^{48}Ca(t,p),(pol t,p) 1983DaZV,1967Bj06

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 157, 1 (2019)	15-Apr-2019

1967Bj06 (also 1966Hi01): E(t)=11.97 MeV beam from the Aldermaston Tandem generator. Enriched target. Measured $\sigma(\theta)$ with a magnetic spectrograph (FWHM=15-25 keV). Deduced levels, J, π, L-transfers. See 1968Br01 for analysis of these data.

1983DaZV,1983DaZZ: E=17 MeV. Polarized t. Measured $\sigma(\theta)$, analyzing powers; Q3D magnetic spectrometer. DWBA.

1989WaZO: E=37.3 MeV at Daresbury Lab. Measured $\sigma(\theta)$ from ≈30° to 65° in c.m. system. Heavily oxidized target. Deduced direct (simultaneous) and sequential (two-step) contributions; DWBA and CCBA, respectively. Spectroscopic factor of 1 was assumed for the first three states with configuration=$2p^2_{3/2}$, and for the 3^- state with configuration=$(2p_{3/2})(1g_{9/2})$. CCBA calculations for the ^{50}Ca g.s. under-predict the data, but coherent addition of the direct reaction with a normalization, N=1000 MeV-fm$^{3/2}$, used for ^{16}O(t,p) yielded a reasonable fit. However, application of the same N to the excited states of ^{18}O and ^{50}Ca overpredicted the data. Only three excited states reported at 1.03, 3.00 and 3.99 MeV.

Others:

1966Wi11: E(t)=7.5 MeV. Measured proton spectra, $\sigma(\theta)$ at Los Alamos, FWHM=50 keV. Levels at 0, 1025 and 2999 keV, deduced L values.

1966Ve06: shell-model calculations, and explanation of (p,t) results in 1966Hi01.

1967Gl08: discussion of results for 0^+ states in 1966Hi01.

^{50}Ca Levels

E(level)[†]	Jπ	L[‡]	dσ/dΩ[c]	Comments
0		0[a]	100	L=0 (1966Wi11).
1029 *15*		2[a]	42	E=1025 *7*, L=2 (1966Wi11).
2999 *15*		2[a]	36	L: other: L=4 in 1989WaZO. E=2999 *10*, L=2 (1966Wi11).
3519 *15*			2	L=0 suggested in 1968Br01, 1967Gl08 and 1966Ve06 in theoretical analyses, by $J^\pi=(1,2^+)$ for a 3531 level in the Adopted Levels.
3993 *15*		3[a]	21	Jπ: $J^\pi=2^+$ excluded by 1983DaZZ. Note that L(t,p)=3 disagrees with L(α,2p)=4. 1968Br01 state that L=4 or 5 are inconsistent with $\sigma(\theta)$ data of 1967Bj06.
4470 *15*	$(0^+)^{\#}$	(0)[#a]	2,2	
4517 *15*		3[b]		
4829 *15*	$(4^+)^{\#}$	(4)[#b]		
4878 *15*		1		
5043 *15*		1		
5110[@] *20*		[b]		
5168[@] *20*				
5281[@] *20*				
5362[@] *20*				
5434[@] *20*				
5516 *20*		(4)[&]		
5576 *20*		(4)[&]		

[†] From 1967Bj06; values from 1983DaZV agree within 10 keV (evaluator), but no uncertainties were given.

[‡] From DWBA (1983DaZV). L-values for selected levels were deduced by 1967Bj06 and further analysis by 1968Br01.

[#] Supported by excitation energy and analyzing power.

[@] Not observed in 1983DaZV.

[&] Probably L=(4) but data are insufficient.

[a] L-value also determined in 1967Bj06 and/or 1968Br01.

[b] $\sigma(\theta)$ obtained in 1967Bj06 but no L assigned in reanalysis of data by 1968Br01.

[c] Relative cross sections at an angle where value is maximum (1968Br01,1967Bj06).