

$^{122}\text{Sn}(\text{d},\text{p}\gamma)$ 1976Ma09

Type	Author	History Citation	Literature Cutoff Date
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1976Ma09: E=5-10 MeV deuteron beams were produced from the tandem of Institute of Physics at University of Uppsala. Targets were 2.5-3.5 mg/cm³ ^{122}Sn (92% to 98.5% enriched). γ rays were detected with two Ge(Li) detectors and a LEPS; protons were detected with an annular Si detector; conversion electrons were detected with a Lithium-drifted Si detector (FWHM $\approx$ 2 keV at 975 keV). Measured $E\gamma$, $I\gamma$, E(ce), I(ce), excitation functions, $\gamma\gamma$ -coin, $\text{p}\gamma$ -coin. Deduced levels, J, π , conversion coefficients, γ -ray multiplicities. Systematics of neighboring Sn isotopes.

The level scheme is that proposed by **1976Ma09**. The evaluator added tentatively the levels at 619.0 and 1044.6 based on ^{123}In β^- decay, to place 619.0 γ and 1020.0 γ , respectively.

 ^{123}Sn Levels

E(level) [†]	J π [‡]	Comments
0.0	11/2 ⁻	
24.6	3/2 ⁺	Additional information 1. E(level): from Adopted Levels.
150.48 19	1/2 ⁺	
619.0 3	(9/2) ⁻	
870.5 4	(5/2) ⁺	
920.5 6	(3/2) ⁺	
931.3 8	7/2 ⁻	
1044.6 10	(7/2) ⁺	
1071.1 7	(1/2,3/2) ⁺	
1136.4 7	(1/2,3/2,5/2) ⁺	
1195.4 10	(5/2) ⁺	
1488.8? 10	(5/2) ⁺	

[†] From a least-squares fit to γ -ray energies, unless otherwise noted.

[‡] From Adopted Levels.

 $\gamma(^{123}\text{Sn})$

Experimental K-shell coefficients in **1976Ma09** are normalized to theoretical $\alpha(\text{K})$ for 845.9 γ assuming Mult=E2.

E_γ	I_γ	$E_i(\text{level})$	J π_i	E_f	J π_f	Mult. [†]	α [‡]	Comments
125.9 2	100	150.48	1/2 ⁺	24.6	3/2 ⁺			
619.0 3	17 3	619.0	(9/2) ⁻	0.0	11/2 ⁻	M1,E2	0.00416	$\alpha(\text{K})=0.00354$; $\alpha(\text{L})=0.00046$ Mult.: from $\alpha(\text{K})_{\text{exp}}=0.0028$ 5, mostly E2.
*626.2 8	2.2 5							
*676.0 4	6.1 6							
719.9 8	2.2 5	870.5	(5/2) ⁺	150.48	1/2 ⁺			
770.3 9	4.1 5	920.5	(3/2) ⁺	150.48	1/2 ⁺	M1	0.00288	$\alpha(\text{K})=0.00248$; $\alpha(\text{L})=0.00030$ Mult.: from $\alpha(\text{K})_{\text{exp}}=0.0027$ 5.
845.9 4	17.8 18	870.5	(5/2) ⁺	24.6	3/2 ⁺	[E2]		
895.6 8	11.7 11	920.5	(3/2) ⁺	24.6	3/2 ⁺	M1,E2		Mult.: from $\alpha(\text{K})_{\text{exp}}=0.0015$ 2, mostly E2.
920.9 8	5.6 5	1071.1	(1/2,3/2) ⁺	150.48	1/2 ⁺	M1+E2		$\alpha(\text{K})=0.00149$; $\alpha(\text{L})=0.00018$ Mult.: from $\alpha(\text{K})_{\text{exp}}=0.0016$ 3.
931.3 8	14 3	931.3	7/2 ⁻	0.0	11/2 ⁻	E2		Mult.: from $\alpha(\text{K})_{\text{exp}}=0.00130$ 23.
985.6 10		1136.4	(1/2,3/2,5/2) ⁺	150.48	1/2 ⁺			

Continued on next page (footnotes at end of table)

$^{122}\text{Sn}(\text{d},\text{p}\gamma)$ [1976Ma09](#) (continued) $\gamma(^{123}\text{Sn})$ (continued)

E_γ	I_γ	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult. [†]	Comments
1020.0 <i>10</i>	13 <i>3</i>	1044.6	(7/2) ⁺	24.6	3/2 ⁺	(E2)	$\alpha(\text{K})=0.00119$; $\alpha(\text{L})=0.00014$ Mult.: M1,E2 from $\alpha(\text{K})_{\text{exp}}=0.00123$ 22; E2 consistent with ΔJ^π .
1046 <i>1</i>	4.9 <i>12</i>	1071.1	(1/2,3/2) ⁺	24.6	3/2 ⁺		
1112.0 <i>9</i>	9.5 <i>14</i>	1136.4	(1/2,3/2,5/2) ⁺	24.6	3/2 ⁺	M1,E2	$\alpha(\text{K})=0.00098$ <i>10</i> ; $\alpha(\text{L})=0.00012$ <i>1</i> Mult.: from $\alpha(\text{K})_{\text{exp}}=0.00097$ <i>16</i> .
^x 1130.8 <i>13</i>	2.2 <i>7</i>						
1170.8 <i>10</i>	11.9 <i>12</i>	1195.4	(5/2) ⁺	24.6	3/2 ⁺	M1,E2	$\alpha(\text{K})=0.00088$ <i>11</i> ; $\alpha(\text{L})=0.00011$ <i>1</i> Mult.: from $\alpha(\text{K})_{\text{exp}}=0.00095$ <i>16</i> .
1464.2 [#] <i>10</i>	4.3 <i>4</i>	1488.8?	(5/2) ⁺	24.6	3/2 ⁺		

[†] From $\alpha(\text{K})_{\text{exp}}$ in [1976Ma09](#).

[‡] Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on γ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

[#] Placement of transition in the level scheme is uncertain.

^x γ ray not placed in level scheme.

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Level Scheme

Intensities: Relative I_γ

Legend

- $I_\gamma < 2\% \times I_\gamma^{\text{max}}$
- $I_\gamma < 10\% \times I_\gamma^{\text{max}}$
- $I_\gamma > 10\% \times I_\gamma^{\text{max}}$
- - - - -→ γ Decay (Uncertain)
- Coincidence

