

^{97}Y IT decay (142 ms) 1996Lh03,1996Lh05,1986Lh01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	N. Nica	NDS 111, 525 (2010)	19-Nov-2009

Parent: ^{97}Y : E=3522.6 4; $J^\pi=(27/2^-)$; $T_{1/2}=142$ ms 8; %IT decay=94.8 9

^{97}Y -%IT decay: From 5.2 % 9 for β^- decay mode (^{97}Y β^- decay (142 ms), 2009Ma40).

1986Lh01: $^{235}\text{U}(n,\text{F})$ E=th; measured E_γ , I_γ , $\gamma\gamma$, X_γ , $(\beta^-)\gamma$, $\gamma\gamma(t)$; Ge and Ge(Li) detectors for γ , scin for β^- .

1996Lh03,1996Lh05: $^{232}\text{Th}(p,\text{F})$ E=25 MeV; on-line mass separation (IGISOL) and 12 Compton-suppressed Ge array (TARDIS); measured E_γ , I_γ , $\gamma\gamma$; 1996Lh03 give level scheme and 1996Lh05 give table of γ 's.

 ^{97}Y Levels

The level scheme is proposed by 1986Lh01, and completed by 1996Lh03 and 1996Lh05. 1986Lh01 pointed out that the experimental results do not exclude the reversal of the level scheme between the 667.5-keV and 3361-keV levels. Although the more recent references added substantial new data (levels and gammas), the same statement is reiterated by 1996Lh05, which assume the same order of levels. Since there is no connection between the levels fed in ^{97}Sr β^- decay and the levels fed in the decay of this isomer, and since none of the levels seen here have a measurable half-life, the order of the transitions has not been unequivocally established.

E(level) [†]	J^π [‡]	$T_{1/2}$ [#]	Comments
667.52 23	(9/2) ⁺	1.17 s 3	% β^- >99.3; %IT<0.7; % β^- n<0.08 Configuration=(π 1g _{9/2}) Additional information 1. J^π : 9/2 ⁺ In 1986Lh01. $T_{1/2}$: from Adopted Levels. % β^- , %IT, % β^- n: from Adopted Levels.
1336.0 3		<3 ns	
1530.2 4			
1657.4 3	(13/2) ⁺	<2 ns	Configuration=((96SR 2 ⁺)(π 1g _{9/2}))
1913.9 4			
2116.1 4			
2475.0 4			
2501.5 4			
2568.8 4	(17/2) ⁺	<2 ns	Configuration=((96SR 4 ⁺)(π 1g _{9/2}))
2748.2 4		<4 ns	
2965.3 4		<2 ns	
3163.3 4			
3360.3 4	(21/2) ⁺	<2 ns	Configuration=((96SR 6 ⁺)(π 1g _{9/2})) Also contains Configuration=((π 1g _{9/2})($(\nu$ 2d _{5/2}) ⁻¹ (ν 1g _{7/2}))6 ⁺), considering the E3 transition from (27/2 ⁻) level.
3522.6 4	(27/2) ⁻	142 ms 8	%IT=98.4 7 (1996Lh03); % β^- =1.6 7 (1996Lh03) Configuration=((π 1g _{9/2})($(\nu$ 1h _{11/2})(ν 1g _{7/2}))9 ⁻) $T_{1/2}$: weighted average of 138 15 ms (1987Bo19) and 144 10 ms (1986Lh01). %IT, % β^- : from comparison of coin intensity of 699 γ , 818 γ , 840 γ (^{97}Y β^- (142 ms)) with intensities of 792 γ , 911 γ , 321 γ , 669 γ , and 990 γ (^{97}Y IT decay (142 ms)).

[†] From least-squares fit to E_γ 's.

[‡] J^π and configuration assignments are those suggested by 1986Lh01 on the basis of observed cascading γ transitions and systematics of other high-spin core coupled states in the region (same As In Adopted Levels dataset, except where noted). It is suggested that the three γ 's (792, 912, and 990 keV) in the main cascade are stretched E2 transitions and represent the 6⁺ to 4⁺ to 2⁺ to 0⁺ transitions in the ^{96}Sr core.

[#] From $\gamma\gamma(t)$ analysis (1986Lh01, upper limits), except where noted otherwise.

⁹⁷Y IT decay (142 ms) 1996Lh03,1996Lh05,1986Lh01 (continued)

γ(⁹⁷Y)

(162.2γ)(K x ray) experiment (1986Lh01) shows that only the 162γ is significantly converted.
 A 180.3(2)γ from 2748 level In 1986Lh01 was removed by 1996Lh03 and 1996Lh05.

<u>E_γ</u>	<u>I_γ[†]#</u>	<u>E_i(level)</u>	<u>J_i^π</u>	<u>E_f</u>	<u>J_f^π</u>	<u>Mult.</u>	<u>α[@]</u>	<u>Comments</u>
94.0 3	1.3 5	2568.8	(17/2 ⁺)	2475.0				
^x 112.7 4								
162.3 2	47 4	3522.6	(27/2 ⁻)	3360.3	(21/2 ⁺)	E3	1.123	α(K)=0.884 14; α(L)=0.199 3; α(M)=0.0347 6; α(N+...)=0.00434 7 α(N)=0.00421 7; α(O)=0.0001332 20 I _γ : deduced by evaluator from I(γ+ce)=100. 55 5 from 1996Lh03 and 50 (No UNC.) from 1996Lh03 would imply I(γ+ce)>100. Mult.: α(K)exp=0.98 20 (from γX/γγ, 1986Lh01), α(exp)=1.00 19 (from intensity balance at 3361.1-keV level, 1986Lh01).
194.3 6	0.7 4	1530.2		1336.0				
196.9 3	7.7 9	3360.3	(21/2 ⁺)	3163.3				
202.1 3	1.8 6	2116.1		1913.9				
216.9 2	4.8 9	2965.3		2748.2				
246.7 2	2.1 6	2748.2		2501.5				
273.2 3	2.4 6	2748.2		2475.0				
321.3 2	29 4	1657.4	(13/2 ⁺)	1336.0				
359.0 2	2.8 10	2475.0		2116.1				
383.6 5	0.7 4	1913.9		1530.2				
394.8 2	15.1 23	3360.3	(21/2 ⁺)	2965.3				
396.2 3	10 3	2965.3		2568.8	(17/2 ⁺)			
415.1 2	1.7 6	3163.3		2748.2				
452.7 3	2.6 7	2568.8	(17/2 ⁺)	2116.1				
458.3 9	0.6 4	2116.1		1657.4	(13/2 ⁺)			
585.8 6	3.1 12	2116.1		1530.2				
594.6 3	2.1 9	3163.3		2568.8	(17/2 ⁺)			
612.3 3	4.9 8	3360.3	(21/2 ⁺)	2748.2				
632.2 3	6.7 13	2748.2		2116.1				
668.5 2	40 6	1336.0		667.52	(9/2) ⁺			
688.1 3	3.2 13	3163.3		2475.0				
780.1 3	9.1 18	2116.1		1336.0				
791.7 [‡] 2	72 5	3360.3	(21/2 ⁺)	2568.8	(17/2 ⁺)			
817.4 ^{&} 12	1.4 11	2475.0		1657.4	(13/2 ⁺)			
^x 841.0 8								a line very close In energy is placed In the level scheme of ⁹⁷ Zr (1996Lh03).
843.8 4	0.9 4	2501.5		1657.4	(13/2 ⁺)			
862.5 6	0.6 4	1530.2		667.52	(9/2) ⁺			
911.4 [‡] 2	74 10	2568.8	(17/2 ⁺)	1657.4	(13/2 ⁺)			
989.9 [‡] 2	58 8	1657.4	(13/2 ⁺)	667.52	(9/2) ⁺			
1091.2 4	1.3 4	2748.2		1657.4	(13/2 ⁺)			
1138.4 ^{&} 7	1.4 8	2475.0		1336.0				
1165.3 4	1.2 5	2501.5		1336.0				
1246.1 ^{&} 18	1.3 9	1913.9		667.52	(9/2) ⁺			

[†] From 1996Lh03.

[‡] Possibly stretched E2 transition in yrast cascade (from systematics).

Absolute intensity per 100 decays.

Continued on next page (footnotes at end of table)

^{97}Y IT decay (142 ms) [1996Lh03](#),[1996Lh05](#),[1986Lh01](#) (continued)

$\gamma(^{97}\text{Y})$ (continued)

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

& Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

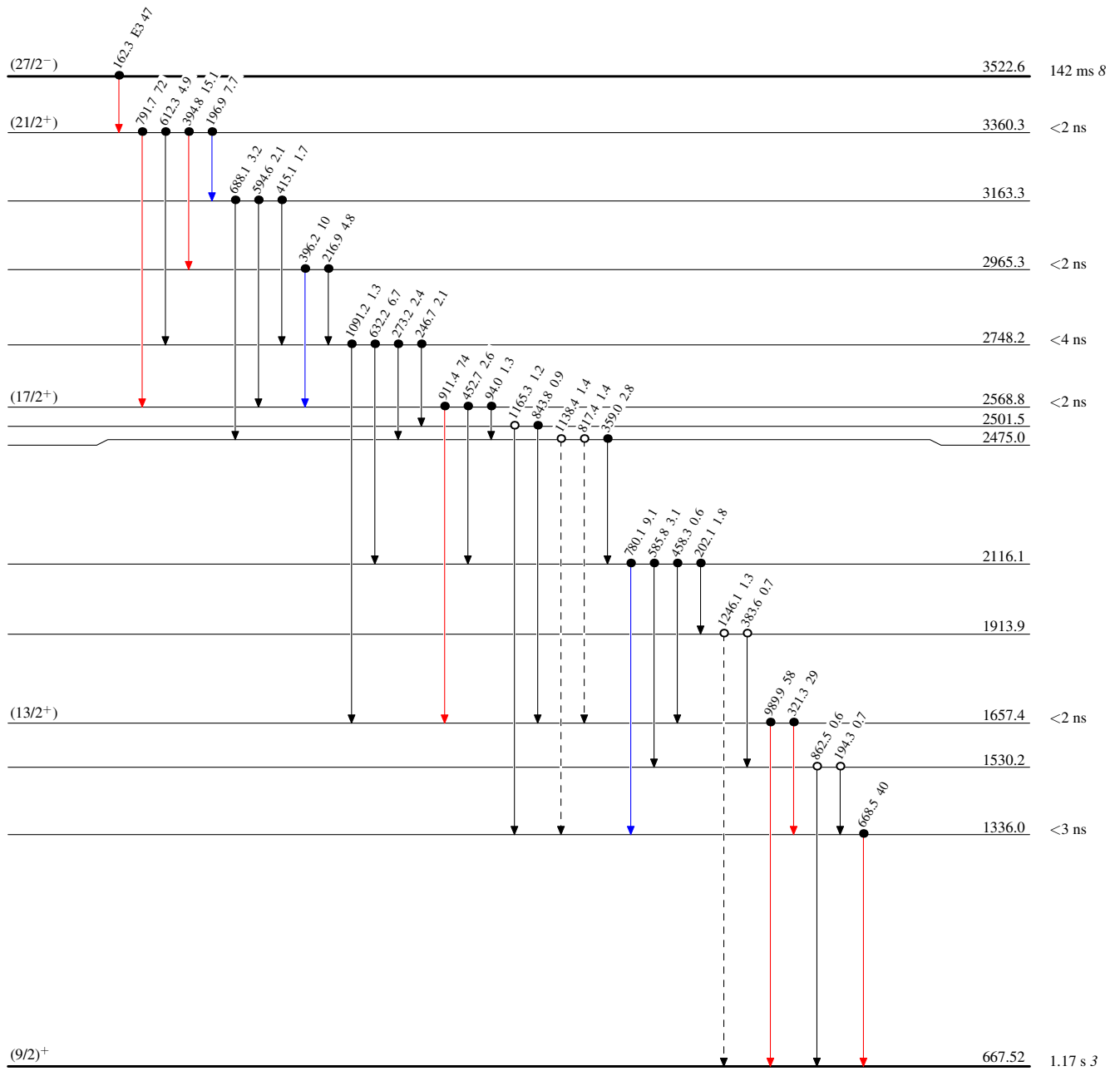
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Decay Scheme

Intensities: I_γ per 100 parent decays
%IT=94.8 9

Legend

- I_γ < 2% × I_γ^{max}
- I_γ < 10% × I_γ^{max}
- I_γ > 10% × I_γ^{max}
- - - - - → γ Decay (Uncertain)
- Coincidence
- Coincidence (Uncertain)



⁹⁷Y₅₈