^{42}Ca(p,γ):resonances   1977Di17,1969Wa19

History

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

1977Di17: E=1.999-2.758 MeV proton beams were produced from the 4 and 3 MV Van de Graaff accelerators, at the Centre de Recherches Nucleaires, Strasbourg, France and at McMaster University respectively, for E>2 MeV; from the 3 MeV Van de Graaff accelerator at the Accelerator Laboratory at University of Helsinki, Finland, for E<2 MeV. Targets of enriched CaCO$_3$ on tungsten and gold backings. γ-rays were detected by Ge(Li) detectors. Measured γ yields. Deduced energies of resonances.

1969Wa19: E=1.201-2.063 proton beams were produced from the Aerospace Research Laboratories (ARL) 2 MeV Van de Graaff accelerator, FWHM=1 keV. Targets of enriched CaCO$_3$ on a 10-mil-thick Ag backing. γ-rays were detected by an 8-in-diam by 8-in-long NaI(Tl) detector. Measured γ yields. Deduced energies of resonances, relative resonance strengths.

Others:

1968So11: eight resonances in E(p)(lab)=1345-1424 keV region.

1965Br31, 1966Br21, 1964Br29: E=1013-1421.

^{43}Sc Levels

E(level)[†]	J$^\pi$[&]	E(p)(LAB)[@]	Relative intensity[#]	Comments
5919[‡]	3/2	1013		E(level): S(p)=4929.8 _19_ (2012Wa38).
				E(p)(LAB): from 1965Br31.
5950[‡]	(3/2,5/2)	1044		E(p)(LAB): from 1977Di17.
				Absolute strength=0.67 (1977Di17).
6060[‡]	(5/2)	1157		E(p)(LAB): from 1965Br31.
6103[‡]	(3/2$^-$,5/2$^+$)	1201	105	Absolute strength=0.68 (1977Di17).
6116		1214	7	
6127		1226	13	
6136[‡]	3/2	1234.8	109	Absolute strength=0.68 _14_ (1969Wa19).
6143[‡]	3/2$^-$	1241.9	148	Absolute strength=0.92 _18_ (1969Wa19).
6146		1245	27	
6151		1250	74	
6174		1274	6	
6182[‡]	5/2	1282	42	
6185		1285	91	
6190		1290	6	
6198[‡]	(3/2,5/2$^+$)	1298	121	Absolute strength=0.74 (1977Di17).
6200		1300	14	
6210		1310	13	
6211		1312	91	
6217[‡]	(3/2$^-$,5/2$^+$)	1318	91	Absolute strength=0.73 (1977Di17).
6228		1329	46	
6242		1343	7	
6247[‡]	(3/2,5/2)	1348	116	
6253		1354	36	
6262		1364	13	
6280		1382	59	
6286		1388	4	
6291		1393	34	
6297		1400	71	
6312		1415	10	
6315		1418	22	
6320[‡]	5/2$^+$	1422.8	202	Absolute strength=1.37 _27_ (1969Wa19).
6348		1452	70	
6355		1459	13	
6370		1474	20	

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^{42}Ca(p,γ):resonances   **1977Di17,1969Wa19 (continued)**

^{43}Sc Levels (continued)

E(level)[†]	J$^{\pi}$[&]	E(p)(LAB)[@]	Relative intensity[#]	Comments
6374		1478	85	
6386		1491	3	
6391		1496	13	
6395		1500	85	
6403		1509	53	
6410		1515	15	
6416		1521	50	
6426		1532	49	
6432		1538	61	
6439		1545	128	
6453		1559	22	
6461		1567	9	
6469		1576	56	
6479		1586	53	
6481		1588	53	
6493		1600	5	
6499		1606	92	
6503		1610	38	
6508		1616	34	
6515		1623	23	
6535		1643	100	
6547		1656	6	
6551		1660	49	
6558		1667	24	
6564		1673	41	
6571		1680	21	
6576		1685	58	
6584		1693	31	
6596		1706	75	
6604		1714	195	
6625		1735	99	
6631		1741	51	
6665		1776	63	
6674		1786	47	
6676		1788	64	
6680		1792	77	
6685[‡]	1/2$^-$	1797	95	
6694		1806	40	
6697[‡]	5/2	1808.3	255	Absolute strength=2.2 *4* (1969Wa19).
6709[‡]	1/2$^-$	1821	41	
6713		1825	16	
6716		1829	48	
6719		1832	127	
6730		1843	57	
6736		1850	142	
6749		1862	33	
6759		1873	111	
6777[‡]	5/2	1891	163	Absolute strength=1.47 *29* (1969Wa19).
6786		1900	63	
6794		1908	148	
6801		1916	135	
6814		1929	177	
6830		1945	185	
6834		1949	47	
6846		1962	183	
6856		1972	113	

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^{42}Ca(p,γ):resonances　　1977Di17,1969Wa19 (continued)

^{43}Sc Levels (continued)

E(level)[†]	J$^\pi$[&]	E(p)(LAB)[@]	Relative intensity[#]	Comments
6861		1977	107	
6871		1987	34	
6877		1993	183	
6881		1997	52	
6889		2006	4	
6901		2018	37	
6906		2023	37	
6913		2030	221	
6920[‡]	7/2	2036.6	301	Absolute strength=3.0 *6* (1969Wa19).
6925		2042	30	
6934		2052	110	
6942		2060	190	
6946		2064	87	
6961		2079		
6967		2086		
6971		2090		
6979		2098		
6984		2103		
6991		2110		
6996		2115		
6999		2119		
7004		2123		
7015		2135		
7022		2142		
7025		2145		
7033		2153		
7042		2162		
7051		2171		
7058		2179		
7063		2184		
7072		2193		
7080		2201		
7091		2212		
7095		2217		
7099		2221		
7108		2230		
7118		2240		
7127		2249		
7135		2257		
7141		2264		
7146		2269		
7154		2277		
7159		2282		
7171		2294		
7174		2297		
7177		2300		
7180		2304		
7183		2307		
7198		2322		
7212		2336		
7214		2339		
7223		2348		
7228		2353		
7240		2365		
7250		2375		
7263		2389		
7269		2395		

^{42}Ca(p,γ):resonances   1977Di17,1969Wa19 (continued)

^{43}Sc Levels (continued)

E(level)[†]	J$^{\pi}$[&]	E(p)(LAB)[@]	Comments
7275		2401	
7280		2406	
7285		2411	
7288		2414	
7295		2421	
7302		2428	
7305		2432	
7313		2440	
7344[‡]	(3/2$^-$,5/2)	2471	Absolute strength=3.59 (1977Di17).
7349		2477	
7354		2482	
7366		2494	
7373		2501	
7382		2510	
7388		2517	
7394[‡]	(3/2$^-$,5/2$^+$)	2523	Absolute strength=2.28 (1977Di17).
7402		2531	
7411		2540	
7414		2543	
7418		2547	
7423		2552	
7429		2559	
7433		2563	
7443		2573	
7450		2580	
7466		2596	
7471		2602	
7480		2611	
7483		2614	
7491		2622	
7498		2629	
7501		2632	
7512[‡]	(5/2$^+$,7/2,9/2$^-$)	2643	Absolute strength=4.20 (1977Di17).
7513		2645	
7518		2650	
7522		2654	
7531		2663	
7536		2668	
7544		2676	
7551		2683	
7559		2692	
7564		2697	
7581[‡]	(3/2$^-$,5/2,7/2$^+$)	2714	Absolute strength=2.93 (1977Di17).
7592		2725	
7600		2734	
7603		2737	
7607		2741	
7611		2745	
7618		2752	
7624		2758	

[†] From E$_{c.m.}$+S(p) where S(p)=4929.8 *19* from 2012Wa38 and E$_{c.m.}$ deduced from E$_p$(lab) from 1969Wa19 and 1977Di17.
[‡] Detailed primary and secondary γ-ray data from this resonance is available. See ^{42}Ca(p,γ) E=res dataset.

^{43}Sc Levels (continued)

From 1969Wa19.
@ Proton energies are from 1969Wa19 from 1201 to ≈2000 and from 1977Di17 above 2 MeV. 2 keV uncertainty for energies from 1969Wa19. Uncertainty in proton energies given by 1977Di17 is estimated (by the evaluators) to be about 1 keV, whereas the uncertainty in excitation energies is 2 keV, essentially due to ΔS(p).
& From Adopted Levels.