|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Supplementary Table S6 Zircon trace element data for the samples in western segment. | | | | | | | | | | | | |
| ***Rhyolite (D730-9), 21 spots*** | | | | | | | | | | | | |
| Spot No | Ti | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Ho | Er |
| D730-9.01 | 15.58 | 0 | 12.49 | 0.06 | 1.23 | 3.07 | 0.56 | 15.36 | 4.97 | 55.78 | 21.36 | 94.78 |
| D730-9.02 | 13.05 | 0 | 12.69 | 0.04 | 1.00 | 2.47 | 0.46 | 13.90 | 4.40 | 50.66 | 19.99 | 87.16 |
| D730-9.03 | 10.43 | 0 | 13.88 | 0.04 | 1.09 | 2.19 | 0.32 | 12.75 | 4.68 | 52.53 | 20.46 | 93.15 |
| D730-9.04 | 10.17 | 0.013 | 14.82 | 0.10 | 2.15 | 5.85 | 0.94 | 28.84 | 9.36 | 104.19 | 38.35 | 160.25 |
| D730-9.05 | 13.91 | 0.008 | 13.05 | 0.11 | 2.36 | 4.30 | 0.79 | 23.16 | 6.82 | 81.96 | 30.58 | 133.78 |
| D730-9.06 | 13.09 | 0.007 | 14.09 | 0.23 | 3.54 | 5.52 | 1.08 | 26.85 | 8.63 | 95.29 | 35.27 | 153.40 |
| D730-9.07 | 12.44 | 0 | 13.73 | 0.05 | 0.95 | 2.47 | 0.51 | 12.80 | 4.42 | 54.30 | 21.40 | 95.55 |
| D730-9.08 | 7.86 | 0 | 17.10 | 0.02 | 1.50 | 3.33 | 0.50 | 20.00 | 6.75 | 81.10 | 31.44 | 143.90 |
| D730-9.09 | 12.43 | 0.095 | 15.23 | 0.23 | 4.32 | 7.20 | 1.30 | 35.08 | 10.87 | 119.14 | 43.25 | 184.85 |
| D730-9.10 | 15.33 | 0.363 | 13.53 | 0.11 | 1.95 | 3.16 | 0.75 | 18.69 | 6.02 | 71.21 | 26.42 | 119.64 |
| D730-9.11 | 14.73 | 0.027 | 16.11 | 0.31 | 5.43 | 8.45 | 1.31 | 37.64 | 12.19 | 137.24 | 49.30 | 212.62 |
| D730-9.12 | 8.07 | 0 | 16.58 | 0.25 | 2.45 | 6.24 | 0.97 | 31.46 | 9.69 | 107.93 | 39.15 | 173.85 |
| D730-9.13 | 16.66 | 0.004 | 13.35 | 0.13 | 1.90 | 3.81 | 0.79 | 20.27 | 6.74 | 77.10 | 28.64 | 129.94 |
| D730-9.14 | 12.28 | 0 | 14.19 | 0.18 | 3.00 | 5.54 | 1.04 | 28.04 | 8.93 | 98.98 | 36.20 | 156.16 |
| D730-9.15 | 15.78 | 0.057 | 18.25 | 0.50 | 6.59 | 9.09 | 1.94 | 44.93 | 14.73 | 172.69 | 64.63 | 286.85 |
| D730-9.16 | 12.43 | 0.002 | 14.85 | 0.29 | 4.22 | 7.17 | 1.24 | 34.79 | 10.78 | 117.48 | 43.34 | 188.12 |
| D730-9.17 | 8.66 | 0.016 | 18.22 | 0.24 | 4.66 | 7.49 | 1.35 | 38.90 | 11.44 | 127.59 | 45.93 | 196.19 |
| D730-9.18 | 9.96 | 0 | 13.46 | 0.06 | 0.89 | 2.10 | 0.50 | 14.17 | 4.75 | 56.24 | 21.80 | 98.37 |
| D730-9.19 | 13.82 | 0 | 12.89 | 0.05 | 1.50 | 3.00 | 0.50 | 15.85 | 5.21 | 61.38 | 23.15 | 105.39 |
| D730-9.20 | 11.44 | 0.027 | 13.22 | 0.23 | 3.91 | 7.08 | 1.21 | 30.85 | 9.66 | 106.56 | 39.52 | 166.55 |
| D730-9.21 | 10.99 | 0.004 | 13.61 | 0.13 | 2.47 | 4.12 | 0.79 | 21.82 | 7.25 | 85.47 | 32.88 | 143.94 |
| Spot No | Tm | Yb | Lu | U | (La/Yb)N | Age(Ma) | T(℃) | CeN/CeN\* | EuN/EuN\* | logƒO2 | ΔFMQ | Ce4+/Ce3+ |
| D730-9.01 | 20.03 | 182.61 | 37.58 | 59.73 |  | 342.7 | 851.5 | 59.28 | 0.25 | -9.32 | 0.68 | 78.97 |
| D730-9.02 | 18.14 | 165.06 | 33.59 | 61.22 |  | 347.9 | 831.6 | 72.69 | 0.24 | -9.39 | 0.83 | 103.73 |
| D730-9.03 | 20.42 | 179.54 | 38.62 | 62.40 |  | 340.3 | 807.5 | 59.17 | 0.18 | -11.22 | 1.17 | 124.35 |
| D730-9.04 | 31.81 | 276.55 | 55.14 | 77.45 | 0.00003 | 344.2 | 804.8 | 43.77 | 0.22 | -12.47 | 1.12 | 44.08 |
| D730-9.05 | 27.46 | 247.60 | 51.41 | 67.39 | 0.00002 | 343.3 | 838.7 | 23.56 | 0.24 | -13.32 | 0.74 | 42.73 |
| D730-9.06 | 31.53 | 282.26 | 58.11 | 81.58 | 0.00002 | 340.5 | 831.9 | 14.47 | 0.27 | -15.44 | 0.76 | 29.00 |
| D730-9.07 | 19.88 | 177.96 | 37.55 | 65.76 |  | 343.2 | 826.3 | 87.19 | 0.28 | -8.93 | 0.95 | 129.53 |
| D730-9.08 | 30.84 | 294.38 | 60.47 | 138.90 |  | 343.7 | 778.3 | 59.23 | 0.19 | -12.55 | 1.08 | 113.14 |
| D730-9.09 | 37.50 | 323.83 | 65.29 | 81.82 | 0.00021 | 340.0 | 826.2 | 13.67 | 0.25 | -15.90 | 0.94 | 22.95 |
| D730-9.10 | 24.52 | 222.13 | 44.09 | 75.78 | 0.00117 | 346.1 | 849.7 | 26.32 | 0.30 | -12.45 | 0.62 | 60.38 |
| D730-9.11 | 42.19 | 363.64 | 72.05 | 94.70 | 0.00005 | 341.8 | 845.2 | 10.75 | 0.22 | -16.00 | 0.77 | 19.18 |
| D730-9.12 | 35.27 | 314.55 | 62.38 | 113.52 |  | 343.3 | 780.9 | 40.14 | 0.21 | -13.89 | 1.18 | 45.43 |
| D730-9.13 | 27.04 | 250.49 | 52.41 | 82.03 | 0.00001 | 343.9 | 859.2 | 32.80 | 0.28 | -11.23 | 0.46 | 58.91 |
| D730-9.14 | 32.37 | 284.03 | 57.33 | 86.12 |  | 344.3 | 825.0 | 20.35 | 0.26 | -14.46 | 0.78 | 33.37 |
| D730-9.15 | 57.33 | 493.09 | 99.86 | 176.10 | 0.00008 | 340.9 | 853.0 | 8.89 | 0.29 | -16.38 | 0.38 | 21.27 |
| D730-9.16 | 37.77 | 322.02 | 63.69 | 92.21 | 0.00001 | 344.5 | 826.3 | 13.93 | 0.24 | -15.82 | 0.79 | 22.88 |
| D730-9.17 | 40.23 | 344.72 | 69.94 | 112.63 | 0.00003 | 343.7 | 788.1 | 14.66 | 0.24 | -17.34 | 1.29 | 25.75 |
| D730-9.18 | 20.66 | 186.33 | 39.17 | 68.63 |  | 347.5 | 802.6 | 82.67 | 0.28 | -10.18 | 1.07 | 145.63 |
| D730-9.19 | 22.99 | 202.66 | 41.11 | 69.23 |  | 344.0 | 838.0 | 40.23 | 0.22 | -11.34 | 0.71 | 74.52 |
| D730-9.20 | 33.19 | 286.89 | 57.68 | 79.74 | 0.00007 | 343.9 | 817.3 | 14.26 | 0.25 | -16.13 | 0.79 | 20.88 |
| D730-9.21 | 29.93 | 269.55 | 55.78 | 91.97 | 0.00001 | 339.1 | 813.0 | 21.36 | 0.26 | -14.80 | 0.75 | 47.26 |
| ***Monzogranite (D731-1), 16 spots*** | | | | | | | | | | | | |
| Spot No | Ti | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Ho | Er |
| D731-1.01 | 8.45 | 0.97 | 12.15 | 0.11 | 1.48 | 2.44 | 0.66 | 16.17 | 6.82 | 87.48 | 39.95 | 194.14 |
| D731-1.02 | 7.28 | 0.00 | 13.11 | 0.09 | 1.18 | 3.37 | 0.70 | 27.00 | 9.85 | 131.27 | 55.69 | 261.95 |
| D731-1.03 | 6.98 | 0.24 | 7.71 | 0.07 | 0.54 | 1.26 | 0.37 | 12.43 | 4.72 | 66.32 | 28.66 | 142.67 |
| D731-1.04 | 9.13 | 0.04 | 12.84 | 0.07 | 0.98 | 2.52 | 0.65 | 20.09 | 7.96 | 111.88 | 49.80 | 241.82 |
| D731-1.05 | 9.82 | 0.27 | 8.00 | 0.20 | 1.22 | 1.95 | 0.36 | 13.19 | 5.01 | 66.01 | 27.54 | 136.55 |
| D731-1.06 | 9.50 | 6.64 | 25.58 | 2.08 | 10.61 | 4.53 | 0.46 | 18.10 | 6.43 | 90.54 | 38.42 | 186.63 |
| D731-1.07 | 13.31 | 0.43 | 21.67 | 0.44 | 4.68 | 6.12 | 1.21 | 37.38 | 13.97 | 183.28 | 76.11 | 353.98 |
| D731-1.08 | 3.70 | 0.46 | 9.70 | 0.16 | 0.92 | 1.37 | 0.27 | 8.91 | 3.35 | 46.77 | 21.16 | 111.38 |
| D731-1.09 | 7.09 | 0.35 | 9.19 | 0.12 | 1.10 | 1.78 | 0.27 | 10.13 | 3.89 | 53.06 | 22.42 | 107.01 |
| D731-1.10 | 5.22 | 0.43 | 15.99 | 0.28 | 2.71 | 4.66 | 0.73 | 32.52 | 11.83 | 151.42 | 63.07 | 299.45 |
| D731-1.11 | 6.50 | 0.03 | 9.19 | 0.05 | 0.79 | 1.63 | 0.36 | 13.86 | 5.62 | 73.29 | 34.31 | 167.40 |
| D731-1.12 | 10.61 | 0.30 | 17.53 | 0.53 | 5.16 | 5.68 | 1.07 | 38.24 | 13.40 | 165.27 | 65.91 | 295.35 |
| D731-1.13 | 9.67 | 5.25 | 25.84 | 1.75 | 9.75 | 4.53 | 0.68 | 22.21 | 7.72 | 101.79 | 43.34 | 211.23 |
| D731-1.14 | 7.21 | 0.00 | 10.52 | 0.01 | 0.40 | 1.62 | 0.18 | 10.97 | 4.65 | 61.29 | 25.60 | 125.81 |
| D731-1.15 | 9.29 | 0.82 | 12.26 | 0.26 | 1.74 | 2.55 | 0.48 | 21.14 | 7.65 | 102.48 | 44.16 | 215.34 |
| D731-1.16 | 6.98 | 2.60 | 30.70 | 1.77 | 9.85 | 8.19 | 1.45 | 39.25 | 12.59 | 166.93 | 66.65 | 318.93 |
| Spot No | Tm | Yb | Lu | U | (La/Yb)N | Age(Ma) | T(℃) | CeN/CeN\* | EuN/EuN\* | logƒO2 | ΔFMQ | Ce4+/Ce3+ |
| D731-1.01 | 42.81 | 410.41 | 95.27 | 239.03 | 0.00170 | 334.3 | 785.6 | 31.74 | 0.32 | -14.55 | -0.04 | 137.36 |
| D731-1.02 | 57.15 | 534.20 | 117.51 | 280.61 | 0.00001 | 336.8 | 770.7 | 73.80 | 0.22 | -12.08 | 0.08 | 154.72 |
| D731-1.03 | 32.49 | 321.87 | 74.13 | 156.15 | 0.00054 | 331.1 | 766.6 | 77.91 | 0.28 | -12.08 | -0.29 | 273.25 |
| D731-1.04 | 53.85 | 527.13 | 117.40 | 244.62 | 0.00005 | 327.3 | 793.5 | 78.14 | 0.28 | -10.80 | -0.03 | 226.81 |
| D731-1.05 | 30.28 | 296.17 | 67.16 | 109.49 | 0.00066 | 333.9 | 801.0 | 24.47 | 0.22 | -14.82 | -0.22 | 100.60 |
| D731-1.06 | 42.49 | 404.38 | 88.24 | 226.90 | 0.01178 | 331.8 | 797.6 | 2.40 | 0.16 | -23.70 | 1.20 | 35.30 |
| D731-1.07 | 76.58 | 707.61 | 147.75 | 336.50 | 0.00044 | 338.1 | 833.8 | 14.09 | 0.24 | -15.46 | 0.27 | 60.53 |
| D731-1.08 | 27.17 | 284.88 | 67.94 | 304.12 | 0.00116 | 333.9 | 707.9 | 36.27 | 0.24 | -17.95 | 0.08 | 213.32 |
| D731-1.09 | 23.63 | 227.79 | 49.02 | 133.86 | 0.00111 | 332.2 | 768.1 | 31.74 | 0.19 | -15.38 | 0.13 | 118.56 |
| D731-1.10 | 64.78 | 609.79 | 127.24 | 326.81 | 0.00051 | 334.0 | 738.9 | 23.60 | 0.18 | -17.93 | 0.58 | 77.89 |
| D731-1.11 | 38.93 | 393.18 | 88.21 | 222.66 | 0.00006 | 335.4 | 759.7 | 56.39 | 0.23 | -13.62 | -0.24 | 224.30 |
| D731-1.12 | 61.31 | 571.40 | 116.50 | 262.43 | 0.00037 | 331.8 | 809.3 | 8.72 | 0.22 | -18.33 | 0.32 | 38.58 |
| D731-1.13 | 45.16 | 445.99 | 99.65 | 246.35 | 0.00844 | 333.0 | 799.5 | 2.87 | 0.21 | -22.94 | 1.13 | 38.31 |
| D731-1.14 | 27.60 | 268.66 | 58.12 | 197.55 | 0.00000 | 330.6 | 769.7 | 243.82 | 0.13 | -7.64 | 0.01 | 374.27 |
| D731-1.15 | 46.96 | 444.43 | 97.58 | 209.31 | 0.00133 | 331.6 | 795.4 | 24.02 | 0.20 | -15.15 | 0.01 | 114.08 |
| D731-1.16 | 66.12 | 641.17 | 135.06 | 397.68 | 0.00291 | 332.9 | 766.6 | 6.04 | 0.25 | -21.69 | 1.29 | 34.89 |
| ***Moyite (D801-6), 8 spots*** | | | | | | | | | | | | |
| Spot No | Ti | La | Ce | Pr | Nd | Sm | Eu | Gd | Tb | Dy | Ho | Er |
| D801-6.01 | 12.90 | 0.05 | 27.65 | 0.14 | 2.52 | 4.17 | 0.50 | 30.26 | 11.55 | 144.67 | 58.88 | 263.28 |
| D801-6.02 | 10.99 | 0.76 | 12.79 | 0.43 | 3.73 | 5.31 | 0.86 | 27.59 | 9.29 | 110.97 | 44.02 | 200.88 |
| D801-6.03 | 2.85 | 0.03 | 17.35 | 0.02 | 1.26 | 1.94 | 0.08 | 14.32 | 6.37 | 81.79 | 36.85 | 176.54 |
| D801-6.04 | 23.00 | 0.25 | 17.84 | 0.17 | 1.52 | 2.60 | 0.28 | 15.13 | 5.71 | 76.78 | 31.86 | 156.19 |
| D801-6.05 | 6.62 | 0.00 | 18.02 | 0.05 | 1.32 | 2.50 | 0.26 | 18.57 | 6.86 | 87.84 | 36.19 | 167.01 |
| D801-6.06 | 14.80 | 0.10 | 25.66 | 0.28 | 4.72 | 8.40 | 1.15 | 56.28 | 18.53 | 222.68 | 85.56 | 370.46 |
| D801-6.07 | 5.18 | 0.12 | 19.15 | 0.26 | 2.77 | 5.53 | 0.52 | 31.67 | 11.66 | 150.94 | 58.03 | 273.13 |
| D801-6.08 | 5.79 | 0.05 | 18.83 | 0.15 | 3.12 | 6.02 | 0.65 | 40.59 | 14.40 | 174.05 | 68.78 | 311.87 |
| Spot No | Tm | Yb | Lu | U | (La/Yb)N | Age(Ma) | T(℃) | CeN/CeN\* | EuN/EuN\* | logƒO2 | ΔFMQ | Ce4+/Ce3+ |
| D801-6.01 | 53.91 | 479.67 | 96.09 | 467.67 | 0.00007 | 342.2 | 830.4 | 42.26 | 0.14 | -11.48 | 0.44 | 130.01 |
| D801-6.02 | 42.41 | 380.68 | 78.41 | 458.89 | 0.00144 | 346.9 | 813.0 | 11.39 | 0.22 | -17.16 | -0.75 | 32.31 |
| D801-6.03 | 40.18 | 381.73 | 83.10 | 606.32 | 0.00006 | 343.3 | 685.8 | 49.66 | 0.04 | -17.99 | 0.71 | 247.01 |
| D801-6.04 | 33.40 | 298.08 | 64.58 | 442.51 | 0.00060 | 342.0 | 898.0 | 46.95 | 0.14 | -8.36 | -0.78 | 154.25 |
| D801-6.05 | 35.74 | 331.38 | 66.22 | 337.40 | 0.00000 | 344.6 | 761.4 | 60.71 | 0.12 | -13.27 | 0.56 | 175.30 |
| D801-6.06 | 76.26 | 658.86 | 128.73 | 464.04 | 0.00011 | 344.2 | 845.7 | 22.52 | 0.16 | -13.20 | 0.19 | 48.65 |
| D801-6.07 | 57.08 | 501.56 | 101.92 | 489.46 | 0.00017 | 343.6 | 738.3 | 32.03 | 0.12 | -16.82 | 0.55 | 72.92 |
| D801-6.08 | 63.04 | 562.39 | 111.89 | 437.98 | 0.00006 | 342.5 | 748.6 | 27.09 | 0.13 | -16.93 | 0.52 | 60.73 |
| Ti-in-zircon temperatures are calculated using the equation proposed by Ferry and Watson, 2007, where it is assumed that logaSiO2 = 1 due to the existence of quartz in the host rocks, and logaTiO2 = 0.75 due to the presence of titanite  Eu anomalies (EuN/EuN\*) are calculated by EuN/(SmN × GdN)1/2, where "N" indicates chondrite-normalized values (Sun and McDonough, 1989)  Ce anomalies (CeN/CeN\*) are calculated by CeN/(NdN2/SmN) proposed by Loader et al., 2017.  Log*f*O2 values are calculated using the equation of Loucks et al., 2020.  FMQ values are calculated following the equation of Myers and Eugster (1983): log*f*O2 = –24,441.9/T (K) + 8.290 (± 0.167).  Ce4+/Ce3+ ratios are calculated following the method of Ballard et al. (2002). | | | | | | | | | | | | |

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