^{138}Ba(α,5nγ) E=70 MeV 1978Mu09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 108,2173 (2007)	1-Oct-2006

Additional information 1.
Other: E(α)=52 MeV (1977Lu04).
For ^{135}Ba(α,2nγ) at E=25 MeV see 1984BaZN.
Measured: γ, $\gamma\gamma$, $\gamma(\theta)$ (1978Mu09,1977Lu04).

^{137}Ce Levels

E(level)	J$^\pi$†	$T_{1/2}$	E(level)	J$^\pi$†	E(level)	J$^\pi$†	$T_{1/2}$
0.0	3/2$^+$	9.0 h	2335.7	(21/2)	3416	(25/2)	
254.3	11/2$^-$	34.4 h	2489.0	21/2$^-$	3703	(27/2)	
434.0	(3/2)$^+$		2587.5		4173		
927.6	15/2$^-$		2702.2		4255	(31/2)	5 ns *2*
2039.1	19/2$^-$		2811.6	(23/2)$^-$	4339		
2191.0	19/2$^-$		2889.3		4585		
2196.8?	(21/2$^+$)		2970.7		4732	(33/2)	
2309.2			3225	(23/2)			

† From $\gamma(\theta)$, systematics of (HI,xnγ), and adopted values.

γ(^{137}Ce)

E$_\gamma$	I$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.	α‡	Comments
138.9 *3*	0.37 *7*	2335.7	(21/2)	2196.8?	(21/2$^+$)	D		Mult.: A_2=−0.21 *5*, A_4=−0.07 *8*.
157.7# *3*	0.84 *17*	2196.8?	(21/2$^+$)	2039.1	19/2$^-$	D		Placement on level scheme is uncertain. See 2000Zh39. Mult.: A_2=−0.14 *3*, A_4=−0.05 *5*.
166.1 *3*	0.76 *23*	4339		4173				Mult.: A_2=+0.03 *6*, A_4=−0.08 *9*.
190.8 *3*	2.01 *20*	3416	(25/2)	3225	(23/2)	D		Mult.: A_2=−0.16 *4*, A_4=−0.06 *6*.
254.3 *3*		254.3	11/2$^-$	0.0	3/2$^+$			
270.1 *5*	0.57 *11*	2309.2		2039.1	19/2$^-$			Mult.: A_2=+0.07 *4*, A_4=−0.03 *6*.
278.3 *5*	0.13 *4*	2587.5		2309.2		D		Mult.: A_2=−0.35 *9*, A_4=+0.02 *14*.
x285.5†	0.89 *6*							
287.2 *3*	2.24 *22*	3703	(27/2)	3416	(25/2)	D		Mult.: A_2=−0.20 *4*, A_4=−0.06 *6*.
298.1 *3*	1.24 *12*	2489.0	21/2$^-$	2191.0	19/2$^-$	D		Mult.: A_2=−0.14 *3*, A_4=−0.05 *5*.
301.8 *5*	0.18 *5*	2889.3		2587.5				
322.5 *3*	0.84 *8*	2811.6	(23/2)$^-$	2489.0	21/2$^-$	D		Mult.: A_2=−0.22 *6*, A_4=−0.09 *9*.
337.7 *5*	0.56 *28*	3225	(23/2)	2889.3		D		Mult.: A_2=−0.23 *5*, A_4=−0.07 *8*.
x350.7	0.44 *7*							
412.3 *3*	0.17 *4*	4585		4173		D		Mult.: A_2=−0.03 *12*, A_4=+0.13 *18*.
434.0	0.40 *8*	434.0	(3/2)$^+$	0.0	3/2$^+$			
443.5 *3*	0.20 *4*	3416	(25/2)	2970.7		D		Mult.: A_2=−0.40 *12*, A_4=+0.15 *18*.
449.8 *3*	4.00 *32*	2489.0	21/2$^-$	2039.1	19/2$^-$	D		Mult.: A_2=−0.24 *4*, A_4=−0.05 *6*.
470.3 *3*	1.06 *19*	4173		3703	(27/2)	D		Mult.: A_2=−0.39 *4*, A_4=−0.07 *6*.
476.7 *3*	1.00 *15*	4732	(33/2)	4255	(31/2)	D		Mult.: A_2=−0.38 *4*, A_4=−0.04 *6*.
481.8 *3*	0.49 *20*	2970.7		2489.0	21/2$^-$	D		Mult.: A_2=−0.47 *12*, A_4=+0.04 *18*.
505.4 *3*	0.58 *25*	2702.2		2196.8?	(21/2$^+$)	D		Mult.: A_2=−0.21 *6*, A_4=−0.09 *9*.
522.2 *3*	0.29 *8*	3225	(23/2)	2702.2		Q		Mult.: A_2=+0.32 *8*, A_4=+0.10 *12*.
552.1 *3*	1.44 *29*	4255	(31/2)	3703	(27/2)	Q		Mult.: A_2=+0.59 *18*.
673.3 *3*	9.95 *70*	927.6	15/2$^-$	254.3	11/2$^-$	E2	0.00499	α(K)=0.00422 *6*; α(L)=0.000610 *9*; α(M)=0.0001283 *18*; α(N+..)=3.31×10^{-5} *5*

Continued on next page (footnotes at end of table)

^{138}Ba(α,5nγ) E=70 MeV 1978Mu09 (continued)

γ(^{137}Ce) (continued)

E_γ	I_γ	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[‡]	Comments
								α(N)=2.83×10^{-5} *4*; α(O)=4.49×10^{-6} *7*; α(P)=3.02×10^{-7} *5* Mult.: A_2=+0.43 *3*, A_4=−0.05 *5*.
734.9 *3*	1.33 *13*	3225	(23/2)	2489.0	21/2$^-$	D		Mult.: A_2=−0.03 *3*, A_4=−0.02 *5*.
[x]830.5	0.99 *16*							
889.5 *3*	0.81 *24*	3225	(23/2)	2335.7	(21/2)	D		Mult.: A_2=−0.56 *5*, A_4=+0.13 *8*.
1027.6 *3*	0.62 *9*	3225	(23/2)	2196.8?	(21/2$^+$)			Mult.: A_2=+0.03 *5*, A_4=−0.01 *8*.
1111.5 *3*	6.40 *51*	2039.1	19/2$^-$	927.6	15/2$^-$	E2	1.61×10^{-3}	α(K)=0.001382 *20*; α(L)=0.000183 *3*; α(M)=3.81×10^{-5} *6*; α(N+..)=1.046×10^{-5} *15* α(N)=8.44×10^{-6} *12*; α(O)=1.361×10^{-6} *19*; α(P)=1.004×10^{-7} *14*; α(IPF)=5.61×10^{-7} *10* Mult.: A_2=+0.35 *3*, A_4=−0.05 *5*.
1263.4 *3*	2.38 *21*	2191.0	19/2$^-$	927.6	15/2$^-$	E2	1.26×10^{-3}	α(K)=0.001066 *15*; α(L)=0.0001389 *20*; α(M)=2.89×10^{-5} *4*; α(N+..)=2.24×10^{-5} *4* α(N)=6.41×10^{-6} *9*; α(O)=1.035×10^{-6} *15*; α(P)=7.75×10^{-8} *11*; α(IPF)=1.493×10^{-5} *22* Mult.: A_2=+0.35 *3*, A_4=−0.00 *6*.

[†] Observed only by 1977Lu04 in coin with 1111.5γ, 673.3γ, and 449.8γ.

[‡] 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.

[x] γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ

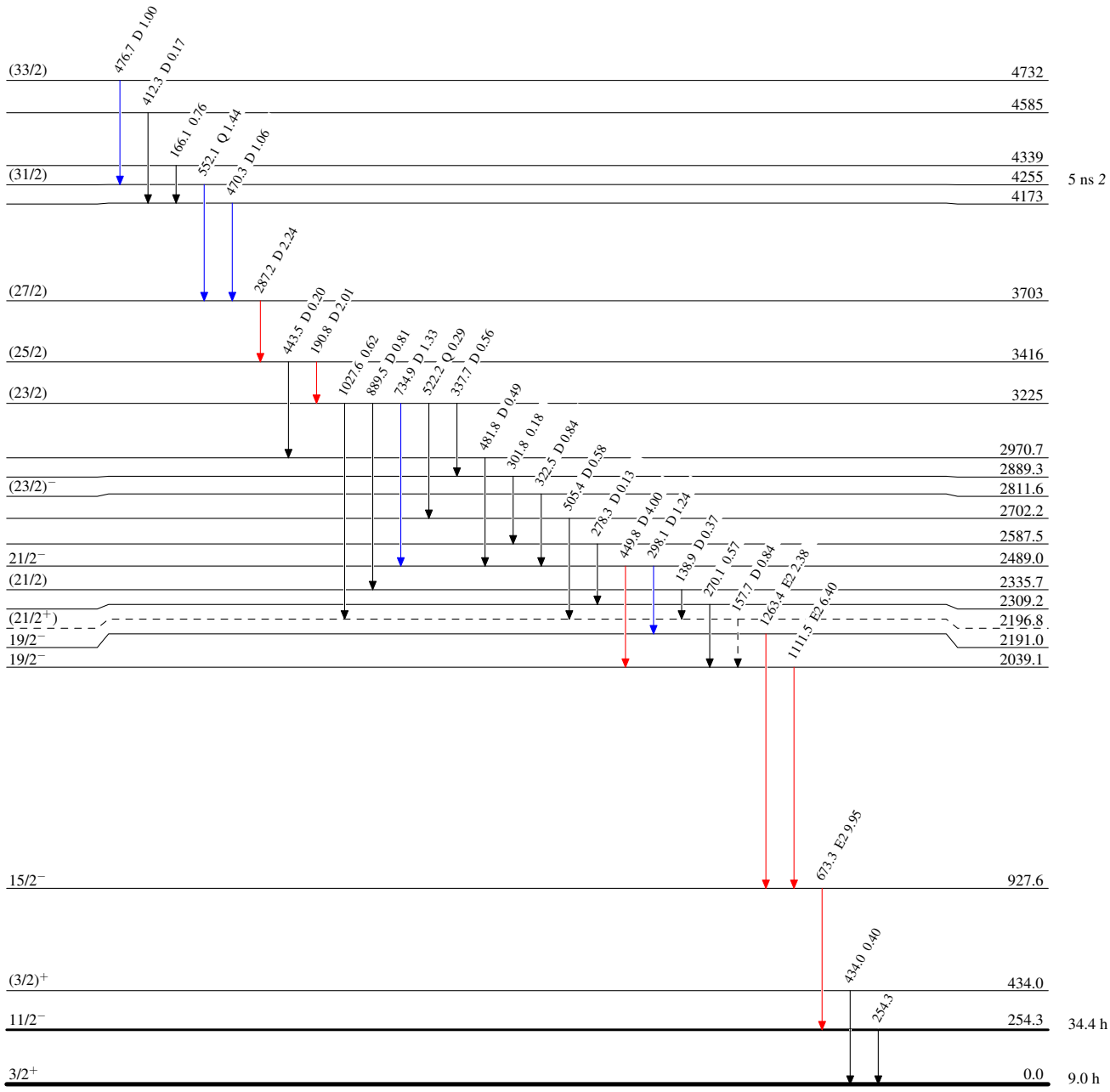
Legend

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

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

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

γ Decay (Uncertain)



$^{137}_{58}Ce_{79}$