^{41}K(α,d) 1977Na30

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen[#]	NDS 126, 1 (2015)	31-Mar-2015

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

1977Na30 (also 1975Na18): E=40 MeV α beam was produced from the MSU Cyclotron. Enriched ^{41}K target (98%) on a thin carbon foil, thickness of ≈100 μg/cm^2. Deuteron particles were analyzed with a split-pole magnetic spectrograph (FWHM=40 keV) and detected by a proportional-counter in the focal plane. Measured $\sigma(E_d,\theta)$ from 6° to 55°. Deduced levels, J, π, L from DWBA analysis. Absolute differential cross sections are accurate to 30%.

For transferred proton-neutron pair, proposed configurations are: $(d_{3/2}p_{3/2})$ for L=3, $[(f_{7/2})^2_5+(f_{7/2}p_{3/2})_5]$ for L=4, $(d_{3/2}f_{7/2})$ for L=5, $[(f_{7/2})^2_5+(f_{7/2}p_{3/2})_5+(f_{7/2})^2_7]$ for L=4+6, and $(f^2_{7/2\ 7})$ for L=6.

^{43}Ca Levels

E(level)	J^π[#]	L	dσ/dΩ (μb/sr)[‡]	Comments
0	$7/2^-$[@]	5	150	
2045 *10*	$3/2^-$[@]	3	65	
2850 *10*	$(11/2^+,13/2^+)$	4+6	23, 20	
2951 *10*		6	76	
3072 *10*	$(11/2^+,13/2^+)$	4+6	10, 18	
3196[†] *10*				
3278 *10*	$(11/2^+$ to $17/2^+)$	6	24	
3372 *10*		6	79	
3500 *10*	$(11/2^+,13/2^+)$	4+6	130, 110	
3838 *10*	$(7/2^+$ to $13/2^+)$	4	60	
3944 *10*		6	135	
4134 *10*	$(11/2^+,13/2^+)$	6	78	
4191 *10*	$(11/2^+$ to $17/2^+)$	6	220	
4291 *10*	$(11/2^+,13/2^+)$	4+6	32, 21	
4357 *10*	$(11/2^+,13/2^+)$	4+6	58, 25	
4462 *10*	$(11/2^+,13/2^+)$	4+(6)	33, 6	
4591 *10*		6	510	
4701 *10*				
4888 *10*	$(11/2^+$ to $17/2^+)$	6	105	
5189 *10*	$(11/2^+,13/2^+)$	4+6	20,35	
5246 *10*	$(11/2^+,13/2^+)$	4+6	110, 28	
5351 *10*	$(11/2^+,13/2^+)$	4+6	78, 34	
5696 *10*	$(11/2^+,13/2^+)$	4+6	42, 37	
6087 *10*				Additional information 1.
6173 *10*				

[†] Very weakly populated.

[‡] At 10°.

[#] Above 2045, the assignments are from 1977Na30, based on L(α,d) from $3/2^+$. For transferred proton-neutron pair, proposed configurations are: $(d_{3/2}p_{3/2})$ for L=3, $[(f_{7/2})^2_5+(f_{7/2}p_{3/2})_5]$ for L=4, $(d_{3/2}f_{7/2})$ for L=5, $[(f_{7/2})^2_5+(f_{7/2}p_{3/2})_5+(f_{7/2})^2_7]$ for L=4+6, and $(f_{7/2})^2_7$ for L=6.

[@] From Adopted Levels.