

$^{119}\text{Sn}(\alpha,2n\gamma), ^{121}\text{Sb}(d,2n\gamma)$  1979Ha47,1979Ha18

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

1979Ha18: E=19.8-27 MeV;  $\gamma$  singles, excitation functions,  $\gamma\gamma$  coincidence, linear polarization; deduced the half-life of the 443-keV level.

1979Ha47: semi  $\gamma$  singles, excitation functions,  $\gamma\gamma$ -coincidence,  $I\gamma(\theta)$ ; solenoidal electron spectrometer was used for ce. Also  $^{121}\text{Sb}(d,2n\gamma)$  E(d)=13.5 MeV was studied.

1980Io01:  $^{118}\text{Sn}(\alpha,2n\gamma)$  E=24 MeV;  $^{121}\text{Sb}(d,2n\gamma)$  E=12 MeV; beam delayed  $\gamma$  coincidence and differentially perturbed angular distribution; deduced the  $T_{1/2}$  and g-factor of the 443-keV level.

The level scheme is that proposed by 1979Ha47, however, a slight modification is made to place the cascading 244.8 $\gamma$ , 219.4 $\gamma$  directly on the 293.98 level, resulting in a level at 538.7 keV interconnecting the 293.89 keV, 11/2 $^-$  and the 758.4 keV, (7/2 $^-$ ) states, which is established in  $^{121}\text{I}$   $\varepsilon+\beta^+$  decay. The 1482 keV level was removed to accommodate with other in-beam studies.

 $^{121}\text{Te}$  Levels

E(level)	$J^\pi$ &	$T_{1/2}$	Comments
0.0	1/2 $^+$		
212.18@ 9	3/2 $^+$		Additional information 1.
293.98 $^\dagger$ 3	11/2 $^-$	164.2 d 8	Additional information 2.
438.57 $^\dagger$ 9	(9/2) $^-$		
443.08# 10	7/2 $^+$	85.3 ns 5	$\mu=+0.738$ 10 $\mu$ : from DPAD (1980Io01). $T_{1/2}$ : from beam- $\gamma(t)$ (1980Io01); other: 86 ns 6 (1979Ha47).
475.24@ 9	(5/2) $^+$		
532.14 22	3/2 $^+, 5/2^+$		
538.79 $^\dagger$ 10	(7/2) $^-$		
594.38 $^\ddagger$ 10	(5/2) $^+$		
682.98@ 9	(7/2) $^+$		
758.25 19	(7/2) $^-$		
830.50# 14	(9/2) $^+$		
887.7 $^\ddagger$ 4			
925.58 $^\dagger$ 10	(15/2) $^-$		
975.28 $^\dagger$ 9	(13/2) $^-$		
1018.41@ 17	(9/2) $^+$		
1080.26# 14	(11/2) $^+$		
1171.0 $^\ddagger$ 4			
1177.48 16	(11/2) $^-$		This level is proposed as 13/2 $^-$ in 1h $_{11/2}$ band in this reaction (1979Ha47), but reinterpreted as band head of $\gamma$ band based on 1h $_{11/2}$ in $^{116}\text{Cd}(^9\text{Be},4n\gamma)$ .
1207.99@ 13	(11/2) $^+$		
1419.44# 16	(13/2) $^+$		
1599.58 $^\dagger$ 13	(17/2) $^-$		
1654.28 $^\dagger$ 13	(19/2) $^-$		
1711.85# 17	(15/2) $^+$		
1806.69@ 24	(15/2) $^+$		
1851.48? 19			
2015.98 $^\dagger$ 14	(21/2) $^-$		
2070.3# 3	(17/2) $^+$		
2281.48 17	(23/2) $^+$		

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$^{119}\text{Sn}(\alpha,2n\gamma), ^{121}\text{Sb}(d,2n\gamma)$  **1979Ha47,1979Ha18** (continued)

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$^{121}\text{Te}$  Levels (continued)

<u>E(level)</u>	<u><math>J^{\pi}</math>&amp;</u>
2332.08 <sup>†</sup> 17	(23/2) <sup>-</sup>
2952.8 <sup>?</sup> 4	23/2,25/2

<sup>†</sup> Band(A): band built on  $1h_{11/2}$ .

<sup>‡</sup> Band(B): band built on  $2d_{5/2}$ .

# Band(C): band built on  $1g_{7/2}$ .

@ Band(D): band built on  $2d_{3/2}$ .

& From rotational band based on shell model configurations; band structures evidenced from M1, M1+E2(D(+Q)) cascades, and E2(Q) cross over transitions, and also from other in-beam studies.

<sup>119</sup>Sn( $\alpha,2n\gamma$ ),<sup>121</sup>Sb(d,2n $\gamma$ ) **1979Ha47,1979Ha18** (continued)

$\gamma(^{121}\text{Te})$										
$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult.#	$\delta^@$	$\alpha^b$	$I_\gamma^\ddagger$	Comments
144.6 1	36.8 4	438.57	(9/2) <sup>-</sup>	293.98	11/2 <sup>-</sup>	M1+E2	-0.29 10	0.259 13	41.1 3	ce(K)/( $\gamma$ +ce)=0.175 6; ce(L)/( $\gamma$ +ce)=0.025 3; ce(M)/( $\gamma$ +ce)=0.0050 6; ce(N+)/( $\gamma$ +ce)=0.00109 11 ce(N)/( $\gamma$ +ce)=0.00099 11; ce(O)/( $\gamma$ +ce)=0.000103 9 Mult.: A <sub>2</sub> =+0.14 6, A <sub>4</sub> =0.00 8, L(p)=-0.31 5; $\alpha$ (K)exp=0.17 2, K/L=7.6 10.
189.6& 2	1.2 3	1207.99	(11/2) <sup>+</sup>	1018.41	(9/2) <sup>+</sup>				0.2 1	I $\gamma$ : obscured or disturbed by other $\gamma$ in <sup>121</sup> Sb(d,2n $\gamma$ ).
202.1 2	1.1 3	1177.48	(11/2) <sup>-</sup>	975.28	(13/2) <sup>-</sup>					
207.7& 2	2.8 6	682.98	(7/2) <sup>+</sup>	475.24	(5/2) <sup>+</sup>				3.4 4	
212.2 1	100.0 7	212.18	3/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>	M1+E2	+0.226 8	0.0869	100	
219.4 2	1.8 3	758.25	(7/2) <sup>-</sup>	538.79	(7/2) <sup>-</sup>				4.6 5	ce(K)/( $\gamma$ +ce)=0.0687 9; ce(L)/( $\gamma$ +ce)=0.01240 18; ce(M)/( $\gamma$ +ce)=0.00253 4; ce(N+)/( $\gamma$ +ce)=0.000532 8 ce(N)/( $\gamma$ +ce)=0.000486 7; ce(O)/( $\gamma$ +ce)=4.65×10 <sup>-5</sup> 7 Mult.: A <sub>2</sub> =+0.19 4, A <sub>4</sub> =-0.03 6, L(p)=+0.30 8; $\alpha$ (K)exp=0.077 4, K/L=5.0 6.
230.9 1	57.3 5	443.08	7/2 <sup>+</sup>	212.18	3/2 <sup>+</sup>	E2		0.0919	51.3 8	
244.8 1	14.5 4	538.79	(7/2) <sup>-</sup>	293.98	11/2 <sup>-</sup>	[E2]		0.0755	28.2 3	ce(K)/( $\gamma$ +ce)=0.0575 8; ce(L)/( $\gamma$ +ce)=0.01012 15; ce(M)/( $\gamma$ +ce)=0.00206 3; ce(N+)/( $\gamma$ +ce)=0.000435 7 ce(N)/( $\gamma$ +ce)=0.000396 6; ce(O)/( $\gamma$ +ce)=3.82×10 <sup>-5</sup> 6 Mult.: A <sub>2</sub> =+0.04 5, A <sub>4</sub> =-0.07 6; $\alpha$ (K)exp=0.043 6, M1+E2 was assigned (1979Ha47).
249.8& 2	1.2 3	1080.26	(11/2) <sup>+</sup>	830.50	(9/2) <sup>+</sup>				0.5 1	$\alpha$ (K)=0.01132 16; $\alpha$ (L)=0.001403 20; $\alpha$ (M)=0.000278 4; $\alpha$ (N+)=6.05×10 <sup>-5</sup> 9 $\alpha$ (N)=5.47×10 <sup>-5</sup> 8; $\alpha$ (O)=5.81×10 <sup>-6</sup> 9 I $\gamma$ : not determined in <sup>121</sup> Sb(d,2n $\gamma$ ). Mult.: A <sub>2</sub> =-0.31 12, A <sub>4</sub> =0.00 15, L(p)=-0.31 9. $\delta$ : -0.03 7 (if D+Q).
263.2 2	1.3 4	475.24	(5/2) <sup>+</sup>	212.18	3/2 <sup>+</sup>				2.2 2	
265.5 1	7.0 4	2281.48	(23/2) <sup>+</sup>	2015.98	(21/2) <sup>-</sup>	(E1)		0.01307		
283.3 2	1.7 4	1171.0		887.7						I $\gamma$ : obscured or disturbed by other $\gamma$ in <sup>121</sup> Sb(d,2n $\gamma$ ).
292.3 3	3.1 5	1711.85	(15/2) <sup>+</sup>	1419.44	(13/2) <sup>+</sup>				7.2 2	I $\gamma$ : doublet(293.3 $\gamma$ +292.3 $\gamma$ ) in <sup>121</sup> Sb(d,2n $\gamma$ ).
293.3 3	4.4 5	887.7		594.38	(5/2) <sup>+</sup>				7.2 2	I $\gamma$ : doublet (293.3 $\gamma$ +292.3 $\gamma$ ) in <sup>121</sup> Sb(d,2n $\gamma$ ). Mult.: A <sub>2</sub> =-0.47 10, A <sub>4</sub> =-0.17 16 for (292.3 $\gamma$ +293.3 $\gamma$ ) $\alpha$ (K)exp=0.024 4 for (292.3 $\gamma$ +293.3 $\gamma$ ).
316.1 1	26.9 7	2332.08	(23/2) <sup>-</sup>	2015.98	(21/2) <sup>-</sup>	M1+E2	-0.06 4	0.0298	1.6 3	ce(K)/( $\gamma$ +ce)=0.0251 4; ce(L)/( $\gamma$ +ce)=0.00316 5; ce(M)/( $\gamma$ +ce)=0.000629 9; ce(N+)/( $\gamma$ +ce)=0.0001381 20 ce(N)/( $\gamma$ +ce)=0.0001246 18; ce(O)/( $\gamma$ +ce)=1.356×10 <sup>-5</sup> 20

$^{119}\text{Sn}(\alpha,2n\gamma),^{121}\text{Sb}(d,2n\gamma)$  **1979Ha47,1979Ha18** (continued)

$\gamma(^{121}\text{Te})$  (continued)

$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. #	$\delta^@$	$\alpha^b$	$I_\gamma^\ddagger$	Comments
										ce(N)/( $\gamma$ +ce)=0.0001246 18; ce(O)/( $\gamma$ +ce)=1.356 $\times 10^{-5}$ 20 Mult.: $A_2=-0.38$ 5, $A_4=0.00$ 7, L(p)=-0.27 4; $\alpha(\text{K})\text{exp}=0.024$ 2, K/L=8 2.
319.8 <sup>c</sup> 3	4.0 <sup>c</sup> 6	532.14	3/2 <sup>+</sup> ,5/2 <sup>+</sup>	212.18	3/2 <sup>+</sup>				6.2 3	I $\gamma$ : Multiply-placed $\gamma$ ray with intensity not divided in $^{121}\text{Sb}(d,2n\gamma)$ .
319.8 <sup>c</sup> 3	4.0 <sup>c</sup> 6	758.25	(7/2 <sup>-</sup> )	438.57	(9/2 <sup>-</sup> )				6.2 3	
339.2 1	5.2 5	1419.44	(13/2 <sup>+</sup> )	1080.26	(11/2 <sup>+</sup> )				1.3 3	
358.7 <sup>e</sup> 2	1.8 5	2070.3	(17/2 <sup>+</sup> )	1711.85	(15/2 <sup>+</sup> )				4.2 2	I $\gamma$ : not determined in $^{121}\text{Sb}(d,2n\gamma)$ .
361.7 1	71.0 9	2015.98	(21/2 <sup>-</sup> )	1654.28	(19/2 <sup>-</sup> )	M1+E2	-0.15 4	0.0211		ce(K)/( $\gamma$ +ce)=0.01789 25; ce(L)/( $\gamma$ +ce)=0.00225 4; ce(M)/( $\gamma$ +ce)=0.000449 7; ce(N+)/( $\gamma$ +ce)=9.85 $\times 10^{-5}$ 14 ce(N)/( $\gamma$ +ce)=8.89 $\times 10^{-5}$ 13; ce(O)/( $\gamma$ +ce)=9.67 $\times 10^{-6}$ 14 Mult.: $A_2=-0.52$ 4, $A_4=-0.01$ 5, L(p)=-0.20 3; $\alpha(\text{K})\text{exp}=0.019$ 2.
382.2 1	6.1 6	594.38	(5/2 <sup>+</sup> )	212.18	3/2 <sup>+</sup>				11.0 5	
387.4 1	21.6 7	830.50	(9/2 <sup>+</sup> )	443.08	7/2 <sup>+</sup>	M1+E2	-4.6 6	0.01728	15.4 4	ce(K)/( $\gamma$ +ce)=0.01434 20; ce(L)/( $\gamma$ +ce)=0.00212 3; ce(M)/( $\gamma$ +ce)=0.000428 6; ce(N+)/( $\gamma$ +ce)=9.17 $\times 10^{-5}$ 13 ce(N)/( $\gamma$ +ce)=8.33 $\times 10^{-5}$ 12; ce(O)/( $\gamma$ +ce)=8.47 $\times 10^{-6}$ 12 Mult.: $A_2=-0.27$ 5, $A_4=+0.14$ 7, L(p)=+0.19 2; $\alpha(\text{K})\text{exp}=0.014$ 4.
416.4 1	14.0 6	2015.98	(21/2 <sup>-</sup> )	1599.58	(17/2 <sup>-</sup> )	(E2)		0.01388		$\alpha(\text{K})=0.01174$ 17; $\alpha(\text{L})=0.001717$ 24; $\alpha(\text{M})=0.000346$ 5; $\alpha(\text{N}+)=7.42\mathbf{\times 10^{-5}}$ 11 $\alpha(\text{N})=6.74\mathbf{\times 10^{-5}}$ 10; $\alpha(\text{O})=6.88\mathbf{\times 10^{-6}}$ 10 I $\gamma$ : not determined in $^{121}\text{Sb}(d,2n\gamma)$ . Mult.: $A_2=+0.47$ 9, $A_4=-0.02$ 13, L(p)=+0.93 24; $\alpha(\text{K})\text{exp}=0.013$ 3.
<sup>x</sup> 419.6 3	2.5 5								2.1 3	
470.8 1	23.3 6	682.98	(7/2 <sup>+</sup> )	212.18	3/2 <sup>+</sup>	(E2)			26.0 5	ce(K)/( $\gamma$ +ce)=0.00815 12; ce(L)/( $\gamma$ +ce)=0.001156 17; ce(M)/( $\gamma$ +ce)=0.000232 4; ce(N+)/( $\gamma$ +ce)=5.01 $\times 10^{-5}$ 7 ce(N)/( $\gamma$ +ce)=4.54 $\times 10^{-5}$ 7; ce(O)/( $\gamma$ +ce)=4.68 $\times 10^{-6}$ 7 Mult.: $A_2=+0.24$ 7, $A_4=-0.03$ 9, L(p)=+0.39 15; $\alpha(\text{K})\text{exp}(475.2\gamma + 470.8\gamma)=0.0074$ 11.
475.2 1	19.6 5	475.24	(5/2 <sup>+</sup> )	0.0	1/2 <sup>+</sup>	(E2)			29.4 5	ce(K)/( $\gamma$ +ce)=0.00794 11; ce(L)/( $\gamma$ +ce)=0.001124 16; ce(M)/( $\gamma$ +ce)=0.000226 4; ce(N+)/( $\gamma$ +ce)=4.87 $\times 10^{-5}$ 7 ce(N)/( $\gamma$ +ce)=4.41 $\times 10^{-5}$ 7; ce(O)/( $\gamma$ +ce)=4.56 $\times 10^{-6}$ 7 Mult.: $A_2=+0.24$ 6, $A_4=-0.02$ 8, L(p)=+0.40 13; $\alpha(\text{K})\text{exp}(475.2\gamma + 470.8\gamma)=0.0074$ 11.
525.0 1	19.2 7	1207.99	(11/2 <sup>+</sup> )	682.98	(7/2 <sup>+</sup> )	(E2)			11.9 4	ce(K)/( $\gamma$ +ce)=0.00603 9; ce(L)/( $\gamma$ +ce)=0.000835 12; ce(M)/( $\gamma$ +ce)=0.0001674 24; ce(N+)/( $\gamma$ +ce)=3.62 $\times 10^{-5}$ 5

$^{119}\text{Sn}(\alpha,2n\gamma),^{121}\text{Sb}(d,2n\gamma)$  **1979Ha47,1979Ha18** (continued)

$\gamma(^{121}\text{Te})$  (continued)

$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult. #	$\delta^\oplus$	$I_\gamma^\ddagger$	Comments
532.3 3	9.5 6	532.14	3/2 <sup>+</sup> ,5/2 <sup>+</sup>	0.0	1/2 <sup>+</sup>			9.5 4	ce(N)/( $\gamma$ +ce)=3.28×10 <sup>-5</sup> 5; ce(O)/( $\gamma$ +ce)=3.41×10 <sup>-6</sup> 5 Mult.: A <sub>2</sub> =+0.22 6, A <sub>4</sub> =-0.09 8, L(p)=+0.32 13.
536.6 2	13.1 6	975.28	(13/2) <sup>-</sup>	438.57	(9/2) <sup>-</sup>	(E2)		6.0 4	ce(K)/( $\gamma$ +ce)=0.00568 8; ce(L)/( $\gamma$ +ce)=0.000783 11; ce(M)/( $\gamma$ +ce)=0.0001570 22; ce(N+)/( $\gamma$ +ce)=3.39×10 <sup>-5</sup> 5 ce(N)/( $\gamma$ +ce)=3.07×10 <sup>-5</sup> 5; ce(O)/( $\gamma$ +ce)=3.20×10 <sup>-6</sup> 5 E <sub>γ</sub> : adopted from level scheme (authors gave a value of 535.6 keV in their table). Mult.: A <sub>2</sub> =+0.21 11, A <sub>4</sub> =+0.04 15, L(p)=+0.37 22.
543.2 2	10.6 7	1018.41	(9/2 <sup>+</sup> )	475.24	(5/2) <sup>+</sup>	(Q)		10.4 4	Mult.: A <sub>2</sub> =+0.25 12, A <sub>4</sub> =-0.33 17.
588.8 2	23.4 8	1419.44	(13/2 <sup>+</sup> )	830.50	(9/2) <sup>+</sup>	(E2)		10.9 4	ce(K)/( $\gamma$ +ce)=0.00444 7; ce(L)/( $\gamma$ +ce)=0.000601 9; ce(M)/( $\gamma$ +ce)=0.0001203 17; ce(N+)/( $\gamma$ +ce)=2.61×10 <sup>-5</sup> 4 ce(N)/( $\gamma$ +ce)=2.36×10 <sup>-5</sup> 4; ce(O)/( $\gamma$ +ce)=2.47×10 <sup>-6</sup> 4 Mult.: A <sub>2</sub> =+0.26 5, A <sub>4</sub> =-0.08 7, L(p)=+0.40 11.
594.4 3	13.6 7	594.38	(5/2) <sup>+</sup>	0.0	1/2 <sup>+</sup>	(E2)		9.2 6	ce(K)/( $\gamma$ +ce)=0.00433 6; ce(L)/( $\gamma$ +ce)=0.000585 9; ce(M)/( $\gamma$ +ce)=0.0001171 17; ce(N+)/( $\gamma$ +ce)=2.54×10 <sup>-5</sup> 4 ce(N)/( $\gamma$ +ce)=2.30×10 <sup>-5</sup> 4; ce(O)/( $\gamma$ +ce)=2.41×10 <sup>-6</sup> 4 I <sub>γ</sub> : obscured or disturbed by other $\gamma$ in $^{121}\text{Sb}(d,2n\gamma)$ . Mult.: A <sub>2</sub> =+0.24 12, A <sub>4</sub> =+0.23 17, L(p)=+0.39 15; Mult.: A <sub>2</sub> =+0.35 9, A <sub>4</sub> =+0.01 12.
598.7 2	20.7 8	1806.69	(15/2 <sup>+</sup> )	1207.99	(11/2 <sup>+</sup> )	(Q)		11.8 6	
624.3& 3	21.9 14	1599.58	(17/2) <sup>-</sup>	975.28	(13/2) <sup>-</sup>	(E2)		3.3 4	ce(K)/( $\gamma$ +ce)=0.00381 6; ce(L)/( $\gamma$ +ce)=0.000511 8; ce(M)/( $\gamma$ +ce)=0.0001022 15; ce(N+)/( $\gamma$ +ce)=2.22×10 <sup>-5</sup> 4 ce(N)/( $\gamma$ +ce)=2.00×10 <sup>-5</sup> 3; ce(O)/( $\gamma$ +ce)=2.11×10 <sup>-6</sup> 3 Mult.: A <sub>2</sub> =+0.43 8, A <sub>4</sub> =-0.02 12, L(p)=+0.81 20.
631.6 <sup>d</sup> 1	207.5 <sup>d</sup> 30	925.58	(15/2) <sup>-</sup>	293.98	11/2 <sup>-</sup>	E2		45.0 12	ce(K)/( $\gamma$ +ce)=0.00370 6; ce(L)/( $\gamma$ +ce)=0.000495 7; ce(M)/( $\gamma$ +ce)=9.89×10 <sup>-5</sup> 14; ce(N+)/( $\gamma$ +ce)=2.15×10 <sup>-5</sup> 3 ce(N)/( $\gamma$ +ce)=1.94×10 <sup>-5</sup> 3; ce(O)/( $\gamma$ +ce)=2.05×10 <sup>-6</sup> 3 I <sub>γ</sub> : Multiply-placed $\gamma$ ray with intensity not divided in $^{121}\text{Sb}(d,2n\gamma)$ . Mult.: A <sub>2</sub> =+0.33 4, A <sub>4</sub> =-0.08 4, L(p)=+0.55 9; $\alpha$ (K)exp=0.0037 4.
631.6 <sup>d</sup> 1	19.5 <sup>d</sup> 10	1711.85	(15/2 <sup>+</sup> )	1080.26	(11/2 <sup>+</sup> )				
637.2 1	25.4 13	1080.26	(11/2 <sup>+</sup> )	443.08	7/2 <sup>+</sup>	(E2)		14.2 6	ce(K)/( $\gamma$ +ce)=0.00362 5; ce(L)/( $\gamma$ +ce)=0.000483 7; ce(M)/( $\gamma$ +ce)=9.66×10 <sup>-5</sup> 14; ce(N+)/( $\gamma$ +ce)=2.10×10 <sup>-5</sup> 3 ce(N)/( $\gamma$ +ce)=1.90×10 <sup>-5</sup> 3; ce(O)/( $\gamma$ +ce)=2.00×10 <sup>-6</sup> 3 Mult.: A <sub>2</sub> =+0.33 7, A <sub>4</sub> =+0.03 11, L(p)=+0.61 16.
650.9 2	9.6 7	2070.3	(17/2 <sup>+</sup> )	1419.44	(13/2 <sup>+</sup> )	(Q)		2.0 3	I <sub>γ</sub> : obscured or disturbed by other $\gamma$ in $^{121}\text{Sb}(d,2n\gamma)$ . Mult.: A <sub>2</sub> =+0.46 12, A <sub>4</sub> =-0.10 18.
674.0 <sup>c</sup> 1	35.2 <sup>c</sup> 11	1599.58	(17/2) <sup>-</sup>	925.58	(15/2) <sup>-</sup>	(M1+E2)	-0.9 5	5.4 4	ce(K)/( $\gamma$ +ce)=0.0036 3; ce(L)/( $\gamma$ +ce)=0.000454 23; ce(M)/( $\gamma$ +ce)=9.0×10 <sup>-5</sup> 5; ce(N+)/( $\gamma$ +ce)=1.98×10 <sup>-5</sup> 11 ce(N)/( $\gamma$ +ce)=1.78×10 <sup>-5</sup> 9; ce(O)/( $\gamma$ +ce)=1.93×10 <sup>-6</sup> 12

$\gamma$ (<sup>121</sup>Te) (continued)

$E_\gamma$	$I_\gamma^\dagger$	$E_i(\text{level})$	$J_i^\pi$	$E_f$	$J_f^\pi$	Mult.#	$I_\gamma^\ddagger$	Comments
674.0 <sup>ce</sup> 1	35.2 <sup>c</sup> 11	1851.48?		1177.48	(11/2 <sup>-</sup> )		7.5 4	I $\gamma$ : Multiply-placed $\gamma$ ray with intensity not divided in <sup>121</sup> Sb(d,2n $\gamma$ ). Mult.: A <sub>2</sub> =-0.98 5, A <sub>4</sub> =+0.07 8, L(p)=+0.14 4; $\alpha$ (K)exp=0.0039 9.
677.8 <sup>&amp;</sup> 3	11.6 10	2332.08	(23/2) <sup>-</sup>	1654.28	(19/2) <sup>-</sup>	(Q)	3.9 3	I $\gamma$ : Multiply-placed $\gamma$ ray with intensity not divided in <sup>121</sup> Sb(d,2n $\gamma$ ). Mult.: A <sub>2</sub> =+0.52 12, A <sub>4</sub> =+0.06 21.
681.3 1	45.0 13	975.28	(13/2) <sup>-</sup>	293.98	11/2 <sup>-</sup>	M1+E2	21.4 6	ce(K)/( $\gamma$ +ce)=0.0035 4; ce(L)/( $\gamma$ +ce)=0.00044 4; ce(M)/( $\gamma$ +ce)=8.7 $\times$ 10 <sup>-5</sup> 7; ce(N+)/( $\gamma$ +ce)=1.91 $\times$ 10 <sup>-5</sup> 16 ce(N)/( $\gamma$ +ce)=1.72 $\times$ 10 <sup>-5</sup> 15; ce(O)/( $\gamma$ +ce)=1.86 $\times$ 10 <sup>-6</sup> 19 Mult.: A <sub>2</sub> =-0.64 4, A <sub>4</sub> =+0.20 6, L(p)=+0.04 4; $\alpha$ (K)exp=0.0030 7. $\delta$ : -0.43 $\leq\delta\leq$ -0.28 or -2.3 $\leq\delta\leq$ -1.6. $\delta$ value given in the authors' table for the 677.8 keV, shown as (E2). was interpreted as the data for this $\gamma$ ray.
<sup>x</sup> 724.4 3	9.9 12						7.4 6	This $\gamma$ was placed from 1482 keV level in <a href="#">1979Ha47</a> .
728.7 1	131.4 18	1654.28	(19/2) <sup>-</sup>	925.58	(15/2) <sup>-</sup>	E2	16.1 6	ce(K)/( $\gamma$ +ce)=0.00259 4; ce(L)/( $\gamma$ +ce)=0.000338 5; ce(M)/( $\gamma$ +ce)=6.75 $\times$ 10 <sup>-5</sup> 10; ce(N+)/( $\gamma$ +ce)=1.469 $\times$ 10 <sup>-5</sup> 21 ce(N)/( $\gamma$ +ce)=1.328 $\times$ 10 <sup>-5</sup> 19; ce(O)/( $\gamma$ +ce)=1.411 $\times$ 10 <sup>-6</sup> 20 Mult.: A <sub>2</sub> =+0.31 3, A <sub>4</sub> =-0.11 4, L(p)=+0.47 7; $\alpha$ (K)exp=0.0023 3.
739.0 <sup>&amp;</sup> 2	13.4 11	1177.48	(11/2) <sup>-</sup>	438.57	(9/2) <sup>-</sup>		4.0 3	Mult.: A <sub>2</sub> =+0.08 12, A <sub>4</sub> =+0.06 22.
936.8 <sup>a</sup> 3		2952.8?	23/2,25/2	2015.98	(21/2) <sup>-</sup>			

<sup>†</sup> I( $\gamma$ 's) are relative to I(212.2 $\gamma$ )=100 at  $\theta=125^\circ$  and E( $\alpha$ )=27 MeV.

<sup>‡</sup> From [1979Ha47](#): Intensity is normalized to 100 for 212.2 $\gamma$  in <sup>121</sup>Sb(d,2n $\gamma$ ).

<sup>#</sup> Deduced from  $\alpha$ (K)exp, K/L,  $\gamma$ ( $\theta$ ) and linear polarization; angular distribution coefficients A<sub>2</sub>, A<sub>4</sub> values, linear polarization L(p) values in [1979Ha47](#), and  $\alpha$ (K)exp values are given in comments.

<sup>@</sup> Center values and symmetric uncertainty value have been deduced by evaluators from upper and lower limits in <sup>119</sup>Sn( $\alpha$ ,2n $\gamma$ ).

<sup>&</sup> Influenced by  $\gamma$  rays not listed with these data; but detail is not given in [1979Ha47](#).

<sup>a</sup> Doublet; deduced from coincidence.

<sup>b</sup> Total theoretical internal conversion coefficients, calculated using the BrIcc code ([2008Ki07](#)) with Frozen orbital approximation based on  $\gamma$ -ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

<sup>c</sup> Multiply placed with undivided intensity.

<sup>d</sup> Multiply placed with intensity suitably divided.

<sup>e</sup> Placement of transition in the level scheme is uncertain.

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

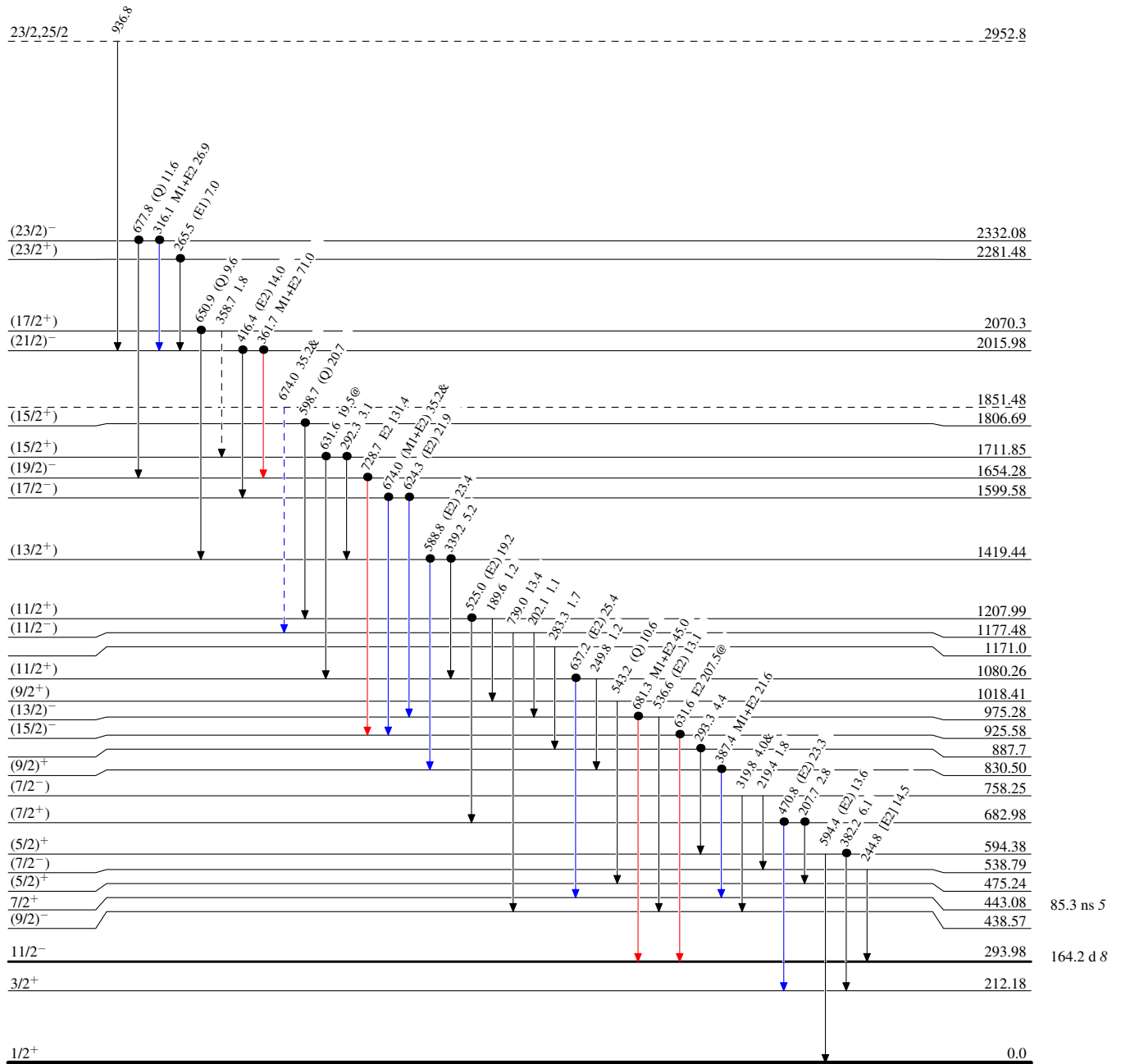
$^{119}\text{Sn}(\alpha,2n\gamma), ^{121}\text{Sb}(d,2n\gamma)$  1979Ha47,1979Ha18

## Level Scheme

Intensities: Relative  $I_\gamma$   
 & Multiply placed: undivided intensity given  
 @ Multiply placed: intensity suitably divided

## Legend

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

 $^{121}_{52}\text{Te}_{69}$

$^{119}\text{Sn}(\alpha,2n\gamma), ^{121}\text{Sb}(\text{d},2n\gamma)$  1979Ha47,1979Ha18

## Level Scheme (continued)

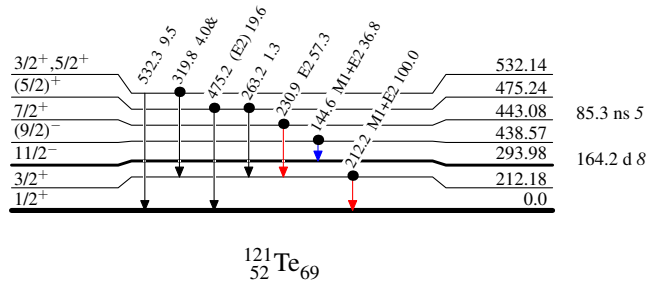
Intensities: Relative  $I_\gamma$ 

&amp; Multiply placed: undivided intensity given

@ Multiply placed: intensity suitably divided

## Legend

- $I_\gamma < 2\% \times I_\gamma^{max}$
- $I_\gamma < 10\% \times I_\gamma^{max}$
- $I_\gamma > 10\% \times I_\gamma^{max}$
- Coincidence





$^{119}\text{Sn}(\alpha,2n\gamma), ^{121}\text{Sb}(d,2n\gamma)$  1979Ha47,1979Ha18