

${}^{39}\text{K}(\gamma, \gamma')$ 1988Mo13

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

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

1988Mo13: E=6.6, 8.5, 9.4 MeV bremsstrahlung electrons were produced from the MUSL-2 accelerator of the University of Illinois. Targets were 6.8 g/cm² K₂CO₃ and 3.1 g/cm² metallic K (93.26% in ³⁹K in natural potassium). Scattered γ rays were detected with a 55-cm³ Ge(Li) detector (FWHM \approx 12 keV at 7 MeV). Measured E γ , I γ . Deduced level, widths. Comparisons with available data.

Others:

1972Sh07: E(max)=14 MeV bremsstrahlung. Measured E γ , I γ ; no prominent peaks observed for ³⁹K.

2004Li47: E=low. Measured isotopically selective ionization of potassium molecules using shaped laser pulses.

All data are from **1988Mo13**, unless otherwise noted.

 ${}^{39}\text{K}$ Levels

E(level) [†]	J^π [‡]	Γ [#]	$g\Gamma_0^2/\Gamma$ (eV) [@]	Comments
0	3/2 ⁺			
2523 1	1/2 ⁺			
2815 1	7/2 ⁻			
3019 1	3/2 ⁻	0.030 eV 5	0.030 5	
3884 1	5/2 ⁻	0.063 eV 10	0.095 15	
3940 2	3/2 ⁺	0.020 eV 5	0.018 4	
4084 2	3/2 ⁻	0.020 eV 7	0.013 5	
4515 2	5/2 ⁺	0.016 eV 4	0.024 6	
4738 3	5/2 ⁺	0.017 eV 9	0.025 12	
5263 2	5/2 ⁺	0.35 eV 3	0.52 5	
5321 2	3/2 ⁺	0.33 eV 3	0.33 3	
5600 2	5/2 ⁺	0.23 eV 2	0.35 3	
5791 2	(5/2,7/2) ⁺		0.140 20	
5941 2	5/2 ⁺	0.173 eV 20	0.26 3	
6332 2	3/2 ⁺	2.56 eV 20	2.56 20	
6409 2	(1/2 to 7/2 ⁺)		0.28 6	
6458 2	(1/2,3/2,5/2) ⁺		0.14 3	
6499 2	(3/2,5/2) ⁺		0.11 3	
6525 2	(1/2 to 7/2 ⁺)		0.27 5	
6550? 3				
6740 3	(3/2 ⁺ ,5/2 ⁺)		0.19 4	
6818 3	3/2 ⁺ ,5/2 ⁺		0.14 4	
6915 2	3/2 ⁺ ,5/2 ⁺		0.33 9	
7631? 3	(3/2 ⁻ ,5/2 ⁺)		0.15 6	$\Gamma_p/\Gamma_0=0.49$, $g\Gamma_0=0.36$ eV, $g\Gamma=0.88$ eV.
7978? 3	(3/2 ⁻ ,5/2)		0.22 7	$\Gamma_p/\Gamma_0=0.31$, $g\Gamma_0=0.51$ eV, $g\Gamma=1.18$ eV.
8253 2	(1/2 to 7/2 ⁺)		0.90 22	$\Gamma_p/\Gamma_0=0.79$, $g\Gamma_0=1.61$ eV, $g\Gamma=2.89$ eV.
8390 2	(1/2 to 7/2 ⁺)		0.28 7	$\Gamma_p/\Gamma_0=0.59$, $g\Gamma_0=0.45$ eV, $g\Gamma=0.71$ eV.

[†] From E γ .

[‡] From Adopted Levels.

[#] $\Gamma_0/\Gamma_\gamma=1$ (100% branching to g.s.) assumed if not specified otherwise.

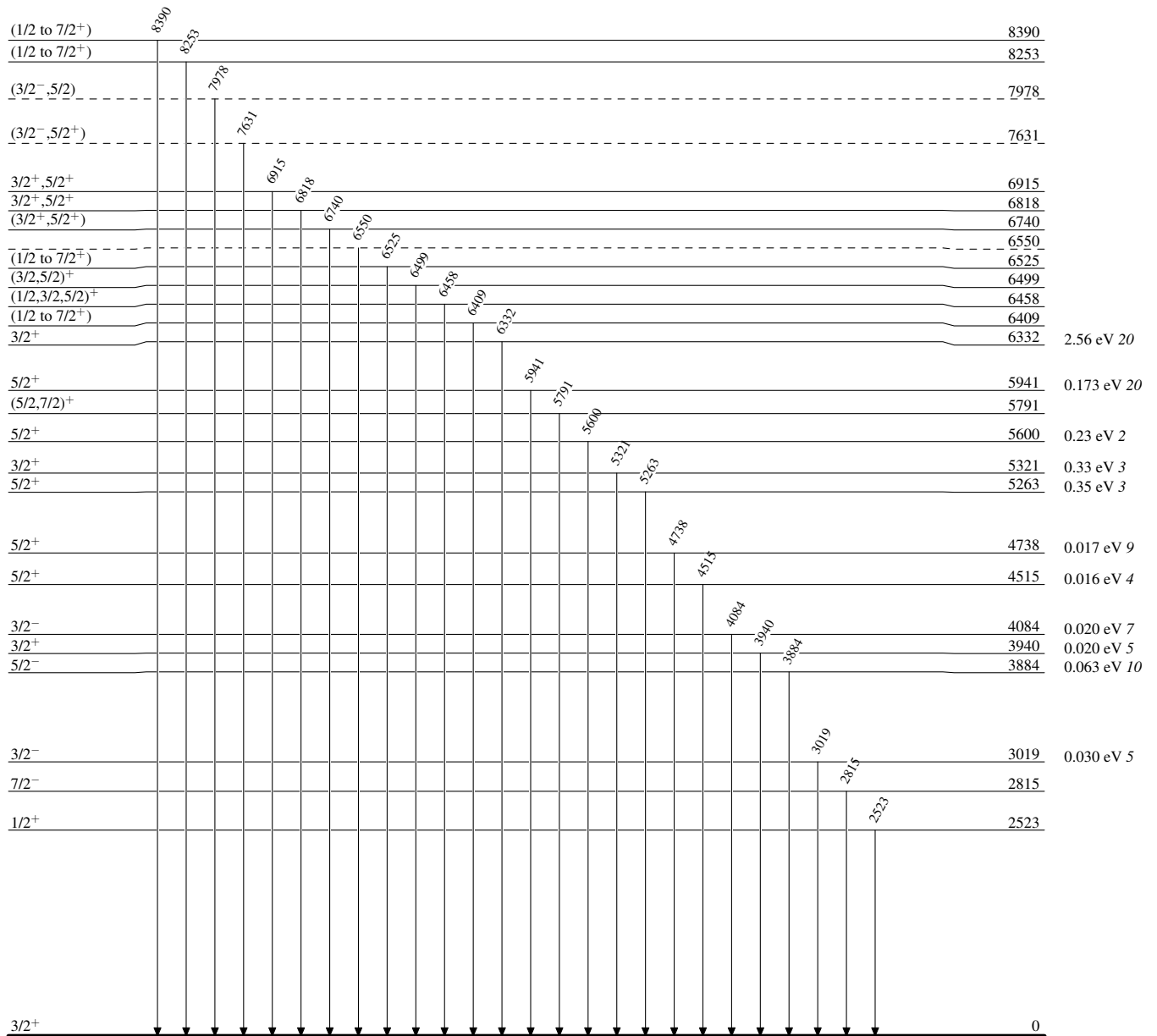
[@] $g=(2J+1)/(2J_0+1)$, J=spin of excited state, J₀=spin of g.s.

${}^{39}\text{K}(\gamma, \gamma')$ **1988Mo13** (continued) $\gamma({}^{39}\text{K})$

E_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Comments
2523 1	2523	1/2 ⁺	0	3/2 ⁺	
2815 1	2815	7/2 ⁻	0	3/2 ⁺	
3019 1	3019	3/2 ⁻	0	3/2 ⁺	
3884 1	3884	5/2 ⁻	0	3/2 ⁺	
3940 2	3940	3/2 ⁺	0	3/2 ⁺	branching to g.s.=91% 1 is used.
4084 2	4084	3/2 ⁻	0	3/2 ⁺	branching to g.s.=65% 3 is used.
4515 2	4515	5/2 ⁺	0	3/2 ⁺	
4738 3	4738	5/2 ⁺	0	3/2 ⁺	
5263 2	5263	5/2 ⁺	0	3/2 ⁺	
5321 2	5321	3/2 ⁺	0	3/2 ⁺	
5600 2	5600	5/2 ⁺	0	3/2 ⁺	
5791 2	5791	(5/2, 7/2) ⁺	0	3/2 ⁺	
5941 2	5941	5/2 ⁺	0	3/2 ⁺	
6332 2	6332	3/2 ⁺	0	3/2 ⁺	
6409 2	6409	(1/2 to 7/2 ⁺)	0	3/2 ⁺	
6458 2	6458	(1/2, 3/2, 5/2) ⁺	0	3/2 ⁺	
6499 2	6499	(3/2, 5/2) ⁺	0	3/2 ⁺	
6525 2	6525	(1/2 to 7/2 ⁺)	0	3/2 ⁺	
6550 3	6550?		0	3/2 ⁺	E_γ : weak and uncertain transition, but cannot be associated with the 6546, 7/2 ⁻ level, which deexcites 100% to the 2814 level (1988Mo13).
6740 3	6740	(3/2 ⁺ , 5/2 ⁺)	0	3/2 ⁺	
6818 3	6818	3/2 ⁺ , 5/2 ⁺	0	3/2 ⁺	
6915 2	6915	3/2 ⁺ , 5/2 ⁺	0	3/2 ⁺	E_γ : coincides with 6916 γ from ${}^{16}\text{O}(\gamma, \gamma')$ (1988Mo13).
7631 3	7631?	(3/2 ⁻ , 5/2 ⁺)	0	3/2 ⁺	branching to g.s.=52% is used.
7978 3	7978?	(3/2 ⁻ , 5/2)	0	3/2 ⁺	branching to g.s.=50% is used.
8253 2	8253	(1/2 to 7/2 ⁺)	0	3/2 ⁺	
8390 2	8390	(1/2 to 7/2 ⁺)	0	3/2 ⁺	

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Level Scheme

 $^{39}\text{K}_{20}$