$^{2}H(^{32}Si,p)$ 2024Ch33

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 199,1 (2025)	30-Sep-2024

2024Ch33: E=8.3 MeV/nucleon ^{32}Si beam was produced from the ReA6 reaccelerator-beam facility at NSCL. Target was 120 μg/cm^2 $(Cd_2)_n$. Protons were detected with the SOLARIS solenoidal spectrometer (FWHM=150 keV). Measured $\sigma(E_p,\theta)$, $\theta_{cm}\approx10^\circ$ to 40°. Deduced levels, J, π, spectroscopic factors from DWBA analysis. Comparisons with shell-model calculations.

^{33}Si Levels

The authors state that 4.52 and 5.43-MeV levels have fitted widths of 220(80) keV and <90 keV, respectively, but no further details are given about these quantities.

E(level)†	J^π†	L‡	C^2S_{rel}‡	Comments
0.0	$3/2^+$	2	0.37 *4*	
1010	$1/2^+$	0	0.25 *5*	
1435	$7/2^-$	3	0.89 *5*	
1981	$3/2^-$	1	0.92 *6*	
3190 *20*	$(7/2^-)$	(3)	0.07 *2*	
3580 *20*	$1/2^-$	1	0.91 *7*	J^π: the authors state that the sum-rule analysis strongly supports $1/2^-$ since it almost exhausts the full $1p_{1/2}$ orbital single-particle strength.
4520 *20*		(1,2)		C^2S_{rel}: 0.08 *2* for L=(1), 0.10 *3* for L=(2) (2024Ch33).
5430 *40*		(3)		C^2S_{rel}: 0.10 *3* for L=(3).

† As given in 2024Ch33. J^π values are listed here only for the purpose of extracting C^2S.

‡ From DWBA analysis of measured $\sigma(\theta)$ (2024Ch33). Relative spectroscopic factors C^2S_{rel} are deduced by the authors by normalizing the summed strength of g.s. and 1010 level to $\Sigma(2J+1)C^2S=2.0$ and then applying the same normalization factor to other states.