

$^{36}\text{Ar}(\text{d},\text{t})$ 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 $\sigma(\text{E}_t, \theta)$. Deduced levels, L-transfers, 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 fabricated by implanting 25-70-keV 3-6 $\mu\text{g}/\text{cm}^2$ of ^{36}Ar ions into 30 $\mu\text{g}/\text{cm}^2$ 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 $\theta_{\text{lab}}=15^\circ$, 20° , 25° with FWHM \approx 9 keV and at 54° with FWHM \approx 16 keV. Deduced levels, proton resonance energies, level densities. Comparisons with shell-model calculations.

 ^{35}Ar Levels

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

$\text{E}(\text{level})^\dagger$	J^π^\ddagger	$\text{L}^\#$	$\text{C}^2\text{S}^\#$	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 $\text{S}=0.11$ or 0.032 assuming $\text{L}=1$.
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.

‡ As given in 1970Wh04, also used for extracting C^2S .

$^\#$ From DWBA analysis of the measured $\sigma(\theta)$ in 1970Wh04.