^{64}Zn(pol d,^{3}He),(d,^{3}He) 1991Se09,1979Ha03,1978Ze04

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

1991Se09: two measurements were performed. (pol d,^{3}He) E=52 MeV polarized deuteron beam was from the Karlsruhe isochronous cyclotron. Target was a 1 mg/cm^2 self-supporting Zn foil (99.7% enriched). Reaction products were detected with a ΔE-E telescope of a silicon strip detector and a surface barrier detector (FWHM=130 keV). Measured $\sigma(\theta)$, $\theta_{c.m.}$=12° to 38°. Deduced J, π, analyzing powers, L-transfers, spectroscopic factors from DWBA analysis. (d,^{3}He) E=52 MeV deuteron beam was produced from the Julich isochronous cyclotron. Target was a 200 μg/cm^2 self-supporting Zn foil (99.5% enriched). Reaction products were momentum-analyzed with the variable-dispersion QQDDQ spectrometer BIG KARL (FWHM=20 keV) and detected with a mult-wire drift chamber. Measured E(^{3}He,θ). Deduced levels, J, π.

1979Ha03: E=55 MeV deuteron beam was produced from the KVI cyclotron. Target was 720 μg/cm^2 self-supporting foil of 99.8% enriched ^{64}Zn. Reaction products were detected with a ΔE-E solid-state detector telescope (FWHM≈100 keV). Measured $\sigma(\theta)$. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis.

1978Ze04: E=23.3 MeV deuteron beam wes produced from the ANL 60-inch cyclotron. Target was about 150 μg/cm^2 >98% enriched ^{64}Zn on a carbon backing. Reaction products were detected with a ΔE-E telescope of surface barrier detectors (FWHM<50 keV). Measured $\sigma(\theta)$. Deduced levels, L-transfers, spectroscopic factors from DWBA analysis.

Others: 1977Br27, 1965Hi01.

^{63}Cu Levels

Spectroscopic factors C^{2}S is defined by dσ/dΩ(exp)=2.95×C^{2}S×dσ/dΩ(DWBA)/(2j+1), where j is the transferred total angular momentum (1979Ha03).

E(level)[†]	Jπ[‡]	L[#]	C^{2}S[#]	Comments
0.0	3/2$^-$[&]	1	1.00	C^{2}S: others: 1.2 (1979Ha03), 1.6 (1978Ze04).
671 *5*	1/2$^-$[&]	1	0.33	C^{2}S: others: 0.5 (1979Ha03), 0.43 (1978Ze04).
961[@] *3*	5/2$^-$[&]	3	0.50	E(level): other: 963 *5* (1991Se09). C^{2}S: others: 0.7 (1979Ha03), 0.50 (1978Ze04).
1330 *3*	7/2$^-$[&]	3	1.08	E(level): weighted average of 1331 *3* (1979Ha03) and 1327 *5* (1991Se09). C^{2}S: others: 1.4 (1979Ha03), 1.5 (1978Ze04).
1411 *5*	5/2$^-$	3	0.28	C^{2}S: other: 0.2 (1978Ze04).
1546 *5*	3/2$^-$	1	0.02	E(level): other: 1500 *30* (1979Ha03). C^{2}S: others: 0.05 (1979Ha03), 0.045 (1978Ze04).
1861 *5*	7/2$^-$[&]	3	1.36	E(level): other: 1862 *5* (1979Ha03). C^{2}S: others: 1.9 (1979Ha03), 1.7 (1978Ze04).
2090 *4*	7/2$^-$[&]	3	0.34	E(level): weighted average of 2088 *4* (1979Ha03) and 2092 *5* (1991Se09). C^{2}S: others: 0.5 (1979Ha03), 0.45 (1978Ze04).
2340 *5*	5/2$^-$	3	0.05	
2405 *5*	7/2$^-$	3	0.05	
2507 *5*	9/2$^+$	4	0.20	E(level): other: 2500 *20* (1979Ha03). L: other: 3+4 (1979Ha03). C^{2}S: other: 0.2 for L=3+4 (1979Ha03).
2674 *5*		3	0.37,0.22	E(level): other: 2673 *6* (1979Ha03). C^{2}S: others: 0.4 (1979Ha03), 0.35 (1978Ze04), both for J=7/2.
2798 *5*		1	0.02,0.01	
2835 *5*		3	0.20,0.10	E(level): other: 2834 *7* (1979Ha03). C^{2}S: other: 0.3 for J=7/2 (1979Ha03).
2847 *5*		1	0.06,0.05	
3037 *5*		1	0.01,0.01	
3224 *5*				
3296 *5*	3/2$^-$[&]	1	0.06	E(level): weighted average of 3293 *8* (1979Ha03) and 3297 *5* (1991Se09).

Continued on next page (footnotes at end of table)

^{64}Zn(pol d,^{3}He),(d,^{3}He) 1991Se09,1979Ha03,1978Ze04 (continued)

^{63}Cu Levels (continued)

E(level)[†]	Jπ[‡]	L[#]	C^{2}S[#]	Comments
				L: other: L=1(3) (1979Ha03).
				C^{2}S: other: 0.09 for L=1 and J=3/2 (1979Ha03).
3434 *5*		1	0.03,0.02	
3460 *5*		1	0.06,0.05	
3578 *5*		1	0.06,0.05	
3583		(3)	0.55,0.29	E(level),L: this level is only resolved in (d,^{3}Heγ) in 1992Se03 by the same authors of 1991Se09, which state that the $\sigma(\theta)$ of this level exhibited L=3.
3600 *20*	7/2$^-$	3	0.8	E(level),L,C^{2}S: from 1979Ha03.
3678 *5*		3	0.79,0.42	
3730 *20*	7/2$^-$	3	0.8	E(level),L,C^{2}S: from 1979Ha03.
3774 *5*		3	0.72,0.38	
3890 *5*		3	1.0,0.52	E(level): other: 3885 *10* (1979Ha03).
				C^{2}S: other: 0.8 for J=7/2 (1979Ha03).
4023 *5*		1	0.02,0.01	
4111 *5*	1/2$^+$[&]	0	0.34	E(level): other: 4117 *11* (1979Ha03).
				C^{2}S: other: 0.4 (1979Ha03).
4133 *5*				
4222 *5*		3	0.71,0.37	
4286 *5*		3	0.33,0.17	E(level): other: 4260 *20* (1979Ha03).
				L: other: 3(1) (1979Ha03).
				C^{2}S: other: 0.7 for L=3 and J=7/2 (1979Ha03).
4356 *5*		1	0.04,0.03	
4375 *5*		3	0.16,0.08	
4436 *5*	1/2$^+$[&]	0	0.36	E(level): other: 4440 *20* (1979Ha03).
				C^{2}S: other: 0.6 (1979Ha03).
4503 *5*		3	1.02,0.52	
4580 *40*	7/2$^-$	3	0.6	E(level),L,C^{2}S: from 1979Ha03.
4735 *5*	1/2$^+$[&]	0	0.08	
4799 *5*	1/2$^+$[&]	0	0.13	E(level): other: 4780 *10* (1979Ha03).
				C^{2}S: other: 0.3 (1979Ha03).
4958 *5*		3	0.29,0.15	E(level): other: 4970 *20* (1979Ha03).
				C^{2}S: other: 0.4 for J=7/2 (1979Ha03).
5163 *5*	3/2$^-$	3,1	0.2	E(level): other: 5170 *20* (1979Ha03).
				L,C^{2}S: from 1979Ha03, L=1 and L=3 are equally likely.
5191 *5*				
5342 *5*	(1/2$^+$)	(0)	0.3	E(level): other: 5360 *30* (1979Ha03).
				L,C^{2}S: from 1979Ha03.
5420 *5*				
5646 *5*	(7/2$^-$)	(3)	0.3	E(level): other: 5650 *20* (1979Ha03).
				L,C^{2}S: from 1979Ha03.
5713 *5*				
5831 *5*	(7/2$^-$)	(3)	0.3	E(level): other: 5830 *30* (1979Ha03).
				L,C^{2}S: from 1979Ha03.
6.5×10^3 *10*	3/2$^+$	2	2.7	E(level),Jπ,L,C^{2}S: integral from 5.5 to 7.5 MeV of excitation (1979Ha03).
8.5×10^3 *10*	3/2$^+$	2	1.8	E(level),Jπ,L,C^{2}S: integral from 7.5 to 9.5 MeV of excitation (1979Ha03).

[†] From 1991Se09, unless otherwise noted.
[‡] Value assumed for the extraction of C^{2}S, unless otherwise noted.
[#] From DWBA analysis of measured $\sigma(\theta)$ in 1991Se09, unless otherwise noted. Where two values are listed, they are for J=L−1/2 and L+1/2, respectively.
[@] From 1979Ha03.
[&] From analysis of measured analyzing powers in 1991Se09.