Adopted Levels, Gammas

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	M. J. Martin	NDS 114, 1497 (2013)	31-Aug-2013

Q(β^-)=−5.45×10^3 *14*; S(n)=9.02×10^3 *6*; S(p)=7.4×10^2 *6*; Q(α)=3.85×10^3 *10* 2017Wa10
Q(ε)=8.78×10^3 *5*; S(2n)=21372 *6*; S(2p)=4.35×10^3 *6*; Q(εp)=4.61×10^3 *5* 2017Wa10
Additional information 1.

Calculations: suppression of β^+ decay: 1988Su04.
Using total absorption spectroscopy, 2003NaZY study the Gamow-Teller transition. For decay of the 2$^-$ state, the Gamow-Teller strength is concentrated in a narrow prominent peak at about 4500 keV. For decay of the 9$^+$ state, in addition to the peak at 4500, a second peak is seen at about 6100 keV.

^{152}Tm Levels

Cross Reference (XREF) Flags

- A ^{152}Tm IT decay (294 ns)
- B ^{152}Yb ε decay
- C ^{156}Lu α decay (494 ms)
- D ^{156}Lu α decay (198 ms)

E(level)†	J$^\pi$‡	T$_{1/2}$	XREF	Comments
0.0	(2)$^-$	8.0 s *10*	Bcd	%ε+%β^+=100 J$^\pi$: J from syst for N=83 odd-odd nuclei and shell model. π from E1 γ's from 1$^+$ states. T$_{1/2}$: from 1982No13.
141.61 *17*	1$^+$		B	J$^\pi$: log *ft*=5.05 from 0$^+$ g.s.
458.36 *23*	1$^+$		B	J$^\pi$: log *ft*=4.57 from 0$^+$.
482.32 *9*	(1)$^+$		B	J$^\pi$: log *ft*=3.52 from 0$^+$ allows J$^\pi$=1$^+$ or 0$^+$. E1 γ to (2)$^-$ rules out J=0.
968.6 *4*	1$^+$		B	J$^\pi$: log *ft*=5.55 from 0$^+$.
1090.74 *24*	1$^+$		B	J$^\pi$: log *ft*=5.32 from 0$^+$.
0.0+x	(9)$^+$#	5.2 s *6*	A cd	%ε+%β^+=100 E(level): x=440 *320* from measured Q(ε) for this decay. J$^\pi$: log *ft*=4.5 to 8$^+$ level in ^{152}Er establishes π. T$_{1/2}$: from 1980Li18.
114.34+x *9*	(8)$^+$		A	J$^\pi$: M1,E2 γ to (9)$^+$ level.
656.88+x *9*	(9)$^+$		A	
1018.21+x *8*	(10$^+$)		A	
1169.64+x *11*	(11$^-$)		A	J$^\pi$: E1 γ to (10$^+$) level; octupole excitation on configuration=(π h$_{11/2}$)$^{+5}$(ν f$_{7/2}$). T$_{1/2}$: less than a few ns (IT decay, 1986Mc14).
1405.25+x *13*	(12$^-$)		A	J$^\pi$: M1,E2 γ to (11$^-$) level.
1450.06+x *15*	(11$^+$)#		A	
1934.79+x *16*	(13$^-$)		A	
2131.42+x *14*	(13$^+$)#		A	
2272.17+x *17*	(15$^-$)		A	
2345.1+x *3*	(14$^-$,15$^-$,16$^-$)		A	J$^\pi$: fed by (E1) γ from (15$^+$) level.
2451.55+x *17*	(15$^+$)#		A	J$^\pi$: (E1) γ to (15$^-$) level.
2555.05+x *19*	(17$^+$)#	294 ns *12*	A	%IT=100 T$_{1/2}$: from IT decay (1986Mc14). %IT: No other decay observed.
≈6300		42 ns *5*		%IT≤100

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Adopted Levels, Gammas (continued)

^{152}Tm Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	XREF	Comments
				$T_{1/2}$: from 1986Mc14. E(level): level populated in ^{94}Mo(^{60}Ni,pnγ) (1986Mc14). Decay scheme is not known. This isomer feeds the 294 ns (9$^+$) isomer; the strongest γ's in this decay are: 114.0, 128.1, 264.7, 287.5, 357.8, 411.4, 725.7, 777.2, 854.8, 1183.0, 1258.6, 1288.6. %IT: No other decay observed.

[†] From least squares fit to Eγ.
[‡] For J≥8 the assignments are from ^{152}Tm IT decay.
[#] Configuration=(π $h_{11/2}$)$^{+5}$(ν $f_{7/2}$).

γ(^{152}Tm)

E_i(level)	J_i^{π}	E_{γ}[‡]	I_{γ}[#]	E_f	J_f^{π}	Mult.[‡]	α[†]	Comments
141.61	1$^+$	141.61 *17*		0.0	(2)$^-$	E1	0.1329	α(K)=0.1109 *16*; α(L)=0.01717 *25*; α(M)=0.00382 *6*; α(N+..)=0.001004 *15* α(N)=0.000880 *13*; α(O)=0.0001190 *17*; α(P)=5.19×10^{-6} *8*
458.36	1$^+$	316.75 *15*		141.61	1$^+$	(M1)	0.1253	α(K)=0.1053 *15*; α(L)=0.01560 *22*; α(M)=0.00347 *5*; α(N+..)=0.000935 *14* α(N)=0.000812 *12*; α(O)=0.0001170 *17*; α(P)=6.38×10^{-6} *9*
482.32	(1)$^+$	482.32 *9*		0.0	(2)$^-$	E1	0.00630	α(K)=0.00534 *8*; α(L)=0.000755 *11*; α(M)=0.0001669 *24*; α(N+..)=4.46×10^{-5} *7* α(N)=3.88×10^{-5} *6*; α(O)=5.49×10^{-6} *8*; α(P)=2.83×10^{-7} *4*
968.6	1$^+$	827.0 *3*		141.61	1$^+$			
1090.74	1$^+$	949.13 *17*		141.61	1$^+$			
114.34+x	(8)$^+$	114.4 *1*		0.0+x	(9)$^+$	M1,E2	1.98 *14*	α(K)=1.3 *5*; α(L)=0.6 *3*; α(M)=0.13 *8*; α(N+..)=0.034 *18* α(N)=0.030 *17*; α(O)=0.0037 *18*; α(P)=7.E−5 *4* Mult.: α=2.1 *3*; theory: α(M1)=2.11, α(E2)=1.85.
656.88+x	(9)$^+$	542.6 *1*	100 *6*	114.34+x	(8)$^+$			
		656.9 *2*	24 *3*	0.0+x	(9)$^+$			
1018.21+x	(10$^+$)	361.4 *1*	100 *4*	656.88+x	(9)$^+$			
		1018.2 *1*	76 *4*	0.0+x	(9)$^+$			
1169.64+x	(11$^-$)	151.5 *1*	100 *8*	1018.21+x	(10$^+$)	E1	0.1111	α(K)=0.0929 *13*; α(L)=0.01428 *21*; α(M)=0.00317 *5*; α(N+..)=0.000836 *12* α(N)=0.000732 *11*; α(O)=9.94×10^{-5} *14*; α(P)=4.39×10^{-6} *7* Mult.: α<0.24; theory: α(M1)=0.951, α(E2)=0.673.
		1169.6 *3*	12.5 *14*	0.0+x	(9)$^+$	[M2,E3]	0.008 *3*	α(K)=0.0068 *25*; α(L)=0.0011 *4*; α(M)=0.00024 *7*; α(N+..)=6.6×10^{-5} *19* α(N)=5.7×10^{-5} *16*; α(O)=8.1×10^{-6} *25*; α(P)=4.2×10^{-7} *16*; α(IPF)=6.29×10^{-7} *11*
1405.25+x	(12$^-$)	235.7 *1*	100	1169.64+x	(11$^-$)	M1,E2	0.22 *7*	α(K)=0.17 *7*; α(L)=0.0366 *18*;

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Adopted Levels, Gammas (continued)

γ(^{152}Tm) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[#]	E_f	J_f^π	Mult.[‡]	α[†]	Comments
								α(M)=0.0084 *7*; α(N+..)=0.00222 *14* α(N)=0.00195 *14*; α(O)=0.000260 *4*; α(P)=1.0×10^{-5} *5* Mult.: α=0.20 *14*; theory: α(M1)=0.279, α(E2)=0.152.
1450.06+x	(11$^+$)	1449.8 *2*	100	0.0+x	(9)$^+$			
1934.79+x	(13$^-$)	529.6 *1*	100 *6*	1405.25+x	(12$^-$)			
		764.9 *3*	18 *6*	1169.64+x	(11$^-$)			
2131.42+x	(13$^+$)	681.3 *1*	48 *3*	1450.06+x	(11$^+$)			
		726.2 *1*	100 *7*	1405.25+x	(12$^-$)			
2272.17+x	(15$^-$)	337.4 *1*	100	1934.79+x	(13$^-$)	[E2]	0.0504	α(K)=0.0374 *6*; α(L)=0.01000 *14*; α(M)=0.00234 *4*; α(N+..)=0.000611 *9* α(N)=0.000539 *8*; α(O)=6.94×10^{-5} *10*; α(P)=1.96×10^{-6} *3*
2345.1+x	(14$^-$,15$^-$,16$^-$)	(73.0)	100	2272.17+x	(15$^-$)	[M1,E2]	9.2 *15*	α(K)=4.1 *24*; α(L)=4 *3*; α(M)=0.9 *8*; α(N+..)=0.24 *18* α(N)=0.21 *17*; α(O)=0.025 *18*; α(P)=0.00024 *16* I(γ+ce)=9 from intensity balance at 2345.1+x level.
2451.55+x	(15$^+$)	106.5 *2*	7 *1*	2345.1+x	(14$^-$,15$^-$,16$^-$)	(E1)	0.283	α(K)=0.234 *4*; α(L)=0.0376 *6*; α(M)=0.00838 *13*; α(N+..)=0.00219 *4* α(N)=0.00192 *3*; α(O)=0.000256 *4*; α(P)=1.054×10^{-5} *16*
		179.5 *2*	13 *1*	2272.17+x	(15$^-$)	(E1)	0.0712	α(K)=0.0596 *9*; α(L)=0.00902 *13*; α(M)=0.00200 *3*; α(N+..)=0.000529 *8* α(N)=0.000463 *7*; α(O)=6.34×10^{-5} *9*; α(P)=2.88×10^{-6} *5*
		320.1 *1*	100 *5*	2131.42+x	(13$^+$)	[E2]	0.0588	α(K)=0.0432 *6*; α(L)=0.01206 *17*; α(M)=0.00283 *4*; α(N+..)=0.000737 *11* α(N)=0.000652 *10*; α(O)=8.34×10^{-5} *12*; α(P)=2.24×10^{-6} *4*
2555.05+x	(17$^+$)	103.5 *1*	100	2451.55+x	(15$^+$)	(E2)	2.69	α(K)=0.969 *14*; α(L)=1.320 *20*; α(M)=0.323 *5*; α(N+..)=0.0820 *12* α(N)=0.0734 *11*; α(O)=0.00854 *13*; α(P)=4.05×10^{-5} *6* B(E2)(W.u.)=0.91 *4* Mult.: α=2.9 *5* from level scheme.

[†] Additional information 2.
[‡] From ^{152}Yb ε decay for γ's from levels with known energy; from ^{152}Tm IT decay (294 ns) for γ's from levels built on E=x level.
[#] From ^{152}Tm IT decay.

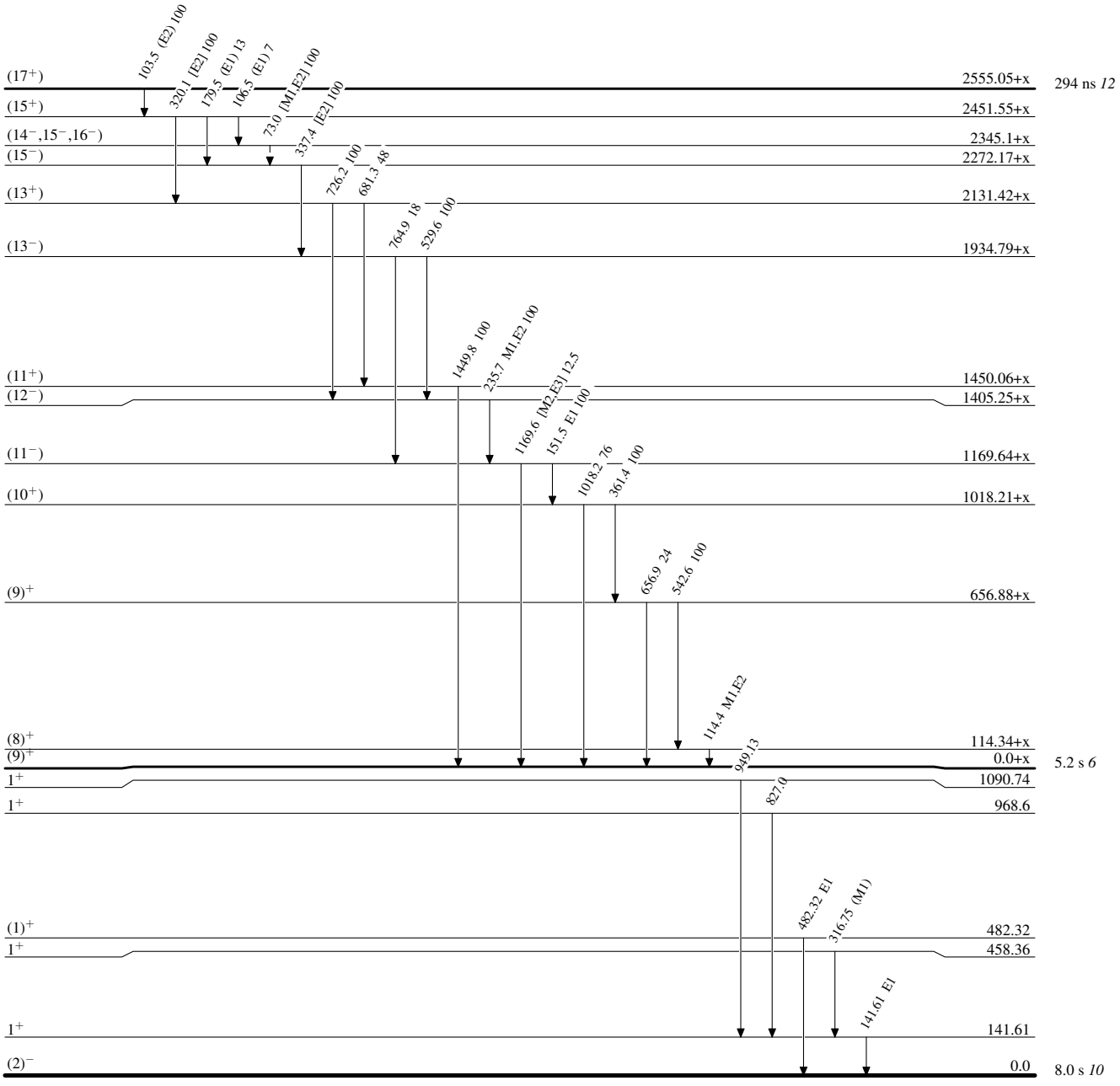
Adopted Levels, Gammas

Legend

Level Scheme

Intensities: Relative photon branching from each level

- - - - - - ► γ Decay (Uncertain)



$^{152}_{69}Tm_{83}$