^{151}Tm IT decay (24 ns) 1987McZZ,1982He08,1982No13

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	NDS 110, 1 (2009)	20-Nov-2008

Parent: ^{151}Tm: E=6908.5 *4*; $T_{1/2}$=24 ns *4*; %IT decay=100.0

1987McZZ: ^{96}Ru(^{58}Ni,3p) E=255 MeV. Measured γ, $\gamma\gamma$, $\gamma\gamma$(t), recoil-catcher method.

1982He08: ^{95}Mo(^{58}Ni,pnγ) and ^{93}Nb(^{60}Ni,2nγ) E=225-285 MeV. Measured γ, $\gamma\gamma$, $\gamma\gamma$(t). They identified a set of negative parity states and interpreted these as $\pi h^5_{11/2}$ yrast levels.

1982No13: ^{96}Ru(^{58}Ni,3pγ) E=238-250 MeV. Measured γ, $\gamma\gamma$.

Other: 1984ChZS.

^{151}Tm Levels

E(level)‡	J$^\pi$#	$T_{1/2}$	Comments
0.0	(11/2$^-$)		E(level): see 1990Ak01 (also 1993To07) for assignment of 11/2$^-$ as the g.s. of ^{151}Tm from systematics in this region. The $s_{1/2}$ state is predicted at≈50 keV.
1477.60 *10*	(15/2$^-$)		
1489.83 *18*	(15/2$^+$)		
1905.64? *13*	(19/2$^+$)		E(level): the position of this level is uncertain because the ordering of the 415-393 γ-ray cascade is tentative.
2176.48 *19*	(19/2$^-$)		
2299.55 *20*	(23/2$^+$)		
2515.27 *20*	(23/2$^-$)		
2655.67 *22*	(27/2$^-$)	451 ns *34*	%IT=100 $T_{1/2}$: from $\gamma\gamma$(t); weighted average of 470 ns *50* (1982He08) 420 ns *40* (1982No13) and 466 ns *34* (1987McZZ).
3555.6 *3*			
3981.4 *4*			
3987.88† *24*	(31/2$^-$)		
4407.2 *3*			
4612.7† *3*	(35/2$^-$)		
5858.3† *4*	(37/2)		J$^\pi$: (dipole) γ to (35/2$^-$).
6908.5† *4*		24 ns *4*	$T_{1/2}$: from γ(t) (1987McZZ). It is assumed that this is the isomer; however, there is a possibility that a very low energy isomeric transition has not been observed.

† Seen only by 1987McZZ.

‡ Relative to the (11/2$^-$) isomer.

From 'Adopted Levels', where assignments were based on theoretical considerations: the negative parity states are well described by the $\pi h^5_{11/2}$ yrast levels. The positive parity levels are assumed to have an $h_{11/2}$ proton coupled to a 3$^-$, 5$^-$, 7$^-$ core.

γ(^{151}Tm)

E$_\gamma$†	I$_\gamma$@	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.#	α&	Comments
140.4 *1*		2655.67	(27/2$^-$)	2515.27	(23/2$^-$)	E2	0.880	Mult.: from α(exp)=0.89 *26* (1984ChZS) and α(exp)=0.80 *7* (1987McZZ). α(exp) values are deduced from intensity balance.
215.7 *2*	14 *1*	2515.27	(23/2$^-$)	2299.55	(23/2$^+$)			α(exp)=0.071 *7* from intensity balance (1987McZZ). It is consistent with E1 implied by level spins, but does not rule out E2.
338.8 *1*	100 *5*	2515.27	(23/2$^-$)	2176.48	(19/2$^-$)			
393.9‡ *1*	‡	2299.55	(23/2$^+$)	1905.64?	(19/2$^+$)			
415.8‡ *1*	‡	1905.64?	(19/2$^+$)	1489.83	(15/2$^+$)			

Continued on next page (footnotes at end of table)

^{151}Tm IT decay (24 ns) 1987McZZ,1982He08,1982No13 (continued)

$\gamma(^{151}Tm)$ (continued)

E_γ[†]	I_γ[@]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[#]
425.8[a] *3*	35[a] *3*	3981.4		3555.6		
425.8[a] *3*	35[a] *3*	4407.2		3981.4		
624.8 *1*	90 *4*	4612.7	(35/2$^-$)	3987.88	(31/2$^-$)	(E2)
698.8 *2*		2176.48	(19/2$^-$)	1477.60	(15/2$^-$)	
1050.2 *2*	100 *5*	6908.5		5858.3	(37/2)	
1245.6 *2*	90 *5*	5858.3	(37/2)	4612.7	(35/2$^-$)	(D)
1256.0 *2*	16 *3*	3555.6		2299.55	(23/2$^+$)	
1332.2 *1*	91 *4*	3987.88	(31/2$^-$)	2655.67	(27/2$^-$)	(E2)
1451 *1*	9 *5*	5858.3	(37/2)	4407.2		
1477.7 *1*		1477.60	(15/2$^-$)	0.0	(11/2$^-$)	
1489.8 *2*	15 *3*	1489.83	(15/2$^+$)	0.0	(11/2$^-$)	

[†] From 1987McZZ. Their values agree well with those from 1982No13.
[‡] Ordering of 415-393 cascade is tentative. Intensity is not given since contaminated by a transition in ^{68}As.
[#] From $\gamma(\theta)$ in 1987McZZ, except for the 140-keV G.
[@] Absolute intensity per 100 decays.
[&] 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.
[a] Multiply placed with undivided intensity.

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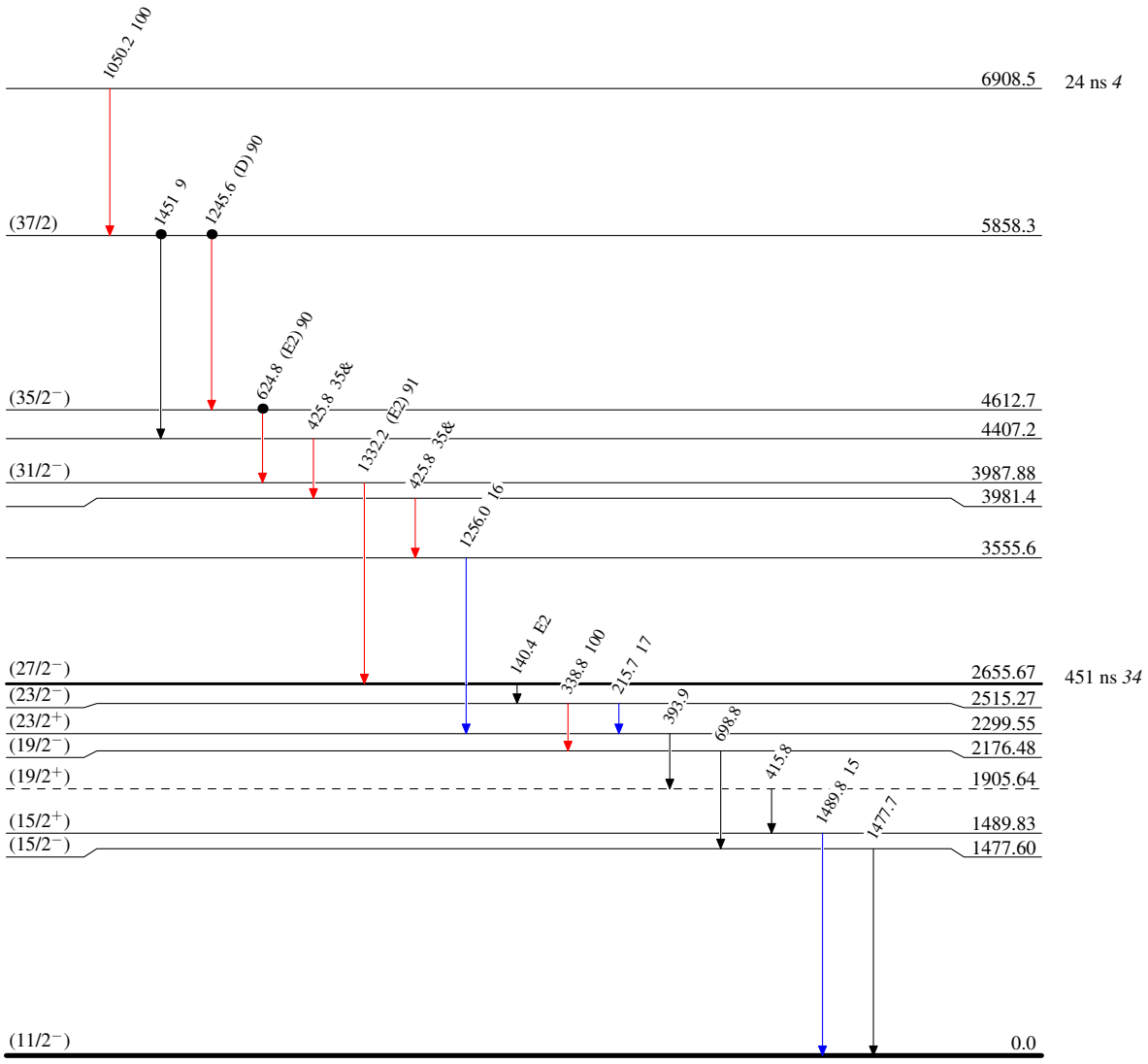
Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays
& Multiply placed: undivided intensity given
%IT=100.0

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



$^{151}_{69}Tm_{82}$