^{48}Ca(e,e′) 1985Wi06,1983St09

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 179, 1 (2022)	30-Nov-2021

1985Wi06: E=149.6-288.8 MeV beam from the MIT-Bates Linear Accelerator. Scattered electrons were detected with a high-resolution spectrometer. Measured $\sigma(\theta)$. Data taken for 0.6<q<2.9 fm^{-1} in forward directions and 1.0<q<3.0 fm^{-1} in a backward direction (160°). Deduced levels, J, π from analysis with RPA and DWBA calculations.

1983St09: E=30-57 MeV beams from the DALINAC at Darmstadt and E=66-145 MeV beams from the Mainz 350-MeV Linear Accelerator. Measured $\sigma(\theta)$, FWHM=25-35 keV (DALINAC) and 50-80 keV (Mainz). Deduced levels, M1 transition strengths.

1980St17: E=30-50 MeV beams from DALINAC at Darmstadt. Measured $\sigma(\theta$=105°, 165°) using a double-focusing magnetic spectrograph. Deduced transition strengths. Results corrected in 1983St09.

1969Ei03: E≈60 MeV beam from the Yale Electron Accelerator. Measured $\sigma(\theta$=70° to 150°) with a double-focusing magnetic spectrograph with a plastic scintillator. Deduced transition strengths.

1978Gr02: E=36-60 MeV beams from the DALINAC at Darmstadt. Measured $\sigma(\theta$=93° to 141°) using a double-focusing magnetic spectrograph (FWHM≈30 keV) with 36 overlapping plastic scintillators in coincidence with a Cerenkov counter. Deduced E0 matrix elements.

2000Vo15: E=42.4, 50.0, 66.4, and 88.2 MeV. Measured $\sigma(\theta$=180°) for E_x=4-15 MeV; large solid-angle, large momentum acceptance spectrometer. Deduced M4 and M2 transition form factors to 4$^-$, 6.11 MeV and 2$^-$, 6.89 MeV, states. Investigated dependence of analysis on the choice of the interaction and the corrections. See also 1999Vo03, 1999Vo11, and 2000Ri09.

Others: 1982Eu01, 1979Gr09, 1974DeZB.

^{48}Ca Levels

B(E2),B(E3): from 1969Ei03, except as noted.

E(level)[†]	J$^\pi$[#]	L[b]	B(M1)↑[c]	Comments
0.0	0$^+$[@]			
3837 *17*	2$^+$[@]			B(E2)↑=0.0082 *5* (1985Wi06) B(E2)↑: other: 0.0088 *11* (1969Ei03).
4272	0$^+$[@]			E(level): from 1978Gr02. Monopole matrix element=2.28 fm^2 *49* (1978Gr02).
4507 *5*	3$^-$[@]			B(E3)↑=0.0065 *10* (1969Ei03)
4608 *8*	3$^{(+)}$[@&]			
5147 *5*	5$^+$			J$^\pi$: results are discrepant in various experiments; see the Adopted Levels for discussion.
5252	4$^-$[&]			E(level): taken by 1985Wi06 from 1972Gr27.
5372 *13*	3$^-$[@]			B(E3)↑≈2.0×10^{-4} (1969Ei03)
5726 *12*	5$^-$[@]			
6105 *21*	4$^-$[&*a*]			
6340 *15*	4$^+$[@]			
6647 *7*	4$^+$			
6689 *10*	(2$^-$)[&]			
6796 *7*	(1$^-$,2$^+$)			
6893 *9*	(5$^+$,2$^-$)[&]			
7018 *14*	(5$^-$,3$^-$,6$^-$)			
7286 *5*	(1$^-$)			
7397 *10*	(4$^-$)[&*a*]			
7476 *7*	(4$^+$)			
7657 *10*	3$^-$			B(E3)↑≈0.0014 (1969Ei03)
7696[‡]		(M1)	<0.05	
7791 *7*	3$^-$[@]			

Continued on next page (footnotes at end of table)

^{48}Ca(e,e′) 1985Wi06,1983St09 (continued)

^{48}Ca Levels (continued)

E(level)[†]	Jπ[#]	L[b]	B(M1)↑[c]	Comments
7953 *15*	$(2^-,6^-)$[&]			
8038 *15*	$(1^-,2^+)$			
8113 *9*	$1^+,2^+,3^+$[@]			
8150[‡]	$(1^+,2^+)$[@]	(M1)	<0.05	
8272 *7*	$(4^+,5^-)$			
8385 *18*	(3^-)			Jπ: first maxima for Coulomb form factor at ≈1.0 fm^{-1} (1985Wi06).
8435 *5*	3^-[@]			
8477 *15*	$3^+,4^+,5^+$[@]			
8518 *8*	3^-			
8557 *14*	6^-[&]			
8605 *6*	3^-			
8804 *9*	5^-			
8884 *14*	$(1^-,2^+)$			Jπ: first maxima for Coulomb form factor at ≈1.0 fm^{-1} (1985Wi06).
9038 *15*				
9138 *22*	8^-[&]			
9276 *10*	8^-[&]			
9290 *9*	2^+			B(E2)↑=4.4×10^{-4} *9* (1985Wi06)
9392[‡]		(M1)	<0.07	
9550 *20*	3^-			
9885[‡]		(M1)	<0.09	
9.95×10^3 *3*	8^-[&]			
9954[‡]		(M1)	<0.10	
10138[‡]		(M1)	0.12 *3*	
10227 *5*	1^+	M1	3.9 *3*	E(level): from 1980St17. Jπ: based on dependence of strength on momentum transfer (1980St17).
10330[‡]		(M1)	0.09 *4*	
10354[‡]		(M1)	0.08 *4*	
10782[‡]		(M1)	0.12 *4*	
10930[‡]		(M1)	0.05 *2*	
11410[‡]		(M1)	<0.09	
11490[‡]		(M1)	0.15 *3*	
11728[‡]		(M1)	0.12 *4*	
12055[‡]		(M1)	0.08 *3*	
12270[‡]		(M1)	0.10 *5*	
12310[‡]		(M1)	0.11 *3*	
12493[‡]		(M1)	0.09 *4*	
12700[‡]		(M1)	0.10 *5*	

[†] From 1985Wi06, unless otherwise noted.
[‡] From 1983St09.
[#] From DWBA fit to the Coulomb form factors and RPA calculations in 1985Wi06, except as noted.
[@] From Adopted Levels.
[&] Unnatural parity state from absence of longitudinal form factor (1985Wi06).
[a] Discrepant with adopted $J^\pi(6105)=1^-,2,3,4^+$ and $J^\pi(7401)=(2^-)$, respectively.
[b] Identified as M1 transitions using the method described by 1972ThZF; except for the 10227 state E2 may not be excluded due to the weakness of the transitions (1983St09).
[c] From 1983St09.