^{1}H(^{36}Ar,d) 2010Le03,2011Le01

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

2010Le03, 2011Le01: A ^{36}Ar beam at 33 MeV/u was provided at the National Superconducting Cyclotron Laboratory, MSU. Targets were polyethylene $(CH_2)_n$. Deuterons were detected using the High-Resolution Array (HiRA) of Si and CsI(Tl) telescope detectors in coincidence with recoil residues identified in the S800 spectrometer by the focal plane ionization chamber and ToF. Measured $\sigma(E_d,\theta)$ in inverse kinematics. Deduced neutron spectroscopic factors from adiabatic distorted wave approximation (ADWA) analysis of the measured $\sigma(\theta)$ using Chapel-Hill global optical potential arameters (CH89) and JLM optical potentials and geometry for transferred neutron constrained by Hartree−Fock calculations (JLM+HF). Comparisons with shell−model calculated spectroscopic factors.

Theoretical studies involving ^{1}H(^{36}Ar,d)^{35}Ar: 2011Nu01, 2023He15.

^{35}Ar Levels

E(level)	J^{π}	L[‡]	C^2S[‡]	Comments
0	$3/2^{+}$	2	2.3 *2*	C^2S: other: 1.6 *1* from 2011Le01 ADWA (JLM+HF). C^2S: 2.29 *23* (CH89) and 1.60 *16* (JLM+HF) from 2010Le03 ADWA. C^2S: 2.10 from large basis-shell model calculations (2010Le03). C^2S: 2.21 *49* from a reanalysis of the $\sigma(\theta)$ data using finite-range ADWA (2011Nu01), including theoretical uncertainties associated with optical potentials (7%) and the approximate solution of three-body problems (19%). C^2S: 2.1 *+2−4* from a reanalysis of the $\sigma(\theta)$ data using ADWA within a Bayesian framework (2023He15), including theoretical uncertainties associated with optical potentials.
1180		0	1.2 *1*	
2980[†]				
3190[†]				
5570				

[†] Doublet in measured spectra.

[‡] From 2011Le01 ADWA (CH89).