

$^{37}\text{Cl}(\alpha, \text{d})$ 1977To18,1977Na10

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	Jun Chen	NDS 149, 1 (2018)	1-Jan-2018

$J^\pi(^{37}\text{Cl g.s.})=3/2^+$.

1977To18: E=27 MeV alpha beam was produced from the Argonne Physics Division FN Tandem van de Graaff accelerator. Target was $\approx 400 \mu\text{g}/\text{cm}^2$ PbCl_2 (95% enriched) on a carbon backing. Reaction products were momentum-analyzed with a split-pole magnetic spectrograph (FWHM=40-50 keV) and detected with a position-sensitive proportional counter in conjunction with a dE/dx counter. Measured $\sigma(E_d, \theta)$. Deduced levels, J, π , L-transfers from DWBA analysis. Comparisons with available data.

1977Na10 (also **1975Na18**): E=40 MeV alpha beam was produced from the Michigan State University cyclotron. Target was a layer of enriched Sulphur sandwiched between layers of Formvar and carbon foils. Reaction products were momentum-analyzed with an Engel split-pole magnetic spectrograph (FWHM=40-60 keV) and detected with a proportional-counter plastic-scintillator. Measured $\sigma(E_d, \sigma)$. Deduced levels, J, π , L-transfers from DWBA analysis.

 ^{39}Ar Levels

E(level) [†]	J^π ^a	L [#]	$\text{d}\sigma/\text{d}\Omega$ (mb/sr) [@]	Comments
0			0.70 6	L: $\sigma(\theta)$ is shown in 1977To18 ; mixture of L values.
1267 3			0.36 3	
1516 6			0.027 6	
2090 5			0.28 4	
2342 5			0.42 3	
2482 5			0.28 2	
2648 5			0.72 12	
2754 6			0.12 2	
3061 6				
3159 12			0.11 2	
3262 9			0.15 3	
3379 6			0.029 5	E(level): probable anti-analog state or at least a part of it (1977To18).
3450 [‡] 6	(11/2 to 17/2) ⁺	6	0.15 ^{&} 2	
3990 ^{&}				
4184 10				
4250 20				
4475 20				
4523 [‡] 10				
4816 10				
4927 [‡] 10	(11/2,13/2) ⁺	4+6	0.23 ^{&} 3	
4998 [‡] 10	(11/2 to 17/2) ⁺	6	0.18 ^{&} 3	
5147 10				
5245 [‡] 15	(11/2,13/2) ⁺	4+6	0.66 [‡] 10	L: other: 6 (1977To18).
5543 [‡] 7	(17/2) ⁺	6	1.3 [‡] 2	J^π : from 1977Na10 and 1977To18 . L: also from 1977To18 .
5811 [‡] 10	(11/2,17/2) ⁺	6	0.14 ^{&} 2	
6230 ^{&} 10	(11/2,13/2) ⁺	4+6	0.30 5	

[†] From [1977To18](#), unless otherwise noted.

[‡] Weighted average from [1977Na10](#) and [1977To18](#).

[#] From [1977Na10](#), unless otherwise noted.

[@] From [1977To18](#) at 10° , unless otherwise noted.

[&] From [1977Na10](#).

^a From [1977Na10](#). $J^\pi=7/2^+, 9/2^+$ are possible from quoted L-transfers, but less likely since such spins should involve L=2 or 4.