^{137}Ce ε decay (34.4 h) 1975He20

History

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

Parent: ^{137}Ce: E=254.29 *5*; J^π=11/2$^-$; $T_{1/2}$=34.4 h *3*; Q(ε)=1222.1 *16*; %ε+%$β^+$ decay=0.79 *4*

Additional information 1.

Measured: γ, ce (1975He20,1975ArYT), γγ (1982Ko05,1964FrZZ), ceγ (1980ZhZY) ce (1975Mo12), γ(θ,T) (1964FrZZ), γ (1982Ko05).

Decay scheme is that from 1975He20, except for the 781 level and its decaying transitions which have been seen by 1982Ko05;

^{137}La Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	7/2$^+$		
10.61 *5*	5/2$^+$		
762.30 *10*	11/2$^+$		
835.36 *8*	9/2$^+$		
917.44 *11*	9/2$^+$		
1004.61 *8*	11/2$^-$	0.41 ns *7*	$T_{1/2}$: from 1967Va21.

ε,$β^+$ radiations

E(decay)	E(level)	Iε[†‡]	Log *ft*	I(ε+$β^+$)[‡]	Comments
(471.8 *16*)	1004.61	0.51 *4*	7.38 *4*	0.51 *4*	εK=0.8334; εL=0.1296; εM+=0.03705
(559.0 *16*)	917.44	0.007 *3*	9.4 *2*	0.007 *3*	εK=0.8367; εL=0.1271; εM+=0.03621
(641.0 *16*)	835.36	0.08 *3*	8.5 *2*	0.08 *3*	εK=0.8390; εL=0.1254; εM+=0.03564
(714.1 *16*)	762.30	0.197 *14*	8.17 *4*	0.197 *14*	εK=0.8405; εL=0.1242; εM+=0.03525

† Absolute intensity per 100 decays.

‡ For absolute intensity per 100 decays, multiply by 0.0079 *4*.

γ(^{137}La)

Iγ normalization: Σ Ti(254γ in ^{137}Ce (34.4 h) IT Decay) and Σ I(γ+ce) for γ rays to g.s. or 10.6-keV level in ^{137}La=100.
α(K)exp normalized so that α(K)(825γ)=0.0025 (E2, theory).

E_γ[†]	I_γ[†‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	α[#]	Comments
10.61 *5*		10.61	5/2$^+$	0.0	7/2$^+$	M1	117.6 *24*	α(L)=93.2 *19*; α(M)=19.4 *4*; α(N+..)=5.01 *10* α(N)=4.26 *9*; α(O)=0.690 *14*; α(P)=0.0528 *11* Mult.: M1:M2:M3=23.4 *16*:2.87 *24*:1 (1975Mo12); M1:M2:M3:M4+= 100:10 *1*:2.6 *7*:0.50 *15*, δ<0.008 (1975ArYT).
87.2 *2*	20 *3*	1004.61	11/2$^-$	917.44	9/2$^+$			
169.26 *4*	995 *60*	1004.61	11/2$^-$	835.36	9/2$^+$	E1	0.0550	α(K)=0.0471 *7*; α(L)=0.00625 *9*; α(M)=0.001290 *18*; α(N+..)=0.000328 *5* α(N)=0.000281 *4*; α(O)=4.46×10^{-5} *7*; α(P)=3.07×10^{-6} *5* Mult.: from 1964FrZZ.
762.30 *10*	435 *20*	762.30	11/2$^+$	0.0	7/2$^+$	E2	0.00352	α(K)=0.00300 *5*; α(L)=0.000416 *6*; α(M)=8.66×10^{-5} *13*; α(N+..)=2.22×10^{-5} *4* α(N)=1.89×10^{-5} *3*; α(O)=3.04×10^{-6} *5*;

Continued on next page (footnotes at end of table)

^{137}Ce ε decay (34.4 h) 1975He20 (continued)

γ(^{137}La) (continued)

E_γ[†]	I_γ[†‡]	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α[#]	Comments
									α(P)=2.18×10^{-7} *3* Mult.: α(K)exp=0.030 *3*, α(L)exp=0.0004 *1*, K/L=7.4 *12*.
824.82 *12*	1000	835.36	9/2$^+$	10.61	5/2$^+$	E2		0.00293	α(K)=0.00250 *4*; α(L)=0.000342 *5*; α(M)=7.11×10^{-5} *10*; α(N+..)=1.82×10^{-5} *3* α(N)=1.556×10^{-5} *22*; α(O)=2.50×10^{-6} *4*; α(P)=1.82×10^{-7} *3*
									Mult.: α(K)exp=0.00247 *19* if α(K)(254γ)=5.54 (M4), K/L=7.9 *7*.
835.38 *12*	234 *10*	835.36	9/2$^+$	0.0	7/2$^+$	E2		0.00285	α(K)=0.00243 *4*; α(L)=0.000331 *5*; α(M)=6.89×10^{-5} *10*; α(N+..)=1.769×10^{-5} *25* α(N)=1.508×10^{-5} *22*; α(O)=2.43×10^{-6} *4*; α(P)=1.772×10^{-7} *25* Mult.: α(K)exp=0.0022 *3*.
906.84 *16*	6.3 *11*	917.44	9/2$^+$	10.61	5/2$^+$				
917.45 *17*	29 *5*	917.44	9/2$^+$	0.0	7/2$^+$				
993.81 *21*	4.5 *6*	1004.61	11/2$^-$	10.61	5/2$^+$				
1004.49 *20*	51 *6*	1004.61	11/2$^-$	0.0	7/2$^+$	M2(+E3)	<0.8	0.0061 *6*	α(K)=0.0052 *5*; α(L)=0.00071 *5*; α(M)=0.000147 *11*; α(N+..)=3.8×10^{-5} *3* α(N)=3.24×10^{-5} *23*; α(O)=5.3×10^{-6} *4*; α(P)=4.1×10^{-7} *4* Mult.,δ: α(K)exp=0.0056 *9* (1975He20). Additional information 2.

[†] From 1975He20.
[‡] For absolute intensity per 100 decays, multiply by 4.50×10^{-4} *23*.
[#] 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.

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Decay Scheme

Intensities: I_γ per 100 parent decays