附表1 锆石U-Pb同位素数据

Appendix table 1 Zircon U-Pb isotopic data

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 测点号 | 含量（10-6） | | | Th/U | 同位素比值 | | | | | |  | 年龄(Ma) | | | | | | 谐和度 |
| Pb | Th | U | 206Pb | 1σ | 207Pb | 1σ | 207Pb | 1σ |  | 206Pb | 1σ | 207Pb | 1σ | 207Pb | 1σ |
| 238U | 235U | 206Pb |  | 238U | 235U | 206Pb |
| 1604-1-01 | 151 | 119 | 436 | 0.27 | 0.3258 | 0.0034 | 5.4868 | 0.0749 | 0.1221 | 0.0014 |  | 1818 | 19 | 1899 | 26 | 1988 | 21 | 91 |
| 1604-1-02 | 269 | 230 | 872 | 0.26 | 0.2905 | 0.0030 | 4.8909 | 0.0667 | 0.1221 | 0.0014 |  | 1644 | 17 | 1801 | 25 | 1987 | 21 | 83 |
| 1604-1-03 | 118 | 314 | 298 | 1.05 | 0.3325 | 0.0033 | 6.5061 | 0.0891 | 0.1419 | 0.0017 |  | 1850 | 18 | 2047 | 28 | 2251 | 20 | 82 |
| 1604-1-04 | 263 | 50 | 839 | 0.06 | 0.3152 | 0.0034 | 5.1816 | 0.0730 | 0.1192 | 0.0014 |  | 1766 | 19 | 1850 | 26 | 1944 | 21 | 91 |
| 1604-1-05 | 157 | 114 | 463 | 0.25 | 0.3214 | 0.0034 | 5.4894 | 0.0753 | 0.1239 | 0.0014 |  | 1797 | 19 | 1899 | 26 | 2013 | 21 | 89 |
| 1604-1-06 | 134 | 149 | 505 | 0.30 | 0.2473 | 0.0032 | 4.3347 | 0.0655 | 0.1271 | 0.0015 |  | 1425 | 18 | 1700 | 26 | 2059 | 21 | 69 |
| 1604-1-07 | 50 | 118 | 112 | 1.05 | 0.3481 | 0.0041 | 5.8001 | 0.0864 | 0.1208 | 0.0015 |  | 1926 | 22 | 1946 | 29 | 1969 | 22 | 98 |
| 1604-1-08 | 172 | 71 | 560 | 0.13 | 0.2964 | 0.0033 | 5.0070 | 0.0710 | 0.1225 | 0.0014 |  | 1673 | 19 | 1821 | 26 | 1993 | 21 | 84 |
| 1604-1-09 | 112 | 240 | 265 | 0.91 | 0.3461 | 0.0036 | 5.7899 | 0.0802 | 0.1213 | 0.0014 |  | 1916 | 20 | 1945 | 27 | 1976 | 21 | 97 |
| 1604-1-10 | 112 | 101 | 345 | 0.29 | 0.3028 | 0.0031 | 5.0426 | 0.0694 | 0.1208 | 0.0014 |  | 1705 | 17 | 1827 | 25 | 1968 | 21 | 87 |
| 1604-1-11 | 75 | 81 | 218 | 0.37 | 0.3141 | 0.0031 | 5.3048 | 0.0823 | 0.1225 | 0.0017 |  | 1761 | 17 | 1870 | 29 | 1993 | 24 | 88 |
| 1604-1-12 | 228 | 69 | 718 | 0.10 | 0.3138 | 0.0033 | 5.2298 | 0.0731 | 0.1209 | 0.0014 |  | 1759 | 18 | 1857 | 26 | 1969 | 21 | 89 |
| 1604-1-13 | 44 | 127 | 105 | 1.20 | 0.3260 | 0.0032 | 5.4551 | 0.0803 | 0.1214 | 0.0016 |  | 1819 | 18 | 1894 | 28 | 1976 | 23 | 92 |
| 1604-1-14 | 255 | 122 | 913 | 0.13 | 0.2726 | 0.0028 | 4.5297 | 0.0619 | 0.1205 | 0.0014 |  | 1554 | 16 | 1736 | 24 | 1964 | 21 | 79 |
| 1604-1-15 | 152 | 57 | 568 | 0.10 | 0.2644 | 0.0032 | 4.3725 | 0.0729 | 0.1199 | 0.0015 |  | 1512 | 18 | 1707 | 28 | 1955 | 23 | 77 |
| 1604-1-16 | 116 | 156 | 303 | 0.51 | 0.3489 | 0.0036 | 5.7712 | 0.0810 | 0.1200 | 0.0015 |  | 1929 | 20 | 1942 | 27 | 1956 | 22 | 99 |
| 1604-1-17 | 303 | 202 | 1386 | 0.15 | 0.2122 | 0.0031 | 3.5200 | 0.0589 | 0.1203 | 0.0015 |  | 1241 | 18 | 1532 | 26 | 1961 | 22 | 63 |
| 1604-1-18 | 309 | 194 | 944 | 0.21 | 0.3245 | 0.0032 | 5.0156 | 0.0681 | 0.1121 | 0.0013 |  | 1812 | 18 | 1822 | 25 | 1834 | 22 | 99 |
| 1604-1-19 | 110 | 72 | 359 | 0.20 | 0.2993 | 0.0032 | 5.0157 | 0.0686 | 0.1215 | 0.0014 |  | 1688 | 18 | 1822 | 25 | 1979 | 21 | 85 |
| 1604-1-20 | 142 | 325 | 410 | 0.79 | 0.2970 | 0.0035 | 4.9882 | 0.0719 | 0.1218 | 0.0014 |  | 1676 | 20 | 1817 | 26 | 1983 | 21 | 85 |
| 1604-1-21 | 40 | 73 | 108 | 0.67 | 0.3282 | 0.0034 | 5.0625 | 0.0740 | 0.1119 | 0.0014 |  | 1830 | 19 | 1830 | 27 | 1830 | 23 | 100 |
| 1604-1-22 | 159 | 150 | 470 | 0.32 | 0.3183 | 0.0037 | 5.2301 | 0.0750 | 0.1192 | 0.0014 |  | 1781 | 21 | 1858 | 27 | 1944 | 21 | 92 |
| 1604-1-23 | 89 | 94 | 255 | 0.37 | 0.3205 | 0.0034 | 5.4208 | 0.0762 | 0.1227 | 0.0014 |  | 1792 | 19 | 1888 | 27 | 1995 | 21 | 90 |
| 1604-1-24 | 221 | 132 | 663 | 0.20 | 0.3277 | 0.0037 | 5.0691 | 0.0723 | 0.1122 | 0.0013 |  | 1827 | 20 | 1831 | 26 | 1835 | 21 | 100 |
| 1604-1-25 | 133 | 171 | 376 | 0.45 | 0.3209 | 0.0035 | 5.3597 | 0.0757 | 0.1211 | 0.0014 |  | 1794 | 19 | 1878 | 27 | 1973 | 21 | 91 |
| 1604-1-26 | 128 | 221 | 394 | 0.56 | 0.2937 | 0.0031 | 4.9346 | 0.0673 | 0.1219 | 0.0014 |  | 1660 | 17 | 1808 | 25 | 1984 | 21 | 84 |
| 1604-1-27 | 99 | 126 | 284 | 0.44 | 0.3247 | 0.0037 | 5.3951 | 0.0766 | 0.1205 | 0.0014 |  | 1812 | 21 | 1884 | 27 | 1964 | 21 | 92 |
| 1604-1-28 | 180 | 42 | 556 | 0.07 | 0.3278 | 0.0038 | 5.0035 | 0.0749 | 0.1107 | 0.0013 |  | 1828 | 21 | 1820 | 27 | 1811 | 21 | 101 |
| 1604-1-29 | 121 | 128 | 323 | 0.40 | 0.3507 | 0.0037 | 5.8150 | 0.0794 | 0.1203 | 0.0014 |  | 1938 | 20 | 1949 | 27 | 1960 | 21 | 99 |
| 1604-1-30 | 301 | 148 | 1056 | 0.14 | 0.2833 | 0.0032 | 4.2974 | 0.0599 | 0.1100 | 0.0013 |  | 1608 | 18 | 1693 | 24 | 1800 | 21 | 89 |
| 1604-1-31 | 148 | 110 | 406 | 0.27 | 0.3484 | 0.0040 | 5.7248 | 0.0807 | 0.1192 | 0.0014 |  | 1927 | 22 | 1935 | 27 | 1944 | 21 | 99 |
| 1604-1-32 | 68 | 96 | 188 | 0.51 | 0.3293 | 0.0033 | 5.0695 | 0.0703 | 0.1116 | 0.0014 |  | 1835 | 19 | 1831 | 25 | 1826 | 22 | 100 |

续附表1

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 测点号 | 含量（10-6） | | | Th/U | 同位素比值 | | | | | |  | 年龄(Ma) | | | | | | 谐和度 |
| Pb | Th | U | 206Pb | 1σ | 207Pb | 1σ | 207Pb | 1σ |  | 206Pb | 1σ | 207Pb | 1σ | 207Pb | 1σ |
| 238U | 235U | 206Pb |  | 238U | 235U | 206Pb |
| 1613-1-01 | 36 | 99 | 77 | 1.28 | 0.3530 | 0.0040 | 5.7848 | 0.0922 | 0.1188 | 0.0017 |  | 1949 | 22 | 1944 | 31 | 1939 | 25 | 100 |
| 1613-1-02 | 96 | 70 | 263 | 0.27 | 0.3471 | 0.0038 | 5.8312 | 0.0870 | 0.1218 | 0.0015 |  | 1921 | 21 | 1951 | 29 | 1983 | 22 | 98 |
| 1613-1-03 | 51 | 117 | 116 | 1.01 | 0.3545 | 0.0044 | 5.8225 | 0.0960 | 0.1191 | 0.0017 |  | 1956 | 24 | 1950 | 32 | 1943 | 25 | 100 |
| 1613-1-04 | 37 | 164 | 62 | 2.65 | 0.3512 | 0.0041 | 5.9081 | 0.0953 | 0.1220 | 0.0017 |  | 1940 | 22 | 1962 | 32 | 1986 | 25 | 99 |
| 1613-1-05 | 56 | 109 | 134 | 0.81 | 0.3518 | 0.0041 | 5.7189 | 0.0867 | 0.1179 | 0.0015 |  | 1943 | 23 | 1934 | 29 | 1925 | 22 | 100 |
| 1613-1-06 | 87 | 103 | 221 | 0.47 | 0.3519 | 0.0038 | 5.8410 | 0.0847 | 0.1204 | 0.0015 |  | 1944 | 21 | 1953 | 28 | 1962 | 22 | 100 |
| 1613-1-07 | 363 | 67 | 1509 | 0.04 | 0.2376 | 0.0027 | 3.9056 | 0.0637 | 0.1192 | 0.0015 |  | 1374 | 16 | 1615 | 26 | 1944 | 22 | 83 |
| 1613-1-08 | 45 | 65 | 109 | 0.60 | 0.3565 | 0.0039 | 5.7181 | 0.0871 | 0.1163 | 0.0015 |  | 1966 | 22 | 1934 | 29 | 1901 | 24 | 98 |
| 1613-1-09 | 37 | 110 | 66 | 1.68 | 0.3435 | 0.0035 | 5.6977 | 0.1039 | 0.1203 | 0.0021 |  | 1903 | 20 | 1931 | 35 | 1961 | 31 | 99 |
| 1613-1-10 | 212 | 33 | 673 | 0.05 | 0.3128 | 0.0043 | 5.2256 | 0.0787 | 0.1212 | 0.0015 |  | 1754 | 24 | 1857 | 28 | 1973 | 22 | 94 |
| 1613-1-11 | 48 | 51 | 120 | 0.43 | 0.3562 | 0.0043 | 5.8149 | 0.0948 | 0.1184 | 0.0015 |  | 1964 | 24 | 1949 | 32 | 1932 | 23 | 99 |
| 1613-1-12 | 76 | 78 | 198 | 0.39 | 0.3528 | 0.0036 | 5.7300 | 0.0800 | 0.1178 | 0.0014 |  | 1948 | 20 | 1936 | 27 | 1923 | 22 | 99 |
| 1613-1-13 | 40 | 61 | 98 | 0.62 | 0.3484 | 0.0037 | 5.7804 | 0.0864 | 0.1203 | 0.0016 |  | 1927 | 20 | 1943 | 29 | 1961 | 23 | 99 |
| 1613-1-14 | 88 | 124 | 214 | 0.58 | 0.3548 | 0.0038 | 5.8398 | 0.0822 | 0.1194 | 0.0014 |  | 1957 | 21 | 1952 | 27 | 1947 | 21 | 100 |
| 1613-1-15 | 306 | 79 | 865 | 0.09 | 0.3513 | 0.0044 | 5.8473 | 0.0894 | 0.1207 | 0.0014 |  | 1941 | 24 | 1953 | 30 | 1967 | 21 | 99 |
| 1613-1-16 | 135 | 153 | 353 | 0.43 | 0.3531 | 0.0037 | 5.7345 | 0.0790 | 0.1178 | 0.0014 |  | 1949 | 21 | 1937 | 27 | 1923 | 21 | 99 |
| 1613-1-17 | 228 | 35 | 654 | 0.05 | 0.3536 | 0.0041 | 5.7059 | 0.0851 | 0.1170 | 0.0014 |  | 1952 | 23 | 1932 | 29 | 1911 | 21 | 99 |
| 1613-1-18 | 26 | 142 | 47 | 3.03 | 0.3502 | 0.0037 | 5.7812 | 0.1018 | 0.1197 | 0.0020 |  | 1935 | 20 | 1944 | 34 | 1952 | 29 | 100 |
| 1613-1-19 | 38 | 50 | 100 | 0.50 | 0.3495 | 0.0041 | 5.7649 | 0.0914 | 0.1196 | 0.0016 |  | 1932 | 23 | 1941 | 31 | 1950 | 24 | 100 |
| 1613-1-20 | 152 | 42 | 430 | 0.10 | 0.3528 | 0.0035 | 5.9379 | 0.0829 | 0.1221 | 0.0015 |  | 1948 | 19 | 1967 | 27 | 1987 | 22 | 99 |
| 1613-1-21 | 78 | 74 | 224 | 0.33 | 0.3341 | 0.0033 | 5.6426 | 0.0773 | 0.1225 | 0.0015 |  | 1858 | 18 | 1923 | 26 | 1993 | 22 | 97 |
| 1613-1-22 | 98 | 58 | 288 | 0.20 | 0.3305 | 0.0038 | 5.4888 | 0.0803 | 0.1205 | 0.0015 |  | 1841 | 21 | 1899 | 28 | 1963 | 22 | 97 |
| 1613-1-23 | 158 | 43 | 530 | 0.08 | 0.2983 | 0.0034 | 4.9484 | 0.0720 | 0.1203 | 0.0014 |  | 1683 | 19 | 1811 | 26 | 1961 | 21 | 92 |
| 1613-1-24 | 19 | 124 | 37 | 3.36 | 0.3557 | 0.0038 | 5.8810 | 0.1367 | 0.1199 | 0.0026 |  | 1962 | 21 | 1958 | 46 | 1955 | 38 | 100 |
| 1613-1-25 | 33 | 68 | 85 | 0.79 | 0.3494 | 0.0039 | 5.9058 | 0.0914 | 0.1226 | 0.0017 |  | 1932 | 21 | 1962 | 30 | 1994 | 24 | 98 |
| 1613-1-26 | 127 | 301 | 329 | 0.91 | 0.3483 | 0.0040 | 5.8995 | 0.0846 | 0.1228 | 0.0015 |  | 1927 | 22 | 1961 | 28 | 1998 | 21 | 98 |
| 1613-1-27 | 345 | 68 | 1316 | 0.05 | 0.2595 | 0.0026 | 4.3858 | 0.0586 | 0.1226 | 0.0014 |  | 1487 | 15 | 1710 | 23 | 1994 | 21 | 85 |
| 1613-1-28 | 107 | 45 | 304 | 0.15 | 0.3533 | 0.0039 | 5.7484 | 0.0795 | 0.1180 | 0.0014 |  | 1950 | 21 | 1939 | 27 | 1926 | 21 | 99 |
| 1613-1-29 | 141 | 166 | 382 | 0.43 | 0.3543 | 0.0038 | 5.7351 | 0.0797 | 0.1174 | 0.0014 |  | 1955 | 21 | 1937 | 27 | 1917 | 21 | 99 |
| 1613-1-30 | 146 | 46 | 415 | 0.11 | 0.3560 | 0.0038 | 5.7975 | 0.0814 | 0.1181 | 0.0014 |  | 1963 | 21 | 1946 | 27 | 1928 | 21 | 99 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 测点号 | 含量（10-6） | | | Th/U | 同位素比值 | | | | | |  | 年龄(Ma) | | | | | | 谐和度 |
| Pb | Th | U | 206Pb | 1σ | 207Pb | 1σ | 207Pb | 1σ |  | 206Pb | 1σ | 207Pb | 1σ | 207Pb | 1σ |
| 238U | 235U | 206Pb |  | 238U | 235U | 206Pb |
| 1611-1-01 | 76 | 34 | 218 | 0.16 | 0.3429 | 0.0035 | 5.8161 | 0.0836 | 0.1230 | 0.0015 |  | 1901 | 19 | 1949 | 28 | 2000 | 22 | 97 |
| 1611-1-02 | 53 | 175 | 116 | 1.50 | 0.3508 | 0.0035 | 5.6529 | 0.0827 | 0.1169 | 0.0015 |  | 1939 | 20 | 1924 | 28 | 1909 | 23 | 99 |
| 1611-1-03 | 53 | 116 | 133 | 0.87 | 0.3482 | 0.0035 | 5.5996 | 0.0790 | 0.1166 | 0.0015 |  | 1926 | 19 | 1916 | 27 | 1905 | 22 | 99 |
| 1611-1-04 | 73 | 197 | 171 | 1.15 | 0.3540 | 0.0037 | 5.6763 | 0.0813 | 0.1163 | 0.0014 |  | 1954 | 20 | 1928 | 28 | 1900 | 22 | 99 |
| 1611-1-05 | 92 | 133 | 243 | 0.55 | 0.3487 | 0.0036 | 5.6987 | 0.0783 | 0.1185 | 0.0014 |  | 1928 | 20 | 1931 | 27 | 1934 | 21 | 100 |
| 1611-1-06 | 52 | 227 | 110 | 2.06 | 0.3427 | 0.0036 | 5.7091 | 0.0822 | 0.1208 | 0.0015 |  | 1900 | 20 | 1933 | 28 | 1968 | 22 | 98 |
| 1611-1-07 | 76 | 179 | 188 | 0.96 | 0.3458 | 0.0036 | 5.6428 | 0.0788 | 0.1184 | 0.0014 |  | 1914 | 20 | 1923 | 27 | 1932 | 22 | 100 |
| 1611-1-08 | 39 | 87 | 95 | 0.92 | 0.3491 | 0.0037 | 5.7991 | 0.0882 | 0.1205 | 0.0016 |  | 1930 | 20 | 1946 | 30 | 1963 | 24 | 99 |
| 1611-1-09 | 81 | 114 | 213 | 0.53 | 0.3480 | 0.0036 | 5.7329 | 0.0812 | 0.1195 | 0.0015 |  | 1925 | 20 | 1936 | 27 | 1948 | 22 | 99 |
| 1611-1-10 | 49 | 122 | 118 | 1.04 | 0.3449 | 0.0035 | 5.7319 | 0.0814 | 0.1205 | 0.0015 |  | 1910 | 20 | 1936 | 27 | 1964 | 22 | 99 |
| 1611-1-11 | 72 | 118 | 185 | 0.64 | 0.3472 | 0.0035 | 5.6963 | 0.0780 | 0.1190 | 0.0014 |  | 1921 | 20 | 1931 | 26 | 1941 | 21 | 99 |
| 1611-1-12 | 46 | 203 | 82 | 2.46 | 0.3512 | 0.0036 | 5.7123 | 0.0839 | 0.1180 | 0.0015 |  | 1940 | 20 | 1933 | 28 | 1926 | 23 | 100 |
| 1611-1-13 | 56 | 114 | 132 | 0.86 | 0.3522 | 0.0037 | 5.7803 | 0.0815 | 0.1190 | 0.0015 |  | 1945 | 20 | 1943 | 27 | 1942 | 22 | 100 |
| 1611-1-14 | 60 | 135 | 138 | 0.98 | 0.3525 | 0.0035 | 5.8168 | 0.0811 | 0.1197 | 0.0015 |  | 1946 | 20 | 1949 | 27 | 1952 | 22 | 100 |
| 1611-1-15 | 61 | 223 | 117 | 1.90 | 0.3501 | 0.0035 | 5.7756 | 0.0822 | 0.1197 | 0.0015 |  | 1935 | 19 | 1943 | 28 | 1951 | 22 | 100 |
| 1611-1-16 | 45 | 165 | 81 | 2.03 | 0.3494 | 0.0037 | 5.7041 | 0.0895 | 0.1184 | 0.0016 |  | 1932 | 21 | 1932 | 30 | 1932 | 25 | 100 |
| 1611-1-17 | 62 | 86 | 154 | 0.56 | 0.3559 | 0.0039 | 5.7504 | 0.0850 | 0.1172 | 0.0015 |  | 1963 | 21 | 1939 | 29 | 1914 | 22 | 99 |
| 1611-1-18 | 185 | 341 | 468 | 0.73 | 0.3367 | 0.0033 | 5.8713 | 0.0807 | 0.1265 | 0.0015 |  | 1871 | 18 | 1957 | 27 | 2050 | 21 | 95 |
| 1611-1-19 | 40 | 227 | 54 | 4.18 | 0.3509 | 0.0035 | 5.8967 | 0.0937 | 0.1219 | 0.0018 |  | 1939 | 20 | 1961 | 31 | 1984 | 26 | 99 |
| 1611-1-20 | 51 | 219 | 87 | 2.51 | 0.3474 | 0.0036 | 5.7880 | 0.0902 | 0.1208 | 0.0017 |  | 1922 | 20 | 1945 | 30 | 1969 | 25 | 99 |
| 1611-1-21 | 54 | 224 | 97 | 2.32 | 0.3500 | 0.0037 | 5.8599 | 0.0887 | 0.1214 | 0.0017 |  | 1935 | 20 | 1955 | 30 | 1977 | 24 | 99 |
| 1611-1-22 | 58 | 109 | 140 | 0.78 | 0.3544 | 0.0036 | 5.7345 | 0.0805 | 0.1174 | 0.0015 |  | 1955 | 20 | 1937 | 27 | 1917 | 22 | 99 |
| 1611-1-23 | 197 | 105 | 539 | 0.20 | 0.3491 | 0.0046 | 5.9490 | 0.0909 | 0.1236 | 0.0015 |  | 1930 | 26 | 1968 | 30 | 2009 | 22 | 98 |
| 1611-1-24 | 219 | 120 | 627 | 0.19 | 0.3357 | 0.0033 | 5.8568 | 0.0807 | 0.1265 | 0.0015 |  | 1866 | 19 | 1955 | 27 | 2050 | 22 | 95 |
| 1611-1-25 | 46 | 172 | 92 | 1.87 | 0.3414 | 0.0035 | 5.8167 | 0.0847 | 0.1236 | 0.0016 |  | 1893 | 19 | 1949 | 28 | 2009 | 23 | 97 |
| 1611-1-26 | 117 | 47 | 335 | 0.14 | 0.3406 | 0.0034 | 5.7345 | 0.0785 | 0.1221 | 0.0015 |  | 1889 | 19 | 1937 | 27 | 1987 | 21 | 98 |
| 1611-1-27 | 56 | 109 | 138 | 0.79 | 0.3494 | 0.0036 | 5.6881 | 0.0816 | 0.1181 | 0.0015 |  | 1932 | 20 | 1930 | 28 | 1927 | 23 | 100 |
| 1611-1-28 | 101 | 93 | 275 | 0.34 | 0.3481 | 0.0035 | 5.6158 | 0.0760 | 0.1170 | 0.0014 |  | 1926 | 19 | 1919 | 26 | 1911 | 21 | 100 |
| 1611-1-29 | 200 | 118 | 557 | 0.21 | 0.3437 | 0.0038 | 5.7247 | 0.0824 | 0.1208 | 0.0014 |  | 1905 | 21 | 1935 | 28 | 1968 | 21 | 98 |
| 1611-1-30 | 52 | 163 | 111 | 1.47 | 0.3518 | 0.0037 | 5.7475 | 0.0880 | 0.1185 | 0.0016 |  | 1943 | 21 | 1939 | 30 | 1934 | 24 | 100 |

附表2 全岩主量元素（%）及微量元素（10-6）分析数据

Appendix table 2 Bulk-rock major(%) and trace element(10-6) data

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 送样号 | 1613-1 | 1642-1 | 1647-1 | 1650-1 | TG33-1 | TG43-1 | PM04b22-1 | PM04b26-1 | PM04b30-1 | PM04b43-1 | PM04b47-1 | PM04b53-1 | PM05b5-1 | PM05b7-1 | PM05b11-1 | PM05b23-2 | PM05b31-1 | PM05b45-1 | TG41-1 |
| 斑状石榴紫苏花岗岩 | | | | | | | | | | | | | | | | | | |
| SiO2 | 62.59 | 64.47 | 61.49 | 69.78 | 63.64 | 62.24 | 64.41 | 66.12 | 65.37 | 66.25 | 67.91 | 65.29 | 60.04 | 63.94 | 59.82 | 62.88 | 62.92 | 62.34 | 58.99 |
| TiO2 | 0.95 | 0.82 | 0.87 | 0.58 | 0.77 | 0.80 | 0.69 | 0.68 | 0.75 | 0.72 | 0.92 | 0.85 | 1.02 | 0.79 | 1.08 | 0.90 | 0.92 | 0.85 | 0.94 |
| Al2O3 | 16.21 | 16.72 | 17.27 | 13.48 | 17.22 | 17.91 | 16.73 | 15.98 | 16.48 | 15.43 | 15.38 | 16.30 | 18.04 | 16.49 | 18.11 | 16.44 | 17.71 | 16.72 | 18.93 |
| Fe2O3 | 2.32 | 1.41 | 1.53 | 1.38 | 1.22 | 1.34 | 1.37 | 1.25 | 1.26 | 1.34 | 1.97 | 1.88 | 1.99 | 2.04 | 1.71 | 1.18 | 1.28 | 5.26 | 1.99 |
| FeO | 3.60 | 3.40 | 4.76 | 3.14 | 2.19 | 3.20 | 2.13 | 3.18 | 3.69 | 4.18 | 2.40 | 3.00 | 4.30 | 4.31 | 4.60 | 5.08 | 3.43 | 4.70 | 6.26 |
| MnO | 0.05 | 0.04 | 0.06 | 0.04 | 0.02 | 0.04 | 0.03 | 0.04 | 0.05 | 0.06 | 0.03 | 0.04 | 0.05 | 0.06 | 0.05 | 0.06 | 0.04 | 0.15 | 0.09 |
| MgO | 1.94 | 1.93 | 2.61 | 1.92 | 1.97 | 1.78 | 1.65 | 1.91 | 2.16 | 2.26 | 2.15 | 2.22 | 3.13 | 2.72 | 3.31 | 2.72 | 2.54 | 3.16 | 3.65 |
| CaO | 2.76 | 2.88 | 4.27 | 3.60 | 4.04 | 4.40 | 2.65 | 3.08 | 3.29 | 3.02 | 3.07 | 3.26 | 3.85 | 3.76 | 4.37 | 4.14 | 3.83 | 3.34 | 2.93 |
| Na2O | 2.37 | 2.64 | 2.51 | 2.06 | 2.83 | 2.84 | 2.17 | 2.23 | 2.63 | 1.99 | 2.47 | 2.57 | 2.68 | 2.49 | 2.78 | 2.37 | 2.67 | 1.90 | 2.41 |
| K2O | 6.04 | 4.60 | 3.26 | 2.85 | 4.51 | 4.11 | 6.84 | 4.42 | 3.18 | 3.77 | 2.90 | 3.54 | 3.39 | 2.15 | 2.45 | 2.89 | 3.61 | 0.78 | 2.40 |
| P2O5 | 0.17 | 0.22 | 0.30 | 0.18 | 0.31 | 0.28 | 0.50 | 0.19 | 0.27 | 0.23 | 0.07 | 0.25 | 0.26 | 0.21 | 0.32 | 0.26 | 0.23 | 0.04 | 0.06 |
| 灼失 | 0.60 | 0.50 | 0.54 | 0.64 | 1.05 | 0.71 | 0.60 | 0.57 | 0.48 | 0.30 | 0.48 | 0.46 | 0.78 | 0.56 | 0.89 | 0.50 | 0.43 | 0.25 | 0.66 |
| H2O+ | 0.14 | 0.11 | 0.13 | 0.24 | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ |
| CO2 | 0.37 | 0.09 | 0.37 | 0.33 | 0.03 | 0.05 | 0.03 | 0.05 | 0.05 | 0.03 | 0.06 | 0.06 | 0.06 | 0.04 | 0.06 | 0.06 | 0.04 | 0.04 | 0.04 |
| Total | 100.11 | 99.83 | 99.97 | 100.22 | 99.80 | 99.70 | 99.80 | 99.70 | 99.66 | 99.58 | 99.80 | 99.72 | 99.60 | 99.57 | 99.55 | 99.48 | 99.64 | 99.54 | 99.35 |
| TFeO | 5.69 | 4.67 | 6.14 | 4.38 | 3.29 | 4.41 | 3.36 | 4.30 | 4.82 | 5.39 | 4.17 | 4.69 | 6.09 | 6.15 | 6.14 | 6.14 | 4.58 | 9.43 | 8.05 |
| Mg# | 38 | 43 | 43 | 44 | 52 | 42 | 47 | 44 | 45 | 43 | 48 | 46 | 48 | 44 | 49 | 44 | 50 | 38 | 45 |
| A/NK | 1.55 | 1.79 | 2.25 | 2.08 | 1.80 | 1.96 | 1.52 | 1.89 | 2.12 | 2.10 | 2.13 | 2.02 | 2.23 | 2.56 | 2.50 | 2.34 | 2.13 | 4.21 | 2.88 |
| A/CNK | 1.11 | 1.16 | 1.18 | 1.10 | 1.02 | 1.05 | 1.06 | 1.14 | 1.21 | 1.21 | 1.21 | 1.17 | 1.21 | 1.25 | 1.20 | 1.14 | 1.16 | 1.68 | 1.60 |
| Sc | 12.6 | 16.1 | 35.3 | 14.9 | 7.06 | 13 | 11.3 | 18.3 | 18.2 | 25.4 | 18.3 | 15.8 | 24.4 | 33.1 | 16.7 | 29 | 14 | 31.4 | 26.4 |
| Cr | 64.1 | 71.3 | 86.2 | 94.5 | 64.4 | 50.2 | 54.6 | 60.8 | 66.1 | 73.7 | 111 | 71.2 | 94.1 | 78.7 | 101 | 86.8 | 77.7 | 98.8 | 144 |
| Co | 13.5 | 10.7 | 15.1 | 10.2 | 10.1 | 10.4 | 9.33 | 11.4 | 12.7 | 12.7 | 11.9 | 12.1 | 15 | 13.8 | 17.2 | 14.8 | 13.6 | 20.6 | 22.1 |
| Ni | 20.7 | 14.8 | 17.7 | 18.3 | 18.7 | 13.8 | 15.7 | 16.4 | 16.5 | 16.9 | 28 | 18.8 | 17.4 | 13 | 22.9 | 19.6 | 21.2 | 9.39 | 40.4 |
| Ga | 22.3 | 24.2 | 27.7 | 18.4 | 24.4 | 26.7 | 22.5 | 21.7 | 23.8 | 21.5 | 24 | 25.2 | 27.4 | 23.8 | 30.3 | 23.8 | 26.6 | 20.6 | 30.6 |
| Cs | 0.37 | 0.46 | 0.84 | 0.17 | 0.31 | 0.3 | 0.44 | 0.34 | 0.49 | 0.47 | 0.58 | 0.3 | 0.48 | 0.39 | 0.58 | 0.21 | 0.34 | 0.2 | 0.45 |
| Rb | 159 | 157 | 130 | 83 | 157 | 112 | 242 | 157 | 123 | 140 | 128 | 146 | 144 | 102 | 113 | 104 | 152 | 30.4 | 90.6 |
| Ba | 1500 | 1080 | 1290 | 700 | 1220 | 1360 | 1700 | 1150 | 1080 | 1080 | 874 | 1120 | 1240 | 740 | 779 | 847 | 1740 | 286 | 706 |
| Pb | 24.9 | 18.3 | 11.7 | 11.6 | 20.3 | 22.2 | 24.9 | 20.9 | 19.8 | 19 | 20 | 21.2 | 14.9 | 11.2 | 12.3 | 14.8 | 14.9 | 7.18 | 19.5 |
| Th | 5.9 | 18.4 | 4.24 | 7.56 | 8.84 | 3.59 | 4.75 | 12.6 | 16.8 | 15.5 | 36.5 | 12.1 | 12.3 | 7.82 | 12.9 | 15.9 | 10.9 | 2.98 | 20 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

续附表2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 送样号 | 1613-1 | 1642-1 | 1647-1 | 1650-1 | TG33-1 | TG43-1 | PM04b22-1 | PM04b26-1 | PM04b30-1 | PM04b43-1 | PM04b47-1 | PM04b53-1 | PM05b5-1 | PM05b7-1 | PM05b11-1 | PM05b23-2 | PM05b31-1 | PM05b45-1 | TG41-1 |
| 斑状石榴紫苏花岗岩 | | | | | | | | | | | | | | | | | | |
| U | 0.38 | 0.79 | 0.3 | 0.35 | 0.52 | 0.42 | 0.42 | 0.5 | 0.67 | 0.62 | 0.93 | 0.7 | 0.42 | 0.33 | 0.43 | 0.56 | 0.38 | 0.32 | 0.82 |
| Sr | 362 | 324 | 384 | 333 | 454 | 398 | 404 | 359 | 353 | 327 | 302 | 364 | 390 | 340 | 376 | 381 | 457 | 250 | 307 |
| Y | 15.4 | 24.2 | 31.7 | 14.8 | 10.1 | 18.2 | 24.8 | 32.9 | 33.5 | 40.7 | 17.8 | 23.5 | 30.6 | 51.9 | 18.3 | 39 | 16.9 | 58.5 | 51.8 |
| Zr | 319 | 227 | 275 | 169 | 262 | 317 | 231 | 261 | 290 | 301 | 270 | 323 | 338 | 270 | 344 | 330 | 258 | 177 | 301 |
| Hf | 9 | 6.51 | 7.62 | 4.7 | 7.57 | 8.52 | 6.31 | 6.92 | 7.72 | 8.2 | 7.24 | 8.47 | 8.87 | 7.2 | 8.84 | 8.81 | 6.7 | 4.81 | 8.41 |
| Nb | 10.5 | 13.5 | 13.1 | 8.87 | 9.81 | 14.4 | 8.1 | 9.14 | 9.22 | 10.6 | 13 | 13.2 | 14.9 | 13.4 | 12.7 | 13.2 | 11.7 | 12.3 | 11.7 |
| Ta | 0.37 | 0.51 | 0.59 | 0.4 | 0.28 | 0.68 | 0.3 | 0.38 | 0.37 | 0.42 | 0.47 | 0.57 | 0.62 | 0.61 | 0.49 | 0.56 | 0.38 | 0.63 | 0.63 |
| La | 73.8 | 78.1 | 74.8 | 51.7 | 74 | 69.7 | 70.2 | 67 | 74.9 | 72.5 | 93.4 | 73.6 | 85.7 | 69.2 | 87.5 | 79.6 | 76 | 36.2 | 79.9 |
| Ce | 131 | 162 | 145 | 100 | 150 | 130 | 159 | 137 | 158 | 148 | 191 | 150 | 172 | 136 | 170 | 163 | 148 | 69.1 | 158 |
| Pr | 14.9 | 20.2 | 18.5 | 12.5 | 18.7 | 16 | 21.4 | 16.3 | 20.2 | 18.3 | 23 | 18.4 | 21.2 | 16.7 | 21.4 | 19.9 | 17.9 | 7.7 | 19.3 |
| Nd | 52.3 | 75.9 | 68.8 | 46 | 70.5 | 59.6 | 91.1 | 62.4 | 79.4 | 70 | 86.6 | 69.4 | 82.1 | 63.4 | 81.2 | 77.1 | 67.1 | 27 | 72.3 |
| Sm | 7.16 | 12.3 | 10.8 | 7.51 | 11 | 8.9 | 16.7 | 10.1 | 13.5 | 11.6 | 12.7 | 11 | 12.2 | 10.5 | 11.9 | 12.2 | 9.59 | 6.62 | 11.6 |
| Eu | 2.77 | 2.1 | 2.62 | 1.7 | 2.18 | 2.52 | 2.58 | 2.08 | 2.07 | 1.97 | 1.87 | 2.13 | 2.39 | 1.88 | 1.92 | 1.94 | 2.75 | 1.29 | 1.86 |
| Gd | 7.66 | 11.7 | 10.8 | 7.5 | 7.66 | 7.39 | 11.8 | 8.73 | 10.8 | 10.2 | 10.1 | 9.11 | 10.5 | 9.69 | 9.67 | 10.8 | 7.55 | 8.9 | 10.4 |
| Tb | 0.75 | 1.31 | 1.36 | 0.79 | 0.82 | 0.86 | 1.35 | 1.24 | 1.42 | 1.47 | 1.15 | 1.11 | 1.36 | 1.52 | 1.06 | 1.52 | 0.86 | 1.82 | 1.58 |
| Dy | 2.85 | 4.96 | 6.4 | 3.08 | 2.5 | 3.7 | 5.29 | 6.28 | 6.61 | 7.68 | 4.32 | 4.82 | 6.31 | 9.01 | 3.99 | 7.73 | 3.53 | 10.8 | 9.23 |
| Ho | 0.58 | 0.89 | 1.22 | 0.56 | 0.36 | 0.65 | 0.88 | 1.16 | 1.21 | 1.46 | 0.62 | 0.81 | 1.07 | 1.86 | 0.66 | 1.37 | 0.61 | 2.02 | 1.9 |
| Er | 1.7 | 2.3 | 3.56 | 1.75 | 0.93 | 1.68 | 2.26 | 2.77 | 3.06 | 3.7 | 1.46 | 2 | 2.49 | 4.81 | 1.65 | 3.1 | 1.62 | 4.96 | 5.06 |
| Tm | 0.26 | 0.34 | 0.48 | 0.18 | 0.1 | 0.22 | 0.32 | 0.39 | 0.44 | 0.55 | 0.16 | 0.27 | 0.31 | 0.75 | 0.2 | 0.38 | 0.21 | 0.86 | 0.81 |
| Yb | 1.73 | 2.42 | 3.01 | 1.13 | 0.65 | 1.25 | 1.85 | 2.14 | 2.61 | 3.18 | 0.93 | 1.58 | 1.78 | 4.29 | 1.19 | 2 | 1.26 | 5.61 | 4.97 |
| Lu | 0.29 | 0.35 | 0.47 | 0.17 | 0.1 | 0.19 | 0.28 | 0.31 | 0.4 | 0.46 | 0.15 | 0.23 | 0.26 | 0.65 | 0.18 | 0.28 | 0.2 | 0.88 | 0.71 |
| ∑REE | 297.75 | 374.87 | 347.82 | 234.57 | 339.50 | 302.66 | 385.01 | 317.90 | 374.62 | 351.07 | 427.46 | 344.46 | 399.67 | 330.26 | 392.52 | 380.92 | 337.18 | 183.76 | 377.62 |
| La/Yb | 42.66 | 32.27 | 24.85 | 45.75 | 113.85 | 55.76 | 37.95 | 31.31 | 28.70 | 22.80 | 100.43 | 46.58 | 48.15 | 16.13 | 73.53 | 39.80 | 60.32 | 6.45 | 16.08 |
| La/Sm | 6.65 | 4.10 | 4.47 | 4.44 | 4.34 | 5.06 | 2.71 | 4.28 | 3.58 | 4.03 | 4.75 | 4.32 | 4.53 | 4.25 | 4.75 | 4.21 | 5.12 | 3.53 | 4.45 |

续附表2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 送样号 | 1618-7 | TG33-2 | TG33-3 | TG35-1 | TG35-2 | TG37-1 | TG37-2 | PM07b15-1 | PM07b17-1 | PM07b74-1 | PM19b11-1 | PM22b26-1 | PM23b1-1 | PM23b7-1 | PM23b10-1 |
| 淡色石榴二长花岗岩 | | | | | | | | | | | | | | |
| SiO2 | 73.53 | 75.36 | 74.41 | 74.44 | 73.54 | 72.94 | 72.38 | 73.24 | 69.74 | 73.26 | 74.02 | 73.72 | 73.75 | 73.62 | 74.16 |
| TiO2 | 0.023 | 0.039 | 0.057 | 0.1 | 0.14 | 0.15 | 0.12 | 0.038 | 0.076 | 0.025 | 0.059 | 0.04 | 0.036 | 0.056 | 0.059 |
| Al2O3 | 15.04 | 13.54 | 13.86 | 14.84 | 15.16 | 15.36 | 16.08 | 15.14 | 16.55 | 15.02 | 14.73 | 15.12 | 15 | 15.08 | 14.91 |
| Fe2O3 | 0.03 | 0.15 | 0.12 | 0.21 | 0.31 | 0.14 | 0.24 | 0.038 | 0.24 | 0.22 | 0.12 | 0.13 | 0.083 | 0.17 | 0.13 |
| FeO | 0.63 | 0.34 | 0.35 | 0.54 | 0.78 | 1.25 | 0.68 | 0.4 | 0.64 | 0.54 | 0.11 | 0.33 | 0.11 | 0.2 | 0.22 |
| MnO | 0.006 | 0.008 | 0.008 | 0.012 | 0.017 | 0.019 | 0.014 | 0.005 | 0.011 | 0.02 | 0.002 | 0.014 | 0.003 | 0.005 | 0.004 |
| MgO | 0.18 | 0.19 | 0.2 | 0.36 | 0.44 | 0.62 | 0.42 | 0.086 | 0.29 | 0.14 | 0.094 | 0.1 | 0.048 | 0.1 | 0.13 |
| CaO | 0.98 | 1.01 | 0.92 | 1.71 | 1.69 | 1.91 | 2.04 | 1.48 | 1.08 | 0.73 | 0.67 | 0.79 | 0.83 | 1.12 | 1.04 |
| Na2O | 3.87 | 2.1 | 2.06 | 4.82 | 4.83 | 5 | 5.33 | 2.48 | 2.62 | 4.45 | 2.63 | 4.13 | 3.36 | 3.92 | 3.26 |
| K2O | 5.13 | 6.41 | 7.09 | 2.31 | 2.29 | 1.85 | 2.04 | 6.14 | 8.09 | 4.52 | 6.45 | 4.89 | 6 | 5.13 | 5.55 |
| P2O5 | 0.17 | 0.087 | 0.082 | 0.05 | 0.06 | 0.048 | 0.05 | 0.079 | 0.09 | 0.18 | 0.096 | 0.11 | 0.094 | 0.11 | 0.078 |
| 灼失 | 0.35 | 0.73 | 0.82 | 0.56 | 0.67 | 0.56 | 0.52 | 0.82 | 0.51 | 0.83 | 1.02 | 0.58 | 0.68 | 0.47 | 0.43 |
| H2O+ | 0.18 | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ | \ |
| CO2 | 0.08 | 0.016 | 0.062 | 0.014 | 0.014 | 0.015 | 0.058 | 0.032 | 0.028 | 0.014 | 0.023 | 0.066 | 0.046 | 0.082 | 0.067 |
| Total | 100.20 | 99.98 | 100.04 | 99.97 | 99.94 | 99.86 | 99.97 | 99.98 | 99.97 | 99.95 | 100.02 | 100.02 | 100.04 | 100.06 | 100.04 |
| TFeO | 0.66 | 0.47 | 0.46 | 0.73 | 1.06 | 1.38 | 0.90 | 0.43 | 0.86 | 0.74 | 0.22 | 0.45 | 0.18 | 0.35 | 0.34 |
| Mg# | 33 | 42 | 44 | 47 | 43 | 45 | 46 | 26 | 38 | 25 | 44 | 29 | 32 | 34 | 41 |
| A/NK | 1.26 | 1.30 | 1.25 | 1.42 | 1.45 | 1.50 | 1.46 | 1.41 | 1.26 | 1.23 | 1.30 | 1.25 | 1.25 | 1.26 | 1.31 |
| A/CNK | 1.11 | 1.11 | 1.10 | 1.10 | 1.12 | 1.12 | 1.10 | 1.13 | 1.10 | 1.11 | 1.18 | 1.13 | 1.12 | 1.09 | 1.14 |
| Sc | 9.06 | 2.06 | 1.79 | 1.5 | 1.9 | 2.32 | 1.46 | 0.82 | 2.32 | 1.89 | 0.44 | 1.34 | 0.86 | 0.81 | 0.82 |
| Cr | 7.2 | 5.19 | 6.29 | 8.4 | 14.2 | 10.3 | 9.88 | 9.58 | 8.02 | 6.68 | 3.72 | 3.17 | 5.25 | 2.64 | 5.91 |
| Co | 0.83 | 0.84 | 0.65 | 1.92 | 2.32 | 3.07 | 2.16 | 1.67 | 1.11 | 0.33 | 0.35 | 0.54 | 0.5 | 0.54 | 0.86 |
| Ni | 2.95 | 3.46 | 2.5 | 6.58 | 7.64 | 6.56 | 5.56 | 10.3 | 5.13 | 3.49 | 2.95 | 2.39 | 3.61 | 3.16 | 5.15 |
| Ga | 14.8 | 13.9 | 13.6 | 19 | 19.5 | 19.7 | 21 | 11.6 | 15.6 | 19.2 | 9.33 | 13.3 | 8.87 | 11.2 | 11.5 |
| Cs | 0.13 | 0.28 | 0.28 | 0.18 | 0.21 | 0.49 | 0.18 | 0.23 | 0.39 | 0.6 | 0.52 | 0.24 | 0.31 | 0.69 | 0.26 |
| Rb | 116 | 190 | 209 | 33.6 | 33.4 | 44.6 | 37.3 | 153 | 201 | 224 | 174 | 152 | 215 | 176 | 148 |
| Ba | 177 | 1740 | 1960 | 932 | 896 | 727 | 920 | 1420 | 2290 | 66.8 | 865 | 416 | 247 | 292 | 456 |
| Pb | 44.1 | 29.2 | 30.4 | 15.4 | 15 | 14.1 | 34.5 | 27.6 | 40.3 | 28.3 | 39 | 31.3 | 47.5 | 40.6 | 43.7 |

续附表2

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 送样号 | 1618-7 | TG33-2 | TG33-3 | TG35-1 | TG35-2 | TG37-1 | TG37-2 | PM07b15-1 | PM07b17-1 | PM07b74-1 | PM19b11-1 | PM22b26-1 | PM23b1-1 | PM23b7-1 | PM23b10-1 |
| 淡色石榴二长花岗岩 | | | | | | | | | | | | | | |
| Th | 0.18 | 14.2 | 9.56 | 0.28 | 0.43 | 1.16 | 0.89 | 0.39 | 0.19 | 0.28 | 0.13 | 0.22 | 0.35 | 0.34 | 0.39 |
| U | 0.4 | 0.61 | 0.45 | 0.24 | 0.32 | 0.56 | 0.4 | 0.16 | 0.39 | 0.32 | 0.77 | 0.52 | 0.13 | 0.31 | 0.21 |
| Sr | 107 | 387 | 410 | 436 | 443 | 525 | 618 | 382 | 396 | 57.2 | 307 | 164 | 121 | 133 | 158 |
| Y | 18.9 | 6 | 5.44 | 3.17 | 4.24 | 5.61 | 3.34 | 1.92 | 6.91 | 9.11 | 1.23 | 5.95 | 1.23 | 3.24 | 3.46 |
| Zr | 11.3 | 189 | 127 | 86.8 | 91.6 | 118 | 104 | 55.8 | 19.5 | 26.9 | 30.7 | 26.8 | 10.8 | 14.8 | 14.2 |
| Hf | 0.44 | 5.88 | 3.91 | 2.58 | 2.7 | 3.44 | 2.88 | 1.74 | 0.57 | 1.29 | 0.93 | 1.05 | 0.37 | 0.58 | 0.52 |
| Nb | 0.53 | 0.25 | 0.4 | 0.66 | 1.8 | 2.12 | 1.41 | 0.074 | 0.092 | 0.36 | 0.056 | 0.45 | 0.18 | 0.69 | 0.17 |
| Ta | 0.036 | 0.073 | 0.021 | 0.038 | 0.14 | 0.18 | 0.12 | 0.0088 | 0.0094 | 0.024 | 0.0062 | 0.02 | 0.015 | 0.055 | 0.015 |
| La | 5.38 | 40.6 | 37.6 | 14.6 | 7.95 | 13.2 | 14.6 | 20.9 | 36.1 | 3.8 | 12.9 | 12.7 | 3.78 | 14.1 | 23.4 |
| Ce | 9.62 | 78.3 | 63.9 | 25.6 | 12.4 | 19 | 24.9 | 43 | 48.2 | 7.14 | 29.3 | 21.3 | 15.1 | 30.6 | 53.1 |
| Pr | 1.5 | 8.98 | 7.47 | 3.41 | 1.49 | 2.47 | 2.6 | 3.8 | 4.35 | 1.03 | 2.26 | 1.95 | 0.99 | 2.56 | 4.32 |
| Nd | 5.34 | 31.3 | 25.3 | 12.2 | 5.42 | 8.84 | 8.94 | 12.8 | 12.8 | 3.68 | 7.39 | 6.09 | 3.68 | 8.58 | 14.2 |
| Sm | 1.75 | 4.24 | 3.31 | 1.63 | 0.99 | 1.5 | 1.38 | 1.45 | 1.31 | 1 | 0.98 | 0.86 | 0.62 | 1.19 | 1.25 |
| Eu | 0.5 | 2.06 | 2.16 | 0.64 | 0.58 | 0.61 | 0.72 | 2.12 | 2.72 | 0.19 | 1.1 | 0.65 | 0.31 | 0.55 | 0.74 |
| Gd | 2.59 | 3.08 | 2.48 | 1.2 | 0.9 | 1.36 | 1.2 | 1.2 | 1.7 | 0.96 | 0.87 | 0.93 | 0.48 | 1.02 | 1.3 |
| Tb | 0.52 | 0.3 | 0.25 | 0.14 | 0.14 | 0.2 | 0.14 | 0.1 | 0.21 | 0.24 | 0.082 | 0.16 | 0.051 | 0.12 | 0.12 |
| Dy | 3.6 | 1.16 | 0.97 | 0.6 | 0.76 | 1.05 | 0.66 | 0.34 | 1.22 | 1.56 | 0.27 | 1.03 | 0.23 | 0.56 | 0.55 |
| Ho | 0.6 | 0.23 | 0.21 | 0.11 | 0.14 | 0.19 | 0.12 | 0.06 | 0.24 | 0.28 | 0.04 | 0.19 | 0.037 | 0.11 | 0.12 |
| Er | 1.43 | 0.71 | 0.69 | 0.3 | 0.35 | 0.49 | 0.3 | 0.2 | 0.64 | 0.72 | 0.12 | 0.49 | 0.1 | 0.29 | 0.35 |
| Tm | 0.21 | 0.12 | 0.12 | 0.042 | 0.057 | 0.082 | 0.044 | 0.026 | 0.12 | 0.14 | 0.013 | 0.085 | 0.016 | 0.047 | 0.052 |
| Yb | 1.18 | 0.8 | 0.83 | 0.28 | 0.37 | 0.5 | 0.28 | 0.16 | 0.68 | 0.92 | 0.074 | 0.54 | 0.11 | 0.26 | 0.34 |
| Lu | 0.16 | 0.13 | 0.14 | 0.04 | 0.057 | 0.076 | 0.048 | 0.023 | 0.1 | 0.14 | 0.011 | 0.079 | 0.016 | 0.036 | 0.049 |
| ∑REE | 34.38 | 172.01 | 145.43 | 60.79 | 31.60 | 49.57 | 55.93 | 86.18 | 110.39 | 21.80 | 55.41 | 47.05 | 25.52 | 60.02 | 99.89 |
| La/Yb | 4.56 | 50.75 | 45.30 | 52.14 | 21.49 | 26.40 | 52.14 | 130.63 | 53.09 | 4.13 | 174.32 | 23.52 | 34.36 | 54.23 | 68.82 |
| La/Sm | 1.98 | 6.18 | 7.33 | 5.78 | 5.18 | 5.68 | 6.83 | 9.31 | 17.79 | 2.45 | 8.50 | 9.53 | 3.94 | 7.65 | 12.09 |