

${}^{90}\text{Zr}(\text{pol d,p})$ 1973Ra18

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Coral M. Baglin	NDS 114, 1293 (2013)	1-Sep-2013

Others: 1978Ba13, 1979St23, 1984Ha26 (E=56 MeV, 4 levels), 1990Na34.

1973Ra18: E=11 and 12 MeV. 98% ${}^{90}\text{Zr}$ target; $\theta(\text{c.m.})\approx 15^\circ$ to 165° ; semi, FWHM=65 keV for 12 MeV data, 165 keV for 11 MeV data. Measured vector analyzing power.

1973Ro16: E=10.0 MeV. 98% ${}^{90}\text{Zr}$ target; semi telescope; FWHM=40 keV for $\theta(\text{lab})\geq 15^\circ$, FWHM=330 keV for $\theta(\text{lab})< 15^\circ$. Measured vector and tensor analyzing power for four levels; $\theta(\text{c.m.})\approx 5^\circ$ to 130° .

1978Ba13: E=12.3 MeV (0, 1200, 2030 levels; analyzing power).

1979St23: E=5.6-9.0 MeV (g.s. only; measured analyzing power; DWBA and resonance analysis).

1984Ha26: E=56 MeV (four levels).

1990Na34: E=18 MeV (two levels); measured polarization transfer coefficients.

 ${}^{91}\text{Zr}$ Levels

E(level) [†]	J^π [‡]	L [‡]	S [#]	Comments
0	5/2 ⁺	2	1.09	
1205	1/2 ⁺	0	0.88	
1466	5/2 ⁺	2	0.032	
1882	7/2 ⁺	4	0.11	
2042	3/2 ⁺	2	0.78	
2170 [@]	[11/2 ⁻] [@]	(5) [@]	0.42 [@]	
2201 [@]	7/2 ⁺ [@]	(4) [@]	0.55 [@]	
2321				
2558	1/2 ⁺	0	0.32	
2694	(3/2 ⁺) ^a			
2811	(5/2 ⁺) ^a			
2871 ^{&}	3/2 ⁺ ^{&}	2	0.083 ^{&}	
2928 ^{&}	NOT 1/2 ⁺ ^{&}			L: not 0.
3083	3/2 ⁺	2	0.16	
3290	3/2 ⁺	2	0.22	
3469	7/2 ⁺	4	0.58	
3554	7/2 ⁺			
3681	3/2 ⁺	2	0.16	
3850	(5/2 ⁺)			Weak transition; analyzing power data have poor statistics.
3908				L=2+5 doublet expected, but no combination of spins could reproduce the analyzing power data.
4007				Observed but not analyzed because this is probably a multiplet of levels whose L values are unknown (1973Ra18).

[†] Levels observed by 1973Ra18. The energies are rounded-off values from Adopted Levels. 1973Ra18 did not determine energies; they adopted the energies of the (d,p) measurement of 1970Bi03 for their angular distribution curves. These energies are about 10 keV lower at 2 MeV and 20 keV lower at 3 MeV than the adopted values.

[‡] From DWBA analysis of $\sigma(\theta)$ and vector analyzing power (1973Ra18).

[#] From DWBA (1973Ra18). Other C²S: 1984Ha26 (four levels).

[@] The 2170 and 2201 levels form a doublet in 1973Ra18. $\sigma(\theta)$ is reproduced well by a superposition of L=5 and L=4 DWBA predictions; the analyzing power determines $J^\pi(2201)=7/2^+$, regardless of J(2170), but fails to determine J(2170), possibly due to inadequacies of L=5 DWBA predictions (1973Ra18). S is deduced assuming $J^\pi(2170)=11/2^-$.

[&] The 2871 and 2928 levels form a doublet in 1973Ra18. Since the 2928 level is relatively weakly excited, 1973Ra18 were unable to determine either L or J for it, but could rule out L=0.

^a Weak transition. 1973Ra18 assumed L=2 but adopted value differs; hence, their tentative J assignment is not valid and is not adopted.