# $^{205}$Bi ε decay 1972Ha71

| History | | | |
|---|---|---|---|
| Type | Author | Citation | Literature Cutoff Date |
| Full Evaluation | F. G. Kondev | NDS 166, 1 (2020) | 20-Apr-2020 |

Parent: $^{205}$Bi: E=0.0; $J^{\pi}=9/2^{-}$; $T_{1/2}$=14.91 d *7*; Q(ε)=2706 *5*; %ε+%$β^{+}$ decay=100.0

1972Ha71: $^{205}$Bi source was produced by bombarding an enriched (88.59%) $^{206}$Pb target with 18.5-MeV proton beams. Detectors: 2 Ge(Li) and one Si(Li). Measured: Eγ, γγ coin, conversion electrons.

Others: 1990Si13, 1973Ah01, 1972LaYV, 1971Gi03, 1971KoZP, 1971Ru01, 1971Jo06, 1960St24, 1960Ve04, 1959St42, 1956Sc18.

## $^{205}$Pb Levels

| E(level)† | $J^{\pi}$‡ | $T_{1/2}$‡ | Comments |
|---|---|---|---|
| 0.0 | $5/2^{-}$ | $1.70\times10^{7}$ y *9* | |
| 2.329 *7* | $1/2^{-}$ | 24.2 μs *4* | |
| 262.81 *3* | $3/2^{-}$ | | |
| 576.21 *4* | $3/2^{-}$ | | |
| 703.44 *3* | $7/2^{-}$ | | |
| 761.43 *4* | $5/2^{-}$ | | |
| 987.62 *3* | $9/2^{-}$ | | |
| 1013.84 *3* | $13/2^{+}$ | 5.55 ms *2* | $T_{1/2}$: Other: 4.8 ms *15* from Xrays-987.7γ(Δt) in 1960Ve04. |
| 1043.72 *3* | $7/2^{-}$ | | |
| 1264.73 *4* | $5/2^{-}$ | | |
| 1499.14 *4* | $9/2^{-}$ | | |
| 1575.35 *5* | $9/2^{-}$ | | |
| 1593.57 *3* | $9/2^{+}$ | | |
| 1614.32 *3* | $7/2^{-}$ | | |
| 1704.97 *4* | $(7/2,9/2)^{-}$ | | |
| 1756.4 *3* | $(7/2,9/2^{-})$ | | |
| 1758.63 *4* | $9/2^{+}$ | | |
| 1764.37 *4* | $7/2^{-}$ | | |
| 1775.80 *4* | $7/2^{-}$ | | |
| 1817.99 *18* | $(3/2^{-},5/2^{-})$ | | |
| 1842.05 *5* | $(13/2)^{+}$ | | |
| 1965.98 *7* | $(7/2,9/2^{-})$ | | |
| 2203.87 *5* | $11/2^{+}$ | | |
| 2252.29 *4* | $(7/2)^{+}$ | | |
| 2488.08 *4* | $(9/2)^{+}$ | | |
| 2521.47 *13* | $(7/2)^{-}$ | | |
| 2565.12 *3* | $9/2^{+}$ | | |
| 2606.87 *4* | $9/2^{+}$ | | |

† From a least-squares fit to Eγ.

‡ From Adopted Levels.

## ε,$β^{+}$ radiations

| E(decay) | E(level) | Iε†‡ | Log *ft* | I(ε+$β^{+}$)‡ | Comments |
|---|---|---|---|---|---|
| (99 *5*) | 2606.87 | 3.69 *7* | 6.27 *8* | 3.69 *7* | εK=0.07 *6*; εL=0.66 *4*; εM+=0.277 *18* |
| (141 *5*) | 2565.12 | 9.32 *13* | 6.42 *6* | 9.32 *13* | εK=0.43 *3*; εL=0.414 *20*; εM+=0.161 *9* |
| (185 *5*) | 2521.47 | 0.32 *6* | 8.28 *9* | 0.32 *6* | εK=0.579 *12*; εL=0.307 *8*; εM+=0.114 *4* |
| (218 *5*) | 2488.08 | 1.08 *3* | 7.96 *4* | 1.08 *3* | εK=0.636 *7*; εL=0.267 *5*; εM+=0.0970 *21* |
| (454 *5*) | 2252.29 | 1.26 *6* | 8.725 *24* | 1.26 *6* | εK=0.7496 *9*; εL=0.1867 *7*; εM+=0.0637 *3* |
| (502 *5*) | 2203.87 | 2.78 *12* | 8.485 *22* | 2.78 *12* | εK=0.7571 *7*; εL=0.1813 *5*; εM+=0.06160 *20* |
| (740 *5*) | 1965.98 | 0.26 *7* | 9.90 *12* | 0.26 *7* | εK=0.7776 *3*; εL=0.16664 *20*; εM+=0.05572 *8* |

Continued on next page (footnotes at end of table)

## $^{205}$Bi ε decay 1972Ha71 (continued)

### ε,β+ radiations (continued)

| E(decay) | E(level) | Iβ+ ‡ | Iε†‡ | Log *ft* | I(ε+β+)‡ | Comments |
|---|---|---|---|---|---|---|
| (864 *5*) | 1842.05 | | 0.157 *22* | 10.65[1u] *7* | 0.157 *22* | εK=0.7442 *5*; εL=0.1903 *4*; εM+=0.06551 *15* |
| (930 *5*) | 1775.80 | | 5.52 *10* | 8.787 *10* | 5.52 *10* | εK=0.7857 *2*; εL=0.1609 *2*; εM+=0.05342 *5* |
| (942 *5*) | 1764.37 | | 32.6 *7* | 8.028 *11* | 32.6 *7* | εK=0.7861 *2*; εL=0.1606 *2*; εM+=0.05332 *5* |
| (947# *5*) | 1758.63 | | 0.08 *5* | 10.6 *3* | 0.08 *5* | εK=0.7863 *2*; εL=0.1605 *2*; εM+=0.05327 *5* |
| (950 *5*) | 1756.4 | | 0.218 *13* | 10.21 *3* | 0.218 *13* | εK=0.7863 *2*; εL=0.1604 *2*; εM+=0.05325 *5* |
| (1001# *5*) | 1704.97 | | 0.09 *6* | 10.6 *3* | 0.09 *6* | εK=0.7878 *2*; εL=0.1593 *1*; εM+=0.05282 *4* |
| (1092 *5*) | 1614.32 | | 11.16 *13* | 8.632 *7* | 11.16 *13* | εK=0.7901 *2*; εL=0.15770 *9*; εM+=0.05217 *4* |
| (1112 *5*) | 1593.57 | | 8.21 *10* | 8.782 *7* | 8.21 *10* | εK=0.7906 *2*; εL=0.15736 *8*; εM+=0.05203 *4* |
| (1131 *5*) | 1575.35 | | 0.76 *4* | 9.831 *24* | 0.76 *4* | εK=0.7910 *1*; εL=0.15708 *8*; εM+=0.05192 *3* |
| (1207# *5*) | 1499.14 | | <0.18 | >10.5 | <0.18 | εK=0.7925 *1*; εL=0.15600 *7*; εM+=0.05149 *3* |
| (1662# *5*) | 1043.72 | <0.00032 | <0.18 | >10.8 | <0.18 | av Eβ=309.9 *23*; εK=0.7971; εL=0.15144 *5*; εM+=0.04972 *2* |
| (1692 *5*) | 1013.84 | 0.0015 *5* | 4.2 *15* | 10.46[1u] *16* | 4.2 *15* | av Eβ=334.9 *23*; εK=0.7819 *1*; εL=0.16326 *8*; εM+=0.05444 *3* |
| (1718 *5*) | 987.62 | 0.005 *4* | 2.1 *15* | 9.8 *4* | 2.1 *15* | av Eβ=334.8 *23*; εK=0.7970; εL=0.15098 *5*; εM+=0.04954 *2* |
| 2002 *8* | 703.44 | 0.142 *3* | 16.20 *19* | 9.025 *6* | 16.34 *19* | av Eβ=459.6 *22*; εK=0.7941 *1*; εL=0.14854 *5*; εM+=0.04864 *2* |

† From γ-ray intensity balances at each level.
‡ Absolute intensity per 100 decays.
# Existence of this branch is questionable.

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb)

Iγ normalization: From the decay scheme and ΣI$_i$(γ+ce)(g.s.)=100%, and by assuming no direct ε feeding to the ground state.

| E$_\gamma$ [†] | I$_\gamma$ [†&] | E$_i$(level) | J$_i^\pi$ | E$_f$ | J$_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 2.328 *7* | 0.000304 *7* | 2.329 | 1/2$^-$ | 0.0 | 5/2$^-$ | E2 | | 3.76×10$^7$ *8* | %Iγ=9.45×10$^{-8}$ *23*<br>α(N)=3.18×10$^7$ *7*; α(O)=5.61×10$^6$ *12*; α(P)=1.60×10$^5$ *4*<br>E$_\gamma$: From 1971Jo06.<br>Mult.: From N2/N3=0.70 *25* in 1971Jo06.<br>I$_\gamma$: From intensity balance at the 2.329-keV level. |
| 26.220 *11* | 3.9 *4* | 1013.84 | 13/2$^+$ | 987.62 | 9/2$^-$ | M2 | | 1.144×10$^4$ | %Iγ=0.00121 *12*<br>α(L)=8.39×10$^3$ *12*; α(M)=2.32×10$^3$ *4*<br>α(N)=605 *9*; α(O)=116.2 *17*; α(P)=8.80 *13*<br>E$_\gamma$: From 1971Ru01.<br>I$_\gamma$: From I(γ+ce) in 1972Ha71 and the reported here α value. |
| [x]90.03 *3* | | | | | | | | | E$_\gamma$: From 1971Ru01. |
| [x]112.7 *1* | 28 *2* | | | | | | | | %Iγ=0.0087 *6* |
| 115.10 *10* | 240 *10* | 1614.32 | 7/2$^-$ | 1499.14 | 9/2$^-$ | M1+E2 | 0.69 *25* | 5.4 *5* | %Iγ=0.0746 *31*<br>α(K)=3.6 *8*; α(L)=1.33 *22*; α(M)=0.33 *7*<br>α(N)=0.084 *16*; α(O)=0.016 *3*; α(P)=0.001113 *17*<br>Mult.,δ: α(K)exp=3.6 *7* (1960St24). |
| [x]122.66 *10* | 22 *2* | | | | | | | | %Iγ=0.0068 *6* |
| 127.0 *2* | 10 *2* | 703.44 | 7/2$^-$ | 576.21 | 3/2$^-$ | [E2] | | 2.35 | %Iγ=0.0031 *6*<br>α(K)=0.423 *6*; α(L)=1.433 *23*; α(M)=0.378 *6*<br>α(N)=0.0953 *15*; α(O)=0.0170 *3*; α(P)=0.000716 *12* |
| 129.62 *10* | 20 *2* | 1704.97 | (7/2,9/2)$^-$ | 1575.35 | 9/2$^-$ | [M1] | | 4.46 | %Iγ=0.0062 *6*<br>α(K)=3.64 *6*; α(L)=0.630 *9*; α(M)=0.1477 *21*<br>α(N)=0.0376 *6*; α(O)=0.00748 *11*; α(P)=0.000799 *12* |
| [x]148.8 *2* | 17 *5* | | | | | | | | %Iγ=0.0053 *16* |
| 164.95 *10* | 50 *3* | 1758.63 | 9/2$^+$ | 1593.57 | 9/2$^+$ | [M1,E2] | | | %Iγ=0.0155 *9* |
| 170.8 *2* | 13 *3* | 1764.37 | 7/2$^-$ | 1593.57 | 9/2$^+$ | [E1] | | 0.1152 | %Iγ=0.0040 *9*<br>α(K)=0.0932 *14*; α(L)=0.01686 *25*; α(M)=0.00396 *6*<br>α(N)=0.000993 *15*; α(O)=0.000190 *3*; α(P)=1.621×10$^{-5}$ *24* |
| 185.22 *10* | 305 *20* | 761.43 | 5/2$^-$ | 576.21 | 3/2$^-$ | M1(+E2) | ≤0.3 | 1.58 *5* | %Iγ=0.095 *6*<br>α(K)=1.28 *5*; α(L)=0.230 *4*; α(M)=0.0542 *11*<br>α(N)=0.0138 *3*; α(O)=0.00273 *5*; α(P)=0.000284 *7*<br>Mult.,δ: α(K)exp=1.48 *21* (1972Ha71) and 1.5 *4* (1960St24). |

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 205.74 *7* | 81 *10* | 1704.97 | (7/2,9/2)$^-$ | 1499.14 | 9/2$^-$ | M1(+E2) | ≤0.7 | 1.07 *14* | %Iγ=0.0252 *31*<br>α(K)=0.85 *14*; α(L)=0.1701 *25*; α(M)=0.0406 *10*<br>α(N)=0.01031 *25*; α(O)=0.00202 *3*; α(P)=0.000197 *19*<br>Mult.,δ: α(K)exp=0.90 *20* (1972Ha71). |
| 221.07 *7* | 100 *6* | 1264.73 | 5/2$^-$ | 1043.72 | 7/2$^-$ | M1+E2 | 0.5 *4* | 0.85 *17* | %Iγ=0.0311 *19*<br>α(K)=0.67 *17*; α(L)=0.137 *4*; α(M)=0.0327 *5*<br>α(N)=0.00829 *12*; α(O)=0.00162 *4*; α(P)=0.000157 *24*<br>Mult.,δ: α(K)exp=0.88 *24* (1972Ha71) and 0.56 *19* (1956Sc18). |
| 235.97 *6* | 182 *10* | 2488.08 | (9/2)$^+$ | 2252.29 | (7/2)$^+$ | M1(+E2) | ≤0.7 | 0.73 *10* | %Iγ=0.0566 *31*<br>α(K)=0.58 *10*; α(L)=0.113 *4*; α(M)=0.0268 *5*<br>α(N)=0.00681 *13*; α(O)=0.00134 *4*; α(P)=0.000133 *14*<br>Mult.,δ: α(K)exp=0.73 *15* (1972Ha71) and 0.50 *19* (1956Sc18). |
| 248.4 *2* | 6 *4* | 1842.05 | (13/2)$^+$ | 1593.57 | 9/2$^+$ | [E2] | | 0.207 | %Iγ=0.0019 *12*<br>α(K)=0.1014 *15*; α(L)=0.0792 *12*; α(M)=0.0205 *3*<br>α(N)=0.00518 *8*; α(O)=0.000945 *14*; α(P)=5.26×10$^{-5}$ *8* |
| 259.46 *20* | 160[‡] *80* | 1758.63 | 9/2$^+$ | 1499.14 | 9/2$^-$ | [E1] | | 0.0415 | %Iγ=0.050 *25*<br>α(K)=0.0339 *5*; α(L)=0.00583 *9*; α(M)=0.001363 *20*<br>α(N)=0.000343 *5*; α(O)=6.64×10$^{-5}$ *10*; α(P)=6.04×10$^{-6}$ *9* |
| 260.50 *5* | 35×10$^2$ *1* | 262.81 | 3/2$^-$ | 2.329 | 1/2$^-$ | M1(+E2) | ≤0.14 | 0.624 *10* | %Iγ=1.088 *32*<br>α(K)=0.509 *9*; α(L)=0.0877 *13*; α(M)=0.0206 *3*<br>α(N)=0.00522 *8*; α(O)=0.001041 *15*; α(P)=0.0001109 *17*<br>Mult.: γγ(θ) in 1973Ah01; α(K)exp=0.50 *6* and K/L=5.5 *7* (1972Ha71); α(K)exp=0.56 *13*, average of values given in 1959St42 and 1960St24.<br>δ: From α(K)exp in 1996Sc24. Other: δ=1.6 *2* from γγ(θ) in 1973Ah01. |
| 262.80 *5* | 1170 *40* | 262.81 | 3/2$^-$ | 0.0 | 5/2$^-$ | M1(+E2) | ≤0.14 | 0.609 *10* | %Iγ=0.364 *13*<br>α(K)=0.497 *8*; α(L)=0.0856 *13*; α(M)=0.0201 *3*<br>α(N)=0.00510 *8*; α(O)=0.001016 *15*; α(P)=0.0001082 *17*<br>Mult.: γγ(θ) in 1973Ah01; α(K)exp=0.45 *7* and K/L=5.8 *7* (1972Ha71); α(K)exp=0.40 *10* (1960St24).<br>δ: From α(K)exp in 1996Sc24. Other: δ=−0.7 *2* from γγ(θ) in 1973Ah01. |
| 277.2 *5* | 50 *10* | 1264.73 | 5/2$^-$ | 987.62 | 9/2$^-$ | [E2] | | 0.1468 *23* | %Iγ=0.0155 *31*<br>α(K)=0.0783 *12*; α(L)=0.0513 *8*; α(M)=0.01323 *21*<br>α(N)=0.00334 *6*; α(O)=0.000612 *10*; α(P)=3.60×10$^{-5}$ *6* |
| 282.38 *7* | 1370 *20* | 1043.72 | 7/2$^-$ | 761.43 | 5/2$^-$ | M1(+E2) | ≤0.44 | 0.47 *3* | %Iγ=0.426 *7*<br>α(K)=0.38 *3*; α(L)=0.0685 *21*; α(M)=0.0161 *4*<br>α(N)=0.00410 *11*; α(O)=0.000813 *25*; α(P)=8.5×10$^{-5}$ *5*<br>Mult.,δ: α(K)exp=0.39 *6* (1972Ha71) and 0.42 *7*, average of values given in 1956Sc18 and 1959St42. |





$^{205}_{82}Pb_{123}$-4

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$[†] | $I_\gamma$[†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ[#] | α[@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 284.15 *10* | 5440 *70* | 987.62 | 9/2⁻ | 703.44 | 7/2⁻ | M1+E2 | 0.33 *22* | 0.46 *5* | %Iγ=1.691 *24*<br>α(K)=0.37 *5*; α(L)=0.067 *4*; α(M)=0.0158 *6*<br>α(N)=0.00401 *16*; α(O)=0.00079 *4*; α(P)=8.2×10$^{-5}$ *8*<br>Mult.: From γγ(θ) in 1973Ah01; α(K)exp=0.37 *5* (1972Ha71) and 0.38 *9*, average of values given in 1956Sc18 and 1959St42.<br>δ: From α(K)exp. Other: 0.06 *6* from γγ(θ) in 1973Ah01. |
| 284.26 *10* | 100[‡] *30* | 2488.08 | (9/2)⁺ | 2203.87 | 11/2⁺ | [M1] | | 0.494 | %Iγ=0.031 *9*<br>α(K)=0.404 *6*; α(L)=0.0691 *10*; α(M)=0.01617 *23*<br>α(N)=0.00411 *6*; α(O)=0.000819 *12*; α(P)=8.76×10$^{-5}$ *13* |
| 310.35 *5* | 336 *10* | 1013.84 | 13/2⁺ | 703.44 | 7/2⁻ | E3 | | 0.548 | %Iγ=0.1044 *32*<br>α(K)=0.1609 *23*; α(L)=0.287 *4*; α(M)=0.0771 *11*<br>α(N)=0.0196 *3*; α(O)=0.00357 *5*; α(P)=0.000205 *3*<br>Mult.: α(K)exp=0.14 *3* (1972Ha71) and 0.17 *7* (1960St24). |
| 312.84 *20* | 80[‡] *30* | 2565.12 | 9/2⁺ | 2252.29 | (7/2)⁺ | M1(+E2) | ≤0.7 | 0.33 *5* | %Iγ=0.025 *9*<br>α(K)=0.27 *5*; α(L)=0.050 *4*; α(M)=0.0117 *7*<br>α(N)=0.00298 *18*; α(O)=0.00059 *4*; α(P)=6.0×10$^{-5}$ *8*<br>Mult.,δ: α(K)exp=0.28 *7* (1972Ha71) and 0.29 *9* (1960St24). |
| 313.43 *20* | 110[‡] *30* | 576.21 | 3/2⁻ | 262.81 | 3/2⁻ | M1(+E2) | ≤0.7 | 0.33 *5* | %Iγ=0.034 *9*<br>α(K)=0.27 *5*; α(L)=0.049 *4*; α(M)=0.0117 *7*<br>α(N)=0.00297 *18*; α(O)=0.00059 *4*; α(P)=6.0×10$^{-5}$ *8*<br>Mult.,δ: α(K)exp=0.28 *7* (1972Ha71) and 0.29 *9* (1960St24). |
| [x]339.25 *20* | 35 *5* | | | | | | | | %Iγ=0.0109 *16* |
| 349.55 *5* | 1810 *30* | 1614.32 | 7/2⁻ | 1264.73 | 5/2⁻ | M1+E2 | 0.52 *25* | 0.24 *4* | %Iγ=0.563 *10*<br>α(K)=0.19 *3*; α(L)=0.035 *3*; α(M)=0.0084 *6*<br>α(N)=0.00213 *16*; α(O)=0.00042 *4*; α(P)=4.3×10$^{-5}$ *6*<br>Mult.,δ: α(K)exp=0.182 *25* and K/L=4.9 *13* (1972Ha71); α(K)exp=0.21 *3*, average of values given in 1956Sc18 and 1959St42. |
| 354.45 *10* | 55 *6* | 2606.87 | 9/2⁺ | 2252.29 | (7/2)⁺ | [M1,E2] | | 0.271 | %Iγ=0.0171 *19*<br>α(K)=0.222 *4*; α(L)=0.0377 *6*; α(M)=0.00882 *13*<br>α(N)=0.00224 *4*; α(O)=0.000447 *7*; α(P)=4.78×10$^{-5}$ *7* |
| 361.20 *20* | 100[‡] *30* | 2565.12 | 9/2⁺ | 2203.87 | 11/2⁺ | [M1,E2] | | 0.258 | %Iγ=0.031 *9*<br>α(K)=0.211 *3*; α(L)=0.0358 *5*; α(M)=0.00838 *12*<br>α(N)=0.00213 *3*; α(O)=0.000425 *6*; α(P)=4.55×10$^{-5}$ *7* |
| 361.85 *20* | 98[‡] *30* | 2203.87 | 11/2⁺ | 1842.05 | (13/2)⁺ | [M1,E2] | | 0.256 | %Iγ=0.030 *9*<br>α(K)=0.210 *3*; α(L)=0.0356 *5*; α(M)=0.00834 *12*<br>α(N)=0.00212 *3*; α(O)=0.000423 *6*; α(P)=4.52×10$^{-5}$ *7* |
| 444.8 *7* | 44 *20* | 2203.87 | 11/2⁺ | 1758.63 | 9/2⁺ | [M1,E2] | | 0.1473 *22* | %Iγ=0.014 *6*<br>α(K)=0.1207 *18*; α(L)=0.0204 *3*; α(M)=0.00477 *7*<br>α(N)=0.001212 *18*; α(O)=0.000242 *4*; α(P)=2.59×10$^{-5}$ *4* |
| 476.30 *15* | 75 *10* | 2252.29 | (7/2)⁺ | 1775.80 | 7/2⁻ | [E1] | | 0.01059 | %Iγ=0.0233 *31* |





$^{205}_{82}Pb_{123}$-5

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | α(K)=0.00875 *13*; α(L)=0.001413 *20*; α(M)=0.000328 *5*<br>α(N)=8.29×10$^{-5}$ *12*; α(O)=1.626×10$^{-5}$ *23*;<br>α(P)=1.587×10$^{-6}$ *23* |
| 488.05 *15* | 125 *15* | 2252.29 | (7/2)$^+$ | 1764.37 | 7/2$^-$ | [E1] | | 0.01006 | %Iγ=0.039 *5*<br>α(K)=0.00831 *12*; α(L)=0.001339 *19*; α(M)=0.000311 *5*<br>α(N)=7.86×10$^{-5}$ *11*; α(O)=1.542×10$^{-5}$ *22*;<br>α(P)=1.509×10$^{-6}$ *22* |
| 493.65 *5* | 1200 *25* | 2252.29 | (7/2)$^+$ | 1758.63 | 9/2$^+$ | M1(+E2) | −0.1 *+19−2* | 0.11 *7* | %Iγ=0.373 *8*<br>α(K)=0.09 *6*; α(L)=0.015 *7*; α(M)=0.0036 *15*<br>α(N)=0.0009 *4*; α(O)=0.00018 *8*; α(P)=1.9×10$^{-5}$ *10*<br>Mult.: $A_2$=−0.3 *+1−2*, $A_4$=−0.01 *+1−4* (1990Si13);<br>α(K)exp=0.092 *13* (1972Ha71) and 0.12 *2*<br>(1956Sc18).<br>δ: From 1990Si13. |
| 498.40 *15* | 300 *50* | 761.43 | 5/2$^-$ | 262.81 | 3/2$^-$ | M1(+E2) | ≤0.9 | 0.091 *18* | %Iγ=0.093 *16*<br>α(K)=0.074 *16*; α(L)=0.0131 *19*; α(M)=0.0031 *5*<br>α(N)=0.00079 *11*; α(O)=0.000156 *23*; α(P)=1.6×10$^{-5}$ *3*<br>Mult.,δ: From α(K)exp=0.09 *3* (1972Ha71). |
| 498.87 *20* | 130[‡] *80* | 2203.87 | 11/2$^+$ | 1704.97 | (7/2,9/2)$^-$ | | | | %Iγ=0.040 *25* |
| 499.54 *20* | 200[‡] *50* | 1764.37 | 7/2$^-$ | 1264.73 | 5/2$^-$ | (M1) | | 0.1082 | %Iγ=0.062 *16*<br>α(K)=0.0887 *13*; α(L)=0.01494 *21*; α(M)=0.00349 *5*<br>α(N)=0.000888 *13*; α(O)=0.0001770 *25*;<br>α(P)=1.90×10$^{-5}$ *3*<br>Mult.: From α(K)exp=0.09 *3* (1972Ha71). |
| 503.4 *5* | 25 *15* | 1264.73 | 5/2$^-$ | 761.43 | 5/2$^-$ | [M1,E2] | | 0.1060 *16* | %Iγ=0.008 *5*<br>α(K)=0.0869 *13*; α(L)=0.01464 *21*; α(M)=0.00342 *5*<br>α(N)=0.000869 *13*; α(O)=0.0001734 *25*;<br>α(P)=1.86×10$^{-5}$ *3* |
| 511.50 *5* | 2750 *50* | 1499.14 | 9/2$^-$ | 987.62 | 9/2$^-$ | M1+E2 | 0.22 *12* | 0.098 *5* | %Iγ=0.855 *16*<br>α(K)=0.080 *4*; α(L)=0.0137 *5*; α(M)=0.00320 *12*<br>α(N)=0.00081 *3*; α(O)=0.000162 *6*; α(P)=1.72×10$^{-5}$ *8*<br>Mult.: $A_2$=−0.39 *6*, $A_4$=−0.003 *+3−9* (1990Si13);<br>α(K)exp=0.082 *11* (1972Ha71) and 0.07 *2*<br>(1956Sc18).<br>δ: From α(K)exp and δ=−0.089 (1990Si13) and −0.4 *1*<br>(1973Ah01). |





$^{205}_{82}Pb_{123}$-6

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 549.84 *4* | 949×10[1] *10* | 1593.57 | 9/2+ | 1043.72 | 7/2− | E1+M2 | 0.087 *+20−26* | 0.0096 *9* | %Iγ=2.95 *4*<br>α(K)=0.0079 *7*; α(L)=0.00132 *15*; α(M)=0.00031 *4*<br>α(N)=7.8×10$^{-5}$ *9*; α(O)=1.54×10$^{-5}$ *18*;<br>α(P)=1.54×10$^{-6}$ *19*<br>Mult.: $A_2$=0.3 *1*, $A_4$=0.000 *2* (1990Si13);<br>α(K)exp=0.0080 *14* (1972Ha71) and 0.0074 *21*,<br>average of values given in 1956Sc18 and 1959St42.<br>δ: From α(K)exp and δ in 1990Si13. |
| 561.27 *5* | 170 *15* | 1264.73 | 5/2− | 703.44 | 7/2− | [M1,E2] | | 0.0796 | %Iγ=0.053 *5*<br>α(K)=0.0653 *10*; α(L)=0.01096 *16*; α(M)=0.00256 *4*<br>α(N)=0.000650 *10*; α(O)=0.0001297 *19*;<br>α(P)=1.391×10$^{-5}$ *20* |
| 570.60 *5* | 1394×10[1] *20* | 1614.32 | 7/2− | 1043.72 | 7/2− | M1+E2 | 0.37 *13* | 0.070 *5* | %Iγ=4.33 *7*<br>α(K)=0.057 *4*; α(L)=0.0098 *5*; α(M)=0.00228 *12*<br>α(N)=0.00058 *3*; α(O)=0.000115 *6*; α(P)=1.22×10$^{-5}$ *8*<br>Mult.: $A_2$=−0.43 *+3−7* $A_4$=0.0 (1990Si13);<br>α(K)exp=0.064 *7* and K/L=5.8 *12* (1972Ha71);<br>α(K)exp=0.065 *10*, average of values given in<br>1956Sc18 and 1959St42.<br>δ: From α(K)exp and δ=−0.01 *+10−3* (1990Si13) and<br>0.8 *1* from (1973Ah01). |
| 573.85 *5* | 2000 *40* | 576.21 | 3/2− | 2.329 | 1/2− | M1(+E2) | ≤1.2 | 0.059 *16* | %Iγ=0.622 *13*<br>α(K)=0.048 *14*; α(L)=0.0086 *18*; α(M)=0.0020 *4*<br>α(N)=0.00051 *11*; α(O)=0.000101 *21*; α(P)=1.0×10$^{-5}$<br>*3*<br>Mult.,δ: α(K)exp=0.054 *20* (1956Sc18). |
| 576.30 *10* | 605 *20* | 576.21 | 3/2− | 0.0 | 5/2− | [M1] | | 0.0742 | %Iγ=0.188 *6*<br>α(K)=0.0609 *9*; α(L)=0.01021 *15*; α(M)=0.00239 *4*<br>α(N)=0.000606 *9*; α(O)=0.0001209 *17*;<br>α(P)=1.297×10$^{-5}$ *19* |
| 579.80 *10* | 175×10[2] *2* | 1593.57 | 9/2+ | 1013.84 | 13/2+ | E2 | | 0.0208 | %Iγ=5.44 *7*<br>α(K)=0.01527 *22*; α(L)=0.00417 *6*; α(M)=0.001026 *15*<br>α(N)=0.000260 *4*; α(O)=4.95×10$^{-5}$ *7*;<br>α(P)=4.10×10$^{-6}$ *6*<br>Mult.: $A_2$=−0.22 *5* (1990Si13); α(K)exp=0.0151 *18*<br>and K/L=3.5 *8* (1972Ha71); α(K)exp=0.015 *2*,<br>average of values given in 1956Sc18 and 1959St42. |
| 606.25 *15* | 80 *13* | 1593.57 | 9/2+ | 987.62 | 9/2− | [E1] | | 0.00645 | %Iγ=0.025 *4*<br>α(K)=0.00535 *8*; α(L)=0.000846 *12*; α(M)=0.000196 *3*<br>α(N)=4.95×10$^{-5}$ *7*; α(O)=9.76×10$^{-6}$ *14*;<br>α(P)=9.74×10$^{-7}$ *14* |
| 626.71 *10* | 1880 *20* | 1614.32 | 7/2− | 987.62 | 9/2− | M1+E2 | 0.50 *22* | 0.051 *6* | %Iγ=0.584 *7*<br>α(K)=0.042 *6*; α(L)=0.0072 *7*; α(M)=0.00169 *16* |





$^{205}_{82}Pb_{123}$-7

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$[†] | $I_\gamma$[†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ[#] | α[@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | α(N)=0.00043 *4*; α(O)=8.5×10$^{-5}$ *9*; α(P)=9.0×10$^{-6}$ *10*<br>Mult.,δ: α(K)exp=0.043 *6* (1972Ha71) and 0.040 *7* (1956Sc18). |
| 646.00 *10* | 210 *10* | 2488.08 | (9/2)$^+$ | 1842.05 | (13/2)$^+$ | [E2] | | 0.01634 | %Iγ=0.0653 *31*<br>α(K)=0.01228 *18*; α(L)=0.00308 *5*; α(M)=0.000751 *11*<br>α(N)=0.000190 *3*; α(O)=3.65×10$^{-5}$ *6*; α(P)=3.14×10$^{-6}$ *5* |
| 661.40 *15* | 90 *15* | 1704.97 | (7/2,9/2)$^-$ | 1043.72 | 7/2$^-$ | [M1,E2] | | 0.0518 | %Iγ=0.028 *5*<br>α(K)=0.0425 *6*; α(L)=0.00710 *10*; α(M)=0.001658 *24*<br>α(N)=0.000421 *6*; α(O)=8.40×10$^{-5}$ *12*; α(P)=9.02×10$^{-6}$ *13* |
| [x]668.6 *6* | 60 *40* | | | | | | | | %Iγ=0.019 *12* |
| [x]669.8 *12* | 30 *40* | | | | | | | | %Iγ=0.009 *12* |
| [x]683.5 *3* | 85 *10* | | | | | | | | %Iγ=0.0264 *31* |
| 688.50 *5* | 730 *30* | 1264.73 | 5/2$^-$ | 576.21 | 3/2$^-$ | M1+E2 | 1.5 *+7–4* | 0.024 *5* | %Iγ=0.227 *9*<br>α(K)=0.019 *4*; α(L)=0.0038 *6*; α(M)=0.00089 *13*<br>α(N)=0.00023 *4*; α(O)=4.4×10$^{-5}$ *7*; α(P)=4.4×10$^{-6}$ *8*<br>Mult.,δ: α(K)exp=0.021 *5* (1972Ha71) and 0.017 *6* (1956Sc18). |
| 701.16 *20* | 5×10$^{2}$[‡] *2* | 1965.98 | (7/2,9/2$^-$) | 1264.73 | 5/2$^-$ | | | | %Iγ=0.16 *6* |
| 703.4[ab] | | 2521.47 | (7/2)$^-$ | 1817.99 | (3/2$^-$,5/2$^-$) | | | | %Iγ=0.03108 *20* |
| 703.45 *5* | 100000 | 703.44 | 7/2$^-$ | 0.0 | 5/2$^-$ | M1+E2 | 7.1 *8* | 0.0142 *3* | %Iγ=31.08 *20*<br>α(K)=0.01088 *21*; α(L)=0.00252 *4*; α(M)=0.000610 *10*<br>α(N)=0.0001545 *25*; α(O)=2.98×10$^{-5}$ *5*; α(P)=2.66×10$^{-6}$ *5*<br>Mult.: A$_2$=−0.33 *1*, A$_4$=0.625 *1* (1990Si13); α(K)exp=0.0110 *10* and K/L=4.6 *4* (1972Ha71); K/L=4.2 *1* (1956Sc18); α(K)exp=0.010 *3* (1956Sc18).<br>δ: From α(K)exp and K/L, and δ=7.2 *8* (1990Si13) and 6 *1* from 1973Ah01. |
| 704.86 *20* | 122×10$^{1}$[‡] *30* | 2203.87 | 11/2$^+$ | 1499.14 | 9/2$^-$ | [E1] | | 0.00480 | %Iγ=0.38 *9*<br>α(K)=0.00399 *6*; α(L)=0.000623 *9*; α(M)=0.0001442 *21*<br>α(N)=3.64×10$^{-5}$ *6*; α(O)=7.19×10$^{-6}$ *10*; α(P)=7.26×10$^{-7}$ *11* |
| 717.37 *5* | 1000 *20* | 1704.97 | (7/2,9/2)$^-$ | 987.62 | 9/2$^-$ | M1+E2 | 0.67 *13* | 0.0330 *25* | %Iγ=0.311 *7* |





$^{205}_{82}Pb_{123}$-8

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | α(K)=0.0268 *21*; α(L)=0.0047 *3*; α(M)=0.00110 *7*<br>α(N)=0.000279 *17*; α(O)=5.5×10$^{-5}$ *4*; α(P)=5.8×10$^{-6}$ *5*<br>Mult.,δ: α(K)exp=0.026 *7* (1972Ha71) and 0.027 *2* (1956Sc18). |
| 720.65 *10* | 460 *30* | 1764.37 | 7/2$^-$ | 1043.72 | 7/2$^-$ | M1(+E2) | ≤0.12 | 0.0412 *7* | %Iγ=0.143 *9*<br>α(K)=0.0338 *5*; α(L)=0.00564 *9*; α(M)=0.001317 *20*<br>α(N)=0.000335 *5*; α(O)=6.68×10$^{-5}$ *10*; α(P)=7.16×10$^{-6}$ *11*<br>Mult.,δ: α(K)exp=0.0359 *+11−8* (1972Ha71). |
| 723.09 *20* | 90[‡] *40* | 2565.12 | 9/2$^+$ | 1842.05 | (13/2)$^+$ | [E2] | | 0.01283 | %Iγ=0.028 *12*<br>α(K)=0.00983 *14*; α(L)=0.00228 *4*; α(M)=0.000552 *8*<br>α(N)=0.0001397 *20*; α(O)=2.69×10$^{-5}$ *4*;<br>α(P)=2.40×10$^{-6}$ *4* |
| 723.57 *5* | 490 *40* | 2488.08 | (9/2)$^+$ | 1764.37 | 7/2$^-$ | (E1) | | 0.00456 | %Iγ=0.152 *12*<br>α(K)=0.00379 *6*; α(L)=0.000591 *9*; α(M)=0.0001368 *20*<br>α(N)=3.46×10$^{-5}$ *5*; α(O)=6.83×10$^{-6}$ *10*;<br>α(P)=6.91×10$^{-7}$ *10*<br>Mult.: α(K)exp<0.038 (1972Ha71). |
| 729.40 *5* | 210 *12* | 2488.08 | (9/2)$^+$ | 1758.63 | 9/2$^+$ | (M1+E2) | | 0.0401 | %Iγ=0.065 *4*<br>α(K)=0.0330 *5*; α(L)=0.00549 *8*; α(M)=0.001281 *18*<br>α(N)=0.000326 *5*; α(O)=6.50×10$^{-5}$ *9*; α(P)=6.97×10$^{-6}$ *10*<br>Mult.: α(K)exp<0.078 (1972Ha71). |
| 744.70 *10* | 2240 *50* | 1758.63 | 9/2$^+$ | 1013.84 | 13/2$^+$ | E2 | | 0.01206 | %Iγ=0.696 *16*<br>α(K)=0.00928 *13*; α(L)=0.00211 *3*; α(M)=0.000510 *8*<br>α(N)=0.0001292 *18*; α(O)=2.49×10$^{-5}$ *4*;<br>α(P)=2.24×10$^{-6}$ *4*<br>Mult.: α(K)exp=0.010 *3* (1972Ha71) and 0.009 *3* (1956Sc18). |
| 757.09 *20* | 40×10$^1$[‡] *15* | 2521.47 | (7/2)$^-$ | 1764.37 | 7/2$^-$ | | | | %Iγ=0.12 *5* |
| 759.10 *10* | 333×10$^1$ *15* | 761.43 | 5/2$^-$ | 2.329 | 1/2$^-$ | E2 | | 0.01159 | %Iγ=1.03 *5*<br>α(K)=0.00895 *13*; α(L)=0.00201 *3*; α(M)=0.000485 *7*<br>α(N)=0.0001229 *18*; α(O)=2.37×10$^{-5}$ *4*;<br>α(P)=2.15×10$^{-6}$ *3*<br>Mult.: α(K)exp=0.0106 *22* (1972Ha71) and 0.0088 *25* (1956Sc18). |
| 761.35 *10* | 22×10$^2$ *1* | 761.43 | 5/2$^-$ | 0.0 | 5/2$^-$ | M1+E2 | 4.2 *18* | 0.0128 *23* | %Iγ=0.684 *31*<br>α(K)=0.0100 *20*; α(L)=0.0021 *3*; α(M)=0.00052 *7*<br>α(N)=0.000131 *16*; α(O)=2.5×10$^{-5}$ *4*; α(P)=2.4×10$^{-6}$ *4*<br>Mult.,δ: α(K)exp=0.0100 *22* (1972Ha71) and 0.010 *4* (1956Sc18). |
| 764.99 *20* | 30[‡] *12* | 2606.87 | 9/2$^+$ | 1842.05 | (13/2)$^+$ | [E2] | | 0.01140 | %Iγ=0.009 *4* |





$^{205}_{82}Pb_{123}$-9

γ($^{205}$Pb) (continued)

| $E_\gamma$ † | $I_\gamma$ †& | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | α@ | Comments |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | α(K)=0.00881 *13*; α(L)=0.00197 *3*; α(M)=0.000475 *7*<br>α(N)=0.0001204 *17*; α(O)=2.33×10$^{-5}$ *4*; α(P)=2.11×10$^{-6}$ *3* |
| 771.40[b] *15* | 150 *12* | 1758.63 | 9/2$^+$ | 987.62 | 9/2$^-$ | [E1] | 0.00404 | %Iγ=0.047 *4*<br>α(K)=0.00336 *5*; α(L)=0.000521 *8*; α(M)=0.0001205 *17*<br>α(N)=3.05×10$^{-5}$ *5*; α(O)=6.02×10$^{-6}$ *9*; α(P)=6.12×10$^{-7}$ *9* |
| [x]777.85 *15* | 235 *30* | | | | | | | %Iγ=0.073 *9* |
| 780.92 *5* | 1840 *30* | 1043.72 | 7/2$^-$ | 262.81 | 3/2$^-$ | E2 | 0.01093 | %Iγ=0.572 *10*<br>α(K)=0.00847 *12*; α(L)=0.00187 *3*; α(M)=0.000451 *7*<br>α(N)=0.0001142 *16*; α(O)=2.21×10$^{-5}$ *3*; α(P)=2.01×10$^{-6}$ *3*<br>Mult.: From γγ(θ) in 1973Ah01. |
| 788.13 *15* | 320 *50* | 1775.80 | 7/2$^-$ | 987.62 | 9/2$^-$ | [M1,E2] | 0.0328 | %Iγ=0.099 *16*<br>α(K)=0.0270 *4*; α(L)=0.00448 *7*; α(M)=0.001046 *15*<br>α(N)=0.000266 *4*; α(O)=5.30×10$^{-5}$ *8*; α(P)=5.70×10$^{-6}$ *8* |
| 789.3 *2* | 60 *30* | 2565.12 | 9/2$^+$ | 1775.80 | 7/2$^-$ | [E1] | 0.00387 | %Iγ=0.019 *9*<br>α(K)=0.00322 *5*; α(L)=0.000498 *7*; α(M)=0.0001152 *17*<br>α(N)=2.91×10$^{-5}$ *4*; α(O)=5.76×10$^{-6}$ *8*; α(P)=5.86×10$^{-7}$ *9* |
| 795.67 *5* | 450 *20* | 1499.14 | 9/2$^-$ | 703.44 | 7/2$^-$ | [M1,E2] | 0.0320 | %Iγ=0.140 *6*<br>α(K)=0.0263 *4*; α(L)=0.00437 *7*; α(M)=0.001020 *15*<br>α(N)=0.000259 *4*; α(O)=5.17×10$^{-5}$ *8*; α(P)=5.56×10$^{-6}$ *8* |
| 800.80 *5* | 610 *20* | 2565.12 | 9/2$^+$ | 1764.37 | 7/2$^-$ | [E1] | 0.00376 | %Iγ=0.190 *6*<br>α(K)=0.00313 *5*; α(L)=0.000485 *7*; α(M)=0.0001120 *16*<br>α(N)=2.83×10$^{-5}$ *4*; α(O)=5.60×10$^{-6}$ *8*; α(P)=5.71×10$^{-7}$ *8* |
| 806.55 *10* | 510 *40* | 2565.12 | 9/2$^+$ | 1758.63 | 9/2$^+$ | [M1,E2] | 0.0309 | %Iγ=0.159 *12*<br>α(K)=0.0254 *4*; α(L)=0.00422 *6*; α(M)=0.000985 *14*<br>α(N)=0.000250 *4*; α(O)=4.99×10$^{-5}$ *7*; α(P)=5.36×10$^{-6}$ *8* |
| 813.75 *10* | 1510 *40* | 1575.35 | 9/2$^-$ | 761.43 | 5/2$^-$ | E2 | 0.01004 | %Iγ=0.469 *13*<br>α(K)=0.00783 *11*; α(L)=0.001685 *24*; α(M)=0.000406 *6*<br>α(N)=0.0001028 *15*; α(O)=1.99×10$^{-5}$ *3*; α(P)=1.83×10$^{-6}$ *3*<br>Mult.: α(K)exp=0.008 *3* (1972Ha71). |
| 828.22 *5* | 930 *40* | 1842.05 | (13/2)$^+$ | 1013.84 | 13/2$^+$ | [M1,E2] | 0.0289 | %Iγ=0.289 *13*<br>α(K)=0.0237 *4*; α(L)=0.00394 *6*; α(M)=0.000919 *13*<br>α(N)=0.000233 *4*; α(O)=4.66×10$^{-5}$ *7*; α(P)=5.00×10$^{-6}$ *7* |
| 831.0 *3* | 130 *30* | 2606.87 | 9/2$^+$ | 1775.80 | 7/2$^-$ | [E1] | 0.00351 | %Iγ=0.040 *9*<br>α(K)=0.00293 *4*; α(L)=0.000451 *7*; α(M)=0.0001043 *15*<br>α(N)=2.64×10$^{-5}$ *4*; α(O)=5.22×10$^{-6}$ *8*; α(P)=5.33×10$^{-7}$ *8* |
| 842.8 *3* | 70 *20* | 2606.87 | 9/2$^+$ | 1764.37 | 7/2$^-$ | [E1] | 0.00342 | %Iγ=0.022 *6*<br>α(K)=0.00285 *4*; α(L)=0.000439 *7*; α(M)=0.0001015 *15*<br>α(N)=2.57×10$^{-5}$ *4*; α(O)=5.08×10$^{-6}$ *8*; α(P)=5.19×10$^{-7}$ *8* |
| 848.2 *3* | 85 *12* | 2606.87 | 9/2$^+$ | 1758.63 | 9/2$^+$ | [M1,E2] | 0.0272 | %Iγ=0.026 *4*<br>α(K)=0.0223 *4*; α(L)=0.00370 *6*; α(M)=0.000863 *13*<br>α(N)=0.000219 *3*; α(O)=4.38×10$^{-5}$ *7*; α(P)=4.70×10$^{-6}$ *7* |
| 852.90 *5* | 232 *15* | 1614.32 | 7/2$^-$ | 761.43 | 5/2$^-$ | [M1,E2] | 0.0268 | %Iγ=0.072 *5* |

$\gamma(^{205}Pb)$ (continued)

| $E_\gamma$[†] | $I_\gamma$[†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ[#] | α[@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | α(K)=0.0220 *3*; α(L)=0.00365 *6*; α(M)=0.000851 *12*<br>α(N)=0.000216 *3*; α(O)=4.31×10$^{-5}$ *6*;<br>α(P)=4.64×10$^{-6}$ *7* |
| 860.13 *5* | 1400 *25* | 2565.12 | 9/2$^+$ | 1704.97 | (7/2,9/2)$^-$ | | | | %Iγ=0.435 *8* |
| 871.95 *5* | 1340 *30* | 1575.35 | 9/2$^-$ | 703.44 | 7/2$^-$ | [M1,E2] | | 0.0253 | %Iγ=0.416 *10*<br>α(K)=0.0208 *3*; α(L)=0.00344 *5*; α(M)=0.000803 *12*<br>α(N)=0.000204 *3*; α(O)=4.07×10$^{-5}$ *6*;<br>α(P)=4.38×10$^{-6}$ *7* |
| 890.15 *5* | 2180 *30* | 1593.57 | 9/2$^+$ | 703.44 | 7/2$^-$ | (E1) | | 0.00309 | %Iγ=0.678 *10*<br>α(K)=0.00258 *4*; α(L)=0.000396 *6*; α(M)=9.14×10$^{-5}$ *13*<br>α(N)=2.31×10$^{-5}$ *4*; α(O)=4.58×10$^{-6}$ *7*;<br>α(P)=4.69×10$^{-7}$ *7*<br>Mult.: α(K)exp≤0.0037 (1972Ha71). |
| 894.56 *5* | 2000 *30* | 2488.08 | (9/2)$^+$ | 1593.57 | 9/2$^+$ | M1(+E2) | ≤0.6 | 0.0216 *21* | %Iγ=0.622 *10*<br>α(K)=0.0178 *18*; α(L)=0.0030 *3*; α(M)=0.00069 *6*<br>α(N)=0.000176 *15*; α(O)=3.5×10$^{-5}$ *3*;<br>α(P)=3.8×10$^{-6}$ *4*<br>Mult.,δ: α(K)exp=0.019 *3* (1972Ha71). |
| 901.90 *5* | 415 *15* | 2606.87 | 9/2$^+$ | 1704.97 | (7/2,9/2)$^-$ | | | | %Iγ=0.129 *5* |
| 910.90 *5* | 528×10[1] *10* | 1614.32 | 7/2$^-$ | 703.44 | 7/2$^-$ | M1(+E2) | −0.05 *5* | 0.0226 | %Iγ=1.641 *33*<br>α(K)=0.0186 *3*; α(L)=0.00307 *5*; α(M)=0.000716 *11*<br>α(N)=0.000182 *3*; α(O)=3.63×10$^{-5}$ *6*;<br>α(P)=3.90×10$^{-6}$ *6*<br>Mult.: γγ(θ) in 1973Ah01; α(K)exp=0.019 *3* (1972Ha71) and 0.018 *3*, average of values given in 1956Sc18 and 1959St42.<br>δ: From 1973Ah01. |
| 922.15 *10* | 170 *10* | 1965.98 | (7/2,9/2$^-$) | 1043.72 | 7/2$^-$ | | | | %Iγ=0.0528 *31* |
| [x]931.50 *15* | 125 *15* | | | | | | | | %Iγ=0.039 *5* |
| 950.84 *5* | 1250 *30* | 2565.12 | 9/2$^+$ | 1614.32 | 7/2$^-$ | [E1] | | 0.00274 | %Iγ=0.389 *10*<br>α(K)=0.00229 *4*; α(L)=0.000350 *5*; α(M)=8.07×10$^{-5}$ *12*<br>α(N)=2.04×10$^{-5}$ *3*; α(O)=4.04×10$^{-6}$ *6*;<br>α(P)=4.16×10$^{-7}$ *6* |
| 971.56 *5* | 900 *20* | 2565.12 | 9/2$^+$ | 1593.57 | 9/2$^+$ | [M1,E2] | | 0.0192 | %Iγ=0.280 *6*<br>α(K)=0.01575 *22*; α(L)=0.00260 *4*; α(M)=0.000606 *9*<br>α(N)=0.0001540 *22*; α(O)=3.07×10$^{-5}$ *5*;<br>α(P)=3.31×10$^{-6}$ *5* |
| 978.50 *10* | 130 *20* | 1965.98 | (7/2,9/2$^-$) | 987.62 | 9/2$^-$ | | | | %Iγ=0.040 *6* |
| 987.49 *20* | 3×10[2‡] *1* | 2252.29 | (7/2)$^+$ | 1264.73 | 5/2$^-$ | [E1] | | 0.00256 | %Iγ=0.093 *31*<br>α(K)=0.00214 *3*; α(L)=0.000326 *5*; α(M)=7.52×10$^{-5}$ |

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$[†] | $I_\gamma$[†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ[#] | α[@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | *11*<br>α(N)=1.90×10$^{-5}$ *3*; α(O)=3.77×10$^{-6}$ *6*; α(P)=3.89×10$^{-7}$ *6* |
| 987.66 *5* | 5188×10$^1$ *50* | 987.62 | 9/2$^-$ | 0.0 | 5/2$^-$ | E2 | | 0.00682 | %Iγ=16.12 *19*<br>α(K)=0.00543 *8*; α(L)=0.001062 *15*; α(M)=0.000253 *4*<br>α(N)=6.41×10$^{-5}$ *9*; α(O)=1.252×10$^{-5}$ *18*; α(P)=1.205×10$^{-6}$ *17*<br>Mult.: γγ(θ) in 1973Ah01; α(K)exp=0.0055 *7* and K/L=5.6 *8* (1972Ha71); α(K)exp=0.0054 *5*, average of values given in 1956Sc18 and 1959St42. |
| 989.12 *20* | <100[‡] | 2488.08 | (9/2)$^+$ | 1499.14 | 9/2$^-$ | [E1] | | 0.00255 | %Iγ<0.03128<br>α(K)=0.00213 *3*; α(L)=0.000325 *5*; α(M)=7.49×10$^{-5}$ *11*<br>α(N)=1.89×10$^{-5}$ *3*; α(O)=3.76×10$^{-6}$ *6*; α(P)=3.88×10$^{-7}$ *6* |
| 989.84 *20* | 240[‡] *80* | 2565.12 | 9/2$^+$ | 1575.35 | 9/2$^-$ | [E1] | | 0.00255 | %Iγ=0.075 *25*<br>α(K)=0.00213 *3*; α(L)=0.000324 *5*; α(M)=7.48×10$^{-5}$ *11*<br>α(N)=1.89×10$^{-5}$ *3*; α(O)=3.75×10$^{-6}$ *6*; α(P)=3.87×10$^{-7}$ *6* |
| 992.65 *20* | 28×10$^1$[‡] *10* | 2606.87 | 9/2$^+$ | 1614.32 | 7/2$^-$ | [E1] | | 0.00254 | %Iγ=0.087 *31*<br>α(K)=0.00212 *3*; α(L)=0.000323 *5*; α(M)=7.44×10$^{-5}$ *11*<br>α(N)=1.88×10$^{-5}$ *3*; α(O)=3.73×10$^{-6}$ *6*; α(P)=3.85×10$^{-7}$ *6* |
| 1001.59 *20* | 82×10$^1$[‡] *14* | 1704.97 | (7/2,9/2)$^-$ | 703.44 | 7/2$^-$ | M1+E2 | 0.8 *4* | 0.013 *3* | %Iγ=0.25 *4*<br>α(K)=0.0110 *24*; α(L)=0.0019 *4*; α(M)=0.00044 *8*<br>α(N)=0.000111 *21*; α(O)=2.2×10$^{-5}$ *5*; α(P)=2.3×10$^{-6}$ *5*<br>Mult.,δ: α(K)exp=0.0108 *22* (1972Ha71) and 0.013 *5* (1956Sc18). |
| 1001.95 *20* | 88×10$^1$[‡] *14* | 1264.73 | 5/2$^-$ | 262.81 | 3/2$^-$ | M1+E2 | 0.8 *4* | 0.013 *3* | %Iγ=0.27 *4*<br>α(K)=0.0109 *24*; α(L)=0.0019 *4*; α(M)=0.00044 *8*<br>α(N)=0.000111 *21*; α(O)=2.2×10$^{-5}$ *5*; α(P)=2.3×10$^{-6}$ *5*<br>Mult.,δ: α(K)exp=0.0108 *22* (1972Ha71). |
| 1003.0 *3* | 23×10$^1$ *10* | 1764.37 | 7/2$^-$ | 761.43 | 5/2$^-$ | M1+E2 | 0.8 *5* | 0.013 *4* | %Iγ=0.071 *31*<br>α(K)=0.011 *3*; α(L)=0.0019 *5*; α(M)=0.00044 *10*<br>α(N)=0.000111 *25*; α(O)=2.2×10$^{-5}$ *5*; α(P)=2.3×10$^{-6}$ *6*<br>Mult.,δ: α(K)exp=0.0108 *22* (1972Ha71). |
| 1013.40 *15* | 265[‡] *60* | 2606.87 | 9/2$^+$ | 1593.57 | 9/2$^+$ | M1+E2 | −0.4 *1* | 0.0157 *7* | %Iγ=0.082 *19*<br>α(K)=0.0129 *6*; α(L)=0.00215 *9*; α(M)=0.000501 *21*<br>α(N)=0.000127 *6*; α(O)=2.54×10$^{-5}$ *11*; α(P)=2.71×10$^{-6}$ *12*<br>Mult.: A$_2$=−0.13 *9*, A$_4$=−0.07 *+3−4* (1990Si13); ce in 1965Be08.<br>δ: From 1990Si13. |
| 1013.8 *1* | 185 *40* | 1013.84 | 13/2$^+$ | 0.0 | 5/2$^-$ | [M4] | | 0.1475 | %Iγ=0.057 *12*<br>α(K)=0.1098 *16*; α(L)=0.0284 *4*; α(M)=0.00705 *10*<br>α(N)=0.00181 *3*; α(O)=0.000355 *5*; α(P)=3.41×10$^{-5}$ *5*<br>$I_\gamma$: From ce(K)(1013.8)/ce(K)(703.3)=1.77 *26* of 1965Be08 corrected for 1013.4 M1 component. |





$^{205}_{82}Pb_{123}$-12

γ($^{205}$Pb) (continued)

| $E_\gamma$ † | $I_\gamma$ †& | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ# | α@ | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1014.30 *5* | 2940 *60* | 1775.80 | 7/2$^-$ | 761.43 | 5/2$^-$ | M1+E2 | 0.5 *4* | 0.015 *3* | %Iγ=0.914 *20*<br>α(K)=0.0123 *23*; α(L)=0.0021 *4*; α(M)=0.00048 *8*<br>α(N)=0.000122 *20*; α(O)=2.4×10$^{-5}$ *4*; α(P)=2.6×10$^{-6}$ *5*<br>Mult.,δ: α(K)exp=0.0124 *20* (1972Ha71). |
| 1031.5 *3* | 110 *35* | 2606.87 | 9/2$^+$ | 1575.35 | 9/2$^-$ | [E1] | | 0.00237 | %Iγ=0.034 *11*<br>α(K)=0.00198 *3*; α(L)=0.000301 *5*; α(M)=6.93×10$^{-5}$ *10*<br>α(N)=1.753×10$^{-5}$ *25*; α(O)=3.48×10$^{-6}$ *5*; α(P)=3.60×10$^{-7}$ *5* |
| 1038.86 *24* | 365 *30* | 1614.32 | 7/2$^-$ | 576.21 | 3/2$^-$ | [E2] | | 0.00618 | %Iγ=0.113 *9*<br>α(K)=0.00494 *7*; α(L)=0.000947 *14*; α(M)=0.000225 *4*<br>α(N)=5.70×10$^{-5}$ *8*; α(O)=1.116×10$^{-5}$ *16*;<br>α(P)=1.084×10$^{-6}$ *16* |
| 1043.75 *5* | 2415×10[1] *30* | 1043.72 | 7/2$^-$ | 0.0 | 5/2$^-$ | M1+E2 | 0.031 *20* | 0.01593 | %Iγ=7.51 *11*<br>α(K)=0.01311 *19*; α(L)=0.00216 *3*; α(M)=0.000503 *7*<br>α(N)=0.0001278 *18*; α(O)=2.55×10$^{-5}$ *4*; α(P)=2.75×10$^{-6}$ *4*<br>Mult.: A$_2$=0.27 *2*, A$_4$=0.001 *1* (1990Si13);<br>α(K)exp=0.0130 *14* and K/L=6.8 *10* (1972Ha71); γγ(θ) in 1973Ah01; α(K)exp=0.013 *2*, average of values given in 1956Sc18 and 1959St42.<br>δ: From α(K)exp and K/L, and δ=0.03 *1* (1990Si13) and −0.15 *15* (1973Ah01). |
| 1060.75 *15* | 142 *15* | 1764.37 | 7/2$^-$ | 703.44 | 7/2$^-$ | [M1,E2] | | 0.01529 | %Iγ=0.044 *5*<br>α(K)=0.01258 *18*; α(L)=0.00207 *3*; α(M)=0.000483 *7*<br>α(N)=0.0001227 *18*; α(O)=2.45×10$^{-5}$ *4*; α(P)=2.63×10$^{-6}$ *4* |
| x1063.90 *15* | 80 *15* | | | | | | | | %Iγ=0.025 *5* |
| 1066.03 *15* | 352 *15* | 2565.12 | 9/2$^+$ | 1499.14 | 9/2$^-$ | [E1] | | 0.00223 | %Iγ=0.109 *5*<br>α(K)=0.00186 *3*; α(L)=0.000283 *4*; α(M)=6.52×10$^{-5}$ *10*<br>α(N)=1.650×10$^{-5}$ *24*; α(O)=3.27×10$^{-6}$ *5*; α(P)=3.39×10$^{-7}$ *5* |
| 1072.40 *10* | 972 *20* | 1775.80 | 7/2$^-$ | 703.44 | 7/2$^-$ | M1(+E2) | ≤0.7 | 0.0134 *15* | %Iγ=0.302 *7*<br>α(K)=0.0110 *13*; α(L)=0.00183 *19*; α(M)=0.00043 *5*<br>α(N)=0.000108 *11*; α(O)=2.16×10$^{-5}$ *23*; α(P)=2.3×10$^{-6}$ *3*<br>Mult.,δ: α(K)exp=0.013 *3* (1972Ha71). |
| x1075.10 *10* | 35 *15* | | | | | | | | %Iγ=0.011 *5* |
| 1107.72 *10* | 318 *30* | 2606.87 | 9/2$^+$ | 1499.14 | 9/2$^-$ | [E1] | | 0.00209 | %Iγ=0.099 *9*<br>α(K)=0.001741 *25*; α(L)=0.000264 *4*; α(M)=6.08×10$^{-5}$ *9*<br>α(N)=1.538×10$^{-5}$ *22*; α(O)=3.05×10$^{-6}$ *5*; α(P)=3.17×10$^{-7}$ *5*; α(IPF)=1.017×10$^{-6}$ *15* |

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1190.03 *5* | 727×10[1] *20* | 2203.87 | 11/2$^+$ | 1013.84 | 13/2$^+$ | M1+E2 | 0.08 *4* | 0.01136 *17* | %Iγ=2.26 *6*<br>α(K)=0.00935 *14*; α(L)=0.001535 *23*; α(M)=0.000358 *6*<br>α(N)=9.08×10$^{-5}$ *14*; α(O)=1.81×10$^{-5}$ *3*; α(P)=1.95×10$^{-6}$ *3*; α(IPF)=5.55×10$^{-6}$ *8*<br>Mult.: $A_2$=0.04 *5*, $A_4$=0.002 *+2−1* (1990Si13); α(K)exp=0.0094 *18* (1972Ha71) and 0.011 *2* (1956Sc18).<br>δ: From α(K)exp and δ=−0.08 *3* (1990Si13). |
| 1199.62 *10* | 610 *40* | 1775.80 | 7/2$^-$ | 576.21 | 3/2$^-$ | [E2] | | 0.00470 | %Iγ=0.190 *12*<br>α(K)=0.00379 *6*; α(L)=0.000689 *10*; α(M)=0.0001628 *23*<br>α(N)=4.13×10$^{-5}$ *6*; α(O)=8.11×10$^{-6}$ *12*; α(P)=8.07×10$^{-7}$ *12*; α(IPF)=3.82×10$^{-6}$ *6* |
| 1208.70 *5* | 1645 *30* | 2252.29 | (7/2)$^+$ | 1043.72 | 7/2$^-$ | E1+M2 | −0.08 *+6−5* | 0.0020 *3* | %Iγ=0.511 *10*<br>α(K)=0.00162 *21*; α(L)=0.00025 *4*; α(M)=5.7×10$^{-5}$ *9*<br>α(N)=1.45×10$^{-5}$ *23*; α(O)=2.9×10$^{-6}$ *5*; α(P)=3.0×10$^{-7}$ *5*; α(IPF)=1.80×10$^{-5}$ *3*<br>Mult.: $A_2$=+0.44 *9*, $A_4$=+0.003 *+6−3* (1990Si13).<br>δ: From 1990Si13. |
| 1216.25 *10* | 324 *15* | 2203.87 | 11/2$^+$ | 987.62 | 9/2$^-$ | | | | %Iγ=0.101 *5* |
| 1256.9 *5* | 70 *35* | 2521.47 | (7/2)$^-$ | 1264.73 | 5/2$^-$ | | | | %Iγ=0.022 *11* |
| 1261.65 *20* | 198 *20* | 1264.73 | 5/2$^-$ | 2.329 | 1/2$^-$ | [E2] | | 0.00428 | %Iγ=0.062 *6*<br>α(K)=0.00346 *5*; α(L)=0.000619 *9*; α(M)=0.0001459 *21*<br>α(N)=3.70×10$^{-5}$ *6*; α(O)=7.28×10$^{-6}$ *11*; α(P)=7.29×10$^{-7}$ *11*; α(IPF)=1.035×10$^{-5}$ *15* |
| 1264.60 *20* | 160[‡] *70* | 2252.29 | (7/2)$^+$ | 987.62 | 9/2$^-$ | [E1] | | 1.69×10$^{-3}$ | %Iγ=0.050 *22*<br>α(K)=0.001382 *20*; α(L)=0.000208 *3*; α(M)=4.79×10$^{-5}$ *7*<br>α(N)=1.212×10$^{-5}$ *17*; α(O)=2.41×10$^{-6}$ *4*; α(P)=2.52×10$^{-7}$ *4*; α(IPF)=3.81×10$^{-5}$ *6* |
| 1264.8 *2* | 400 *70* | 1264.73 | 5/2$^-$ | 0.0 | 5/2$^-$ | [M1,E2] | | 0.00977 | %Iγ=0.124 *22*<br>α(K)=0.00804 *12*; α(L)=0.001316 *19*; α(M)=0.000307 *5*<br>α(N)=7.79×10$^{-5}$ *11*; α(O)=1.555×10$^{-5}$ *22*; α(P)=1.675×10$^{-6}$ *24*; α(IPF)=1.90×10$^{-5}$ *3* |
| [x]1265.9 *3* | 150 *40* | | | | | | | | %Iγ=0.047 *12*<br>$E_\gamma$: Tentatively assigned to $^{205}$Bi ε decay. |
| [x]1277.2 *2* | 122 *14* | | | | | | | | %Iγ=0.038 *4* |





$^{205}_{82}Pb_{123}$-14

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ † | $I_\gamma$ †& | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | α@ | Comments |
|---|---|---|---|---|---|---|---|---|
| 1351.52 *5* | 34×10$^2$ *1* | 1614.32 | 7/2$^-$ | 262.81 | 3/2$^-$ | E2 | 0.00378 | %Iγ=1.057 *32*<br>α(K)=0.00305 *5*; α(L)=0.000535 *8*; α(M)=0.0001259 *18*<br>α(N)=3.19×10$^{-5}$ *5*; α(O)=6.29×10$^{-6}$ *9*; α(P)=6.36×10$^{-7}$ *9*; α(IPF)=2.49×10$^{-5}$ *4*<br>Mult.: $A_2$=−0.63 *14* (1990Si13); α(K)exp=0.0031 *9* (1972Ha71) and 0.0033 *13* (1956Sc18). |
| x1438.7 *2* | 375 *20* | | | | | | | %Iγ=0.117 *6* |
| 1499.00 *15* | 550 *45* | 1499.14 | 9/2$^-$ | 0.0 | 5/2$^-$ | (E2) | 0.00316 | %Iγ=0.171 *14*<br>α(K)=0.00253 *4*; α(L)=0.000433 *6*; α(M)=0.0001014 *15*<br>α(N)=2.57×10$^{-5}$ *4*; α(O)=5.08×10$^{-6}$ *8*; α(P)=5.19×10$^{-7}$ *8*; α(IPF)=6.33×10$^{-5}$ *9*<br>Mult.: α(K)exp=0.0034 *8* (1972Ha71). |
| 1501.40 *10* | 730 *45* | 1764.37 | 7/2$^-$ | 262.81 | 3/2$^-$ | (E2) | 0.00315 | %Iγ=0.227 *14*<br>α(K)=0.00252 *4*; α(L)=0.000431 *6*; α(M)=0.0001010 *15*<br>α(N)=2.56×10$^{-5}$ *4*; α(O)=5.06×10$^{-6}$ *7*; α(P)=5.18×10$^{-7}$ *8*; α(IPF)=6.41×10$^{-5}$ *9*<br>Mult.: α(K)exp=0.0034 *8* (1972Ha71) and 0.0044 *25* (1956Sc18). |
| 1513.40 *20* | 225 *40* | 1775.80 | 7/2$^-$ | 262.81 | 3/2$^-$ | [E2] | 0.00311 | %Iγ=0.070 *12*<br>α(K)=0.00249 *4*; α(L)=0.000424 *6*; α(M)=9.94×10$^{-5}$ *14*<br>α(N)=2.52×10$^{-5}$ *4*; α(O)=4.98×10$^{-6}$ *7*; α(P)=5.10×10$^{-7}$ *8*; α(IPF)=6.78×10$^{-5}$ *10* |
| 1521.20 *10* | 640 *40* | 2565.12 | 9/2$^+$ | 1043.72 | 7/2$^-$ | [E1] | 1.39×10$^{-3}$ | %Iγ=0.199 *12*<br>α(K)=0.001010 *15*; α(L)=0.0001506 *21*; α(M)=3.46×10$^{-5}$ *5*<br>α(N)=8.77×10$^{-6}$ *13*; α(O)=1.745×10$^{-6}$ *25*; α(P)=1.84×10$^{-7}$ *3*; α(IPF)=0.000185 *3* |
| 1548.65 *15* | 900 *50* | 2252.29 | (7/2)$^+$ | 703.44 | 7/2$^-$ | [E1] | 1.37×10$^{-3}$ | %Iγ=0.280 *16*<br>α(K)=0.000980 *14*; α(L)=0.0001461 *21*; α(M)=3.36×10$^{-5}$ *5*<br>α(N)=8.50×10$^{-6}$ *12*; α(O)=1.692×10$^{-6}$ *24*; α(P)=1.782×10$^{-7}$ *25*; α(IPF)=0.000204 *3* |
| 1551.00 *10* | 3120 *80* | 2565.12 | 9/2$^+$ | 1013.84 | 13/2$^+$ | E2 | 0.00299 | %Iγ=0.970 *26*<br>α(K)=0.00238 *4*; α(L)=0.000404 *6*; α(M)=9.45×10$^{-5}$ *14*<br>α(N)=2.40×10$^{-5}$ *4*; α(O)=4.74×10$^{-6}$ *7*; α(P)=4.86×10$^{-7}$ *7*; α(IPF)=8.01×10$^{-5}$ *12*<br>Mult.: α(K)exp=0.0028 *8* (1972Ha71) and 0.0033 *17* (1956Sc18). |
| 1563.15 *10* | 530 *30* | 2606.87 | 9/2$^+$ | 1043.72 | 7/2$^-$ | [E1] | 1.37×10$^{-3}$ | %Iγ=0.165 *9*<br>α(K)=0.000965 *14*; α(L)=0.0001438 *21*; α(M)=3.31×10$^{-5}$ *5*<br>α(N)=8.37×10$^{-6}$ *12*; α(O)=1.666×10$^{-6}$ *24*; α(P)=1.754×10$^{-7}$ *25*; α(IPF)=0.000214 *3* |
| 1577.50 *15* | 535 *30* | 2565.12 | 9/2$^+$ | 987.62 | 9/2$^-$ | [E1] | 1.36×10$^{-3}$ | %Iγ=0.166 *9*<br>α(K)=0.000950 *14*; α(L)=0.0001415 *20*; α(M)=3.26×10$^{-5}$ *5*<br>α(N)=8.24×10$^{-6}$ *12*; α(O)=1.640×10$^{-6}$ *23*; α(P)=1.727×10$^{-7}$ *25*; α(IPF)=0.000224 *4* |





$^{205}_{82}Pb_{123}$-15

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1593.00 *15* | 370 *25* | 2606.87 | 9/2$^+$ | 1013.84 | 13/2$^+$ | [E2] | | 0.00286 | %Iγ=0.115 *8*<br>α(K)=0.00227 *4*; α(L)=0.000383 *6*; α(M)=8.95×10$^{-5}$ *13*<br>α(N)=2.27×10$^{-5}$ *4*; α(O)=4.49×10$^{-6}$ *7*; α(P)=4.62×10$^{-7}$ *7*; α(IPF)=9.47×10$^{-5}$ *14* |
| 1614.30 *15* | 732×10$^1$ *12* | 1614.32 | 7/2$^-$ | 0.0 | 5/2$^-$ | M1+E2 | 0.7 *3* | 0.0046 *5* | %Iγ=2.28 *4*<br>α(K)=0.0036 *4*; α(L)=0.00060 *7*; α(M)=0.000139 *15*<br>α(N)=3.5×10$^{-5}$ *4*; α(O)=7.0×10$^{-6}$ *8*; α(P)=7.5×10$^{-7}$ *9*; α(IPF)=0.000150 *14*<br>Mult.: $A_2$=1.09 *+1−4*, $A_4$=0.26 *+8−7* (1990Si13); α(K)exp=0.0047 *11* (1972Ha71) and 0.0053 *13* (1956Sc18).<br>δ: From α(K)exp and δ=−0.84 *+17−23* (1990Si13). |
| 1619.10 *15* | 1180 *50* | 2606.87 | 9/2$^+$ | 987.62 | 9/2$^-$ | [E1] | | 1.34×10$^{-3}$ | %Iγ=0.367 *16*<br>α(K)=0.000910 *13*; α(L)=0.0001354 *19*; α(M)=3.11×10$^{-5}$ *5*<br>α(N)=7.88×10$^{-6}$ *11*; α(O)=1.569×10$^{-6}$ *22*; α(P)=1.654×10$^{-7}$ *24*; α(IPF)=0.000253 *4* |
| [x]1676.4 *3* | 105 *20* | | | | | | | | %Iγ=0.033 *6* |
| 1756.4 *3* | 700 *40* | 1756.4 | (7/2,9/2$^-$) | 0.0 | 5/2$^-$ | | | | %Iγ=0.218 *13* |
| 1760.0 *4* | 4×10$^2$[‡] *1* | 2521.47 | (7/2)$^-$ | 761.43 | 5/2$^-$ | | | | %Iγ=0.124 *31* |
| 1764.30 *10* | 1044×10$^2$ *20* | 1764.37 | 7/2$^-$ | 0.0 | 5/2$^-$ | M1+E2 | 0.055 *17* | 0.00445 | %Iγ=32.4 *7*<br>α(K)=0.00345 *5*; α(L)=0.000560 *8*; α(M)=0.0001303 *19*<br>α(N)=3.31×10$^{-5}$ *5*; α(O)=6.61×10$^{-6}$ *10*; α(P)=7.13×10$^{-7}$ *10*; α(IPF)=0.000269 *4*<br>Mult.: K/L=6.0 *3* (1956Sc18); internal pair coef=3.4×10$^{-4}$ *6* (1971Al03); $A_2$=0.22 *2*, $A_4$=0.002 *1* (1990Si13); α(K)exp=0.0042 *5* and K/L=6.6 *8* (1972Ha71); α(K)exp=0.0045 *9*, average of values given in 1956Sc18 and 1959St42.<br>δ: From α(K)exp and K/L, and δ=+0.055 *+10−8* (1990Si13). |
| 1775.80 *10* | 1282×10$^1$ *25* | 1775.80 | 7/2$^-$ | 0.0 | 5/2$^-$ | M1(+E2) | +0.03 *+4−3* | 0.00439 | %Iγ=3.98 *8*<br>α(K)=0.00340 *5*; α(L)=0.000551 *8*; α(M)=0.0001283 *19*<br>α(N)=3.26×10$^{-5}$ *5*; α(O)=6.51×10$^{-6}$ *10*; α(P)=7.02×10$^{-7}$ *10*; α(IPF)=0.000277 *4*<br>Mult.: $A_2$=0.26 *+6−7*, $A_4$=0.001 *+2−1* |





$^{205}_{82}Pb_{123}$-16

## $^{205}$Bi ε decay 1972Ha71 (continued)

### γ($^{205}$Pb) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†&] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult. | δ [#] | α [@] | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | (1990Si13); α(K)exp=0.0039 *10* (1972Ha71) and 0.0043 *12*, average of values given in 1956Sc18 and 1959St42.<br>δ: From 1990Si13. |
| 1815.6 *4* | 44 *15* | 1817.99 | (3/2$^-$,5/2$^-$) | 2.329 | 1/2$^-$ | | | | %Iγ=0.014 *5* |
| 1818.0[a] *2* | 152 *12* | 1817.99 | (3/2$^-$,5/2$^-$) | 0.0 | 5/2$^-$ | | | | %Iγ=0.047 *4* |
| 1818.0[a] *2* | 152 *12* | 2521.47 | (7/2)$^-$ | 703.44 | 7/2$^-$ | | | | %Iγ=0.047 *4* |
| 1861.70 *10* | 1984×10$^1$ *30* | 2565.12 | 9/2$^+$ | 703.44 | 7/2$^-$ | E1(+M2) | +0.002 *+19−6* | 1.29×10$^{-3}$ *2* | %Iγ=6.17 *10*<br>α(K)=0.000722 *11*; α(L)=0.0001069 *16*; α(M)=2.46×10$^{-5}$ *4*<br>α(N)=6.22×10$^{-6}$ *10*; α(O)=1.239×10$^{-6}$ *19*; α(P)=1.311×10$^{-7}$ *20*; α(IPF)=0.000430 *6*<br>Mult.: $A_2$=0.30 *+1−4*, $A_4$=0.0 (1990Si13); α(K)exp=0.00089 *3* (1972Ha71) and 0.0010 *3*, average of values given in 1956Sc18 and 1959St42.<br>δ: From 1990Si13. |
| 1903.45 *10* | 793×10$^1$ *12* | 2606.87 | 9/2$^+$ | 703.44 | 7/2$^-$ | E1(+M2) | +0.01 *+2−1* | 1.29×10$^{-3}$ *2* | %Iγ=2.46 *4*<br>α(K)=0.000697 *11*; α(L)=0.0001031 *17*; α(M)=2.37×10$^{-5}$ *4*<br>α(N)=6.00×10$^{-6}$ *10*; α(O)=1.195×10$^{-6}$ *20*; α(P)=1.266×10$^{-7}$ *21*; α(IPF)=0.000460 *7*<br>Mult.: $A_2$=0.32 *+2−3* (1990Si13); α(K)exp=0.0007 *2* (1972Ha71) and 0.00078 *18*, average of values given in 1956Sc18 and 1959St42.<br>δ: From 1990Si13. |
| 1965.8 *5* | 26 *5* | 1965.98 | (7/2,9/2$^-$) | 0.0 | 5/2$^-$ | | | | %Iγ=0.0081 *16* |
| [x]2003.3 *5* | 12 *5* | | | | | | | | %Iγ=0.0037 *16* |
| 2565.10 *15* | 136 *7* | 2565.12 | 9/2$^+$ | 0.0 | 5/2$^-$ | M2 | | 0.00438 | %Iγ=0.0423 *22*<br>α(K)=0.00323 *5*; α(L)=0.000536 *8*; α(M)=0.0001252 *18*<br>α(N)=3.18×10$^{-5}$ *5*; α(O)=6.36×10$^{-6}$ *9*; α(P)=6.84×10$^{-7}$ *10*; α(IPF)=0.000454 *7*<br>Mult.: α(K)exp=0.0023 *6* (1972Ha71) and 0.0018 *9* (1959St42). |
| 2607.1 *2* | 60 *6* | 2606.87 | 9/2$^+$ | 0.0 | 5/2$^-$ | M2 | | 0.00425 | %Iγ=0.0186 *19*<br>α(K)=0.00310 *5*; α(L)=0.000515 *8*; α(M)=0.0001202 *17*<br>α(N)=3.06×10$^{-5}$ *5*; α(O)=6.10×10$^{-6}$ *9*; α(P)=6.57×10$^{-7}$ *10*; α(IPF)=0.000473 *7*<br>Mult.: α(K)exp=0.0029 *8* (1972Ha71) and 0.0025 *13* (1959St42). |





$^{205}_{82}Pb_{123}$-17

$\gamma(^{205}Pb)$ (continued)

† From 1972Ha71, unless otherwise stated.
‡ From coincidence data. Eγ deduced from E(level) in 1972Ha71.
# Using the briccmixing program and the α(K)exp and γ(θ) data.
@ Additional information 1.
& For absolute intensity per 100 decays, multiply by $3108\times10^{-7}$ *20*.
a Multiply placed.
b Placement of transition in the level scheme is uncertain.
x γ ray not placed in level scheme.





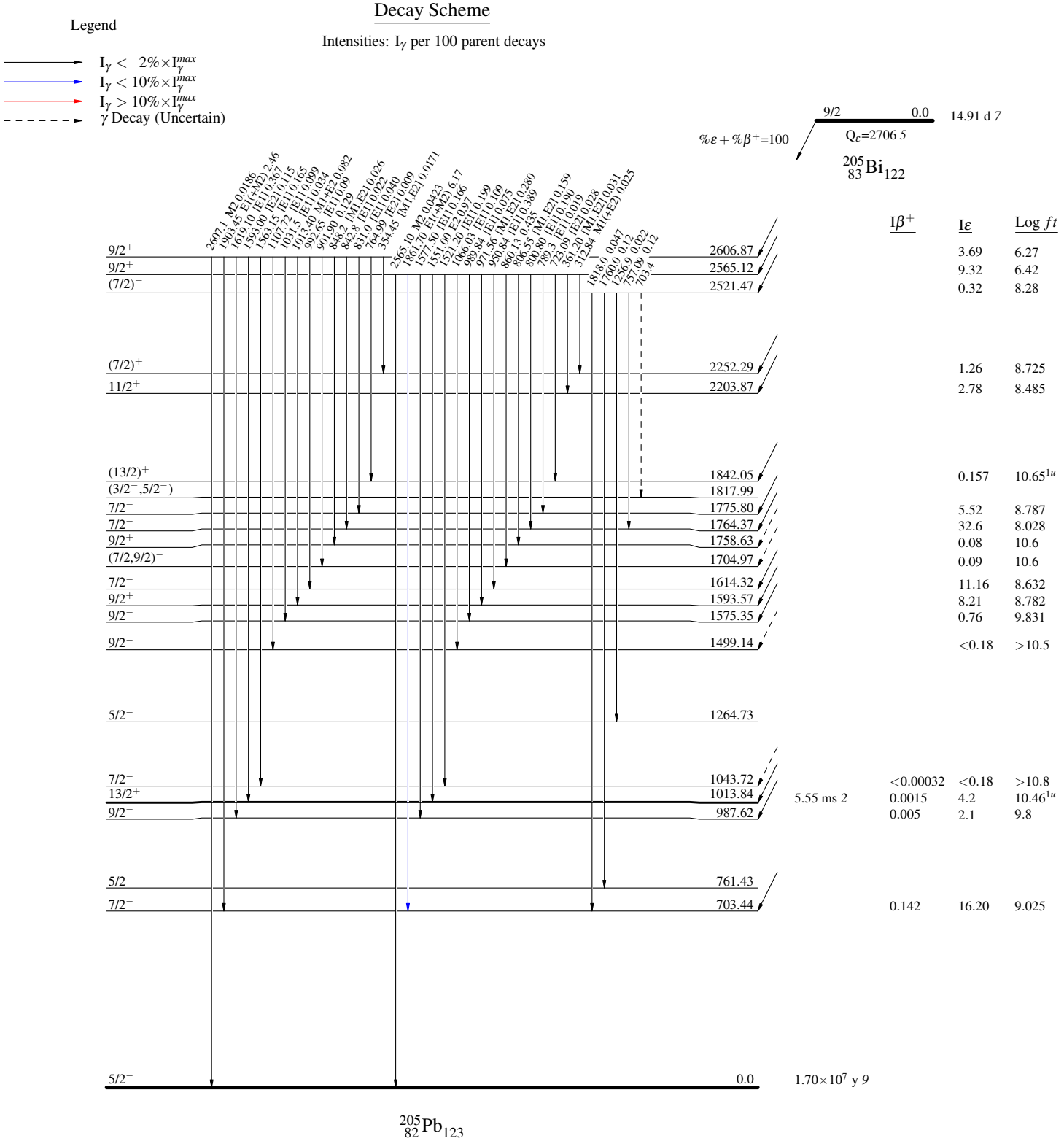


$^{205}_{82}Pb_{123}$-18

## $^{205}$Bi ε decay 1972Ha71

### Decay Scheme

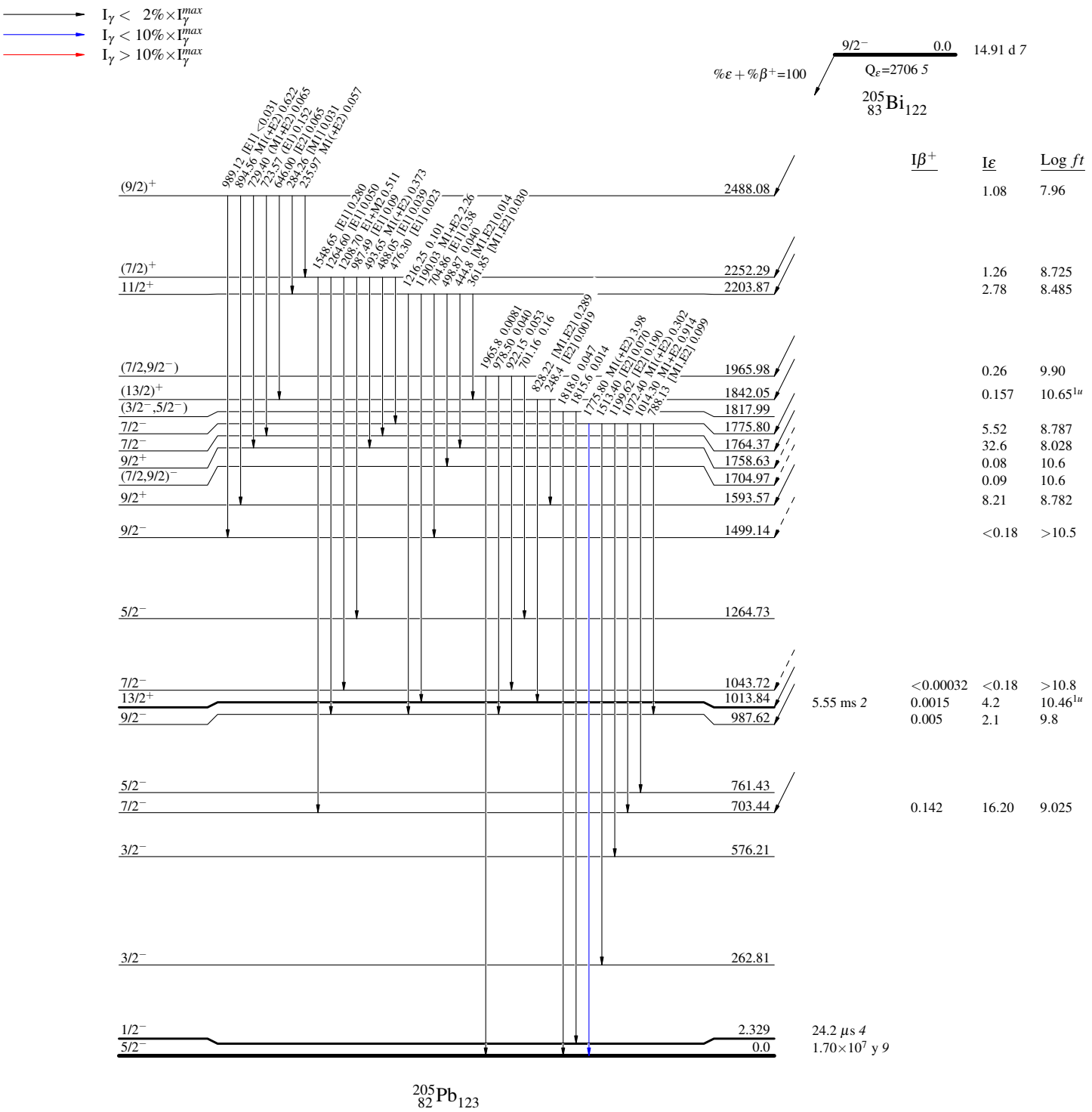
Intensities: $I_\gamma$ per 100 parent decays



## $^{205}$Bi ε decay 1972Ha71

### Decay Scheme (continued)

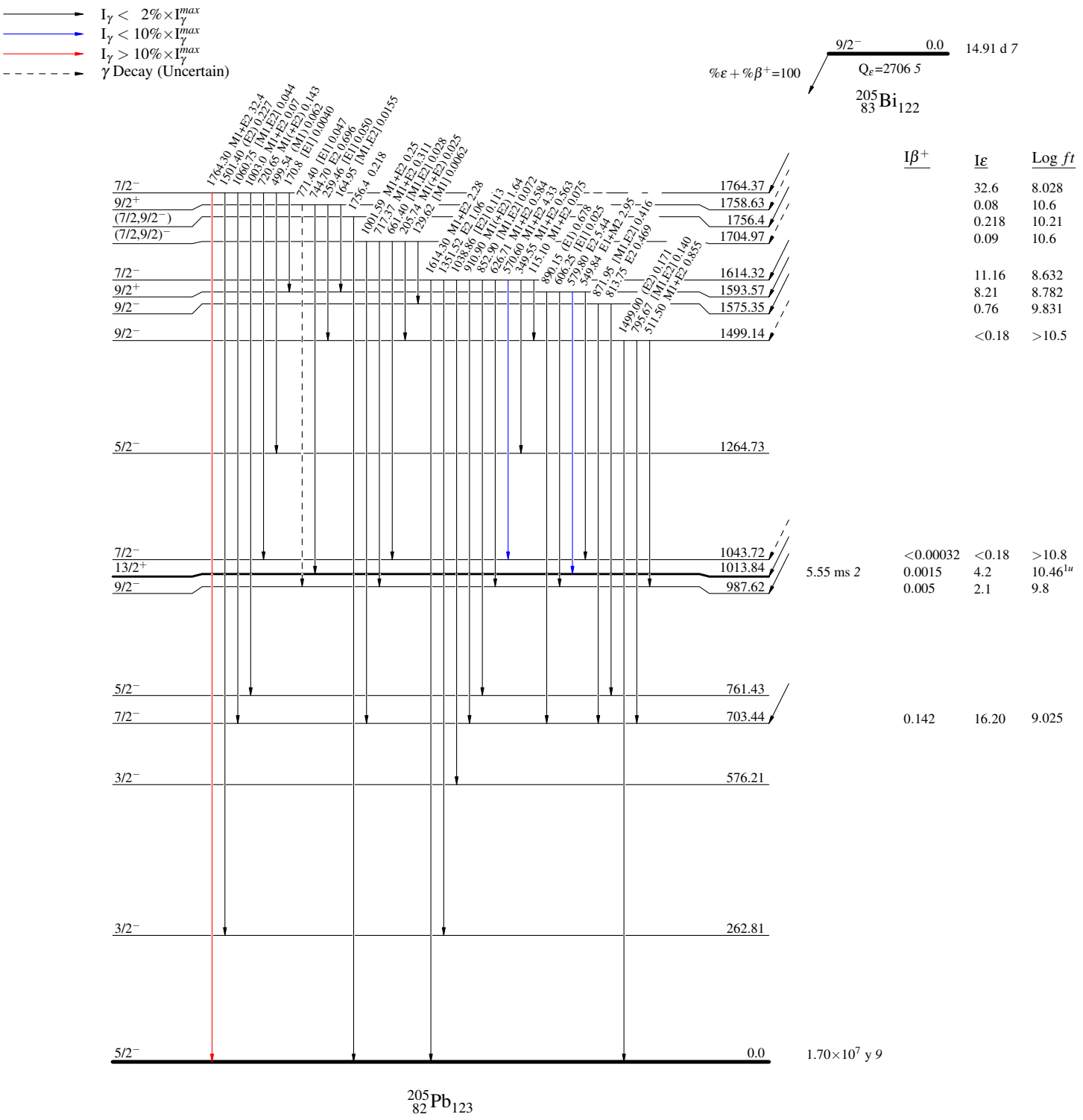
Intensities: $I_\gamma$ per 100 parent decays



## $^{205}$Bi ε decay 1972Ha71

### Decay Scheme (continued)

Intensities: $I_\gamma$ per 100 parent decays



## $^{205}$Bi ε decay 1972Ha71

### Decay Scheme (continued)

Intensities: $I_\gamma$ per 100 parent decays