

$^{59}\text{Co}(\alpha, p\gamma)$ 1978Ke11, 1978Oh04, 1977Ch04

Type	Author	History	Citation	Literature Cutoff Date
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Additional information 1.

1978Ke11: E=10 MeV. Measured $E\gamma$, $I\gamma$, $p\gamma$ coin, and lifetimes by Doppler-shift attenuation method, centroid-shift analysis.

1978Oh04: E=8 MeV. Measured $E\gamma$, $I\gamma$, $p\gamma$ coin, and lifetimes by Doppler-shift attenuation method. Line-shape analysis for levels up to 3280 keV and centroid-shift analysis for levels above this energy.

1977Ch04: E=6-11 MeV, $\gamma\gamma$ and $p\gamma$ coincidences. No γ -ray intensities are given – this paper is mainly concerned with the structure of ^{62}Cu .

 ^{62}Ni Levels

E(level) [†]	$J^{\pi b}$	$T_{1/2}$ ^{&}	Comments
0.0	0 ⁺		
1172.9 3	2 ⁺	1.08 ps +18-13	$T_{1/2}$: τ (in ps)=1.55 25 (1978Ke11), 1.6 +4-6 (1978Oh04).
2048.5 5	0 ⁺	0.76 ^a ps +76-28	
2301.8 3	2 ⁺	0.58 ps +16-9	$T_{1/2}$: τ (in ps)=0.9 2 (1978Ke11), 0.5 +6-3 (1978Oh04); average of values from both γ rays.
2335.9 3	4 ⁺	0.86 ps +24-13	$T_{1/2}$: τ (in ps)=1.2 3 (1978Ke11), 1.5 +10-5 (1978Oh04).
2890.2 5	0 ⁺	>3.1 ^a ps	
3058.7 3	2 ⁺	2.3 ^a ps +14-7	Additional information 2. $T_{1/2}$: average of values from three γ rays (1978Ke11). Other: >0.7 ps (1978Oh04).
3158.3 5	2 ⁺	0.69 ^a ps +55-28	
3176.3 5	4 ⁺	0.73 ^a ps 17	$T_{1/2}$: >0.7 ps (1978Oh04).
3258.3 5	2 ⁺	0.71 ^a ps 17	$T_{1/2}$: >0.35 ps (1978Oh04).
3277.4 4	4 ⁺	0.195 ps +34-18	$T_{1/2}$: τ in ps: 0.28 4 (1978Ke11), 0.3 +2-1 (1978Oh04).
3371.1 19		0.19 ^a ps 9	
3378 [‡] 3			
3462 [‡] 3			
3486 [‡] 3			
3519.7 6	2 ⁺	0.201 ^a ps 38	
3522.3 4	2 ⁺ , 3 ⁺	0.15 ps +6-5	$T_{1/2}$: τ in ps: 0.46 15 (1978Ke11), 0.15 +10-6 (1978Oh04).
3756.7 5	3 ⁻	0.149 ps +34-22	$T_{1/2}$: from weighted average of $\tau=0.235$ ps 45 (1978Ke11), 0.12 ps +12-7 (1978Oh04). Lifetimes measured for both gamma rays from this level.
3861.7 17	1 ⁺ , 2 ⁺	0.277 ^a ps +17-9	
3967 [‡] 3	2 ⁺		
3976.7 15		0.111 ^a ps 35	$T_{1/2}$: from 1978Ke11, average of values from both γ rays.
3999.9 11	4 ⁺	0.042 ps +28-21	$T_{1/2}$: from 1978Oh04, could also be attributed to 3967 level.
4010.9 16		>0.90 ^a ps	
4018.2 5		0.076 ps +62-28	$T_{1/2}$: from 1978Oh04 only.
4055.1 8	3 ⁺ , 4 ⁺	0.042 ps +15-10	Additional information 3. J^{π} : 4 ⁺ in 1978Oh04. Additional information 4.
4062.8@ 11			
4146.5 7		0.34 ^a ps +21-11	
4151.0# 5	2 ⁺ , 3 ⁺	0.034 ^a ps 9	
4153.6 [‡] 5			
4161.0 4	(4 ⁺)		
4178 [‡] 3			
4424 [‡] 3			
4646.6 [‡] 6			

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$^{59}\text{Co}(\alpha, p\gamma)$ **1978Ke11, 1978Oh04, 1977Ch04 (continued)**

^{62}Ni Levels (continued)

† From least-squares fit to E_γ data.

‡ Level from 1977Ch04 only.

Level from 1978Ke11 only.

@ Level from 1978Oh04 only.

& From weighted average of values from 1978Ke11 and 1978Oh04. Method of measurement: Doppler-shift attenuation in $p\gamma$ coin. Centroid-shift analysis used by 1978Ke11 for all γ rays and by 1978Oh04 for levels up to 3280 keV. Above 3280 keV excitation, 1978Oh04 used line-shape analysis.

^a From 1978Ke11. 1978Oh04 either do not measure this value, or give only a lower limit.

^b From Adopted Levels.

$\gamma(^{62}\text{Ni})$

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\ddagger	E_f	J_f^π	Mult.	Comments
1172.9	2 ⁺	1173.2 3	100	0.0	0 ⁺		
2048.5	0 ⁺	875.6 4	100	1172.9	2 ⁺	E2	B(E2)(W.u.)=1.0×10 ² +4-10
2301.8	2 ⁺	1129.3 3	42 4	1172.9	2 ⁺		Additional information 5.
		2301.3 4	58 4	0.0	0 ⁺		Additional information 6.
2335.9	4 ⁺	1162.93 25	100	1172.9	2 ⁺		
2890.2	0 ⁺	1717.2 4	100	1172.9	2 ⁺		
3058.7	2 ⁺	722.6 3	21 3	2335.9	4 ⁺		Additional information 7.
		757.1 3	39 3	2301.8	2 ⁺		Additional information 8.
		1885.7 3	40 4	1172.9	2 ⁺		Additional information 9.
3158.3	2 ⁺	1984.7 6	72 7	1172.9	2 ⁺		
		3158.4 9	28 7	0.0	0 ⁺		
3176.3	4 ⁺	841 @ ^b	<8	2335.9	4 ⁺		
		875 @	13	2301.8	2 ⁺		
		2003.3 4	90 4	1172.9	2 ⁺		I_γ : 87 (1978Oh04). Additional information 10.
3258.3	2 ⁺	2085.3 4	100	1172.9	2 ⁺		
3277.4	4 ⁺	2104.5 3	100	1172.9	2 ⁺		
3371.1		3371.0 19	100	0.0	0 ⁺		
3378		2205# 3		1172.9	2 ⁺		
3462		2289# 3		1172.9	2 ⁺		
3486		1184# 3		2301.8	2 ⁺		
3519.7	2 ⁺	2346.7 5	100	1172.9	2 ⁺		
3522.3	2 ⁺ , 3 ⁺	463.0 8	5 3	3058.7	2 ⁺		
		1186.4 5	32 5	2335.9	4 ⁺		I_γ : <35 (1978Oh04).
		1220.6 4	63 7	2301.8	2 ⁺		I_γ : 100 (1978Oh04).
3756.7	3 ⁻	1454.9 5	50 6	2301.8	2 ⁺		Additional information 11.
		2583.7 5	50 6	1172.9	2 ⁺		Additional information 12.
3861.7	1 ⁺ , 2 ⁺	3861.6 17	100	0.0	0 ⁺		
3967	2 ⁺	1665# 3		2301.8	2 ⁺		E_γ : 1665 γ is placed from 3998 level In 1978Oh04.
3976.7		2805.2 18	44 14	1172.9	2 ⁺		
		3974.2 23	56 14	0.0	0 ⁺		
3999.9	4 ⁺	1664 @	100	2335.9	4 ⁺		E_γ : 1664 γ is placed from 3967 level In 1977Ch04.
4010.9		2837.9 15	100	1172.9	2 ⁺		
4018.2		1682.3 3	100	2335.9	4 ⁺		Additional information 13.
4055.1	3 ⁺ , 4 ⁺	777 @ ^b		3277.4	4 ⁺		I_γ : <40 (1978Oh04).
		1719.1 7	81 9	2335.9	4 ⁺		Additional information 14.
		2882.7 18	19 9	1172.9	2 ⁺		
4062.8		1761 @		2301.8	2 ⁺		

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$^{59}\text{Co}(\alpha, p\gamma)$ [1978Ke11](#), [1978Oh04](#), [1977Ch04](#) (continued) $\gamma(^{62}\text{Ni})$ (continued)

$E_i(\text{level})$	J_i^π	E_γ^\dagger	I_γ^\ddagger	E_f	J_f^π	Comments
4146.5		870 [@]		3277.4	4 ⁺	
		1844.1 ⁸	100	2301.8	2 ⁺	Additional information 15.
4151.0	2 ⁺ , 3 ⁺	1092.3 ^{& 3}	100	3058.7	2 ⁺	
4153.6		1817.7 ^{# 3}		2335.9	4 ⁺	
4161.0	(4 ⁺)	884	34 ^a	3277.4	4 ⁺	Additional information 16.
		1001 [@]	18	3158.3	2 ⁺	
		1825.2 ³	48 ^a	2335.9	4 ⁺	Additional information 17.
4178		1002 ^{# 3}		3176.3	4 ⁺	
4424		2122 ^{# 3}		2301.8	2 ⁺	
4646.6		628.4 ^{# 3}		4018.2		

[†] From [1978Ke11](#), unless otherwise stated. Others: [1977Ch04](#), [1978Oh04](#).

[‡] Averages of values from [1978Ke11](#) and [1978Oh04](#).

[#] γ ray from [1977Ch04](#) only.

[@] γ ray from [1978Oh04](#) only.

[&] γ ray from [1978Ke11](#) only.

^a From [1978Oh04](#).

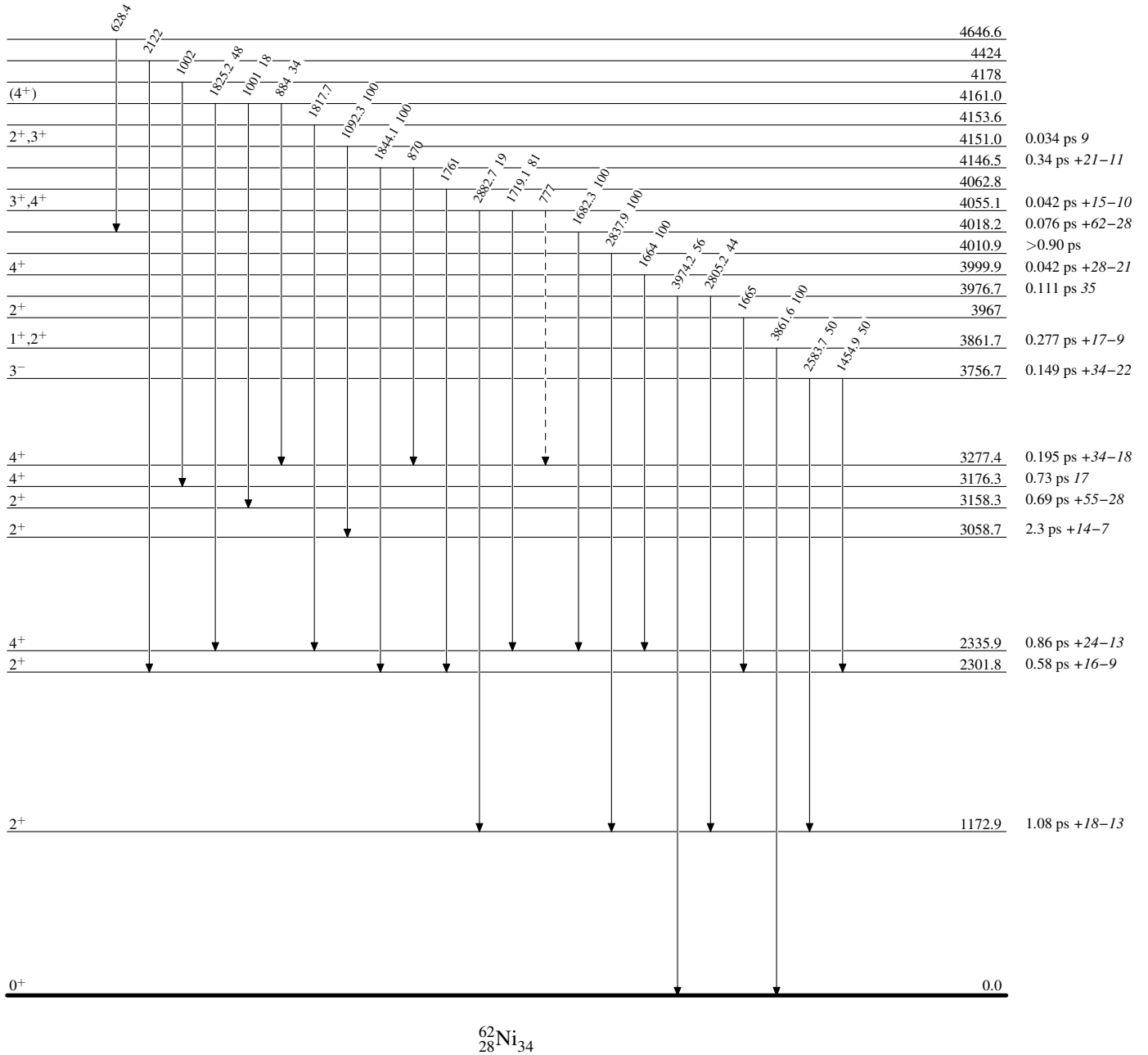
^b Placement of transition in the level scheme is uncertain.

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Legend

Level Scheme

Intensities: % photon branching from each level

-----► γ Decay (Uncertain)

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Legend

Level Scheme (continued)

Intensities: % photon branching from each level

-----► γ Decay (Uncertain)