^{133}Ce ε decay (97 min) 1978He16

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Yu. Khazov and A. Rodionov, F. G. Kondev	NDS 112,855 (2011)	31-Oct-2010

Parent: ^{133}Ce: E=0.0; J$^{\pi}$=1/2^{+}; $T_{1/2}$=97 min *4*; Q(ε)=3071 *30*; %ε+%β^{+} decay=100

1978He16: ^{133}Ce ε (97 min) [from Ba(α,xn)]; measured Eγ, Iγ, $\gamma\gamma$, ce; deduced levels, α(exp), log *ft*. Ge(Li) detectors, Compton-suppressed system, magnetic spectrometer.

1984Gr30: ^{133}Ce ε (97 min) [from Gd(p,X), E=660 MeV]; measured ce; deduced α(exp), δ. Magnetic spectrograph.

Others: 1966Ab05, 1968Ge01.

^{133}La Levels

E(level)†	J$^{\pi}$‡	$T_{1/2}$‡
0.0	5/2^{+}	3.912 h *8*
97.261 *10*	3/2^{+}	<0.4 ns
174.1 *4*	1/2^{+}	0.83 ns *18*

† From a least-squares fit to Eγ's.

‡ From 'Adopted Levels'.

ε,β^{+} radiations

E(decay)	E(level)	Iβ^{+} †	Iε†	Log *ft*	I($\varepsilon+\beta^{+}$)†	Comments
(2897 *30*)	174.1	19 *3*	34 *5*	5.86 *7*	53 *8*	av Eβ=843 *15*; εK=0.545 *11*; εL=0.0750 *15*; εM+=0.0211 *5*
(2974 *30*)	97.261	18 *7*	29 *10*	5.95 *16*	47 *17*	av Eβ=878 *15*; εK=0.520 *11*; εL=0.0715 *15*; εM+=0.0201 *4*

† Absolute intensity per 100 decays.

γ(^{133}La)

Iγ normalization: from Σ(I(γ+ce) to g.s.)=100 and by assuming that there is no direct feeding to g.s.

E_γ †	I_γ †#	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	δ ‡	α @	Comments
76.9 *5*	350 *50*	174.1	1/2$^+$	97.261	3/2$^+$	M1+E2	0.057 *+10−19*	2.31 *6*	ce(K)=685 *67*; α(K)exp=1.96 α(K)=1.96 *5*; α(L)=0.272 *8*; α(M)=0.0567 *16*; α(N+..)=0.0146 *4* α(N)=0.0124 *4*; α(O)=0.00202 *5*; α(P)=0.000153 *4* α(L1)=0.244 *6*; α(L2)=0.0215 *11*; α(L3)=0.0071 *12* L1:L2:L3=8.6 *8*:0.90 *9*:0.24 *3* (1984Gr30). δ: calculated by evaluators from M1+(0.32 *+14−18*)%E2 (1984Gr30).
97.261 *10*	100×10^1 *15*	97.261	3/2$^+$	0.0	5/2$^+$	M1+E2	0.157 *17*	1.195 *18*	ce(K)=110×10^1 *10*; ce(L1)=140 *13*; ce(L2)=17.5 *18*; ce(L3)<6; α(K)exp=1.10 *10* (1984Gr30) α(K)=1.007 *15*; α(L)=0.149 *4*; α(M)=0.0311 *8*; α(N+..)=0.00799 *20* α(N)=0.00682 *17*; α(O)=0.001092 *25*; α(P)=7.78×10^{-5} *11* δ: from M1+(2.4 *5*)%E2 in 1984Gr30.
174.0 *5*	9 *2*	174.1	1/2$^+$	0.0	5/2$^+$	E2		0.286 *5*	ce(K)=1.94 *30*; α(K)exp=0.22 *6* (1984Gr30) α(K)=0.214 *4*; α(L)=0.0570 *11*; α(M)=0.01237 *23*; α(N+..)=0.00305 *6* α(N)=0.00265 *5*; α(O)=0.000391 *8*; α(P)=1.293×10^{-5} *22* L2:L3=0.17 *2*:0.16 *2*.
^{x}376.7 *3*	≈20					M1,E2		0.026 *3*	ce(K)=0.5 *2*; α(K)exp≈0.026 (1984Gr30) α(K)=0.022 *3*; α(L)=0.00327 *6*; α(M)=0.000684 *10*; α(N+..)=0.000175 *3* α(N)=0.0001495 *23*; α(O)=2.38×10^{-5} *8*; α(P)=1.6×10^{-6} *3*
^{x}557.7 *3*	250 *50*					(E2)		0.00769	ce(K)=1.6 *3*; ce(L)=0.26 *3*; α(K)exp=0.0066 *16* (1984Gr30) α(K)=0.00647 *10*; α(L)=0.000964 *14*; α(M)=0.000202 *3*; α(N+..)=5.15×10^{-5} *8* α(N)=4.40×10^{-5} *7*; α(O)=6.98×10^{-6} *10*; α(P)=4.63×10^{-7} *7*

† From 1978He16. Iγ′s are relative to Iγ(97.261γ)=1000.

‡ From α(exp) and δ in 1984Gr30, Ice′s are normalized by evaluators in accordance with the calculated α(K)=1.964 for 76.9γ, whose multipolarity M1+0.32%E2 is deduced from L-subshell ratios in 1984Gr30.

For absolute intensity per 100 decays, multiply by 0.0455 *8*.

@ 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.

^{x} γ ray not placed in level scheme.

^{133}Ce ε decay (97 min) 1978He16

Decay Scheme

Intensities: Relative I_γ