Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 132, 1 (2016)	4-Dec-2015

Q(β^-)=−5.29×10^3 *3*; S(n)=9.95×10^3 *3*; S(p)=1.79×10^3 *4*; Q(α)=3.88×10^3 *3* 2017Wa10
Q(ε)=4.70×10^3 *4*; S(2n)=1.823×10^4 *3*; S(2p)=7.25×10^3 *4* 2017Wa10
Additional information 1.
Theory and model calculations that might be of interest include 1987Ba07 (moments).

^{157}Tm Levels

Cross Reference (XREF) Flags

A ^{157}Yb ε decay
B (HI,xnγ)

E(level)†	J$^\pi$‡@	T$_{1/2}$	XREF	Comments
0	1/2$^+$#	3.63 min *9*	AB	%ε+%β^+=100 μ=+0.476 *15* Δ<r^2>(157-169)=1.093 fm^2 *8*, Δ<r^2>(157-158)= 0.091 fm^2 *11*, Δ<r^2>(157-159)=0.243 fm^2 *9* from 1988Al04. Others: 1987Mi31, 1986Al32, 1985AlZR, and 1987AlZU, all by the same authors. RMS charge radius <r^2>$^{1/2}$=5.1140 fm *74* (2013An02). J$^\pi$: J measured by atomic-beam, magnetic resonance method (1984Ek01) and laser spectroscopy (1986Al32, 1987Mi31 and 1988Al04 by the same authors) and π from 1/2[411] assignment (1990Ja11). T$_{1/2}$: Weighted average of 3.33 m *42* (1974Pu03), 3.6 m *3* (1976La03, also given as 3.6 m *3* in 1975LaZU and 3.6 m *4* in 1975ZuZY), and 3.65 m *10* (1993Al03). %ε+%β^+: %α=0.00075 *25* (2002KaZO). μ: From 1989Ra17 evaluation and 2011StZZ compilation and based on data of 1988Al04.
35.23 *11*			A	T$_{1/2}$: 1.6 s quoted in ^{157}Yb ε decay by 2008VaZV from a 1999 report. With no given evidence this value looks questionable and it is not adopted. Other value: > 40 ns from lack of observed coincidences in xγ(t) measurement (^{157}Yb ε decay, 1996Xu03).
69.51 *9*			A	
105.78 *8*			A	
115.20 *20*			A	
164.50 *4*			A	
206.78 *22*			A	
231.08 *4*			A	
317.5 *3*			A	
339.95 *8*			A	
347.86 *9*			A	
353.86 *6*			A	
430.53 *11*			A	
458.28 *8*			A	
580.40 *12*			A	
639.81 *11*			A	
656.87 *11*			A	
787.74 *14*			A	
834.70 *21*			A	
x&	11/2$^-$		B	
x+393.0&	15/2$^-$		B	
x+405.6a	13/2$^-$		B	

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Adopted Levels, Gammas (continued)

^{157}Tm Levels (continued)

E(level)†	Jπ‡@	XREF	E(level)†	Jπ‡@	XREF	E(level)†	Jπ‡@	XREF
x+909.7[a]	17/2−	B	x+3297.4[c]	33/2−	B	x+6321.4[b]	51/2−	B
x+913.7[&]	19/2−	B	x+3382.9[g]	35/2+	B	x+6414.8[g]	51/2+	B
x+1511.1[a]	21/2−	B	x+3638.8[b]	35/2−	B	x+6749.7[c]	53/2−	B
x+1525.0[&]	23/2−	B	x+3788.4[h]	37/2+	B	x+6808.6[h]	53/2+	B
x+1574.2[e]	19/2+	B	x+3877.9[c]	37/2−	B	x+7136.0[b]	55/2−	B
x+1851.3[f]	21/2+	B	x+4025.3[g]	39/2+	B	x+7184.3[g]	55/2+	B
x+2036.2[e]	23/2+	B	x+4232.9[b]	39/2−	B	x+7486.5[c]	57/2−	B
x+2180.7[a]	25/2−	B	x+4426.6[h]	41/2+	B	x+7601.3[h]	57/2+	B
x+2207.3[&]	27/2−	B	x+4508.7[c]	41/2−	B	x+7659	57/2−	B
x+2287.8[f]	25/2+	B	x+4728.3[g]	43/2+	B	x+8272.7[c]	61/2−	B
x+2338.6[g]	27/2+	B	x+4876.7[b]	43/2−	B	x+8467.4	(61/2−)	B
x+2544.3[e]	27/2+	B	x+5120.6[h]	45/2+	B	x+9352.4[c]	65/2−	B
x+2756.9[f]	29/2+	B	x+5168.2[c]	45/2−	B	x+9906.6[c]	69/2−	B
x+2814.3[g]	31/2+	B	x+5534.6[b]	47/2−	B	x+10638.8[c]	73/2−	B
x+2939.7[&]	31/2−	B	x+5564.1[g]	47/2+	B	x+11195.4[d]	75/2(−)	B
x+3142.6[b]	31/2−	B	x+5953.4[h]	49/2+	B	x+11960.8[d]	79/2(−)	B
x+3210.0[h]	33/2+	B	x+5976.1[c]	49/2−	B	x+13242.4[d]	83/2(−)	B

† Values are from ^{157}Yb ε decay, where least-squares fit was done, and from (HI,xnγ) data.
‡ For excited levels, from 1995Ri01 and based on analysis of data for whole scheme including γ multipolarities from γ(θ) data and the band structure.
# The review of 1990Ja11 suggests that the 1/2[411], 7/2[404], and 5/2[402] states are close together and that they are the ground states for ^{163}Tm, ^{161}Tm, and ^{159}Tm, respectively. From model calculations, 1996Xu03 argue that the ground state is not axially symmetric with an 1/2[411] assignment, but rather it is triaxially deformed.
@ See ^{157}Yb ε decay (1996Xu03) for several assignments that are not adopted here.
& Band(A): Signature=−1/2 portion of 11/2− band.
a Band(B): Signature=+1/2 portion of 11/2− band.
b Band(C): Signature=−1/2 portion of negative-parity band.
c Band(D): Signature=+1/2 portion of negative-parity band.
d Band(E): Signature=−1/2 portion of another negative-parity band.
e Band(F): Signature=−1/2 portion of 1st positive-parity band.
f Band(G): Signature=+1/2 portion of 1st positive-parity band.
g Band(H): Signature=−1/2 portion of 2nd positive-parity band.
h Band(I): Signature=+1/2 portion of 2nd positive-parity band.

γ(^{157}Tm)

Unplaced γ's are not included here; see ^{157}Yb ε decay.

E_i(level)	E_γ†	I_γ	E_f	J^π_f
35.23	35.2 *2*	100	0	1/2+
69.51	69.52 *9*	100	0	1/2+
105.78	105.7 *1*	100	0	1/2+
115.20	115.2 *2*	100	0	1/2+
164.50	129.26 *12*	45.5 *22*	35.23	

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Adopted Levels, Gammas (continued)

γ(^{157}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
164.50		164.49 *4*	100 *3*	0	$1/2^+$			
206.78		101.0 *2*	100	105.78				
231.08		231.10 *4*	100	0	$1/2^+$			
317.5		202.3 *2*	100	115.20				
339.95		339.95 *8*	100	0	$1/2^+$			
347.86		116.78 *14*	3 *1*	231.08				
		242.05 *5*	100 *4*	105.78				
		348.36 *25*	24 *4*	0	$1/2^+$			
353.86		189.33 *6*	66 *7*	164.50				
		353.90 *9*	100 *16*	0	$1/2^+$			
430.53		361.02 *8*	100 *24*	69.51				
		430.5 *2*	18 *9*	0	$1/2^+$			
458.28		227.31 *10*	100 *13*	231.08				
		458.15 *11*	88 *25*	0	$1/2^+$			
580.40		474.62 *9*	100	105.78				
639.81		285.93 *10*	100 *15*	353.86				
		475.4 *2*	77 *15*	164.50				
656.87		492.37 *10*	100	164.50				
787.74		447.79 *11*	100	339.95				
834.70		670.2 *2*	100	164.50				
x+393.0	$15/2^-$	392.9	100	x	$11/2^-$	E2	0.0326	α(K)=0.0249 *4*; α(L)=0.00594 *9*; α(M)=0.001381 *20* α(N)=0.000318 *5*; α(O)=4.16×10^{-5} *6*; α(P)=1.336×10^{-6} *19*
x+405.6	$13/2^-$	405.6	100	x	$11/2^-$	M1+E2	0.047 *18*	α(K)=0.039 *16*; α(L)=0.0067 *14*; α(M)=0.0015 *3* α(N)=0.00035 *7*; α(O)=4.9×10^{-5} *12*; α(P)=2.3×10^{-6} *11*
x+909.7	$17/2^-$	504.2	73 *13*	x+405.6	$13/2^-$	E2	0.01677	α(K)=0.01328 *19*; α(L)=0.00270 *4*; α(M)=0.000620 *9* α(N)=0.0001435 *20*; α(O)=1.92×10^{-5} *3*; α(P)=7.32×10^{-7} *11*
		516.6	100 *7*	x+393.0	$15/2^-$	M1+E2	0.0253 *95*	α(K)=0.0209 *84*; α(L)=0.00339 *89*; α(M)=0.00076 *19* α(N)=0.00018 *5*; α(O)=2.50×10^{-5} *71*; α(P)=1.23×10^{-6} *54*
x+913.7	$19/2^-$	520.7	100	x+393.0	$15/2^-$	E2	0.01545	α(K)=0.01229 *18*; α(L)=0.00245 *4*; α(M)=0.000563 *8* α(N)=0.0001303 *19*; α(O)=1.752×10^{-5} *25*; α(P)=6.79×10^{-7} *10*
x+1511.1	$21/2^-$	597.3	100 *6*	x+913.7	$19/2^-$	M1+E2	0.0175 *65*	α(K)=0.0146 *57*; α(L)=0.00230 *64*; α(M)=5.1×10^{-4} *14* α(N)=1.20×10^{-4} *33*; α(O)=1.70×10^{-5} *51*; α(P)=8.5×10^{-7} *36*
		601.3	100 *6*	x+909.7	$17/2^-$	E2	0.01085	α(K)=0.00875 *13*; α(L)=0.001625 *23*; α(M)=0.000370 *6* α(N)=8.59×10^{-5} *12*; α(O)=1.170×10^{-5} *17*; α(P)=4.89×10^{-7} *7*
x+1525.0	$23/2^-$	611.3	100	x+913.7	$19/2^-$	E2	0.01043	α(K)=0.00843 *12*; α(L)=0.001553 *22*; α(M)=0.000354 *5* α(N)=8.20×10^{-5} *12*; α(O)=1.119×10^{-5} *16*; α(P)=4.71×10^{-7} *7*
x+1574.2	$19/2^+$	664.6	100	x+909.7	$17/2^-$	E1	0.00318	α(K)=0.00270 *4*; α(L)=0.000375 *6*; α(M)=8.26×10^{-5} *12*

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Adopted Levels, Gammas (continued)

γ(^{157}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=1.92×10^{-5} *3*; α(O)=2.74×10^{-6} *4*; α(P)=1.449×10^{-7} *21*
x+1851.3	21/2$^+$	937.7	100	x+913.7	19/2$^-$	E1	1.61×10^{-3}	α(K)=0.001375 *20*; α(L)=0.000187 *3*; α(M)=4.13×10^{-5} *6* α(N)=9.62×10^{-6} *14*; α(O)=1.379×10^{-6} *20*; α(P)=7.46×10^{-8} *11*
x+2036.2	23/2$^+$	185.0	6 *3*	x+1851.3	21/2$^+$	M1+E2	0.44 *11*	α(K)=0.33 *13*; α(L)=0.085 *17*; α(M)=0.020 *5* α(N)=0.0046 *11*; α(O)=0.00060 *9*; α(P)=1.86×10^{-5} *93*
		462.0	38 *6*	x+1574.2	19/2$^+$	E2	0.0210	α(K)=0.01647 *23*; α(L)=0.00353 *5*; α(M)=0.000813 *12* α(N)=0.000188 *3*; α(O)=2.50×10^{-5} *4*; α(P)=9.00×10^{-7} *13*
		525.0	100 *6*	x+1511.1	21/2$^-$	E1	0.00523	α(K)=0.00443 *7*; α(L)=0.000624 *9*; α(M)=0.0001378 *20* α(N)=3.21×10^{-5} *5*; α(O)=4.54×10^{-6} *7*; α(P)=2.36×10^{-7} *4*
x+2180.7	25/2$^-$	655.4	100 *17*	x+1525.0	23/2$^-$	M1+E2	0.0139 *51*	α(K)=0.0116 *44*; α(L)=0.00180 *52*; α(M)=4.0×10^{-4} *12* α(N)=9.4×10^{-5} *27*; α(O)=1.33×10^{-5} *41*; α(P)=6.8×10^{-7} *28*
		669.4	100 *17*	x+1511.1	21/2$^-$	E2	0.00843	α(K)=0.00687 *10*; α(L)=0.001216 *17*; α(M)=0.000276 *4* α(N)=6.40×10^{-5} *9*; α(O)=8.80×10^{-6} *13*; α(P)=3.85×10^{-7} *6*
x+2207.3	27/2$^-$	682.3	100	x+1525.0	23/2$^-$	E2	0.00807	α(K)=0.00658 *10*; α(L)=0.001156 *17*; α(M)=0.000262 *4* α(N)=6.08×10^{-5} *9*; α(O)=8.37×10^{-6} *12*; α(P)=3.69×10^{-7} *6*
x+2287.8	25/2$^+$	251.5	13 *4*	x+2036.2	23/2$^+$	(M1+E2)	0.178 *55*	α(K)=0.140 *56*; α(L)=0.0294 *5*; α(M)=0.0068 *3* α(N)=0.00157 *6*; α(O)=0.000210 *10*; α(P)=8.1×10^{-6} *39*
		436.1	13 *4*	x+1851.3	21/2$^+$	(E2)	0.0245	α(K)=0.0191 *3*; α(L)=0.00423 *6*; α(M)=0.000978 *14* α(N)=0.000226 *4*; α(O)=2.99×10^{-5} *5*; α(P)=1.034×10^{-6} *15*
		763.0	100 *9*	x+1525.0	23/2$^-$	E1	0.00240	α(K)=0.00204 *3*; α(L)=0.000282 *4*; α(M)=6.21×10^{-5} *9* α(N)=1.447×10^{-5} *21*; α(O)=2.07×10^{-6} *3*; α(P)=1.103×10^{-7} *16*
x+2338.6	27/2$^+$	50.8[@]	34 *8*	x+2287.8	25/2$^+$	M1+E2	27 *24*	α(L)=21 *18*; α(M)=5.1 *45* α(N)=1.2 *10*; α(O)=0.13 *12*; α(P)=6.7×10^{-4} *48*
		157.5	17 *8*	x+2180.7	25/2$^-$	E1	0.1003	α(K)=0.0839 *12*; α(L)=0.01285 *18*; α(M)=0.00286 *4* α(N)=0.000659 *10*; α(O)=8.96×10^{-5} *13*; α(P)=3.99×10^{-6} *6*
		302.3	100 *17*	x+2036.2	23/2$^+$	E2	0.0698	α(K)=0.0506 *7*; α(L)=0.01484 *21*; α(M)=0.00349 *5*

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Tm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=0.000803 *12*; α(O)=0.0001021 *15*; α(P)=2.60×10^{-6} *4*
x+2544.3	27/2$^+$	256.1	25 *6*	x+2287.8	25/2$^+$	M1+E2	0.169 *53*	α(K)=0.134 *53*; α(L)=0.0277 *4*; α(M)=0.00638 *21* α(N)=0.00148 *4*; α(O)=0.000198 *11*; α(P)=7.7×10^{-6} *37*
		363.7	88 *25*	x+2180.7	25/2$^-$	E1	0.01207	α(K)=0.01019 *15*; α(L)=0.001467 *21*; α(M)=0.000325 *5* α(N)=7.54×10^{-5} *11*; α(O)=1.059×10^{-5} *15*; α(P)=5.29×10^{-7} *8*
		507.8	100 *12*	x+2036.2	23/2$^+$	E2	0.01646	α(K)=0.01305 *19*; α(L)=0.00264 *4*; α(M)=0.000607 *9* α(N)=0.0001405 *20*; α(O)=1.88×10^{-5} *3*; α(P)=7.20×10^{-7} *10*
x+2756.9	29/2$^+$	212.5	67 *17*	x+2544.3	27/2$^+$	M1+E2	0.291 *79*	α(K)=0.224 *87*; α(L)=0.052 *6*; α(M)=0.0121 *18* α(N)=0.0028 *4*; α(O)=0.000369 *21*; α(P)=1.27×10^{-5} *62*
		468.5	50 *17*	x+2287.8	25/2$^+$	E2	0.0203	α(K)=0.01591 *23*; α(L)=0.00338 *5*; α(M)=0.000778 *11* α(N)=0.000180 *3*; α(O)=2.40×10^{-5} *4*; α(P)=8.71×10^{-7} *13*
		549.4	100 *17*	x+2207.3	27/2$^-$	E1	0.00474	α(K)=0.00402 *6*; α(L)=0.000564 *8*; α(M)=0.0001246 *18* α(N)=2.90×10^{-5} *4*; α(O)=4.11×10^{-6} *6*; α(P)=2.14×10^{-7} *3*
x+2814.3	31/2$^+$	57.4[@]	18 *6*	x+2756.9	29/2$^+$	M1+E2	15 *13*	α(L)=11.7 *98*; α(M)=2.9 *25* α(N)=0.65 *55*; α(O)=0.076 *61*; α(P)=4.7×10^{-4} *33*
		270.0	35 *6*	x+2544.3	27/2$^+$	E2	0.0987	α(K)=0.0694 *10*; α(L)=0.0226 *4*; α(M)=0.00535 *8* α(N)=0.001228 *18*; α(O)=0.0001543 *22*; α(P)=3.48×10^{-6} *5*
		475.5	100 *6*	x+2338.6	27/2$^+$	E2	0.0195	α(K)=0.01534 *22*; α(L)=0.00323 *5*; α(M)=0.000743 *11* α(N)=0.0001718 *24*; α(O)=2.29×10^{-5} *4*; α(P)=8.40×10^{-7} *12*
x+2939.7	31/2$^-$	732.5	100	x+2207.3	27/2$^-$	E2	0.00687	α(K)=0.00563 *8*; α(L)=0.000962 *14*; α(M)=0.000217 *3* α(N)=5.05×10^{-5} *7*; α(O)=6.99×10^{-6} *10*; α(P)=3.17×10^{-7} *5*
x+3142.6	31/2$^-$	201.8	24 *6*	x+2939.7	31/2$^-$	M1+E2	0.340 *88*	α(K)=0.26 *10*; α(L)=0.063 *9*; α(M)=0.015 *3* α(N)=0.0034 *6*; α(O)=0.00044 *4*; α(P)=1.47×10^{-5} *72*
		934.4	100 *6*	x+2207.3	27/2$^-$	E2	0.00406	α(K)=0.00338 *5*; α(L)=0.000534 *8*; α(M)=0.0001196 *17* α(N)=2.79×10^{-5} *4*; α(O)=3.91×10^{-6} *6*; α(P)=1.91×10^{-7} *3*
x+3210.0	33/2$^+$	395.9	100 *12*	x+2814.3	31/2$^+$	M1+E2	0.051 *19*	α(K)=0.041 *17*; α(L)=0.0072 *14*; α(M)=0.0016 *3* α(N)=0.00038 *7*; α(O)=5.3×10^{-5} *12*; α(P)=2.4×10^{-6} *11*
		453.2	25 *6*	x+2756.9	29/2$^+$	E2	0.0221	α(K)=0.01729 *25*; α(L)=0.00374 *6*; α(M)=0.000864 *13*

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Tm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=0.000200 *3*; α(O)=2.65×10^{-5} *4*; α(P)=9.43×10^{-7} *14*
x+3297.4	33/2$^-$	155.3	100 *12*	x+3142.6	31/2$^-$	M1+E2	0.75 *14*	α(K)=0.54 *21*; α(L)=0.164 *52*; α(M)=0.039 *14* α(N)=0.0089 *31*; α(O)=0.00113 *29*; α(P)=3.0×10^{-5} *16*
		357.6	62 *12*	x+2939.7	31/2$^-$	M1+E2	0.067 *24*	α(K)=0.054 *23*; α(L)=0.0097 *16*; α(M)=0.0022 *3* α(N)=0.00051 *8*; α(O)=7.1×10^{-5} *14*; α(P)=3.2×10^{-6} *15*
x+3382.9	35/2$^+$	172.8	11 *4*	x+3210.0	33/2$^+$	M1+E2	0.54 *12*	α(K)=0.40 *16*; α(L)=0.11 *3*; α(M)=0.0257 *73* α(N)=0.0059 *16*; α(O)=0.00076 *15*; α(P)=2.2×10^{-5} *12*
		568.6	100 *7*	x+2814.3	31/2$^+$	E2	0.01242	α(K)=0.00997 *14*; α(L)=0.00190 *3*; α(M)=0.000434 *6* α(N)=0.0001007 *14*; α(O)=1.365×10^{-5} *20*; α(P)=5.54×10^{-7} *8*
x+3638.8	35/2$^-$	341.0	80 *10*	x+3297.4	33/2$^-$	M1+E2	0.076 *27*	α(K)=0.061 *25*; α(L)=0.0112 *16*; α(M)=0.0026 *3* α(N)=0.00059 *8*; α(O)=8.1×10^{-5} *15*; α(P)=3.6×10^{-6} *17*
		496.9	15 *5*	x+3142.6	31/2$^-$	E2	0.01740	α(K)=0.01376 *20*; α(L)=0.00282 *4*; α(M)=0.000648 *9* α(N)=0.0001500 *21*; α(O)=2.01×10^{-5} *3*; α(P)=7.57×10^{-7} *11*
		698.9	100 *10*	x+2939.7	31/2$^-$	E2	0.00764	α(K)=0.00624 *9*; α(L)=0.001086 *16*; α(M)=0.000246 *4* α(N)=5.71×10^{-5} *8*; α(O)=7.87×10^{-6} *11*; α(P)=3.51×10^{-7} *5*
x+3788.4	37/2$^+$	405.1	100 *12*	x+3382.9	35/2$^+$	M1+E2	0.048 *18*	α(K)=0.039 *16*; α(L)=0.0067 *14*; α(M)=0.0015 *3* α(N)=0.00035 *7*; α(O)=4.9×10^{-5} *12*; α(P)=2.3×10^{-6} *11*
		578.5	50 *12*	x+3210.0	33/2$^+$	E2	0.01191	α(K)=0.00957 *14*; α(L)=0.00181 *3*; α(M)=0.000413 *6* α(N)=9.58×10^{-5} *14*; α(O)=1.301×10^{-5} *19*; α(P)=5.33×10^{-7} *8*
x+3877.9	37/2$^-$	239.1	59 *6*	x+3638.8	35/2$^-$	M1+E2	0.206 *62*	α(K)=0.161 *64*; α(L)=0.0348 *14*; α(M)=0.0080 *6* α(N)=0.00186 *12*; α(O)=0.000248 *5*; α(P)=9.2×10^{-6} *45*
		580.6	100 *12*	x+3297.4	33/2$^-$	E2	0.01180	α(K)=0.00949 *14*; α(L)=0.00179 *3*; α(M)=0.000409 *6* α(N)=9.48×10^{-5} *14*; α(O)=1.288×10^{-5} *18*; α(P)=5.29×10^{-7} *8*
x+4025.3	39/2$^+$	236.8	16 *5*	x+3788.4	37/2$^+$	M1+E2	0.212 *63*	α(K)=0.166 *65*; α(L)=0.0360 *16*; α(M)=0.0083 *7* α(N)=0.00192 *13*; α(O)=0.000256 *5*; α(P)=9.5×10^{-6} *46*
		642.5	100 *11*	x+3382.9	35/2$^+$	E2	0.00927	α(K)=0.00753 *11*; α(L)=0.001356 *19*; α(M)=0.000308 *5* α(N)=7.15×10^{-5} *10*; α(O)=9.79×10^{-6} *14*; α(P)=4.22×10^{-7} *6*
x+4232.9	39/2$^-$	354.9	100 *11*	x+3877.9	37/2$^-$	M1+E2	0.068 *25*	α(K)=0.055 *23*; α(L)=0.0099 *16*; α(M)=0.0023 *3* α(N)=0.00052 *8*; α(O)=7.2×10^{-5} *14*; α(P)=3.2×10^{-6} *15*
		594.2	67 *11*	x+3638.8	35/2$^-$	E2	0.01116	α(K)=0.00900 *13*; α(L)=0.001680 *24*; α(M)=0.000383 *6* α(N)=8.88×10^{-5} *13*; α(O)=1.208×10^{-5} *17*; α(P)=5.02×10^{-7} *7*

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Tm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
x+4426.6	$41/2^+$	400.9	86 *14*	x+4025.3	$39/2^+$	M1+E2	0.049 *19*	α(K)=0.040 *17*; α(L)=0.0069 *14*; α(M)=0.0016 *3* α(N)=0.00036 *7*; α(O)=5.1×10^{-5} *12*; α(P)=2.3×10^{-6} *11*
		638.3	100 *14*	x+3788.4	$37/2^+$	E2	0.00942	α(K)=0.00764 *11*; α(L)=0.001381 *20*; α(M)=0.000314 *5* α(N)=7.28×10^{-5} *11*; α(O)=9.97×10^{-6} *14*; α(P)=4.28×10^{-7} *6*
x+4508.7	$41/2^-$	275.9	35 *5*	x+4232.9	$39/2^-$	M1+E2	0.137 *45*	α(K)=0.109 *44*; α(L)=0.0218 *10*; α(M)=0.00499 *10* α(N)=0.00116 *3*; α(O)=0.000156 *14*; α(P)=6.3×10^{-6} *30*
		630.7	100 *10*	x+3877.9	$37/2^-$	E2	0.00969	α(K)=0.00785 *11*; α(L)=0.001426 *20*; α(M)=0.000324 *5* α(N)=7.52×10^{-5} *11*; α(O)=1.029×10^{-5} *15*; α(P)=4.39×10^{-7} *7*
x+4728.3	$43/2^+$	301.3	38 *8*	x+4426.6	$41/2^+$	M1+E2	0.107 *37*	α(K)=0.086 *35*; α(L)=0.0164 *15*; α(M)=0.00376 *23* α(N)=0.00087 *6*; α(O)=0.000119 *16*; α(P)=5.0×10^{-6} *24*
		703.3	100 *8*	x+4025.3	$39/2^+$	E2	0.00753	α(K)=0.00615 *9*; α(L)=0.001068 *15*; α(M)=0.000242 *4* α(N)=5.62×10^{-5} *8*; α(O)=7.75×10^{-6} *11*; α(P)=3.46×10^{-7} *5*
x+4876.7	$43/2^-$	368.0	89 *25*	x+4508.7	$41/2^-$	M1+E2	0.062 *23*	α(K)=0.050 *21*; α(L)=0.0089 *16*; α(M)=0.0020 *3* α(N)=0.00047 *8*; α(O)=6.5×10^{-5} *14*; α(P)=2.9×10^{-6} *14*
		643.5	100 *25*	x+4232.9	$39/2^-$	E2	0.00924	α(K)=0.00750 *11*; α(L)=0.001351 *19*; α(M)=0.000307 *5* α(N)=7.12×10^{-5} *10*; α(O)=9.75×10^{-6} *14*; α(P)=4.20×10^{-7} *6*
x+5120.6	$45/2^+$	392.0		x+4728.3	$43/2^+$	M1+E2	0.052 *20*	α(K)=0.042 *18*; α(L)=0.0074 *15*; α(M)=0.0017 *3* α(N)=0.00039 *7*; α(O)=5.4×10^{-5} *13*; α(P)=2.5×10^{-6} *12*
		695.0	100	x+4426.6	$41/2^+$	E2	0.00773	α(K)=0.00632 *9*; α(L)=0.001102 *16*; α(M)=0.000249 *4* α(N)=5.80×10^{-5} *9*; α(O)=7.98×10^{-6} *12*; α(P)=3.55×10^{-7} *5*
x+5168.2	$45/2^-$	291.2	36 *7*	x+4876.7	$43/2^-$	M1+E2	0.118 *40*	α(K)=0.094 *38*; α(L)=0.0183 *13*; α(M)=0.00419 *18* α(N)=0.00097 *5*; α(O)=0.000132 *15*; α(P)=5.4×10^{-6} *26*
		659.4	100 *7*	x+4508.7	$41/2^-$	E2	0.00873	α(K)=0.00710 *10*; α(L)=0.001265 *18*; α(M)=0.000287 *4* α(N)=6.67×10^{-5} *10*; α(O)=9.15×10^{-6} *13*; α(P)=3.98×10^{-7} *6*
x+5534.6	$47/2^-$	366.5	100 *12*	x+5168.2	$45/2^-$	M1+E2	0.062 *23*	α(K)=0.051 *21*; α(L)=0.0090 *16*; α(M)=0.0020 *3* α(N)=0.00048 *8*; α(O)=6.6×10^{-5} *14*; α(P)=3.0×10^{-6} *14*
		657.9	75 *12*	x+4876.7	$43/2^-$	E2	0.00877	α(K)=0.00714 *10*; α(L)=0.001273 *18*; α(M)=0.000289 *4* α(N)=6.71×10^{-5} *10*; α(O)=9.20×10^{-6} *13*; α(P)=4.00×10^{-7} *6*
x+5564.1	$47/2^+$	443.0	21 *5*	x+5120.6	$45/2^+$	(M1+E2)	0.038 *15*	α(K)=0.031 *13*; α(L)=0.0052 *12*; α(M)=0.00117 *25*

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Tm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
								α(N)=0.00027 *6*; α(O)=3.81×10^{-5} *98*; α(P)=1.81×10^{-6} *82*
x+5564.1	47/2$^+$	836.0	100 *10*	x+4728.3	43/2$^+$	E2	0.00514	α(K)=0.00425 *6*; α(L)=0.000694 *10*; α(M)=0.0001561 *22* α(N)=3.63×10^{-5} *5*; α(O)=5.07×10^{-6} *7*; α(P)=2.40×10^{-7} *4*
x+5953.4	49/2$^+$	389.0	50 *25*	x+5564.1	47/2$^+$	M1+E2	0.053 *20*	α(K)=0.043 *18*; α(L)=0.0076 *15*; α(M)=0.0017 *3* α(N)=0.00040 *7*; α(O)=5.5×10^{-5} *13*; α(P)=2.5×10^{-6} *12*
		832.8	100 *25*	x+5120.6	45/2$^+$	E2	0.00518	α(K)=0.00428 *6*; α(L)=0.000700 *10*; α(M)=0.0001575 *22* α(N)=3.67×10^{-5} *6*; α(O)=5.11×10^{-6} *8*; α(P)=2.42×10^{-7} *4*
x+5976.1	49/2$^-$	440.9	45 *9*	x+5534.6	47/2$^-$	M1+E2	0.038 *15*	α(K)=0.031 *13*; α(L)=0.0053 *12*; α(M)=0.00119 *25* α(N)=0.00028 *6*; α(O)=3.87×10^{-5} *99*; α(P)=1.83×10^{-6} *83*
		808.0	100 *18*	x+5168.2	45/2$^-$	E2	0.00553	α(K)=0.00456 *7*; α(L)=0.000754 *11*; α(M)=0.0001697 *24* α(N)=3.95×10^{-5} *6*; α(O)=5.50×10^{-6} *8*; α(P)=2.58×10^{-7} *4*
x+6321.4	51/2$^-$	345.2	100 *11*	x+5976.1	49/2$^-$	M1,E2	0.073 *27*	α(K)=0.059 *25*; α(L)=0.0108 *16*; α(M)=0.0025 *3* α(N)=0.00057 *8*; α(O)=7.8×10^{-5} *15*; α(P)=3.5×10^{-6} *17*
		786.9	78 *22*	x+5534.6	47/2$^-$	E2	0.00586	α(K)=0.00483 *7*; α(L)=0.000804 *12*; α(M)=0.000181 *3* α(N)=4.22×10^{-5} *6*; α(O)=5.86×10^{-6} *9*; α(P)=2.72×10^{-7} *4*
x+6414.8	51/2$^+$	461.3	38 *12*	x+5953.4	49/2$^+$	M1+E2	0.034 *13*	α(K)=0.028 *12*; α(L)=0.0046 *11*; α(M)=0.00105 *23* α(N)=0.00024 *6*; α(O)=3.41×10^{-5} *90*; α(P)=1.63×10^{-6} *73*
		850.8	100 *12*	x+5564.1	47/2$^+$	E2	0.00495	α(K)=0.00410 *6*; α(L)=0.000665 *10*; α(M)=0.0001495 *21* α(N)=3.48×10^{-5} *5*; α(O)=4.86×10^{-6} *7*; α(P)=2.31×10^{-7} *4*
x+6749.7	53/2$^-$	428.3	45 *9*	x+6321.4	51/2$^-$	M1+E2	0.041 *16*	α(K)=0.034 *14*; α(L)=0.0057 *13*; α(M)=0.0013 *3* α(N)=0.00030 *7*; α(O)=4.2×10^{-5} *11*; α(P)=1.97×10^{-6} *90*
		773.7	100 *9*	x+5976.1	49/2$^-$	E2	0.00608	α(K)=0.00501 *7*; α(L)=0.000839 *12*; α(M)=0.000189 *3* α(N)=4.40×10^{-5} *7*; α(O)=6.11×10^{-6} *9*; α(P)=2.82×10^{-7} *4*
x+6808.6	53/2$^+$	393.8		x+6414.8	51/2$^+$	M1+E2	0.051 *19*	α(K)=0.042 *18*; α(L)=0.0073 *15*; α(M)=0.0017 *3* α(N)=0.00038 *7*; α(O)=5.3×10^{-5} *12*; α(P)=2.5×10^{-6} *12*
		855.1	100	x+5953.4	49/2$^+$	E2	0.00490	α(K)=0.00405 *6*; α(L)=0.000657 *10*; α(M)=0.0001477 *21* α(N)=3.44×10^{-5} *5*; α(O)=4.80×10^{-6} *7*; α(P)=2.29×10^{-7} *4*
x+7136.0	55/2$^-$	386.3	57 *14*	x+6749.7	53/2$^-$	M1+E2	0.054 *20*	α(K)=0.044 *19*; α(L)=0.0077 *15*; α(M)=0.0018 *3* α(N)=0.00041 *7*; α(O)=5.6×10^{-5} *13*; α(P)=2.6×10^{-6} *12*

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Adopted Levels, Gammas (continued)

γ(^{157}Tm) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
x+7136.0	55/2$^-$	814.6	100 *21*	x+6321.4	51/2$^-$	E2	0.00544	α(K)=0.00449 *7*; α(L)=0.000739 *11*; α(M)=0.0001663 *24* α(N)=3.87×10^{-5} *6*; α(O)=5.39×10^{-6} *8*; α(P)=2.53×10^{-7} *4*
x+7184.3	55/2$^+$	375.7[@]	29 *14*	x+6808.6	53/2$^+$	M1+E2	0.058 *22*	α(K)=0.048 *20*; α(L)=0.0084 *15*; α(M)=0.0019 *3* α(N)=0.00044 *8*; α(O)=6.1×10^{-5} *13*; α(P)=2.8×10^{-6} *13*
		759.5	100 *14*	x+6414.8	51/2$^+$	E2	0.00634	α(K)=0.00521 *8*; α(L)=0.000878 *13*; α(M)=0.000198 *3* α(N)=4.61×10^{-5} *7*; α(O)=6.39×10^{-6} *9*; α(P)=2.93×10^{-7} *5*
x+7486.5	57/2$^-$	350.4	86 *14*	x+7136.0	55/2$^-$	M1+E2	0.070 *26*	α(K)=0.057 *24*; α(L)=0.0103 *16*; α(M)=0.0023 *3* α(N)=0.00055 *8*; α(O)=7.5×10^{-5} *15*; α(P)=3.3×10^{-6} *16*
		736.8	100 *14*	x+6749.7	53/2$^-$	E2	0.00678	α(K)=0.00556 *8*; α(L)=0.000948 *14*; α(M)=0.000214 *3* α(N)=4.98×10^{-5} *7*; α(O)=6.89×10^{-6} *10*; α(P)=3.13×10^{-7} *5*
x+7601.3	57/2$^+$	417.1	100 *25*	x+7184.3	55/2$^+$	M1+E2	0.044 *17*	α(K)=0.036 *15*; α(L)=0.0062 *13*; α(M)=0.0014 *3* α(N)=0.00033 *7*; α(O)=4.5×10^{-5} *11*; α(P)=2.11×10^{-6} *96*
		793.2	50 *25*	x+6808.6	53/2$^+$	E2	0.00576	α(K)=0.00475 *7*; α(L)=0.000789 *11*; α(M)=0.0001777 *25* α(N)=4.13×10^{-5} *6*; α(O)=5.75×10^{-6} *8*; α(P)=2.68×10^{-7} *4*
x+8272.7	61/2$^-$	786.2	100	x+7486.5	57/2$^-$	E2	0.00587	α(K)=0.00484 *7*; α(L)=0.000806 *12*; α(M)=0.000182 *3* α(N)=4.22×10^{-5} *6*; α(O)=5.87×10^{-6} *9*; α(P)=2.73×10^{-7} *4*
x+8467.4	(61/2$^-$)	808.1	100	x+7659	57/2$^-$	(E2)	0.00553	α(K)=0.00456 *7*; α(L)=0.000753 *11*; α(M)=0.0001696 *24* α(N)=3.95×10^{-5} *6*; α(O)=5.49×10^{-6} *8*; α(P)=2.58×10^{-7} *4*
x+9352.4	65/2$^-$	884.9	18 *9*	x+8467.4	(61/2$^-$)			
		1079.6	100 *9*	x+8272.7	61/2$^-$	E2	0.00302	α(K)=0.00253 *4*; α(L)=0.000386 *6*; α(M)=8.61×10^{-5} *12* α(N)=2.01×10^{-5} *3*; α(O)=2.84×10^{-6} *4*; α(P)=1.431×10^{-7} *20*
x+9906.6	69/2$^-$	554.1	100	x+9352.4	65/2$^-$	E2	0.01323	α(K)=0.01059 *15*; α(L)=0.00205 *3*; α(M)=0.000468 *7* α(N)=0.0001085 *16*; α(O)=1.467×10^{-5} *21*; α(P)=5.88×10^{-7} *9*
x+10638.8	73/2$^-$	732.0	100	x+9906.6	69/2$^-$	E2	0.00688	α(K)=0.00564 *8*; α(L)=0.000964 *14*; α(M)=0.000218 *3* α(N)=5.06×10^{-5} *7*; α(O)=7.00×10^{-6} *10*; α(P)=3.17×10^{-7} *5*
x+11195.4	75/2$^{(-)}$	556.4	100	x+10638.8	73/2$^-$	(M1+E2)	0.0209 *79*	α(K)=0.0174 *69*; α(L)=0.00277 *76*; α(M)=6.2×10^{-4} *16* α(N)=1.45×10^{-4} *38*; α(O)=2.05×10^{-5} *60*; α(P)=1.02×10^{-6} *44*

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Adopted Levels, Gammas (continued)

$\gamma(^{157}Tm)$ (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ	E_f	J_f^π	Mult.[‡]	α[#]	Comments
x+11960.8	$79/2^{(-)}$	765.2	100	x+11195.4	$75/2^{(-)}$	E2	0.00623	α(K)=0.00512 *8*; α(L)=0.000862 *12*; α(M)=0.000194 *3* α(N)=4.52×10^{-5} *7*; α(O)=6.27×10^{-6} *9*; α(P)=2.89×10^{-7} *4*
x+13242.4	$83/2^{(-)}$	1281.6	100	x+11960.8	$79/2^{(-)}$	E2	0.00217	α(K)=0.00181 *3*; α(L)=0.000267 *4*; α(M)=5.94×10^{-5} *9* α(N)=1.385×10^{-5} *20*; α(O)=1.97×10^{-6} *3*; α(P)=1.025×10^{-7} *15*; α(IPF)=1.571×10^{-5} *22*

[†] For γ energies from (HI,xnγ), uncertainties are 0.1 keV for most γ's, but as large as 0.5 keV for weak and contaminated γ's from general comment (1995Ri01).

[‡] From 1995Ri01 and are based on analysis of data for the whole scheme including angular correlation data and J^π assignments; note that multipolarity assignments are made for all γ's in the (HI,xnγ).

[#] Additional information 2.

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

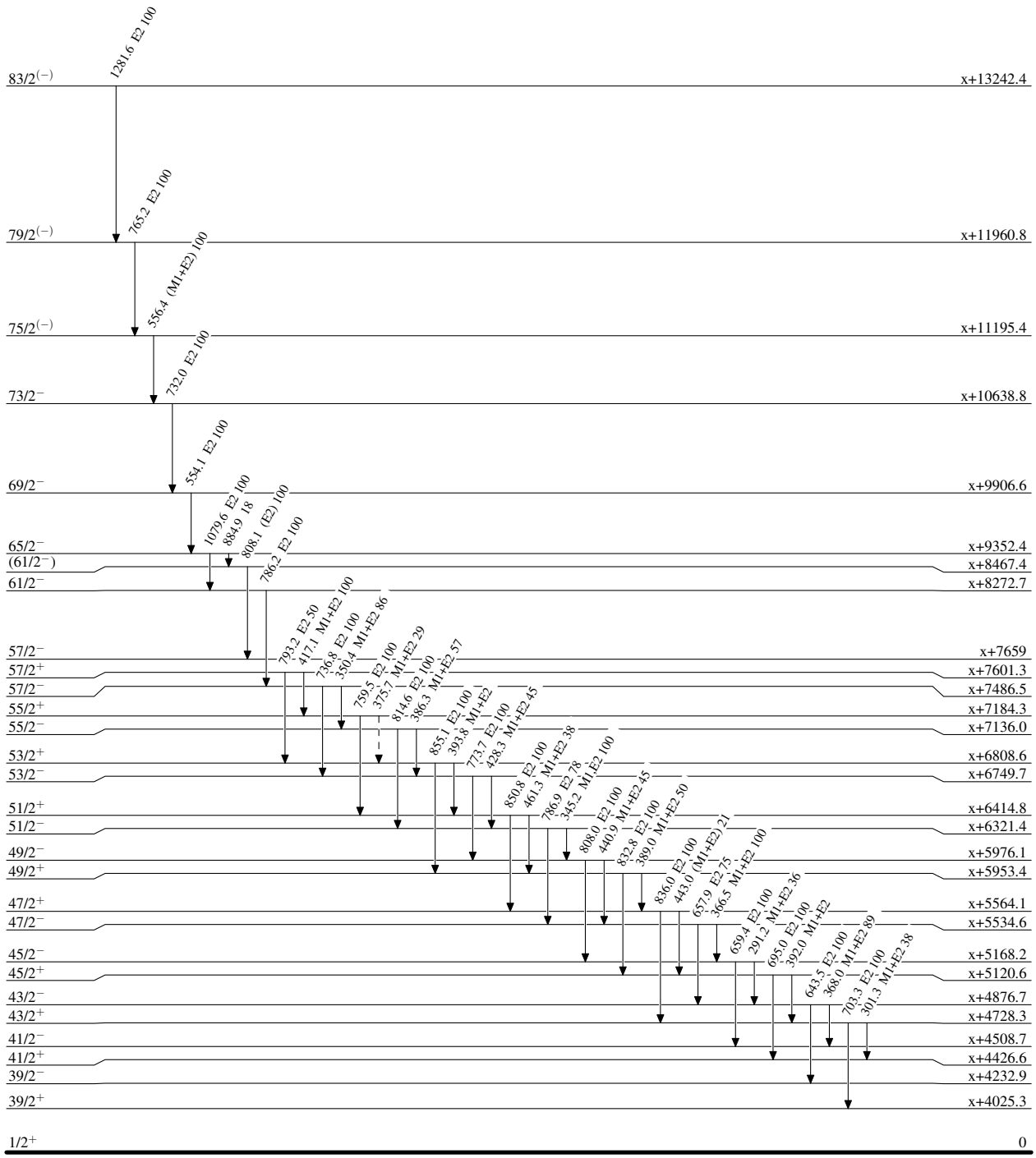
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

γ Decay (Uncertain)



$^{157}_{69}Tm_{88}$

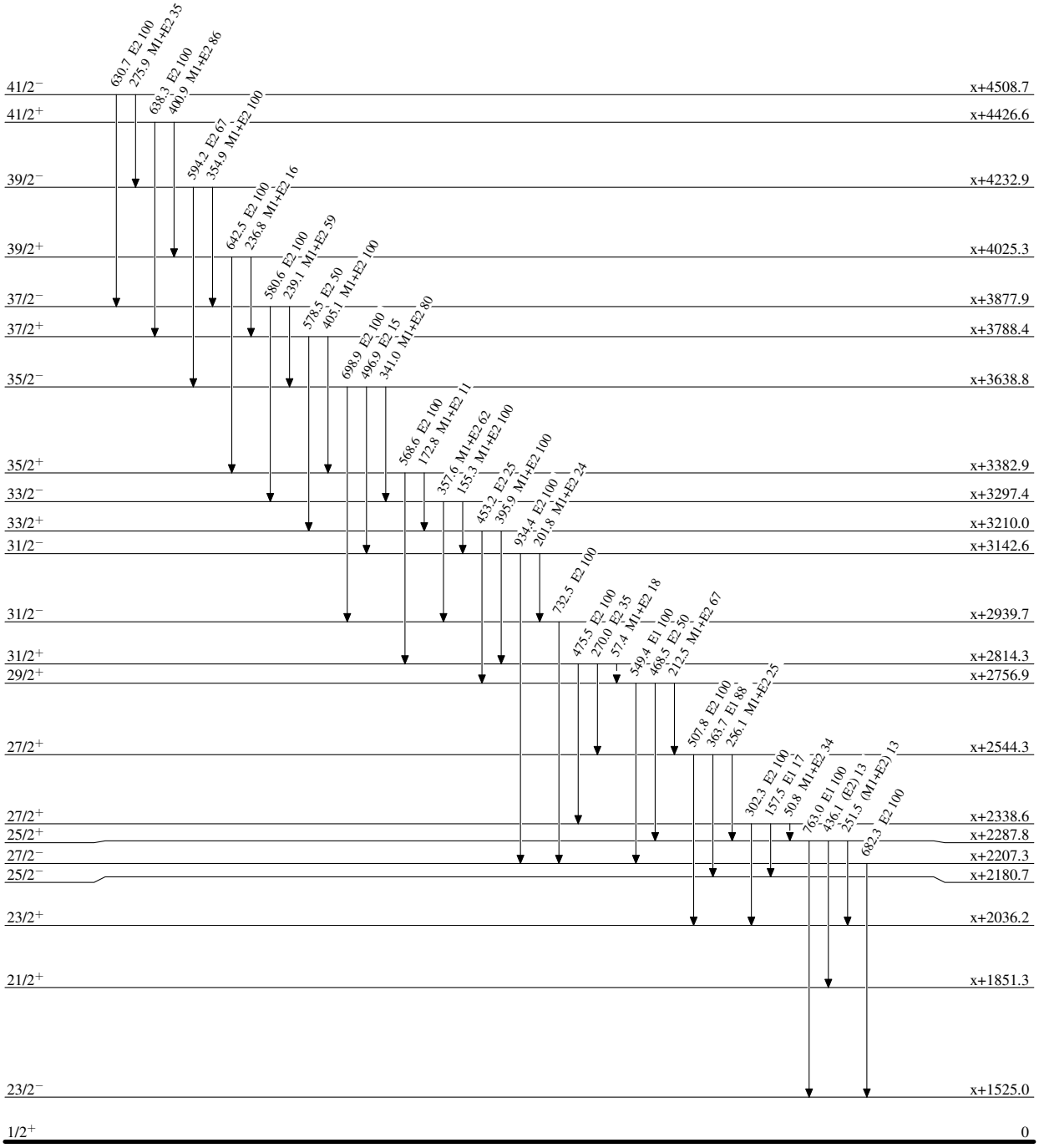
Adopted Levels, Gammas

Legend

Level Scheme (continued)

Intensities: Relative photon branching from each level

γ Decay (Uncertain)

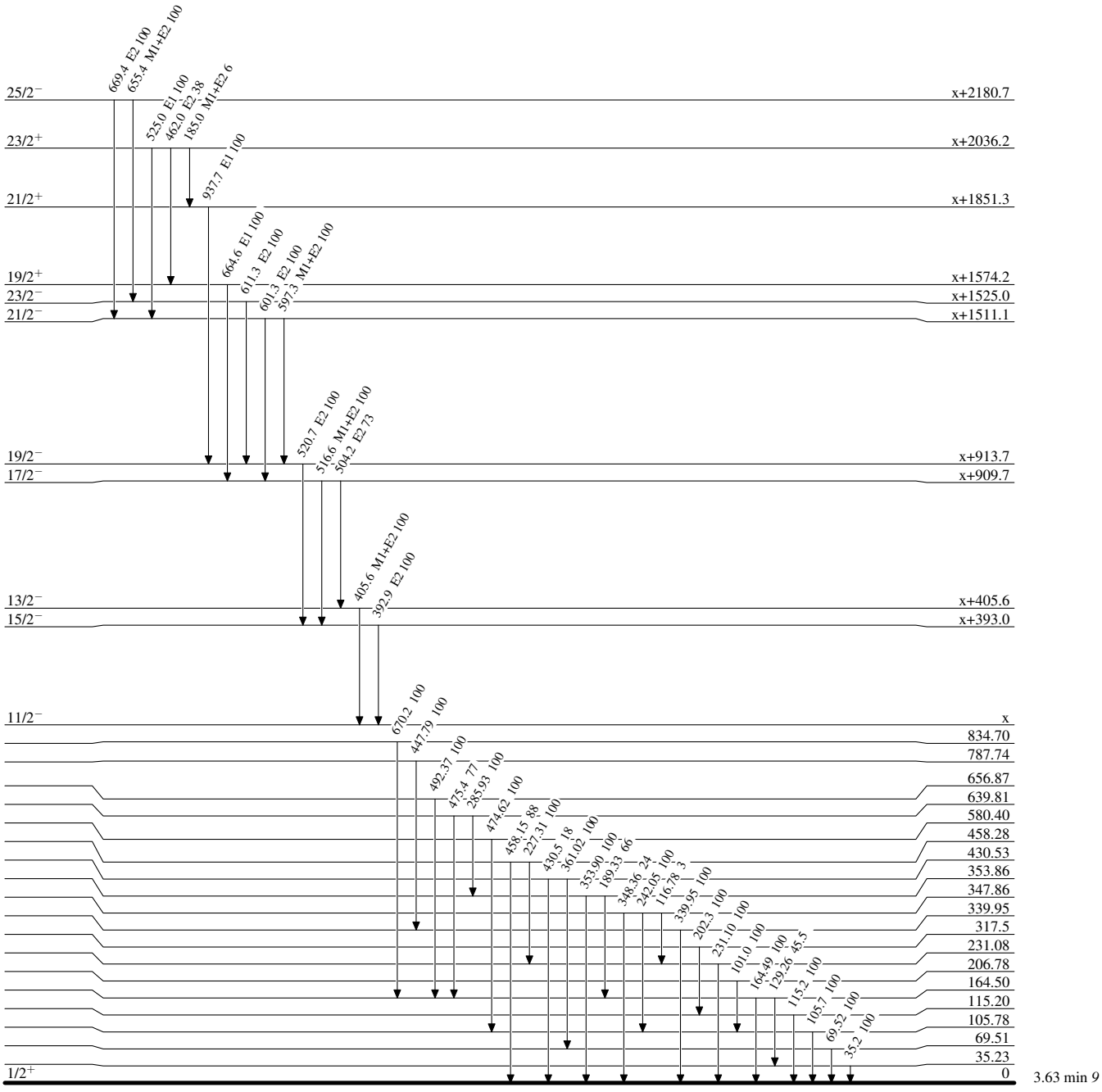


$^{157}_{69}Tm_{88}$

Adopted Levels, Gammas

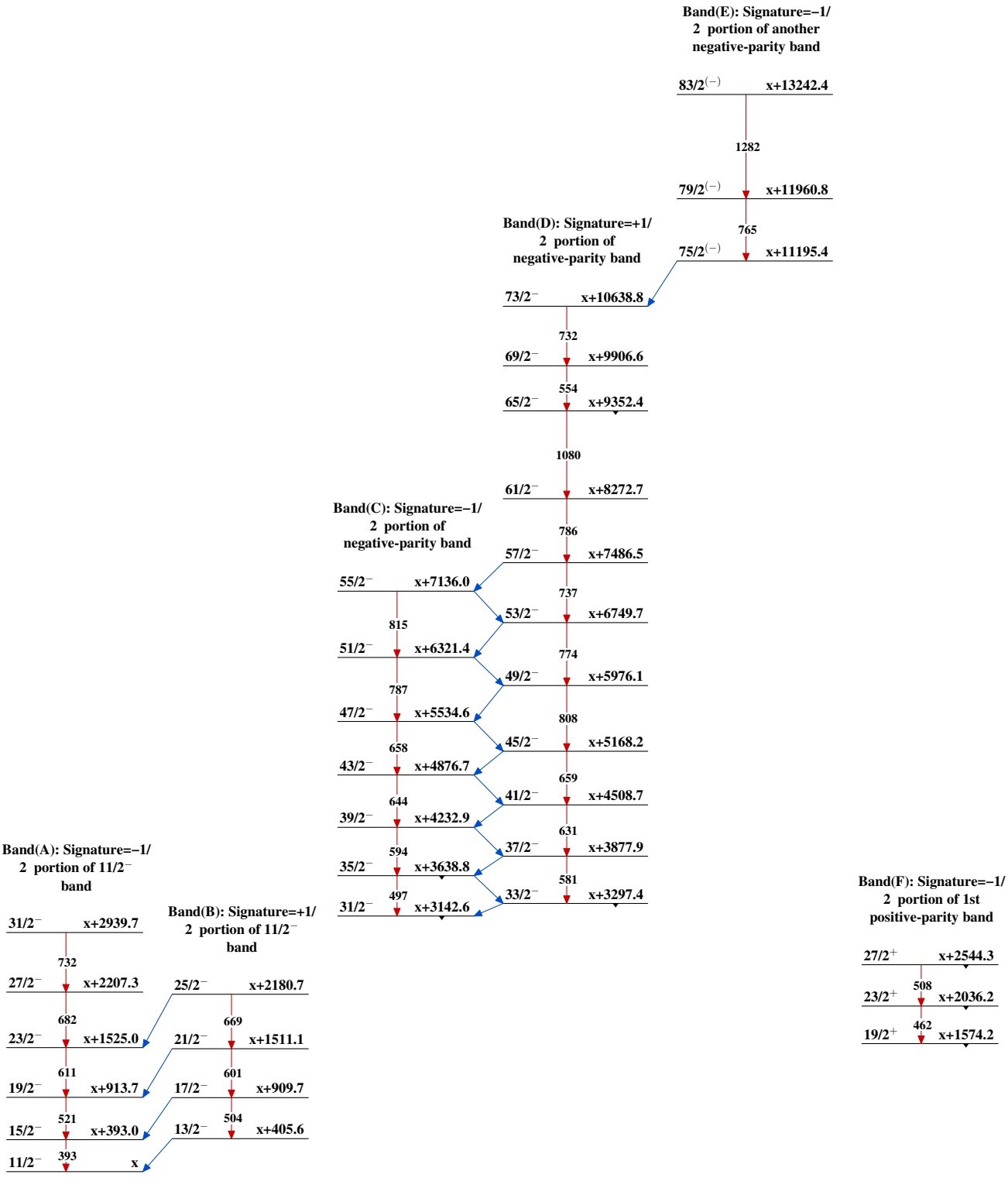
Level Scheme (continued)

Intensities: Relative photon branching from each level



$^{157}_{69}Tm_{88}$

Adopted Levels, Gammas



Adopted Levels, Gammas (continued)