Приложение 1. Химический и изотопный (Sr, Nd) составы образцов вулканических пород Кульпольнейского комплекса и даек берриасского возраста.

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| --- | --- | --- | --- | --- | --- | --- | --- |
| Компоненты | 19-018-01 | 19-024-01 | 19-024-06 | 19-038-03 | 19-039-01 | 19-040-04 | 19-024-12 |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| SiO2 | 51.00 | 45.08 | 48.24 | 44.18 | 53.14 | 45.50 | 54.93 |
| TiO2 | 2.51 | 1.61 | 1.61 | 1.45 | 0.93 | 1.48 | 2.21 |
| Al2O3 | 13.87 | 15.97 | 15.56 | 16.72 | 15.96 | 14.86 | 13.21 |
| Fe2O3 | 4.94 | 6.23 | 6.65 | 8.06 | 6.38 | 10.78 | 8.77 |
| FeO | 8.92 | 6.43 | 5.09 | 6.39 | 4.11 | 6.36 | 3.02 |
| MnO | 0.16 | 0.19 | 0.21 | 0.24 | 0.17 | 0.28 | 0.15 |
| MgO | 3.36 | 5.67 | 6.31 | 7.59 | 6.55 | 5.45 | 3.65 |
| CaO | 8.22 | 11.87 | 7.23 | 9.64 | 4.49 | 6.85 | 6.29 |
| Na2O | 4.76 | 2.89 | 4.54 | 2.01 | 4.59 | 4.21 | 5.32 |
| K2O | 0.27 | 0.21 | 0.61 | 0.10 | 0.52 | 0.24 | 0.15 |
| P2O5 | 0.25 | 0.119 | 0.17 | 0.17 | 0.13 | 0.11 | 0.20 |
| п. п. п. | 1.65 | 3.02 | 3.22 | 2.73 | 2.57 | 3.16 | 1.77 |
| Сумма | 98.25 | 96.27 | 96.21 | 96.56 | 96.97 | 96.13 | 97.90 |
| Li | 5.7 | 14.3 | 14.3 | 21.6 | 19.7 | 18.7 | 10.5 |
| Be | 1.1 | 1.2 | 1.2 | 0.7 | 1.0 | 0.6 | 0.8 |
| Sc | 38 | 31 | 31 | 44 | 26 | 47 | 38 |
| V | 436 | 192 | 192 | 281 | 142 | 480 | 307 |
| Cr | 34 | 149 | 149 | 199 | 125 | 12 | 17 |
| Co | 34 | 34 | 34 | 47 | 32 | 41 | 25 |
| Ni | 20 | 87 | 87 | 88 | 57 | 10 | 14 |
| Cu | 16 | 49 | 49 | 44 | 38 | 10 | 15 |
| Zn | 106 | 80 | 80 | 90 | 88 | 176 | 98 |
| Ga | 17 | 17 | 17 | 19 | 15 | 17 | 15 |
| Rb | 7.6 | 16.1 | 16.1 | 1.6 | 9.7 | 3.4 | 2.6 |
| Sr | 140 | 239 | 239 | 201 | 135 | 151 | 189 |
| Y | 51 | 52 | 52 | 30 | 46 | 27 | 44 |
| Zr | 188 | 203 | 203 | 103 | 202 | 97 | 134 |
| Nb | 3.62 | 3.20 | 3.20 | 2.07 | 2.25 | 3.41 | 2.07 |
| Mo | 2.2 | 0.3 | 0.3 | 0.3 | 0.5 | 0.5 | 2.4 |
| Sn | 2.1 | 2.1 | 2.1 | 1.0 | 1.7 | 0.8 | 2.4 |
| Cs | 0.56 | 1.68 | 1.68 | 0.54 | 0.80 | 2.51 | 0.38 |
| Ba | 42 | 43 | 43 | 53 | 67 | 24 | 28 |
| La | 7.78 | 10.35 | 10.35 | 7.83 | 10.81 | 4.99 | 7.27 |
| Ce | 23.86 | 30.93 | 30.93 | 21.11 | 29.39 | 13.62 | 19.76 |
| Pr | 3.67 | 4.41 | 4.41 | 2.93 | 3.88 | 2.15 | 3.10 |
| Nd | 20.60 | 23.23 | 23.23 | 14.15 | 19.08 | 11.13 | 16.90 |
| Sm | 6.43 | 6.67 | 6.67 | 4.09 | 6.13 | 3.19 | 5.22 |
| Eu | 2.26 | 1.84 | 1.84 | 1.37 | 1.18 | 1.16 | 1.92 |
| Gd | 8.17 | 7.71 | 7.71 | 4.97 | 7.34 | 3.85 | 6.77 |
| Tb | 1.42 | 1.36 | 1.36 | 0.73 | 1.16 | 0.69 | 1.11 |
| Dy | 9.27 | 8.48 | 8.48 | 5.15 | 7.40 | 4.44 | 7.45 |
| Ho | 1.96 | 1.81 | 1.81 | 1.06 | 1.59 | 0.94 | 1.61 |
| Er | 5.57 | 5.06 | 5.06 | 3.22 | 4.72 | 2.80 | 4.56 |
| Tm | 0.80 | 0.75 | 0.75 | 0.44 | 0.67 | 0.40 | 0.66 |
| Yb | 5.14 | 5.38 | 5.38 | 3.06 | 4.61 | 2.77 | 4.22 |
| Lu | 0.75 | 0.70 | 0.70 | 0.43 | 0.66 | 0.40 | 0.63 |
| Hf | 4.8 | 5.6 | 5.6 | 2.7 | 5.4 | 2.3 | 3.7 |
| Ta | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.3 | 0.2 |
| Pb | 2.2 | 1.2 | 1.2 | 1.4 | 2.5 | 0.7 | 2.0 |
| Th | 0.7 | 1.5 | 1.5 | 1.2 | 1.6 | 0.4 | 1.2 |
| U | 0.6 | 0.6 | 0.6 | 0.3 | 0.3 | 0.2 | 0.3 |
| 87Rb/86Sr |  | 0.05852 | 0.19374 |  | 0.20275 |  | - |
| 87Sr/86Sr ± 2σ |  | 0.702730 ± 0.000007 | 0.703837 ± 0.000005 |  | 0.703908 ± 0.000005 |  | - |
| 147Sm/144Nd |  | 0.18038 | 0.17269 | 0.17057 | 0.17360 | 0.17500 | - |
| 143Nd/144Nd ± 2σ |  | 0.513133 ± 0.000005 | 0.513127 ± 0.000002 | 0.513028 ± 0.000002 | 0.513070 ± 0.000005 | 0.513110 ± 0.000004 | - |
| ԑNd |  | 10.0\* | 10.0\* | 8.1\* | 8.9\* | 9.7\* | - |
| Компоненты | 19-028-01 | 19-030-01 | 19-030-04 | 19-031-01 | 19-045-01 | 19-048-01 | 19-068-01 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| SiO2 | 47.62 | 51.07 | 48.59 | 43.31 | 47.86 | 52.74 | 50.13 |
| TiO2 | 1.71 | 0.94 | 0.93 | 1.10 | 1.21 | 1.75 | 0.93 |
| Al2O3 | 13.41 | 14.92 | 14.64 | 13.80 | 16.41 | 13.47 | 16.75 |
| Fe2O3 | 5.78 | 6.16 | 5.64 | 8.75 | 6.10 | 8.97 | 5.16 |
| FeO | 6.36 | 4.57 | 4.86 | 3.61 | 5.57 | 4.42 | 5.38 |
| MnO | 0.24 | 0.19 | 0.16 | 0.19 | 0.17 | 0.21 | 0.15 |
| MgO | 9.16 | 7.57 | 9.56 | 5.76 | 4.85 | 3.59 | 6.13 |
| CaO | 8.21 | 7.07 | 8.46 | 14.17 | 8.29 | 6.44 | 6.75 |
| Na2O | 2.21 | 2.71 | 2.55 | 2.54 | 1.53 | 4.32 | 2.58 |
| K2O | 0.63 | 0.24 | 0.29 | 0.21 | 0.35 | 0.10 | 0.52 |
| P2O5 | 0.52 | 0.12 | 0.17 | 0.12 | 0.08 | 0.57 | 0.09 |
| п. п. п. | 3.44 | 3.93 | 3.61 | 6.04 | 6.96 | 2.93 | 4.83 |
| Сумма | 95.85 | 95.56 | 95.86 | 93.55 | 92.41 | 96.58 | 94.57 |
| Li | 23.1 | 22.4 | 16.2 | 19.4 | 17.6 | 16.3 | 39.9 |
| Be | 0.6 | 0.8 | 0.6 | 0.4 | 0.4 | 0.5 | 0.6 |
| Sc | 41 | 28 | 35 | 37 | 41 | 45 | 35 |
| V | 183 | 145 | 206 | 225 | 335 | 156 | 241 |
| Cr | 291 | 151 | 240 | 172 | 26 | 6 | 69 |
| Co | 37 | 29 | 49 | 38 | 36 | 19 | 30 |
| Ni | 170 | 83 | 126 | 61 | 16 | 3 | 20 |
| Cu | 46 | 29 | 44 | 48 | 78 | 13 | 50 |
| Zn | 87 | 77 | 88 | 71 | 85 | 105 | 81 |
| Ga | 17 | 14 | 14 | 12 | 18 | 18 | 17 |
| Rb | 9.8 | 6.0 | 8.0 | 4.4 | 6.2 | 1.8 | 17.0 |
| Sr | 334 | 181 | 226 | 193 | 220 | 148 | 176 |
| Y | 32 | 30 | 23 | 19 | 24 | 34 | 20 |
| Zr | 114 | 124 | 97 | 82 | 61 | 74 | 57 |
| Nb | 4.25 | 2.69 | 2.50 | 1.51 | 1.03 | 1.62 | 1.08 |
| Mo | 0.7 | 0.4 | 0.3 | 0.1 | 0.5 | 1.2 | 0.4 |
| Sn | 0.7 | 1.4 | 0.7 | 0.7 | 2.1 | 1.3 | 0.6 |
| Cs | 3.24 | 0.81 | 0.66 | 0.29 | 1.12 | 0.04 | 1.71 |
| Ba | 84 | 52 | 51 | 25 | 150 | 61 | 251 |
| La | 7.64 | 10.65 | 6.60 | 4.93 | 4.50 | 5.88 | 4.25 |
| Ce | 21.95 | 25.46 | 16.65 | 13.58 | 11.59 | 16.58 | 10.70 |
| Pr | 3.37 | 2.99 | 2.33 | 1.81 | 1.69 | 2.61 | 1.43 |
| Nd | 17.93 | 14.72 | 12.79 | 9.50 | 9.09 | 15.02 | 7.58 |
| Sm | 5.25 | 4.11 | 3.24 | 2.67 | 2.80 | 4.73 | 2.27 |
| Eu | 2.38 | 1.12 | 1.10 | 0.90 | 0.94 | 2.00 | 0.86 |
| Gd | 6.30 | 4.18 | 3.71 | 3.24 | 3.65 | 6.15 | 2.86 |
| Tb | 1.01 | 0.74 | 0.64 | 0.56 | 0.63 | 0.98 | 0.50 |
| Dy | 5.95 | 4.54 | 3.94 | 3.63 | 4.20 | 6.08 | 3.12 |
| Ho | 1.28 | 1.02 | 0.80 | 0.71 | 0.91 | 1.27 | 0.70 |
| Er | 3.38 | 2.98 | 2.38 | 2.11 | 2.70 | 3.56 | 2.05 |
| Tm | 0.49 | 0.48 | 0.34 | 0.30 | 0.39 | 0.49 | 0.30 |
| Yb | 2.86 | 3.38 | 2.51 | 2.09 | 2.49 | 3.11 | 2.18 |
| Lu | 0.46 | 0.45 | 0.32 | 0.31 | 0.39 | 0.46 | 0.30 |
| Hf | 2.5 | 3.2 | 2.2 | 2.0 | 1.8 | 1.9 | 1.5 |
| Ta | 0.3 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| Pb | 1.4 | 1.8 | 1.2 | 1.0 | 1.7 | 1.3 | 2.3 |
| Th | 0.8 | 1.7 | 0.6 | 0.5 | 1.0 | 0.9 | 0.8 |
| U | 0.3 | 0.4 | 0.2 | 0.1 | 0.4 | 0.3 | 0.3 |
| 87Rb/86Sr | - | - | - | - | 0.08217 | - | - |
| 87Sr/86Sr ± 2σ | - | - | - | - | 0.70389507  ± 0.000008 | - | - |
| 147Sm/144Nd | - | - | 0.16150 | - | 0.18697 | - | - |
| 143Nd/144Nd ± 2σ | - | - | 0.513008  ± 0.000004 | - | 0.512999  ± 0.000004 | - | - |
| ԑNd | - | - | 7.9\* | - | 7.2\* | - | - |

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| Компоненты | 19-101-01 | 19-020-02 | 19-019-01 | 19-019-03 | 19-020-06 | 19-025-06 | 19-024-09 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| SiO2 | 51.79 | 62.77 | 52.36 | 53.62 | 52.90 | 55.75 | 56.66 |
| TiO2 | 1.71 | 1.03 | 0.83 | 0.79 | 0.86 | 1.20 | 0.86 |
| Al2O3 | 13.90 | 13.09 | 16.18 | 15.26 | 14.63 | 13.59 | 15.95 |
| Fe2O3 | 8.17 | 4.69 | 1.92 | 2.24 | 4.23 | 4.25 | 6.53 |
| FeO | 4.85 | 5.76 | 8.18 | 8.00 | 6.19 | 6.79 | 3.58 |
| MnO | 0.21 | 0.22 | 0.15 | 0.14 | 0.16 | 0.18 | 0.18 |
| MgO | 5.05 | 1.91 | 5.79 | 5.33 | 7.43 | 3.55 | 2.46 |
| CaO | 5.19 | 3.95 | 10.11 | 11.14 | 8.16 | 5.93 | 5.73 |
| Na2O | 4.00 | 5.04 | 2.45 | 1.81 | 3.10 | 3.41 | 3.81 |
| K2O | 0.54 | 0.34 | 0.36 | 0.25 | 0.54 | 0.14 | 1.12 |
| P2O5 | 0.55 | 0.136 | 0.10 | 0.09 | 0.10 | 0.13 | 0.12 |
| п. п. п. | 3.51 | 0.44 | 1.52 | 1.23 | 1.00 | 4.34 | 2.61 |
| Сумма | 95.96 | 98.92 | 98.43 | 98.67 | 98.31 | 94.91 | 97.00 |
| Li | 21.6 | 3.7 | 20.2 | 12.8 | 16.3 | 42.3 | 15.2 |
| Be | 0.6 | 1.5 | 0.6 | 0.6 | 0.6 | 0.7 | 0.8 |
| Sc | 41 | 27 | 40 | 39 | 41 | 36 | 21 |
| V | 162 | 103 | 279 | 274 | 245 | 272 | 114 |
| Cr | 8 | 22 | 125 | 140 | 225 | 22 | 11 |
| Co | 19 | 14 | 35 | 34 | 38 | 24 | 15 |
| Ni | 3 | 11 | 58 | 59 | 82 | 9 | 5 |
| Cu | 12 | 9 | 29 | 56 | 61 | 54 | 6 |
| Zn | 98 | 71 | 82 | 76 | 88 | 101 | 72 |
| Ga | 18 | 17 | 18 | 18 | 16 | 19 | 16 |
| Rb | 15.7 | 3.2 | 10.2 | 5.8 | 11.1 | 6.3 | 11.1 |
| Sr | 224 | 74 | 87 | 81 | 133 | 96 | 188 |
| Y | 33 | 36 | 24 | 24 | 28 | 32 | 23 |
| Zr | 70 | 98 | 75 | 75 | 94 | 90 | 82 |
| Nb | 1.49 | 3.55 | 2.67 | 2.35 | 1.63 | 2.26 | 2.52 |
| Mo | 1.7 | 0.4 | 2.0 | 4.5 | 2.2 | 1.4 | 0.2 |
| Sn | 1.1 | 1.3 | 1.3 | 1.5 | 1.1 | 1.5 | 0.5 |
| Cs | 0.37 | 0.79 | 2.12 | 0.52 | 0.66 | 5.34 | 0.57 |
| Ba | 92 | 54 | 108 | 65 | 153 | 90 | 189 |
| La | 5.62 | 10.02 | 7.37 | 6.91 | 5.61 | 7.57 | 6.73 |
| Ce | 15.76 | 24.61 | 16.87 | 16.08 | 14.22 | 18.18 | 14.45 |
| Pr | 2.45 | 3.27 | 2.23 | 2.07 | 2.00 | 2.50 | 2.19 |
| Nd | 14.23 | 16.02 | 10.84 | 10.10 | 10.48 | 12.60 | 10.00 |
| Sm | 4.45 | 4.55 | 2.92 | 2.84 | 3.13 | 3.70 | 2.74 |
| Eu | 1.87 | 1.32 | 0.91 | 0.82 | 0.96 | 1.18 | 0.91 |
| Gd | 5.85 | 5.68 | 3.59 | 3.54 | 4.02 | 4.62 | 3.67 |
| Tb | 0.94 | 0.87 | 0.62 | 0.60 | 0.68 | 0.81 | 0.62 |
| Dy | 5.80 | 5.91 | 4.09 | 4.04 | 4.72 | 5.42 | 3.86 |
| Ho | 1.22 | 1.24 | 0.89 | 0.86 | 1.01 | 1.16 | 0.84 |
| Er | 3.38 | 3.72 | 2.64 | 2.58 | 3.06 | 3.48 | 2.50 |
| Tm | 0.46 | 0.55 | 0.39 | 0.38 | 0.45 | 0.51 | 0.36 |
| Yb | 2.90 | 4.22 | 2.62 | 2.56 | 2.96 | 3.35 | 2.71 |
| Lu | 0.43 | 0.54 | 0.39 | 0.38 | 0.46 | 0.50 | 0.37 |
| Hf | 1.8 | 2.7 | 2.2 | 2.1 | 2.6 | 2.7 | 2.4 |
| Ta | 0.1 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.2 |
| Pb | 1.1 | 3.5 | 3.6 | 2.6 | 1.6 | 5.2 | 1.3 |
| Th | 0.8 | 2.6 | 2.3 | 2.0 | 1.4 | 2.0 | 1.7 |
| U | 0.3 | 0.9 | 0.7 | 0.6 | 0.5 | 0.7 | 0.6 |
| 87Rb/86Sr | - | - | - | - | 0.08218 | - | 0.24670 |
| 87Sr/86Sr ± 2σ | - | - | - | - | 0.704009  ± 0.000010 | - | 0.703888 ± 0.000006 |
| 147Sm/144Nd | - | - | - | - | 0.18014 | - | 0.16267 |
| 143Nd/144Nd ± 2σ | - | - | - | - | 0.513008  ± 0.000004 | - | 0.512988  ± 0.000003 |
| ԑNd | - | - | - | - | 7.6\* | - | 7.4\*\* |

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| Компоненты | 19-019-02 | 19-020-01 | 19-020-05 | 19-021-02 | 19-022-01 | 19-063-1 |
| 22 | 23 | 24 | 25 | 26 | 27 |
| SiO2 | 52.58 | 58.23 | 54.11 | 53.02 | 70.81 | 48.22 |
| TiO2 | 0.82 | 0.84 | 0.80 | 0.67 | 0.28 | 0.44 |
| Al2O3 | 15.95 | 13.84 | 14.47 | 15.28 | 13.85 | 19.50 |
| Fe2O3 | 1.90 | 1.93 | 3.83 | 4.07 | 1.48 | 2.89 |
| FeO | 7.83 | 7.17 | 5.92 | 5.17 | 2.42 | 4.02 |
| MnO | 0.14 | 0.14 | 0.15 | 0.14 | 0.09 | 0.11 |
| MgO | 5.74 | 5.60 | 7.09 | 7.22 | 0.90 | 6.34 |
| CaO | 10.81 | 6.93 | 8.40 | 8.15 | 1.51 | 11.60 |
| Na2O | 2.15 | 3.20 | 2.91 | 2.99 | 5.46 | 2.19 |
| K2O | 0.33 | 0.69 | 0.47 | 0.71 | 1.59 | 0.37 |
| P2O5 | 0.10 | 0.11 | 0.10 | 0.10 | 0.06 | 0.07 |
| п. п. п. | 0.78 | 1.26 | 1.08 | 1.91 | 1.28 | 3.82 |
| Сумма | 98.35 | 98.68 | 98.25 | 97.52 | 98.45 | 95.74 |
| Li | 17.0 | 16.5 | 12.3 | 7.5 | 12.8 | 17.1 |
| Be | 0.6 | 0.7 | 0.5 | 0.5 | 1.3 | 0.5 |
| Sc | 37 | 34 | 38 | 39 | 10 | 41 |
| V | 278 | 204 | 226 | 230 | 19 | 285 |
| Cr | 141 | 170 | 228 | 244 | 40 | 136 |
| Co | 34 | 30 | 35 | 35 | 5 | 41 |
| Ni | 58 | 51 | 70 | 71 | 7 | 52 |
| Cu | 21 | 68 | 64 | 92 | 11 | 54 |
| Zn | 77 | 74 | 74 | 69 | 67 | 76 |
| Ga | 18 | 16 | 16 | 16 | 15 | 14 |
| Rb | 9.0 | 16.8 | 9.1 | 15.5 | 35.5 | 2.9 |
| Sr | 80 | 129 | 128 | 117 | 66 | 254 |
| Y | 23 | 37 | 27 | 26 | 57 | 23 |
| Zr | 76 | 144 | 93 | 94 | 189 | 88 |
| Nb | 2.62 | 2.39 | 1.57 | 1.52 | 3.90 | 2.16 |
| Mo | 3.1 | 7.5 | 2.6 | 1.6 | 4.8 | 1.0 |
| Sn | 1.5 | 1.8 | 1.1 | 1.2 | 2.7 | 0.9 |
| Cs | 1.76 | 0.94 | 0.70 | 0.55 | 1.40 | 0.13 |
| Ba | 96 | 207 | 149 | 189 | 426 | 47 |
| La | 7.33 | 8.24 | 5.51 | 5.48 | 16.87 | 5.46 |
| Ce | 16.89 | 20.96 | 13.87 | 13.63 | 40.71 | 14.68 |
| Pr | 2.17 | 2.82 | 1.95 | 1.90 | 5.09 | 2.08 |
| Nd | 10.62 | 14.15 | 10.18 | 9.67 | 23.37 | 10.90 |
| Sm | 2.87 | 4.11 | 3.06 | 2.88 | 6.10 | 3.02 |
| Eu | 0.89 | 1.08 | 0.95 | 0.84 | 1.18 | 1.07 |
| Gd | 3.53 | 5.19 | 3.95 | 3.69 | 7.18 | 3.73 |
| Tb | 0.60 | 0.88 | 0.67 | 0.64 | 1.24 | 0.60 |
| Dy | 4.06 | 5.99 | 4.49 | 4.38 | 8.71 | 4.02 |
| Ho | 0.84 | 1.29 | 0.97 | 0.95 | 1.88 | 0.84 |
| Er | 2.57 | 3.92 | 2.94 | 2.84 | 5.85 | 2.46 |
| Tm | 0.38 | 0.58 | 0.44 | 0.43 | 0.91 | 0.36 |
| Yb | 2.50 | 3.83 | 2.83 | 2.87 | 5.98 | 2.26 |
| Lu | 0.38 | 0.57 | 0.43 | 0.44 | 0.93 | 0.34 |
| Hf | 2.1 | 4.0 | 2.6 | 2.6 | 5.6 | 2.1 |
| Ta | 0.2 | 0.2 | 0.1 | 0.1 | 0.3 | 0.1 |
| Pb | 3.0 | 2.5 | 2.0 | 1.8 | 6.3 | 1.0 |
| Th | 2.1 | 2.4 | 1.4 | 1.5 | 5.2 | 0.7 |
| U | 0.6 | 0.8 | 0.5 | 0.5 | 1.7 | 0.3 |
| 87Rb/86Sr | - | - | - | - | - | - |
| 87Sr/86Sr ± 2σ | - | - | - | - | - | - |
| 147Sm/144Nd | - | - | - | - | 0.15697 | - |
| 143Nd/144Nd ± 2σ | - | - | - | - | 0.512975  ± 0.000004 | - |
| ԑNd | - | - | - | - | 7.28\*\* | - |

Примечание. Прочерк – элемент не определён. 1-20 – породы Кульпольнейского комплекса: 1-15 – эффузивные породы; 16-20 – туфы; 21-27 – дайки берриасского возраста. При расчете величины ԑNd использованы возрасты: \* - 155 млн лет, \*\* - 140 млн лет.