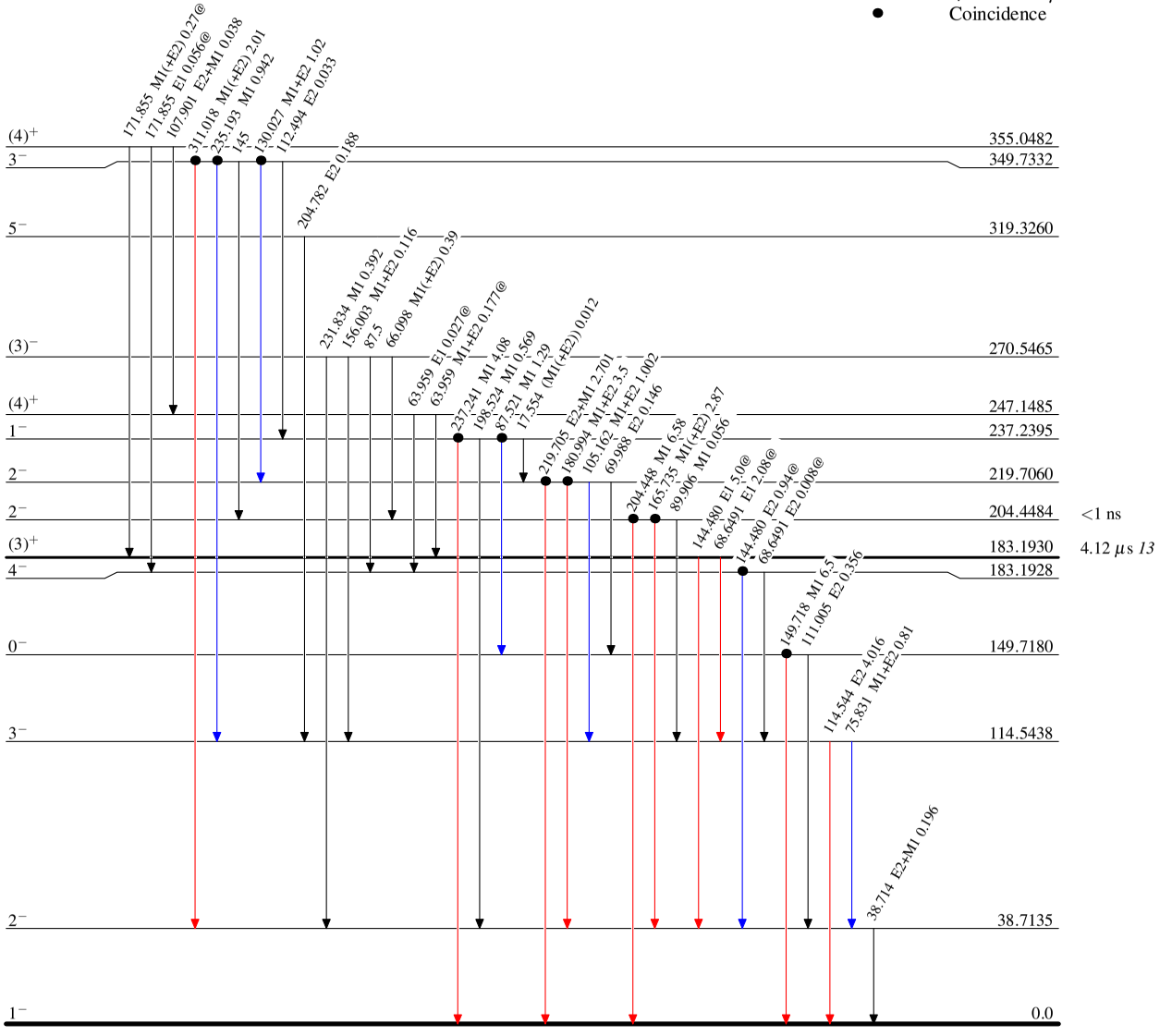
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09

Level Scheme (continued)

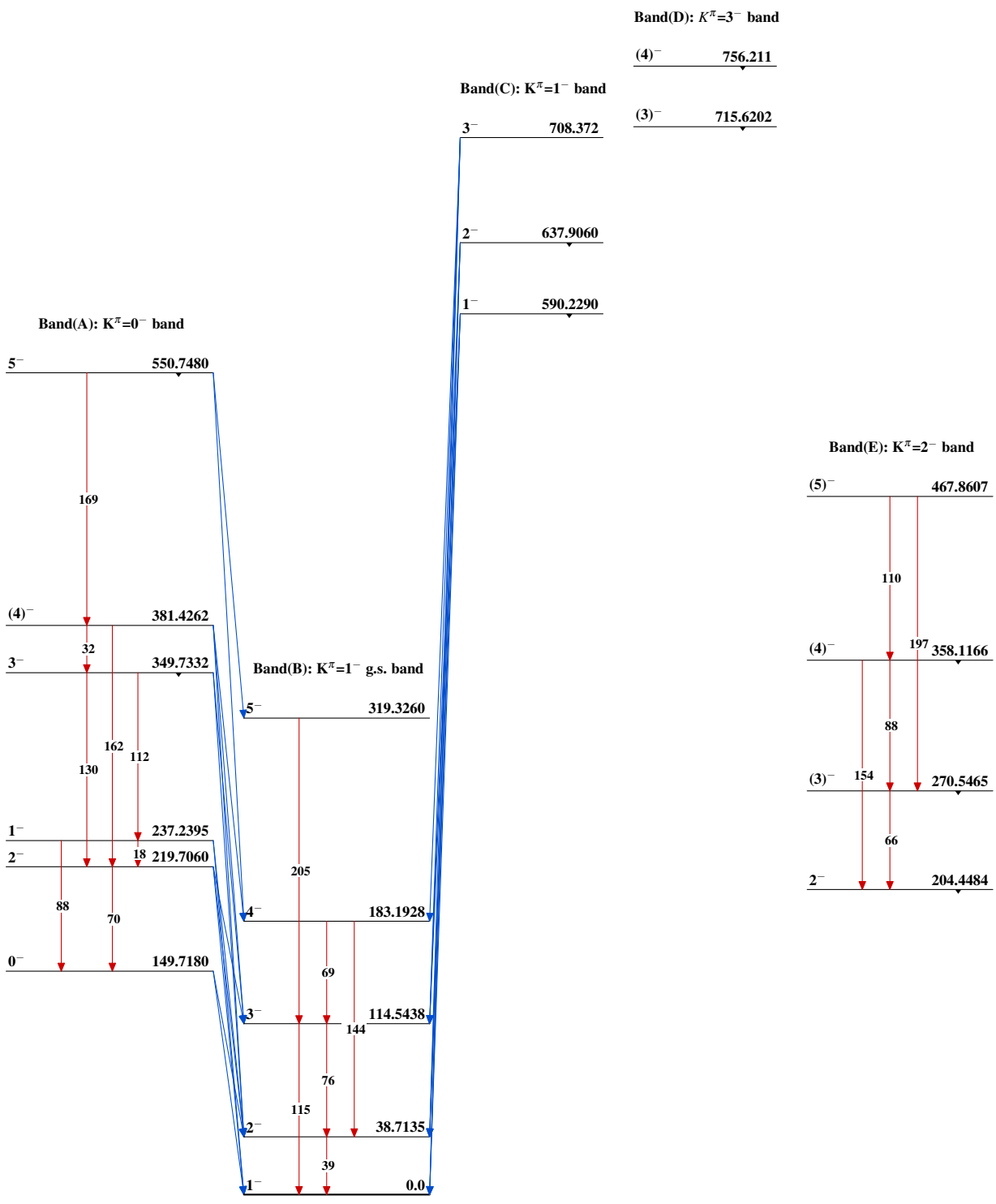
Intensities: Relative I_γ
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

Legend
$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
Coincidence



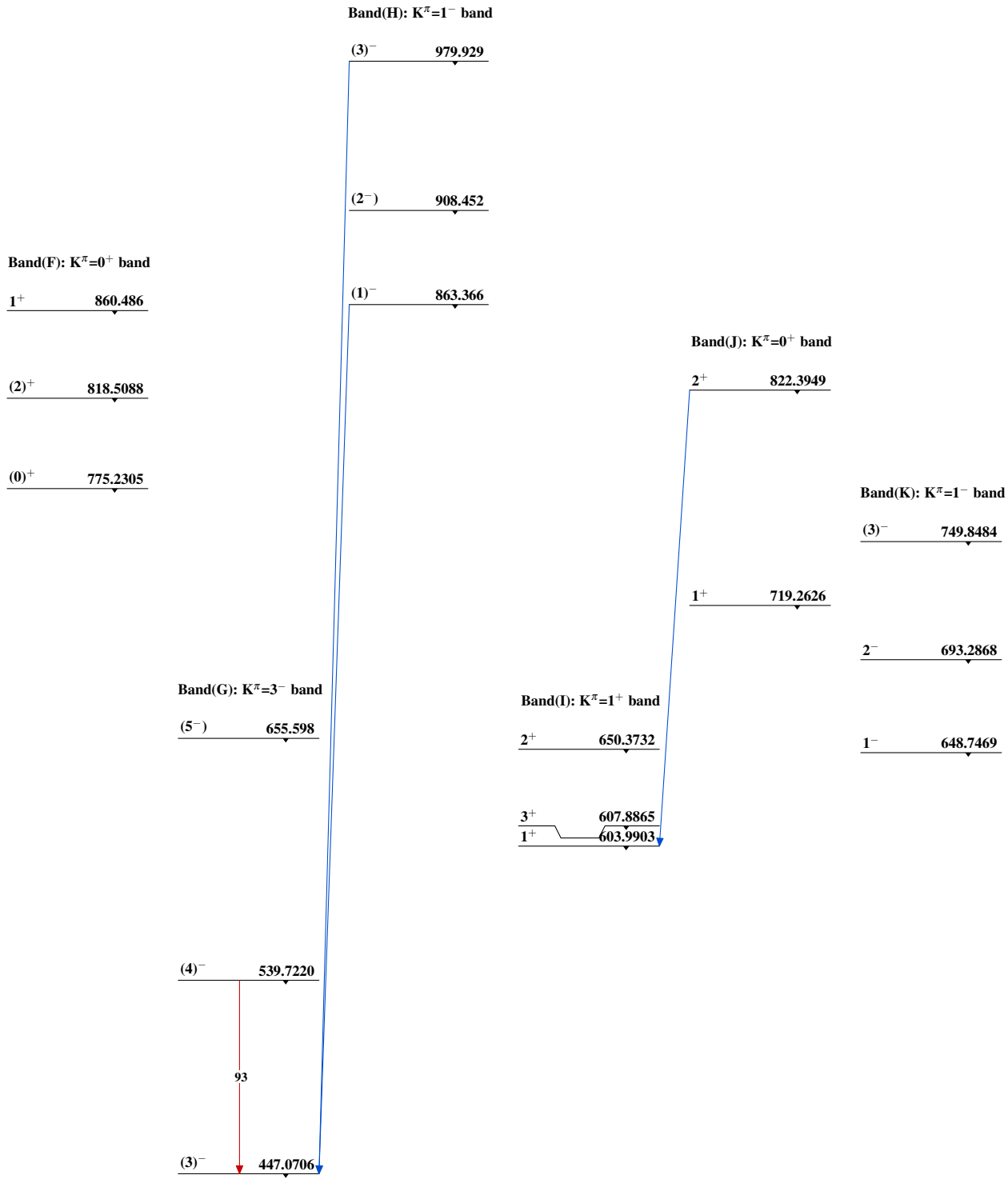
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09



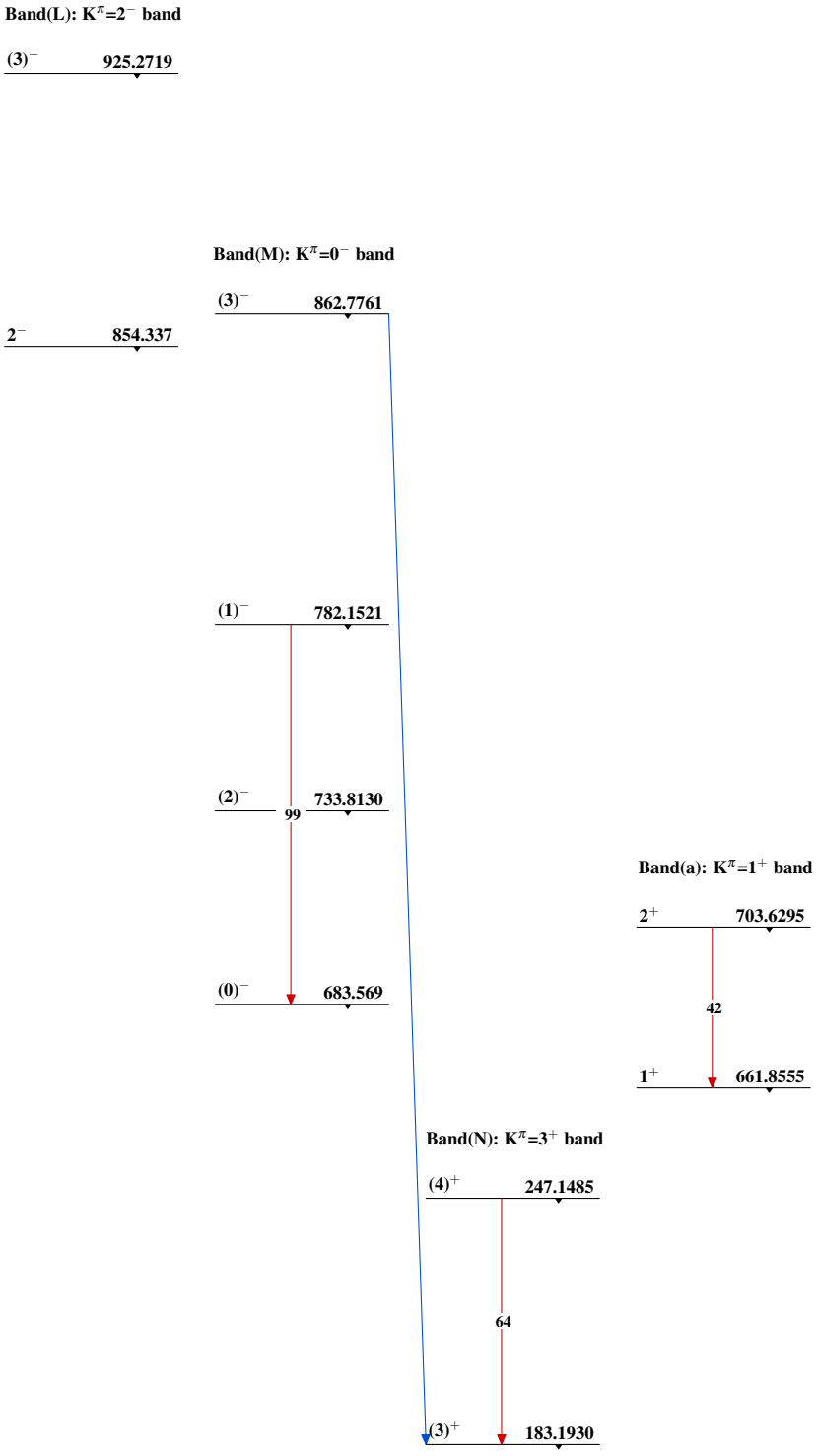
$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)



$^{170}_{69}Tm_{101}$

^{169}Tm(n,γ) E=0-136 eV 1996Ho12,1989Du03,1968Lo09 (continued)



$^{170}_{69}Tm_{101}$