

$^{122}\text{Sn}(\text{d,p})$ 1971Di11,1972Ca33

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1971Di11,1972Bo76: E=12 MeV deuteron beam was produced at ORNL. Enriched target. Reaction products were momentum analyzed with a magnetic spectrograph. Measured $\sigma(E_p, \theta)$. Deduced levels, J, π , L-transfers, spectroscopic factors from DWBA analysis. Comparisons with available data.

1972Ca33: E=5.55, 5.15, 4.75, 4.55 MeV deuteron beams were produced from the University of Arizona model CN Van de Graaff. Targets were 180-450 $\mu\text{g}/\text{cm}^2$ 92.3% enriched ^{122}Sn . Reaction products were momentum-analyzed with a movable cooled silicon surface-barrier detectors fitted with electron magnets (FWHM=25 keV). Measured $\sigma(E_p, \theta)$. Deduced levels. Comparisons with available data.

1967Sc12: E=15 MeV deuteron beam was produced from the University of Pittsburgh 47-in. fixed-frequency cyclotron. Reaction products were momentum analyzed with a 60° wedge magnetic spectrograph (FWHM=40-60 keV). Measured $\sigma(E_p, \theta)$, $\theta=9^\circ$ to 50°. Deduced levels, J, π , L-transfers, spectroscopic factors from DWBA analysis.

1964Ne10: E=12 MeV deuteron beam was produced from the FSU tandem Van de Graaff accelerator. Target was 88.9% enriched ^{122}Sn . Reaction products were momentum analyzed with a broad-range magnetic spectrograph. Measured $\sigma(E_p)$. Deduced levels.

Others: **1975Be09, 1961Co03.**

^{123}Sn Levels

E(level) [†]	J ^π @	L [‡]	C ² S [‡]	Comments
0.0	11/2 ⁻	5	0.38	
24	3/2 ⁺	2	0.39	E(level): other: 25 (1972Ca33). C ² S: other: 0.43 (1967Sc12).
150 15	1/2 ⁺	0	0.19	C ² S: other: 0.36 (1967Sc12).
621				
870				
926 15	7/2 ⁻	3	0.020	E(level): other: 932 (1971Di11, 1964Ne10).
1043				
1076				
1109				
1140				
1158	7/2 ⁺	4	0.043	
1191 15	5/2 ⁺	2	0.086	E(level): other: 1197 (1971Di11), 1199 (1964Ne10). C ² S: other: 0.062 (1967Sc12).
1301				
1440				
1466				
1485 15	5/2 ⁺	2	0.029	E(level): other: 1492 (1971Di11), 1494 (1964Ne10). C ² S: other: 0.024 (1967Sc12).
1714				
1729				
1784				
1829	(3/2 ⁻)	(1) [#]	0.003 [#]	
1902	(5/2 ⁺)	(2) [#]	0.002 [#]	
2007				
2026				
2085?				
2114				
2157 15		(1+2) [#]	#	E(level): other: 2162 (1971Di11).
2260 15	(3/2 ⁻)	1	0.004	E(level): other: 2271 (1971Di11), 2274 (1964Ne10). C ² S: other: 0.005 for a level at 2290 (1967Sc12).
2362 15				E(level): other: 2365 (1971Di11).
2425	(1/2 ⁺)	(0) [#]	0.012 [#]	L,C ² S: for a level at 2400 (1967Sc12).
2446				

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$^{122}\text{Sn}(\text{d,p})$ **1971Di11,1972Ca33** (continued) ^{123}Sn Levels (continued)

E(level) [†]	J ^π @	L [‡]	C ² S [‡]	Comments
2612 15				E(level): other: 2601 (1971Di11).
2667 15	7/2 ⁻	3	0.056	E(level): other: 2676 (1971Di11).
2716 15	7/2 ⁻	3	0.224	E(level): other: 2726 (1971Di11).
2746	7/2 ⁻	3	0.054	E(level): other: 2757 (1971Di11), 2758 (1964Ne10).
2820 15	7/2 ⁻	3	0.017	E(level): other: 2828 (1971Di11), 2826 (1964Ne10).
				C ² S: other: 0.023 (1967Sc12).
3040 15		3	0.021	E(level): other: 3049 (1971Di11), 3050 (1964Ne10).
3073	(7/2 ⁻)	(3) [#]	0.12 [#]	E(level): other: 3071 (1964Ne10).
3113	7/2 ⁻	3	0.027	E(level): other: 3112 (1964Ne10).
3151	7/2 ⁻	3	0.048	E(level): other: 3130 from 1972Ca33 could correspond to 3113+3151; 3150 (1964Ne10).
				C ² S: other: 0.12 for a level at 3140 (1967Sc12).
3188	3/2 ⁻ ,5/2 ⁺	1,2	0.049,0.065	E(level): other: 3196 from 1972Ca33 could correspond to 3188+3217; 3182 (1964Ne10).
3217	7/2 ⁻	3	0.026	E(level): other: 3215 (1964Ne10).
3252 15	3/2 ⁻ ,5/2 ⁺	1,2	0.021,0.028	E(level): other: 3265 (1971Di11), 3263 (1964Ne10).
3320	3/2 ⁻ ,5/2 ⁺	1,2	0.011,0.016	E(level): other: 3316 (1964Ne10).
3345 15	3/2 ⁻ ,5/2 ⁺	1,2	0.052,0.062	E(level): other: 3358 (1971Di11), 3354 (1964Ne10).
3383 15	3/2 ⁻ ,5/2 ⁺	1,2	0.088,0.099	E(level): other: 3395 (1971Di11, 1964Ne10).
				C ² S: other: 0.23 for a level at 3400 with L=(1) (1967Sc12).
3435	3/2 ⁻ ,5/2 ⁺	1,2	0.015,0.017	E(level): other: 3443 from 1972Ca33 could correspond to 3435+3456; 3432 (1964Ne10).
3456	3/2 ⁻ ,5/2 ⁺	1,2	0.039,0.043	E(level): other: 3454 (1964Ne10).
3514				E(level): other: 3522 from 1972Ca33 could correspond to 3514+3534; 3526 (1964Ne10).
3534	3/2 ⁻ ,5/2 ⁺	1,2	0.014,0.016	C ² S: other: 0.043 for a level at 3530 with L=(1) (1967Sc12).
3551	3/2 ⁻ ,5/2 ⁺	1,2	0.007,0.008	E(level): other: 3549 (1964Ne10).
3632	3/2 ⁻ ,5/2 ⁺	1,2	0.004,0.004	E(level): other: 3627 (1964Ne10).
3650	3/2 ⁻ ,5/2 ⁺	1,2	0.002,0.002	E(level): other: 3640 (1964Ne10).
3677				E(level): other: 3666 (1964Ne10).
3694				
3720	3/2 ⁻ ,5/2 ⁺	1,2	0.023,0.024	E(level): other: 3713 (1964Ne10).
3735				E(level): other: 3727 (1964Ne10).
3773	3/2 ⁻ ,5/2 ⁺	1,2	0.015,0.016	E(level): other: 3761 (1964Ne10).
3809	3/2 ⁻ ,5/2 ⁺	1,2	0.052,0.058	C ² S: other: 0.14 for a level at 3810 with L=(1) (1967Sc12).
3827	3/2 ⁻ ,5/2 ⁺	1,2	0.011,0.013	E(level): other: 3805 (1964Ne10).
3849	3/2 ⁻ ,5/2 ⁺	1,2	0.031,0.033	E(level): other: 3842 (1964Ne10).
3868				
3910	7/2 ⁻	3	0.007	E(level): other: 3903 (1964Ne10).
3966	7/2 ⁻	3	0.019	E(level): other: 3952 (1964Ne10).
4008				E(level): other: 3999 (1964Ne10).
4057	7/2 ⁻	3	0.059	E(level): other: 4033 15 in 1972Ca33 could correspond to this level; 4043 (1964Ne10).
				C ² S: other: 0.11 for a level at 4050 with L=(1) (1967Sc12).
4087 15	7/2 ⁻	3	0.017	E(level): other: 4075 (1971Di11), 4097 (1964Ne10).
4105				
4267	3/2 ⁻ ,5/2 ⁺	1,2	0.036,0.042	E(level): other: 4242 15 in 1972Ca33 could correspond to this level.
4358	7/2 ⁻	3	0.007	
4423	7/2 ⁻	3	0.009	E(level): other: 4436 from 1972Ca33 could correspond to 4423+4464.
4464				
4736				E(level): other: 4702 15 in 1972Ca33 could correspond to this level.
4773 15				
4845 15				
4875 15				
4923 15				
4964 15				

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$^{122}\text{Sn}(\text{d,p})$ **1971Di11,1972Ca33** (continued)

^{123}Sn Levels (continued)

E(level)[†]

5019 *15*

5127 *15*

[†] Values with uncertainties are from [1972Ca33](#) and those without uncertainties are from [1971Di11](#), unless otherwise noted.

[‡] From [1971Di11](#), extracted from DWBA analysis of measured differential cross sections.

[#] From [1967Sc12](#).

[@] Assumed for C²S.