^{134}Ce ε decay 1976Gr09,1984Is05

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

Parent: ^{134}Ce: E=0.0; $J^\pi=0^+$; $T_{1/2}$=3.16 d *4*; Q(ε)=3.8×10^2 *3*; %ε decay=100.0

^{134}La Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	1^+	6.45 min *16*	
31.898 *16*	$(2)^+$		
54.601 *14*	$(2)^+$		
93.697 *17*	$(2,3)^+$		
136.32 *4*	$(2,3)^+$		E(level)=148.09 *5* is possible because the order of 104.5-116.2 γ-ray cascade is uncertain.
162.312 *9*	1^+		
187.009 *11*	$(2)^+$		
205.28 *4*	$(2)^+$		
252.483 *14*	$(1)^+$		
294.264 *12*	$(1)^+$		
355.479 *12*	$(1)^+$		

ε radiations

ε(K)/ε=0.798 *40* (1976Gr09), 0.72 *8* (1973Al15).
ε(L)/ε(K)=0.23 (1965Bi12).

E(decay)	E(level)	Iε[†]	Log *ft*	Comments
(2×10^1 *3*)	355.479	0.25 *1*	≤5.5	εL=0.69 *22*; εM+=0.31 *15*
(9×10^1 *3*)	294.264	0.11 *1*	6.6 *7*	εK=0.7 *3*; εL=0.26 *20*; εM+=0.08 *8*
(1.3×10^2 *3*)	252.483	0.050 *9*	7.4 *4*	εK=0.75 *6*; εL=0.19 *4*; εM+=0.057 *14*
(1.7×10^2 *3*)	205.28	<0.001	>9.4	εK=0.788 *19*; εL=0.163 *14*; εM+=0.048 *5*
(1.9×10^2 *3*)	187.009	<0.001	>9.6	εK=0.796 *15*; εL=0.157 *11*; εM+=0.046 *4*
(2.2×10^2 *3*)	162.312	0.53 *4*	6.95 *16*	εK=0.804 *11*; εL=0.151 *8*; εM+=0.044 *3*
(2.4×10^2 *3*)	136.32	<0.002	>9.5	εK=0.811 *8*; εL=0.147 *6*; εM+=0.0427 *19*
(2.9×10^2 *3*)	93.697	<0.04	>8.3	εK=0.818 *5*; εL=0.141 *4*; εM+=0.0409 *13*
(3.3×10^2 *3*)	54.601	<0.1	>8.1	εK=0.823 *4*; εL=0.137 *3*; εM+=0.0396 *9*
(3.5×10^2 *3*)	31.898	<0.3	>7.7	εK=0.825 *3*; εL=0.1357 *23*; εM+=0.0391 *8*
(3.8×10^2 *3*)	0.0	98.9 *2*	5.23 *8*	εK=0.8279 *25*; εL=0.1337 *19*; εM+=0.0384 *7*

[†] Absolute intensity per 100 decays.

γ(^{134}La)

Iγ normalization: From Iγ(162.3)=0.230% 16 and Iγ(130.4+131.9)=0.226% 16 (1976Gr09).
α(exp)=Ice/Iγ normalized to α(K)(130.4)=0.441. Ice from 1984Is05.
I(K x ray,La)=72300 3600 (1976Gr09).

E_γ[†]	I_γ[†#]	E_i(level)	J^π_i	E_f	J^π_f	Mult.	δ	α[@]	Comments
22.70 10	4.5 8	54.601	(2)$^+$	31.898	(2)$^+$	M1+E2	0.124 17	27 5	α(L)= 21 4; α(M)= 4.5 7 Mult.: L1:L2:L3=40 9:25 7:30 8. I_γ: from ce data; Iγ<22 estimated by 1976Gr09.
31.89 10	58 13	31.898	(2)$^+$	0.0	1$^+$	M1+E2	0.17 3	9.5 18	α(L)= 7.4 14; α(M)= 1.6 3 Mult.: L1:L2:L3=186 40:96 30:150 40. I_γ: from ce data; Iγ<50 estimated by 1976Gr09.
39.08 9	14 3	93.697	(2,3)$^+$	54.601	(2)$^+$	M1+E2	0.14 5	3.7 10	α(L)= 3.0 8; α(M)= 0.63 18 Mult.: L1:L2=25 6:8 3. I_γ: from ce data; Iγ<150 estimated by 1976Gr09.
54.65 6	16.9 24	54.601	(2)$^+$	0.0	1$^+$	M1+E2		6.30	α(K)= 5.38; α(L)= 0.731; α(M)= 0.1517; α(N+..)= 0.0418 Mult.: α(K)exp=5.3 13, α(L1)exp=0.9 3, α(M1)exp=0.23 7.
^{x}59.04 20	0.21 10								
61.30[‡] 10	2.0[‡] 6	355.479	(1)$^+$	294.264	(1)$^+$	(M1+E2)		4.51	Mult.: α(K)exp=3.1 7.
61.88[‡] 14	1.6[‡] 5	93.697	(2,3)$^+$	31.898	(2)$^+$	M1+E2		4.39	Mult.: α(K)exp=3.1 7.
^{x}66.26[a] 20	0.12 6								
68.55 16	0.76 25	162.312	1$^+$	93.697	(2,3)$^+$	[M1,E2]		5.6 23	
^{x}70.85 12	1.21 20								
90.18 6	5.5 5	252.483	(1)$^+$	162.312	1$^+$	M1,E2		2.2 8	Mult.: α(K)exp=1.8 6.
93.47 16	0.93 25	93.697	(2,3)$^+$	0.0	1$^+$	[M1,E2]		1.9 7	
102.998 10	25.3 25	355.479	(1)$^+$	252.483	(1)$^+$	(M1+E2)		1.01	Mult.: α(K)exp=0.71 16.
104.53 8	2.14 28	136.32	(2,3)$^+$	31.898	(2)$^+$	M1,E2		1.3 4	Mult.: α(K)exp≤1.16.
107.34 4	6.1 4	294.264	(1)$^+$	187.009	(2)$^+$	M1+E2		1.2 4	Mult.: α(K)exp=0.65 16.
116.19 4	2.68 27	252.483	(1)$^+$	136.32	(2,3)$^+$	M1,E2		0.95 24	Mult.: α(K)exp≤0.56.
130.414 15	209 15	162.312	1$^+$	31.898	(2)$^+$	M1+E2	0.04 +8−4	0.517 4	α(K)= 0.4413 13; α(L)= 0.0597 17; α(M)= 0.0123 4; α(N+..)=0.00341 10 Mult.: K:L1:L2:L3=93:11.6 16:0.84 15:≤0.2.
131.93 5	17.1 17	294.264	(1)$^+$	162.312	1$^+$	M1,E2		0.63 13	Mult.: α(K)exp=0.52 14.
150.20 4	3.76 40	355.479	(1)$^+$	205.28	(2)$^+$	M1,E2		0.41 7	Mult.: α(K)exp=0.47 13.
158.785 10	39.1 27	252.483	(1)$^+$	93.697	(2,3)$^+$	M1,E2		0.35 5	Mult.: α(K)exp=0.23 6.
162.306 10	230 16	162.312	1$^+$	0.0	1$^+$	M1+E2	0.60 4	0.3029 22	α(K)= 0.2473 8; α(L)= 0.0438 12; α(M)= 0.0092 3; α(N+..)=0.00251 7 Mult.: K:L1:L2:L3=58 9:6.8 11:3.4 5:1.3 2.
168.453 25	12.2 9	355.479	(1)$^+$	187.009	(2)$^+$	M1,E2		0.29 4	Mult.: α(K)exp=0.22 4.
(173.38)	0.5	205.28	(2)$^+$	31.898	(2)$^+$	M1+E2		0.26 3	Mult.: from (HI,xnγ).
187.013 12	21.8 15	187.009	(2)$^+$	0.0	1$^+$	M1,E2		0.21 2	Mult.: α(K)exp=0.18 4.

γ(^{134}La) (continued)

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[@]	Comments
193.157 *12*	40.4 *28*	355.479	$(1)^+$	162.312	1^+	M1,E2	0.188 *14*	Mult.: α(K)exp=0.15 *4*.
197.891 *25*	13.6 *10*	252.483	$(1)^+$	54.601	$(2)^+$	M1,E2	0.174 *12*	Mult.: α(K)exp=0.088 *25*.
200.60 *8*	1.61 *24*	294.264	$(1)^+$	93.697	$(2,3)^+$	[M1,E2]	0.17 *1*	
205.27 *6*	4.2 *5*	205.28	$(2)^+$	0.0	1^+	M1+E2	0.156 *9*	Mult.: α(K)exp≈0.095.
220.56 *5*	4.6 *6*	252.483	$(1)^+$	31.898	$(2)^+$	M1,E2	0.125 *4*	Mult.: α(K)exp≈0.108.
239.65 *2*	13.1 *10*	294.264	$(1)^+$	54.601	$(2)^+$	M1,E2	0.0974 *4*	Mult.: α(K)exp=0.076 *25*.
252.54 *7*	3.7 *5*	252.483	$(1)^+$	0.0	1^+	[M1,E2]	0.083 *1*	
262.26[&] *10*	3.4 *5*	294.264	$(1)^+$	31.898	$(2)^+$	[M1,E2]	0.075 *2*	
262.26[&a] *10*	≤3.4	355.479	$(1)^+$	93.697	$(2,3)^+$			
[x]265.54 *7*	3.9 *5*							
294.264 *15*	54 *4*	294.264	$(1)^+$	0.0	1^+	M1,E2	0.053 *3*	Mult.: α(K)exp≤0.048.
300.884 *15*	88 *7*	355.479	$(1)^+$	54.601	$(2)^+$	M1,E2	0.050 *4*	Mult.: α(K)exp=0.032 *10*.
323.59 *5*	15.6 *16*	355.479	$(1)^+$	31.898	$(2)^+$	M1,E2	0.041 *4*	Mult.: α(K)exp≈0.038.
355.54 *5*	8.8 *9*	355.479	$(1)^+$	0.0	1^+	M1,E2	0.031 *4*	Mult.: α(K)exp≈0.057.

† From 1976Gr09.
‡ Doublet; intensity suitably divided, Iγ(61.30+61.88)=3.6 *8*.
\# For absolute intensity per 100 decays, multiply by 1.0×10^{-3}.
@ 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.
& Multiply placed.
a Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

$^{134}_{57}La_{77}$-3

^{134}Ce ε decay 1976Gr09,1984Is05

Decay Scheme

Intensities: I_γ per 100 parent decays