$^{181}Ta(^{18}O,5n\gamma)$ 2014Ma55,2016Ma13

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	Jun Chen and Balraj Singh	NDS 177, 1 (2021)	3-Sep-2021

See $^{181}Ta(^{18}O,5n\gamma)$:SD dataset for SD-band data.

2014Ma55 (also 2013Ma03): E=91 and 93 MeV ^{18}O beam impinged on two or three 0.5 mg/cm^2 self-supporting ^{181}Ta foils. The AFRODITE array of eight Compton-suppressed clover detectors and 6 LEPS detectors was used for γ-ray spectroscopy at iThemba LABS. Four clover detectors were placed at 135°, while the other four clovers were arranged at 90°. Measured Eγ, Iγ, γγ-coin, γ(θ)(ADO) ratio, γ(linear polarization), branching ratios, B(M1), B(E2). Deduced levels, J, π, bands, multipolarity, rotational band alignments and Routhians. Calculated proton and neutron quasiparticle Routhians, and band crossing frequencies using the cranked shell model (CSM). Investigation of chirality. See 2016Ma13 of the same group for lifetime measurements using DSAM.

1979Kr09: E=80-100 MeV beams from the Munich MP tandem. Measured Eγ, γγ-coin, γ(θ), excitation functions with Ge(Li) detectors.

Level scheme of normal bands is from 2014Ma55, which is extended with respect to that of 1979Kr09 as well as that of 2012Pa16 in $Re(^{13}C,4n\gamma)$ and has been adopted by the evaluators in Adopted Levels, Gammas, because of higher statistics and completeness. Level scheme of super-deformed (SD) bands is from 1991Az03.

^{194}Tl Levels

Configurations are discussed in detail by 2014Ma55. Nomenclature for orbitals in cranked shell-model (CSM) calculations is as follows:

A: 1/2[660],α=+1/2, $\nu i_{13/2}$ orbital.
B: 1/2[660],α=−1/2, $\nu i_{13/2}$ orbital.
C: 3/2[651],α=+1/2, $\nu i_{13/2}$ orbital.
D: 3/2[651],α=−1/2, $\nu i_{13/2}$ orbital.
E: α=−1/2, νj, j=$p_{3/2}$, $f_{5/2}$, $p_{1/2}$.
F: α=+1/2, νj, j=$p_{3/2}$, $f_{5/2}$, $p_{1/2}$.
e: 9/2[550],α=−1/2, $\pi h_{9/2}$ orbital.
f: 9/2[550],α=+1/2, $\pi h_{9/2}$ orbital.
g: 1/2[550],α=−1/2, $\pi h_{11/2}$ orbital.

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	Comments
260 *14*	(7+)	32.8 min *2*	Additional information 1. E(level),J^{π},$T_{1/2}$: from Adopted Levels. E(level)=0.0+x in 1979Kr09 and 2014Ma55.
552.80[@] *20*	(8−)		
598.2[@] *4*	(9−)		E(level): 292.8+y in 1979Kr09, with x≤y≤x+85.
694.4[@] *5*	(10−)		389.1+y in 1979Kr09.
972.4[@] *5*	(11−)		667.0+y in 1979Kr09.
1217.2[@] *5*	(12−)		911.7+y in 1979Kr09.
1434.7[b] *5*	(11−)		
1620.6[@] *5*	(13−)		1314.9+y in 1979Kr09.
1740.8[b] *5*	(12−)		
1794.9 *6*	(11+)		
1843.0 *6*	(12−)		
1903.9[@] *5*	(14−)		1598.2+y in 1979Kr09.
1938.3 *6*	(12+)		
1998.0[b] *5*	(13−)		
2030.9[&] *5*	(12+)		
2056.2[&] *6*	(13+)		
2114.6 *6*	(13−)		

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

^{194}Tl Levels (continued)

E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]	E(level)[†]	J^{π}[‡]	$T_{1/2}$[#]
2133.1[&] 6	(14$^+$)		3521.3[&] 8	(20$^+$)	
2213.8[c] 8	(14$^+$)		3530.7[c] 10	(19$^+$)	
2237.8[&] 7	(15$^+$)		3640.8[@] 7	(19$^-$)	
2260.8[b] 5	(14$^-$)		3687.1[b] 7	(19$^-$)	>1.18 ps
2372.3[@] 5	(15$^-$)		3777.8[@] 7	(20$^-$)	
2392.5[&] 7	(16$^+$)		3884.1[&] 8	(21$^+$)	
2401.3[c] 9	(15$^+$)		3884.2[a] 7	(21$^-$)	0.44 ps +18−12
2476.1 6	(14$^-$)		3887.2[b] 8	(20$^-$)	>0.83 ps
2568.0[&] 8	(17$^+$)		3896.4[c] 11	(20$^+$)	
2604.1[b] 6	(15$^-$)		4099.9[@] 7	(21$^-$)	0.82 ps +14−10
2628.6[c] 9	(16$^+$)		4136.3[b] 8	(21$^-$)	0.57 ps +12−9
2663.5[@] 6	(16$^-$)		4211.7[a] 8	(22$^-$)	0.49 ps +17−10
2714.8 6	(15$^-$)		4238.2[&] 8	(22$^+$)	
2780.4[a] 5	(16$^-$)		4340.5[@] 8	(22$^-$)	0.83 ps +28−14
2857.4[&] 8	(18$^+$)		4440.2[b] 8	(22$^-$)	0.62 ps +14−10
2859.2[a] 6	(17$^-$)		4572.4[&] 9	(23$^+$)	
2881.4[c] 10	(17$^+$)		4641.6[a] 8	(23$^-$)	0.20 ps +5−3
2942.2[b] 6	(16$^-$)		4721.4[@] 8	(23$^-$)	1.25 ps +31−21
3021.6[a] 6	(18$^-$)		4819.3[b] 8	(23$^-$)	>1.04 ps
3142.0[@] 6	(17$^-$)		4894.9[&] 9	(24$^+$)	0.87 ps +45−24
3161.0[&] 8	(19$^+$)		5037.5[a] 8	(24$^-$)	0.29 ps +8−6
3204.4[c] 10	(18$^+$)		5082.6[@] 8	(24$^-$)	0.97 ps +49−21
3262.4[b] 6	(17$^-$)		5257.3[&] 9	(25$^+$)	0.35 ps +14−8
3300.9[a] 6	(19$^-$)	0.74 ps +25−17	5491.6[a] 9	(25$^-$)	
3389.5[@] 6	(18$^-$)		5655.9[&] 10	(26$^+$)	0.33 ps +17−8
3425.0 7	(18$^-$)		6103.9[&] 10	(27$^+$)	0.33 ps +10 −6
3507.6[a] 7	(20$^-$)	0.73 ps +55−24	6587.0[&] 10	(28$^+$)	0.31 ps +8−6
3517.2[b] 6	(18$^-$)				

[†] From a least-squares fit to γ-ray energies, keeping the energy of the 260-keV level fixed and assuming $\Delta E\gamma$=0.3 keV for values quoted to tenth keV and 1 keV for those quoted to keV if not given.

[‡] For levels above the (7$^+$) isomer, assignments are based on possible band assignments, $\gamma\gamma$(ADO) and γ(pol) data in 2014Ma55. The same assignments are adopted in Adopted Levels.

[#] From DSAM in 2016Ma13 with line-shape analysis.

[@] Band(A): Band #1 based on (8$^-$) Configuration=e/f⊗A, e/f⊗ABC above the crossing near $\hbar\omega$=0.31 MeV. This band is a possible chiral partner of band 4 (2014Ma55).

[&] Band(B): Band #2 based on (12$^+$) Configuration=e/f⊗ABF, e/f⊗ABCDF above the crossing near $\hbar\omega$=0.33 MeV (2014Ma55).

[a] Band(C): Band #3 based on (16$^-$) Configuration=e/f⊗ABC (2014Ma55).

[b] Band(D): Band #4 based on (11$^-$) Configuration=e/f⊗ABC. This band is a possible chiral partner of band 1 (2014Ma55).

[c] Band(E): Band #5 based on (14$^+$). Configuration=e/f⊗ABE (2014Ma55).

^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl)

R_{ADO} values are for 90° and 135°, deduced to be 0.85 and 1.35 for stretched dipole and stretched quadrupole transitions, respectively (2014Ma55).

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	α[#]	Comments
(25.3 *3*)		2056.2	(13$^+$)	2030.9	(12$^+$)			E_γ: from level-energy difference; γ not observed, inferred from γγ coincidence data (2014Ma55).
45.4 *3*	14.1 *17*	598.2	(9$^-$)	552.80	(8$^-$)	(M1)	15.8 *4*	α(L)=12.1 *3*; α(M)=2.84 *7* α(N)=0.717 *18*; α(O)=0.139 *4*; α(P)=0.0131 *4* R_{ADO}=0.80 *20* (2014Ma55), intensity balance suggests M1.
76.9 *3*	25.0 *24*	2133.1	(14$^+$)	2056.2	(13$^+$)	(M1)	3.38 *7*	α(L)=2.59 *5*; α(M)=0.606 *11* α(N)=0.153 *3*; α(O)=0.0297 *6*; α(P)=0.00281 *5* R_{ADO}=0.83 *12*.
78.8 *3*	11.3 *12*	2859.2	(17$^-$)	2780.4	(16$^-$)	(M1)	3.15 *6*	α(L)=2.41 *5*; α(M)=0.564 *11* α(N)=0.143 *3*; α(O)=0.0277 *5*; α(P)=0.00261 *5* R_{ADO}=0.88 *12*.
96.2 *3*	14 *4*	694.4	(10$^-$)	598.2	(9$^-$)	(M1)		E_γ: weighted average of 95.8 *3* from 2014Ma55 and 96.3 *2* from 1979Kr09. I_γ: unweighted average of 18.6 *21* from 2014Ma55 and 10 *4* from 1979Kr09. R_{ADO}=0.87 *10* (2014Ma55). γ contaminated by ^{194}Hg (1979Kr09).
104.7 *3*	12.5 *14*	2237.8	(15$^+$)	2133.1	(14$^+$)	(M1)	7.54 *13*	α(K)=6.15 *10*; α(L)=1.059 *18*; α(M)=0.248 *4* α(N)=0.0625 *11*; α(O)=0.01214 *20*; α(P)=0.001146 *19* R_{ADO}=0.84 *12*.
117.9 *5*	2.6 *4*	2056.2	(13$^+$)	1938.3	(12$^+$)	(M1)	5.37 *10*	α(K)=4.38 *9*; α(L)=0.753 *14*; α(M)=0.176 *4* α(N)=0.0444 *9*; α(O)=0.00862 *16*; α(P)=0.000814 *16* R_{ADO}=0.86 *15*.
137.3 *5*	6.2 *15*	3777.8	(20$^-$)	3640.8	(19$^-$)	(M1)	3.48 *6*	α(K)=2.84 *5*; α(L)=0.486 *9*; α(M)=0.1136 *20* α(N)=0.0287 *5*; α(O)=0.00557 *10*; α(P)=0.000526 *10* R_{ADO}=0.85 *15*.
143.4 *3*	11.1 *15*	1938.3	(12$^+$)	1794.9	(11$^+$)	(M1)	3.07	α(K)=2.51 *4*; α(L)=0.430 *7*; α(M)=0.1004 *16* α(N)=0.0253 *4*; α(O)=0.00492 *8*; α(P)=0.000465 *7* R_{ADO}=0.78 *12*.
154.7 *2*	31 *3*	2392.5	(16$^+$)	2237.8	(15$^+$)	(M1+E2)	1.8 *8*	α(K)=1.2 *9*; α(L)=0.45 *10*; α(M)=0.11 *3* α(N)=0.028 *8*; α(O)=0.0051 *12*; α(P)=0.00030 *8* A_2=−0.50 *15*; A_4=+0.06 *6* (1979Kr09) γ unplaced in 1979Kr09. E_γ: weighted average of 154.6 *3* from 2014Ma55 and 154.7 *2* from 1979Kr09. I_γ: weighted average of 30 *3* from 2014Ma55 and 32 *4* from 1979Kr09. R_{ADO}=0.86 *12*.
155.0 *5*	1.1 *2*	1998.0	(13$^-$)	1843.0	(12$^-$)			
157.6 *5*	5.0 *7*	2213.8	(14$^+$)	2056.2	(13$^+$)	(M1)	2.35	α(K)=1.92 *4*; α(L)=0.328 *6*; α(M)=0.0767 *13* α(N)=0.0194 *4*; α(O)=0.00376 *7*; α(P)=0.000355 *6* R_{ADO}=0.83 *12*.
162.4 *3*	13.9 *15*	3021.6	(18$^-$)	2859.2	(17$^-$)	(M1)	2.16	α(K)=1.77 *3*; α(L)=0.301 *5*; α(M)=0.0704 *11* α(N)=0.0178 *3*; α(O)=0.00345 *6*;

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	α #	Comments
								α(P)=0.000326 5 R_{ADO}=0.84 12.
170.0 5	2.1 4	3687.1	(19⁻)	3517.2	(18⁻)	(M1)	1.90	α(K)=1.55 3; α(L)=0.265 5; α(M)=0.0619 10 α(N)=0.0156 3; α(O)=0.00303 5; α(P)=0.000287 5 R_{ADO}=0.74 19.
175.4 2	43 8	2568.0	(17⁺)	2392.5	(16⁺)	(M1)	1.738	α(K)=1.422 21; α(L)=0.242 4; α(M)=0.0566 9 α(N)=0.01430 21; α(O)=0.00278 4; α(P)=0.000262 4 A_2=−0.5 3; A_4=+0.01 3 (1979Kr09) E_γ: weighted average of 175.6 3 from 2014Ma55 and 175.3 2 from 1979Kr09. I_γ: unweighted average of 34.8 32 from 2014Ma55 and 51 6 from 1979Kr09. R_{ADO}=0.84 12.
176.4 5	3.8 6	2780.4	(16⁻)	2604.1	(15⁻)	(M1)	1.71 3	α(K)=1.400 23; α(L)=0.238 4; α(M)=0.0557 9 α(N)=0.01407 23; α(O)=0.00273 5; α(P)=0.000258 5 R_{ADO}=0.83 15.
187.5 5	6.3 9	2401.3	(15⁺)	2213.8	(14⁺)	(M1)	1.441 23	α(K)=1.179 19; α(L)=0.201 4; α(M)=0.0469 8 α(N)=0.01184 19; α(O)=0.00230 4; α(P)=0.000217 4 R_{ADO}=0.88 12.
ˣ197.1@ 2	36 4							A_2=−0.04 6; A_4=0.00 3 (1979Kr09) E_γ,I_γ: from 1979Kr09 only; the line may have been contributed by ^{19}F.
200.1 5	2.9 5	3887.2	(20⁻)	3687.1	(19⁻)	(M1)	1.201 19	α(K)=0.983 16; α(L)=0.167 3; α(M)=0.0390 7 α(N)=0.00986 16; α(O)=0.00192 3; α(P)=0.000181 3 D from R_{ADO}=0.80 18.
206.7 3	11.6 21	3507.6	(20⁻)	3300.9	(19⁻)	M1	1.097	α(K)=0.898 13; α(L)=0.1526 23; α(M)=0.0356 6 α(N)=0.00900 14; α(O)=0.00175 3; α(P)=0.0001652 24 D from R_{ADO}=0.76 19; E1 ruled out by RUL.
215.6 5	8.2 4	3640.8	(19⁻)	3425.0	(18⁻)	(M1)	0.976 15	α(K)=0.799 13; α(L)=0.1356 21; α(M)=0.0317 5 α(N)=0.00800 13; α(O)=0.001553 24; α(P)=0.0001468 23 R_{ADO}=0.81 10.
227.3 2	5.9 10	2628.6	(16⁺)	2401.3	(15⁺)	(M1)	0.842	α(K)=0.689 10; α(L)=0.1170 17; α(M)=0.0273 4 α(N)=0.00690 10; α(O)=0.001340 19; α(P)=0.0001266 18 A_2=−0.6 4; A_4=+0.2 2 (1979Kr09) γ unplaced in 1979Kr09. E_γ: weighted average of 227.0 5 from 2014Ma55 and 227.3 2 from 1979Kr09. I_γ: weighted average of 6.4 8 from 2014Ma55 and 4.2 14 from 1979Kr09. R_{ADO}=0.77 13.
238.7 5	1.4 6	2714.8	(15⁻)	2476.1	(14⁻)			
240.4 5	7.8 12	4340.5	(22⁻)	4099.9	(21⁻)	(M1)	0.721	α(K)=0.590 9; α(L)=0.1001 16; α(M)=0.0234 4 α(N)=0.00590 9; α(O)=0.001146 18; α(P)=0.0001083 17 D form R_{ADO}=0.81 14.

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ†	I_γ†	E_i(level)	J^π_i	E_f	J^π_f	Mult.‡	α#	Comments
241.0 *5*	3.0 *6*	3021.6	(18−)	2780.4	(16−)	(E2)	0.219 *4*	α(K)=0.1082 *16*; α(L)=0.0829 *14*; α(M)=0.0214 *4* α(N)=0.00536 *9*; α(O)=0.000944 *16*; α(P)=4.33×10^{-5} *7* ΔJ=2, Q from R_{ADO}=1.20 *16*, M2 less likely for a low-energy transition.
244.8 *2*	59.1 *24*	1217.2	(12−)	972.4	(11−)	M1	0.686	α(K)=0.562 *8*; α(L)=0.0952 *14*; α(M)=0.0222 *4* α(N)=0.00561 *8*; α(O)=0.001090 *16*; α(P)=0.0001030 *15* A_2=−0.50 *6*; A_4=+0.04 *4* (1979Kr09); pol=−0.07 *3* E_γ: weighted average of 244.9 *3* from 2014Ma55 and 244.7 *2* from 1979Kr09. I_γ: weighted average of 59.7 *14* from 2014Ma55 and 49 *6* from 1979Kr09. R_{ADO}=0.89 *15*.
247.5 *5*	3.8 *4*	3389.5	(18−)	3142.0	(17−)	(M1)	0.665	α(K)=0.545 *9*; α(L)=0.0923 *14*; α(M)=0.0215 *4* α(N)=0.00544 *9*; α(O)=0.001057 *16*; α(P)=9.99×10^{-5} *15* R_{ADO}=0.75 *10*.
249.1 *5*	2.4 *3*	4136.3	(21−)	3887.2	(20−)	(M1)	0.653	α(K)=0.535 *8*; α(L)=0.0907 *14*; α(M)=0.0212 *4* α(N)=0.00534 *8*; α(O)=0.001038 *16*; α(P)=9.81×10^{-5} *15* D from R_{ADO}=0.87 *20*.
251.2 *5*	5.5 *14*	3640.8	(19−)	3389.5	(18−)	(M1)	0.639	α(K)=0.523 *8*; α(L)=0.0886 *14*; α(M)=0.0207 *4* α(N)=0.00522 *8*; α(O)=0.001014 *16*; α(P)=9.59×10^{-5} *15* R_{ADO}=0.78 *11*.
252.9 *5*	3.5 *9*	2881.4	(17+)	2628.6	(16+)	(M1)	0.627	α(K)=0.513 *8*; α(L)=0.0869 *13*; α(M)=0.0203 *3* α(N)=0.00512 *8*; α(O)=0.000995 *15*; α(P)=9.41×10^{-5} *15* R_{ADO}=0.79 *15*.
254.8 *5*	2.4 *4*	3517.2	(18−)	3262.4	(17−)	(M1)	0.614	α(K)=0.503 *8*; α(L)=0.0851 *13*; α(M)=0.0199 *3* α(N)=0.00502 *8*; α(O)=0.000975 *15*; α(P)=9.22×10^{-5} *14* R_{ADO}=0.77 *14*.
257.2 *5*	2.3 *5*	1998.0	(13−)	1740.8	(12−)	(M1)	0.598	α(K)=0.490 *8*; α(L)=0.0830 *13*; α(M)=0.0194 *3* α(N)=0.00489 *8*; α(O)=0.000950 *15*; α(P)=8.98×10^{-5} *14* R_{ADO}=0.78 *18*.
262.8 *3*	10.8 *9*	2260.8	(14−)	1998.0	(13−)	M1	0.564	α(K)=0.462 *7*; α(L)=0.0782 *12*; α(M)=0.0182 *3* α(N)=0.00461 *7*; α(O)=0.000895 *13*; α(P)=8.46×10^{-5} *13* R_{ADO}=0.73 *12*. POL=−0.06 *4*.
278.0 *2*	100 *6*	972.4	(11−)	694.4	(10−)	M1	0.483	α(K)=0.396 *6*; α(L)=0.0669 *10*; α(M)=0.01561 *22* α(N)=0.00394 *6*; α(O)=0.000766 *11*; α(P)=7.24×10^{-5} *11* A_2=−0.50 *3*; A_4=+0.02 *2* (1979Kr09); pol=−0.05 *3* E_γ: weighted average of 278.2 *3* from 2014Ma55 and 277.9 *2* from 1979Kr09. I_γ: from 1979Kr09. Other: 100 *14* from 2014Ma55. R_{ADO}=0.89 *15*.
279.3 *2*	24 *3*	3300.9	(19−)	3021.6	(18−)	M1	0.477	α(K)=0.391 *6*; α(L)=0.0660 *10*; α(M)=0.01541 *22* α(N)=0.00389 *6*; α(O)=0.000756 *11*; α(P)=7.15×10^{-5} *11* A_2=−0.43 *7*; A_4=+0.05 *5* (1979Kr09) γ unplaced in 1979Kr09. E_γ: weighted average of 279.4 *3* from 2014Ma55

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[‡]	α[#]	Comments
								and 279.2 *2* from 1979Kr09. I_γ: weighted average of 23.6 *29* from 2014Ma55 and 24 *3* from 1979Kr09. D from R_{ADO}=0.88 *12*; E1 ruled out by RUL.
282.9 *5*	3.9 *10*	3425.0	(18⁻)	3142.0	(17⁻)	M1	0.460	α(K)=0.377 *6*; α(L)=0.0638 *10*; α(M)=0.01488 *22* α(N)=0.00376 *6*; α(O)=0.000730 *11*; α(P)=6.90×10⁻⁵ *11* R_{ADO}=0.78 *10*. POL=−0.06 *3* for 282.9+283.3.
283.3 *2*	23.0 *10*	1903.9	(14⁻)	1620.6	(13⁻)	M1	0.459	α(K)=0.376 *6*; α(L)=0.0635 *9*; α(M)=0.01482 *21* α(N)=0.00374 *6*; α(O)=0.000727 *11*; α(P)=6.88×10⁻⁵ *10* A_2=−0.44 *10*; A_4=+0.01 *1* (1979Kr09); pol=−0.06 *3* E_γ: from 1979Kr09. Other: 283.3 *5* from 2014Ma55. I_γ: weighted average of 22.8 *10* from 2014Ma55 and 25 *3* from 1979Kr09. R_{ADO}=0.89 *11*. POL for 282.9+283.3.
289.4 *2*	42.5 *24*	2857.4	(18⁺)	2568.0	(17⁺)	M1	0.433	α(K)=0.355 *5*; α(L)=0.0599 *9*; α(M)=0.01397 *20* α(N)=0.00353 *5*; α(O)=0.000685 *10*; α(P)=6.48×10⁻⁵ *10* A_2=−0.44 *10*; A_4=+0.01 *2* (1979Kr09); pol=−0.08 *3* γ placed from a 2346.2+y level in 1979Kr09. E_γ: weighted average of 289.5 *3* from 2014Ma55 and 289.4 *2* from 1979Kr09. I_γ: weighted average of 43.7 *24* from 2014Ma55 and 39 *4* from 1979Kr09. R_{ADO}=0.77 *9*.
291.2 *3*	10 *3*	2663.5	(16⁻)	2372.3	(15⁻)	(M1)	0.425	α(K)=0.349 *5*; α(L)=0.0589 *9*; α(M)=0.01374 *20* α(N)=0.00347 *5*; α(O)=0.000674 *10*; α(P)=6.37×10⁻⁵ *10* Mult.: R_{ADO}=0.78 *15*.
292.8 *2*	256 *13*	552.80	(8⁻)	260	(7⁺)	D		A_2=−0.19 *5*; A_4=+0.01 *2* (1979Kr09) E_γ: weighted average of 293.0 *5* from 2014Ma55 and 292.8 *2* from 1979Kr09. I_γ: from 1979Kr09.
297.6 *5*	1.1 *6*	3687.1	(19⁻)	3389.5	(18⁻)			
303.7 *3*	28 *4*	3161.0	(19⁺)	2857.4	(18⁺)	M1	0.379	α(K)=0.311 *5*; α(L)=0.0524 *8*; α(M)=0.01224 *18* α(N)=0.00309 *5*; α(O)=0.000600 *9*; α(P)=5.68×10⁻⁵ *8* R_{ADO}=0.78 *9*. POL=−0.07 *4*.
303.9 *5*	1.8 *7*	4440.2	(22⁻)	4136.3	(21⁻)	(M1)	0.379	α(K)=0.310 *5*; α(L)=0.0524 *8*; α(M)=0.01221 *18* α(N)=0.00308 *5*; α(O)=0.000599 *9*; α(P)=5.67×10⁻⁵ *9* D from R_{ADO}=0.76 *12*.
306.2 *5*	1.8 *4*	1740.8	(12⁻)	1434.7	(11⁻)	(M1)	0.371	α(K)=0.304 *5*; α(L)=0.0513 *8*; α(M)=0.01196 *18* α(N)=0.00302 *5*; α(O)=0.000587 *9*; α(P)=5.55×10⁻⁵ *9* R_{ADO}=0.72 *10*.
320.2 *5*	2.4 *6*	3262.4	(17⁻)	2942.2	(16⁻)	(M1)	0.328	α(K)=0.269 *4*; α(L)=0.0454 *7*; α(M)=0.01058 *16* α(N)=0.00267 *4*; α(O)=0.000519 *8*; α(P)=4.91×10⁻⁵ *8* R_{ADO}=0.79 *10*.
322.3 *3*	12.8 *19*	4099.9	(21⁻)	3777.8	(20⁻)	(M1)	0.323	α(K)=0.264 *4*; α(L)=0.0446 *7*; α(M)=0.01040 *15* α(N)=0.00262 *4*; α(O)=0.000510 *8*; α(P)=4.82×10⁻⁵ *7* D from R_{ADO}=0.83 *16*.
322.4 *5*	6.5 *13*	4894.9	(24⁺)	4572.4	(23⁺)	M1	0.322	α(K)=0.264 *4*; α(L)=0.0445 *7*; α(M)=0.01039 *16*

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	α #	Comments
								α(N)=0.00262 *4*; α(O)=0.000509 *8*; α(P)=4.82×10^{-5} *7* R_{ADO}=0.78 *12*. POL=−0.07 *5*.
323.0 *5*	2.6 *9*	3204.4	(18$^+$)	2881.4	(17$^+$)	(M1)	0.321	α(K)=0.263 *4*; α(L)=0.0443 *7*; α(M)=0.01033 *16* α(N)=0.00261 *4*; α(O)=0.000507 *8*; α(P)=4.80×10^{-5} *7* R_{ADO}=0.71 *12*.
326.4 *5*	1.8 *7*	3530.7	(19$^+$)	3204.4	(18$^+$)	(M1)	0.312	α(K)=0.256 *4*; α(L)=0.0430 *7*; α(M)=0.01004 *15* α(N)=0.00254 *4*; α(O)=0.000493 *8*; α(P)=4.66×10^{-5} *7* R_{ADO}=0.81 *15*.
327.5 *5*	5.0 *6*	4211.7	(22$^-$)	3884.2	(21$^-$)	(M1)	0.309	α(K)=0.253 *4*; α(L)=0.0427 *7*; α(M)=0.00995 *15* α(N)=0.00251 *4*; α(O)=0.000488 *8*; α(P)=4.62×10^{-5} *7* D from R_{ADO}=0.72 *11*.
330.2 *5*	4.8 *5*	2568.0	(17$^+$)	2237.8	(15$^+$)	(E2)	0.0838	α(K)=0.0511 *8*; α(L)=0.0246 *4*; α(M)=0.00624 *10* α(N)=0.001567 *24*; α(O)=0.000281 *5*; α(P)=1.531×10^{-5} *23* ΔJ=2, Q from R_{ADO}=1.33 *21*, M2 less likely for a low-energy transition.
334.3 *5*	8.0 *10*	4572.4	(23$^+$)	4238.2	(22$^+$)	(M1)	0.292	α(K)=0.240 *4*; α(L)=0.0403 *6*; α(M)=0.00941 *14* α(N)=0.00237 *4*; α(O)=0.000461 *7*; α(P)=4.37×10^{-5} *7* R_{ADO}=0.78 *13*.
338.2 *5*	2.9 *4*	2942.2	(16$^-$)	2604.1	(15$^-$)	(M1)	0.283	α(K)=0.232 *4*; α(L)=0.0391 *6*; α(M)=0.00911 *14* α(N)=0.00230 *4*; α(O)=0.000447 *7*; α(P)=4.23×10^{-5} *7* R_{ADO}=0.80 *12*.
343.3 *5*	9.2 *5*	2604.1	(15$^-$)	2260.8	(14$^-$)	M1	0.272	α(K)=0.223 *4*; α(L)=0.0375 *6*; α(M)=0.00875 *13* α(N)=0.00221 *4*; α(O)=0.000429 *7*; α(P)=4.06×10^{-5} *6* R_{ADO}=0.81 *12*. POL=−0.06 *4*.
354.1 *3*	13.5 *16*	4238.2	(22$^+$)	3884.1	(21$^+$)	(M1)	0.250	α(K)=0.205 *3*; α(L)=0.0345 *5*; α(M)=0.00804 *12* α(N)=0.00203 *3*; α(O)=0.000394 *6*; α(P)=3.73×10^{-5} *6* R_{ADO}=0.83 *12*.
358.5 *5*	2.6 *7*	4136.3	(21$^-$)	3777.8	(20$^-$)			
360.4 *5*	24 *3*	3521.3	(20$^+$)	3161.0	(19$^+$)	M1	0.238	α(K)=0.196 *3*; α(L)=0.0329 *5*; α(M)=0.00766 *12* α(N)=0.00193 *3*; α(O)=0.000376 *6*; α(P)=3.56×10^{-5} *6* R_{ADO}=0.85 *10*. POL=−0.04 *3* for 360.4+362.4+362.7.
361.3 *5*	2.0 *9*	2476.1	(14$^-$)	2114.6	(13$^-$)			
361.7 *5*	4.5 *16*	5082.6	(24$^-$)	4721.4	(23$^-$)	[M1]	0.236	α(K)=0.194 *3*; α(L)=0.0325 *5*; α(M)=0.00759 *11* α(N)=0.00192 *3*; α(O)=0.000372 *6*; α(P)=3.52×10^{-5} *6*
362.4 *5*	4.6 *11*	5257.3	(25$^+$)	4894.9	(24$^+$)	M1	0.235	α(K)=0.193 *3*; α(L)=0.0324 *5*; α(M)=0.00755 *11* α(N)=0.00191 *3*; α(O)=0.000370 *6*; α(P)=3.50×10^{-5} *5* R_{ADO}=0.81 *16*. POL=−0.04 *3* for 360.4+362.4+362.7.
362.7 *5*	15 *3*	3884.1	(21$^+$)	3521.3	(20$^+$)	M1	0.234	α(K)=0.192 *3*; α(L)=0.0323 *5*; α(M)=0.00753 *11* α(N)=0.00190 *3*; α(O)=0.000369 *6*; α(P)=3.50×10^{-5} *5* R_{ADO}=0.78 *18*. POL=−0.04 *3*. Both for 360.4+362.4+362.7.
365.7 *5*	0.6 *2*	3896.4	(20$^+$)	3530.7	(19$^+$)			

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$^{181}Ta(^{18}O,5n\gamma)$ 2014Ma55,2016Ma13 (continued)

$\gamma(^{194}Tl)$ (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α#	Comments
374.2 *5*	7.2 *6*	972.4	(11⁻)	598.2	(9⁻)	(E2)	0.0591	α(K)=0.0382 *6*; α(L)=0.01572 *24*; α(M)=0.00396 *6* α(N)=0.000994 *15*; α(O)=0.000179 *3*; α(P)=1.048×10⁻⁵ *16* I_γ: weighted average of 7.2 *6* from 2014Ma55 and 8 *4* from 1979Kr09. Mult.: Q, ΔJ=2 from R_{ADO}=1.30 *21*, M2 less likely for a low-energy transition.
376.6 *3*	13.8 *17*	3884.2	(21⁻)	3507.6	(20⁻)	M1	0.212	α(K)=0.1737 *25*; α(L)=0.0292 *5*; α(M)=0.00680 *10* α(N)=0.001717 *25*; α(O)=0.000334 *5*; α(P)=3.16×10⁻⁵ *5* R_{ADO}=0.81 *11*. POL=−0.08 *4*.
379.1 *5*	1.6 *5*	4819.3	(23⁻)	4440.2	(22⁻)	(M1)	0.208	α(K)=0.1707 *25*; α(L)=0.0286 *5*; α(M)=0.00668 *10* α(N)=0.001686 *25*; α(O)=0.000328 *5*; α(P)=3.10×10⁻⁵ *5* D from R_{ADO}=0.87 *25*.
381.2 *5*	8 *3*	4721.4	(23⁻)	4340.5	(22⁻)	(M1)	0.205	α(K)=0.1682 *25*; α(L)=0.0282 *4*; α(M)=0.00658 *10* α(N)=0.001661 *24*; α(O)=0.000323 *5*; α(P)=3.06×10⁻⁵ *5* D from R_{ADO}=0.88 *20*.
388.6 *5*	4.9 *9*	3777.8	(20⁻)	3389.5	(18⁻)			
395.9 *5*	1.3 *2*	5037.5	(24⁻)	4641.6	(23⁻)	[M1]	0.185	α(K)=0.1520 *22*; α(L)=0.0255 *4*; α(M)=0.00594 *9* α(N)=0.001499 *22*; α(O)=0.000291 *5*; α(P)=2.76×10⁻⁵ *4*
398.6 *5*	3.6 *5*	5655.9	(26⁺)	5257.3	(25⁺)	(M1)	0.182	α(K)=0.1492 *22*; α(L)=0.0250 *4*; α(M)=0.00583 *9* α(N)=0.001472 *22*; α(O)=0.000286 *5*; α(P)=2.71×10⁻⁵ *4* D from R_{ADO}=0.74 *21*.
403.3 *2*	43 *3*	1620.6	(13⁻)	1217.2	(12⁻)	M1	0.1762	α(K)=0.1446 *21*; α(L)=0.0242 *4*; α(M)=0.00565 *8* α(N)=0.001426 *20*; α(O)=0.000277 *4*; α(P)=2.62×10⁻⁵ *4* A_2=−0.58 *6*; A_4=+0.03 *3* (1979Kr09); pol=−0.06 *3* E_γ: weighted average of 403.5 *3* from 2014Ma55 and 403.2 *2* from 1979Kr09. I_γ: weighted average of 44.1 *29* from 2014Ma55 and 42 *4* from 1979Kr09. R_{ADO}=0.76 *12*.
408.2 *5*	3.9 *6*	2780.4	(16⁻)	2372.3	(15⁻)	(M1)	0.1706	α(K)=0.1400 *21*; α(L)=0.0234 *4*; α(M)=0.00547 *8* α(N)=0.001380 *20*; α(O)=0.000268 *4*; α(P)=2.54×10⁻⁵ *4* R_{ADO}=0.74 *14*.
430.0 *5*	2.2 *3*	4641.6	(23⁻)	4211.7	(22⁻)	(M1)	0.1485	α(K)=0.1219 *18*; α(L)=0.0204 *3*; α(M)=0.00475 *7* α(N)=0.001199 *18*; α(O)=0.000233 *4*; α(P)=2.21×10⁻⁵ *4* D from R_{ADO}=0.78 *22*.
442@ *5*	<1.7	3300.9	(19⁻)	2859.2	(17⁻)	[E2]	0.0381 *13*	α(K)=0.0263 *8*; α(L)=0.0090 *4*; α(M)=0.00223 *10* α(N)=0.000561 *23*; α(O)=0.000102 *5*; α(P)=6.51×10⁻⁶ *23* E_γ,I_γ: from 2016Ma13.
448.0 *5*	1.8 *5*	6103.9	(27⁺)	5655.9	(26⁺)	(M1)	0.1331	D from R_{ADO}=0.85 *25*.
454.1 *5*	1.0 *5*	5491.6	(25⁻)	5037.5	(24⁻)			
458.7 *4*	1.8 *4*	4099.9	(21⁻)	3640.8	(19⁻)	[E2]	0.0347	α(K)=0.0242 *4*; α(L)=0.00795 *12*; α(M)=0.00198

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult.‡	α#	Comments
								3 α(N)=0.000496 *7*; α(O)=9.06×10^{-5} *13*; α(P)=5.88×10^{-6} *9* A_2=−0.8 *2*; A_4=+0.10 *10* (1979Kr09) γ placed from a 2056.8+y level in 1979Kr09. In spectral Fig. 2, 1979Kr09 label this γ ray also from ^{195}Tl. E_γ: weighted average of 459.6 *5* from 2014Ma55 and 458.6 *2* from 1979Kr09. I_γ: from 2014Ma55. Other: 39 *4* from 1979Kr09 is discrepant.
465.0 *5*	4.8 *6*	2857.4	(18$^+$)	2392.5	(16$^+$)	Q		R_{ADO}=1.34 *40*.
468.4 *3*	13.9 *19*	2372.3	(15$^-$)	1903.9	(14$^-$)	M1	0.1183	α(K)=0.0971 *14*; α(L)=0.01620 *23*; α(M)=0.00378 *6* α(N)=0.000953 *14*; α(O)=0.000185 *3*; α(P)=1.755×10^{-5} *25* R_{ADO}=0.87 *13*. POL=−0.05 *3*.
478.5 *5*	7.9 *13*	3142.0	(17$^-$)	2663.5	(16$^-$)	(M1)	0.1118	α(K)=0.0918 *14*; α(L)=0.01530 *22*; α(M)=0.00357 *5* α(N)=0.000900 *13*; α(O)=0.0001749 *25*; α(P)=1.658×10^{-5} *24* R_{ADO}=0.83 *15*.
479.9 *5*	1.5 *3*	2881.4	(17$^+$)	2401.3	(15$^+$)			
483.1 *5*	1.0 *5*	6587.0	(28$^+$)	6103.9	(27$^+$)	[M1]	0.1090	
486.1 *5*	4.4 *9*	3507.6	(20$^-$)	3021.6	(18$^-$)	E2	0.0301	α(K)=0.0214 *3*; α(L)=0.00661 *10*; α(M)=0.001637 *24* α(N)=0.000411 *6*; α(O)=7.54×10^{-5} *11*; α(P)=5.03×10^{-6} *8* ΔJ=2, Q from R_{ADO}=1.38 *21*; M2 ruled out by RUL.
495.5 *5*	1.1 *3*	3517.2	(18$^-$)	3021.6	(18$^-$)	Q		R_{ADO}=1.3 *4*.
519.6 *5*	1.3 *2*	2780.4	(16$^-$)	2260.8	(14$^-$)	Q		R_{ADO}=1.31 *40*.
520.0@ *5*	0.7 *2*	2260.8	(14$^-$)	1740.8	(12$^-$)			
522.8 *2*	30.9 *17*	1217.2	(12$^-$)	694.4	(10$^-$)	E2	0.0253	α(K)=0.0183 *3*; α(L)=0.00529 *8*; α(M)=0.001303 *19* α(N)=0.000327 *5*; α(O)=6.03×10^{-5} *9*; α(P)=4.16×10^{-6} *6* A_2=+0.26 *4*; A_4=−0.06 *6* (1979Kr09); pol=+0.09 *3* E_γ: weighted average of 523.0 *3* from 2014Ma55 and 522.7 *2* from 1979Kr09. I_γ: weighted average of 31.5 *14* from 2014Ma55 and 26 *4* from 1979Kr09. R_{ADO}=1.35 *16*.
553.1 *5*	0.4 *1*	4440.2	(22$^-$)	3887.2	(20$^-$)	[E2]	0.0221	α(K)=0.01625 *23*; α(L)=0.00447 *7*; α(M)=0.001097 *16* α(N)=0.000276 *4*; α(O)=5.09×10^{-5} *8*; α(P)=3.60×10^{-6} *6*
562.8 *5*	8.7 *13*	4340.5	(22$^-$)	3777.8	(20$^-$)	[E2]	0.0213	α(K)=0.01567 *23*; α(L)=0.00425 *6*; α(M)=0.001041 *15* α(N)=0.000262 *4*; α(O)=4.84×10^{-5} *7*; α(P)=3.45×10^{-6} *5*
563.4 *5*	1.8 *7*	1998.0	(13$^-$)	1434.7	(11$^-$)	Q		R_{ADO}=1.31 *21*.
575.0 *5*	1.1 *5*	3517.2	(18$^-$)	2942.2	(16$^-$)			
575.8 *5*	1.2 *3*	3204.4	(18$^+$)	2628.6	(16$^+$)	Q		R_{ADO}=1.37 *40*.

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^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ †	I_γ †	E_i(level)	J_i^π	E_f	J_f^π	Mult. ‡	α #	Comments
583.2 *5*	1.6 *6*	3884.2	(21⁻)	3300.9	(19⁻)	E2	0.0196	ΔJ=2, Q from R_{ADO}=1.41 *40*; M2 ruled out by RUL.
593.0 *3*	14 *3*	3161.0	(19⁺)	2568.0	(17⁺)	Q		R_{ADO}=1.42 *24*.
600.3 *5*	1.8 *10*	2714.8	(15⁻)	2114.6	(13⁻)			
606.3 *5*	2.7 *7*	2604.1	(15⁻)	1998.0	(13⁻)			
621.6 *5*	1.4 *3*	4721.4	(23⁻)	4099.9	(21⁻)	[E2]	0.01699	
625.8 *5*	0.7 *2*	1843.0	(12⁻)	1217.2	(12⁻)			
640.3 *5*	1.3 *2*	2260.8	(14⁻)	1620.6	(13⁻)			
648.4 *2*	15.2 *8*	1620.6	(13⁻)	972.4	(11⁻)	E2	0.01548	A_2=+0.25 *3*; A_4=−0.07 *9* (1979Kr09); pol=+0.11 *4* E_γ: weighted average of 648.3 *3* from 2014Ma55 and 648.5 *2* from 1979Kr09. I_γ: weighted average of 15.0 *8* from 2014Ma55 and 18 *3* from 1979Kr09. R_{ADO}=1.22 *27*.
649.2 *5*	1.4 *4*	3530.7	(19⁺)	2881.4	(17⁺)			
656.7 *5*	2.6 *4*	4894.9	(24⁺)	4238.2	(22⁺)	E2	0.01505	ΔJ=2, Q from R_{ADO}=1.32 *36*; M2 ruled out by RUL.
658.4 *5*	1.6 *2*	3262.4	(17⁻)	2604.1	(15⁻)	Q		R_{ADO}=1.26 *38*.
663.9 *3*	11.4 *18*	3521.3	(20⁺)	2857.4	(18⁺)	Q		R_{ADO}=1.41 *31*.
681.4 *5*	2.0 *3*	2942.2	(16⁻)	2260.8	(14⁻)	Q		R_{ADO}=1.43 *40*.
683.0 *5*	0.7 *3*	4819.3	(23⁻)	4136.3	(21⁻)	[E2]	0.01383	
685.0 *5*	2.2 *8*	5257.3	(25⁺)	4572.4	(23⁺)	E2	0.01374	ΔJ=2, Q from R_{ADO}=1.36 *38*; M2 ruled out by RUL. E_γ: placed from a 2056.8+y level in 1979Kr09.
686.7 *2*	42 *4*	1903.9	(14⁻)	1217.2	(12⁻)	E2	0.01367	A_2=+0.20 *8*; A_4=−0.03 *3* (1979Kr09); pol=+0.11 *3* E_γ: weighted average of 686.8 *3* from 2014Ma55 and 686.7 *2* from 1979Kr09. I_γ: weighted average of 41.3 *42* from 2014Ma55 and 42 *4* from 1979Kr09. R_{ADO}=1.26 *28*.
688.2 *5*	4.6 *7*	4572.4	(23⁺)	3884.1	(21⁺)	Q		R_{ADO}=1.37 *37*.
692.0 *5*	0.5 *2*	3896.4	(20⁺)	3204.4	(18⁺)			
704.1 *5*	3.5 *7*	4211.7	(22⁻)	3507.6	(20⁻)	E2	0.01295	ΔJ=2, Q from R_{ADO}=1.27 *25*; M2 ruled out by RUL.
716.8 *3*	12 *3*	4238.2	(22⁺)	3521.3	(20⁺)	Q		R_{ADO}=1.35 *30*.
723.1 *3*	14 *3*	3884.1	(21⁺)	3161.0	(19⁺)	E2	0.01224	R_{ADO}=1.46 *30*. POL=+0.07 *5*.
726.0 *3*	11 *3*	3389.5	(18⁻)	2663.5	(16⁻)	Q		R_{ADO}=1.32 *35*.
740.5 *5*	0.9 *4*	1434.7	(11⁻)	694.4	(10⁻)			
742.0 *3*	4.1 *18*	5082.6	(24⁻)	4340.5	(22⁻)	E2	0.01159	A_2=+0.24 *5*; A_4=−0.08 *10* (1979Kr09) γ placed from a 2056.8+y level in 1979Kr09. 2014Ma55 report weak γ rays of 740.5 and 742.6 keV, both placed differently. 458.6 and 741.9 γ rays were placed from the same level in 1979Kr09. E_γ: weighted average of 742.6 *5* from 2014Ma55 and 741.9 *2* from 1979Kr09. I_γ: from 2014Ma55. Other: 18 *3* from 1979Kr09 is discrepant. ΔJ=2, Q from $\gamma(\theta)$; M2 ruled out by RUL.
^{x}748.6 @								E_γ: placed from a 2346.2+y level in 1979Kr09; not seen in 2014Ma55.
751.5 *5*	8.9 *18*	2372.3	(15⁻)	1620.6	(13⁻)	Q		R_{ADO}=1.28 *28*.
757.5 *5*	3.0 *5*	4641.6	(23⁻)	3884.2	(21⁻)	E2	0.01110	ΔJ=2, Q from R_{ADO}=1.40 *40*; M2 ruled out RUL.
759.6 *5*	33 *6*	2663.5	(16⁻)	1903.9	(14⁻)	E2	0.01104	R_{ADO}=1.39 *28*. POL=+0.06 *3* for 759.6+761.4.
761.0 *5*	1.8 *5*	5655.9	(26⁺)	4894.9	(24⁺)	E2	0.01099	R_{ADO}=1.41 *40*; M2 ruled out by RUL.
761.4 *5*	14 *3*	3425.0	(18⁻)	2663.5	(16⁻)	E2	0.01098	R_{ADO}=1.40 *35*. POL=+0.06 *3* for 759.6+761.4.

Continued on next page (footnotes at end of table)

^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13 (continued)

γ(^{194}Tl) (continued)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult. ‡	α #	Comments
768.5 *5*	1.9 *7*	1740.8	(12⁻)	972.4	(11⁻)	D		R_{ADO}=0.75 *23*.
769.6 *5*	4.4 *9*	3142.0	(17⁻)	2372.3	(15⁻)	Q		R_{ADO}=1.3 *3*.
780.8 *5*	5.4 *10*	1998.0	(13⁻)	1217.2	(12⁻)	M1	0.0311	α(K)=0.0256 *4*; α(L)=0.00420 *6*; α(M)=0.000978 *14* α(N)=0.000247 *4*; α(O)=4.80×10^{-5} *7*; α(P)=4.56×10^{-6} *7* R_{ADO}=0.71 *21*. POL=−0.06 *4*.
810.9 *5*	2.2 *5*	2714.8	(15⁻)	1903.9	(14⁻)	D		R_{ADO}=0.51 *20*.
822.4 *5*	5.4 *13*	1794.9	(11⁺)	972.4	(11⁻)	E1	0.00344	R_{ADO}=1.18 *21*. POL=−0.06 *3*.
825.7 *5*	2.5 *8*	5037.5	(24⁻)	4211.7	(22⁻)	E2	0.00929	ΔJ=2, Q from R_{ADO}=1.29 *38*; M2 ruled out by RUL.
836.3 *5*	0.7 *3*	1434.7	(11⁻)	598.2	(9⁻)			
839.0 *5*	0.6 *3*	2056.2	(13⁺)	1217.2	(12⁻)			
846.6 *5*	1.6 *8*	6103.9	(27⁺)	5257.3	(25⁺)	[E2]	0.00883	
850.0 *5*	1.5 *8*	5491.6	(25⁻)	4641.6	(23⁻)			
855.5 *5*	2.8 *9*	2476.1	(14⁻)	1620.6	(13⁻)	D		R_{ADO}=0.41 *30*.
870.7 *5*	1.2 *2*	1843.0	(12⁻)	972.4	(11⁻)			
876.4 *3*	19.9 *20*	2780.4	(16⁻)	1903.9	(14⁻)	E2	0.00823	R_{ADO}=1.34 *22*. POL=+0.07 *4*.
897.4 *5*	3.2 *14*	2114.6	(13⁻)	1217.2	(12⁻)	D		R_{ADO}=0.44 *30*.
931.1 *5*	1.2 *5*	6587.0	(28⁺)	5655.9	(26⁺)	[E2]	0.00730	
966.0 *5*	4.6 *10*	1938.3	(12⁺)	972.4	(11⁻)	E1	0.00256	R_{ADO}=0.86 *25*. POL=+0.09 *4*.
1043.6 *5*	2.55 *11*	2260.8	(14⁻)	1217.2	(12⁻)			
1046.5 *5*	0.4 *2*	1740.8	(12⁻)	694.4	(10⁻)			
1058.6 *3*	14.7 *21*	2030.9	(12⁺)	972.4	(11⁻)	E1	0.00217	R_{ADO}=0.90 *16*. POL=+0.08 *3*.
1094.1 *5*	1.5 *5*	2714.8	(15⁻)	1620.6	(13⁻)	(Q)		R_{ADO}=1.15 *30*.
1100.7 *5*	7.7 *5*	1794.9	(11⁺)	694.4	(10⁻)	E1	0.00202	R_{ADO}=1.01 *21*. POL=+0.05 *4*.

† From 2014Ma55, unless otherwise noted. Uncertainty of 0.3 keV assigned for Iγ≥10, and 0.5 keV for weaker γ rays and unresolved doublets, based on a statement by 2014Ma55 that typical uncertainty is 0.3 keV, and may increase to 0.5 keV for weak lines or doublets. Quoted intensities are relative to Iγ(278γ)=100; original values from 1979Kr09 have been re-normalized.

‡ Firm assignments are from R_{ADO}, $\gamma(\theta)$ and POL data in 2014Ma55, in addition to using RUL (for E2 and M2) by evaluators. MULT=(M1) assigned by evaluators based on R_{DCO} value for low-energy in-band ΔJ=1 transitions (<500 keV or so), where conversion coefficients are significant for transition intensity balances. Otherwise MULT=D for ΔJ=1 and Q for ΔJ=2 assigned by evaluators, when only the R_{DCO} values are available and conversion coefficients are not significant.

Total theoretical internal conversion coefficients, calculated using the BrIcc code (2008Ki07) with Frozen orbital approximation based on γ-ray energies, assigned multipolarities, and mixing ratios, unless otherwise specified.

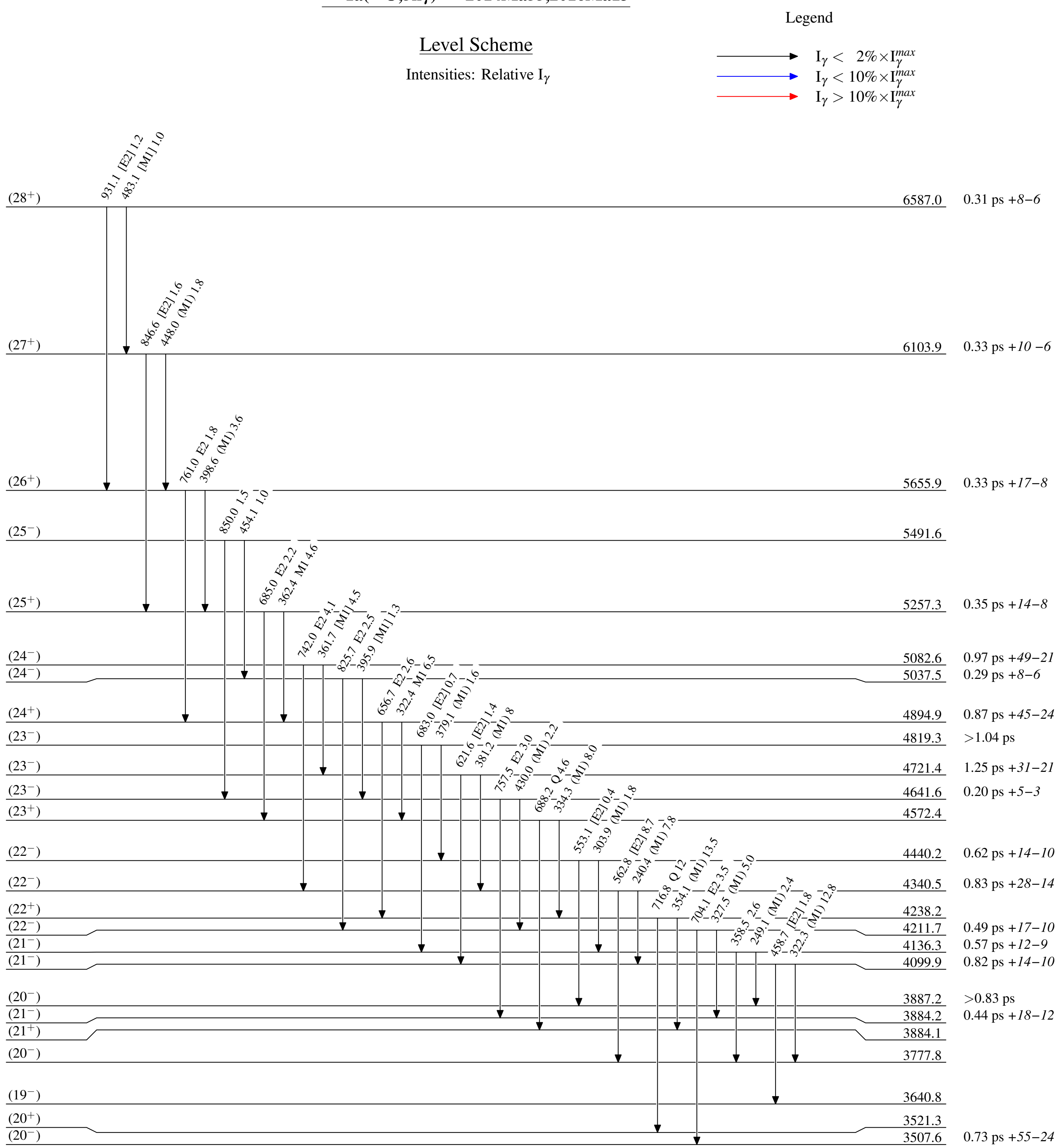
@ Placement of transition in the level scheme is uncertain.

^{x} γ ray not placed in level scheme.

^{181}Ta(^{18}O,5nγ) 2014Ma55,2016Ma13

Level Scheme

Intensities: Relative I_γ

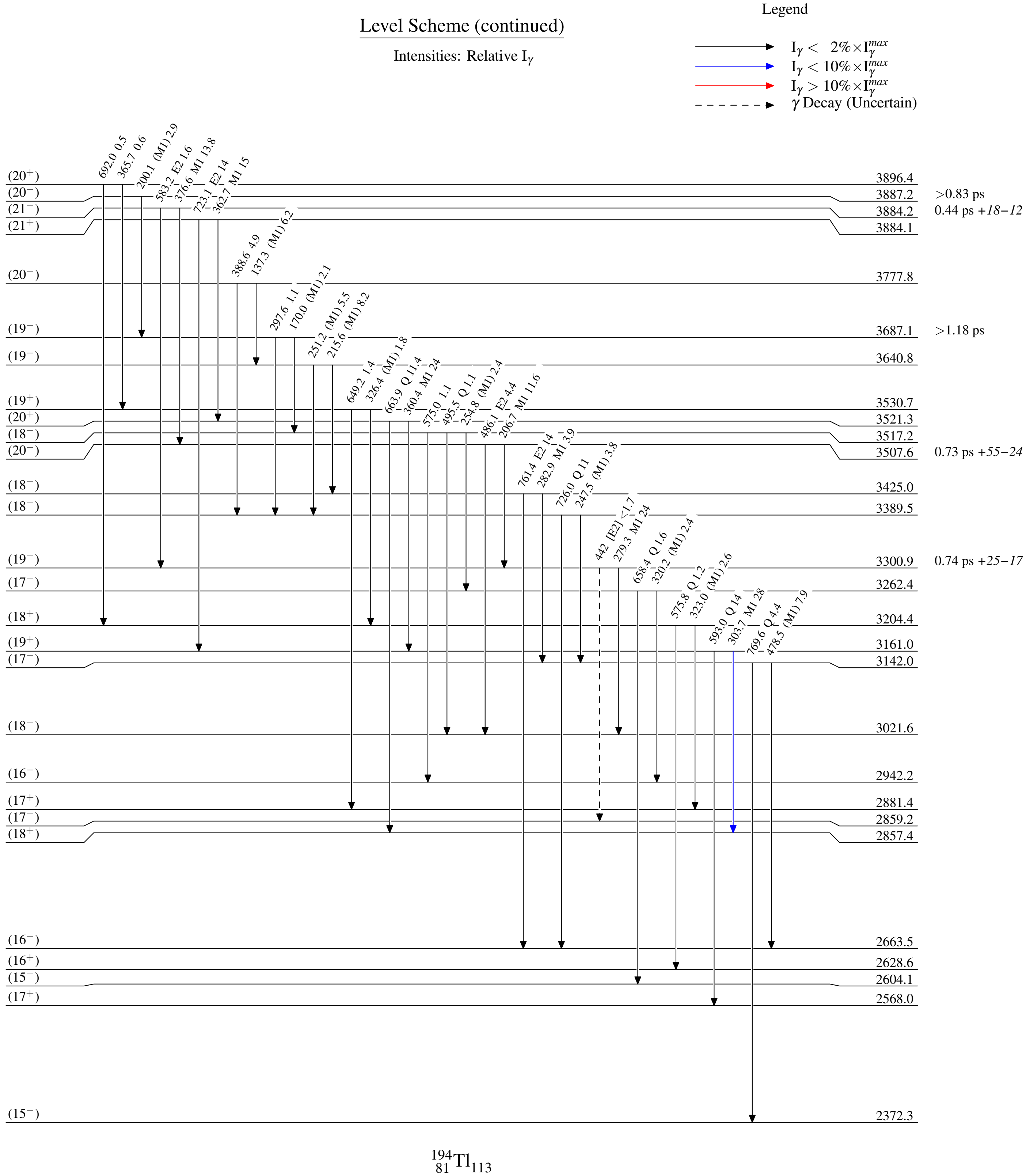


$^{194}_{81}Tl_{113}$

$^{181}Ta(^{18}O,5n\gamma)$ 2014Ma55,2016Ma13

Level Scheme (continued)

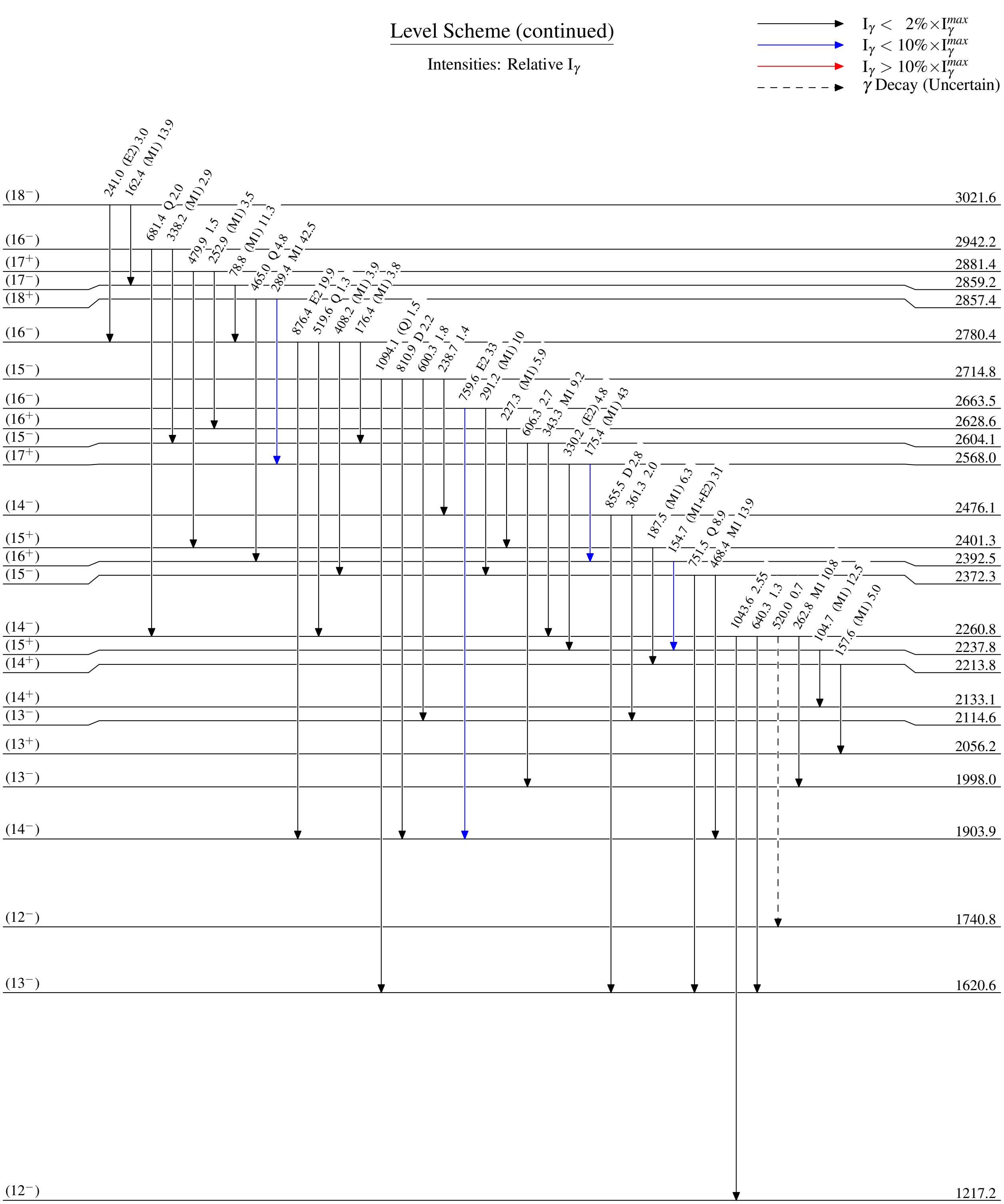
Intensities: Relative I_γ



$^{181}Ta(^{18}O,5n\gamma)$ 2014Ma55,2016Ma13

Level Scheme (continued)

Intensities: Relative I_γ

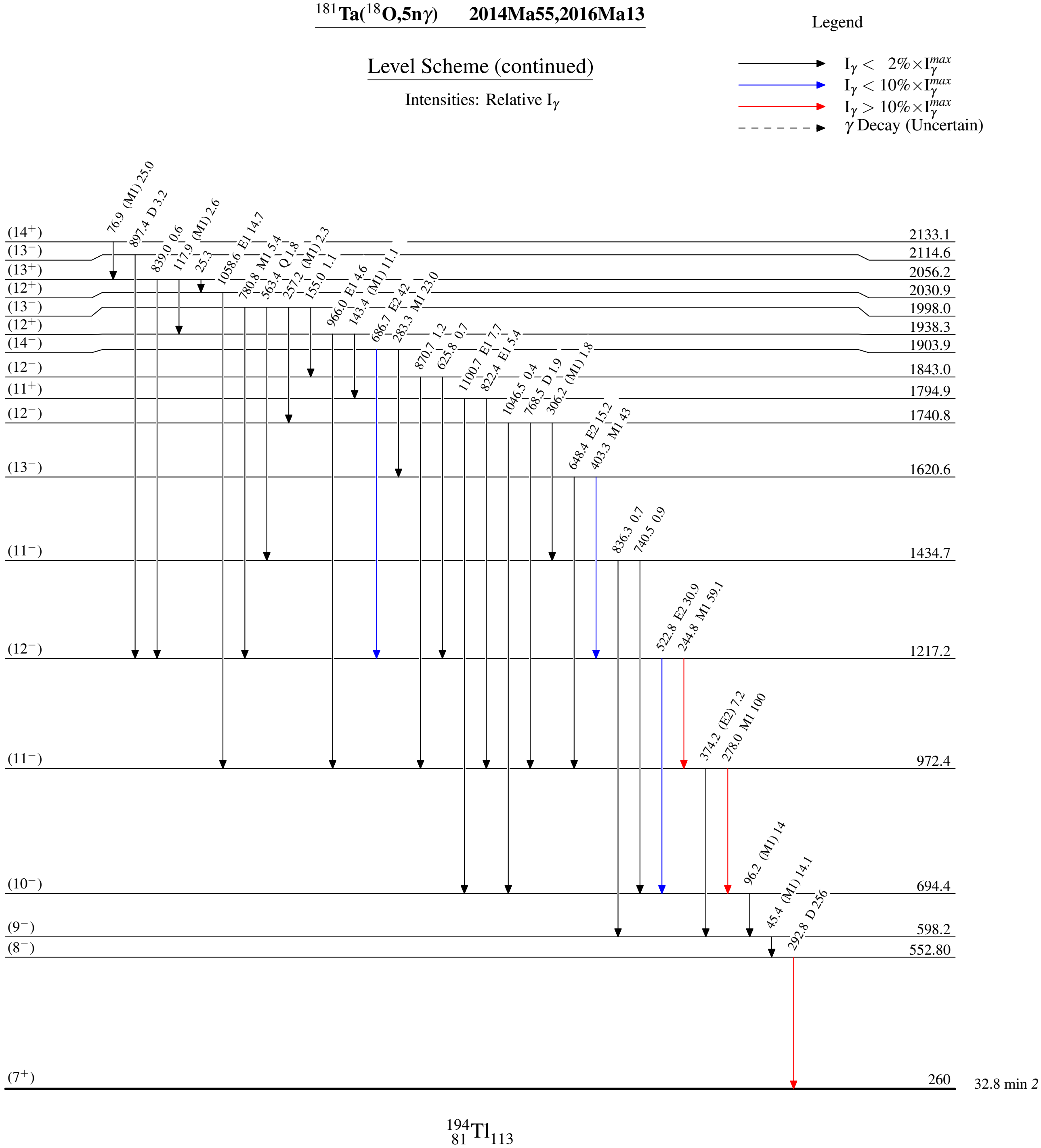


$^{194}_{81}Tl_{113}$

$^{181}Ta(^{18}O,5n\gamma)$ **2014Ma55,2016Ma13**

Level Scheme (continued)

Intensities: Relative I_γ



$^{181}Ta(^{18}O,5n\gamma)$ 2014Ma55,2016Ma13