^{203}Tl(n,n′γ) 1981He14,2020Fo05

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

1981He14: E(n)=2.75 MeV; Target: natural thallium; Detectors: Ge(Li); Measured: Eγ, Iγ; Deduced: absolute cross sections for γ emission.

2020Fo05: neutron produced by bombarding a natural W target with 800 proton beam at the LANSCE facility (LANL). GEANIE array comprising of 11 Compton-suppressed planar Ge detectors, 9 Compton-suppressed coaxial Ge detectors and 6 unsuppressed coaxial Ge detectors. Measured Eγ, Iγ, excitation functions, γγ coin.

Others: 1970Ba38, 1971Fe07, 1975Ah02, 1977Da06.

^{203}Tl Levels

σ is the neutron inelastic scattering cross section from 1981He14.

E(level)[†]	Jπ[‡]	Comments
0	1/2+	Jπ: From Adopted Levels.
279.14 *6*	3/2+	σ=294 mb *141*.
680.51 *5*	5/2+	σ=280 mb *41*.
1044.10 *8*	3/2+	σ=62 mb *12*.
1065.37 *8*	(5/2)+	σ=90 mb *9*.
1072.30 *11*	(3/2+)	σ=71 mb *11*.
1073.91 *7*	(7/2+)	
1113.78 *11*		σ=33 mb *9*.
1184.24 *8*	(7/2+)	σ=203 mb *20*.
1215.55 *7*		σ=100 mb *8*.
1217.39 *11*		
1232.32 *12*		σ=58 mb *6*.
1305.77 *18*		
1320.12 *11*		σ=105 mb *9*.
1334.8 *3*		σ=11 mb *3*.
1406.3 *7*		
1447.98 *10*		σ=34 mb *3*.
1449.40 *12*		
1483.7 *4*	(9/2−)	Jπ: Based on excitation function data in 2020Fo05 and systematics of similar states in neighboring nuclei. configuration: Proposed intruder π($h^{+1}_{9/2}$) state. The assignment is tentative.
1488.22 *12*		σ=20.2 mb *24*.
1568.85 *11*		σ=16 mb *3*.
1611.02 *12*		σ=13 mb *3*.
1637.7 *7*		σ=19 mb *5*.
1669.23 *15*		σ=14 mb *3*.
1683.66 *10*		σ=23.7 mb *25*.
1715.5 *3*		σ=21 mb *3*.
1836.31 *15*		σ=35 mb *8*.
1839.76 *20*		σ=4.5 mb *12*.
1888.5 *4*		σ=16.2 mb *21*.
1901.5 *3*		σ=6.6 mb *9*.
1988.94 *15*		σ=22 mb *3*.
2076.00?[#] *13*		
2231.6 *4*		σ=7.8 mb *24*.
2310.11?[#] *19*		
2341.9 *3*		σ=5.5 mb *14*.

[†] From a least-squares fit to Eγ.

[‡] From γ(θ) in 1977Da06 and the observed multiple decay branches, unless otherwise stated.

[#] Assigned by the evaluator on the basis of the observed multiple decay branches and energy sums.

^{203}Tl(n,n′γ) 1981He14,2020Fo05 (continued)

γ(^{203}Tl)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π	Mult.[‡]	δ[‡]	Comments
279.14	3/2+	279.188	100	0	1/2+	M1+E2	+1.7 *4*	
680.51	5/2+	401.35 *7*	82 *2*	279.14	3/2+	M1(+E2)	−0.03 *15*	
		680.46 *5*	18 *2*	0	1/2+	E2		
1044.10	3/2+	363.41 *15*	30 *3*	680.51	5/2+			
		765.06 *9*	46 *4*	279.14	3/2+	M1(+E2)	+0.8 *8*	
		1044.17 *20*	24 *3*	0	1/2+			
1065.37	(5/2)+	384.9 *3*	12 *3*	680.51	5/2+			
		786.23 *5*	88 *3*	279.14	3/2+	M1+E2	+2.7 *10*	
1072.30	(3/2+)	793.16 *9*	100	279.14	3/2+	M1(+E2)	−0.5 *5*	
1073.91	(7/2+)	794.73 *5*	100	279.14	3/2+	(E2)		
1113.78		834.55 *15*	60 *8*	279.14	3/2+			
		1113.89 *16*	40 *4*	0	1/2+			
1184.24	(7/2+)	503.45[#] *11*	12 *2*	680.51	5/2+			
		905.17 *6*	88 *2*	279.14	3/2+	(E2)		
1215.55		535.09 *13*	29 *3*	680.51	5/2+			
		936.36 *6*	62 *4*	279.14	3/2+			
		1215.85 *17*	9.3 *20*	0	1/2+			
1217.39		143.16 *13*		1073.91	(7/2+)			
		537.11[#] *14*		680.51	5/2+			
1232.32		551.64 *16*	20 *3*	680.51	5/2+			
		953.32 *15*	71 *5*	279.14	3/2+			
		1232.8 *7*	9 *4*	0	1/2+			
1305.77		232.01[#@] *6*		1073.91	(7/2+)			
		1026.6 *4*		279.14	3/2+			
		1305.77 *20*		0	1/2+			
1320.12		276.1 *3*	34 *4*	1044.10	3/2+			
		639.58 *13*	23 *3*	680.51	5/2+			
		1040.94 *20*	42 *5*	279.14	3/2+			
		1321.3 *8*	1.9 *10*	0	1/2+			
1334.8		654.3 *3*	68 *13*	680.51	5/2+			
		1056.1[@] *7*	32 *13*	279.14	3/2+			
1406.3		1126.8 *7*	≈8	279.14	3/2+			I_γ: Line obscured by background transition, Branching from (γ,γ′).
		1408.2 *15*	≈92	0	1/2+			I_γ: Line obscured by background transition, Branching from (γ,γ′).
1447.98		404.1 *3*	18 *4*	1044.10	3/2+			
		1168.84 *8*	70 *5*	279.14	3/2+			
		1447.5 *5*	12 *4*	0	1/2+			
1449.40		232.01[#] *6*	100	1217.39				
1483.7	(9/2−)	409.8 *4*		1073.91	(7/2+)			E_γ: From 2020Fo05.
1488.22		303.96 *9*	100	1184.24	(7/2+)			
1568.85		336.6 *3*	39 *8*	1232.32				
		503.45[#] *11*		1065.37	(5/2)+			
		888.4 *2*	46 *9*	680.51	5/2+			
		1289.8[@] *3*	15 *10*	279.14	3/2+			
1611.02		497.24 *15*	83 *7*	1113.78				
		537.11[#] *14*		1073.91	(7/2+)			
		930.4 *5*	17 *7*	680.51	5/2+			
1637.7		563.8 *7*	84 *7*	1073.91	(7/2+)			
		1637.8[@] *5*	16 *7*	0	1/2+			
1669.23		1389.2 *5*	42 *9*	279.14	3/2+			
		1669.30 *15*	58 *9*	0	1/2+			
1683.66		1404.55 *9*	100	279.14	3/2+			

Continued on next page (footnotes at end of table)

^{203}Tl(n,n′γ) 1981He14,2020Fo05 (continued)

γ(^{203}Tl) (continued)

E_i(level)	J_i^π	E_γ[†]	I_γ[†]	E_f	J_f^π
1715.5		1035.5 *7*	43 *8*	680.51	$5/2^+$
		1715.4 *3*	57 *8*	0	$1/2^+$
1836.31		386.89 *10*	89 *5*	1449.40	
		1156.1[@] *6*	11 *5*	680.51	$5/2^+$
1839.76		1839.9 *5*	100	0	$1/2^+$
1888.5		1609.4 *4*	100	279.14	$3/2^+$
1901.5		1901.5 *3*	100	0	$1/2^+$
1988.94		377.9 *3*	35 *6*	1611.02	
		924.0 *5*	18 *6*	1065.37	$(5/2)^+$
		1988.88 *18*	47 *6*	0	$1/2^+$
2076.00?		392.42 *15*	27 *5*	1683.66	
		587.1 *5*	10 *3*	1488.22	
		858.1 *3*	18 *8*	1217.39	
2076.00?		1002.2 *3*	20 *4*	1073.91	$(7/2^+)$
		1032.5 *4*	13 *4*	1044.10	$3/2^+$
		2075.9 *4*	12 *3*	0	$1/2^+$
2231.6		1952.9 *7*	71 *12*	279.14	$3/2^+$
		2231.4 *5*	29 *12*	0	$1/2^+$
2310.11?		470.35 *9*	45 *5*	1839.76	
		473.78 *13*	28 *5*	1836.31	
		862.8	15 *6*	1447.98	
		1244.5[@] *4*	5 *3*	1065.37	$(5/2)^+$
		2310.1 *8*	7 *3*	0	$1/2^+$
2341.9		2062.7 *3*	63 *14*	279.14	$3/2^+$
		2342.0[@] *5*	37 *14*	0	$1/2^+$

[†] From 1981He14, unless otherwise stated. Iγ is the % branching from each level.
[‡] From γ(θ) in 1977Da06.
[#] Multiply placed.
[@] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

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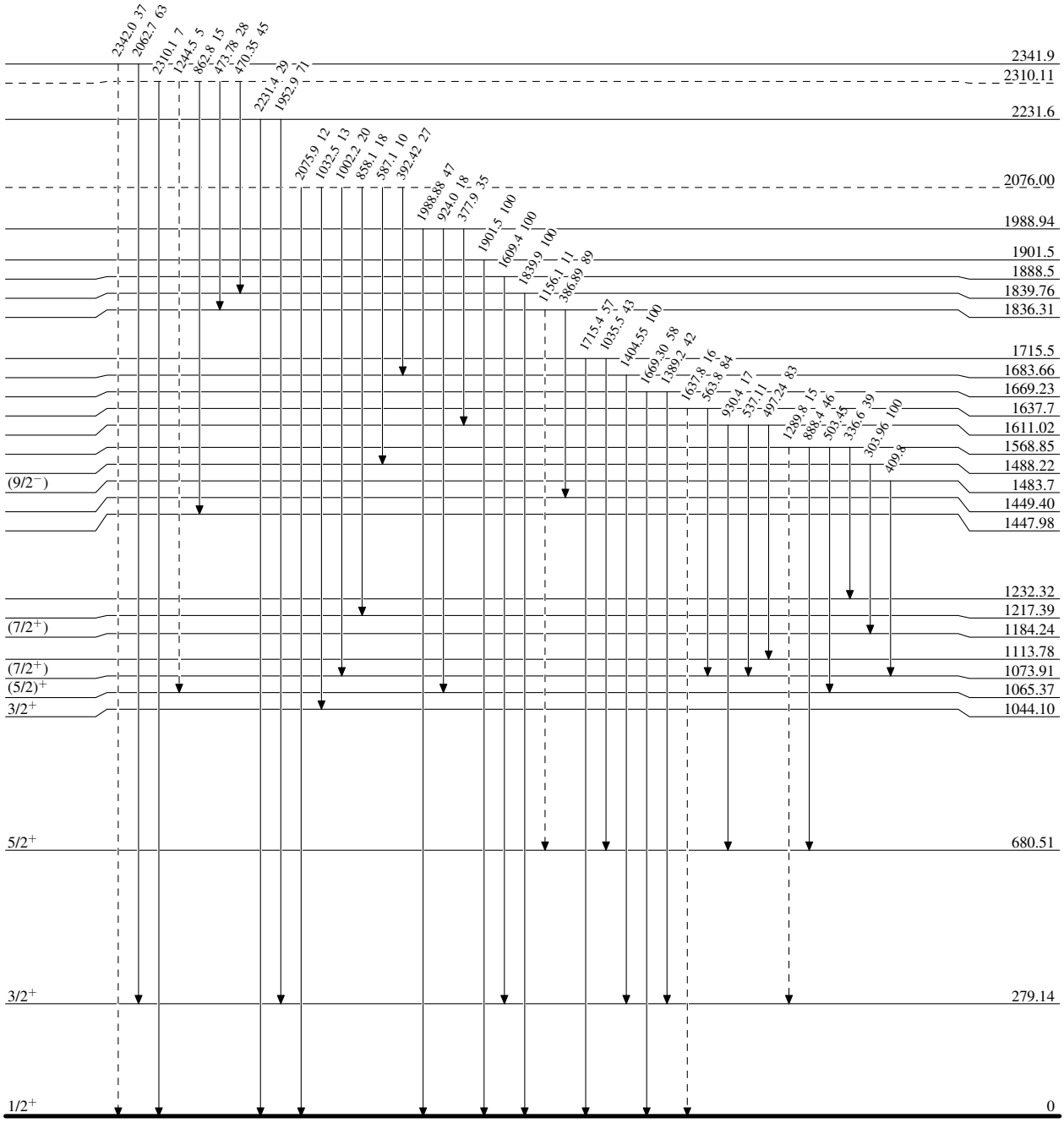
Legend

Level Scheme

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{203}_{81}Tl_{122}$

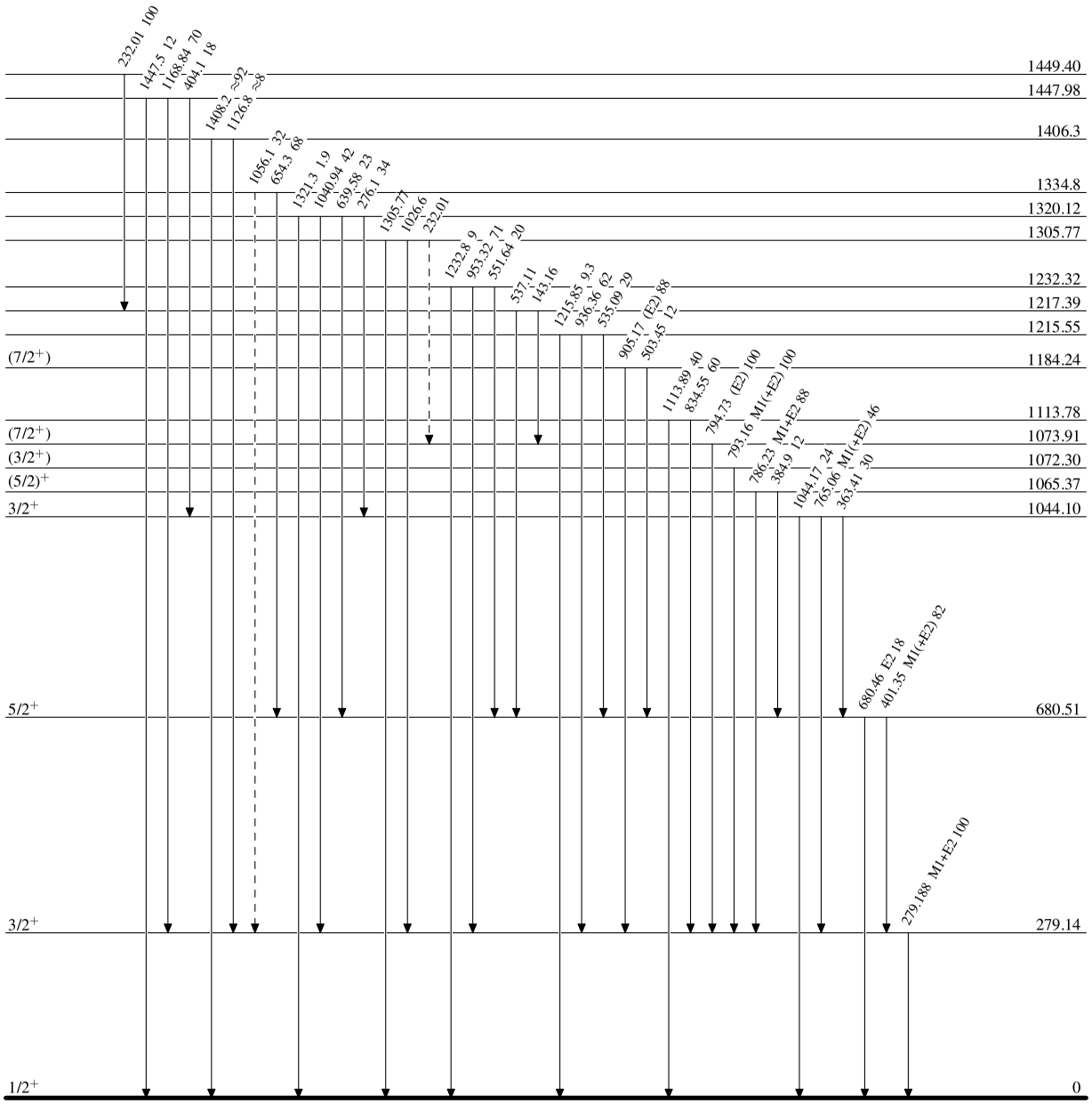
^{203}Tl(n,n′γ) 1981He14,2020Fo05

Legend

Level Scheme (continued)

Intensities: % photon branching from each level

γ Decay (Uncertain)



$^{203}_{81}Tl_{122}$