**Table S1.** THg and Hg isotopic composition of samples collected from hydrothermal Au deposits in NE China.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | Type | THg | | δ202Hg | | δ201Hg | δ200Hg | δ199Hg | Δ201Hg | Δ200Hg | Δ199Hg |
| ID |  | ppm | | ‰ | | ‰ | ‰ | ‰ | ‰ | ‰ | ‰ |
| Yongxin Au deposit | | | | | | | | | | | |
| YX-1 | ore | 0.023 | | -1.88 | | -1.34 | -0.87 | -0.29 | 0.07 | 0.07 | 0.19 |
| YX-2 | ore | 0.042 | | -0.99 | | -0.69 | -0.51 | -0.12 | 0.05 | -0.01 | 0.13 |
| YX-3 | rhyolite | 0.009 | | -0.87 | | -0.68 | -0.44 | -0.22 | -0.02 | 0.00 | 0.00 |
| YX-4 | ore | 0.119 | | -0.94 | | -0.69 | -0.40 | -0.16 | 0.02 | 0.07 | 0.07 |
| YX-5 | andesite | 0.005 | | -0.97 | | -0.69 | -0.45 | -0.19 | 0.04 | 0.04 | 0.05 |
| YX-6 | andesite | 0.010 | | -1.00 | | -0.78 | -0.52 | -0.25 | -0.02 | -0.02 | 0.00 |
| YX-7 | ore | 0.038 | | 0.17 | | 0.13 | 0.06 | 0.01 | 0.00 | -0.02 | -0.03 |
| Tuanjiegou Au deposit | | | | | | | | | | | |
| WL8 | ore | 1.058 | | -0.23 | | -0.21 | -0.07 | -0.07 | -0.04 | 0.05 | -0.02 |
| WL7 | pyrite in breccia | 12.60 | | -1.89 | | -1.31 | -0.88 | -0.34 | 0.11 | 0.07 | 0.14 |
| WL6 | ore | 1.160 | | -1.78 | | -1.19 | -0.84 | -0.20 | 0.15 | 0.06 | 0.25 |
| WL5 | ore | 0.372 | | -1.36 | | -0.85 | -0.64 | -0.07 | 0.18 | 0.04 | 0.27 |
| WL4 | ore | 0.590 | | -1.11 | | -0.72 | -0.52 | -0.10 | 0.11 | 0.04 | 0.18 |
| WL3 | ore | 0.146 | | -0.84 | | -0.52 | -0.39 | -0.03 | 0.12 | 0.03 | 0.18 |
| WL2 | ore | 0.615 | | -1.33 | | -0.91 | -0.66 | -0.21 | 0.09 | 0.01 | 0.13 |
| WL98 | ore | 0.961 | | -0.33 | | -0.26 | -0.17 | -0.10 | -0.01 | -0.01 | -0.02 |
| W106 | pyrite in quartz vein | 7.058 | | -1.78 | | -1.19 | -0.90 | -0.23 | 0.15 | -0.01 | 0.21 |
| TJA1 | ore | 0.686 | | -1.62 | | -1.17 | -0.85 | -0.34 | 0.05 | -0.03 | 0.07 |
| TJA2 | ore | 0.301 | | -0.81 | | -0.55 | -0.46 | -0.13 | 0.06 | -0.05 | 0.07 |
| TJA3 | ore | 0.577 | | -1.01 | | -0.79 | -0.53 | -0.24 | -0.02 | -0.02 | 0.01 |
| Pangkaimen Au deposit | | | | | | | | | | | |
| PKA1 | ore | 0.126 | | -0.89 | | -0.58 | -0.37 | -0.13 | 0.09 | 0.08 | 0.09 |
| PKA2 | ore | 0.680 | | -1.26 | | -0.89 | -0.61 | -0.23 | 0.06 | 0.03 | 0.09 |
| PKA3 | ore | 1.058 | | -0.75 | | -0.43 | -0.31 | -0.03 | 0.13 | 0.07 | 0.16 |
| PKA4 | andesite | 0.030 | | -1.45 | | -1.06 | -0.69 | -0.22 | 0.03 | 0.04 | 0.14 |
| PKA5 | ore | 0.290 | | -1.19 | | -0.89 | -0.56 | -0.22 | 0.01 | 0.04 | 0.08 |
| PKA6 | ore | 0.128 | | 0.10 | | 0.06 | 0.12 | 0.06 | -0.02 | 0.06 | 0.04 |
| PKA7 | pyrite in breccia | 6.138 | | -1.04 | | -0.69 | -0.51 | -0.14 | 0.09 | 0.01 | 0.12 |
| PKA8 | pyrite in breccia | 8.070 | | -0.96 | | -0.59 | -0.40 | -0.08 | 0.13 | 0.08 | 0.16 |
| Sipingshan Au deposit | | | | | | | | | | | |
| SPSA3 | ore | 5.240 | | -1.12 | | -0.79 | -0.57 | -0.21 | 0.06 | 0.00 | 0.08 |
| SPSA1 | ore | 4.866 | | -0.76 | | -0.58 | -0.32 | -0.11 | -0.01 | 0.06 | 0.08 |
| SPSA2 | ore | 4.568 | | -0.98 | | -0.65 | -0.51 | -0.14 | 0.08 | -0.02 | 0.11 |
| SPSA4 | Pyrite in chert | 13.54 | | -0.91 | | -0.62 | -0.43 | -0.13 | 0.07 | 0.03 | 0.10 |
| Sandaowanzi Au deposit | | | | | | | | | | | |
| SDW1 | ore | | 7.557 | | -1.01 | -0.71 | -0.48 | -0.13 | 0.05 | 0.03 | 0.13 |
| SDW2 | ore | | 7.326 | | -1.01 | -0.69 | -0.50 | -0.14 | 0.07 | 0.00 | 0.11 |
| SDW3 | Pyrite in quartz vein | | 16.98 | | -1.04 | -0.73 | -0.51 | -0.18 | 0.05 | 0.01 | 0.08 |
| SDW4 | ore | | 7.693 | | -1.00 | -0.70 | -0.52 | -0.16 | 0.05 | -0.01 | 0.09 |
| SDW5 | Pyrite in quartz vein | | 21.58 | | -0.98 | -0.70 | -0.47 | -0.10 | 0.04 | 0.03 | 0.15 |
| Fuqiang Au deposit | | | | | | | | | | | |
| FQA1 | ore | 0.071 | | -1.14 | | -0.78 | -0.57 | -0.20 | 0.08 | 0.01 | 0.09 |
| FQA2 | ore | 0.083 | | -0.71 | | -0.47 | -0.35 | -0.08 | 0.06 | 0.01 | 0.10 |
| FQA3 | ore | 0.038 | | -0.46 | | -0.27 | -0.17 | 0.05 | 0.08 | 0.06 | 0.17 |
| FQA4 | tuff | 0.008 | | -2.20 | | -1.58 | -1.05 | -0.37 | 0.08 | 0.06 | 0.19 |
| FQA5 | ore | 0.033 | | -0.66 | | -0.41 | -0.28 | -0.02 | 0.09 | 0.05 | 0.15 |
| FQA6 | ore | 0.065 | | -0.70 | | -0.50 | -0.31 | -0.05 | 0.02 | 0.05 | 0.13 |
| Jichang Au deposit | | | | | | | | | | | |
| JCA1 | tuff | 0.027 | | -0.43 | | -0.33 | -0.20 | -0.04 | -0.01 | 0.02 | 0.07 |
| JCA2 | ore | 0.327 | | -1.44 | | -0.99 | -0.64 | -0.22 | 0.10 | 0.09 | 0.14 |
| JCA3 | andesite | 0.045 | | -1.16 | | -0.85 | -0.63 | -0.22 | 0.02 | -0.05 | 0.07 |
| JCA4 | ore | 0.064 | | -0.90 | | -0.66 | -0.43 | -0.17 | 0.02 | 0.02 | 0.06 |
| JCA5 | ore | 0.290 | | -1.66 | | -1.11 | -0.83 | -0.27 | 0.14 | 0.01 | 0.14 |
| JCA6 | ore | 0.201 | | -1.70 | | -1.15 | -0.86 | -0.31 | 0.13 | 0.00 | 0.12 |