^{32}S(d,α),(pol d,α) 1975Bo46,1958En51,1982Ta04

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. S. Basunia, A. Chakraborty	NDS 197,1 (2024)	31-May-2024

1975Bo46: ^{32}S(pol d, α), E=8-12 MeV; Sb_2S_3 (natural material) target approximately of 50 μg/cm^2 thickness on carbon backing having thickness of 10 μg/cm^2; the emitted α particles were detected at back angle (175 degree) using thick annular silicon surface barrier detector; measured σ(E, Eα), polarization parameter T20, deduced levels, J^π.

1958En51: ^{32}S(d,α), E=6-6.5 MeV; natural antimony sulfide target, the target was bombarded with deuterons accelerated by the MIT-ONR electrostatic generator, the charged reaction products such as protons, alpha particles, and elastically scattered deuterons were observed at the angles of 50, 90, and 130 degrees to the deuteron beam using a high-resolution, broad-range magnetic spectrograph; measured level energies.

1982Ta04: ^{32}S(pol d, α), E=16 MeV; the polarized deuteron beam produced by the TUNL Lamb-shift ion source was used, the stae of polarization of the incident deuteron beam was determined by using a calibrated deuteron polarimeter, gas target of H_2S (with 95% ^{32}S) was used, the emitted particles were detected by four solid-state detectors having the overall detector energy resolution of 100 − 200 keV (FWHM); measured $\sigma(\theta)$, deduced levels, L, j-transfer, performed DWBA analysis.

Others:

1982De29: ^{32}S(d,α), E=40 MeV, measured $\sigma(\theta)$.

1982Qa02: ^{32}S(d,α), E=4-14 MeV.

1980Te05: ^{32}S(d,α), E=5-12 MeV.

1969Bo30: ^{32}S(d,α), E=4-5.5 MeV.

1965El05: ^{32}S(d,α), E=2-2.5 MeV.

^{30}P Levels

Differential cross-section values are the mean value at 175° are from 1975Bo46, listed in comments.

E(level)[†]	J$^\pi$[@]	L[&]	Comments
0	1$^+$	0	dσ/dΩ = 250 μb/sr *6*; parity=U (1975Bo46). σ=0.42 (relative to 1 for 1972 keV level) summed value for θ=25° to 90° (not repeated in the following listing) (1982Ta04).
680 *10*	0$^+$		dσ/dΩ < 20 μb/sr (1975Bo46).
708 *8*	1$^+$	2	dσ/dΩ = 203 μb/sr *6*; parity=U (1975Bo46). σ=0.29 (relative to 1 for 1972 keV level) (1982Ta04).
1451 *10*	2$^+$	2	dσ/dΩ = 133 μb/sr *4*; parity=N (1975Bo46). σ=0.13 (relative to 1 for 1972 keV level) (1982Ta04).
1972 *10*	3$^+$	2	dσ/dΩ = 249 μb/sr *7*; parity=U (1975Bo46). σ=1 (1982Ta04).
2538 *10*	3$^+$		dσ/dΩ = 320 μb/sr *9*; parity=U (1975Bo46).
2723 *10*	2$^+$		dσ/dΩ = 248 μb/sr *8*; parity=N (1975Bo46).
2839 *10*	3$^+$		dσ/dΩ = 196 μb/sr *7*; parity=U (1975Bo46).
2937 *10*	2$^{(+)}$		dσ/dΩ = 52 μb/sr *6*; parity=(N) (1975Bo46).
3018 *10*	1$^+$		dσ/dΩ = 440 μb/sr *10*; parity=U (1975Bo46).
3734 *10*	1$^+$		dσ/dΩ = 272 μb/sr *9*; parity=U (1975Bo46).
3836 *10*	2$^+$		dσ/dΩ = 156 μb/sr *7*; parity=N (1975Bo46).
3926 *10*	3$^+$		dσ/dΩ = 184 μb/sr *6*; parity=U (1975Bo46).
4141 *10*	2$^-$		dσ/dΩ = 177 μb/sr *7*; parity=U (1975Bo46).
4181 *10*	2$^{(+)}$		dσ/dΩ = 43 μb/sr *8*; parity=(N) (1975Bo46).
4230 *10*			dσ/dΩ = 126 μb/sr *9* (unresolved doublet in 1975Bo46).
4298 *4*	1$^-$,(2$^-$)		E(level): weighted average of 4296 *10* (1958En51) and 4298 *4* (1975Bo46). dσ/dΩ = 91 μb/sr *9* (1975Bo46).
4342 *10*			dσ/dΩ = 120 μb/sr *7*; parity=U (1975Bo46).
4421 *10*	2$^+$		dσ/dΩ = 121 μb/sr *7*; parity=N (1975Bo46).
4469[#]	0$^+$		dσ/dΩ < 30 μb/sr *6* (1975Bo46).
4501 *10*	1$^+$		dσ/dΩ = 79 μb/sr *6*; parity=U (1975Bo46).

Continued on next page (footnotes at end of table)

^{32}S(d,α),(pol d,α) 1975Bo46,1958En51,1982Ta04 (continued)

^{30}P Levels (continued)

E(level)[†]	Jπ[@]	Comments
4625 *10*	3^-	dσ/dΩ = 70 μb/sr *5*; parity=N (1975Bo46).
4735 *4*	$(0^-,1^+,3^+)$	E(level): weighted average of 4734 *10* (1958En51) and 4735 *4* (1975Bo46). dσ/dΩ = 103 μb/sr *6*; parity=U (1975Bo46).
4929 *10*		dσ/dΩ = 76 μb/sr *16* (1975Bo46).
4938[#]	1^+	dσ/dΩ = 289 μb/sr *16*; parity=U (1975Bo46).
5029 *5*		E(level): weighted average of 5024 *10* (1958En51) and 5030 *5* (1975Bo46). dσ/dΩ = 46 μb/sr *7*; parity=(N) (1975Bo46).
5206 *5*	$(1,3)^+$	E(level): weighted average of 5200 *10* (1958En51) and 5208 *5* (1975Bo46). dσ/dΩ = 288 μb/sr *11*; parity=U (1975Bo46).
5233? *10*		dσ/dΩ = 69 μb/sr *10*; parity=U (1975Bo46).
5417 *10*	(0^-)	E(level): weighted average of 5412 *10* (1958En51) and 5418 *4* (1975Bo46). dσ/dΩ = 249 μb/sr *12*; parity=U (1975Bo46).
5510 *4*	$1^+,(3^+,1)$	E(level): weighted average of 5504 *10* (1958En51) and 5511 *4* (1975Bo46). dσ/dΩ = 190 μb/sr *13*; parity=U (1975Bo46).
5594 *4*	2^+	E(level): weighted average of 5598 *10* (1958En51) and 5594 *4* (1975Bo46). The quoted uncertainty is 110 keV in 1958En51; probably it is a typo. dσ/dΩ = 100 μb/sr *10*; parity=N (1975Bo46).
5711 *5*	1^+	E(level): weighted average of 5700 *10* (1958En51) and 5713 *4* (1975Bo46). dσ/dΩ = 389 μb/sr *12*; parity=U (1975Bo46).
5806 *8*		E(level): weighted average of 5790 *10* (1958En51) and 5810 *5* (1975Bo46). dσ/dΩ = 112 μb/sr *14*.
5908[‡] *8*		dσ/dΩ = 336 μb/sr *11* (for unresolved triplet in 1975Bo46); parity=U.
5997	(1^+)	dσ/dΩ = 196 μb/sr *11*; parity=U (1975Bo46).
6050	$(0^+,1)$	dσ/dΩ < 40 μb/sr.
6093		dσ/dΩ = 42 μb/sr *8* (1975Bo46).
6173?[‡] *8*		dσ/dΩ = 37 μb/sr *9* (1975Bo46).
6234[‡] *5*		dσ/dΩ = 204 μb/sr *13*; parity=U (1975Bo46).
6269	2^-	dσ/dΩ = 86 μb/sr *16*; parity=U (1975Bo46).
6299		dσ/dΩ = 81 μb/sr *19* (1975Bo46).
6372[‡] *6*		dσ/dΩ = 109 μb/sr *6* (1975Bo46).
6482[#]	1^+	dσ/dΩ = 310 μb/sr *13*; parity=U (1975Bo46).
6521[#]		dσ/dΩ = 81 μb/sr *12* (1975Bo46).
6610[‡] *6*		dσ/dΩ = 112 μb/sr *12*; parity=U (1975Bo46).
6668		E(level): 6684 *5* in 1975Bo46 from literature. dσ/dΩ = 112 μb/sr *12*; parity=U (1975Bo46).
6788[‡] *8*		dσ/dΩ = 120 μb/sr *20*; parity=(U) (1975Bo46).
6854	1^+	E(level): 6859 *3* in 1975Bo46 from literature. dσ/dΩ = 170 μb/sr *20*; parity=U (1975Bo46).
6877		E(level): 6880 *5* in 1975Bo46 from literature. dσ/dΩ = 100 μb/sr *20* (for unresolved doublet in 1975Bo46).
6927		E(level): 6927 *3* in 1975Bo46 from literature. dσ/dΩ = 156 μb/sr *12* (1975Bo46).

[†] From 1958En51, except otherwise noted.
[‡] From 1975Bo46.
[#] From Adopted Levels, rounded value to the nearest keV.
[@] From 1975Bo46, based on analyzing power. The reported U=unnatural and N=natural parities are listed in the comments.
[&] From 1982Ta04, based on σ(θ) and DWBA analysis.