^{197}Au(^{207}Pb,Xγ) 2019Ro12

Type	Author	History Citation	Literature Cutoff Date
Full Evaluation	F. G. Kondev	NDS 192,1 (2023)	1-Aug-2023

2019Ro12: ^{200}Tl produced via ^{197}Au(^{207}Pb,Xγ) reaction with E=1430−MeV ^{207}Pb beam from the ATLAS accelerator at ANL, incident on a ^{197}Au target of ≈50 mg/cm^2. γ rays were detected with the Gammasphere array of 100 HPGe detectors. Measured Eγ, Iγ, $\gamma\gamma$-coin, $\gamma\gamma$(t). Deduced levels, J, π, $T_{1/2}$, γ-ray multipolarities, configurations.

^{200}Tl Levels

E(level)[†]	J$^\pi$[‡]	$T_{1/2}$	Comments
0.0	2^-		
541.0 *3*	4^-		
754.0 *4*	7^+	34.0 ms *10*	$T_{1/2}$: From Adopted Levels.
762.0 *4*	5^+	397 ns *17*	$T_{1/2}$: From 220.0γ-541.0γ(Δt) and 262.0γ-541.0γ(Δt) (2019Ro12).
886.3 *5*	6^+		
1024.1 *5*	6^+		
1244.1 *5*	7^-	7.0 ns *5*	$T_{1/2}$: Weighted average of 6.9 ns *5* (311γ-490γ(Δt)) and 7.1 ns *5* (230γ-490γ(Δt)) and centroid-shift analysis (2019Ro12).
1247.8 *5*	8^-		
1323.3 *5*	9^-		
1350.1 *6*	(7^+)		
1442.4 *5*	10^-		
1659.5 *6*	11^-		
1734.1 *6*	(8^+)		
1889.4 *6*	12^-		
2237.6 *6*	13^-		
2548.3 *6*	14^-		
2921.9 *6*	15^-		
3026.6 *6*	15^-		
3220.3 *6*	15^+		
3257.3 *7*	13^+		
3282.2 *6*	16^-		
3313.1 *7*	14^+		
3337.7 *6*	16^-		
3591.1 *7*	15^+		
3608.6 *7*	16^-		
3665.2 *7*	(17^-)		
3770.4 *7*	16^+		
3799.4 *7*	(17^-)		
3856.4 *6*	18^-		
3927.6 *7*	17^+		
4032.0 *7*	18^+		
4047.9 *7*	19^+		
4164.2 *7*	(20^+)		
4373.2 *7*	19^+		
4435.6 *7*	(21^+)		
4651.3 *7*	(20^+)		
4871.5 *7*	(21^+)		
4942.5 *7*	(22^+)		
5073.5 *7*	(22^+)		
5153.5 *7*	(22,23)		
5156.8 *7*	(22^-)		
5269.3 *7*	(22,23)		
5722.2 *7*	(23)		
5906.0 *7*	(24^-)		
6005.3 *8*	(26^-)	57 ns *2*	$T_{1/2}$: From γ_1-γ_2(t) (2019Ro12) using γ_1=285.3- and 749.3-keV, and γ_2=217.1-, 229.8-,

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^{197}Au(^{207}Pb,Xγ) 2019Ro12 (continued)

^{200}Tl Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	$T_{1/2}$	Comments
			310.8-, 311.1-, 348.2-, and 490.2-keV transitions. configuration: $\pi(h^{-1}_{11/2})\otimes\nu(i^{-3}_{13/2},f^{-1}_{5/2},p^{-1}_{3/2})$. The assignment is tentative.

[†] From a least-squares fit to Eγ.
[‡] From 2019Ro12.

$\gamma(^{200}Tl)$

E$_\gamma$[†]	I$_\gamma$[†]	E$_i$(level)	J$_i^\pi$	E$_f$	J$_f^\pi$	Mult.[#]
(57)		3856.4	18$^-$	3799.4	(17$^-$)	
75.5[‡] *2*		1323.3	9$^-$	1247.8	8$^-$	
(80)		5153.5	(22,23)	5073.5	(22$^+$)	
93		3313.1	14$^+$	3220.3	15$^+$	
99.3 *4*		6005.3	(26$^-$)	5906.0	(24$^-$)	E2
104.4 *3*		4032.0	18$^+$	3927.6	17$^+$	
116.3 *3*		4164.2	(20$^+$)	4047.9	19$^+$	M1
119.1 *3*		1442.4	10$^-$	1323.3	9$^-$	
132.4 *3*		886.3	6$^+$	754.0	7$^+$	
157.2 *4*		3927.6	17$^+$	3770.4	16$^+$	
179.4 *4*		3770.4	16$^+$	3591.1	15$^+$	
183.8 *4*		5906.0	(24$^-$)	5722.2	(23)	
190.8 *5*		3799.4	(17$^-$)	3608.6	16$^-$	
191.0 *5*		3856.4	18$^-$	3665.2	(17$^-$)	
191.5 *3*		4047.9	19$^+$	3856.4	18$^-$	E1
194.7 *3*		1442.4	10$^-$	1247.8	8$^-$	
195.8 *3*		5269.3	(22,23)	5073.5	(22$^+$)	
211.0 *3*		5153.5	(22,23)	4942.5	(22$^+$)	
213.0 *3*		754.0	7$^+$	541.0	4$^-$	
217.1 *2*		1659.5	11$^-$	1442.4	10$^-$	
220.0 *3*	9.1 *8*	1244.1	7$^-$	1024.1	6$^+$	
220.2 *3*		4871.5	(21$^+$)	4651.3	(20$^+$)	M1
221.0 *3*		762.0	5$^+$	541.0	4$^-$	
229.8 *2*		1889.4	12$^-$	1659.5	11$^-$	
255.5 *4*		3282.2	16$^-$	3026.6	15$^-$	
261.6 *3*		4032.0	18$^+$	3770.4	16$^+$	
262.0 *3*		1024.1	6$^+$	762.0	5$^+$	
271.5 *3*		4435.6	(21$^+$)	4164.2	(20$^+$)	
278.0 *2*		3591.1	15$^+$	3313.1	14$^+$	
278.1 *2*		4651.3	(20$^+$)	4373.2	19$^+$	
285.3 *3*		5156.8	(22$^-$)	4871.5	(21$^+$)	E1
310.8 *2*		2548.3	14$^-$	2237.6	13$^-$	
311.1 *2*		3337.7	16$^-$	3026.6	15$^-$	
326.0 *3*		1350.1	(7$^+$)	1024.1	6$^+$	
326.3 *5*		3608.6	16$^-$	3282.2	16$^-$	
(327)		5269.3	(22,23)	4942.5	(22$^+$)	
327.3 *5*		3665.2	(17$^-$)	3337.7	16$^-$	
336.0 *4*		1659.5	11$^-$	1323.3	9$^-$	
336.6 *4*		3927.6	17$^+$	3591.1	15$^+$	
341.2 *2*		4373.2	19$^+$	4032.0	18$^+$	
348.2 *2*		2237.6	13$^-$	1889.4	12$^-$	
357.8 *3*	34.7 *17*	1244.1	7$^-$	886.3	6$^+$	
373.7 *3*		2921.9	15$^-$	2548.3	14$^-$	
384.0 *3*		1734.1	(8$^+$)	1350.1	(7$^+$)	

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^{197}Au(^{207}Pb,Xγ) 2019Ro12 (continued)

γ(^{200}Tl) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J_i^π	E_f	J_f^π	E_γ [†]	E_i(level)	J_i^π	E_f	J_f^π
415.8 *3*		3337.7	16^-	2921.9	15^-	658.8 *3*	2548.3	14^-	1889.4	12^-
436.1 *4*		4871.5	(21^+)	4435.6	(21^+)	707.2 *3*	4871.5	(21^+)	4164.2	(20^+)
447.3 *3*		1889.4	12^-	1442.4	10^-	733.9 *2*	3282.2	16^-	2548.3	14^-
452.9 *2*		5722.2	(23)	5269.3	(22,23)	749.3 *2*	5906.0	(24^-)	5156.8	(22^-)
457.3 *3*		3770.4	16^+	3313.1	14^+	752.5 *3*	5906.0	(24^-)	5153.5	(22,23)
478.2 *2*		3026.6	15^-	2548.3	14^-	773.0 *4*	3799.4	(17^-)	3026.6	15^-
490.2 *2*	100 *3*	1244.1	7^-	754.0	7^+	778.4 *3*	4942.5	(22^+)	4164.2	(20^+)
493.8[‡] *2*		1247.8	8^-	754.0	7^+	789.1 *3*	3337.7	16^-	2548.3	14^-
517.2 *3*		3799.4	(17^-)	3282.2	16^-	823.6 *3*	4871.5	(21^+)	4047.9	19^+
518.7 *2*		3856.4	18^-	3337.7	16^-	850.6 *2*	5722.2	(23)	4871.5	(21^+)
541.0 *3*		541.0	4^-	0.0	2^-	909.3 *2*	5073.5	(22^+)	4164.2	(20^+)
574.2 *3*		3856.4	18^-	3282.2	16^-	982.7 *2*	3220.3	15^+	2237.6	13^-
578.1 *3*		2237.6	13^-	1659.5	11^-	1075.5 *4*	3313.1	14^+	2237.6	13^-
619.4 *3*		4651.3	(20^+)	4032.0	18^+	1367.9 *4*	3257.3	13^+	1889.4	12^-
648.6[@] *3*		5722.2	(23)	5073.5	(22^+)					

[†] From 2019Ro12 (in general), but the actual Eγ, ΔEγ and Iγ values are from S. Tandel – private communication to the evaluator (03/11/2022), unless otherwise stated.
[‡] From adopted gammas. Not observed in 2019Ro12.
[#] As proposed in 2019Ro12, based on intensity balance and level scheme.
[@] Placement of transition in the level scheme is uncertain.

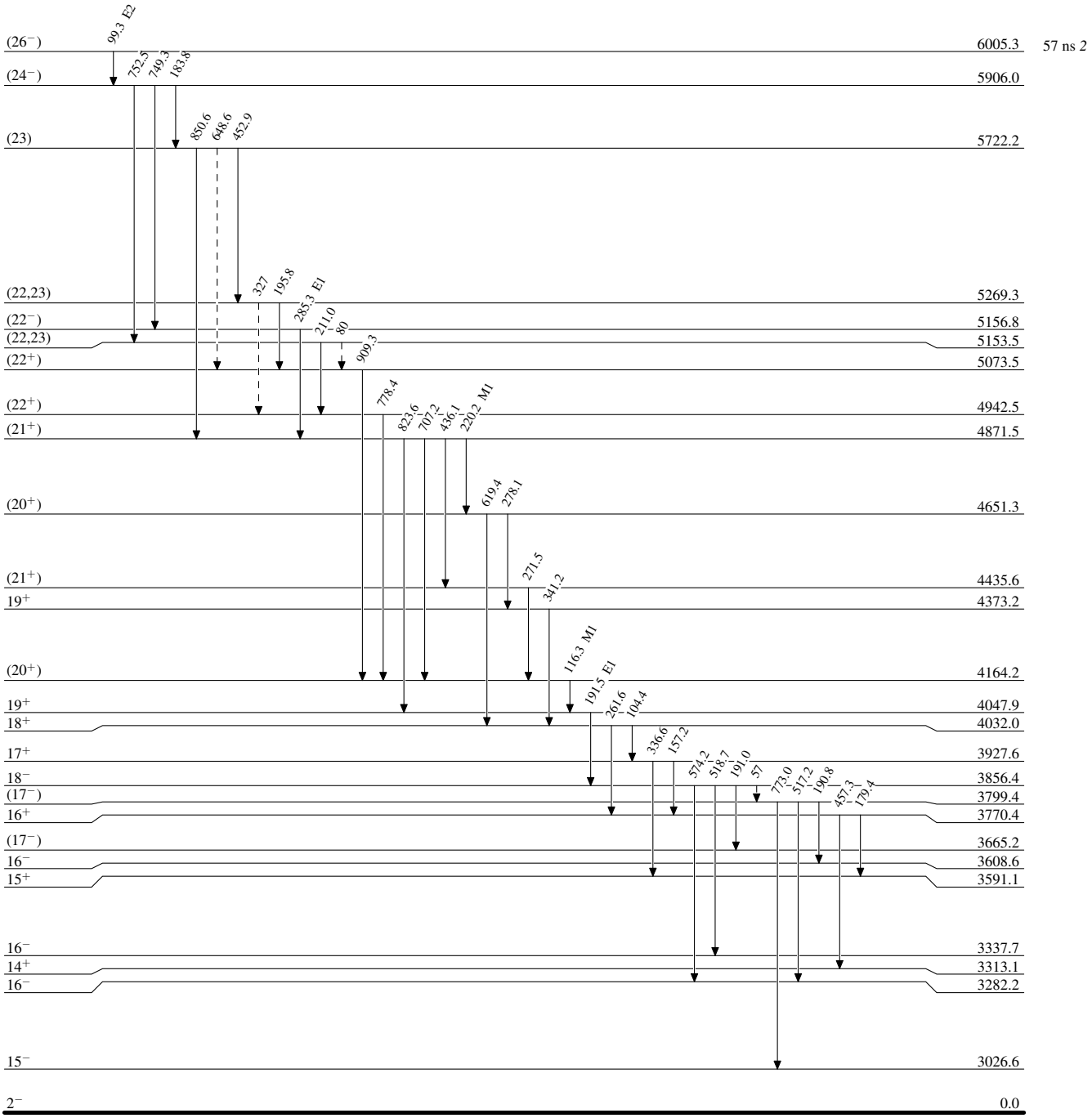
^{197}Au(^{207}Pb,Xγ) 2019Ro12

Legend

Level Scheme

Intensities: Relative I_γ

γ Decay (Uncertain)

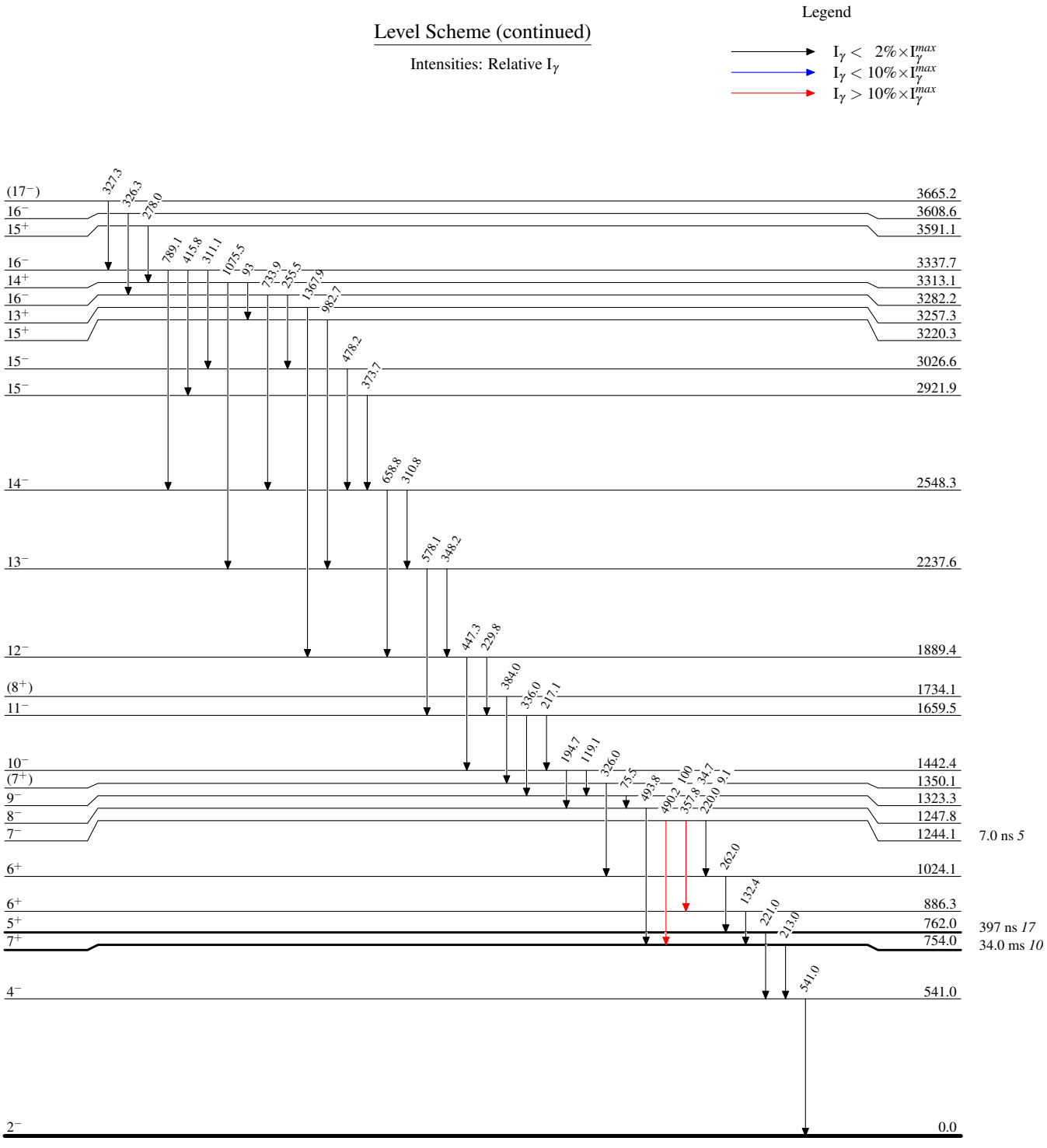


$^{200}_{81}Tl_{119}$

^{197}Au(^{207}Pb,Xγ) 2019Ro12

Level Scheme (continued)

Intensities: Relative I_γ



$^{200}_{81}Tl_{119}$