Table S5. LA-ICP-MS trace element contents in µg/g (≃ppm) of glass samples. The compositions are averages from 3 analyses on different glass chips.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Sample** | **Li** | **Be** | | **B** | | **Na** | | **Mg** | | **Al** | | **Si** | | **P** | | | **K** | | | **Ca** | | | **Sc** | | | | **Ti** | | | **V** |
| **Outsider Seamount** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR1-7 | 4.87 | 0.941 | | 2.10 | | 24872 | | 39076 | | 81204 | | 241994 | | 1078 | | | 8899 | | | 76421 | | | 35.7 | | | | 9506 | | | 283 |
| SO199-DR1-10 | 4.79 | 0.946 | | 2.10 | | 24823 | | 38939 | | 81202 | | 241362 | | 1067 | | | 8854 | | | 76795 | | | 36.0 | | | | 9511 | | | 282 |
| SO199-DR1-15 | 5.02 | 1.01 | | 2.18 | | 25177 | | 38030 | | 81020 | | 242518 | | 1090 | | | 9146 | | | 76741 | | | 36.4 | | | | 9530 | | | 284 |
| SO199-DR1-18 | 4.92 | 0.971 | | 2.21 | | 25162 | | 39261 | | 80751 | | 241889 | | 1094 | | | 9042 | | | 77467 | | | 35.9 | | | | 9328 | | | 276 |
| **Investigator Ridge** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR2-15 | 4.78 | 0.316 | | 1.05 | | 19125 | | 50190 | | 77631 | | 244435 | | 353 | | | 472 | | | 85123 | | | 40.7 | | | | 6310 | | | 268 |
| SO199-DR2-17 | 4.53 | 0.304 | | 0.980 | | 18971 | | 52028 | | 80621 | | 242662 | | 325 | | | 465 | | | 85234 | | | 38.8 | | | | 5812 | | | 246 |
| SO199-DR2-18 | 4.68 | 0.303 | | 1.10 | | 18851 | | 50284 | | 78054 | | 243937 | | 353 | | | 461 | | | 85098 | | | 41.0 | | | | 6428 | | | 271 |
| SO199-DR10-13 | 4.91 | 0.458 | | 1.22 | | 17205 | | 47459 | | 74902 | | 239578 | | 632 | | | 1662 | | | 80627 | | | 40.4 | | | | 8495 | | | 331 |
| SO199-DR10-14 | 4.94 | 0.440 | | 1.20 | | 17601 | | 47908 | | 73324 | | 241243 | | 620 | | | 1691 | | | 78594 | | | 39.5 | | | | 8348 | | | 329 |
| SO199-DR10-15 | 5.08 | 0.413 | | 1.26 | | 17323 | | 44933 | | 73359 | | 248808 | | 573 | | | 1555 | | | 78211 | | | 36.9 | | | | 7378 | | | 320 |
| SO199-DR10-22C | 5.26 | 0.482 | | 1.33 | | 18580 | | 43045 | | 73026 | | 243476 | | 679 | | | 1852 | | | 77182 | | | 40.1 | | | | 8969 | | | 347 |
| SO199-DR22-1A | 9.48 | 1.01 | | 3.49 | | 21734 | | 25730 | | 68826 | | 247194 | | 1509 | | | 4358 | | | 59770 | | | 39.1 | | | | 17948 | | | 461 |
| SO199-DR22-1B | 9.59 | 1.01 | | 3.43 | | 22293 | | 25787 | | 67967 | | 247448 | | 1522 | | | 4323 | | | 59045 | | | 38.1 | | | | 17722 | | | 458 |
|  |  |  | |  | |  | |  | |  | |  | |  | | |  | | |  | | |  | | | |  | | |  |
| **Sample** | **Cr** | **Mn** | | **Fe** | | **Co** | | **Ni** | | **Cu** | | **Zn** | | **Ga** | | | **As** | | | **Rb** | | | **Sr** | | | | **Y** | | | **Zr** |
| **Outsider Seamount** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR1-7 | 41.5 | 1312 | | 72249 | | 36.0 | | 38.6 | | 46.5 | | 84.3 | | 17.2 | | | 0.412 | | | 36.7 | | | 270 | | | | 26.3 | | | 128 |
| SO199-DR1-10 | 42.4 | 1317 | | 73174 | | 36.2 | | 37.9 | | 46.3 | | 84.8 | | 17.3 | | | 0.415 | | | 36.3 | | | 270 | | | | 26.1 | | | 127 |
| SO199-DR1-15 | 41.7 | 1318 | | 72037 | | 35.7 | | 36.1 | | 46.8 | | 87.3 | | 17.4 | | | 0.438 | | | 37.2 | | | 270 | | | | 27.1 | | | 131 |
| SO199-DR1-18 | 41.8 | 1317 | | 71471 | | 36.4 | | 40.9 | | 47.5 | | 87.3 | | 17.4 | | | 0.408 | | | 36.9 | | | 273 | | | | 26.4 | | | 128 |
| **Investigator Ridge** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR2-15 | 394 | 1290 | | 69016 | | 40.3 | | 93.4 | | 85.8 | | 81.0 | | 15.5 | | | 0.111 | | | 0.648 | | | 89.8 | | | | 25.3 | | | 60.3 |
| SO199-DR2-17 | 421 | 1233 | | 66000 | | 40.4 | | 108 | | 85.5 | | 75.5 | | 14.9 | | | 0.114 | | | 0.670 | | | 92.4 | | | | 23.6 | | | 55.0 |
| SO199-DR2-18 | 381 | 1288 | | 69275 | | 40.2 | | 91.8 | | 83.8 | | 80.0 | | 15.3 | | | 0.108 | | | 0.621 | | | 88.9 | | | | 25.7 | | | 60.7 |
| SO199-DR10-13 | 291 | 1468 | | 86899 | | 45.9 | | 120 | | 91.7 | | 116 | | 16.2 | | | 0.211 | | | 4.94 | | | 104 | | | | 27.7 | | | 85.7 |
| SO199-DR10-14 | 290 | 1483 | | 87838 | | 46.4 | | 125 | | 99.7 | | 114 | | 16.6 | | | 0.203 | | | 4.98 | | | 102 | | | | 27.3 | | | 83.9 |
| SO199-DR10-15 | 313 | 1388 | | 81312 | | 42.9 | | 102 | | 105 | | 106 | | 16.1 | | | 0.172 | | | 4.73 | | | 82.8 | | | | 22.8 | | | 64.9 |
| SO199-DR10-22C | 249 | 1518 | | 90245 | | 44.8 | | 96.2 | | 101 | | 118 | | 17.3 | | | 0.232 | | | 5.31 | | | 104 | | | | 29.2 | | | 91.2 |
| SO199-DR22-1A | 11.9 | 1900 | | 112339 | | 39.4 | | 13.9 | | 35.9 | | 173 | | 22.6 | | | 0.504 | | | 13.6 | | | 135 | | | | 58.6 | | | 214 |
| SO199-DR22-1B | 12.0 | 1921 | | 113591 | | 39.3 | | 13.7 | | 35.3 | | 176 | | 22.6 | | | 0.511 | | | 13.6 | | | 133 | | | | 55.8 | | | 204 |
|  |  |  | |  | |  | |  | |  | |  | |  | | |  | | |  | | |  | | | |  | | |  |
| **Sample** | **Nb** | **Mo** | | **In** | | **Sn** | | **Sb** | | **Cs** | | **Ba** | | **La** | | | **Ce** | | | **Pr** | | | **Nd** | | | | **Sm** | | | **Eu** |
| **Outsider Seamount** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR1-7 | 18.6 | 1.03 | | 0.101 | | 1.50 | | 0.042 | | 0.851 | | 198 | | 15.4 | | | 32.7 | | | 4.07 | | | 17.2 | | | | 4.08 | | | 1.41 |
| SO199-DR1-10 | 18.6 | 1.02 | | 0.099 | | 1.50 | | 0.040 | | 0.850 | | 197 | | 15.3 | | | 32.5 | | | 4.04 | | | 17.0 | | | | 4.12 | | | 1.42 |
| SO199-DR1-15 | 18.8 | 1.02 | | 0.105 | | 1.54 | | 0.047 | | 0.916 | | 201 | | 15.7 | | | 32.8 | | | 4.12 | | | 17.8 | | | | 4.18 | | | 1.46 |
| SO199-DR1-18 | 18.4 | 0.975 | | 0.108 | | 1.53 | | 0.041 | | 0.907 | | 197 | | 15.5 | | | 32.4 | | | 4.07 | | | 17.6 | | | | 4.12 | | | 1.45 |
| **Investigator Ridge** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR2-15 | 1.13 | 0.125 | | 0.093 | | 0.751 | | 0.023 | | 0.006 | | 6.5 | | 1.93 | | | 6.4 | | | 1.16 | | | 6.64 | | | | 2.40 | | | 0.934 |
| SO199-DR2-17 | 1.12 | 0.123 | | 0.083 | | 0.686 | | 0.018 | | 0.007 | | 6.9 | | 1.76 | | | 5.9 | | | 1.07 | | | 6.15 | | | | 2.30 | | | 0.888 |
| SO199-DR2-18 | 1.09 | 0.117 | | 0.087 | | 0.758 | | <0.02 | | 0.007 | | 6.3 | | 1.89 | | | 6.4 | | | 1.15 | | | 6.63 | | | | 2.48 | | | 0.936 |
| SO199-DR10-13 | 7.95 | 0.335 | | 0.112 | | 1.04 | | 0.027 | | 0.067 | | 42.9 | | 6.55 | | | 15.6 | | | 2.24 | | | 11.0 | | | | 3.20 | | | 1.17 |
| SO199-DR10-14 | 7.73 | 0.335 | | 0.112 | | 1.03 | | 0.031 | | 0.067 | | 42.5 | | 6.36 | | | 15.3 | | | 2.18 | | | 10.8 | | | | 3.07 | | | 1.13 |
| SO199-DR10-15 | 6.31 | 0.311 | |  | |  | |  | | 0.057 | | 36.4 | | 4.96 | | | 12.4 | | | 1.78 | | | 8.6 | | | | 2.58 | | | 0.940 |
| SO199-DR10-22C | 8.50 | 0.382 | | 0.120 | | 1.11 | | 0.030 | | 0.072 | | 45.7 | | 6.99 | | | 16.5 | | | 2.38 | | | 11.6 | | | | 3.35 | | | 1.19 |
| SO199-DR22-1A | 17.0 | 0.804 | | 0.199 | | 2.43 | | 0.051 | | 0.239 | | 92.1 | | 14.6 | | | 35.9 | | | 5.13 | | | 24.9 | | | | 7.03 | | | 2.30 |
| SO199-DR22-1B | 16.9 | 0.816 | | 0.202 | | 2.31 | | 0.053 | | 0.244 | | 92.7 | | 14.6 | | | 36.2 | | | 5.19 | | | 24.8 | | | | 7.14 | | | 2.35 |
|  |  |  |  | |  | |  | |  | |  | |  | |  | | |  | | |  | | |  | |  | | |  | |
| **Sample** | **Gd** | **Tb** | **Dy** | | **Ho** | | **Er** | | **Tm** | | **Yb** | | **Lu** | | | **Hf** | | | **Ta** | | | **W** | | | **Pb** | | | **Th** | | **U** |
| **Outsider Seamount** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR1-7 | 4.67 | 0.774 | 4.85 | | 0.977 | | 2.83 | | 0.403 | | 2.68 | | 0.405 | | | 3.05 | | | 1.14 | | | 0.391 | | | 2.74 | | | 2.83 | | 0.579 |
| SO199-DR1-10 | 4.68 | 0.747 | 4.75 | | 0.974 | | 2.80 | | 0.407 | | 2.72 | | 0.389 | | | 3.05 | | | 1.14 | | | 0.382 | | | 2.77 | | | 2.85 | | 0.571 |
| SO199-DR1-15 | 4.75 | 0.778 | 4.93 | | 1.00 | | 2.91 | | 0.412 | | 2.79 | | 0.406 | | | 3.15 | | | 1.15 | | | 0.389 | | | 2.76 | | | 2.89 | | 0.580 |
| SO199-DR1-18 | 4.59 | 0.753 | 4.83 | | 0.982 | | 2.80 | | 0.391 | | 2.68 | | 0.387 | | | 3.06 | | | 1.12 | | | 0.370 | | | 2.72 | | | 2.76 | | 0.567 |
| **Investigator Ridge** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SO199-DR2-15 | 3.57 | 0.641 | 4.43 | | 0.954 | | 2.83 | | 0.408 | | 2.80 | | 0.404 | | | 1.70 | | | 0.077 | | | 0.009 | | | 0.433 | | | 0.097 | | 0.027 |
| SO199-DR2-17 | 3.33 | 0.599 | 4.11 | | 0.877 | | 2.63 | | 0.369 | | 2.55 | | 0.380 | | | 1.56 | | | 0.070 | | | <0.01 | | | 0.398 | | | 0.089 | | 0.024 |
| SO199-DR2-18 | 3.54 | 0.648 | 4.46 | | 0.951 | | 2.82 | | 0.401 | | 2.78 | | 0.411 | | | 1.68 | | | 0.076 | | | 0.010 | | | 0.438 | | | 0.091 | | 0.025 |
| SO199-DR10-13 | 4.16 | 0.730 | 4.84 | | 1.01 | | 3.03 | | 0.435 | | 3.03 | | 0.456 | | | 2.34 | | | 0.509 | | | 0.068 | | | 0.627 | | | 0.727 | | 0.167 |
| SO199-DR10-14 | 4.09 | 0.705 | 4.76 | | 1.00 | | 2.98 | | 0.425 | | 2.91 | | 0.433 | | | 2.27 | | | 0.491 | | | 0.078 | | | 0.622 | | | 0.662 | | 0.161 |
| SO199-DR10-15 | 3.31 | 0.587 | 3.96 | | 0.833 | | 2.49 | | 0.362 | | 2.54 | | 0.366 | | | 1.74 | | | 0.381 | | | 0.070 | | | 0.579 | | | 0.522 | | 0.131 |
| SO199-DR10-22C | 4.34 | 0.761 | 5.09 | | 1.06 | | 3.18 | | 0.459 | | 3.12 | | 0.466 | | | 2.42 | | | 0.542 | | | 0.091 | | | 0.667 | | | 0.754 | | 0.181 |
| SO199-DR22-1A | 9.10 | 1.58 | 10.2 | | 2.13 | | 6.35 | | 0.904 | | 6.24 | | 0.895 | | | 5.44 | | | 1.08 | | | 0.189 | | | 1.70 | | | 1.65 | | 0.360 |
| SO199-DR22-1B | 8.86 | 1.53 | 9.88 | | 2.08 | | 6.18 | | 0.873 | | 6.09 | | 0.862 | | | 5.26 | | | 1.06 | | | 0.177 | | | 1.75 | | | 1.63 | | 0.383 |