Table S1. Whole-rock compositions of the mafic gneisses and granulites in the central DML.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample No. | 08020401H | 08020404C | 8020402 | 08020404B | 08020404D | 08020406A | 8020407 | 08020404G | 08020404J | 08020405B |
| ID No. | S1 | S2 | S3 | S4 | S5 | S6 | S7 | S8 | S9 | S10 |
| XRF analysis |  |  |  |  |  |  |  |  |  |  |
| SiO2 | 47.89 | 46.63 | 45.83 | 49.80 | 48.25 | 47.00 | 49.00 | 43.77 | 41.75 | 50.52 |
| TiO2 | 2.55 | 0.77 | 2.39 | 1.95 | 0.91 | 2.16 | 0.98 | 5.27 | 4.90 | 3.07 |
| Al2O3 | 13.75 | 17.78 | 13.71 | 15.44 | 13.88 | 13.85 | 15.09 | 11.98 | 11.40 | 14.14 |
| Fe2O3 | 23.64 | 16.11 | 15.63 | 11.92 | 18.72 | 15.51 | 10.31 | 20.58 | 21.88 | 15.08 |
| MnO | 0.29 | 0.22 | 0.23 | 0.15 | 0.24 | 0.24 | 0.14 | 0.51 | 0.31 | 0.18 |
| MgO | 7.35 | 8.04 | 7.32 | 7.64 | 9.49 | 7.46 | 10.15 | 5.61 | 5.59 | 4.42 |
| CaO | 3.18 | 4.00 | 11.38 | 8.70 | 4.30 | 11.39 | 9.11 | 9.73 | 10.36 | 8.00 |
| Na2O | 1.32 | 2.30 | 1.77 | 2.84 | 1.92 | 1.76 | 2.23 | 1.70 | 1.20 | 2.64 |
| K2O | 0.80 | 3.27 | 1.21 | 0.94 | 2.06 | 0.38 | 2.14 | 0.38 | 2.00 | 1.09 |
| P2O5 | 0.16 | 0.10 | 0.25 | 0.38 | 0.11 | 0.20 | 0.31 | 0.77 | 0.56 | 0.63 |
| Total | 100.93 | 99.22 | 99.71 | 99.77 | 99.88 | 99.95 | 99.45 | 100.31 | 99.96 | 99.76 |
|  |  |  |  |  |  |  |  |  |  |  |
| Ba | 295 | 545 | 95 | 142 | 438 | 63 | 864 | 60 | 308 | 251 |
| Co | 57 | 49 | 49 | 56 | 49 | 48 | 51 | 37 | 29 | 44 |
| Cr | 111 | 816 | 289 | 305 | 1197 | 220 | 503 | 52 | 82 | 115 |
| Nb | 14.5 | 10.1 | 7.6 | 17.6 | 10.5 | 6.9 | 3.1 | 10.7 | 11.8 | 14 |
| Ni | 49 | 149 | 93 | 234 | 185 | 74 | 304 | 20 | 25 | 61 |
| Rb | 50.5 | 165.3 | 48.9 | 17.7 | 93.8 | 10.5 | 60.2 | 7.3 | 72.4 | 19.4 |
| Sr | 19 | 101 | 87 | 453 | 70 | 94 | 803 | 113 | 66 | 229 |
| V  | 532 | 226 | 406 | 176 | 247 | 397 | 218 | 607 | 596 | 221 |
| Y  | 44 | 20.1 | 40 | 21.6 | 17.4 | 37.2 | 37.7 | 57.4 | 58.6 | 48 |
| Zr | 168 | 126 | 153 | 185 | 90 | 121 | 160 | 283 | 312 | 257 |
| INAA analysis |  |  |  |  |  |  |  |
| Sc (0.1)\* | 59.7 | 50.4 | 52.8 | 21.5 | 43.1 | 54.4 | 35.7 | 58.9 | 60.4 | 34.4 |
| ICP-MS analysis |  |  |  |  |  |  |  |  |  |
| V (5) | 487 | 212 | 426 | 180 | 247 | 416 | 225 | 604 | 598 | 171 |
| Cr (20) | 108 | 801 | 297 | 315 | 1170 | 225 | 531 | 59 | 99 | 117 |
| Co (1) | 53 | 44 | 53 | 54 | 47 | 52 | 52 | 43 | 39 | 35 |
| Ni (20) | 50 | 130 | 70 | 200 | 180 | 60 | 280 | 30 | 30 | 30 |
| Cu (10) | < 10 | < 10 | 40 | 30 | < 10 | 60 | 100 | 20 | 30 | 30 |
| Zn (30) | 390 | 160 | 140 | 140 | 200 | 160 | 120 | 180 | 240 | 150 |
| Ga (1) | 28 | 29 | 23 | 25 | 26 | 23 | 19 | 28 | 29 | 23 |
| Ge (0.5) | 3.6 | 2.6 | 2.3 | 2 | 3 | 2.4 | 2.2 | 3 | 3.4 | 1.8 |
| Rb (1) | 62 | 181 | 55 | 15 | 112 | 6 | 61 | 3 | 97 | 13 |
| Sr (2) | 13 | 89 | 87 | 437 | 69 | 96 | 734 | 128 | 70 | 189 |
| Y (0.5) | 58.3 | 28.7 | 51.8 | 21.8 | 23.1 | 44.9 | 43.3 | 82.4 | 89.7 | 46.5 |
| Zr (1) | 184 | 118 | 163 | 192 | 89 | 126 | 165 | 334 | 377 | 223 |
| Nb (0.2) | 13.4 | 6.3 | 5.2 | 16.7 | 6.7 | 4.2 | 5.8 | 11.4 | 11.7 | 11.6 |
| Cs (0.1) | 1.7 | 7.4 | 4.1 | 0.4 | 3.7 | < 0.1 | 0.3 | < 0.1 | 1.9 | 0.2 |
| Ba (3) | 268 | 489 | 94 | 149 | 389 | 42 | 837 | 62 | 311 | 197 |
| La (0.05) | 23.4 | 15.8 | 8.65 | 20.6 | 9.68 | 7.2 | 55.3 | 20.3 | 15.7 | 19.1 |
| Ce (0.05) | 55 | 33.1 | 23.7 | 47.1 | 20.2 | 20.5 | 136 | 58.3 | 43.3 | 48.8 |
| Pr (0.01) | 7.75 | 4.09 | 3.71 | 6.18 | 2.63 | 3.35 | 18.5 | 9.29 | 7.06 | 7.26 |
| Nd (0.05) | 35.7 | 16.8 | 18.9 | 26.9 | 11.2 | 16.8 | 73.9 | 45.5 | 35.7 | 34.2 |
| Sm (0.01) | 10.9 | 4.98 | 6.07 | 6.51 | 2.93 | 5.39 | 13.6 | 13.2 | 11.5 | 9.26 |
| Eu (0.005) | 1.24 | 1.23 | 2.04 | 2.03 | 1.01 | 1.8 | 2.27 | 3.92 | 3.43 | 2.4 |
| Gd (0.01) | 11.3 | 6.07 | 7.89 | 6.15 | 3.5 | 7.05 | 9.78 | 15.2 | 14.6 | 9.72 |
| Tb (0.01) | 1.83 | 1.04 | 1.47 | 0.91 | 0.64 | 1.32 | 1.47 | 2.61 | 2.62 | 1.57 |
| Dy (0.01) | 10.4 | 5.47 | 9.22 | 4.51 | 4.05 | 8.14 | 7.97 | 15.5 | 16.5 | 8.65 |
| Ho (0.01) | 2.07 | 1 | 1.81 | 0.77 | 0.82 | 1.59 | 1.53 | 2.97 | 3.35 | 1.66 |
| Er (0.01) | 6.01 | 2.6 | 5.3 | 1.95 | 2.43 | 4.68 | 4.29 | 8.39 | 9.54 | 4.64 |
| Tm (0.005) | 0.877 | 0.365 | 0.796 | 0.262 | 0.365 | 0.691 | 0.612 | 1.19 | 1.38 | 0.668 |
| Yb (0.01) | 5.87 | 2.3 | 5.27 | 1.65 | 2.47 | 4.59 | 3.97 | 7.61 | 9.16 | 4.4 |
| Lu (0.002) | 0.969 | 0.375 | 0.882 | 0.269 | 0.412 | 0.749 | 0.627 | 1.24 | 1.53 | 0.72 |
| Hf (0.1) | 4.7 | 2.8 | 3.8 | 4.1 | 2 | 3 | 3.7 | 7.4 | 8.5 | 5.1 |
| Ta (0.01) | 0.84 | 0.35 | 0.29 | 1.09 | 0.34 | 0.26 | 0.3 | 0.73 | 0.74 | 0.78 |
| W (0.5) | < 0.5 | 1.3 | < 0.5 | 0.8 | < 0.5 | < 0.5 | < 0.5 | < 0.5 | 2.4 | < 0.5 |
| Tl (0.05) | 0.3 | 0.85 | 0.28 | 0.07 | 0.51 | 0.05 | 0.31 | < 0.05 | 0.45 | 0.07 |
| Pb (5) | < 5 | 7 | < 5 | < 5 | 5 | < 5 | 10 | < 5 | < 5 | 5 |
| Th (0.05) | 6.76 | 0.93 | 0.91 | 1.73 | 0.36 | 1.19 | 3.53 | 0.36 | 0.29 | 0.71 |
| U (0.01) | 0.91 | 0.34 | 0.34 | 0.65 | 0.19 | 0.48 | 0.47 | 0.26 | 0.21 | 0.32 |

Fe as Fe2O3. Detection limit of ICP-MS is listed in parentheses

Table S1. Whole-rock compositions of the mafic gneisses and granulites in the central DML (continued 1).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample No. | 08020405C | 08020404F | 08020404H | 08020406B | 011220T01C | 01121901A | 01121901C | 01121902A | 01122002C | 011220T01B |
| ID No. | S11 | S12 | S13 | S14 | H1 | H2 | H3 | H4 | H5 | H6 |
| XRF analysis |  |  |  |  |  |  |  |  |  |  |
| SiO2 | 45.88 | 40.35 | 38.83 | 39.80 | 49.67 | 48.21 | 46.72 | 48.91 | 42.83 | 37.10 |
| TiO2 | 3.69 | 0.95 | 2.49 | 5.28 | 0.29 | 3.83 | 4.04 | 0.77 | 2.42 | 0.18 |
| Al2O3 | 13.45 | 19.00 | 17.41 | 12.26 | 20.80 | 15.12 | 16.23 | 15.27 | 13.45 | 19.80 |
| Fe2O3 | 19.37 | 26.06 | 25.02 | 22.49 | 6.90 | 12.63 | 13.03 | 9.90 | 13.79 | 22.07 |
| MnO | 0.23 | 0.27 | 0.29 | 0.35 | 0.10 | 0.15 | 0.17 | 0.16 | 0.24 | 0.61 |
| MgO | 3.62 | 7.13 | 7.34 | 7.27 | 5.97 | 3.96 | 4.91 | 8.62 | 7.51 | 5.59 |
| CaO | 8.81 | 1.93 | 3.37 | 11.61 | 9.53 | 7.17 | 7.36 | 10.31 | 10.86 | 10.96 |
| Na2O | 2.43 | 0.82 | 0.45 | 0.52 | 3.83 | 2.54 | 2.57 | 3.55 | 2.82 | 0.83 |
| K2O | 0.74 | 2.93 | 4.75 | 0.17 | 0.98 | 1.98 | 2.45 | 1.09 | 1.78 | 0.17 |
| P2O5 | 1.85 | 0.09 | 0.22 | 0.59 | 0.07 | 1.46 | 1.22 | 0.14 | 1.54 | 0.06 |
| Total | 100.08 | 99.53 | 100.18 | 100.33 | 98.14 | 97.05 | 98.70 | 98.73 | 97.24 | 97.37 |
|  |  |  |  |  |  |  |  |  |  |  |
| Ba | 202 | 698 | 722 | 39 | 199 | 1483 | 549 | 92 | 189 | 48 |
| Co | 37 | 45 | 68 | 37 | 42 | 27 | 28 | 45 | 38 | 55 |
| Cr | 76 | 740 | 324 | 184 | 91 | 62 | 159 | 394 | 95 | 124 |
| Nb | 17.3 | 11.8 | 9.7 | 10.8 | 0.6 | 20.5 | 21.7 | 3.2 | 5.4 | 8 |
| Ni | 35 | 85 | 111 | 56 | 166 | 28 | 39 | 170 | 65 | 65 |
| Rb | 12 | 129 | 341.6 | 7.1 | 36.1 | 61.6 | 77.5 | 32.4 | 63.3 | 5.8 |
| Sr | 180 | 49 | 50 | 32 | 427 | 943 | 692 | 254 | 300 | 125 |
| V  | 211 | 276 | 373 | 654 | 49 | 211 | 202 | 189 | 332 | 135 |
| Y  | 79.6 | 20.2 | 18 | 74.7 | 9.9 | 52.2 | 38 | 20.3 | 50.3 | 240.9 |
| Zr | 458 | 140 | 173 | 278 | 34 | 604 | 442 | 94 | 88 | 44 |
| INAA analysis |  |  |  |  |  |  |  |  |
| Sc (0.1) | 41 | - | - | - | 8.8 | 25.5 | 24.5 | 33.4 | - | - |
| ICP-MS analysis |  |  |  |  |  |  |  |  |  |
| V (5) | 211 | - | - | - | 50 | 189 | 183 | 197 | - | - |
| Cr (20) | 78 | - | - | - | 81 | 76 | 180 | 441 | - | - |
| Co (1) | 41 | - | - | - | 43 | 27 | 30 | 47 | - | - |
| Ni (20) | 40 | - | - | - | 160 | < 20 | 30 | 150 | - | - |
| Cu (10) | 40 | - | - | - | 20 | 20 | 20 | 20 | - | - |
| Zn (30) | 240 | - | - | - | 100 | 210 | 250 | 110 | - | - |
| Ga (1) | 29 | - | - | - | 20 | 27 | 28 | 18 | - | - |
| Ge (0.5) | 2.9 | - | - | - | 1.4 | 2.4 | 2 | 1.9 | - | - |
| Rb (1) | 9 | - | - | - | 33 | 67 | 86 | 31 | - | - |
| Sr (2) | 200 | - | - | - | 352 | 889 | 635 | 232 | - | - |
| Y (0.5) | 111 | - | - | - | 7.3 | 61.4 | 46.1 | 19.8 | - | - |
| Zr (1) | 513 | - | - | - | 29 | 575 | 442 | 86 | - | - |
| Nb (0.2) | 20.6 | - | - | - | 0.9 | 20.4 | 21.6 | 3.4 | - | - |
| Cs (0.1) | < 0.1 | - | - | - | 3.9 | 1.9 | 7.5 | 1 | - | - |
| Ba (3) | 206 | - | - | - | 194 | 1370 | 494 | 68 | - | - |
| La (0.05) | 45.9 | - | - | - | 8.72 | 98 | 94.4 | 11.7 | - | - |
| Ce (0.05) | 120 | - | - | - | 19.9 | 219 | 214 | 25.5 | - | - |
| Pr (0.01) | 18 | - | - | - | 2.6 | 30.1 | 28.6 | 3.16 | - | - |
| Nd (0.05) | 85.2 | - | - | - | 10.5 | 125 | 116 | 13.3 | - | - |
| Sm (0.01) | 22.1 | - | - | - | 2.08 | 23.5 | 22.2 | 3.22 | - | - |
| Eu (0.005) | 4.3 | - | - | - | 0.702 | 4.41 | 3.47 | 1.05 | - | - |
| Gd (0.01) | 23.9 | - | - | - | 1.61 | 18.3 | 16.3 | 3.38 | - | - |
| Tb (0.01) | 3.72 | - | - | - | 0.24 | 2.47 | 2.03 | 0.58 | - | - |
| Dy (0.01) | 20.7 | - | - | - | 1.29 | 12.3 | 9.64 | 3.39 | - | - |
| Ho (0.01) | 3.84 | - | - | - | 0.26 | 2.15 | 1.66 | 0.66 | - | - |
| Er (0.01) | 10.4 | - | - | - | 0.71 | 5.47 | 4.17 | 1.93 | - | - |
| Tm (0.005) | 1.47 | - | - | - | 0.103 | 0.744 | 0.565 | 0.28 | - | - |
| Yb (0.01) | 9.44 | - | - | - | 0.68 | 4.61 | 3.54 | 1.86 | - | - |
| Lu (0.002) | 1.52 | - | - | - | 0.117 | 0.717 | 0.541 | 0.311 | - | - |
| Hf (0.1) | 10.2 | - | - | - | 0.8 | 10.9 | 9 | 2 | - | - |
| Ta (0.01) | 1.16 | - | - | - | 0.05 | 1.06 | 1.14 | 0.22 | - | - |
| W (0.5) | < 0.5 | - | - | - | < 0.5 | 2.2 | 1.1 | < 0.5 | - | - |
| Tl (0.05) | 0.05 | - | - | - | 0.64 | 0.48 | 0.6 | 0.23 | - | - |
| Pb (5) | 6 | - | - | - | 16 | 15 | 16 | 12 | - | - |
| Th (0.05) | 1.58 | - | - | - | 0.92 | 1.32 | 1.98 | 2.17 | - | - |
| U (0.01) | 0.54 | - | - | - | 0.25 | 1.75 | 1.79 | 2.19 | - | - |

Fe as Fe2O3. Detection limit of ICP-MS is listed in parentheses

Table S1. Whole-rock compositions of the mafic gneisses and granulites in the central DML (continued 2).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample No. | B01122102A | B01122109 | troll79Maf | troll80Maf | troll81Grt | troll82GRt | 02010202B | 02010202F | 02010202G | 02010202H |
| ID No. | H7 | H8 | T1 | T2 | T3 | T4 | F1 | F2 | F3 | F4 |
| XRF analysis |  |  |  |  |  |  |  |  |  |  |
| SiO2 | 50.21 | 46.47 | 42.91 | 46.31 | 43.52 | 45.12 | 51.70 | 43.40 | 45.54 | 56.88 |
| TiO2 | 1.29 | 1.36 | 3.70 | 5.33 | 0.48 | 4.14 | 3.55 | 0.29 | 0.31 | 0.51 |
| Al2O3 | 15.07 | 14.28 | 12.77 | 11.61 | 15.38 | 12.75 | 14.11 | 3.40 | 3.73 | 8.24 |
| Fe2O3 | 12.14 | 12.71 | 20.65 | 16.64 | 16.91 | 19.36 | 12.95 | 11.94 | 10.95 | 7.36 |
| MnO | 0.18 | 0.19 | 0.31 | 0.24 | 1.34 | 0.27 | 0.09 | 0.17 | 0.16 | 0.14 |
| MgO | 7.74 | 8.58 | 3.62 | 3.68 | 4.45 | 5.84 | 3.83 | 27.49 | 25.93 | 11.13 |
| CaO | 11.78 | 12.34 | 9.42 | 8.15 | 14.20 | 9.62 | 3.53 | 10.70 | 9.50 | 13.32 |
| Na2O | 0.54 | 1.00 | 2.85 | 0.73 | 0.14 | 1.02 | 1.92 | 0.48 | 0.40 | 0.97 |
| K2O | 0.09 | 0.39 | 1.02 | 2.15 | 0.63 | 0.46 | 4.49 | 0.19 | 0.71 | 0.56 |
| P2O5 | 0.11 | 0.11 | 0.73 | 2.31 | 0.16 | 0.37 | 1.63 | 0.05 | 0.06 | 0.11 |
| Total | 99.15 | 97.44 | 97.98 | 97.15 | 97.22 | 98.95 | 97.80 | 98.11 | 97.29 | 99.21 |
|  |  |  |  |  |  |  |  |  |  |  |
| Ba | 37 | 27 | 212 | 634 | 102 | 56 | 364 | 72 | 121 | 100 |
| Co | 55 | 50 | 34 | 27 | 21 | 39 | 30 | 94 | 83 | 40 |
| Cr | 236 | 395 | 36 | 79 | 132 | 87 | 71 | 2536 | 2642 | 1340 |
| Nb | 3.2 | 2.4 | 12.7 | 22.4 | 6.2 | 8 | 58.1 | 0.5 | 0.5 | 3.8 |
| Ni | 103 | 153 | 5 | 26 | 44 | 42 | 57 | 1396 | 1320 | 279 |
| Rb | 3.3 | 9.2 | 12 | 104.8 | 38.3 | 6.5 | 329.8 | 8.8 | 43.8 | 35.3 |
| Sr | 70 | 57 | 189 | 141 | 112 | 69 | 93 | 55 | 32 | 73 |
| V  | 296 | 304 | 316 | 174 | 100 | 536 | 180 | 110 | 108 | 164 |
| Y  | 32.3 | 30.1 | 49.3 | 67 | 20.2 | 49.9 | 68.2 | 10.2 | 9.3 | 21.8 |
| Zr | 88 | 91 | 233 | 539 | 127 | 253 | 718 | 33 | 37 | 63 |
| INAA analysis |  |  |  |  |  |  |  |  |
| Sc (0.1)\* | 51.8 | 47 | 67.9 | 46.4 | 19.5 | 54.7 | 21.3 | 39.6 | 39.6 | - |
| ICP-MS analysis |  |  |  |  |  |  |  |  |  |
| V (5) | 308 | 311 | 311 | 149 | 110 | 527 | 165 | 116 | 119 | - |
| Cr (20) | 261 | 432 | 35 | 90 | 162 | 99 | 82 | 2340 | 2640 | - |
| Co (1) | 56 | 52 | 41 | 34 | 32 | 45 | 27 | 96 | 88 | - |
| Ni (20) | 90 | 120 | < 20 | < 20 | 40 | 40 | 50 | 900 | 920 | - |
| Cu (10) | 10 | 20 | < 10 | 10 | < 10 | 10 | 20 | 110 | 90 | - |
| Zn (30) | 120 | 100 | 280 | 280 | 830 | 170 | 360 | 60 | 100 | - |
| Ga (1) | 22 | 19 | 30 | 27 | 32 | 29 | 37 | 4 | 5 | - |
| Ge (0.5) | 3.4 | 2.1 | 2.7 | 2.9 | 10.5 | 2.1 | 2.8 | 1.8 | 2.1 | - |
| Rb (1) | < 1 | 6 | 12 | 131 | 48 | 6 | 386 | 7 | 46 | - |
| Sr (2) | 64 | 51 | 212 | 154 | 119 | 72 | 91 | 47 | 25 | - |
| Y (0.5) | 33.9 | 31.3 | 66.2 | 95.3 | 25.4 | 64.5 | 103 | 6 | 7.2 | - |
| Zr (1) | 80 | 73 | 269 | 609 | 128 | 286 | 496 | 17 | 20 | - |
| Nb (0.2) | 3.2 | 1.8 | 15.6 | 28.9 | 7.2 | 9 | 63.5 | 1.1 | 1.4 | - |
| Cs (0.1) | < 0.1 | 0.1 | < 0.1 | 4.6 | 0.6 | < 0.1 | 7.4 | 0.3 | 4 | - |
| Ba (3) | 12 | 12 | 181 | 580 | 94 | 35 | 333 | 58 | 110 | - |
| La (0.05) | 5.78 | 3.81 | 26.8 | 52.2 | 30.4 | 14.9 | 96.2 | 3.5 | 4.22 | - |
| Ce (0.05) | 15.1 | 10.4 | 65.1 | 131 | 66.6 | 40.4 | 228 | 7.79 | 10.4 | - |
| Pr (0.01) | 2.28 | 1.68 | 9.19 | 18.8 | 7.15 | 6.28 | 32.1 | 1.04 | 1.35 | - |
| Nd (0.05) | 11.1 | 8.64 | 42.2 | 86.4 | 26.8 | 30.7 | 134 | 4.36 | 5.52 | - |
| Sm (0.01) | 3.86 | 3.09 | 11.3 | 21.6 | 5.72 | 9.19 | 37.4 | 1.16 | 1.41 | - |
| Eu (0.005) | 1.2 | 1.06 | 2.9 | 4.51 | 1.08 | 3.18 | 1.25 | 0.304 | 0.334 | - |
| Gd (0.01) | 5.11 | 4.36 | 12.2 | 21.8 | 4.98 | 11.1 | 36.1 | 1.29 | 1.34 | - |
| Tb (0.01) | 0.98 | 0.86 | 2.05 | 3.35 | 0.82 | 1.98 | 5.34 | 0.21 | 0.23 | - |
| Dy (0.01) | 6.07 | 5.27 | 12.2 | 17.8 | 4.64 | 11.5 | 23.8 | 1.16 | 1.33 | - |
| Ho (0.01) | 1.2 | 1.1 | 2.4 | 3.38 | 0.91 | 2.33 | 3.43 | 0.22 | 0.25 | - |
| Er (0.01) | 3.53 | 3.31 | 6.76 | 9.04 | 2.58 | 6.6 | 7.48 | 0.59 | 0.69 | - |
| Tm (0.005) | 0.511 | 0.493 | 0.971 | 1.27 | 0.375 | 0.935 | 0.863 | 0.078 | 0.102 | - |
| Yb (0.01) | 3.42 | 3.27 | 6.26 | 8.08 | 2.52 | 6.35 | 4.95 | 0.49 | 0.64 | - |
| Lu (0.002) | 0.556 | 0.535 | 1.04 | 1.34 | 0.437 | 1.05 | 0.709 | 0.08 | 0.105 | - |
| Hf (0.1) | 2.2 | 1.9 | 6.1 | 13.1 | 3.4 | 6.4 | 9.4 | 0.4 | 0.5 | - |
| Ta (0.01) | 0.37 | 0.14 | 0.95 | 1.74 | 0.55 | 0.56 | 3.42 | 0.07 | 0.08 | - |
| W (0.5) | < 0.5 | 0.6 | < 0.5 | 27.3 | 0.7 | < 0.5 | 1.1 | < 0.5 | 15.6 | - |
| Tl (0.05) | < 0.05 | 0.05 | 0.11 | 0.92 | 0.26 | 0.05 | 2.44 | 0.08 | 0.53 | - |
| Pb (5) | < 5 | < 5 | 8 | 10 | 5 | < 5 | 20 | < 5 | < 5 | - |
| Th (0.05) | 0.54 | 0.38 | 1.29 | 4.25 | 8.54 | 0.7 | 31.4 | 1.26 | 0.91 | - |
| U (0.01) | 4 | 0.76 | 0.89 | 2.84 | 2.26 | 6.5 | 15.9 | 1.3 | 2.3 | - |

Fe as Fe2O3. Detection limit of ICP-MS is listed in parentheses

Table S1. Whole-rock compositions of the mafic gneisses and granulites in the central DML (continued 3).

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sample No. | 02010202I | 02010202J | 02010203B | 02010301I | 02010301J | 02010401B | 02010401C | 02010401D | 02010502H | 02010601A |
| ID No. | F5 | F6 | F7 | F8 | F9 | F10 | F11 | F12 | F13 | F14 |
| XRF analysis |  |  |  |  |  |  |  |  |  |  |
| SiO2 | 50.95 | 47.45 | 48.97 | 54.63 | 47.57 | 56.15 | 48.98 | 55.82 | 45.32 | 43.00 |
| TiO2 | 0.44 | 1.33 | 0.68 | 0.84 | 0.76 | 0.60 | 0.69 | 0.72 | 1.11 | 0.59 |
| Al2O3 | 9.11 | 15.61 | 11.80 | 13.65 | 13.42 | 15.93 | 16.40 | 13.55 | 9.91 | 14.34 |
| Fe2O3 | 10.19 | 11.88 | 10.15 | 10.51 | 11.52 | 8.92 | 9.87 | 8.81 | 11.23 | 12.90 |
| MnO | 0.19 | 0.15 | 0.17 | 0.17 | 0.21 | 0.11 | 0.15 | 0.11 | 0.15 | 0.17 |
| MgO | 14.97 | 7.91 | 13.42 | 8.52 | 12.52 | 6.52 | 8.28 | 8.02 | 13.87 | 14.92 |
| CaO | 10.13 | 10.94 | 7.49 | 7.46 | 7.11 | 5.93 | 8.93 | 7.39 | 10.84 | 9.33 |
| Na2O | 1.23 | 2.89 | 2.00 | 1.34 | 2.18 | 3.48 | 2.78 | 2.89 | 1.03 | 1.85 |
| K2O | 1.05 | 1.48 | 3.23 | 1.43 | 2.11 | 1.75 | 2.98 | 1.81 | 4.01 | 0.92 |
| P2O5 | 0.07 | 0.17 | 0.30 | 0.16 | 0.09 | 0.22 | 0.12 | 0.12 | 0.03 | 0.04 |
| Total | 98.34 | 99.81 | 98.22 | 98.71 | 97.49 | 99.61 | 99.18 | 99.24 | 97.51 | 98.06 |
|  |  |  |  |  |  |  |  |  |  |  |
| Ba | 88 | 25.1 | 365 | 207 | 152 | 148 | 168 | 165 | 314 | 136 |
| Co | 51 | 37.2 | 58 | 39 | 55 | 37 | 42 | 43 | 64 | 100 |
| Cr | 1959 | 331 | 1022 | 566 | 1217 | 387 | 384 | 454 | 699 | 98 |
| Nb | 7.1 | 3.3 | 5.1 | 4.4 | 2.5 | 14.5 | 8.5 | 9.4 | 1.5 | 1 |
| Ni | 550 | 109.4 | 512 | 58 | 336 | 112 | 170 | 163 | 341 | 241 |
| Rb | 66.5 | 30.6 | 164.4 | 76 | 171.2 | 121.3 | 204.9 | 147.4 | 120.5 | 31.5 |
| Sr | 32 | 154 | 166 | 152 | 112 | 132 | 175 | 115 | 41 | 58 |
| V  | 96 | 256 | 151 | 211 | 186 | 160 | 162 | 151 | 331 | 90 |
| Y  | 46.6 | 30.2 | 16.1 | 24.1 | 7 | 48.1 | 29.2 | 42.8 | 16.5 | 11.6 |
| Zr | 65 | 99.3 | 94 | 93 | 68 | 91 | 91 | 192 | 52 | 70 |
| INAA analysis |  |  |  |  |  |  |  |  |
| Sc (0.1)\* | 41.1 | 37.1 | 26.3 | - | 32.6 | - | 26.8 | - | 59.7 | 13.8 |
| ICP-MS analysis |  |  |  |  |  |  |  |  |  |
| V (5) | 102 | 234 | 160 | - | 185 | - | 171 | - | 361 | 84 |
| Cr (20) | 1800 | 306 | 1080 | - | 1350 | - | 423 | - | 747 | 99 |
| Co (1) | 51 | 46 | 59 | - | 53 | - | 42 | - | 70 | 94 |
| Ni (20) | 470 | 100 | 460 | - | 270 | - | 160 | - | 270 | 170 |
| Cu (10) | < 10 | 20 | < 10 | - | < 10 | - | < 10 | - | < 10 | < 10 |
| Zn (30) | 180 | 160 | 130 | - | 210 | - | 190 | - | 160 | 80 |
| Ga (1) | 23 | 21 | 19 | - | 21 | - | 21 | - | 18 | 14 |
| Ge (0.5) | 4.3 | 2.1 | 2.2 | - | 3.2 | - | 2.3 | - | 2 | 1.3 |
| Rb (1) | 72 | 46 | 179 | - | 181 | - | 221 | - | 135 | 28 |
| Sr (2) | 25 | 152 | 158 | - | 100 | - | 158 | - | 34 | 43 |
| Y (0.5) | 53.3 | 34.6 | 23.9 | - | 13.6 | - | 42.9 | - | 22.8 | 8.6 |
| Zr (1) | 58 | 102 | 86 | - | 54 | - | 78 | - | 33 | 47 |
| Nb (0.2) | 9.7 | 3.4 | 6.3 | - | 3.5 | - | 7.5 | - | 1.9 | 0.9 |
| Cs (0.1) | 4 | 0.3 | 5.9 | - | 65.9 | - | 6.4 | - | 6.1 | 2.4 |
| Ba (3) | 67 | 76 | 358 | - | 136 | - | 157 | - | 310 | 123 |
| La (0.05) | 16.2 | 20.2 | 20.6 | - | 4.83 | - | 11.4 | - | 3.87 | 2.21 |
| Ce (0.05) | 52.8 | 50.3 | 32.9 | - | 10.7 | - | 25.9 | - | 12.2 | 6 |
| Pr (0.01) | 8.35 | 6.58 | 5.05 | - | 1.49 | - | 3.77 | - | 2.2 | 0.9 |
| Nd (0.05) | 37.1 | 26 | 21 | - | 6.75 | - | 16.2 | - | 12.3 | 4.09 |
| Sm (0.01) | 11.2 | 6.3 | 4.93 | - | 2.01 | - | 4.88 | - | 4.25 | 1.31 |
| Eu (0.005) | 0.997 | 1.37 | 1.04 | - | 0.682 | - | 0.923 | - | 0.94 | 0.611 |
| Gd (0.01) | 11.2 | 6.37 | 4.75 | - | 2.18 | - | 5.76 | - | 4.51 | 1.54 |
| Tb (0.01) | 1.97 | 1.07 | 0.76 | - | 0.39 | - | 1.08 | - | 0.75 | 0.27 |
| Dy (0.01) | 10.5 | 6.19 | 4.09 | - | 2.44 | - | 6.92 | - | 4.22 | 1.56 |
| Ho (0.01) | 1.87 | 1.23 | 0.79 | - | 0.5 | - | 1.43 | - | 0.81 | 0.3 |
| Er (0.01) | 4.72 | 3.41 | 2.22 | - | 1.45 | - | 4.32 | - | 2.27 | 0.85 |
| Tm (0.005) | 0.641 | 0.477 | 0.313 | - | 0.214 | - | 0.661 | - | 0.317 | 0.121 |
| Yb (0.01) | 3.92 | 3.16 | 1.99 | - | 1.42 | - | 4.57 | - | 2.02 | 0.79 |
| Lu (0.002) | 0.607 | 0.505 | 0.318 | - | 0.238 | - | 0.754 | - | 0.323 | 0.128 |
| Hf (0.1) | 1.9 | 2.4 | 2.1 | - | 1.3 | - | 2.1 | - | 1.2 | 1.1 |
| Ta (0.01) | 1.18 | 0.18 | 0.42 | - | 0.22 | - | 0.89 | - | 0.17 | 0.05 |
| W (0.5) | 25.6 | < 0.5 | < 0.5 | - | 0.7 | - | 7.3 | - | < 0.5 | < 0.5 |
| Tl (0.05) | 0.5 | 0.31 | 1.15 | - | 1.25 | - | 1.56 | - | 0.78 | 0.22 |
| Pb (5) | 5 | 10 | 8 | - | 7 | - | 24 | - | < 5 | < 5 |
| Th (0.05) | 2.61 | 1.71 | 2.03 | - | 0.63 | - | 3.07 | - | 1.71 | 0.82 |
| U (0.01) | 2.39 | 1.05 | 1.53 | - | 0.99 | - | 0.62 | - | 0.45 | 0.74 |

Fe as Fe2O3. Detection limit of ICP-MS is listed in parentheses

Table S1. Whole-rock compositions of the mafic gneisses and granulites in the central DML(continued 4).

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sample No. | 02010601B | 02010601D | 02010601Ｆ | 02010601G | 02010602A | 02010602Ｂ | 02010701A |
| ID No. | F15 | F16 | F17 | F18 | F19 | F20 | F21 |
| XRF analysis |  |  |  |  |  |  |  |
| SiO2 | 42.24 | 44.43 | 47.60 | 39.37 | 41.48 | 49.34 | 60.90 |
| TiO2 | 0.56 | 0.83 | 0.62 | 4.82 | 3.84 | 1.04 | 0.91 |
| Al2O3 | 18.16 | 16.19 | 14.16 | 16.86 | 11.46 | 13.30 | 16.06 |
| Fe2O3 | 12.41 | 18.21 | 10.74 | 19.17 | 26.73 | 11.06 | 7.74 |
| MnO | 0.19 | 0.27 | 0.19 | 0.29 | 0.64 | 0.18 | 0.10 |
| MgO | 11.68 | 6.21 | 10.79 | 5.49 | 4.53 | 11.67 | 3.91 |
| CaO | 9.89 | 11.14 | 12.36 | 10.33 | 7.84 | 7.32 | 5.51 |
| Na2O | 2.03 | 1.72 | 2.68 | 1.49 | 0.98 | 2.16 | 2.74 |
| K2O | 0.48 | 0.36 | 0.75 | 0.15 | 0.61 | 2.91 | 2.01 |
| P2O5 | 0.11 | 0.01 | 0.05 | 1.31 | 1.09 | 0.19 | 0.25 |
| Total | 97.75 | 99.29 | 99.93 | 99.29 | 99.20 | 99.57 | 100.14 |
|  |  |  |  |  |  |  |  |
| Ba | 38 | 48.5 | 53.7 | 65 | 42.7 | 586.1 | 504 |
| Co | 74 | 47.3 | 38.5 | 34 | 49.7 | 40 | 22 |
| Cr | 57 | 100.4 | 353.5 | 59 | 74.8 | 772 | 229 |
| Nb | 1.1 | 1.8 | 1.7 | 14.4 | 9.7 | 5.5 | 13.2 |
| Ni | 152 | 42 | 170.7 | 33 | 23.8 | 192.4 | 53 |
| Rb | 7.4 | 3.8 | 7.5 | 3.9 | 39.5 | 346.8 | 119.1 |
| Sr | 305 | 95.8 | 154.2 | 158 | 176.7 | 364.9 | 238 |
| V  | 84 | 428.8 | 229.4 | 286 | 146.7 | 169.3 | 119 |
| Y  | 17.5 | 15.6 | 16.3 | 58.8 | 40.2 | 21.1 | 35.9 |
| Zr | 63 | 17.6 | 13 | 366 | 33 | 102.8 | 224 |
| INAA analysis |  |  |  |  |  |
| Sc (0.1)\* | 12 | 45.6 | 51 | - | 101 | 29.8 | - |
| ICP-MS analysis |  |  |  |  |  |  |
| V (5) | 84 | 398 | 227 | - | 75 | 167 | - |
| Cr (20) | 59 | 117 | 243 | - | 77 | 702 | - |
| Co (1) | 73 | 45 | 53 | - | 19 | 53 | - |
| Ni (20) | 120 | 40 | 130 | - | 20 | 210 | - |
| Cu (10) | < 10 | < 10 | < 10 | - | 30 | < 10 | - |
| Zn (30) | 100 | 150 | 120 | - | 270 | 150 | - |
| Ga (1) | 19 | 21 | 15 | - | 18 | 20 | - |
| Ge (0.5) | 1.5 | 2.8 | 1.6 | - | 2.4 | 2.7 | - |
| Rb (1) | 4 | 3 | 7 | - | 37 | 357 | - |
| Sr (2) | 265 | 101 | 146 | - | 168 | 368 | - |
| Y (0.5) | 13.9 | 12.4 | 13.8 | - | 32.4 | 20.1 | - |
| Zr (1) | 50 | 16 | 13 | - | 30 | 137 | - |
| Nb (0.2) | 0.9 | 1.5 | 0.5 | - | 10.4 | 5.4 | - |
| Cs (0.1) | < 0.1 | < 0.1 | 0.1 | - | 2.2 | 35.6 | - |
| Ba (3) | 23 | 41 | 60 | - | 157 | 707 | - |
| La (0.05) | 5.22 | 10.2 | 1.88 | - | 19.4 | 13.6 | - |
| Ce (0.05) | 12.5 | 23.2 | 5.03 | - | 49.4 | 31 | - |
| Pr (0.01) | 1.72 | 3.11 | 0.87 | - | 7.12 | 4.09 | - |
| Nd (0.05) | 7.78 | 13.5 | 4.56 | - | 34.3 | 17.3 | - |
| Sm (0.01) | 1.97 | 3.34 | 1.65 | - | 8.56 | 4.05 | - |
| Eu (0.005) | 0.977 | 1.17 | 0.59 | - | 3.81 | 1.51 | - |
| Gd (0.01) | 2.06 | 3.23 | 2.15 | - | 8.56 | 3.86 | - |
| Tb (0.01) | 0.38 | 0.5 | 0.4 | - | 1.24 | 0.64 | - |
| Dy (0.01) | 2.41 | 2.56 | 2.52 | - | 6.47 | 3.66 | - |
| Ho (0.01) | 0.49 | 0.45 | 0.52 | - | 1.17 | 0.7 | - |
| Er (0.01) | 1.37 | 1.12 | 1.48 | - | 2.95 | 1.99 | - |
| Tm (0.005) | 0.195 | 0.151 | 0.216 | - | 0.379 | 0.288 | - |
| Yb (0.01) | 1.24 | 0.98 | 1.45 | - | 2.32 | 1.96 | - |
| Lu (0.002) | 0.195 | 0.162 | 0.23 | - | 0.37 | 0.322 | - |
| Hf (0.1) | 1.2 | 0.5 | 0.4 | - | 0.8 | 3.1 | - |
| Ta (0.01) | 0.05 | 0.08 | 0.02 | - | 0.84 | 0.38 | - |
| W (0.5) | < 0.5 | < 0.5 | 0.9 | - | 2.4 | 0.6 | - |
| Tl (0.05) | 0.05 | < 0.05 | < 0.05 | - | 0.24 | 2.45 | - |
| Pb (5) | < 5 | < 5 | < 5 | - | < 5 | 6 | - |
| Th (0.05) | 0.87 | 0.99 | 0.21 | - | 0.94 | 0.88 | - |
| U (0.01) | 1.3 | 0.71 | 0.09 | - | 2.67 | 0.68 | - |

Fe as Fe2O3. Detection limit of ICP-MS is listed in parentheses