^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	C. J. Chiara and F. G. Kondev	NDS 111,141 (2010)	1-Oct-2009

2007ChZX: Budapest Reactor data measured with thermal N beam; Compton-suppressed HPGe detector for γ singles, 25% efficiency and 1.8 keV FWHM at 1332 keV.

1974Co21: 3-g natural Tl target; N beam from reactor passed through paraffin to remove fast N′s;Ge(Li) detector centered within NaI(Tl) annulus, FWHM=9 keV at 7 MeV; measured Eγ, Iγ.

1975RaYX: natural Tl target, thickness not specified for high-Eγ study, 0.27 g/cm^2 for low-Eγ study; measured Eγ, Iγ with one NaI(Tl) and twoGe(Li) detectors for high-energy γ′s, planarGe(Li) with FWHM=600 eV at 122 keV for low-energy γ′s; $\gamma\gamma$(t) measurements with planarGe(Li) and NaI(Tl).

1973Fu17: natural Tl targets,≈6 g/cm^2 to study entire γ spectrum,≈0.4−g/cm^2 Tl_2O_3 to study low-energy γ′s; thermal N beam from reactor; single γ′s having Eγ<1.8 MeV withGe(Li), 3.5 keV FWHM at 1 MeV; $\gamma\gamma$-coin between low-energy γ′s (Eγ<2 MeV) and high-energy primary γ′s (4.5 MeV<Eγ<7 MeV) with twoGe(Li) detectors, FWHM in coin spectra 4.5 keV at 1 MeV; measured Eγ, Iγ.

Additional information 2.

Others: 1965Pr07, 1967We04 (as quoted in 1969Gr41), 1969Ra10.

^{204}Tl Levels

Additional information 3.

E(level)[†]	J$^\pi$[‡]	T$_{1/2}$	Comments
0.0	2$^-$		J$^\pi$: From Adopted Levels.
139.97 *4*			
145.89 *5*		18.7 ns *14*	T$_{1/2}$: from $\gamma\gamma$(t) with planarGe(Li) and NaI(Tl) detectors by 1975RaYX.
300.14 *4*			
318.85 *4*			
347.78 *9*			
424.80 *6*			
431.88 *5*			
471.93 *4*			
488.11 *5*			
535.60 *6*			
626.31 *6*			
629.39 *5*			
677.95 *7*			
736.28 *25*			Additional information 4.
737.10 *5*			Additional information 5.
764.30 *5*			
872.52 *10*			
905.99 *8*			
1013.22 *5*			
1051.18 *6*			
1121.34 *7*			Additional information 6.
1134.03 *9*			
1204.35 *8*			
1250.22 *5*			
1374.71 *7*			
1393.21 *14*			
1416.3 *3*			
1474.33 *5*			
1482.4 *7*			
1499.6 *7*			
1524.27 *21*			

Continued on next page (footnotes at end of table)

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

^{204}Tl Levels (continued)

E(level)[†]	J$^{\pi}$[‡]	Comments
1640.09 *16*		
1673.48 *19*		
1709.7 *7*		Additional information 7.
1741.04 *6*		
1787.2 *6*		
1813.30 *16*		
1850.3 *4*		Additional information 8.
1902.46 *12*		
1939.4 *4*		
1948.87 *15*		Additional information 9.
1967.12 *13*		Additional information 10.
2045.4 *7*		
2053.76 *17*		
2084.7 *3*		
2114.09 *16*		
2134.5 *7*		
2158.97 *14*		
2188.5 *7*		
2205.9 *7*		
2214.44 *10*		
2252.11 *16*		
2261.9 *7*		
2274.3 *7*		
2311.15 *13*		
2345.71 *25*		
2368.4 *8*		
2395.8 *8*		
2429.25 *18*		
2458.74 *15*		Additional information 11.
2493.39 *13*		
2526.9 *7*		
2539.64 *18*		Additional information 12.
2553.3 *4*		
2578.0 *6*		
2585.7 *7*		
2618.8 *7*		
2637.3 *7*		
2645.6 *7*		
(6654.76 *5*)	0^+,1^+	

[†] From a least-squares fit to Eγ.

[‡] Levels fed strongly by primary γ's are expected to have J$^{\pi}$ = 0^-, 1^-, or 2^-.

$\gamma(^{204}Tl)$

Iγ normalization: Iγ values from 2007ChZX were normalized by the factor σ_γ(873)/Iγ(873)=0.168/0.068 to obtain elemental partial cross sections, σ_γ, where the absolute partial cross section σ_γ(873)=0.168 b was determined by 2003Re38. The data from 1967We04 and 1974Co21 were normalized by the factors 0.02203 and 0.07109, respectively, to match the 2007ChZX σ_γ values; the normalization factors were determined from the average ratios of intensities, compared to 2007ChZX, for the 16 most intense primary γ's observed in all three works. The σ_γ values were then converted to intensity per 100 N captures by multiplying σ_γ by 100/fσ_0, where f=0.29524 is the isotopic abundance and σ_0 = 12.5 b *6* is the total capture cross section (1970Si10). To obtain σ_γ (in barns), multiply value quoted for Iγ by fσ/100 = 0.0369.

Iγ normalization: Additional information 60.

γ's with Eγ > 4 MeV were assumed to be primary, based on the observation by 1974Co21 that Iγ varies on average as Eγ^5.

Additional information 13.

E$_\gamma$[‡]	I$_\gamma$[#g]	E$_i$(level)	E$_f$	J$^\pi_f$	Mult.	α[†]	Comments
(5.9[&] *1*)	≈0.0095	145.89	139.97		[M1]	≈1.59×10^3	Additional information 36. E$_\gamma$: γ not observed, but inferred to exist in 1975RaYX. Eγ and ΔEγ come from the difference in level energies. I$_\gamma$: From branching ratio of Ti(145.88)/Ti(5.9)=0.022 *12* in 1975RaYX, assuming multipolarity M1 for 5.9γ and E2 for 145.88γ (see adopted level scheme).
47.4[&h] *5*		535.60	488.11				Additional information 39.
77.07 *22*	0.30 *14*	424.80	347.78				
108.0[&h] *5*		737.10	629.39				
110.72[f] *15*	0.049 *11*	737.10	626.31				E$_\gamma$: A second γ with this energy, tentatively placed in the level scheme by 1975RaYX, was found to be a background line in 2007ChZX.
[x]120.9[a] *3*							
132.11 *14*	0.17 *3*	431.88	300.14				
139.94 *9*	10.84 *19*	139.97	0.0	2$^-$			
145.88 *10*	0.146 *14*	145.89	0.0	2$^-$	[E2]	1.289	α(K)=0.341 *5*; α(L)=0.708 *11*; α(M)=0.185 *3*; α(N+..)=0.0547 *8* α(N)=0.0464 *7*; α(O)=0.00804 *12*; α(P)=0.000288 *5*
152.93 *11*	0.390 *16*	471.93	318.85				
154.01 *9*	2.51 *5*	300.14	145.89				E$_\gamma$: A second γ with similar energy, tentatively placed in the level scheme by 1975RaYX, was found to be a background line in 2007ChZX.
157.32 *10*	0.165 *14*	629.39	471.93				
169.1[f&] *5*		488.11	318.85				I$_\gamma$: Not observed in 2007ChZX; Iγ assigned solely to 169.23γ.
169.23[f] *12*	0.100 *19*	905.99	737.10				
171.88 *9*	0.295 *14*	471.93	300.14				
178.78 *11*	0.135 *14*	318.85	139.97				
188.09 *20*	0.049 *11*	488.11	300.14				
194.5[&h] *5*		626.31	431.88				Additional information 41.
198.33 *8*	1.11 *3*	629.39	431.88				
[x]203.2[a] *4*							

$^{204}_{81}Tl_{123}$-3

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

$\gamma(^{204}Tl)$ (continued)

E_γ‡	I_γ#g	E_i(level)	E_f	J_f^π	unnormalized Iγ@	Comments
216.7& 5		535.60	318.85			
228.9&h 5		764.30	535.60			
x232.6a 2						
235.7& 5		535.60	300.14			Additional information 40.
x242.4b 10						
249.06 12	0.095 14	737.10	488.11			
253.17 15	0.076 14	677.95	424.80			
x270.0b 10						
276.2& 5		764.30	488.11			
278.33f 21	0.049 14	626.31	347.78			
278.8&fh 5		424.80	145.89			I_γ: Not observed in 2007ChZX; Iγ assigned solely to 278.33γ.
284.81 12	0.141 14	424.80	139.97			
286.88 11	0.157 14	431.88	145.89			Additional information 37.
292.26f 8	2.66 5	764.30	471.93		5.6 5	E_γ: A second γ with similar energy, placed in the level scheme by 1975RaYX, was found to be a background line in 2007ChZX.
299.91 24	0.073 19	300.14	0.0	2^-		
310.31 9	0.66 3	629.39	318.85			
318.88 8	8.81 16	318.85	0.0	2^-	18 7	
325.85f 8	0.82 3	626.31	300.14			
326.1f& 5		471.93	145.89			I_γ: Not observed in 2007ChZX; Iγ assigned solely to 325.85γ.
329.05h 8	0.341 24	629.39	300.14			
330.09 9	0.72 3	677.95	347.78			E_γ: Placement by $\gamma\gamma$ coin in 1975RaYX; $\gamma\gamma$ coin in 1973Fu17 disagrees, with placement instead from 471.93-keV level.
331.76 9	1.01 3	471.93	139.97			
336.96 10	0.217 16	872.52	535.60			
347.9& 5	≤9.8	347.78	0.0	2^-	14 5	E_γ: Two γ's near 348 keV were observed in 1975RaYX, but only one at 347.96 keV in 2007ChZX, with a single corresponding intensity. It is unclear which placement is correct for the latter, more precise energy, thus the energies from 1975RaYX are given (347.9 and 348.3) and the intensity from 2007ChZX given as an upper limit for both.
348.3& 5	≤9.8	488.11	139.97		14 5	E_γ: See comment for 347.9γ. Additional information 38.
369.65 24	0.13 3	905.99	535.60			
383.99 8	0.92 3	1013.22	629.39		1.5 5	E_γ: Placement by $\gamma\gamma$ coin in 1973Fu17 and by 1965Pr07; 1967We04 disagree, with placement instead from 1121.34-keV level.
389.48 11	0.214 19	535.60	145.89			
395.62 8	2.34 5	535.60	139.97		3.7 6	
416.91 17	0.19 3	764.30	347.78		0.5 4	E_γ: Placement by $\gamma\gamma$ coin in 1975RaYX; 1965Pr07 disagree, with placement instead from a 553-keV level. Additional information 43.
418.27 11	0.38 3	737.10	318.85			Additional information 42.

$^{204}_{81}Tl_{123}$-4

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

γ(^{204}Tl) (continued)

E_γ[‡]	I_γ[#g]	E_i(level)	E_f	J_f^π	unnormalized $I\gamma$[@]	Comments
[x]422.36 *13*						
424.3[a] *2*		1051.18	626.31			E_γ: Placement confirmed by γγ coin in 1973Fu17. 1973Fu17 also observed a more intense, unplaced 424.5γ that is more consistent with the 424.81γ observed in 2007ChZX.
424.81 *8*	3.25 *7*	424.80	0.0	2^-	4.8 *6*	
437.11 *9*	0.82 *3*	737.10	300.14		1.8 *3*	E_γ: Placement by γγ coin in both 1975RaYX and 1973Fu17; 1967We04 and 1965Pr07 proposed different placements, from 757- and 1204-keV levels, respectively.
[x]456.8[a] *2*						
[x]466.28 *11*	0.25 *3*					Additional information 14.
471.90 *8*	3.14 *8*	471.93	0.0	2^-	4.4 *5*	
483.29 *12*	0.22 *3*	629.39	145.89			
488.11 *8*	2.60 *11*	488.11	0.0	2^-	3.9 *5*	
489.26 *24*	0.21 *8*	629.39	139.97			E_γ: Placement by γγ coin in 1975RaYX; 1973Fu17 disagree, with placement instead from 1741.04-keV level.
541.22 *8*	1.30 *4*	1013.22	471.93		2.0 *3*	
553.56 *15*	0.147 *19*	872.52	318.85			Additional information 44.
[x]558.39 *8*	12.8 *4*					
563.21 *8*	0.96 *4*	1051.18	488.11		1.4 *3*	
587.01 *10*	0.29 *3*	905.99	318.85			
591.13 *9*	0.61 *3*	737.10	145.89		1.1 *3*	
596.31 *24*	0.081 *19*	736.28	139.97			
606.8[&] *5*		905.99	300.14			
[x]611.0[d] *10*						
618.86 *18*	0.087 *16*	1051.18	431.88			Additional information 47.
624.46 *8*	1.12 *3*	764.30	139.97			
626.54 *8*	1.05 *3*	626.31	0.0	2^-	4.7 *4*	
629.12 *8*	1.05 *3*	629.39	0.0	2^-		
[x]633.15 *8*						
[x]636.0[d] *10*						Additional information 15.
[x]656.1[a] *3*						
678.01 *8*	0.98 *4*	677.95	0.0	2^-	1.2 *4*	
[x]693.8[a] *4*						Additional information 16.
[x]697.95 *11*	0.31 *3*					
[x]702.3[a] *4*						Additional information 17.
[x]708.3[a] *3*						
713.06 *8*	1.61 *5*	1013.22	300.14		2.0 *4*	Additional information 45.
714.86 *24*	0.20 *3*	1204.35	488.11			E_γ: Placement by 1967We04 and 1965Pr07; 1973Fu17 disagree, with placement instead from 1013.22-keV level. Additional information 51.
[x]720.1[a] *1*						
[x]724.1[a] *3*						
732.09 *9*	1.73 *8*	1051.18	318.85			Additional information 48.

$^{204}_{81}Tl_{123}$-5

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

$\gamma(^{204}Tl)$ (continued)

E_γ ‡	I_γ #g	E_i(level)	J_i^π	E_f	J_f^π	unnormalized $I\gamma$ @	Comments
737.12 *8*	3.19 *14*	737.10		0.0	2^-	4.7 *5*	
x745.28 *15*	0.27 *3*						
764.13 *9*	0.86 *3*	764.30		0.0	2^-	1.9 *4*	E_γ: Placement by 1975RaYX and 1965Pr07; 1967We04 disagree, with placement instead from 1250.22-keV level.
x787.2[a] *2*							
x802.33 *14*	0.187 *19*						Additional information 18.
818.14 *8*	0.76 *3*	1250.22		431.88		1.1 *3*	Additional information 52. E_γ: Placement by 1973Fu17 and 1965Pr07; 1967We04 disagree, with placement instead from 2458.74-keV level.
873.16 *8*	4.55 *11*	1013.22		139.97		4.3 *5*	
885.89 *8*	1.41 *3*	1204.35		318.85		≤0.4	E_γ: Placement by 1965Pr07; unplaced by 1973Fu17 and uncertain γ in 1967We04.
x899.0[a] *5*							
x904.8[a] *5*							
911.4[a] *1*	2.21[c] *24*	1051.18		139.97		3.7 *4*	Additional information 49.
931.39 *8*	0.70 *3*	1250.22		318.85		0.5 *3*	Additional information 53. E_γ: Placement by 1973Fu17 and 1965Pr07; 1967We04 disagree, with placement instead from 1948.87-keV level.
949.88 *8*	1.30 *4*	1250.22		300.14		1.4 *2*	Additional information 54. E_γ: Placement by $\gamma\gamma$ coin in 1973Fu17; 1967We04 disagree, with placement instead from 1967.12-keV level.
x957.1[a] *5*							
x960.86 *10*	0.35 *3*						
x972.3[a] *5*	0.18[c] *12*					0.3 *2*	
x975.47 *11*	0.41 *4*						Additional information 19.
x995.2[a] *3*	0.42[c] *18*					0.7 *3*	
1002.21 *14*	0.16 *3*	1474.33		471.93			
1013.27 *9*	0.59 *3*	1013.22		0.0	2^-	0.4 *3*	Additional information 46. E_γ: Placement by $\gamma\gamma$ coin in 1973Fu17 and by 1965Pr07; 1967We04 disagree, with placement instead from 2539.64-keV level.
x1026.83 *8*	0.72 *3*					0.5 *3*	Additional information 20.
x1036.83 *10*	0.44 *3*					0.3 *2*	
1042.75 *12*	0.274 *19*	1474.33		431.88			Additional information 56.
x1053.0[a] *5*							Additional information 21.
x1055.56 *9*	0.61 *3*					0.5 *3*	Additional information 22.
x1063.00 *9*	0.50 *3*					0.6 *3*	Additional information 23.
x1074.19 *8*	0.48 *3*						
1093.02 *8*	0.96 *3*	2214.44		1121.34		0.9 *3*	
1110.37 *8*	1.12 *3*	1250.22		139.97		1.2 *3*	Additional information 55. E_γ: Placement by $\gamma\gamma$ coin in 1973Fu17; 1967We04 disagree, with placement from 1850.3-keV level.
1121.29 *7*	1.63 *5*	1121.34		0.0	2^-	1.4 *3*	
1134.01 *9*	0.362 *19*	1134.03		0.0	2^-	≤1.2	Additional information 50.
x1138.6[a] *4*							

$^{204}_{81}Tl_{123}$-6

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

γ(^{204}Tl) (continued)

E_γ [‡]	I_γ [#g]	E_i(level)	E_f	J_f^π	unnormalized $I\gamma$ [@]	Comments
1155.43 *7*	1.64 *5*	1474.33	318.85		2.0 *7*	
x1164.74 *7*	2.96 *8*				≤1.8	Additional information 24.
1183.8[a] *5*	≤0.48[c]	1673.48	488.11		≤0.8	E_γ: Placement by 1967We04; unplaced in 1973Fu17.
x1201.6[a] *2*						
1205.39 *8*	2.09 *8*	1741.04	535.60			
x1211.5[a] *5*						
1234.69 *7*	2.02 *7*	1374.71	139.97		1.9 *5*	
1250.47 *9*	0.46 *3*	1250.22	0.0	2^-		
1253.2[a] *5*		1741.04	488.11			
1269.5[a] *4*		1741.04	471.93			
x1273.24 *8*	0.99 *3*					Additional information 25.
x1293.14 *8*	0.78 *3*				1.3 *4*	
1307.5[a] *5*		1741.04	431.88			E_γ: Placement by γγ coin in 1973Fu17. Additional information 57.
1334.37 *10*	0.48 *3*	1474.33	139.97			E_γ: Placement by γγ coin in 1973Fu17.
x1340.22 *13*	0.35 *5*					
x1360.62 *24*	0.23 *3*					
x1387.07 *14*	0.40 *4*					
x1414.32 *14*	0.50 *8*					Additional information 26.
1422.8[a] *2*		1741.04	318.85			
1440.40 *21*	0.21 *4*	1741.04	300.14			
1474.29 *9*	0.92 *5*	1474.33	0.0	2^-	2.4 *5*	
x1478.77 *8*	1.47 *6*					Additional information 27.
x1500.57 *14*	0.30 *3*					
1524.5[a] *4*	0.48[c] *24*	1524.27	0.0	2^-	0.8 *4*	E_γ: Placement by 1967We04; unplaced in 1973Fu17.
x1527.78 *9*	0.59 *3*					
x1583.24 *25*	0.15 *3*					Additional information 28.
x1629.70 *17*	0.44 *4*					Additional information 29.
x1671.0[a] *5*	≤0.48[c]				≤0.8	Additional information 30.
x1675.74 *13*	0.56 *5*					
x1689.6[b] *10*						
x1706.20 *16*	0.25 *4*				≤1.0	E_γ: Placement by 1967We04 from 1709.7-keV level is uncertain because of discrepancy between Eγ and ΔE of levels in decay scheme.
x1711.3[a] *5*						Additional information 31.
1741.01 *8*	1.49 *7*	1741.04	0.0	2^-	1.0 *3*	
1756.27 *12*	0.72 *8*	2493.39	737.10		0.9 *4*	
x1808.9 *3*	0.17 *7*					
x1929.9[b] *10*						
x1936.7[b] *10*						
x1971.7[b] *10*						
x2013.4[e] *7*	0.270 *13*				0.474 *24*	
x2027.5[e] *7*	0.048 *10*				0.085 *17*	

$^{204}_{81}Tl_{123}$-7

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

$\gamma(^{204}Tl)$ (continued)

E_γ ‡	I_γ #g	E_i(level)	unnormalized $I\gamma$ @	Comments
x2063.0e 7	0.048 10		0.085 17	
x2084.2e 7	0.144 10		0.254 17	
x2112.3e 7	0.173 10		0.305 17	
x2129.5e 7	0.106 10		0.186 17	
x2289.6e 7	0.029 10		0.051 17	
x2319.5e 7	0.193 10		0.339 17	
x2328.5e 7	0.029 10		0.051 17	
x2346.4e 7	0.029 10		0.051 17	
x2397.3e 7	0.029 10		0.051 17	
x2428.6e 7	0.039 10		0.068 17	
x2458.6e 7	0.029 10		0.051 17	
x2497.4e 7	0.048 10		0.085 17	
x2515.6e 7	0.029 10		0.051 17	
x2557.8e 7	0.039 10		0.068 17	
x2573.4e 7	0.039 10		0.068 17	
x2621.5e 7	0.039 10		0.068 17	
x2633.5e 7	0.039 10		0.068 17	
x2638.1e 7	0.048 10		0.085 17	
x2665.2e 7	0.019 10		0.034 17	
x2697.3e 7	0.029 10		0.051 17	
x2714.3e 7	0.039 10		0.068 17	
x2751.8e 7	0.015 10		0.027 17	
x2779.4e 7	0.039 10		0.068 17	
x2806.9e 7	0.039 10		0.068 17	
x2815.9e 7	0.019 10		0.034 17	
x2844.3e 7	0.019 10		0.034 17	
x2863.9e 7	0.039 10		0.068 17	Additional information 32.
x2906.5e 7	0.058 10		0.102 17	
x2926.6e 7	0.029 10		0.051 17	
x2938.6e 7	0.029 10		0.051 17	
x2947.9e 7	0.048 10		0.085 17	
x2958.8e 7	0.029 10		0.051 17	
x2975.9e 7	0.019 10		0.034 17	
x2998.8e 7	0.029 10		0.051 17	
x3011.1e 7	0.079 10		0.139 17	
x3028.0e 7	0.029 10		0.051 17	
x3039.1e 7	0.048 10		0.085 17	
x3068.6e 7	0.048 10		0.085 17	
x3095.7e 7	0.019 10		0.034 17	

$^{204}_{81}Tl_{123}$-8

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

$\gamma(^{204}Tl)$ (continued)

E_γ ‡	I_γ #g	E_i(level)	unnormalized $I\gamma$ @	Comments
x3117.5e 7	0.077 10		0.135 17	
x3129.2e 7	0.067 10		0.119 17	
x3143.8e 7	0.029 10		0.051 17	
x3159.4e 7	0.013 10		0.024 17	
x3183.3e 7	0.012 10		0.020 17	
x3207.4e 7	0.058 10		0.102 17	
x3211.3e 7	0.048 10		0.085 17	
x3233.2e 7	0.077 10		0.135 17	
x3255.8e 7	0.029 10		0.051 17	
x3260.5e 7	0.039 10		0.068 17	
x3287.9e 7	0.087 10		0.152 17	
x3302.1e 7	0.048 10		0.085 17	
x3356.4e 7	0.013 10		0.024 17	
x3377.5e 7	0.048 10		0.085 17	
x3386.8e 7	0.039 10		0.068 17	
x3410.2e 7	0.039 10		0.068 17	
x3415.5e 7	0.019 10		0.034 17	
x3428.0e 7	0.008 10		0.014 17	
x3440.4e 7	0.019 10		0.034 17	
x3451.0e 7	0.029 10		0.051 17	
x3467.9e 7	0.106 10		0.186 17	
x3539.2e 7	0.048 10		0.085 17	
x3563.7e 7	0.048 10		0.085 17	
x3576.7e 7	0.019 10		0.034 17	
x3598.3e 7	0.039 10		0.068 17	
x3651.4e 7	0.039 10		0.068 17	
x3656.5e 7	0.029 10		0.051 17	
x3671.7e 7	0.029 10		0.051 17	Additional information 33.
x3699.1e 7	0.039 10		0.068 17	
x3762.1e 7	0.048 10		0.085 17	
x3786.0e 7	0.019 10		0.034 17	
x3793.7e 7	0.029 10		0.051 17	
x3826.9e 7	0.029 10		0.051 17	Additional information 34.
x3865.6e 7	0.048 10		0.085 17	
x3879.1e 7	0.015 10		0.027 17	
x3902.1e 7	0.039 10		0.068 17	
x3907.6e 7	0.077 10		0.135 17	
x3942.9e 7	0.289 14		0.508 25	
x3957.3e 7	0.058 10		0.102 17	

$^{204}_{81}Tl_{123}$-9

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

γ(^{204}Tl) (continued)

E_γ ‡	I_γ #g	E_i(level)	J_i^π	E_f	unnormalized $I\gamma$ @	Comments
x3973.8 e 7	0.096 10				0.169 17	Additional information 35.
4009.1 e 7	0.231 12	(6654.76)	$0^+,1^+$	2645.6	0.406 20	
4017.4 e 7	0.270 13	(6654.76)	$0^+,1^+$	2637.3	0.474 24	
4035.9 e 7	0.077 10	(6654.76)	$0^+,1^+$	2618.8	0.135 17	
4069.0 e 7	0.096 10	(6654.76)	$0^+,1^+$	2585.7	0.169 17	
4076.7 6	0.212 11	(6654.76)	$0^+,1^+$	2578.0	0.373 19	
4101.4 4	0.173 10	(6654.76)	$0^+,1^+$	2553.3	0.305 17	
4115.08 17	0.482 24	(6654.76)	$0^+,1^+$	2539.64	0.85 4	
4127.8 e 7	0.058 10	(6654.76)	$0^+,1^+$	2526.9	0.102 17	
4160.9 e 7	0.116 10	(6654.76)	$0^+,1^+$	2493.39	0.203 17	
4195.98 14	1.00 5	(6654.76)	$0^+,1^+$	2458.74	1.76 9	
4225.47 17	1.31 7	(6654.76)	$0^+,1^+$	2429.25	2.30 12	
4258.9 8	0.077 10	(6654.76)	$0^+,1^+$	2395.8	0.135 17	
4286.3 8	0.154 10	(6654.76)	$0^+,1^+$	2368.4	0.271 17	
4309.00 24	0.60 3	(6654.76)	$0^+,1^+$	2345.71	1.05 5	
4343.56 12	1.18 6	(6654.76)	$0^+,1^+$	2311.15	2.07 10	
4380.4 e 7	0.154 10	(6654.76)	$0^+,1^+$	2274.3	0.271 17	
4392.8 e 7	0.096 10	(6654.76)	$0^+,1^+$	2261.9	0.169 17	
4402.60 15	0.270 13	(6654.76)	$0^+,1^+$	2252.11	0.474 24	
4439.3 3	0.212 11	(6654.76)	$0^+,1^+$	2214.44	0.373 19	
4448.8 e 7	0.077 10	(6654.76)	$0^+,1^+$	2205.9	0.135 17	
4466.2 e 7	0.058 10	(6654.76)	$0^+,1^+$	2188.5	0.102 17	
4495.74 13	1.29 6	(6654.76)	$0^+,1^+$	2158.97	2.27 11	
4520.2 e 7	0.058 10	(6654.76)	$0^+,1^+$	2134.5	0.102 17	
4540.62 15	0.94 5	(6654.76)	$0^+,1^+$	2114.09	1.66 8	
4570.0 3	0.60 3	(6654.76)	$0^+,1^+$	2084.7	1.05 5	
4600.95 16	0.83 4	(6654.76)	$0^+,1^+$	2053.76	1.46 7	
4609.3 e 7	0.327 10	(6654.76)	$0^+,1^+$	2045.4	0.576 17	
4687.58 12	2.93 15	(6654.76)	$0^+,1^+$	1967.12	5.1 3	
4705.83 14	1.73 9	(6654.76)	$0^+,1^+$	1948.87	3.05 15	
4715.3 4	0.482 24	(6654.76)	$0^+,1^+$	1939.4	0.85 4	
4752.24 11	3.83 19	(6654.76)	$0^+,1^+$	1902.46	6.7 3	
4804.4 4	0.405 20	(6654.76)	$0^+,1^+$	1850.3	0.71 4	
4841.40 15	1.18 6	(6654.76)	$0^+,1^+$	1813.30	2.07 10	Additional information 58.
4867.5 6	0.193 10	(6654.76)	$0^+,1^+$	1787.2	0.339 17	
4913.57 11	4.49 22	(6654.76)	$0^+,1^+$	1741.04	7.9 4	
4945.0 e 7	0.925 10	(6654.76)	$0^+,1^+$	1709.7	1.626 17	
4980.97 20	0.58 3	(6654.76)	$0^+,1^+$	1673.48	1.02 5	
5014.61 15	1.64 8	(6654.76)	$0^+,1^+$	1640.09	2.88 14	
5130.50 23	1.31 7	(6654.76)	$0^+,1^+$	1524.27	2.30 12	
5155.1 e 7	0.173 10	(6654.76)	$0^+,1^+$	1499.6	0.305 17	
5172.3 e 7	0.559 10	(6654.76)	$0^+,1^+$	1482.4	0.982 17	

$^{204}_{81}Tl_{123}$-10

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17 (continued)

γ(^{204}Tl) (continued)

E_γ[‡]	I_γ[#g]	E_i(level)	J_i^π	E_f	J_f^π	unnormalized Iγ[@]
5180.38 *12*	3.93 *20*	(6654.76)	0$^+$,1$^+$	1474.33		6.9 *3*
5238.4 *3*	0.52 *3*	(6654.76)	0$^+$,1$^+$	1416.3		0.91 *5*
5261.48 *13*	2.18 *11*	(6654.76)	0$^+$,1$^+$	1393.21		3.83 *19*
5279.86 *12*	5.5 *3*	(6654.76)	0$^+$,1$^+$	1374.71		9.7 *5*
5404.41 *12*	3.58 *18*	(6654.76)	0$^+$,1$^+$	1250.22		6.3 *3*
5451.07 *14*	1.93 *10*	(6654.76)	0$^+$,1$^+$	1204.35		3.39 *17*
5520.3 *4*	0.62 *3*	(6654.76)	0$^+$,1$^+$	1134.03		1.08 *5*
5533.35 *13*	3.43 *17*	(6654.76)	0$^+$,1$^+$	1121.34		6.0 *3*
5603.28 *13*	7.4 *4*	(6654.76)	0$^+$,1$^+$	1051.18		13.0 *7*
5641.57 *12*	8.5 *4*	(6654.76)	0$^+$,1$^+$	1013.22		14.9 *7*
5749.8[e] *7*	0.073 *10*	(6654.76)	0$^+$,1$^+$	905.99		0.129 *17*
5890.2 *4*	0.212 *11*	(6654.76)	0$^+$,1$^+$	764.30		0.373 *19*
5917.48 *16*	2.33 *12*	(6654.76)	0$^+$,1$^+$	737.10		4.10 *20*
6025.21 *24*	0.65 *3*	(6654.76)	0$^+$,1$^+$	629.39		1.15 *6*
6118.79 *23*	0.54 *3*	(6654.76)	0$^+$,1$^+$	535.60		0.95 *5*
6166.61 *14*	4.76 *24*	(6654.76)	0$^+$,1$^+$	488.11		8.4 *4*
6183.05 *15*	2.20 *11*	(6654.76)	0$^+$,1$^+$	471.93		3.86 *19*
6222.57 *16*	1.93 *10*	(6654.76)	0$^+$,1$^+$	431.88		3.39 *17*
6336.11 *22*	0.62 *3*	(6654.76)	0$^+$,1$^+$	318.85		1.08 *5*
6355.4[e] *7*	0.058 *10*	(6654.76)	0$^+$,1$^+$	300.14		0.102 *17*
6514.57 *15*	3.60 *18*	(6654.76)	0$^+$,1$^+$	139.97		6.3 *3*
6654.71 *25*	0.270 *13*	(6654.76)	0$^+$,1$^+$	0.0	2$^-$	0.474 *24*

[†] Additional information 59.

[‡] From 2007ChZX, unless otherwise noted. Placement of each γ is from one or more of 1965Pr07, 1967We04, 1973Fu17, 1974Co21, and 1975RaYX; when these works suggest different placements, the disagreements are indicated.

[#] From 2007ChZX for Eγ<2 MeV, except from 1967We04 as noted. From 1974Co21 for Eγ>2 MeV.

[@] Intensity per 100 isotopic neutron captures as reported in 1967We04 (Eγ < 2 MeV) and 1974Co21 (Eγ > 2 MeV). 1974Co21 give elemental captures, which have been divided here by the ^{203}Tl isotopic abundance 0.29524 to obtain isotopic captures. The intensities per 100 captures that are reported by 1967We04 and 1974Co21 are typically 1.5 to 2 times larger than those determined in 2007ChZX. The source of this discrepancy is unclear.

[&] From 1975RaYX; ΔEγ′s not given, 0.5 keV assigned by evaluators.

[a] From 1973Fu17.

[b] From 1969Ra10.

[c] From 1967We04, as quoted in 1969Gr41.

[d] From 1965Pr07.

[e] From 1974Co21.

[f] Multiply placed in level scheme by 1975RaYX.

[g] Intensity per 100 neutron captures.

$^{204}_{81}Tl_{123}$-11

$\gamma(^{204}\text{Tl})$ (continued)

[h] Placement of transition in the level scheme is uncertain.
[x] γ ray not placed in level scheme.

$^{204}_{81}\text{Tl}_{123}$-12

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17

Level Scheme

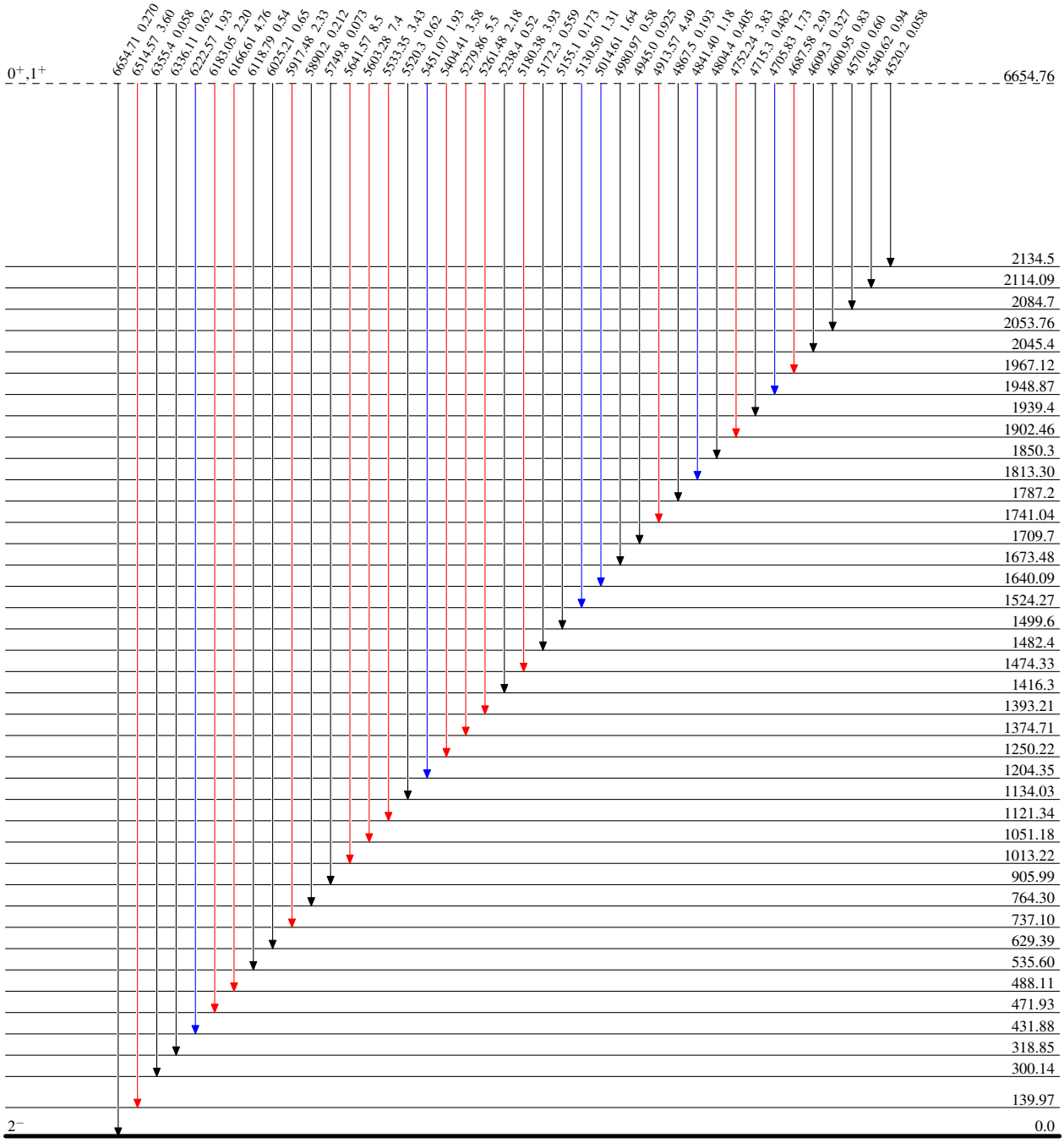
Intensities: I_γ per 100 neutron captures

Legend

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

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

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



$^{204}_{81}Tl_{123}$

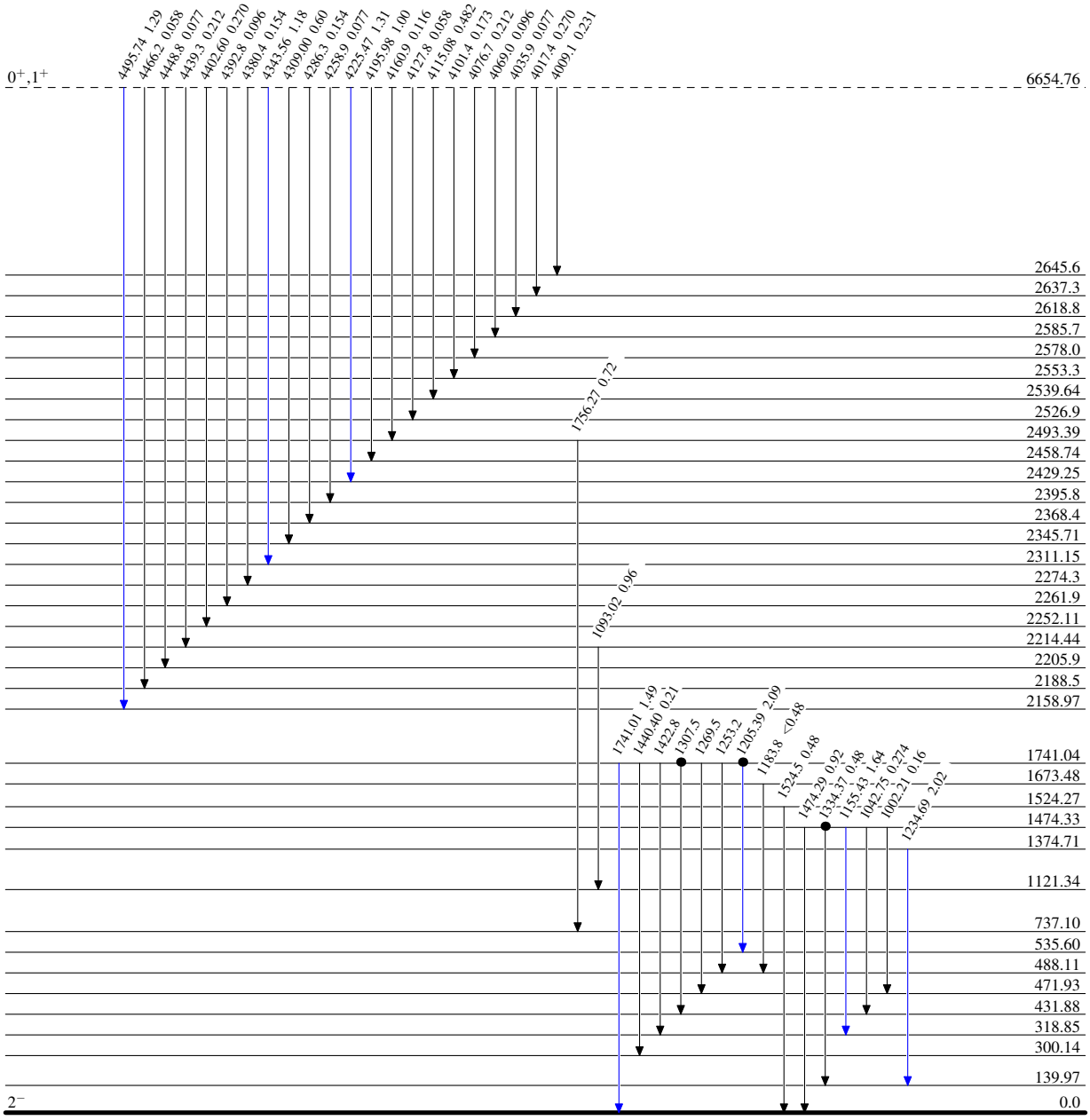
^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17

Legend

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

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures



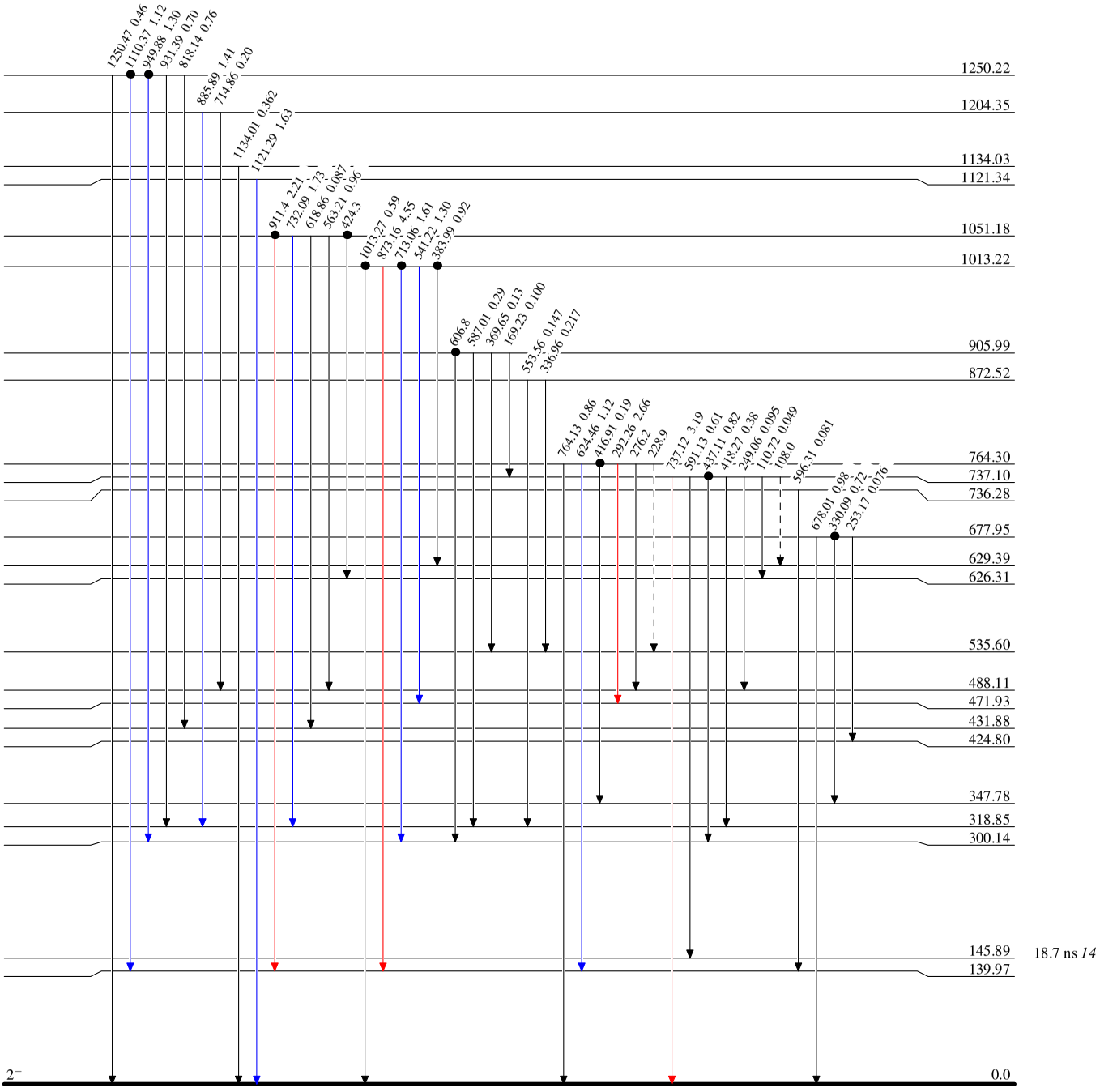
$^{204}_{81}Tl_{123}$

^{203}**Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17**

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures

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

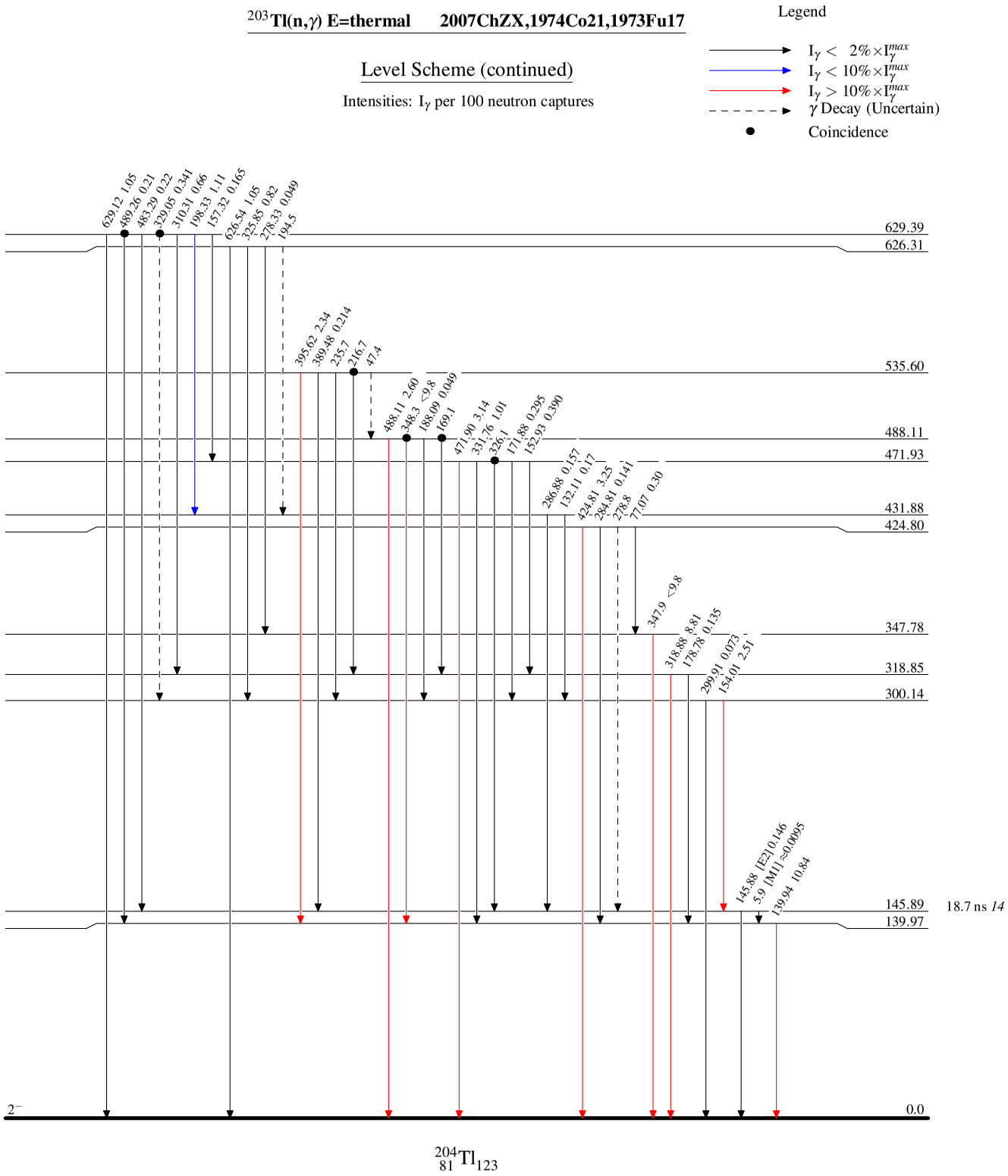


$^{204}_{81}Tl_{123}$

^{203}Tl(n,γ) E=thermal 2007ChZX,1974Co21,1973Fu17

Level Scheme (continued)

Intensities: I_γ per 100 neutron captures



$^{204}_{81}Tl_{123}$