Adopted Levels, Gammas

History

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

Q(β^-)=−6465 *25*; S(n)=9101 *14*; S(p)=4106 *17*; Q(α)=5484.8 *14* 2012Wa38
Note: Current evaluation has used the following Q record.
Q(β^-)=−6460 *30*; S(n)=9100 *30*; S(p)=4083 *24*; Q(α)=5484.8 *14* 2003Au03

^{204}Po Levels

Cross Reference (XREF) Flags

- A ^{208}Rn α decay
- B ^{204}At ε decay
- C ^{204}Pb(^{3}He,3nγ)
- D ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ)

E(level)†	J$^\pi$‡	$T_{1/2}$	XREF	Comments
0	0$^+$	3.519 h *12*	ABCD	%α=0.67 *3*; %ε+%β^+=99.33 *3* %α: Unweighted average of 0.660 *7* (1965AnZZ), 0.66 *8* (1963Be28), 0.75 *10* (1967Le08), and 0.62 *6* (1971Go35). Other: 5.3 *4* (1970Jo26). $T_{1/2}$: Weighted average of 3.53 h *3* (1961La02), 3.50 h *1* (1965AnZZ), 3.57 h *2* (1970Ra14), and 3.55 h *15* (1970DaZM) (α-decay measurements), and 3.525 h *20* (1965AnZZ) and 3.69 h *11* (1970DaZM) (γ-ray measurements following ^{204}Po ε decay). Others: 3.8 h (1951Ka03), 3.5 h *6* (1956Bu12), 3.6 h *2* (1961Fo05), 3.6 h *1* (1967Ti04), and 3.5 h *1* (1970Jo26). Eα=5377.1 keV *12* recommended in 1991Ry01 from measured energies of 5379 *5* (1967Ti04), 5377 *1* (1969Go23), 5380 *10* (1970Jo26), 5379 *3* (1970Ra14) and 5374 *5* (1970DaZM) (with the energy adjusted for calibration as suggested by 1991Ry01). The energies measured by 1969Go23 and 1970Ra14 were used by 2003Au03 as input in their mass adjustment. The output of Q(α)=5484.8 *14* corresponds to Eα=5377.4 *14*. $\Delta<r^2>(^{208}Po,^{204}Po)$=−0.206 *2* (1991Ko32).
684.341 *10*	2$^+$		ABCD	J$^\pi$: 684.3γ E2 to 0$^+$.
1200.661 *14*	4$^+$		BCD	J$^\pi$: 516.3γ E2 to 2$^+$.
1255.30 *15*	(3)$^+$		CD	J$^\pi$: 570.8γ M1+E2 to 2$^+$; $\gamma(\theta)$ excludes 2$^+$; the absence of a γ-ray transition to g.s. (J$^\pi$=0$^+$) would argue against 1$^+$.
1552.18 *4*	4$^+$		BCD	J$^\pi$: 351.7γ M1+E2 to 4$^+$, 867.8γ E2 to 2$^+$.
1626.915 *17*	6$^+$		BCD	J$^\pi$: 426.2γ E2 to 4$^+$.
1634.55 *7*	(3$^+$)		BC	J$^\pi$: 950.25γ (M1+E2) to 2$^+$ and 433.7γ to 4$^+$; absence of a γ-ray transition to g.s. (J$^\pi$=0$^+$) would argue against 2$^+$.
1639.03 *6*	8$^+$	154 ns *4*	BCD	μ=+7.38 *10*; Q=1.14 *5* (1989Ra17) J$^\pi$: 12.1γ to 6$^+$; μ, systematics of similar isomers in neighboring nuclei. $T_{1/2}$: Weighted average of 140 ns *5* (1971Ha01), 143 ns *5* (1970BrZO), 150 ns *10* (1983He08), 158 ns *2* (1987Ra04), and 150 ns *10* (1990Fa03). Others: 190 ns *20* (1970Ya03) and 140 ns (1972Be12). μ: From g-factor=+0.923 *13* (1973Br14) deduced using the stroboscopic resonance technique. The value was corrected for Knight (1.2% 4) and diamagnetic (−1.79%) shifts. Other: 7.28 *32*, from g-factor=0.91 *4* (1973Na18) measured using the stroboscopic resonance technique. This value was corrected for Knight and diamagnetic shifts by 0±1%. Configuration=(π $h_{9/2}$)$^{+2}$.
1651.3? *3*	(6$^-$,7$^-$)		B	J$^\pi$: 24γ (E1) to 6$^+$; the absence of a γ-ray transition to 4$^+$ levels would argue against 5$^-$.
1715.84 *20*	(3,4$^+$)		C	J$^\pi$: 1031.5γ to 2$^+$; non observation in ^{204}At ε decay (J$^\pi$=7$^+$) or in

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Adopted Levels, Gammas (continued)

^{204}Po Levels (continued)

E(level)†	Jπ‡	$T_{1/2}$	XREF	Comments
				^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ) suggests J≤4; absence of a γ-ray transition to g.s. ($J^\pi=0^+$) would argue against J=1,2+.
1728.58 *6*	$(4)^+$		BC	J^π: 527.9γ M1(+E2) to 4^+, 1044.3γ to 2^+.
1962.15 *3*	6^+		BCD	J^π: 335.2γ ΔJ=0 M1 to 6^+, 761.65γ (E2) to 4^+.
2041.697 *23*	5^-		BCD	J^π: 414.6γ to 6^+, 489.5γ and 841.1γ E1′s to 4^+ levels. Main Configuration=$((\nu\, i_{13/2})^{-1}(\nu\, f_{5/2})^{-1})$.
2100.26 *20*	$(3,4,5)^+$		C	J^π: 899.6γ M1+E2 to 4^+.
2194?			B	
2227.33 *6*	9^-	15.6 ns *5*	BCD	J^π: 588.3γ E1 to 8^+. $T_{1/2}$: From 588γ(t) in ^{204}Pb(^{3}He,3nγ) (1987Ra04). Others:≈17 ns in ^{204}At ε decay (1983He08), 15 ns *4* (1976Be12),<22 ns (1990Fa03), and≈20 ns (1970Ya03) in ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ). Main Configuration=$((\nu\, i_{13/2})^{-1}(\nu\, f_{5/2})^{-1})$.
2248.17 *6*	8^+		BC	J^π: 609.14γ M1+E2 to 8^+, 621.20γ to 6^+. The Iγ(609.1γ)/Iγ(621.2γ) ratio is inconsistent with both 609.1γ and 621.2γ being dipole transitions, thus arguing against $J^\pi=7^+$.
2289.70 *4*	7^-		BCD	Main Configuration=$((\nu\, i_{13/2})^{-1}(\nu\, f_{5/2})^{-1})$. J^π: 327.7γ E1 to 6^+, 650.7γ to 8^+.
2303.14 *4*	6^-		BCD	J^π: 261.4γ M1 to 5^-.
2323.65 *9*	6,7,8		B	J^π: Level directly populated in ^{204}At ε decay ($J^\pi=7^+$).
2376.37 *15*	(7)		BC	J^π: 749.5γ D to 6^+.
2471.58 *5*	$(6,7)^+$		BCD	J^π: 844.7γ M1(+E2) to 6^+.
2527.44 *20*	10^+		CD	J^π: 888.4γ E2 to 8^+.
2539.14 *20*	9^+		D	J^π: 900.1γ M1 to 8^+.
2547.55 *8*	$6^+,7,8^+$		B	J^π: 908.5γ to 8^+, 920.7γ to 6^+.
2553.26 *7*	6,7,8		BC	E(level): This level is placed in accordance with the ^{204}Pb(^{3}He,3nγ) (1987Ra04) data, where the depopulating 926.3γ feeds the 1627-keV level ($J^\pi=6^+$). J^π: Level directly populated in ^{204}At ε decay ($J^\pi=7^+$).
2587.33 *21*			C	
2620.5 *3*	11^-	3.6 ns *2*	CD	J^π: 93.1γ E1 to 10^+. $T_{1/2}$: From 93γ(t) in ^{204}Pb(^{3}He,3nγ) (1987Ra04). Main Configuration=$((\pi\, h_{9/2})^{+1}(\pi\, i_{13/2})^{+1})$.
2727.95 *16*	$(7,8)^+$		B	J^π: 479.8γ M1 to 8^+; direct population in ^{204}At ε decay ($J^\pi=7^+$) rules out 9^+.
2788.9 *3*	10^+		D	J^π: 249.7γ M1 to 9^+, 1149.9γ (E2) to 8^+.
2789.13 *18*	$(6,7,8^+)$		B	J^π: 1137.7γ to $(6^-,7^-)$, 1162.2γ to 6^+; level populated in ^{204}At ε decay ($J^\pi=7^+$).
2803.35? *6*	$(6,7^-)$		B	J^π: 761.7γ to 5^-; level populated in ^{204}At ε decay ($J^\pi=7^+$).
2827.6 *5*	10^-		D	J^π: 600.3γ M1 to 9^-.
2895.3 *6*	(11^+)		D	J^π: 106.4γ (M1) to 10^+.
2899.86 *10*	7^-		B	J^π: 596.7γ to 6^-, 672.4γ to 9^-, 858.2γ to 5^-; level populated in ^{204}At ε decay ($J^\pi=7^+$).
2905.08 *20*	11^-		CD	J^π: 677.7γ E2 to 9^-. Possible Configuration=$((\nu\, p_{3/2})^{-1}(\nu\, f_{5/2})^{-2}(\nu\, i_{13/2})^{-1})$.
2946.3 *4*	10^-		CD	J^π: 719.3γ M1 to 9^-.
3009.82? *8*	$(6^+,7,8)$		B	J^π: 761.7γ to 8^+; level populated in ^{204}At ε decay ($J^\pi=7^+$).
3083.6 *6*	11^+		D	J^π: 294.7γ M1 to 10^+.
3125.5 *3*	12^+		D	J^π: 598.1γ E2 to 10^+. Possible Configuration=$(\nu\, i_{13/2})^{-2}$.
3133.5 *6*	11^+		D	J^π: 344.6γ M1 to 10^+.
3217.4 *4*	$(10,11,12)^-$		C	J^π: 596.9γ M1+E2 to 11^-.
3227.3 *3*	12^-		CD	J^π: 281.4γ E2 to 10^-, 322.2γ M1 to 11^-.
3387? *3*			D	
3387.3 *5*	13^-	9 ns *3*	D	J^π: 261.8γ E1 to 12^+. The A_2=0.13 *18* for 261.8γ in ^{204}Pb(α,4nγ),

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Adopted Levels, Gammas (continued)

^{204}Po Levels (continued)

E(level)[†]	Jπ[‡]	$T_{1/2}$	XREF	Comments
				^{198}Pt(^{12}C,6nγ) might suggest Jπ=12$^-$.
				$T_{1/2}$: From 261.8γ(t) and 598.1γ(t) in ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ) (1990Fa03).
				Main Configuration=$((\pi\ h_{9/2})^{+2}(\nu\ f_{5/2})^{-1}(\nu\ i_{13/2})^{-1})$.
3439.3 *5*	13$^-$		CD	Jπ: 211.9γ (M1) to 12$^-$, 534.2γ E2 to 11$^-$.
3459.0 *6*	12$^-$		D	Jπ: 838.5γ M1 to 11$^-$.
3528.3 *3*	13$^-$		D	Jπ: 623.2γ E2 to 11$^-$, 907.7γ (E2) to 11$^-$.
3564.1 *5*	15$^-$	11.5 ns *9*	CD	μ=6.15 *30*
				Jπ: 124.8γ (E2) to 13$^-$; μ.
				$T_{1/2}$: Weighted average of 13 ns *3* (1976Be12), 11 ns *1* (1982Ha16), and 13 ns *2* (1990Fa03) in ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ).
				μ: From g-factor=0.41 *2* deduced using the in-beam time differential perturbed angular distribution technique from γ(θ,t) of ^{204}Po implanted in nickel foil (1982Ha16). For calibration of the internal magnetic field, 1982Ha16 assumed g-factor=0.91 for the 6$^+$ state in ^{208}Po.
				Main Configuration=$((\pi\ h_{9/2})^{+2}(\nu\ f_{5/2})^{-1}(\nu\ i_{13/2})^{-1})$.
3576? *3*			D	
3649? *5*			D	
3723.2 *7*			D	
3767.4 *8*	13$^-$		D	Jπ: 308.4γ M1 to 12$^-$.
3898.6 *8*	14$^-$		D	Jπ: 439.6γ E2 to 12$^-$.
3975.4 *6*	15$^-$		D	Jπ: 447.1γ E2 to 13$^-$.
4096? *5*			D	
4137.3 *8*			D	
4168.7 *7*	(16$^-$)		D	Jπ: 604.6γ (M1) to 15$^-$.
4174.9 *5*	15$^-$		D	Jπ: 787.6γ E2 to 13$^-$.
4186.6 *12*			D	
4202.9 *6*	15$^-$		D	Jπ: 815.6γ E2 to 13$^-$.
4212.2 *6*	(14$^+$)		D	Jπ: 824.9γ (E1) to 13$^-$.
4312.8 *8*	(16$^-$)		D	Jπ: 748.7γ M1 to (15$^-$).
4358.6 *9*	16$^-$		D	Jπ: 460.0γ E2 to 14$^-$.
4362.2 *7*	13$^-$		D	Jπ: 903.2γ M1+E2 to 12$^-$.
4383.3 *7*	(17$^-$)		D	Jπ: 819.2γ (E2) to 15$^-$.
4437.6 *7*	(16$^+$)		D	Jπ: 225.4γ (E2) to (14$^+$).
4471.1 *7*	17$^-$		D	Jπ: 296.2γ E2 to 15$^-$.
4532.4 *8*			D	
4615.5 *9*	(18$^-$)		D	Jπ: 232.2γ M1 to (17$^-$).
4819.4 *10*			D	
4978.1 *11*			D	
5155.1 *12*			D	
5295.1 *12*	(19$^-$)		D	Jπ: 824γ (E2) to 17$^-$.
5911.1 *16*	(20,21$^-$)		D	Jπ: 616γ to 19$^-$.

[†] From a least-squares fit to Eγ.

[‡] From deduced γ-ray transition multipolarities using α(K)exp and/or K/L in ^{204}At ε decay and α(K)exp and/or γ(θ) in ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ), unless otherwise specified.

Adopted Levels, Gammas (continued)

γ(^{204}Po)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]	α[†]	Comments
684.341	2^+	684.34 *1*	100	0	0^+	E2		0.01584	α(K)=0.01185 *17*; α(L)=0.00302 *5*; α(M)=0.000741 *11*; α(N+..)=0.000233 *4* α(N)=0.000190 *3*; α(O)=3.86×10^{-5} *6*; α(P)=4.47×10^{-6} *7*
1200.661	4^+	516.32 *1*	100	684.341	2^+	E2		0.0297	α(K)=0.0207 *3*; α(L)=0.00678 *10*; α(M)=0.001699 *24*; α(N+..)=0.000533 *8* α(N)=0.000436 *7*; α(O)=8.72×10^{-5} *13*; α(P)=9.63×10^{-6} *14* Mult.: Other: α(K)exp=0.0215 *4* in ^{204}Pb(^{3}He,3nγ) (1987Ra04).
1255.30	$(3)^+$	570.8[&] *2*	100[&]	684.341	2^+	M1+E2[&]	0.6 *4*	0.072 *16*	α(K)=0.058 *14*; α(L)=0.0106 *18*; α(M)=0.0025 *4*; α(N+..)=0.00080 *13* α(N)=0.00065 *11*; α(O)=0.000134 *23*; α(P)=1.7×10^{-5} *4* Mult.: A_2=−0.03 *4* and A_4=−0.01 *5* in ^{204}Pb(^{3}He,3nγ) (1987Ra04) are not consistent with a ΔJ=0 transition. δ: From α(K)exp=0.057 *12* in ^{204}Pb(^{3}He,3nγ) (1987Ra04).
1552.18	4^+	351.70 *10*	100 *6*	1200.661	4^+	M1+E2	0.7 *2*	0.25 *4*	α(K)=0.19 *3*; α(L)=0.039 *3*; α(M)=0.0094 *7*; α(N+..)=0.00298 *20* α(N)=0.00242 *16*; α(O)=0.00050 *4*; α(P)=6.2×10^{-5} *6* δ: From α(K)exp=0.20 *2* in ^{204}Pb(^{3}He,3nγ) (1987Ra04). Other: 0.6 *4* from α(K)exp=0.21 *5* in ^{204}At ε decay (1983He08).
		867.80[&] *4*	64[&] *5*	684.341	2^+	E2[&]		0.00972 *14*	α=0.00972 *14*; α(K)=0.00755 *11*; α(L)=0.001645 *23*; α(M)=0.000398 *6*; α(N+..)=0.0001257 α(N)=0.0001023 *15*; α(O)=2.09×10^{-5} *3*; α(P)=2.51×10^{-6} *4*
1626.915	6^+	74	≈0.15	1552.18	4^+	[E2]		28.4	α(L)=21.1 *3*; α(M)=5.62 *8*; α(N+..)=1.737 *25* α(N)=1.439 *21*; α(O)=0.273 *4*; α(P)=0.0242 *4*
		426.24 *1*	100	1200.661	4^+	E2		0.0476	α(K)=0.0309 *5*; α(L)=0.01252 *18*; α(M)=0.00318 *5*; α(N+..)=0.000996 *14* α(N)=0.000817 *12*; α(O)=0.0001618 *23*; α(P)=1.723×10^{-5} *25*
1634.55	(3^+)	379.1 *2*	41 *14*	1255.30	$(3)^+$				E_γ,I_γ: From ^{204}Pb(^{3}He,3nγ) (1987Ra04).
		433.7 *2*	68 *18*	1200.661	4^+				E_γ,I_γ: From ^{204}Pb(^{3}He,3nγ) (1987Ra04).
		950.25 *7*	100 *18*	684.341	2^+	(M1+E2)			Mult.: From γ(θ) in ^{204}Pb(^{3}He,3nγ).
1639.03	8^+	(12.1[&])	100[&]	1626.915	6^+	[E2][&]		5.3×10^4 *5*	α(M)=4.1×10^4 *4*; α(N+..)=1.25×10^4 *11* α(N)=1.04×10^4 *9*; α(O)=1.95×10^3 *17*; α(P)=169 *15* B(E2)(W.u.)=3.7 *5*
1651.3?	$(6^-,7^-)$	24[c]	100	1626.915	6^+	(E1)		4.49	α(L)=3.39 *5*; α(M)=0.847 *12*; α(N+..)=0.250 *4* α(N)=0.209 *3*; α(O)=0.0377 *6*; α(P)=0.00328 *5*
1715.84	$(3,4^+)$	1031.5 *2*	100	684.341	2^+				E_γ,I_γ: From ^{204}Pb(^{3}He,3nγ) (1987Ra04).
1728.58	$(4)^+$	527.88 *6*	100 *13*	1200.661	4^+	M1(+E2)	≤0.5	0.102 *9*	α(K)=0.083 *8*; α(L)=0.0146 *10*; α(M)=0.00344 *22*; α(N+..)=0.00109 *7* α(N)=0.00089 *6*; α(O)=0.000185 *12*; α(P)=2.38×10^{-5} *17* δ: From α(K)exp=0.082 *8* in ^{204}Pb(^{3}He,3nγ) (1987Ra04).

$^{204}_{84}Po_{120}$-4

Adopted Levels, Gammas (continued)

γ(^{204}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	δ[@]	α[†]	Comments
1728.58	(4)$^+$	1044.32 *9*	80 *11*	684.341	2$^+$				
1962.15	6$^+$	335.21 *3*	75 *5*	1626.915	6$^+$	M1		0.373	α(K)=0.304 *5*; α(L)=0.0530 *8*; α(M)=0.01248 *18*; α(N+..)=0.00397 *6* α(N)=0.00321 *5*; α(O)=0.000672 *10*; α(P)=8.69×10^{-5} *13* Mult.: Others: A_2=0.14 *4* and A_4=−0.01 *6* in ^{204}Pb(^{3}He,3nγ) (1987Ra04) are consistent with ΔJ=0 transition.
		761.65[&] *5*	100[&] *5*	1200.661	4$^+$	(E2)[&]		0.01266	α(K)=0.00965 *14*; α(L)=0.00228 *4*; α(M)=0.000556 *8*; α(N+..)=0.0001752 *25* α(N)=0.0001427 *20*; α(O)=2.90×10^{-5} *4*; α(P)=3.42×10^{-6} *5*
2041.697	5$^-$	414.62 *5*	11.5 *10*	1626.915	6$^+$	[E1]		0.01524	α(K)=0.01251 *18*; α(L)=0.00209 *3*; α(M)=0.000490 *7*; α(N+..)=0.0001543 *22* α(N)=0.0001253 *18*; α(O)=2.58×10^{-5} *4*; α(P)=3.17×10^{-6} *5*
		489.52 *5*	33.1 *21*	1552.18	4$^+$	E1		0.01073	α(K)=0.00883 *13*; α(L)=0.001453 *21*; α(M)=0.000340 *5*; α(N+..)=0.0001071 *15* α(N)=8.69×10^{-5} *13*; α(O)=1.79×10^{-5} *3*; α(P)=2.23×10^{-6} *4*
		841.06 *2*	100 *4*	1200.661	4$^+$	E1		0.00372 *6*	α=0.00372 *6*; α(K)=0.00309 *5*; α(L)=0.000485 *7*; α(M)=0.0001128 *16*; α(N+..)=3.57×10^{-5} *5* α(N)=2.89×10^{-5} *4*; α(O)=6.00×10^{-6} *9*; α(P)=7.62×10^{-7} *11*
2100.26	(3,4,5)$^+$	899.6[&] *2*	100[&]	1200.661	4$^+$	M1+E2[&]	0.9 *1*	0.0192 *11*	α(K)=0.0155 *9*; α(L)=0.00277 *14*; α(M)=0.00066 *4*; α(N+..)=0.000208 *10* α(N)=0.000169 *9*; α(O)=3.51×10^{-5} *18*; α(P)=4.47×10^{-6} *24* δ: From α(K)exp=0.016 *1* in ^{204}Pb(^{3}He,3nγ) (1987Ra04).
2194?		152[c]	100	2041.697	5$^-$				
2227.33	9$^-$	588.30 *2*	100	1639.03	8$^+$	E1		0.00738 *11*	α=0.00738 *11*; α(K)=0.00609 *9*; α(L)=0.000986 *14*; α(M)=0.000230 *4*; α(N+..)=7.26×10^{-5} *11* α(N)=5.89×10^{-5} *9*; α(O)=1.218×10^{-5} *17*; α(P)=1.525×10^{-6} *22* B(E1)(W.u.)=6.2×10^{-8} *3*
2248.17	8$^+$	609.14 *3*	100 *3*	1639.03	8$^+$	M1+E2	0.6 *4*	0.061 *13*	α(K)=0.049 *11*; α(L)=0.0089 *16*; α(M)=0.0021 *4*; α(N+..)=0.00067 *11* α(N)=0.00054 *9*; α(O)=0.000113 *19*; α(P)=1.4×10^{-5} *3* δ: From α(K)exp=0.05 *1* in ^{204}Pb(^{3}He,3nγ) (1987Ra04).
		621.20 *9*	2.3 *4*	1626.915	6$^+$				
2289.70	7$^-$	327.69 *6*	100 *7*	1962.15	6$^+$	E1		0.0256	α(K)=0.0209 *3*; α(L)=0.00359 *5*; α(M)=0.000844 *12*; α(N+..)=0.000265 *4* α(N)=0.000215 *3*; α(O)=4.41×10^{-5} *7*; α(P)=5.36×10^{-6} *8*
		650.66 *6*	50 *4*	1639.03	8$^+$				
		662.72 *4*	42 *4*	1626.915	6$^+$				
2303.14	6$^-$	261.44 *3*	100	2041.697	5$^-$	M1		0.738	α(K)=0.600 *9*; α(L)=0.1051 *15*; α(M)=0.0248 *4*; α(N+..)=0.00789 *11* α(N)=0.00638 *9*; α(O)=0.001335 *19*; α(P)=0.0001725 *25*

$^{204}_{84}Po_{120}$-5

Adopted Levels, Gammas (continued)

γ(^{204}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
2323.65	6,7,8	672.4[b] *6*	≤33[b]	1651.3?	(6⁻,7⁻)			
		696.73 *9*	100 *17*	1626.915	6⁺			
2376.37	(7)	749.45 *15*	100	1626.915	6⁺	D		E_γ: Other: Eγ=751.8 keV *10* in ^{204}Pb(^{3}He,3nγ) (1987Ra04). Mult.: A_2=−0.17 *16*, A_4=−0.2 *2* in ^{204}Pb(^{3}He,3nγ) (1987Ra04).
2471.58	(6,7)⁺	222[c]	≈34	2248.17	8⁺			
		844.66 *4*	100 *8*	1626.915	6⁺	M1(+E2)	0.021 *11*	α(K)=0.017 *10*; α(L)=0.0031 *14*; α(M)=0.0007 *4*; α(N+..)=0.00023 *10* α(N)=0.00019 *8*; α(O)=3.9×10^{-5} *18*; α(P)=5.0×10^{-6} *24* Mult.: From α(K)exp≈0.02 and A_2=0.05 *8*, A_4=0.04 *11* in ^{204}Pb(^{3}He,3nγ) (1987Ra04). Note that α(K)exp=0.005 and A_2<0 in ^{204}Pb(α,4nγ) would favor E1 assignment.
2527.44	10⁺	888.4[&] *2*	100[&]	1639.03	8⁺	E2[&]	0.00928 *13*	α=0.00928 *13*; α(K)=0.00723 *11*; α(L)=0.001555 *22*; α(M)=0.000376 *6*; α(N+..)=0.0001187 α(N)=9.65×10^{-5} *14*; α(O)=1.98×10^{-5} *3*; α(P)=2.37×10^{-6} *4*
2539.14	9⁺	900.1[a] *2*	100[a]	1639.03	8⁺	M1[a]	0.0273	α(K)=0.0223 *4*; α(L)=0.00379 *6*; α(M)=0.000890 *13*; α(N+..)=0.000283 *4* α(N)=0.000229 *4*; α(O)=4.79×10^{-5} *7*; α(P)=6.21×10^{-6} *9*
2547.55	6⁺,7,8⁺	908.49 *7*	100 *10*	1639.03	8⁺			
		920.72 *14*	47 *9*	1626.915	6⁺			
2553.26	6,7,8	926.34 *6*	100	1626.915	6⁺			E_γ: Note that in ^{204}At ε decay scheme of 1983He08, 926.3γ deexcites a 2577.2-keV level.
2587.33		360.0 *2*	100	2227.33	9⁻			E_γ,I_γ: From ^{204}Pb(^{3}He,3nγ) (1987Ra04).
2620.5	11⁻	93.1[&] *2*	100[&]	2527.44	10⁺	E1[&]	0.118	B(E1)(W.u.)=6.0×10^{-5} *3* α: The transition energy is too close to the K-shell binding energy. The α(exp) value does not include the K-shell component.
2727.95	(7,8)⁺	479.78 *15*	100	2248.17	8⁺	M1	0.1422	α(K)=0.1160 *17*; α(L)=0.0200 *3*; α(M)=0.00471 *7*; α(N+..)=0.001500 *21* α(N)=0.001213 *17*; α(O)=0.000254 *4*; α(P)=3.29×10^{-5} *5*
2788.9	10⁺	249.7[a] *3*	100[a] *10*	2539.14	9⁺	M1[a]	0.838	α(K)=0.681 *10*; α(L)=0.1194 *18*; α(M)=0.0282 *4*; α(N+..)=0.00896 *13* α(N)=0.00725 *11*; α(O)=0.001517 *22*; α(P)=0.000196 *3*
		1149.9[a] *5*	31[a] *7*	1639.03	8⁺	(E2)[a]	0.00563 *8*	α=0.00563 *8*; α(K)=0.00450 *7*; α(L)=0.000861 *12*; α(M)=0.000205 *3*; α(N+..)=6.59×10^{-5} *10* α(N)=5.27×10^{-5} *8*; α(O)=1.088×10^{-5} *16*; α(P)=1.344×10^{-6} *19*; α(IPF)=9.42×10^{-7} *21*
2789.13	(6,7,8⁺)	1137.74 *30*	51 *23*	1651.3?	(6⁻,7⁻)			
		1162.23 *18*	100 *26*	1626.915	6⁺			
2803.35?	(6,7⁻)	761.65[bc] *5*	100[b]	2041.697	5⁻			
2827.6	10⁻	600.3[a] *5*	100[a]	2227.33	9⁻	M1[a]	0.0786	α(K)=0.0641 *9*; α(L)=0.01101 *16*; α(M)=0.00259 *4*; α(N+..)=0.000824 *12* α(N)=0.000666 *10*; α(O)=0.0001395 *20*; α(P)=1.81×10^{-5} *3*

$^{204}_{84}Po_{120}$-6

Adopted Levels, Gammas (continued)

γ(^{204}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
2895.3	(11$^+$)	106.4[a] *5*	100[a]	2788.9	10$^+$	(M1)[a]	9.30 *18*	α(K)=7.54 *15*; α(L)=1.35 *3*; α(M)=0.318 *7*; α(N+..)=0.1011 *20* α(N)=0.0818 *16*; α(O)=0.0171 *4*; α(P)=0.00221 *5*
2899.86	7$^-$	596.66 *25*	35 *8*	2303.14	6$^-$			
		672.4[b] *6*	≤19[b]	2227.33	9$^-$			
		858.18 *10*	100 *13*	2041.697	5$^-$			
2905.08	11$^-$	677.7[&] *2*	100[&]	2227.33	9$^-$	E2[&]	0.01618	α(K)=0.01208 *17*; α(L)=0.00310 *5*; α(M)=0.000762 *11*; α(N+..)=0.000240 *4* α(N)=0.000196 *3*; α(O)=3.96×10^{-5} *6*; α(P)=4.58×10^{-6} *7*
2946.3	10$^-$	719.3[a] *5*	100[a]	2227.33	9$^-$	M1[a]	0.0489	α(K)=0.0400 *6*; α(L)=0.00682 *10*; α(M)=0.001603 *23*; α(N+..)=0.000510 *8* α(N)=0.000413 *6*; α(O)=8.64×10^{-5} *13*; α(P)=1.119×10^{-5} *16*
3009.82?	(6$^+$,7,8)	761.65[b] *5*	100[b]	2248.17	8$^+$			
3083.6	11$^+$	294.7 *5*	100	2788.9	10$^+$	M1	0.531	α(K)=0.432 *7*; α(L)=0.0755 *12*; α(M)=0.0178 *3*; α(N+..)=0.00566 *9* α(N)=0.00458 *7*; α(O)=0.000958 *15*; α(P)=0.0001239 *19*
3125.5	12$^+$	598.1 *2*	100	2527.44	10$^+$	E2	0.0212	α(K)=0.01543 *22*; α(L)=0.00438 *7*; α(M)=0.001087 *16*; α(N+..)=0.000342 *5* α(N)=0.000279 *4*; α(O)=5.62×10^{-5} *8*; α(P)=6.37×10^{-6} *9*
3133.5	11$^+$	344.6 *5*	100	2788.9	10$^+$	M1	0.346	α(K)=0.282 *5*; α(L)=0.0491 *8*; α(M)=0.01157 *17*; α(N+..)=0.00368 *6* α(N)=0.00298 *5*; α(O)=0.000623 *9*; α(P)=8.06×10^{-5} *12*
3217.4	(10,11,12)$^-$	596.9[&] *2*	100[&]	2620.5	11$^-$	M1+E2[&]	0.05 *3*	α(K)=0.040 *25*; α(L)=0.008 *4*; α(M)=0.0019 *8*; α(N+..)=0.00059 *25* α(N)=0.00048 *20*; α(O)=0.00010 *5*; α(P)=1.2×10^{-5} *6*
3227.3	12$^-$	281.4 *5*	48 *9*	2946.3	10$^-$	E2	0.1530 *23*	α(K)=0.0774 *12*; α(L)=0.0563 *9*; α(M)=0.01468 *23*; α(N+..)=0.00457 *8* α(N)=0.00377 *6*; α(O)=0.000733 *12*; α(P)=7.25×10^{-5} *12*
		322.2 *2*	100 *10*	2905.08	11$^-$	M1	0.416	α(K)=0.338 *5*; α(L)=0.0591 *9*; α(M)=0.01392 *20*; α(N+..)=0.00443 *7* α(N)=0.00358 *5*; α(O)=0.000750 *11*; α(P)=9.69×10^{-5} *14*
3387?		≈598	100	2788.9	10$^+$			
3387.3	13$^-$	261.8 *3*	100	3125.5	12$^+$	E1	0.0430	α(K)=0.0350 *5*; α(L)=0.00616 *9*; α(M)=0.001450 *21*; α(N+..)=0.000454 *7* α(N)=0.000370 *6*; α(O)=7.54×10^{-5} *11*; α(P)=9.03×10^{-6} *13* B(E1)(W.u.)=1.2×10^{-6} *4*
3439.3	13$^-$	211.9 *5*	15 *2*	3227.3	12$^-$	(M1)	1.322 *21*	α(K)=1.074 *17*; α(L)=0.189 *3*; α(M)=0.0446 *7*; α(N+..)=0.01419 *22* α(N)=0.01148 *18*; α(O)=0.00240 *4*; α(P)=0.000310 *5*
		534.2 *5*	100 *13*	2905.08	11$^-$	E2	0.0275	α(K)=0.0194 *3*; α(L)=0.00611 *9*; α(M)=0.001528 *22*; α(N+..)=0.000480 *7* α(N)=0.000392 *6*; α(O)=7.86×10^{-5} *12*; α(P)=8.73×10^{-6} *13*
3459.0	12$^-$	838.5 *5*	100	2620.5	11$^-$	M1	0.0328	α(K)=0.0268 *4*; α(L)=0.00456 *7*; α(M)=0.001071 *15*; α(N+..)=0.000341 *5* α(N)=0.000276 *4*; α(O)=5.77×10^{-5} *9*; α(P)=7.48×10^{-6} *11*
3528.3	13$^-$	623.2 *3*	100 *12*	2905.08	11$^-$	E2	0.0194	α(K)=0.01423 *20*; α(L)=0.00390 *6*; α(M)=0.000965 *14*; α(N+..)=0.000304 *5* α(N)=0.000248 *4*; α(O)=5.00×10^{-5} *7*; α(P)=5.70×10^{-6} *8*
		907.7 *5*	32 *8*	2620.5	11$^-$	(E2)	0.00889 *13*	α=0.00889 *13*; α(K)=0.00694 *10*; α(L)=0.001477 *21*; α(M)=0.000357

$^{204}_{84}Po_{120}$-7

Adopted Levels, Gammas (continued)

γ(^{204}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
								5; α(N+..)=0.0001126
								α(N)=9.16×10^{-5} *13*; α(O)=1.88×10^{-5} *3*; α(P)=2.26×10^{-6} *4*
3564.1	15$^-$	124.8 *3*	100	3439.3	13$^-$	(E2)	2.85 *5*	α(K)=0.394 *6*; α(L)=1.82 *4*; α(M)=0.485 *9*; α(N+..)=0.150 *3*
								α(N)=0.1244 *23*; α(O)=0.0237 *5*; α(P)=0.00215 *4*
								B(E2)(W.u.)=5.9 *5*
3576?		≈787	100	2788.9	10$^+$			
3649?		≈262	100	3387?				
3723.2		335.9 *5*	100	3387.3	13$^-$			
3767.4	13$^-$	308.4 *5*	100	3459.0	12$^-$	M1	0.469	α(K)=0.381 *6*; α(L)=0.0666 *10*; α(M)=0.01570 *23*; α(N+..)=0.00499 *8*
								α(N)=0.00404 *6*; α(O)=0.000846 *13*; α(P)=0.0001093 *16*
3898.6	14$^-$	439.6 *5*	100	3459.0	12$^-$	E2	0.0440	α(K)=0.0290 *5*; α(L)=0.01130 *17*; α(M)=0.00287 *5*; α(N+..)=0.000897 *13*
								α(N)=0.000736 *11*; α(O)=0.0001460 *22*; α(P)=1.564×10^{-5} *23*
3975.4	15$^-$	447.1 *5*	100	3528.3	13$^-$	E2	0.0422	α(K)=0.0280 *4*; α(L)=0.01069 *16*; α(M)=0.00271 *4*; α(N+..)=0.000848 *13*
								α(N)=0.000695 *10*; α(O)=0.0001380 *20*; α(P)=1.483×10^{-5} *22*
4096?		447	100	3649?				
4137.3		678.3 *5*	100	3459.0	12$^-$			
4168.7	(16$^-$)	604.6 *4*	100	3564.1	15$^-$	(M1)	0.0771	α(K)=0.0630 *9*; α(L)=0.01080 *16*; α(M)=0.00254 *4*; α(N+..)=0.000808 *12*
								α(N)=0.000654 *10*; α(O)=0.0001369 *20*; α(P)=1.772×10^{-5} *25*
4174.9	15$^-$	787.6 *3*	100	3387.3	13$^-$	E2	0.01182	α(K)=0.00906 *13*; α(L)=0.00209 *3*; α(M)=0.000509 *8*; α(N+..)=0.0001606 *23*
								α(N)=0.0001308 *19*; α(O)=2.66×10^{-5} *4*; α(P)=3.15×10^{-6} *5*
4186.6		1103 *1*	100	3083.6	11$^+$			
4202.9	15$^-$	815.6 *4*	100	3387.3	13$^-$	E2	0.01101	α(K)=0.00848 *12*; α(L)=0.00192 *3*; α(M)=0.000466 *7*; α(N+..)=0.0001469 *21*
								α(N)=0.0001196 *17*; α(O)=2.44×10^{-5} *4*; α(P)=2.90×10^{-6} *4*
4212.2	(14$^+$)	824.9 *4*	100	3387.3	13$^-$	(E1)	0.00386 *6*	α=0.00386 *6*; α(K)=0.00320 *5*; α(L)=0.000504 *7*; α(M)=0.0001171 *17*;
								α(N+..)=3.70×10^{-5} *6*
								α(N)=3.00×10^{-5} *5*; α(O)=6.23×10^{-6} *9*; α(P)=7.90×10^{-7} *11*
4312.8	(16$^-$)	748.7 *5*	100	3564.1	15$^-$	M1	0.0441	α(K)=0.0360 *5*; α(L)=0.00614 *9*; α(M)=0.001443 *21*; α(N+..)=0.000459 *7*
								α(N)=0.000371 *6*; α(O)=7.77×10^{-5} *11*; α(P)=1.007×10^{-5} *15*
4358.6	16$^-$	460.0 *5*	100	3898.6	14$^-$	E2	0.0393	α(K)=0.0263 *4*; α(L)=0.00975 *14*; α(M)=0.00246 *4*; α(N+..)=0.000772 *12*
								α(N)=0.000633 *10*; α(O)=0.0001258 *19*; α(P)=1.359×10^{-5} *20*
4362.2	13$^-$	903.2 *4*	100	3459.0	12$^-$	M1+E2	0.018 *9*	α(K)=0.015 *8*; α(L)=0.0026 *12*; α(M)=0.0006 *3*; α(N+..)=0.00020 *9*
								α(N)=0.00016 *7*; α(O)=3.3×10^{-5} *15*; α(P)=4.2×10^{-6} *20*
4383.3	(17$^-$)	819.2 *4*	100	3564.1	15$^-$	(E2)	0.01091	α(K)=0.00841 *12*; α(L)=0.00190 *3*; α(M)=0.000460 *7*; α(N+..)=0.0001452 *21*
								α(N)=0.0001182 *17*; α(O)=2.41×10^{-5} *4*; α(P)=2.87×10^{-6} *4*
4437.6	(16$^+$)	225.4 *4*	100	4212.2	(14$^+$)	(E2)	0.312	α(K)=0.1279 *19*; α(L)=0.1372 *22*; α(M)=0.0361 *6*; α(N+..)=0.01122 *18*
								α(N)=0.00926 *15*; α(O)=0.00179 *3*; α(P)=0.000171 *3*
4471.1	17$^-$	296.2 *4*	100	4174.9	15$^-$	E2	0.1309	α(K)=0.0689 *10*; α(L)=0.0462 *7*; α(M)=0.01201 *18*; α(N+..)=0.00374 *6*
								α(N)=0.00308 *5*; α(O)=0.000601 *9*; α(P)=5.99×10^{-5} *9*
4532.4		809.2 *4*	100	3723.2				
4615.5	(18$^-$)	232.2 *5*	100	4383.3	(17$^-$)	M1	1.025	α(K)=0.833 *13*; α(L)=0.1463 *23*; α(M)=0.0345 *6*; α(N+..)=0.01098 *17*
								α(N)=0.00888 *14*; α(O)=0.00186 *3*; α(P)=0.000240 *4*
4819.4		287.0 *5*	100	4532.4				

$^{204}_{84}Po_{120}$-8

Adopted Levels, Gammas (continued)

γ(^{204}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[#]	α[†]	Comments
4978.1		158.7 *5*	100	4819.4				
5155.1		684 *1*	100	4471.1	17^-			
5295.1	(19^-)	824 *1*	100	4471.1	17^-	(E2)	0.01078	α(K)=0.00832 *12*; α(L)=0.00187 *3*; α(M)=0.000454 *7*; α(N+..)=0.0001431 *21* α(N)=0.0001165 *17*; α(O)=2.38×10^{-5} *4*; α(P)=2.83×10^{-6} *4*
5911.1	$(20,21^-)$	616.0 *10*	100	5295.1	(19^-)			

† Additional information 1.
‡ From ^{204}At ε decay for transitions depopulating levels below 3083.6 keV and from ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ) for levels 3083.6 keV and above, unless otherwise specified.
# From α(K)exp and/or K/L in ^{204}At ε decay, unless otherwise specified. For transitions depopulating the 3083.6-keV level and levels above it, the data are from α(K)exp and/or γ(θ) in ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ).
@ From α(K)exp in ^{204}Pb(^{3}He,3nγ).
& From ^{204}Pb(^{3}He,3nγ).
a From ^{204}Pb(α,4nγ), ^{198}Pt(^{12}C,6nγ).
b Multiply placed with undivided intensity.
c Placement of transition in the level scheme is uncertain.

$^{204}_{84}Po_{120}$-9

Adopted Levels, Gammas

Level Scheme

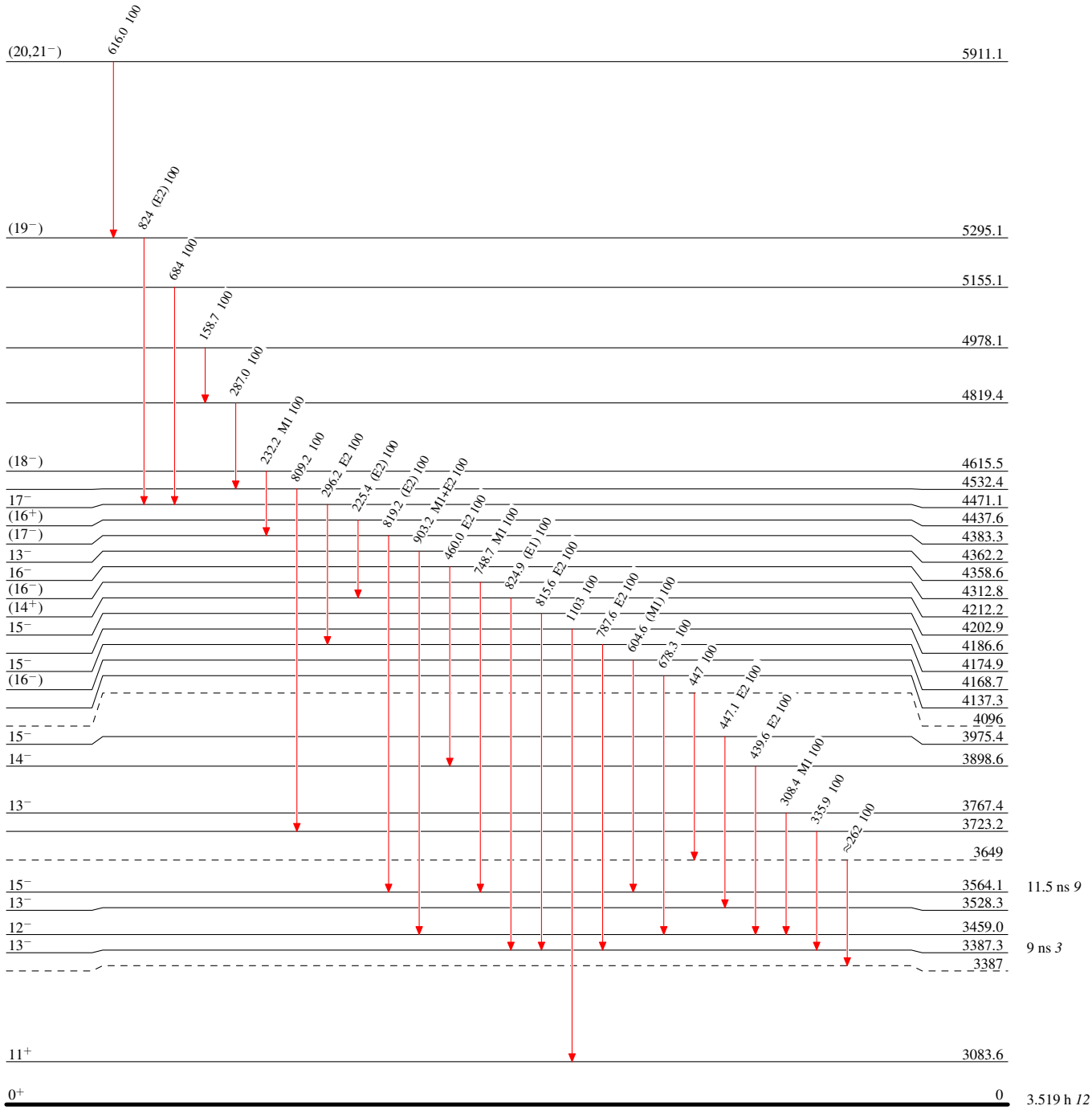
Intensities: Type not specified

Legend

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

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

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

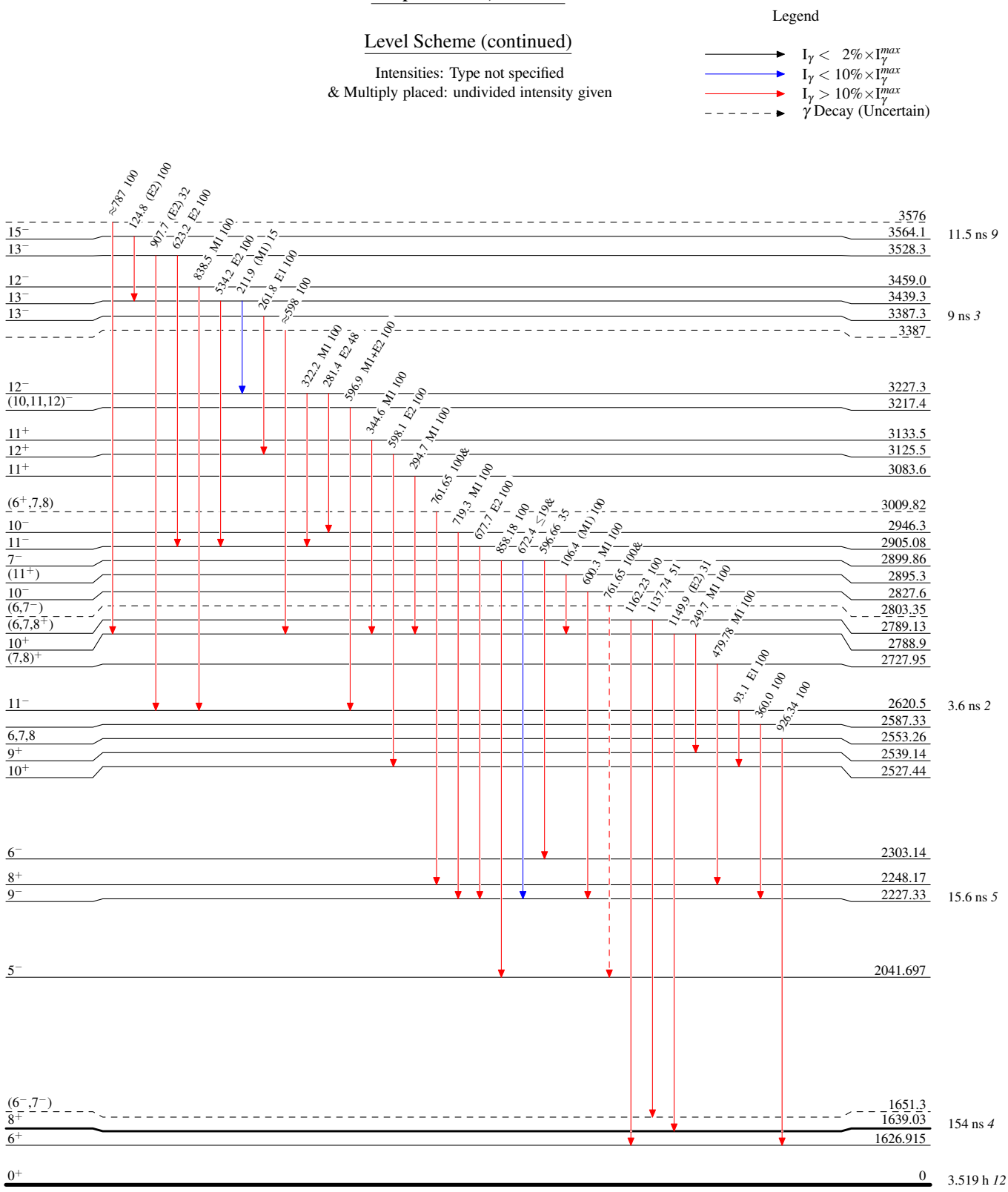


$^{204}_{84}Po_{120}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given



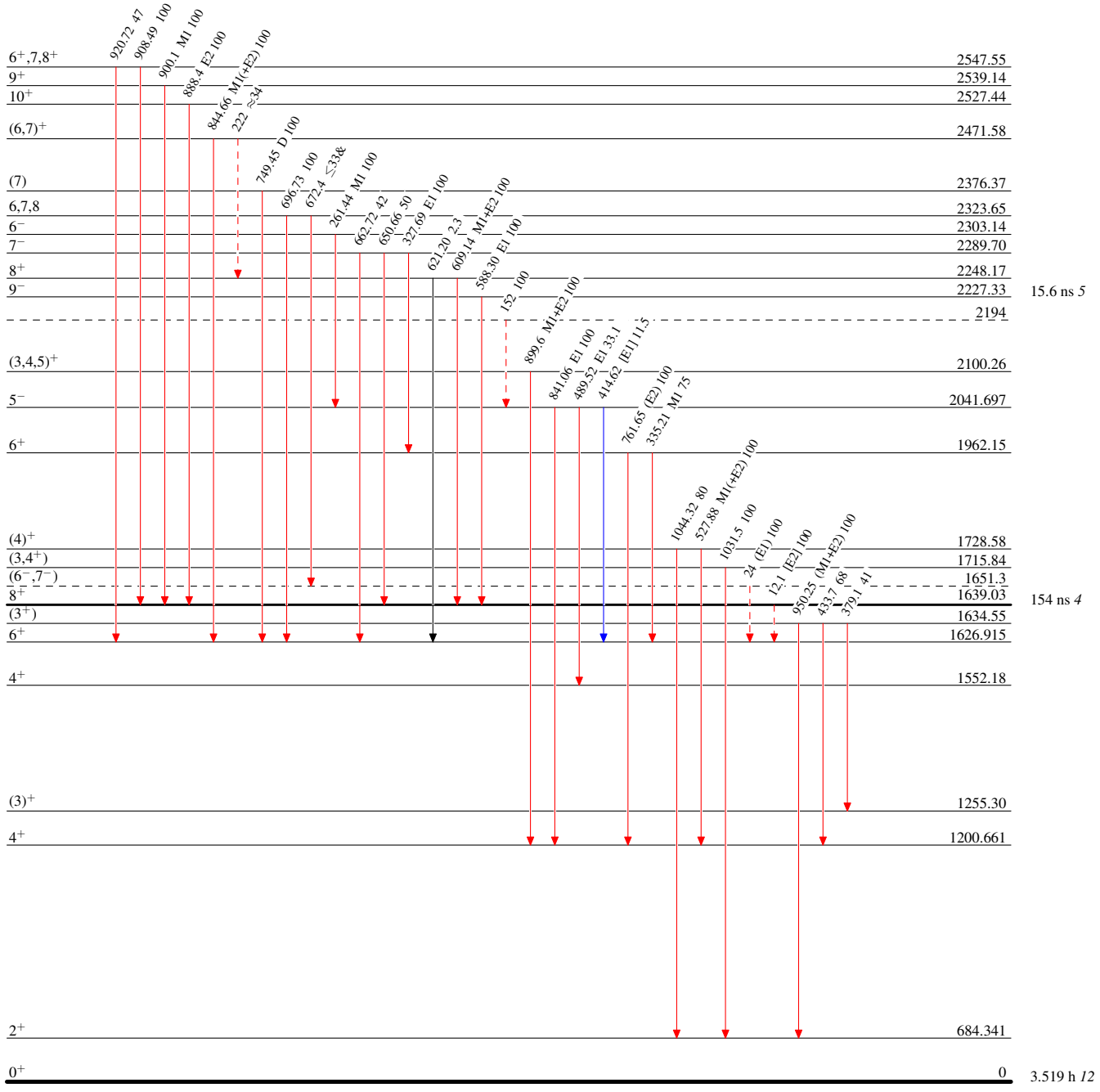
$^{204}_{84}Po_{120}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given

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)

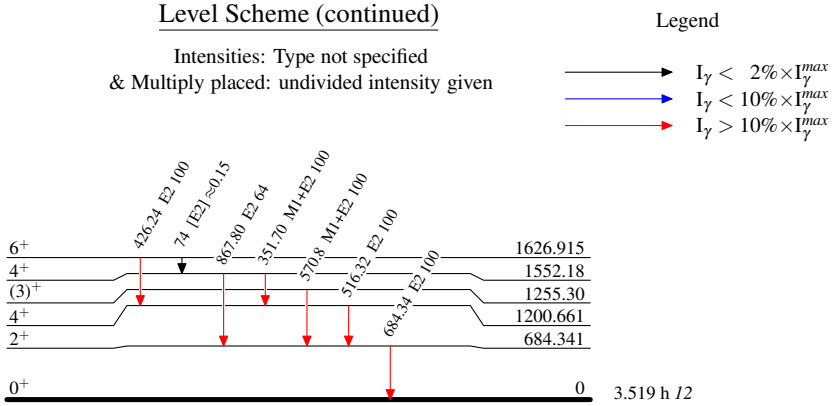


$^{204}_{84}Po_{120}$

Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Type not specified
& Multiply placed: undivided intensity given



$^{204}_{84}Po_{120}$