^{36}Ar(d,t) 1970Wh04,2015Fr01

$J^\pi=0^+$ for ^{36}Ar ground state.

1970Wh04: a 21.0-MeV deuteron beam was produced by the Yale MP tandem Van de Graaff accelerator. The target was a ^{36}Ar gas cell. Tritons were detected using a 140−μm-530−μm thick ΔE-E telescope of silicon surface barrier detectors with FWHM=65-70 keV. Measured $\sigma(E_t,\theta)$. Deduced levels, L, and spectroscopic factors from JULIE-DWBA analysis of the measured $\sigma(\theta)$. Comparisons with shell-model calculations.

2015Fr01: a 22-MeV deuteron beam was produced by the MP tandem Van de Graaff accelerator at the Maier-Leibnitz Laboratorium (MLL) in Garching, Germany. Targets were produced by implanting 25-70-keV 3-6 μg/cm^2 of ^{36}Ar ions into 30 μg/cm^2 natural abundance carbon foils. Reaction products were momentum analyzed by a Q3D magnetic spectrograph. Tritons were detected using a multiwire gas-filled proportional counter backed by a scintillator at the focal plane. Measured E_t at θ_{lab}=15°, 20°, 25° with FWHM≈9 keV and at 54° with FWHM≈16 keV. Deduced levels, proton resonance energies, level densities. Comparisons with shell-model calculations.

^{35}Ar Levels

Spectroscopic factor $C^2S=\sigma(\theta)_{exp}/\sigma(\theta)_{DWBA}/N$, where N=3.33 is a normalization factor adopted by 1970Wh04 from 1966Ba54.

E(level)†	J^π‡	L#	C^2S#	Comments
0	$3/2^+$	2	3.4	
1180 *10*	$1/2^+$	0	1.4	
1700	$5/2^+$	(2)	<0.2	
2635 *20*	$3/2^+$	(2)	0.5	C^2S: 1970Wh04 states that there is a large uncertainty in the spectroscopic strength. 1970Wh04 also gives S=0.11 or 0.032 assuming L=1.
2986 *20*	$5/2^+$	2	2.6	
3200 *20*	$7/2^-$	(3)	0.33,0.11	C^2S: assuming r_{0n}=1.25 F and V_n 60 MeV, respectively. 1970Wh04 states that there is a large uncertainty in the spectroscopic strength.
5913 *5*				
5991 *3*				
6037 *3*				May be a doublet (2015Fr01).
6055? *3*				Tentative (2015Fr01).
6076 *3*				
6164 *3*				
6253 *3*				
6273 *3*				
6302 *3*				
6332 *3*				
6345 *3*				
6415 *2*				
6439? *4*				Tentative (2015Fr01).
6460 *3*				
6523 *3*				
6557 *3*				
6585 *3*				
6606 *3*				
6617 *2*				
6644 *3*				
6651 *3*				
6672 *3*				

† From 1970Wh04 for low-lying states up to 3200 keV and from 2015Fr01 for others.
‡ From the Adopted Levels for extracting C^2S.
# From DWBA analysis of the measured $\sigma(\theta)$ in 1970Wh04.