Table 1 Average EMPA data and the calculated parameters of each mica type from 12 samples in the Yuanzhuding porphyry Cu-Mo deposit

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample NO. | 1 | 3 | 6 | 20 | 2 | 3 | 4 | 9 | 12 |
| Sample name | ZK0-112-02 | ZK0-112-05 | ZK11-112-17 | ZK0-112-01 | ZK0-112-03 | ZK0-112-05 | ZK0-112-08 | ZK11-112-21 | ZK26-100-05 |
| NO. of spots | 11 | 9 | 8 | 9 | 6 | 3 | 2 | 6 | 6 |
| Mica type | Bt-I | Bt-I | Bt-I | Bt-I | Bt-II | Bt-II | Bt-II | Bt-II | Bt-II |
| SiO2 | 38.65 | 37.94 | 38.08 | 37.87 | 34.91 | 37.22 | 38.53 | 36.90 | 36.74 |
| TiO2 | 4.17 | 4.15 | 3.74 | 4.32 | 2.95 | 4.00 | 3.14 | 3.02 | 2.15 |
| Al2O3 | 13.96 | 13.70 | 13.49 | 14.09 | 17.24 | 14.88 | 15.52 | 16.24 | 18.65 |
| FeO | 13.01 | 16.45 | 16.38 | 13.98 | 17.79 | 14.39 | 12.70 | 14.99 | 14.12 |
| MnO | 0.08 | 0.17 | 0.13 | 0.09 | 0.11 | 0.17 | 0.11 | 0.12 | 0.07 |
| MgO | 15.88 | 13.62 | 14.00 | 15.41 | 11.63 | 13.82 | 14.76 | 13.70 | 14.03 |
| CaO | 0.02 | 0.02 | 0.03 | 0.02 | LOD | LOD | 0.09 | LOD | LOD |
| Na2O | 0.14 | 0.17 | 0.12 | 0.17 | 0.11 | 0.09 | 0.12 | 0.12 | 0.13 |
| K2O | 9.92 | 9.58 | 9.51 | 9.64 | 10.30 | 10.18 | 9.96 | 9.93 | 10.05 |
| BaO | 0.32 | 0.36 | 0.30 | 0.36 | 0.25 | 0.33 | 0.30 | 0.25 | 0.16 |
| F | 0.64 | 0.36 | 0.55 | 0.54 | 0.34 | 0.31 | 0.54 | 0.48 | 0.47 |
| Cl | 0.05 | 0.05 | 0.08 | 0.04 | 0.06 | 0.07 | 0.04 | 0.05 | 0.04 |
| Total | 96.82 | 96.57 | 96.41 | 96.54 | 95.70 | 95.46 | 95.81 | 95.79 | 96.61 |
| Si | 2.84 | 2.84 | 2.86 | 2.81 | 2.67 | 2.80 | 2.85 | 2.77 | 2.71 |
| Al(IV) | 1.16 | 1.16 | 1.14 | 1.19 | 1.33 | 1.20 | 1.15 | 1.23 | 1.29 |
| Al(VI) | 0.05 | 0.05 | 0.05 | 0.04 | 0.22 | 0.12 | 0.21 | 0.20 | 0.33 |
| Ti | 0.23 | 0.23 | 0.21 | 0.24 | 0.17 | 0.23 | 0.18 | 0.17 | 0.12 |
| Fe3+ | 0.19 | 0.22 | 0.22 | 0.29 | 0.10 | 0.11 | 0.08 | 0.07 | 0.05 |
| Fe2+ | 0.61 | 0.81 | 0.81 | 0.58 | 1.03 | 0.80 | 0.71 | 0.87 | 0.82 |
| Fe3+(M) | 0.19 | 0.22 | 0.22 | 0.29 | 0.10 | 0.11 | 0.08 | 0.07 | 0.05 |
| Mn | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| Mg | 1.74 | 1.52 | 1.57 | 1.70 | 1.33 | 1.55 | 1.63 | 1.53 | 1.54 |
| Ca | 0.00 | 0.00 | 0.00 | 0.00 | - | - | 0.01 | - | - |
| Na | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.02 | 0.02 | 0.02 |
| K | 0.93 | 0.91 | 0.91 | 0.91 | 1.01 | 0.98 | 0.94 | 0.95 | 0.95 |
| Ba | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 |
| OH | 1.84 | 1.91 | 1.86 | 1.87 | 1.91 | 1.92 | 1.87 | 1.88 | 1.89 |
| F | 0.15 | 0.09 | 0.13 | 0.13 | 0.08 | 0.07 | 0.13 | 0.11 | 0.11 |
| Cl | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| mgli | 1.51 | 1.32 | 1.36 | 1.51 | 1.25 | 1.38 | 1.40 | 1.38 | 1.40 |
| feal | 0.98 | 1.23 | 1.20 | 1.08 | 1.09 | 1.02 | 0.76 | 0.92 | 0.66 |
| Li2O | 1.54 | 1.34 | 1.38 | 1.32 | 0.47 | 1.13 | 1.51 | 1.04 | 0.99 |
| XMg | 0.57 | 0.50 | 0.51 | 0.56 | 0.45 | 0.52 | 0.54 | 0.51 | 0.51 |
| XSid | 0.16 | 0.19 | 0.17 | 0.18 | 0.40 | 0.24 | 0.24 | 0.30 | 0.37 |
| XAnn | 0.27 | 0.31 | 0.32 | 0.26 | 0.15 | 0.24 | 0.23 | 0.19 | 0.12 |
| XOH | 0.92 | 0.95 | 0.93 | 0.93 | 0.96 | 0.96 | 0.93 | 0.94 | 0.94 |
| XF | 0.07 | 0.04 | 0.06 | 0.06 | 0.04 | 0.04 | 0.06 | 0.06 | 0.05 |
| XCl | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| IV(F) | 2.13 | 2.45 | 2.13 | 2.18 | 2.30 | 2.88 | 2.13 | 2.21 | 2.14 |
| IV(Cl) | -3.55 | -3.51 | -3.71 | -3.49 | -3.44 | -3.66 | -3.44 | -3.49 | -3.36 |
| IV(F/Cl) | 5.67 | 5.96 | 5.84 | 5.67 | 5.75 | 6.55 | 5.57 | 5.70 | 5.50 |
| logXF/XOH | -1.12 | -1.52 | -1.19 | -1.18 | -1.47 | -1.94 | -1.17 | -1.29 | -1.24 |
| logXCl/XOH | -2.56 | -2.46 | -2.29 | -2.59 | -2.44 | -2.35 | -2.61 | -2.50 | -2.64 |
| logXF/XCl | 1.44 | 0.94 | 1.10 | 1.41 | 0.96 | 0.41 | 1.44 | 1.21 | 1.39 |
| Temperature (°C) |  |  |  |  |  |  |  |  |  |
| logf(H2O)f(HF)fluid |  |  |  |  |  |  |  |  |  |
| logf(H2O)/f(HCl)fluid |  |  |  |  |  |  |  |  |  |
| logf(HF)/f(HCl)fluid |  |  |  |  |  |  |  |  |  |

Table 1 (continued)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample NO. | 1 | 2 | 3 | 6 | 9 | 10 | 2 | 3 | 5 | 11 | 12 |
| Sample name | ZK0-112-02 | ZK0-112-03 | ZK0-112-05 | ZK11-112-17 | ZK11-112-21 | ZK15-104-04 | ZK0-112-03 | ZK0-112-05 | ZK11-112-02 | ZK22-106-09 | ZK26-100-05 |
| NO. of spots | 9 | 2 | 4 | 3 | 2 | 5 | 4 | 3 | 4 | 3 | 7 |
| Mica type | Bt-III | Bt-III | Bt-III | Bt-III | Bt-III | Bt-III | Ser | Ser | Ser | Ser | Ser |
| SiO2 | 39.26 | 36.20 | 39.04 | 39.29 | 37.15 | 39.73 | 51.98 | 52.13 | 48.74 | 46.05 | 46.35 |
| TiO2 | 3.28 | 4.17 | 3.06 | 2.78 | 2.55 | 2.00 | 0.51 | 0.36 | 0.32 | 0.76 | 0.54 |
| Al2O3 | 13.70 | 14.73 | 13.85 | 13.24 | 15.79 | 14.55 | 26.89 | 29.00 | 27.68 | 33.73 | 34.02 |
| FeO | 12.15 | 16.99 | 14.88 | 15.73 | 13.21 | 9.61 | 1.86 | 2.09 | 3.22 | 2.44 | 2.35 |
| MnO | 0.08 | 0.09 | 0.09 | 0.15 | 0.10 | 0.08 | 0.01 | 0.01 | LOD | 0.01 | 0.01 |
| MgO | 16.80 | 12.57 | 14.97 | 14.48 | 14.89 | 19.22 | 2.71 | 2.21 | 2.23 | 0.99 | 1.06 |
| CaO | 0.05 | 0.01 | 0.05 | 0.01 | 0.01 | 0.02 | 0.06 | 0.06 | 0.03 | 0.01 | LOD |
| Na2O | 0.14 | 0.09 | 0.14 | 0.13 | 0.10 | 0.11 | 0.04 | 0.09 | 0.10 | 0.44 | 0.40 |
| K2O | 9.86 | 10.28 | 9.82 | 9.74 | 9.84 | 9.91 | 10.72 | 10.11 | 11.13 | 10.15 | 10.83 |
| BaO | 0.28 | 0.35 | 0.26 | 0.22 | 0.21 | 0.17 | 0.05 | 0.01 | 0.02 | 0.06 | 0.05 |
| F | 0.72 | 0.31 | 0.52 | 0.55 | 0.44 | 0.95 | 0.26 | 0.23 | 0.32 | 0.08 | 0.04 |
| Cl | 0.04 | 0.04 | 0.03 | 0.07 | 0.02 | 0.02 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 |
| Total | 96.36 | 95.83 | 96.71 | 96.37 | 94.30 | 96.37 | 95.10 | 96.33 | 93.81 | 94.73 | 95.66 |
| Si | 2.89 | 2.75 | 2.89 | 2.93 | 2.80 | 2.89 | 3.47 | 3.42 | 3.35 | 3.10 | 3.10 |
| Al(IV) | 1.11 | 1.25 | 1.11 | 1.07 | 1.20 | 1.12 | 0.53 | 0.58 | 0.65 | 0.90 | 0.90 |
| Al(VI) | 0.07 | 0.08 | 0.10 | 0.09 | 0.21 | 0.13 | 1.58 | 1.66 | 1.59 | 1.78 | 1.78 |
| Ti | 0.18 | 0.24 | 0.17 | 0.16 | 0.15 | 0.11 | 0.03 | 0.02 | 0.02 | 0.04 | 0.03 |
| Fe3+ | 0.10 | 0.20 | 0.06 | 0.04 | 0.03 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Fe2+ | 0.65 | 0.88 | 0.86 | 0.94 | 0.80 | 0.52 | 0.10 | 0.12 | 0.19 | 0.14 | 0.13 |
| Fe3+(M) | 0.10 | 0.20 | 0.06 | 0.04 | 0.03 | 0.06 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Mn | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | - | 0.00 | 0.00 |
| Mg | 1.84 | 1.43 | 1.65 | 1.61 | 1.67 | 2.08 | 0.27 | 0.22 | 0.23 | 0.10 | 0.11 |
| Ca | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| Na | 0.02 | 0.01 | 0.02 | 0.02 | 0.01 | 0.02 | 0.01 | 0.01 | 0.01 | 0.06 | 0.05 |
| K | 0.93 | 1.00 | 0.93 | 0.93 | 0.95 | 0.92 | 0.91 | 0.85 | 0.97 | 0.87 | 0.92 |
| Ba | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OH | 1.83 | 1.92 | 1.87 | 1.86 | 1.89 | 1.78 | 1.94 | 1.95 | 1.93 | 1.98 | 1.42 |
| F | 0.17 | 0.07 | 0.12 | 0.13 | 0.11 | 0.22 | 0.06 | 0.05 | 0.07 | 0.02 | 0.01 |
| Cl | 0.01 | 0.01 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| mgli | 1.59 | 1.30 | 1.41 | 1.35 | 1.51 | 1.81 | -0.45 | -0.50 | -0.38 | -0.40 | -0.40 |
| feal | 0.86 | 1.25 | 1.00 | 1.05 | 0.78 | 0.57 | -1.45 | -1.53 | -1.39 | -1.60 | -1.62 |
| Li2O | 1.72 | 0.84 | 1.65 | 1.72 | 1.11 | 1.85 | 5.37 | 5.41 | 4.44 | 3.66 | 3.75 |
| XMg | 0.59 | 0.48 | 0.53 | 0.52 | 0.55 | 0.65 | 0.10 | 0.08 | 0.09 | 0.04 | 0.04 |
| XSid | 0.13 | 0.27 | 0.16 | 0.13 | 0.26 | 0.14 | 0.70 | 0.77 | 0.79 | 0.96 | 0.96 |
| XAnn | 0.28 | 0.25 | 0.30 | 0.35 | 0.19 | 0.21 | 0.20 | 0.15 | 0.13 | 0.00 | 0.00 |
| XOH | 0.91 | 0.96 | 0.94 | 0.93 | 0.95 | 0.89 | 0.97 | 0.98 | 0.96 | 0.99 | 0.99 |
| XF | 0.08 | 0.04 | 0.06 | 0.06 | 0.05 | 0.11 | 0.03 | 0.02 | 0.04 | 0.01 | 0.01 |
| XCl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| IV(F) | 2.09 | 2.34 | 2.19 | 2.12 | 2.25 | 2.04 | 2.11 | 2.03 | 1.80 | 2.69 | 3.02 |
| IV(Cl) | -3.39 | -3.40 | -3.28 | -3.66 | -3.13 | -3.29 | -2.04 | -2.11 | -2.03 | -1.66 | -1.89 |
| IV(F/Cl) | 5.49 | 5.73 | 5.47 | 5.78 | 5.38 | 5.33 | 4.15 | 4.14 | 3.82 | 4.35 | 4.91 |
| logXF/XOH | -1.05 | -1.44 | -1.22 | -1.16 | -1.28 | -0.93 | -1.73 | -1.69 | -1.45 | -2.43 | -2.76 |
| logXCl/XOH | -2.76 | -2.55 | -2.76 | -2.35 | -2.94 | -2.98 | -3.16 | -3.05 | -3.15 | -3.42 | -3.20 |
| logXF/XCl | 1.71 | 1.10 | 1.54 | 1.19 | 1.67 | 2.06 | 1.43 | 1.36 | 1.70 | 0.99 | 0.43 |
| Temperature (°C) | 575 | 575 | 575 | 575 | 575 | 575 |  |  |  |  |  |
| logf(H2O)f(HF)fluid | 5.04 | 5.29 | 5.13 | 5.06 | 5.22 | 5.00 |  |  |  |  |  |
| logf(H2O)/f(HCl)fluid | 5.18 | 4.89 | 5.14 | 4.72 | 5.34 | 5.44 |  |  |  |  |  |
| logf(HF)/f(HCl)fluid | -0.63 | -1.02 | -0.69 | -1.01 | -0.59 | -0.40 |  |  |  |  |  |

Table 2 Trace element concentrations of quartz-bearing veins in the Yuanzhuding porphyry Cu-Mo deposit

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Spots | 49Ti | 7Li | 23Na | 27Al | 39K | 43Ca | 55Mn | 56Fe | 63Cu | 71Ga | 74Ge | 75As | 88Sr | 121Sb | 137Ba | 208Pb |
| ZK0-112-03-1 | 29.4 | 6.07 | <0.81 | 56.7 | <1.95 | <71.39 | <0.59 | <2.63 | <0.09 | 0.02 | 1.29 | <0.34 | 0.01 | <0.03 | 0.01 | <0.01 |
| ZK0-112-03-2 | 32.5 | 6.26 | <1.02 | 56.1 | <2.60 | 69.2 | <0.54 | <3.94 | <0.09 | 0.01 | 1.10 | <0.30 | 0.01 | <0.07 | 0.01 | 0.01 |
| ZK0-112-03-3 | 34.6 | 3.11 | 4.65 | 101 | 3.48 | 177 | <0.48 | <2.81 | <0.13 | <0.04 | 1.18 | <0.24 | 0.98 | <0.04 | 0.39 | 0.02 |
| ZK0-112-03-4 | 34.1 | 7.32 | <0.61 | 63.3 | <1.34 | <61.52 | <0.29 | 3.31 | 0.23 | <0.01 | 0.55 | 0.19 | <0.01 | <0.02 | <0.05 | <0.01 |
| ZK0-112-03-5 | 32.3 | 7.37 | 1.03 | 66.9 | <2.31 | <69.32 | <0.47 | 5.05 | <0.08 | 0.01 | 0.97 | <0.18 | <0.01 | <0.05 | 0.01 | <0.01 |
| ZK0-112-03-6 | 27.9 | 6.82 | <0.58 | 60.5 | <1.52 | <62.09 | <0.50 | <2.54 | <0.06 | <0.01 | 1.21 | 0.24 | 0.01 | <0.02 | <0.06 | <0.01 |
| ZK0-112-03-7 | 27.0 | 8.14 | 1.32 | 82.9 | 1.96 | <61.08 | <0.45 | <2.75 | <0.07 | 0.03 | 1.17 | <0.18 | 0.07 | <0.05 | 0.06 | <0.01 |
| ZK0-112-03-8 | 32.3 | 4.66 | <0.96 | 48.1 | <1.90 | <87.81 | <0.43 | <2.98 | <0.12 | <0.02 | 1.16 | <0.41 | <0.01 | <0.06 | <0.05 | 0.01 |
| ZK0-112-03-9 | 31.4 | 5.73 | <0.98 | 55.9 | <1.80 | <74.34 | <0.31 | <1.87 | <0.08 | 0.01 | 0.82 | <0.20 | 0.01 | <0.05 | <0.05 | <0.01 |
| ZK0-112-03-10 | 32.6 | 3.61 | 1.29 | 49.9 | <1.75 | <62.31 | <0.33 | <1.99 | 0.09 | <0.02 | 1.10 | <0.22 | 0.01 | <0.05 | 0.03 | <0.01 |
| ZK0-112-03-11 | 36.3 | 2.85 | 2.68 | 49.9 | <3.88 | <86.08 | <0.44 | <3.75 | 3.10 | <0.05 | 0.95 | <0.46 | 0.03 | <0.07 | <0.05 | 0.17 |
| ZK0-112-03-12 | 29.3 | 3.06 | <0.98 | 63.4 | <1.59 | <55.22 | <0.29 | <1.71 | 2.59 | <0.03 | 1.14 | <0.24 | <0.01 | <0.04 | <0.05 | <0.01 |
| ZK0-112-03-13 | 25.0 | 6.78 | 4.34 | 97.5 | 5.13 | <67.27 | <0.53 | <2.98 | <0.15 | <0.04 | 0.82 | <0.28 | 0.12 | <0.05 | <0.08 | 0.02 |
| ZK15-104-04-1 | 6.50 | 2.00 | <0.87 | 29.3 | <0.85 | <38.39 | <0.89 | <1.68 | 0.20 | 0.01 | 1.97 | 0.19 | <0.01 | 0.05 | <0.02 | 0.01 |
| ZK15-104-04-2 | 5.65 | 1.04 | <0.75 | 23.0 | <0.73 | <50.34 | <1.03 | <2.13 | <0.15 | <0.01 | 1.58 | 0.18 | <0.01 | <0.02 | <0.02 | 0.01 |
| ZK15-104-04-3 | 16.0 | 3.39 | <0.65 | 35.8 | <0.82 | <34.29 | <0.83 | <1.66 | <0.16 | 0.01 | 1.89 | 0.15 | <0.01 | <0.03 | <0.02 | <0.01 |
| ZK15-104-04-4 | 21.4 | 7.77 | 1.14 | 105 | 3.79 | <26.91 | <0.79 | <1.60 | <0.16 | <0.01 | 1.98 | 0.14 | 0.03 | 0.04 | 0.04 | 0.01 |
| ZK15-104-04-5 | 24.2 | 5.79 | <0.68 | 95.3 | 2.01 | <37.07 | <0.75 | <1.72 | <0.13 | 0.01 | 1.90 | <0.09 | 0.02 | 0.03 | 0.04 | 0.01 |
| ZK15-104-04-6 | 19.5 | 12.5 | <0.60 | 177 | <0.63 | <34.18 | <0.93 | <1.72 | 0.17 | <0.01 | 3.23 | 0.14 | <0.01 | 0.20 | <0.02 | <0.01 |
| ZK15-104-04-7 | 26.5 | 17.1 | 0.69 | 243 | <0.57 | <27.63 | <1.00 | <1.68 | <0.17 | <0.01 | 3.85 | 0.24 | <0.01 | 0.47 | 0.01 | <0.01 |
| ZK15-104-04-8 | 7.74 | 3.20 | <0.82 | 42.7 | <0.61 | <40.96 | <0.79 | <1.45 | <0.14 | <0.01 | 2.32 | 0.19 | <0.01 | 0.04 | <0.03 | <0.01 |
| ZK15-104-04-9 | 5.40 | 3.99 | <0.78 | 38.2 | <0.64 | <34.68 | <0.83 | <1.71 | <0.11 | <0.01 | 1.84 | 0.16 | <0.01 | <0.02 | 0.01 | <0.01 |
| ZK15-104-04-10 | 10.5 | 4.51 | <0.83 | 45.5 | <0.53 | <35.55 | <0.92 | <1.73 | <0.11 | <0.02 | 1.70 | 0.10 | <0.01 | <0.02 | <0.03 | <0.01 |
| ZK15-104-04-11 | 2.91 | 1.48 | <0.74 | 14.2 | <0.65 | <43.85 | <1.02 | <1.49 | <0.16 | <0.01 | 1.97 | <0.15 | <0.01 | <0.04 | <0.03 | <0.01 |
| ZK15-104-04-12 | 9.16 | 5.83 | <0.72 | 56.5 | <0.62 | <39.61 | <0.91 | <1.79 | <0.12 | <0.02 | 2.47 | 0.17 | <0.01 | 0.05 | <0.03 | <0.01 |
| ZK15-104-04-13 | 5.75 | 3.60 | <0.60 | 33.1 | <0.59 | <36.68 | 0.91 | <1.53 | <0.12 | <0.01 | 1.95 | 0.15 | <0.01 | 0.03 | <0.03 | <0.01 |
| ZK15-104-04-14 | 4.70 | 1.54 | <0.67 | 17.1 | <0.57 | <29.43 | <0.82 | <1.56 | <0.14 | 0.01 | 1.60 | <0.12 | <0.06 | <0.03 | <0.03 | <0.01 |
| ZK15-104-04-15 | 8.37 | 1.95 | <0.82 | 29.6 | <0.62 | <38.41 | <0.95 | <1.58 | <0.12 | <0.01 | 1.59 | 0.18 | <0.01 | <0.03 | <0.03 | <0.01 |

Table 3 Microthermometry of fluid inclusions in the Yuanzhuding porphyry Cu-Mo deposit

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | NO. of analysis | Inclusion type | Bubble volume range (%) | Ice melting temperature (oC) | Solid CO2 melting temperature (oC) | Clathrate melting temperature (oC) | Homogenization temperature range (oC) | Salinity  (wt % NaCl) | Mol % of CO2 | Density (g/cm3) |
| ZK0-112-03 | 39 | V + L | 40 ~ 55 | -2.5 ~ -5.8 avg = -4.4 | -56.8 ~ -56.6 | 7.9 ~ 9.6 avg = 8.7 | 284 ~ 343 avg = 316 | 0.8 ~ 4.1 avg = 2.5 | 2.2 ~ 3.2  avg = 2.6 | 0.50 ~ 0.65 avg = 0.60 |
| ZK15-104-04 | 31 | V + L | 15 ~ 30 | -3.1 ~ -5.3 avg = -4.5 | -56.9 ~ -56.6 | 7.6 ~ 9.2 avg = 8.6 | 248 ~ 295 avg = 275 | 1.6 ~ 4.7 avg = 2.8 | 1.7 ~ 2.0 avg = 1.8 | 0.74 ~ 0.83 avg = 0.78 |

Table 4 Hydrogen and oxygen isotopes of biotite and quartz in the Yuanzhuding porphyry Cu-Mo deposit

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample | Vein | Mineral | δD-Mineral | δ18O-Mineral | δD-H2O | δ18O-H2O |
| ZK0-112-02 | Qz-Kf-Bt vein | Bt | -85.2 | 7.0 | -52.8 | 9.5 |
| ZK11-112-02 | Qz-Kf-Bt vein | Bt | -90.2 | 6.9 | -57.8 | 9.4 |
| ZK11-112-16 | Qz-Kf-Bt vein | Bt | -93.0 | 6.5 | -60.6 | 9.0 |
| ZK0-112-02 | Qz-Kf-Bt vein | Qz |  | 9.4 | -55.3 | 8.1 |
| ZK0-112-03 | Qz-Kf-Bt vein | Qz |  | 9.4 | -55.2 | 8.1 |
| ZK0-112-07 | Qz-Kf-Bt vein | Qz |  | 9.3 | -52.4 | 8.0 |
| ZK11-112-02 | Qz-Kf-Bt vein | Qz |  | 9.5 | -59.4 | 8.2 |
| ZK11-112-07 | Qz-Kf-Bt vein | Qz |  | 11.5 | -67.9 | 10.2 |
| ZK11-112-16 | Qz-Kf-Bt vein | Qz |  | 10.3 | -64.9 | 9.0 |
| ZK15-104-04 | Qz-Ser vein | Qz |  | 11.9 | -64.0 | 5.4 |
| ZK22-106-06 | Qz-Ser vein | Qz |  | 13.4 | -64.2 | 6.9 |
| ZK26-100-03 | Qz-Ser vein | Qz |  | 10.5 | -70.3 | 4.0 |

Table 5 Calculated temperature of Bt-II and Fe2+ / (Fe2+ + Fe3+) ratios of each biotite type

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sample | Depth (m) | Temperature (oC) | Fe2+/(Fe2++Fe3+) | | |
| Bt-II | Bt-I | Bt-II | Bt-III |
| ZK0-112-05b | 95 | 620 | 0.78 | 0.88 | 0.94 |
| ZK0-112-03 | 112 | 540 |  | 0.91 | 0.82 |
| ZK0-112-02 | 125 |  | 0.76 |  | 0.87 |
| ZK0-112-01 | 136 |  | 0.66 |  |  |
| ZK0-112-08 | 168 | 570 |  | 0.90 |  |
| ZK11-112-24 | 54 |  |  |  |  |
| ZK11-112-21 | 70 | 560 |  | 0.93 | 0.96 |
| ZK11-112-17 | 158 |  | 0.79 |  | 0.96 |
| ZK11-112-07 | 175 |  |  |  |  |
| ZK11-112-02 | 195 |  |  |  |  |
| ZK15-104-04 | 248 |  |  |  | 0.90 |
| ZK22-106-09a | 98 |  |  |  |  |
| ZK26-100-05a | 314 | 460 |  | 0.94 |  |