^{252}Cf SF decay 2003Hw03,1974ClZX

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

Parent: ^{252}Cf: E=0; $J^\pi=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=?

^{252}Cf-From 2005Ni22 (Adopted Levels).

Also ^{235}U(n,Fγ), E=th: 1980MoZJ, 1970Gr38. 1970Gr38 observed an isomer with $T_{1/2}$=0.47 *8* μs and assigned it to either ^{96}Sr or ^{97}Sr. No γ rays were observed associated with this $T_{1/2}$ (100 keV<Eγ<260 keV).

2003Hw03: measured Eγ, Iγ, $\gamma\gamma\gamma$ using the Gammasphere array comprised of 102 Compton-suppressed Ge detectors.

1974ClZX: measured Eγ, Iγ, gf(t), Xγ, $\gamma\gamma$; isomeric levels have been studied by observing the K x-rays and γ rays from the isomeric decay in coincidence.

2006Hw01: As 2003Hw03 (but using 72 Compton-suppressed Ge detectors) to study isomeric levels; $T_{1/2}$'s determined by $\gamma\gamma\gamma$ method (supersede 2005Hw01).

Others: 2004Hw02, 1974Su04.

^{97}Sr Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	$1/2^+$	429[#] ms *5*	
167.10 *20*	$3/2^+$	0.22[#] ns *4*	$T_{1/2}$: other: 340 ns *20* (1974ClZX).
308.2 *3*	$7/2^+$	165 ns *25*	$T_{1/2}$: from 2006Hw01. Others: 347 *12* ns (1980MoZJ), 0.38 μs *11* (1974ClZX).
312.0 *3*		<4 ns	
830.2[@] *4*	$(9/2^+)$	263 ns *24*	β_2=0.441 *15* β_2: recalculated by 2004Ur06 (^{248}Cm SF) using data of 2003Hw03. J^π: adopted by 2003Hw03 from similarity to 9/2[404], 1038.8 isomeric level In ^{99}Zr (2003Ur01). Previously $(11/2^-)$ was suggested by 1980MoZJ on the basis of systematics with N=57 and N=59 nuclei. $T_{1/2}$: weighted average of 265 ns *27* (2003Hw03) and 255 ns *56* (2006Hw01). Others: 515 ns *15* (1980MoZJ) (in a priv comm in 3/2003 to the editors two of the coauthors of 1980MoZJ (Pfeiffer, Pinston) suggest correcting the $T_{1/2}$ to 255 ns *10* to the same scale as $T_{1/2}$(308 level)); 382 ns *11* (1974Su04 – this value is used In 2004Hw02 to compare with 265 ns *27* (2003Hw03); however while 1974Su04 report $T_{1/2}$ for a 522.4γ, it does not seem certain that this γ pertains to ^{97}Sr).
1036.1[@] *4*	$(11/2^+)$		
1275.7[@] *4*	$(13/2^+)$		
1548.2[@] *4*	$(15/2^+)$		
1852.2[@] *4*	$(17/2^+)$		

[†] From least-squares fit to Eγ's.

[‡] From Adopted Levels below 830 isomer exclusively (see table comment for J^π of isomer); J^π's of levels above isomer were adopted by 2003Hw03 based on band structure.

[#] From Adopted Levels.

[@] Band(A): ν9/2[404] isomer band.

γ(^{97}Sr)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
141.1 *2*	78 *9*	308.2	$7/2^+$	167.10	$3/2^+$	E_γ: 140.8 from 2003Hw03.
144.9 *2*	68 *20*	312.0		167.10	$3/2^+$	
167.1 *2*	100 *10*	167.10	$3/2^+$	0.0	$1/2^+$	E_γ: 167.0 from 2003Hw03.
205.9 *1*		1036.1	$(11/2^+)$	830.2	$(9/2^+)$	ΔE: adopted by evaluator by similarity to the other γ's In the ν9/2[404] isomer band.

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 2003Hw03,1974ClZX (continued)

γ(^{97}Sr) (continued)

E_γ[†]	I_γ[‡]	E_i(level)	J_i^π	E_f	J_f^π	Comments
239.6 *1*		1275.7	(13/2$^+$)	1036.1	(11/2$^+$)	I_γ: see comment on 445.5γ.
272.5 *1*		1548.2	(15/2$^+$)	1275.7	(13/2$^+$)	I_γ: see comment on 512.1γ.
304.0 *1*		1852.2	(17/2$^+$)	1548.2	(15/2$^+$)	I_γ: see comment on 576.5γ.
445.5 *1*		1275.7	(13/2$^+$)	830.2	(9/2$^+$)	I_γ: Iγ(445.4)/Iγ(239.6)=1.00 *5*/2.86 *14* (2003HW03).
512.1 *1*		1548.2	(15/2$^+$)	1036.1	(11/2$^+$)	I_γ: Iγ(512.1)/Iγ(272.5)=1.00 *10*/3.00 *15* (2003HW03).
522.0 *2*	41	830.2	(9/2$^+$)	308.2	7/2$^+$	E_γ: 522.7 from 1980MoZJ. ΔE: adopted by evaluator by similarity to the other γ′s In the *ν*9/2[404] isomer band. Mult.: depending on J^π assignment of 830 level, this transition can Be either [M2] (11/2$^-$), or [M1+E2] (9/2$^+$). Both hypotheses are supported by RUL.
576.5 *1*		1852.2	(17/2$^+$)	1275.7	(13/2$^+$)	I_γ: Iγ(576.5)/Iγ(304.0)=1.00 *10*/2.95 *21* (2003HW03).

[†] From 1974ClZX for γ′s below 830 level, except for 522γ (from 2003Hw03); from 2003Hw03 for γ′s of *ν*9/2[404] isomer band above this level.

[‡] Relative intensities from 1974ClZX for γ′s below 830 level. 2003Hw03 report branching ratios for γ′s of *ν*9/2[404] isomer band (see table comments).

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Level Scheme

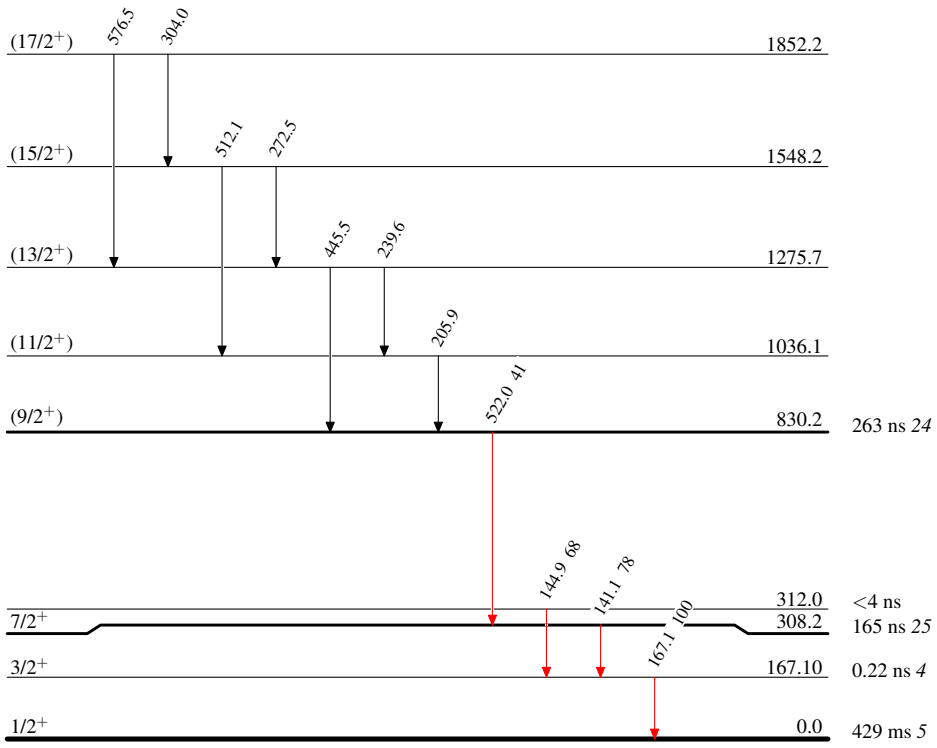
Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$



$^{97}_{38}Sr_{59}$

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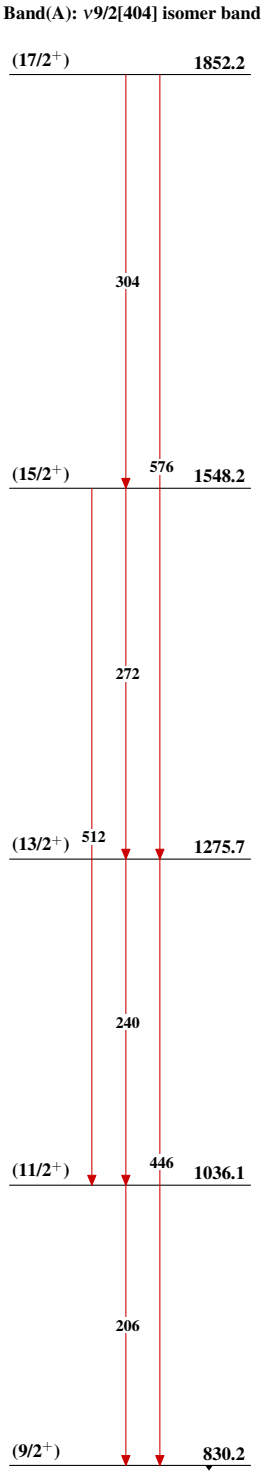

$^{97}_{38}Sr_{59}$