^{252}Cf SF decay 2004Li66

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen, Balraj Singh	NDS 164, 1 (2020)	15-Feb-2020

Parent: ^{252}Cf: E=0; $J^{\pi}=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=3.092 *8*

^{252}Cf-$T_{1/2}$: From ^{252}Cf Adopted Levels in the ENSDF database.

^{252}Cf-%SF decay: %SF=3.092 *8* from ^{252}Cf Adopted Levels in the ENSDF database.

2004Li66: ^{252}Cf source was sandwiched between two Fe foils. γ rays were detected with the Gammasphere array of 102 Compton-suppressed Ge detectors at LBNL. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma\gamma$-coin, $\gamma\gamma$(t). Deduced levels, lifetimes with the Gammasphere.

1997Ha64: experiments were carried first at Oak Ridge with 20 Compton-suppressed Ge detectors and then at LBNL with the Gammasphere array of HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma\gamma$-coin, (X ray)γ-coin. Deduced levels, $T_{1/2}$, J, π, band structures.

1980ChZM: half-life of the first 2^+ state populated in SF decay of ^{254}Cf.

Others: 2005Fo17, 1972Ho08.

Additional information 1.

^{98}Sr Levels

E(level)[†]	J^{π}[#]	$T_{1/2}$[@]	Comments
0.0[&]	0^+		
144.9[&] *5*	2^+	4.0 ns *+30−15*	$T_{1/2}$: from (145γ)(x ray)(t) (1980ChZM) in the SF decay of ^{254}Cf.
216.0[‡] *7*	0^+		
434.4[&] *7*	4^+		
867.8[&] *7*	6^+		
872.1[‡] *7*	(2^+)		
1433.7[&] *8*	8^+		
1838.2[a] *7*	(3^+)	13 ns *3*	
1978.8[a] *7*	(4^+)		
2123.3[&] *9*	10^+		
2153.9[a] *7*	(5^+)		
2361.7[a] *8*	(6^+)		
2534.6[b] *8*	(6^+)	4.5 ns *10*	
2603.2[a] *8*	(7^+)		
2772.2[b] *8*	(7^+)		
2874.0[a] *8*	(8^+)		
2928.9[&] *10*	12^+		
3041.5[b] *8*	(8^+)		
3175.1[a] *9*	(9^+)		
3341.5[b] *10*	(9^+)		
3511.2[a] *9*	(10^+)		
3671.1[b] *11*	(10^+)		

[†] From a least-squares fit to γ-ray energies, assuming $\Delta E\gamma$=0.5 keV for each γ-ray (the first author of 2004Li66 agreed with this general uncertainty).

[‡] From 1997Ha64, not reported in 2004Li66.

[#] Proposed by 2004Li66 based on band structures. Brackets around assignments for levels in the band based on 3^+,1838 level are added by evaluators.

[@] From $\gamma\gamma$(t) (2004Li66), except where noted.

[&] Band(A): g.s. band.

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 2004Li66 (continued)

^{98}Sr Levels (continued)

[a] Band(B): $\nu 9/2[404]$-$\nu 3/2[411]$, $K^\pi=(3^+)$. Band assignment from 2004Li66.
[b] Band(C): $\nu 9/2[404]$+$\nu 3/2[411]$, $K^\pi=(6^+)$. Band assignment from 2004Li66.

$\gamma(^{98}Sr)$

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Comments
70.9‡		216.0	0^+	144.9	2^+	
140.6	8.5 *3*	1978.8	(4^+)	1838.2	(3^+)	
144.9	100	144.9	2^+	0.0	0^+	Other: Eγ=144.3, Iγ=100 (1997Ha64). Intensity of 145γ=0.0040 transitions/fission of ^{254}Cf (1980ChZM).
175.1	3.5 *2*	2153.9	(5^+)	1978.8	(4^+)	
207.8	3.0 *2*	2361.7	(6^+)	2153.9	(5^+)	
237.6	1.8 *3*	2772.2	(7^+)	2534.6	(6^+)	
241.5	2.8 *3*	2603.2	(7^+)	2361.7	(6^+)	
269.3	1.3 *4*	3041.5	(8^+)	2772.2	(7^+)	
270.8	2.6 *2*	2874.0	(8^+)	2603.2	(7^+)	
289.5	72 *3*	434.4	4^+	144.9	2^+	Other: Eγ=289.4, Iγ=54 (1997Ha64).
300.0	0.4 *1*	3341.5	(9^+)	3041.5	(8^+)	
301.1	1.9 *3*	3175.1	(9^+)	2874.0	(8^+)	
315.7	3.0 *2*	2153.9	(5^+)	1838.2	(3^+)	
329.6	0.3 *1*	3671.1	(10^+)	3341.5	(9^+)	
336.1	1.3 *3*	3511.2	(10^+)	3175.1	(9^+)	
382.9	1.8 *2*	2361.7	(6^+)	1978.8	(4^+)	
433.4	50.0 *15*	867.8	6^+	434.4	4^+	Other: Eγ=433.5, Iγ=33 (1997Ha64).
449.3	1.1 *2*	2603.2	(7^+)	2153.9	(5^+)	
512.3	2.0 *2*	2874.0	(8^+)	2361.7	(6^+)	
565.9	22.2 *20*	1433.7	8^+	867.8	6^+	Other: Eγ=565.1, Iγ=29 (1997Ha64).
571.9	2.5 *5*	3175.1	(9^+)	2603.2	(7^+)	
637.2	1.3 *4*	3511.2	(10^+)	2874.0	(8^+)	
655.9‡	1‡	872.1	(2^+)	216.0	0^+	
689.6	6.7 *40*	2123.3	10^+	1433.7	8^+	Other: Eγ=689.3, Iγ=5.0 (1997Ha64).
727.4‡		872.1	(2^+)	144.9	2^+	
805.6	2.0 *6*	2928.9	12^+	2123.3	10^+	
918.2	5.2 *10*	3041.5	(8^+)	2123.3	10^+	
1111.0	<0.1	1978.8	(4^+)	867.8	6^+	
1286.1	0.3 *3*	2153.9	(5^+)	867.8	6^+	
1338.5	0.4 *4*	2772.2	(7^+)	1433.7	8^+	
1403.8	0.6 *3*	1838.2	(3^+)	434.4	4^+	
1544.4	2.7 *6*	1978.8	(4^+)	434.4	4^+	
1607.8	<0.1	3041.5	(8^+)	1433.7	8^+	
1666.8	0.8 *3*	2534.6	(6^+)	867.8	6^+	
1693.3	10.4 *8*	1838.2	(3^+)	144.9	2^+	
1719.5	5.9 *20*	2153.9	(5^+)	434.4	4^+	
1904.4	6.5 *8*	2772.2	(7^+)	867.8	6^+	
2100.2	5.2 *10*	2534.6	(6^+)	434.4	4^+	

† From 2004Li66 and data received as e-mail reply on December 2, 2004 from the first author of 2004Li66, unless otherwise stated.
‡ From 1997Ha64, not reported in 2004Li66.

^{252}Cf SF decay 2004Li66

Level Scheme

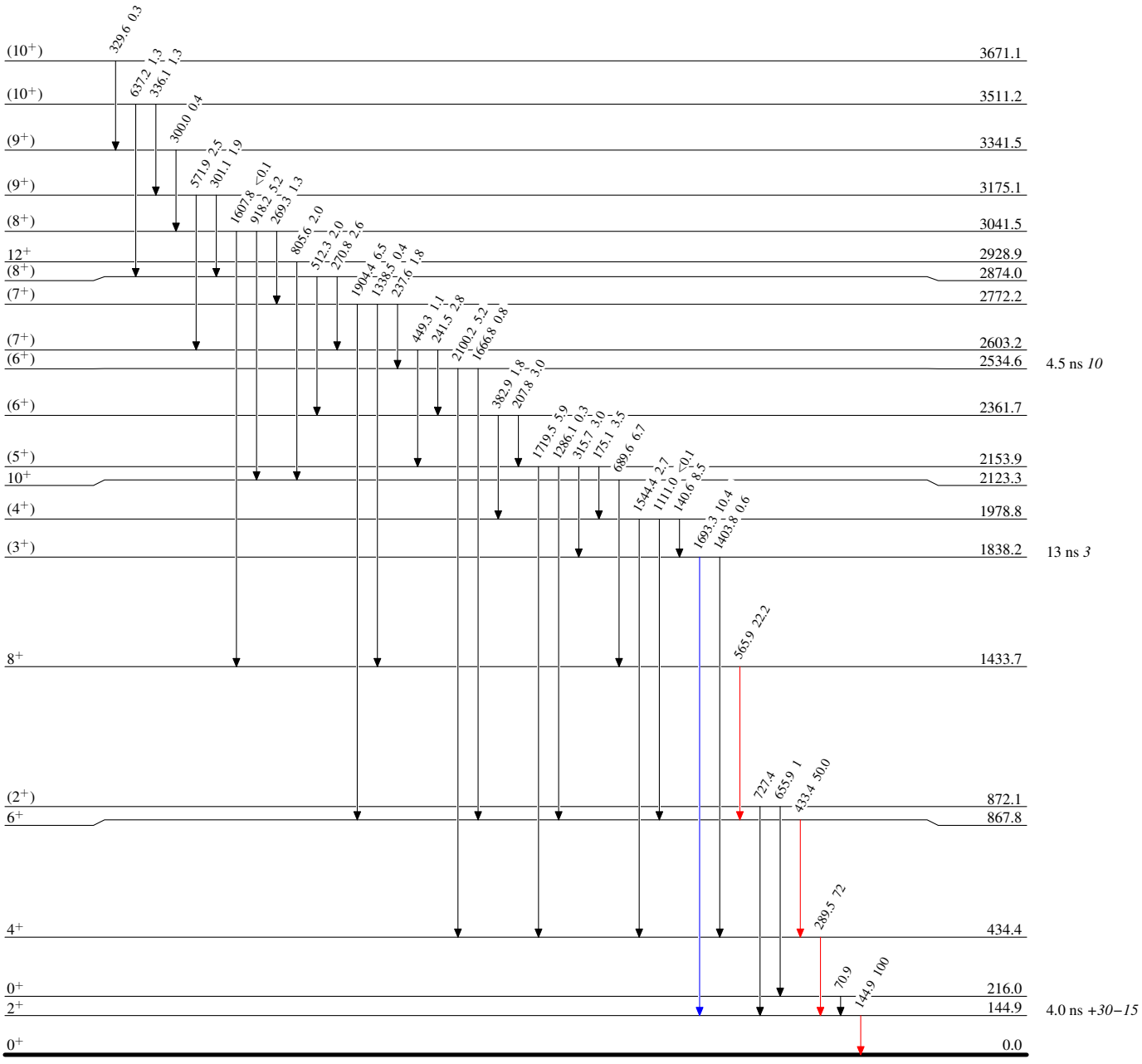
Intensities: Relative I_γ

Legend

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

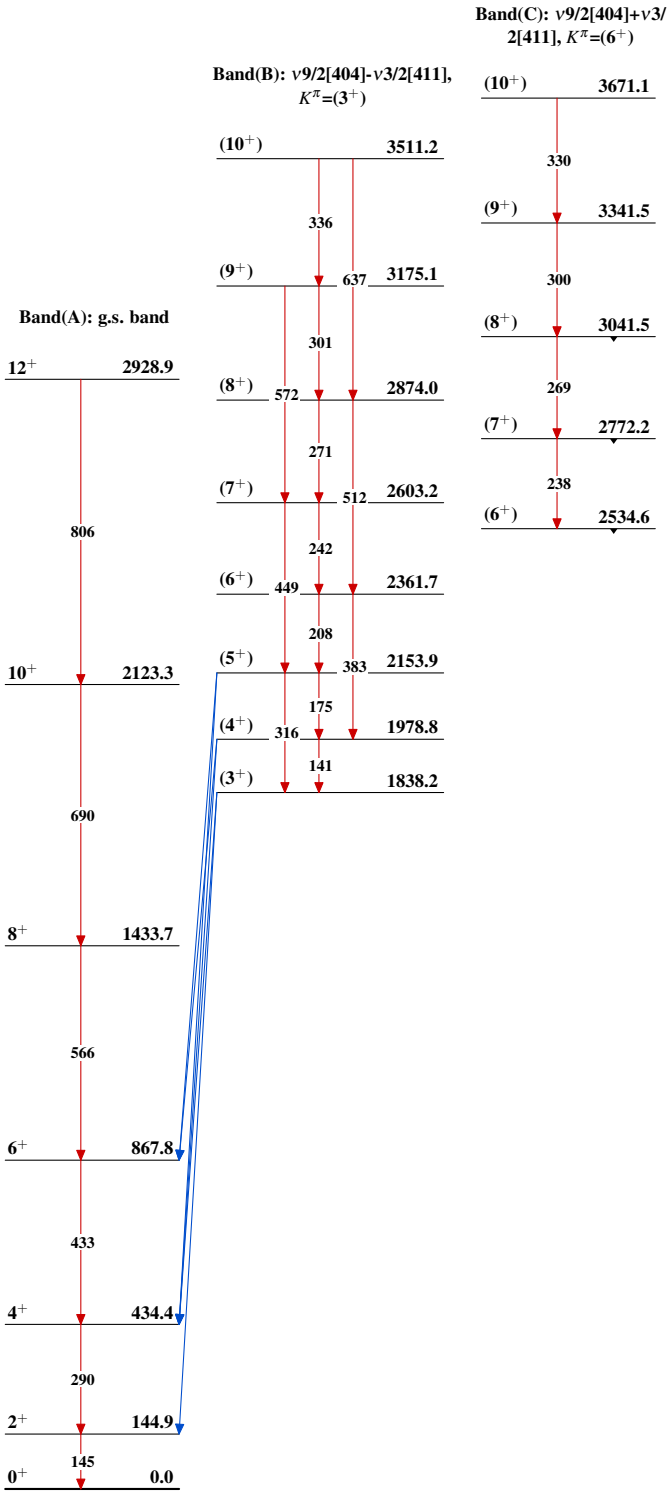
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{98}_{38}Sr_{60}$

^{252}Cf SF decay 2004Li66



$^{98}_{38}Sr_{60}$