

$^{39}\text{K}(\text{n,p})$ 1961Ba31,1964Ba30

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

$J^\pi(^{39}\text{K g.s.})=3/2^+$.

1961Ba31: E=3.8-8.7 MeV neutron beams were produced via $^2\text{H}(\text{d,n})$ reaction with deuterons provided from the Rice University 5.5 MeV electrostatic accelerator on a deuterium gas target. Reaction target was a KI(Tl) scintillation crystal, which also served as a charged-particle detector for detecting reaction products. Measured $\sigma(E_n, E_p)$. Deduced levels. Levels corresponding to 14 proton groups are reported.

1964Ba30,1967Ba05: E=4-8 MeV neutrons were produced via $^2\text{H}(\text{d,n})$ with deuterons from the Frankfurt 5.5-MeV Van de Graaff. Target was a KI(Tl) crystal also as charged-particle detector. Measured $\sigma(E_n, E_p)$. Deduced levels, J. Also measured γ rays from (n,p γ). See also **1963Ba07**.

All references above are from the same group.

Others:

1956Sc93: E=2.0-5.5 MeV. Measured $\sigma(E_n, E_p)$. Discovered a level at 2460 100 and confirmed the level at 1250. Reference: Phys Rev 102, 1557 (1956).

Cross section measurements: **1987Fo02** (E \approx 14 MeV), **1974Ko11** (E=14.1 MeV), **1974Ba16** (E=2.41-2.86 MeV), **1967Jo19** (E=2.46 MeV), **1961Di09** (E=2.4 MeV).

 ^{39}Ar Levels

E(level) [†]	J^π [@]	$\sigma(\text{mb})$ ^{&}	Comments
0 [‡]	7/2 ⁻	14.0 20	J^π : from Adopted Levels.
1320 [‡] 50	3/2	7.2 15	
1570 [#] 50	3/2	8.4 21	
2170 [#] 50	(5/2,7/2,9/2)	14 4	
2520 [‡] 50			E(level): 2460 100 from 1964Ba30 .
3.10 \times 10 ³ [#] 10			
3.45 \times 10 ³ [#] 10			
3820 [‡] 50			
4.52 \times 10 ³ [#] 10			
4.54 \times 10 ³ [#] 6			E(level): 4.52 \times 10 ³ 10 from 1961Ba31 .
4.70 \times 10 ³ [#] 7			E(level): 4.75 \times 10 ³ 10 from 1961Ba31 .
5.06 \times 10 ³ [#] 8			E(level): 4.94 \times 10 ³ 10 from 1961Ba31 .
5.40 \times 10 ³ [‡] 10			E(level): from 1961Ba31 and 1967Ba05 .
5.63 \times 10 ³ 8			E(level): from 1967Ba05 only.
6.00 \times 10 ³ [#] 10			E(level): from 1961Ba31 and 1967Ba05 .

[†] From **1961Ba31** for levels below 4540 and others from **1967Ba05**, unless otherwise noted.

[‡] Strong proton group (**1961Ba31**).

[#] Weak proton group (**1961Ba31**).

[@] From constancy of $\sigma/(2J+1)$ with that of g.s. with known J (**1964Ba30**), unless otherwise noted.

[&] From **1964Ba30** at $E_n=8$ MeV.