^{71}Zn β^- decay (2.45 min) 1970Zo01,1961Th04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Khalifeh Abusaleem, Balraj Singh	NDS 112, 133 (2011)	30-Nov-2010

Parent: ^{71}Zn: E=0.0; $J^\pi=1/2^-$; $T_{1/2}$=2.45 min *10*; Q(β^-)=2810.2 *29*; %β^- decay=100.0

^{71}Zn-Q(β^-): From 2009AuZZ. Other: 2819 *11* (2003Au03).

The decay scheme is from 1970Zo01.

1970Zo01: measured Eγ, Iγ, $\gamma\gamma$ coincidences; NaI and Ge(Li) detectors.

1961Th04: measured Eγ, Iγ, $\gamma\gamma$, $\beta\gamma$ coin, $T_{1/2}$, β^- spectrum and β-γ coincidences; Fermi-Kurie analysis.

Other measurements:

γ: 1967Li01, 1955Le03.

$\beta\gamma$, $\gamma\gamma$ coin: 1955Le03.

$T_{1/2}$: 1962Ma24, 1958Le26, 1955Le03.

^{71}Ga Levels

E(level)[†]	J^π[‡]	$T_{1/2}$
0.0	$3/2^-$	stable
390.05 *9*	$1/2^-$	
487.3 *1*	$5/2^-$	
511.59 *8*	$3/2^-$	
910.34 *8*	$3/2^-$	
964.79 *13*	$5/2^-$	
1109.3 *5*	$1/2^-$	
1631.61 *10*	$3/2^-$	
2064.63 *19*	$1/2^-$,$3/2^-$	
2294.49 *24*	$1/2^-$	

[†] From a least-squares fit to Eγ data.

[‡] From Adopted Levels.

β^- radiations

E(decay)	E(level)	Iβ^-[†‡]	Log *ft*	Comments
(516 *3*)	2294.49	0.23	4.9	av Eβ=166.0 *11*
(746 *3*)	2064.63	0.07	6.0	av Eβ=255.7 *12*
(1179 *3*)	1631.61	4.1	4.9	av Eβ=438.0 *13*
(1701 *3*)	1109.3	0.16	7.0	av Eβ=671.5 *14*
(1845 *3*)	964.79	≤0.08	≥7.4	av Eβ=737.8 *14*
(1900 *3*)	910.34	8.0	5.5	av Eβ=762.9 *14*
(2299 *3*)	511.59	32	5.2	av Eβ=948.6 *14*
(2323 *3*)	487.3	<0.02	>8.4	av Eβ=960.0 *14*
(2420 *3*)	390.05	0.4	7.2	av Eβ=1005.7 *14*
2.61×10^3 *5*	0.0	55	5.4	av Eβ=1190.4 *14*
				Iβ^-: 82 *4* from 1961Th04.

[†] From intensity balance of γ's. These are approximate with no uncertainty estimate on Iγ normalization.

[‡] Absolute intensity per 100 decays.

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$\gamma(^{71}Ga)$

Iγ normalization: from measurement of β-ray spectrum and separation of ^{71}Zn isomer from decay curves, 1970Zo01 determined that 512γ is emitted in 32% of the 2.45-min ^{71}Zn β^- activity. No uncertainty was given by 1970Zo01. This value is disagrees with the earlier less complete data of 1961Th04 which give Iγ(512γ)=13%.

E$_\gamma$	I$_\gamma$[#@]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[‡]	δ[‡]	α[†]	Comments
121.52 *5*	9.3 *9*	511.59	3/2$^-$	390.05	1/2$^-$	(M1+E2)		0.19 *15*	α(K)=0.17 *13*; α(L)=0.020 *16*; α(M)=0.0028 *23*; α(N+..)=0.00013 *10* α(N)=0.00013 *10*
390.0 *3*	12 *1*	390.05	1/2$^-$	0.0	3/2$^-$				
398.6 *2*	1.9 *2*	910.34	3/2$^-$	511.59	3/2$^-$				
423.2 *3*	0.12 *1*	910.34	3/2$^-$	487.3	5/2$^-$				
453.1 *2*	0.55 *6*	964.79	5/2$^-$	511.59	3/2$^-$				
487.3 *1*	0.37 *4*	487.3	5/2$^-$	0.0	3/2$^-$	(M1+E2)	−0.024 *13*	0.001320 *19*	α=0.001320 *19*; α(K)=0.001181 *17*; α(L)=0.0001203 *17*; α(M)=1.760×10^{-5} *25* α(N)=9.52×10^{-7} *14*
511.6 *1*	100	511.59	3/2$^-$	0.0	3/2$^-$	M1+E2	−0.37 *6*	0.00128 *4*	α=0.00128 *4*; α(K)=0.00115 *3*; α(L)=0.000117 *4*; α(M)=1.71×10^{-5} *5*; α(N+..)=9.21×10^{-7} *25* α(N)=9.21×10^{-7} *25*
520.5 *2*	0.25 *2*	910.34	3/2$^-$	390.05	1/2$^-$				
575.1 *5*	0.09 *1*	964.79	5/2$^-$	390.05	1/2$^-$				
666.8 *2*	2.8 *3*	1631.61	3/2$^-$	964.79	5/2$^-$				
721.4 *3*	1.7 *2*	1631.61	3/2$^-$	910.34	3/2$^-$				
910.3 *1*	24.5 *20*	910.34	3/2$^-$	0.0	3/2$^-$	M1+E2	0.08 *3*		
964.8 *2*	2.4 *2*	964.79	5/2$^-$	0.0	3/2$^-$	M1+E2	1.3 *3*		
1109.3 *5*	0.51 *8*	1109.3	1/2$^-$	0.0	3/2$^-$				
1120.0 *1*	6.8 *7*	1631.61	3/2$^-$	511.59	3/2$^-$				
1144.2 *3*	0.25 *3*	1631.61	3/2$^-$	487.3	5/2$^-$				
1241.5 *5*	0.10 *1*	1631.61	3/2$^-$	390.05	1/2$^-$				
[x]1267.0 *10*	0.028 *3*								
1383.8 *5*	0.11 *1*	2294.49	1/2$^-$	910.34	3/2$^-$				
1553.0 *5*	0.08 *1*	2064.63	1/2$^-$,3/2$^-$	511.59	3/2$^-$				
1631.6 *2*	1.2 *1*	1631.61	3/2$^-$	0.0	3/2$^-$				
1904.4 *3*	0.53 *5*	2294.49	1/2$^-$	390.05	1/2$^-$				
2064.6 *2*	0.14 *2*	2064.63	1/2$^-$,3/2$^-$	0.0	3/2$^-$				
2294.8 *5*	0.08 *1*	2294.49	1/2$^-$	0.0	3/2$^-$				

[†] Additional information 1.
[‡] From Adopted Gammas.
[#] Relative intensities with Iγ(512)=100.
[@] For absolute intensity per 100 decays, multiply by 0.32.
[x] γ ray not placed in level scheme.

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Decay Scheme

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