^{252}Cf SF decay 2001Ha14,2009Go09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov, A. Rodionov and G. Shulyak	NDS 136, 163 (2016)	14-Jul-2016

Parent: ^{252}Cf: E=0.0; $J^\pi=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=?

2001Ha14,1999Ha10,1997Ha64,1995Zh34: ^{252}Cf SF decay; measured Eγ, Iγ, γγ and γγγ coin for fission pair Mo-Ba fragments using GAMMASPHERE array comprised of 72 Compton-suppressed Ge detectors. ^{242}Pu SF source was used also.

2009Go09: ^{252}Cf SF decay; measured $\gamma\gamma(\theta)$ (IPAC method). ^{146}Ba; deduced g factor of first 2^+ state. Correlation attenuation in randomly oriented magnetic field, GAMMASPHERE.

1986Ph02,1988PhZY: ^{252}Cf SF decay; measured Eγ, Iγ, γγ and (X-ray)γ coin. ^{146}Ba; deduced levels, J^π, mult.

Others: 1969WiZX, 1970WiZN, 1971Ch44, 1972Ho08, 1977YoZM, 1996Te04, 2005Ja12.

The ^{146}Ba level scheme is as given by 2001Ha14. Data from 1995Zh34 are taken into account; the 4161 keV level de-exciting by 647.0 keV γ ray is not suggested by 2001Ha14 (the same group).

^{146}Ba Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0[#]	0^+		
181.15[#] *5*	2^+	0.86 ns *6*	$T_{1/2}$: from γ(t) 1974JaYY. g=0.26 *5*: weighted average of 0.27 *9* (IPAC method, 2009Go09), 0.20 *10* (IMPAC method, 1999Sm05), 0.28 *7* (IPAC method, 1988Wo03).
513.82[#] *7*	4^+		
738.8[@]	1^-		The level is observed in the ^{146}Cs β^- decay only. It is introduced in the level scheme by 1986Ph02 as a bandhead on the basis of negative parity levels systematics. The level is not connected by transitions with other levels. See 1995Zh34, 2001Ha14.
821.48[@] *7*	3^-		
958.68[#] *8*	6^+		
1024.72[@] *11*	5^-		
1349.22[@] *10*	7^-		
1482.89[#] *10*	8^+		
1777.83[@] *10*	9^-		
1875.09[a] *18*			
1945.05[&] *18*			
2052.21[#] *11*	10^+		
2090.71[a] *15*			
2191.41[&] *14*			
2292.75[@] *19*	11^-		
2389.51[a] *19*			
2516.28[&] *15*			
2632.51[#] *23*	12^+		
2791.1[a] *3*	(12^-)		
2876.66[@] *25*	13^-		
2938.96[&] *20*	13^-		
3192.9[#] *3*	14^+		
3297.9[a] *4*			
3452.56[&] *25*			
3523.7[@] *4*	15^-		E(level): other: E=3514.7; decay to the level 2874.6 by 640.1γ (1995Zh34) is not confirmed by 2001Ha14 (the same group).
3737.5[#] *4*	16^+		

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 2001Ha14,2009Go09 (continued)

^{146}Ba Levels (continued)

† From a least-squares fit to Eγ's, normalized χ^2=1.6.
‡ Based on decay systematics, band assignment, branching ratios (1995Zh34).
# Band(A): g.s. band.
@ Band(B): octupole band.
& Band(C): side band 1.
a Band(D): side band 2.

γ(^{146}Ba)

E_γ †@	I_γ #	E_i(level)	J_i^π	E_f	J_f^π	Comments
133.5‡	<0.1	1482.89	8^+	1349.22	7^-	
181.15 *5*	111	181.15	2^+	0.0	0^+	I_γ: summarized Iγ(332) and Iγ(640) (the evaluators).
198.2‡		2389.51		2191.41		
203.55 *35*	18.6	1024.72	5^-	821.48	3^-	
215.6‡		2090.71		1875.09		
246.5‡		2191.41		1945.05		
274.0‡	0.1	2052.21	10^+	1777.83	9^-	
295.3‡	0.2	1777.83	9^-	1482.89	8^+	
298.7‡		2389.51		2090.71		
307.65 *5*	10	821.48	3^-	513.82	4^+	
324.6	23.6	1349.22	7^-	1024.72	5^-	
324.9‡		2516.28		2191.41		
332.65 *5*	100	513.82	4^+	181.15	2^+	Attenuated (332.6γ)(181.3γ)(θ): A_2=+0.068 *8*, A_4=+0.010 *11* (2009Go09).
390.45 *5*	2.1	1349.22	7^-	958.68	6^+	
401.6‡		2791.1	(12^-)	2389.51		
422.9‡		2938.96	13^-	2516.28		
428.55 *5*	13.6	1777.83	9^-	1349.22	7^-	
444.85 *5*	46	958.68	6^+	513.82	4^+	
464.2‡		2516.28		2052.21	10^+	
506.8‡		3297.9		2791.1	(12^-)	
510.9 *1*	15.7	1024.72	5^-	513.82	4^+	
513.7‡		3452.56		2938.96	13^-	
514.7‡	7.5	2292.75	11^-	1777.83	9^-	
524.30 *5*	28	1482.89	8^+	958.68	6^+	
544.6‡	1.7	3737.5	16^+	3192.9	14^+	
560.4	3.5	3192.9	14^+	2632.51	12^+	
569.35 *5*	9.3	2052.21	10^+	1482.89	8^+	
575.8‡		3452.56		2876.66	13^-	
580.3‡	7.1	2632.51	12^+	2052.21	10^+	
583.8‡	4.2	2876.66	13^-	2292.75	11^-	
607.9‡		2090.71		1482.89	8^+	
640.35 *5*	11	821.48	3^-	181.15	2^+	
646.1‡		2938.96	13^-	2292.75	11^-	
647.0‡	0.5	3523.7	15^-	2876.66	13^-	
708.7‡		2191.41		1482.89	8^+	
738.5‡		2516.28		1777.83	9^-	
741.3		2090.71		1349.22	7^-	E_γ: assumed by the evaluators: the value 714.3 is a misprint in fig. 1 2001Ha14, the energy difference between levels is 741.36 keV.

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^{252}Cf SF decay 2001Ha14,2009Go09 (continued)

$\gamma(^{146}Ba)$ (continued)

E_γ[†@]	E_i(level)	J_i^π	E_f	J_f^π
842.0[‡]	2191.41		1349.22	7^-
916.4[‡]	1875.09		958.68	6^+
986.5[‡]	1945.05		958.68	6^+

† Average of Eγ from 2001Ha14 and 1986Ph02 except as noted.
‡ From 2001Ha14; ΔEγ=0.2 assumed by evaluators for Eγ.
# From 2001Ha14.
@ If ΔEγ not given, ±0.20 keV assumed for least-squares fitting.

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Level Scheme

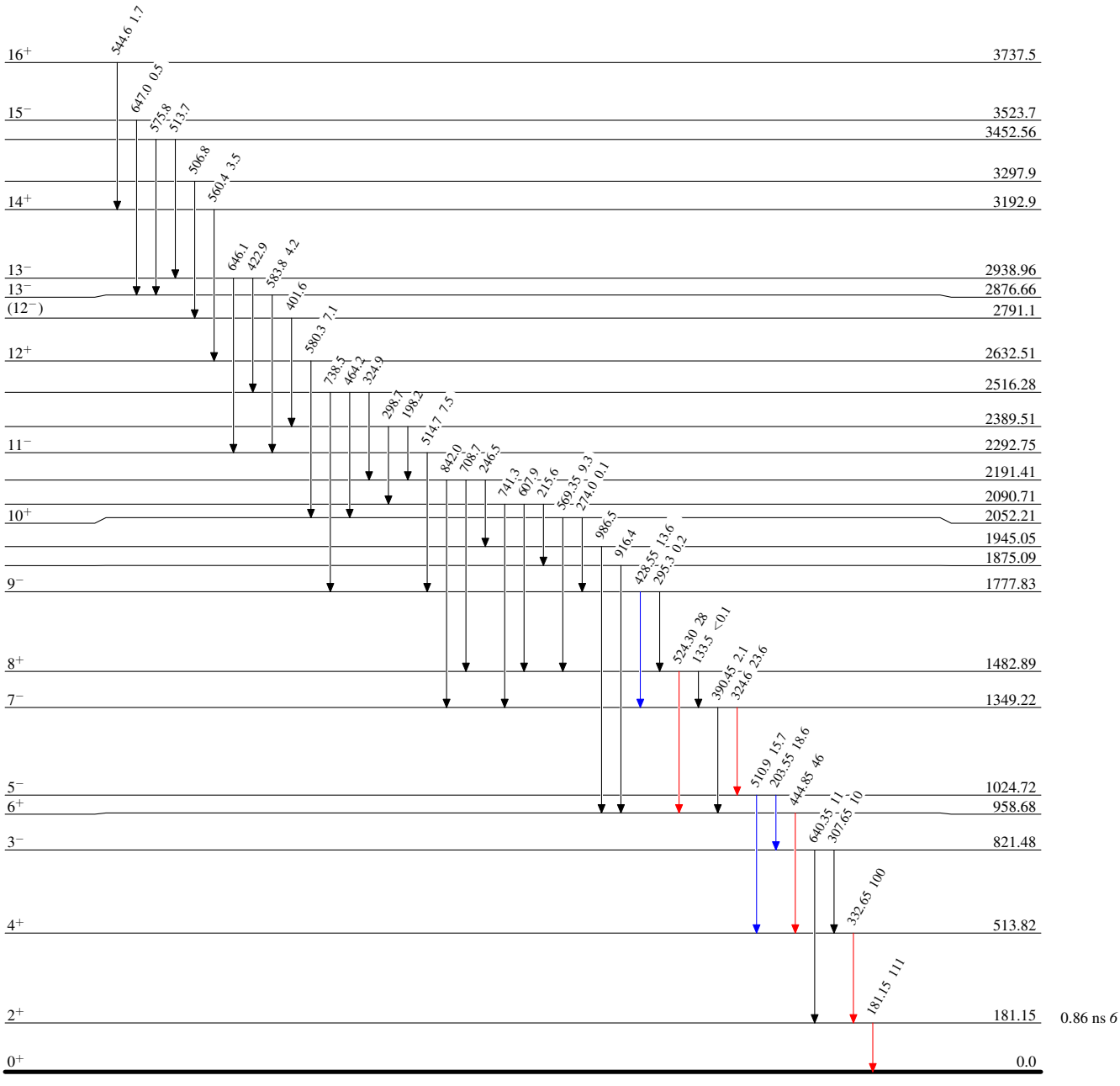
Intensities: Relative I_γ

Legend

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

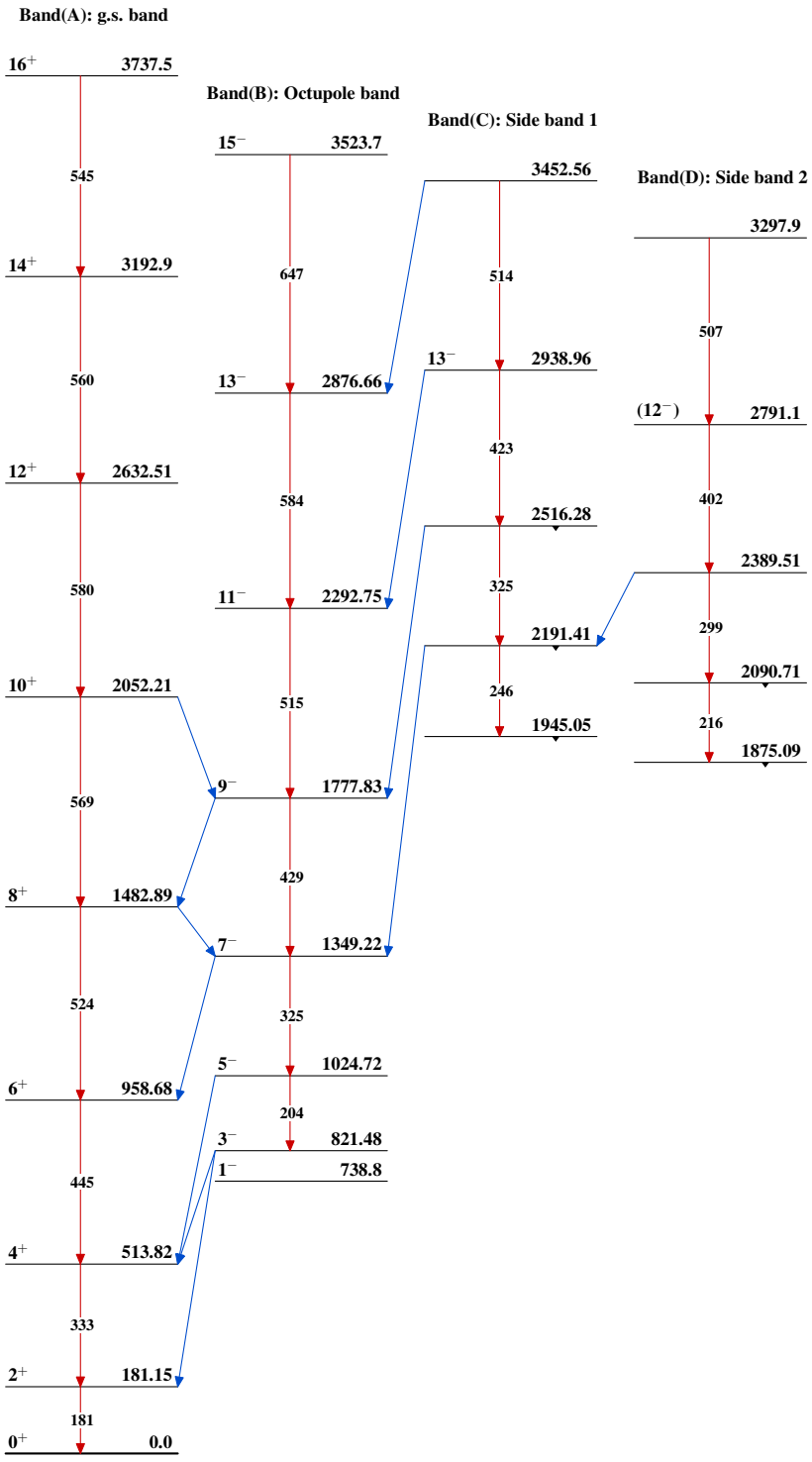
$I_\gamma < 10\% \times I_\gamma^{max}$

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



$^{146}_{56}Ba_{90}$

^{252}Cf SF decay 2001Ha14,2009Go09



$^{146}_{56}Ba_{90}$