^{62}Ni(α,pnγ) 1976Ch36

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen	NDS 178, 41 (2021).	12-Nov-2021

1976Ch36: E=25-40 MeV. Measured γ, $\gamma\gamma$, excitation functions, $\gamma(\theta)$, γ(t). For 609- and 1596-keV transitions, $\gamma(\theta)$ results are stated in Table I (footnote b) in 1979Ch01: L=1 for 609γ and L=2 for 1596γ.
Other: 1971SuZR. E=40 MeV. Measured γ, $\gamma\gamma$, γ(t), $\gamma(\theta$,H,t).
The level scheme is based on observation of all the γ rays in $\gamma\gamma$-coin data.
Cross section measurement: 1985AnZU.

^{64}Cu Levels

E(level)†	J$^\pi$‡	$T_{1/2}$	Comments
0.0	1^+		
159.1 *4*	2^+		
278.0 *4*	2^+		
362.0 *4*	3^+		
574.4 *5*	$(4)^+$		
745.6 *5*	$(3)^+$		
895.7 *6*	$(3)^+$		
1593.4 *7*	6^-	20.4 ns *6*	g=+0.17 *1* (1971SuZR) $T_{1/2}$: from 1971SuZR. Other: 19 ns *2* (1976Ch36). Configuration=$\pi p_{3/2}\otimes\nu g_{9/2}$ (1979Ch01).
1615.5 *7*	$(5)^+$		
1706.3 *7*	(4^+)		
1736.4 *11*	(4^+)		
1769.8 *6*	(5^+)		
1979.0 *11*	(5^+)		
2021.1 *13*	$(2^+,3^+)$		
2053.1 *11*	$(\leq 4^+)$		
2072.4 *9*	(5^-)		
2251.4 *11*	(5^+)		
2322.4 *10*	(5^-)		
2377.4 *9*	(7^-)		J$^\pi$: spin from $\gamma(\theta)$ (1979Ch01). Configuration=$\pi f_{5/2}\otimes\nu g_{9/2}$ (1979Ch01).
2386.4 *13*	(6^-)		
2691.4 *13*	(6^-)		
2715.9 *9*	(7^-)		
3050.4 *17*	(7^-)		
3126.2 *17*	(7^-)		
3190.0 *9*	(8^-)		J$^\pi$: from $\gamma(\theta)$ (1979Ch01).
3798.8 *10*	(9^-)		J$^\pi$: $\gamma(\theta)$ (1979Ch01). Configuration=$\pi g_{9/2}\otimes\nu g_{9/2}$ (1979Ch01).
3986.9 *10*	(9^-)		

† From a least-squares fit to Eγ data.
‡ From Adopted Levels.

^{62}Ni(α,pnγ) 1976Ch36 (continued)

$\gamma(^{64}Cu)$

E_γ	I_γ[†]	E_i(level)	J_i^π	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
84[#] *1*		362.0	3^+	278.0	2^+			
119[#] *1*		278.0	2^+	159.1	2^+			
159.1 *5*	100	159.1	2^+	0.0	1^+	D(+Q)	+0.035	A_2=−0.14 *4*; A_4=−0.02 *6*
202.9 *5*	95	362.0	3^+	159.1	2^+	D		A_2=−0.18 *4*; A_4=−0.03 *7*
212.4 *5*	73	574.4	$(4)^+$	362.0	3^+	D		A_2=−0.18 *5*; A_4=−0.04 *8*
250.0 *5*	3	2322.4	(5^-)	2072.4	(5^-)	D(+Q)		A_2=−0.18 *20*; A_4=0.0 *4*
278.2 *5*	18	278.0	2^+	0.0	1^+	D		A_2=−0.22 *13*; A_4=+0.07 *2*
314[&] *1*	≈7[&]	2386.4	(6^-)	2072.4	(5^-)	(D)		Negative A_2 from $\gamma(\theta)$, as stated in section 3 of text in 1976Ch36, but no numerical data provided.
314[&] *1*	<3[&]	2691.4	(6^-)	2377.4	(7^-)			
315 *1*	<3	2021.1	$(2^+,3^+)$	1706.3	(4^+)			I_γ: 10 for unresolved 315γ+314γ.
321.1 *10*	1	895.7	$(3)^+$	574.4	$(4)^+$			
361.8 *5*	1.5	362.0	3^+	0.0	1^+			
383.5 *5*	2	745.6	$(3)^+$	362.0	3^+			
415.3 *5*	4.5	574.4	$(4)^+$	159.1	2^+			
434.8 *10*	1	3126.2	(7^-)	2691.4	(6^-)			
467.7 *5*	7	745.6	$(3)^+$	278.0	2^+			
479.0 *5*	12	2072.4	(5^-)	1593.4	6^-	D(+Q)	+0.22	A_2=−0.29 *16*; A_4=0.0 *3*
608.8 *5*	8	3798.8	(9^-)	3190.0	(8^-)	(D)		Mult.: L=1 stated in 1979Ch01 from $\gamma(\theta)$.
617.7 *5*	3.5	895.7	$(3)^+$	278.0	2^+			
664 *1*	4	3050.4	(7^-)	2386.4	(6^-)			
784.1 *5*	27	2377.4	(7^-)	1593.4	6^-	D+Q	−1	A_2=−0.81 *13*; A_4=+0.01 *20*
813[#] *1*		3190.0	(8^-)	2377.4	(7^-)			
960.7 *5*	5	1706.3	(4^+)	745.6	$(3)^+$			
1019.0 *5*	55	1593.4	6^-	574.4	$(4)^+$	Q+O	−0.25	A_2=+0.07 *12*; A_4=−0.09 *17*
1041.1 *5*	4	1615.5	$(5)^+$	574.4	$(4)^+$			
1099.0[@a] *5*	5	2691.4	(6^-)	1593.4	6^-			
1122.5 *5*	4.5	2715.9	(7^-)	1593.4	6^-			
1162 *1*		1736.4	(4^+)	574.4	$(4)^+$			E_γ: unresolved from a line in ^{62}Ni(α,$\alpha'\gamma$).
1195.4 *5*	4	1769.8	(5^+)	574.4	$(4)^+$			
1532.5[@a] *5*	2	3126.2	(7^-)	1593.4	6^-			
1596.5 *5*	12	3190.0	(8^-)	1593.4	6^-	(Q)		A_2=+0.43 *20*; A_4=+0.14 *40* Deduced δ(O/Q)=+0.27; L=2 stated in 1979Ch01 from $\gamma(\theta)$.
1609.5 *5*	2.5	3986.9	(9^-)	2377.4	(7^-)			
1617 *1*		1979.0	(5^+)	362.0	3^+			E_γ: unresolved from a line in ^{64}Zn.
1677 *1*	2	2251.4	(5^+)	574.4	$(4)^+$			
1894[#] *1*		2053.1	$(\leq 4^+)$	159.1	2^+			

[†] At 31 MeV (θ=90°).
[‡] From $\gamma(\theta)$ in 1976Ch36, unless otherwise noted. A_2 and A_4 are given under comments where available.
[#] From $\gamma\gamma$ only. Iγ not available.
[@] Unplaced in 1976Ch36 although observed (see figure 2, 1976Ch36) in delayed $\gamma\gamma$ with γ rays from 1593 level. Tentative placement based on suggestion in 1979 Nuclear Data Sheets (1979Ha35).
[&] Multiply placed with intensity suitably divided.
[a] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: Relative I_γ

@ Multiply placed: intensity suitably divided

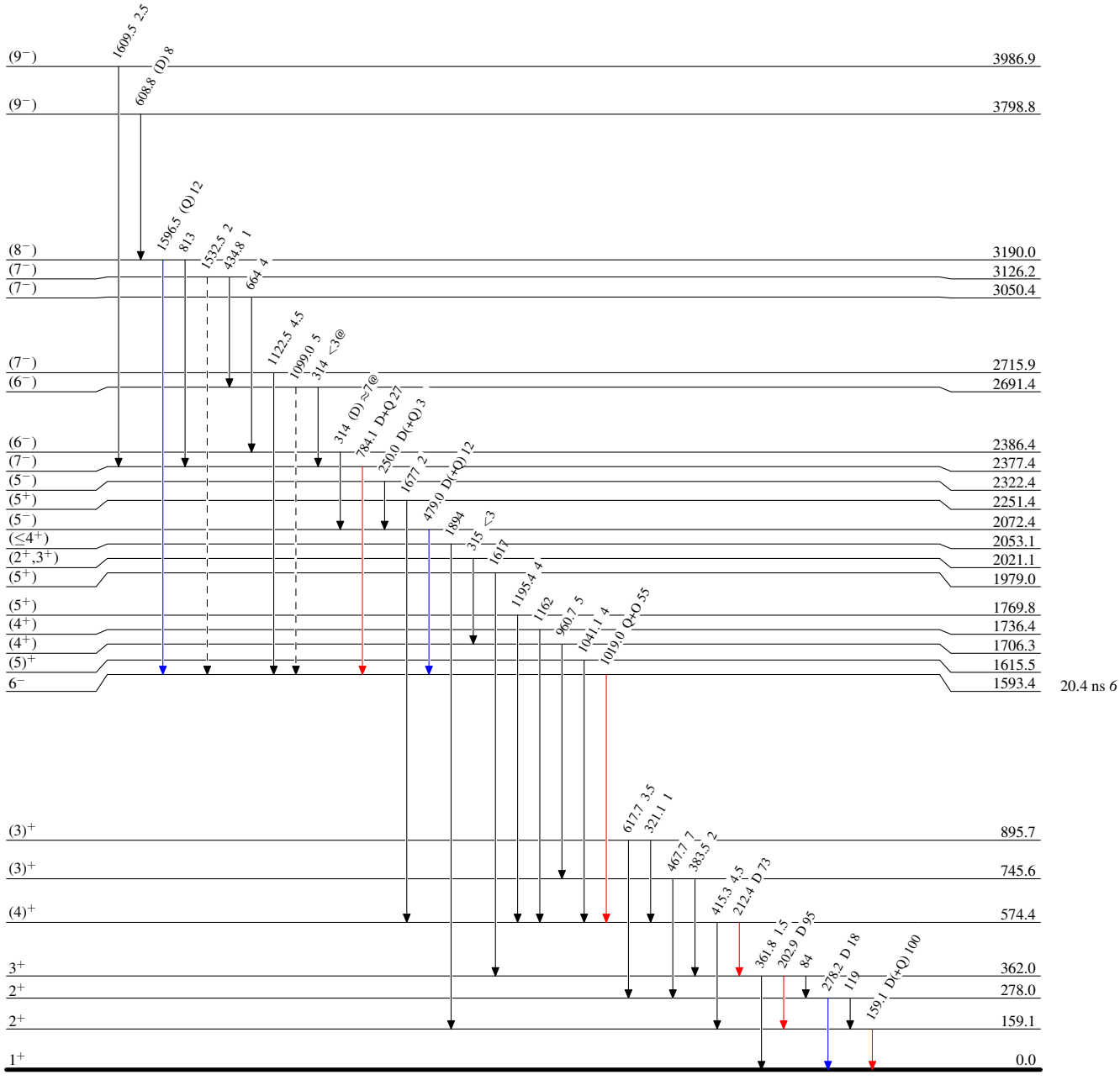
Legend

$I_\gamma < 2\% \times I_\gamma^{max}$

$I_\gamma < 10\% \times I_\gamma^{max}$

$I_\gamma > 10\% \times I_\gamma^{max}$

γ Decay (Uncertain)



$^{64}_{29}Cu_{35}$