

$^{42}\text{Ca}(e,e')$  1989It02

Type	Author	History	Citation	Literature Cutoff Date
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Target  $^{42}\text{Ca}$  g.s.  $J^\pi=0^+$ .

**1989It02** (also **1983It02,1981It02**): E=62.5-250 MeV electron beams were produced from the linear accelerators both at the Laboratory of Nuclear Science, Tohoku University and at the Accelerator Laboratory, University of Saskatchewan. Target of a 48.9 mg/cm<sup>2</sup> 94.4% enriched  $^{42}\text{Ca}$  metallic foil. Scattered electrons were measured by a hodoscope-type array of solid-state detectors or plastic scintillators mounted at the focal plane in a magnetic spectrometers. Measured  $\sigma(\theta)$ . Deduced levels, form factors,  $J^\pi$ ,  $B(\lambda)$ . Overall resolution is 0.15% for one experiment and 0.10% for the other. Comparisons of measured form factors with DWBA calculations.

**1984Ra04**: E=30-57.5 MeV. Measured cross sections, deduced isovector M2 transition strengths. FWHM=25-45 keV.

**1980St17**: E=39 MeV. Measured cross sections. Deduced M1 strength.

**1978Gr02**: E=31-67 MeV. Measured cross sections, deduced monopole (E0) excitation. FWHM $\approx$ 30 keV.

**1971He08**: E=198, 250, 300 MeV. Measured  $\sigma(\theta)$ .

**1968Fr11**: E=250 MeV. Measured cross section for elastic scattering.

 $^{42}\text{Ca}$  Levels

E(level) <sup>†</sup>	$J^\pi$ <sup>‡</sup>	$L$ <sup>‡</sup>	B(EL) <sup>†</sup>	Comments
0	$0^+$			
1520	$2^+$	2	0.0418 15	Other B(E2)=0.0320 20 ( <b>1971He08</b> ).
1837				E(level): from <b>1978Gr02</b> , E0 excitation. E0 matrix element=5.24 fm <sup>2</sup> 39 ( <b>1978Gr02</b> ).
2420	$2^+$	2	0.0118 12	
2750	$4^+$			
3440	$3^-$	3	0.0136 6	Other B(E3)=0.0091 4 ( <b>1971He08</b> ).
				<a href="#">Additional information 1.</a>
4100	$5^-$	5	0.00011 9	Other B(E5)=0.000066 6 ( <b>1971He08</b> ).
				<a href="#">Additional information 2.</a>
4450	$4^+$			
4690	$3^-$	3	0.00215 21	
4980	$3^-$	3	0.0010 1	
5520	$3^-$			
5680	$3^-$			
6100	$(1^-)$	(1)		Assignment as isoscalar E1 transition is based on similarity of q-dependence of form factor with isoscalar E1 transitions of 5900 and 6950 in $^{40}\text{Ca}$ .
9750	$(2^-)$			E(level), $J^\pi$ : from <b>1984Ra04</b> , M2 excitation. B(M2)=30 $\mu_n^2\text{fm}^2$ 10 ( <b>1984Ra04</b> ).
9770	$(2^+)$		0.00032 12	E(level), $J^\pi$ ,B(EL): from <b>1984Ra04</b> , E2 excitation.
11235	$(1^+)$			E(level), $J^\pi$ ,B(EL): from <b>1980St17</b> , M1 excitation. B(M1)=0.59 5 ( <b>1980St17</b> ).

<sup>†</sup> From **1989It02**, except as noted.

<sup>‡</sup> From comparisons of measured form factors with DWBA calculations (**1989It02**), unless otherwise noted.