

¹¹⁶Sn(p,t) [2004Gu01](#),[1979BIZZ](#),[1989Ge03](#)

| Type | Author | History Citation | Literature Cutoff Date |
|-----------------|--------------|---------------------|------------------------|
| Full Evaluation | Jean Blachot | NDS 113, 515 (2012) | 1-Jan-2012 |

[2004Gu01](#): E=26 MeV proton beam, Munich HVEC MP Tandem accelerator Target=¹¹⁶Sn enriched to 96.8%, 100 μg/cm² thick on carbon backing of 5.6 μ/cm². Tritons momentum separated by the Q3D magnetic spectrograph at angles between 6° and 65° and identified by ΔE-E measurements from a position sensitive proportional wire energy loss detector with additional cathode read out and a rest energy scintillation detector, which have a combined FWHM of ≈8 keV. Measured σ, σ(θ). Deduced levels, J, π. Comparison with shell-model calculations.

[1979BIZZ](#): E=27.5 MeV, enriched target. FWHM=14-16 keV.

Measured: σ(E(p),θ), spectra taken between θ(lab)=5° and 70°, dσ/dΩ, DWBA analysis.

[1989Ge03](#): E=168 MeV. FWHM≈130 keV.

[1982Ge06](#): same group as [1989Ge03](#) used also (α,6He) E=218 MeV.

Other: [1970Fl08](#), E=20 MeV.

¹¹⁴Sn Levels

| E(level) [†] | J ^{π&} | L [‡] | σ(integrated) μb ^a | Comments |
|-----------------------|---------------------------------|----------------|-------------------------------|---|
| 0 | 0 ⁺ | 0 | 2492 32 | |
| 1300 3 | 2 ⁺ | 2 | 520 10 | |
| 1954 3 | 0 ⁺ | 0 | 17 1 | |
| 2154 3 | 0 ⁺ | 0 | 1.7 3 | |
| 2188 3 | 4 ⁺ | 4 | 190 4 | |
| 2239 3 | 2 ⁺ | 2 | 1.0 2 | |
| 2274 3 | 3 ⁻ | 3 | 137 3 | |
| 2417 3 | 0 ⁺ | 0 | 8.7 8 | |
| 2451 3 | 2 ⁺ | 2 | 6.8 7 | |
| 2510 3 | 3 ⁻ | 3 | 2.3 4 | |
| 2576 3 | 2 ⁺ | 2 | 1.2 2 | |
| 2613 3 | 4 ⁺ | 4 | 4.9 5 | |
| 2765 3 | 4 ⁺ | 4 | 3.3 5 | |
| 2816 3 | 5 ⁻ | 5 | 22 1 | |
| 2860 3 | 4 ⁺ | 4 | 51 2 | |
| 2906 3 | 3 ⁻ | 3 | 5.7 5 | |
| 2916 3 | 2 ⁺ | 2 | 85 3 | |
| 2943 3 | 2 ⁺ | 2 | 125 3 | |
| 3028 3 | 0 ⁺ | 0 | 24 2 | |
| 3088 3 | 7 ⁻ | 7 | 10.2 7 | |
| 3149 [‡] 3 | 6 ⁺ | 6 | 48 2 | |
| 3186 3 | 2 ⁺ | 2 | 19 1 | |
| 3190 3 | 6 ⁺ | 6 | 2.0 3 | |
| 3206 3 | 4 ⁺ | 4 | 14 1 | |
| 3225 3 | 3 ⁻ | 3 | 4.7 6 | |
| 3242 3 | 5 ⁻ & 6 ⁺ | 5+6 | 4.6 6 | E(level),L: doublet with mixture of 95% L=6, 5% L=5. |
| 3309 3 | 0 ⁺ | 0 | 8.7 9 | |
| 3325 3 | 2 ⁺ | 2 | 17 1 | |
| 3358 3 | 4 ⁺ | 4 | 114 3 | L: σ(θ) pattern and L value not shown in figure 5 of 2004Gu01 . |
| 3363 3 | 5 ⁻ | 5 | 1.4 2 | |
| 3397 3 | 6 ⁺ | 6 | 4.4 3 | |
| 3422 3 | 0 ⁺ | 0 | 51 2 | |
| 3448 3 | 4 ⁺ | 4 | 9.6 9 | |
| 3452 3 | 0 ⁺ | 0 | 1.4 2 | |
| 3473 3 | 6 ⁺ | 6 | 52 2 | |
| 3477 3 | 2 ⁺ | 2 | 10.2 3 | |
| 3486 3 | 5 ⁻ | 5 | 17 1 | |
| 3515 3 | 3 ⁻ & 9 ⁻ | 3+9 | 20 2 | E(level),L: doublet with mixture of 95% L=9, 5% L=3. |

Continued on next page (footnotes at end of table)

$^{116}\text{Sn}(\text{p,t})$ [2004Gu01,1979BIZZ,1989Ge03](#) (continued) ^{114}Sn Levels (continued)

| E(level) [†] | J ^{π&} | L [‡] | $\sigma(\text{integrated}) \mu\text{b}^a$ | Comments |
|-----------------------|--------------------------------|----------------|---|---|
| 3526 3 | 3 ⁻ | 3 | 7.6 8 | |
| 3549 3 | 0 ⁺ | 0 | 40 2 | |
| 3561 3 | 2 ⁺ &7 ⁻ | 2+7 | 32 2 | E(level),L: doublet with mixture of 93% L=7, 7% L=2. |
| 3587 3 | 4 ⁺ | 4 | 4.3 7 | |
| 3654 3 | 4 ⁺ | 4 | 3.5 6 | |
| 3680 3 | 4 ⁺ | 4 | 3.2 6 | |
| 3696 3 | 2 ⁺ | 2 | 8.9 8 | |
| 3727 3 | 2 ⁺ | 2 | 33 2 | |
| 3740 3 | 0 ⁺ | 0 | 14 1 | |
| 3765 3 | 0 ⁺ | 0 | 23 1 | |
| 3786 3 | 4 ⁺ | 4 | 8.0 8 | |
| 3800 3 | 2 ⁺ | 2 | 15 1 | |
| 3871 3 | 5 ⁻ | 5 | 5.9 6 | |
| 3876 3 | 2 ⁺ | 2 | 1.6 2 | |
| 3939 3 | 3 ⁻ | 3 | 9.7 9 | |
| 3971 3 | 2 ⁺ | 2 | 34 2 | |
| 3988 3 | 3 ⁻ | 3 | 7.3 8 | |
| 4000 3 | 4 ⁺ | 4 | 77.0 8 | |
| 4044 3 | 5 ⁻ | 5 | 5.4 6 | |
| 4057 3 | 6 ⁺ | 6 | 11 1 | |
| 4095 3 | 2 ⁺ | 2 | 4.5 5 | |
| 4118 3 | 4 ⁺ | 4 | 9.3 9 | |
| 4136 3 | 4 ⁺ | 4 | 38 2 | L: $\sigma(\theta)$ pattern and L value not shown in figure 5 of 2004Gu01 . |
| 4160 [#] 30 | | ≥8 | | |
| 4177 6 | | | | |
| 4262 6 | | | | |
| 4313 6 | | | | |
| 4353 6 | | | | |
| 4413 6 | | 0 | | |
| 4445 6 | | | | |
| 4472 6 | | | | |
| 4520 [#] 15 | | ≥8 | | |
| 4576 6 | | | | |
| 4595 6 | | | | |
| 4658 6 | | | | |
| 4741 6 | | | | |
| 4797 6 | | | | |
| 4831 10 | | | | |
| 4909 10 | | | | |
| 4964 10 | | | | |
| 5013 10 | | | | |
| 5064 10 | | | | |
| 5093 10 | | | | |
| 5256 10 | | | | |
| ≈7300 [@] | | 8 | | |
| ≈8300 [@] | | 6 | | |

[†] From [2004Gu01](#), E >4136 Kev and L are from [1979BIZZ](#).[‡] Also seen by [1989Ge03](#) and [1982Ge06](#).[#] E and L from [1989Ge03](#). See authors for suggested configurations.[@] E and L from [1989Ge03](#), [1982Ge06](#). See authors for suggested configurations.[&] From $\sigma(\theta)$ and DWBA analysis.

$^{116}\text{Sn}(\text{p,t})$ [2004Gu01,1979BIZZ,1989Ge03](#) (continued)

^{114}Sn Levels (continued)

^a Cross section integrated from 5° to 60°. The quoted uncertainties are combination of statistical uncertainties and a general systematic uncertainty of 15%.