^{33}S(p,p):resonances 1989Va15

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Ninel Nica, Balraj Singh	NDS 113, 1563 (2012)	28-May-2012

^{33}S target J^π: $3/2^+$.

1989Va15: ^{33}S(P, P), (P, P′) E=1.2-3.77 MeV In steps of 100-400 eV At lab angles of 90°, 108°, 135°, and 165°. 88.2% enriched Ag_2S target. Average resolution of 350 eV FWHM. Resonance parameters were extracted for 144 levels with multilevel, multichannel R-matrix code. Final states: $3/2^+$, g.s.; $1/2^+$, 840; $5/2^+$, 1987. Measured $\sigma(\theta)$.

1964Va12: ^{33}S(p,p′γ) E=1.2-3.2 MeV, 22%-enriched S target (CdS on Ta or Ta backings). NaI detector for γ rays. Studied about 40 resonances.

^{34}Cl Levels

ΔE for excitation energies reported by 1989Va15 are of maximum 1.5 keV, obtained from ΔE(p)(lab) of maximum 1.5 keV (for E(p)(lab) values close to calibration points they report ΔE(p)(lab)≈0.3 keV).

E(level)[†]	J^π[‡]	Γ[#]	L[‡]	γ^2 (keV)[@]	Comments
6321.1	2^-	1.6 keV	1	320.0	E(p)(lab)=1214 keV.
6369.0	2^-	1.6 keV	1	240.0	E(p)(lab)=1263.3 keV.
6545.1	2^-	2.0 keV	1	128.0	E(p)(lab)=1444.8 keV. Additional information 1.
6633 *2*					E(p)(lab)=1535 *2* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$=0.15 eV (1964Va12).
6719.5	3^-	3.0 keV	1	95.0	E(p)(lab)=1624.5 keV.
6737.4	2^-	2.0 keV	1	60.0	E(p)(lab)=1643 keV.
6748.9	2^-	0.80 keV	1	23.0	E(p)(lab)=1654.8 keV.
6778 *2*					E(p)(lab)=1685 *2* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$=2.3 eV (1964Va12).
6807.0	1^-	1.0 keV	1	25.0	E(p)(lab)=1714.7 keV. Additional information 2.
6842.7	2^-	2.0 keV	1	42.0	E(p)(lab)=1751.5 keV. Additional information 3.
6851.7	2^+	0.80 keV	0	6.1	E(p)(lab)=1760.8 keV.
6890.7	1^-	0.85 keV	1	15.0	E(p)(lab)=1801.0 keV. Additional information 4.
6934.8	1^-	5.0 keV	1	80.0	E(p)(lab)=1846.4 keV. Additional information 5.
6986.8	1^-	0.6 keV	1	8.2	E(p)(lab)=1900.0 keV. Additional information 6.
6991.2	1^+	0.22 keV	0+2	6.7	E(p)(lab)=1904.6 keV.
7037.7	2^-	8.0 keV	1	95.0	E(p)(lab)=1952.5 keV.
7058 *2*					E(p)(lab)=1973 *2* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$=1.4 eV (1964Va12).
7080.3	$(2,3)^-$		1	15.6	E(p)(lab)=1996.4 keV. J^π: possible $(3)^-$ (1989Va15).
7111.6	2^-	1.2 keV	1	11.9	E(p)(lab)=2028.6 keV.
7124.2	2^-	4.0 keV	1	38.6	E(p)(lab)=2041.6 keV. Additional information 7.
7130.4	2^-	15.0 keV	1	140.0	E(p)(lab)=2048 keV.
7196.1	2^-	1.6 keV	1	13.0	E(p)(lab)=2115.7 keV. Additional information 8.
7213.7	1^-	2.0 keV	1	15.9	E(p)(lab)=2133.8 keV. Additional information 9.
7241.1	1^+	0.55 keV	0+2	16.46	E(p)(lab)=2162.1 keV.
7317.0	2^-	3.5 keV	1	21.7	E(p)(lab)=2240.3 keV.

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^{33}S(p,p):resonances 1989Va15 (continued)

^{34}Cl Levels (continued)

E(level)[†]	Jπ[‡]	Γ[#]	L[‡]	γ^2 (keV)[@]	Comments
7322 *2*					E(p)(lab)=2245 *2* (1964Va12). (2J+1)$\Gamma_{p0}\Gamma_{p1}/\Gamma$=23 eV (1964Va12).
7336 *2*					E(p)(lab)=2260 *2* (1964Va12). (2J+1)$\Gamma_{p0}\Gamma_{p1}/\Gamma$=33 eV (1964Va12).
7358.4	2^-	20.0 keV	1	110.0	E(p)(lab)=2283 keV.
7368.3	$(1\text{ to }3)^-$		3		E(p)(lab)=2293.2 keV.
7386.6	2^-	0.70 keV	1	3.8	E(p)(lab)=2312.0 keV.
7408 *2*					E(p)(lab)=2334 *2* (1964Va12). (2J+1)$\Gamma_{p0}\Gamma_{p1}/\Gamma$=9 eV (1964Va12).
7411.9	$(1,2)^-$		1+3		E(p)(lab)=2338.1 keV.
7452 *2*					E(p)(lab)=2379 *2* (1964Va12). (2J+1)$\Gamma_{p0}\Gamma_{p1}/\Gamma$=60 eV (1964Va12).
7457.5	1^-	4.0 keV	1	19.0	E(p)(lab)=2385.1 keV.
7471 *2*					E(p)(lab)=2399 *2* (1964Va12). (2J+1)$\Gamma_{p0}\Gamma_{p1}/\Gamma$=54 eV (1964Va12).
7475.3	2^+	0.17 keV	0+2	1.81	E(p)(lab)=2403.4 keV.
7491.3	2^-	0.1 keV	3	23.0	E(p)(lab)=2419.9 keV.
7493.8	2^-	1.4 keV	1+3	50.3	E(p)(lab)=2422.5 keV.
7510.1	1^+	0.3 keV	2	6.4	E(p)(lab)=2439.3 keV. Additional information 10.
7525.6	$(1,2)^+$		0		E(p)(lab)=2455.3 keV. Additional information 11.
7527.1	1^+	3.0 keV	0	5.8	E(p)(lab)=2456.8 keV.
7531.1	3^-	40.0 keV	1	170.0	E(p)(lab)=2461 keV. Additional information 12.
7533.9	$(1\text{ to }5)^-$		3		E(p)(lab)=2463.8 keV.
7536.3	2^-	3.60 keV	1	14.2	E(p)(lab)=2466.3 keV.
7546.0	1^+	0.15 keV	2	2.91	E(p)(lab)=2476.3 keV.
7553.3	2^+	2.5 keV	0	4.7	E(p)(lab)=2483.8 keV.
7585.8	1^+	1.4 keV	0+2	5.8	E(p)(lab)=2517.3 keV.
7595.4	2^+	0.70 keV	0+2	10.78	E(p)(lab)=2527.2 keV.
7613.6	2^+	0.30 keV	0	0.52	E(p)(lab)=2546.0 keV. Additional information 13.
7618.0	$(1)^-$	0.50 keV	3	82.0	E(p)(lab)=2550.5 keV.
7648.6	1^-	32.0 keV	1	110.0	E(p)(lab)=2582 keV. Additional information 14.
7652.1	2^-	0.70 keV	1	2.4	E(p)(lab)=2585.6 keV. Jπ: possible $(1)^-$ (1989Va15).
7673.5	1^-	2.0 keV	1	6.6	E(p)(lab)=2607.7 keV. Additional information 15.
7674.3	$(1\text{ to }4)^+$		2		E(p)(lab)=2608.5 keV.
7677.9	3^-	2.0 keV	1	6.6	E(p)(lab)=2612.2 keV.
7684.7	$(2,3)^+$		2		E(p)(lab)=2619.2 keV.
7690.5	1^+	0.30 keV	0+2	1.81	E(p)(lab)=2625.2 keV. Additional information 16. Jπ: possible $(2)^+$ (1989Va15).
7696.8	1^-	1.3 keV	1	4.2	E(p)(lab)=2631.7 keV.
7704.5	$(1\text{ to }5)^-$		3		E(p)(lab)=2639.7 keV.
7719.2	1^-	6.0 keV	1	18.2	E(p)(lab)=2654.8 keV. Additional information 17.
7761.5	$(0\text{ to }2)^+$		2		E(p)(lab)=2698.4 keV.
7768.4	$(1\text{ to }3)^-$		3		E(p)(lab)=2705.5 keV.
7787.5	$(1,2)^+$		0		E(p)(lab)=2725.2 keV.
7799.8	$(3,4)^+$		2		E(p)(lab)=2737.9 keV.
7825.3	3^+	0.04 keV	2	0.46	E(p)(lab)=2764.1 keV. Jπ: possible $(1,2)^+$ (1989Va15).

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^{33}S(p,p):resonances 1989Va15 (continued)

^{34}Cl Levels (continued)

E(level)†	Jπ‡	Γ#	L‡	γ^2 (keV)@	Comments
7827.2	2^-	10.0 keV	1	27.0	E(p)(lab)=2766.1 keV. Additional information 18.
7849.5	$(3,4)^+$		2		E(p)(lab)=2789.1 keV.
7859 *3*					E(p)(lab)=2799 *3* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$=24 eV (1964Va12).
7883 *3*					E(p)(lab)=2824 *3* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$=23 eV (1964Va12).
7897 *3*					E(p)(lab)=2838 *3* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$=24 eV (1964Va12).
7909.4					E(p)(lab)=2850.8 keV.
7909.6	2^-	8.0 keV	1	19.0	E(p)(lab)=2851.0 keV.
7929.1	2^+	1.4 keV	0+2	4.0	E(p)(lab)=2871.1 keV. Additional information 19.
7934.1	3^+	0.50 keV	2	4.7	E(p)(lab)=2876.3 keV.
7944.1	$(1 \text{ to } 4)^+$		2		E(p)(lab)=2886.6 keV. Additional information 20.
7953 *3*					E(p)(lab)=2896 *3* (1964Va12). $(2J+1)\Gamma_{p0}\Gamma_{p1}/\Gamma$<3.6 eV, $(2J+1)\Gamma_{p0}\Gamma_{p2}/\Gamma$=3.5 eV (1964Va12).
7967.7	1^+	0.20 keV	2	1.8	E(p)(lab)=2910.9 keV.
7975.1	2^+	3.0 keV	0	3.5	E(p)(lab)=2918.5 keV. Additional information 21.
7977.4	1^+	2.7 keV	0+2	8.5	E(p)(lab)=2920.9 keV.
7980.2	3^+	0.3 keV	2	2.6	E(p)(lab)=2923.8 keV.
7985.3	2^-	19.0 keV	1	55.0	E(p)(lab)=2929.0 keV. Additional information 22.
8002.5	$(1,2)^+$		0+2		E(p)(lab)=2946.8 keV.
8012.4	$(1 \text{ to } 4)^+$		2		E(p)(lab)=2957.0 keV.
8020.8	2^-	0.60 keV	1+3	7.7	E(p)(lab)=2965.6 keV.
8027.6	1^-	8.0 keV	1	35.0	E(p)(lab)=2972.6 keV. Additional information 23.
8043.1	2^-	4.5 keV	1	12.1	E(p)(lab)=2988.6 keV. Additional information 24.
8048.0	2^+	0.20 keV	2	1.6	E(p)(lab)=2993.7 keV. Additional information 25. Jπ: possible $(1)^+$ (1989Va15).
8052.4	1^-	0.30 keV	3	19.0	E(p)(lab)=2998.2 keV.
8059.2	3^+	1.2 keV	2	9.3	E(p)(lab)=3005.2 keV. Jπ: possible $(2,4)^+$ (1989Va15).
8069.9	$(1 \text{ to } 5)^-$		3		E(p)(lab)=3016.2 keV.
8084.5	2^+	0.70 keV	0	0.73	E(p)(lab)=3031.3 keV.
8087.4	1^-	0.50 keV	3	30.0	E(p)(lab)=3034.3 keV. Additional information 26.
8106.4	$(2)^-$	5.0 keV	1	9.4	E(p)(lab)=3053.8 keV. Additional information 27.
8118.6	2^+	1.1 keV	0+2	4.11	E(p)(lab)=3066.4 keV.
8127.3	0^+	1.0 keV	2	7.0	E(p)(lab)=3075.4 keV. Additional information 28.
8149.2	2^-	26.0 keV	1	140.8	E(p)(lab)=3097.9 keV. Additional information 29.
8155.6	1^-	1.2 keV	1	2.1	E(p)(lab)=3104.5 keV. Additional information 30.
8159.0	1^+	0.90 keV	0	0.88	E(p)(lab)=3108.0 keV.
8164.6	$(1,2)^-$		3		E(p)(lab)=3113.8 keV. Additional information 31.
8186.3	$(3,4)^+$		2+4		E(p)(lab)=3136.2 keV.
8192.5	2^+	0.50 keV	0+2	6.38	E(p)(lab)=3142.6 keV.

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^{33}S(p,p):resonances 1989Va15 (continued)

^{34}Cl Levels (continued)

E(level)[†]	Jπ[‡]	Γ[#]	L[‡]	γ^2 (keV)[@]	Comments
8203.7	1^-	15.0 keV	1	25.0	E(p)(lab)=3154.1 keV.
8210.5	$(3)^+$	0.20 keV	2	1.2	E(p)(lab)=3161.1 keV.
8214.8	3^-	0.30 keV	3	14.0	E(p)(lab)=3165.6 keV.
8231.9	2^-	10.0 keV	1	31.9	E(p)(lab)=3183.2 keV.
8236.3	2^+	0.95 keV	0+2	7.47	E(p)(lab)=3187.7 keV.
8251.3	(2^+)	0.10 keV	2	0.5	E(p)(lab)=3203.2 keV.
8254.2	$(2,3)^-$	0.70 keV	3	30.0	E(p)(lab)=3206.2 keV.
8260.2	4^+	0.80 keV	2	4.6	E(p)(lab)=3212.3 keV.
8265.5	$(2,3)^+$		2		E(p)(lab)=3217.8 keV.
8271.5?	0^-	0.30 keV	1	0.47	E(p)(lab)=3224.0 keV.
8276.7	2^-	2.2 keV	1	3.5	E(p)(lab)=3229.3 keV.
8316.5	4^+	2.0 keV	2	11.0	E(p)(lab)=3270.4 keV.
8317.5	$(1,2)^+$		2		E(p)(lab)=3271.4 keV.
8322.8	$(1\text{ to }5)^-$		3		E(p)(lab)=3276.9 keV.
8330.1	$(1\text{ to }5)^-$		3		E(p)(lab)=3284.4 keV.
8358.4	2^+	1.5 keV	0	1.3	E(p)(lab)=3313.5 keV.
8376.1	2^+	0.80 keV	0	0.66	E(p)(lab)=3331.8 keV.
8381.3	$(2)^-$	0.30 keV	3	11.0	E(p)(lab)=3337.1 keV.
8386.4	$(3,4)^+$		2		E(p)(lab)=3342.4 keV.
8460.3	1^+	0.8 keV	0+2	2.11	E(p)(lab)=3418.6 keV.
8468.1	2^-	2.80 keV	1	65.6	E(p)(lab)=3426.6 keV.
8477.1	$(2)^+$	1.90 keV	0+2	17.0	E(p)(lab)=3435.9 keV.
8485.9	1^-	1.40 keV	1+3	59.0	E(p)(lab)=3444.9 keV.
8494.1	2^+	1.50 keV	0+2	2.86	E(p)(lab)=3453.4 keV.
8494.6	2^-	0.45 keV	3	13.1	E(p)(lab)=3453.9 keV.
8509.2	2^+	25.0 keV	2	110.0	E(p)(lab)=3469 keV.
8537.5	3^-	2.0 keV	1	59.2	E(p)(lab)=3498.1 keV.
8543.3	3^-	2.0 keV	1	58.2	E(p)(lab)=3504.1 keV.
8548.1	1^+	25.0 keV	0	30.3	E(p)(lab)=3509 keV.
8549.1	2^-	3.0 keV	1	3.7	E(p)(lab)=3510.1 keV.
8563.3	4^+	1.5 keV	2	5.9	E(p)(lab)=3524.7 keV.
8579.3	1^+	3.1 keV	0+2	23.02	E(p)(lab)=3541.2 keV.
8587.1	4^-	0.40 keV	1+3	14.4	E(p)(lab)=3549.2 keV.
8597.8	1^+	3.0 keV	0+2	26.71	E(p)(lab)=3560.3 keV.
8601.7	2^+	3.0 keV	0	2.1	E(p)(lab)=3564.3 keV.
8603.2	3^-	0.20 keV	3	4.9	E(p)(lab)=3565.8 keV.
8610.5	3^-	6.0 keV	1+3	125.8	E(p)(lab)=3573.3 keV.
8613.4	$(4,5)^-$		3		E(p)(lab)=3576.3 keV.
8643.5	1^-	0.60 keV	1	11.34	E(p)(lab)=3607.4 keV.
8647.4	2^+	10.0 keV	0	6.9	E(p)(lab)=3611.4 keV.
8651.8	$(1)^+$	1.0 keV	2	3.6	E(p)(lab)=3615.9 keV.
8655.7	$(1)^+$	1.80 keV	0+2	210.69	E(p)(lab)=3619.9 keV.
8665.0	$(4,5)^-$		3		E(p)(lab)=3629.5 keV.
8693.2	1^+	0.50 keV	2	1.7	E(p)(lab)=3658.6 keV.
8697.1	2^+	1.50 keV	0+2	6.07	E(p)(lab)=3662.6 keV.
8700.0	1^-	1.5 keV	1	1.6	E(p)(lab)=3665.6 keV.
8706.3	1^+	0.80 keV	0	0.53	E(p)(lab)=3672.1 keV.
8714.6	3^+	4.0 keV	2	20.9	E(p)(lab)=3680.6 keV.
8733.1	3^-	35.0 keV	1	37.0	E(p)(lab)=3699.7 keV.
8754.6	1^-	0.70 keV	3	14.0	E(p)(lab)=3721.8 keV.
8756.5	1^-	4.0 keV	1	53.1	E(p)(lab)=3723.8 keV.
8761.3	3^+	1.60 keV	0+2	8.63	E(p)(lab)=3728.8 keV.
8779.3	3^+	0.80 keV	0+2	4.7	E(p)(lab)=3747.3 keV.
8790.6	2^-	6.0 keV	1	6.1	E(p)(lab)=3758.9 keV.
8793.9	1^-	0.2 keV	3	3.7	E(p)(lab)=3762.4 keV.

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^{33}S(p,p):resonances 1989Va15 (continued)

^{34}Cl Levels (continued)

† Deduced by evaluators from E(p)(lab) from 1989Va15 (given In record comments), or from 1964Va12 (when E(p)(lab) is specified As from 1964Va12). The following formula was used: E_x = S(p)+E(p)(lab) × AM(^{33}S)/[AM(^{33}S)+AM(P)], with S(p)(^{34}Cl)=5143.14 *7* and the atomic masses (AM) of ^{33}S and proton from 2011AuZZ.

‡ From 1989Va15.

From 1989Va15; the uncertainties are 10% for laboratory widths of a few keV or smaller, and 20% for the larger ones.

@ Reduced width γ^2=Γ/2P where Γ is the laboratory width and P is the Coulomb penetrability (1989Va15).