^{97}Y β^- decay (142 ms) 2009Ma40,1996Lh03

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^π=(27/2$^-$); $T_{1/2}$=142 ms *8*; Q(β^-)=6689 *11*; %β^- decay=5.2 *9*

^{97}Y-From adopted values for ^{97}Y.

^{97}Y-%β^- decay: From 2009Ma40 from off-beam $\gamma\gamma\gamma$ data (sum of 2.9 % 6 feeding of 5570 level, and 2.3 % 7 feeding of 5606 level). 1996Lh05 find 1.6 % 7 from comparison of coin intensity of 699γ, 818γ, and 840γ (this decay) with the intensities of 792γ, 911γ, 321γ, 668γ, and 990γ In ^{97}Y IT decay (142 ms). While undisclosed, a similar comparison was presumably used by 2009Ma40 As well.

2009Ma40 (superseding 2009Ma26): ^{238}U(^{48}Ca,Fγ) E=330 MeV; measured Eγ, Iγ, $\gamma\gamma$ with GAMMASPHERE array composed of 101 Compton-suppressed Ge detectors performed at Argonne National Laboratory. ATLAS accelerator used to produce the beam in bursts of 0.3 ns time width and 412 ns repetition rate. Comparison with shell-model calculations.

1996Lh03: ^{232}Th(p,F) E=25 MeV; on-line mass separation (IGISOL) and 12 Compton-suppressed Ge array (TARDIS); measured Eγ, Iγ, $\gamma\gamma$.

Level scheme is from 2009Ma40 (up to (23/2$^-$), 4620 level same As that from 1996Lh03).

^{97}Zr Levels

E(level)[†]	J^π[‡]	$T_{1/2}$[&]	Comments
0.0	1/2$^+$	16.749 h *8*	%β^-=100 %β^-: from Adopted Levels.
1103.11 *8*	3/2$^+$		
1264.52 *11*	7/2$^+$	102.8 ns *24*	
1400.11 *8*	(3/2$^+$,5/2$^+$)		
1807.30 *11*	(7/2$^-$)		
2264.06 *13*	(11/2$^-$)	1.7 ns *3*	$T_{1/2}$: measured by 1996Lh03.
2625.23 *21*	(13/2$^-$)[#]		
3082.00 *21*	(15/2$^-$)[@]		
3780.2 *3*	(19/2$^-$)[@]		
4620.3 *3*	(23/2$^-$)[@]		
5569.9 *4*	(25/2$^-$)		Configuration=((π $g_{9/2}$)^2(ν $h_{11/2}$)) configuration: 25/2$^-$ doublet member of this configuration (from β^- decay of 27/2$^-$ ((π $g_{9/2}$)(ν $g_{7/2}h_{11/2}$))). J^π: log *ft*=4.7 from (27/2$^-$) of ^{97}Y β^--decay parent.
5606.4 *4*	(27/2$^-$)		Configuration=((π $g_{9/2}$)^2(ν $h_{11/2}$)) configuration: 27/2$^-$ doublet member of this configuration (from β^- decay of 27/2$^-$ ((π $g_{9/2}$)(ν $g_{7/2}h_{11/2}$))). J^π: log *ft*=4.8 from (27/2$^-$) of ^{97}Y β^--decay parent.

[†] From a least squares fit to Eγ's.

[‡] ADOPTED values (some values commented separately are adopted from this dataset).

[#] Postulated by 2009Ma40 based on the spin difference ΔJ=2 between (15/2$^-$), 3082 and (11/2$^-$), 2264 covered by two γ's, whence ΔJ=1 (and $\Delta\pi$=No) is most likely for each.

[@] Postulated by 2009Ma40 based on the spin difference ΔJ=8 between (27/2$^-$), 5606 and (11/2$^-$), 2264 covered by four γ's, whence ΔJ=2 (and $\Delta\pi$=No) is most likely for each.

[&] ADOPTED values.

^{97}Y β^- decay (142 ms) 2009Ma40,1996Lh03 (continued)

β^- radiations

β^- feeding deduced by 2009Ma40 from off-beam $\gamma\gamma\gamma$ data: 2.9 % 6 on 5570 level, and 2.3 % 7 on 5606 level (per 100 decays of the parent).

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(4605 *11*)	5606.4	44 *11*	4.79 *14*	av Eβ=2031.2 *53*
(4642 *11*)	5569.9	56 *6*	4.70 *10*	av Eβ=2048.7 *53*

† Iβ per 100 decays of the parent through this decay branch.
‡ For absolute intensity per 100 decays, multiply by 0.052 *9*.

$\gamma(^{97}Zr)$

Iγ normalization: based on 100% β^- feeding of highest states, 5606, (27/2$^-$) and 5570, (25/2$^-$) from the 142 ms isomeric state In ^{97}Y, which represents 5.2 % 9 of the isomer's total decay.

E$_\gamma$[‡]	I$_\gamma$[#@]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α[†]	Comments
161.4 *1*	71 *3*	1264.52	7/2$^+$	1103.11	3/2$^+$	[E2]	0.195	α(K)=0.1661 *24*; α(L)=0.0237 *4*; α(M)=0.00413 *6*; α(N+..)=0.000586 *9* α(N)=0.000558 *8*; α(O)=2.85×10^{-5} *4* α(N)=0.000561 *9*; α(O)=2.86×10^{-5} *5* I$_\gamma$: 73 (1996Lh03).
297.0 *1*	5.6 *14*	1400.11	(3/2$^+$,5/2$^+$)	1103.11	3/2$^+$			I$_\gamma$: 7 (1996Lh03).
361.2 *2*	39 *4*	2625.23	(13/2$^-$)	2264.06	(11/2$^-$)			I$_\gamma$: 36 *14* (1996Lh03).
407.2 *1*	29 *3*	1807.30	(7/2$^-$)	1400.11	(3/2$^+$,5/2$^+$)			I$_\gamma$: 34 (1996Lh03).
456.8 *1*	37.5 *13*	2264.06	(11/2$^-$)	1807.30	(7/2$^-$)			I$_\gamma$: 40 (1996Lh03).
456.8 *2*	39 *4*	3082.00	(15/2$^-$)	2625.23	(13/2$^-$)			I$_\gamma$: 36 *14* (1996Lh03).
542.8 *1*	8.1 *13*	1807.30	(7/2$^-$)	1264.52	7/2$^+$			I$_\gamma$: 6 (1996Lh03).
698.2 *2*	100	3780.2	(19/2$^-$)	3082.00	(15/2$^-$)			
817.9 *2*	61 *4*	3082.00	(15/2$^-$)	2264.06	(11/2$^-$)			I$_\gamma$: 64 *14* (1996Lh03).
840.1 *1*	100	4620.3	(23/2$^-$)	3780.2	(19/2$^-$)			
949.6 *2*	56 *6*	5569.9	(25/2$^-$)	4620.3	(23/2$^-$)			
986.1 *2*	44 *11*	5606.4	(27/2$^-$)	4620.3	(23/2$^-$)			
999.5 *1*	62.5 *25*	2264.06	(11/2$^-$)	1264.52	7/2$^+$			I$_\gamma$: 60 (1996Lh03).
1103.1 *1*	76 *3*	1103.11	3/2$^+$	0.0	1/2$^+$			I$_\gamma$: 74 (1996Lh03).
1400.1 *1*	24 *3*	1400.11	(3/2$^+$,5/2$^+$)	0.0	1/2$^+$			I$_\gamma$: 27 (1996Lh03).

† Additional information 1.
‡ From 2009Ma40.
# Iγ per 100 decays of the parent through this decay branch. 2009Ma40 found that the intensity of the γ flux from the highest 5606 and 5570 levels (both fed by β^- and decayed by 986γ and 950γ, respectively) down to the 2264 level is unchanged. Based on this the Iγ's for the highest-lying γ rays were deduced from I(986γ)+I(950γ)=100% with known branching ratio from the β^- feeding; for the other γ's the branching ratios given In ^{238}U(^{48}Ca,Fγ) dataset (also measured by 2009Ma40) were used to deduce the Iγ's.
@ For absolute intensity per 100 decays, multiply by 0.052 *9*.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays