

$^{39}\text{K}(\alpha, \alpha')$ **1977Bo12,1968Pe08**

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

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

1977Bo12: E=31 MeV alpha beam was produced from the University of Rochester Nuclear Structure Research Laboratory (NSRL). Target was $200 \mu\text{g}/\text{cm}^2$ isotopically enriched KNO_3 evaporated onto a $40 \mu\text{g}/\text{cm}^2$ carbon backing. Scattered alpha particles were detected with two position-sensitive solid state detectors (FWHM=35 keV). Measured $\sigma(\theta)$. Deduced levels, J, π , L-transfers, B(EL) from DWBA analysis. The overall normalization uncertainty is estimated to be less than 15% by authors.

1968Pe08: E=42 MeV alpha beam was produced from the University of Washington cyclotron. Target was natural metallic potassium (93.1% in ^{39}K). Scattered particles were detected with silicon solid-state detectors (FWHM=120-140 keV). Measured $\sigma(\theta)$. Deduced levels, J, π , L-transfers, deformation parameters from DWBA analysis.

Others:

1983Fr03: (α, α) E=6-9.2 MeV. Measured $\sigma(\theta)$.

1972Oe01: E=24, 29 MeV. Measured $\sigma(\theta)$.

1969Bo05: (α, α) E=22.1-28.2 MeV. Measured $\sigma(\theta)$.

Elastic scattering (α, α) : **1966Gr09** (E=30.5 MeV).

 ^{39}K Levels

B(EL) values are extracted from DWBA analysis in **1977Bo12**.

E(level) [†]	L [†]	$\beta_L R^\ddagger$	Comments
0			
2520	2	0.19	B(E2) $\uparrow$ =0.0034
2810	3	0.29	B(E3) $\uparrow$ =0.00086
3020	3	0.44	B(E3) $\uparrow$ =0.00186
3600	3	0.72	B(E3) $\uparrow$ =0.00517
3880	3	0.63	B(E3) $\uparrow$ =0.00336
3940	5		B(E5) $\uparrow$ =0.000078
			E(level),L: possible doublet with an L=2 level.
4090	(2)		E(level),L: possible doublet with an L=4 level.
4130	3	0.65	B(E3) $\uparrow$ =0.00331
4520	3+5	0.27	B(E3) $\uparrow$ =0.00064; B(E5) $\uparrow$ =0.000021
			$\beta_L R$: for L=3.
4740	2		B(E2) $\uparrow$ =0.0031
5170	3		B(E3) $\uparrow$ =0.00094
5270	3	0.30	L: from 1968Pe08 ; L=2 (1977Bo12). For L=2, B(E2)=0.0030.
5320	(3)		B(E3) $\uparrow$ =0.00036
5360	3	0.30	L: from 1968Pe08 .
5500	3		B(E3) $\uparrow$ =0.00073
5720	5		B(E5) $\uparrow$ =0.000063
5880	3		B(E3) $\uparrow$ =0.00032
5930			
6310	3	0.36	E(level),L: from 1968Pe08 .

[†] From **1977Bo12**, unless otherwise stated.

[‡] From **1968Pe08**, in units of fm.