^{133}Cs(α,3nγ),^{136}Ba(p,3nγ) 1985Mo01

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. A. Sonzogni	NDS 103, 1 (2004)	31-Jul-2004

1985Mo01: ^{133}Cs(α,3nγ) E=55 MeV, ^{136}Ba(p,3nγ) E=32 MeV.

^{134}La Levels

The level scheme is that proposed by 1985Mo01 on the basis of γγ-coincidence data. Spin assignments are based on angular distribution results. The data for levels that decay to the ^{134}La ground state are adopted; however, the data for levels that reach the 0+Y, J level are not adopted with exception of the gammas multipolarities. The adopted scheme for these levels is based on the ^{124}Sn(^{15}N,5nγ) (2001Ba75) dataset.

E(level)†	Jπ‡	$T_{1/2}$	Comments
0.0	1+	6.45 min *16*	$T_{1/2}$: from Adopted Levels.
31.89 *10*	(2)+		
122.86 *14*			
164.28 *14*			
186.98 *19*	(2)+		
205.31 *19*	(2)+		
220.27 *14*			
274.72 *14*			
329.3 *6*			
336.43 *17*			
336.43+x		29 μs *4*	Additional information 1. E(level): decays to 336.4 and 329.3 levels by two low-energy unobserved transitions. $T_{1/2}$: from γ(t) (1985Mo01).
381.7 *6*			
382.9 *5*	(3+)		
467.2 *7*			
484.0 *5*	(3+)		
490.4 *6*			
544.0 *6*	(4+)		
570.4 *6*			
574.8 *8*			
591.5 *3*			
648.1 *6*	(4+)		
659.8 *8*			
715.3 *7*			
727.2 *6*			
746.4 *3*			
762.9 *7*			
852.8 *8*			
899.8 *6*			
919.8 *8*			
0.0+y	J		Additional information 2.
53.4+y *5*	J+1	<5 ns	$T_{1/2}$: from 1985Mo01.
211.7+y *6*	J+2		
241.0+y *6*	J+2		
452.6+y *6*			
501.7+y? *6*			
518.7+y *6*	J+3		
668.7+y *6*	J+3		
765.2+y *8*			
813.7+y *6*	J+4		
925.8+y *6*	J+4		

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^{133}Cs(α,3nγ),^{136}Ba(p,3nγ) 1985Mo01 (continued)

^{134}La Levels (continued)

E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]	Jπ[‡]	E(level)[†]
976.6+y 6	J+4	1471.6+y 8		1684.5+y 7		2133.1+y 6
1194.8+y 7	J+5	1510.2+y 6	J+6	1710.4+y 8		2146.2+y 7
1234.0+y 6	J+5	1532.7+y 7	J+6	1739.3+y 7	J+7	2320.9+y 10
1412.2+y 6		1555.6+y 6		1968.3+y 9	J+7	

[†] From least-squares fit to Eγ.
[‡] As given by 1985Mo01.

γ(^{134}La)

E_γ	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	α[&]	Comments
(31.89 10)	0.7 4	31.89	(2)$^+$	0.0	1$^+$	M1+E2	9.5 18	Eγ,α: from ^{134}Ce ε decay. Iγ: from intensity balance and α.
(41.4)		164.28		122.86				
53.4 5	17.5[#]	53.4+y	J+1	0.0+y	J	M1+E2	6.7	α(K)= 5.75; α(L)= 0.783; α(M)= 0.1624; α(N+..)= 0.0447 Mult.: α(exp)=6 2 (1985Mo01). Iγ: from intensity balance and α.
54.6[‡] 5	19[‡] 9	329.3		274.72				
56.0[‡] 5	7.0[‡] 35	220.27		164.28				
61.7[‡] 5	8.4[‡] 40	336.43		274.72				
84.3[‡] 5	1.2[‡] 6	467.2		382.9	(3$^+$)			
86.4[‡] 5	2.6[‡] 13	570.4		484.0	(3$^+$)			
[x]93.4 2	6.9 28							Eγ: observed in off-beam coincidence with 164.3γ and 122.6γ.
97.4 2	9.0 30	220.27		122.86		(M1+E2)	1.7 5	Mult.: γ(θ): A_2=−0.12 13, A_4=0.04 17.
107.5 2	2.5 12	490.4		382.9	(3$^+$)			
110.4 2	15 5	274.72		164.28				γ(θ): A_2=−0.03 6, A_4=−0.01 9.
115.8[‡] 5	2.2[‡] 11	659.8		544.0	(4$^+$)			
116.1 2	38 8	336.43		220.27				γ(θ): A_2=−0.07 3, A_4=0.12 4.
122.9 2	20 5	122.86		0.0	1$^+$			γ(θ): A_2=−0.06 6, A_4=0.10 8.
144.9 2	46[#] 9	813.7+y	J+4	668.7+y	J+3	(M1+E2)	0.46 8	Mult.: γ(θ): A_2=−0.31 2, A_4=0.07 3.
149.6[‡] 5	4.1[‡] 20	336.43		186.98	(2)$^+$			
151.9 2	21 4	274.72		122.86				γ(θ): A_2=−0.07 4, A_4=−0.07 6.
158.3 2	50[#] 5	211.7+y	J+2	53.4+y	J+1	(M1+E2)	0.35 5	Mult.: γ(θ): A_2=−0.40 2, A_4=0.05 3.
161.1 2	11 3	544.0	(4$^+$)	382.9	(3$^+$)	(M1+E2)	0.33 3	Mult.: γ(θ): A_2=−0.24 8, A_4=0.06 11.
164.3 2	50 10	164.28		0.0	1$^+$			γ(θ): A_2=0.04 4, A_4=0.05 4.
[x]168.9 2	2.9 15							
172.2 2	9.6 30	336.43		164.28				
173.5[‡] 5	7.7[‡] 40	205.31	(2)$^+$	31.89	(2)$^+$	M1+E2	0.26 3	Mult.: γ(θ): A_2=−0.18 8, A_4=0.07 10.
177.6[‡] 5	47[‡] 20	382.9	(3$^+$)	205.31	(2)$^+$	(M1+E2)	0.24 3	Mult.: γ(θ): A_2=−0.10 2, A_4=−0.08 3.
183.2 2	3.8 19	727.2		544.0	(4$^+$)	(E2)	0.24	Mult.: γ(θ): A_2=0.33 24, A_4=−0.21 30.
187.0 2	5.0 20	186.98	(2)$^+$	0.0	1$^+$			
187.6 2	56[#] 6	241.0+y	J+2	53.4+y	J+1	(M1+E2)	0.21 2	Mult.: γ(θ): A_2=−0.34 2, A_4=0.00 3.
187.6[‡] 5	4.0[‡] 20	570.4		382.9	(3$^+$)			
[x]191.1 2	6.0 25							
205.3 2	60 6	205.31	(2)$^+$	0.0	1$^+$	M1+E2	0.156 8	Mult.: γ(θ): A_2=−0.08 2, A_4=−0.06 3.
211.6 2		452.6+y		241.0+y	J+2			
220.2 2	9.4 30	220.27		0.0	1$^+$			γ(θ): A_2=0.08 10, A_4=−0.08 14.

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^{133}Cs(α,3nγ),^{136}Ba(p,3nγ) 1985Mo01 (continued)

γ(^{134}La) (continued)

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[&]	Comments
229.1 2	13.4[#] 40	1739.3+y	J+7	1510.2+y	J+6	(M1+E2)	0.112 2	Mult.: γ(θ): A_2=−0.41 6, A_4=0.09 8.
245.5[‡] 5	16.5[‡] 80	574.8		329.3		(M1+E2)	0.091 1	Mult.: γ(θ): A_2=−0.14 5, A_4=−0.10 7.
257.5 2	12.3[#] 40	1234.0+y	J+5	976.6+y	J+4	(M1+E2)	0.079 3	Mult.: γ(θ): A_2=−0.31 10, A_4=0.13 14.
258.8[‡] 5	9.5[‡] 50	381.7		122.86				
260.0 2	3.0 15	919.8		659.8				γ(θ): A_2=−0.06 9, A_4=−0.18 13.
265.2 2	11 4	648.1	(4$^+$)	382.9	(3$^+$)	(M1+E2)	0.072 2	Mult.: γ(θ): A_2=−0.06 9, A_4=−0.18 13.
[x]272.7 5	5.1 25							
274.7 2	100 10	274.72		0.0	1$^+$			γ(θ): A_2=0.04 2, A_4=−0.05 2.
276.2 2	14[#] 4	1510.2+y	J+6	1234.0+y	J+5	(M1+E2)	0.064 3	Mult.: γ(θ): A_2=−0.28 6, A_4=−0.20 8.
277.5[a]	[@]	518.7+y	J+3	241.0+y	J+2			
278.6[‡] 5	14[‡] 7	484.0	(3$^+$)	205.31	(2)$^+$	(M1+E2)	0.062 3	Mult.: γ(θ): A_2=−0.09 5, A_4=−0.09 7.
282.4[‡] 5	3.8[‡] 19	852.8		570.4				
290.0 2	1.9[#] 9	501.7+y?		211.7+y	J+2			
307.0 2	30[#] 6	518.7+y	J+3	211.7+y	J+2	(M1+E2)	0.047 3	Mult.: γ(θ): A_2=−0.35 04, A_4=0.04 06.
332.4[‡] 5	2.2[‡] 11	715.3		382.9	(3$^+$)			
337.9 2	14[#] 4	1532.7+y	J+6	1194.8+y	J+5	(M1+E2)		Mult.: γ(θ): A_2=−0.35 8, A_4=0.03 11.
380.0[‡] 5	2.9[‡] 15	762.9		382.9	(3$^+$)			
381.2 2	37[#] 7	1194.8+y	J+5	813.7+y	J+4	(M1+E2)		Mult.: γ(θ): A_2=−0.48 3, A_4=0.06 5.
386.2 2	5.5 22	591.5		205.31	(2)$^+$			
406.9 2	6.7[#] 27	2146.2+y		1739.3+y	J+7	(M1+E2)		Mult.: γ(θ): A_2=−0.05 16, A_4=0.13 20.
410.0 2	14 5	746.4		336.43		(E2)		Mult.: γ(θ): A_2=0.27 8, A_4=−0.08 11.
427.7 2	49[#] 5	668.7+y	J+3	241.0+y	J+2			Mult.: γ(θ): A_2=−0.29 3, A_4=−0.01 4.
435.6 5	14.2[#] 40	1968.3+y	J+7	1532.7+y	J+6	(M1+E2)		Mult.: γ(θ): A_2=−0.35 9, A_4=0.03 13.
457.2[‡] 5	23[‡#] 11	668.7+y	J+3	211.7+y	J+2			Mult.: γ(θ): A_2=−0.12 5, A_4=0.02 7.
458.0[‡] 5	5.7[‡#] 30	976.6+y	J+4	518.7+y	J+3			
515.6[‡] 5	14[‡#] 7	1710.4+y		1194.8+y	J+5			γ(θ): A_2<0.0.
524.2[‡] 5	[‡]	765.2+y		241.0+y	J+2			
598.4[‡] 5	6.8[‡#] 30	1412.2+y		813.7+y	J+4			
610.5[‡] 5	4.2[‡#] 21	2320.9+y		1710.4+y				
625.1[‡] 5	8.9[‡] 40	899.8		274.72				γ(θ): A_2=0.01 10, A_4=−0.19 20.
684.8 2	8.6[#] 30	925.8+y	J+4	241.0+y	J+2	(E2)		Mult.: γ(θ): A_2=0.34 9, A_4=−0.06 15.
[x]686.3 2	3.6 18							
715.3 2	8.4[#] 30	1234.0+y	J+5	518.7+y	J+3	(E2)		Mult.: γ(θ): A_2=0.47 14, A_4=−0.26 18.
718.9[‡] 5	9.2[‡#] 40	1532.7+y	J+6	813.7+y	J+4	(E2)		Mult.: γ(θ): A_2=0.30 11, A_4=−0.19 14.
743.5 2	8.6[#] 30	1412.2+y		668.7+y	J+3			
764.9 2	5.5[#] 22	976.6+y	J+4	211.7+y	J+2	(E2)		Mult.: γ(θ): A_2=0.30 10, A_4=−0.08 20.
802.9[‡] 5	7.6[‡#] 40	1471.6+y		668.7+y	J+3			
870.8 2	6.3[#] 25	1684.5+y		813.7+y	J+4			Mult.: γ(θ): A_2=0.12 12, A_4=−0.02 20.
886.9 2	9.5[#] 40	1555.6+y		668.7+y	J+3			
899.1 2	5.7[#] 23	2133.1+y		1234.0+y	J+5			γ(θ): A_2=0.12 8, A_4=0.03 10.
[x]961.1 2	4.2[#] 21							

[†] From (p,3nγ), except as noted.
[‡] Line contaminated.
[#] From (α,3nγ), normalized to Iγ(274.7)=100.

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^{133}Cs(α,3nγ),^{136}Ba(p,3nγ) 1985Mo01 (continued)

γ(^{134}La) (continued)

[@] Weak.

[&] 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.

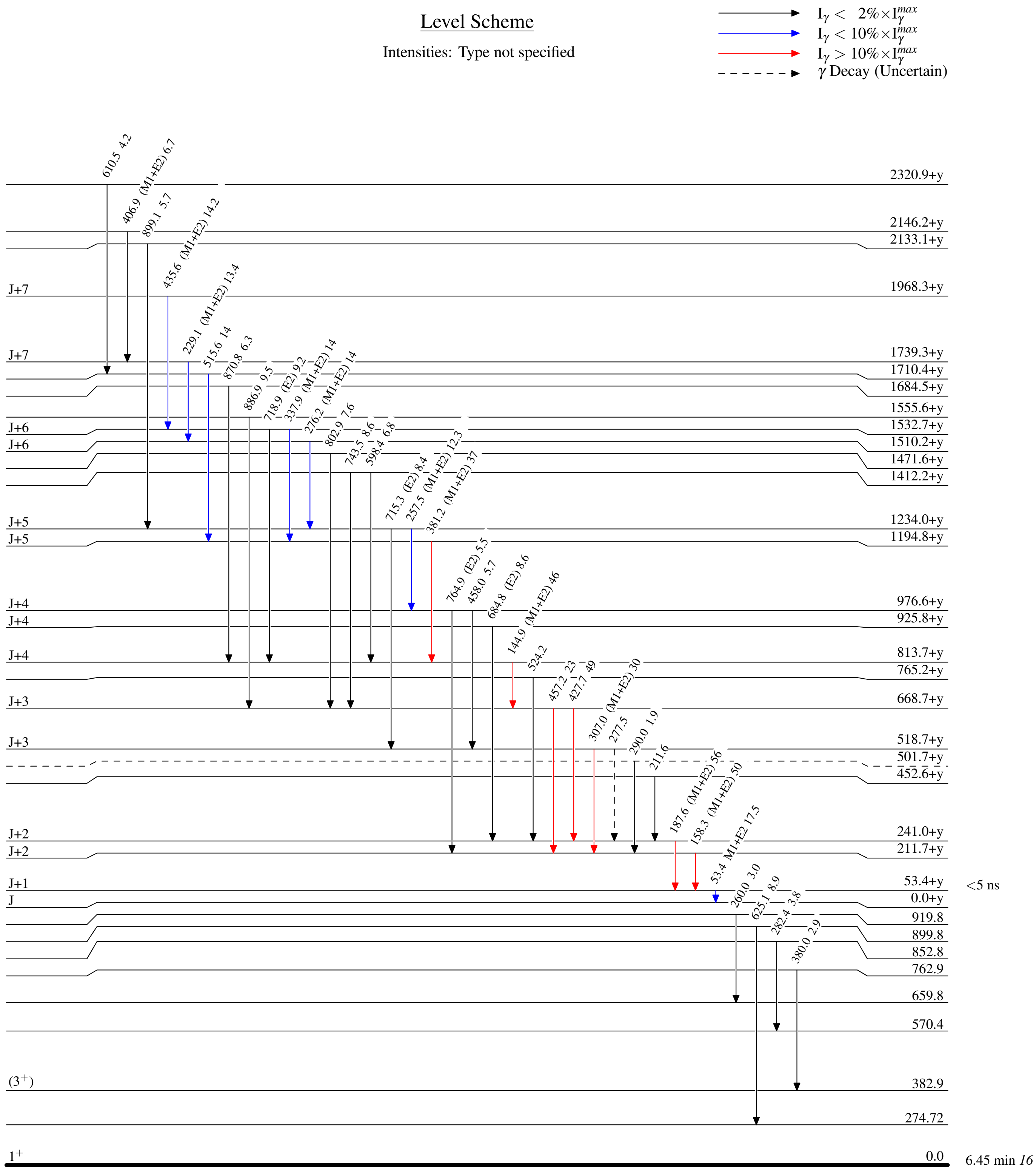
[a] Placement of transition in the level scheme is uncertain.

[x] γ ray not placed in level scheme.

$^{133}Cs(\alpha,3n\gamma),^{136}Ba(p,3n\gamma)$ 1985Mo01

Level Scheme

Intensities: Type not specified



$^{134}_{57}La_{77}$

$^{133}Cs(\alpha,3n\gamma),^{136}Ba(p,3n\gamma)$ 1985Mo01

Level Scheme (continued)

Intensities: Type not specified

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)