^{72}Zn β^- decay 1968Kj02,1969Ku08

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	D. Abriola(a), A. A. Sonzogni	NDS 111,1 (2010)	1-May-2009

Parent: ^{72}Zn: E=0; $J^\pi=0^+$; $T_{1/2}$=46.5 h *1*; Q(β^-)=442.8 *23*; %β^- decay=100.0

The decay scheme is mainly from 1968Kj02.

α: Additional information 2.

Additional information 1.

^{72}Ga Levels

E(level)	J^π	$T_{1/2}$[†]	Comments
0	3^-	14.10 h *2*	$T_{1/2}$: from Adopted Levels.
16.4 *3*	2^-	39.2 ns *7*	
119.2 *4*	(0^+)	35 ms *6*	
128.5 *4*	1,2		E(level): level confirmed by ^{71}Ga(n,γ).
161.1 *4*	1^+	0.59 ns *3*	
207.9 *4*	1^+	<0.19 ns	

[†] From $\beta\gamma$ and $\gamma\gamma$ delayed coincidences (1969Ku08), except where noted otherwise.

β^- radiations

$\beta\gamma$ by 1963De11, 1963Is03, 1963Th03 and 1969Ku08.

E(decay)	E(level)	Iβ^-[†]	Log *ft*	Comments
249	207.9	14.7 *3*	4.972 *17*	av Eβ=67.44 *76* E(decay): deduced value. Eβ^- endpoint ≈250 has been measured by 1963Is03.
296 *6*	161.1	85.1 *2*	4.468 *12*	av Eβ=82.74 *80* E(decay): from 1963Th03.
(314.3[‡] *23*)	128.5	0.21 *13*	7.2 *3*	av Eβ=93.76 *80*
(323.6[‡] *23*)	119.2	<0.01	>8.6	av Eβ=96.93 *80*

[†] Absolute intensity per 100 decays.

[‡] Existence of this branch is questionable.

$\gamma(^{72}Ga)$

Iγ normalization: from ΣI(γ+ce)(to 16.4)=100. From log $f^{1u}t$>8.5, one expects I(β^- to 16.4)<0.01%.

$\gamma\gamma$-coin measurements by 1963Is03, 1963Kj01, 1963Th03, 1968Kj02 and 1969Ku08.

The α(K)exp values given in comments have been recalculated by the evaluators following 1974Al34 from the data of 1968Kj02 with α(K)exp=0.104 *7* for ^{99}Tc(6.02-h) 140.5γ and with a correction made for the 142.6γ Ice(K).

E_γ[†]	I_γ[†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	α	Comments
16.4 *3*	10 *2*	16.4	2^-	0	3^-	(M1)	12.4 *8*	α(K)=11.0 *7*; α(L)=1.20 *7*; α(M)=0.176 *11*; α(N)=0.0092 *6*; α(N+..)=0.0092 *6* α(K)exp=7.1 *23* recalculated from I(K x ray)/Iγ (1968Kj02) with a fluorescence yield of 0.528 from 1972Bb16. 1963Is03 give α(K)exp≈12 from (K x ray)γ measurements. $I_{(\gamma+ce)}$: taken equal to 100.

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^{72}Zn β^- decay 1968Kj02,1969Ku08 (continued)

$\gamma(^{72}Ga)$ (continued)

E_γ [†]	I_γ [†#]	E_i(level)	J_i^π	E_f	J_f^π	Mult. [‡]	α	Comments
41.9 *2*	1.0 *1*	161.1	1^+	119.2	(0^+)	(M1)	0.795 *16*	α(K)exp=0.65 *18* α(K)=0.707 *14*; α(L)=0.0765 *15*; α(M)=0.01119 *22*; α(N)=0.000587 *12*; α(N+..)=0.000587 *12*
46.8 *2*	0.7 *1*	207.9	1^+	161.1	1^+	(M1)	0.579 *11*	α(K)exp=0.47 *24* α(K)=0.515 *10*; α(L)=0.0556 *11*; α(M)=0.00813 *16*; α(N)=0.000427 *8*; α(N+..)=0.000427 *8*
79.4 *2*	2.1 *1*	207.9	1^+	128.5	1,2	(M1)	0.1312 *21*	α(K)exp≤0.07 α(K)=0.1168 *19*; α(L)=0.01246 *20*; α(M)=0.00182 *3*; α(N)=9.64×10^{-5} *15*; α(N+..)=9.64×10^{-5} *15*
88.7 *1*	2.6 *1*	207.9	1^+	119.2	(0^+)	(M1)	0.0968	α(K)exp≤0.05 α(K)=0.0862 *13*; α(L)=0.00917 *14*; α(M)=0.001341 *20*; α(N)=7.11×10^{-5} *11*; α(N+..)=7.11×10^{-5} *11*
102.8 *1*	2.8 *1*	119.2	(0^+)	16.4	2^-	(M2)	0.664	α(K)=0.581 *9*; α(L)=0.0721 *11*; α(M)=0.01064 *16*; α(N)=0.000533 *8*; α(N+..)=0.000533 *8* α(K)exp=0.45 *5*. Mult.: from α(K)exp. M2 is preferred to E2 by $T_{1/2\ 1/2}$ measurement.
112.1 *1*	2.5 *1*	128.5	1,2	16.4	2^-	(M1)	0.0513	α(K)=0.0458 *7*; α(L)=0.00483 *7*; α(M)=0.000707 *10*; α(N)=3.76×10^{-5} *6*; α(N+..)=3.76×10^{-5} *6* α(K)exp=0.018 *6*.
144.7 *1*	100	161.1	1^+	16.4	2^-	(E1)	0.0211	α(K)exp=0.017 *3* α(K)=0.0189 *3*; α(L)=0.00192 *3*; α(M)=0.000279 *4*; α(N)=1.447×10^{-5} *21*; α(N+..)=1.447×10^{-5} *21*
191.5 *2*	11.3 *2*	207.9	1^+	16.4	2^-	(E1)	0.00916 *14*	α(K)exp=0.007 *3* α(K)=0.00820 *12*; α(L)=0.000832 *12*; α(M)=0.0001211 *18*; α(N)=6.34×10^{-6} *9*; α(N+..)=6.34×10^{-6}

† Data are from 1968Kj02.

‡ The α(K)exp are all consistent with mult=E1 or M1, except E2 or M2 for the 102.8γ. The $\Delta\pi$ character comes from the probable J^π for the levels.

For absolute intensity per 100 decays, multiply by 0.8278 *20*.

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Decay Scheme

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