## $^{34}$S(pol d,$\alpha$),(d,$\alpha$) 1977Ba68,1982Ma25

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Jun Chen | NDS 201,1 (2025) | 31-Oct-2024 |

(pol d,$\alpha$):

1977Ba68: E=8.25-9.50 MeV polarized deuteron beam was produced from the FN tandem accelerator at McMaster University. Target was ≈40 $\mu$g/cm$^2$ enriched $Sb_2S_3$ (92.3% $^{34}$S) on thin carbon backings (≈10 $\mu$g/cm$^2$). Reaction products were momentum-analyzed with an Enge split-pole magnetic spectrograph (FWHM=32 keV) and detected with a focal-plane position-sensitive gas-filled proportional counter. Measured $\sigma$(E$_\alpha$), analyzing powers. Deduced levels, natural/unnatural parities. Comparisons with available data.

1982Ma25: E=52 MeV polarized deuteron beam was produced from the Karlsruhe isochronous cyclotron. Target was $H_2S$ gas (90% in $^{34}$S). Reaction products were detected with ΔE-E telescopes (FWHM=300 keV). Measured $\sigma$(E$_\alpha$), analyzing powers. Deduced levels, J, $\pi$, L-transfers from DWBA analysis.

(d,$\alpha$):

1971Ko33: E=6.6 MeV. Enriched GeS target (98% $^{34}$S). Reaction products were detected with a surface-barrier detector. Measured $\sigma$(E$_\alpha$,$\theta$). Deduced levels, J, $\pi$. Report 5 levels.

1978Ba30: E=3.05-3.26 MeV deuteron beams from the electrostatic accelerator of the Radium Institute. Reaction products were momentum-analyzed with a magnetic spectrograph. Measured E$\alpha$. Deduced reaction Q-value. Report g.s. and 80-keV levels.

### $^{32}$P Levels

| E(level)[†] | J$^\pi$[†] | L[‡] | Comments |
|---|---|---|---|
| 0[‡] | 1$^+$[‡] | 2 | |
| 77 | | | E(level): from 1971Ko33. Other: 80 (1978Ba30). |
| 1150 | 1$^+$[‡] | 0 | E(level): other: 1149 (1971Ko33).<br>J$^\pi$: $\pi$=unnatural (1977Ba68). |
| 1323 | N | | E(level): others: 1320 (1982Ma25), 1324 (1971Ko33). |
| 1754 | 3$^+$[‡] | 4 | E(level): others: 1750 (1982Ma25), 1755 (1971Ko33).<br>J$^\pi$: $\pi$=unnatural (1977Ba68). |
| 2180[‡] | 3$^+$[‡] | 4 | |
| 2220 | | | E(level): from 1982Ma25; unresolved with 2180 level. Other: 2200 (1971Ko33). |
| 2658 | N | | |
| 2741 | U | | |
| 3004 | 3$^+$[‡] | 2 | E(level): other: 3000 (1982Ma25).<br>J$^\pi$: $\pi$=unnatural (1977Ba68). |
| 3149 | 4$^+$ | 4 | J$^\pi$: $\pi$=natural (1977Ba68). |
| 3264 | U | | |
| 3322 | N | | |
| 3793 *4* | 3$^+$[‡] | 2 | E(level): other: 3800 (1982Ma25).<br>J$^\pi$: $\pi$=unnatural (1977Ba68). |
| 3875 | N | | E(level): other: 3880 (1982Ma25), unresolved with 3800 level. |
| 4149 | (U) | | |
| 4203 | U | | |
| 4275 | (N) | | |
| 4313 | U | | |
| 4412 | U | | |
| 4554 | U | | |
| 4663 | U | | |
| 4750 | 5$^+$[‡] | 4 | |
| 4850 | U | | |
| 4944 | (N) | | |
| 5010 | U | | J$^\pi$: not 0$^-$ (1977Ba68). |
| 5082 | (2$^+$)[‡] | (2) | E(level): other: 5070 (1982Ma25).<br>J$^\pi$: $\pi$=unnatural from 1977Ba68 disagrees with 2$^+$. |

Continued on next page (footnotes at end of table)

## $^{34}$S(pol d,$\alpha$),(d,$\alpha$) 1977Ba68,1982Ma25 (continued)

### $^{32}$P Levels (continued)

| E(level)[†] | J$^{\pi}$[†] | L[‡] | Comments |
|---|---|---|---|
| 5550 | N | | J$^{\pi}$: not 0$^{+}$ (1977Ba68). |
| 5890[‡] | (2$^{+}$)[‡] | (2) | |
| 6430[‡] | 5$^{+}$[‡] | 4 | |
| 7190[‡] | (4$^{+}$)[‡] | 4 | |
| 7960[‡] | 5$^{+}$[‡] | 4 | |
| 8090[‡] | 5$^{+}$[‡] | 4 | |
| 8540[‡] | 5$^{+}$[‡] | 4 | |
| 10380[‡] | | | |

[†] From 1977Ba68, unless otherwise noted. N for natural parity and U for unnatural parity are determined from measured analyzing powers (1977Ba68).

[‡] From 1982Ma25. Spin-parity and L-transfers are from DWBA analysis of measured analyzing powers (1982Ma25).