**Supp. Table 3:** The major (wt.%) and trace element (ppm) analysis results for the Nanwenhe gneissic granites.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Samples** | MD-003-A | MD-003-B | zk10746-b47 | zk10746-b49 | 2238b-21z | 2238b-32z | 2238b-41z | 2238b-52.1z | 89-1-b6z | MLT-1 | MP002 | 2238b-6z | 2238b-9z | 2238b-17z | 2238b-19z | MLP158-Q21 | MLP158-Q14 | GSR1 | Detection limits |
| **SiO2** | 73.62 | 72.59 | 76.78 | 77.57 | 74.42 | 74.01 | 73.89 | 73.43 | 71.04 | 75.73 | 76.32 | 74.46 | 74.67 | 72.89 | 73.35 | 69.94 | 73.06 | 72.8 | 0.04 |
| **Al2O3** | 13.72 | 15.25 | 13.08 | 12.44 | 13.99 | 14.19 | 13.85 | 14.31 | 14.25 | 12.67 | 12.81 | 13.12 | 12.87 | 13.98 | 13.73 | 14.57 | 13.97 | 13.45 | 0.05 |
| **Fe2O3** | 1.23 | 1.11 | 0.21 | 0.18 | 0.56 | 0.29 | 0.48 | 0.45 | 0.46 | 0.48 | 0.46 | 0.44 | 0.27 | 0.46 | 0.29 | 0.66 | 0.19 | 1.09 | - |
| **FeO** | 1.45 | 0.56 | 0.88 | 1.20 | 0.88 | 1.08 | 1.51 | 1.52 | 2.68 | 0.88 | 0.92 | 1.92 | 1.97 | 2.31 | 1.76 | 2.71 | 0.53 | 0.96 | 0.06 |
| **MgO** | 0.71 | 0.36 | 0.45 | 0.26 | 0.34 | 0.31 | 0.47 | 0.49 | 1.06 | 0.48 | 0.64 | 0.62 | 0.63 | 0.67 | 0.52 | 1.44 | 0.82 | 0.45 | 0.03 |
| **CaO** | 1.79 | 3.09 | 0.98 | 0.80 | 0.67 | 0.68 | 1.30 | 0.96 | 2.06 | 0.27 | 0.71 | 1.55 | 1.23 | 1.39 | 1.19 | 2.52 | 0.49 | 1.58 | 0.03 |
| **Na2O** | 6.04 | 6.02 | 6.30 | 5.73 | 2.57 | 2.66 | 3.32 | 3.20 | 2.80 | 2.41 | 3.08 | 3.22 | 2.89 | 3.23 | 2.92 | 2.60 | 2.81 | 3.40 | 0.27 |
| **K2O** | 0.42 | 0.13 | 0.57 | 0.80 | 5.20 | 5.59 | 4.00 | 4.32 | 4.25 | 5.91 | 3.27 | 3.46 | 4.31 | 3.56 | 5.07 | 4.33 | 5.29 | 4.97 | 0.04 |
| **MnO** | 0.02 | 0.01 | 0.02 | 0.03 | 0.04 | 0.04 | 0.08 | 0.06 | 0.06 | 0.01 | 0.03 | 0.06 | 0.05 | 0.08 | 0.05 | 0.07 | 0.02 | 0.06 | 0.00 |
| **P2O5** | 0.12 | 0.10 | 0.05 | 0.17 | 0.20 | 0.16 | 0.17 | 0.20 | 0.17 | 0.15 | 0.18 | 0.19 | 0.15 | 0.19 | 0.16 | 0.12 | 0.18 | 0.10 | 0.00 |
| **TiO2** | 0.482 | 0.351 | 0.14 | 0.11 | 0.14 | 0.14 | 0.21 | 0.23 | 0.44 | 0.17 | 0.22 | 0.30 | 0.29 | 0.34 | 0.25 | 0.47 | 0.27 | 0.287 | 0.00 |
| **LOI** | 0.24 | 0.37 | 0.48 | 0.62 | 0.89 | 0.80 | 0.59 | 0.75 | 0.57 | 0.76 | 1.21 | 0.58 | 0.56 | 0.77 | 0.55 | 0.41 | 1.82 | 0.77 | 0.07 |
| **TOTAL** | 99.86 | 99.93 | 99.95 | 99.91 | 99.89 | 99.94 | 99.88 | 99.89 | 99.87 | 99.92 | 99.86 | 99.93 | 99.90 | 99.85 | 99.86 | 99.85 | 99.92 | 99.89 | - |
| **TFe2O3** | 2.84 | 1.73 | 1.19 | 1.51 | 1.54 | 1.49 | 2.15 | 2.14 | 3.44 | 1.46 | 1.48 | 2.57 | 2.46 | 3.02 | 2.25 | 3.67 | 0.70 | 2.16 | 0.02 |
| **FeOT** | 2.56 | 1.55 | 1.07 | 1.36 | 1.38 | 1.34 | 1.94 | 1.92 | 3.10 | 1.32 | 1.34 | 2.32 | 2.21 | 2.72 | 2.03 | 3.30 | 0.63 | 1.94 | 0.02 |
| **Cs** | 2.56 | 0.90 | 8.83 | 11.54 | 28.07 | 22.98 | 36.51 | 25.88 | 23.05 | 14.05 | 20.20 | 25.42 | 31.90 | 31.56 | 37.04 |  |  | 38.2 | 0.20 |
| **Rb** | 21.00 | 4.70 | 40.90 | 56.00 | 274.50 | 268.10 | 270.80 | 228.60 | 172.90 | 192.4 | 211.6 | 195.60 | 225.70 | 231.9 | 266.80 | 103.00 | 356.00 | 463.9 | 2.10 |
| **Ba** | 103.10 | 14.80 | 92.00 | 91.90 | 136.20 | 126.50 | 176.90 | 187.40 | 381.80 | 222.8 | 125.0 | 193.50 | 203.70 | 114.6 | 261.80 | 555.00 | 312.00 | 304 | 39.20 |
| **Th** | 38.17 | 34.22 | 16.82 | 13.99 | 9.29 | 9.44 | 13.55 | 10.21 | 20.08 | 11.24 | 15.52 | 18.71 | 13.14 | 18.54 | 20.82 | 18.70 | 17.50 | 54.9 | 0.88 |
| **U** | 7.28 | 6.24 | 11.69 | 13.79 | 11.19 | 4.69 | 12.37 | 9.48 | 7.68 | 5.08 | 11.65 | 11.41 | 8.20 | 8.41 | 14.05 | 6.84 | 9.16 | 19.85 | 1.05 |
| **Nb** | 12.76 | 9.38 | 15.73 | 13.44 | 13.41 | 10.39 | 13.94 | 14.42 | 15.00 | 9.31 | 18.48 | 12.71 | 11.03 | 15.14 | 18.27 | 13.00 | 17.10 | 39.4 | 0.58 |
| **Ta** | 1.33 | 1.22 | 5.08 | 3.84 | 2.69 | 1.93 | 3.28 | 2.73 | 1.81 | 1.68 | 4.28 | 2.09 | 2.03 | 2.64 | 3.54 | 1.48 | 2.32 | 7.48 | 0.28 |
| **La** | 47.79 | 37.33 | 20.34 | 13.17 | 14.79 | 14.38 | 24.25 | 18.08 | 37.33 | 16.16 | 17.38 | 36.76 | 24.59 | 31.15 | 26.17 | 31.90 | 27.50 | 57.7 | 3.66 |
| **Ce** | 91.82 | 67.30 | 41.74 | 26.01 | 31.03 | 30.98 | 45.92 | 36.68 | 74.11 | 32.58 | 36.94 | 75.74 | 50.58 | 64.26 | 54.72 | 60.00 | 56.50 | 112.5 | 4.50 |
| **Pb** | 3.75 | 4.74 | 11.62 | 5.38 | 29.36 | 37.98 | 21.89 | 28.23 | 26.63 | 31.70 | 17.08 | 24.35 | 31.73 | 27.50 | 22.99 | 41.60 | 26.90 | 31.7 | 0.71 |
| **Pr** | 10.20 | 7.72 | 4.89 | 3.00 | 3.76 | 3.75 | 5.18 | 4.39 | 8.55 | 3.98 | 4.54 | 8.91 | 5.98 | 7.48 | 6.45 | 6.88 | 6.63 | 12.81 | 0.11 |
| **Sr** | 111.80 | 219.90 | 95.60 | 59.10 | 28.60 | 31.60 | 52.70 | 46.50 | 69.50 | 33.60 | 39.60 | 44.10 | 62.00 | 35.40 | 50.50 | 93.00 | 51.20 | 108 | 1.70 |
| **Nd** | 38.93 | 29.47 | 18.42 | 11.15 | 14.77 | 14.81 | 19.26 | 17.60 | 33.73 | 15.63 | 17.52 | 34.40 | 23.95 | 28.88 | 25.06 | 27.10 | 24.40 | 48.6 | 1.58 |
| **Zr** | 193.40 | 132.50 | 75.20 | 60.90 | 50.80 | 51.80 | 75.50 | 70.80 | 119.90 | 42.00 | 81.80 | 116.70 | 92.30 | 103.0 | 86.80 | 76.00 | 137.00 | 155 | 11.60 |
| **Hf** | 6.98 | 5.79 | 3.52 | 2.82 | 2.13 | 2.25 | 3.17 | 3.09 | 6.21 | 1.53 | 3.28 | 5.17 | 4.12 | 4.74 | 3.83 | 3.75 | 4.36 | 6.0 | 6.04 |
| **Sm** | 8.11 | 6.15 | 4.37 | 2.67 | 3.40 | 3.62 | 4.20 | 4.00 | 6.85 | 3.66 | 4.16 | 7.18 | 5.10 | 6.10 | 5.62 | 5.22 | 5.72 | 10.12 | 0.42 |
| **Eu** | 1.03 | 0.84 | 0.38 | 0.25 | 0.39 | 0.40 | 0.55 | 0.58 | 0.99 | 0.37 | 0.40 | 0.73 | 0.56 | 0.52 | 0.70 | 0.97 | 0.39 | 0.86 | 0.01 |
| **Gd** | 7.94 | 5.97 | 4.58 | 2.87 | 3.50 | 3.57 | 4.38 | 4.10 | 6.91 | 3.35 | 4.27 | 7.39 | 5.09 | 6.06 | 5.27 | 5.09 | 5.50 | 9.16 | 0.14 |
| **Tb** | 1.41 | 1.02 | 1.04 | 0.65 | 0.60 | 0.69 | 0.87 | 0.75 | 1.17 | 0.60 | 0.82 | 1.34 | 0.93 | 1.11 | 0.94 | 0.84 | 1.07 | 1.72 | 0.07 |
| **Dy** | 8.84 | 6.35 | 6.52 | 4.30 | 3.02 | 3.60 | 5.04 | 4.00 | 6.42 | 3.44 | 4.52 | 7.45 | 5.17 | 6.15 | 5.17 | 4.41 | 5.85 | 10.52 | 0.32 |
| **Y** | 50.98 | 34.57 | 37.62 | 24.57 | 14.55 | 16.65 | 25.35 | 20.00 | 35.46 | 17.43 | 23.74 | 38.02 | 25.77 | 31.51 | 24.48 | 24.60 | 33.60 | 68.5 | 6.51 |
| **Ho** | 1.76 | 1.23 | 1.34 | 0.85 | 0.50 | 0.60 | 0.92 | 0.72 | 1.25 | 0.61 | 0.84 | 1.37 | 0.92 | 1.13 | 0.89 | 0.85 | 1.14 | 2.10 | 0.05 |
| **Er** | 5.07 | 3.46 | 4.09 | 2.63 | 1.25 | 1.54 | 2.51 | 1.92 | 3.41 | 1.61 | 2.25 | 3.59 | 2.35 | 3.19 | 2.38 | 2.47 | 2.97 | 6.47 | 0.03 |
| **Tm** | 0.88 | 0.58 | 0.72 | 0.47 | 0.19 | 0.25 | 0.42 | 0.31 | 0.55 | 0.27 | 0.39 | 0.56 | 0.36 | 0.52 | 0.38 | 0.41 | 0.40 | 1.24 | 0.18 |
| **Yb** | 5.53 | 3.50 | 4.66 | 3.21 | 1.10 | 1.46 | 2.79 | 2.06 | 3.31 | 1.66 | 2.47 | 3.36 | 2.11 | 3.35 | 2.30 | 2.59 | 2.71 | 8.60 | 1.20 |
| **Lu** | 0.77 | 0.49 | 0.68 | 0.47 | 0.15 | 0.20 | 0.39 | 0.29 | 0.47 | 0.23 | 0.34 | 0.47 | 0.29 | 0.45 | 0.32 | 0.39 | 0.35 | 1.3 | 0.12 |

GSR1 is the standard analyzed samples for major and trace elements.