

$^{40}\text{Ar}(\text{d,t}),(\text{pol d,t})$  1975Se13,1966Ro02

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

**1975Se13:** (pol d,t): E=14.83 MeV beam was produced from the Notre Dame Lamb-shift ion source. Target was chemically pure natural argon gas. Reaction products were detected with  $\Delta E$ -E counter telescopes (FWHM=120 keV) of surface-barrier detectors and Si(Li) detectors. Measured  $\sigma(E_t, \theta)$ , analyzing powers. Deduced levels, J,  $\pi$ , L-transfers, spectroscopic factors from DWBA analysis. Comparisons with available data.

**1966Ro02:** E=15 MeV deuteron beam was produced from the cyclotron at the University of Pittsburgh. Target was argon gas. Reaction products were momentum-analyzed with a magnetic spectrograph (FWHM=75 keV) and detected with a CsI(Tl) crystal. Measured  $\sigma(E_t, \theta)$ , relative yields. Deduced levels, J,  $\pi$ , L-transfers from DWBA analysis.

**1968Fi05:** (d,t): E=11.6 MeV. Measured  $\sigma(E_t, \theta)$ . Deduced levels, J,  $\pi$ , L-transfers, spectroscopic factors from DWBA analysis for 0, 1270, 1520 levels and a group at 2200.

**1965Ja07:** (d,t): E=11.8 MeV. Measured  $\sigma(E_t, \theta)$ . Deduced levels, J,  $\pi$ , L-transfers, spectroscopic factors from DWBA analysis for 0, 1270, 1520 and 2370 levels.

 $^{39}\text{Ar}$  Levels

Spectroscopic factor  $C^2S$  is obtained from  $(d\sigma/d\Omega)(\text{exp})=N \times C^2S \times (d\sigma/d\Omega)(\text{DWBA})$ , with N=normalization factor. N=3.33 is used in **1975Se13** and **1968Fi05**.

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Relative population
Level      at 40°
  0         76
 1270       43
 1530       100
 2100       weak
 2380       22
 2520       9
 2670       5
 2860       4
 3100       6
 3210       weak
 3330       6
 3410       9
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E(level) <sup>†</sup>	J $\pi$ <sup>#</sup>	L <sup>#</sup>	C <sup>2</sup> S <sup>#</sup>	Comments
0	7/2 <sup>-</sup>	3	1.35 22	C <sup>2</sup> S: others: 0.91 ( <b>1968Fi05</b> ), 1.30 ( <b>1965Ja07</b> ).
1270 10	3/2 <sup>-</sup>	1	0.14 3	C <sup>2</sup> S: others: 0.12 ( <b>1968Fi05</b> ), 0.05 for L=1, 0.52 for L=3 ( <b>1965Ja07</b> ). L: other: 1,3 ( <b>1965Ja07</b> ).
1530 10	3/2 <sup>+</sup>	2	2.0 3	J $\pi$ : L-1/2 transfer from analyzing power ( <b>1975Se13</b> ). C <sup>2</sup> S: others: 1.03 ( <b>1968Fi05</b> ), 1.30 ( <b>1965Ja07</b> ).
2100 10				
2380 10	1/2 <sup>+</sup>	0	0.85 16	C <sup>2</sup> S: others: 0.33 ( <b>1968Fi05</b> ), 0.14 for L=3 ( <b>1965Ja07</b> ). L: other: 3 ( <b>1965Ja07</b> ).
2520 20				
2670 20	3/2 <sup>-</sup>	1	0.040 8	
2860 20				
3100 20				
3210 20				
3330 20	5/2 <sup>+</sup>	2	0.46 9	
3410 20				
3555 30	3/2 <sup>-</sup>	1	0.020 6	

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$^{40}\text{Ar}(\text{d,t}),(\text{pol d,t})$  1975Se13,1966Ro02 (continued) $^{39}\text{Ar}$  Levels (continued)

<u>E(level)<sup>†</sup></u>	<u>J<sup>π</sup>#</u>	<u>L#</u>	<u>C<sup>2</sup>S#</u>	<u>Comments</u>
3660 <sup>30</sup>				
3889 <sup>‡</sup>	(5/2 <sup>+</sup> ,7/2 <sup>-</sup> )	(2,3)	(0.28) 9	C <sup>2</sup> S: for J=5/2 <sup>+</sup> (1975Se13).
3980 <sup>30</sup>				
4120 <sup>30</sup>				
4255 <sup>‡</sup>	7/2 <sup>-</sup>	3	(0.19) 4	
4350 <sup>30</sup>				
4472 <sup>‡</sup>	(5/2 <sup>+</sup> )	(2)	(0.25) 6	
4910 <sup>‡</sup>				
5150 <sup>‡</sup>				

<sup>†</sup> From 1966Ro02, unless otherwise noted. In the region 1530-3410, the energies seem to be systematically higher (by 13-30 keV) as compared to those in Adopted Levels. There may be a possible calibration problem in this energy region.

<sup>‡</sup> From figure 2 of 1975Se13.

# From 1975Se13. J<sup>π</sup> assignments are based on L from  $\sigma(\theta)$  and L+1/2 transfer from analyzing powers, unless otherwise noted.