**Supplementary Table S1**

**Whole-rock major and trace elements of the Taolin intrusion**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Ref. 1** | | **Ref. 2** | **Ref. 3** | | | | | |
| **Unit** |  |  |  | **Shibu** | **Tiqiushan** | **Laoweizhuang** | **Daxiezhuang** | **Malingzhan** | **Longquangou** |
| **Sample** | **L031-2B** | **L040-7B** |  |  |  |  |  |  |  |
| SiO2 | 66.7 | 66.5 | 65.1 | 76.5 | 76.5 | 67.3 | 69.4 | 69.4 | 61.4 |
| TiO2 | 0.50 | 0.54 | 0.51 | 0.12 | 0.10 | 0.40 | 0.38 | 0.29 | 0.63 |
| Al2O3 | 14.2 | 14.9 | 14.9 | 12.3 | 12.3 | 15.3 | 14.0 | 14.2 | 17.3 |
| Fe2O3 | 1.99 | 2.13 | 1.91 | 1.44 | 0.85 | 4.11 | 2.07 | 0.96 | 3.26 |
| FeO | 1.78 | 2.01 | 2.71 | 0.17 | 0.27 | 0.22 | 1.34 | 1.96 | 1.18 |
| MnO | 0.08 | 0.08 | 0.09 | 0.03 | 0.01 | 0.09 | 0.07 | 0.06 | 0.08 |
| MgO | 1.74 | 1.80 | 1.94 | 0.21 | 0.15 | 1.16 | 1.52 | 0.89 | 1.62 |
| CaO | 2.35 | 3.20 | 3.67 | 0.18 | 0.73 | 1.16 | 1.59 | 1.25 | 2.54 |
| Na2O | 3.58 | 3.72 | 3.70 | 3.62 | 3.38 | 3.21 | 3.56 | 4.05 | 4.55 |
| K2O | 4.38 | 4.58 | 3.98 | 4.48 | 4.91 | 4.01 | 4.37 | 4.91 | 5.15 |
| P2O5 | 0.23 | 0.20 | 0.19 | 0.10 | 0.02 | 0.22 | 0.94 | 0.13 | 0.31 |
| LOI | 3.16 | 0.84 | 0.94 | 0.33 | 0.49 | 2.10 | 0.78 | 0.78 | 1.54 |
| FeOt | 3.57 | 3.93 | 4.43 | 1.47 | 1.03 | 3.92 | 3.20 | 2.82 | 4.11 |
| A/CNK | 0.95 | 0.88 | 0.87 | 1.11 | 1.01 | 1.31 | 1.04 | 1.00 | 0.98 |
| A/NK | 1.34 | 1.35 | 1.44 | 1.14 | 1.13 | 1.59 | 1.33 | 1.19 | 1.33 |
| La | 46.1 | 48.0 |  | 37.7 | 30.8 | 51.5 | 32.2 | 75.6 | 77.5 |
| Ce | 81.4 | 93.8 |  | 53.8 | 66.5 | 87.0 | 56.0 | 130 | 141 |
| Pr | 7.28 | 9.15 |  | 5.70 | 5.09 | 9.80 | 4.80 | 12.2 | 14.2 |
| Nd | 28.3 | 37.6 |  | 17.3 | 15.7 | 35.6 | 16.0 | 40.5 | 50.9 |
| Sm | 4.41 | 5.94 |  | 2.80 | 2.65 | 6.00 | 2.30 | 6.00 | 7.30 |
| Eu | 1.18 | 1.48 |  | 0.28 | 0.21 | 1.20 | 0.45 | 1.10 | 2.55 |
| Gd | 4.73 | 5.87 |  | 2.35 | 2.42 | 4.60 | 1.80 | 4.40 | 5.00 |
| Tb | 0.56 | 0.74 |  | 0.42 | 0.45 | 0.71 | 0.30 | 0.69 | 0.73 |
| Dy | 2.87 | 3.72 |  | 2.80 | 2.15 | 4.10 | 1.90 | 4.00 | 3.95 |
| Ho | 0.57 | 0.79 |  | 0.59 | 0.79 | 0.71 | 0.41 | 0.75 | 0.72 |
| Er | 1.63 | 2.06 |  | 1.70 | 1.19 | 1.90 | 1.20 | 2.00 | 1.90 |
| Tm | 0.24 | 0.30 |  | 0.27 |  | 0.29 | 0.20 | 0.18 | 0.27 |
| Yb | 1.64 | 1.99 |  | 1.80 | 1.83 | 1.80 | 1.40 | 1.90 | 1.60 |
| Lu | 0.27 | 0.31 |  | 0.28 | 0.24 | 0.24 | 0.21 | 0.29 | 0.27 |
| Cs |  |  |  | 3.80 | 4.80 | 3.80 | 2.80 | 3.80 | 2.80 |
| Rb | 140 | 119 |  | 195 | 205 | 130 | 180 | 154 | 90 |
| Sr | 383 | 477 |  | 400 | 36.0 | 1000 | 680 | 540 | 1000 |
| Ba | 140 | 119 |  | 425 | 237 | 1800 | 860 | 1140 | 1310 |
| Y | 14.3 | 18.3 |  | 32.3 | 15.5 | 20.0 | 11.3 | 19.6 | 16.8 |
| Zr | 181 | 158 |  | 115 | 125 | 190 | 192 | 174 | 310 |
| Hf | 5.80 | 5.10 |  |  |  |  |  |  |  |
| Nb | 11.0 | 15.0 |  | 20.0 | 25.5 | 10.0 | 16.4 | 11.4 | 20.0 |
| Ta | 1.10 | 2.50 |  |  |  |  |  |  |  |
| Pb |  |  |  | 23.3 | 41.4 | 34.0 | 23.0 | 28.4 | 28.3 |
| Th | 21.0 | 19.0 |  |  |  |  |  |  |  |
| U | 2.40 | 1.70 |  |  |  |  |  |  |  |
| V | 63.0 | 70.0 |  |  |  |  |  |  |  |
| Cr | 22.0 | 27.0 |  | 67.5 | 2.9 | 52 | 82 | 56 | 29 |
| Co | 10.0 | 11.0 |  |  |  |  |  |  |  |
| Ni | 7.40 | 9.50 |  | 9.25 | 7.6 | 14 | 15 | 16.8 | 6.3 |
| Sc | 10.0 | 11.0 |  | 1.45 | 0.93 | 5.90 | 1.90 | 3.00 | 6.65 |
| δEu | 0.79 | 0.77 |  | 0.33 | 0.25 | 0.70 | 0.68 | 0.65 | 1.29 |
| (La/Sm)N | 6.75 | 5.22 |  | 8.69 | 7.50 | 5.54 | 9.04 | 8.13 | 6.85 |
| (Gd/Lu)N | 2.17 | 2.34 |  | 1.06 | 1.24 | 2.37 | 1.06 | 1.88 | 2.33 |
| TZr(°C) | 723 | 691 |  | 724 | 717 | 785 | 750 | 733 | 763 |

**Note:**

Ref. 1, Meng et al., 2003

Ref. 2, Jiangsu Bureau of Geology and Mineral Resources, 1984

Ref. 3, Jiangsu Bureau of Geology and Mineral Resources, 1985