^{252}Cf,^{248}Cm SF decay 1999Zh31

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 113, 715 (2012)	31-May-2011

Parent: ^{252}Cf: E=0.0; $J^\pi=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=3.092 *8*

Parent: ^{248}Cm: E=0.0; $J^\pi=0^+$; $T_{1/2}=3.48\times10^5$ y *6*; %SF decay=8.39 *16*

^{252}Cf SF decay:

1999Zh31(same group as 1999Ha10,2000HaZW,2000HaZV): Measured Eγ, $\gamma\gamma$, and Iγ using Gammasphere array of 72 Compton-suppressed Ge detectors.

1995Zh34 (same group as 1999Zh31): ORNL 20 Compton-suppressed Ge array and Gammasphere with 36 Ge and 1 LEPS. ^{242}Pu, ^{252}Cf sources. Measured $\gamma\gamma$, $\gamma\gamma\gamma$. Presumably preliminary results also presented in 1999HaZV, 1999Ha10, 1998HaZX, 1998HaZW, 1997Zh25, 1997Ha64, 1996Ha27, 1995ZhZW.

1999Sm05,1999SmZX: Measured $\gamma(\theta,t)$, g-factor, $T_{1/2}$.

^{248}Cm SF decay:

1996Jo14,1997AhZZ: Measured γ, ce, $\gamma\gamma$, $\gamma\gamma\gamma$, DCO, linear polarization with Eurogam2. 52 Compton-shielded Ge detectors and 4 LEPS detectors. γ-rays assigned by x-ray coin and coin with gammas from fission-fragment pair Zr isotopes.

^{143}Ba Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0[#]	$5/2^-$		
117.7[#] *5*	$9/2^-$	2.6 ns *8*	g=0.10 *6* (1999Sm05) $T_{1/2}$: from 1999Sm05.
461.0[#] *6*	$13/2^-$		
716.6[&] *6*	$11/2^-$		
954.1[#] *6*	$17/2^-$		
1067.1[@] *7*	$15/2^+$		
1178.3[a] *7*	$13/2^+$		
1232.3[&] *6*	$15/2^-$		
1410.8[@] *7*	$19/2^+$		
1525.8[a] *6*	$17/2^+$		
1579.8[#] *7*	$21/2^-$		
1800.5[&] *7*	$19/2^-$		
1880.3[@] *7*	$23/2^+$		
2007.7[a] *7*	$21/2^+$		
2271.5[#] *7*	$25/2^-$		
2425.9[&] *7*	$23/2^-$		
2474.1[@] *7*	$27/2^+$		
2586.8[a] *7*	$25/2^+$		
2998.8[#] *8*	$29/2^-$		
3165.8[@] *8*	$31/2^+$		
3201.3[a] *8*	$29/2^+$		
3859.0[a] *9*	$33/2^+$		
3944.6[@] *10*	$35/2^+$		

[†] From a least-squares fit to γ-ray energies.

[‡] As given by the authors (1999Zh31,1996Jo14) based on γ-ray multipolarities and band assignments. Multipolarities were determined from DCO, linear pol, assuming stretched Q to be E2 intra-band transitions and the inter-band stretched D to be E1.

[#] Band(A): Band based on $5/2^-$ g.s. Interpreted as negative parity members of s=−i band.

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^{252}Cf,^{248}Cm SF decay 1999Zh31 (continued)

^{143}Ba Levels (continued)

[@] Band(B): Band based on $15/2^+$. Interpreted as positive parity members of s=−i band.
[&] Band(C): Band based on $11/2^-$. Interpreted as negative parity members of s=+i band.
[a] Band(D): Band based on $13/2^+$. Interpreted as positive parity members of s=+i band.

γ(^{143}Ba)

E_γ[#]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[†]	Comments
117.7 *3*	5	117.7	$9/2^-$	0.0	$5/2^-$	E2	1.082 *18*	α(K)exp=0.53 (1996Jo14); α(exp)=1.10 *10* (1996Jo14) B(E2)(W.u.)=1.0×10^2 *4* α(K)=0.734 *12*; α(L)=0.274 *5*; α(M)=0.0597 *11*; α(N+..)=0.0141 *3* α(N)=0.01242 *23*; α(O)=0.00166 *3*; α(P)=3.49×10^{-5} *6*
160.9 *5*		2586.8	$25/2^+$	2425.9	$23/2^-$			
167.0 *5*		3165.8	$31/2^+$	2998.8	$29/2^-$			
169.0 *5*	1.5	1579.8	$21/2^-$	1410.8	$19/2^+$			
202.6 *5*	2.5	2474.1	$27/2^+$	2271.5	$25/2^-$	D		
207.2 *5*	1.5	2007.7	$21/2^+$	1800.5	$19/2^-$			
274.7[@] *5*		1800.5	$19/2^-$	1525.8	$17/2^+$			
293.5 *3*	7	1525.8	$17/2^+$	1232.3	$15/2^-$	E1	0.01207	α(K)=0.01039 *15*; α(L)=0.001333 *19*; α(M)=0.000273 *4*; α(N+..)=6.80×10^{-5} *10* α(N)=5.85×10^{-5} *9*; α(O)=8.84×10^{-6} *13*; α(P)=6.05×10^{-7} *9*
300.5 *3*	13	1880.3	$23/2^+$	1579.8	$21/2^-$	E1	0.01135	α(K)=0.00978 *14*; α(L)=0.001253 *18*; α(M)=0.000257 *4*; α(N+..)=6.39×10^{-5} *10* α(N)=5.50×10^{-5} *8*; α(O)=8.31×10^{-6} *12*; α(P)=5.70×10^{-7} *9*
343.3 *3*	100	461.0	$13/2^-$	117.7	$9/2^-$	E2	0.0296	α(K)=0.0244 *4*; α(L)=0.00417 *6*; α(M)=0.000876 *13*; α(N+..)=0.000214 *3* α(N)=0.000186 *3*; α(O)=2.70×10^{-5} *4*; α(P)=1.408×10^{-6} *20*
343.7 *5*	3	1410.8	$19/2^+$	1067.1	$15/2^+$			
347.5 *5*	3	1525.8	$17/2^+$	1178.3	$13/2^+$			
389.7 *5*	3.5	1800.5	$19/2^-$	1410.8	$19/2^+$			
391.2 *5*	4	2271.5	$25/2^-$	1880.3	$23/2^+$			
418.2 *5*	0.2	2425.9	$23/2^-$	2007.7	$21/2^+$			
428 *5*		2007.7	$21/2^+$	1579.8	$21/2^-$			
456.7 *3*	19	1410.8	$19/2^+$	954.1	$17/2^-$	E1	0.00402 *6*	α=0.00402 *6*; α(K)=0.00347 *5*; α(L)=0.000438 *7*; α(M)=8.97×10^{-5} *13*; α(N+..)=2.24×10^{-5} *4* α(N)=1.93×10^{-5} *3*; α(O)=2.93×10^{-6} *5*; α(P)=2.07×10^{-7} *3*
458.7 *5*	0.8	1525.8	$17/2^+$	1067.1	$15/2^+$			
461.7 *5*	3	1178.3	$13/2^+$	716.6	$11/2^-$			
469.5 *3*	11.5	1880.3	$23/2^+$	1410.8	$19/2^+$	E2	0.01174	α(K)=0.00984 *14*; α(L)=0.001510 *22*; α(M)=0.000315 *5*; α(N+..)=7.77×10^{-5} *11* α(N)=6.72×10^{-5} *10*; α(O)=9.92×10^{-6} *14*; α(P)=5.89×10^{-7} *9*
481.9 *3*	10	2007.7	$21/2^+$	1525.8	$17/2^+$	E2	0.01092	α(K)=0.00916 *13*; α(L)=0.001394 *20*; α(M)=0.000291 *5*; α(N+..)=7.18×10^{-5} *11* α(N)=6.20×10^{-5} *9*; α(O)=9.18×10^{-6} *13*; α(P)=5.49×10^{-7} *8*
493.1 *3*	62	954.1	$17/2^-$	461.0	$13/2^-$	E2	0.01024	α(K)=0.00860 *13*; α(L)=0.001301 *19*; α(M)=0.000271 *4*; α(N+..)=6.69×10^{-5} *10*

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^{252}Cf,^{248}Cm SF decay 1999Zh31 (continued)

γ(^{143}Ba) (continued)

E_γ[#]	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α[†]	Comments
								α(N)=5.79×10^{-5} *9*; α(O)=8.57×10^{-6} *12*; α(P)=5.17×10^{-7} *8*
515.7 *5*	2	1232.3	15/2$^-$	716.6	11/2$^-$			
524.7 *5*	1.0	2998.8	29/2$^-$	2474.1	27/2$^+$			
568.2 *5*	2	1800.5	19/2$^-$	1232.3	15/2$^-$			
571.7 *5*	1	1525.8	17/2$^+$	954.1	17/2$^-$			
579.1 *5*	5	2586.8	25/2$^+$	2007.7	21/2$^+$	E2	0.00664 *10*	α=0.00664 *10*; α(K)=0.00562 *8*; α(L)=0.000814 *12*; α(M)=0.0001689 *24*; α(N+..)=4.19×10^{-5} *6* α(N)=3.62×10^{-5} *6*; α(O)=5.40×10^{-6} *8*; α(P)=3.41×10^{-7} *5*
593.8 *3*	7.5	2474.1	27/2$^+$	1880.3	23/2$^+$	E2	0.00622 *9*	α=0.00622 *9*; α(K)=0.00527 *8*; α(L)=0.000759 *11*; α(M)=0.0001574 *23*; α(N+..)=3.90×10^{-5} *6* α(N)=3.37×10^{-5} *5*; α(O)=5.03×10^{-6} *7*; α(P)=3.20×10^{-7} *5*
596.9 *5*	1.2	2007.7	21/2$^+$	1410.8	19/2$^+$			
598.9 *3*	12	716.6	11/2$^-$	117.7	9/2$^-$			
606.1 *3*	5.2	1067.1	15/2$^+$	461.0	13/2$^-$	E1	0.00211 *3*	α=0.00211 *3*; α(K)=0.00183 *3*; α(L)=0.000228 *4*; α(M)=4.66×10^{-5} *7*; α(N+..)=1.167×10^{-5} *17* α(N)=1.003×10^{-5} *14*; α(O)=1.530×10^{-6} *22*; α(P)=1.101×10^{-7} *16*
614.5 *5*	2	3201.3	29/2$^+$	2586.8	25/2$^+$			
625.4 *5*	1	2425.9	23/2$^-$	1800.5	19/2$^-$			
625.7 *3*	20	1579.8	21/2$^-$	954.1	17/2$^-$	E2	0.00544 *8*	α=0.00544 *8*; α(K)=0.00461 *7*; α(L)=0.000656 *10*; α(M)=0.0001360 *20*; α(N+..)=3.38×10^{-5} *5* α(N)=2.91×10^{-5} *4*; α(O)=4.36×10^{-6} *7*; α(P)=2.82×10^{-7} *4*
657.7 *5*	1	3859.0	33/2$^+$	3201.3	29/2$^+$			
691.7 *3*	8	2271.5	25/2$^-$	1579.8	21/2$^-$	E2	0.00423 *6*	α=0.00423 *6*; α(K)=0.00360 *5*; α(L)=0.000502 *7*; α(M)=0.0001038 *15*; α(N+..)=2.58×10^{-5} *4* α(N)=2.23×10^{-5} *4*; α(O)=3.35×10^{-6} *5*; α(P)=2.21×10^{-7} *4*
691.7 *5*	3.5	3165.8	31/2$^+$	2474.1	27/2$^+$			
706.5 *5*	0.3	2586.8	25/2$^+$	1880.3	23/2$^+$			
717.3[@] *5*		1178.3	13/2$^+$	461.0	13/2$^-$			
727.2 *5*	0.2	3201.3	29/2$^+$	2474.1	27/2$^+$			
727.3 *5*	1.5	2998.8	29/2$^-$	2271.5	25/2$^-$			
771.3 *3*	15	1232.3	15/2$^-$	461.0	13/2$^-$	M1	0.00459 *7*	α=0.00459 *7*; α(K)=0.00396 *6*; α(L)=0.000502 *7*; α(M)=0.0001029 *15*; α(N+..)=2.59×10^{-5} *4* α(N)=2.22×10^{-5} *4*; α(O)=3.42×10^{-6} *5*; α(P)=2.55×10^{-7} *4*
778.8 *5*	2	3944.6	35/2$^+$	3165.8	31/2$^+$			
846.1 *5*	4	2425.9	23/2$^-$	1579.8	21/2$^-$			
846.4 *3*	5	1800.5	19/2$^-$	954.1	17/2$^-$	M1	0.00368 *6*	α=0.00368 *6*; α(K)=0.00318 *5*; α(L)=0.000402 *6*; α(M)=8.24×10^{-5} *12*; α(N+..)=2.07×10^{-5} *3* α(N)=1.780×10^{-5} *25*; α(O)=2.74×10^{-6} *4*; α(P)=2.04×10^{-7} *3*

[†] Additional information 1.
[‡] From DCO ratio, internal conversion (117γ), and γ polarization measurements (1996Jo14). Quadrupoles were assigned E2 by rotational band placement, and dipoles were assigned E1 or M1 by polarization measurements and level scheme considerations.
[#] Δ(Eγ) set to 0.3 keV for Iγ>5 and 0.5 keV for Iγ<5 for least-squares fitting.
[@] Placement of transition in the level scheme is uncertain.

^{252}Cf,^{248}Cm SF decay 1999Zh31

Level Scheme

Intensities: Type not specified

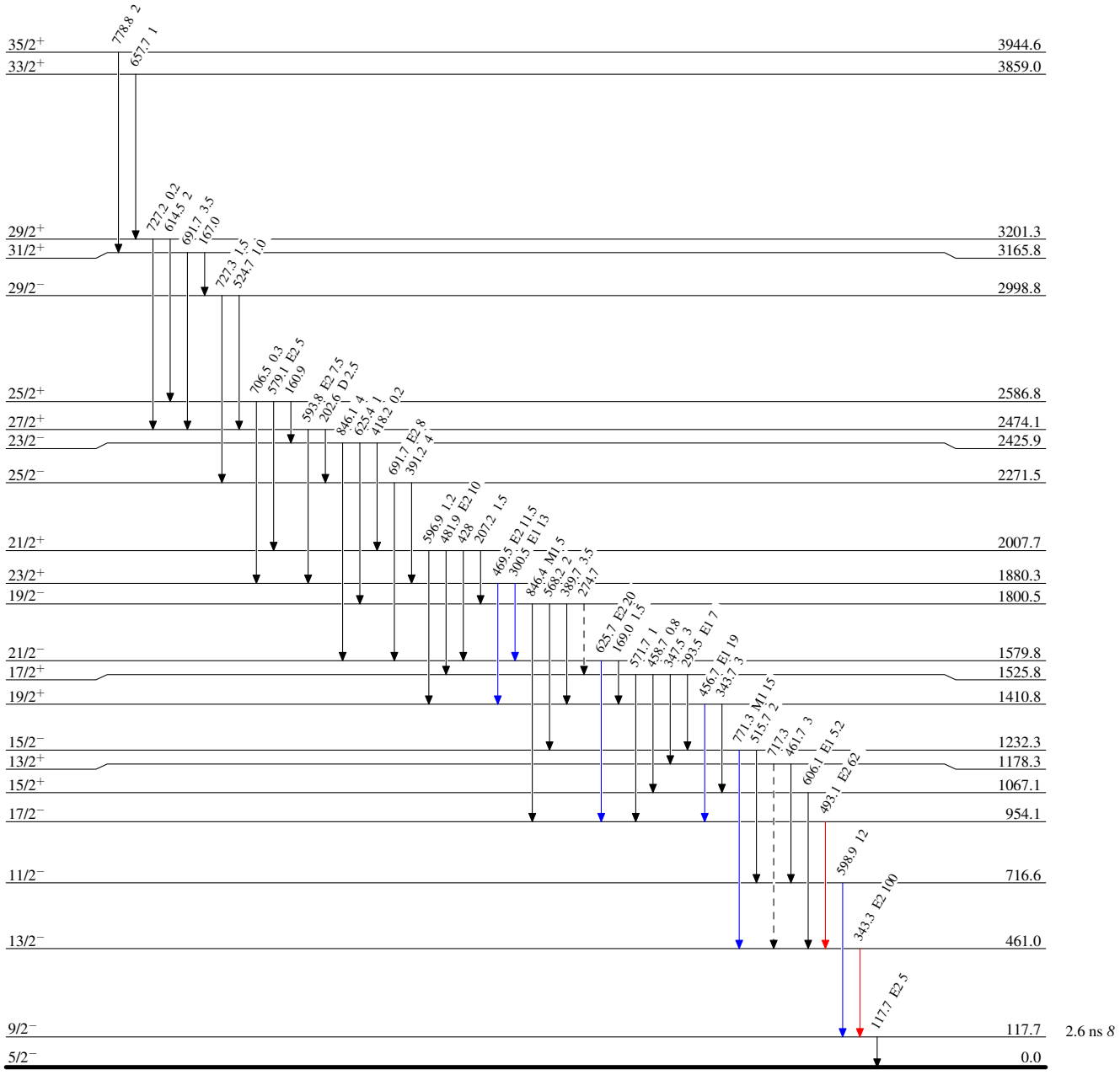
Legend

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

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

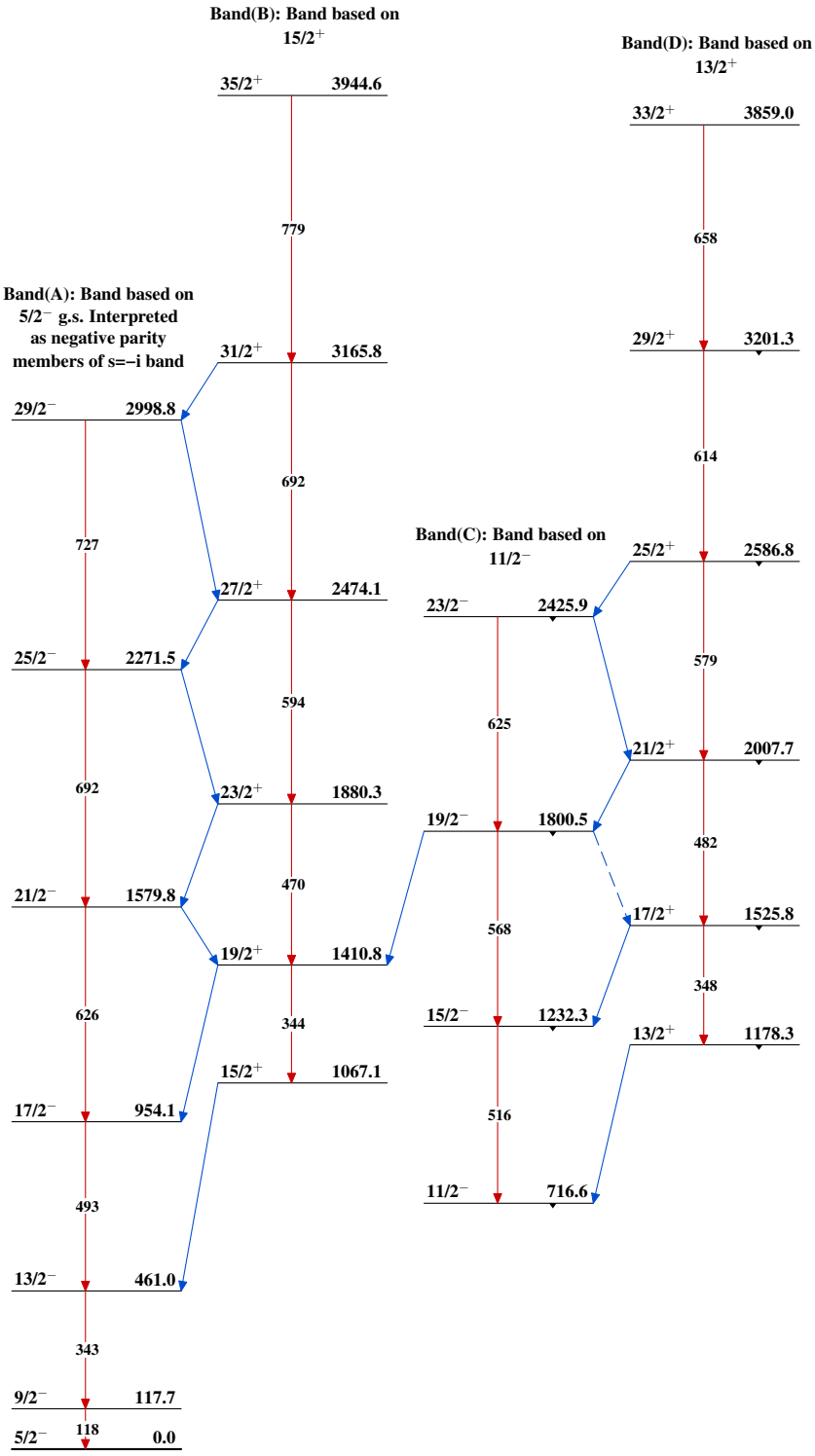
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{143}_{56}Ba_{87}$

^{252}Cf,^{248}Cm SF decay 1999Zh31



$^{143}_{56}Ba_{87}$