^{248}Cm SF decay 2002Ur02

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	P. K. Joshi, B. Singh, S. Singh, A. K. Jain	NDS 138, 1 (2016)	15-Oct-2016

Parent: ^{248}Cm: E=0; $J^\pi=0^+$; $T_{1/2}=3.48\times10^5$ y *4*; %SF decay=0.0038 *21*

^{248}Cm-$T_{1/2}$: From ^{248}Cm Adopted Levels in the ENSDF database (Sept 2014 update).

^{248}Cm-%SF decay: From 0.046 *29* per 100 fissions (1994EnZZ) and %SF=8.39 *16* (^{248}Cm Adopted Levels in the ENSDF database, Sept 2014 update).

2002Ur02: Measured Eγ, Iγ, γγ, γγ(θ), γγ(directional linear polarization) using EUROGAM2 array of Compton-suppressed Ge detectors at Strasbourg facility. K-shell conversion coefficient of 197.6γ measured by triple γ coin using Ge and LEPS detectors and comparing K-x-ray and γ-ray intensities. Identification of γ rays in ^{139}I nuclide was based on observed correlations between γ rays in ^{139}I and in complementary fission fragments of Tc isotopes of mass 105-107.

^{139}I Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0#	(7/2+)	816.0@ *10*	(13/2+)	1762.0@ *14*	(21/2+)	2392.3 *17*	(19/2,23/2)
209.5 *10*	(5/2+)	928.9# *12*	(15/2+)	2035.7# *15*	(23/2+)	2490.8@ *17*	(25/2+)
418.6@ *9*	(9/2+)	1280.5@ *12*	(17/2+)	2221.2 *16*	(17/2,21/2)	2688.5# *18*	(27/2+)
435.0# *9*	(11/2+)	1564.5# *14*	(19/2+)	2316.1 *17*	(19/2,23/2)	3332.3# *7*	

† From least-squares fit to Eγ data, assuming Δ(Eγ)=0.3 keV for each Eγ quoted to nearest tenth of a keV and 1 keV otherwise.

‡ As proposed by 2002Ur02 based on systematics for g.s. and 209.5 level and multipolarities of transitions from higher levels together with band associations. Assignments in Adopted Levels are the same.

Band(A): g.s. band.

@ Band(B): Band based on 9/2+.

γ(^{139}I)

A_2 and A_4 coefficients are from γγ(θ) data.

Eγ	Iγ	Ei(level)	J_i^π	Ef	J_f^π	Mult.†	α‡	Comments
197.6	20 *2*	1762.0	(21/2+)	1564.5	(19/2+)	M1+E2	0.137 *25*	α(K)exp=0.20 *5* (2002Ur02) α(K)=0.113 *16*; α(L)=0.019 *7*; α(M)=0.0040 *15*; α(N)=0.0008 *3*; α(O)=8.5×10−5 *25* α: overlaps M1 and E2. K-conversion coefficient measured by triple γ coin technique and comparing K-x-ray intensity to γ-ray intensity. (198γ)(summed gates)(θ): A_2=−0.10 *1*, A_4=+0.10 *1*.
209#	4 *2*	418.6	(9/2+)	209.5	(5/2+)			
209.5	6 *2*	209.5	(5/2+)	0.0	(7/2+)			
273.8	18 *2*	2035.7	(23/2+)	1762.0	(21/2+)	(D+Q)		(274γ)(summed gates)(θ): A_2=+0.03 *1*, A_4=−0.06 *2*. Sign of A_4 is inconsistent with ΔJ=1 transition.
351.5	9 *1*	1280.5	(17/2+)	928.9	(15/2+)			
381.0	7 *1*	816.0	(13/2+)	435.0	(11/2+)	D		A_2=−0.13 *3*, A_4=−0.05 *4*. Sign of A_4 is inconsistent with ΔJ=1 transition.
397.4	64 *3*	816.0	(13/2+)	418.6	(9/2+)	E2	0.01670	α(K)=0.01405 *20*; α(L)=0.00213 *3*; α(M)=0.000433 *6* α(N)=8.62×10−5 *12*; α(O)=9.50×10−6 *14* A_2=+0.12 *1*, A_4=−0.03 *2*. POL=+0.12 *3*.

Continued on next page (footnotes at end of table)

^{248}Cm SF decay 2002Ur02 (continued)

$\gamma(^{139}I)$ (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	α[‡]	Comments
418.6	80 *4*	418.6	$(9/2^+)$	0.0	$(7/2^+)$	M1+E2	0.0151 *9*	α(K)=0.0129 *9*; α(L)=0.00177 *4*; α(M)=0.000357 *10*; α(N)=7.17×10^{-5} *16*; α(O)=8.19×10^{-6} *17* (419γ)(summed gates)(θ): A_2=−0.19 *2*, A_4=−0.004 *2*. POL=−0.02 *1*.
435.0	100 *5*	435.0	$(11/2^+)$	0.0	$(7/2^+)$	E2	0.01277	α(K)=0.01078 *15*; α(L)=0.001590 *23*; α(M)=0.000323 *5* α(N)=6.45×10^{-5} *9*; α(O)=7.16×10^{-6} *10* A_2=+0.09 *1*, A_4=−0.02 *1*. POL=+0.3 *1*.
464.5	42 *2*	1280.5	$(17/2^+)$	816.0	$(13/2^+)$	E2	0.01055	α(K)=0.00894 *13*; α(L)=0.001296 *19*; α(M)=0.000263 *4* α(N)=5.26×10^{-5} *8*; α(O)=5.87×10^{-6} *9* (464γ)(397γ)(θ): A_2=+0.10 *2*, A_4=+0.04 *2*. POL=+0.08 *3*.
471.2	6 *1*	2035.7	$(23/2^+)$	1564.5	$(19/2^+)$	(Q)		(471γ)(summed gates)(θ): A_2=+0.10 *2*, A_4=+0.01 *2*.
481.6	25 *2*	1762.0	$(21/2^+)$	1280.5	$(17/2^+)$	E2	0.00952	α(K)=0.00807 *12*; α(L)=0.001160 *17*; α(M)=0.000235 *4* α(N)=4.71×10^{-5} *7*; α(O)=5.27×10^{-6} *8* (482γ)(464γ)(θ): A_2=+0.10 *1*, A_4=+0.05 *2*. POL=+0.2 *1*.
493.9	65 *3*	928.9	$(15/2^+)$	435.0	$(11/2^+)$	E2	0.00886	α(K)=0.00752 *11*; α(L)=0.001075 *15*; α(M)=0.000218 *3* α(N)=4.36×10^{-5} *7*; α(O)=4.89×10^{-6} *7* (494γ)(435γ)(θ): A_2=+0.10 *1*, A_4=+0.01 *2*. POL=+0.2 *1*.
635.5	33 *2*	1564.5	$(19/2^+)$	928.9	$(15/2^+)$	E2	0.00449	α(K)=0.00384 *6*; α(L)=0.000521 *8*; α(M)=0.0001051 *15* α(N)=2.11×10^{-5} *3*; α(O)=2.41×10^{-6} *4* (635γ)(494γ)(θ): A_2=+0.11 *2*, A_4=0.00 *2*. POL=+0.15 *8*.
643.8[#]	2 *1*	3332.3		2688.5	$(27/2^+)$			
652.7	5 *1*	2688.5	$(27/2^+)$	2035.7	$(23/2^+)$			
728.8	12 *2*	2490.8	$(25/2^+)$	1762.0	$(21/2^+)$	(Q)		A_2=+0.08 *2*, A_4=+0.02 *4*.
751.6	7 *2*	2316.1	(19/2,23/2)	1564.5	$(19/2^+)$			
827.8	3 *1*	2392.3	(19/2,23/2)	1564.5	$(19/2^+)$			
940.7	2 *1*	2221.2	(17/2,21/2)	1280.5	$(17/2^+)$			

[†] From $\gamma\gamma(\theta)$ and directional linear polarization measurements. In $\gamma\gamma(\theta)$ data, expected A_2=+0.10, A_4=−0.01 for quadrupole (ΔJ=2)−quadrupole (ΔJ=2) cascade and A_2=−0.07 for quadrupole (ΔJ=2)−dipole (ΔJ=1) cascade.

[‡] Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[#] Placement of transition in the level scheme is uncertain.

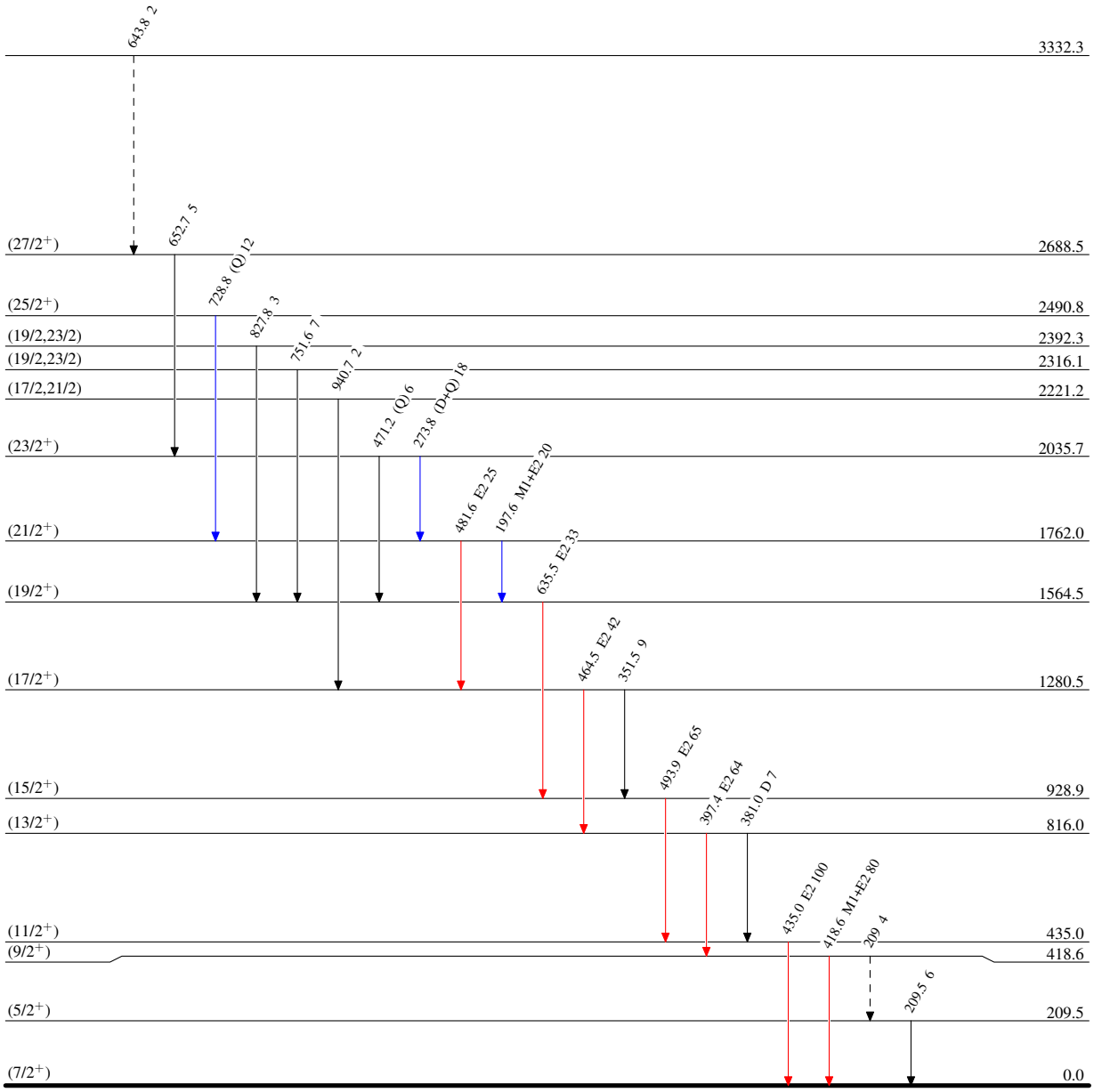
^{248}Cm SF decay 2002Ur02

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)



$^{139}_{53}I_{86}$

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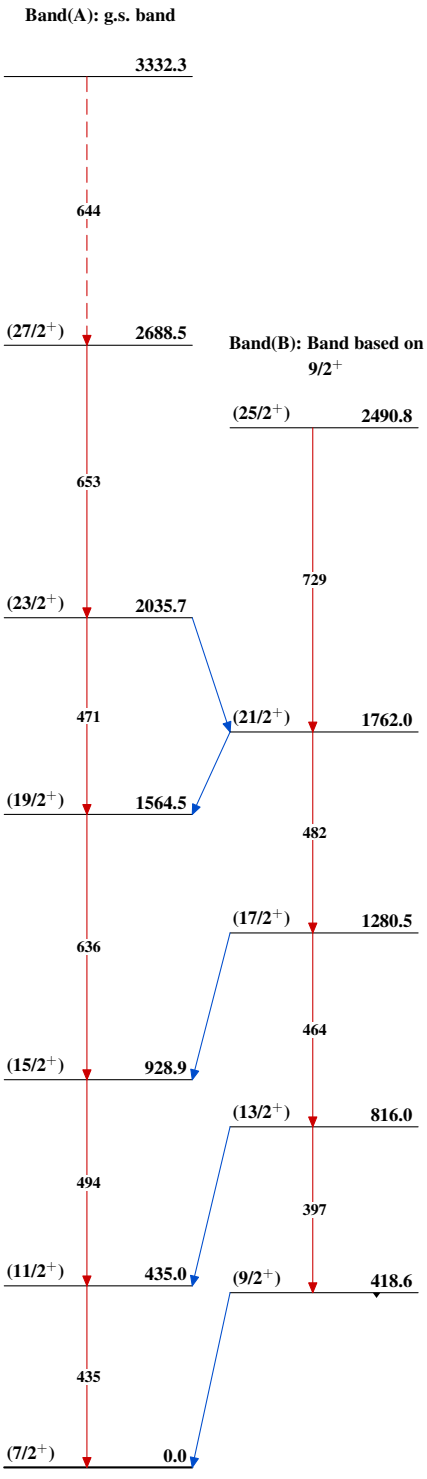

$^{139}_{53}I_{86}$