

$^{203}\text{Tl}(\gamma, \gamma')$ **1974Al15, 1970Mo16, 2016Be31**

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 105,1 (2005)	1-Mar-2005

1974Al15: $E(\gamma)=6418.4$ keV 6 from $^{48}\text{Ti}(n, \gamma)$; Target: natural Tl; Detectors: a large volume (80 cm³) Ge(Li); Measured: $E\gamma$, $I\gamma$.

1970Mo16: $E(\gamma)=6418.4$ keV 6 from $^{48}\text{Ti}(n, \gamma)$; Target: enriched to 92.3% in ^{203}Tl ; Detectors: a small volume (20 cm³) Ge(Li); Measured: $E\gamma$, $I\gamma$, $\gamma(\theta)$, γ -ray polarization; Γ_γ .

2016Be31: $E\gamma=7.5$ MeV bremsstrahlung from the S-DALINAC accelerator and using Darmstadt High Intensity Photon Setup (DHIPS). Measured $E\gamma$, $I\gamma$, $\gamma(\theta)$ using a natural Tl target. Other: [2014Be09](#).

 ^{203}Tl Levels

E(level) [†]	J^π [‡]	$T_{1/2}$	Comments
0	1/2 ⁺		
279.1957 12	3/2 ⁺	283 ps 4	$T_{1/2}$: From Adopted Levels. Values from $^{203}\text{Tl}(\gamma, \gamma')$: 266 ps 45 (1956Me77), 293 ps 14 (1961De32), 194 ps 28 (1967Pa09) and 210 ps 30 (1971Sh35). μ : +0.35 26 in 1962De04 .
1044.3 4			
1074.0 5			
1113.63 21	(1/2, 3/2)		
1232.6 3	(1/2, 3/2)		
1293.9 5			
1321.6 8			
1337.3 16			
1407.89 24	(1/2, 3/2)		
1448.3 3	(1/2, 3/2)		
1639.9 6	(1/2, 3/2)		
1670.4 5			
1716.7 12			
1753.3 10			
1839.8 5	(1/2, 3/2)		
1886.8 6	(1/2, 3/2)		
1901.8 5			
1935.6 5			
1992.4 5			
2233.4 6			
2342.6 4			
2427.9 11			
2461.0 12			
2489.5 12			
2507.8 9			
2662.5? 11			
2742.8? 11			
2955.9? 11			
2966.5 10			
2987.9 12			
3013.0? 11			
3321.2 9			
5076.6 4		1.02 [#] eV 15	
5102.4 4		0.86 [#] eV 11	
6419.18 18	(1/2 ⁻)	32×10 ⁻⁵ keV 6	$T_{1/2}$: From 1970Mo16 . $\Gamma(0)/\Gamma(\gamma)=0.26$ in 1970Mo16 .

[†] From a least-squares fit to $E\gamma$.

[‡] From [1970Mo16](#).

[#] Value corresponds to $g\Gamma^2/\Gamma$ with $g=(2J+1)/2$ ([2016Be31](#)).

$^{203}\text{Tl}(\gamma, \gamma')$ **1974Al15, 1970Mo16, 2016Be31 (continued)**

$\gamma(^{203}\text{Tl})$								Comments
$E_\gamma^\dagger$	$I_\gamma^\dagger$	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	δ	
279.1952 10		279.1957	3/2 ⁺	0	1/2 ⁺	M1+E2	+1.20 -12+20	E_γ : From adopted gammas. Mult.: From $\gamma(\theta)$ in 1970Mo16 . δ : From 1961De32 .
765.5 5	0.7	1044.3		279.1957	3/2 ⁺			
795.7 6	1.7	1074.0		279.1957	3/2 ⁺			
834.3 3	14.8	1113.63	(1/2,3/2)	279.1957	3/2 ⁺			
953.3 5	2.4	1232.6	(1/2,3/2)	279.1957	3/2 ⁺			
1043.5 & 8	0.5 &	1044.3		0	1/2 ⁺			
1043.5 &	0.5 &	1321.6		279.1957	3/2 ⁺			
1113.6 4	6.3	1113.63	(1/2,3/2)	0	1/2 ⁺			
1127.1 8	1.4	1407.89	(1/2,3/2)	279.1957	3/2 ⁺			
1169.2 4	6.3	1448.3	(1/2,3/2)	279.1957	3/2 ⁺			
1232.3 7	0.9	1232.6	(1/2,3/2)	0	1/2 ⁺			
1293.9 5	2.8	1293.9		0	1/2 ⁺			
1386.0 20	0.9	1670.4		279.1957	3/2 ⁺			
1408.1 3	17.6	1407.89	(1/2,3/2)	0	1/2 ⁺			
1447.1 7	0.8	1448.3	(1/2,3/2)	0	1/2 ⁺			
1464.0 18	0.7	2507.8		1044.3				
^x 1535.7 8	0.8							
1609.4 11	0.7	1886.8	(1/2,3/2)	279.1957	3/2 ⁺			
1624.0 11	0.5	1901.8		279.1957	3/2 ⁺			
1671.2 6	1.0	1670.4		0	1/2 ⁺			
1713.3 11	0.5	1992.4		279.1957	3/2 ⁺			
1840.4 11	0.6	1839.8	(1/2,3/2)	0	1/2 ⁺			
1901.5 11	1.0	1901.8		0	1/2 ⁺			
^x 2204 #								
2342.1 4	1.3	2342.6		0	1/2 ⁺			
^x 2632.5 6	0.4							
^x 2875 #								
3098.0 8	0.6	6419.18	(1/2 ⁻)	3321.2				
3406.2 ‡ 10	0.4	6419.18	(1/2 ⁻)	3013.0?				
3431.3 11	0.3	6419.18	(1/2 ⁻)	2987.9				
3452.7 9	0.3	6419.18	(1/2 ⁻)	2966.5				
3463.3 ‡ 10	0.2	6419.18	(1/2 ⁻)	2955.9?				
^x 3543 #								
3676.3 ‡ 10	0.4	6419.18	(1/2 ⁻)	2742.8?				
3756.6 ‡ 10	0.3	6419.18	(1/2 ⁻)	2662.5?				
3911.4 9	0.4	6419.18	(1/2 ⁻)	2507.8				
3929.6 11	0.3	6419.18	(1/2 ⁻)	2489.5				
3958.1 11	0.6	6419.18	(1/2 ⁻)	2461.0				
3991.2 ‡ 10	1.0	6419.18	(1/2 ⁻)	2427.9				
4075.9 5	1.4	6419.18	(1/2 ⁻)	2342.6				
4185.7 5	0.5	6419.18	(1/2 ⁻)	2233.4				
4426.8 5	0.7	6419.18	(1/2 ⁻)	1992.4				
4483.5 4	1.9	6419.18	(1/2 ⁻)	1935.6				
4517.7 6	0.8	6419.18	(1/2 ⁻)	1901.8				
4532.9 6	1.6	6419.18	(1/2 ⁻)	1886.8	(1/2,3/2)			
4579.4 5	2.5	6419.18	(1/2 ⁻)	1839.8	(1/2,3/2)			
4665.8 9	0.5	6419.18	(1/2 ⁻)	1753.3				
4702.4 11	0.4	6419.18	(1/2 ⁻)	1716.7				
4749.3 8	0.6	6419.18	(1/2 ⁻)	1670.4				

Continued on next page (footnotes at end of table)

$^{203}\text{Tl}(\gamma, \gamma')$ **1974Al15, 1970Mo16, 2016Be31** (continued) $\gamma(^{203}\text{Tl})$ (continued)

E_γ †	I_γ †	$E_i(\text{level})$	J_i^π	E_f	J_f^π	Mult.	Comments
4779.2 5	2.0	6419.18	(1/2 ⁻)	1639.9	(1/2, 3/2)		
4970.6 4	7.5	6419.18	(1/2 ⁻)	1448.3	(1/2, 3/2)		
5011.2 4	14.6	6419.18	(1/2 ⁻)	1407.89	(1/2, 3/2)		
5076.5 @ 4		5076.6		0	1/2 ⁺		W(90°)/W(130°)=0.84 2I.
5081.8 16	0.1	6419.18	(1/2 ⁻)	1337.3			
5099.3 13	0.2	6419.18	(1/2 ⁻)	1321.6			
5102.3 @ 4		5102.4		0	1/2 ⁺		W(90°)/W(130°)=0.89 2I.
5186.4 4	2.9	6419.18	(1/2 ⁻)	1232.6	(1/2, 3/2)		
5305.2 4	17	6419.18	(1/2 ⁻)	1113.63	(1/2, 3/2)	(E1)	
5346.0 6	0.4	6419.18	(1/2 ⁻)	1074.0			
5375.2 10	0.3	6419.18	(1/2 ⁻)	1044.3			
6139.6 5	12.3	6419.18	(1/2 ⁻)	279.1957	3/2 ⁺		
6419.1 5	27.9	6419.18	(1/2 ⁻)	0	1/2 ⁺	(E1)	

† From **1974Al15**, unless otherwise stated. $\Delta I_\gamma \approx 10\%$ for the stronger lines (**1974Al15**).

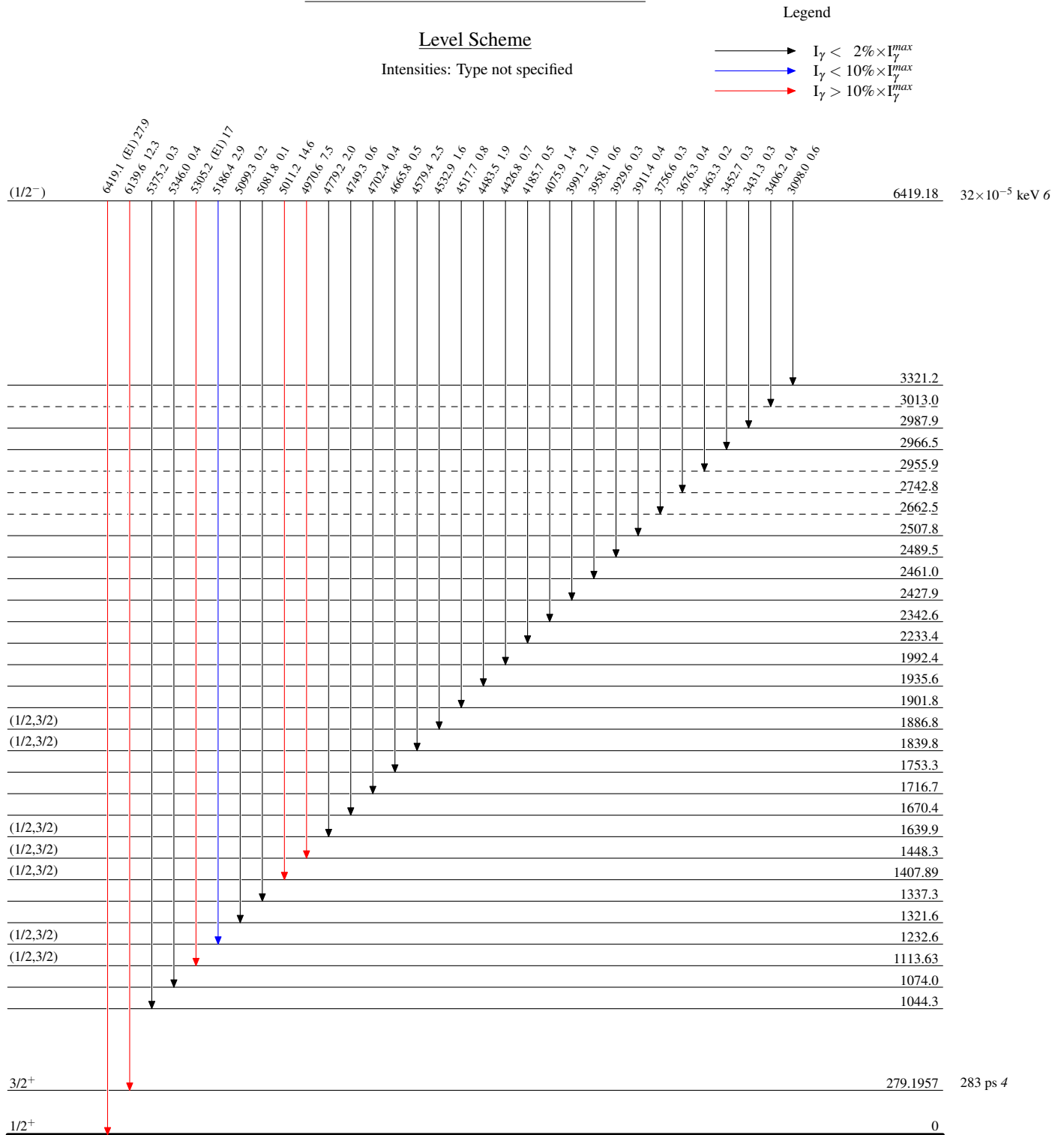
‡ Complex line.

From **1970Mo16**.

@ From **2016Be31**.

& Multiply placed with undivided intensity.

^x γ ray not placed in level scheme.

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Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

Legend

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

