Adopted Levels, Gammas

History

Type	Author	Citation	Literature Cutoff Date
Full Evaluation	J. Chen # and F. G. Kondev	NDS 126, 373 (2015)	30-Sep-2013

Q(β^-)=−3483 *5*; S(n)=6967.7 *19*; S(p)=4784.8 *24*; Q(α)=4979.2 *14* 2012Wa38
Additional information 1.

^{209}Po Levels

Additional information 2.

Cross Reference (XREF) Flags

A	^{209}At ε decay	E	^{208}Pb(α,3nγ)
B	^{213}Rn α decay	F	^{209}Bi(p,n),(p,np′) IAS
C	^{204}Hg(^{9}Be,4nγ)	G	^{209}Bi(d,2nγ)
D	^{207}Pb(α,2nγ)	H	^{210}Po(d,t),(p,d)

E(level)	J$^\pi$†	T$_{1/2}$	XREF	Comments
0.0	1/2$^-$	124 y *3*	ABCDE GH	%α=99.546 *7*; %ε+%β^+=0.454 *7* μ=0.68 *8* (1966Ch27) J$^\pi$: optical spectroscopy (1976Fu06), L(d,t)=1. T$_{1/2}$: Weighted average of 125.2 y *33* in 2014Co16, based on 30 datasets measured over a period of 20.7 years using a liquid scintillator technique (superseded 128 y *7* by the same collaboration (2007Co07)) and 120 y *6* in 2015Po03, based on measurements of two sources measured for 359 and 369 days. Other: 102 y *5* from ^{209}Po/^{208}Po mass and activity ratios in 1956An05 and the presently adopted T$_{1/2}$(^{208}Po)=2.898 y *2*. Authors in 1956An05 obtained T$_{1/2}$=103 y using T$_{1/2}$(^{208}Po)=2.93 y *3*. %α,%ε+%β^+: from measured %I(ε)=0.454 *7* and %I(ε+β)+%I(α)=100 (1996Sc24). Others: %α=99.52 *4* (1989Ma05) and 99.74 (1966Ha29). Additional information 3. μ: from optical spectroscopy (1966Ch27). A value of≈+0.77 quoted by 1989Ra17. Other: 0.61 *5* from 1991Ko32 by atomic beam laser spectroscopy. The rms charge radius (<r^2>)$^{1/2}$: 2013Se03 gives $\delta\nu$(^{209}Po,^{196}Po)=−6.75 GHz *10*, δ⟨r^2⟩(^{209}Po, ^{210}Po)=−0.0813 fm^2 *10* and $\langle\beta_2^2\rangle^{1/2}$=0.09. The systematic uncertainties from electronic factor and mass-shift calculations not included. configuration=ν(3p$_{1/2}$)$^{-1}$.
544.98 *8*	5/2$^-$	70 ps *20*	AB DE GH	J$^\pi$: L(d,t)=3, 545.0γ E2 to 1/2$^-$. T$_{1/2}$: from (790.2γ)(545.0γ)(Δt) in ^{209}At ε+β^+ decay (1971Al31). configuration=ν(2f$_{5/2}$)$^{-1}$.
854.35 *15*	3/2$^-$		A H	J$^\pi$: L(d,t)=1, 554.6γ E2 from 7/2$^-$.
1175.34 *8*	5/2$^-$		A H	J$^\pi$: L(d,t)=3; 1175.3γ E2 to 1/2$^-$.
1213.7 *11*	1/2$^-$,3/2$^-$		A H	J$^\pi$: L(d,t)=1.
1326.85 *9*	9/2$^-$		A CDE G	J$^\pi$: 781.9γ E2 to 5/2$^-$; see also 1761-keV level. configuration=π(1h$_{9/2}$)$^{+2}\otimes\nu$(p$_{1/2}$)$^{-1}$.
1408.90 *9*	7/2$^-$		A	J$^\pi$: 233.6γ M1(+E2) to 5/2$^-$, 903.0γ E1(+M2) from 9/2$^+$.
1417.66 *9*	13/2$^-$	24.2 ns *4*	A CDE G	μ=6.13 *9* (1976Ha56); Q=0.126 *5* (2009Ni05) J$^\pi$: 90.8γ E2 to 9/2$^-$. T$_{1/2}$: weighted average of 24.8 ns *14* (1974Be74) in ^{208}Pb(α,3nγ), 24.4 ns *15* (1976Ha56) in ^{207}Pb(α,2nγ), 24.8 ns *14* (1971Al31) in ^{209}At ε+β^+

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Adopted Levels, Gammas (continued)

^{209}Po Levels (continued)

E(level)	Jπ†	T1/2	XREF	Comments
				decay, and 24.1 ns *4* (2009Ni05) in (d,2nγ).
				μ: from 1976Ha56 by TDPAD, includes corrections for diamagnetism and Knight shift.
				Q: from 2009Ni05 in (d,2nγ) by TDPAD.
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(3p_{1/2})^{-1}$.
1472.56 *19*	17/2−	89.3 ns *5*	CDE G	μ=7.75 *5*; Q=0.659 *7*
				Jπ: 54.9γ E2 to 13/2−.
				T1/2: weighted average of values from ^{207}Pb(α,2nγ) (88.5 *15*) and (d,2nγ) (89.4 *5*). ^{208}Pb(α,3nγ) gives 98.1 ns *16* by gating on 781.9γ and 545.0γ, which follow the γ decay of the T1/2=24.3 ns isomer at E=1417.66, while 88.5 ns *15* in ^{207}Pb(α,2nγ) is from gating on 54.9γ decay of this level.
				μ: from 1976Ha56, includes corrections for diamagnetism and Knight shift.
				Q: from 2009Ni05 in (d,2nγ) by TDPAD. (−)0.39 *8* from 1983Da01 in (α,3nγ) by TDPAD.
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(3p_{1/2})^{-1}$.
1521.85 *9*	11/2−	70 ps *20*	A	Jπ: 239.19γ E1 from 13/2+; 195.0γ M1+E2 to 9/2−; see also 1761-keV level.
				T1/2: from (790.2γ)(781.9γ)(Δt) in ^{209}At ε+β+ decay (1971Al31).
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(3p_{1/2})^{-1}$.
1715.69 *9*	9/2−		A	Jπ: 1170.6γ E2 to 5/2−, 388.8γ M1(+E2) to 9/2−.
1761.03 *9*	13/2+		A H	Jπ: L(d,t)=6, 239.190γ E1 to 11/2−; 239γ(ω,t) in ^{209}Po ε decay, and the E1, M1+E2, E2 cascade from 1761 to 545 (J^π=5/2−) uniquely establishes J^π(1761)=13/2+, J^π(1522)=11/2−, and J^π(1326)=9/2−.
1937.66 *19*	17/2−		C E	Jπ: 520.0γ E2 to 13/2−.
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(2f_{5/2})^{-1}$.
1990.99 *9*	7/2−		A H	Jπ: L(d,t)=3, 321γ E1 from 9/2+.
2029.77 *21*	19/2−		C E	Jπ: 557.2γ M1+E2 to 17/2−.
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(2f_{5/2})^{-1}$.
2061# *10*	(5/2−,7/2−)‡		H	
2082# *10*	(5/2−,7/2−)‡		H	
2166.87 *20*	21/2−		C E	Jπ: 137.1γ M1 to 19/2−, 694.3 (E2) to 17/2−.
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(2f_{5/2})^{-1}$.
2186# *10*	(5/2−,7/2−)‡		H	
2206# *10*	(5/2−,7/2−)‡		H	
2239# *10*	5/2−,7/2−‡		H	
2312.04 *9*	9/2+		A E	Jπ: 790.2γ E1(+M2) to 11/2−, 1767.0 M2 to 5/2−.
2339# *10*	5/2−,7/2−‡		H	
2363# *10*	5/2−,7/2−‡		H	
2654.38 *20*	(5/2+)		A	Jπ: 2654.5γ to 1/2− and 1478.9γ and 2109.5γ to 5/2−. But Possible ε feeding from 9/2− would be consistent only with 5/2+.
2664# *10*	5/2−,7/2−‡		H	
2769.89 *22*	23/2+	2.5 ns *7*	C E	Jπ: 1297.4γ E3 to 17/2−.
				T1/2: preliminary value from 603.0γ(t) in ^{208}Pb(α,3nγ) (1974Be74).
				configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(3p_{1/2})^{-1}$.
2835.67 *13*	(9/2+,11/2−)		A	Jπ: 1427.0γ to 7/2− and 1074.6γ to 13/2+.
2864.50 *11*	11/2+		A	Jπ: 1103.4γ M1+E2 to 13/2+ and 552.5γ M1(+E2) 552.5γ to 9/2+.
2902.35 *11*	11/2+		A	Jπ: 1141.3γ M1+E2 to 13/2+ and 1575.5γ E1 to 9/2−.
2908.46 *10*	(11/2)+		A	Jπ: 1581.6γ E1 to 9/2−, 1147.6γ E2(+M1) to 13/2+; γ(θ) rules out J=7/2, but Jπ=9/2+ is possible.
2976.39 *24*	25/2+		C E	Jπ: 206.5γ M1 to 23/2+.
				configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(1i_{13/2})^{-1}$.
2978.26 *10*	11/2+		A	Jπ: 666.1γ E2(+M1) to 9/2+, 1262.6γ E1(+M2) to 9/2−, 1217.2γ M1+E2 to 13/2+.

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Adopted Levels, Gammas (continued)

^{209}Po Levels (continued)

E(level)	J^{π}[†]	$T_{1/2}$	XREF	Comments
3072.66 *12*	$(9/2^+)$		A	J^{π}: 1356.9γ and 1745.9γ to $9/2^-$ and 1311.7γ to $13/2^+$. Weak γ to $5/2^-$.
3251.63? *24*			A	
3620.3 *3*	$27/2^+$	<7[@] ns	C E	J^{π}: 643.9γ M1+E2 to $25/2^+$. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(2f_{5/2})^{-1}$.
4168.4 *3*	$29/2^+$		C E	configuration=$\pi(1h_{9/2})^{+2}\otimes\nu(1i_{13/2})^{-1}$. J^{π}: 548.1γ M1+E2 to $27/2^+$.
4265.4 *3*	$31/2^-$	119 ns *4*	C E	μ=+9.68 *8* J^{π}: 96.9γ E1 to $29/2^+$ and 1289.1γ E3 to $25/2^+$. $T_{1/2}$: weighted average of 119 *4* from ^{208}Pb(α,3nγ) (1974Be74) and 110 *4* from (^{9}Be,4nγ) (2000Po03). μ: from ^{208}Pb(α,3nγ) (1976Re12). Value includes corrections for diamagnetism and Knight shift. Also quoted by 2011StZZ. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(2g^{+1}_{9/2}3p^{-2}_{1/2})^{3}$.
4354.1 *3*	$31/2^-$	<7[@] ns	C E	J^{π}: 185.6γ E1 to $29/2^+$ and 1377.6γ (E3) to $25/2^+$. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(1i_{13/2})^{-1}$.
4530.9 *3*	$33/2^-$	<7[@] ns	C	J^{π}: 176.8γ M1 to $31/2^-$. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(1i_{13/2})^{-1}$.
5355.4 *3*	$35/2^-$	<3.5[@] ns	C	J^{π}: 824.6γ M1 to $33/2^-$. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(3p^{-1}_{1/2}2f^{-1}_{5/2}2g^{+1}_{9/2})^{3}$.
5503.4 *3*	$37/2^+$	<10[@] ns	C	J^{π}: 148.0γ E1 to $35/2^-$ and 1238.0γ (E3) to $31/2^-$. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(3p^{-2}_{1/2}1j^{+1}_{15/2})^{3}$.
6232.8 *4*	$39/2^+$		C	J^{π}: 729.4γ M1 to $37/2^+$. configuration=$\pi(1h_{9/2}1i_{13/2})^{+2}\otimes\nu(3p^{-1}_{1/2}2f^{-1}_{5/2}1j^{+1}_{15/2})^{3}$.
6302.2 *4*	$(39/2^+)$		C	J^{π}: possible 1771.2γ E3 to $33/2^-$. Additional information 4.
6463.9 *4*	$(41/2^+)$		C	J^{π}: 161.5γ E2(+M1) to $(39/2^+)$. Additional information 5.
6739.1 *4*	$(43/2^+)$	<7[@] ns	C	J^{π}: 275.2γ stretched M1 to $(41/2^+)$. Additional information 6.
6807.4 *4*	$(41/2^+)$		C	J^{π}: 574.6γ (M1) to $39/2^+$ and 1304.1γ (E2) to $37/2^+$. Additional information 7.
7159.2 *4*	$(45/2^+)$		C	J^{π}: 420.1γ (M1+E2) to $(43/2^+)$. Additional information 8.
7247.7 *5*	$(43/2^+)$		C	J^{π}: 440.3γ (M1+E2) to $(41/2^+)$. Additional information 9.
7692.9 *4*	$(47/2^+)$		C	J^{π}: 953.8γ (E2) to $(43/2^+)$. Additional information 10.
8390.5 *6*	$(47/2^-)$		C	J^{π}: 1231.3γ (E1) to $(45/2^+)$. Additional information 11.
16324 *13*	$(9/2^-)$		F	J^{π}: analog of ^{209}Bi g.s. from (p,n) and (p,np′) data. Widths determined from the two reactions do not agree. 1974Fi14, in (p,n) show that both σ and Γ are sensitive to the choice of line shape for the resonance and background. They suggest that the discrepancy may be due to difficulties with experimental precision and reduction of data. For alternate explanations see 1973Gr13, 1974Wo04.

[†] From deduced γ-ray transition multipolarities based on ce data and $\gamma(\theta,T)$ in ^{209}At $\varepsilon+\beta^+$ decay, $\gamma(\theta)$ and γ(lin pol) in (^{9}Be,4nγ), $\gamma(\theta)$ in (α,3nγ), combined with angular distributions in particle-transfer reactions of (d,t) and (p,d), unless otherwise noted.
[‡] From L(d,t)=3 or (3) (1979Bh01).
[#] From (d,t) and (p,d) (1979Bh01).
[@] Limits from 2000Po03 in (^{9}Be,4nγ) based on γ(t).

Adopted Levels, Gammas (continued)

$\gamma(^{209}Po)$

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
544.98	5/2$^-$	545.0 *1*	100	0.0	1/2$^-$	E2		0.0262	B(E2)(W.u.)=2.2 *7* α(K)=0.0186 *3*; α(L)=0.00575 *8*; α(M)=0.001437 *21*; α(N+..)=0.000451 *7* α(N)=0.000369 *6*; α(O)=7.40×10^{-5} *11*; α(P)=8.25×10^{-6} *12* Mult.: α(K)exp=0.019 (1971Al31), α(K)exp=0.0178 *11* and α(L)exp=0.0054 *5* (1973Af01) A_2=−0.50 *7* (1987Si14), A_2=−0.335 *2* and A_4=−0.128 *2* (1983Ha51) in ^{209}At $\varepsilon+\beta^+$ decay; A_2=+0.16 *2*, A_4=−0.01 *4* (1974Be74), A_2=+24 *2*, A_4=+0.01 *3* (1968Ya08) in (α,3nγ).
854.35	3/2$^-$	854.4 *2*	100	0.0	1/2$^-$	M1		0.0313	α(K)=0.0256 *4*; α(L)=0.00434 *6*; α(M)=0.001020 *15*; α(N+..)=0.000324 *5* α(N)=0.000262 *4*; α(O)=5.49×10^{-5} *8*; α(P)=7.12×10^{-6} *10* Mult.: α(K)exp=0.026 *5* (1974Ja26), α(L)exp≈0.0034 (1973Af01) in ^{209}At $\varepsilon+\beta^+$ decay.
1175.34	5/2$^-$	630.3 *1*	35.7 *14*	544.98	5/2$^-$	M1		0.0691	α(K)=0.0564 *8*; α(L)=0.00967 *14*; α(M)=0.00227 *4*; α(N+..)=0.000724 *11* α(N)=0.000585 *9*; α(O)=0.0001225 *18*; α(P)=1.587×10^{-5} *23* Mult.: α(L)exp=0.014 *4* (1974Ja26); α(K)exp≈0.08, α(L)exp=0.016 *5* (1973Af01) in ^{209}At $\varepsilon+\beta^+$ decay.
		1175.3 *1*	100 *5*	0.0	1/2$^-$	E2		0.00540	α(K)=0.00432 *6*; α(L)=0.000821 *12*; α(M)=0.000196 *3*; α(N+..)=6.39×10^{-5} *9* α(N)=5.02×10^{-5} *7*; α(O)=1.037×10^{-5} *15*; α(P)=1.283×10^{-6} *18*; α(IPF)=2.02×10^{-6} *3* Mult.: α(K)exp=0.0049 *8* from 1974Ja26, α(K)exp=0.005 *3* from 1971Al31, α(K)exp=0.0047 *10*, α(L)exp=0.00067 *17* from 1973Af01 in ^{209}At $\varepsilon+\beta^+$ decay.
1213.7	1/2$^-$,3/2$^-$	1213.7 *11*	100	0.0	1/2$^-$				
1326.85	9/2$^-$	151.4 *2*	0.097 *18*	1175.34	5/2$^-$	[E2]		1.319	α(K)=0.294 *5*; α(L)=0.761 *12*; α(M)=0.202 *3*; α(N+..)=0.0627 *10* α(N)=0.0519 *8*; α(O)=0.00992 *15*; α(P)=0.000910 *14*
		781.9 *1*	100 *3*	544.98	5/2$^-$	E2		0.01200	α(K)=0.00918 *13*; α(L)=0.00213 *3*; α(M)=0.000519 *8*; α(N+..)=0.0001637 *23* α(N)=0.0001333 *19*; α(O)=2.71×10^{-5} *4*; α(P)=3.21×10^{-6} *5* Mult.: α(K)exp=0.0091 *7*, α(L)exp=0.0019 *2* (1974Ja26), α(K)exp=0.0100 *8* (1971Al31), α(K)exp=0.0089 *8*, α(L)exp=0.00184 *21* (1973Af01) in ^{209}At $\varepsilon+\beta^+$ decay; A_2=+0.16 *2*, A_4=−0.02 *4* (1974Be74), A_2=+0.24 *2*, A_4=+0.01 *3* (1968Ya08) in (α,3nγ).
1408.90	7/2$^-$	233.6 *1*	49 *4*	1175.34	5/2$^-$	M1(+E2)	−0.30 +*22*−*30*	0.95 *14*	α(K)=0.76 *13*; α(L)=0.142 *5*; α(M)=0.0337 *7*; α(N+..)=0.0107 *3* α(N)=0.00867 *19*; α(O)=0.00180 *6*; α(P)=0.000229 *17* Mult.: α(K)exp=0.76 *5*, α(L)exp=0.136 *10* (1974Ja26),

$^{209}_{84}Po_{125}$-4

Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
									α(K)exp=0.75 *10* (1971Al31), α(K)exp=0.79 *12*, α(L)exp=0.17 *3* (1973Af01) in ^{209}At ε+β$^+$ decay δ$sign from δ=−0.1 *5* by γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay.
1408.90	7/2$^-$	554.6 *2*	28 *5*	854.35	3/2$^-$	E2		0.0252	α(K)=0.0179 *3*; α(L)=0.00546 *8*; α(M)=0.001362 *20*; α(N+..)=0.000428 *6* α(N)=0.000350 *5*; α(O)=7.02×10^{-5} *10*; α(P)=7.85×10^{-6} *11* Mult.: α(K)exp≈0.022 (1973Af01) in ^{209}At ε+β$^+$ decay.
		863.9 *1*	100 *5*	544.98	5/2$^-$	M1(+E2)	−0.4 *+3−4*	0.028 *6*	α(K)=0.022 *5*; α(L)=0.0039 *7*; α(M)=0.00091 *15*; α(N+..)=0.00029 *5* α(N)=0.00023 *4*; α(O)=4.9×10^{-5} *9*; α(P)=6.3×10^{-6} *11* Mult.: α(K)exp=0.027 *5*, α(L)exp=0.0028 *8* (1973Af01) in ^{209}At ε+β$^+$ decay. δ: sign from γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay.
1417.66	13/2$^-$	90.8 *1*	100	1326.85	9/2$^-$	E2		10.77	α(L)=7.98 *12*; α(M)=2.13 *4*; α(N+..)=0.658 *10* α(N)=0.545 *9*; α(O)=0.1036 *16*; α(P)=0.00924 *14* B(E2)(W.u.)=4.37 *10* Mult.: α(L12)exp/α(L3)exp=1.34 *10* (1974Ja26), α(L)exp=8.7 *11* (1973Af01) and α(L2)exp/α(L3)exp=1.25 *6* (1971Al31) in ^{209}At ε+β$^+$ decay; A_2=+0.27 *3* (1976Ha56) in (α,2nγ).
1472.56	17/2$^-$	54.9[@] *2*	100[#]	1417.66	13/2$^-$	E2		120 *3*	α(L)=88.9 *21*; α(M)=23.6 *6*; α(N+..)=7.29 *17* α(N)=6.05 *14*; α(O)=1.15 *3*; α(P)=0.1007 *23* B(E2)(W.u.)=1.43 *5* Mult.: A_2=+0.27 *2* (1976Ha56) in (α,2nγ), $T_{1/2}$ rules out mult=M2.
1521.85	11/2$^-$	104.187 *3*	10.1 *16*	1417.66	13/2$^-$	M1		9.87	α(K)=8.00 *12*; α(L)=1.429 *20*; α(M)=0.337 *5*; α(N+..)=0.1074 *15* α(N)=0.0869 *13*; α(O)=0.0182 *3*; α(P)=0.00235 *4* B(M1)(W.u.)=0.008 *3* Mult.: α(L1)exp=2.4 *4* (1971Al31) in ^{209}At ε+β$^+$ decay.
		113.1 *1*	0.78 *16*	1408.90	7/2$^-$	E2		4.29	α(K)=0.429 *6*; α(L)=2.86 *5*; α(M)=0.764 *12*; α(N+..)=0.236 *4* α(N)=0.196 *3*; α(O)=0.0373 *6*; α(P)=0.00335 *5* B(E2)(W.u.)=13 *5* Mult.: from α(K)exp=1.0 *6* (1971Al31) in ^{209}At ε+β$^+$ decay.
		195.0 *1*	100 *5*	1326.85	9/2$^-$	M1+E2	+0.40 *+17−22*	1.51 *13*	α(K)=1.19 *13*; α(L)=0.241 *4*; α(M)=0.0577 *14*; α(N+..)=0.0183 *4* α(N)=0.0149 *4*; α(O)=0.00307 *6*; α(P)=0.000381 *11* B(M1)(W.u.)=0.010 *4*; B(E2)(W.u.)=15 *12*

$^{209}_{84}Po_{125}$-5

Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
									Mult.: α(K)exp=1.17 *12*, α(L)exp=0.22 *2*, α(M)exp=0.061 *7* (1974Ja26), α(K)exp=1.18 *10* (1971Al31), α(K)exp=1.21 *8*, α(L)exp=0.24 *3* (1973Af01) in ^{209}At ε+β$^+$ decay. δ: From ce data. Sign from δ=+0.090 *6* by γγ(θ) (1985BuZQ) and +0.08 *5* by γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay.
1715.69	9/2$^-$	388.8 *1*	16.4 *9*	1326.85	9/2$^-$	M1(+E2)	≤0.6	0.23 *4*	α(K)=0.19 *3*; α(L)=0.034 *4*; α(M)=0.0080 *8*; α(N+..)=0.00254 *24* α(N)=0.00206 *19*; α(O)=0.00043 *5*; α(P)=5.5×10^{-5} *7* Mult.: α(K)exp=0.19 *2* (1974Ja26), α(K)exp=0.20 *9* (1971Al31), α(K)exp=0.19 *4*, α(L)exp=0.028 *7* (1973Af01) in ^{209}At ε+β$^+$ decay.
		1170.6 *1*	100 *3*	544.98	5/2$^-$	E2		0.00544	α(K)=0.00435 *6*; α(L)=0.000828 *12*; α(M)=0.000197 *3*; α(N+..)=6.42×10^{-5} *9* α(N)=5.07×10^{-5} *7*; α(O)=1.046×10^{-5} *15*; α(P)=1.294×10^{-6} *19*; α(IPF)=1.77×10^{-6} *3* Mult.: α(K)exp=0.0046 *6*, α(L)exp=0.00094 *32* (1974Ja26), α(K)exp=0.0030 *15* (1971Al31), α(K)exp=0.0036 *8*, α(L)exp=0.00067 *17* (1973Af01) in ^{209}At ε+β$^+$ decay.
1761.03	13/2$^+$	239.190 *18*	100	1521.85	11/2$^-$	E1		0.0533	α(K)=0.0432 *6*; α(L)=0.00769 *11*; α(M)=0.00181 *3*; α(N+..)=0.000567 *8* α(N)=0.000462 *7*; α(O)=9.40×10^{-5} *14*; α(P)=1.119×10^{-5} *16* Mult.: α(K)exp=0.037 *4*, α(L)exp=0.005 *1* (1974Ja26), α(K)exp=0.038 *3* (1971Al31), α(K)exp=0.041 *7*, α(L)exp=0.0069 *15* (1973Af01) in ^{209}At ε+β$^+$ decay.
1937.66	17/2$^-$	465.1[@] *2*	61[#] *18*	1472.56	17/2$^-$	M1+E2	1.16 *20*	0.088 *11*	α(K)=0.068 *10*; α(L)=0.0147 *12*; α(M)=0.0035 *3*; α(N+..)=0.00112 *9* α(N)=0.00091 *7*; α(O)=0.000187 *15*; α(P)=2.28×10^{-5} *22* Mult.,δ: A$_2$=+0.16 *12*, A$_4$=−0.20 *17* (1974Be74) in (α,3nγ).
		520.0[@] *2*	100[#]	1417.66	13/2$^-$	E2		0.0293	α(K)=0.0204 *3*; α(L)=0.00663 *10*; α(M)=0.001661 *24*; α(N+..)=0.000521 *8* α(N)=0.000427 *6*; α(O)=8.53×10^{-5} *12*; α(P)=9.43×10^{-6} *14* Mult.: A$_2$=+0.33 *7*, A$_4$=+0.02 *10* (1974Be74) in (α,3nγ).
1990.99	7/2$^-$	815.6 *1*	49 *10*	1175.34	5/2$^-$	M1+E2	0.6 *4*	0.029 *6*	α(K)=0.023 *5*; α(L)=0.0041 *7*; α(M)=0.00097 *17*; α(N+..)=0.00031 *6* α(N)=0.00025 *5*; α(O)=5.2×10^{-5} *9*; α(P)=6.7×10^{-6} *13* Mult.: α(K)exp=0.029 *8* (tentative) from 1974Ja26, α(K)exp=0.022 *5* from 1973Af01 in ^{209}At ε+β$^+$ decay.
		1446.1 *1*	100 *3*	544.98	5/2$^-$	M1+E2	1.2 *+8−4*	0.0055 *10*	α(K)=0.0045 *8*; α(L)=0.00077 *13*; α(M)=0.00018 *3*; α(N+..)=0.000120 *18* α(N)=4.6×10^{-5} *8*; α(O)=9.7×10^{-6} *16*; α(P)=1.24×10^{-6} *21*;

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
									α(IPF)=6.3×10^{-5} *9* Mult.: α(K)exp=0.0044 *10* (tentative) from 1974Ja26; α(K)exp=0.0044 *10* from 1973Af01 in ^{209}At ε+β$^+$ decay.
2029.77	19/2$^-$	557.2[@] *1*	100[#]	1472.56	17/2$^-$	M1+E2	0.53 *5*	0.080 *3*	α(K)=0.0648 *22*; α(L)=0.0117 *3*; α(M)=0.00276 *7*; α(N+..)=0.000877 *23* α(N)=0.000710 *19*; α(O)=0.000148 *4*; α(P)=1.89×10^{-5} *6* Mult.: A_2=−0.32 *3*, pol=0.15 *8* from 2000Po03 in (^{9}Be,4nγ). δ: from 1974Be74 in (α,3nγ). Other: δ=1.67 *16* from 1974Be74 in (α,3nγ).
2166.87	21/2$^-$	137.1[@] *1*	100[#]	2029.77	19/2$^-$	M1		4.52	α(K)=3.66 *6*; α(L)=0.649 *10*; α(M)=0.1532 *22*; α(N+..)=0.0488 *7* α(N)=0.0394 *6*; α(O)=0.00826 *12*; α(P)=0.001066 *15* Mult.: α(exp)=3.9 *8* from 1974Be74 in (α,3nγ). I_γ: I(137γ)/I(694γ)=66/100 from (α,3nγ).
		694.3[@] *1*	54[#] *9*	1472.56	17/2$^-$	(E2)		0.01536	α(K)=0.01153 *17*; α(L)=0.00290 *4*; α(M)=0.000712 *10*; α(N+..)=0.000224 *4* α(N)=0.000183 *3*; α(O)=3.71×10^{-5} *6*; α(P)=4.31×10^{-6} *6* Mult.: A_2=+0.11 *6*, A_4=−0.01 *8* (1974Be74) in (α,3nγ). I_γ: I(137γ)/I(694γ)=66/100 from (α,3nγ).
2312.04	9/2$^+$	321.1 *1*	0.99 *4*	1990.99	7/2$^-$	E1		0.0268	α(K)=0.0219 *3*; α(L)=0.00377 *6*; α(M)=0.000885 *13*; α(N+..)=0.000278 *4* α(N)=0.000226 *4*; α(O)=4.63×10^{-5} *7*; α(P)=5.62×10^{-6} *8* Mult.: α(K)exp=0.026 *15* (tentative) from 1974Ja26, α(K)exp≈0.027 from 1973Af01 in ^{209}At ε+β$^+$ decay.
		551.0 *1*	7.7 *3*	1761.03	13/2$^+$	(E2)		0.0256	α(K)=0.0182 *3*; α(L)=0.00557 *8*; α(M)=0.001390 *20*; α(N+..)=0.000436 *7* α(N)=0.000357 *5*; α(O)=7.16×10^{-5} *10*; α(P)=7.99×10^{-6} *12* Mult.: α(K)exp=0.0183 from 1974Ja26; α(K)exp=0.018 (tentative) from 1971Al31; α(K)exp=0.024 *4* from 1973Af01 in ^{209}At ε+β$^+$ decay. K-conversion electrons of 551.0γ and 552.5γ are not resolved.
		596.2[b] *1*	1.03[b] *6*	1715.69	9/2$^-$	(E1+M2)		0.0093 *21*	α(K)=0.0076 *17*; α(L)=0.0013 *4*; α(M)=0.00031 *9*; α(N+..)=0.00010 *3* α(N)=7.9×10^{-5} *22*; α(O)=1.6×10^{-5} *5*; α(P)=2.1×10^{-6} *6* Mult.: α(K)exp=0.031 *5* from 1974Ja26 and α(K)exp=0.018 *5* from 1973Af01 for the 596.2γ doublet in ^{209}At ε+β$^+$ decay.
		790.2 *1*	100 *3*	1521.85	11/2$^-$	E1(+M2)	−0.02 *+4−3*	0.00422 *21*	α(K)=0.00349 *16*; α(L)=0.00055 *4*; α(M)=0.000129 *8*; α(N+..)=4.06×10^{-5} *25* α(N)=3.29×10^{-5} *20*; α(O)=6.8×10^{-6} *4*; α(P)=8.7×10^{-7} *6* Mult.: α(K)exp=0.0033 *3*, α(L)exp=0.00050 *7* from 1974Ja26, α(K)exp=0.0040 *4* from 1971Al31; α(K)exp=0.0034 *3*,

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
									α(L)exp=0.00056 *14* from 1973Af01 in ^{209}At ε+β$^+$ decay.
2312.04	9/2$^+$	903.0 *1*	5.79 *17*	1408.90	7/2$^-$	E1(+M2)	+0.10 *+6−16*	0.0039 *10*	δ: from γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay. α(K)=0.0032 *8*; α(L)=0.00052 *15*; α(M)=0.00012 *4*; α(N+..)=3.9×10^{-5} *12* α(N)=3.1×10^{-5} *10*; α(O)=6.5×10^{-6} *20*; α(P)=8.3×10^{-7} *25* Mult.: α(K)exp=0.0033 *4* from 1974Ja26, 0.0025 *13* from 1971Al31, α(K)exp=0.0028 *3* from 1973Af01 in ^{209}At ε+β$^+$ decay.
		985.2 *1*	1.35 *14*	1326.85	9/2$^-$	E1		0.00279	δ: from γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay. α(K)=0.00232 *4*; α(L)=0.000361 *5*; α(M)=8.37×10^{-5} *12*; α(N+..)=2.65×10^{-5} *4* α(N)=2.14×10^{-5} *3*; α(O)=4.46×10^{-6} *7*; α(P)=5.69×10^{-7} *8* Mult.: α(K)exp=0.003 *1* from 1973Af01, α(K)exp<0.003 from 1971Al31 in ^{209}At ε+β$^+$ decay.
		1136.5 *3*	0.107 *14*	1175.34	5/2$^-$	(M2)		0.0356	α(K)=0.0286 *4*; α(L)=0.00534 *8*; α(M)=0.001273 *18*; α(N+..)=0.000406 *6* α(N)=0.000328 *5*; α(O)=6.86×10^{-5} *10*; α(P)=8.83×10^{-6} *13*; α(IPF)=2.24×10^{-7} *4* Mult.: α(K)exp=0.037 *12* (tentative) from 1974Ja26 in ^{209}At ε+β$^+$ decay.
		1767.0 *1*	0.80 *4*	544.98	5/2$^-$	M2		0.01151	α(K)=0.00925 *13*; α(L)=0.001634 *23*; α(M)=0.000386 *6*; α(N+..)=0.000240 *4* α(N)=9.95×10^{-5} *14*; α(O)=2.08×10^{-5} *3*; α(P)=2.69×10^{-6} *4*; α(IPF)=0.0001172 *17* Mult.: α(K)exp=0.0096 *20* from 1974Ja26, α(K)exp≈0.0045 from 1973Af01 in ^{209}At ε+β$^+$ decay.
2654.38	(5/2$^+$)	1478.9 *3*	98 *9*	1175.34	5/2$^-$				
		2109.5 *3*	100 *9*	544.98	5/2$^-$				Eγ: from 1974Ja26. 1973Af01 report 2108.2 *6*, 1971Al31 report 2111 *1*.
		2654.4 *4*	6.7 *22*	0.0	1/2$^-$				
2769.89	23/2$^+$	603.0[@] *1*	100[#]	2166.87	21/2$^-$	E1		0.00703	α(K)=0.00580 *9*; α(L)=0.000937 *14*; α(M)=0.000219 *3*; α(N+..)=6.90×10^{-5} *10* α(N)=5.59×10^{-5} *8*; α(O)=1.158×10^{-5} *17*; α(P)=1.451×10^{-6} *21* B(E1)(W.u.)=3.1×10^{-7} *9* Mult.: A$_2$=−0.23 *4*, A$_4$=+0.03 *5* from 1974Be74 in (α,3nγ).
		1297.4[@] *2*	14[#] *3*	1472.56	17/2$^-$	E3		0.00972	α(K)=0.00743 *11*; α(L)=0.001732 *25*; α(M)=0.000423 *6*; α(N+..)=0.0001394 *20* α(N)=0.0001089 *16*; α(O)=2.23×10^{-5} *4*; α(P)=2.70×10^{-6} *4*; α(IPF)=5.47×10^{-6} *8*

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ ‡	I_γ ‡	E_f	J_f^π	Mult.&	δ[a]	α†	Comments
									B(E3)(W.u.)=3.7 *13* Mult.: A_2=+0.09 *18*, A_4=−0.30 *26*, pol=0.4 *8* from 2000Po03 in (^{9}Be,4nγ), A_2=+0.46 *3*, A_4=−0.03 *5* from 1974Be74 in (α,3nγ). $T_{1/2}$ rules out mult=M3.
2835.67	(9/2$^+$,11/2$^-$)	1074.6 *1*	100 *9*	1761.03	13/2$^+$				
		1427.0 *3*	14 *3*	1408.90	7/2$^-$				
2864.50	11/2$^+$	552.5 *2*	29 *3*	2312.04	9/2$^+$	M1(+E2)	<0.4	0.093 *6*	α(K)=0.076 *5*; α(L)=0.0132 *6*; α(M)=0.00310 *14*; α(N+..)=0.00099 *5* α(N)=0.00080 *4*; α(O)=0.000167 *8*; α(P)=2.15×10^{-5} *11* Mult.: α(K)exp=0.086 *10* from 1974Ja26, α(K)exp=0.070 *25* from 1971Al31 in ^{209}At ε+β$^+$ decay.
		1103.4 *1*	100 *3*	1761.03	13/2$^+$	M1+E2	1.6 *+8−5*	0.0089 *18*	α(K)=0.0072 *15*; α(L)=0.00130 *23*; α(M)=0.00031 *6*; α(N+..)=9.8×10^{-5} *17* α(N)=7.9×10^{-5} *14*; α(O)=1.6×10^{-5} *3*; α(P)=2.1×10^{-6} *4*; α(IPF)=2.0×10^{-7} *3* Mult.,δ: α(K)exp=0.0090 *9*, α(L)exp=0.0016 *4* from 1974Ja26, α(K)exp=0.0085 *17* from 1971Al31, α(K)exp=0.0059 *10*, α(L)exp=0.00081 *21* from 1973Af01 in ^{209}At ε+β$^+$ decay. δ=2.2 *6* from γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay.
		1148.8 *3*	14.5 *17*	1715.69	9/2$^-$	[E1]		0.00213	α(K)=0.001769 *25*; α(L)=0.000272 *4*; α(M)=6.32×10^{-5} *9*; α(N+..)=2.40×10^{-5} *4* α(N)=1.619×10^{-5} *23*; α(O)=3.37×10^{-6} *5*; α(P)=4.32×10^{-7} *6*; α(IPF)=4.04×10^{-6} *7*
		1537.7 *1*	8.9 *7*	1326.85	9/2$^-$				
		2319.6 *4*	0.13 *3*	544.98	5/2$^-$				
2902.35	11/2$^+$	1141.3 *1*	37.5 *21*	1761.03	13/2$^+$	M1+E2	1.2 *+7−4*	0.0094 *19*	α(K)=0.0077 *16*; α(L)=0.00135 *24*; α(M)=0.00032 *6*; α(N+..)=0.000102 *18* α(N)=8.2×10^{-5} *14*; α(O)=1.7×10^{-5} *3*; α(P)=2.2×10^{-6} *4*; α(IPF)=9.8×10^{-7} *14* Mult.: α(K)exp=0.019 *6* from 1974Ja26, α(K)exp=0.0069 *15* from 1973Af01 in ^{209}At ε+β$^+$ decay.
		1484.7 *2*	10.4 *11*	1417.66	13/2$^-$	[E1]		1.52×10^{-3}	α(K)=0.001140 *16*; α(L)=0.0001735 *25*; α(M)=4.02×10^{-5} *6*; α(N+..)=0.0001693 *24* α(N)=1.029×10^{-5} *15*; α(O)=2.15×10^{-6} *3*; α(P)=2.77×10^{-7} *4*; α(IPF)=0.0001566 *22*
		1575.5 *1*	100 *5*	1326.85	9/2$^-$	E1		1.46×10^{-3}	α(K)=0.001033 *15*; α(L)=0.0001567 *22*; α(M)=3.63×10^{-5} *5*; α(N+..)=0.000230 *4*

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
									α(N)=9.29×10^{-6} *13*; α(O)=1.94×10^{-6} *3*; α(P)=2.50×10^{-7} *4*; α(IPF)=0.000218 *3* Mult.: α(K)exp≈0.00116 from 1973Af01, A_2=+0.349 *14*, A_4=−0.012 *25* from 1983Ha51 in ^{209}At ε+β$^+$ decay.
2902.35	11/2$^+$	2357.7 *6*	0.62 *21*	544.98	5/2$^-$				
2908.46	(11/2)$^+$	596.2[b] *1*	36.4[b] *10*	2312.04	9/2$^+$	(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* Mult.: α(K)exp=0.031 *5* from 1974Ja26 and α(K)exp=0.018 *5* from 1973Af01 for the 596.2γ doublet in ^{209}At ε+β$^+$ decay.
		1147.6 *1*	76 *5*	1761.03	13/2$^+$	E2(+M1)		0.010 *5*	α(K)=0.008 *4*; α(L)=0.0014 *6*; α(M)=0.00034 *14*; α(N+..)=0.00011 *5* α(N)=9.E−5 *4*; α(O)=1.8×10^{-5} *8*; α(P)=2.3×10^{-6} *10*; α(IPF)=1.3×10^{-6} *5* Mult.: α(K)exp=0.005 *1* (tentative) from 1974Ja26, α(K)exp=0.005 *3* from 1971Al31, α(K)exp=0.0038 *7* from 1973Af01 in ^{209}At ε+β$^+$ decay.
		1192.8 *2*	9.1 *10*	1715.69	9/2$^-$	[E1]		0.00200	α(K)=0.001657 *24*; α(L)=0.000255 *4*; α(M)=5.90×10^{-5} *9*; α(N+..)=3.13×10^{-5} *5* α(N)=1.513×10^{-5} *22*; α(O)=3.15×10^{-6} *5*; α(P)=4.05×10^{-7} *6*; α(IPF)=1.264×10^{-5} *19*
		1490.8 *1*	15.2 *10*	1417.66	13/2$^-$	[E1]		1.52×10^{-3}	α(K)=0.001133 *16*; α(L)=0.0001723 *25*; α(M)=3.99×10^{-5} *6*; α(N+..)=0.0001732 *25* α(N)=1.022×10^{-5} *15*; α(O)=2.13×10^{-6} *3*; α(P)=2.75×10^{-7} *4*; α(IPF)=0.0001606 *23*
		1581.6 *1*	100 *4*	1326.85	9/2$^-$	E1		1.45×10^{-3}	α(K)=0.001026 *15*; α(L)=0.0001557 *22*; α(M)=3.60×10^{-5} *5*; α(N+..)=0.000234 *4* α(N)=9.23×10^{-6} *13*; α(O)=1.93×10^{-6} *3*; α(P)=2.49×10^{-7} *4*; α(IPF)=0.000223 *4* Mult.: A_2=+0.319 *8*, A_4=+0.020 *13* from 1983Ha51 and α(K)exp=0.00087 *40* (tentative) from 1974Ja26, α(K)exp≈0.00076 from 1973Af01 in ^{209}At ε+β$^+$ decay.
		2363.7 *4*	0.76 *10*	544.98	5/2$^-$				
2976.39	25/2$^+$	206.5[@] *1*	100[#]	2769.89	23/2$^+$	M1		1.421	α(K)=1.155 *17*; α(L)=0.203 *3*; α(M)=0.0479 *7*; α(N+..)=0.01525 *22* α(N)=0.01234 *18*; α(O)=0.00258 *4*; α(P)=0.000334 *5* Mult.: α(exp)=1.6 *4*, A_2=−0.27 *5*, A_4=+0.11 *7* from 1974Be74 in (α,3nγ).
2978.26	11/2$^+$	666.1 *1*	99 *3*	2312.04	9/2$^+$	E2(+M1)	>+3.6	0.0183 *16*	α(K)=0.0138 *14*; α(L)=0.00343 *19*; α(M)=0.00084 *5*; α(N+..)=0.000265 *14*

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
									α(N)=0.000216 *12*; α(O)=4.38×10^{-5} *24*; α(P)=5.1×10^{-6} *4* Mult.,δ: α(K)exp=0.013 *2*, α(L)exp=0.0030 *8* from 1974Ja26, α(K)exp=0.0140 *14* from 1973Af01, sign of mixing ratio from γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay.
2978.26	11/2$^+$	1217.2 *1*	59 *4*	1761.03	13/2$^+$	M1+E2	1.0 *+12−6*	0.009 *3*	α(K)=0.0072 *23*; α(L)=0.0012 *4*; α(M)=0.00029 *9*; α(N+..)=0.00010 *3* α(N)=7.5×10^{-5} *21*; α(O)=1.6×10^{-5} *5*; α(P)=2.0×10^{-6} *6*; α(IPF)=7.6×10^{-6} *18* Mult.,δ: α(K)exp=0.0071 *20* (tentative) from 1974Ja26, α(K)exp≈0.0094 from 1973Af01 in ^{209}At ε+β$^+$ decay.
		1262.6 *1*	100 *4*	1715.69	9/2$^-$	E1(+M2)	+0.09 *+12−27*	0.0020 *9*	α(K)=0.0017 *7*; α(L)=0.00026 *13*; α(M)=6.E−5 *3*; α(N+..)=5.5×10^{-5} *9* α(N)=1.6×10^{-5} *8*; α(O)=3.2×10^{-6} *17*; α(P)=4.2×10^{-7} *22*; α(IPF)=3.56×10^{-5} *12* Mult.: α(K)exp=0.0018 *4* from 1974Ja26, α(K)exp=0.00102 *22* from 1973Af01 in ^{209}At ε+β$^+$ decay. δ: from γ(θ,T) (1987Si14) in ^{209}At ε+β$^+$ decay.
		1456.6 *2*	6.3 *5*	1521.85	11/2$^-$				
		1651.3 *3*	2.17 *19*	1326.85	9/2$^-$				
		2433.44 *20*	0.72 *10*	544.98	5/2$^-$				
3072.66	(9/2$^+$)	1311.7 *2*	33 *3*	1761.03	13/2$^+$				
		1356.9 *1*	100 *6*	1715.69	9/2$^-$				
		1745.9 *2*	51 *3*	1326.85	9/2$^-$				
		2528.1 *6*	1.7 *6*	544.98	5/2$^-$				
3251.63?		415.8 *6*	100 *33*	2835.67	(9/2$^+$,11/2$^-$)				
		939.5 *3*	83 *17*	2312.04	9/2$^+$				
		1730.0 *4*	22 *3*	1521.85	11/2$^-$				
3620.3	27/2$^+$	643.9[@] *1*	100[#]	2976.39	25/2$^+$	M1+E2	0.12 *2*	0.0647 *10*	α(K)=0.0528 *8*; α(L)=0.00906 *13*; α(M)=0.00213 *3*; α(N+..)=0.000678 *10* α(N)=0.000548 *8*; α(O)=0.0001148 *17*; α(P)=1.485×10^{-5} *22* B(M1)(W.u.)>1.1×10^{-5}; B(E2)(W.u.)>8.9×10^{-5} Mult.: A_2=−0.26 *4*, pol=−0.46 *17* from 2000Po03 in (^{9}Be,4nγ), A_2=−0.42 *4*, A_4=+0.03 *5* from 1974Be74 in (α,3nγ). δ: from 1974Be74 in (α,3nγ).
4168.4	29/2$^+$	548.1[@] *1*	100[#]	3620.3	27/2$^+$	M1+E2		0.06 *4*	α(K)=0.05 *4*; α(L)=0.010 *5*; α(M)=0.0024 *10*;

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[†]	Comments
								α(N+..)=0.0007 *3* α(N)=0.00061 *25*; α(O)=0.00013 *6*; α(P)=1.6×10^{-5} *8* Mult.: A_2=−0.29 *5*, pol=−0.19 *23* from 2000Po03 in (^{9}Be,4nγ).
4265.4	31/2$^-$	96.9[@] *1*	43[#] *10*	4168.4	29/2$^+$	E1	0.485	α(K)=0.379 *6*; α(L)=0.0807 *12*; α(M)=0.0192 *3*; α(N+..)=0.00592 *9* α(N)=0.00486 *7*; α(O)=0.000961 *14*; α(P)=0.0001057 *15* B(E1)(W.u.)=4.6×10^{-7} *12* Mult.: α(exp)=0.2 *4* from 1974Be74 in (α,3nγ).
		1289.1[@] *2*	100[#]	2976.39	25/2$^+$	E3	0.00986	α(K)=0.00753 *11*; α(L)=0.001762 *25*; α(M)=0.000430 *6*; α(N+..)=0.0001412 *20* α(N)=0.0001108 *16*; α(O)=2.27×10^{-5} *4*; α(P)=2.74×10^{-6} *4*; α(IPF)=4.97×10^{-6} *7* B(E3)(W.u.)=0.40 *4* Mult.: A_2=+0.10 *7*, A_4=−0.18 *10*, pol=0.48 *34* from 2000Po03 in (^{9}Be,4nγ); A_2=+0.27 *5*, A_4=+0.05 *7* from 1974Be74 in (α,3nγ).
4354.1	31/2$^-$	185.6[@] *1*	100[#]	4168.4	29/2$^+$	E1	0.0984	α(K)=0.0793 *12*; α(L)=0.01460 *21*; α(M)=0.00345 *5*; α(N+..)=0.001076 *16* α(N)=0.000878 *13*; α(O)=0.0001774 *25*; α(P)=2.07×10^{-5} *3* B(E1)(W.u.)>3.6×10^{-6} Mult.: A_2=−0.24 *11* from 2000Po03 in (^{9}Be,4nγ).
		1377.6[@] *4*	9[#] *4*	2976.39	25/2$^+$	E3	0.00857	α(K)=0.00660 *10*; α(L)=0.001483 *21*; α(M)=0.000361 *5*; α(N+..)=0.0001264 *18* α(N)=9.28×10^{-5} *13*; α(O)=1.91×10^{-5} *3*; α(P)=2.32×10^{-6} *4*; α(IPF)=1.218×10^{-5} *18* B(E3)(W.u.)>0.54 Mult.: from 2000Po03 in (^{9}Be,4nγ) but no γ(θ) and γ(pol) data are given.
4530.9	33/2$^-$	176.8[#] *1*	100[#]	4354.1	31/2$^-$	M1	2.20	α(K)=1.78 *3*; α(L)=0.315 *5*; α(M)=0.0743 *11*; α(N+..)=0.0236 *4* α(N)=0.0191 *3*; α(O)=0.00400 *6*; α(P)=0.000517 *8* B(M1)(W.u.)>0.00016 Mult.: A_2=+0.05 *1*, α(exp)=1.7 *6* from 2000Po03 in (^{9}Be,4nγ).
		265.6[#] *2*	25[#] *7*	4265.4	31/2$^-$	M1	0.706	α(K)=0.574 *9*; α(L)=0.1006 *15*; α(M)=0.0237 *4*; α(N+..)=0.00755 *11* α(N)=0.00611 *9*; α(O)=0.001278 *18*; α(P)=0.0001651 *24* B(M1)(W.u.)>1.2×10^{-5} Mult.: A_2=−0.02 *12*, pol=−0.7 *6* from 2000Po03 in (^{9}Be,4nγ).
5355.4	35/2$^-$	824.6[#] *1*	100[#]	4530.9	33/2$^-$	M1	0.0343	α(K)=0.0280 *4*; α(L)=0.00477 *7*; α(M)=0.001119 *16*; α(N+..)=0.000356 *5* α(N)=0.000288 *4*; α(O)=6.03×10^{-5} *9*; α(P)=7.82×10^{-6} *11* B(M1)(W.u.)>1.1×10^{-5} Mult.: A_2=−0.12 *7*, pol=−0.14 *24* from 2000Po03 in (^{9}Be,4nγ).
5503.4	37/2$^+$	148.0[#] *2*	43[#] *8*	5355.4	35/2$^-$	E1	0.1719	α(K)=0.1375 *20*; α(L)=0.0263 *4*; α(M)=0.00622 *9*; α(N+..)=0.00193 *3* α(N)=0.001579 *23*; α(O)=0.000317 *5*; α(P)=3.64×10^{-5} *6* B(E1)(W.u.)>1.7×10^{-6} Mult.: α(exp)<0.37 from 2000Po03 in (^{9}Be,4nγ).
		1238.0[#] *2*	100[#]	4265.4	31/2$^-$	E3	0.01075	α(K)=0.00816 *12*; α(L)=0.00196 *3*; α(M)=0.000480 *7*; α(N+..)=0.0001545 *22* α(N)=0.0001237 *18*; α(O)=2.53×10^{-5} *4*; α(P)=3.04×10^{-6} *5*; α(IPF)=2.47×10^{-6} *4* B(E3)(W.u.)>6.9 Mult.: from 2000Po03 in (^{9}Be,4nγ) but no γ(θ) and γ(pol) data are given.

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Adopted Levels, Gammas (continued)

$\gamma(^{209}Po)$ (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	δ[a]	α[†]	Comments
6232.8	39/2$^+$	729.4[#] *1*	100[#]	5503.4	37/2$^+$	M1		0.0472	α(K)=0.0385 *6*; α(L)=0.00658 *10*; α(M)=0.001546 *22*; α(N+..)=0.000492 *7* α(N)=0.000398 *6*; α(O)=8.33×10^{-5} *12*; α(P)=1.079×10^{-5} *16* Mult.: A_2=−0.46 *12*, pol=−0.86 *27* from 2000Po03 in (^{9}Be,4nγ).
6302.2	(39/2$^+$)	1771.2[#] *2*	100[#]	4530.9	33/2$^-$	(E3)		0.00518	α(K)=0.00403 *6*; α(L)=0.000802 *12*; α(M)=0.000192 *3*; α(N+..)=0.0001484 *21* α(N)=4.95×10^{-5} *7*; α(O)=1.024×10^{-5} *15*; α(P)=1.274×10^{-6} *18*; α(IPF)=8.74×10^{-5} *13* Mult.: A_2=0.00 *17* from 2000Po03 in (^{9}Be,4nγ).
6463.9	(41/2$^+$)	161.5[#] *2*	37[#] *7*	6302.2	(39/2$^+$)	M1+E2	>1.0	1.5 *5*	α(K)=0.8 *6*; α(L)=0.53 *5*; α(M)=0.138 *14*; α(N+..)=0.043 *5* α(N)=0.035 *4*; α(O)=0.0069 *6*; α(P)=0.000683 *12* Mult.,δ: α(exp)=1.4 *5* from 2000Po03 in (^{9}Be,4nγ).
		1108.6[#] *2*	100[#]	5355.4	35/2$^-$	(E3)		0.01370	α(K)=0.01018 *15*; α(L)=0.00265 *4*; α(M)=0.000655 *10*; α(N+..)=0.000207 *3* α(N)=0.0001688 *24*; α(O)=3.44×10^{-5} *5*; α(P)=4.08×10^{-6} *6*; α(IPF)=4.88×10^{-8} *9*
6739.1	(43/2$^+$)	275.2[#] *1*	100[#]	6463.9	(41/2$^+$)	M1		0.640	α(K)=0.521 *8*; α(L)=0.0912 *13*; α(M)=0.0215 *3*; α(N+..)=0.00684 *10* α(N)=0.00553 *8*; α(O)=0.001158 *17*; α(P)=0.0001497 *21* B(M1)(W.u.)>9.2×10^{-5} Mult.: A_2=−0.26 *7*, pol=−0.83 *26* from 2000Po03 in (^{9}Be,4nγ).
6807.4	(41/2$^+$)	574.6[#] *2*	100[#]	6232.8	39/2$^+$	(M1)		0.0882	α(K)=0.0720 *10*; α(L)=0.01237 *18*; α(M)=0.00291 *4*; α(N+..)=0.000926 *13* α(N)=0.000749 *11*; α(O)=0.0001567 *22*; α(P)=2.03×10^{-5} *3* Mult.: from 2000Po03 in (^{9}Be,4nγ) but no $\gamma(\theta)$ and γ(pol) data are given.
		1304.1[#] *4*	67[#] *12*	5503.4	37/2$^+$	(E2)		0.00446	α(K)=0.00358 *5*; α(L)=0.000657 *10*; α(M)=0.0001558 *22*; α(N+..)=6.51×10^{-5} *10* α(N)=4.00×10^{-5} *6*; α(O)=8.28×10^{-6} *12*; α(P)=1.033×10^{-6} *15*; α(IPF)=1.577×10^{-5} *23* Mult.: from 2000Po03 in (^{9}Be,4nγ) but no $\gamma(\theta)$ and γ(pol) data are given.
7159.2	(45/2$^+$)	420.1[#] *1*	100[#]	6739.1	(43/2$^+$)	(M1+E2)		0.13 *8*	α(K)=0.10 *7*; α(L)=0.021 *8*; α(M)=0.0050 *17*; α(N+..)=0.0016 *6* α(N)=0.0013 *5*; α(O)=0.00027 *10*; α(P)=3.3×10^{-5} *15* Mult.: from 2000Po03 in (^{9}Be,4nγ) but no $\gamma(\theta)$ and γ(pol) data are given.
7247.7	(43/2$^+$)	440.3[#] *2*	100[#]	6807.4	(41/2$^+$)	(M1+E2)		0.11 *7*	α(K)=0.09 *6*; α(L)=0.018 *7*; α(M)=0.0044 *16*; α(N+..)=0.0014 *5* α(N)=0.0011 *4*; α(O)=0.00023 *9*; α(P)=2.8×10^{-5} *13* Mult.: from 2000Po03 in (^{9}Be,4nγ) but no $\gamma(\theta)$ and γ(pol) data are given.
7692.9	(47/2$^+$)	953.8[#] *2*	100[#]	6739.1	(43/2$^+$)	(E2)		0.00807	α(K)=0.00633 *9*; α(L)=0.001314 *19*; α(M)=0.000316 *5*;

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Adopted Levels, Gammas (continued)

γ(^{209}Po) (continued)

E_i(level)	J_i^π	E_γ[‡]	I_γ[‡]	E_f	J_f^π	Mult.[&]	α[†]	Comments
								α(N+..)=9.99×10^{-5} *14* α(N)=8.13×10^{-5} *12*; α(O)=1.667×10^{-5} *24*; α(P)=2.02×10^{-6} *3* Mult.: A_2=+0.10 *36*, pol=−0.37 *116* from 2000Po03 in (^{9}Be,4nγ).
8390.5	(47/2$^-$)	1231.3[#] *4*	100[#]	7159.2	(45/2$^+$)	(E1)	0.00191	α(K)=0.001568 *22*; α(L)=0.000241 *4*; α(M)=5.58×10^{-5} *8*; α(N+..)=4.22×10^{-5} *6* α(N)=1.429×10^{-5} *20*; α(O)=2.98×10^{-6} *5*; α(P)=3.83×10^{-7} *6*; α(IPF)=2.46×10^{-5} *4* Mult.: A_2=−0.16 *22* from 2000Po03 in (^{9}Be,4nγ).

† Additional information 12.
‡ From ^{209}At ε+β$^+$ decay, unless otherwise noted.
# From ^{204}Hg(^{9}Be,4nγ).
@ From weighted average of values from (α,3nγ) and (^{9}Be,4nγ).
& From ce data in ^{209}At ε+β$^+$ decay and (^{9}Be,4nγ), γ(θ) and γ(lin pol) in (^{9}Be,4nγ), unless otherwise noted.
a From ce data in in ^{209}At ε+β$^+$ decay using the BrIccMixing program, unless otherwise noted.
b Multiply placed with undivided intensity.

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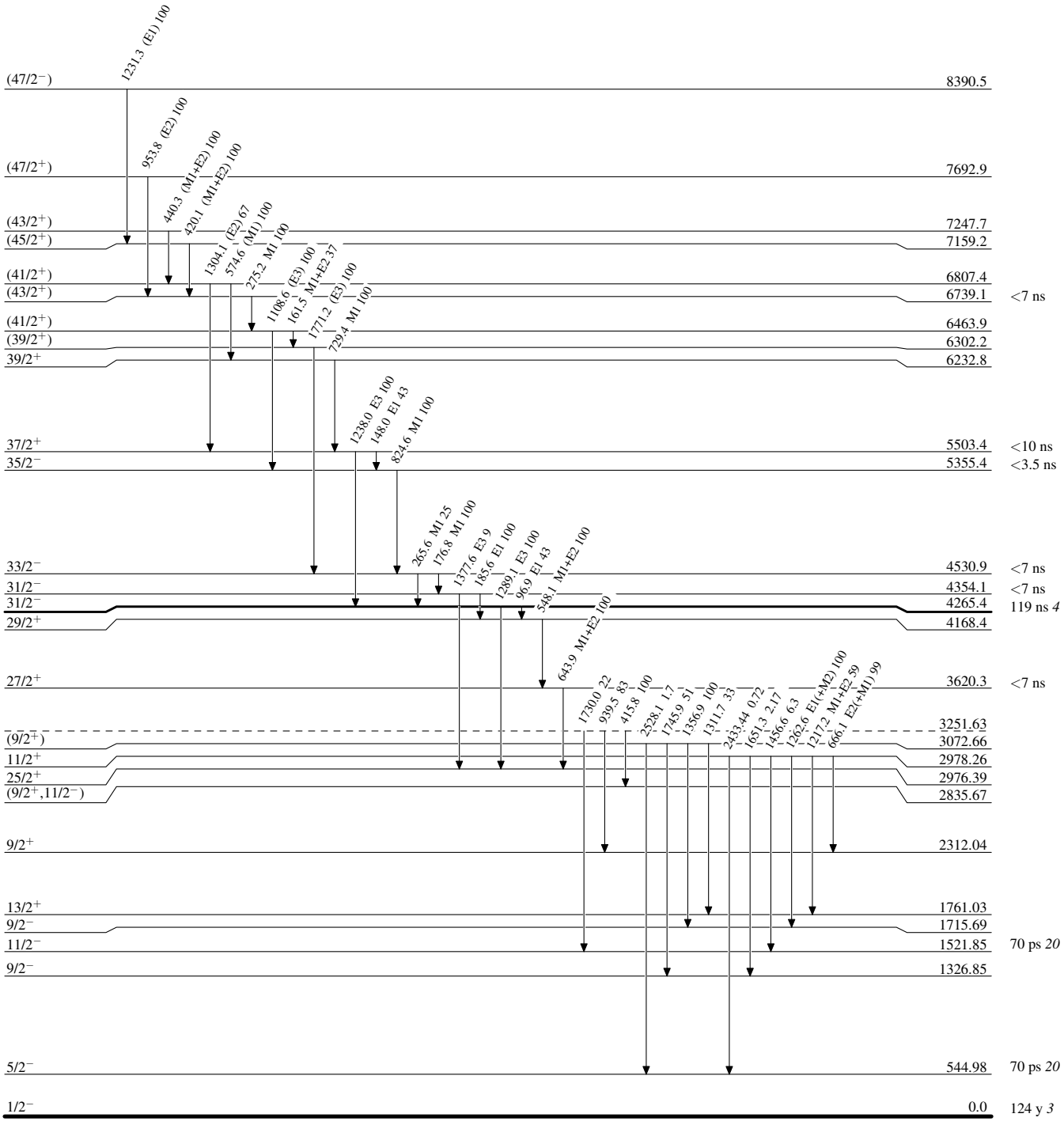
Adopted Levels, Gammas

Level Scheme

Intensities: Relative photon branching from each level



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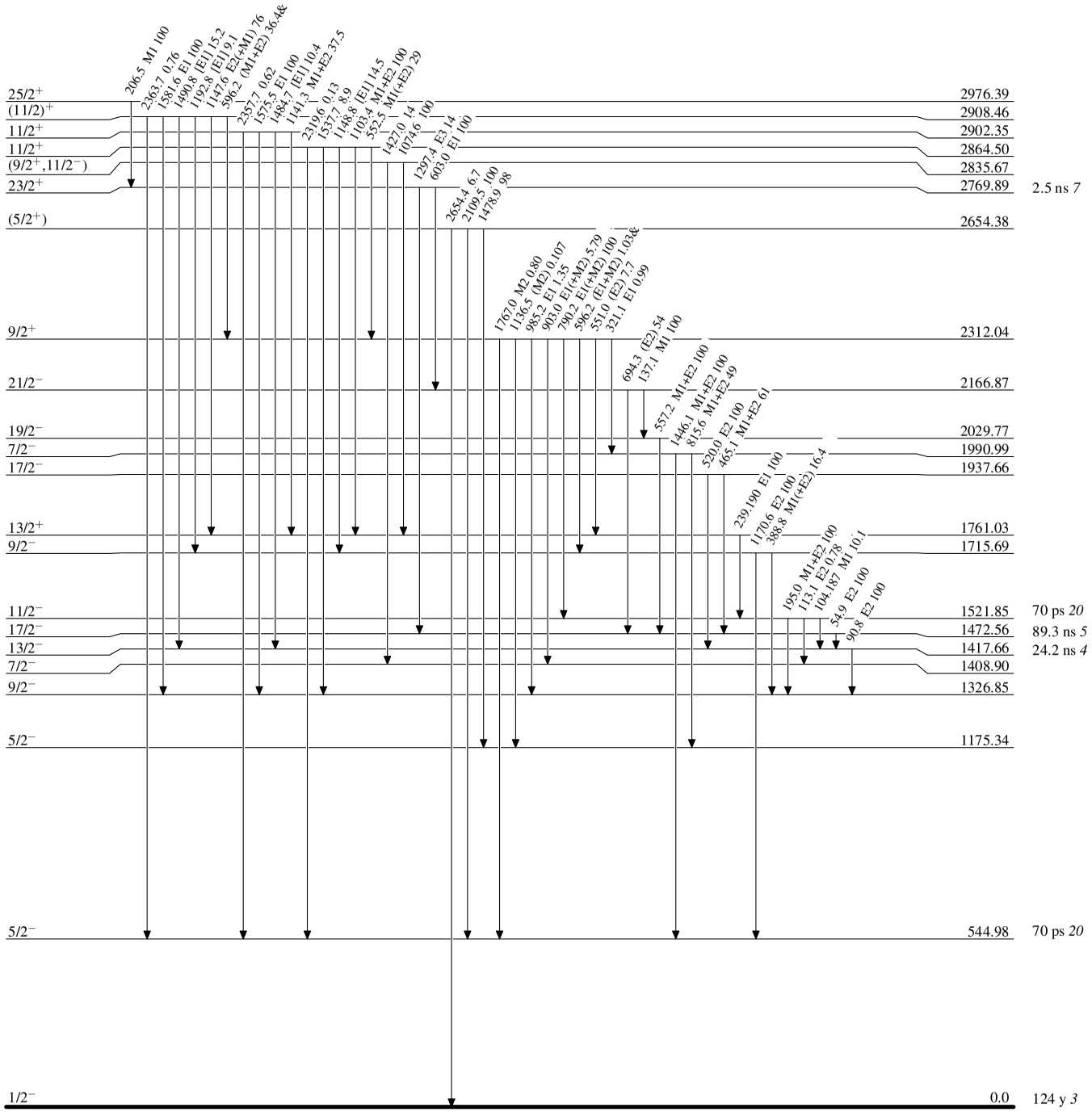
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



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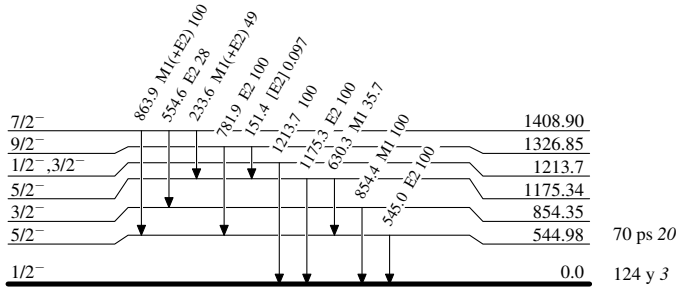
Adopted Levels, Gammas

Level Scheme (continued)

Intensities: Relative photon branching from each level
& Multiply placed: undivided intensity given



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