^{74}Zn β^- decay (95.6 s) 1989Wi14

History

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

Parent: ^{74}Zn: E=0.0; $J^\pi=0^+$; $T_{1/2}$=95.6 s *12*; Q(β^-)=2293 *4*; %β^- decay=100.0

^{74}Zn-$T_{1/2}$: From ^{74}Zn Adopted Levels.

^{74}Zn-Q(β^-): From 2017Wa10.

1989Wi14 (also 1988WiZV): measured Eγ, Iγ, $\gamma\gamma$-coin.

Others: 1983Ru06; measured Eγ, Iγ, $\beta\gamma$, $\gamma\gamma$-coin.

1981Gi17, 1974Gr29, 1972Er05: production, identification and $T_{1/2}$ of ^{74}Zn isotope only. 1972Er05 report energies and intensities of intense γ-transitions.

^{74}Ga Levels

1989Wi14 list following β feedings: 3.5% (log *ft*=5.0) for 1086 level, 11.8% (log *ft*=4.7) for 894 level; 2.5% (log *ft*=5.8) for 455 level, 43% (log *ft*=4.7) for 252 level and 39% (log *ft*=4.9) for 109 level.

E(level)‡	J^π†	$T_{1/2}$	E(level)‡	J^π†	E(level)‡	J^π†
0.0	(3^-)		108.654 *12*	$(1^+)^{\#}$	251.787 *14*	$(1^+)^{\#}$
56.550 *9*	(2^-)		141.333 *15*	$(1^-,2,3^+)$	455.06 *5*	$(1^+)^{\#}$
59.571 *14*	(0^+)	9.5 s *10*	145.032 *18*		894.11 *5*	$(1^+)^{\#}$
102.276 *14*			227.802 *19*		1085.72 *9*	$(1^+)^{\#}$

† From Adopted Levels.

‡ From least-squares fit to Eγ values.

Indication of strong (>2%) β feeding (probable allowed transition) from 0^+ parent, although absolute β feedings are unknown.

^{74}Zn β^- decay (95.6 s) 1989Wi14 (continued)

$\gamma(^{74}Ga)$

Iγ normalization: From 1989Wi14, but due to lack of knowledge about multipolarities of the many low-energy transitions which involve large conversion coefficients, normalization factor cannot be deduced with any certainty.

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[†]	δ	α[‡]	Comments
(3.2 *2*)		59.571	(0^+)	56.550	(2^-)	[M2]		2.9×10^5 *11*	E_γ: unobserved γ, value deduced by 1974Va08 (see ^{74}Ga IT decay). This transition is expected to be almost totally converted.
45.746 *17*	5.3 *4*	102.276		56.550	(2^-)	[D]		0.64 *2*	
49.087 *10*	217 *5*	108.654	(1^+)	59.571	(0^+)	[D]		0.523 *17*	
52.110 *14*	70.6 *8*	108.654	(1^+)	56.550	(2^-)	[D]		0.440 *13*	
56.559 *10*	120 *3*	56.550	(2^-)	0.0	(3^-)	(M1(+E2))	<0.17	0.42 *8*	I_γ: 1989Wi14 did not include feeding from 59 level.
84.81 *3*	3.4 *5*	141.333	$(1^-,2,3^+)$	56.550	(2^-)	[D]		0.108 *2*	
85.1[@] *4*	5 *1*	145.032		59.571	(0^+)	[D]		0.106 *2*	E_γ,I_γ: γ reported only by 1983Ru06.
88.496 *24*	8.9 *8*	145.032		56.550	(2^-)	[D]		0.095 *2*	
102.25 *3*	6.3 *5*	102.276		0.0	(3^-)	[D,Q]		0.35 *29*	
106.762 *22*	5.3 *8*	251.787	(1^+)	145.032		[D,Q]		0.30 *25*	
108.635 *20*	2.8 *21*	108.654	(1^+)	0.0	(3^-)	[M2]		0.546	
110.461 *24*	3.7 *3*	251.787	(1^+)	141.333	$(1^-,2,3^+)$				
119.149 *20*	13.0 *11*	227.802		108.654	(1^+)	[D,Q]		0.20 *16*	
125.54 *3*	2.8 *5*	227.802		102.276					
141.330 *21*	24.5 *19*	141.333	$(1^-,2,3^+)$	0.0	(3^-)	[D,Q]		0.11 *8*	
143.137 *24*	140 *4*	251.787	(1^+)	108.654	(1^+)	[D,Q]		0.10 *8*	
145.02 *4*	2.6 *2*	145.032		0.0	(3^-)				
149.517 *24*	10.4 *6*	251.787	(1^+)	102.276					
168.22 *6*	1.7 *2*	227.802		59.571	(0^+)				
171.13 *7*	0.8 *2*	227.802		56.550	(2^-)				
192.212 *19*	100.0 *20*	251.787	(1^+)	59.571	(0^+)				
195.19 *4*	15.5 *11*	251.787	(1^+)	56.550	(2^-)				
251.89[@] *5*	2.3 *13*	251.787	(1^+)	0.0	(3^-)				
346.46 *5*	18.9 *10*	455.06	(1^+)	108.654	(1^+)				
395.16 *13*	3.3 *4*	455.06	(1^+)	59.571	(0^+)				
398.30 *25*	1.6 *4*	455.06	(1^+)	56.550	(2^-)				
438.83 *17*	3.9 *7*	894.11	(1^+)	455.06	(1^+)				
630.72 *12*	3.7 *7*	1085.72	(1^+)	455.06	(1^+)				
642.9 *3*	2.7 *6*	894.11	(1^+)	251.787	(1^+)				
666.21 *10*	16.4 *19*	894.11	(1^+)	227.802					
749.2 *3*	2.5 *6*	894.11	(1^+)	145.032					
752.82 *7*	23.3 *17*	894.11	(1^+)	141.333	$(1^-,2,3^+)$				
785.44 *12*	7.0 *8*	894.11	(1^+)	108.654	(1^+)				
792.01 *16*	5.8 *7*	894.11	(1^+)	102.276					
834.00 *24*	4.6 *8*	1085.72	(1^+)	251.787	(1^+)				
837.49 *11*	11.1 *7*	894.11	(1^+)	56.550	(2^-)				

^{74}Zn β^- decay (95.6 s) 1989Wi14 (continued)

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

E_γ	I_γ[#]	E_i(level)	J_i^π	E_f	J_f^π
894.10[@] *13*	3.2 *4*	894.11	(1^+)	0.0	(3^-)
977.07 *24*	3.6 *7*	1085.72	(1^+)	108.654	(1^+)
983.7 *3*	3.3 *8*	1085.72	(1^+)	102.276	
1025.81 *23*	4.1 *7*	1085.72	(1^+)	59.571	(0^+)
1028.7 *4*	2.9 *7*	1085.72	(1^+)	56.550	(2^-)

† Non-observation of strong K x-rays of Ga suggests dipole multipolarity for low-energy transitions (less than ≈100 keV).
‡ Theoretical values from BrIcc code (2008Ki07) with Frozen-orbital approximation.
# For absolute intensity per 100 decays, multiply by 0.15.
@ Placement of transition in the level scheme is uncertain.

$^{74}_{31}Ga_{43}$-3

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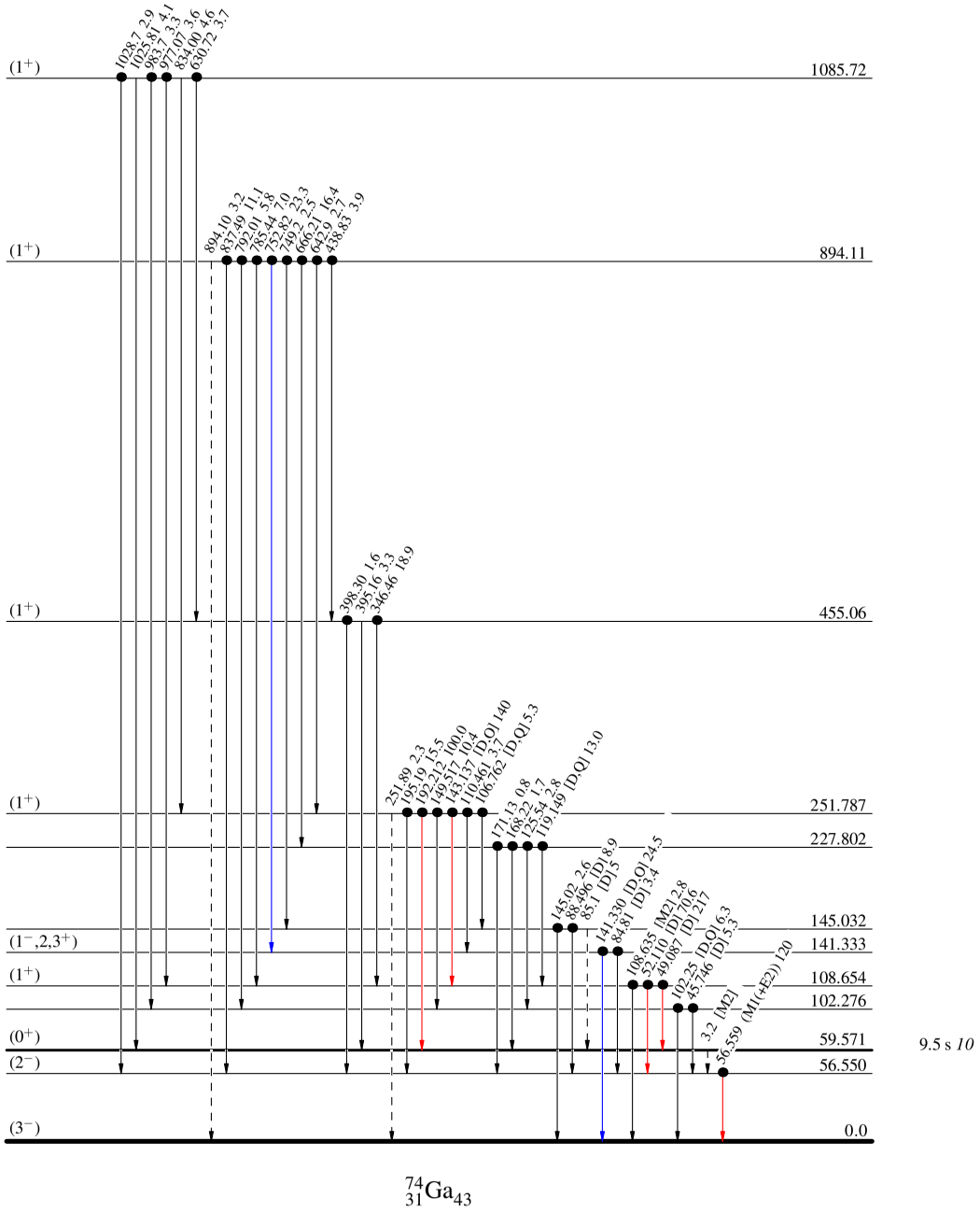
Decay Scheme

Intensities: Relative I_γ

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

0^+ 0.0 95.6 s *12*
Q_{β^-}=2293 *4* $\%\beta^-$=100.0
$^{74}_{30}Zn_{44}$



$^{74}_{31}Ga_{43}$