(HI,xnγ) 2005Po10,1982Po03,1981Ma28

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	M. Shamsuzzoha Basunia	NDS 121, 561 (2014)	31-Mar-2014

Others: 1986Po01, 1985Po13, 1980Po07, 1979Po19.

2005Po10: $^{198}Pt(^{17}O,5n\gamma)$, Enriched ^{198}Pt target, E=96 MeV. Measured Eγ, Iγ, γγ, γ(θ) at three angles, γγ(t), lifetimes, ce with the caesar array of Compton-suppressed Ge detectors and a superconducting electron spectrometer operated in lens mode. Same research group of 1982Po03.

1982Po03: $^{205}Tl(^{10}B,5n\gamma)$. Target: 96.4% enriched ^{205}Tl, E=68 to 75 MeV. Measured γγ(t) and nγ(t) in the time range of 4 μs. Measured γ(θ) for θ=90° to 150°. Detectors:Ge(Li) for γ rays, liquid scintillator for neutrons. Other: 1980Po07. $^{198}Pt(^{16}O,4n\gamma)$. Target: 95.8% enriched ^{198}Pt, E=85 to 97 MeV. Measured γγ(t), nγ(t), γ(θ) for θ=0° to 90°. $^{198}Pt(^{17}O,5n\gamma)$. Target: 95.8% enriched ^{198}Pt, E=94 to 98 MeV. Measured nγ(t) in the range of 2 μs, Eγ, Iγ. Detectors:Ge(Li),Ge(Li) Compton-suppressed spectrometer. Measured conversion electrons. Detector: Si(Li) with a "MINI-orange" magnetic filter. The detection efficiency of theGe(Li) and of the electron spectrometer were determined using calibrated sources of ^{152}Eu, ^{207}Bi, ^{113}Sn, ^{137}Cs, and ^{65}Zn. Deduced γ-ray multipolarities. Measured half-lives using the pulsed-beam method.

1981Ma28: $^{202}Hg(^{12}C,4n\gamma)$. Target: 96.3% enriched ^{202}Hg, E=80 MeV. Measured differential perturbed angular distributions of γ rays (DPAD). Deduced g-factors, half-lives. Detector:Ge(Li).

1986Po01: $^{202}Hg(^{12}C,4n\gamma)$, E=78 MeV. Measured time-differential perturbed angular distribution of γ rays (TDPAD), g-factors. Detectors:Ge(Li).

1985Po13: $^{198}Pt(^{17}O,5n\gamma)$. Target: 95.8% enriched ^{198}Pt, E=95 MeV. Measured γ(t), pulsed-beam method. Detectors:Ge(Li). Deduced level half-lives.

1979Po19: $^{204}Pb(^{9}Be,3n\gamma)$, E=40-55 MeV. Measured Eγ, Iγ, γγ coin, γ(t) pulsed beam, γ(θ). Deduced γ-ray multipolarities, level half-lives.

^{210}Rn Levels

E(level)[†&]	J^{π}[@]	$T_{1/2}$[‡]	Comments
0.0[a]	0^+		
643.90[a] *10*	2^+		
1461.60[a] *14*	4^+		
1545.10 *14*	4^+		
1664.70[a] *15*	6^+	7.6 ns *7*	$T_{1/2}$: from 1980Po07. Other values: 7.6 ns *14* (1982Po03); 10.4 ns *10* (1985Po13).
x+1664.6[a] *1*	8^+	644 ns *40*	Additional information 1. $T_{1/2}$: weighted average of 631 ns *35* (1982Po03), 750 ns *40* (DPAD) (1981Ma28), 742 ns *35* (1979Po19), and 590 ns *20* (1980Po07). g-factor=0.898 *7* (TDPAD) (1986Po01); g-factor=0.883 *10* (DPAD) (1981Ma28).
x+2031.60 *10*	(8^+)		
x+2265.79 *8*	9^+	<21 ns	
x+2376.88[a] *8*	10^+	<1.4 ns	$T_{1/2}$: from 1985Po13.
x+2562.32 *11*	11^-	64 ns *3*	$T_{1/2}$: weighted average of 64 ns *3* (1982Po03), 58 ns *4* (DPAD) (1981Ma28), 68 ns *4* (1979Po19). g-factor=1.105 *10* (DPAD) (1981Ma28).
x+2922.62[a] *12*	12^+	<1.4 ns	$T_{1/2}$: from 1985Po13.
x+3110.06 *13*	12^-	<5.5 ns	
x+3248.06[a] *13*	14^+	76 ns *7*	$T_{1/2}$: weighted average of 72 ns *3* (1982Po03), 99 ns *8* (DPAD) (1981Ma28), and 102 ns *18* (1979Po19). g-factor=1.066 *7* (TDPAD) (1986Po01); g-factor=1.043 *20* (DPAD) (1981Ma28).
x+3404.14 *12*	$(13)^-$	<5.5 ns	
x+3782.81 *14*	$(14)^-$		
x+3812.40[a] *16*	17^-	1.06 μs *5*	$T_{1/2}$: weighted average of 1102 ns *62* (1982Po03), 1000 ns *125* (DPAD) (1981Ma28), and 998 ns *83* (1979Po19). g-factor=1.052 *5* (TDPAD) (1986Po01); g-factor=1.039 *10* (DPAD) (1981Ma28).
x+3864.28 *14*	$(15)^-$	<8 ns	
x+3920.03 *16*	(15^+)	<5.5 ns	

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

^{210}Rn Levels (continued)

E(level)[†&]	Jπ[@]	$T_{1/2}$[‡]	Comments
x+4351.70 *19*	(17⁻)		
x+4614.20 *19*	(18⁻)		
x+4730.70 *22*	(17⁻)		
x+4889.12 *19*	(15⁺)		
x+4898.95 *20*	(16)⁺	<5.5 ns	
x+4913.72 *22*	(17⁺)		
x+4993.43[a] *19*	20⁺	12.3 ns *9*	$T_{1/2}$: weighted average of 13.2 ns *7* (1985Po13) and 11.4 ns *7* (1982Po03). g-factor=1.116 *5* (TDPAD) (1986Po01).
x+5046.41 *22*	(17⁺)		
x+5056.20 *24*	(18⁻)		
x+5162.8 *3*	(19⁻)		
x+5170.8 *3*	(19⁻)		
x+5253.87 *22*	(17⁺)		Jπ: From Table 2. Not given in level scheme fig. 1 in 2005Po10.
x+5380.99 *21*	(18)⁺	<5.5 ns	Jπ: from figure 1 and text of 2005Po10; (17)⁺ in Table 2.
x+5383.87 *20*	19⁺	<5.5 ns	
x+5684.64 *21*	(19)⁺	<5.5 ns	
x+5861.0 *4*	(20)⁻		
x+5866.33 *20*	21⁺	<5.5 ns	
x+5876.31[a] *20*	20⁺	<7 ns	
x+6036.02[a] *21*	21⁺	<7 ns	
x+6469.02[a] *21*	23⁺	1.04 μs *7*	g-factor=0.701 *7* (TDPAD) (1986Po01).
x+6525.83 *23*	(22)⁺		
x+6543.4 *3*	(21)⁺		
x+6895.12 *23*	24⁺	<35 ns	
x+7035.9 *4*	(23)⁺		
x+7224.3 *4*	(23)⁺		
x+7311.02[a] *23*	26⁻	34 ns *2*	g-factor=0.733 *9* (TDPAD) (1986Po01).
x+7329.4 *5*	(24⁺)		
x+7379.8 *3*			
x+7419.3 *4*	(25⁺)		
x+7460.4 *5*	(24⁺)		
x+7875.12 *25*	(27⁻)		
x+7973.4 *3*	(26)⁻		
x+7978.6 *4*	(27⁻)		
x+8263.3 *5*	(27⁻)		
x+8556.13[a] *25*	29⁺	1.8 ns *2*	$T_{1/2}$: from 1985Po13.
x+8887.4 *9*			
x+8899.1 *4*	(29⁺)		
x+8928.6 *4*	(29⁺)		
x+9249.6[a] *3*	30⁺	<0.69[#] ns	
x+9569.3 *3*	(30⁻)		
x+9735.6 *4*	(31⁻)		
x+9764.7[a] *3*	31⁺	<0.69[#] ns	
x+10079.9 *3*	(31⁺)		
x+10086.8[a] *3*	32⁺	<0.69[#] ns	
x+10752.1[a] *4*	(34⁺)	<0.69[#] ns	
x+10835.6 *6*	(33⁺)		
x+10975.4 *4*	(34⁺)		
x+11185.9 *5*	(35⁻)		
x+11492.3 *7*	(36⁻)		
x+11978.4 *7*	(36⁻)		
x+12026.0[a] *5*	(37⁻)	<0.69[#] ns	

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

^{210}Rn Levels (continued)

† Deduced by evaluator from a least-squares fit to γ-ray energies.
‡ γ(t) pulsed-beam method (1982Po03), unless otherwise specified.
# From 2005Po10.
@ Spin and parity assignments are based on γ-ray multipolarities and γ(θ). Shell-model configurations are based on a comparison between experimental level energies with calculated values where the four valence protons were restricted to the 1h9/2, 2f7/2, and 1i13/2 orbitals, and the neutron holes, to the $3p_{1/2}$, 3p3/2, and 2f5/2 orbitals. The strong E3 transitions from the 3812+x ($J^\pi=17^-$) and 4994+x ($J^\pi=20^+$) levels are consistent with systematics of E3 transitions in this mass region, and their strengths are comparable to those from the octupole state in ^{208}Pb, and to the (i13/2 to h9/2) transition in ^{209}Bi. This gives additional support to the assigned shell model configurations. The suggested core excited configurations for levels above the 6469+x "YRAST trap" explain the strong E3 transitions connecting these levels. See also 1986Po01 for a comparison of experimental g-factors and B(E3) values with semi-empirical shell model calculations which include couplings to the 3^- octupole vibration of the core. See Adopted Levels for evaluator′s adopted values. For multi-particle configurations proposed for all the excited states in ^{210}Rn – please see 2005Po10 and 1982Po03.
& x<50 keV, based on detection efficiency of a possible γ ray between the x+1665 and 1665 levels (1982Po03).
a Band(A): yrast sequence (2005Po10).

γ(^{210}Rn)

E_γ †	I_γ †	E_i(level)	J^π_i	E_f	J^π_f	Mult.&	α b	Comments
(10@)		x+4898.95	(16)$^+$	x+4889.12	(15$^+$)			
(15@)		x+4913.72	(17$^+$)	x+4898.95	(16)$^+$			
(≈45@)		x+1664.6	8$^+$	1664.70	6$^+$			E_γ: Estimated in 2006Ku26 (^{214}Ra α decay:68.6 μs) – γ ray not observed. Experimental limit≤50 in 1979Po19 and 1982Po03.
(82@)		x+3864.28	(15)$^-$	x+3782.81	(14)$^-$			
111.1‡ *1*	19 *3*	x+2376.88	10$^+$	x+2265.79	9$^+$	M1	9.73	α(K)=7.85 *12*; α(L)=1.434 *21*; α(M)=0.341 *5* α(N)=0.0888 *13*; α(O)=0.0194 *3*; α(P)=0.00284 *4* Mult.: from α(exp)=14 *4* (transition intensity balance – 1982Po03).
119.6# *1*	59 *2*	1664.70	6$^+$	1545.10	4$^+$	E2	3.88	α(K)=0.361 *5*; α(L)=2.60 *4*; α(M)=0.700 *11* α(N)=0.182 *3*; α(O)=0.0368 *6*; α(P)=0.00411 *6* Mult.: from α(exp)=4.4 *4* (transition intensity balance – 1982Po03).
127.4 *2*	4 *1*	x+5380.99	(18)$^+$	x+5253.87	(17$^+$)	M1	6.59	α(K)=5.32 *8*; α(L)=0.967 *15*; α(M)=0.230 *4* α(N)=0.0599 *9*; α(O)=0.01311 *20*; α(P)=0.00191 *3*
133.0 *2*	2 *1*	x+5046.41	(17$^+$)	x+4913.72	(17$^+$)			
159.7‡ *1*	74 *5*	x+6036.02	21$^+$	x+5876.31	20$^+$	M1a	3.47	α(K)=2.80 *4*; α(L)=0.507 *8*; α(M)=0.1204 *17* α(N)=0.0314 *5*; α(O)=0.00687 *10*; α(P)=0.001003 *15* Mult.: from α(exp)=5.2 *20* (transition intensity balance – 1982Po03). α(L)exp=0.51 *2* $ α(M)exp=0.109 *14* (2005Po10).
166.3 *2*	3 *2*	x+9735.6	(31$^-$)	x+9569.3	(30$^-$)			
185.5 *1*	87 *9*	x+2562.32	11$^-$	x+2376.88	10$^+$	E1	0.1032	α(K)=0.0826 *12*; α(L)=0.01569 *22*; α(M)=0.00373 *6* α(N)=0.000962 *14*; α(O)=0.000204 *3*; α(P)=2.73×10^{-5} *4* Mult.: from α(exp)<0.07 (transition intensity balance – 1982Po03); α(L)exp=0.144 *17* (deduced from prompt spectra – 2005Po10).
191.7‡ *1*	43 *9*	x+5876.31	20$^+$	x+5684.64	(19)$^+$	M1	2.07	A_2=−0.06 *13* (2005Po10)

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

Eγ[†]	Iγ[†]	Ei(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[b]	Comments
								α(K)=1.675 24; α(L)=0.302 5; α(M)=0.0718 11 α(N)=0.0187 3; α(O)=0.00409 6; α(P)=0.000598 9 Mult.: from α(exp)=1.7 6 (transition intensity balance).
203.1 1	553 13	1664.70	6^+	1461.60	4^+	E2	0.495	A_2=+0.16 8 (2005Po10) α(K)=0.1594 23; α(L)=0.248 4; α(M)=0.0663 10 α(N)=0.01727 25; α(O)=0.00352 5; α(P)=0.000405 6 Mult.: From α(L1)exp+α(L2)exp=0.161 11, α(L3)exp=0.092 8, α(M)exp=0.071 9 (2005Po10).
210.5 2	2 1	x+11185.9	(35^-)	x+10975.4	(34^+)			
236.1 2	12 5	x+7460.4	(24^+)	x+7224.3	$(23)^+$			
284.7 2	5 4	x+8263.3	(27^-)	x+7978.6	(27^-)			
293.5 2	11 3	x+7329.4	(24^+)	x+7035.9	$(23)^+$			
294.1 1	14 3	x+3404.14	$(13)^-$	x+3110.06	12^-	M1	0.631	α(K)=0.511 8; α(L)=0.0914 13; α(M)=0.0217 3 α(N)=0.00565 8; α(O)=0.001237 18; α(P)=0.000181 3 Mult.: From α(K)exp=0.45 4 (2005Po10).
303.6[‡] 1	119 5	x+5684.64	$(19)^+$	x+5380.99	$(18)^+$	M1+E2	0.36 23	A_2=−0.12 10 (2005Po10) α(K)=0.27 20; α(L)=0.066 18; α(M)=0.016 4 α(N)=0.0043 10; α(O)=0.00091 23; α(P)=0.00012 5 Mult.: From α(K)exp=0.16 5 (2005Po10).
315.2 1	9 3	x+10079.9	(31^+)	x+9764.7	31^+			
319.7 1	13 4	x+9569.3	(30^-)	x+9249.6	30^+			
322.1 1	49 5	x+10086.8	32^+	x+9764.7	31^+	M1+E2	0.30 19	A_2=+0.07 21 (2005Po10) α(K)=0.23 17; α(L)=0.055 16; α(M)=0.014 4 α(N)=0.0035 9; α(O)=0.00076 21; α(P)=0.00010 4 Mult.: From α(exp)=0.14 9, α(exp) determined from analysis of γ-ray intensity balances in coincidence with the 665.3 transition as a direct conversion coefficient measurement was not possible.
325.4 1	628 11	x+3248.06	14^+	x+2922.62	12^+	E2[a]	0.1086	A_2=+0.18 3 (2005Po10) α(K)=0.0578 9; α(L)=0.0378 6; α(M)=0.00987 14 α(N)=0.00257 4; α(O)=0.000531 8; α(P)=6.43×10^{-5} 9 Mult.: from α(K)exp=0.068 7 (1982Po03); α(K)exp=0.0542 23, α(L1)exp+α(L2)exp=0.0295 13 (2005Po10).
325.5 1	18 5	x+5056.20	(18^-)	x+4730.70	(17^-)	M1	0.478	α(K)=0.387 6; α(L)=0.0691 10; α(M)=0.01640 23 α(N)=0.00427 6; α(O)=0.000935 14; α(P)=0.0001366 20 Mult.: From α(K)exp=0.50 4 (deduced from prompt spectra – 2005Po10).

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[b]	Comments
343.0 *2*	6 *1*	x+8899.1	(29$^+$)	x+8556.13	29$^+$			
355.0 *1*	63 *10*	x+5253.87	(17$^+$)	x+4898.95	(16)$^+$	M1	0.377	α(K)=0.306 *5*; α(L)=0.0545 *8*; α(M)=0.01292 *19* α(N)=0.00337 *5*; α(O)=0.000737 *11*; α(P)=0.0001076 *15* Mult.: From α(K)exp=0.324 *28* (2005Po10).
360.4 *2*	2 *1*	x+2922.62	12$^+$	x+2562.32	11$^-$	E1	0.0220	α(K)=0.0179 *3*; α(L)=0.00312 *5*; α(M)=0.000738 *11* α(N)=0.000191 *3*; α(O)=4.10×10^{-5} *6*; α(P)=5.71×10^{-6} *8* Mult.: From table 2 in 2005Po10.
367.0 *1*	27 *8*	x+2031.60	(8$^+$)	x+1664.6	8$^+$			
372.5 *2*	6 *3*	x+8928.6	(29$^+$)	x+8556.13	29$^+$			
378.7 *1*	17 *4*	x+3782.81	(14)$^-$	x+3404.14	(13)$^-$	M1	0.316	α(K)=0.256 *4*; α(L)=0.0457 *7*; α(M)=0.01083 *16* α(N)=0.00282 *4*; α(O)=0.000617 *9*; α(P)=9.02×10^{-5} *13* Mult.: α(K)exp=0.256 *24* (deduced from prompt spectra −2005Po10).
379.0 *1*	28 *7*	x+4730.70	(17$^-$)	x+4351.70	(17$^-$)			
^{x}381.5 *1*	≥3							
383.4 *1*	16 *3*	x+7419.3	(25$^+$)	x+7035.9	(23)$^+$			
^{x}387.3 *3*	4 *2*							
390.4 *1*	87 *8*	x+5383.87	19$^+$	x+4993.43	20$^+$	M1	0.291	A_2=+0.00 *13* (2005Po10) α(K)=0.236 *4*; α(L)=0.0420 *6*; α(M)=0.00996 *14* α(N)=0.00260 *4*; α(O)=0.000568 *8*; α(P)=8.30×10^{-5} *12* Mult.: From α(K)exp=0.28 *4* (1982Po03); α(K)exp=0.32 *5*, α(L)exp=0.053 *13* (2005Po10).
^{x}390.4 *3*	6 *3*							
^{x}390.7 *3*								I_γ: weak γ ray.
415.9 *1*	23 *3*	x+7311.02	26$^-$	x+6895.12	24$^+$	M2[a]	0.750	α(K)=0.569 *8*; α(L)=0.1362 *19*; α(M)=0.0337 *5* α(N)=0.00885 *13*; α(O)=0.00193 *3*; α(P)=0.000277 *4* Mult.: From α(exp)=0.50 *14*, α(K)exp=0.63 *4*, α(L)exp=0.149 *16* (2005Po10).
426.1 *1*	59 *8*	x+6895.12	24$^+$	x+6469.02	23$^+$	M1	0.230	A_2=−0.14 *18* (2005Po10) α(K)=0.187 *3*; α(L)=0.0331 *5*; α(M)=0.00785 *11* α(N)=0.00205 *3*; α(O)=0.000448 *7*; α(P)=6.54×10^{-5} *10* Mult.: From α(K)exp=0.29 *3*, α(L)exp=0.039 *9* (2005Po10).
433.0 *1*	342 *25*	x+6469.02	23$^+$	x+6036.02	21$^+$	E2[a]	0.0501	A_2=+0.24 *5* (2005Po10) α(K)=0.0316 *5*; α(L)=0.01376 *20*; α(M)=0.00353 *5* α(N)=0.000920 *13*; α(O)=0.000192 *3*; α(P)=2.42×10^{-5} *4* Mult.: from α(K)exp=0.036 *7* (1982Po03); α(K)exp=0.034 *4*, α(L)exp=0.0130 *12*, α(M)exp=0.0041 *10* (2005Po10).
460.2 *1*	6 *1*	x+3864.28	(15)$^-$	x+3404.14	(13)$^-$			
467.2 *1*	25 *5*	x+5380.99	(18)$^+$	x+4913.72	(17$^+$)			

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [&]	δ [c]	α [b]	Comments
482.0 *1*	13 *2*	x+5380.99	(18)$^+$	x+4898.95	(16)$^+$				
492.4[‡] *1*	52 *6*	x+5876.31	20$^+$	x+5383.87	19$^+$	M1+E2		0.10 *6*	A_2=−0.41 *21* (2005Po10) α(K)=0.08 *6*; α(L)=0.016 *7*; α(M)=0.0038 *15* α(N)=0.0010 *4*; α(O)=0.00021 *9*; α(P)=3.0×10^{-5} *14* Mult.: From α(K)exp=0.065 *4* $ α(L)exp=0.010 *2* (2005Po10).
515.1 *1*	86 *8*	x+9764.7	31$^+$	x+9249.6	30$^+$	M1		0.1385	A_2=−0.42 *14* (2005Po10) α(K)=0.1124 *16*; α(L)=0.0199 *3*; α(M)=0.00470 *7* α(N)=0.001226 *18*; α(O)=0.000268 *4*; α(P)=3.92×10^{-5} *6* Mult.: from α(K)exp=0.11 *3* (1982Po03); α(K)exp=0.136 *7* (2005Po10).
539.3 *1*	58 *10*	x+4351.70	(17$^-$)	x+3812.40	17$^-$	M1		0.1226	A_2=+0.8 *3* (2005Po10) α(K)=0.0995 *14*; α(L)=0.01756 *25*; α(M)=0.00416 *6* α(N)=0.001083 *16*; α(O)=0.000237 *4*; α(P)=3.47×10^{-5} *5* Mult.: From α(K)exp=0.088 *6* (deduced from prompt spectra − 2005Po10).
545.7 *1*	748 *20*	x+2922.62	12$^+$	x+2376.88	10$^+$	E2[a]		0.0287	α(K)=0.0199 *3*; α(L)=0.00661 *10*; α(M)=0.001668 *24* α(N)=0.000434 *6*; α(O)=9.15×10^{-5} *13*; α(P)=1.189×10^{-5} *17* Mult.: from α(K)exp=0.016 *4* (1982Po03)$ α(K)exp=0.018 *1* $ α(L1)exp+α(L2)exp=0.0060 *4* $ α(L3)exp=0.00144 *15* (2005Po10).
547.7 *1*	64 *6*	x+3110.06	12$^-$	x+2562.32	11$^-$	M1		0.1177	α(K)=0.0955 *14*; α(L)=0.01685 *24*; α(M)=0.00399 *6* α(N)=0.001039 *15*; α(O)=0.000228 *4*; α(P)=3.33×10^{-5} *5* Mult.: from α(K)exp=0.083 *16* (1982Po03)$ α(K)exp=0.114 *5* $ α(L)exp=0.012 *3* (deduced from prompt spectra −2005Po10).
548.6 *2*	20 *6*	x+5162.8	(19$^-$)	x+4614.20	(18$^-$)				
[x]558.0 *3*	13 *5*								
564.2 *1*	50 *10*	x+7875.12	(27$^-$)	x+7311.02	26$^-$				
564.3 *1*	600 *20*	x+3812.40	17$^-$	x+3248.06	14$^+$	E3		0.0851	A_2=+0.20 *8* (2005Po10) α(K)=0.0454 *7*; α(L)=0.0294 *5*; α(M)=0.00775 *11* α(N)=0.00203 *3*; α(O)=0.000423 *6*; α(P)=5.32×10^{-5} *8* Mult.: from α(K)exp=0.051 *5* (1982Po03); α(K)exp=0.0462 *13*, α(L3)exp=0.0037 *4*, α(M)exp=0.0074 *4* (2005Po10).
566.9 *3*	45 *10*	x+7035.9	(23)$^+$	x+6469.02	23$^+$	M1		0.1074	α(K)=0.0872 *13*; α(L)=0.01537 *22*; α(M)=0.00364 *6* α(N)=0.000948 *14*; α(O)=0.000207 *3*;

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	δ[c]	α[b]	Comments
									α(P)=3.03×10^{-5} *5* Mult.: From α(K)exp=0.098 *13* (deduced from prompt spectra − 2005Po10).
601.2[‡] *1*	219 *13*	x+2265.79	9$^+$	x+1664.6	8$^+$	M1+E2	−0.20 *5*	0.0893 *19*	A$_2$=−0.09 *15* (2005Po10) α(K)=0.0724 *16*; α(L)=0.01282 *25*; α(M)=0.00304 *6* α(N)=0.000791 *15*; α(O)=0.000173 *4*; α(P)=2.53×10^{-5} *5* Mult.,δ: from α(K)exp=0.065 *7*, and γ(θ) (1982Po03); α(K)exp=0.056 *3* $ α(L)exp=0.015 *1* (2005Po10).
602.7 *1*	29 *5*	x+6469.02	23$^+$	x+5866.33	21$^+$	E2		0.0229	α(K)=0.01635 *23*; α(L)=0.00494 *7*; α(M)=0.001237 *18* α(N)=0.000322 *5*; α(O)=6.81×10^{-5} *10*; α(P)=8.97×10^{-6} *13* Mult.: From tables 2 and 3 and text of 2005Po10; M1+E2 in Table 1.
616.2 *1*	58 *7*	x+3864.28	(15)$^-$	x+3248.06	14$^+$	E1		0.00725	A$_2$=−0.10 *27* (2005Po10) α(K)=0.00596 *9*; α(L)=0.000982 *14*; α(M)=0.000230 *4* α(N)=5.97×10^{-5} *9*; α(O)=1.293×10^{-5} *19*; α(P)=1.84×10^{-6} *3* Mult.: from α(K)exp<0.007 (1982Po03).
638.3 *1*	29 *4*	x+5684.64	(19)$^+$	x+5046.41	(17$^+$)				
643.9 *1*	1000 *30*	643.90	2$^+$	0.0	0$^+$	E2		0.0198	A$_2$=+0.16 *3* (2005Po10) α(K)=0.01440 *21*; α(L)=0.00409 *6*; α(M)=0.001021 *15* α(N)=0.000266 *4*; α(O)=5.63×10^{-5} *8*; α(P)=7.49×10^{-6} *11* Mult.: from α(K)exp=0.014 *2*, α(L)exp=0.0034 *4* (1982Po03).
659.5 *1*	31 *5*	x+6525.83	(22)$^+$	x+5866.33	21$^+$	M1		0.0720	α(K)=0.0585 *9*; α(L)=0.01027 *15*; α(M)=0.00243 *4* α(N)=0.000633 *9*; α(O)=0.0001385 *20*; α(P)=2.03×10^{-5} *3* Mult.: From α(K)exp=0.058 *8*, α(L)exp=0.015 *4* (2005Po10).
662.4 *2*	21 *3*	x+7973.4	(26)$^-$	x+7311.02	26$^-$	M1		0.0712	α(K)=0.0579 *9*; α(L)=0.01015 *15*; α(M)=0.00240 *4* α(N)=0.000625 *9*; α(O)=0.0001369 *20*; α(P)=2.00×10^{-5} *3*

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

E_γ[†]	I_γ[†]	E_i(level)	J^π_i	E_f	J^π_f	Mult.[&]	α[b]	Comments
								Mult.: α(K)exp=0.095 *9*, α(L)exp=0.025 *5* (deduced from prompt spectra – 2005Po10).
665.3 *2*	23 *3*	x+10752.1	(34$^+$)	x+10086.8	32$^+$			
667.6 *3*	6 *3*	x+7978.6	(27$^-$)	x+7311.02	26$^-$			
672.0 *1*	21 *3*	x+3920.03	(15$^+$)	x+3248.06	14$^+$			
672.7 *1*	12 *3*	x+3782.81	(14)$^-$	x+3110.06	12$^-$			
677.1 *2*	16 *8*	x+6543.4	(21)$^+$	x+5866.33	21$^+$	M1	0.0672	α(K)=0.0546 *8*; α(L)=0.00958 *14*; α(M)=0.00227 *4* α(N)=0.000590 *9*; α(O)=0.0001292 *19*; α(P)=1.89×10^{-5} *3* Mult.: From α(K)exp=0.05 *2* (2005Po10).
681.4 *2*	18 *4*	x+8556.13	29$^+$	x+7875.12	(27$^-$)	M2	0.1700	α(K)=0.1328 *19*; α(L)=0.0281 *4*; α(M)=0.00683 *10* α(N)=0.00179 *3*; α(O)=0.000390 *6*; α(P)=5.64×10^{-5} *8* Mult.: From Table 2 in 2005Po10.
690.2 *2*		x+5861.0	(20)$^-$	x+5170.8	(19$^-$)	M1	0.0639	α(K)=0.0519 *8*; α(L)=0.00910 *13*; α(M)=0.00215 *3* α(N)=0.000561 *8*; α(O)=0.0001228 *18*; α(P)=1.80×10^{-5} *3* Mult.: From α(K)exp=0.08 *3* (deduced from prompt spectra – 2005Po10). I_γ: weak transition.
693.5 *1*	88 *9*	x+9249.6	30$^+$	x+8556.13	29$^+$	M1+E2	0.040 *23*	α(K)=0.032 *20*; α(L)=0.006 *3*; α(M)=0.0015 *7* α(N)=0.00038 *17*; α(O)=8.E−5 *4*; α(P)=1.2×10^{-5} *6* Mult.: α(K)exp=0.020 *3* (deduced from prompt spectra – 2005Po10).
^{x}705.1 *4*	8 *3*							
712.3 *1*	700 *26*	x+2376.88	10$^+$	x+1664.6	8$^+$	E2[a]	0.01602	A_2=+0.21 *9* (2005Po10) α(K)=0.01189 *17*; α(L)=0.00311 *5*; α(M)=0.000770 *11* α(N)=0.000201 *3*; α(O)=4.27×10^{-5} *6*; α(P)=5.74×10^{-6} *8* Mult.: from α(K)exp=0.011 *1* (1982Po03); α(K)exp=0.0112 *5* $ α(L)exp=0.0035 *2* (2005Po10).
740.2 *5*	40 *10*	x+11492.3	(36$^-$)	x+10752.1	(34$^+$)			
755.7 *5*	9 *3*	x+10835.6	(33$^+$)	x+10079.9	(31$^+$)			
^{x}769.3 *5*	19 *3*							
792.5 *5*	7 *3*	x+11978.4	(36$^-$)	x+11185.9	(35$^-$)			
801.8 *1*	71 *15*	x+4614.20	(18$^-$)	x+3812.40	17$^-$	M1	0.0431	A_2=−0.28 *20* (2005Po10) α(K)=0.0351 *5*; α(L)=0.00612 *9*; α(M)=0.001448 *21* α(N)=0.000377 *6*; α(O)=8.26×10^{-5} *12*; α(P)=1.208×10^{-5} *17* Mult.: From α(K)exp=0.0311 *21*, α(L)exp=0.0087 *10* (deduced from prompt spectra – 2005Po10).
817.7[‡] *1*	827 *30*	1461.60	4$^+$	643.90	2$^+$	E2	0.01207	A_2=+0.19 *3* (2005Po10) α(K)=0.00918 *13*; α(L)=0.00218 *3*; α(M)=0.000535 *8* α(N)=0.0001392 *20*; α(O)=2.98×10^{-5} *5*;

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

E_γ [†]	I_γ [†]	E_i(level)	J^π_i	E_f	J^π_f	Mult. [&]	α [b]	Comments
								α(P)=4.06×10^{-6} *6* Mult.: From α(K)exp=0.0092 *3*, α(L)exp=0.00203 *13* (2005Po10).
841.9 *1*	40 *7*	x+3404.14	(13)$^-$	x+2562.32	11$^-$	E2	0.01139	α(K)=0.00870 *13*; α(L)=0.00203 *3*; α(M)=0.000497 *7* α(N)=0.0001292 *18*; α(O)=2.77×10^{-5} *4*; α(P)=3.79×10^{-6} *6* Mult.: from α(K)exp=0.017 *2* (1982Po03); α(K)exp=0.011 *2* (2005Po10).
842.0 [‡] *1*	230 *30*	x+7311.02	26$^-$	x+6469.02	23$^+$	E3 [a]	0.0291	A_2=+0.47 *9* (2005Po10) α(K)=0.0196 *3*; α(L)=0.00709 *10*; α(M)=0.00181 *3* α(N)=0.000473 *7*; α(O)=0.0001001 *14*; α(P)=1.324×10^{-5} *19* Mult.: from α(K)exp=0.017 *2* (1982Po03); α(K)exp=0.0206 *18* $ α(L)exp=0.0072 *8* (2005Po10).
854.0 *2*	21 *5*	x+7379.8		x+6525.83	(22)$^+$			
^{x}868.6 *3*	12 *3*							
872.9 *1*	154 *8*	x+5866.33	21$^+$	x+4993.43	20$^+$	M1	0.0346	A_2=−0.31 *10* (2005Po10) α(K)=0.0281 *4*; α(L)=0.00490 *7*; α(M)=0.001157 *17* α(N)=0.000301 *5*; α(O)=6.60×10^{-5} *10*; α(P)=9.66×10^{-6} *14* Mult.: from α(K)exp=0.024 *3* and α(L)exp≈0.008 (1982Po03); α(K)exp=0.0167 *11*, α(L)exp=0.0035 *8* (2005Po10).
882.9 [‡] *2*	92 *8*	x+5876.31	20$^+$	x+4993.43	20$^+$	M1	0.0336	A_2=+0.29 *15* (2005Po10) α(K)=0.0273 *4*; α(L)=0.00475 *7*; α(M)=0.001123 *16* α(N)=0.000292 *4*; α(O)=6.40×10^{-5} *9*; α(P)=9.37×10^{-6} *14* Mult.: from α(K)exp=0.029 *4* (1982Po03); α(K)exp=0.0273 *14*, α(L)exp=0.0052 *7* (2005Po10).
888.6 *2*	12 *3*	x+10975.4	(34$^+$)	x+10086.8	32$^+$			
897.6 *2*	20 *3*	x+2562.32	11$^-$	x+1664.6	8$^+$	E3	0.0249	α(K)=0.01717 *24*; α(L)=0.00579 *9*; α(M)=0.001468 *21* α(N)=0.000384 *6*; α(O)=8.14×10^{-5} *12*; α(P)=1.085×10^{-5} *16* Mult.: from α(K)exp<0.03 (1982Po03); α(K)exp=0.015 *3* (deduced from prompt spectra − 2005Po10).
901.2 *1*	192 *18*	1545.10	4$^+$	643.90	2$^+$	E2	0.00995	A_2=+0.23 *13* (2005Po10) α(K)=0.00768 *11*; α(L)=0.001719 *24*; α(M)=0.000419 *6* α(N)=0.0001090 *16*; α(O)=2.34×10^{-5} *4*; α(P)=3.22×10^{-6} *5* Mult.: α(K)exp=0.0075 *6*, α(L)exp=0.0018 *2* (2005Po10).
914.0 *8*	10 *3*	x+8887.4		x+7973.4	(26)$^-$			
969.2 *2*	12 *3*	x+4889.12	(15$^+$)	x+3920.03	(15$^+$)	M1+E2	0.017 *9*	α(K)=0.014 *8*; α(L)=0.0026 *12*; α(M)=0.0006 *3* α(N)=0.00016 *7*; α(O)=3.5×10^{-5} *16*;

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(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

γ(^{210}Rn) (continued)

Eγ[†]	Iγ[†]	Ei(level)	J^π_i	Ef	J^π_f	Mult.[&]	α[b]	Comments
								α(P)=5.0×10^{-6} 23 Mult.: From α(K)exp=0.016 4 (2005Po10).
[x]1014.6 5	8 4							
1035.0 3	36 7	x+4898.95	(16)$^+$	x+3864.28	(15)$^-$			
1086.5 2	37 7	x+4898.95	(16)$^+$	x+3812.40	17$^-$	E1	0.00254	α(K)=0.00211 3; α(L)=0.000332 5; α(M)=7.75×10^{-5} 11 α(N)=2.01×10^{-5} 3; α(O)=4.38×10^{-6} 7; α(P)=6.33×10^{-7} 9 Mult.: From α(K)exp=0.003 1 (2005Po10).
1106.2 2	22 5	x+4889.12	(15$^+$)	x+3782.81	(14)$^-$			
1181.0[‡] 1	395 12	x+4993.43	20$^+$	x+3812.40	17$^-$	E3	0.01333	A_2=+0.19 5 (2005Po10) α(K)=0.00989 14; α(L)=0.00259 4; α(M)=0.000643 9 α(N)=0.0001678 24; α(O)=3.60×10^{-5} 5; α(P)=4.94×10^{-6} 7; α(IPF)=6.95×10^{-7} 10 Mult.: from α(K)exp=0.0084 9 (1982Po03); α(K)exp=0.0097 5, α(L)exp=0.0024 3, α(M)exp=0.00082 19 (2005Po10).
1245.0 1	112 10	x+8556.13	29$^+$	x+7311.02	26$^-$	E3[a]	0.01189	A_2=+0.25 10 (2005Po10) α(K)=0.00891 13; α(L)=0.00225 4; α(M)=0.000555 8 α(N)=0.0001448 21; α(O)=3.11×10^{-5} 5; α(P)=4.29×10^{-6} 6; α(IPF)=2.71×10^{-6} 4 Mult.: from α(K)exp=0.0084 13 (1982Po03), $ α(K)exp=0.0092 5 $ α(L)exp=0.0029 2 α(M)exp=0.00062 16 (2005Po10).
1273.9 2	5 2	x+12026.0	(37$^-$)	x+10752.1	(34$^+$)	E3	0.01132	α(K)=0.00851 12; α(L)=0.00211 3; α(M)=0.000521 8 α(N)=0.0001359 19; α(O)=2.92×10^{-5} 4; α(P)=4.03×10^{-6} 6; α(IPF)=4.07×10^{-6} 6 Mult.: From α(K)exp=0.010 3, α(L)exp=0.0031 12 (deduced from prompt spectra − 2005Po10). Additional information 2.
1358.0 3	27 10	x+7224.3	(23)$^+$	x+5866.33	21$^+$			
1358.4 2	27 10	x+5170.8	(19$^-$)	x+3812.40	17$^-$	E2	0.00459	α(K)=0.00366 6; α(L)=0.000686 10; α(M)=0.0001638 23 α(N)=4.26×10^{-5} 6; α(O)=9.23×10^{-6} 13; α(P)=1.313×10^{-6} 19; α(IPF)=2.49×10^{-5} 4 Mult.: From α(K)exp=0.0032 6 (deduced from prompt spectra − 2005Po10).

† From 2005Po10, except otherwise noted.
‡ Weighted average of data from 2005Po10 and 1982Po03.
\# From 1982Po03.
@ Transition not observed, but required by coincidence data or systematic considerations (2005Po10).
& From measured α(K)exp and α(L)exp values in 2005Po10 and 1982Po03. Measured values are statistically consistent from these

Continued on next page (footnotes at end of table)

(HI,xnγ) 2005Po10,1982Po03,1981Ma28 (continued)

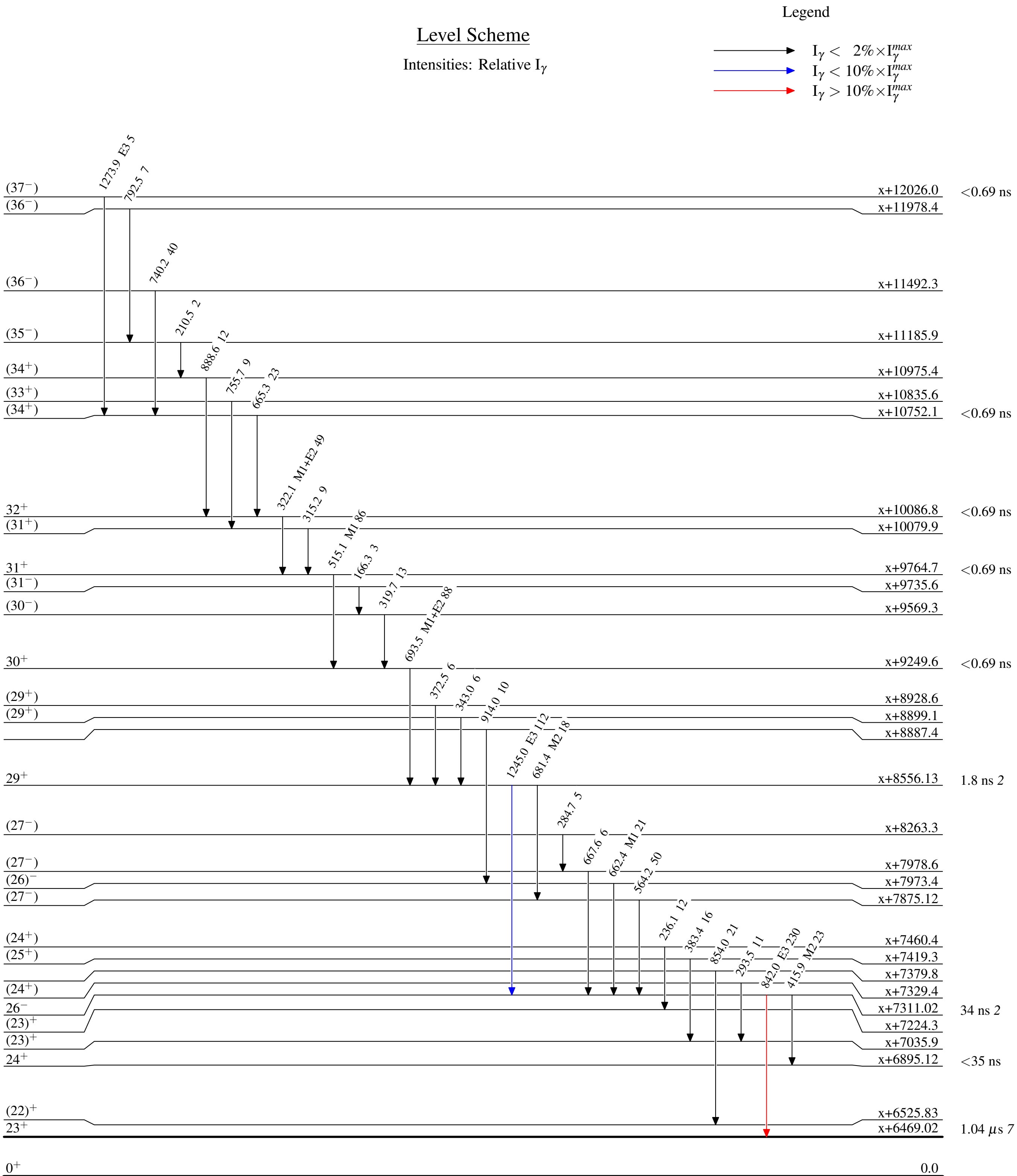
$\gamma(^{210}Rn)$ (continued)

two measurements.
[a] Stretched transition, from $\gamma(\theta)$ (1982Po03).
[b] Additional information 3.
[c] If No value given it was assumed δ=1.00 for E2/M1, δ=1.00 for E3/M2 and δ=0.10 for the other multipolarities.
[x] γ ray not placed in level scheme.

(HI,xnγ) 2005Po10,1982Po03,1981Ma28

Level Scheme

Intensities: Relative I_γ



$^{210}_{86}Rn_{124}$

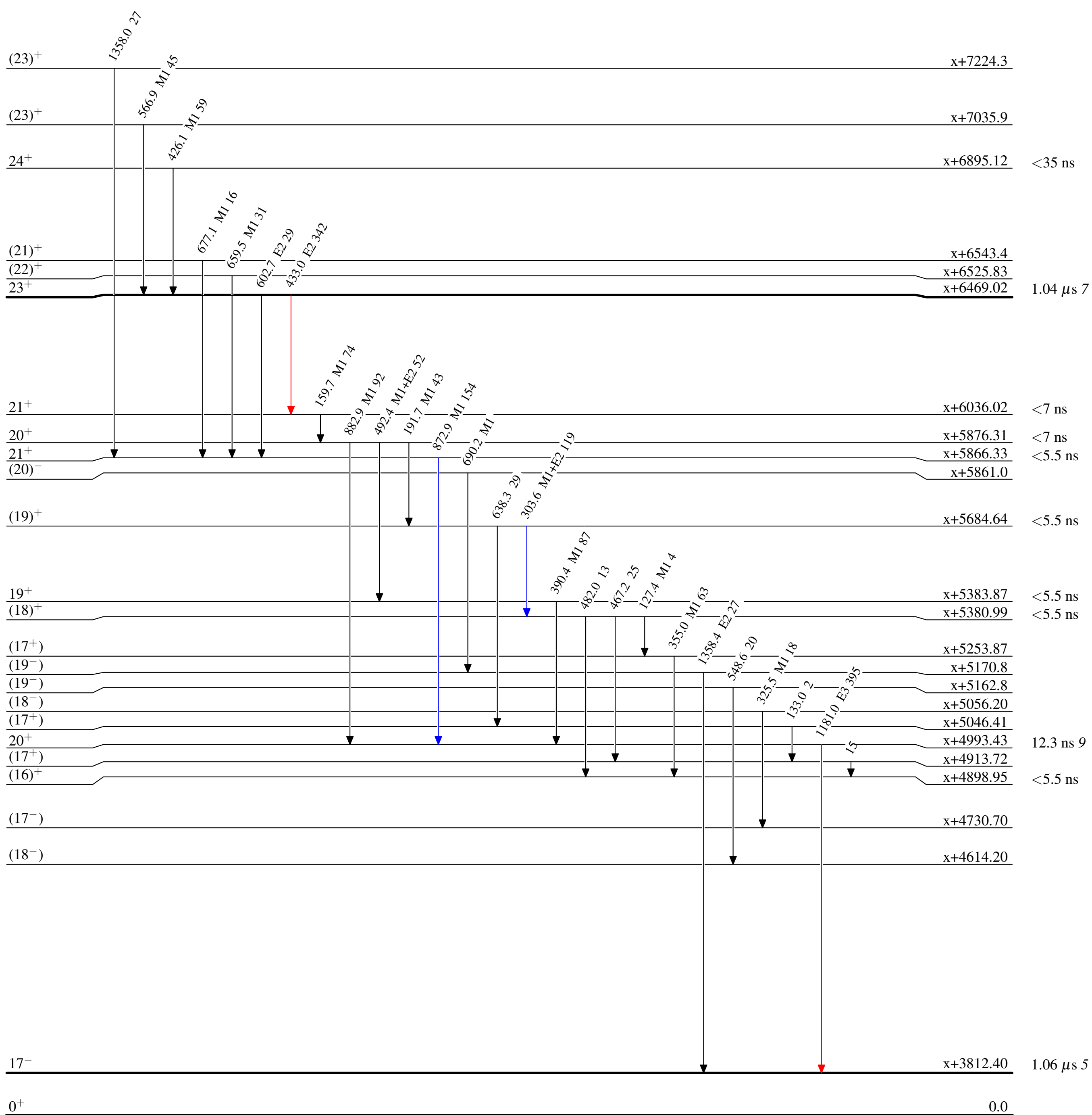
(HI,xnγ) 2005Po10,1982Po03,1981Ma28

Level Scheme (continued)

Intensities: Relative I$_\gamma$

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)

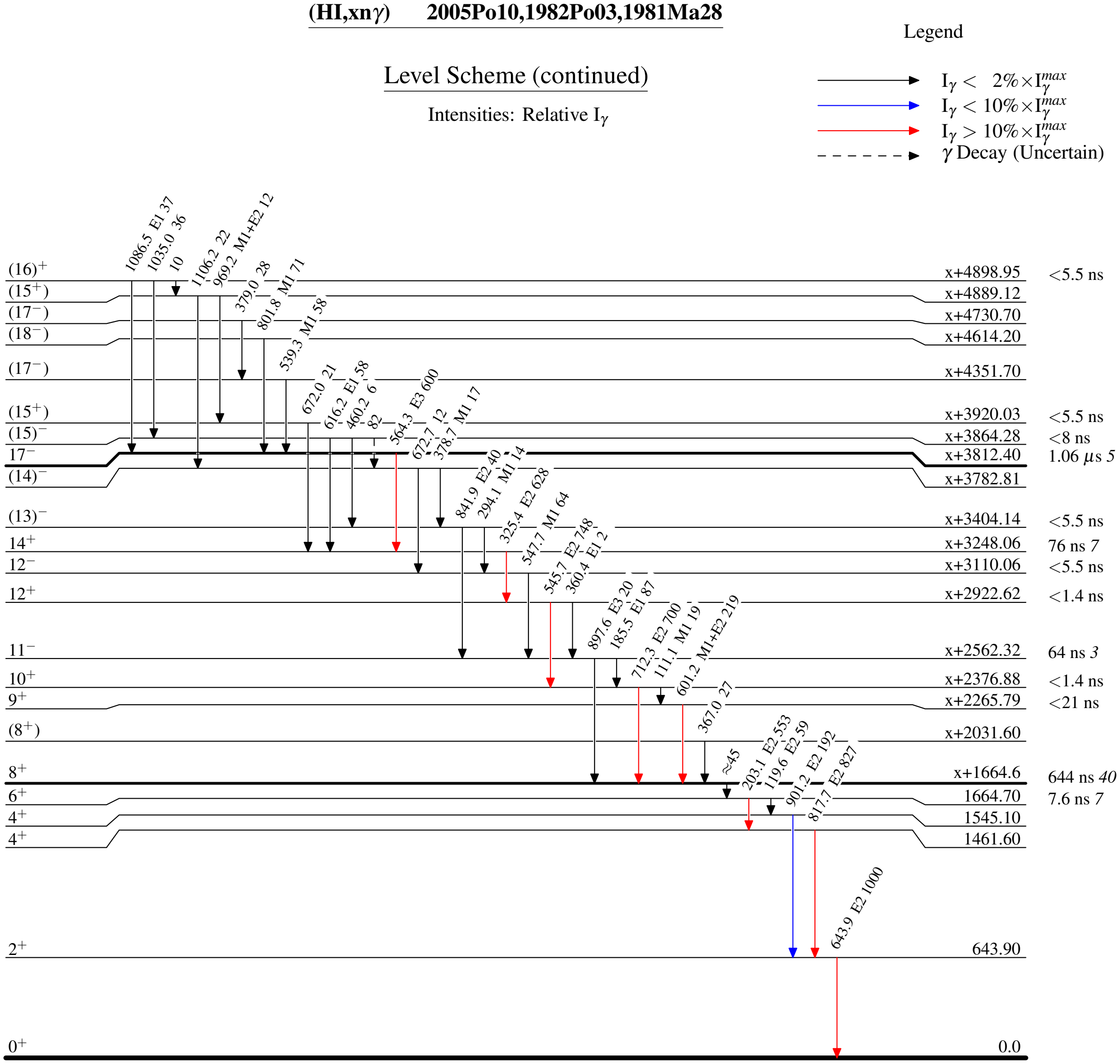


$^{210}_{86}$Rn$_{124}$

(HI,xnγ) 2005Po10,1982Po03,1981Ma28

Level Scheme (continued)

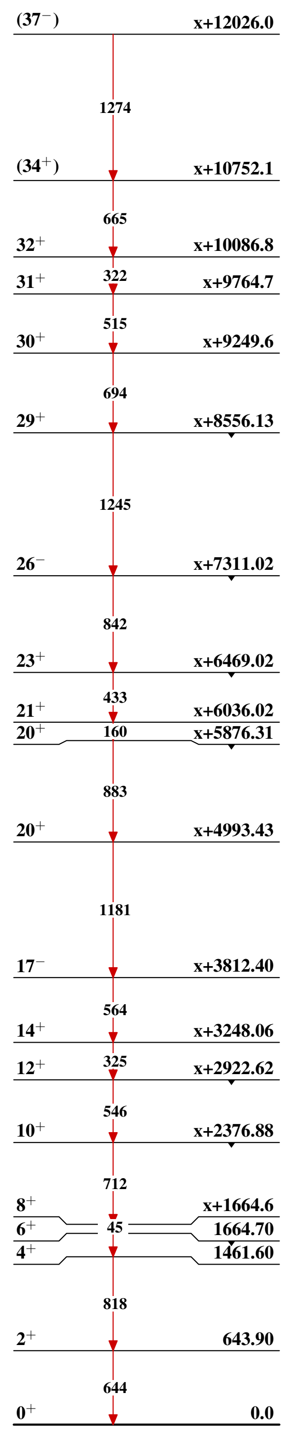
Intensities: Relative I_γ



$^{210}_{86}Rn_{124}$

(HI,xnγ) 2005Po10,1982Po03,1981Ma28

Band(A): Yrast sequence (2005Po10)



$^{210}_{86}Rn_{124}$