**Table S1**. Major element (wt. %) and trace element (ppm) compositions of the Zhoujiapuzi granite

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sample | XY-003 | XY-004 | XY-005 | XY-009 | XY-010 | XY-012 |
| Latitude | N40°19′9″ | N40°18′12″ | N40°18′2″ | N40°18′5″ | N 40°20'10″ | N40°22′8″ |
| Longtitude | E123°50′34″ | E123°44′37″ | E123°46′9″ | E123°48′48″ | E123°41'42″ | E123°38′10″ |
| SiO2 | 68.11 | 72.28 | 72.29 | 72.27 | 73.02 | 72.26 |
| TiO2 | 0.34 | 0.18 | 0.17 | 0.13 | 0.09 | 0.16 |
| Al2O3 | 16.83 | 14.57 | 14.49 | 14.83 | 15.02 | 14.81 |
| TFe2O3 | 2.49 | 1.67 | 1.52 | 1.76 | 1.10 | 2.04 |
| MnO | 0.03 | 0.02 | 0.02 | 0.03 | 0.02 | 0.04 |
| MgO | 0.44 | 0.23 | 0.22 | 0.15 | 0.10 | 0.20 |
| CaO | 1.98 | 1.40 | 1.35 | 1.04 | 1.26 | 1.23 |
| Na2O | 4.65 | 3.87 | 3.81 | 3.93 | 4.03 | 3.96 |
| K2O | 4.32 | 4.57 | 4.66 | 4.71 | 4.59 | 4.42 |
| P2O5 | 0.08 | 0.05 | 0.02 | 0.03 | 0.02 | 0.04 |
| LOI | 0.37 | 0.37 | 0.37 | 0.45 | 0.33 | 0.47 |
| Mg# | 26.11 | 21.60 | 22.45 | 14.56 | 15.38 | 16.39 |
| V | 6 | 5 | 5 | <5 | <5 | 6 |
| Cr | 20 | 10 | 20 | 20 | 10 | 10 |
| Ga | 26.4 | 22.4 | 22.0 | 24.6 | 21.8 | 24.3 |
| Rb | 120.5 | 126.5 | 121.0 | 215.0 | 191.0 | 218.0 |
| Sr | 540 | 545 | 551 | 309 | 381 | 338 |
| Y | 8.8 | 6.7 | 5.4 | 15.5 | 5.1 | 9.3 |
| Zr | 242 | 190 | 190 | 166 | 113 | 215 |
| Nb | 10.3 | 8.4 | 6.8 | 13.4 | 7.4 | 16.6 |
| Sn | 1 | 1 | 1 | 3 | 2 | 4 |
| Cs | 1.15 | 1.29 | 1.13 | 2.11 | 1.59 | 2.14 |
| Ba | 1300 | 1385 | 1405 | 869 | 1065 | 967 |
| Hf | 6.8 | 5.6 | 5.2 | 4.8 | 3.2 | 6.1 |
| Ta | 0.6 | 0.4 | 0.4 | 1.1 | 0.7 | 1.6 |
| W | <1 | <1 | 1 | 1 | 1 | 1 |
| Th | 16.85 | 8.53 | 13.40 | 18.20 | 6.17 | 7.54 |
| U | 1.89 | 1.31 | 1.32 | 4.01 | 3.36 | 4.15 |
| La | 67.2 | 34.1 | 48.2 | 32.9 | 13.4 | 18.1 |
| Ce | 121.5 | 62.9 | 88.0 | 63.2 | 26.5 | 28.6 |
| Pr | 12.55 | 6.49 | 9.18 | 5.92 | 2.34 | 3.10 |
| Nd | 31.2 | 22.2 | 30.9 | 19.9 | 7.3 | 10.5 |
| Sm | 6.91 | 3.89 | 4.98 | 3.97 | 1.16 | 1.85 |
| Eu | 1.15 | 0.87 | 1.05 | 0.64 | 0.58 | 0.54 |
| Gd | 3.89 | 2.38 | 2.63 | 2.47 | 0.72 | 1.43 |
| Tb | 0.39 | 0.28 | 0.25 | 0.39 | 0.13 | 0.26 |
| Dy | 1.84 | 1.24 | 1.10 | 2.52 | 0.81 | 1.62 |
| Ho | 0.34 | 0.24 | 0.19 | 0.55 | 0.17 | 0.35 |
| Er | 0.86 | 0.67 | 0.49 | 1.60 | 0.46 | 0.96 |
| Tm | 0.13 | 0.10 | 0.07 | 0.23 | 0.07 | 0.14 |
| Yb | 0.83 | 0.61 | 0.43 | 1.40 | 0.49 | 0.89 |
| Lu | 0.12 | 0.09 | 0.07 | 0.22 | 0.08 | 0.14 |
| ΣREE | 261.51 | 136.06 | 187.54 | 135.91 | 54.21 | 68.48 |
| LaN/YbN | 58.08 | 40.10 | 80.40 | 16.86 | 19.62 | 14.59 |
| δEu | 0.68 | 0.87 | 0.89 | 0.62 | 1.94 | 1.01 |
| δCe | 1.03 | 1.04 | 1.03 | 1.11 | 1.16 | 0.94 |
| Mg#=molar Mg/(Mg+Fe)\*100; TFeO= all Fe calculated as Fe2O3; LOI: loss on ignition | | | | | | |

**Table S1 (continued)**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Standard sample | OREAS 146 | SY-4 | NCSDC47009 | SARM-5 |
| SiO2 |  |  | 15.56 | 51.54 |
| TiO2 |  |  | 0.14 | 0.18 |
| Al2O3 |  |  | 2.55 | 4.27 |
| TFe2O3 |  |  | 2.88 | 12.85 |
| MnO |  |  | 20.5 | 0.23 |
| MgO |  |  | 3.79 | 25.7 |
| CaO |  |  | 19.80 | 2.65 |
| Na2O |  |  | 0.04 | 0.47 |
| K2O |  |  | 0.70 | 0.08 |
| P2O5 |  |  | 0.14 | 0.01 |
| V | 152 | 6 |  |  |
| Cr | 190 | 10 |  |  |
| Ga | 25.9 | 38.1 |  |  |
| Rb | 26.5 | 55.8 |  |  |
| Sr | 3170 | 1255 |  |  |
| Y | 937 | 120.0 |  |  |
| Zr | 234 | 597 |  |  |
| Nb | 394 | 14.0 |  |  |
| Sn | 44 | 8 |  |  |
| Cs | 0.50 | 1.60 |  |  |
| Ba | ＞10000 | 355 |  |  |
| Hf | 4.0 | 12.2 |  |  |
| Ta | 3.9 | 0.8 |  |  |
| W | 30 | ＜1 |  |  |
| Th | 955 | 1.18 |  |  |
| U | 2.64 | 0.73 |  |  |
| La | 2570 | 59.6 |  |  |
| Ce | 4890 | 126.5 |  |  |
| Pr | 565 | 15.00 |  |  |
| Nd | 2170 | 59.5 |  |  |
| Sm | 476 | 13.65 |  |  |
| Eu | 127.0 | 2.06 |  |  |
| Gd | 332 | 14.30 |  |  |
| Tb | 44.2 | 2.78 |  |  |
| Dy | 219 | 18.75 |  |  |
| Ho | 36.0 | 4.57 |  |  |
| Er | 82.9 | 15.00 |  |  |
| Tm | 9.85 | 2.31 |  |  |
| Yb | 52.7 | 15.50 |  |  |
| Lu | 6.20 | 2.18 |  |  |