

<sup>42</sup>Ca(p,p') 1968Ba28,1971Ma53,1970La22

Type	Author	History	Citation	Literature Cutoff Date
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See also <sup>42</sup>Ca(p,p'γ) dataset.

Inelastic and elastic scattering experiments:

**1968Ba28:** E=22.9 MeV proton beam was produced at the University of Colorado 132 fixed-field alternating-gradient cyclotron. A self-supporting target of <sup>42</sup>Ca enriched to 93.7%. Scattered protons were detected with a 3 mm lithium-drifted silicon detector, FWHM=100 100 keV. Measured σ(E<sub>p</sub>,θ). Deduced levels, L, deformation parameters from DWBA analysis.

**1971Ma53:** E=49.75 MeV proton beam was produced at the proton linear accelerator at the Rutherford High Energy Laboratory, Chilton, Berkshire. A self-supporting target of 90% enriched <sup>42</sup>Ca, 2mg/cm<sup>2</sup> thick. Scattered protons were detected with an n=1/2 double-focusing magnetic spectrometer with an acoustic spark-chamber assembly, FWHM=65 keV. Measured σ(E<sub>p</sub>,θ). Deduced levels, L, deformation parameters from DWBA analysis.

**1970La22:** (p,p'γ) E=7.03 MeV proton from the University of Liverpool E(n) tandem accelerator. A 200 μg/cm<sup>2</sup> thick enriched <sup>42</sup>Ca target. Scattered protons were detected with an annular silicon surface barrier detected and γ-rays were detected with NaI crystals. Measured scattered proton energies, E<sub>γ</sub>, I<sub>γ</sub>, p<sub>γ</sub>(θ). Deduced levels, J<sup>π</sup>, γ-branchings, mixing ratios.

**1969Ko03:** E=7.8 MeV. Measured scattered proton energies, lifetimes by Doppler-shift attenuation of γ rays. FWHM (for proton spectra)=120 keV.

**1956Br08:** E=6.5, 7.0, 7.4 MeV. A total of 14 groups reported up to 4043 keV.

**1961Be19:** E=3.6-6.3 MeV. E0 transition observed.

**1976A119:** E=1.044 GeV. Measured σ(θ).

**1976U101** (also **1976UIZZ**): E=4.40 MeV. Measured pair spectra, deduced E0 strength.

**1983Mi25, 1982Be32:** (pol p,p') E=650 MeV. Measured σ(θ), DWIA analysis.

Elastic scattering experiments:

**1986Mc05** (also **1980NaZU**): E=21-48.4 MeV. Measured σ(θ), deduced nuclear matter radii.

**1981Ra02:** (pol p,p) E=800 MeV. Measured σ(θ), analyzing powers.

**1981No07:** (pol p,p) E=65 MeV. Measured σ(θ), polarization.

**1980Fa07:** E=35.2 MeV. Measured σ(θ).

**1979Ig01:** (pol p,p) E=0.8 GeV. Measured σ(θ), A<sub>y</sub>(θ).

**Additional information 1.**

**1971Ma17:** E=49.3 MeV. Measured σ(θ).

**1969Sm02:** E=26.5 MeV.

<sup>42</sup>Ca Levels

E(level) <sup>†</sup>	L <sup>†</sup>	B <sub>L</sub> <sup>@</sup>	Comments
0			
1520 10	2	0.21	B(E2)(W.u.)=3.8 6 ( <b>1971Ma53</b> ), 6.4 10 ( <b>1968Ba28</b> ).
1850 10	0		<a href="#">Additional information 2.</a>
2430 10	2	0.07	B(E2)(W.u.)=0.59 10 ( <b>1971Ma53</b> ), 0.87 10 ( <b>1968Ba28</b> ).
2760 10	4	0.105	<a href="#">Additional information 3.</a>
3330 <sup>‡</sup> 25	2+6 <sup>‡</sup>		B(E4)(W.u.)=3.6 5 ( <b>1971Ma53</b> ), 3.9 6 ( <b>1968Ba28</b> ). E(level): doublet. Others: 3250+3300 ( <b>1970La22</b> ), 3260 ( <b>1968Ba28</b> ); 3250+3297 ( <b>1956Br08</b> ), 3191+3250+3297 in <b>1969Ko03</b> . B(E2)(W.u.)=0.35 5, B(E6)(W.u.)=0.32 5 ( <b>1971Ma53</b> ).
3390 <sup>#</sup>			
3460 10	3	0.26	B(E3)(W.u.)=16.5 25 ( <b>1971Ma53</b> ), 15.9 24 ( <b>1968Ba28</b> ).
3600 25			E(level): from <b>1971Ma53</b> . E=3651 ( <b>1969Ko03</b> ).
3780 10	2,3	0.08,0.09	
3890 <sup>‡</sup> 25	3,4 <sup>‡</sup>		B(E3)(W.u.)=0.65 8, B(E4)(W.u.)=1.4 2 ( <b>1971Ma53</b> ).
3949			E(level): from <b>1956Br08</b> and <b>1969Ko03</b> .
4000 <sup>#</sup>			
4040 <sup>#</sup>			

Continued on next page (footnotes at end of table)

$^{42}\text{Ca}(p,p')$  1968Ba28,1971Ma53,1970La22 (continued) $^{42}\text{Ca}$  Levels (continued)

<u>E(level)<sup>†</sup></u>	<u>L<sup>†</sup></u>	<u>B<sub>L</sub><sup>@</sup></u>	<u>Comments</u>
4120 <i>10</i>	5	0.14	<a href="#">Additional information 4.</a> B(E5)(W.u.)=10.8 <i>16</i> (1971Ma53), 11.8 <i>18</i> (1968Ba28).
4230 <sup>#</sup>			
4350 <sup>#</sup>			
4470 <i>10</i>	4	0.09	<a href="#">Additional information 5.</a> B(E4)(W.u.)=2.8 <i>4</i> (1971Ma53), 3.0 <i>4</i> (1968Ba28).
4500 <sup>#</sup>			
4560 <sup>#</sup>			
4730 <i>10</i>	3	0.12	E(level): 4690 <i>25</i> (1971Ma53). B(E2)(W.u.)=3.5 <i>4</i> (1971Ma53), 3.4 <i>4</i> (1968Ba28).
4850 <sup>‡</sup> <i>25</i>	2 <sup>‡</sup>		B(E2)(W.u.)=0.42 <i>6</i> (1971Ma53).
4970 <i>10</i>	3	0.09	<a href="#">Additional information 6.</a> L: from 1971Ma53. L=2,3 in 1968Ba28. B(E2)(W.u.)=1.2 <i>2</i> (1971Ma53), 1.5 <i>5</i> (1968Ba28).
5740 <i>10</i>	2,3	0.09,0.10	
6220 <i>10</i>	2,3	0.08,0.10	
7030 <i>10</i>			

<sup>†</sup> From 1968Ba28, unless otherwise stated.

<sup>‡</sup> From 1971Ma53.

<sup>#</sup> From 1970La22.

<sup>@</sup> From 1968Ba28.