^{41}K(^{3}He,d) 1973Ja17,1971Pe04,1970Fo04

History

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

Target ^{41}K g.s. $J^{\pi}=3/2^{+}$.

1973Ja17: E=23 MeV ^{3}He beam was produced at the Nuclear Structure Research Laboratory at the University of Rochester. Targets of KI (99% enriched in ^{41}K) evaporated onto carbon backings. Deuterons were momentum analyzed with an Enge broad-range spectrograph and detected in nuclear emulsions, FWHM=9-14 keV. Measured $\sigma(\theta)$. Deduced levels, J^{π}, L-transfer, spectroscopic factors from DWBA analysis.

1971Pe04: E=10 MeV ^{3}He beam was produced from the CN Van de Graaff accelerator of Legnaro, Padova. Targets of KI (natural and 99.16% enriched in ^{41}K) evaporated onto carbon backings. Reaction products were detected with a ΔE-E telescope of surface-barrier detectors. Measured $\sigma(\theta)$. Deduced levels, J^{π}, L-transfer, spectroscopic factors from DWBA analysis.

1970Fo04 (also 1968Fo05): E=11.0 MeV beam was produced from the Liverpool University Tandem accelerator. Target of 300 μg/cm^2 KI (95.35% enriched in ^{41}K) evaporated onto a thin carbon backing. Deuterons were measured with a magnetic spectrograph (14′ to 40′) and a surface barrier detector telescope (35′ to 85′). Measured $\sigma(\theta)$. Deduced levels, J^{π}, L-tranfer, spectroscopic factors from DWBA analysis.

Other: 1968Ly02.

^{42}Ca Levels

Following J^{π} values are implied by L-transfers: 0^{-} to 3^{-} for L=1; 0^{+} to 4^{+} for L=2; 1^{-} to 5^{-} for L=3; 1^{-}, 2^{-}, 3^{-} for L=1+3.
Spectroscopic factor C^2S: $N*g*C^2S=\sigma(\theta)^{exp}/\sigma(\theta)^{DWBA}$, where N is the normalization factor and $g=(2J_f+1)/(2J_i+1)$.

E(level)[†]	L	$(2J_f+1)C^2S$[‡]	Comments
0 *5*	2	2.22 *21*	$(2J_f+1)C^2S$: 2.90 (1970Fo04), 2.50 (1971Pe04).
1522 *5*	2	0.25 *6*	$(2J_f+1)C^2S$: <0.20 (1971Pe04).
1832 *5*	2	0.39 *7*	$(2J_f+1)C^2S$: <0.39 (1971Pe04).
2418 *5*	2	0.37 *6*	$(2J_f+1)C^2S$: <0.24 (1971Pe04).
3297?			Very weakly excited.
3444 *5*	1+3[#]	0.06,1.06	$(2J_f+1)C^2S$: 2.11 (1970Fo04), 2.31 (1971Pe04) for L=3.
3880 *5*	1(+3)	0.02,0.06	
3949 *5*	3	2.8 *3*	$(2J_f+1)C^2S$: 4.17 (1970Fo04), 4.59 (1971Pe04).
4044 *5*	1+3	0.03,0.27	
4093 *5*	3	3.0 *3*	$(2J_f+1)C^2S$: 5.91 (1970Fo04), 6.05 (1971Pe04).
4116 *5*	(1)	0.18	
4225 *5*	(1)	0.02	
4420 *5*	1+3[#]	0.03,0.71	$(2J_f+1)C^2S$: 1.78 (1970Fo04), 1.40 (1971Pe04) for L=3.
4685 *5*	1(+3)[@]	0.14,0.11	$(2J_f+1)C^2S$: 0.43 (1970Fo04), 0.42 (1971Pe04) for L=1.
4710 *5*			
4896 *5*	1+3[@]	0.18,0.40	$(2J_f+1)C^2S$: 0.61 (1970Fo04), 0.48 (1971Pe04) for L=1.
4944 *5*	1(+3)	0.06,0.07	
4969 *5*	1+3[@]	0.09,0.23	$(2J_f+1)C^2S$: 0.12 (1970Fo04) for L=1.
5075 *5*	1(+3)[@]	0.26,0.32	$(2J_f+1)C^2S$: 0.60 (1970Fo04), 0.48 (1971Pe04) for L=1.
5156 *5*	1+3[@]	0.07,0.12	$(2J_f+1)C^2S$: 0.17 (1970Fo04) for L=1.
5205 *5*			
5322 *5*	3	0.32 *5*	
5389 *5*	1(+3)[@]	0.10,0.12	$(2J_f+1)C^2S$: 0.35 (1971Pe04) for L=1.
5410 *5*	1+3[@]	0.06,0.15	$(2J_f+1)C^2S$: 0.33 (1970Fo04) for L=1.
5466 *5*	3	0.34 *7*	
5488 *5*	1+3[@]	0.11,0.49	$(2J_f+1)C^2S$: 0.78 (1971Pe04) for L=1.
5509 *5*	1+3[@]	0.07,0.37	$(2J_f+1)C^2S$: 0.65 (1970Fo04) for L=1.

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^{41}K(^{3}He,d) 1973Ja17,1971Pe04,1970Fo04 (continued)

^{42}Ca Levels (continued)

E(level)[†]	L	$(2J_f+1)C^2S$[‡]	Comments
5587 *5*	1+3	0.06,0.27	
5622 *5*	1(+3)[@]	0.16,0.16	$(2J_f+1)C^2S$: 0.50 (1970Fo04), 0.44 (1971Pe04) for L=1.
5665 *5*	1+3[@]	0.07,0.30	$(2J_f+1)C^2S$: 0.29 (1970Fo04) for L=1.
5720 *5*	(2,1+3)		
5795 *5*	1	0.12 *1*	$(2J_f+1)C^2S$: 0.36 (1970Fo04,1971Pe04).
5826 *5*	1	0.04 *1*	
5877 *5*	(2,1+3)		
5918 *5*	(1+3)	0.02,0.07	
5975 *5*	1	0.02 *1*	
6023 *5*	2	0.27 *4*	
6039 *5*	(1+3)	0.03,0.13	
6100 *5*	(1+3)	0.01,0.24	
6158 *5*	1+3	0.07,0.23	
6191 *5*			
6242 *5*	(1+3)	0.05,0.19	

[†] From 1973Ja17. Values from 1971Pe04 and 1970Fo04 are in general agreement, but less accurate.
[‡] From 1973Ja17. Values quoted by 1978En02 are adjusted upwards by≈37%, based on standard normalization factors in 1977En02.
[#] Pure L=3 in 1970Fo04 and/or 1971Pe04.
[@] Pure L=1 in 1970Fo04 and/or 1971Pe04.