^{40}Ca(α,d) 1973Th11,1977Na25

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen[#] and Balraj Singh	NDS 135, 1 (2016)	31-May-2016

Target ^{40}Ca $J^{\pi}=0^{+}$.

1977Na25: E=40 MeV α beam was produced at the Michigan State University cyclotron. Target of 99.9% enriched metallic calcium onto a thin carbon backing. Deuterons were momentum analyzed with a split-pole magnetic spectrograph and detected with a position-sensitive resistive-wire proportional counter, energy resolution FWHM=50 keV. Measured $\sigma(E_d,\theta)$. Deduced levels, J^{π}, L from DWBA analysis.

1973Th11: E=25.5 MeV α beam was produced at the University of Minnesota tandem generator. Targets of natural metallic calcium evaporated onto carbon or gold backings. Deuterons were analyzed with an Engel split-pole magnetic spectrometer and detected in an array of four position-sensitive surface-barrier counters in the focal plane, energy resolution FWHM=10-17 keV. Measured $\sigma(E_d,\theta)$. Deduced levels, J^{π}, L from DWBA analysis.

1994Fi01: E=55.7 MeV. Measured $\sigma(E_d,\theta)$, DWBA analysis. FWHM=120 keV.

1966Ri04: E=50 MeV. Five groups reported at 600, 1430, 2250, 3000 and 3555. FWHM ≈ 200 keV.

1966Ki10: four strong groups at 600, 1440, 2230 and 3000.

Others: 1967Be44, 1964Ri03.

Energy	σ(integral)(1977Na25)
618	294
1514	145
2182	3.8
2384	4.4
2844	2.8
2918	2.5
3001	3.8
3091	34.5
3182	4.4
3307	3.7
3395	15.5
3607	28.0
3794	4.9
3896	4.0
4067	2.3
4391	18.6
4467	6.3
4748	8.5
4868	3.6
4996	7.5
5053	4.0
5122	4.6

^{42}Sc Levels

E(level)[†]	L[‡]	Relative intensity[#]	E(level)[†]	L[‡]	Relative intensity[#]	E(level)[†]	L[‡]	Relative intensity[#]
0			2189[&] *6*	2	11.3	2588[&] *6*		2.0
611[&] *6*		740[a]	2223[&] *6*		12.1	2653[&] *6*		5.0
619[&] *6*	6	740[a]	2270[&] *6*		9.9	2726[&] *6*		3.1
1491[&] *6*		90	2390[&] *6*	2	13.8	2795[&] *6*		4.8
1511[&] *6*	4	296	2439[&] *6*		3.5	2832[&] *6*		4.7
1846[&] *6*		3.3	2459[&] *6*		4.2	2846[&] *6*	2	6.8
1889[&] *6*		5.8	2540[&] *6*		3.7	2883[&] *6*		1.1

Continued on next page (footnotes at end of table)

^{40}Ca(α,d) 1973Th11,1977Na25 (continued)

^{42}Sc Levels (continued)

E(level)[†]	L[‡]	Relative intensity[#]	E(level)[†]	L[‡]	E(level)[†]	L[‡]
2914[&] *6*	4	20.1	3794 *10*	4	5053 *10*	4
2964[&] *6*		4.6	3896 *10*	4	5122 *10*	2
2997[&] *6*	4	5.2	4067 *10*	4	5310[@] *30*	
3024[&] *6*		14.1	4252 *10*		5630[@] *30*	
3091 *10*	4		4391 *10*	2	6050[@] *30*	
3182 *10*	4		4467 *10*	2	7120[@] *30*	
3307 *10*	4		4748 *10*	4	7940[@] *30*	
3395 *10*	2		4800 *10*		8540[@] *30*	
3607 *10*	6		4868 *10*	2		
3701 *10*			4996 *10*	2		

[†] From 1973Th11 for levels below 3050, above this values are from 1977Na25, unless otherwise stated.
[‡] From 1977Na25.
[#] From 1973Th11.
[@] From 1994Fi01, probably unresolved structures.
[&] Doublet.
[a] 740 combined for 611+619.