^{248}Cm SF decay 2012Ur01

History			
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 113, 2187 (2012)	15-Sep-2012

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

Dataset includes prompt γ rays from ^{252}Cf SF decay and delayed γ rays from ^{235}U(n,γ) E=thermal.

^{248}Cm SF decay: EUROGAM2 array of anti-Compton spectrometers with four LEPS detectors attached; triple-coincidences using 900 ns window and high-fold coincidences using 300 ns window; measured Eγ, Iγ, $\gamma\gamma$ coin, $\gamma\gamma(\theta)$.

^{252}Cf SF decay: Gammasphere detector array; measured $\gamma\gamma\gamma$ coin data (900 ns time window) and $\gamma\gamma$(t); searched for isomers and measured half-lives.

Compared observed level structure with large-scale shell model calculations and with known structure of ^{94}Rb.

^{92}Rb Levels

E(level)†	J^π‡	$T_{1/2}$#	Comments
0.0	0^-		
142.2 *2*	1^-		
284.2 *3*	3^-@	54 ns *3*	$T_{1/2}$: from (1363γ)(142.2γ)(t) (2012Ur01), time spectrum fitted with exponential decay and a constant background. The presence of this isomer was also confirmed in an independent measurement using cold neutron beam facility at Grenoble by measuring delayed γ rays following fission of ^{235}U by thermal neutrons using an array of 15 Ge detectors.
430.5 *3*	(4^-)	<5 ns	$T_{1/2}$: from 2012Ur01.
1387.6 *3*	(5^-)		
1426.5 *4*			
1431.2 *4*			
1564.5 *5*			
1647.4 *3*	(5^-)		
1682.2 *3*	(6^-)		
1755.5 *5*			
1836.6 *4*	(6^-)		
1958.2 *4*	(7^+)@	7 ns *2*	$T_{1/2}$: from (734.5γ)(276γ)(t) and (734.5γ)(1363γ)(t) (2012Ur01); time spectra of 276γ and 1363γ fitted with exponential decay and a constant background.
1992.1 *4*			
2259.6 *5*			
2692.7 *4*	(8^+)		
2850.9 *5*	(8,9)		
2979.3 *5*	($9,10^+$)		
3698.6 *5*	($11,12^+$)		
4788.5 *7*	(12,13)		

† From least-squares fit to Eγ data.

‡ Authors′ suggested values.

Measured in ^{252}Cf SF decay using Gammasphere array (2012Ur01).

@ Interpreted (2012Ur01) as π-ν configuration involving high-j (ν $1h_{11/2}$) and (π $1g_{9/2}$) orbitals.

$\gamma(^{92}Rb)$

E_γ†	I_γ†	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α‡	Comments
34.9 *2*	40 *10*	1682.2	(6^-)	1647.4	(5^-)	[M1]	2.92 *7*	α(K)=2.57 *6*; α(L)=0.296 *7*; α(M)=0.0489 *11*; α(N+..)=0.00573 *13* α(N)=0.00550 *12*; α(O)=0.000229 *5*
121.6 *2*	9 *2*	1958.2	(7^+)	1836.6	(6^-)	[E1]	0.0537	α(K)=0.0476 *7*; α(L)=0.00518 *8*; α(M)=0.000849 *13*;

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^{248}Cm SF decay 2012Ur01 (continued)

$\gamma(^{92}Rb)$ (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α ‡	Comments
								α(N+..)=9.82×10^{-5} *15* α(N)=9.44×10^{-5} *14*; α(O)=3.82×10^{-6} *6*
142.0 *2*	145 *15*	284.2	3$^-$	142.2	1$^-$	E2	0.267	α(K)=0.230 *4*; α(L)=0.0312 *5*; α(M)=0.00515 *8*; α(N+..)=0.000565 *9* α(N)=0.000547 *9*; α(O)=1.80×10^{-5} *3* (142.0γ)(142.2γ)(θ): A$_2$=−0.06 *1*, A$_4$=−0.01 *2*; not M2 from RUL. Mult.: ΔJ=2, Q from $\gamma\gamma(\theta)$ with ΔJ=1, 142.2γ in gate. B(E2)(W.u.)=7.2 *4* (2012UR01); however, the evaluator obtains B(E2)(W.u.)=5.8 *4*. Apparently 2012Ur01 did not account for the conversion coefficient.
142.2 *2*	145 *15*	142.2	1$^-$	0.0	0$^-$	M1	0.0556	α(K)=0.0491 *8*; α(L)=0.00550 *8*; α(M)=0.000910 *14*; α(N+..)=0.0001071 *16* α(N)=0.0001028 *15*; α(O)=4.38×10^{-6} *7*
146.3 *1*	100 *5*	430.5	(4$^-$)	284.2	3$^-$	[M1]	0.0515	α(K)=0.0455 *7*; α(L)=0.00509 *8*; α(M)=0.000842 *12*; α(N+..)=9.92×10^{-5} *14* α(N)=9.52×10^{-5} *14*; α(O)=4.06×10^{-6} *6* Mult.: (146.3γ)(142.0γ+142.2γ)(θ): A$_2$=+0.04 *2*, A$_4$=+0.32 *9*; not M2 from RUL.
189.1 *2*	16 *2*	1836.6	(6$^-$)	1647.4	(5$^-$)			
276.0 *1*	73 *5*	1958.2	(7$^+$)	1682.2	(6$^-$)	(E1)	0.00500 *7*	α=0.00500 *7*; α(K)=0.00443 *7*; α(L)=0.000478 *7*; α(M)=7.85×10^{-5} *11*; α(N+..)=9.21×10^{-6} *13* α(N)=8.84×10^{-6} *13*; α(O)=3.73×10^{-7} *6* B(E1)(W.u.)=2.3E−6 *7* (2012UR01). The compiler obtains B(E1)(W.u.)=2.0E−6 *6*. It seems 2012Ur01 did not account for conversion coefficient. Mult.: ΔJ=1 transition from (734.5γ)(276γ)(θ).
286.6 *2*	44 *4*	2979.3	(9,10$^+$)	2692.7	(8$^+$)			
294.6 *1*	29 *3*	1682.2	(6$^-$)	1387.6	(5$^-$)			
309.9 *2*	21 *2*	1992.1		1682.2	(6$^-$)			
449.0 *2*	11 *2*	1836.6	(6$^-$)	1387.6	(5$^-$)			
719.3 *2*	24 *3*	3698.6	(11,12$^+$)	2979.3	(9,10$^+$)			
734.5 *2*	70 *5*	2692.7	(8$^+$)	1958.2	(7$^+$)	D		(734.5γ)(276γ)(θ): A$_2$=+0.11 *3*, A$_4$=+0.08 *5*. ΔJ=1 transition.
828.4 *3*	6 *1*	2259.6		1431.2				
892.7 *3*	5 *1*	2850.9	(8,9)	1958.2	(7$^+$)			
957.0 *2*	36 *3*	1387.6	(5$^-$)	430.5	(4$^-$)			(957γ)(276γ)(θ): A$_2$=+0.4 *1*, A$_4$=+0.03 *2*.
996.0 *2*	4 *1*	1426.5		430.5	(4$^-$)			
1000.7 *2*	19 *2*	1431.2		430.5	(4$^-$)			
1089.9 *4*	10 *2*	4788.5	(12,13)	3698.6	(11,12$^+$)			
1103.4 *2*	16 *2*	1387.6	(5$^-$)	284.2	3$^-$			
1134.0 *3*	5 *1*	1564.5		430.5	(4$^-$)			
1216.9 *2*	17 *2*	1647.4	(5$^-$)	430.5	(4$^-$)			
1251.7 *2*	26 *3*	1682.2	(6$^-$)	430.5	(4$^-$)			
1325.0 *3*	3 *1*	1755.5		430.5	(4$^-$)			
1363.2 *2*	84 *4*	1647.4	(5$^-$)	284.2	3$^-$			

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^{248}Cm SF decay 2012Ur01 (continued)

$\gamma(^{92}Rb)$ (continued)

† From ^{248}Cm SF decay.

‡ 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.

^{248}Cm SF decay 2012Ur01

Level Scheme

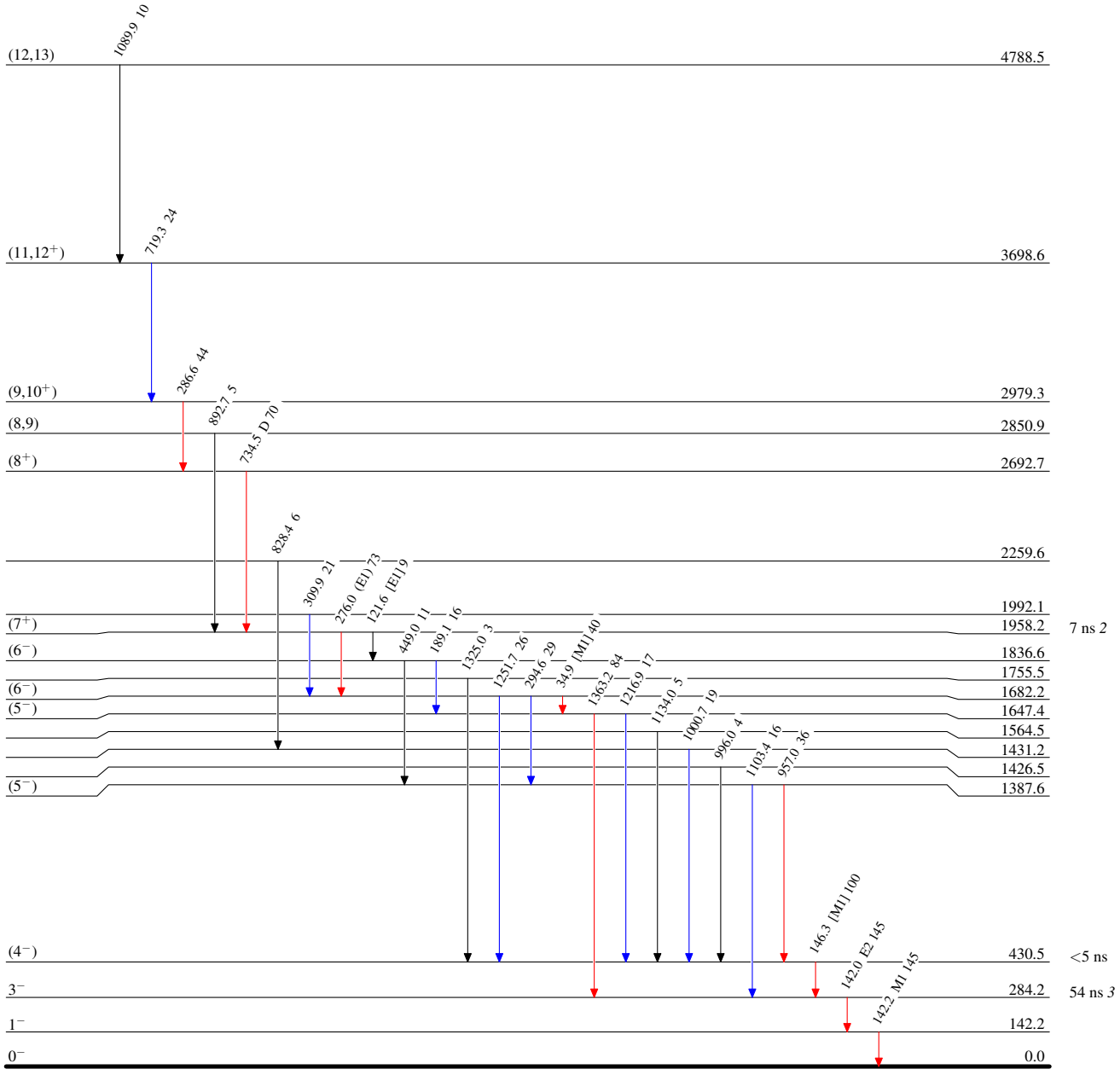
Intensities: Relative I_γ

Legend

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

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

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



$^{92}_{37}Rb_{55}$