^{39}K(n,γ),(n,n):resonances 2006MuZX,1984Ma40,1973Si32

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J^π(^{39}K g.s.)=3/2$^+$.

2006MuZX: Compilation of thermal neutron induced σ and resonance parameter data for nuclei of Z=1-100.

1984Ma40: E=1-152 keV neutron beams were provided by the Oak Ridge Electron Linear Accelerator (ORELA). Target was a natural potassium sample (93.26% in ^{39}K). Neutron energies were measured using time-of-flight with a 40-m flight path. Capture γ rays were detected by a pair of nonhydrogenous liquid scintillators. Measured yields. Deduced resonance energies, J, widths. A total of 64 resonances reported up to E_n(lab)=152.0 keV.

1973Si32 (also 1971SiYI): E=1-200 keV. Natural target. A total 35 resonances (8 tentative) assigned to ^{40}K, up to E_n(lab)=193.1 keV. Deduced resonance energies, J, L(n), widths.

Others:

2008GuZQ: E=10-64 keV. Measured Eγ, Iγ. Deduced σ.

1960La05: analysis of resonance data.

1958Go01: total neutron cross sections in keV region.

^{40}K Levels

All resonance parameters including resonance neutron energies, J^π, L, gΓ_n and Γ_γ are directly adopted from the compilation in 2006MuZX and are based on data from 1984Ma40 and 1973Si32.

E(level)[†]	J^π[‡]	g$\Gamma_n\Gamma_\gamma/\Gamma$[#]	L	E_n(lab) (keV)	Comments
7800.70 *6*	(0 to 3)$^-$	0.0075 eV *5*	1	1.108 *1*	2gΓ_n=0.015 eV *1*.
7802.82 *6*	(0 to 3)$^-$	0.0653 eV *2*	1	3.281 *3*	2gΓ_n=0.1000 eV *15*.
7808.77 *6*	1$^+$	0.172 eV *3*	0	9.386 *9*	2gΓ_n=54 eV *6*, Γ_γ=0.463 eV *8*.
7811.47 *6*		0.0412 eV *7*		12.159 *13*	
7811.93 *6*	3$^-$	0.2577 eV *15*	1	12.626 *13*	2gΓ_n=1.3 eV *3*, Γ_γ=0.488 eV *5*.
7813.56 *6*	(2)$^-$	0.1176 eV *14*	1	14.302 *21*	2gΓ_n=0.81 eV *17*, Γ_γ=0.266 eV *5*.
7815.18 *6*	2$^-$	0.1496 eV *19*	1	15.958 *24*	2gΓ_n=1.69 eV *30*, Γ_γ=0.291 eV *4*.
7815.91 *6*	(3$^-$)	0.143 eV *2*	(1)	16.715 *14*	2gΓ_n=0.320 eV *1*, Γ_γ=0.30 EV.
7823.96 *7*		0.1145 eV *20*		24.97 *3*	
7824.53 *7*	2$^+$	0.246 eV *4*	0	25.55 *3*	2gΓ_n=118.4 eV *34*, Γ_γ=0.396 eV *7*.
7827.26 *7*		0.2290 eV *15*		28.36 *3*	
7830.98 *7*	3$^-$	0.535 eV *8*	1	32.17 *3*	2gΓ_n=3.6 eV, Γ_γ=0.869 eV *19*.
7832.10 *7*	2$^-$	0.184 eV *8*	1	33.32 *3*	2gΓ_n=16.2 eV *11*, Γ_γ=0.301 eV *14*.
7836.23 *8*	(2$^-$)	0.207 eV *6*	(1)	37.56 *6*	2gΓ_n=5.8 eV, Γ_γ=0.343 eV *13*.
7836.33 *8*	(2$^-$)	0.194 eV *6*	(1)	37.66 *6*	2gΓ_n=5.8 eV, Γ_γ=0.322 eV *13*.
7841.26 *7*	2$^+$	0.63 eV *3*	0	42.72 *4*	2gΓ_n=674 eV *32*, Γ_γ=0.973 eV *4*.
7843.62 *8*		0.115 eV *5*		45.14 *5*	
7844.45 *8*	2$^-$	0.386 eV *10*	1	45.99 *5*	2gΓ_n=52 eV *2*, Γ_γ=0.626 eV *17*.
7850.42 *8*	(2)$^-$	0.220 eV *8*	1	52.12 *5*	2gΓ_n=15.9 eV *43*, Γ_γ=0.362 eV *13*.
7852.62 *8*		0.129 eV *6*		54.37 *6*	
7852.79 *8*	2$^-$	0.261 eV *9*	1	54.55 *6*	2gΓ_n=20.4 eV *54*, Γ_γ=0.429 eV *15*.
7853.39 *8*		0.134 eV *7*		55.16 *6*	
7854.04 *8*		0.107 eV *7*		55.83 *6*	
7855.97 *8*	1$^+$	0.55 eV *5*	0	57.81 *6*	2gΓ_n=804 eV *80*, Γ_γ=1.47 eV *13*.
7856.94 *8*		0.144 eV *8*		58.80 *6*	
7857.99 *8*	1$^-$	0.076 eV *8*	1	59.88 *6*	2gΓ_n=62 eV *10*, Γ_γ=0.203 eV *21*.
7860.29 *8*		0.185 eV *8*		62.24 *6*	
7866.25 *9*	1	0.67 eV *8*	(0)	68.35 *7*	2gΓ_n=1454.00 eV *18*, Γ_γ=1.78 eV *21*.
7866.80 *9*		0.184 eV *12*		68.92 *7*	
7873.43 *10*		0.053 eV *7*		75.72 *8*	
7878.23 *10*		0.279 eV *12*		80.64 *8*	
7878.74 *10*		0.175 eV *10*		81.17 *8*	

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^{39}K(n,γ),(n,n):resonances 2006MuZX,1984Ma40,1973Si32 (continued)

^{40}K Levels (continued)

E(level)[†]	Jπ[‡]	gΓnΓγ/Γ[#]	L	En(lab) (keV)	Comments
7882.37 *10*		0.095 eV *9*		84.89 *8*	
7885.12 *11*	1−	0.11 eV *3*	1	87.71 *9*	2gΓn=350 eV *40*, Γγ=0.283 eV *43*.
7890.06 *11*		0.210 eV *17*	1	92.78 *9*	2gΓn=36 eV *9*.
7890.36 *11*		0.254 eV *17*	1	93.09 *9*	
7893.94 *12*		0.278 eV *24*		96.76 *10*	2gΓn=225 eV *20*.
7894.47 *12*		0.276 eV *24*		97.31 *10*	2gΓn=225 eV *20*.
7896.32 *12*	2−	0.149 eV *19*	1	99.20 *10*	2gΓn=142 eV *32*, Γγ=0.239 eV *30*.
7899.05 *21*	2−	0.221 eV *19*	1	102.0 *2*	2gΓn=45 eV *13*, Γγ=0.358 eV *31*.
7900.50 *21*		0.215 eV *19*		103.49 *20*	
7901.41 *21*		0.299 eV *20*		104.42 *20*	
7903.13 *21*		0.115 eV *17*		106.19 *20*	
7905.46 *21*		0.180 eV *23*		108.58 *20*	
7905.58 *21*	1+	0.34 eV *9*	0	108.7 *2*	2gΓn=1500 eV *320*, Γγ=0.96 eV *24*.
7906.44 *21*		0.159 eV *21*		109.59 *20*	
7906.81 *21*		0.133 eV *18*		109.96 *20*	
7911.78 *25*		0.125 eV *15*		115.06 *25*	
7914.07 *25*		0.49 eV *9*		117.41 *25*	
7915.41 *25*		0.128 eV *15*		118.79 *25*	2gΓn=77 eV *13*.
7916.7 *3*		0.198 eV *18*		120.1 *3*	
7919.3 *3*	(2)−	0.308 eV *21*	1	122.8 *3*	2gΓn=34 eV *9*, Γγ=0.503 eV *36*.
7922.6 *3*	(2)	0.40 eV *3*		126.2 *3*	2gΓn=53.0 eV *56*, Γγ=0.654 eV *61*.
7923.5 *3*		0.268 eV *20*		127.1 *3*	
7924.3 *3*		0.04 eV *2*		127.9 *3*	
7925.7 *3*		0.219 eV *20*		129.4 *3*	
7931.5 *3*		0.25 eV *3*		135.3 *3*	
7932.2 *3*		0.37 eV *4*		136.0 *3*	
7932.8 *3*		0.66 eV *4*		136.6 *3*	
7940.1 *3*	2−	1.45 eV *6*	1	144.1 *3*	2gΓn=215 eV *43*.
7941.0 *3*		0.24 eV *3*		145.1 *3*	
7943.1 *3*		0.37 eV *4*		147.2 *3*	
7944.0 *3*		0.33 eV *3*		148.1 *3*	
7947.8 *4*		0.25 eV *4*		152.0 *4*	
7949.6 *4*	(3−)		(1)	153.9 *4*	2gΓn=1600 eV *210*.
7957.8 *4*			(1)	162.3 *4*	2gΓn=940 eV *110*.
7972.7 *4*	1		(1)	177.6 *4*	2gΓn=840 eV *110*.
7983.1 *5*			1	188.3 *5*	2gΓn=210 eV *43*.
7987.8 *5*	1+		0	193.1 *5*	2gΓn=750 eV *150*.

[†] From Ec.m.+S(n) where S(n)=7799.62 *6* (2012Wa38) and Ec.m. deduced from En(lab) in 2006MuZX.
[‡] L=0 gives 1+ or 2+ and L=1 gives 0−,1−,2−,3−, with further restriction from analysis of resonance data.
[#] g=(2J+1)/8.