^{36}Ar(^{3}He,n) 1986Al15,1977Bo16,1969Sh04

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 152, 1 (2018)	30-Sep-2017

1986Al15: E=25.4 MeV ^{3}He beam was produced from the University of Colorado accelerator. Target was enriched ^{36}Ar gas. Neutrons were detected with three counters of liquid scintillator (FWHM=350 keV for the most energetic neutrons). Measured $\sigma(\theta)$, tof. Deduced levels, J, π, L-transfers from DWBA analysis. Report 12 levels up to 7470.

1977Bo16: E=11.5 MeV ^{3}He beam was produced from the CN Van de Graaff accelerator at the Hahn-Meitner-Institut, incident on a gas target of enriched ^{38}Ar. Neutrons were detected with 16 liquid scintillators with energies determined by the time-of-flight method (flight path=17.5 m, FWHM=10 keV at E(n)=4 MeV and 50 keV at 12 MeV). Measured TOF spectrum, $\sigma(\theta)$. Deduced levels, J, π, L from DWBA analysis. Comparisons with available data and shell-model calculations. Report 7 levels up to 4900.

1969Sh04: E=9.0 MeV. Measured $\sigma(\theta)$, tof, FWHM≈350 keV for g.s. group to ≈125 keV for 4920 group. Deduced levels, J, π, L from DWBA analysis. Total of six groups reported up to 4920.

^{38}Ca Levels

E(level)[†]	L[†]	dσ/dΩ(max) mb/sr[‡]	Comments
0	0	2.80	L: from 1986Al15, 1977Bo16 and 1969Sh04.
2224 *50*	(2)	<0.02[#]	E(level): weighted average of 2250 *70* (1986Al15) and 2210 *50* (1969Sh04).
3067 *30*		0.46	E(level): weighted average of 3070 *30* (1986Al15) and 3060 *50* (1969Sh04). L: 0 in 1977Bo16 and 1969Sh04, but $\sigma(\theta)$ distribution in 1986Al15 does not show characteristic L=0 shape.
3670 *30*	2,2+3	0.43[#]	E(level),L: 1969Sh04 observe a doublet structure of E=3690 *30* at some angles, however the $\sigma(\theta)$ distribution for the group is consistent with DWBA for L=2. $\sigma(\theta)$ distribution in 1977Bo16 fits L=2 uniquely, in 1986Al15 it fits L=2 or L=2+3.
4412 *30*	2+5	0.18[@]	E(level): weighted average of 4390 *30* (1986Al15) and 4450 *40* (1969Sh04). L: other: 3 (1977Bo16).
4750	0	0.20	E(level),L: from 1977Bo16 only, energy taken by 1977Bo16 from (p,t) data.
4860 *40*	3,(2+4)	0.29[@]	E(level),L: this level in 1986Al15 and the level at 4920 *30* in 1969Sh04 could be doublet; L=(2+4) could correspond to 4899, 2^+ level in (p,t). L: other: 3 (1977Bo16).
5140 *60*	2		
5560 *60*	3		
5790 *40*	(4)		
6760 *50*			
7200 *50*			
7470 *50*			

[†] From 1986Al15, unless otherwise noted.
[‡] From 1977Bo16, at 0°, unless otherwise stated.
[#] At 25° (1977Bo16).
[@] At 30° (1977Bo16).