^{175}Tm β^- decay 1970Ja20,1969Fu03

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 102, 719 (2004)	1-Jun-2004

Parent: ^{175}Tm: E≈0; $J^\pi=1/2^+$; $T_{1/2}$=15.2 min *5*; Q(β^-)=2390 *50*; %β^- decay=100.0

^{175}Yb Levels

E(level)[†]	J^π	$T_{1/2}$	Comments
0.0	$7/2^-$	4.185 d *1*	$T_{1/2}$: from 1989Ab05.
104.5 *1*	$(9/2)^-$		
514.7 *2*	$1/2^-$	68.2 ms *3*	$T_{1/2}$: from 1972Br53.
555.8 *2*	$3/2^-$		
602.4 *2*	$5/2^-$		
639.0 *2*	$(5/2)^-$		
697.7 *5*	$7/2^-$		
811.1 *2*	$(3/2^-)$		
871.4 *3*	$(5/2)^-$		
919.9 *3*	$1/2^-$		
992.0 *3*	$3/2^-$		
1009.1 *3*	$5/2^-$		
1068.1? *8*	$(3/2^+)$		
1308.8 *5*			
1468.4 *3*	$(3/2^+)$		
1496.8 *2*	$(3/2^+)$	<0.1 ns	$T_{1/2}$: from 1969Fu03.
1620 *3*			
1682.3 *6*	1/2,3/2,5/2		
1690.7 *4*			
1793.1 *3*			
1864.4 *3*			
1891.6 *3*			
2082 *1*			
2093 *1*			
2114 *1*			
2140 *2*			

[†] Deduced by evaluator from a least-squares fit to γ-ray energies.

β^- radiations

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(2.5×10^2 *5*)	2140	0.23 *5*	5.5 *4*	av Eβ=72 *15*
(2.8×10^2 *5*)	2114	0.47 *6*	5.3 *3*	av Eβ=80 *15*
(3.0×10^2 *5*)	2093	0.28 *5*	5.6 *3*	av Eβ=87 *15*
(3.1×10^2 *5*)	2082	1.39 *14*	5.0 *3*	av Eβ=90 *16*
(5.0×10^2 *5*)	1891.6	7.7 *11*	4.9 *2*	av Eβ=153 *17*
(5.3×10^2 *5*)	1864.4	1.7 *3*	5.6 *2*	av Eβ=163 *17*
(6.0×10^2 *5*)	1793.1	3.2 *4*	5.5 *2*	av Eβ=188 *18*
(7.0×10^2 *5*)	1690.7	0.61 *6*	6.5 *2*	av Eβ=225 *18*
(7.1×10^2 *5*)	1682.3	0.48 *10*	6.6 *2*	av Eβ=228 *18*
(7.7×10^2 *5*)	1620	0.20 *4*	7.1 *2*	av Eβ=251 *19*
(8.9×10^2 *5*)	1496.8	37.1 *14*	5.1 *1*	av Eβ=298 *19*
(9.2×10^2 *5*)	1468.4	1.8 *3*	6.4 *2*	av Eβ=309 *19*
(1.32×10^3 *5*)	1068.1?	0.26 *4*	7.8 *1*	av Eβ=470 *21*
(1.40×10^3 *5*)	992.0	5.5 *4*	6.6 *1*	av Eβ=501 *21*

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^{175}Tm β^- decay 1970Ja20,1969Fu03 (continued)

β^- radiations (continued)

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
(1.47×10^3 *5*)	919.9	12.4 *9*	6.3 *1*	av Eβ=531 *21*
(1.58×10^3 *5*)	811.1	3.1 *4*	7.1 *1*	av Eβ=577 *21*
(1.83×10^3 *5*)	555.8			
(1.88×10^3 *5*)	514.7	19 *8*	6.6 *3*	Iβ^-: feeding intensity to 514+556 levels.

[†] Absolute intensity per 100 decays.

γ(^{175}Yb)

E$_\gamma$[†]	I$_\gamma$[‡&]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]	δ	α[a]	Comments
41.0 *1*		555.8	3/2$^-$	514.7	1/2$^-$				
46.5 *2*	6 *3*	602.4	5/2$^-$	555.8	3/2$^-$	(M1+E2)		6.4 *11*	α: experimental value from transition intensity balance at 602 level. I$_\gamma$: from Iγ(47γ)/Iγ(602γ)=6.7 *23* in ^{174}Yb(n,γ). Mult.: from α=6.4 *11*, assuming no direct β^- feeding to 602 level.
75.1 *4*		1009.1	5/2$^-$						
88.0 *2*	6 *3*	602.4	5/2$^-$	514.7	1/2$^-$	(E2)		5.36	α(K)= 1.34; α(L)= 3.06; α(M)= 0.753; α(N+..)= 0.209 I$_\gamma$: from Iγ(88γ)/Iγ(602γ)=7.1 *15* in ^{174}Yb(n,γ).
95.2 *4*		697.7	7/2$^-$	602.4	5/2$^-$				I$_{(\gamma+ce)}$: I(γ+ce)=I(γ+ce)(311.27γ)= 4.2 *6* from intensity balance at 698 level.
104.5 *1*	2.5 *10*	104.5	(9/2)$^-$	0.0	7/2$^-$	(E2)		2.75	α(K)= 0.936; α(L)= 1.38; α(M)= 0.338; α(N+..)= 0.0936
146.5 *3*		1009.1	5/2$^-$						
162.5 *4*	2.1 *5*	1468.4	(3/2$^+$)	1308.8					
172.0 *4*	1.5 *4*	811.1	(3/2$^-$)	639.0	(5/2)$^-$				
197.5[c] *7*	≈0.5	1068.1?	(3/2$^+$)	871.4	(5/2)$^-$				
[x]218 *1*	≈0.6								
[x]268 *1*	≈1								
295.7 *6*	2.5 *4*	1793.1		1496.8	(3/2$^+$)				
311.4 *5*	3.7 *5*	1009.1	5/2$^-$	697.7	7/2$^-$	(M1)			
325.2 *6*	2.2 *5*	1793.1		1468.4	(3/2$^+$)				
[x]341 *1*	≈3								
363.8 *2*	87 *5*	919.9	1/2$^-$	555.8	3/2$^-$	(M1+E2)	<1.7	0.08 *3*	α(K)= 0.063 *24*; α(L)= 0.011 *4*; α(M)= 0.0024 *8*; α(N+..)= 0.00077 *14*
394 *1*	23 *7*	1891.6		1496.8	(3/2$^+$)				E$_\gamma$,I$_\gamma$: from $\gamma\gamma$ coin (1969Fu03). Line was masked in singles spectrum by 396γ from ^{175}Yb β^- decay (1969Fu03, 1970Ja20).
405.5 *5*	1.8 *8*	919.9	1/2$^-$	514.7	1/2$^-$				I$_\gamma$: Iγ=10 *4* from 1969Fu03 seems to be incorrect.
423.5 *3*	2.5 *5*	1891.6		1468.4	(3/2$^+$)				
428[c]	≤1	1068.1?	(3/2$^+$)	639.0	(5/2)$^-$				
436.2 *2*	17 *2*	992.0	3/2$^-$	555.8	3/2$^-$	(M1+E2)	<2	0.046 *17*	α(K)= 0.038 *15*; α(L)= 0.0063 *22*; α(M)= 0.0014 *5*; α(N+..)= 0.00044 *10*

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^{175}Tm β^- decay 1970Ja20,1969Fu03 (continued)

$\gamma(^{175}Yb)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	Mult.#	δ	α a	Comments
477.2 *2*	20.3 *17*	992.0	3/2$^-$	514.7	1/2$^-$	(M1+E2)	<4.2	0.035 *13*	α(K)= 0.028 *12*; α(L)= 0.0047 *17*; α(M)= 0.0011 *4*; α(N+..)= 0.00031 *8*
487.7 *2*	4.8 *5*	1496.8	(3/2$^+$)	1009.1	5/2$^-$				
514.7 *2*	445 *35*	514.7	1/2$^-$	0.0	7/2$^-$	(M3)		0.318	α(K)= 0.246; α(L)= 0.0544 %Iγ=64.9 *9*. Eγ≈510, Iγ≈2.5 from γγ coin (1969Fu03).
534.4 *2*	13 *1*	639.0	(5/2)$^-$	104.5	(9/2)$^-$				
555.8 *2*	2.0 *3*	555.8	3/2$^-$	0.0	7/2$^-$				
576.9 *2*	8.2 *6*	1496.8	(3/2$^+$)	919.9	1/2$^-$				
601.9 *4*	0.9 *3*	602.4	5/2$^-$	0.0	7/2$^-$				
625.7 *7*	1.8 *3*	1496.8	(3/2$^+$)	871.4	(5/2)$^-$				
639.0 *2*	44 *3*	639.0	(5/2)$^-$	0.0	7/2$^-$	(M1,E2)			
656.8 *4*	1.1 *4*	1468.4	(3/2$^+$)	811.1	(3/2$^-$)				
670.2 *2*	1.3 *4*	1308.8		639.0	(5/2)$^-$				
685[c] *3*	0.8	1496.8	(3/2$^+$)	811.1	(3/2$^-$)				
766.9 *3*	2.4 *5*	871.4	(5/2)$^-$	104.5	(9/2)$^-$				
800.0 *7*	1.4 *4*	1793.1		992.0	3/2$^-$				
811.2 *2*	29.5 *21*	811.1	(3/2$^-$)	0.0	7/2$^-$				
857.8 *2*	41.3 *24*	1496.8	(3/2$^+$)	639.0	(5/2)$^-$				
871.4 *3*	3.7 *4*	871.4	(5/2)$^-$	0.0	7/2$^-$				
894.3 *2*	53 *3*	1496.8	(3/2$^+$)	602.4	5/2$^-$				
921.5 *3*	3.7 *7*	1793.1		871.4	(5/2)$^-$				
941.0 *2*	100	1496.8	(3/2$^+$)	555.8	3/2$^-$				
948.0 *14*	2.6 *15*	1864.4		919.9	1/2$^-$				
953.9 *2*	13.5 *14*	1468.4	(3/2$^+$)	514.7	1/2$^-$				
982.1[@] *2*	70[@] *5*	1496.8	(3/2$^+$)	514.7	1/2$^-$				
982.1[@] *2*	6[@] *2*	1793.1		811.1	(3/2$^-$)				
993 *3*	2.6 *15*	1864.4		871.4	(5/2)$^-$				
1053.4 *4*	1.0 *3*	1864.4		811.1	(3/2$^-$)				
1065[bc] *3*	0.3[b] *3*	1068.1?	(3/2$^+$)	0.0	7/2$^-$				
1065[bc] *3*	0.3[b] *3*	1620		555.8	3/2$^-$				
1090 *3*	0.5	1690.7		602.4	5/2$^-$				
1105[c] *3*	0.4	1620		514.7	1/2$^-$				
1126.5 *4*	2.4 *6*	1682.3	1/2,3/2,5/2	555.8	3/2$^-$				
1134.3 *4*	1.5 *3*	1690.7		555.8	3/2$^-$				
1154.2 *4*	3.5 *11*	1793.1		639.0	(5/2)$^-$				
1168 *1*	0.9 *3*	1682.3	1/2,3/2,5/2	514.7	1/2$^-$				
1176.3 *3*	2.2 *3*	1690.7		514.7	1/2$^-$				
1237.0 *5*	2 *1*	1793.1		555.8	3/2$^-$				
1252.5 *5*	1.2 *2*	1891.6		639.0	(5/2)$^-$				
1261.9 *3*	1.6 *3*	1864.4		602.4	5/2$^-$				
1272.9[c] *5*	0.7 *4*	2082		811.1	(3/2$^-$)				
1279.2 *6*	0.5 *2*	1793.1		514.7	1/2$^-$				
1288.5 *10*	0.2	1891.6		602.4	5/2$^-$				
1308.7[b] *5*	2.9[b] *3*	1308.8		0.0	7/2$^-$				
1308.7[b] *5*	2.9[b] *3*	1864.4		555.8	3/2$^-$				
1335.6 *5*	3.2 *4*	1891.6		555.8	3/2$^-$				
1349.6 *7*	0.8 *2*	1864.4		514.7	1/2$^-$				
1376.9 *3*	21.0 *17*	1891.6		514.7	1/2$^-$				
[x]1439.4 *10*	1.0 *2*								
1454.4 *7*	0.9 *2*	2093		639.0	(5/2)$^-$				

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^{175}Tm β^- decay 1970Ja20,1969Fu03 (continued)

$\gamma(^{175}Yb)$ (continued)

E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π	E_γ †	I_γ ‡&	E_i(level)	J_i^π	E_f	J_f^π
1511 *2*	0.8 *2*	2114		602.4	5/2$^-$	1567 *3*	0.45 *10*	2082		514.7	1/2$^-$
1525.1 *4*	8.4 *9*	2082		555.8	3/2$^-$	1578 *3*	0.3 *2*	2093		514.7	1/2$^-$
1537.5[b] *15*	0.7[b] *2*	2093		555.8	3/2$^-$	1583 *2*	0.5 *2*	2140		555.8	3/2$^-$
1537.5[b] *15*	0.7[b] *2*	2140		602.4	5/2$^-$	1599.2 *9*	1.19 *19*	2114		514.7	1/2$^-$
[x]1550 *1*	0.8 *2*					1625 *3*	0.4 *2*	2140		514.7	1/2$^-$
1558.1 *9*	1.2 *3*	2114		555.8	3/2$^-$						

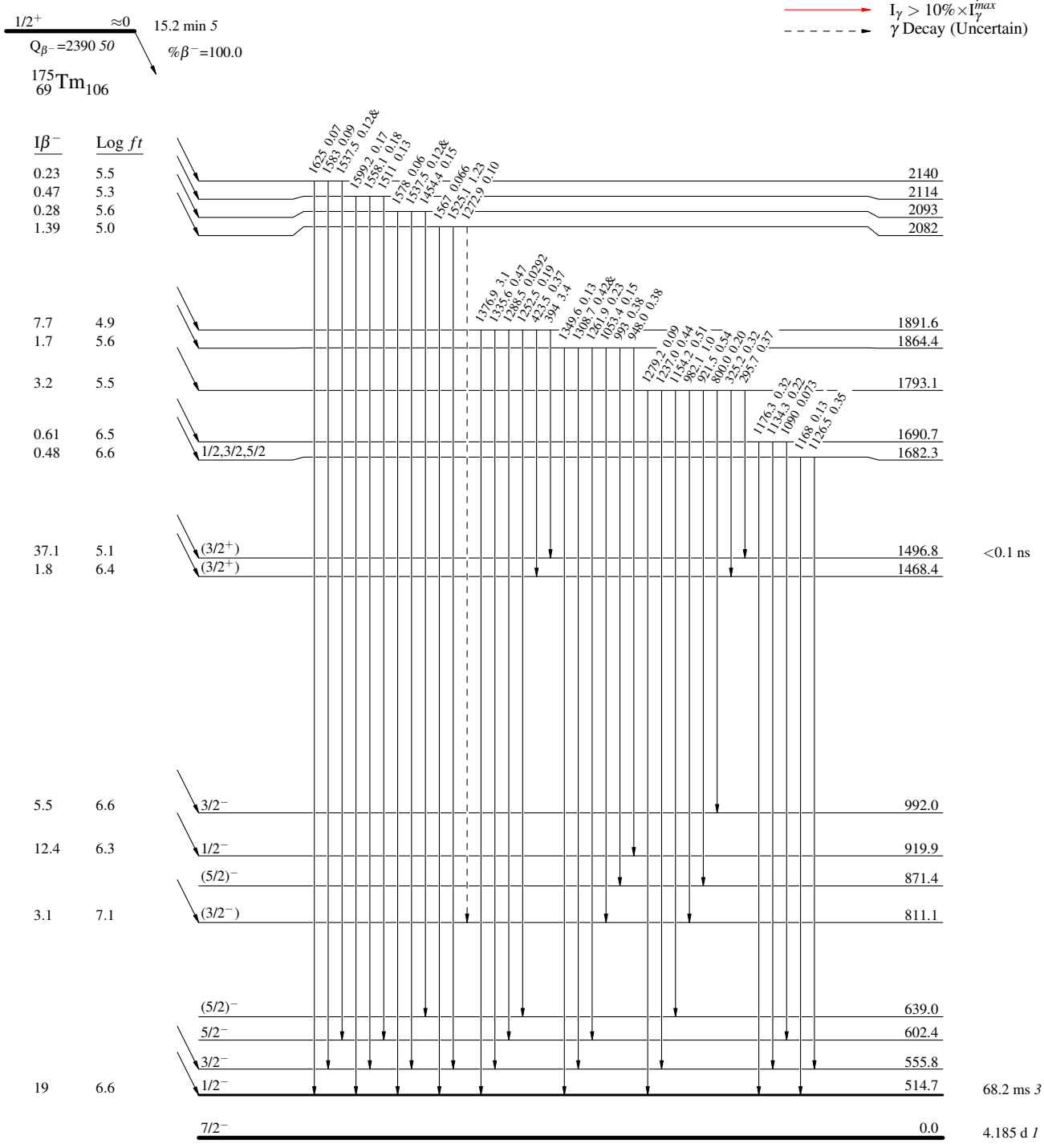
† Weighted average from 1969Fu03 and 1970Ja20, except as noted.
‡ Weighted average with χ^2 minimization of Iγ from 1970Ja20 and 1969Fu03.
# From adopted gammas, except as noted.
@ From $\gamma\gamma$ coin (1969Fu03). Iγ(982 doublet)=76 *8* (1970Ja20).
& For absolute intensity per 100 decays, multiply by 0.146 *10*.
[a] 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.
[b] Multiply placed with undivided intensity.
[c] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

^{175}Tm β^- decay 1970Ja20,1969Fu03

Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given

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



^{175}Tm β^- decay 1970Ja20,1969Fu03

Decay Scheme (continued)

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given