^{39}K(α,n),(α,nγ) 1965Ne02,1974Br04,1972Be50

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

1965Ne02: E=7.8-12 MeV alpha beam of 5-10 nA from the Florida State University Tandem Van de Graaff accelerator. Potassium targets of KI and KBr powder in disks of 2.5 cm diameter or evaporated onto tantalum backings. A 5.1 cm by 5.1 cm scintillator for detecting β activity of the residual nucleus and a 7.6 cm by 7.6 cm NaI detector for γ-rays. Measured cross sections, $\beta+\gamma$ coin of decay of ^{42}Sc ground state and isomer activities, $T_{1/2}$. Levels in ^{42}Sc deduced from observed thresholds.

1974Br04: E=10.4 MeV alpha beam from the Stony Brook tandem Van de Graaff accelerator. Target of a 140 μg/cm^2 natural KI. Ge(Li) detector. Measured Eγ, Iγ. Deduced levels, $T_{1/2}$ using Recoil Distance Method (RDM) for levels at 1490 and 1511 keV.

1972Be50: E=15 MeV alpha beam from the Stanford FN tandem Van de Graaff accelerator. Natural potassium target. A Ge(Li) detector for detecting γ-rays and a scintillator for neutrons. Measured Eγ, nγ-coin. Deduced levels, $T_{a/2}$ by RDM for levels at 1490 and 1511 keV.

1961Sm05: E=8.29 MeV alpha beam from Yale cyclotron. Natural potassium target. Neutrons were detected were detected by their proton recoils in nuclear emulsions. Measured neutron spectra. Neutron group corresponding to ^{42}Sc ground state is reported.

Additional information 1.

^{42}Sc Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0	0^+	0.65[#] s *1*	
611	1^+	60.6[#] s *4*	E(level): 600 *30* in 1965Ne02.
616	7^+		E(level): 526 *20* in 1965Ne02.
1490	3^+	31 ps *9*	E(level): 1420 *30* in 1965Ne02. $T_{1/2}$: Weighted average of 33 ps *9* in 1974Br04 and 31 ps *5* in 1972Be50.
1510	5^+	45 ps *8*	E(level): 1340 *30* in 1965Ne02. $T_{1/2}$: Weighted average of 36 ps *10* in 1974Br04 and 51 ps *8* in 1972Be50.
2220 *30*			
2960 *30*			
3570 *40*			

[†] From Adopted Levels for the first four excited states since the level energies deduced by 1965Ne02 from their threshold data disagree with those from many other reactions. The matching of the levels between the Adopted Levels and those given by 1965Ne02 is based on decay modes as indicated by 1965Ne02.

[‡] From Adopted Levels.

[#] From β-counting in 1965Ne02.

γ(^{42}Sc)

E$_\gamma$	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$
880	1490	3^+	611	1^+
894	1510	5^+	616	7^+

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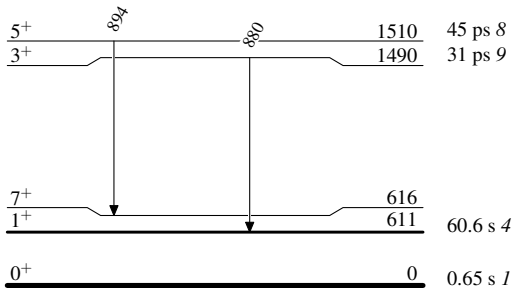
Level Scheme



$^{42}_{21}Sc_{21}$