^{252}Cf SF decay 1996Ba34

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 185, 2 (2022)	23-Aug-2022

Parent: ^{252}Cf: E=0; $J^\pi=0^+$; $T_{1/2}$=2.647 y *3*; %SF decay=3.102 *3*

^{252}Cf-$T_{1/2}$: From ^{252}Cf Adopted Levels in the ENSDF database (Jan 2021 update).

^{252}Cf-%SF decay: %SF=3.102 *3* for ^{252}Cf decay.

1996Ba34: Measured Eγ, Iγ, γγ using Gammasphere array with with 36 Ge detectors at LBNL.

Others: 1974ClZX (also 1973ClZV,1972ClZN): measured γ, $T_{1/2}$ in 6-parameter coin. experiment. Mass assignment of γ rays is within one unit (148-150) (1974ClZX). Fission fragment isomers populated before β decay in deexcitation of fission fragments observed through (x-ray)γ and γγ coincidences. Mass assignments, energies, lifetimes measured in 6-parameter experiment using a Ge(Li) and a Si(Li) detector.

1971Ho29 (also 1969WiZX). Measured γ.

The level scheme and band structures proposed by 1996Ba34 are extensively revised by 2002Sy01, based on their ^{149}La β^- decay study. These revisions are incorporated in the Adopted Levels, Gammas.

^{149}Ce Levels

E(level)[†]	J^π[‡]	Comments
0	(3/2$^-$)	J^π: from the Adopted Levels.
0+x	(5/2$^+$)	E(level): 142.6 in the Adopted Levels. Additional information 1.
135.3 *3*	(5/2$^-$)	E(level): 135.3γ placed from 190.9, (9/2$^+$) level in the Adopted dataset.
142.2+x *3*	(9/2$^+$)	E(level): 142.6γ placed from 142.6, (5/2$^+$) level in the Adopted dataset.
151.8 *4*	(7/2$^-$)	E(level): 206.7, (9/2$^+$) in the Adopted Levels.
280.7[@] *4*	(9/2$^-$)	E(level): 335.7, (11/2$^+$) in the Adopted Levels.
282.8+x[#] *5*	(13/2$^+$)	E(level): 347.0, (13/2$^+$) in the Adopted Levels.
524.1+x[#] *6*	(17/2$^+$)	E(level): 588.4, (17/2$^+$) in the Adopted Levels.
533.2[@] *5*	(13/2$^-$)	E(level): 588.0, (15/2$^+$) in the Adopted Levels.
866.7+x[#] *6*	(21/2$^+$)	E(level): 931.6, (21/2$^+$) in the Adopted Levels.
890.4[@] *6*	(17/2$^-$)	E(level): 945.2, (19/2$^+$) in the Adopted Levels.
1297.4+x[#] *7*	(25/2$^+$)	E(level): 1362.7, (25/2$^+$) in the Adopted Levels.
1340.8[@] *7*	(21/2$^-$)	E(level): 1395.6, (23/2$^+$) in the Adopted Levels.
1798.9+x[#] *8*	(29/2$^+$)	E(level): 1864.7, (29/2$^+$) in the Adopted Levels.
1868.5[@] *8*	(25/2$^-$)	E(level): 1923.5, (27/2$^+$) in the Adopted Levels.
2355.4+x[#] *8*	(33/2$^+$)	E(level): 2421.9, (33/2$^+$) in the Adopted Levels.
2455.9[@] *8*	(29/2$^-$)	E(level): 2510.5, (31/2$^+$) in the Adopted Levels.
2951.4+x[#] *9*	(37/2$^+$)	E(level): 3018.1, (37/2$^+$) in the Adopted Levels.
3087.2[@] *9*	(33/2$^-$)	E(level): 3141.8, (35/2$^+$) in the Adopted Levels.
3568.9+x[#] *9*	(41/2$^+$)	E(level): 3635.6, (41/2$^+$) in the Adopted Levels.

[†] From least-squares fit to Eγ data assuming ΔEγ=0.3 keV. In 2012Ur04 and 2002Sy01, all the positive-parity states are built on a 142.6 level with 64.0 → 142.6 cascade from a 206.6 level (x=64.0 for states above 206.9), and all the excited negative-parity states on a 55.0 level. The low-lying level structure from ^{149}La β^- decay (2002Sy01) differs substantially from that in 1996Ba34.

[‡] As proposed by 1996Ba34; based on band assignments.

[#] Band(A): $\nu i_{13/2}$. See Adopted Levels for dominant 3/2[651] assignment by 2002Sy01.

[@] Band(B): $\nu h_{9/2}$. Negative-parity band is suggested in 1996Ba34, but positive-parity band in he Adopted Levels from 2012Ur04, with ν3/2[651] configuration.

^{252}Cf SF decay 1996Ba34 (continued)

$\gamma(^{149}Ce)$

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Comments
(16.5)		151.8	(7/2$^-$)	135.3	(5/2$^-$)	
128.9	5.9	280.7	(9/2$^-$)	151.8	(7/2$^-$)	
135.3	81	135.3	(5/2$^-$)	0	(3/2$^-$)	Other: Eγ=135.6 *2*, Iγ/100 fissions=0.293 *17* (1974ClZX,1973ClZV). $T_{1/2}$=3.5 ns *5* (1974ClZX) for 135.3γ is proposed (2003Sy01) as half-life of 206.6 level.
140.6	145	282.8+x	(13/2$^+$)	142.2+x	(9/2$^+$)	
142.2	100	142.2+x	(9/2$^+$)	0+x	(5/2$^+$)	Other: Eγ=142.2 *2*, Iγ/100 fissions=0.303 *18*(1974ClZX,1973ClZV). γ also reported by 1971Ho29. $T_{1/2}$=3.9 ns *5* (1974ClZX) for 142.2γ is proposed (2003Sy01) as half-life of 206.6 level.
145.4	21	280.7	(9/2$^-$)	135.3	(5/2$^-$)	
241.3	80	524.1+x	(17/2$^+$)	282.8+x	(13/2$^+$)	
252.5	75	533.2	(13/2$^-$)	280.7	(9/2$^-$)	
342.6	56	866.7+x	(21/2$^+$)	524.1+x	(17/2$^+$)	
357.2	50	890.4	(17/2$^-$)	533.2	(13/2$^-$)	
430.7	32	1297.4+x	(25/2$^+$)	866.7+x	(21/2$^+$)	
450.4	31	1340.8	(21/2$^-$)	890.4	(17/2$^-$)	
501.5	15	1798.9+x	(29/2$^+$)	1297.4+x	(25/2$^+$)	
527.7	14	1868.5	(25/2$^-$)	1340.8	(21/2$^-$)	
556.5	4.3	2355.4+x	(33/2$^+$)	1798.9+x	(29/2$^+$)	
587.4	3	2455.9	(29/2$^-$)	1868.5	(25/2$^-$)	
596.0	2.1	2951.4+x	(37/2$^+$)	2355.4+x	(33/2$^+$)	
617.5	1.0	3568.9+x	(41/2$^+$)	2951.4+x	(37/2$^+$)	E_γ: this γ was not seen consistently in $\gamma\gamma$-coin data in ^{248}Cm SF decay (2012Ur04).
631.3	1.1	3087.2	(33/2$^-$)	2455.9	(29/2$^-$)	E_γ: this γ was not seen in ^{248}Cm SF decay (2012Ur04).

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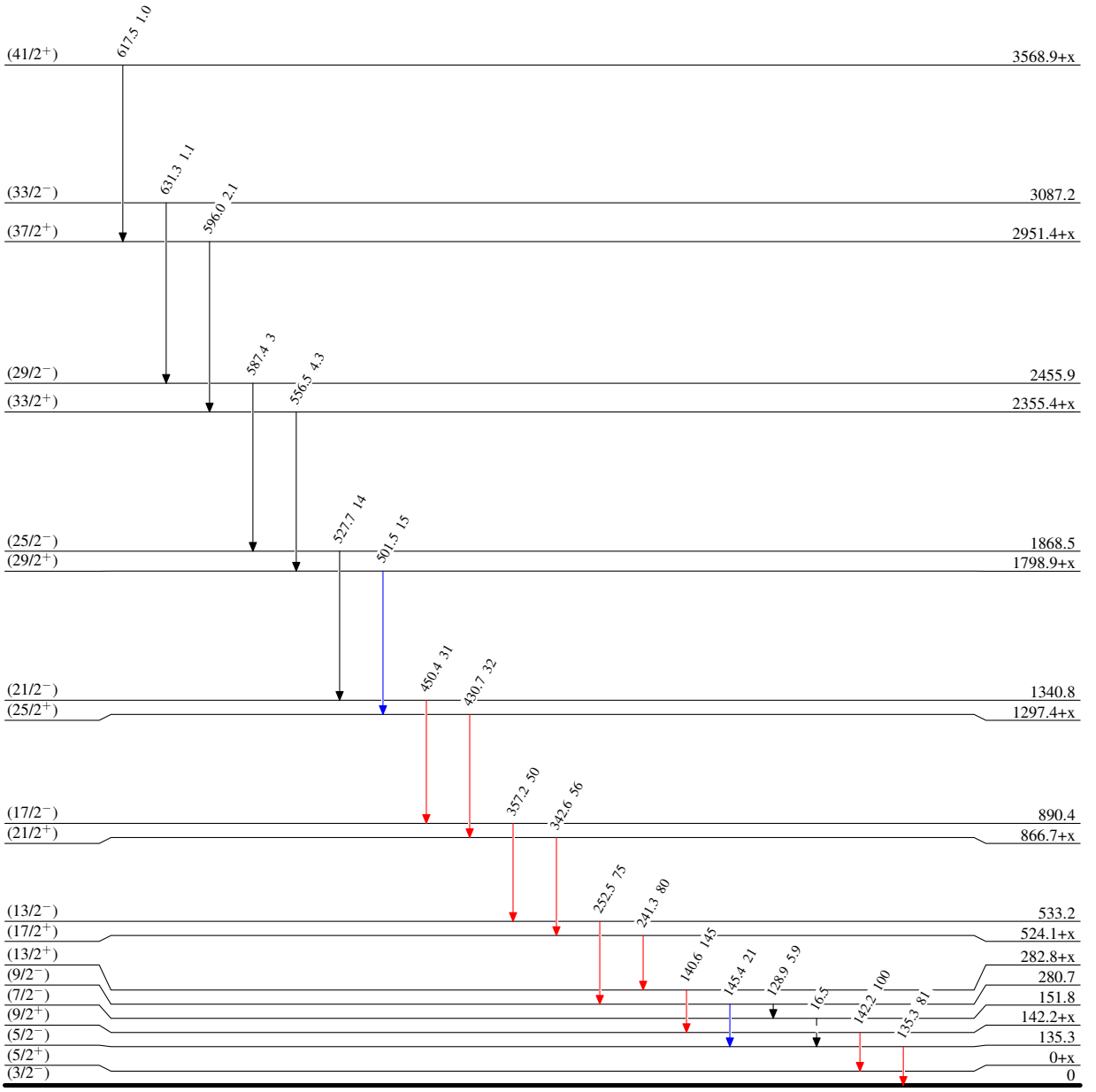
Level Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$
γ Decay (Uncertain)



$^{149}_{58}Ce_{91}$

^{252}Cf SF decay 1996Ba34

$^{149}_{58}Ce_{91}$