^{67}Cu β^- decay 1978Me10,1969Ra15,1953Ea11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Huo Junde, Huang Xiaolong, J. K. Tuli	NDS 106, 159 (2005)	1-Apr-2005

Parent: ^{67}Cu: E=0.0; J^π=3/2$^-$; $T_{1/2}$=61.83 h *12*; Q(β^-)=561.7 *15*; %β^- decay=100.0

1978Me10: measured Eγ, Iγ on chemically separated sources.

1969Ra15: measured Eγ, Iγ; source purification by ion exchange chemistry.

1953Ea11: measured β^- and conversion electron spectra with a thick lens spectrometer; Fermi plot analysis; ion exchange chemistry.

1966Fr12, 1969Li04: measured α in ^{67}Ga ε decay.

1973Le18: measured $T_{1/2}$ of 93 keV level in ^{67}Zn.

The decay scheme is based on the γ data of 1978Me10, ce data of 1966Fr12 and 1969Li04 in ^{67}Ga ε decay and g.s. β^- branching from 1953Ea11.

Others: 1970Ma56.

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 Cascade                 spin sequence
(209γ)(184γ)             3/2⁻        3/2-(M1+E2)5/2⁻
(494.3γ)(393.6γ)         5/2-(M1+E2)3/2⁻        5/2⁻
(494.3γ)(300.2γ)         5/2-(M1+E2)3/2-(M1+E2)1/2⁻
(703.6γ)(184.6γ)         5/2⁻        3/2-(M1+E2)5/2⁻
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^{67}Zn Levels

E(level)[†]	J^π[‡]	$T_{1/2}$	Comments
0.0	5/2$^-$	stable	
93.311 *5*	1/2$^-$	9.10 μs *7*	$T_{1/2}$: from 1973Le18.
184.577 *6*	3/2$^-$		
393.530 *7*	3/2$^-$		

[†] From a least-squares fit to the Eγ data.
[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(168.2 *15*)	393.530	≈1.1	≈5.8	av Eβ=51.0 *25*
(377.1 *15*)	184.577	≈57	≈5.2	av Eβ=121 *3*
(468.4 *15*)	93.311	≈22	≈6.0	av Eβ=154 *3*
(561.7 *15*)	0.0	≈20	≈6.3	av Eβ=189 *3* Iβ^-: from 1953Ea11.

[†] From γ-ray intensity balance at each level, except as indicated.
[‡] Absolute intensity per 100 decays.

γ(^{67}Zn)

Iγ normalization: Based on a g.s. β^- branching of ≈20% (1953Ea11) and 10% E2 for the 184γ corresponding to the δ=0.34 *4* derived from the ce data of 1966Fr12.

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$^{67}Cu\ \beta^-$ decay 1978Me10,1969Ra15,1953Ea11 (continued)

$\gamma(^{67}Zn)$ (continued)

E_γ †	I_γ †#	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	δ‡	α@	Comments
91.266 *5*	7.0 *1*	184.577	3/2⁻	93.311	1/2⁻	M1+E2	+0.06 *5*	0.083 *8*	α(K)exp=0.066 *10*(1969Li04) α(K)=0.073 *7*; α(L)=0.0076 *8*
93.311 *5*	16.1 *2*	93.311	1/2⁻	0.0	5/2⁻	E2		0.873	α(K)exp=0.77 *8*(1966Fr12) α(K)=0.751; α(L)=0.0920
184.577 *10*	48.7 *3*	184.577	3/2⁻	0.0	5/2⁻	M1+E2	0.34 *4*	0.0180 *13*	α(K)exp=0.0156 *10*(1966Fr12) α(K)=0.0158 *11*; α(L)=0.00165 *12* δ: from α(K)exp+α(L1)exp= 1.72×10⁻² *10*(1966Fr12).
208.951 *10*	0.115 *5*	393.530	3/2⁻	184.577	3/2⁻	M1+E2	−0.034 *21*	0.00913 *6*	α(K)=0.00804 *6*; α(L)=0.00082
300.219 *10*	0.797 *11*	393.530	3/2⁻	93.311	1/2⁻	M1+E2	+0.20 *8*		
393.529 *10*	0.220 *8*	393.530	3/2⁻	0.0	5/2⁻				δ: −0.17 *8* or −2.4 *3* for M1+E2.

† From 1978Me10.
‡ From adopted gammas.
\# Absolute intensity per 100 decays.
@ 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: $I_{(\gamma+ce)}$ per 100 parent decays