^{248}Cm SF decay   2010Si17

| | | History | |
Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 112, 1163 (2011)	15-Dec-2010

Parent: ^{248}Cm: E=0.0; J^π=0$^+$; $T_{1/2}$=3.48×10^5 y 6; %SF decay=?

Dataset includes some information from ^{235}U(n,Fγ) and ^{252}Cf SF decay also.

^{248}Cm SF decay and ^{252}Cf SF decay: sources placed At center of EUROGAM-II (300 ns time window) and GAMMASPHERE (900 ns time window) arrays, respectively; measured Eγ, Iγ, highfold coin γ data, angular correlations between delayed γ-rays (^{248}Cm source).

^{235}U(n,Fγ): cold neutron beam, thin ^{235}U target, fission rate≈10^6 per S; unslowed fission fragments collected In thin Al stopper foil on which a 15-detector array was focused (3 Ge detectors, 5 EUROGAM phase-1 detectors and the Cologne 7-Ge crystal cluster detector); FIFI fission-fragment identifier to identify complementary fission fragments (tof from 2 sets of microchannel plates and E from CF$_4$ gas axial ionization chamber); measured delayed γ cascades from ns to μs isomers, fragment-γ-γ coin, isomer $T_{1/2}$. shell model calculations.

^{93}Rb Levels

E(level)[†]	J^{π}[‡]	$T_{1/2}$	Comments
0.0	5/2$^-$		J^π: from Adopted Levels.
733.6	(7/2$^-$)		
912.8	(7/2$^-$)		
1285.2[#]	(9/2$^+$)		
2015.8			
2031.3[#]	(13/2$^+$)		
2576.3			
2942.8[#]	(17/2$^+$)		
3032.2			
3234.3	(17/2)		
3405.6	(19/2)		
3885.5			
3941.0[#]	(21/2$^+$)		
4086.3			
4319.8			
4322.1	(23/2$^-$)		
4423.0	(27/2$^-$)	111[@] ns 11	J^π: level $T_{1/2}$ is consistent with Weisskopf estimate for an E2 100-keV transition to the (23/2) 4322 level; similarity of this isomer to the K^π=27/2$^-$ π g$_{9/2}$⊗ν (g$_{7/2}$h$_{11/2}$) isomer In the ^{95}Y isotone suggests the same dominant configuration for this level; supported by shell model calculations (2010Si17).
5159.2	(29/2,31/2)		

[†] From least-squares fit to Eγ, assigning equal weight to all data.

[‡] Authors′ recommended values.

[#] Band(A): π=+ sequence.

[@] Weighted average of 114 ns 14 from exponential + background fit to time spectra of gammas deexciting isomer when gated by prompt 736γ In ^{252}Cf SF decay and 106 ns 20 from fragment-γ(t) In ^{235}U(n,F).

^{248}Cm SF decay   2010Si17 (continued)

$\gamma(^{93}$Rb)

$E_\gamma^\dagger$	$I_\gamma^\dagger$	E_i(level)	J_i^π	E_f	J_f^π	Mult.	$\alpha^\ddagger$	Comments
100.9	5 1	4423.0	(27/2$^-$)	4322.1	(23/2$^-$)	[E2]	0.940	
171.3	12 1	3405.6	(19/2)	3234.3	(17/2)	D		Mult.: from 746γ-171$\gamma(\theta)$.
202.1	10 2	3234.3	(17/2)	3032.2				
233.5	2 1	4319.8		4086.3				
372.3	72 7	1285.2	(9/2$^+$)	912.8	(7/2$^-$)	D		Mult.: from 746γ-372$\gamma(\theta)$.
381.0	5 1	4322.1	(23/2$^-$)	3941.0	(21/2$^+$)	D		Mult.: from 998γ-381$\gamma(\theta)$; this assumes that 998γ is Q, ΔJ=2 analogous to γ of similar E In ^{92}Kr where structure is very similar to that of ^{93}Rb.
436.6	4 1	4322.1	(23/2$^-$)	3885.5				
456.0	10 1	3032.2		2576.3				
479.9	5 1	3885.5		3405.6	(19/2)			
551.5	56 6	1285.2	(9/2$^+$)	733.6	(7/2$^-$)	D		Mult.: from 746γ-552$\gamma(\theta)$.
560.5	12 2	2576.3		2015.8				
730.6	18 2	2015.8		1285.2	(9/2$^+$)			
733.6	70 6	733.6	(7/2$^-$)	0.0	5/2$^-$			
736.2	3 1	5159.2	(29/2,31/2)	4423.0	(27/2$^-$)			
746.1	45 5	2031.3	(13/2$^+$)	1285.2	(9/2$^+$)	Q		Mult.: from $\gamma\gamma(\theta)$.
911.5	12 2	2942.8	(17/2$^+$)	2031.3	(13/2$^+$)			
912.9	100 4	912.8	(7/2$^-$)	0.0	5/2$^-$			
998.2	7 1	3941.0	(21/2$^+$)	2942.8	(17/2$^+$)			
1143.5	4 1	4086.3		2942.8	(17/2$^+$)			
1203.0	14 2	3234.3	(17/2)	2031.3	(13/2$^+$)	Q		Mult.: from 746γ-1203$\gamma(\theta)$.
1285.2	33 6	1285.2	(9/2$^+$)	0.0	5/2$^-$	(M2)	0.000653 10	α=0.000653 10; α(K)=0.000575 8; α(L)=6.20×10^{-5} 9; α(M)=1.024×10^{-5} 15; α(N+..)=6.02×10^{-6} 9 α(N)=1.165×10^{-6} 17; α(O)=5.09×10^{-8} 8; α(IPF)=4.80×10^{-6} 7 Mult.: Q, ΔJ=2 from 746γ-1285$\gamma(\theta)$; adopted $\Delta\pi$=(yes).

† 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.
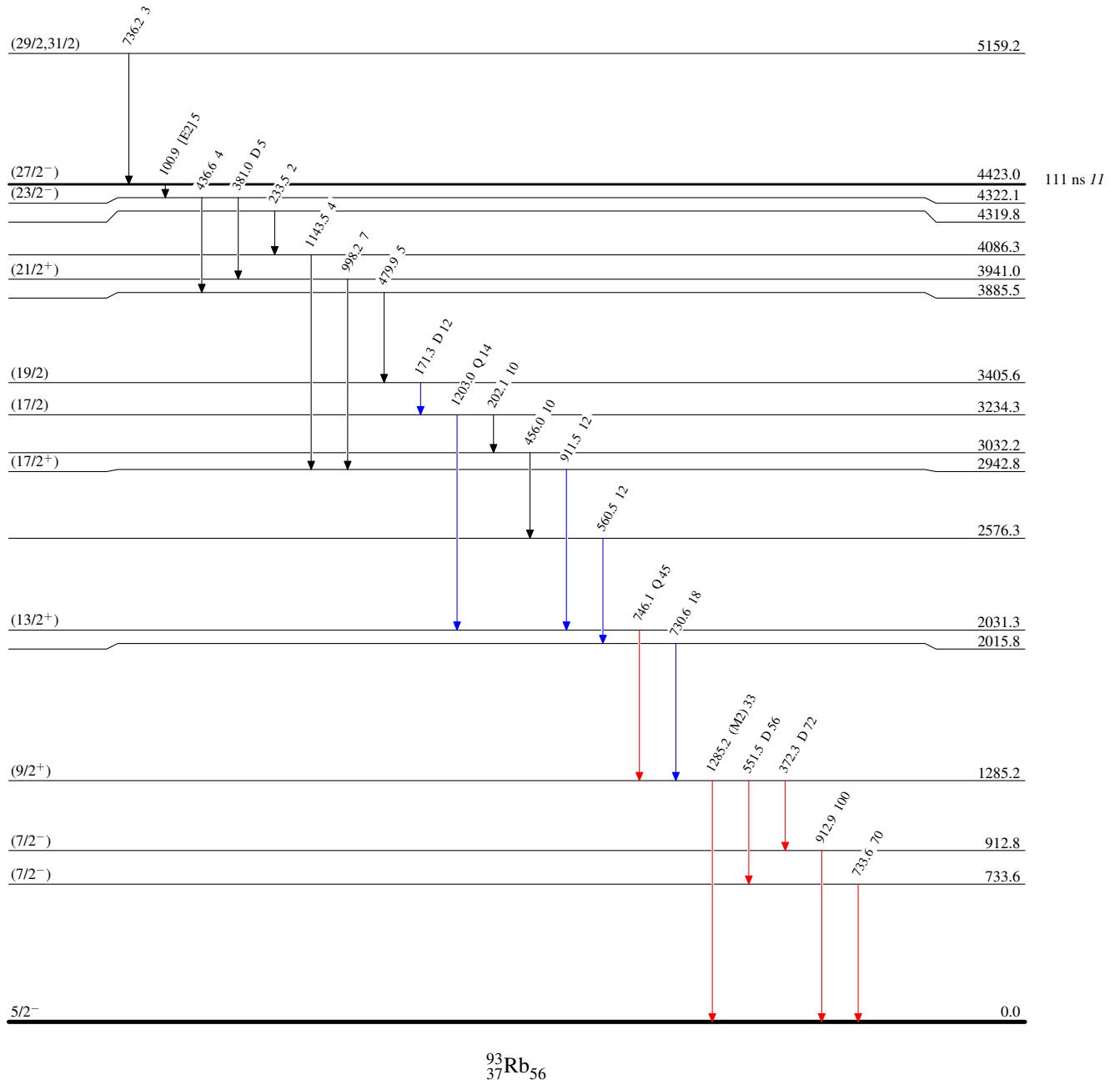
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Level Scheme

Intensities: Relative I$_\gamma$

Legend

→	I$_\gamma$ < 2%×I$_\gamma^{max}$
→	I$_\gamma$ < 10%×I$_\gamma^{max}$
→	I$_\gamma$ > 10%×I$_\gamma^{max}$

$^{93}_{37}$Rb$_{56}$

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Band(A): π=+ sequence

(21/2$^+$)   3941.0

998

(17/2$^+$)   2942.8

912

(13/2$^+$)   2031.3

746

(9/2$^+$)   1285.2

$^{93}_{37}$Rb$_{56}$