**Table S1**. Whole-rock major and trace element of the low-Sr and high-Yb granites in the Xianghualing, SW China

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample** | **ZK65-1** | **ZK65-2** | **ZK65-3** | **ZK57-2** |
| **Major element (wt%)** | | | | |
| SiO2 | 77.98 | 76.33 | 74.09 | 76.06 |
| TiO2 | 0.08 | 0.05 | 0.07 | 0.06 |
| Al2O3 | 11.04 | 12.09 | 12.50 | 12.66 |
| Fe2O3 | 0.53 | 0.14 | 0.53 | 0.22 |
| FeOT | 1.34 | 1.06 | 1.38 | 1.02 |
| MnO | 0.03 | 0.03 | 0.03 | 0.02 |
| MgO | 0.05 | 0.05 | 0.06 | 0.06 |
| CaO | 0.63 | 0.62 | 0.78 | 0.66 |
| Na2O | 2.45 | 2.85 | 1.74 | 3.45 |
| K2O | 4.77 | 5.42 | 7.41 | 4.90 |
| P2O5 | 0.01 | 0.01 | 0.01 | 0.01 |
| LOI | 0.80 | 0.78 | 1.12 | 0.73 |
| Total | 99.99 | 100.01 | 100.00 | 100.01 |
| **CIPW normative mineral (wt%)** | | | | |
| Q | 44.3 | 37.5 | 34.0 | 35.6 |
| An | 3.1 | 3.1 | 3.9 | 3.2 |
| Ab | 21.1 | 24.5 | 15.0 | 29.5 |
| Or | 28.6 | 32.5 | 44.6 | 29.3 |
| C | 0.7 | 0.4 | 0.2 | 0.5 |
| Hy | 1.2 | 1.7 | 1.3 | 1.4 |
| Il | 0.2 | 0.1 | 0.1 | 0.1 |
| Mt | 0.8 | 0.2 | 0.8 | 0.3 |
| Ap | 0.0 | 0.0 | 0.0 | 0.0 |
| DI | 94.0 | 94.5 | 93.7 | 94.4 |
| **Trace element (ppm)** | | | | |
| Sc | 2.11 | 1.77 | 1.85 | 1.59 |
| Ti | 294 | 179 | 288 | 225 |
| V | 0.58 | 0.30 | 0.40 | 0.61 |
| Cr | 4.33 | 4.35 | 4.27 | 3.73 |
| Co | 0.43 | 0.40 | 0.53 | 0.30 |
| Ni | 1.63 | 2.08 | 1.12 | 1.89 |
| Ga | 23.7 | 25.7 | 25.6 | 25.3 |
| Rb | 1639 | 1733 | 2351 | 1606 |
| Sr | 3.99 | 3.63 | 4.16 | 7.26 |
| Y | 116 | 235 | 173 | 156 |
| Zr | 100 | 115 | 209 | 122 |
| Nb | 46.7 | 2.53 | 1.87 | 0.30 |
| Cs | 32.3 | 23.0 | 26.5 | 39.1 |
| Ba | 9.85 | 7.16 | 8.70 | 12.1 |
| La | 55.4 | 34.3 | 47.8 | 39.7 |
| Ce | 170 | 76.2 | 142 | 96.1 |
| Pr | 13.6 | 10.2 | 12.7 | 11.5 |
| Nd | 24.6 | 34.3 | 29.7 | 38.1 |
| Sm | 8.92 | 10.7 | 10.9 | 10.5 |
| Eu | 0.06 | 0.06 | 0.08 | 0.12 |
| Gd | 7.93 | 12.4 | 11.7 | 11.4 |
| Tb | 1.75 | 2.71 | 2.58 | 2.41 |
| Dy | 10.2 | 17.9 | 16.2 | 14.8 |
| Ho | 2.13 | 3.88 | 3.35 | 3.15 |
| Er | 7.13 | 12.7 | 10.5 | 9.97 |
| Tm | 1.15 | 2.01 | 1.58 | 1.58 |
| Yb | 7.93 | 14.0 | 10.6 | 10.7 |
| Lu | 1.14 | 1.95 | 1.47 | 1.57 |
| Hf | 5.56 | 6.51 | 6.61 | 6.99 |
| Ta | 11.0 | 15.3 | 12.5 | 11.9 |
| Pb | 52.5 | 53.1 | 66.1 | 48.2 |
| Th | 46.6 | 33.5 | 36.7 | 32.1 |
| U | 28.8 | 31.9 | 36.7 | 32.1 |
| W | 37.4 | 66.7 | 34.2 | 41.2 |
| Sn | 10.4 | 8.68 | 9.66 | 39.7 |
| Pb | 52.5 | 53.1 | 66.1 | 48.2 |
| Zn | 44.9 | 30.4 | 30.1 | 15.0 |
| K2O/Na2O | 2.0 | 1.9 | 4.3 | 1.4 |
| CaO/ Na2O | 0.3 | 0.2 | 0.5 | 0.2 |
| A/CNK | 1.1 | 1.0 | 1.0 | 1.0 |
| A/NK | 1.2 | 1.1 | 1.2 | 1.2 |
| A/MF | 5.5 | 7.5 | 6.0 | 8.0 |
| C/MF | 0.6 | 0.7 | 0.7 | 0.8 |
| La/Nb | 1.19 | 0.64 | 0.39 | 0.71 |
| Nb/Ta | 4.3 | 3.5 | 9.8 | 4.7 |
| Zr/Hf | 18.0 | 17.7 | 31.6 | 17.5 |
| (Gd/Yb)N | 1.0 | 0.9 | 1.1 | 1.1 |
| ΣREE | 311.9 | 233.3 | 301.2 | 251.6 |
| LREE | 272.6 | 165.8 | 243.2 | 196.0 |
| HREE | 39.4 | 67.6 | 58.0 | 55.6 |
| LREE/HREE | 6.9 | 2.5 | 4.2 | 3.5 |
| LaN/YbN | 5.0 | 1.8 | 3.3 | 2.7 |
| δEu | 0.02 | 0.02 | 0.02 | 0.02 |
| δCe | 1.5 | 1.0 | 1.4 | 1.1 |

A/NK=Al2O3/ (Na2O+K2O) (molar ratio); A/CNK= Al2O3/ (CaO+Na2O+K2O) (molar ratio); A/MF=Al2O3/ (MgO+FeOT) (molar ratio); C/MF=MgO/(MgO+FeOT) (molar ratio); δEu= Eu/Eu\*=w(Eu)N/[w(Sm)N+w(Gd)N], δCe=Ce/Ce\*=w(Ce)N/[w(La)N+w(Pr)N]. N denotes normalized to primitive mantle from [58]. DI is differentiation index. DI=Quartz (Qtz)+Orthoclase (Or)+Albite(Ab)+Nepheline(Ne)+Leucite(Lc)+K-feldspar(kfs), from CIPW calculating values.