| TABLE A.1 | | | | | |
|---|---|---|---|---|---|
| Height of the sample: metre from the sediment/basalt contact | | | | | |
| **Tiourjdal section** | | | | **Oued Lahr section** | |
| **sample** | **metre** | **sample** | **metre** | **sample** | **metre** |
| haj-01 | 0.40 | haj-41 | 4.90 | ol1 | 0.10 |
| haj-02 | 0.70 | haj-42 | 5.08 | ol2 | 0.20 |
| haj-03 | 0.14 | haj-43 | 5.45 | ol3 | 0.35 |
| haj-04 | 0.19 | haj-44 | 5.73 | ol4 | 0.45 |
| haj-05 | 0.25 | | | ol5 | 0.93 |
| haj-06 | 0.35 | | | ol6 | 1.17 |
| haj-07 | 0.41 | | | ol7 | 1.62 |
| haj-08 | 0.57 | | | ol8 | 1.87 |
| haj-09 | 0.77 | | | ol9 | 2.35 |
| haj-10 | 0.90 | | | | |
| haj-11 | 1.05 | | | | |
| haj-12 | 1.20 | | | | |
| haj-13 | 1.35 | | | | |
| haj-14 | 1.44 | | | | |
| haj-15 | 1.49 | | | | |
| haj-16 | 1.55 | | | | |
| haj-17 | 1.63 | | | | |
| haj-18 | 1.70 | | | | |
| haj-19 | 1.76 | | | | |
| haj-20 | 1.85 | | | | |
| haj-21 | 1.95 | | | | |
| haj-22 | 2.03 | | | | |
| haj-23 | 2.19 | | | | |
| haj-24 | 2.36 | | | | |
| haj-25 | 2.45 | | | | |
| haj-26 | 2.55 | | | | |
| haj-27 | 2.65 | | | | |
| haj-28 | 2.75 | | | | |
| haj-29 | 2.83 | | | | |
| haj-30 | 2.93 | | | | |
| haj-31 | 3.05 | | | | |
| haj-32 | 3.17 | | | | |
| haj-33 | 3.38 | | | | |
| haj-34 | 3.65 | | | | |
| haj-35 | 3.77 | | | | |
| haj-36 | 4.16 | | | | |
| haj-37 | 4.34 | | | | |
| haj-38 | 4.46 | | | | |
| haj-39 | 4.51 | | | | |
| haj-40 | 4.66 | | | | |

| TABLE A.5 | | |
|---|---|---|
| Section | Sample | d13C TOC (VPDB) |
| *Tiourjdal* | haj-01 | -27.3 |
| | haj-02 | -21.6 |
| | haj-03 | -26.1 |
| | haj-04 | -21.4 |
| | haj-05 | -26.3 |
| | haj-06 | -20.6 |
| | haj-07 | -20.9 |
| | haj-09 | -20.8 |
| | haj-11 | -24.8 |
| | haj-12 | -20.3 |
| | haj-14 | -21.6 |
| | haj-15 | -23.4 |
| | haj-16 | -20.8 |
| | haj-18 | -22.0 |
| | haj-20 | -21.5 |
| | haj-22 | -20.9 |
| | haj-24 | -21.4 |
| | haj-26 | -20.1 |
| | haj-28 | -20.9 |
| | haj-30 | -20.9 |
| | haj-32 | -21.6 |
| | haj-34 | -21.2 |
| | haj-37 | -21.9 |
| | haj-39 | -24.1 |
| | haj-41 | -22.8 |
| | haj-44 | -24.7 |
| *Oued Lahr* | ol1 | -20.3 |
| | ol2 | -20.5 |
| | ol3 | -20.5 |
| | ol4 | -21.1 |
| | ol5 | -24.3 |
| | ol6 | -22.7 |
| | ol7 | -21.5 |
| | ol8 | -21.5 |
| | ol9 | -21.9 |

| TABLE 3: mineralogy by XRD diffration | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Bulk rock mineralogy (recalculated to 100%) | | | | | | |
| | sample | quartz | K-feldspar | dolomite | gypsum | hematite | di-octahedral sheet silicates | tri-octahedral sheet silicates |
| *Tiourjdal section* | haj-01 | 2 | 0 | 0 | 0 | 1 | 32 | 65 |
| | haj-02 | 2 | 0 | 2 | 0 | 1 | 25 | 70 |
| | haj-03 | 2 | 0 | 0 | 0 | 0 | 34 | 63 |
| | haj-04 | 1 | 0 | 0 | 0 | 0 | 15 | 84 |
| | haj-05 | 12 | 1 | 0 | 0 | 0 | 39 | 48 |
| | haj-06 | 6 | 0 | 0 | 38 | 0 | 28 | 28 |
| | haj-07 | 2 | 0 | 0 | 41 | 0 | 32 | 25 |
| | haj-08 | 12 | 1 | 0 | 2 | 1 | 50 | 33 |
| | haj-09 | 1 | 0 | 0 | 41 | 0 | 31 | 27 |
| | haj-10 | 17 | 3 | 0 | 0 | 1 | 51 | 28 |
| | haj-11 | 16 | 1 | 0 | 0 | 0 | 40 | 43 |
| | haj-12 | 4 | 0 | 0 | 35 | 0 | 32 | 28 |
| | haj-13 | 12 | 1 | 0 | 0 | 2 | 45 | 41 |
| | haj-14 | 6 | 0 | 0 | 40 | 0 | 22 | 32 |
| | haj-15 | 2 | 0 | 0 | 0 | 0 | 17 | 81 |
| | haj-16 | 4 | 1 | 0 | 48 | 0 | 27 | 21 |
| | haj-17 | 17 | 2 | 0 | 12 | 1 | 44 | 24 |
| | haj-18 | 30 | 2 | 2 | 0 | 0 | 40 | 25 |
| | haj-19 | 15 | 3 | 14 | 2 | 1 | 39 | 26 |
| | haj-20 | 26 | 2 | 0 | 4 | 1 | 42 | 25 |
| | haj-21 | 23 | 1 | 0 | 0 | 2 | 46 | 28 |
| | haj-22 | 21 | 1 | 6 | 38 | 0 | 22 | 11 |
| | haj-23 | 15 | 2 | 1 | 1 | 1 | 51 | 30 |
| | haj-24 | 31 | 4 | 1 | 0 | 0 | 39 | 26 |
| | haj-25 | 24 | 2 | 0 | 2 | 1 | 43 | 28 |
| | haj-26 | 5 | 0 | 0 | 0 | 0 | 52 | 42 |
| | haj-27 | 16 | 2 | 0 | 3 | 2 | 46 | 31 |
| | haj-29 | 19 | 3 | 0 | 2 | 1 | 45 | 30 |
| | haj-30 | 11 | 2 | 0 | 14 | 1 | 45 | 28 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | haj-31 | 10 | 1 | 0 | 4 | 1 | 50 | 34 |
| | haj-32 | 15 | 2 | 0 | 14 | 0 | 42 | 27 |
| | haj-33 | 16 | 1 | 0 | 3 | 1 | 47 | 32 |
| | haj-34 | 7 | 1 | 0 | 17 | 1 | 46 | 28 |
| | haj-35 | 9 | 1 | 0 | 1 | 1 | 52 | 35 |
| | haj-36 | 11 | 2 | 0 | 4 | 1 | 48 | 33 |
| | haj-37 | 3 | 1 | 0 | 63 | 0 | 20 | 14 |
| | haj-38 | 9 | 2 | 0 | 3 | 0 | 51 | 35 |
| | haj-39 | 8 | 3 | 0 | 14 | 0 | 41 | 33 |
| | haj-40 | 9 | 2 | 0 | 2 | 1 | 47 | 39 |
| | haj-41 | 10 | 3 | 0 | 5 | 0 | 46 | 37 |
| | haj-42 | 14 | 2 | 0 | 4 | 1 | 47 | 31 |
| | haj-43 | 13 | 2 | 0 | 0 | 1 | 51 | 33 |
| | haj-44 | 20 | 2 | 0 | 0 | 0 | 41 | 38 |
| *Oued Lahr section* | ol1 | 19 | 3 | 2 | 0 | 0 | 43 | 32 |
| | ol2 | 17 | 2 | 0 | 0 | 0 | 50 | 30 |
| | ol3 | 18 | 1 | 7 | 0 | 0 | 45 | 29 |
| | ol4 | 15 | 1 | 26 | 0 | 0 | 29 | 29 |
| | ol5 | 14 | 1 | 0 | 0 | 1 | 46 | 37 |
| | ol6 | 30 | 10 | 0 | 0 | 0 | 32 | 28 |
| | ol7 | 13 | 1 | 0 | 0 | 0 | 45 | 41 |
| | ol8 | 6 | 0 | 18 | 0 | 0 | 36 | 40 |
| | ol9 | 19 | 3 | 0 | 0 | 1 | 45 | 32 |

**TABLE A.4: Elemental analysis**

| | Tiourjdal section | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | haj-01 | haj-02 | haj-03 | haj-04 | haj-05 | haj-06 | haj-08 | haj-10 | haj-11 | haj15 | haj-16 | haj-18 | haj-20 | haj-21 | haj-27 | haj-28 | haj-31 |
| SiO2 | 52.92 | 48.28 | 51.84 | 53.51 | 55.32 | 35.43 | 58.09 | 58.02 | 58.90 | 52.02 | 26.35 | 61.35 | 61.70 | 62.66 | 60.47 | 62.48 | 54.84 |
| TiO2 | 0.72 | 0.64 | 0.71 | 0.72 | 0.85 | 0.52 | 0.83 | 0.81 | 0.80 | 0.72 | 0.44 | 0.64 | 0.80 | 0.82 | 0.77 | 0.84 | 0.85 |
| Al2O3 | 11.72 | 9.56 | 11.53 | 10.20 | 14.23 | 11.39 | 13.33 | 15.34 | 13.30 | 12.40 | 6.22 | 9.56 | 12.29 | 13.29 | 12.20 | 13.76 | 13.94 |
| Fe2O3 | 7.00 | 6.79 | 5.65 | 3.44 | 5.12 | 4.33 | 6.12 | 7.30 | 5.02 | 5.05 | 4.35 | 6.58 | 4.83 | 7.53 | 6.50 | 4.26 | 5.60 |
| MnO | 0.03 | 0.07 | 0.03 | 0.02 | 0.03 | 0.03 | 0.05 | 0.06 | 0.09 | 0.04 | 0.02 | 0.14 | 0.10 | 0.04 | 0.04 | 0.03 | 0.05 |
| MgO | 24.17 | 32.59 | 27.57 | 31.45 | 21.91 | 13.39 | 17.59 | 13.37 | 13.19 | 27.13 | 7.86 | 14.94 | 9.78 | 11.09 | 10.69 | 11.95 | 13.67 |
| CaO | 0.72 | 1.15 | 0.26 | 0.12 | 0.24 | 15.22 | 0.44 | 0.56 | 4.41 | 0.78 | 24.49 | 3.37 | 3.30 | 0.70 | 2.25 | 1.35 | 2.68 |
| Na2O | 0.87 | 0.29 | 0.80 | 0.39 | 0.39 | 0.53 | 0.39 | 0.44 | 0.30 | 0.24 | 0.11 | 0.61 | 0.30 | 0.34 | 0.35 | 0.35 | 0.40 |
| K2O | 1.85 | 0.33 | 1.00 | 0.18 | 1.55 | 2.26 | 2.52 | 3.50 | 2.85 | 0.95 | 0.82 | 1.57 | 3.29 | 2.98 | 2.67 | 3.25 | 3.22 |
| P2O5 | 0.09 | 0.11 | 0.13 | 0.04 | 0.10 | 0.12 | 0.16 | 0.14 | 0.12 | 0.08 | 0.08 | 0.10 | 0.13 | 0.14 | 0.11 | 0.12 | 0.13 |
| tot | 100.09 | 99.81 | 99.52 | 100.07 | 99.74 | 83.22 | 99.52 | 99.54 | 98.98 | 99.41 | 70.74 | 98.86 | 96.52 | 99.59 | 96.05 | 98.39 | 95.38 |
| *L.O.I.* | *14.79* | *13.77* | *12.71* | *11.60* | *11.28* | *19.02* | *11.20* | *11.40* | *11.71* | *12.15* | *17.33* | *14.87* | *10.39* | *8.54* | *10.75* | *10.92* | *13.43* |

| | Tiourjdal section | | | | | | | Oeud Lahr section | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | haj-34 | haj-36 | haj-37 | haj-38 | haj-39 | haj-42 | haj-44 | ol1 | ol2 | ol5 | ol7 | ol8 | ol9 |
| SiO2 | 47.48 | 58.87 | 50.84 | 55.03 | 59.46 | 56.25 | 62.59 | 60.30 | 60.34 | 58.36 | 57.52 | 46.39 | 64.41 |
| TiO2 | 0.73 | 0.85 | 0.82 | 0.83 | 0.96 | 0.83 | 0.78 | 0.94 | 0.95 | 0.90 | 0.83 | 0.73 | 0.91 |
| Al2O3 | 15.26 | 13.94 | 13.50 | 14.94 | 14.10 | 11.94 | 12.69 | 14.52 | 14.12 | 14.82 | 14.12 | 15.13 | 13.57 |
| Fe2O3 | 4.91 | 6.33 | 4.21 | 4.99 | 3.65 | 5.99 | 6.34 | 4.35 | 4.07 | 6.17 | 4.19 | 4.28 | 3.55 |
| MnO | 0.04 | 0.06 | 0.05 | 0.05 | 0.05 | 0.05 | 0.02 | 0.11 | 0.19 | 0.07 | 0.10 | 0.43 | 0.03 |
| MgO | 14.71 | 14.11 | 14.57 | 16.53 | 15.97 | 11.95 | 14.03 | 14.13 | 12.55 | 15.48 | 18.23 | 25.01 | 13.38 |
| CaO | 6.43 | 0.76 | 5.42 | 1.71 | 0.61 | 3.61 | 0.35 | 1.90 | 3.25 | 0.43 | 1.57 | 5.76 | 0.32 |
| Na2O | 0.49 | 0.56 | 0.64 | 0.61 | 0.67 | 0.53 | 0.35 | 0.22 | 0.24 | 0.34 | 0.46 | 0.54 | 0.43 |
| K2O | 3.25 | 3.19 | 3.25 | 3.18 | 3.49 | 3.08 | 2.43 | 2.97 | 3.26 | 3.05 | 2.08 | 1.90 | 3.13 |
| P2O5 | 0.14 | 0.14 | 0.13 | 0.14 | 0.15 | 0.12 | 0.10 | 0.15 | 0.15 | 0.15 | 0.14 | 0.15 | 0.14 |
| tot | 93.44 | 98.81 | 93.43 | 98.01 | 99.11 | 94.35 | 99.68 | 99.59 | 99.12 | 99.77 | 99.24 | 100.32 | 99.87 |
| *L.O.I.* | *16.69* | *12.79* | *15.49* | *11.74* | *12.86* | *13.75* | *7.78* | *10.63* | *15.64* | *9.68* | *10.67* | *17.99* | *7.98* |

| TABLE A.5: Ternary diagram data | Sample | Al *ppm* | Mg *ppm* | Si *ppm* | Reference |
|---|---|---|---|---|---|
| *THIS STUDY* | haj-01 | 52859 | 125137 | 210765 | |
| *Tiourjdal section* | haj-02 | 43633 | 170750 | 194587 | |
| | haj-03 | 53272 | 146224 | 211504 | |
| | haj-04 | 47726 | 168924 | 221093 | |
| | haj-05 | 66823 | 118109 | 229399 | |
| | haj-06 | 48821 | 65883 | 134103 | |
| | haj-08 | 62653 | 94907 | 241103 | |
| | haj-10 | 71938 | 71975 | 240270 | |
| | haj-11 | 62153 | 70758 | 243061 | |
| | haj-15 | 57659 | 144814 | 213600 | |
| | haj-16 | 27217 | 39481 | 101816 | |
| | haj-18 | 43077 | 77277 | 244110 | |
| | haj-20 | 58292 | 53249 | 258423 | |
| | haj-21 | 64337 | 61628 | 267861 | |
| | haj-27 | 57633 | 57970 | 252253 | |
| | haj-28 | 64878 | 64679 | 260142 | |
| | haj-31 | 63875 | 71904 | 221898 | |
| | haj-34 | 67290 | 74461 | 184883 | |
| | haj-36 | 64347 | 74767 | 239966 | |
| | haj-37 | 60387 | 74814 | 200818 | |
| | haj-38 | 69794 | 88645 | 227014 | |
| | haj-39 | 65034 | 84555 | 242176 | |
| | haj-42 | 54509 | 62625 | 226762 | |
| | haj-44 | 61942 | 78614 | 269786 | |
| *Oued Lahr section* | ol1 | 68685 | 76728 | 251882 | |
| | ol2 | 63048 | 64328 | 237920 | |
| | ol5 | 70849 | 84952 | 246370 | |
| | ol7 | 66763 | 98947 | 240162 | |

| | | | | | |
|---|---|---|---|---|---|
| | ol8 | 65676 | 124623 | 177820 | |
| | ol9 | 66094 | 74809 | 277028 | |
| *REFERENCE DATA* | AN 11 | 72477 | 57124 | 246653 | *Marzoli et al., 2004* |
| *CAMP basalts* | AN 13 | 79577 | 50257 | 240388 | *Marzoli et al., 2004* |
| | AN 133 | 78286 | 44442 | 250231 | *Marzoli et al., 2004* |
| | AN 134 | 74253 | 48707 | 250970 | *Marzoli et al., 2004* |
| | AN 135 | 71906 | 26050 | 274945 | *Marzoli et al., 2004* |
| | AN 136 | 71932 | 36414 | 261132 | *Marzoli et al., 2004* |
| | AN 137 A | 74521 | 49050 | 245895 | *Marzoli et al., 2004* |
| | AN 137 B | 78265 | 42647 | 250549 | *Marzoli et al., 2004* |
| | AN 137 C | 76078 | 40927 | 253100 | *Marzoli et al., 2004* |
| | AN 138 | 77980 | 47467 | 250720 | *Marzoli et al., 2004* |
| | AN 149 | 73574 | 37780 | 238720 | *Marzoli et al., 2004* |
| | AN 156 A | 80457 | 47739 | 243578 | *Marzoli et al., 2004* |
| | AN 156 B | 80755 | 49125 | 243283 | *Marzoli et al., 2004* |
| | AN 159 | 72811 | 35533 | 240106 | *Marzoli et al., 2004* |
| | AN 16 | 76926 | 53473 | 251972 | *Marzoli et al., 2004* |
| | AN 160 | 76499 | 41006 | 251391 | *Marzoli et al., 2004* |
| | AN 163 | 77069 | 43954 | 252848 | *Marzoli et al., 2004* |
| | AN 169 | 80494 | 49591 | 244050 | *Marzoli et al., 2004* |
| | AN 18 | 75227 | 50951 | 246552 | *Marzoli et al., 2004* |
| | AN 19 | 76571 | 48069 | 252072 | *Marzoli et al., 2004* |
| | AN 2 | 62524 | 79424 | 240986 | *Marzoli et al., 2004* |
| | AN 20 | 73777 | 47331 | 248806 | *Marzoli et al., 2004* |
| | AN 201 | 73656 | 44587 | 239225 | *Marzoli et al., 2004* |
| | AN 22 | 78714 | 47055 | 243684 | *Marzoli et al., 2004* |
| | AN 25 | 72723 | 40920 | 240308 | *Marzoli et al., 2004* |
| | AN 3 | 61408 | 79178 | 240969 | *Marzoli et al., 2004* |
| | AN 31 | 80855 | 42428 | 252765 | *Marzoli et al., 2004* |
| | AN 32 | 76602 | 48901 | 251861 | *Marzoli et al., 2004* |

| | | | | | |
|---|---|---|---|---|---|
| | AN 37 | 76203 | 48021 | 252476 | *Marzoli et al., 2004* |
| | AN 38 | 72665 | 36667 | 240046 | *Marzoli et al., 2004* |
| | AN 39 | 73699 | 50945 | 249719 | *Marzoli et al., 2004* |
| | AN 44 | 72123 | 36110 | 240437 | *Marzoli et al., 2004* |
| | AN 45 | 73084 | 41391 | 233780 | *Marzoli et al., 2004* |
| | AN 48 | 78615 | 39899 | 255369 | *Marzoli et al., 2004* |
| | AN 49 | 75760 | 49273 | 251045 | *Marzoli et al., 2004* |
| | AN 53 | 76504 | 48092 | 249317 | *Marzoli et al., 2004* |
| | AN 54 | 75609 | 44043 | 250837 | *Marzoli et al., 2004* |
| | AN 56 | 71025 | 51750 | 250735 | *Marzoli et al., 2004* |
| | AN 57 | 80457 | 51468 | 240485 | *Marzoli et al., 2004* |
| | AN 61 | 72085 | 36674 | 240393 | *Marzoli et al., 2004* |
| | AN 62 | 76882 | 43758 | 249898 | *Marzoli et al., 2004* |
| | AN 63 | 79725 | 48650 | 243709 | *Marzoli et al., 2004* |
| | AN 66 | 74967 | 48069 | 254348 | *Marzoli et al., 2004* |
| | AN 68 | 74664 | 44731 | 252322 | *Marzoli et al., 2004* |
| | AN 7 | 80403 | 50264 | 243693 | *Marzoli et al., 2004* |
| | AN 139 | 74829 | 50466 | 250972 | *Marzoli et al., 2004* |
| | AN 24 | 73234 | 33958 | 241216 | *Marzoli et al., 2004* |
| | AN 42 | 73962 | 37763 | 238886 | *Marzoli et al., 2004* |
| | AN 65 | 80369 | 48879 | 244357 | *Marzoli et al., 2004* |
| *Product minerals from hydrothermal alteration of CAMP basalts* | Corrensite | 66321 | 100558 | 153588 | *Dekayr et al., 2005* |
| | Corrensite | 64839 | 111191 | 175041 | *Dekayr et al., 2005* |
| | Corrensite | 57694 | 95636 | 148072 | *Dekayr et al., 2005* |
| | Saponite | 31176 | 122674 | 210751 | *Dekayr et al., 2005* |
| | Saponite | 29006 | 87434 | 196495 | *Dekayr et al., 2005* |
| | Saponite | 32446 | 126806 | 203693 | *Dekayr et al., 2005* |
| | Saponite | 42344 | 100740 | 194298 | *Dekayr et al., 2005* |
| | Saponite | 45837 | 103353 | 195747 | *Dekayr et al., 2005* |
| | Saponite | 30170 | 112467 | 214443 | *Dekayr et al., 2005* |

| | | | | | |
|---|---|---|---|---|---|
| | Saponite | 38321 | 115566 | 220566 | *Dekayr et al., 2005* |
| | Talc | 6087 | 126867 | 243095 | *Dekayr et al., 2005* |
| | Talc | 2117 | 147525 | 261183 | *Dekayr et al., 2005* |
| *Typical chlorite composition* | Chlorite | 68544 | 212295 | 158121 | *http://www.handbookofmineralogy.org/* |
| | Chlorite | 50283 | 214847 | 150128 | *http://www.handbookofmineralogy.org/* |
| *Average composition of claystones from various geological contexts* | NASC | 89452 | 17377 | 302875 | *Gromet et al., 1984* |
| | Average shale Clark '24 | 90087 | 16405 | 300118 | *Gromet et al., 1984* |
| | NA Paleozoic | 94162 | 24426 | 279272 | *Gromet et al., 1984* |
| | Russia Paleozoic | 89399 | 27707 | 265390 | *Gromet et al., 1984* |
| | NA Mesozoic-Cenozoic | 87811 | 20537 | 316804 | *Gromet et al., 1984* |
| | russian Mesozoic-Cenozoic | 88128 | 15433 | 299557 | *Gromet et al., 1984* |
| | Canada Proterozoic | 88234 | 15737 | 312691 | *Gromet et al., 1984* |
| | Russia Proteroxoic | 98609 | 15798 | 294649 | *Gromet et al., 1984* |
| | Canada Archean | 95856 | 21691 | 290396 | *Gromet et al., 1984* |
| | Average Archean | 85270 | 15190 | 306007 | *Gromet et al., 1984* |
| *average composition of* | Continental Crust | 79600 | 22000 | 288000 | *Wedepohl, 1995* |

**TABLE A.6: ICP-MS trace element analysis data**

| Sample | Ba ppm | Co ppm | Cs ppm | Ga ppm | Hf ppm | Nb ppm | Rb ppm | Sr ppm | Ta ppm | Th ppm | U ppm | V ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| haj-01 | 252 | 14.2 | 7.1 | 13.6 | 5.4 | 11.1 | 59.3 | 70.5 | 0.8 | 8.4 | 2.3 | 127 |
| haj-04 | 425 | 13.7 | 0.8 | 4.5 | 7.7 | 13.4 | 5.7 | 55.3 | 0.9 | 3.4 | 2.5 | 124 |
| haj-21 | 385 | 17.8 | 11.8 | 15.0 | 6.2 | 11.9 | 90.2 | 73.7 | 1.0 | 9.5 | 2.8 | 89 |
| haj-38 | 499 | 16.2 | 17.0 | 15.7 | 5.7 | 14.4 | 101.9 | 102.0 | 0.9 | 10.6 | 3.2 | 99 |
| haj-44 | 328 | 15.4 | 7.8 | 13.6 | 6.7 | 13.3 | 71.4 | 67.6 | 0.8 | 9.2 | 3.3 | 88 |
| ol1 | 265 | 16.0 | 8.6 | 15.9 | 8.0 | 15.3 | 87.2 | 117.5 | 1.0 | 11.0 | 3.4 | 95 |
| ol5 | 279 | 13.4 | 8.8 | 17.1 | 6.9 | 14.4 | 94.5 | 79.9 | 1.0 | 10.4 | 3.0 | 95 |
| ol8 | 179 | 11.8 | 7.1 | 15.4 | 3.3 | 11.0 | 69.5 | 48.1 | 0.9 | 8.8 | 3.5 | 99 |

| | W ppm | Zr ppm | Y ppm | La ppm | Ce ppm | Pr ppm | Nd ppm | Sm ppm | Eu ppm | Gd ppm | Tb ppm | Dy ppm |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| haj-01 | 1.1 | 186.2 | 37.7 | 36.7 | 67.7 | 7.45 | 30.3 | 5.11 | 1.16 | 5.57 | 0.90 | 5.86 |
| haj-04 | 1.3 | 288.2 | 9.1 | 11.5 | 23.3 | 2.51 | 9.9 | 1.61 | 0.38 | 1.58 | 0.25 | 1.53 |
| haj-21 | 1.6 | 219.8 | 24.7 | 34.3 | 65.4 | 7.65 | 28.0 | 5.59 | 1.20 | 5.09 | 0.77 | 4.83 |
| haj-38 | 1.3 | 225.1 | 26.8 | 36.1 | 65.5 | 7.69 | 31.3 | 6.09 | 1.26 | 5.45 | 0.76 | 4.57 |
| haj-44 | 1.2 | 269.4 | 22.9 | 33.1 | 62.2 | 6.78 | 25.4 | 4.86 | 0.99 | 4.76 | 0.71 | 4.58 |
| ol1 | 1.1 | 320.1 | 29.3 | 36.0 | 75.3 | 8.40 | 31.9 | 5.86 | 1.30 | 5.84 | 0.83 | 5.57 |
| ol5 | 1.1 | 290.8 | 27.3 | 35.8 | 71.5 | 8.11 | 30.8 | 5.84 | 1.27 | 5.67 | 0.83 | 5.21 |
| ol8 | 1.3 | 116.7 | 21.5 | 28.8 | 60.5 | 7.07 | 25.5 | 5.77 | 1.26 | 5.30 | 0.69 | 3.94 |

| | Ho ppm | Er ppm | Yb ppm | Lu ppm |
|---|---|---|---|---|
| haj-01 | 1.18 | 3.56 | 2.65 | 0.45 |
| haj-04 | 0.31 | 1.07 | 1.21 | 0.18 |
| haj-21 | 0.93 | 2.67 | 2.38 | 0.35 |
| haj-38 | 0.98 | 2.70 | 2.43 | 0.36 |
| haj-44 | 0.87 | 2.69 | 2.94 | 0.35 |
| ol1 | 1.07 | 3.08 | 3.19 | 0.43 |
| ol5 | 0.97 | 2.81 | 2.95 | 0.41 |
| ol8 | 0.74 | 2.17 | 1.97 | 0.28 |