^{60}Zn ε decay 1969Ho01,1972Du09

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	E. Browne, J. K. Tuli	NDS 114, 1849 (2013)	31-Dec-2012

Parent: ^{60}Zn: E=0; $J^\pi=0^+$; $T_{1/2}$=2.38 min *5*; Q(ε)=4170.8 *16*; %ε+%$β^+$ decay=100.0
^{60}Zn-Q(ε): from 2012Wa38.
Production: Ni(^{3}He,n), E(^{3}He)<10 MeV, chemical separation. Measured γ(t) and γγ with NaI, singles spectra with Ge(Li) (1969Ho01).
Production: Ni(^{3}He,n), E(^{3}He)=15 MeV, mass separation. Measured γ(t) with NaI and singles spectra with Ge(Li) (1972Du09).
Production: Ni(^{3}He,n), E(^{3}He)=15 MeV, chemical separation. Measured $γ^±γ$(t) (1975Ro25).
Production: Ni(α,xn), E(α)= 50 MeV. On-line isotope separator. Measured $β^+$ spectra, γ singles, and γ(t) (1986Ka38).
The decay scheme is established from γγ data from 1969Ho01.
Other: 1955Li39.

^{60}Cu Levels

E(level)	J^π	$T_{1/2}$	Comments
0.0	2^+	23.7 min *4*	$T_{1/2}$: From Adopted Levels.
62.0 *4*	1^+	2.00 ns *10*	$T_{1/2}$: from 1975Ro25, γγ(t).
335.7 *3*			
364.6 *3*	(1^+)		
670.1 *3*	1^+		
947? *1*			

ε,$β^+$ radiations

E(decay)	E(level)	Iβ+ †	Iε†	Log *ft*	I(ε+β+)†	Comments
(3223.8‡ *19*)	947?	0.9 *3*	0.053 *16*	6.0 *1*	1.0 *3*	av Eβ=975.4 *9*; εK=0.04737 *12*; εL=0.005172 *13*; εM+=0.00090
(3500.7 *16*)	670.1	70 *6*	2.8 *2*	4.4 *1*	73 *6*	av Eβ=1104.9 *8*; εK=0.03357 *7*; εL=0.003663 *7*; εM+=0.00064
(3806.2 *16*)	364.6	3.1 *7*	0.086 *19*	5.9 *1*	3.2 *7*	av Eβ=1248.9 *8*; εK=0.02388 *5*; εL=0.002605 *5*; εM+=0.0004547 *8*
(3835.1‡ *16*)	335.7	<4	<0.1	>5.9	<4	av Eβ=1262.6 *8*; εK=0.02317 *4*; εL=0.002527 *5*; εM+=0.0004411 *8*
(4108.8 *17*)	62.0	20 *5*	0.40 *10*	5.3 *1*	20 *5*	av Eβ=1392.4 *8*; εK=0.01763 *3*; εL=0.001923 *3*; εM+=0.0003356 *6*

† Absolute intensity per 100 decays.
‡ Existence of this branch is questionable.

γ(^{60}Cu)

Iγ normalization: from ΣI(γ+ce)(to g.s.)=100, assuming zero feeding to g.s. (0^+ to 2^+ transition).

$E_γ$‡	$I_γ$#@	E_i(level)	J_i^π	E_f	J_f^π	Mult.	δ	α†	Comments
61.4 *6*	40 *5*	62.0	1^+	0.0	2^+	M1(+E2)	<0.11	0.226 *24*	α(K)=0.201 *20*; α(L)=0.022 *3*; α(M)=0.0030 *4*; α(N+..)=8.6×10^{-5} *8* α(N)=8.6×10^{-5} *8* B(M1)(W.u.)>0.036?; B(E2)(W.u.)<2.4×10^2?

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^{60}Zn ε decay 1969Ho01,1972Du09 (continued)

γ(^{60}Cu) (continued)

E_γ ‡	I_γ #@	E_i(level)	J_i^π	E_f	J_f^π	Comments
						Mult.,δ: see Adopted Levels, gammas. This value is consistent with the upper limit α(exp)<1.9 from I(γ±)/I(γ) (1969Ho01).
273.4 *4*	17 *2*	335.7		62.0	1^+	
334.4 *1*	14 *2*	670.1	1^+	335.7		
364.6 *3*	5 *1*	364.6	(1^+)	0.0	2^+	
x572.4 *3*	4.1 *11*					E_γ: peak probably due to 511γ+61γ coin summing.
670.3 *3*	100 *5*	670.1	1^+	0.0	2^+	I_γ: Uncertainty estimated by evaluators.
947& *1*	1.6 *4*	947?		0.0	2^+	E_γ: seen only by 1972Du09.

† Additional information 1.
‡ From 1969Ho01, except as noted.
# Average of values from 1969Ho01 and 1972Du09.
@ For absolute intensity per 100 decays, multiply by 0.64 *5*.
& Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

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Decay Scheme

Intensities: $I_{(\gamma+ce)}$ per 100 parent decays