^{42}Ca(p,$\alpha\gamma$)　　**1968Lo03**

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

1968Lo03: E=10.6-11.1 MeV proton beams were produced from the Oxford University tandem generator. Target was a layer of about 120 μg/cm^2 Ca metal (86% in ^{42}Ca) on a carbon backing of about 15 μg/cm^2. Alpha particles were detected with a surface-barrier silicon counter and γ rays were detected with two NaI(Tl) crystals. Measured Eα, Eγ, Iγ, $\gamma(\theta)$, $\alpha\gamma$-coin. Deduced levels, J, π, γ-ray branching ratios and mixing ratios. Comparisons with available data. Report data for 2530, 2820 and 3020 levels. 1968Lo03 also report γ-ray data for 3600 to 4740 level from ^{39}K(p,p'γ) and 13 proton groups from 2530-4740 in ^{39}K(p,p').

All data are from 1968Lo03.

^{39}K Levels

E(level)	J$^{\pi}$[†]	Comments
0	3/2$^+$	J$^{\pi}$: from Adopted Levels.
2530	1/2,3/2,5/2	J$^{\pi}$: 1/2$^+$ in Adopted Levels.
2820	7/2,(5/2)	J$^{\pi}$: 7/2$^-$ in Adopted Levels.
3020	3/2,5/2,9/2	J$^{\pi}$: 3/2$^-$ in Adopted Levels.

[†] From 1968Lo03 based on $\gamma(\theta)$, unless otherwise noted.

γ(^{39}K)

E$_i$(level)	J$_i^{\pi}$	E$_{\gamma}$	I$_{\gamma}$	E$_f$	J$_f^{\pi}$	Mult.	δ	Comments
2530	1/2,3/2,5/2	2530	100	0	3/2$^+$	D+Q		δ: −0.27 +7−8 for J=3/2 and +0.19 +6−5 for J=5/2, estimated by the evaluator from the plot of χ^2 versus arctg(δ) in Figure 3 of 1968Lo03; for J=1/2, the χ^2 distribution is independent of δ in that plot. δ values for this transition are not given in 1968Lo03. A$_2$=+0.04 *9*, A$_4$=+0.12 *13*.
2820	7/2,(5/2)	290[†]	<6	2530	1/2,3/2,5/2			
		2820	100	0	3/2$^+$	Q(+O)	+0.19 *10*	δ: for J=7/2. Other possible value of +4.3 +20−11 for J=7/2 is less likely from Weisskopf estimates; for J=5/2, δ=+0.58 +25−10. A$_2$=+0.59 *16*, A$_4$=+0.05 *21*.
3020	3/2,5/2,9/2	200[†]	<14	2820	7/2,(5/2)			
		490[†]	<6	2530	1/2,3/2,5/2			
		3020	100	0	3/2$^+$	D(+Q)	+0.03 *15*	δ: for J=3/2. Other possible value of +3.3 +23−12 for J=3/2 is rejected from Weisskopf estimates. For J=5/2, δ=+0.50 *15*; for J=9/2, δ(O/Q)<−6 or >+2.7. A$_2$=+0.47 *14*, A$_4$=+0.03 *20*.

[†] Placement of transition in the level scheme is uncertain.

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Level Scheme

Intensities: Relative photon branching from each level

– – – – – ► γ Decay (Uncertain)

3/2,5/2,9/2		3020
7/2,(5/2)		2820
1/2,3/2,5/2		2530

3020 D(+Q) 100
490 <6
200 <14
2820 Q(+O) 100
290 <6
2530 D+Q 100

| 3/2$^+$ | | 0 |

$^{39}_{19}K_{20}$