## $^{34}$S(d,$^{3}$He) 1984Th08,1968Be13

History

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

$J^{\pi}=0^{+}$ for $^{34}$S target.

1984Th08: E=30 MeV deuteron beam was produced from the BNL Double MP tandem facility. Targets were 4.4 and 5.0 $\mu$g/cm$^2$ sulphur with 18.8% $^{34}$S. Reaction products were momentum-analyzed with the BNL Q3D magnetic spectrometer (FWHM≈15 keV) and detected with a multi-wire proportional counter backed by a topping plastic scintillator. Measured $^{3}$He spectra, $\sigma(\theta)$. Deduced levels, J, $\pi$, L-transfers, spectroscopic factors from the DWBA analysis of the angular distributions.

1968Be13: E=23.4 MeV deuteron beam was produced from the Argonne cyclotron. Target was PbS evaporated onto carbon, 35 $\mu$g/cm$^2$ and 50% enriched in $^{34}$S. Charged particles were detected with a surface-barrier ΔE-E telescope. Measured $^{3}$He spectra, $\sigma(\theta)$. Deduced levels, J, $\pi$, L-transfers, spectroscopic factors from the DWBA analysis of measured angular distributions. Comparisons with shell-model calculations (1964Gl06). 1968Be13 also report data on $^{30}$Si($\alpha$,p).

### $^{33}$P Levels

Spectroscopic factor is defined as $C^2S=(1.0/N)\times\sigma(\theta)^{exp}/\sigma(\theta)^{DWBA}$, where the N is a normalization factor depending on the interaction between the reacting particles (1984Th08).

| E(level)[†] | L[‡] | $C^2S$[‡] | Comments |
|---|---|---|---|
| 0 | 0 | 2.2 | $C^2S$: $s_{1/2}$ proton transfer assumed in DWBA calculations. Other: 1.8 (1968Be13). |
| 1431.6 | 2 | 0.37[#] | |
| 1847.6 | 2 | 1.26[@] | $C^2S$: other: 3.4 for L+1/2 and 5.0 for L−1/2 (1968Be13). |
| 2538.6 | 2 | <0.10[#] | |
| 3275 | 2 | 0.06 | |
| 3490 | 2 | 0.19[@] | |
| 3628 | 4 | | |
| 4048 | 2 | 0.53,0.46[&] | |
| 5060 *10* | 2 | 0.39,0.34[&] | |

[†] Quoted by 1984Th08 from 1978En02 evaluation, except for the 5060 keV level, which is from their measurement.
[‡] From DWBA analysis of measured $\sigma(\theta)$ in 1984Th08. Uncertainty in $C^2S$ is estimated as 50% (1984Th08).
[#] $d_{3/2}$ proton transfer assumed in DWBA calculations.
[@] $d_{5/2}$ proton transfer assumed in DWBA calculations.
[&] Quoted values are for L−1/2 and L+1/2, respectively.