

$^{42}\text{Ca}(\text{d},\text{n})$ 1971Bo04,1968Gr06

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen [#]		NDS 126, 1 (2015)	31-Mar-2015

Target ^{42}Ca $J^\pi=0^+$.

1971Bo04: E=5.0-6.05 MeV deuteron beam was produced from the CN Van de Graaff at the Hahn-Meitner-Institute, Berlin. Target of a $100\text{ }\mu\text{g}/\text{cm}^2$ CaCO_3 enriched to 92%. Neutron energy was measured by time-of-flight, FWHM $\approx$ 100 keV. Measured $\sigma(E_n, \theta)$. Deduced levels, J, π , L and spectroscopic factors from DWBA analysis.

1968Gr06: E=5.15 MeV deuteron beam was produced from the University of Alberta 5.5 MeV Van de Graaff accelerator. Target of a 86.4% enriched ^{42}Ca metal evaporated onto a $125\text{ }\mu\text{m}$ gold backing. Measured $\sigma(E_n, \theta)$. Deduced levels, spectroscopic factors from DWBA analysis.

1992NaZN: E=25 MeV. Measured $\sigma(\theta)$, deduced spectroscopic factors. FWHM $\approx$ 150 keV. A total of 48 groups reported, out of which 22 groups are above 6.2 MeV.

1971De17: E<5.5 MeV. Measured $\sigma(E)$.

1965Ok01: measured $\sigma(\theta)$.

Additional information 1.

 ^{43}Sc Levels

E(level) [†]	L [#]	(2J+1)C ² S [‡]	Comments
0	3	4.0	(2J+1)C ² S: other: 4.1 (1992NaZN).
152 12	2	1.1	(2J+1)C ² S: other: 0.91 (1992NaZN).
475 11	1	0.31	(2J+1)C ² S: other: 0.30 (1992NaZN).
860 10	0	0.14	(2J+1)C ² S: other: 0.64 (1992NaZN).
1177 9	1	0.72	(2J+1)C ² S: other: 0.69 (1992NaZN).
1395 13			
1817 9	1	0.40	(2J+1)C ² S: other: 0.35 (1992NaZN).
1947 13	1	0.04	L,(2J+1)C ² S: L=0, S=0.03 (1968Gr06).
2117 9	(1)	0.08	(2J+1)C ² S: other: 0.085 (1992NaZN).
2310 10	3	1.3	(2J+1)C ² S: other: 1.1 (1992NaZN).
2657 10	(0)	0.05	E(level): from 1971Bo04 and 1992NaZN. (2J+1)C ² S: other: 0.18 (1992NaZN).
2830 @	1+3 @	0.020,0.11 @	(2J+1)C ² S: for p3/2 and f5/2.
2930 @	2 @	0.070,0.054 @	
2977 11			
3330 @	3 @	0.34,0.28 @	
3460	2	0.25,0.20	E(level): from 1971Bo04 and 1992NaZN. L,(2J+1)C ² S: from 1992NaZN.
3630 9			
3683 9	3	0.90	(2J+1)C ² S: other: 0.84,0.61 (1992NaZN).
3940	3	0.80,0.60	E(level): from 1971Bo04 and 1992NaZN. L,(2J+1)C ² S: from 1992NaZN.
4011 12			
4243 9	3	2.2	(2J+1)C ² S: 1978En02 give (2J+1)S=6.5 with C ² =2 for T=3/2. Other: 1.5 (1992NaZN).
4379 9	3	0.8	(2J+1)C ² S: other: 0.50,0.37 (1992NaZN).
4580 15			
4670 9	1	0.13	
4725 9	1	0.13	(2J+1)C ² S: 1978En02 give (2J+1)S=0.38 with C ² =2 for T=3/2. Other: 0.33,0.34 (1992NaZN).
4898 9	(1)	0.21	E(level),L,(2J+1)C ² S: 1992NaZN give L=2, S=0.33,0.27 for a 4910 group.
5026 9	1	0.47	(2J+1)C ² S: other: 0.56,0.56 (1992NaZN).
5260 @	1 @	0.13,0.13 @	
5511 9	1	0.37,0.38	L,(2J+1)C ² S: from 1992NaZN for a 5540 group.
5647 9	1	0.11	

Continued on next page (footnotes at end of table)

$^{42}\text{Ca}(\text{d},\text{n})$ [1971Bo04](#),[1968Gr06](#) (continued) ^{43}Sc Levels (continued)

E(level) [†]	L [#]	(2J+1)C ² S [‡]	Comments
5715 9	1	0.16	(2J+1)C ² S: other: 0.37,0.38 (1992NaZN).
5826 9			
5988 9			
6041 9	1	0.08	(2J+1)C ² S: other: 0.26,0.27 (1992NaZN).
6155 9	1	1.15	(2J+1)C ² S: 1978En02 give (2J+1)S=3.4 with C ² =2 for T=3/2. Other: S=1.7 (1992NaZN).
6777 @	1 @	0.53,0.48 @	
7030 @	1 @	0.51,0.55 @	
7160 @	2 @	0.19,0.18 @	
7380 @	1 @	0.35,0.37 @	
7530 @	1 @	0.32,0.34 @	
7700 @	3 @	0.41,0.30 @	
7900 @	3 @	0.20,0.15 @	
8111 @	3 @	0.30,0.23 @	
8380 @	3 @	0.77,0.57 @	
8690 @	3 @	0.35,0.26 @	
8910 @	3 @	0.42,0.31 @	
9170 @	3 @	0.45,0.33 @	
9450 @	3 @	0.55,0.40 @	
9750 @	3 @	0.62,0.45 @	
10040 @	3 @	0.46,0.34 @	
10230 @	2 @	0.18,0.17 @	
10750 @	3 @	0.44,0.32 @	
10910 @	3 @	0.57,0.42 @	
11260 @	3 @	0.58,0.43 @	
11560 @	3 @	0.31,0.23 @	
11840 @	1 @	0.25,0.27 @	
12090 @	1 @	0.30,0.32 @	

[†] From [1968Gr06](#), unless otherwise stated. Above 6155, levels reported by [1992NaZN](#) only are not given in the Adopted Levels due to poor resolution in this region and weak peaks, as judged from spectrum shown by [1992NaZN](#).

[‡] From [1971Bo04](#). When unknown, J=3/2 for L=1 and J=7/2 for L=3 is assumed. Relative values for first few levels are also available from [1968Gr06](#). Values quoted by [1978En02](#) are (2J+1)S and have been adjusted upwards by ≈50% based on revised normalization factor N. When values are quoted from [1992NaZN](#), the first value corresponds to L-1/2 and the second value to L+1/2.

[#] From [1971Bo04](#), unless otherwise stated. L values from [1968Gr06](#) measured for g.s., 475, 860, 1177, 1817, 1947 and 6155 are in agreement with those from [1971Bo04](#), except for the 1947 level.

@ From [1992NaZN](#) only.