^{252}Cf SF decay 2001Lu16

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: ^{252}Cf: E=0.0; $J^\pi=0^+$; $T_{1/2}$=2.645 y *8*; %SF decay=0.0043 *28*

^{252}Cf-$T_{1/2}$: From ^{252}Cf Adopted Levels in the ENSDF database (March 2005 update).

^{252}Cf-%SF decay: From 0.0014 *9* per fission (NUDAT 2.6) and %SF=3.092 *8* (^{252}Cf Adopted Levels in the ENSDF database, March 2005 update).

2001Lu16 (also 2003Ha49,2002Ha46): measured Eγ, Iγ and γγ using GAMMASPHERE array comprised of 100 escape-suppressed Ge detectors. Coincidence resolving time ≈1 μs. Comparisons made with the known structure of ^{135}Te isotone. Additional information 1.

^{139}Ba Levels

E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡	E(level)†	Jπ‡
0.0@	7/2⁻	1976.586@ *20*	(17/2⁻)	3088.59 *6*		3890.96# *5*	(25/2⁻)
1307.884@ *17*	11/2⁻	2091.723@ *21*	(19/2⁻)	3122.78# *3*	(21/2⁻)	4046.92 *8*	
1538.75 *3*	13/2⁺	2479.376 *22*		3344.30 *6*		4616.29# *6*	(29/2⁻)
1828.143@ *20*	(15/2⁻)	2681.23 *4*		3381.94 *4*		4956.67# *6*	(31/2⁻)

† From Eγs, assigning Δ(Eγ)=0.1 keV systematic error for each γ ray (as proposed by 2001Lu16).
‡ As proposed in 2001Lu16 based on band structures.
# Band(A): γ sequence based on (21/2⁻).
@ Band(B): γ sequence based on 7/2⁻, g.s..

γ(^{139}Ba)

E_γ†	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α@	$I_{(\gamma+ce)}$
115.137 *6*	10.9#	2091.723	(19/2⁻)	1976.586	(17/2⁻)	[M1]	0.662	18.1
148.443 *5*	29.1#	1976.586	(17/2⁻)	1828.143	(15/2⁻)	[M1]	0.325	38.6
230.87 *3*	7.2	1538.75	13/2⁺	1307.884	11/2⁻			
255.710 *21*	0.8	3344.30		3088.59				
289.39 *4*	0.6	1828.143	(15/2⁻)	1538.75	13/2⁺			
340.378 *24*	1.1	4956.67	(31/2⁻)	4616.29	(29/2⁻)			
387.653 *5*	1.7	2479.376		2091.723	(19/2⁻)			
520.258 *9*	60.9#	1828.143	(15/2⁻)	1307.884	11/2⁻	[E2]	0.0088	61.4
589.51 *3*	1.5	2681.23		2091.723	(19/2⁻)			
702.61&		4046.92		3344.30				
725.33 *3*	1.9	4616.29	(29/2⁻)	3890.96	(25/2⁻)			
768.18 *3*	2.4	3890.96	(25/2⁻)	3122.78	(21/2⁻)			
902.56 *3*	0.9	3381.94		2479.376				
958.33 *6*	0.9	4046.92		3088.59				
996.86 *5*	7.3	3088.59		2091.723	(19/2⁻)			
1031.049 *21*	5.9	3122.78	(21/2⁻)	2091.723	(19/2⁻)			
1307.877 *17*	100#	1307.884	11/2⁻	0.0	7/2⁻	[E2]	0.00106	100

† Uncertainty is statistical. 2001Lu16 propose 0.1 keV systematic uncertainty for each γ ray.
‡ Expected to be dipoles and quadrupoles (E2) since the coincidence resolving time is approximately 1 μs. An E3 transition from a possible 25/2⁺ to 19/2⁻ level was looked for but not found as is the case in ^{135}Te isotone.
# Intensity quoted by 2001Lu16 is corrected for internal conversion for assumed multipolarity as specified.

Continued on next page (footnotes at end of table)

^{252}Cf SF decay 2001Lu16 (continued)

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

@ 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.

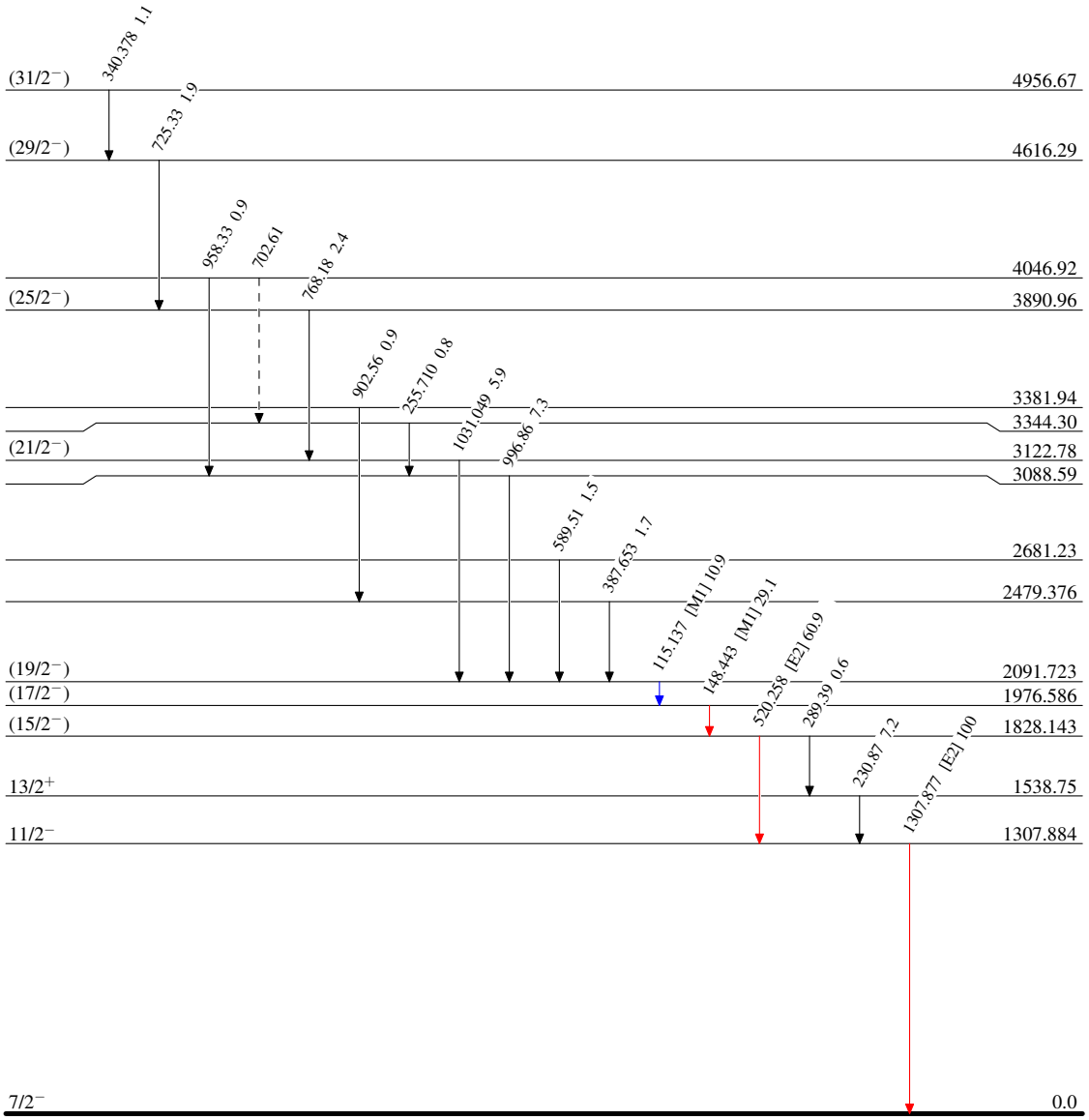
^{252}Cf SF decay 2001Lu16

Level Scheme

Intensities: Relative I_γ

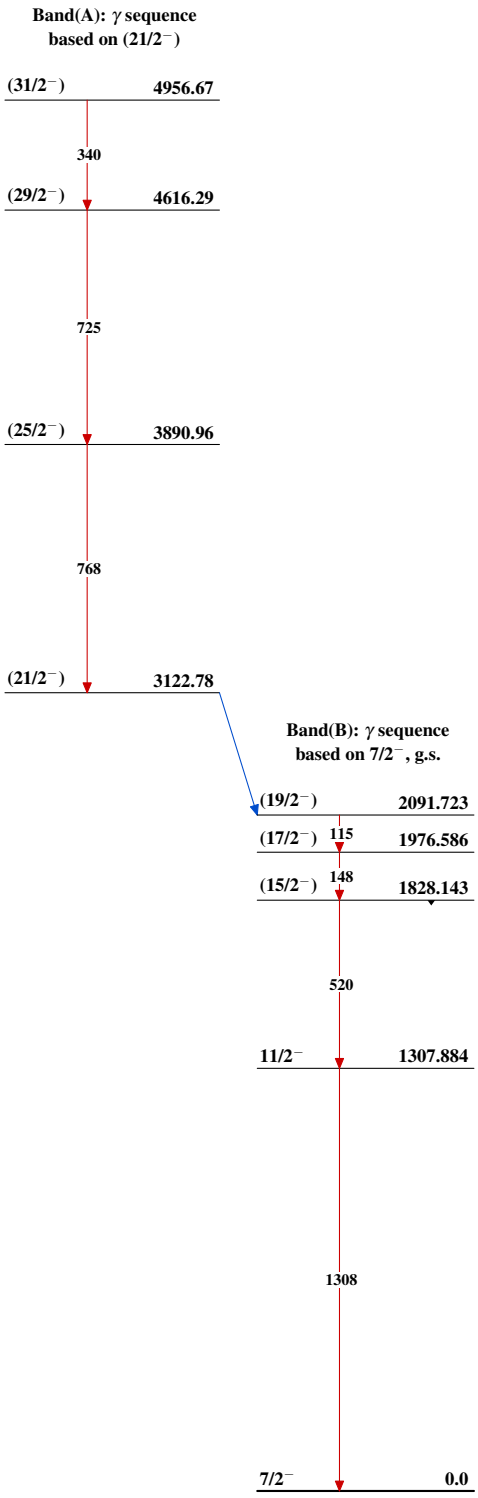
Legend

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



$^{139}_{56}Ba_{83}$

^{252}Cf SF decay 2001Lu16



$^{139}_{56}Ba_{83}$