## $^{120}$Sn(n,$\gamma$) 1976Ca24,1981Ba53,2007Eg02

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | S. Ohya | NDS 111, 1619 (2010) | 20-Jan-2009 |

1976Ca24: E(n)=0.1-7 keV; enriched target 98.4%, semi $\gamma$; time-of-flight $^{6}$Li glass scin; deduced S(n)=6170.3 *20*.
1981Ba53: E=th, measured primary $\gamma$, no secondary $\gamma$; deduced levels; deduced S(n)=6170.5 *7*.
2007Eg02: E=th, measured absolute $\gamma$ intensities.
The level scheme is that proposed in 1976Ca24; additional levels are from 1981Ba53.
Others: 1966Ha38, 1968Bh01.

### $^{121}$Sn Levels

| E(level)† | Jπ‡ | $T_{1/2}$‡ | E(level)† | Jπ‡ |
|---|---|---|---|---|
| 0.0 | $3/2^+$ | | 2498.7[a] *8* | |
| 6.30 *8* | $11/2^-$ | 43.9 y *5* | 2514.0[a] *14* | $9/2^-$,$11/2^-$ |
| 60.34 *2* | $1/2^+$ | | 2524.8 *16* | |
| 664.0[a] *19* | $7/2^-$,$9/2^-$ | | 2558.0[a] *12* | |
| 869.1[#] *4* | $5/2^+$ | | 2589.0[a] *23* | $7/2^-$ |
| 908.6[&] *4* | $5/2^+$ | | 2652.0[a] *12* | |
| 925.7 *10* | $7/2^+$ | | 2666[a] *2* | $7/2^-$ |
| 949.2 *5* | $7/2^-$ | | 2713.0[a] *16* | $7/2^+$,$9/2^+$ |
| 1101.2[#] *3* | $3/2^+$ | | 2804.0[a] *25* | $(3/2)^+$ |
| 1121.2 *5* | $5/2^+$ | | 2849.0[a] *14* | $(5/2^-,7/2^-)$ |
| 1350[a] *4* | $(7/2^+,9/2^+)$ | | 2951[a] *4* | $1/2^-$,$3/2^-$ |
| 1403.5 *5* | $5/2^+$ | | 2961.0[a] *13* | |
| 1653.1[@] *5* | $1/2^+$,3/2 | | 2999.0[a] *13* | $3/2^+$ |
| 1710.0[a] *16* | $(3/2)^+$ | | 3076.5[a] *10* | |
| 1864? *4* | | | 3138.0[a] *15* | $(7/2^-)$ |
| 1877 *1* | $1/2^-$,$3/2^-$ | | 3154.0[a] *14* | $(5/2^-,7/2,9/2^+)$ |
| 1912.2[#] *4* | $1/2^+$ | | 3172[a] *4* | |
| 1940.0[a] *26* | $(3/2)^+$ | | 3382.0[a] *13* | $(7/2^+,9/2^+)$ |
| 1960.3[@] *5* | $1/2^+$ | | 3396.0[a] *14* | $3/2^-$ |
| 1974.5[a] *10* | | | 3510.0[a] *7* | $3/2^-$ |
| 2067.2[#] *11* | $(3/2^+)$ | | 3518.0[a] *10* | |
| 2113.6 *10* | $(3/2^+,5/2^+)$ | | 3680.0[a] *13* | $3/2^-$ |
| 2163.6[#] *7* | (1/2,3/2) | | 3762.5[a] *17* | $1/2^-$,$3/2^-$ |
| 2168[a] *2* | $7/2^+$,$9/2^+$ | | 3932.5[a] *15* | $1/2^-$,$3/2^-$ |
| 2238[a] *2* | | | 4059.0[a] *15* | |
| 2242.8 *5* | | | 4274[a] *3* | |
| 2285.2[#] *5* | $3/2^+$,$5/2^+$ | | 4519.0[a] *11* | |
| 2330[a] *2* | $9/2^-$,$11/2^-$ | | 4540.0[a] *10* | |
| 2361.0[a] *12* | | | 5051.0[a] *16* | |
| 2376[a] *3* | $(5/2^-,7/2^-)$ | | (6170.3[b] *3*) | |
| 2440[a] *3* | $(7/2^+,9/2^+)$ | | | |

† E(levels) are based on a least-squares fit to the secondary $\gamma$ energies.
‡ From Adopted Levels.
[#] Fed by primary $\gamma$ from 951-eV, $1/2^+$ resonance.
[@] Fed by primary $\gamma$ from 427-eV, $1/2^{(-)}$ resonance.
[&] Fed only by primary $\gamma$ from 6674-eV resonance.
[a] From 1981Ba53.
[b] $^{120}$Sn n-capture state.

## $^{120}$Sn(n,$\gamma$) 1976Ca24,1981Ba53,2007Eg02 (continued)

### $\gamma(^{121}Sn)$

| $E_i$(level) | $J_i^\pi$ | $E_\gamma$[†] | $I_\gamma$[‡] | $E_f$ | $J_f^\pi$ | Comments |
|---|---|---|---|---|---|---|
| 60.34 | 1/2$^+$ | (60.34 *2*) | | 0.0 | 3/2$^+$ | |
| 869.1 | 5/2$^+$ | 808.9 *1* | 35 *8* | 60.34 | 1/2$^+$ | $E_\gamma$: weighted average of 808.9 *1* (2007Eg02), 809.1 *5* (1976Ca24). $I_\gamma$: calculated with absolute value 3.9 % *9* (Experimental error *4*) from 2007Eg02 Other: 18 (1976Ca24). |
| | | 869.2 *1* | 65 *16* | 0.0 | 3/2$^+$ | $E_\gamma$: weighted average of 869.2 *1* (2007Eg02), 868.8 *5* (1976Ca24). $I_\gamma$: calculated with absolute 7.2 % *18* (Experimental error *9*) from 2007Eg02; Other: 82 (1976Ca24). |
| 908.6 | 5/2$^+$ | 848.2 *5* | 40 | 60.34 | 1/2$^+$ | |
| | | 908.8 *4* | 60 | 0.0 | 3/2$^+$ | $E_\gamma$: weighted average of 909.1 *5* (2007Eg02), 908.5 *5* (1976Ca24). $I_\gamma$: absolute value 8.1 % *19* (Experimental error *8*) (2007Eg02). |
| 925.7 | 7/2$^+$ | 925.6 *1* | 100 | 0.0 | 3/2$^+$ | $E_\gamma$: weighted average of 925.6 *1* (2007Eg02), 925.7 *10* (1976Ca24). $I_\gamma$: absolute value 17.5 % *37* (Experimental error *5*) (2007Eg02). |
| 949.2 | 7/2$^-$ | 942.9 *5* | 100 | 6.30 | 11/2$^-$ | |
| 1101.2 | 3/2$^+$ | 1041.1 *5* | 37 | 60.34 | 1/2$^+$ | |
| | | 1101.6 *3* | 63 | 0.0 | 3/2$^+$ | $E_\gamma$: weighted average of 1102.1 *4* (2007Eg02), 1100.7 *5* (1976Ca24). $I_\gamma$: absolute value 6.9 % *6* (Experimental error *5*) (2007Eg02). |
| 1121.2 | 5/2$^+$ | 1060.7 *10* | 10 | 60.34 | 1/2$^+$ | |
| | | 1121.2 *5* | 90 | 0.0 | 3/2$^+$ | |
| 1403.5 | 5/2$^+$ | 1403.5 *5* | 100 | 0.0 | 3/2$^+$ | |
| 1653.1 | 1/2$^+$,3/2 | 553.2 *10* | 21 | 1101.2 | 3/2$^+$ | |
| | | 782.9 *10* | 41 | 869.1 | 5/2$^+$ | |
| | | 1653.0 *5* | 38 | 0.0 | 3/2$^+$ | |
| 1877 | 1/2$^-$,3/2$^-$ | 1816.6 *10* | 100 | 60.34 | 1/2$^+$ | |
| 1912.2 | 1/2$^+$ | 810.5 *5* | 50 | 1101.2 | 3/2$^+$ | |
| | | 1852.3 *5* | 50 | 60.34 | 1/2$^+$ | |
| 1960.3 | 1/2$^+$ | 1051.4 *10* | 19 | 908.6 | 5/2$^+$ | |
| | | 1091.7 *10* | 52 | 869.1 | 5/2$^+$ | |
| | | 1899.9 *5* | 29 | 60.34 | 1/2$^+$ | |
| 2067.2 | (3/2$^+$) | 966.0 *10* | 100 | 1101.2 | 3/2$^+$ | |
| 2113.6 | (3/2$^+$,5/2$^+$) | 2113.6 *10* | 100 | 0.0 | 3/2$^+$ | |
| 2163.6 | (1/2,3/2) | 1254.5 *10* | 27 | 908.6 | 5/2$^+$ | |
| | | 2103.7 *10* | 56 | 60.34 | 1/2$^+$ | |
| | | 2163.7 *20* | 17 | 0.0 | 3/2$^+$ | |
| 2242.8 | | 1141.7 *10* | 17 | 1101.2 | 3/2$^+$ | |
| | | 2242.8 *5* | 83 | 0.0 | 3/2$^+$ | |
| 2285.2 | 3/2$^+$,5/2$^+$ | 2285.2 *5* | 100 | 0.0 | 3/2$^+$ | |
| 2524.8 | | 2524.0 *20* | 100 | 0.0 | 3/2$^+$ | |
| (6170.3) | | 3644.2 *25* | | 2524.8 | | |
| | | 3884.7 *25* | | 2285.2 | 3/2$^+$,5/2$^+$ | |
| | | 3927.6 *25* | | 2242.8 | | |
| | | 4007.3 *25* | | 2163.6 | (1/2,3/2) | |
| | | 4057.3 *25* | | 2113.6 | (3/2$^+$,5/2$^+$) | |
| | | 4104.7 *25* | | 2067.2 | (3/2$^+$) | |
| | | 4209.7 *25* | | 1960.3 | 1/2$^+$ | |
| | | 4257.4 *25* | | 1912.2 | 1/2$^+$ | |
| | | 4294.8 *25* | | 1877 | 1/2$^-$,3/2$^-$ | |
| | | 4306[#] *3* | | 1864? | | |

Continued on next page (footnotes at end of table)

## $^{120}$Sn(n,$\gamma$) 1976Ca24,1981Ba53,2007Eg02 (continued)

### $\gamma(^{121}Sn)$ (continued)

| $E_i$(level) | $J_i^\pi$ | $E_\gamma$ † | $E_f$ | $J_f^\pi$ | $E_i$(level) | $J_i^\pi$ | $E_\gamma$ † | $E_f$ | $J_f^\pi$ |
|---|---|---|---|---|---|---|---|---|---|
| (6170.3) | | 4517.1 *25* | 1653.1 | $1/2^+$,3/2 | (6170.3) | | 5263 *3* | 908.6 | $5/2^+$ |
| | | 4768.4 *20* | 1403.5 | $5/2^+$ | | | 5302 *3* | 869.1 | $5/2^+$ |
| | | 5049.3 *20* | 1121.2 | $5/2^+$ | | | 6110.1 *20* | 60.34 | $1/2^+$ |
| | | 5069.1 *20* | 1101.2 | $3/2^+$ | | | 6170.2 *20* | 0.0 | $3/2^+$ |

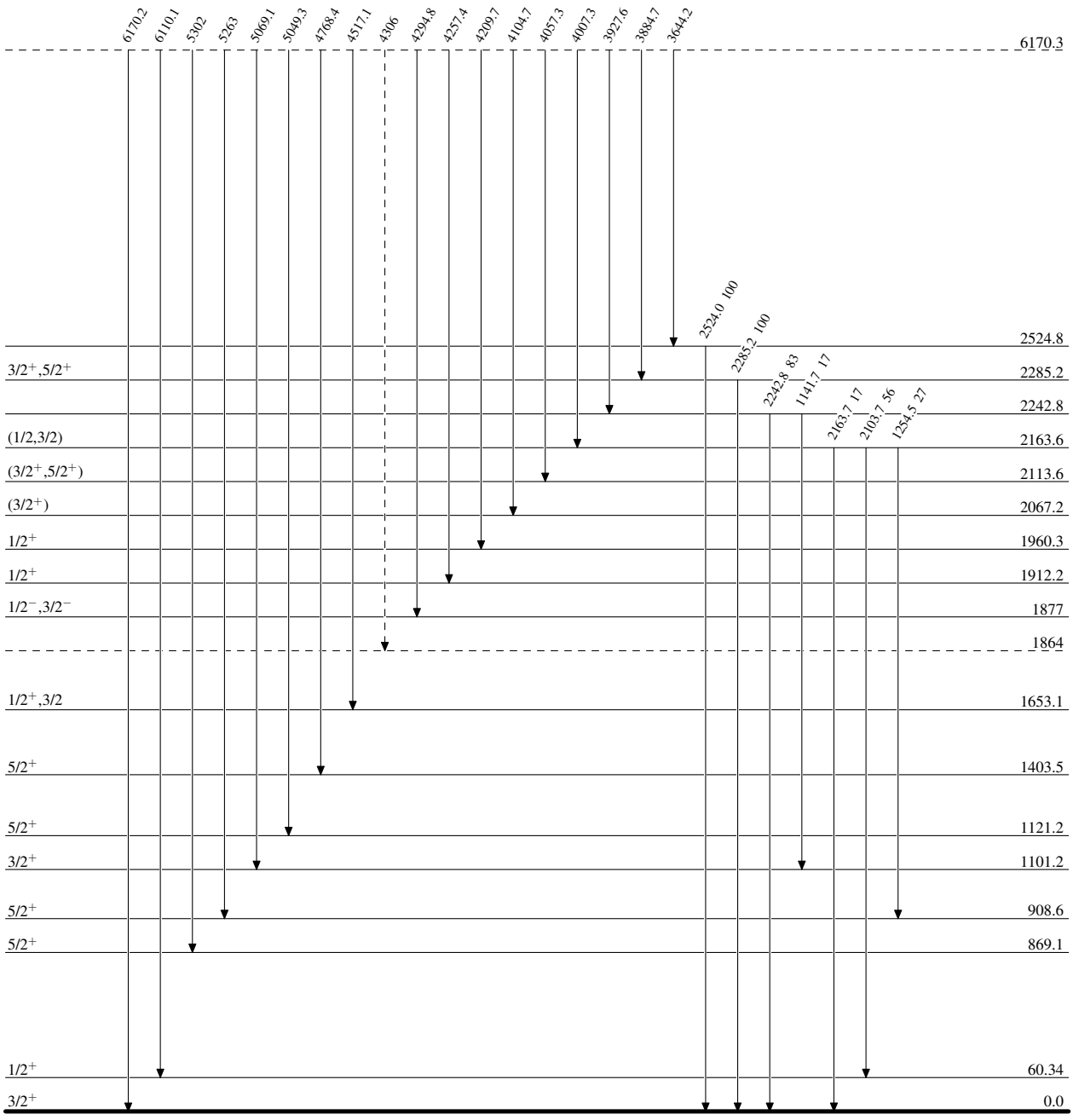
† From 1976Ca24, except where noted otherwise. Calibrated with $\gamma^{\pm}$, $^{56}$Fe(n,$\gamma$), $^{1}$H(n,$\gamma$).
‡ From 1976Ca24. The values are % photon branching from each level at 90°; calibrated with $^{53}$Cr(n,$\gamma$) and $^{66}$Ga, $^{226}$Ra gammas; primary $\gamma$ ray intensities from the 365-, 427-, 922-, 951-, 1286-, 1422- and 1716-eV resonances are given in 1976Ca24.
# Placement of transition in the level scheme is uncertain.
x $\gamma$ ray not placed in level scheme.

**$^{120}$Sn(n,γ) 1976Ca24,1981Ba53,2007Eg02** Legend

## Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)




$^{121}_{50}Sn_{71}$

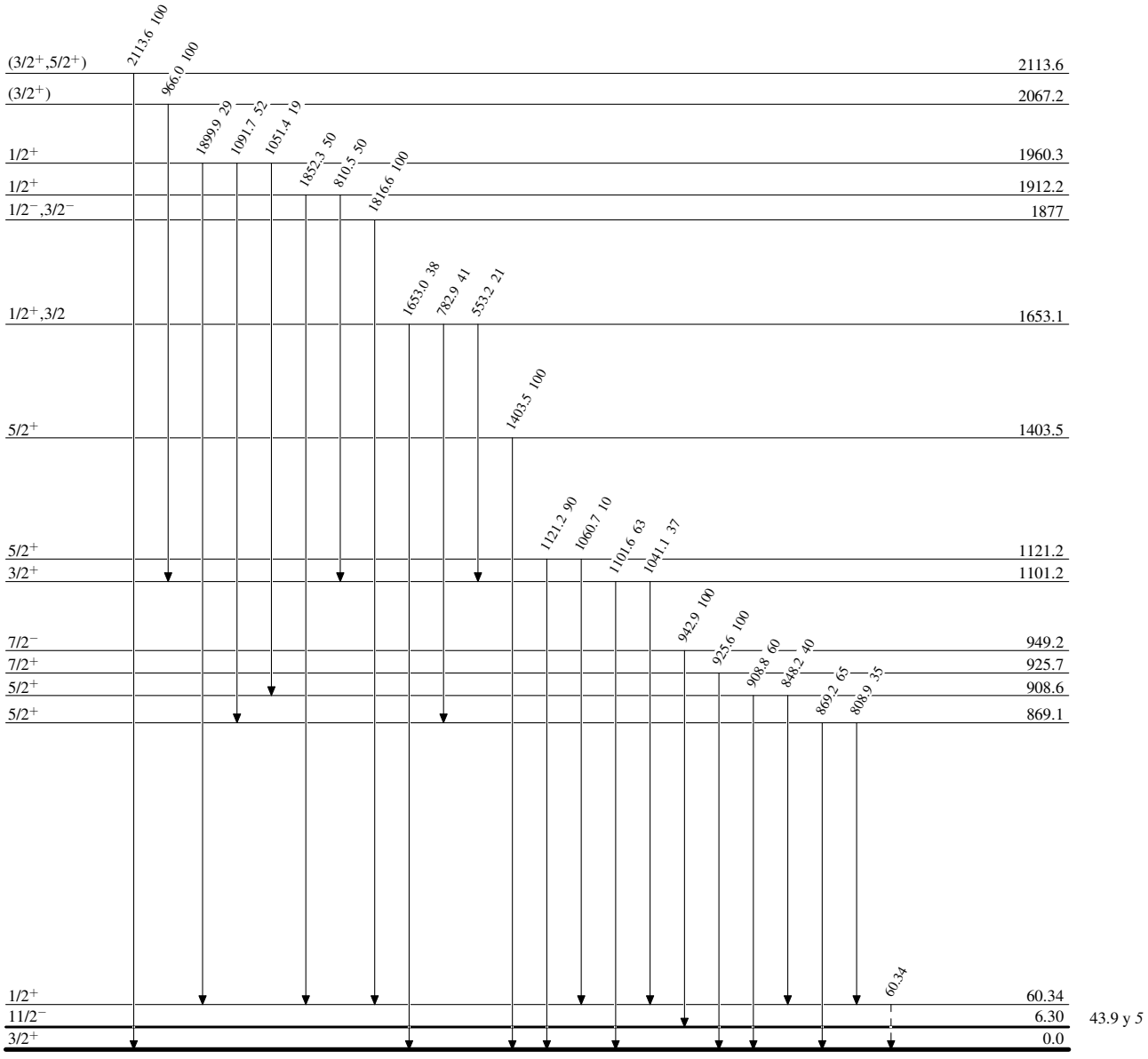
## $^{120}$Sn(n,γ) 1976Ca24,1981Ba53,2007Eg02

Legend

### Level Scheme (continued)

Intensities: % photon branching from each level

- - - - - - ► γ Decay (Uncertain)




$^{121}_{50}Sn_{71}$