^{248}Cm SF decay 2001Ur01

History

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

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

^{248}Cm-$T_{1/2}$: From ^{248}Cm Adopted Levels in the ENSDF database.

^{248}Cm-%SF decay: %SF=8.39 *16* for ^{248}Cm decay from ^{248}Cm Adopted Levels in the ENSDF database.

2001Ur01: ^{248}Cm source was 5 mg of curium oxide embedded in a pellet of potassium chloride (KCl). γ rays were detected with the EUROGAM2 array of 52 large Ge detectors in anti-Compton shields, 24 four-crystal Clover detectors, and 4 LEPS detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma(\theta)$, $\gamma\gamma(\theta)$(DCO), γ(lin pol). Deduced levels, J, π, band structures. See also 1997Ur02.

2012Sm02: measured Eγ, multi-fold $\gamma\gamma$-coin, Doppler-broadened lineshapes, level lifetimes using EUROGAM-2 array.

All data are from 2001Ur01, unless otherwise noted.

^{98}Zr Levels

E(level)[†]	J^π[@]	$T_{1/2}$[&]	Comments
0.0[a]	0^+		
853.1[c] *4*	0^+		
1222.68[a] *25*	2^+		
1435.9[‡d]	0^+		
1590.34[‡c] *25*	2^+		
1743.7[‡d]	2^+		
1805.9[b] *3*	3^-		
1843.0[c] *3*	4^+		
2047.3[a] *3*	4^+		
2277.4[d] *4*	4^+		
2490.1[c] *4*	6^+		
2799.8[b] *3*	(5^-)		
3064.0[a] *3*			
3117.0[d] *4*	(6^+)		
3215.3[c] *5*	8^+	1.95 ps *47*	$T_{1/2}$: statistical uncertainty=0.43 ps, systematic uncertainty=0.19 ps.
3249.0 *5*			
3336.0 *4*			
3576.0[a] *4*			
3591.8[b] *5*			
3811.1[d] *5*			
3893.0 *6*			
3984.3[c] *6*	(10^+)	1.42 ps *34*	$T_{1/2}$: statistical uncertainty=0.30 ps, systematic uncertainty=0.14 ps.
4198.8[a] *5*			
4291.1 *5*	(8)[#]		
4544			
4754.3 *7*			
4821.3?[c] *7*	(12^+)		Level questioned by the evaluators, due to a different placement of 837γ, and not listed in the Adopted Levels, Gammas dataset.

[†] From least-squares fit to Eγ data, assuming ΔEγ=0.3 keV for each γ ray.

[‡] Level included from literature (2001Ur01).

[#] (5,6) in Adopted Levels.

[@] As proposed by 2001Ur01.

[&] From Doppler-broadened lineshapes (2012Sm02).

[a] Seq.(B): γ cascade based on g.s.

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2001Ur01 (continued)

^{98}Zr Levels (continued)

[b] Seq.(C): γ cascade based on 3^-.
[c] Band(A): Band based on 853, 0^+. Q(intrinsic)=2.00 *10* (2001Ur01) from lifetime data for 12^+, 10^+ and 8^+ states.
[d] Seq.(D): γ cascade based on 1436, 0^+.

γ(^{98}Zr)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	Comments
204.1	3 *1*	2047.3	4^+	1843.0	4^+		A_2=+0.2 *1*; A_4=0.0 *6*
241.5	14 *2*	2047.3	4^+	1805.9	3^-		
252.5	3 *1*	1843.0	4^+	1590.34	2^+		
253[‡]		4544		4291.1	(8)		
369.6	0.9 *3*	1222.68	2^+	853.1	0^+		
449.2	0.7 *3*	3249.0		2799.8	(5^-)		
457.2	3 *1*	2047.3	4^+	1590.34	2^+		
512.0	1.0 *5*	3576.0		3064.0			
583.2	31 *2*	1805.9	3^-	1222.68	2^+	E1	A_2=−0.08 *1*; A_4=−0.01 *1*; pol=+0.08 *3*
620.4	58 *3*	1843.0	4^+	1222.68	2^+	E2	A_2=+0.09 *1*; A_4=−0.03 *1*; pol=+0.15 *4*
622.8	0.8 *4*	4198.8		3576.0			
647.1	36 *2*	2490.1	6^+	1843.0	4^+	E2	A_2=+0.08 *1*; A_4=−0.01 *1*; pol=+0.11 *4*
677.7	4 *1*	3893.0		3215.3	8^+		
687[‡#]		2277.4	4^+	1590.34	2^+		
694.3[‡]		3811.1		3117.0	(6^+)		
725.2	17 *2*	3215.3	8^+	2490.1	6^+	E2	A_2=+0.014 *3*; A_4=+0.04 *2*; pol=+0.18 *8*
752.3	6 *1*	2799.8	(5^-)	2047.3	4^+		
769.0	8 *3*	3984.3	(10^+)	3215.3	8^+		
770.0	4 *2*	4754.3		3984.3	(10^+)		
776.2	2 *1*	3576.0		2799.8	(5^-)		
792.0	1.0 *5*	3591.8		2799.8	(5^-)		
824.5	5 *1*	2047.3	4^+	1222.68	2^+	Q	DCO=0.84 *12*
837.0	6 *2*	4821.3?	(12^+)	3984.3	(10^+)		E_γ: this γ should be placed from a 5590, (14^+) level, as in 2006Si36 and in the Adopted Levels, Gammas.
839.6[‡]		3117.0	(6^+)	2277.4	4^+		
846[#]	4 *2*	3336.0		2490.1	6^+		
957.0	3 *1*	2799.8	(5^-)	1843.0	4^+		
994.0	3 *1*	2799.8	(5^-)	1805.9	3^-		A_2=−0.93 *4*; A_4=+0.07 *5* Negative A_2 is inconsistent with expected E2 transition from (5^-) to 3^- level.
1016.7	2 *1*	3064.0		2047.3	4^+		
1054.7	6 *1*	2277.4	4^+	1222.68	2^+		A_2=+0.21 *8*; A_4=+0.04 *4*
1221.1	3 *1*	3064.0		1843.0	4^+		
1222.6	100 *5*	1222.68	2^+	0.0	0^+		
1258.0	4 *1*	3064.0		1805.9	3^-		
1274.0	1.0 *5*	3117.0	(6^+)	1843.0	4^+	Q	DCO=0.90 *4*
1321.0	3 *1*	3811.1		2490.1	6^+		
1493.0	2 *1*	3336.0		1843.0	4^+		
1590.4		1590.34	2^+	0.0	0^+		
1801.0	2 *1*	4291.1	(8)	2490.1	6^+		

[†] For the geometry of the detectors used by 2001Ur01, DCO(calculated)=0.89 for ΔJ=2, Q; 1.09 for ΔJ=1, dipole and 0.81 for ΔJ=0, dipole. POL(calculated)=+0.14 for ΔJ=2, E2; +0.09 for ΔJ=1, E1; −0.09 for ΔJ=1, M1; −0.25 for ΔJ=0, E1 and +0.25 for ΔJ=0, M1.
[‡] From Fig. 4 of 2001Ur01.
[#] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: Relative I_γ

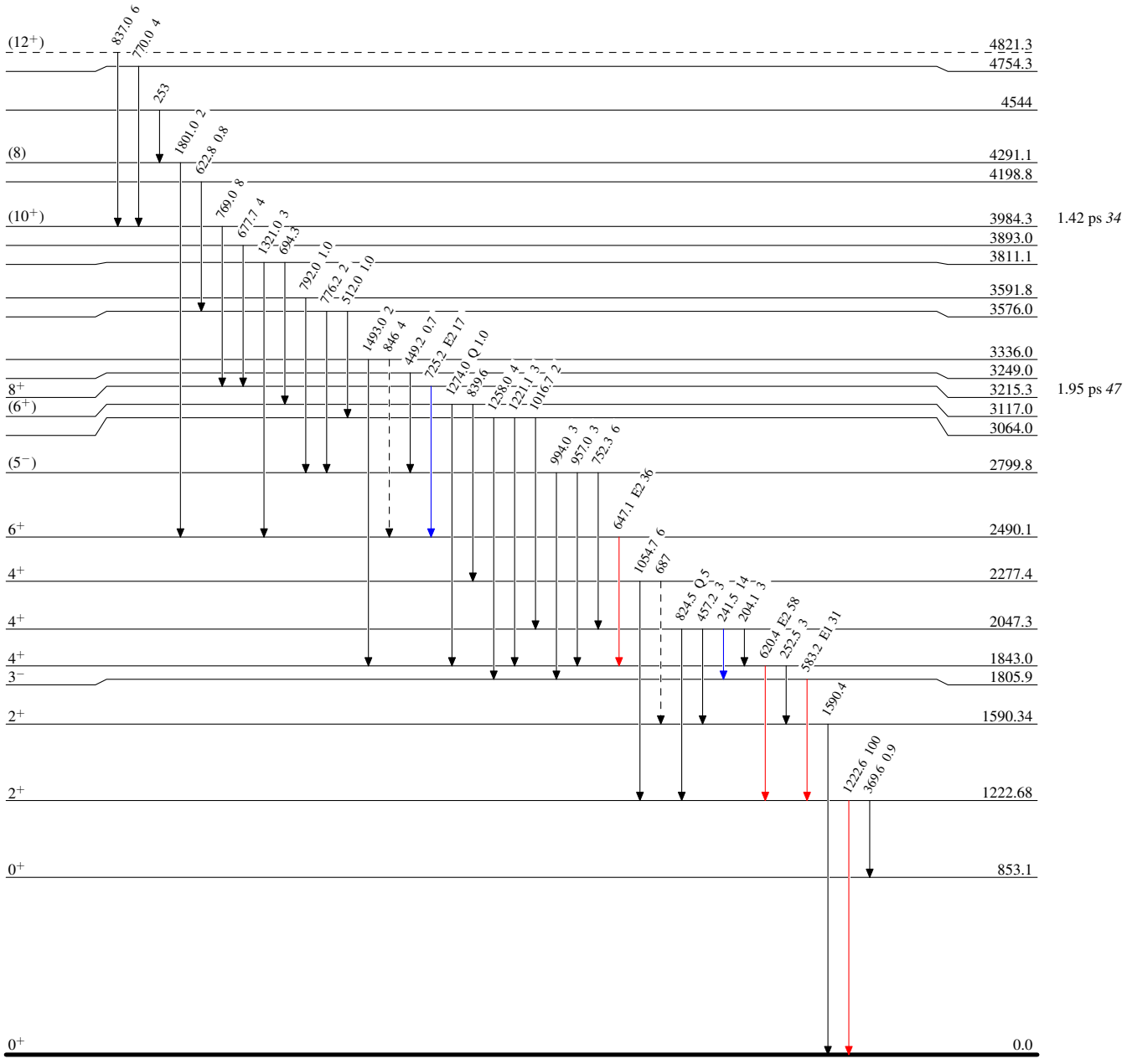
Legend

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

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

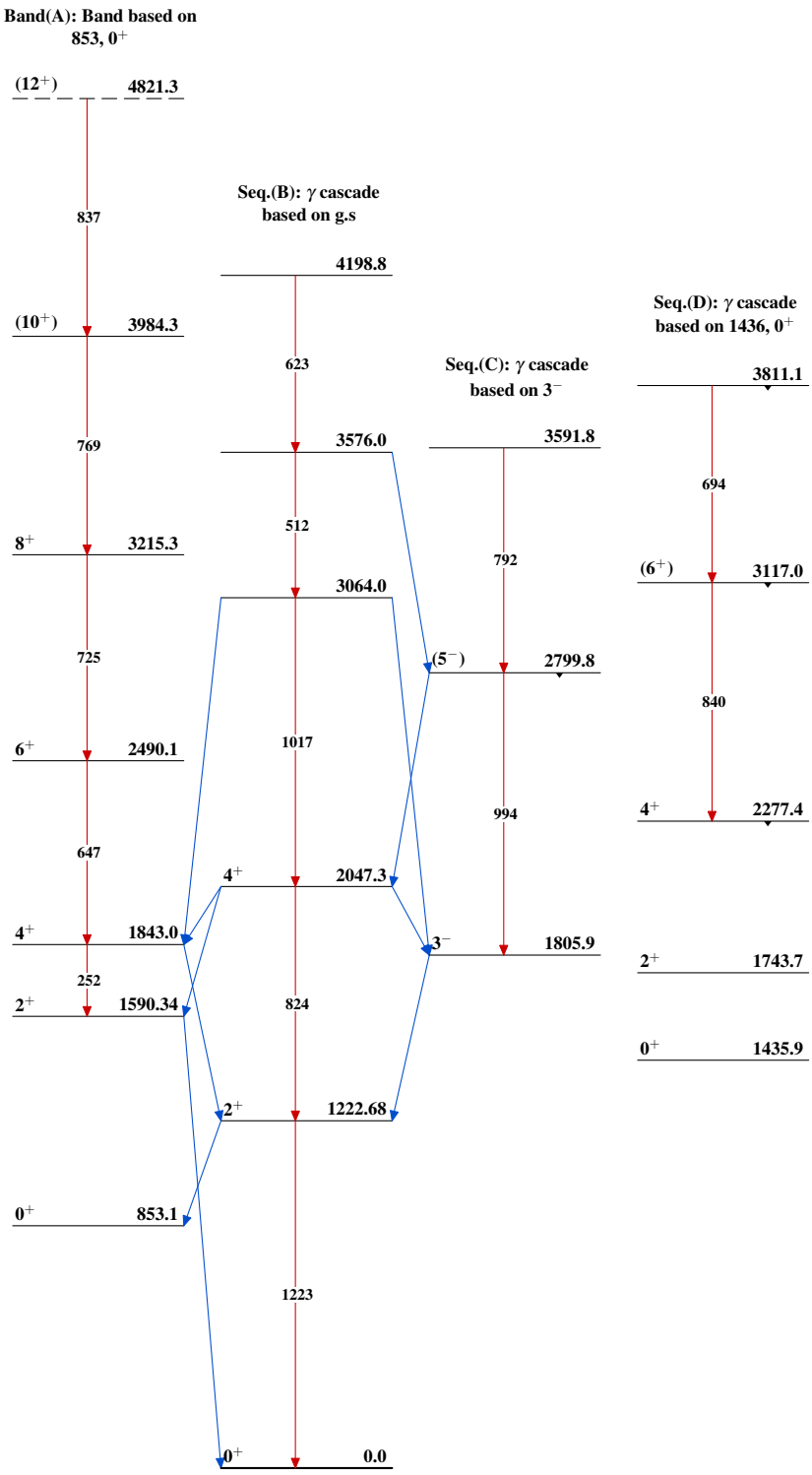
$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{98}_{40}Zr_{58}$

^{248}Cm SF decay 2001Ur01



$^{98}_{40}Zr_{58}$