^{127}Ce β^+ decay (34 s) 1996Ge07

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	A. Hashizume	NDS 112, 1647 (2011)	1-Oct-2009

Parent: ^{127}Ce: E=0.0; $J^\pi=(1/2^+)$; $T_{1/2}$=34 s *2*; Q(β^+)=5.92×10^3 *6*; %β^+ decay=100.0

1996Ge07: (^{94}Mo,^{96}Mo)+^{40}Ca, E=255 MeV; on-line mass; γ, $\gamma\gamma$(t), (K x ray)γ(t), (ce)(γ) coin.

1996Ge07 report two half-lives in the ^{127}Ce decay. The 58.5 keV γ decays with T=29 s *2* and the 120.4 keV γ decays with T=34 s *2*. The proposed level scheme in ^{127}La by the ^{127}Ce decay is not separated for the decay of the ground and isomeric states. The ^{127}Ce decay is recently studied by the reaction (^{94}Mo,^{96}Mo)+^{35}Cl, E=185 MeV, mass separated source by 2005Ii01. However, the observed half-life of all γ's is 28.6 s *7*, and there is no γ which decays with 34 s half-life. 2005Ii01 attribute that the difference is due to many precursors in the source obtained by the ^{94,96}Mo+^{40}Ca reaction. The 120.4 keV γ is assigned as the transition from the 134.4 state to the 14 state. Among proposed levels by 1996Ge07, all levels decaying to the 134.4 keV state are assumed to be excited in the 34 s ground state decay (evaluator). As Q_ε=5.9 MeV, the level scheme is only partial.

^{127}La Levels

E(level)†	J^π‡	Comments
0	$(11/2^-)$	
14.2 *4*	$(3/2^+)$	Additional information 1.
72.80 *15*	$(5/2^+)$	
134.34 *12*	$(^+)$	
210.15 *12*	$(^+)$	
215.94? *24*		
352.36 *21*	$(^+)$	
836.60 *14*		
928.45 *18*		
999.13 *14*		
1162.02 *22*	$(3/2,5/2)^+$	
1213.2? *6*		

† From a least-squares fit to E_γ's (evaluator).

‡ From Adopted Levels.

$\gamma(^{127}La)$

E_γ†	I_γ‡	E_i(level)	J_i^π	E_f	J_f^π
58.5 *2*	100.0	72.80	$(5/2^+)$	14.2	$(3/2^+)$
75.7 *2*	26 *9*	210.15	$(^+)$	134.34	$(^+)$
81.6 *2*	100.0	215.94?		134.34	$(^+)$
120.4 *2*	100.0	134.34	$(^+)$	14.2	$(3/2^+)$
137.5 *2*	14 *6*	210.15	$(^+)$	72.80	$(5/2^+)$
195.9 *2*	100 *9*	210.15	$(^+)$	14.2	$(3/2^+)$
279.3 *2*	1.0×10^2 *3*	352.36	$(^+)$	72.80	$(5/2^+)$
338 *1*	20 *10*	352.36	$(^+)$	14.2	$(3/2^+)$
626.5 *2*	57 *15*	836.60		210.15	$(^+)$
702.3 *2*	1.0×10^2 *3*	836.60		134.34	$(^+)$
718.2 *2*	1.0×10^2 *5*	928.45		210.15	$(^+)$
765 *2*	43 *15*	836.60		72.80	$(5/2^+)$
789.0 *2*	25 *13*	999.13		210.15	$(^+)$
794.2 *2*	1.0×10^2 *5*	928.45		134.34	$(^+)$
809.4 *2*	23 *8*	1162.02	$(3/2,5/2)^+$	352.36	$(^+)$
822.3 *2*	57 *15*	836.60		14.2	$(3/2^+)$
864.8 *2*	100 *25*	999.13		134.34	$(^+)$

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^{127}Ce β^+ decay (34 s) 1996Ge07 (continued)

$\gamma(^{127}La)$ (continued)

E_γ [†]	I_γ [‡]	E_i(level)	J_i^π	E_f	J_f^π
952.0 *5*	23 *8*	1162.02	$(3/2,5/2)^+$	210.15	$(^+)$
984.9 *2*	38 *13*	999.13		14.2	$(3/2^+)$
1003.0 *5*	100.0	1213.2?		210.15	$(^+)$
1029.0 *5*	15 *8*	1162.02	$(3/2,5/2)^+$	134.34	$(^+)$
1148.0 *5*	100 *23*	1162.02	$(3/2,5/2)^+$	14.2	$(3/2^+)$

† From 1996Ge07. $\Delta(E_\gamma)$=0.2 for E_γ<810 and $\Delta(E_\gamma)$=0.5 for E_γ>952 are assumed (evaluator).

‡ As the source is a mixture of g.s. $(5/2^+)$ (28.6 s) and 0.0+X $(1/2^+)$ (34 s) in ^{127}Ce, only relative intensities of γ's for each level are shown.

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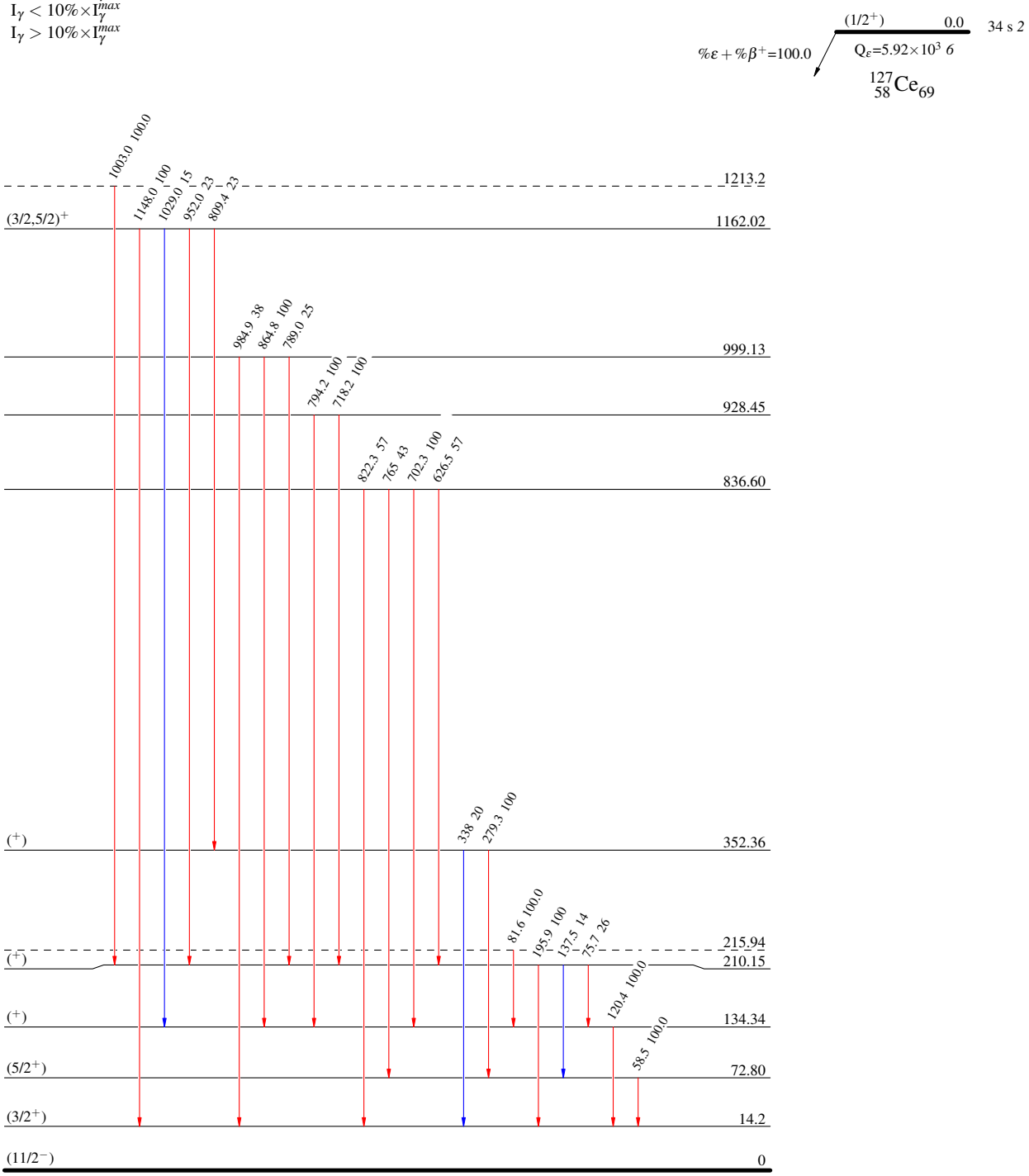
Decay Scheme

Intensities: Relative I_γ

Legend

$I_\gamma < 2\% \times I_\gamma^{max}$
$I_\gamma < 10\% \times I_\gamma^{max}$
$I_\gamma > 10\% \times I_\gamma^{max}$



$^{127}_{57}La_{70}$