

$^{42}\text{Ca}(^3\text{He},\text{d})$ 1971Bo04,1968Br08,1966Sc17

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

1971Bo04 (also 1967LyZY): E=18 MeV ^3He beam was produced from the EN Tandem Van de Graaff of the Max-Planck-Institut, Heidelberg. Target enriched ^{42}Ca metal foil. Deuterons were momentum analyzed with a broad-range magnetic spectrograph and detected by a $\Delta\text{E-E}$ counter telescope, overall FWHM=20 keV. Measured $\sigma(\text{E}_\text{d},\theta)$. Deduced levels, J, π , L, spectroscopic factors from DWBA analysis. The uncertainty in cross sections is expected to be about 25%.

1968Br08: E=16.5 MeV. A total of 50 groups reported, but about 15 groups not confirmed by 1971Bo04.

1966Sc17: E=11 MeV ^3He beam was produced from the tandem Van de Graaff accelerator at Argonne National Laboratory. Target of enriched CaCO_3 on tantalum backing. Deuterons were momentum analyzed with a broad-range magnetic spectrograph and detected in nuclear emulsions. Measured $\sigma(\text{E}_\text{d},\theta)$. A total of 30 groups reported with L transfers for ten of these.

Others:

1974La14: E=15, 18 MeV.

1973GuZR (also 1972BrXX): no details are available.

1968To17: measured $\sigma(\theta)$.

1968Ly02: E=18 MeV, measured $\sigma(\text{E}_\text{d},\theta)$.

----- d σ /d Ω (max) mb/sr (1971Bo04)			
E(level)	cross section	E(level)	cross section
0	4.13	4662	1.84
154	1.28	4712	1.77
470	5.35	4765	0.22
851	2.07	4810	0.76
1179	14.2	4887	2.25
1809	6.70	5007	4.86
1958	0.71	5187	0.76
2097	1.10	5258	1.07
2291	1.41	5317	0.25
2657	0.69	5490	0.62
2681	0.53	5530	0.47
2978	0.08	5633	1.58
3330	1.24	5724	3.12
3474	0.27	5819	0.52
3613	0.59	5871	0.64
3673	1.77	5921	1.52
3786	0.11	5964	0.75
3939	0.30	6024	1.35
3956	0.15	6079	1.40
3985	0.29	6145	10.3
4234	5.49	6384	0.50
4363	0.62	6444	0.81
4388	0.65	6704	5.54
4555	0.61	6811	1.20
4584	0.21	6917	0.33

 ^{43}Sc Levels

E(level) [†]	L [‡]	(2J+1)C ² S [#]	Comments
0.0	3	4.4	(2J+1)C ² S: 6.4 (1966Sc17).
154 10	2	0.95	(2J+1)C ² S: 1.05 (1966Sc17).
470 10	1	0.30	(2J+1)C ² S: 0.57 (1966Sc17).
846 @ 8			

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$^{42}\text{Ca}(^3\text{He},\text{d})$ [1971Bo04](#),[1968Br08](#),[1966Sc17](#) (continued) ^{43}Sc Levels (continued)

E(level) [†]	L [‡]	(2J+1)C ² S [#]	Comments
851 <i>10</i>	0	0.11	E(level): 856 (1966Sc17), 857 (1968Br08). (2J+1)C ² S: 0.38 (1966Sc17).
876 [@] <i>8</i>			
1179 <i>10</i>	1	0.81	(2J+1)C ² S: 1.4 (1966Sc17).
1647 <i>10</i>			E(level): from 1966Sc17 . Not reported by 1971Bo04 .
1809 <i>10</i>	1	0.45	(2J+1)C ² S: 0.57 (1966Sc17).
1958 <i>10</i>	1	0.04	
2097 <i>10</i>	1	0.07	(2J+1)C ² S: 0.10 (1966Sc17).
2120? [@] <i>10</i>			
2291 <i>10</i>	3	1.6	(2J+1)C ² S: 1.3 (1966Sc17).
2339 [@] <i>10</i>			
2395 [@] <i>10</i>			
2606 [@] <i>10</i>			
2657 <i>10</i>	0	0.06	
2681 <i>10</i>			
2875 [@] <i>10</i>			
2978 <i>10</i>			
3191 [@] <i>10</i>			
3258 [@] <i>10</i>			
3330 <i>10</i>	3	0.25	
3452 [@] <i>10</i>			
3474 <i>10</i>	3	0.13	
3500 [@] <i>10</i>			
3613 <i>10</i>			
3673 <i>10</i>	3	0.85	(2J+1)C ² S: 0.67 (1966Sc17).
3786 <i>10</i>			
3939 <i>10</i>	3	0.11	
3956 <i>10</i>			
3985 <i>10</i>			
4234 <i>10</i>	3	2.2	(2J+1)C ² S: 2.1 (1966Sc17) 1978En02 quote (2J+1)S=5.5 for T=3/2.
4363 <i>10</i>	3	0.17	
4388 <i>10</i>	3	0.24	
4555 <i>10</i>			
4584 <i>10</i>			
4662 <i>10</i>	1	0.15	
4712 <i>10</i>	1	0.13	(2J+1)C ² S: 1978En02 quote (2J+1)S=0.32 for T=3/2.
4765 <i>10</i>	1	0.02	
4810 <i>10</i>	1	0.07	
4876 [@] <i>10</i>			
4887 <i>10</i>	1	0.21	
4927 [@] <i>10</i>			
5007 <i>10</i>	1	0.35	
5187 <i>10</i>			
5258 <i>10</i>	1	0.14	
5317 <i>10</i>			
5446 [@] <i>10</i>			
5490 <i>10</i>	1	0.07	
5530 <i>10</i>	1	0.05	
5633 <i>10</i>	1	0.16	
5724 <i>10</i>	1	0.31	
5819 <i>10</i>			
5871 <i>10</i>			

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$^{42}\text{Ca}(^3\text{He},\text{d})$ [1971Bo04](#),[1968Br08](#),[1966Sc17](#) (continued) ^{43}Sc Levels (continued)

E(level) [†]	L [‡]	(2J+1)C ² S [#]	Comments
5921 <i>10</i>			
5964 <i>10</i>			
6024 <i>10</i>	1	0.16	
6079 <i>10</i>			
6105 [@] <i>10</i>			
6145 <i>10</i>	1	1.4	(2J+1)C ² S: 1978En02 quote (2J+1)S=3.5 for T=3/2.
6282 <i>10</i>			E(level): from 1966Sc17 , not reported by 1971Bo04 .
6384 <i>10</i>			
6444 <i>10</i>			
6704 <i>10</i>	(1)		
6811 <i>10</i>			
6917 <i>10</i>			

[†] From [1971Bo04](#), unless otherwise stated.

[‡] From [1971Bo04](#).

[#] From [1971Bo04](#). Values quoted by [1978En02](#) are (2J+1)S and adjusted upwards by $\approx 25\%$ based on standardized normalization factors as in [1977En02](#).

[@] From [1968Br08](#) only. Above 2610, values quoted by [1968Br08](#) are lowered by 15 keV, based on comparison of energies in [1971Bo04](#) and [1966Sc17](#). Below 2610, the values may be 7 keV too high.