

$^{42}\text{Ca}(^3\text{He},\text{p})$ 1970Sc22,1973Gu14

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh		NDS 190,1 (2023)	20-Jun-2023

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

1970Sc22: E=15, 18 MeV ^3He beams were produced from the E(n) tandem Van de Graaff. Target was $\approx 50 \mu\text{g}/\text{cm}^2$ CaCO_3 (94.4% enriched in ^{42}Ca) evaporated onto a carbon backing. Reaction products were momentum analyzed by a broad-range magnetic spectrograph. Measured $\sigma(E_p, \theta)$, at $\theta(\text{c.m.})=5^\circ$ to 55° . Deduced level, J, π , L-transfers from DWBA analysis. Comparisons with available data and shell-model calculations.

1973Gu14: E=35 MeV ^3He beam from the SPNME cyclotron at Saclay. Target was $135 \mu\text{g}/\text{cm}^2$ 94.4% enriched ^{42}Ca on a $25 \mu\text{g}/\text{cm}^2$ carbon backing. Reaction products were detected with a ΔE -E telescope (FWHM=80 keV). Measured $\sigma(E_p, \theta)$, at $\theta(\text{c.m.})=10^\circ$ to 55° . Deduced level, J, π , L from DWBA analysis.

 ^{44}Sc Levels

E(level) [†]	L [†]	E(level) [†]	L [†]	E(level) [†]	L [†]	E(level) [†]	L [†]
0	2	1550	4 [#]	3280	6 [#]	4330	2 [#]
270		1610		3400 [‡]		4560	
360	4	1700		3630	0+2	4690	4 [#]
680	0+2	1790		3720	0+2 ^{&}	5010	
760 [‡]	2+4 [#]	2250 [‡]	2 [#]	3900 [‡]	(2) [#]	5500	
980	2+4 [@]	2796	0	3980	2	5590	
1070	4	2930	2	4040	0+2 ^{&}		
1160		3000 [‡]	2 [#]	4140	2		
1210	2+4 [#]	3160	0+2	4250 [‡]	2 [#]		

[†] From 1970Sc22, unless otherwise stated. $\Delta(E)$ not given, estimated as ≈ 50 keV by the evaluators. Values are also available in 1973Gu14 and are in good agreement.

[‡] From 1973Gu14 only.

[#] From 1973Gu14.

[@] 6 (1973Gu14).

[&] 2 (1973Gu14).