^{48}Ca(^{3}He,α),(pol ^{3}He,α) 1985Ha08,1978Fo34

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	T. W. Burrows	NDS 108, 923 (2007)	20-Feb-2007

1978Fo34: E=25 MeV. Measured σ(θ=5°−40°, 5° steps); magnetic spectrometer, focal-plane position-sensitive Si detectors.
1985Ha08: E=33.1 MeV. Measured σ(θ) and A(θ) (θ(C.M.)≈10°−110°); ΔE-E telescopes. Beam polarization=50-60%.
All data are from 1978Fo34, except As noted. Both groups performed DWBA and CRC analyses. Others: see 1995Bu05.

^{47}Ca Levels

Σ C^{2}S>>3.55 for 2d3/2 hole states. Therefore, a large number of the L=2 states above 4.92 MeV may be identified as components of the 2d5/2 hole state which seems to be highly fragmented.

E(level)	Jπ[†]	L[‡]	C^{2}S[‡]	Comments
0.0	7/2−	3	5.42,6.94	Jπ: from characteristic shape of A(θ) (1985Ha08). Main component of 1f7/2. Using the isospin-dependent potential, C^{2}S=87% of shell-model sum rule.
2014 *8*	3/2−	(1)	0.03,0.04	
2569 *8*	3/2+	2	1.74,2.23	Main component of 2d3/2(T<). Using the isospin-dependent potential, C^{2}S=63% of shell-model sum rule.
2591 *8*	1/2+	0	1.08,1.38	Main component of 2s1/2(T<). Using the isospin-dependent potential, C^{2}S=78% of shell-model sum rule. For the≈2.6−MeV doublet, A(θ) indicates that the 1/2+ member is weakly excited (1985Ha08).
2846 *8*				L: non-pickup character of σ(θ) discrepant with results from other pickup and stripping reactions.
3267 *8*	7/2−	(3)[@]	0.01,0.02	
3296 *8*	7/2−	(3)[@]	0.03,0.04	
3423 *8*	7/2−	(3)[@]	0.10,0.13	
3566 *8*	9/2−[&]	[#]		
3844 *8*	7/2+,11/2−	[#]		Jπ: 7/2+ from CRC analysis; assumed ((^{48}Ca 3−) (ν 1f7/2)$^{-1}$). 11/2− from empirical arguments.
3877 *8*	5/2−[&]	[#]		
3933 *8*	7/2−	(3)[@]	0.06,0.08	
3997 *8*	13/2	[#]		Jπ: From CRC analysis. 13/2− if ((^{48}Ca 3−) (ν 1f7/2)$^{-1}$); 13/2+ if ((^{48}Ca 4+) (ν 1f7/2)$^{-1}$).
4050 *8*	1/2−	(1)	0.01,0.01	
4102 *8*	3/2+	(2)	0.03,0.05	
4205 *8*	9/2+	4	0.01,0.01	
4386 *8*	7/2+[a]	[#]		
4412 *8*		[#]		
4455 *8*		[#]		
4531 *8*	3/2+[a]	[#]		
4584 *8*	5/2+[a]	[#]		
4611 *8*	5/2+[a]	[#]		
4714 *8*	9/2−[&]	[#]		
4785 *8*	5/2−	(3)[@]	0.01,0.01	
4810 *8*		[#]		
4880 *8*	13/2−	[#]		Jπ: From CRC analysis. Assumed ((^{48}Ca 4+) (ν 1f7/2)$^{-1}$).
4918 *8*	9/2−[&]	[#]		
4960 *8*	5/2+	2	0.02,0.03	

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^{48}Ca(^{3}He,α),(pol ^{3}He,α) 1985Ha08,1978Fo34 (continued)

^{47}Ca Levels (continued)

E(level)	J$^{\pi}$ [†]	L [‡]	C^{2}S [‡]
4980 *8*	5/2+	2	0.14,0.20
5053 *8*	7/2+ [a]	[#]	
5189 *8*		[#]	
5245 *8*	5/2+	2	0.01,0.01
5293 *8*	5/2+	2	0.08,0.12
5448 *8*	5/2+	2	0.14,0.19
5550 *8*		[#]	
5588 *8*		[#]	
5641 *8*		[#]	
5785 *8*	1/2+	0	0.04,0.06 [b]
5875 *8*	5/2+	2	0.02,0.03
5916 *8*		[#]	
5963 *8*		(3) [@]	0.01,0.01
6065 *15*	5/2+	2	0.20,0.28
6127 *15*	5/2+	2	0.02,0.03
6158 *15*			
6254 *15*	5/2+	2	0.12,0.17
6291 *15*	5/2+	2	0.05,0.07
6467 *15*	5/2+	2	0.08,0.12
6524 *15*	5/2+	2	0.03,0.04
6610 *15*	5/2+	2	0.02,0.03
6635 *15*	5/2+	2	0.10,0.14
6670 *15*	5/2+	2	0.05,0.07
6719 *15*	7/2−	(3) [@]	0.01,0.01
6760 *15*	7/2−	(3) [@]	0.02,0.02
6883 *15*	7/2−	(3) [@]	0.03,0.04
6920 *15*	5/2+	(2)	0.01,0.01
7024 *15*			
7063 *15*	7/2−	(3) [@]	0.03,0.04
7117 *15*		[#]	
7151 *15*	5/2+	2	0.10,0.15
7305 *15*	5/2+	2	0.07,0.09
7415 *15*	5/2+	2	0.08,0.10
7499 *15*	5/2+	2	0.11,0.15
7545 *15*		[#]	
7642 *15*			
7679 *15*			
7736 *15*	5/2+	2	0.03,0.05
7785 *15*			
7842 *15*		[#]	
7893 [c] *15*	1/2+	0	0.03,0.04 [b]
7893 [c] *15*	5/2+	2	0.01,0.02
7954 *15*	5/2+	2	0.03,0.04
7995 *15*		[#]	
8021 *15*	1/2+	0	0.02,0.03 [b]
8121 *15*	1/2+	0	0.02,0.03 [b]
8264 *15*		(3) [@]	
8301 *15*	5/2+	2	0.03,0.04
8352 *15*	5/2+	2	0.02,0.04
8380 *15*	1/2+	0	0.04,0.05 [b]
8447 *15*			

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^{48}Ca(^{3}He,α),(pol ^{3}He,α) 1985Ha08,1978Fo34 (continued)

^{47}Ca Levels (continued)

E(level)	J$^{\pi}$†	L‡	C^{2}S‡	Comments
8595[c] *15*	1/2$^+$	0	0.01,0.01[b]	
8595[c] *15*	5/2$^+$	2	0.01,0.02	
8669[c] *15*	1/2$^+$	0	0.01,0.01[b]	
8669[c] *15*	5/2$^+$	2	0.03,0.04	
8748[c] *15*	1/2$^+$	0	0.01,0.01[b]	
8748[c] *15*	5/2$^+$	2	0.02,0.03	
8902 *15*				
8995 *15*				
9124 *15*	1/2$^+$	0	0.02,0.03[b]	
9230 *15*	5/2$^+$	2	0.03,0.04	
9271 *15*	7/2$^-$	(3)[@]	0.02,0.03	
9341 *15*	1/2$^+$	0	0.02,0.02[b]	
9451 *15*	1/2$^+$	0	0.02,0.03[b]	
9545 *15*	5/2$^+$	2	0.05,0.07	
9612 *15*				
9678 *15*	5/2$^+$	2	0.04,0.05	
9720[c] *15*	1/2$^+$	0	0.01,0.01[b]	
9720[c] *15*	5/2$^+$	2	0.01,0.01	
9776[c] *15*	1/2$^+$	0	0.01,0.01[b]	
9776[c] *15*	5/2$^+$	2	0.01,0.02	
9830 *15*				
9924 *15*				
9978 *15*	5/2$^+$	2	0.06,0.08	
10056 *15*	5/2$^+$	2	0.04,0.06	
10182 *15*	5/2$^+$	2	0.06,0.08	
10238 *15*				
10302 *15*	5/2$^+$	2	0.09,0.13	
10358 *15*	5/2$^+$	2	0.09,0.12	
10431 *15*	5/2$^+$	2	0.08,0.11	
10485 *15*	5/2$^+$	2	0.07,0.11	
10581 *15*	5/2$^+$	2	0.07,0.11	
10640 *15*	5/2$^+$	2	0.06,0.09	
10680 *15*	5/2$^+$	2	0.06,0.09	
10765[c] *15*	1/2$^+$	0	0.07,0.10[b]	
11003 *15*	5/2$^+$	2	0.11,0.16	
11187 *15*				
11580 *15*				
11826 *15*				
12745 *15*	1/2$^+$	0	0.26,0.18	T=9/2 IAR(1/2$^+$, g.s., ^{47}K).
13103 *15*	3/2$^+$	2	0.74,0.46	T=9/2 IAR(3/2$^+$, ^{360,} ^{47}K

† Assumed for DWBA analysis, except as noted.

‡ From DWBA analysis. The first C^{2}S value is based on the separation-energy method; the second, on an isospin-dependent potential.

$\sigma(\theta)$ exhibits a non-pickup character.

@ Agreement between theory and experiment is generally bad for L=3 transitions.

& From CRC analysis. Assumed ((^{48}Ca 2$^+$)(ν 1f7/2)$^{-1}$).

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^{48}Ca(^{3}He,α),(pol ^{3}He,α) 1985Ha08,1978Fo34 (continued)

^{47}Ca Levels (continued)

[a] From CRC analysis. Assumed ((^{48}Ca 3^{-})(ν 1f7/2)$^{-1}$).
[b] These states account for≈25% of the 2s1/2(T<) strength.
[c] Doublet.