Table 4-7 Elemental and Sr-Nd isotopic analyses for some early Paleozoic TTGs from the Yunkai domian

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | GDX03-3 | GD17 | GD18-1 | GD18-2 | GDX10-1 | GDX10-2 | GDX11 | GD16-1 | GD19 | GD11-3 |
| Rock type | Hb-bearing tonalite | | | | Biotite tonalite | | | | | |
| Pluton | Mala | Qianpai | Qianpai | Qianpai | Chashan | Chashan | Chashan | Qianpai | Qianpai | Yanjiang |
| SiO2 | 63.80 | 64.55 | 66.82 | 66.58 | 69.57 | 69.21 | 67.59 | 67.82 | 68.35 | 67.79 |
| TiO2 | 1.22 | 0.84 | 0.78 | 0.76 | 0.48 | 0.51 | 0.62 | 0.75 | 0.67 | 0.58 |
| Al2O3 | 13.79 | 15.27 | 14.69 | 14.74 | 14.43 | 14.26 | 14.36 | 15.17 | 14.59 | 15.62 |
| Fe2O3 | 2.01 | 1.91 | 1.21 | 1.10 | 1.03 | 0.95 | 1.02 | 0.98 | 1.32 | 0.54 |
| FeO | 5.05 | 4.91 | 4.72 | 4.85 | 3.05 | 3.27 | 3.74 | 4.22 | 3.78 | 4.12 |
| MnO | 0.12 | 0.10 | 0.093 | 0.10 | 0.11 | 0.08 | 0.09 | 0.052 | 0.086 | 0.086 |
| MgO | 2.11 | 1.90 | 1.56 | 1.68 | 1.20 | 1.74 | 1.44 | 1.52 | 1.43 | 1.34 |
| CaO | 3.98 | 4.15 | 3.90 | 3.93 | 2.68 | 2.08 | 3.19 | 2.99 | 3.44 | 3.30 |
| Na2O | 4.65 | 3.20 | 3.37 | 3.34 | 3.50 | 3.48 | 3.79 | 3.08 | 3.25 | 3.43 |
| K2O | 1.60 | 1.20 | 1.71 | 1.78 | 1.90 | 1.98 | 1.89 | 2.06 | 1.90 | 1.87 |
| P2O5 | 0.26 | 0.17 | 0.15 | 0.15 | 0.12 | 0.13 | 0.12 | 0.16 | 0.12 | 0.19 |
| LOI | 1.31 | 1.46 | 0.67 | 0.87 | 1.83 | 2.22 | 2.04 | 0.88 | 0.78 | 0.80 |
| Total | 99.89 | 99.66 | 99.90 | 99.89 | 99.92 | 99.91 | 99.91 | 99.88 | 99.90 | 99.89 |
| Na2O/K2O | 2.90 | 2.67 | 1.98 | 1.87 | 1.84 | 1.76 | 2.00 | 1.49 | 1.71 | 1.83 |
| A/CNK | 0.83 | 1.08 | 1.01 | 1.01 | 1.14 | 1.22 | 1.02 | 1.19 | 1.07 | 1.14 |
| La | 59.8 | 38.0 | 32.5 | 41.0 | 24.9 | 31.6 | 30.2 | 29.2 | 33.6 | 25.6 |
| Ce | 103 | 71.7 | 62.4 | 81.7 | 51.0 | 63.3 | 61.3 | 53.9 | 64.9 | 49.6 |
| Pr | 15.8 | 8.45 | 7.65 | 9.51 | 6.13 | 7.67 | 7.31 | 6.55 | 7.99 | 5.95 |
| Nd | 66.5 | 31.0 | 29.0 | 37.3 | 25.6 | 31.6 | 29.2 | 24.6 | 30.8 | 22.9 |
| Sm | 16.8 | 6.28 | 6.01 | 7.00 | 6.02 | 7.00 | 6.08 | 4.74 | 6.28 | 5.12 |
| Eu | 2.36 | 1.53 | 1.41 | 1.32 | 1.19 | 1.15 | 1.25 | 1.80 | 1.33 | 1.41 |
| Gd | 17.2 | 6.38 | 5.62 | 6.22 | 5.96 | 6.61 | 5.76 | 4.62 | 5.73 | 4.74 |
| Tb | 3.32 | 1.05 | 0.95 | 1.01 | 1.19 | 1.28 | 1.03 | 0.77 | 0.91 | 0.82 |
| Dy | 19.5 | 6.27 | 5.91 | 5.72 | 7.82 | 8.06 | 6.19 | 4.96 | 5.52 | 5.06 |
| Ho | 3.54 | 1.32 | 1.12 | 1.06 | 1.58 | 1.64 | 1.23 | 1.02 | 1.04 | 0.93 |
| Er | 10.1 | 3.64 | 3.28 | 3.07 | 4.84 | 4.96 | 3.70 | 3.06 | 2.84 | 2.60 |
| Tm | 1.58 | 0.533 | 0.58 | 0.47 | 0.75 | 0.77 | 0.58 | 0.57 | 0.50 | 0.48 |
| Yb | 10.2 | 3.23 | 3.36 | 2.93 | 4.94 | 5.06 | 3.74 | 3.30 | 2.83 | 2.71 |
| Lu | 1.49 | 0.506 | 0.50 | 0.42 | 0.70 | 0.70 | 0.54 | 0.52 | 0.43 | 0.43 |
| δEu | 0.42 | 0.73 | 0.73 | 0.60 | 0.60 | 0.51 | 0.63 | 1.16 | 0.67 | 0.86 |
| Y | 111.3 | 36.7 | 29.4 | 31.2 | 46.4 | 51.1 | 36.9 | 29.4 | 27.3 | 26.9 |
| Rb | 144 | 60.5 | 73.1 | 71.3 | 67.1 | 63.1 | 69.3 | 113 | 91.5 | 157 |
| Sr | 70.69 | 137 | 111 | 101.57 | 144.00 | 117.03 | 118.38 | 171 | 109 | 190 |
| Ba | 315 | 395 | 417 | 403 | 347 | 347 | 350 | 576 | 413 | 488 |
| Nb | 20.62 | 7.45 | 10.6 | 10.33 | 10.45 | 10.30 | 9.53 | 18.0 | 10.3 | 16.3 |
| Ta | 2.81 | 0.797 | 1.97 | 0.72 | 0.95 | 1.06 | 0.86 | 1.25 | 0.89 | 1.58 |
| Zr | 354 | 241 | 151 | 151 | 157 | 153 | 154 | 164 | 161 | 199 |
| Hf | 10.03 | 5.91 | 4.46 | 4.47 | 4.74 | 4.41 | 4.71 | 4.28 | 4.60 | 5.55 |
| Ga | 21.51 | 23.6 | 18.5 | 17.92 | 18.77 | 18.05 | 18.76 | 21.8 | 18.2 | 19.4 |
| U | 7.82 | 1.35 | 3.66 | 1.47 | 2.16 | 2.40 | 1.72 | 2.05 | 1.30 | 2.75 |
| Th | 20.55 | 8.75 | 9.64 | 11.13 | 8.94 | 10.84 | 9.60 | 9.71 | 9.82 | 10.3 |
| V | 152 | 128 | 87.3 | 79.1 | 53.6 | 60.7 | 79.3 | 83.4 | 76.6 | 49.5 |
| Cr | 30.1 | 29.6 | 31.2 | 20.6 | 15.0 | 12.6 | 13.9 | 20.4 | 20.7 | 16.6 |
| Co | 17.3 | 57.0 | 13.0 | 13.0 | 8.4 | 9.3 | 12.0 | 12.4 | 12.6 | 9.85 |
| Ni | 9.9 | 25.7 | 15.2 | 11.7 | 6.9 | 7.5 | 7.7 | 10.8 | 10.7 | 8.11 |
| Pb | 10.7 | 9.3 | 13.7 | 15.3 | 15.1 | 12.4 | 15.5 | 27.5 | 16.4 | 26.0 |
| t(Zr)/℃ | 777 | 783 | 740 | 738 | 770 | 778 | 750 | 771 | 756 | 783 |
| 87Rb/86Sr | 5.901 | 1.189 | 1.913 |  | 1.155 |  |  | 1.890 |  | 2.418 |
| 147Sm/144Nd | 0.1523 | 0.1258 | 0.1221 |  | 0.1483 |  |  | 0.1197 | 0.1233 | 0.1395 |
| 87Sr/86Sr | 0.748635 | 0.721669 | 0.725720 |  | 0.727063 |  |  | 0.739457 |  | 0.738016 |
| ±2σ | 0.000009 | 0.000010 | 0.000004 |  | 0.000008 |  |  | 0.000006 |  | 0.000005 |
| 143Nd/144Nd | 0.512371 | 0.512221 | 0.512221 |  | 0.512285 |  |  | 0.512048 | 0.512192 | 0.511995 |
| ±2σ | 0.000006 | 0.000006 | 0.000003 |  | 0.000005 |  |  | 0.000003 | 0.000005 | 0.000003 |
| t(Ma) | 444.6 | 447.8 | 447.8 |  | 451.4 |  |  | 442.2 | 442.2 | 446.1 |
| (87Sr/86Sr)ⅰ | 0.71126 | 0.71408 | 0.71352 |  | 0.71964 |  |  | 0.72755 |  | 0.72265 |
| εNd(t) | -2.69 | -4.09 | -3.87 |  | -4.10 |  |  | -7.18 | -4.56 | -9.30 |
| T2DM | 1401 | 1517 | 1499 |  | 1521 |  |  | 1763 | 1550 | 1937 |

Table 4-7(Continued).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample | GD11-5 | GDX02 | GDX09 | GD11-1 | GD11-4 | GDX10-4 | GDX07 | GD21-1 | GD21-4 | GDX08 |
| Rock type | Bi tonalite | trondhjemite | | Biotite granodiorite | | | | monzogranite | | |
| Pluton | Yanjiang | Mala | Mala | Yanjiang | Yanjiang | Chashan | Mala | Mala | Mala | Mala |
| SiO2 | 69.81 | 77.02 | 76.91 | 72.85 | 72.27 | 75.47 | 72.74 | 73.75 | 73.53 | 72.47 |
| TiO2 | 0.35 | 0.175 | 0.26 | 0.21 | 0.21 | 0.14 | 0.36 | 0.30 | 0.34 | 0.36 |
| Al2O3 | 14.98 | 12 | 12.00 | 14.43 | 14.75 | 13.28 | 13.70 | 13.35 | 13.14 | 13.64 |
| Fe2O3 | 0.69 | 0.572 | 1.06 | 0.44 | 0.25 | 0.23 | 0.70 | 0.68 | 1.05 | 0.66 |
| FeO | 3.65 | 2.51 | 1.39 | 2.08 | 2.25 | 0.87 | 2.32 | 1.90 | 1.97 | 2.53 |
| MnO | 0.10 | 0.038 | 0.04 | 0.072 | 0.07 | 0.04 | 0.06 | 0.047 | 0.05 | 0.06 |
| MgO | 0.84 | 0.234 | 0.32 | 0.49 | 0.47 | 0.44 | 0.61 | 0.49 | 0.57 | 0.64 |
| CaO | 2.94 | 1.65 | 2.04 | 2.37 | 2.27 | 0.71 | 2.22 | 1.72 | 1.94 | 2.20 |
| Na2O | 4.01 | 4.29 | 4.34 | 3.39 | 3.90 | 4.27 | 3.52 | 3.40 | 3.55 | 3.52 |
| K2O | 1.73 | 1.5 | 1.09 | 3.05 | 2.88 | 3.84 | 3.06 | 3.58 | 3.18 | 3.05 |
| P2O5 | 0.10 | 0.055 | 0.04 | 0.067 | 0.07 | 0.04 | 0.08 | 0.070 | 0.08 | 0.08 |
| LOI | 0.70 | 0.06 | 0.43 | 0.35 | 0.51 | 0.61 | 0.51 | 0.40 | 0.48 | 0.68 |
| Total | 99.91 | 100.10 | 99.92 | 99.91 | 99.91 | 99.94 | 99.88 | 99.91 | 99.89 | 99.89 |
| Na2O/K2O | 2.33 | 2.86 | 3.98 | 1.11 | 1.35 | 1.11 | 1.15 | 0.95 | 1.12 | 1.16 |
| A/CNK | 1.08 | 1.03 | 1.00 | 1.09 | 1.08 | 1.06 | 1.04 | 1.06 | 1.03 | 1.04 |
| La | 38.0 | 61.3 | 64.5 | 27.4 | 28.5 | 13.0 | 40.3 | 36.9 | 43.6 | 29.8 |
| Ce | 74.7 | 104.0 | 115.5 | 50.2 | 56.4 | 26.7 | 77.1 | 67.9 | 75.6 | 65.2 |
| Pr | 8.89 | 13.6 | 12.92 | 6.22 | 6.90 | 3.58 | 9.26 | 8.62 | 10.59 | 6.92 |
| Nd | 33.9 | 47.1 | 47.5 | 23.8 | 27.3 | 15.3 | 36.8 | 32.1 | 40.8 | 26.5 |
| Sm | 6.31 | 9.25 | 8.12 | 5.09 | 6.06 | 4.57 | 7.36 | 6.82 | 8.28 | 5.47 |
| Eu | 1.16 | 1.34 | 1.23 | 1.05 | 1.22 | 0.61 | 1.22 | 0.99 | 0.95 | 1.10 |
| Gd | 5.21 | 8.67 | 7.41 | 4.30 | 5.19 | 4.86 | 6.85 | 6.43 | 7.04 | 5.21 |
| Tb | 0.74 | 1.47 | 1.22 | 0.65 | 0.84 | 1.11 | 1.19 | 1.24 | 1.22 | 1.07 |
| Dy | 3.48 | 9.04 | 7.07 | 3.56 | 4.33 | 7.65 | 6.93 | 8.37 | 7.07 | 7.23 |
| Ho | 0.61 | 1.9 | 1.38 | 0.61 | 0.75 | 1.59 | 1.36 | 1.78 | 1.40 | 1.60 |
| Er | 1.72 | 5.37 | 4.09 | 1.62 | 2.11 | 4.97 | 3.96 | 5.63 | 4.08 | 5.07 |
| Tm | 0.25 | 0.91 | 0.62 | 0.28 | 0.31 | 0.86 | 0.60 | 1.12 | 0.63 | 0.87 |
| Yb | 1.61 | 5.65 | 3.92 | 1.56 | 1.94 | 5.70 | 3.67 | 6.77 | 4.03 | 5.69 |
| Lu | 0.24 | 0.81 | 0.52 | 0.23 | 0.27 | 0.81 | 0.52 | 1.06 | 0.55 | 0.80 |
| δEu | 0.60 | 0.45 | 0.48 | 0.67 | 0.65 | 0.39 | 0.51 | 0.45 | 0.37 | 0.62 |
| Y | 17.4 | 53.4 | 40.0 | 15.9 | 22.6 | 52.5 | 39.6 | 54.1 | 42.9 | 47.4 |
| Rb | 125 | 87 | 43 | 151 | 146 | 81 | 121 | 158 | 139 | 130 |
| Sr | 127.08 | 44.6 | 74.29 | 113 | 107.90 | 61.64 | 85.47 | 68.8 | 62.56 | 84.93 |
| Ba | 252 | 381 | 272 | 565 | 511 | 363 | 633 | 551 | 570 | 566 |
| Nb | 15.05 | 9.52 | 6.84 | 12.7 | 16.43 | 6.93 | 10.63 | 14.5 | 10.65 | 12.29 |
| Ta | 0.98 | 0.61 | 0.80 | 1.15 | 1.33 | 1.52 | 0.72 | 1.63 | 0.89 | 1.25 |
| Zr | 141 | 182 | 175 | 115 | 144 | 96 | 174 | 150 | 171 | 177 |
| Hf | 4.12 | 5.92 | 5.37 | 4.16 | 5.04 | 3.65 | 5.54 | 4.75 | 5.63 | 5.71 |
| Ga | 16.63 | 21.7 | 15.38 | 16.7 | 18.80 | 12.81 | 17.41 | 17.4 | 17.15 | 18.79 |
| U | 1.71 | 6.65 | 1.23 | 2.57 | 3.58 | 3.30 | 1.70 | 5.14 | 2.84 | 3.36 |
| Th | 19.10 | 17.7 | 17.34 | 13.7 | 15.15 | 14.33 | 11.72 | 18.2 | 20.18 | 12.60 |
| V | 31.4 | 3.2 | 12.5 | 17.3 | 25.5 | 14.2 | 25.0 | 24.0 | 26.1 | 25.6 |
| Cr | 7.43 | 24.3 | 2.04 | 3.53 | 5.31 | 10.12 | 3.86 | 5.65 | 4.37 | 4.96 |
| Co | 5.17 | 1.98 | 2.41 | 3.35 | 3.52 | 2.00 | 3.95 | 3.32 | 3.72 | 4.20 |
| Ni | 4.26 | 3.19 | 0.96 | 2.43 | 2.59 | 1.70 | 2.54 | 3.12 | 2.48 | 2.66 |
| Pb | 16.7 | 14.5 | 12.6 | 24.6 | 31.1 | 24.2 | 22.0 | 25.7 | 21.3 | 23.0 |
| t(Zr)/℃ | 755 | 791 | 785 | 742 | 761 | 738 | 772 | 764 | 771 | 773 |
| 87Rb/86Sr |  | 5.625 | 1.681 | 3.825 |  |  |  |  | 6.535 |  |
| 147Sm/144Nd | 0.1126 | 0.1188 | 0.1033 | 0.1318 | 0.1342 |  | 0.1209 |  | 0.1227 |  |
| 87Sr/86Sr |  | 0.737990 | 0.722760 | 0.743881 |  |  |  |  | 0.753908 |  |
| ±2σ |  | 0.000015 | 0.000010 | 0.000006 |  |  |  |  | 0.000010 |  |
| 143Nd/144Nd | 0.512004 | 0.512199 | 0.512235 | 0.512041 | 0.512047 |  | 0.512181 |  | 0.512197 |  |
| ±2σ | 0.000004 | 0.000007 | 0.000006 | 0.000003 | 0.000005 |  | 0.000005 |  | 0.000006 |  |
| t(Ma) | 446 | 443.7 | 443.7 | 446 | 446 |  | 440.6 |  | 440.5 |  |
| (87Sr/86Sr)ⅰ |  | 0.70244 | 0.71214 | 0.71957 |  |  |  |  | 0.71290 |  |
| εNd(t) | -7.58 | -4.15 | -2.57 | -7.96 | -7.98 |  | -4.66 |  | -4.45 |  |
| T2DM | 1798 | 1519 | 1390 | 1829 | 1831 |  | 1557 |  | 1540 |  |