

¹³⁷Ba(³He,3n γ) E=27 MeV **1983Ko13**

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

Additional information 1.

Other: E(³He)=38 MeV (1977Lu04).

Measured: γ , $\gamma\gamma$, $\gamma(\theta)$, $\gamma(t)$, ce, yield.

¹³⁷Ce Levels

E(level)	J π^{\ddagger}	T _{1/2} [†]	E(level)	J π^{\ddagger}	E(level)	J π^{\ddagger}
0.0	3/2 ⁺	9.0 h	1179.5		2336.0	(21/2)
254.3	11/2 ⁻	34.4 h	1337.4		2489.3	21/2 ⁻
434.0	(3/2) ⁺		1981.0	(17/2 ⁻)	2811.8	(23/2) ⁻
927.8	15/2 ⁻		2039.6	19/2 ⁻	3224.1	(23/2)
1144.4	13/2 ⁻		2191.0	19/2 ⁻	3414.7	(25/2)
1147.2			2197.4?	(21/2 ⁺)		

[†] T_{1/2}(γ) \leq 1.5 ns for E(lev) \geq 434 keV.

[‡] Adopted values.

$\gamma(^{137}\text{Ce})$

E γ	I γ	E _i (level)	J π^{\ddagger}	E _f	J π^{\ddagger}	Mult. [†]	α^{\ddagger}	Comments
138.6 2	12 2	2336.0	(21/2)	2197.4?	(21/2 ⁺)			
157.8 [#] 2	25 5	2197.4?	(21/2 ⁺)	2039.6	19/2 ⁻	D		Placement on level scheme is uncertain. See 2000Zh39 . Mult.: A ₂ =-0.12 4, A ₄ =-.05 7.
190.6 3	15 2	3414.7	(25/2)	3224.1	(23/2)	D		Mult.: A ₂ =-0.19 5, A ₄ =-0.04 9.
254.3 2	37 4	254.3	11/2 ⁻	0.0	3/2 ⁺	M4	7.93	B(M4)(W.u.)=2.31 7 $\alpha(K)=5.45$ 8; $\alpha(L)=1.92$ 3; $\alpha(M)=0.445$ 7; $\alpha(N+..)=0.1142$ 17 $\alpha(N)=0.0985$ 15; $\alpha(O)=0.01496$ 22; $\alpha(P)=0.000734$ 11
298.1 2	55 6	2489.3	21/2 ⁻	2191.0	19/2 ⁻	M1	0.0586	Additional information 2 . $\alpha(K)=0.0501$ 7; $\alpha(L)=0.00668$ 10; $\alpha(M)=0.001397$ 20; $\alpha(N+..)=0.000364$ 6 $\alpha(N)=0.000310$ 5; $\alpha(O)=5.03\times 10^{-5}$ 7; $\alpha(P)=3.84\times 10^{-6}$ 6
322.4 2	33 3	2811.8	(23/2) ⁻	2489.3	21/2 ⁻	M1	0.0477	Mult.: A ₂ =-0.35 4, A ₄ =+0.09 7. $\alpha(K)=0.0408$ 6; $\alpha(L)=0.00543$ 8; $\alpha(M)=0.001134$ 16; $\alpha(N+..)=0.000296$ 5 $\alpha(N)=0.000252$ 4; $\alpha(O)=4.09\times 10^{-5}$ 6; $\alpha(P)=3.12\times 10^{-6}$ 5
434.0 2	245 17	434.0	(3/2) ⁺	0.0	3/2 ⁺	E2+M1	0.019 4	Mult.: A ₂ =-0.19 7, A ₄ =-0.00 13; $\alpha(K)\text{exp}=0.068$ 10. $\alpha(K)=0.016$ 3; $\alpha(L)=0.00234$ 17; $\alpha(M)=0.00049$ 3; $\alpha(N+..)=0.000127$ 10 $\alpha(N)=0.000109$ 8; $\alpha(O)=1.73\times 10^{-5}$ 16; $\alpha(P)=1.2\times 10^{-6}$ 3
449.8 2	170 15	2489.3	21/2 ⁻	2039.6	19/2 ⁻	M1	0.0203	Mult.: A ₂ =+0.15 2, A ₄ =+0.03 3; $\alpha(K)\text{exp}=0.013$ 15. $\alpha(K)=0.01738$ 25; $\alpha(L)=0.00229$ 4;

Continued on next page (footnotes at end of table)

$^{137}\text{Ba}(^3\text{He},3n\gamma) E=27 \text{ MeV}$ **1983Ko13 (continued)** $\gamma(^{137}\text{Ce})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	α^\ddagger	Comments
673.5 2	1000	927.8	15/2 ⁻	254.3	11/2 ⁻	E2	0.00499	$\alpha(\text{M})=0.000477$ 7; $\alpha(\text{N}+..)=0.0001244$ 18 $\alpha(\text{N})=0.0001059$ 15; $\alpha(\text{O})=1.720\times 10^{-5}$ 25; $\alpha(\text{P})=1.323\times 10^{-6}$ 19 Mult.: $A_2=-0.37$ 2, $A_4=+0.00$ 4; $\alpha(\text{K})_{\text{exp}}=0.21$ 4.
713.2 4	60 15	1147.2		434.0	(3/2) ⁺	D		$\alpha(\text{K})=0.00422$ 6; $\alpha(\text{L})=0.000610$ 9; $\alpha(\text{M})=0.0001282$ 18; $\alpha(\text{N}+..)=3.31\times 10^{-5}$ 5 $\alpha(\text{N})=2.83\times 10^{-5}$ 4; $\alpha(\text{O})=4.49\times 10^{-6}$ 7; $\alpha(\text{P})=3.02\times 10^{-7}$ 5 Mult.: $A_2=+0.26$ 1, $A_4=-0.05$ 2. Mult.: $A_2=-0.11$ 12, $A_4=+0.08$ 20.
734.8 5	13 5	3224.1	(23/2)	2489.3	21/2 ⁻			
745.5 4	45 10	1179.5		434.0	(3/2) ⁺			
836.6 3	260 20	1981.0	(17/2 ⁻)	1144.4	13/2 ⁻	(E2)	0.00299	$\alpha(\text{K})=0.00255$ 4; $\alpha(\text{L})=0.000352$ 5; $\alpha(\text{M})=7.37\times 10^{-5}$ 11; $\alpha(\text{N}+..)=1.91\times 10^{-5}$ 3 $\alpha(\text{N})=1.628\times 10^{-5}$ 23; $\alpha(\text{O})=2.61\times 10^{-6}$ 4; $\alpha(\text{P})=1.84\times 10^{-7}$ 3 Mult.: $\alpha(\text{K})_{\text{exp}}=0.0021$ 5.
890.1 2	340 30	1144.4	13/2 ⁻	254.3	11/2 ⁻	M1+E2	0.0032 7	$\alpha(\text{K})=0.0028$ 6; $\alpha(\text{L})=0.00036$ 6; $\alpha(\text{M})=7.6\times 10^{-5}$ 13; $\alpha(\text{N}+..)=2.0\times 10^{-5}$ 4 $\alpha(\text{N})=1.7\times 10^{-5}$ 3; $\alpha(\text{O})=2.7\times 10^{-6}$ 5; $\alpha(\text{P})=2.0\times 10^{-7}$ 5 Mult.: $A_2=-0.57$ 2, $A_4=+0.04$ 3; $\alpha(\text{K})_{\text{exp}}=0.0018$ 5.
903.4 4	50 10	1337.4		434.0	(3/2) ⁺	D+Q		Mult.: $A_2=+0.17$ 8, $A_4=+0.13$ 13.
^x 1054.2 5	42 7							
1111.8 3	495 40	2039.6	19/2 ⁻	927.8	15/2 ⁻	E2	1.61×10^{-3}	$\alpha(\text{K})=0.001381$ 20; $\alpha(\text{L})=0.000183$ 3; $\alpha(\text{M})=3.81\times 10^{-5}$ 6; $\alpha(\text{N}+..)=1.046\times 10^{-5}$ 15 $\alpha(\text{N})=8.43\times 10^{-6}$ 12; $\alpha(\text{O})=1.360\times 10^{-6}$ 19; $\alpha(\text{P})=1.003\times 10^{-7}$ 14; $\alpha(\text{IPF})=5.67\times 10^{-7}$ 10 Mult.: $A_2=+0.19$ 6, $A_4=+0.0$; $\alpha(\text{K})_{\text{exp}}=0.0012$ 2.
1263.2 3	135 15	2191.0	19/2 ⁻	927.8	15/2 ⁻	E2	1.26×10^{-3}	$\alpha(\text{K})=0.001066$ 15; $\alpha(\text{L})=0.0001389$ 20; $\alpha(\text{M})=2.89\times 10^{-5}$ 4; $\alpha(\text{N}+..)=2.24\times 10^{-5}$ 4 $\alpha(\text{N})=6.41\times 10^{-6}$ 9; $\alpha(\text{O})=1.036\times 10^{-6}$ 15; $\alpha(\text{P})=7.75\times 10^{-8}$ 11; $\alpha(\text{IPF})=1.489\times 10^{-5}$ 22 Mult.: $A_2=+0.33$ 3, $A_4=-0.00$ 4; $\alpha(\text{K})_{\text{exp}}=0.0009$ 2.

[†] $\alpha(\text{K})_{\text{exp}}$ have been normalized to $\alpha(\text{K})(673.5\gamma)=0.0042$ (E2).

$^{137}\text{Ba}({}^3\text{He},3n\gamma)$ E=27 MeV **1983Ko13** (continued)

$\gamma(^{137}\text{Ce})$ (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.

^x γ ray not placed in level scheme.

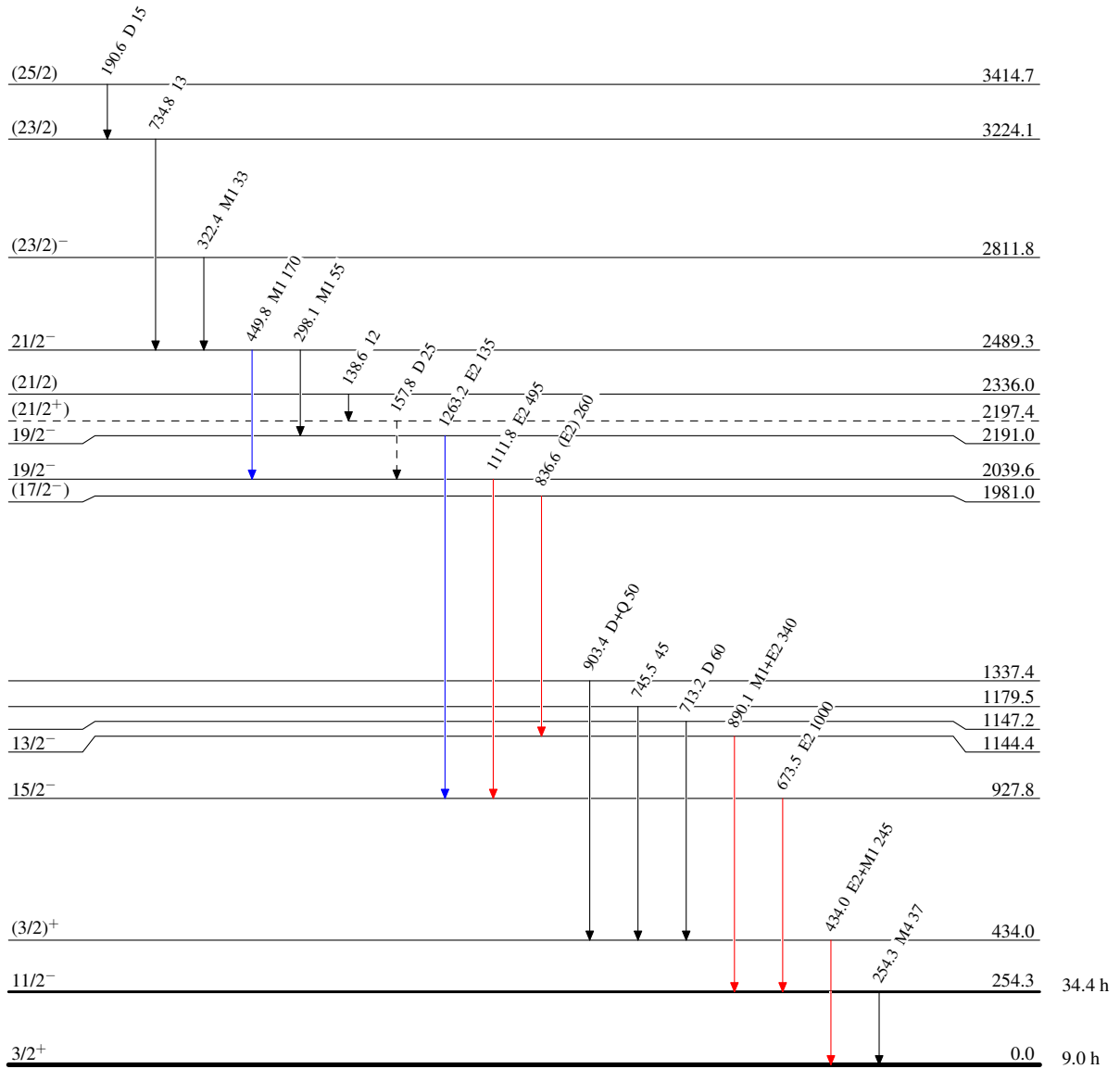
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Legend

Level Scheme

Intensities: Relative I γ

- I γ < 2% × I γ^{max}
- I γ < 10% × I γ^{max}
- I γ > 10% × I γ^{max}
- - - - - γ Decay (Uncertain)



¹³⁷Ce₇₉