^{40}Ar(^{3}He,d) 1975Me05,1975Me10

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. D. Nesaraja, E. A. Mccutchan	NDS 133, 1 (2016)	30-Sep-2015

1975Me05, 1975Me10: E(^{3}He)=18 MeV. Measured $\sigma(\theta)$ for θ=7.5° to 45° using multiangle spectrograph and Ilford K2 emulsion plates (FWHM 25 keV); DWBA calculations. 1975Me05 report levels up to 7617 and 1975Me10 report proton-unbound levels from 7836 to 10239. For proton-unbound states (for levels ≥8349), 1975Me10 also list Γ_p values deduced from comparison of measured cross sections with DWBA calculations for $2p_{1/2}$, $2p_{3/2}$, $1d_{3/2}$ and $1f_{7/2}$ orbitals.

Other:

1970La06: E=10 MeV. Measured $\sigma(\theta)$ with FWHM ≈150 keV. A total of 11 groups reported up to 6570 with L-values and strengths. DWBA analysis. The groups reported were: 0.0 (L=2), 980 (L=0), 1310 (L=3), 1600 (L=1), 2200 (L=2), 2640 (L=1), 3090 (L=1), 4300 (L=1), 4530 (L=1), 6020 (L=1) and 6570 (L=1). Good agreement for the first four states with the results of 1975Me05, however, the large energy resolution of ≈150 keV makes a comparison with the higher energy levels difficult.

^{41}K Levels

Cross sections given under comments are for 18.75°, uncertainties are <10%.

E(level)[†]	L[†‡]	(2J+1)C^{2}S[†#@]	Comments
0	2	1.53	
980 *5*	0	0.16	
1293 *5*	3	2.91	
1582 *5*	1	0.69	
1693 *5*			Very weak group.
2164 *5*	1	0.052	
2313 *5*	3	0.069	
2592 *5*	1	0.18	
2672 *5*	0	0.021	
2710 *5*	2	0.047	
2755 *5*	2	0.055	
3046 *10*	1	0.14	
3216[&] *10*	3+1,3+0	0.16,0.008	(2J+1)C^{2}S: 0.16, 0.0079 for L=3+1; 0.17, 0.0082 for L=3+0.
3446 *10*	3	0.24	
3480 *10*	3	0.076	
3619 *10*	1	0.0051	
3736 *10*	1	0.049	
3773 *10*	3	0.13	
3819 *10*	1	0.029	
3858 *10*	3	0.11	
3916 *10*	1	0.071	
4032 *10*	2	0.051	
4140 *10*	3	0.21	
4237[&] *10*	3+1	0.16,0.047	
4339 *10*	3	0.043	
4443 *10*	1	0.035	
4478 *10*	1	0.025	
4587 *10*	3	0.032	
4661[&] *10*	3+1	0.024,0.003	
4728 *10*	1	0.010	
4848 *10*	1	0.0093	
4922[&] *10*	3+1	0.037,0.004	
4995 *10*	3	0.056	
5091 *10*	1	0.026	
5160 *10*	3	0.044	
5235 *10*	1	0.032	

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^{40}Ar(^{3}He,d) 1975Me05,1975Me10 (continued)

^{41}K Levels (continued)

E(level)[†]	L[†‡]	(2J+1)C^{2}S[†#@]	Comments
5270 *10*	1	0.014	
5335 *10*	1	0.0032	
5393 *10*	1	0.065	
5448 *10*	1	0.016	
5543[&] *10*	3+1	0.03,0.0056	
5620 *10*	1	0.0065	
5669 *10*	1	0.010	
5717 *10*	1	0.027	
5816 *10*	0	0.0092	
5852 *10*	3	0.033	
5894 *10*	1	0.027	
5933 *10*	1	0.014	
5986[&] *10*	3+1	0.085,0.014	
6062 *10*	1	0.033	
6109 *10*	1	0.010	
6190 *10*	1	0.019	
6261 *10*	1	0.021	
6303 *10*	1	0.013	
6350 *10*	3	0.049	
6504 *10*	1	0.056	
6601 *10*	1	0.0071	
6654 *10*	1	0.027	
6704 *10*	3	0.032	
6809 *10*	1	0.033	
6874 *10*	1	0.023	
6919 *10*	1	0.016	
6980 *10*	1	0.018	
7037[&] *10*	3+1	0.041,0.018	
7085 *10*	3	0.078	
7159 *10*	1	0.032	
7232 *10*	1	0.013	
7319[&] *10*	3+1	0.035,0.012	
7420 *10*	1	0.032	
7471 *10*	3	0.035	
7511 *10*	1	0.013	
7617 *10*	1	0.016	
7836 *15*	2,(1)	0.076,0.048	dσ/dΩ=0.286 mb/sr.
7893 *15*	2,(1)	0.048,0.031	dσ/dΩ=0.176 mb/sr.
7940 *15*	(3)	0.067	dσ/dΩ=0.224 mb/sr.
8041 *15*	(3)	0.039	dσ/dΩ=0.127 mb/sr.
8116 *15*	1	0.048	dσ/dΩ=0.236 mb/sr.
8152 *15*	1	0.026	dσ/dΩ=0.127 mb/sr.
8229 *15*	(3)	0.022	dσ/dΩ=0.068 mb/sr.
8268 *15*	1	0.022	dσ/dΩ=0.104 mb/sr.
8349 *15*	3	0.84	1978En02 give (2J+1)S=4.2 (C^2=1/5 for T=5/2). dσ/dΩ=2.45 mb/sr. E(level): analog of ^{41}Ar ground state with J^π=7/2$^-$ (1975Me10).
8464 *15*	1	0.044	dσ/dΩ=0.180 mb/sr.
8548 *15*	(3)	0.092	1978En02 give (2J+1)S=0.46 (C^2=1/5 for T=5/2). dσ/dΩ=0.254 mb/sr. E(level): analog of ^{41}Ar 167-keV level with J^π=7/2$^-$ (1975Me10).
8660 *15*	1	0.048	dσ/dΩ=0.181 mb/sr.
8748 *15*	1	0.064	dσ/dΩ=0.217 mb/sr.
8801 *15*	(1)	0.029	dσ/dΩ=0.101 mb/sr.
8873 *15*	1	0.18	1978En02 give (2J+1)S=0.90 (C^2=1/5 for T=5/2).

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^{40}Ar(^{3}He,d) 1975Me05,1975Me10 (continued)

^{41}K Levels (continued)

E(level)[†]	L[†‡]	(2J+1)C^{2}S[†#@]	Comments
			dσ/dΩ=0.66 mb/sr.
			E(level): analog of ^{41}Ar 516-keV level with $J^\pi=3/2^-$ (1975Me10).
9050 *15*	(1)	0.15	dσ/dΩ=0.301 mb/sr.
9116 *15*	(3)	0.074	dσ/dΩ=0.179 mb/sr.
9203 *15*	3,(1)	0.038,0.025	dσ/dΩ=0.089 mb/sr.
9243 *15*	1	0.028	dσ/dΩ=0.101 mb/sr.
9376 *15*	(2)	0.16	1978En02 give (2J+1)S=0.80 (C^2=1/5 for T=5/2).
			dσ/dΩ=0.44 mb/sr.
			E(level): analog of ^{41}Ar 1035-keV level with $J^\pi=(3/2)^+$ (1975Me10).
9471 *15*	(1)	0.083	dσ/dΩ=0.232 mb/sr.
9626 *15*	1	0.38	1978En02 give (2J+1)S=1.9 (C^2=1/5 for T=5/2).
			dσ/dΩ=0.97 mb/sr.
			E(level): analog of ^{41}Ar 1354-keV level with $J^\pi=3/2^-$ (1975Me10).
9728 *15*	1	0.036	dσ/dΩ=0.071 mb/sr.
9789 *15*	(1)	0.033	dσ/dΩ=0.065 mb/sr.
9857 *15*	1	0.042	dσ/dΩ=0.077 mb/sr.
9936 *15*	(1)	0.036	1978En02 give (2J+1)S=0.18 (C^2=1/5 for T=5/2).
			dσ/dΩ=0.064 mb/sr.
			E(level): analog of ^{41}Ar 1635-keV level with $J^\pi=3/2^-$ (1975Me10).
10093 *15*	1	0.048	dσ/dΩ=0.154 mb/sr.
10195[&] *15*	0+1	0.032,0.020	1978En02 give (2J+1)S=0.16, 0.10 (C^2=1/5 for T=5/2).
			dσ/dΩ=0.046 mb/sr.
			E(level): analog of ^{41}Ar 1869-keV level with $J^\pi=1/2^+$ (1975Me10).
10239 *15*	(1)	0.054	dσ/dΩ=0.152 mb/sr.

[†] From 1975Me05 up to 7617 level and from 1975Me10 above this energy. For calibration purpose, precisely known energies of 980.42, 1293.66 and 2166.0 were used.
[‡] From comparison to DWBA calculations.
[#] From $d\sigma/d\Omega_{exp}=N(2J+1)C^2S\sigma_{DWBA}/(2j+1)$ with N=4.42.
[@] 1978En02 quote (2J+1)S values (C^2=1 for low-lying states) for levels up to 3216, adjusted upwards by ≈25%, based on standardized normalization factors deduced in 1977En02. 1978En02 consider most of the higher levels as unresolved structures.
[&] Doublet.