

Appendix 1. Major (wt%) and trace element (ppm) abundances of the igneous rocks samples from the Gangcha complex in the Xiekeng Cu-Au deposit, west Qinling Terrane.

| sample | Dacite | | Andesite | | | | Gabbroic diorite | | | | | | | Gabbro | | | |
|--------------------------------|--------|-------|----------|-------|-------|-------|------------------|-------|-------|-------|-------|-------|-------|--------|-------|-------|-------|
| | XK8 | XK20 | XK27 | XK29 | XK31 | XK33 | XK35 | XK7 | XK11 | XK12 | XK15 | XK17 | XK39 | XK40 | XK41 | XK22 | XK23 |
| Major oxides (wt.%) | | | | | | | | | | | | | | | | | |
| SiO ₂ | 66.73 | 66.97 | 64.08 | 64.32 | 64.01 | 64.06 | 64.22 | 54.68 | 54.99 | 54.92 | 54.1 | 55.1 | 55.33 | 54.69 | 57.71 | 50.71 | 48.77 |
| TiO ₂ | 0.35 | 0.34 | 0.47 | 0.46 | 0.47 | 0.47 | 0.47 | 0.87 | 0.94 | 0.95 | 0.94 | 0.96 | 0.86 | 1.12 | 0.69 | 0.52 | 1.06 |
| Al ₂ O ₃ | 17.14 | 16.76 | 16.91 | 16.95 | 16.88 | 17.14 | 16.98 | 15.15 | 16.21 | 16.18 | 16.34 | 16.17 | 15.74 | 16.15 | 14.87 | 10.93 | 11.35 |
| Fe ₂ O ₃ | 0.92 | 0.82 | 0.64 | 0.74 | 0.7 | 0.53 | 0.53 | 1.2 | 1.6 | 1.57 | 1.86 | 1.97 | 1.35 | 1.23 | 1.23 | 2.17 | 3.04 |
| FeO | 2.07 | 2.03 | 2.42 | 1.67 | 2.14 | 2.35 | 2.35 | 5.69 | 5.98 | 5.91 | 5.69 | 5.66 | 5.8 | 6.38 | 5.08 | 8.17 | 8.71 |
| MnO | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.02 | 0.04 | 0.13 | 0.14 | 0.13 | 0.13 | 0.14 | 0.13 | 0.12 | 0.11 | 0.19 | 0.18 |
| MgO | 1.26 | 1.73 | 2.08 | 1.91 | 1.77 | 2.07 | 2 | 6.79 | 6.85 | 6.73 | 6.65 | 6.78 | 6.31 | 5.71 | 6.04 | 11.3 | 10.84 |
| CaO | 4.37 | 4.67 | 3.84 | 3.83 | 4.58 | 4.45 | 3.76 | 9.8 | 8.67 | 8.72 | 8.71 | 8.63 | 8.15 | 7.96 | 8.18 | 11.05 | 11.09 |
| Na ₂ O | 4.11 | 3.51 | 4.76 | 5.37 | 4.96 | 4.59 | 4.58 | 3.05 | 2.97 | 2.98 | 2.98 | 2.96 | 2.88 | 3.59 | 3.02 | 2.12 | 2 |
| K ₂ O | 1.17 | 1.35 | 3.35 | 3.88 | 3.17 | 3.23 | 4.09 | 1.42 | 1.33 | 1.34 | 1.24 | 1.38 | 1.5 | 1.6 | 2.01 | 0.79 | 1.04 |
| P ₂ O ₅ | 0.12 | 0.12 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.15 | 0.15 | 0.15 | 0.15 | 0.16 | 0.12 | 0.2 | 0.11 | 0.04 | 0.03 |
| LOI | 1.45 | 1.51 | 1.22 | 0.6 | 0.58 | 0.92 | 0.86 | 0.71 | -0.07 | -0.01 | 0.85 | -0.03 | 0.77 | 0.44 | 0.51 | 1.43 | 1.68 |
| Total | 99.74 | 99.86 | 99.95 | 99.91 | 99.44 | 99.97 | 100.02 | 99.64 | 99.76 | 99.57 | 99.64 | 99.88 | 98.94 | 99.19 | 99.56 | 99.42 | 99.79 |
| ^T FeO | 2.90 | 2.77 | 3.00 | 2.34 | 2.77 | 2.83 | 2.83 | 6.77 | 7.42 | 7.32 | 7.36 | 7.43 | 7.01 | 7.49 | 6.19 | 10.12 | 11.45 |
| Mg# | 43.90 | 52.94 | 55.55 | 59.54 | 53.49 | 56.86 | 56.01 | 64.35 | 62.43 | 62.33 | 61.91 | 62.15 | 61.82 | 57.86 | 63.73 | 66.77 | 63.03 |
| A/CNK | 1.07 | 1.06 | 0.92 | 0.85 | 0.85 | 0.89 | 0.9 | 0.62 | 0.73 | 0.73 | 0.74 | 0.73 | 0.74 | 0.73 | 0.67 | 0.45 | 0.46 |
| Trace elements (ppm) | | | | | | | | | | | | | | | | | |
| Li | 64.7 | 71 | 32.2 | 17.4 | 18.6 | 21.9 | 21 | 32.8 | 20.9 | 18.6 | 24.2 | 21 | 40.7 | 45.1 | 31.5 | 23.6 | 29.4 |
| Sc | 4.8 | 5.23 | 7.76 | 7.69 | 7.86 | 8.4 | 7.92 | 29.5 | 29 | 26.9 | 27.2 | 28.5 | 25.7 | 24.9 | 28.9 | 46.1 | 42.9 |
| V | 33.5 | 32.8 | 53.8 | 50.3 | 55.3 | 53.1 | 51.8 | 184 | 201 | 184 | 187 | 200 | 170 | 168 | 163 | 242 | 397 |
| Cr | 10.1 | 13 | 7.52 | 8.24 | 8.61 | 8.79 | 9.32 | 190 | 233 | 212 | 206 | 199 | 186 | 156 | 189 | 545 | 453 |
| Co | 8.28 | 4.53 | 6.88 | 7.47 | 7.02 | 7.81 | 12.5 | 31.3 | 32.4 | 29.4 | 31.7 | 30.8 | 28.8 | 31.4 | 24 | 43.6 | 50.2 |
| Ni | 5.07 | 5.05 | 3.41 | 4.78 | 4.08 | 3.56 | 4.57 | 47.7 | 59.3 | 54.2 | 57.6 | 56.3 | 56.5 | 44 | 54.1 | 103 | 125 |
| Cu | 8 | 6.57 | 8.93 | 7.84 | 9.7 | 7.24 | 7.45 | 59.4 | 45.9 | 92.1 | 172 | 61.2 | 12.5 | 90.1 | 25.8 | 11.9 | 78.3 |
| Ga | 16.6 | 16.7 | 17.8 | 17.3 | 17.7 | 17.7 | 17.4 | 16.4 | 17.8 | 16.1 | 17.5 | 17.3 | 16.7 | 18.3 | 16 | 13.2 | 14.9 |

| | | | | | | | | | | | | | | | | | |
|----------------------|-------|-------|--------|-------|-------|--------|--------|-------|------|-------|-------|-------|--------|-------|------|-------|-------|
| Rb | 35.6 | 34.8 | 126 | 154 | 91.6 | 106 | 163 | 44.8 | 45.1 | 42.8 | 40.3 | 44.4 | 52.1 | 69.6 | 54.5 | 32.2 | 40.8 |
| Sr | 326 | 347 | 326 | 319 | 337 | 327 | 319 | 280 | 255 | 238 | 251 | 242 | 251 | 276 | 293 | 202 | 206 |
| Y | 11.1 | 12.2 | 15.8 | 16 | 16.1 | 15.6 | 16.3 | 21.6 | 23.4 | 21.7 | 21.8 | 23.1 | 24.7 | 24.1 | 27.6 | 22.9 | 22.4 |
| Zr | 174 | 172 | 171 | 176 | 177 | 171 | 181 | 145 | 156 | 150 | 151 | 155 | 75.9 | 186 | 372 | 94.7 | 88.4 |
| Nb | 7 | 6.85 | 7.66 | 7.78 | 7.88 | 7.56 | 7.85 | 4.63 | 4.57 | 4.35 | 4.36 | 4.48 | 11.9 | 7.09 | 8.72 | 1.68 | 1.83 |
| Cs | 4.01 | 5.01 | 3.58 | 2.37 | 4.14 | 4.19 | 3.4 | 5.85 | 3.93 | 3.86 | 3.78 | 3.96 | 7.48 | 10.8 | 4.88 | 7.61 | 8.45 |
| Ba | 227 | 352 | 676 | 750 | 712 | 689 | 798 | 302 | 233 | 221 | 235 | 235 | 379 | 275 | 448 | 130 | 154 |
| Hf | 4.47 | 4.28 | 4.53 | 4.62 | 4.67 | 4.4 | 4.82 | 3.95 | 4.1 | 4 | 4.11 | 4.08 | 2.55 | 4.92 | 8.73 | 2.7 | 2.52 |
| Ta | 0.57 | 0.55 | 0.68 | 0.66 | 0.66 | 0.66 | 0.67 | 0.36 | 0.37 | 0.36 | 0.33 | 0.36 | 0.76 | 0.56 | 0.55 | 0.11 | 0.13 |
| Pb | 16.8 | 42.9 | 29.1 | 15.1 | 22.5 | 17.3 | 16.2 | 18.4 | 10.8 | 10.6 | 11.2 | 10.4 | 11.1 | 17.5 | 9.68 | 8.55 | 7.38 |
| Th | 4.59 | 5.09 | 9.52 | 9 | 9.8 | 9.52 | 9.45 | 4.11 | 4.35 | 4.22 | 3.55 | 4.44 | 5.69 | 6.43 | 4.77 | 2.59 | 2.4 |
| U | 1.38 | 1.37 | 2.28 | 2.39 | 2.49 | 2.44 | 2.81 | 1.1 | 1.19 | 1.17 | 0.96 | 1.25 | 0.99 | 2.24 | 1.52 | 0.73 | 0.63 |
| La | 14.5 | 15.6 | 23.6 | 18.9 | 26 | 23 | 22.6 | 13 | 12.7 | 12.4 | 11.9 | 12.5 | 17.7 | 15.8 | 14.7 | 7.82 | 7.59 |
| Ce | 26.6 | 28 | 43.4 | 37 | 45.4 | 41.9 | 40.6 | 27.6 | 26.8 | 26 | 25 | 26.2 | 36.4 | 32.2 | 30.7 | 17 | 16.3 |
| Pr | 3.45 | 3.6 | 5.12 | 4.59 | 5.29 | 4.94 | 4.95 | 3.76 | 3.68 | 3.56 | 3.5 | 3.5 | 4.76 | 4.27 | 4.26 | 2.48 | 2.44 |
| Nd | 12.7 | 13.3 | 17.8 | 16.7 | 18.4 | 17.4 | 17.6 | 15.2 | 15.4 | 14.5 | 14.5 | 14.8 | 19.7 | 17.5 | 17.9 | 11.3 | 11.2 |
| Sm | 2.56 | 2.58 | 3.2 | 3.22 | 3.24 | 3.47 | 3.39 | 3.68 | 3.76 | 3.74 | 3.85 | 3.76 | 4.55 | 4.24 | 4.55 | 3.18 | 3.05 |
| Eu | 0.74 | 0.78 | 0.83 | 0.82 | 0.88 | 0.88 | 0.88 | 1.04 | 1.06 | 1.03 | 1.05 | 1.02 | 0.93 | 1.15 | 0.91 | 0.94 | 0.93 |
| Gd | 2.4 | 2.52 | 3.12 | 3.14 | 3.23 | 3.17 | 3.21 | 4.23 | 4.31 | 4.19 | 4.25 | 4.45 | 4.91 | 4.44 | 5.13 | 3.9 | 3.89 |
| Tb | 0.34 | 0.38 | 0.45 | 0.47 | 0.47 | 0.45 | 0.47 | 0.64 | 0.67 | 0.66 | 0.65 | 0.67 | 0.73 | 0.69 | 0.79 | 0.64 | 0.63 |
| Dy | 1.96 | 2.24 | 2.92 | 2.88 | 2.96 | 2.75 | 2.96 | 4.18 | 4.38 | 4.16 | 4.23 | 4.16 | 4.76 | 4.51 | 5 | 4.3 | 4.18 |
| Ho | 0.41 | 0.45 | 0.6 | 0.59 | 0.61 | 0.6 | 0.62 | 0.89 | 0.93 | 0.91 | 0.88 | 0.9 | 1.02 | 0.92 | 1.06 | 0.93 | 0.88 |
| Er | 1.29 | 1.33 | 1.89 | 1.8 | 1.82 | 1.85 | 1.98 | 2.65 | 2.69 | 2.6 | 2.55 | 2.68 | 2.9 | 2.78 | 3.13 | 2.69 | 2.67 |
| Tm | 0.17 | 0.2 | 0.26 | 0.26 | 0.27 | 0.26 | 0.26 | 0.36 | 0.38 | 0.35 | 0.36 | 0.38 | 0.41 | 0.37 | 0.44 | 0.4 | 0.37 |
| Yb | 1.31 | 1.41 | 1.84 | 1.82 | 1.83 | 1.72 | 1.95 | 2.48 | 2.54 | 2.5 | 2.51 | 2.44 | 2.67 | 2.44 | 3.17 | 2.6 | 2.35 |
| Lu | 0.21 | 0.22 | 0.28 | 0.27 | 0.3 | 0.29 | 0.3 | 0.36 | 0.4 | 0.36 | 0.35 | 0.36 | 0.4 | 0.4 | 0.46 | 0.37 | 0.35 |
| REE | 68.64 | 72.61 | 105.31 | 92.46 | 110.7 | 102.68 | 101.77 | 80.07 | 79.7 | 76.96 | 75.58 | 77.82 | 101.84 | 91.71 | 92.2 | 58.55 | 56.83 |
| (La/Yb) _N | 7.94 | 7.94 | 9.20 | 7.45 | 10.19 | 9.59 | 8.31 | 3.76 | 3.59 | 3.56 | 3.40 | 3.67 | 4.76 | 4.64 | 3.33 | 2.16 | 2.32 |