附表1 贡觉火山岩LA-ICP-MS锆石U-Pb年龄分析数据

Table 1 LA-ICP-MS zircon U-Pb age analysis data of Gonjo Volcanic rocks

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 测点 | Pb | Th | U | Th/U | 同位素比值 | 同位素年龄（Ma） |
| (10-6) | 207Pb/206Pb | (±1*σ*) | 207Pb/235U | (±1*σ*) | 206Pb/238U | (±1*σ*) | 207Pb/206Pb | (±1*σ*) | 207Pb/235U | (±1*σ*) | 206Pb/238U | (±1*σ*) |
| D1004-2-01 | 19  | 296  | 408  | 0.73  | 0.050 2  | 0.001 2  | 0.259 2  | 0.006 5  | 0.037 4  | 0.000 3  | 211  | 57  | 234  | 5  | 237  | 2  |
| D1004-2-02 | 30  | 496  | 617  | 0.80  | 0.051 6  | 0.001 2  | 0.262 7  | 0.006 4  | 0.036 9  | 0.000 3  | 333  | 56  | 237  | 5  | 233  | 2  |
| D1004-2-03 | 16  | 196  | 318  | 0.62  | 0.054 0  | 0.002 2  | 0.285 4  | 0.011 5  | 0.038 5  | 0.000 4  | 369  | 91  | 255  | 9  | 243  | 2  |
| D1004-2-04 | 17  | 227  | 356  | 0.64  | 0.052 4  | 0.001 5  | 0.275 8  | 0.007 8  | 0.038 2  | 0.000 3  | 306  | 67  | 247  | 6  | 242  | 2  |
| D1004-2-05 | 39  | 693  | 820  | 0.85  | 0.055 8  | 0.001 2  | 0.295 8  | 0.006 3  | 0.038 3  | 0.000 3  | 456  | 51  | 263  | 5  | 243  | 2  |
| D1004-2-06 | 18  | 245  | 385  | 0.64  | 0.054 2  | 0.001 7  | 0.284 9  | 0.008 4  | 0.038 3  | 0.000 4  | 389  | 70  | 255  | 7  | 242  | 2  |
| D1004-2-07 | 13  | 158  | 271  | 0.58  | 0.055 1  | 0.001 9  | 0.286 6  | 0.009 4  | 0.037 8  | 0.000 4  | 417  | 81  | 256  | 7  | 239  | 2  |
| D1004-2-08 | 14  | 174  | 302  | 0.58  | 0.055 5  | 0.002 0  | 0.289 4  | 0.009 5  | 0.038 0  | 0.000 4  | 432  | 80  | 258  | 7  | 241  | 2  |
| D1004-2-09 | 16  | 212  | 341  | 0.62  | 0.053 1  | 0.001 5  | 0.271 7  | 0.007 3  | 0.037 1  | 0.000 3  | 345  | 32  | 244  | 6  | 235  | 2  |
| D1004-2-10 | 15  | 192  | 341  | 0.56  | 0.054 8  | 0.001 6  | 0.288 3  | 0.008 0  | 0.038 3  | 0.000 4  | 467  | 67  | 257  | 6  | 242  | 2  |
| D1004-2-11 | 18  | 252  | 371  | 0.68  | 0.052 7  | 0.001 5  | 0.276 1  | 0.007 8  | 0.038 1  | 0.000 4  | 317  | 67  | 248  | 6  | 241  | 2  |
| D1004-2-12 | 13  | 157  | 283  | 0.56  | 0.051 4  | 0.001 6  | 0.264 7  | 0.008 0  | 0.037 4  | 0.000 3  | 261  | 70  | 238  | 6  | 237  | 2  |
| D1004-2-13 | 16  | 264  | 354  | 0.75  | 0.052 1  | 0.001 8  | 0.271 6  | 0.008 7  | 0.038 2  | 0.000 4  | 287  | 80  | 244  | 7  | 242  | 3  |
| D1004-2-14 | 14  | 186  | 308  | 0.60  | 0.052 7  | 0.001 6  | 0.273 1  | 0.008 0  | 0.037 6  | 0.000 4  | 317  | 64  | 245  | 6  | 238  | 2  |
| D1004-2-15 | 15  | 201  | 318  | 0.63  | 0.052 2  | 0.001 6  | 0.266 6  | 0.008 2  | 0.037 0  | 0.000 3  | 295  | 66  | 240  | 7  | 234  | 2  |
| D1004-2-16 | 15  | 173  | 327  | 0.53  | 0.055 8  | 0.002 2  | 0.288 1  | 0.010 2  | 0.037 7  | 0.000 4  | 443  | 87  | 257  | 8  | 239  | 2  |
| D1004-2-17 | 14  | 163  | 295  | 0.55  | 0.056 5  | 0.001 6  | 0.291 2  | 0.008 1  | 0.037 4  | 0.000 4  | 472  | 61  | 259  | 6  | 237  | 2  |
| D1004-2-18 | 16  | 219  | 344  | 0.63  | 0.053 0  | 0.001 9  | 0.271 2  | 0.008 6  | 0.037 5  | 0.000 4  | 328  | 75  | 244  | 7  | 238  | 2  |
| D1004-2-19 | 14  | 177  | 306  | 0.58  | 0.055 8  | 0.001 6  | 0.288 8  | 0.008 1  | 0.037 5  | 0.000 3  | 456  | 63  | 258  | 6  | 237  | 2  |
| D1004-2-20 | 17  | 248  | 364  | 0.68  | 0.052 4  | 0.001 5  | 0.271 0  | 0.007 4  | 0.037 6  | 0.000 3  | 302  | 63  | 244  | 6  | 238  | 2  |
| D1004-2-21 | 21  | 288  | 431  | 0.67  | 0.052 5  | 0.001 5  | 0.269 0  | 0.007 8  | 0.037 1  | 0.000 3  | 306  | 65  | 242  | 6  | 235  | 2  |
| D1004-2-22 | 12  | 150  | 258  | 0.58  | 0.058 0  | 0.002 1  | 0.295 5  | 0.009 7  | 0.037 4  | 0.000 4  | 532  | 80  | 263  | 8  | 237  | 3  |
| D1004-2-23 | 17  | 235  | 360  | 0.65  | 0.053 2  | 0.001 6  | 0.274 3  | 0.007 7  | 0.037 5  | 0.000 3  | 339  | 36  | 246  | 6  | 237  | 2  |
| D1004-3-01 | 33.0 | 500  | 774  | 0.65  | 0.051 5  | 0.001 2  | 0.252 3  | 0.006 8  | 0.035 5  | 0.000 5  | 261  | 52  | 228  | 5  | 225  | 3  |
| D1004-3-02 | 56.0 | 1 000  | 1 247  | 0.80  | 0.050 2  | 0.000 8  | 0.245 8  | 0.005 6  | 0.035 4  | 0.000 6  | 203  | 38  | 223  | 5  | 224  | 4  |
| D1004-3-03 | 49.8 | 876  | 1 090  | 0.80  | 0.050 5  | 0.001 0  | 0.244 2  | 0.005 2  | 0.035 0  | 0.000 4  | 219  | 45  | 222  | 4  | 222  | 2  |
| D1004-3-04 | 54.7 | 626  | 1 364  | 0.46  | 0.059 9  | 0.001 2  | 0.271 2  | 0.006 4  | 0.032 6  | 0.000 4  | 601  | 46  | 244  | 5  | 207  | 2  |
| D1004-3-05 | 41.9 | 557  | 898  | 0.62  | 0.052 0  | 0.002 3  | 0.242 3  | 0.010 6  | 0.033 8  | 0.000 3  | 284  | 104  | 220  | 9  | 214  | 2  |
| D1004-3-06 | 119.6 | 977  | 2 976  | 0.33  | 0.047 8  | 0.003 1  | 0.184 6  | 0.011 9  | 0.028 0  | 0.000 2  | 88  | 145  | 172  | 10  | 178  | 1  |
| D1004-3-07 | 96.1 | 1 795  | 2 564  | 0.70  | 0.051 7  | 0.000 9  | 0.232 0  | 0.006 0  | 0.032 5  | 0.000 6  | 271  | 41  | 212  | 5  | 206  | 4  |
| D1004-3-08 | 73.9 | 768  | 1 931  | 0.40  | 0.071 3  | 0.001 6  | 0.312 4  | 0.009 2  | 0.031 3  | 0.000 4  | 967  | 57  | 276  | 7  | 199  | 2  |
| D1004-3-09 | 182.2 | 3 019  | 4 295  | 0.70  | 0.046 1  | 0.002 6  | 0.200 0  | 0.011 0  | 0.031 5  | 0.000 4  |  | 123  | 185  | 9  | 200  | 3  |
| D1004-3-10 | 97.7 | 2 435  | 2 272  | 1.07  | 0.060 5  | 0.002 8  | 0.235 6  | 0.010 8  | 0.028 2  | 0.000 3  | 622  | 104  | 215  | 9  | 179  | 2  |
| D1004-3-11 | 103.1 | 946  | 2 776  | 0.34  | 0.053 4  | 0.000 8  | 0.231 6  | 0.003 6  | 0.031 4  | 0.000 2  | 347  | 33  | 212  | 3  | 199  | 1  |
| D1004-3-12 | 77.3 | 789  | 2 167  | 0.36  | 0.063 7  | 0.001 2  | 0.264 9  | 0.005 9  | 0.030 0  | 0.000 4  | 732  | 41  | 239  | 5  | 190  | 2  |
| D1004-3-13 | 79.7 | 623  | 2 170  | 0.29  | 0.050 3  | 0.001 0  | 0.223 4  | 0.003 7  | 0.031 5  | 0.000 2  | 210  | 37  | 205  | 3  | 200  | 1  |
| D1004-3-14 | 66.8 | 798  | 1 791  | 0.45  | 0.057 9  | 0.001 1  | 0.257 5  | 0.005 8  | 0.032 2  | 0.000 5  | 527  | 39  | 233  | 5  | 204  | 3  |
| D1004-3-15 | 51.8 | 561  | 1 169  | 0.48  | 0.051 1  | 0.002 6  | 0.237 3  | 0.012 0  | 0.033 7  | 0.000 3  | 244  | 120  | 216  | 10  | 214  | 2  |
| D1004-3-16 | 69.8 | 388  | 943  | 0.41  | 0.061 1  | 0.001 3  | 0.302 3  | 0.007 6  | 0.0356  | 0.0004  | 642  | 49  | 268  | 6  | 225  | 3  |

注：D1004-2安山质熔结凝灰岩加权平均年龄为238.3±1.3 Ma（MSWD=1.7，*n*=23）；D1004-3含橄榄石玄武岩年龄谐和度差，加权平均年龄值无意义.

附表2 贡觉火山岩主量元素（%）、微量元素（10-6）分析结果

Table 2 Analysis results of major element (%) and trace element (10-6) of Gonjo volcanic rocks

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 样品号 | D1003-YQ3 | D1003-YQ4 | D1004-YQ1 | D1004-YQ2 | D1004-YQ3 | D1004-YQ4 | D1004-YQ5 | D1004-YQ6 | D1004-YQ7 | D1004-YQ8 |
| 岩性 | 角闪安山岩 | 辉石安山岩 | 玄武岩 | 玄武岩 | 安山玄武岩 | 安山质熔结凝灰岩 | 安山质熔结凝灰岩 | 含橄榄玄武岩 | 橄榄玄武岩 | 橄榄玄武岩 |
| SiO2 | 54.13 | 53.82 | 48.13 | 47.52 | 49.9 | 47.93 | 47.52 | 44.03 | 41.57 | 40.36 |
| TiO2 | 0.9 | 0.91 | 0.84 | 0.85 | 0.8 | 0.78 | 0.82 | 0.57 | 0.59 | 0.52 |
| Al2O3 | 17.3 | 17.38 | 17.91 | 17.86 | 17.94 | 17.45 | 16.27 | 13.05 | 12.21 | 12.16 |
| Fe2O3T | 7.85 | 7.5 | 11.11 | 10.91 | 9.31 | 9.67 | 10.06 | 7.31 | 6.37 | 6.37 |
| MnO | 0.13 | 0.12 | 0.16 | 0.16 | 0.14 | 0.13 | 0.14 | 0.18 | 0.21 | 0.2 |
| MgO | 3.38 | 3.38 | 6.91 | 6.64 | 5.84 | 7.22 | 7.11 | 5.11 | 4.19 | 3.94 |
| CaO | 4.17 | 4.72 | 5.99 | 7.32 | 7.23 | 8.41 | 9.06 | 14.63 | 18.14 | 19.38 |
| Na2O | 4.52 | 4.66 | 3.63 | 3.74 | 4.64 | 3.8 | 3.67 | 4.63 | 4.16 | 3.94 |
| K2O | 4.05 | 3.84 | 0.95 | 0.41 | 0.22 | 0.53 | 0.59 | 0.11 | 0.093 | 0.15 |
| P2O5 | 0.35 | 0.36 | 0.13 | 0.15 | 0.15 | 0.15 | 0.16 | 0.14 | 0.13 | 0.15 |
| LOI | 3.04 | 3.13 | 4.14 | 4.36 | 3.78 | 3.86 | 4.55 | 10.24 | 12.32 | 12.82 |
| 总量 | 99.82  | 99.82  | 99.90  | 99.92  | 99.95  | 99.93  | 99.95  | 100.00  | 99.98  | 99.99  |
| Mg# | 46.22  | 47.36  | 55.39  | 54.85  | 55.60  | 59.85  | 58.52  | 58.25  | 56.77  | 55.25  |
| La | 54.8 | 52.2 | 10.6 | 12.8 | 12.1 | 9.81 | 10.1 | 6.76 | 5.81 | 6.82 |
| Ce | 99.9 | 95.9 | 24.3 | 25.9 | 25 | 20.8 | 21.6 | 14 | 12.3 | 13.8 |
| Pr | 10.9 | 10.6 | 3.28 | 3.39 | 3.23 | 2.79 | 2.83 | 1.82 | 1.66 | 1.8 |
| Nd | 38.4 | 38 | 14 | 14.4 | 13.8 | 12.1 | 12.1 | 7.76 | 7.17 | 7.75 |
| Sm | 6.71 | 6.61 | 3.14 | 3.27 | 2.98 | 2.78 | 2.8 | 1.83 | 1.76 | 1.75 |
| Eu | 1.52 | 1.69 | 0.79 | 1.14 | 0.79 | 0.89 | 0.88 | 0.62 | 0.6 | 0.63 |
| Gd | 5.19 | 5.38 | 3.31 | 3.44 | 3.04 | 2.88 | 2.9 | 1.97 | 1.89 | 1.91 |
| Tb | 0.75 | 0.75 | 0.52 | 0.54 | 0.49 | 0.45 | 0.45 | 0.31 | 0.31 | 0.3 |
| Dy | 4.15 | 4.05 | 3.08 | 3.36 | 2.89 | 2.63 | 2.71 | 1.85 | 1.92 | 1.84 |
| Ho | 0.82 | 0.81 | 0.65 | 0.73 | 0.62 | 0.55 | 0.57 | 0.4 | 0.41 | 0.38 |
| Er | 2.28 | 2.21 | 1.89 | 2.15 | 1.75 | 1.61 | 1.64 | 1.15 | 1.18 | 1.12 |
| Tm | 0.32 | 0.32 | 0.27 | 0.32 | 0.26 | 0.23 | 0.23 | 0.17 | 0.17 | 0.16 |
| Yb | 2.15 | 2.04 | 1.82 | 2.13 | 1.68 | 1.48 | 1.58 | 1.05 | 1.12 | 1.07 |
| Lu | 0.33 | 0.31 | 0.27 | 0.33 | 0.26 | 0.23 | 0.24 | 0.16 | 0.17 | 0.16 |
| Y | 20 | 19.4 | 16.2 | 19 | 14.5 | 13.2 | 13.4 | 9.55 | 9.9 | 9.48 |
| ∑REE | 248.22  | 240.27  | 84.12  | 92.90  | 83.39  | 72.43  | 74.03  | 49.40  | 46.37  | 48.97  |
| ∑Ce/∑Y | 5.90  | 5.81  | 2.00  | 1.90  | 2.27  | 2.11  | 2.12  | 1.97  | 1.72  | 1.98  |
| LREE/HREE | 13.27  | 12.92  | 4.75  | 4.68  | 5.27  | 4.89  | 4.88  | 4.64  | 4.09  | 4.69  |
| δEu | 0.76  | 0.84  | 0.74  | 1.03  | 0.80  | 0.95  | 0.94  | 0.99  | 1.00  | 1.05  |
| Sc | 21.2 | 22 | 32.8 | 32.3 | 31.3 | 34.4 | 35.8 | 27.5 | 28.6 | 27.5 |
| Ni | 8.07 | 7.65 | 31.3 | 32.7 | 32.3 | 66.7 | 71.2 | 70.9 | 67.6 | 83 |
| Rb | 112 | 114 | 24.9 | 11 | 4.82 | 15.2 | 17 | 1.45 | 1.25 | 2.39 |
| Sr | 375 | 360 | 253 | 290 | 264 | 265 | 275 | 89.1 | 94.3 | 98.1 |
| Zr | 228 | 214 | 72.9 | 77.8 | 60.1 | 54 | 56.4 | 36.2 | 37 | 32 |
| Nb | 24.5 | 22.9 | 4.45 | 4.74 | 4.18 | 3.61 | 3.79 | 2.69 | 2.73 | 2.51 |
| Cs | 0.62 | 0.44 | 0.83 | 0.45 | 0.17 | 1.44 | 1.45 | 0.07 | 0.08 | 0.06 |
| Ba | 1533 | 1558 | 651 | 265 | 133 | 173 | 206 | 30.4 | 24.8 | 19.4 |
| Hf | 5.03 | 4.77 | 1.94 | 2.02 | 1.88 | 1.58 | 1.71 | 1.07 | 1.1 | 0.99 |
| Ta | 1.89 | 1.75 | 0.37 | 0.43 | 0.37 | 0.29 | 0.3 | 0.22 | 0.22 | 0.24 |
| Pb | 51.8 | 31.7 | 4.88 | 4.52 | 7.16 | 3.84 | 3.89 | 2.45 | 2.27 | 2.79 |
| Th | 17.1 | 16.3 | 3.84 | 4.14 | 3.73 | 2.44 | 2.57 | 1.66 | 1.69 | 1.57 |
| U | 3.99 | 3.7 | 1.13 | 1.22 | 1.02 | 0.73 | 0.86 | 0.53 | 0.55 | 0.62 |