

<sup>120</sup>Sn(<sup>32</sup>S,3nγ) 1981Ha17

Type	Author	History	Citation	Literature Cutoff Date
Full Evaluation	Balraj Singh and Jun Chen		NDS 185, 2 (2022)	23-Aug-2022

**1981Ha17:** E=145 MeV <sup>32</sup>S beam was produced from the Chalk River MP Tandem Van de Graaff. Target was ≈2 mg/cm<sup>2</sup> <sup>120</sup>Sn on a lead backing. γ rays were detected with Ge(Li) and NaI(Tl) detectors. Measured Eγ, γγ-coin, γ(t), excitation functions. Deduced levels.

Also includes the following measurements:

**1980Ja16:** <sup>144</sup>Sm(<sup>12</sup>C,α3nγ) E=70-130 MeV. Measured γ, γγ, γ(t) for isomers; delayed γ-multiplicity.

**1979Ha29:** (<sup>12</sup>C,Xγ) E=70, 80, 101, 120 MeV on targets of <sup>139</sup>La, <sup>141</sup>Pr, <sup>142</sup>Nd, <sup>144</sup>Nd, <sup>146</sup>Nd, <sup>144</sup>Sm, <sup>148</sup>Sm, <sup>150</sup>Sm, <sup>152</sup>Gd, <sup>154</sup>Gd. Measured γ, γ(t), isomers; 11 delayed γ rays reported; average γ multiplicity.

Level scheme is from the Adopted Levels, Gammas, based on results from **1980Da18** up to 3885 level and from **1983JuZY** above that in (α,7nγ), which is a substantial revision of a tentative scheme proposed by **1981Ha17** in this study. The order of the 741γ-491γ cascade tentatively proposed in **1981Ha17**, resulting an intermediate level at 6669, has been reversed based on later studies by **1996Gu17** in <sup>122</sup>Sn(<sup>32</sup>S,5nγ) and **2002Go06** in <sup>141</sup>Pr(<sup>16</sup>O,p7nγ), resulting an intermediate level at 6919, instead.

<sup>149</sup>Dy Levels

E(level) <sup>†</sup>	J <sup>π</sup> <sup>‡</sup>	T <sub>1/2</sub>	Comments
0.0	7/2 <sup>-</sup>		
1073.2 3	13/2 <sup>+</sup>		
2251.8 5	17/2 <sup>+</sup>		
2550.4 6	21/2 <sup>+</sup>		
2660.8 6	27/2 <sup>-</sup>	0.490 s 15	T <sub>1/2</sub> : from the Adopted Levels.
3644.8 7			
3884.8 8			
4154.9 8			E(level): this level corresponds to the 5747 level in the Adopted Levels.
4585.1 9			E(level): this level corresponds to the 6177 level in the Adopted Levels.
5076.0 9			E(level): this level corresponds to the 7409 level in the Adopted Levels.
5817.0 9			E(level): this level corresponds to the 6918 and 7409 level in the Adopted Levels.
7153.8 10			E(level): this level corresponds to the 5221 level in the Adopted Levels.
7210.0 10			E(level): this level corresponds to the 5477 level in the Adopted Levels.
7409.5 10	45/2,47/2,49/2	28 ns 3	E(level): this isomer corresponds to the 8520 level in the Adopted Levels. T <sub>1/2</sub> : weighted average of 29 ns 3 ( <b>1979Ha29</b> ), 25 ns 5 ( <b>1980Ja16</b> ) and 28 ns 3 ( <b>1981Ha17</b> ).

<sup>†</sup> From a least-squares fit to γ-ray energies.

<sup>‡</sup> As given by **1981Ha17**. See the Adopted Levels for assignments for levels above 3.5 MeV excitation.

γ(<sup>149</sup>Dy)

E <sub>γ</sub> <sup>†</sup>	E <sub>i</sub> (level)	J <sub>i</sub> <sup>π</sup>	E <sub>f</sub>	J <sub>f</sub> <sup>π</sup>	Comments
110.4 3	2660.8	27/2 <sup>-</sup>	2550.4	21/2 <sup>+</sup>	Mult=E3 in Adopted Gammas.
199.5 3	7409.5	45/2,47/2,49/2	7210.0		This γ placed from 4084 level in the Adopted dataset.
240.0 3	3884.8		3644.8		
255.7 3	7409.5	45/2,47/2,49/2	7153.8		This γ placed from 5477 level in the Adopted dataset.
270.1 3	4154.9		3884.8		This γ placed from 5747 level in the Adopted dataset.
298.6 3	2550.4	21/2 <sup>+</sup>	2251.8	17/2 <sup>+</sup>	
430.2 3	4585.1		4154.9		This γ placed from 6177 level in the Adopted dataset.
491.0 3	5076.0		4585.1		This γ placed from 7409 level in the Adopted dataset.
741.1 3	5817.0		5076.0		This γ placed from 6918 level in the Adopted dataset.
984.0 3	3644.8		2660.8	27/2 <sup>-</sup>	
<sup>x</sup> 1006					E <sub>γ</sub> : from <b>1979Ha29</b> only.
1073.2 3	1073.2	13/2 <sup>+</sup>	0.0	7/2 <sup>-</sup>	Mult=E3 in Adopted Gammas.

Continued on next page (footnotes at end of table)

$^{120}\text{Sn}(^{32}\text{S},3n\gamma)$  **1981Ha17** (continued) $\gamma(^{149}\text{Dy})$  (continued)

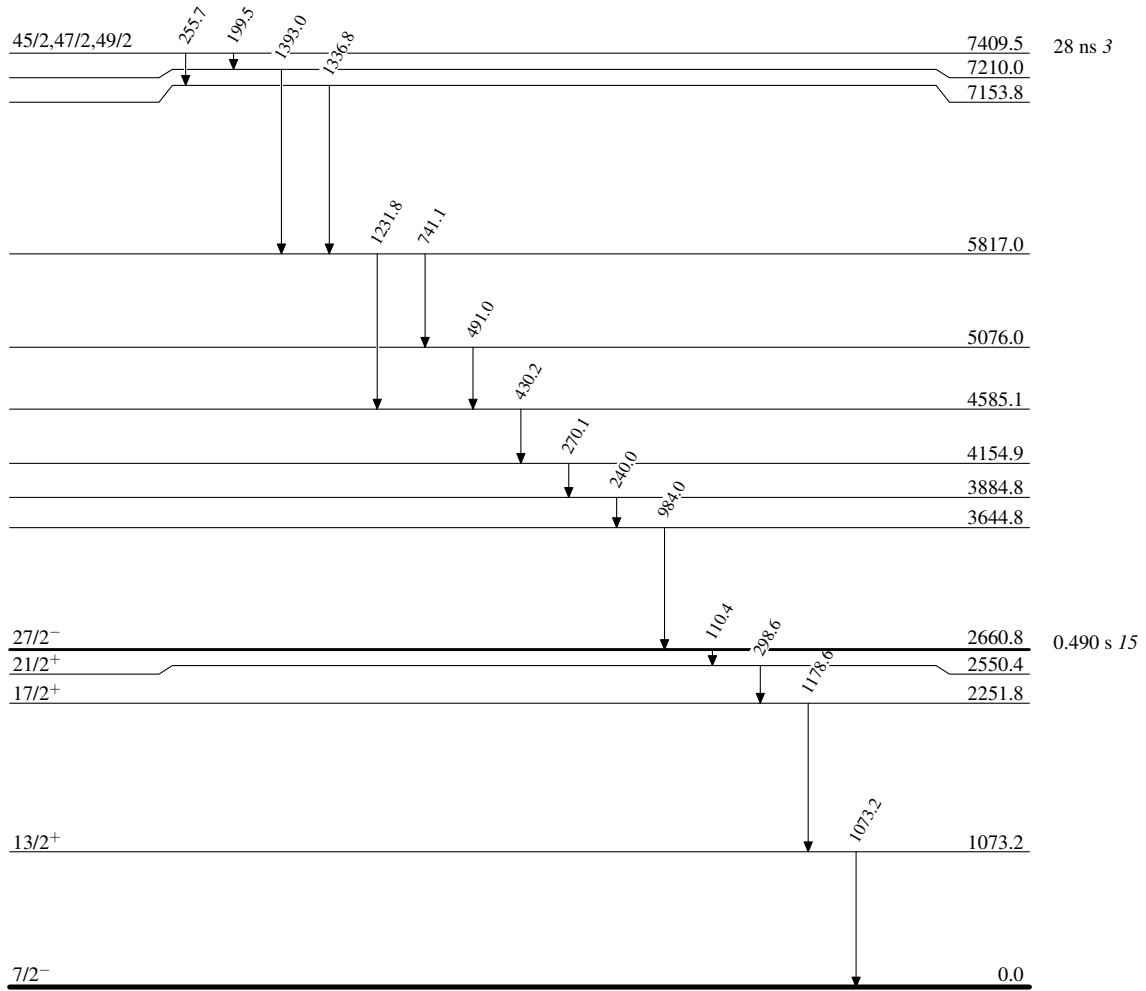
$E_\gamma$ †	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Comments
1178.6 3	2251.8	17/2 <sup>+</sup>	1073.2	13/2 <sup>+</sup>	
1231.8 3	5817.0		4585.1		This $\gamma$ placed from 7409 level in the Adopted dataset.
1336.8 3	7153.8		5817.0		This $\gamma$ placed from 5221 level in the Adopted Levels.
1393.0 3	7210.0		5817.0		This $\gamma$ placed from 5477 level in the Adopted Levels.

† From **1981Ha17**, unless otherwise stated. Placements of  $\gamma$  rays above 3.9 MeV excitation are different from those in the Adopted dataset, as noted in comments.

<sup>x</sup>  $\gamma$  ray not placed in level scheme.

$^{120}\text{Sn}(^{32}\text{S},3n\gamma)$  1981Ha17

## Level Scheme

 $^{149}_{66}\text{Dy}_{83}$