## (HI,xnγ) 1985Pi05,1994Da17

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | Balraj Singh | NDS 108, 79 (2007) | 15-Oct-2006 |

1985Pi05: $^{194}$Pt($^{10}$B,5nγ) E=57-72 MeV; Measured Eγ, Iγ, γγ, γ(θ), γγ(θ)(DCO), lifetimes by γ(t), excitation functions.
1994Da17: $^{186}$W($^{19}$F,6nγ) E=115, 105 MeV. Measured Eγ, Iγ, γγ γγ(θ)(DCO) using TESSA3 array with 16 Compton-suppressed Ge detectors and inner array of 50 BGO detectors. Deduced dipole band interpreted As oblate magnetic rotational band.
2003Gl05: $^{9}$Be($^{238}$U,Xγ) E=750 MeV/nucleon. Measured $T_{1/2}$ for $29/2^-$ isomer At 2523+x.

### $^{199}$Bi Levels

1985Pi05 proposed configurations for several levels.

| E(level)† | Jπ‡ | $T_{1/2}$@ | Comments |
|---|---|---|---|
| 0.0 | $9/2^-$ | | |
| 1002.18 *19* | $13/2^-$ | | |
| 1034.3 *3* | $11/2^-$ | | |
| 1396.3 *3* | $13/2^+$# | | |
| 1501.77 *25* | $17/2^-$ | | |
| 1619.4 *5* | | | |
| 1635.9 *4* | | | |
| 1647.5 *3* | $17/2^+$ | 34.1 ns *24* | |
| 1922.3 *4* | $21/2^+$# | <50 ns | |
| 1922.3+x | $25/2^+$# | 0.10 μs *3* | E(level): x=25 *25* from estimated Eγ(to 1922.3 level)<50 keV in the decay of 0.10 μs isomer decay. |
| 1999.5 *5* | $(19/2^-)$ | | |
| 2001.0 *5* | | | |
| 2029.8+x *3* | $27/2^+$# | | |
| 2179.82+x *22* | $(27/2^-)$ | | |
| 2238.06+x *18* | $(27/2^-)$ | | |
| 2345.59+x? *25* | | | |
| 2435.7+x? *4* | | | |
| 2443.2+x *3* | | | |
| 2523.17+x *22* | $29/2^-$ | 168 ns *13* | $T_{1/2}$: other: 171 ns *63* (2003Gl05). |
| 2570.39+x *25* | $(27/2^+)$ | | |
| 2749.2+x *4* | | | |
| 2928.1+x *3* | (29/2) | | |
| 3018.0+x *3* | $31/2^-$# | | |
| 3401.2+x *3* | $33/2^-$# | | |
| 3635.0+x *5* | | | |
| 3780.9+x *5* | $(35/2^-)$ | | |
| 3903.0+x? *5* | | | |
| 4296.9+x *11* | | | |
| y& | J | | |
| 184.4+y& *5* | J+1 | | |
| 400.2+y& *7* | J+2 | | |
| 642.0+y& *9* | J+3 | | |
| 923.2+y& *10* | J+4 | | |
| 1236.7+y& *12* | J+5 | | |
| 1590.3+y& *13* | J+6 | | |

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**(HI,xnγ) 1985Pi05,1994Da17 (continued)**

$^{199}$Bi Levels (continued)

| E(level)[†] | Jπ[‡] |
|---|---|
| 1950.8+y[&] *14* | J+7 |
| 2316.7+y[&] *15* | J+8 |

[†] From least-squares fit to Eγ′s.
[‡] From 1985Pi05 based on γ(θ), γγ(θ)(DCO) for selected transitions and band structure. The assignments are the same In 'Adopted Levels', except that some of these are placed In parentheses when strong arguments are lacking.
[#] Placed In parentheses In 'Adopted Levels'.
[@] From γ(t) (1985Pi05).
[&] Band(A): magnetic-dipole rotational band (1994Da17). Oblate structure. Population intensity ≈ 20% relative to 100 for 494.8γ from 31/2$^-$ level. Tentative configuration=$\pi(h_{9/2}i_{13/2}s^{-1}_{1/2})\otimes\nu(i^{-1}_{13/2}$ or $i^{-3}_{13/2})$.

γ($^{199}$Bi)

| Eγ[†] | Iγ[†] | Ei(level) | Jiπ | Ef | Jfπ | Mult.[‡] | Comments |
|---|---|---|---|---|---|---|---|
| x | | 1922.3+x | 25/2$^+$ | 1922.3 | 21/2$^+$ | | |
| (80.0[#]) | | 2523.17+x | 29/2$^-$ | 2443.2+x | | | |
| (87.6[#]) | | 2523.17+x | 29/2$^-$ | 2435.7+x? | | | |
| 107.3 *4* | 1.5[&] *11* | 2029.8+x | 27/2$^+$ | 1922.3+x | 25/2$^+$ | | |
| 145.70 *20* | 75.2 *8* | 1647.5 | 17/2$^+$ | 1501.77 | 17/2$^-$ | (E1) | $A_2$=+0.133 *4*; $A_4$=−0.016 *7*; DCO=1.02 *4*<br>Mult.: ΔJ=0, dipole transition. |
| 184.4[@] *5* | | 184.4+y | J+1 | y | J | D[@] | |
| 197.6 *3* | 4.4[&] *10* | 2435.7+x? | | 2238.06+x | (27/2$^-$) | | |
| 205.13 *25* | 7.68 *9* | 2443.2+x | | 2238.06+x | (27/2$^-$) | D | $A_2$=−0.090 *24*; $A_4$=+0.03 *4* |
| 215.8[@] *5* | | 400.2+y | J+2 | 184.4+y | J+1 | D[@] | |
| 239.8 *4* | 1.81 *10* | 1635.9 | | 1396.3 | 13/2$^+$ | | $A_2$=+0.36 *12*; $A_4$=+0.03 *19* |
| 241.8[@] *5* | | 642.0+y | J+3 | 400.2+y | J+2 | D[@] | |
| 251.13 *25* | 6.40 *7* | 1647.5 | 17/2$^+$ | 1396.3 | 13/2$^+$ | (E2) | $A_2$=+0.087 *21*; $A_4$=−0.06 *4* |
| 257.55 *25* | 4.80 *8* | 2179.82+x | (27/2$^-$) | 1922.3+x | 25/2$^+$ | D | $A_2$=−0.13 *3*; $A_4$=−0.03 *5* |
| 274.82 *20* | 81.3 *9* | 1922.3 | 21/2$^+$ | 1647.5 | 17/2$^+$ | (E2) | $A_2$=+0.130 *4*; $A_4$=−0.040 *6*; DCO=0.97 *13* |
| 281.2[@] *5* | | 923.2+y | J+4 | 642.0+y | J+3 | D[@] | |
| 285.16 *25* | 14.91 *15* | 2523.17+x | 29/2$^-$ | 2238.06+x | (27/2$^-$) | D+Q | $A_2$=−0.185 *12*; $A_4$=+0.047 *20*; DCO=1.23 *14* |
| 313.5[@] *5* | | 1236.7+y | J+5 | 923.2+y | J+4 | D[@] | |
| 315.80 *20* | 38.9 *4* | 2238.06+x | (27/2$^-$) | 1922.3+x | 25/2$^+$ | D | $A_2$=−0.108 *5*; $A_4$=+0.044 *9*; DCO=1.25 *13* |
| [x]328.6 *3* | 3.8[&] *10* | | | | | | |
| 343.4 *3* | 5.5[&] *9* | 2523.17+x | 29/2$^-$ | 2179.82+x | (27/2$^-$) | | |
| 352.0 *4* | 2.86 *6* | 1999.5 | (19/2$^-$) | 1647.5 | 17/2$^+$ | | $A_2$=−0.20 *5*; $A_4$=−0.20 *8*<br>sign of $A_4$ is inconsistent with ΔJ=1 transition. |
| 353.5 *4* | 2.5[&] *6* | 2001.0 | | 1647.5 | 17/2$^+$ | | |
| 353.6[@] *5* | | 1590.3+y | J+6 | 1236.7+y | J+5 | D[@] | |
| 360.5[@] *5* | | 1950.8+y | J+7 | 1590.3+y | J+6 | D[@] | |
| 362.01 *25* | 6.13 *11* | 1396.3 | 13/2$^+$ | 1034.3 | 11/2$^-$ | D | $A_2$=−0.06 *4*; $A_4$=+0.08 *6* |
| 365.9[@] *5* | | 2316.7+y | J+8 | 1950.8+y | J+7 | D[@] | |
| [x]366.96 *25* | 5.2[&] *11* | | | | | | |
| 379.7 *4* | 4.57 *10* | 3780.9+x | (35/2$^-$) | 3401.2+x | 33/2$^-$ | D | $A_2$=−0.38 *5*; $A_4$=−0.09 *8* |

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**(HI,xnγ) 1985Pi05,1994Da17 (continued)**

γ($^{199}$Bi) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [†] | $E_i$(level) | $J_i^\pi$ | $E_f$ | $J_f^\pi$ | Mult.[‡] | δ[‡] | Comments |
|---|---|---|---|---|---|---|---|---|
| 383.05 *25* | 8.48 *15* | 3401.2+x | 33/2$^-$ | 3018.0+x | 31/2$^-$ | D+Q | −0.10 *11* | $A_2$=−0.24 *4*; $A_4$=−0.11 *6* |
| 393.9 | 4.4[&] *13* | 4296.9+x | | 3903.0+x? | | | | |
| 394.1 | 3.6[&] *13* | 1396.3 | 13/2$^+$ | 1002.18 | 13/2$^-$ | | | |
| 403.65 *25* | 2.58 *13* | 2749.2+x | | 2345.59+x? | | | | $A_2$=+0.50 *10*; $A_4$=−0.10 *16* |
| [x]419.82 *25* | 4.7[&] *8* | | | | | | | |
| 423.29 *25* | 4.2[&] *10* | 2345.59+x? | | 1922.3+x | 25/2$^+$ | | | |
| 493.2 *3* | 18.94 *19* | 2523.17+x | 29/2$^-$ | 2029.8+x | 27/2$^+$ | D | | $A_2$=−0.122 *10*; $A_4$=−0.003 *6* |
| 494.80 *25* | 25.5 *3* | 3018.0+x | 31/2$^-$ | 2523.17+x | 29/2$^-$ | (M1+E2) | −1.9 *17* | $A_2$=−0.390 *8*; $A_4$=+0.049 *12* |
| 499.61 *20* | 85.4 *9* | 1501.77 | 17/2$^-$ | 1002.18 | 13/2$^-$ | Q | | $A_2$=+0.118 *5*; $A_4$=−0.039 *7*; DCO=1.01 *5* |
| 601.5 *3* | 6.23 *15* | 1635.9 | | 1034.3 | 11/2$^-$ | | | $A_2$=−0.09 *5*; $A_4$=−0.13 *8* |
| 617.0 *3* | 2.8[&] *10* | 3635.0+x | | 3018.0+x | 31/2$^-$ | | | |
| 617.2 *4* | ≈2 | 1619.4 | | 1002.18 | 13/2$^-$ | | | |
| 648.09 *25* | 6.44 *11* | 2570.39+x | (27/2$^+$) | 1922.3+x | 25/2$^+$ | D | | $A_2$=−0.45 *4*; $A_4$=0.00 *6* |
| 878.06 *25* | 5.69 *20* | 3401.2+x | 33/2$^-$ | 2523.17+x | 29/2$^-$ | Q | | $A_2$=+0.38 *8*; $A_4$=−0.25 *12* |
| 885.0 *3* | 4.84 *13* | 3903.0+x? | | 3018.0+x | 31/2$^-$ | D | | $A_2$=−0.20 *6*; $A_4$=−0.07 *9* |
| [x]933.6 *4* | 4.12 *13* | | | | | | | $A_2$=+0.16 *6*; $A_4$=−0.02 *10* |
| 1002.19 *20* | 100.0 *3* | 1002.18 | 13/2$^-$ | 0.0 | 9/2$^-$ | Q | | $A_2$=+0.122 *5*; $A_4$=−0.010 *8* |
| 1005.8 *3* | 8.62 *13* | 2928.1+x | (29/2) | 1922.3+x | 25/2$^+$ | Q | | $A_2$=+0.21 *3*; $A_4$=−0.12 *5* |
| 1034.3 *3* | 17.86 *18* | 1034.3 | 11/2$^-$ | 0.0 | 9/2$^-$ | (M1+E2) | −1.3 *10* | $A_2$=−0.272 *21*; $A_4$=+0.05 *3* |

[†] From $^{194}$Pt($^{10}$B,5nγ) at E=70 MeV (1985Pi05) unless otherwise stated. Transitions for the dipole band are from 1994Da17.
[‡] From γ(θ) (1985Pi05).
[#] Not seen, expected from γγ coincidence spectra.
[@] From 1994Da17. DCO′s for some of the transitions are shown In figure 2 of 1994Da17.
[&] From γγ coin data (1985Pi05).
[x] γ ray not placed in level scheme.

**(HI,xnγ) 1985Pi05,1994Da17**

Level Scheme

Intensities: Relative $I_\gamma$

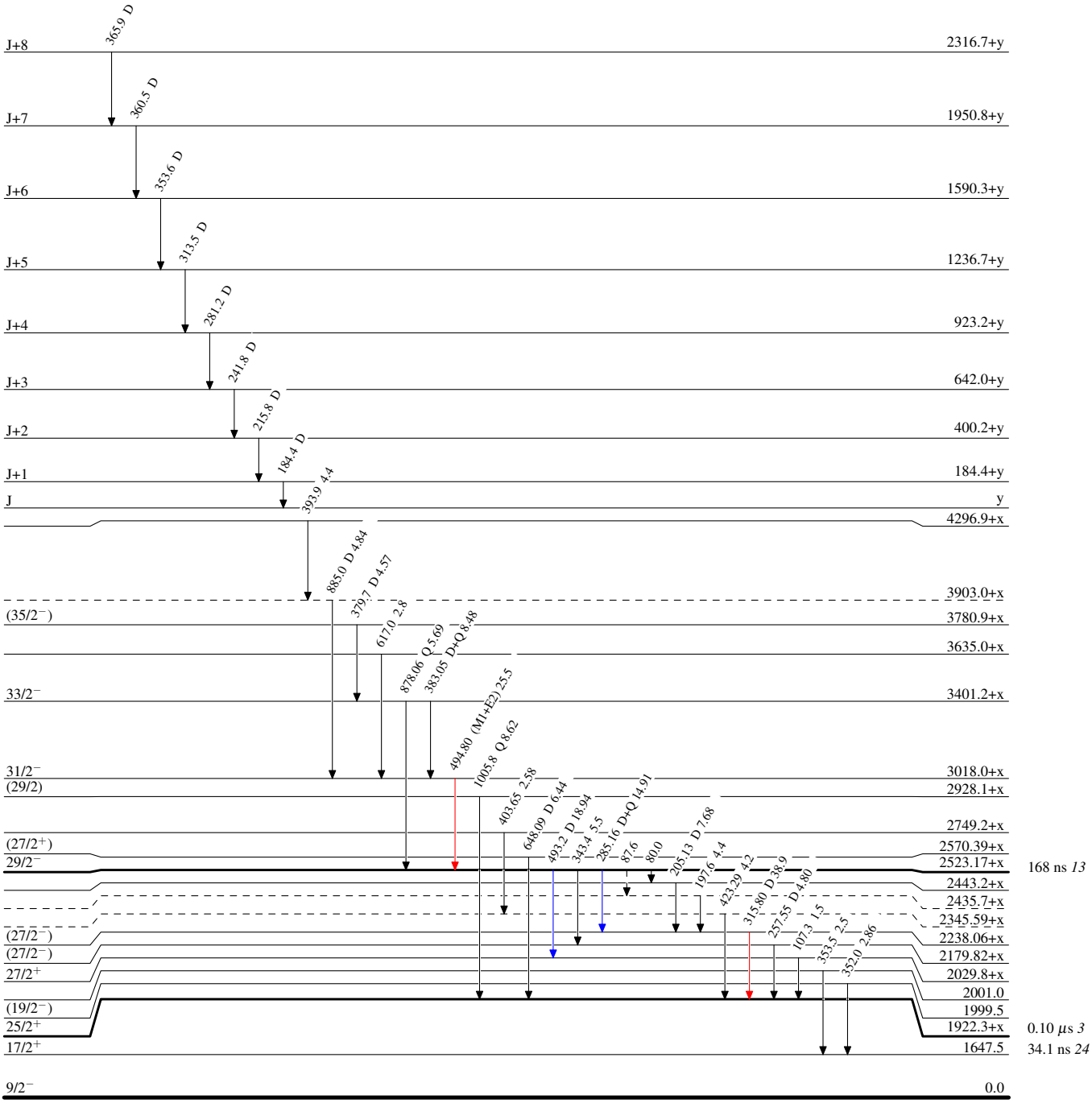
Legend

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

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

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

γ Decay (Uncertain)

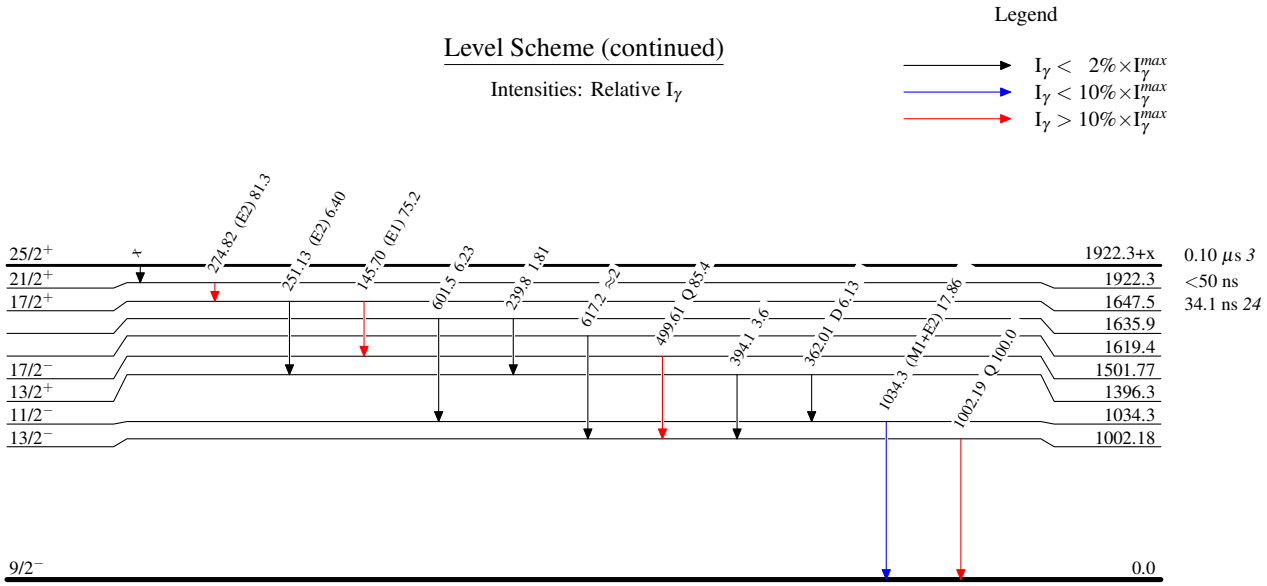



$^{199}_{83}Bi_{116}$

**(HI,xnγ) 1985Pi05,1994Da17**

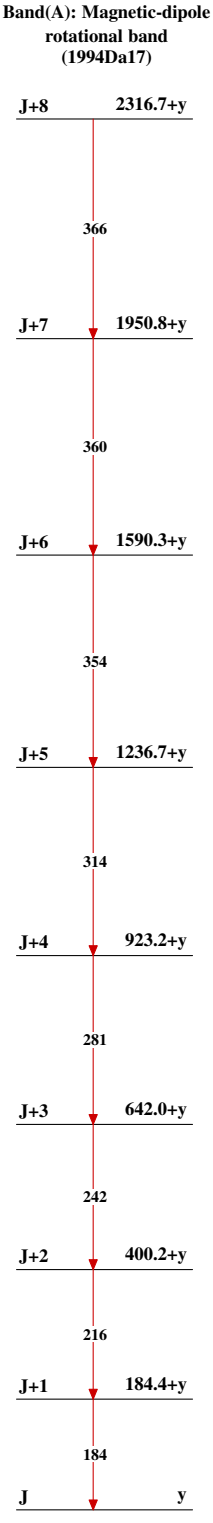
Level Scheme (continued)

Intensities: Relative $I_\gamma$




$^{199}_{83}Bi_{116}$

**(HI,xnγ) 1985Pi05,1994Da17**




$^{199}_{83}Bi_{116}$