**Supplementary Table 3. Major element (wt.%) and trace element (ppm) data for bulk rocks**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Samples | PYZ16 | PYZ18 | PYZ20 | PYZ22 | PYZ24 | PYZ26 | HS5 | HS7 | HS10 | HS12 |
| SiO2 (wt.%) | 48.88 | 47.40 | 49.05 | 47.93 | 47.75 | 46.15 | 48.65 | 47.52 | 50.48 | 48.76 |
| TiO2 | 3.21 | 3.21 | 3.25 | 3.02 | 3.22 | 3.18 | 3.36 | 3.27 | 3.41 | 3.26 |
| Al2O3 | 13.58 | 13.30 | 13.62 | 13.44 | 13.43 | 13.68 | 13.98 | 13.74 | 13.64 | 13.31 |
| Fe2O3t | 15.10 | 16.25 | 14.71 | 15.88 | 14.88 | 15.72 | 15.13 | 15.28 | 14.84 | 16.07 |
| MnO | 0.22 | 0.24 | 0.21 | 0.23 | 0.24 | 0.23 | 0.20 | 0.22 | 0.21 | 0.24 |
| MgO | 4.13 | 4.82 | 4.07 | 4.86 | 5.48 | 4.44 | 4.54 | 4.57 | 4.04 | 4.40 |
| CaO | 9.56 | 9.60 | 9.49 | 9.81 | 9.99 | 9.38 | 5.15 | 9.43 | 6.02 | 7.89 |
| Na2O | 3.12 | 2.85 | 3.11 | 2.69 | 2.69 | 3.11 | 5.18 | 2.79 | 4.00 | 3.14 |
| K2O | 1.25 | 0.89 | 1.28 | 0.88 | 0.63 | 0.76 | 0.67 | 0.84 | 1.01 | 1.01 |
| P2O5 | 0.41 | 0.41 | 0.42 | 0.39 | 0.39 | 0.41 | 0.42 | 0.42 | 0.44 | 0.42 |
| LOI | 0.52 | 0.78 | 0.47 | 0.99 | 1.26 | 2.37 | 2.17 | 1.15 | 1.70 | 1.20 |
| Total | 99.99 | 99.73 | 99.67 | 100.13 | 99.94 | 99.41 | 99.44 | 99.22 | 99.81 | 99.69 |
| Mg# | 35 | 37 | 35 | 38 | 42 | 36 | 37 | 37 | 35 | 35 |
| Sc (ppm) | 29.2 | 29 | 29.5 | 30.1 | 29.8 | 30.1 | 28.13 | 27.9 | 29.11 | 28.48 |
| V | 401 | 399 | 405 | 400 | 413 | 410 | 409.79 | 407.15 | 408.04 | 395.71 |
| Cr | 33.3 | 33.9 | 35.1 | 38 | 37 | 37.2 | 33.29 | 35.15 | 35.23 | 34.31 |
| Co | 43 | 46.6 | 43.7 | 44.3 | 44.7 | 42.6 | 46.61 | 42.57 | 39.26 | 41.07 |
| Ni | 49.2 | 51.6 | 50.7 | 51.1 | 50.3 | 46.4 | 53.46 | 51.96 | 44.97 | 51.7 |
| Cu | 304 | 307 | 312 | 289 | 289 | 317 | 320.14 | 316.73 | 234.59 | 289.35 |
| Zn | 130 | 131 | 132 | 127 | 131 | 132 | 135.47 | 134.74 | 144.38 | 127.21 |
| Ga | 22.7 | 22.2 | 22.6 | 21.3 | 20.8 | 20.7 | 22.96 | 22.46 | 21.18 | 22.21 |
| Tl | 0.05 | 0.015 | 0.05 | 0.029 | 0.03 | 0.041 | 0.02 | 0.02 | 0.05 | 0.04 |
| Rb | 27.6 | 10.3 | 27.9 | 10.2 | 5.92 | 18.1 | 10.33 | 8.92 | 15.64 | 14.38 |
| Sr | 466 | 504 | 453 | 478 | 410 | 401 | 917.88 | 435.5 | 910.18 | 631.6 |
| Y | 39.7 | 38.7 | 39.7 | 38 | 36.7 | 35 | 39.07 | 39.64 | 40.68 | 38.94 |
| Zr | 260 | 258 | 273 | 233 | 238 | 243 | 274.47 | 269.94 | 277.41 | 270.95 |
| Nb | 40.1 | 39.4 | 41.3 | 37.1 | 37 | 38.9 | 41.91 | 40.9 | 42.43 | 41.22 |
| Ta | 2.38 | 2.39 | 2.43 | 2.18 | 2.21 | 2.31 | 2.52 | 2.4 | 2.48 | 2.4 |
| Cs | 0.29 | 0.48 | 0.27 | 0.71 | 0.22 | 0.46 | 0.07 | 0.18 | 0.09 | 0.11 |
| Ba | 370 | 396 | 387 | 411 | 318 | 315 | 601.48 | 331.32 | 580.48 | 438.28 |
| La | 40.2 | 40.3 | 41.4 | 36.8 | 37.2 | 34.5 | 39 | 40.33 | 38.68 | 39.21 |
| Ce | 83.8 | 83.3 | 87.4 | 75.6 | 77.3 | 71.8 | 85.11 | 85.48 | 85.39 | 83.23 |
| Pr | 10.3 | 10.3 | 10.6 | 9.21 | 9.38 | 8.78 | 10.48 | 10.53 | 10.57 | 10.3 |
| Nd | 42.6 | 42.6 | 42.7 | 38.1 | 38.7 | 36 | 43.88 | 44.14 | 44.02 | 43.06 |
| Sm | 9.01 | 8.76 | 9.18 | 8.04 | 8.14 | 7.54 | 9.33 | 9.42 | 9.57 | 9.28 |
| Eu | 2.78 | 2.73 | 2.71 | 2.47 | 2.61 | 2.39 | 2.86 | 2.92 | 2.8 | 2.75 |
| Gd | 8.18 | 8.26 | 8.45 | 7.76 | 7.79 | 7.18 | 8.46 | 8.6 | 8.84 | 8.31 |
| Tb | 1.24 | 1.28 | 1.3 | 1.2 | 1.17 | 1.13 | 1.31 | 1.34 | 1.36 | 1.27 |
| Dy | 7.38 | 7.56 | 7.44 | 7.04 | 6.78 | 6.55 | 7.47 | 7.36 | 7.53 | 7.45 |
| Ho | 1.41 | 1.43 | 1.43 | 1.34 | 1.25 | 1.2 | 1.45 | 1.46 | 1.46 | 1.41 |
| Er | 3.89 | 3.87 | 3.88 | 3.76 | 3.57 | 3.38 | 3.83 | 3.82 | 3.93 | 3.82 |
| Tm | 0.54 | 0.55 | 0.56 | 0.53 | 0.49 | 0.49 | 0.53 | 0.53 | 0.54 | 0.53 |
| Yb | 3.29 | 3.39 | 3.33 | 3.39 | 3.11 | 2.92 | 3.34 | 3.34 | 3.46 | 3.29 |
| Lu | 0.48 | 0.49 | 0.5 | 0.49 | 0.45 | 0.43 | 0.49 | 0.48 | 0.48 | 0.47 |
| Sn | 2.16 | 2.07 | 2.15 | 1.87 | 1.83 | 1.94 | 2.05 | 2.08 | 2.3 | 2.21 |
| Li | 5.7 | 8.35 | 6.43 | 8.83 | 7.44 | 18.3 | 7.22 | 15.38 | 15.81 | 15.33 |
| Be | 1.98 | 1.72 | 1.84 | 1.81 | 1.48 | 1.34 | 1.65 | 1.49 | 1.71 | 1.6 |
| Hf | 6.6 | 6.62 | 7.02 | 6.03 | 6.11 | 6.07 | 6.87 | 6.79 | 6.73 | 6.57 |
| Pb | 5.25 | 5.04 | 5.17 | 4.91 | 4.93 | 13 | 4.56 | 4.48 | 4.28 | 3.57 |
| Th | 5.64 | 5.54 | 5.75 | 5.19 | 5.04 | 5.39 | 5.78 | 5.74 | 6.04 | 5.75 |
| U | 1.24 | 1.27 | 1.38 | 1.32 | 1.18 | 1.65 | 1.38 | 1.27 | 1.33 | 1.27 |
| Eu\* | 0.99 | 0.98 | 0.94 | 0.96 | 1.00 | 0.99 | 0.98 | 0.99 | 0.93 | 0.96 |
| (Tb/Yb)N | 1.72 | 1.72 | 1.78 | 1.62 | 1.72 | 1.77 | 1.79 | 1.83 | 1.79 | 1.76 |
| Th/Hf | 0.85 | 0.84 | 0.82 | 0.86 | 0.82 | 0.89 | 0.84 | 0.85 | 0.90 | 0.88 |
| Th/Nb | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 | 0.14 |
| Th/Ta | 2.37 | 2.32 | 2.37 | 2.38 | 2.28 | 2.33 | 2.29 | 2.39 | 2.44 | 2.40 |
| La/Yb | 12.22 | 11.89 | 12.43 | 10.86 | 11.96 | 11.82 | 11.68 | 12.07 | 11.18 | 11.92 |
| Ce/Pb | 15.96 | 16.53 | 16.91 | 15.40 | 15.68 | 5.52 | 18.66 | 19.08 | 19.95 | 23.31 |
| Dy/Yb | 2.24 | 2.23 | 2.23 | 2.08 | 2.18 | 2.24 | 2.24 | 2.20 | 2.18 | 2.26 |
| Ce/Y | 2.11 | 2.15 | 2.20 | 1.99 | 2.11 | 2.05 | 2.18 | 2.16 | 2.10 | 2.14 |
| Zr/Nb | 6.48 | 6.55 | 6.61 | 6.28 | 6.43 | 6.25 | 6.55 | 6.60 | 6.54 | 6.57 |
| La/Nb | 1.00 | 1.02 | 1.00 | 0.99 | 1.01 | 0.89 | 0.93 | 0.99 | 0.91 | 0.95 |
| Sm/Yb | 2.74 | 2.58 | 2.76 | 2.37 | 2.62 | 2.58 | 2.79 | 2.82 | 2.77 | 2.82 |
| Samples | HS14 | HS17 | SX02 | SX14 | SX15 | SX16 | SX17 | QYG02 | QYG03 | QYG04 |
| SiO2 (wt.%) | 49.51 | 49.15 | 48.31 | 46.75 | 50.37 | 47.84 | 49.08 | 42.98 | 51.24 | 49.04 |
| TiO2 | 3.22 | 3.32 | 3.881 | 3.782 | 3.803 | 3.802 | 3.872 | 4.226 | 3.675 | 3.747 |
| Al2O3 | 13.28 | 13.94 | 13.67 | 13.94 | 13.78 | 13.84 | 13.44 | 15.16 | 13.76 | 14.01 |
| Fe2O3t | 14.63 | 14.13 | 13.1 | 14.51 | 12.58 | 13.99 | 13.66 | 16.27 | 12.21 | 12.68 |
| MnO | 0.25 | 0.27 | 0.156 | 0.15 | 0.161 | 0.163 | 0.152 | 0.198 | 0.175 | 0.15 |
| MgO | 4.39 | 4.42 | 4.77 | 4.74 | 4.24 | 4.89 | 4.48 | 5.88 | 4.63 | 4.93 |
| CaO | 8.31 | 8.46 | 7.42 | 8.69 | 8.14 | 8.97 | 9.62 | 8.51 | 8.91 | 9.88 |
| Na2O | 3.26 | 3.41 | 3.47 | 2.52 | 2.55 | 2.26 | 2.08 | 2 | 1.99 | 1.93 |
| K2O | 1.00 | 1.11 | 1.492 | 1.282 | 1.8 | 1.107 | 0.885 | 0.573 | 1.182 | 1.294 |
| P2O5 | 0.42 | 0.43 | 0.405 | 0.405 | 0.403 | 0.41 | 0.416 | 0.423 | 0.385 | 0.385 |
| LOI | 1.07 | 0.99 | 2.94 | 2.71 | 2.11 | 2.5 | 2.68 | 3.58 | 1.82 | 1.83 |
| Total | 99.35 | 99.63 | 99.61 | 99.49 | 99.94 | 99.77 | 100.36 | 99.8 | 99.98 | 99.87 |
| Mg# | 37 | 38 | 42 | 39 | 40 | 41 | 39 | 42 | 43 | 44 |
| Sc (ppm) | 28.76 | 27.67 | 24.4 | 25.5 | 25.1 | 25.2 | 25.8 | 28.5 | 22.4 | 23.6 |
| V | 394.55 | 392.72 | 372 | 369 | 374 | 370 | 381 | 451 | 336 | 347 |
| Cr | 33.97 | 31.55 | 57.9 | 50.7 | 51.1 | 50.9 | 53.1 | 50 | 109 | 113 |
| Co | 42.86 | 37.84 | 40.2 | 44.4 | 39.4 | 43.4 | 41.4 | 48.4 | 36.7 | 40.2 |
| Ni | 47.82 | 44.29 | 56.3 | 59.8 | 57.3 | 59.3 | 59 | 61.7 | 90.7 | 96 |
| Cu | 305.59 | 312.51 | 219 | 210 | 209 | 202 | 215 | 216 | 194 | 189 |
| Zn | 129.26 | 124.56 | 116 | 131 | 119 | 119 | 131 | 128 | 104 | 117 |
| Ga | 21.85 | 22.14 | 24.3 | 25.4 | 23.7 | 25.1 | 24.9 | 26.6 | 24.2 | 25 |
| Tl | 0.03 | 0.08 | 0.15 | 0.093 | 0.19 | 0.11 | 0.059 | 0.053 | 0.083 | 0.11 |
| Rb | 18.61 | 23.16 | 53.1 | 29.3 | 59.2 | 28.2 | 15.6 | 10.6 | 23.3 | 28.4 |
| Sr | 440.15 | 537.02 | 660 | 905 | 806 | 763 | 851 | 553 | 532 | 551 |
| Y | 39 | 38.8 | 36.5 | 37.2 | 37.5 | 37 | 37.9 | 37.2 | 36.4 | 38 |
| Zr | 268.17 | 271.88 | 357 | 348 | 346 | 345 | 344 | 339 | 343 | 359 |
| Nb | 40.26 | 40.56 | 42.3 | 40.5 | 40.1 | 40.1 | 41 | 41.5 | 38.7 | 40.1 |
| Ta | 2.38 | 2.37 | 2.67 | 2.5 | 2.49 | 2.5 | 2.51 | 2.58 | 2.43 | 2.43 |
| Cs | 0.16 | 0.13 | 0.58 | 0.21 | 0.28 | 0.25 | 0.23 | 0.74 | 0.45 | 0.66 |
| Ba | 294.04 | 317.9 | 477 | 552 | 708 | 512 | 463 | 268 | 408 | 457 |
| La | 41.73 | 39.39 | 45.4 | 46 | 47.8 | 46.9 | 47.9 | 39 | 45.9 | 47.7 |
| Ce | 87.04 | 84.21 | 101 | 100 | 103 | 104 | 104 | 92.4 | 100 | 102 |
| Pr | 10.69 | 10.44 | 13 | 12.8 | 12.9 | 13 | 13 | 12.3 | 12.7 | 13.2 |
| Nd | 44.39 | 43.56 | 53.9 | 53.6 | 54 | 53.7 | 55.2 | 53.2 | 53.4 | 55.1 |
| Sm | 9.05 | 9.33 | 11.3 | 11.1 | 10.9 | 11 | 11.3 | 11.6 | 10.7 | 11.3 |
| Eu | 2.78 | 2.73 | 3.13 | 2.9 | 3.21 | 3.11 | 3.26 | 3.33 | 2.91 | 3.19 |
| Gd | 8.59 | 8.39 | 9.56 | 9.18 | 9.34 | 9.41 | 9.21 | 10.1 | 9.19 | 9.59 |
| Tb | 1.3 | 1.31 | 1.41 | 1.35 | 1.36 | 1.36 | 1.35 | 1.43 | 1.35 | 1.42 |
| Dy | 7.51 | 7.49 | 7.72 | 7.69 | 7.86 | 7.55 | 7.74 | 7.87 | 7.33 | 7.59 |
| Ho | 1.42 | 1.41 | 1.34 | 1.35 | 1.35 | 1.34 | 1.37 | 1.41 | 1.34 | 1.39 |
| Er | 3.88 | 3.75 | 3.5 | 3.54 | 3.6 | 3.55 | 3.64 | 3.6 | 3.47 | 3.55 |
| Tm | 0.51 | 0.51 | 0.47 | 0.49 | 0.47 | 0.48 | 0.49 | 0.45 | 0.45 | 0.46 |
| Yb | 3.32 | 3.29 | 2.82 | 2.93 | 2.9 | 2.88 | 2.96 | 2.86 | 2.89 | 2.98 |
| Lu | 0.48 | 0.48 | 0.41 | 0.44 | 0.43 | 0.43 | 0.43 | 0.39 | 0.4 | 0.41 |
| Sn | 2.12 | 1.94 | 2.88 | 3 | 3.02 | 3.05 | 2.92 | 3.27 | 2.87 | 3.2 |
| Li | 13.8 | 11.06 | 11.5 | 7.73 | 7.17 | 7.91 | 7.54 | 11.2 | 5.95 | 6.35 |
| Be | 1.63 | 1.95 | 2.16 | 2.31 | 1.87 | 1.93 | 2.06 | 1.59 | 1.79 | 1.99 |
| Hf | 6.5 | 6.67 | 9.12 | 8.99 | 8.68 | 8.76 | 9.02 | 8.53 | 8.38 | 8.68 |
| Pb | 3.33 | 3.55 | 7.27 | 8.5 | 7.11 | 8.82 | 7.04 | 2.86 | 7.55 | 9.26 |
| Th | 5.76 | 5.66 | 7.26 | 7.32 | 7.38 | 7.29 | 7.46 | 5.87 | 7.86 | 8.21 |
| U | 1.27 | 1.24 | 1.63 | 1.64 | 1.68 | 1.66 | 1.73 | 1.39 | 1.75 | 1.74 |
| Eu\* | 0.96 | 0.94 | 0.92 | 0.88 | 0.97 | 0.93 | 0.98 | 0.94 | 0.90 | 0.94 |
| (Tb/Yb)N | 1.79 | 1.82 | 2.28 | 2.10 | 2.14 | 2.16 | 2.08 | 2.28 | 2.13 | 2.18 |
| Th/Hf | 0.89 | 0.85 | 0.80 | 0.81 | 0.85 | 0.83 | 0.83 | 0.69 | 0.94 | 0.95 |
| Th/Nb | 0.14 | 0.14 | 0.17 | 0.18 | 0.18 | 0.18 | 0.18 | 0.14 | 0.20 | 0.20 |
| Th/Ta | 2.42 | 2.39 | 2.72 | 2.93 | 2.96 | 2.92 | 2.97 | 2.28 | 3.23 | 3.38 |
| La/Yb | 12.57 | 11.97 | 16.10 | 15.70 | 16.48 | 16.28 | 16.18 | 13.64 | 15.88 | 16.01 |
| Ce/Pb | 26.14 | 23.72 | 13.89 | 11.76 | 14.49 | 11.79 | 14.77 | 32.31 | 13.25 | 11.02 |
| Dy/Yb | 2.26 | 2.28 | 2.74 | 2.62 | 2.71 | 2.62 | 2.61 | 2.75 | 2.54 | 2.55 |
| Ce/Y | 2.23 | 2.17 | 2.77 | 2.69 | 2.75 | 2.81 | 2.74 | 2.48 | 2.75 | 2.68 |
| Zr/Nb | 6.66 | 6.70 | 8.44 | 8.59 | 8.63 | 8.60 | 8.39 | 8.17 | 8.86 | 8.95 |
| La/Nb | 1.04 | 0.97 | 1.07 | 1.14 | 1.19 | 1.17 | 1.17 | 0.94 | 1.19 | 1.19 |
| Sm/Yb | 2.73 | 2.84 | 4.01 | 3.79 | 3.76 | 3.82 | 3.82 | 4.06 | 3.70 | 3.79 |
| Samples | QYG05 | QYG06 | LC01 | LC02 | LC03 | LC04 | LC05 | LC06 | LC11 | LC12 |
| SiO2 (wt.%) | 49.8 | 48.02 | 49.32 | 46.86 | 47.07 | 48.07 | 51.46 | 47.96 | 49.63 | 50.52 |
| TiO2 | 3.642 | 3.868 | 3.79 | 3.93 | 4.26 | 3.80 | 3.74 | 4.02 | 3.56 | 3.60 |
| Al2O3 | 13.97 | 13.7 | 14.05 | 13.95 | 12.20 | 14.30 | 14.12 | 13.18 | 13.81 | 13.17 |
| Fe2O3t | 12.6 | 14.07 | 12.55 | 13.59 | 16.11 | 16.17 | 13.32 | 13.50 | 13.78 | 13.66 |
| MnO | 0.159 | 0.158 | 0.16 | 0.20 | 0.24 | 0.19 | 0.20 | 0.17 | 0.17 | 0.17 |
| MgO | 4.5 | 4.61 | 4.91 | 4.77 | 5.79 | 4.15 | 3.83 | 4.63 | 3.81 | 4.07 |
| CaO | 9.31 | 9.58 | 8.15 | 7.78 | 6.59 | 4.84 | 4.75 | 8.78 | 9.14 | 7.65 |
| Na2O | 2.01 | 2.03 | 2.30 | 2.76 | 3.63 | 5.39 | 5.20 | 2.89 | 2.47 | 2.91 |
| K2O | 1.039 | 1.356 | 1.79 | 2.19 | 0.42 | 0.46 | 0.60 | 1.23 | 1.06 | 1.36 |
| P2O5 | 0.387 | 0.421 | 0.39 | 0.43 | 0.41 | 0.41 | 0.41 | 0.43 | 0.39 | 0.40 |
| LOI | 1.86 | 1.91 | 2.13 | 2.77 | 3.35 | 2.39 | 2.33 | 2.52 | 1.59 | 2.09 |
| Total | 99.26 | 99.73 | 99.52 | 99.23 | 100.08 | 100.18 | 99.95 | 99.30 | 99.41 | 99.59 |
| Mg# | 41 | 39 | 44 | 41 | 42 | 34 | 36 | 40 | 35 | 37 |
| Sc (ppm) | 24.9 | 24 | 23.1 | 24.1 | 28.1 | 26.3 | 25.5 | 24.4 | 24.5 | 25.4 |
| V | 353 | 369 | 341 | 377 | 458 | 360 | 345 | 390 | 352 | 349 |
| Cr | 66.1 | 80.2 | 109 | 79.3 | 40.6 | 35.6 | 35.5 | 80 | 36.4 | 34.2 |
| Co | 39.4 | 40.7 | 39.8 | 39.8 | 45.1 | 39.2 | 39 | 40.4 | 37.5 | 38.2 |
| Ni | 56.3 | 64.9 | 93.6 | 64.2 | 48.1 | 37.7 | 37.8 | 64.8 | 36.8 | 36.3 |
| Cu | 203 | 217 | 121 | 341 | 215 | 164 | 172 | 227 | 173 | 174 |
| Zn | 110 | 125 | 112 | 119 | 134 | 131 | 119 | 118 | 129 | 121 |
| Ga | 24.8 | 24.8 | 23.1 | 23.5 | 24 | 25 | 24.3 | 23.9 | 24.7 | 24.4 |
| Tl | 0.078 | 0.12 | 0.22 | 0.2 | 0.032 | 0.044 | 0.075 | 0.16 | 0.077 | 0.11 |
| Rb | 19.3 | 30.6 | 67.4 | 88.2 | 11.1 | 15.5 | 20.6 | 49.5 | 25.3 | 45.7 |
| Sr | 500 | 596 | 692 | 645 | 152 | 464 | 483 | 651 | 529 | 461 |
| Y | 37.8 | 37.5 | 37.3 | 37.9 | 38.2 | 39.1 | 39.1 | 37.2 | 37.5 | 37.8 |
| Zr | 341 | 359 | 359 | 360 | 339 | 339 | 343 | 358 | 336 | 338 |
| Nb | 37.5 | 40.3 | 40.2 | 41 | 41.7 | 36.4 | 36.4 | 40 | 34.9 | 35.8 |
| Ta | 2.3 | 2.46 | 2.52 | 2.54 | 2.51 | 2.25 | 2.25 | 2.51 | 2.15 | 2.17 |
| Cs | 0.47 | 0.26 | 0.43 | 0.24 | 0.25 | 0.15 | 0.23 | 0.21 | 0.61 | 1.04 |
| Ba | 450 | 509 | 847 | 920 | 197 | 183 | 270 | 553 | 472 | 416 |
| La | 45.9 | 48.8 | 49 | 49.8 | 32.1 | 44.3 | 41.7 | 46.7 | 43 | 42.5 |
| Ce | 99.4 | 104 | 104 | 106 | 80.8 | 101 | 94.2 | 101 | 96.8 | 95.7 |
| Pr | 12.8 | 13.3 | 13.4 | 13.2 | 10.9 | 13 | 12.2 | 12.9 | 12 | 12.4 |
| Nd | 53 | 55.2 | 55.4 | 55.3 | 47.7 | 56.4 | 51.1 | 55.7 | 52.2 | 51.8 |
| Sm | 11 | 11.4 | 11.5 | 11.7 | 10.7 | 11.9 | 11.1 | 11.5 | 11 | 11.2 |
| Eu | 3.03 | 3.16 | 3.16 | 3.28 | 3.03 | 3.34 | 3.01 | 3.27 | 3.07 | 3.06 |
| Gd | 9.56 | 9.51 | 9.41 | 9.58 | 9.26 | 10 | 9.37 | 9.61 | 9.34 | 9.56 |
| Tb | 1.35 | 1.4 | 1.44 | 1.42 | 1.42 | 1.44 | 1.44 | 1.39 | 1.45 | 1.45 |
| Dy | 7.44 | 7.44 | 7.75 | 7.81 | 7.49 | 8.12 | 7.99 | 7.69 | 7.52 | 7.63 |
| Ho | 1.38 | 1.35 | 1.4 | 1.4 | 1.42 | 1.45 | 1.44 | 1.38 | 1.37 | 1.4 |
| Er | 3.65 | 3.55 | 3.56 | 3.65 | 3.53 | 3.6 | 3.72 | 3.55 | 3.59 | 3.66 |
| Tm | 0.48 | 0.48 | 0.48 | 0.49 | 0.46 | 0.49 | 0.49 | 0.46 | 0.46 | 0.49 |
| Yb | 3 | 2.91 | 2.91 | 2.99 | 2.78 | 3.02 | 3.05 | 2.81 | 2.87 | 3.02 |
| Lu | 0.42 | 0.41 | 0.41 | 0.43 | 0.39 | 0.42 | 0.42 | 0.39 | 0.42 | 0.41 |
| Sn | 2.88 | 3.03 | 3.02 | 3.06 | 2.68 | 2.97 | 2.75 | 2.68 | 2.85 | 2.87 |
| Li | 5.38 | 5.13 | 5.56 | 5.74 | 6.08 | 3.43 | 3.18 | 7.32 | 6.12 | 5.68 |
| Be | 2.11 | 2.18 | 1.78 | 1.88 | 1.38 | 2.56 | 1.96 | 1.76 | 2.17 | 1.96 |
| Hf | 8.45 | 8.84 | 8.95 | 9.06 | 8.58 | 8.69 | 8.68 | 8.77 | 8.33 | 8.32 |
| Pb | 8.35 | 9.05 | 9.34 | 7.45 | 4.89 | 6.78 | 5.79 | 7.4 | 6.76 | 6.83 |
| Th | 7.43 | 7.23 | 8.2 | 7.49 | 5.69 | 8.02 | 8.12 | 6.46 | 7.72 | 7.88 |
| U | 1.70 | 1.62 | 1.78 | 1.68 | 1.34 | 1.97 | 1.99 | 1.52 | 1.89 | 1.92 |
| Eu\* | 0.90 | 0.93 | 0.93 | 0.95 | 0.93 | 0.94 | 0.90 | 0.95 | 0.93 | 0.90 |
| (Tb/Yb)N | 2.05 | 2.20 | 2.26 | 2.17 | 2.33 | 2.18 | 2.16 | 2.26 | 2.31 | 2.19 |
| Th/Hf | 0.88 | 0.82 | 0.92 | 0.83 | 0.66 | 0.92 | 0.94 | 0.74 | 0.93 | 0.95 |
| Th/Nb | 0.20 | 0.18 | 0.20 | 0.18 | 0.14 | 0.22 | 0.22 | 0.16 | 0.22 | 0.22 |
| Th/Ta | 3.23 | 2.94 | 3.25 | 2.95 | 2.27 | 3.56 | 3.61 | 2.57 | 3.59 | 3.63 |
| La/Yb | 15.30 | 16.77 | 16.84 | 16.66 | 11.55 | 14.67 | 13.67 | 16.62 | 14.98 | 14.07 |
| Ce/Pb | 11.90 | 11.49 | 11.13 | 14.23 | 16.52 | 14.90 | 16.27 | 13.65 | 14.32 | 14.01 |
| Dy/Yb | 2.48 | 2.56 | 2.66 | 2.61 | 2.69 | 2.69 | 2.62 | 2.74 | 2.62 | 2.53 |
| Ce/Y | 2.63 | 2.77 | 2.79 | 2.80 | 2.12 | 2.58 | 2.41 | 2.72 | 2.58 | 2.53 |
| Zr/Nb | 9.09 | 8.91 | 8.93 | 8.78 | 8.13 | 9.31 | 9.42 | 8.95 | 9.63 | 9.44 |
| La/Nb | 1.22 | 1.21 | 1.22 | 1.21 | 0.77 | 1.22 | 1.15 | 1.17 | 1.23 | 1.19 |
| Sm/Yb | 3.67 | 3.92 | 3.95 | 3.91 | 3.85 | 3.94 | 3.64 | 4.09 | 3.83 | 3.71 |
| Samples | LC13 | XY01 | XY02 | XY03 | XY04 | XY05 | XY06 | XY07 |  |  |
| SiO2 (wt.%) | 48.88 | 49.23 | 49.36 | 47.75 | 49.26 | 50.14 | 49.67 | 49.08 |  |  |
| TiO2 | 3.76 | 4.08 | 4.15 | 4.23 | 4.31 | 3.69 | 4.07 | 4.02 |  |  |
| Al2O3 | 13.74 | 13.32 | 13.33 | 13.44 | 13.87 | 13.94 | 13.12 | 13.07 |  |  |
| Fe2O3t | 13.69 | 14.66 | 15.54 | 17.29 | 15.30 | 12.54 | 15.00 | 15.02 |  |  |
| MnO | 0.33 | 0.68 | 0.21 | 0.19 | 0.19 | 0.17 | 0.22 | 0.19 |  |  |
| MgO | 4.96 | 5.82 | 3.93 | 3.93 | 3.75 | 5.02 | 4.34 | 4.39 |  |  |
| CaO | 6.49 | 5.91 | 5.38 | 4.89 | 4.81 | 8.89 | 6.56 | 7.84 |  |  |
| Na2O | 3.58 | 2.38 | 5.02 | 5.03 | 5.57 | 2.01 | 4.02 | 3.27 |  |  |
| K2O | 1.81 | 0.26 | 0.30 | 0.31 | 0.24 | 1.28 | 0.49 | 0.36 |  |  |
| P2O5 | 0.39 | 0.41 | 0.41 | 0.42 | 0.44 | 0.39 | 0.41 | 0.41 |  |  |
| LOI | 2.15 | 3.47 | 2.00 | 2.32 | 2.16 | 1.46 | 1.94 | 1.77 |  |  |
| Total | 99.79 | 100.21 | 99.61 | 99.81 | 99.89 | 99.53 | 99.84 | 99.40 |  |  |
| Mg# | 42 | 44 | 33 | 31 | 33 | 44 | 36 | 37 |  |  |
| Sc (ppm) | 26.6 | 26.5 | 26.5 | 27.1 | 28.5 | 22.9 | 28.1 | 25.5 |  |  |
| V | 370 | 395 | 411 | 430 | 428 | 337 | 409 | 389 |  |  |
| Cr | 36.5 | 22.6 | 22.2 | 22.4 | 23.7 | 110 | 21.5 | 22.2 |  |  |
| Co | 39.6 | 44.8 | 43.9 | 45.4 | 43.2 | 38.2 | 42.6 | 41.5 |  |  |
| Ni | 39.4 | 39 | 38.8 | 39.9 | 40.4 | 92.4 | 38.9 | 38.8 |  |  |
| Cu | 178 | 252 | 187 | 323 | 92.6 | 194 | 257 | 296 |  |  |
| Zn | 126 | 129 | 137 | 131 | 141 | 105 | 148 | 131 |  |  |
| Ga | 24.5 | 26.3 | 26 | 25.2 | 25.7 | 24.8 | 28.4 | 25.7 |  |  |
| Tl | 0.16 | 0.02 | 0.037 | 0.039 | 0.045 | 0.1 | 0.047 | 0.029 |  |  |
| Rb | 64.8 | 4.05 | 8.41 | 9.86 | 6.66 | 25.5 | 13.9 | 9.04 |  |  |
| Sr | 467 | 449 | 365 | 368 | 315 | 620 | 509 | 521 |  |  |
| Y | 37.5 | 40.7 | 41.8 | 42.4 | 46.5 | 36.9 | 44 | 39.4 |  |  |
| Zr | 342 | 343 | 350 | 356 | 395 | 350 | 366 | 340 |  |  |
| Nb | 37.3 | 37 | 38.5 | 37.8 | 41.5 | 38.8 | 41.1 | 36.6 |  |  |
| Ta | 2.28 | 2.23 | 2.3 | 2.3 | 2.68 | 2.32 | 2.45 | 2.2 |  |  |
| Cs | 0.29 | 0.79 | 0.067 | 0.1 | 0.055 | 0.44 | 0.13 | 0.15 |  |  |
| Ba | 544 | 163 | 160 | 123 | 120 | 490 | 244 | 182 |  |  |
| La | 43.4 | 40.7 | 38.9 | 54 | 39.3 | 46.8 | 44.6 | 40.8 |  |  |
| Ce | 103 | 92.6 | 91.3 | 112 | 92.7 | 102 | 99.4 | 92.3 |  |  |
| Pr | 12.7 | 11.6 | 11.9 | 13.6 | 12.6 | 12.6 | 12.8 | 11.8 |  |  |
| Nd | 55.1 | 50.7 | 52.3 | 57.9 | 55.8 | 53.1 | 55.8 | 51.6 |  |  |
| Sm | 11.5 | 11.5 | 11.7 | 12.6 | 12.5 | 11.1 | 12.3 | 11.1 |  |  |
| Eu | 3.1 | 3.26 | 3.46 | 3.57 | 3.38 | 3 | 3.25 | 3.32 |  |  |
| Gd | 9.71 | 10.1 | 10.6 | 11.1 | 11 | 9.36 | 10.7 | 10.1 |  |  |
| Tb | 1.48 | 1.58 | 1.64 | 1.66 | 1.72 | 1.43 | 1.59 | 1.56 |  |  |
| Dy | 7.89 | 8.21 | 8.33 | 8.61 | 9.68 | 7.43 | 9.02 | 7.9 |  |  |
| Ho | 1.46 | 1.5 | 1.54 | 1.56 | 1.68 | 1.37 | 1.54 | 1.46 |  |  |
| Er | 3.63 | 3.88 | 3.88 | 4.12 | 4.42 | 3.55 | 4.02 | 3.89 |  |  |
| Tm | 0.49 | 0.51 | 0.52 | 0.55 | 0.6 | 0.46 | 0.54 | 0.5 |  |  |
| Yb | 2.95 | 3.09 | 3.13 | 3.19 | 3.54 | 2.81 | 3.22 | 3.04 |  |  |
| Lu | 0.42 | 0.43 | 0.45 | 0.45 | 0.48 | 0.4 | 0.45 | 0.43 |  |  |
| Sn | 2.99 | 2.97 | 3.19 | 3.18 | 3.29 | 2.97 | 3.24 | 2.86 |  |  |
| Li | 5.91 | 3.96 | 2.84 | 4.06 | 3.53 | 8.23 | 3.31 | 4.58 |  |  |
| Be | 2.02 | 1.52 | 1.89 | 1.61 | 2.36 | 1.9 | 2.23 | 1.84 |  |  |
| Hf | 8.62 | 8.66 | 8.79 | 8.91 | 9.97 | 8.71 | 9.31 | 8.6 |  |  |
| Pb | 6.18 | 6.91 | 7.35 | 5.53 | 7.81 | 7.71 | 7.82 | 8.83 |  |  |
| Th | 7.98 | 6.52 | 6.75 | 6.7 | 7.78 | 7.95 | 7.03 | 6.43 |  |  |
| U | 2.02 | 1.61 | 1.58 | 1.6 | 1.89 | 1.73 | 1.7 | 1.58 |  |  |
| Eu\* | 0.90 | 0.92 | 0.95 | 0.92 | 0.88 | 0.90 | 0.87 | 0.96 |  |  |
| (Tb/Yb)N | 2.29 | 2.33 | 2.39 | 2.38 | 2.22 | 2.32 | 2.25 | 2.34 |  |  |
| Th/Hf | 0.93 | 0.75 | 0.77 | 0.75 | 0.78 | 0.91 | 0.76 | 0.75 |  |  |
| Th/Nb | 0.21 | 0.18 | 0.18 | 0.18 | 0.19 | 0.20 | 0.17 | 0.18 |  |  |
| Th/Ta | 3.50 | 2.92 | 2.93 | 2.91 | 2.90 | 3.43 | 2.87 | 2.92 |  |  |
| La/Yb | 14.71 | 13.17 | 12.43 | 16.93 | 11.10 | 16.65 | 13.85 | 13.42 |  |  |
| Ce/Pb | 16.67 | 13.40 | 12.42 | 20.25 | 11.87 | 13.23 | 12.71 | 10.45 |  |  |
| Dy/Yb | 2.67 | 2.66 | 2.66 | 2.70 | 2.73 | 2.64 | 2.80 | 2.60 |  |  |
| Ce/Y | 2.75 | 2.28 | 2.18 | 2.64 | 1.99 | 2.76 | 2.26 | 2.34 |  |  |
| Zr/Nb | 9.17 | 9.27 | 9.09 | 9.42 | 9.52 | 9.02 | 8.91 | 9.29 |  |  |
| La/Nb | 1.16 | 1.10 | 1.01 | 1.43 | 0.95 | 1.21 | 1.09 | 1.11 |  |  |
| Sm/Yb | 3.90 | 3.72 | 3.74 | 3.95 | 3.53 | 3.95 | 3.82 | 3.65 |  |  |