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  |