^{68}Zn(d,p), (pol d,p) 1967Vo05,1975Is04,1981Bi06

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja	NDS 115, 1 (2014)	31-Jul-2013

1981Bi06: E=10 MeV polarized deuterons on a 1.1 mg/cm^2 Zn target. Reaction products detected with ΔE-E telescopes with resolution (FWHM)=60 keV. Measured $\sigma(\theta)$ with $\theta \approx 15°-80°$ and vector analyzing powers. DWBA analysis (DWUCK) including non-locality and finite range corrections were made.

1975Is04: E=7.5 MeV deuterons on ^{68Zn} target. Measured $\sigma(\theta)$. DWBA analysis.

1967Vo05: E=10.0 MeV deuterons on enriched ^{68}Zn target. Measured $\sigma(\theta)$ at $\theta=5°-40°$ using a magnetic spectrograph with a resolution (FWHM)=10-15 keV and at $\theta=25°-165°$ using surface barrier detectors with resolution (FWHM)≈ 50 keV. Statistical error in cross sections quoted to 30 % (see erratum in 1967Vo05). DWBA (Macefield) analysis.

1969Za04: Deuteron beam on ^{68}Zn target. Energy resolution 75-80 keV Proton detected using four silicon detectors with θ between 20°−160° $\sigma(\theta)$. Distorted wave method calculation compared with experimental angular distribution.

1963Li06: E=15 MeV deuterons on enriched ^{68}Zn target. Reaction products analyzed by magnetic spectrograph and detected by photographic plates with $\theta=9°-59°$. Resolution≈ 90 keV. Measured $\sigma(\theta)$. DWBA analysis.

^{69}Zn Levels

E(level)[†]	J$^\pi$[‡]	L[@]	S′[&]	Comments
0	1/2$^-$	1	1.10	
438 *5*	9/2$^+$	4	9.0	
531 *5*	5/2$^-$	3	1.17	
835 *5*		1[#]	0.53	
872 *5*	5/2$^+$	2[#]	0.99	J$^\pi$: 5/2$^+$ is definite from cross-section and vector analyzing power data assuming J^π(835)=3/2$^-$.
967 *10*				
1002 *10*				
1136 *10*				
1224 *10*				
1338 *10*				
1436 *10*				
1629 *10*	5/2$^+$	2	0.61	E(level): 1634 in 1981Bi06.
1696 *10*	1/2$^+$	0	0.21	
1786 *10*				
1831 *10*	3/2$^-$,5/2$^+$	1,2	0.05	L: L=1 (1967Vo05). L=1,2 (1981Bi06). Data of 1981Bi06 do not unambiguously distinguish between L=1 or L=2, although L=1 is favored. Vector analyzing power data in ^{68}Zn(pol d,p) suggest J^π=3/2$^-$ or 5/2$^+$.
1941 *10*				
1968[b] *10*		1[b]	0.03	L: From 1967Vo05.
2256 *10*				
2268 *10*	1/2$^+$	0	0.03	
2281 *10*				
2400 *10*	5/2$^+$	2	0.43	L: From 1981Bi06 and 1967Vo05, L=0 reported by 1975Is04.
2504 *10*	1/2$^-$,3/2$^-$	1		
2554[bc] *10*		2[b]	(0.1)	
2580[c] *10*	1/2$^-$,3/2$^-$	1	(0.1)	
2607 *10*				
2625 *10*				
2663 *10*	1/2$^+$	0	0.16	
2740[b] *10*		(2)[b]	(0.03)	
2828 *10*	1/2$^+$	0	0.03	
2905 *10*		2	0.18	
2919 *10*		1		E(level): Unresolved state in 1981Bi06. However cross section and analyzing power data show L=2 and J^π=5/2$^+$ in the vicinity of 2.92 MeV. L=2 in 1967Vo05 at 2.912 MeV and L=1 in 1975Is04 at 2.919 MeV.

Continued on next page (footnotes at end of table)

^{68}Zn(d,p), (pol d,p) 1967Vo05,1975Is04,1981Bi06 (continued)

^{69}Zn Levels (continued)

E(level)[†]	Jπ[‡]	L[@]	S′[&]	Comments
2950[a] *10*		2	0.16	L: From 1967Vo05.
3014 *10*	5/2+	2	0.50	E(level): 3025 in 1981Bi06.
3061[a] *10*	1/2+	0	0.03	
3091 *10*				
3120 *10*				
3134 *10*				
3194[a] *10*		(2)	(0.05)	L: From 1967Vo05.
3338 *10*				
3385[a] *10*	1/2+	0	0.15	
3438[a] *10*	(1/2+)	(0)	(0.02)	L: From 1967Vo05.
3457[b] *10*		(2)[b]	(0.25)	L: From 1967Vo05.
3671 *10*				
3913 *10*				
3978 *10*	1/2+	0	0.27	L: from DWBA analysis of $\sigma(\theta)$ at 3966 (1981Bi06). S′: from 1981Bi06 at 3966.
4089 *10*				
4193 *10*				
4262 *10*				
4518 *10*				
4620 *10*				
4661 *10*				
4722 *10*				

[†] Excitation energies below 900 keV are from 1967Vo05, others are from 1975Is04, unless otherwise noted.
[‡] From measured angular distributions and vector-analyzing powers (1981Bi06).
[#] A $J^\pi=3/2^-$ plus $J^\pi=5/2^+$ doublet reproduces the measured L values and vector-analyzing powers for these levels unresolved in 1981Bi06.
[@] From DWBA analysis of $\sigma(\theta)$ (1975Is04), except as noted.
[&] DWBA spectrum calculated without spin-orbit coupling and without cutoff (1967Vo05). See column 6 in Table IV (1967Vo05).
[a] Possible multiplet.
[b] From 1967Vo05, not observed by 1975Is04 and not reported by 1981Bi06.
[c] Not resolved in 1967Vo05.