## $^{201}$Hg(n,$\gamma$) E=thermal 1975Br02

| Type | Author | History Citation | Literature Cutoff Date |
|---|---|---|---|
| Full Evaluation | F. G. Kondev | NDS 196,342 (2024) | 1-Sep-2023 |

1975Br02: facility HFBR, BNL. Target: 1 g HgO, enriched to >95% in $^{201}$Hg and packed in Al cylindrical can; Detectors: one 40 cm$^3$ Ge(Li) with energy resolutions of 2.5 keV at 1.3 MeV and 7 keV at 7 MeV and one 15 cm$^3$ Ge(Li) used in $\gamma\gamma$ coin; Measured: E$\gamma$, I$\gamma$, $\gamma\gamma$ coin, $\gamma\gamma(\theta)$ at angles of 180° and 135°.
Other: 1963Gr31.

### $^{202}$Hg Levels

| E(level)[†] | J$^\pi$[‡] | Comments |
|---|---|---|
| 0 | 0$^+$ | |
| 439.63 *11* | 2$^+$ | |
| 960.05 *12* | 2$^+$ | |
| 1119.80 *19* | (4$^+$) | |
| 1182.33 *13* | 1$^+$,2$^+$ | |
| 1311.77 *18* | (4$^+$,3$^-$) | |
| 1347.84 *20* | 1$^+$,2$^+$ | |
| 1389.87 *16* | 1$^+$,2$^+$ | |
| 1562.12 *15* | (3)$^+$ | |
| 1564.8 *4* | (0$^+$) | |
| 1575.76 *18* | (2$^+$) | J$^\pi$: From Adopted Levels. |
| 1643.9 *8* | 0$^+$ | |
| 1678.31 *17* | 1$^+$,2$^+$ | |
| 1746.63 *17* | 1,2 | |
| 1788.5 *3* | (2)$^+$ | |
| 1794.18 *24* | | |
| 1823.63 *14* | 1$^+$,2$^+$ | |
| 1852.20 *20* | (2)$^+$ | |
| 1862.2 *4* | (2)$^+$ | |
| 1959.48 *21* | 1$^+$,2$^+$ | |
| 1966.1 *3* | (2)$^+$ | |
| 2071.3 *4* | 2$^+$ | |
| 2126.69 *17* | 1$^+$,2$^+$ | |
| 2161.6 *4* | | |
| 2280.27 *15* | 1$^+$,2$^+$ | |
| 2309.6 *5* | | |
| 2323.2 *4* | | |
| 2357.3 *5* | | |
| 7754.1 *2* | 1$^-$,2$^-$ | Additional information 1.<br>E(level): From 2021Wa16.<br>J$^\pi$: Thermal neutron capture from $^{201}$Hg($J^\pi$=3/2$^-$). |

† From a least-squares fit to E$\gamma$.
‡ From 1975Br02, based on $\gamma$ de-excitation pattern, unless otherwise stated. The assignments to 0$^+$ states are based on the unique $\gamma\gamma(\theta)$ for the 0$^+$ to 2$^+$ to 0$^+$ cascade.

### $\gamma$($^{202}$Hg)

| E$_\gamma$[†] | I$_\gamma$[‡] | E$_i$(level) | J$^\pi_i$ | E$_f$ | J$^\pi_f$ |
|---|---|---|---|---|---|
| 77.1 *4* | 2 | 1823.63 | 1$^+$,2$^+$ | 1746.63 | 1,2 |
| [x]80.0 *3* | 18 | | | | |
| [x]95.9[b] *3* | 2.1 | | | | |
| [x]101.0[b] *4* | 0.2 | | | | |

Continued on next page (footnotes at end of table)

**$^{201}$Hg(n,γ) E=thermal 1975Br02 (continued)**

γ($^{202}$Hg) (continued)

| $E_\gamma$[†] | $I_\gamma$[‡] | $E_i$(level) | $J^\pi_i$ | $E_f$ | $J^\pi_f$ |
|---|---|---|---|---|---|
| 104.5[b] 4 | 2.1 | 1966.1 | (2)$^+$ | 1862.2 | (2)$^+$ |
| [x]111.3[b] 6 | 1.7 | | | | |
| 113.1[b] 4 | 0.5 | 1966.1 | (2)$^+$ | 1852.20 | (2)$^+$ |
| [x]139.7 3 | 3.5 | | | | |
| [x]155.8[b] 14 | 1.5 | | | | |
| [x]162.3 6 | 2.3 | | | | |
| 172.0 4 | 1.3 | 1562.12 | (3)$^+$ | 1389.87 | 1$^+$,2$^+$ |
| 173.4[b] 4 | 0.5 | 1852.20 | (2)$^+$ | 1678.31 | 1$^+$,2$^+$ |
| 185.8 4 | 1.9 | 1575.76 | (2$^+$) | 1389.87 | 1$^+$,2$^+$ |
| [x]198.2 4 | 2.2 | | | | |
| 207.8 5 | 3.0 | 1389.87 | 1$^+$,2$^+$ | 1182.33 | 1$^+$,2$^+$ |
| 222.1 4 | 39 | 1182.33 | 1$^+$,2$^+$ | 960.05 | 2$^+$ |
| 227.2 6 | 2.6 | 1575.76 | (2$^+$) | 1347.84 | 1$^+$,2$^+$ |
| 247.4[b] 11 | 1.2 | 1823.63 | 1$^+$,2$^+$ | 1575.76 | (2$^+$) |
| 250.2 7 | 4.2 | 1562.12 | (3)$^+$ | 1311.77 | (4$^+$,3$^-$) |
| 288.4 5 | 4.3 | 1678.31 | 1$^+$,2$^+$ | 1389.87 | 1$^+$,2$^+$ |
| [x]308.0 4 | 2.3 8 | | | | |
| [x]312.9 3 | 2.6 7 | | | | |
| 320.3 7 | 1.3 | 2280.27 | 1$^+$,2$^+$ | 1959.48 | 1$^+$,2$^+$ |
| [x]326.2[b] 7 | ≈0.5 | | | | |
| [x]333.4[b] 4 | 0.8 3 | | | | |
| 351.5 2 | 12.6 32 | 1311.77 | (4$^+$,3$^-$) | 960.05 | 2$^+$ |
| 380.0[&] 3 | 9.1[&] 10 | 1562.12 | (3)$^+$ | 1182.33 | 1$^+$,2$^+$ |
| 380.0[&] 3 | 9.1[&] 10 | 2126.69 | 1$^+$,2$^+$ | 1746.63 | 1,2 |
| 388.1 5 | 23.6 35 | 1347.84 | 1$^+$,2$^+$ | 960.05 | 2$^+$ |
| 393.3 4 | 2.6 10 | 1575.76 | (2$^+$) | 1182.33 | 1$^+$,2$^+$ |
| 400.4[b] 8 | ≈0.9 | 1966.1 | (2)$^+$ | 1564.8 | (0$^+$) |
| [x]416.2[b] 5 | ≈0.8 | | | | |
| [x]422.7[b] 5 | ≈0.9 | | | | |
| 429.9 3 | 7.0 14 | 1389.87 | 1$^+$,2$^+$ | 960.05 | 2$^+$ |
| 434.0[&b] 8 | ≈3[&] | 1746.63 | 1,2 | 1311.77 | (4$^+$,3$^-$) |
| 434.0[&b] 8 | ≈3[&] | 1823.63 | 1$^+$,2$^+$ | 1389.87 | 1$^+$,2$^+$ |
| 439.5 2 | 128×10$^1$ 13 | 439.63 | 2$^+$ | 0 | 0$^+$ |
| 442.3 8 | ≈5.5 | 1562.12 | (3)$^+$ | 1119.80 | (4$^+$) |
| 456.3[&@] 3 | 3.6[&] 5 | 1575.76 | (2$^+$) | 1119.80 | (4$^+$) |
| 456.3[&@] 3 | 3.6[&] 6 | 2280.27 | 1$^+$,2$^+$ | 1823.63 | 1$^+$,2$^+$ |
| [x]468.0[b] 8 | 2.0 4 | | | | |
| 472.5 4 | 3.3 11 | 1862.2 | (2)$^+$ | 1389.87 | 1$^+$,2$^+$ |
| 476.5[&] 3 | 6.7[&] 20 | 1788.5 | (2)$^+$ | 1311.77 | (4$^+$,3$^-$) |
| 476.5[&] 3 | 6.7[&] 20 | 1823.63 | 1$^+$,2$^+$ | 1347.84 | 1$^+$,2$^+$ |
| [x]481.4 7 | ≈2.4 | | | | |
| 486.1[b] 4 | 1.0 3 | 2280.27 | 1$^+$,2$^+$ | 1794.18 | |
| 496.2 4 | 2.0 4 | 1678.31 | 1$^+$,2$^+$ | 1182.33 | 1$^+$,2$^+$ |
| 520.3 3 | 363 36 | 960.05 | 2$^+$ | 439.63 | 2$^+$ |
| 541.1[b] 3 | 1.1 3 | 1852.20 | (2)$^+$ | 1311.77 | (4$^+$,3$^-$) |
| 549.7[&@#] 10 | 8[&] 2 | 1862.2 | (2)$^+$ | 1311.77 | (4$^+$,3$^-$) |
| 549.7[&@#] 10 | 8[&] 2 | 2126.69 | 1$^+$,2$^+$ | 1575.76 | (2$^+$) |
| [x]556.0 3 | 2.9 6 | | | | |

Continued on next page (footnotes at end of table)

**$^{201}$Hg(n,γ) E=thermal 1975Br02 (continued)**

γ($^{202}$Hg) (continued)

| Eγ[†] | Iγ[‡] | Ei(level) | $J^{\pi}_{i}$ | Ef | $J^{\pi}_{f}$ |
|---|---|---|---|---|---|
| 564.5[&@] 3 | 3.8[&] 12 | 1746.63 | 1,2 | 1182.33 | 1+,2+ |
| 564.5[&@] 3 | 3.8[&] 11 | 2126.69 | 1+,2+ | 1562.12 | (3)+ |
| [x]596.0 2 | 4.5 5 | | | | |
| 602.1[&] 2 | 8.6[&] 9 | 1562.12 | (3)+ | 960.05 | 2+ |
| 602.1[&] 2 | 8.6[&] 9 | 2280.27 | 1+,2+ | 1678.31 | 1+,2+ |
| 611.3[&] 5 | ≈2[&] | 1794.18 | | 1182.33 | 1+,2+ |
| 611.3[&] 5 | ≈2[&] | 1959.48 | 1+,2+ | 1347.84 | 1+,2+ |
| 615.8 3 | 5.1 10 | 1575.76 | (2+) | 960.05 | 2+ |
| 640.9 3 | 8.4 8 | 1823.63 | 1+,2+ | 1182.33 | 1+,2+ |
| 653.7 6 | ≈2.8 | 1966.1 | (2)+ | 1311.77 | (4+,3−) |
| [x]671.4 3 | 3.2 6 | | | | |
| 680.3 2 | 52 5 | 1119.80 | (4+) | 439.63 | 2+ |
| 718.3[&] 3 | 14.1[&] 14 | 1678.31 | 1+,2+ | 960.05 | 2+ |
| 718.3[&] 3 | 14.1[&] 14 | 2280.27 | 1+,2+ | 1562.12 | (3)+ |
| 732.3 5 | ≈0.7 | 1852.20 | (2)+ | 1119.80 | (4+) |
| 742.6 2 | 19.4 20 | 1182.33 | 1+,2+ | 439.63 | 2+ |
| 783.0[a] 8 | 2.9[a] 12 | 1966.1 | (2)+ | 1182.33 | 1+,2+ |
| 786.3 4 | 7.8 8 | 1746.63 | 1,2 | 960.05 | 2+ |
| [x]810.4 6 | 4.1 16 | | | | |
| [x]858.2 6 | ≈2.0 | | | | |
| 863.3 3 | 22.4 22 | 1823.63 | 1+,2+ | 960.05 | 2+ |
| [x]868.6 7 | 4.8 17 | | | | |
| 872.1 3 | 7.4 7 | 1311.77 | (4+,3−) | 439.63 | 2+ |
| 892.0 3 | 3.2 6 | 1852.20 | (2)+ | 960.05 | 2+ |
| 908.5 3 | 42 4 | 1347.84 | 1+,2+ | 439.63 | 2+ |
| 944.6 6 | 5.1 18 | 2126.69 | 1+,2+ | 1182.33 | 1+,2+ |
| 950.3 3 | 35.6 36 | 1389.87 | 1+,2+ | 439.63 | 2+ |
| 960.1 3 | 47 5 | 960.05 | 2+ | 0 | 0+ |
| [x]971.9 6 | ≈3.2 | | | | |
| [x]983.1 6 | 4.8 19 | | | | |
| [x]989.9 5 | ≈2.6 | | | | |
| [x]992.0 5 | 3.5 12 | | | | |
| 999.7 4 | 1.3 4 | 1959.48 | 1+,2+ | 960.05 | 2+ |
| [x]1023.2 4 | 2.8 7 | | | | |
| [x]1078.1 4 | 3.2 8 | | | | |
| [x]1082.1 5 | 2.2 4 | | | | |
| 1097.8 3 | 22.3 10 | 2280.27 | 1+,2+ | 1182.33 | 1+,2+ |
| 1122[b] 1 | ≈1 | 1562.12 | (3)+ | 439.63 | 2+ |
| 1125.2 3 | 9.3 15 | 1564.8 | (0+) | 439.63 | 2+ |
| 1135.9 3 | 5.7 20 | 1575.76 | (2+) | 439.63 | 2+ |
| [x]1140.7[#] 5 | ≈2.2 | | | | |
| 1166.9 3 | 5.3 11 | 2126.69 | 1+,2+ | 960.05 | 2+ |
| [x]1173.5[b] 4 | ≈1.3 | | | | |
| 1182.4[@] 4 | 4.4 11 | 1182.33 | 1+,2+ | 0 | 0+ |
| ≈1203[a#] | ≈10[a] | 1643.9 | 0+ | 439.63 | 2+ |
| 1238.8 3 | 11.3 11 | 1678.31 | 1+,2+ | 439.63 | 2+ |
| [x]1293.4[a] 6 | 4.5[a] 14 | | | | |
| 1306.9 3 | 30.2 30 | 1746.63 | 1,2 | 439.63 | 2+ |
| [x]1314.2[b] 6 | 3.6 14 | | | | |
| 1320.5 3 | 18 7 | 2280.27 | 1+,2+ | 960.05 | 2+ |
| 1354.8 3 | 64 6 | 1794.18 | | 439.63 | 2+ |

Continued on next page (footnotes at end of table)

## $^{201}$Hg(n,γ) E=thermal 1975Br02 (continued)

### γ($^{202}$Hg) (continued)

| $E_\gamma$ [†] | $I_\gamma$ [‡] | $E_i$(level) | $J^\pi_i$ | $E_f$ | $J^\pi_f$ | Comments |
|---|---|---|---|---|---|---|
| 1384.0 *3* | 57 *11* | 1823.63 | $1^+,2^+$ | 439.63 | $2^+$ | |
| 1389.4 *4* | 4.5 *9* | 1389.87 | $1^+,2^+$ | 0 | $0^+$ | |
| 1412.3 *3* | 18.1 *18* | 1852.20 | $(2)^+$ | 439.63 | $2^+$ | |
| [x]1435.8 *5* | 2.7 *11* | | | | | |
| [x]1477.9[b] *2* | 0.5 *2* | | | | | |
| 1519.6 *6* | 5.0 *15* | 1959.48 | $1^+,2^+$ | 439.63 | $2^+$ | |
| 1526.7 *3* | 36 *4* | 1966.1 | $(2)^+$ | 439.63 | $2^+$ | |
| [x]1577.8[@] *4* | 8.6 *17* | | | | | |
| [x]1631.7 *3* | 14 *3* | | | | | |
| 1631.7 *3* | 14.3 *29* | 2071.3 | $2^+$ | 439.63 | $2^+$ | |
| [x]1646.8 *4* | 5.6 *11* | | | | | |
| 1686.7 *3* | 29.9 *30* | 2126.69 | $1^+,2^+$ | 439.63 | $2^+$ | |
| [x]1722.0[&] *3* | 53[&] *11* | | | | | |
| 1722.0[&] *3* | 53[&] *11* | 2161.6 | | 439.63 | $2^+$ | |
| [x]1765.5 *3* | 5.1 *10* | | | | | |
| [x]1783.7 *4* | 8.5 *13* | | | | | |
| 1789.0 *4* | 6.6 *7* | 1788.5 | $(2)^+$ | 0 | $0^+$ | |
| 1794.4[#] *6* | 1.8 *8* | 1794.18 | | 0 | $0^+$ | |
| [x]1802.0[b] *6* | 2.4 *5* | | | | | |
| [x]1810.3[a] *3* | 2.4[a] *6* | | | | | |
| 1823.1[a] *3* | 4.5[a] *16* | 1823.63 | $1^+,2^+$ | 0 | $0^+$ | |
| 1840.4 *3* | 32.8 *33* | 2280.27 | $1^+,2^+$ | 439.63 | $2^+$ | |
| 1853.0[@] *4* | 8.3 *21* | 1852.20 | $(2)^+$ | 0 | $0^+$ | |
| [x]1870.0[&] *4* | 2.4[&] *5* | | | | | |
| 1870.0[&] *4* | 2.4[&] *5* | 2309.6 | | 439.63 | $2^+$ | |
| [x]1878.8[#] *4* | 2.7 *6* | | | | | |
| [x]1883.6[&] *3* | 9.6[&] *10* | | | | | |
| 1883.6[&] *3* | 9.6[&] *10* | 2323.2 | | 439.63 | $2^+$ | |
| [x]1917.7[&] *4* | 4.8[&] *14* | | | | | |
| 1917.7[&] *4* | 4.8[&] *14* | 2357.3 | | 439.63 | $2^+$ | |
| [x]1932.2 *3* | 7.0 *7* | | | | | |
| [x]1938.7[#] *3* | 8.4 *8* | | | | | |
| 1959.4[#] *3* | 4.0 *10* | 1959.48 | $1^+,2^+$ | 0 | $0^+$ | |
| [x]1976.3 *3* | 6.5 *13* | | | | | |
| 5473.4 *6* | 90 *10* | 7754.1 | $1^-,2^-$ | 2280.27 | $1^+,2^+$ | |
| 5626.9 *4* | 33 *6* | 7754.1 | $1^-,2^-$ | 2126.69 | $1^+,2^+$ | |
| 5787.9 *8* | 24 *4* | 7754.1 | $1^-,2^-$ | 1966.1 | $(2)^+$ | |
| 5930.2 *5* | 84 *10* | 7754.1 | $1^-,2^-$ | 1823.63 | $1^+,2^+$ | |
| 5960.5 *7* | 84 *10* | 7754.1 | $1^-,2^-$ | 1794.18 | | $E_\gamma$: Broad peak. |
| 6007.2 *6* | 18 *3* | 7754.1 | $1^-,2^-$ | 1746.63 | 1,2 | |
| 6110.0 *8* | 13 *2* | 7754.1 | $1^-,2^-$ | 1643.9 | $0^+$ | |
| 6192.0 *5* | 31 *6* | 7754.1 | $1^-,2^-$ | 1562.12 | $(3)^+$ | $I_\gamma$: Value corrected for a contribution from a line in $^{201}$Hg. |
| 6364.8 *7* | 3.5 *7* | 7754.1 | $1^-,2^-$ | 1389.87 | $1^+,2^+$ | |
| 6406.2 *9* | 19 *3* | 7754.1 | $1^-,2^-$ | 1347.84 | $1^+,2^+$ | |
| 6571.5 *4* | 32 *6* | 7754.1 | $1^-,2^-$ | 1182.33 | $1^+,2^+$ | |
| 6793.8 *4* | 52 *7* | 7754.1 | $1^-,2^-$ | 960.05 | $2^+$ | |
| 7314.4 *4* | 54 *7* | 7754.1 | $1^-,2^-$ | 439.63 | $2^+$ | |
| 7753.9 *3* | 166 *17* | 7754.1 | $1^-,2^-$ | 0 | $0^+$ | |

Continued on next page (footnotes at end of table)

**$^{201}$Hg(n,$\gamma$) E=thermal 1975Br02 (continued)**

$\gamma$($^{202}$Hg) (continued)

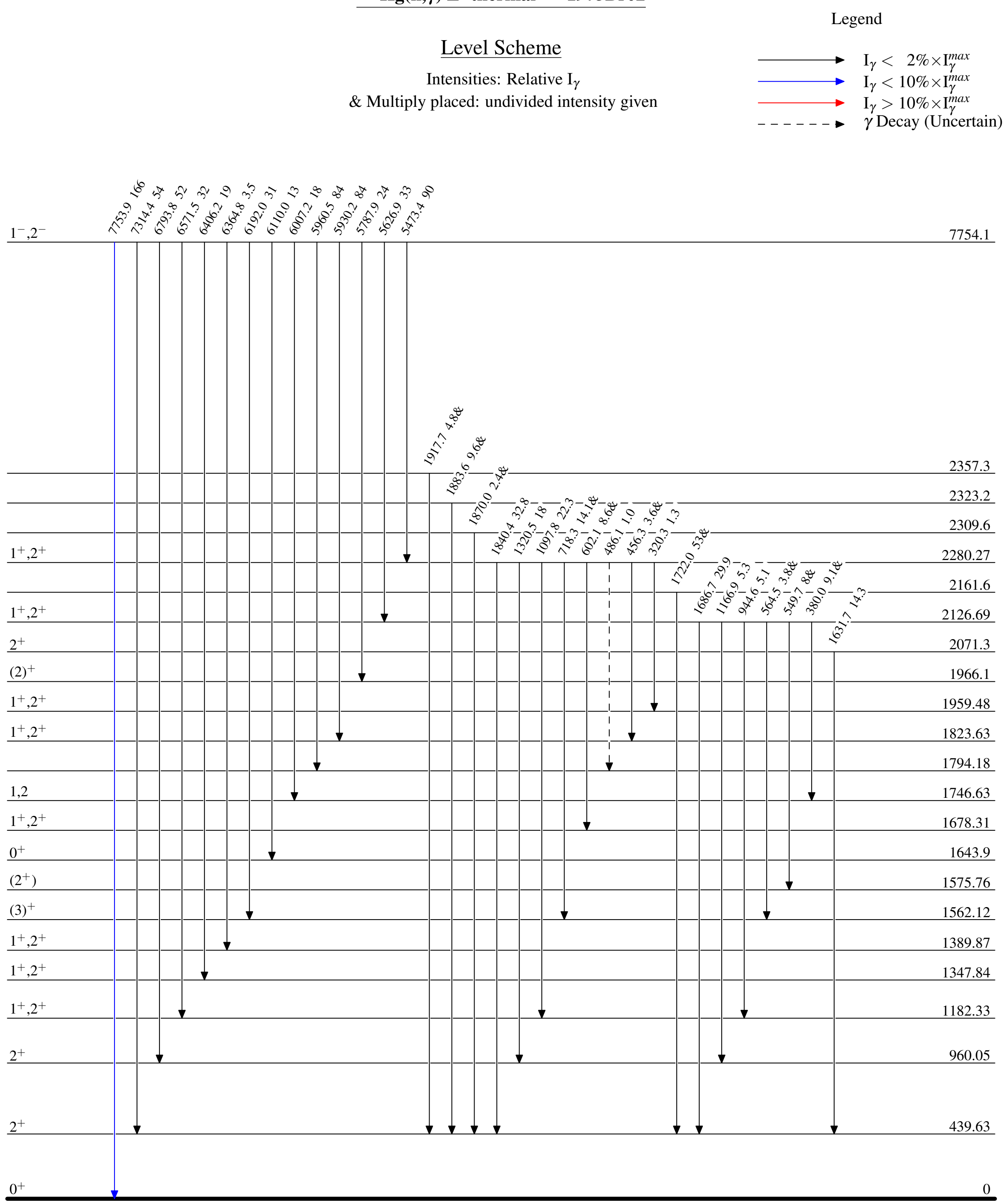
† From 1975Br02. Energy calibration was performed with known lines in $^{200}$Hg following $^{199}$Hg(n,$\gamma$).
‡ From 1975Br02. Values are not corrected for self-absorption in the target, which could be significant for E$\gamma$′s below 300 keV. $\Delta$I$\gamma$>40% when not explicitly given.
# Doublet line.
@ Complex line.
& Multiply placed with undivided intensity.
a Multiply placed with intensity suitably divided.
b Placement of transition in the level scheme is uncertain.
x $\gamma$ ray not placed in level scheme.

## $^{201}$Hg(n,$\gamma$) E=thermal 1975Br02

### Level Scheme

Intensities: Relative $I_\gamma$

& Multiply placed: undivided intensity given




$^{202}_{80}Hg_{122}$

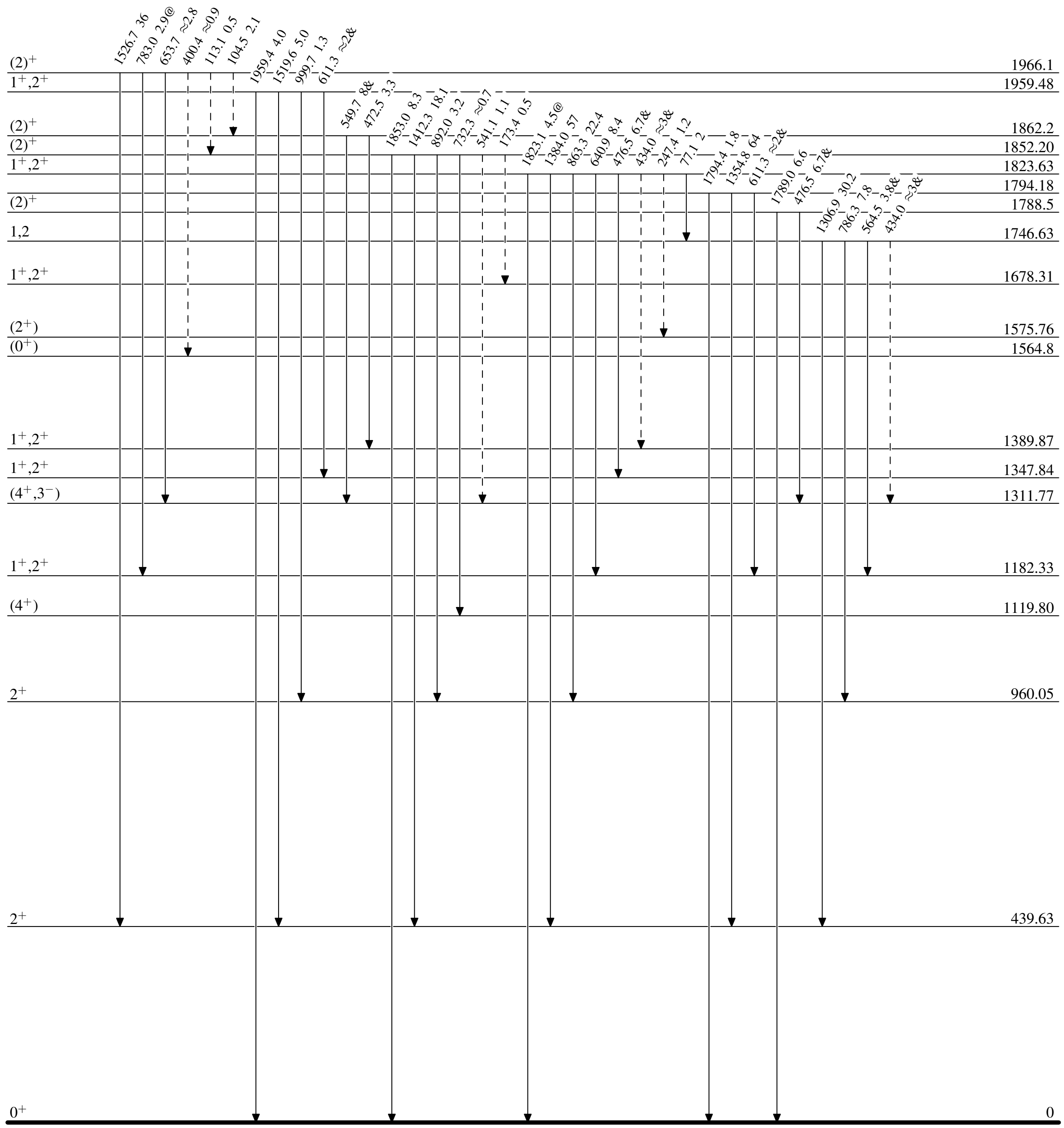
## $^{201}$Hg(n,γ) E=thermal 1975Br02

### Level Scheme (continued)

Intensities: Relative $I_\gamma$
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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)




$^{202}_{80}Hg_{122}$

## $^{201}$Hg(n,γ) E=thermal 1975Br02

### Level Scheme (continued)

Intensities: Relative $I_\gamma$
& Multiply placed: undivided intensity given
@ Multiply placed: intensity suitably divided

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)