^{62}Ni(^{3}He,d) 1976Br36,1976Bo06,1979Fi02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 196,17 (2024)	30-Sep-2023

1976Br36: E=18 MeV was produced at the Nuclear Physics Laboratory at University of Oxford. Target was 600 mg/cm^2 >98% enriched ^{62}Ni. Reaction products were momentum-analyzed with a multigap spectrograph (FWHM=30 keV). Measured $\sigma(E_d,\theta)$. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis.

1976Bo06 (also 1979Fi02): E=30.2 MeV ^{3}He beam was produced from the Centre d'Etudes Nucleaires de Saclay cyclotron. Target was 119 μg/cm^2 99.0% enriched ^{62}Ni. Reaction products were detected with two ΔE-E silicon detector telescopes (FWHM≈50 keV). Measured $\sigma(E_d,\theta)$. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis. 1979Fi02 also report proton decay branching ratios.

1965Bl14: E=22 MeV ^{3}He beam was produced from the Los Alamos variable-energy cyclotron. Targets were 160-600 μg/cm^2 self-supporting foils of 98.7% enriched ^{62}Ni. Reaction products were detected with ΔE-E detector telescopes (FWHM=70-90 keV). Measured $\sigma(E_d,\theta)$. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis.

1968Sm01: E=11 MeV ^{3}He beam was produced from the MIT-ONR Van de Graaff accelerator. Target was 41 μg/cm^2 97.8% enriched ^{62}Ni. Reaction products were momentum-analyzed with the MIT multiple-gap spectrograph (FWHM=21 keV). Measured $\sigma(E_d,\theta)$. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis. Comparisons with available data.

2013Sc06,2013ScZZ: E=18 MeV ^{3}He beam was produced from Yale tandem accelerator of WNSL facility. Target was 219 μg/cm^2 ^{64}Ni (96.5% enriched). Reaction products were momentum-analyzed with a split-pole Enge spectrograph (FWHM≈50 keV). Measured $\sigma(E_\alpha,\theta)$. Deduced levels, J, π, spectroscopic factors from DWBA analysis. Comparison with shell-model calculations.

^{63}Cu Levels

E(level)[†]	Jπ[‡]	L[#]	(2J+1)C^{2}S[#]	Comments
0	3/2$^-$	1	3.00	(2J+1)C^{2}S: others: 3.135 (1968Sm01), 2.64 (1965Bl14), 1.68 (2013Sc06).
667	1/2$^-$	1	1.38	(2J+1)C^{2}S: others: 1.421 (1968Sm01), 1.40 (1965Bl14), 0.85 (2013Sc06).
965	5/2$^-$	3	1.92	(2J+1)C^{2}S: others: 1.760 (1968Sm01), 1.98 (1965Bl14), 1.94 (2013Sc06).
1329	7/2$^-$	3	0.64	(2J+1)C^{2}S: others: 0.573 (1968Sm01), 0.46 (1965Bl14), 0.90 (2013Sc06).
1416	5/2$^-$	3	2.70	(2J+1)C^{2}S: others: 2.059 (1968Sm01), 2.70 (1965Bl14), 2.65 (2013Sc06).
1538	(3/2$^-$)	(1)	<0.01	(2J+1)C^{2}S: other: 0.016 (2013Sc06).
2014	3/2$^-$	1	0.12	(2J+1)C^{2}S: other: 0.111 for J=1/2 (1968Sm01), 0.07 (2013Sc06).
2061	1/2$^-$	1	0.29	(2J+1)C^{2}S: others: 0.281 for a triplet of 2063+2082+2093 (1968Sm01); 0.46 for a doublet (1965Bl14); 0.20 (2013Sc06).
2336	5/2$^-$	3	0.48	(2J+1)C^{2}S: others: 0.319 (1968Sm01), 0.60 (1965Bl14), 0.65 (2013Sc06).
2409	7/2$^-$	3	0.24	(2J+1)C^{2}S: other: 0.62 (2013Sc06).
2500	9/2$^+$	4	5.30	E(level): unresolved triplet of 2497+2504+2510 in 1968Sm01; 3.10 (1965Bl14), 3.26 (2013Sc06).
2686	1/2$^-$	1	0.06	(2J+1)C^{2}S: other: 0.026 (1965Bl14), 1.68 (2013Sc06).
2780	3/2$^-$	1	0.16	(2J+1)C^{2}S: others: 0.114 for a doublet of 2761+2778 (1968Sm01); 0.176 (1965Bl14), 0.12 (2013Sc06).
2860	1/2$^-$	1	0.06	(2J+1)C^{2}S: other: 0.062 (1965Bl14).
3040	1/2$^-$	1	0.04	
3106	1/2$^-$	1	0.02	
3220	5/2$^-$	3	0.30	(2J+1)C^{2}S: other: 0.36 (1965Bl14), 0.42 (2013Sc06).
3295	5/2$^+$	2	0.12	(2J+1)C^{2}S: other: 0.09 (1965Bl14).
3424	1/2$^-$	1	0.12	(2J+1)C^{2}S: other: 0.13 (1965Bl14), 0.11 (2013Sc06).
3472	5/2$^+$	2	0.60	(2J+1)C^{2}S: other: 0.42 (1965Bl14).
3576	1/2$^-$	1	0.08	(2J+1)C^{2}S: other: 0.09 (1965Bl14), 0.23 (2013Sc06).
3708	1/2$^-$	1	0.02	
3785	1/2$^-$	1	0.04	
3881	5/2$^+$	(2)	0.10	(2J+1)C^{2}S: other: 0.114 (1965Bl14).
3947				

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^{62}Ni(^{3}He,d) 1976Br36,1976Bo06,1979Fi02 (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	L[#]	(2J+1)C^{2}S[#]	Comments
3980	9/2$^+$	4	0.51	E(level),L,(2J+1)C^{2}S: from 1965Bl14 only.
4008				
4035				
4060	1/2$^-$	1	0.118	E(level),L,(2J+1)C^{2}S: from 1965Bl14 only.
4594				
4635				
4678				
4734				
4782				
4844				
4871				
4904				
5132				
5216				
5302				
5330				
5358				
5397				
5446				
5489				
5533				
5568				
5595				
5635[@]				
5694[@]				
5723[@]				
5756[@]				
5795[@]				
5835				
5859				
5920				
5994				
6032[@]				
6070				
6104				
6166				
8660[&] *40*	1/2$^-$	1	0.78	E(level),Jπ: IAS of ^{63}Ni g.s. (1976Bo06,1979Fi02). L,(2J+1)C^{2}S: from 1979Fi02. %p>99 to g.s. and <1% to 2$^+$ level in ^{62}Ni (1979Fi02).
8790[&] *40*	5/2$^-$,3/2$^-$	3,1	2.90,0.98	E(level),Jπ: unresolved doublet: J=5/2$^-$, IAS of 87 level in ^{63}Ni; J=3/2$^-$, IAS of 155 level in ^{63}Ni (1976Bo06).
9970[&] *40*	9/2$^+$	4	4.80	E(level),Jπ: IAS of 1292 level in ^{63}Ni (1976Bo06,1979Fi02). (2J+1)C^{2}S: coupling the 2$^+$ core to a proton: C^{2}S<0.01 for L=2, 0.52 for L=4 (1979Fi02). %p=81 *13* to g.s. and 19 *4* to 2$^+$ level in ^{62}Ni (1979Fi02).
10960[&] *40*	5/2$^+$	2	1.80	E(level),Jπ: IAS of 2291 level in ^{63}Ni (1976Bo06,1979Fi02). L,(2J+1)C^{2}S: from 1979Fi02. %p>95 to g.s. and <5 to 2$^+$ level in ^{62}Ni (1979Fi02).
11230[&] *40*	9/2$^+$	4	2.20	E(level),Jπ: IAS of 2514 level in ^{63}Ni (1976Bo06,1979Fi02). (2J+1)C^{2}S: coupling the 2$^+$ core to a proton: C^{2}S=0.01 for L=2, 0.77 for L=4 (1979Fi02). %p=10 *3* to g.s. and 90 *13* to 2$^+$ level in ^{62}Ni (1979Fi02).

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^{62}Ni(^{3}He,d) 1976Br36,1976Bo06,1979Fi02 (continued)

^{63}Cu Levels (continued)

† From 1976Br36, unless otherwise noted.
‡ Values assumed for the extraction of spectroscopic factors.
# From DWBA analysis of measured $\sigma(\theta)$ in 1976Br36, unless otherwise noted. The same L-values are also from 1965Bl14, 1968Sm01 for levels studied in their work, as noted under comments.
@ Weak states (1976Br36).
& From 1976Bo06.