^{74}Cu β^- decay (1.63 s) 2005Va19,1989Wi11

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh	ENSDF	31-Mar-2017

Parent: ^{74}Cu: E=0.0; $J^\pi=2^-$; $T_{1/2}$=1.63 s *5*; Q(β^-)=9751 *7*; %β^- decay=100.0

^{74}Cu-J^π,$T_{1/2}$: From ^{74}Cu Adopted Levels.

^{74}Cu-Q(β^-): From 2017Wa10.

2005Va19 (also thesis: 2002VaZX): ^{74}Cu produced by ^{238}U(n,F) and ^{238}U(p,F) at ISOLDE facility, measured Eγ, Iγ, $\gamma\gamma$, $\beta\gamma$, timing of $\beta\gamma$ and $\gamma\gamma$ coin spectra.

1989Wi11: Measured γ, $\gamma\gamma$, $T_{1/2}$.

1991Kr15: Measured isotopic half-life from timing of delayed neutrons from the decay of ^{74}Cu.

Other: 1987LuZX only three γ rays, 606, 812, 1138 keV were reported.

^{74}Zn Levels

No 1164 and 2616 levels from 1989Wi11 reported in 2005Va19. 558γ from 1164 level placed from 2658 level; 517.2γ from 2616 not reported by 2005Va19; 2010.5γ from 2616 placed from 4563 level.

E(level)	J^π†	E(level)	J^π†	E(level)	E(level)
0.0	0^+	2148.2 *3*	$(1,2^+)$	2904.73 *21*	4562.4 *3*
605.90 *8*	2^+	2353.6 *9*		2969.3 *3*	4861.8 *18*
1418.56 *12*	$(4)^+$	2551.88 *13*		2985.9 *20*	4896.8 *6*
1670.25 *8*	(2^+)	2657.6 *3*		3063.9 *17*	5628 *3*
1788.9 *10*		2698.0 *17*	$(1,2^+)$	3067 *3*	
2099.33 *13*		2809.04 *11*		3571 *5*	

† From 'Adopted Levels'.

β^- radiations

E(decay)	E(level)	Iβ^-†‡	Log *ft*	Comments
(4123 *8*)	5628	0.8 *2*	6.0	av Eβ=1822.3 *37*
(4854 *7*)	4896.8	2.2 *2*	5.8	av Eβ=2176.5 *34*
(4889 *7*)	4861.8	2.0 *2*	5.9	av Eβ=2193.5 *35*
(5189 *7*)	4562.4	3.3 *6*	5.8	av Eβ=2338.9 *34*
(6180 *9*)	3571	1.0 *2*	6.7	av Eβ=2820.9 *42*
(6684 *8*)	3067	1.1 *2*	6.8	av Eβ=3066.2 *37*
(6687 *7*)	3063.9	2.0 *2*	6.5	av Eβ=3067.7 *35*
(6765 *7*)	2985.9	0.9 *2*	6.9	av Eβ=3105.7 *36*
(6782 *7*)	2969.3	4.9 *4*	6.2	av Eβ=3113.8 *35*
(6846 *7*)	2904.73	8.3 *6*	5.9	av Eβ=3145.2 *34*
(6942 *7*)	2809.04	14.3 *11*	5.7	av Eβ=3191.8 *34*
(7053 *7*)	2698.0	0.9 *3*	7.0	av Eβ=3245.8 *35*
(7093 *7*)	2657.6	1.0 *1*	6.9	av Eβ=3265.5 *35*
(7199 *7*)	2551.88	7.5 *10*	6.1	av Eβ=3317.0 *34*
(7397 *7*)	2353.6	0.9 *1*	7.1	av Eβ=3413.5 *35*
(7603 *7*)	2148.2	3.6 *3*	6.5	av Eβ=3513.5 *35*
(7652 *7*)	2099.33	2.7 *6*	6.7	av Eβ=3537.3 *34*
(7962 *7*)	1788.9	1.0 *2*	7.2	av Eβ=3688.4 *35*
(8081 *7*)	1670.25	6.4 *18*	6.4	av Eβ=3746.1 *34*
(8332 *7*)	1418.56	5.2 *14*	8.8[1u]	av Eβ=3871.1 *35*
(9145 *7*)	605.90	30 *3*	6.0	av Eβ=4263.8 *34*

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^{74}Cu β^- decay (1.63 s) 2005Va19,1989Wi11 (continued)

β^- radiations (continued)

† 2005Va19 state that all log *ft* values should be considered as lower limits. Correspondingly, all the β feedings should be considered as upper limits. Large energy gap of about 4 MeV between Q(β^-)=9751 and the highest energy level populated at 5628 leaves the possibility that there may be additional unobserved γ-ray transitions from higher levels.

‡ Absolute intensity per 100 decays.

$\gamma(^{74}Zn)$

Iγ normalization: Σ(Iγ of γ rays to g.s.)=100; zero β feeding assumed to g.s. Since the level scheme is not known completely, this normalization factor is treated as approximate. Also %β^-n is unknown, although, expected to be small.

$\gamma\gamma$ coin information is from 2005Va19 and 1998Wi11.

E_γ†	I_γ†c	E_i(level)	J_i^π	E_f	J_f^π
365.95# *23*	2.3 *2*	3063.9		2698.0	$(1,2^+)$
452.55 *9*	4.1 *3*	2551.88		2099.33	
x505.3@a *6*	0.8 *4*				
x517.2@& *5*	0.6 *3*				
558.24b *22*	1.1 *1*	2657.6		2099.33	
605.90 *11*	100.0 *20*	605.90	2^+	0.0	0^+
680.8‡ *7*	0.4‡ *1*	2099.33		1418.56	$(4)^+$
709.5 *4*	1.9 *1*	2809.04		2099.33	
812.61 *9*	15.2 *15*	1418.56	$(4)^+$	605.90	2^+
881.71 *17*	1.9 *2*	2551.88		1670.25	(2^+)
935.0‡ *9*	1.0‡ *1*	2353.6		1418.56	$(4)^+$
1064.35 *6*	18.5 *15*	1670.25	(2^+)	605.90	2^+
1133.05 *24*	4.2 *3*	2551.88		1418.56	$(4)^+$
1138.79 *8*	17.3 *11*	2809.04		1670.25	(2^+)
1183‡ *1*	1.2‡ *2*	1788.9		605.90	2^+
1298.9@d *4*	1.3 *4*	2969.3		1670.25	(2^+)
1486.0 *3*	2.2 *2*	2904.73		1418.56	$(4)^+$
1493.36 *15*	9.8 *5*	2099.33		605.90	2^+
1543‡ *1*	0.7‡ *1*	2148.2	$(1,2^+)$	605.90	2^+
1551‡ *1*	1.3‡ *2*	2969.3		1418.56	$(4)^+$
1670.23 *10*	10.8 *6*	1670.25	(2^+)	0.0	0^+
1901‡ *5*	1.1‡ *2*	3571		1670.25	(2^+)
1946.2 *3*	3.1 *6*	2551.88		605.90	2^+
2010.52& *23*	3.8 *7*	4562.4		2551.88	
2087.7# *5*	2.6 *2*	4896.8		2809.04	
2092‡ *2*	1.5‡ *2*	2698.0	$(1,2^+)$	605.90	2^+
2148.1# *3*	3.5 *3*	2148.2	$(1,2^+)$	0.0	0^+
2298.89 *24*	8.4 *6*	2904.73		605.90	2^+
2310‡ *2*	0.8‡ *2*	4861.8		2551.88	
2363.3 *3*	4.4 *3*	2969.3		605.90	2^+
2380‡ *2*	1.0‡ *2*	2985.9		605.90	2^+
2461‡ *3*	1.3‡ *2*	3067		605.90	2^+
2698‡ *3*	1.8‡ *2*	2698.0	$(1,2^+)$	0.0	0^+
2723‡ *3*	0.9‡ *2*	5628		2904.73	
3191‡ *4*	1.5‡ *2*	4861.8		1670.25	(2^+)

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^{74}Cu β^- decay (1.63 s) 2005Va19,1989Wi11 (continued)

$\gamma(^{74}Zn)$ (continued)

† Weighted averages of values from 2005Va19 and 1989Wi11.
‡ γ from 2005Va19 only.
# Placement from 2005Va19; unplaced in 1989Wi11.
@ γ from 1989Wi11 only, not confirmed by 2005Va19.
& Placed from a 2616 level in 1989Wi11.
a Placed from 1670 level in 1989Wi11.
b Placed from an 1164 level in 1989Wi11.
c For absolute intensity per 100 decays, multiply by 0.86.
d Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.

^{74}Cu β^- decay (1.63 s) 2005Va19,1989Wi11

Decay Scheme

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

Legend
- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- γ Decay (Uncertain)
- Coincidence

2^- 0.0 1.63 s 5

Q_{β^-}=9751 7 $\%\beta^-$=100.0

$^{74}_{29}Cu_{45}$

Iβ⁻	Log ft		
0.8	6.0	2723 0.86	5628
2.2	5.8	2087.7 2.32	4896.8
2.0	5.9	3191 1.38	4861.8
3.3	5.8	2310 0.77, 2010.52 3.3	4562.4
1.0	6.7	1901 1.03	3571
1.1	6.8	2461 1.20	3067
2.0	6.5	365.95 2.06	3063.9
0.9	6.9	2380 0.95	2985.9
4.9	6.2	2363.3 3.8	2969.3
8.3	5.9	1551 1.20	2904.73
14.3	5.7	1298.9 1.1	2809.04
0.9	7.0	2298.89 7.2	2698.0
7.5	6.1	1486.0 1.98	2551.88
2.7	6.7	1138.79 14.9, 709.5 1.72, 2698 1.63, 2092 1.38	2099.33
6.4	6.4		(2^+) 1670.25
5.2	8.8[1u]		$(4)^+$ 1418.56
30	6.0		2^+ 605.90
			0^+ 0.0

$^{74}_{30}Zn_{44}$

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Decay Scheme (continued)

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