表1南蒙古岛弧地体中酸性岩石LA⁃ICP⁃MS 锆石 U⁃Pb 定年分析结果

Table 1Zircon U⁃Pb dating results for intermediate acidity magmatic rocks in the island arc terrane of South Mongolia

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 测试点 | Pb  （10-6） | Th  （10-6） | U  （10-6 | Th/U | 同位素比值 | | | | | | 年龄（Ma） | | | | | |
| 206Pb/238U | 1σ | 207Pb/235U | 1σ | 207Pb/206Pb | 1σ | 206Pb/238U | 1σ | 207Pb/235U | 1σ | 207Pb/206Pb | 1σ |
| KM19-14 | | | | | | | | | | | | | | | | |
| KM19-14-1 | 46 | 129 | 166 | 0.78 | 0.0529 | 0.0006 | 0.3884 | 0.0124 | 0.0535 | 0.0017 | 332.46 | 3.97 | 333 | 9 | 350 | 72 |
| KM19-14-2 | 45 | 118 | 156 | 0.76 | 0.0530 | 0.0005 | 0.3685 | 0.0130 | 0.0506 | 0.0019 | 333.04 | 3.01 | 319 | 10 | 220 | 53 |
| KM19-14-3 | 22 | 54 | 94 | 0.57 | 0.0530 | 0.0006 | 0.4014 | 0.0173 | 0.0550 | 0.0023 | 333.19 | 3.95 | 343 | 13 | 413 | 93 |
| KM19-14-4 | 37 | 96 | 152 | 0.63 | 0.0529 | 0.0006 | 0.3686 | 0.0104 | 0.0509 | 0.0015 | 332.16 | 3.62 | 319 | 8 | 239 | 69 |
| KM19-14-5 | 28 | 74 | 115 | 0.64 | 0.0532 | 0.0007 | 0.3797 | 0.0132 | 0.0521 | 0.0018 | 334.22 | 4.26 | 327 | 10 | 300 | 78 |
| KM19-14-7 | 62 | 169 | 209 | 0.81 | 0.0529 | 0.0004 | 0.3938 | 0.0096 | 0.0542 | 0.0014 | 332.00 | 2.74 | 337 | 7 | 389 | 57 |
| KM19-14-8 | 20 | 53 | 78 | 0.68 | 0.0529 | 0.0006 | 0.3821 | 0.0159 | 0.0525 | 0.0021 | 332.36 | 3.39 | 329 | 12 | 306 | 93 |
| KM19-14-10 | 10 | 24 | 63 | 0.39 | 0.0523 | 0.0007 | 0.3695 | 0.0215 | 0.0517 | 0.0031 | 328.60 | 4.09 | 319 | 16 | 333 | 169 |
| KM19-14-11 | 28 | 76 | 131 | 0.58 | 0.0530 | 0.0007 | 0.3898 | 0.0132 | 0.0534 | 0.0017 | 332.69 | 4.11 | 334 | 10 | 346 | 72 |
| KM19-14-12 | 39 | 100 | 183 | 0.55 | 0.0529 | 0.0005 | 0.3771 | 0.0123 | 0.0518 | 0.0017 | 332.59 | 3.30 | 325 | 9 | 276 | 74 |
| KM19-14-13 | 19 | 47 | 82 | 0.58 | 0.0530 | 0.0007 | 0.3892 | 0.0165 | 0.0533 | 0.0021 | 332.70 | 4.37 | 334 | 12 | 339 | 86 |
| KM19-14-14 | 38 | 99 | 149 | 0.67 | 0.0528 | 0.0006 | 0.3924 | 0.0128 | 0.0539 | 0.0017 | 331.95 | 3.81 | 336 | 9 | 369 | 70 |
| KM19-14-16 | 51 | 143 | 183 | 0.78 | 0.0525 | 0.0005 | 0.3883 | 0.0117 | 0.0538 | 0.0016 | 329.75 | 3.33 | 333 | 9 | 365 | 69 |
| KM19-14-17 | 22 | 65 | 79 | 0.83 | 0.0525 | 0.0008 | 0.3877 | 0.0199 | 0.0539 | 0.0028 | 329.76 | 4.71 | 333 | 15 | 369 | 115 |
| KM19-14-20 | 24 | 61 | 102 | 0.60 | 0.0529 | 0.0007 | 0.3908 | 0.0147 | 0.0542 | 0.0022 | 332.11 | 4.25 | 335 | 11 | 389 | 89 |
| KM19-21 | | | | | | | | | | | | | | | | |
| KM19-21-1 | 39 | 111 | 113 | 0.99 | 0.0517 | 0.0007 | 0.3924 | 0.0156 | 0.0550 | 0.0021 | 325.21 | 4.42 | 336 | 11 | 413 | 85 |
| KM19-21-2 | 13 | 32 | 60 | 0.54 | 0.0514 | 0.0007 | 0.3687 | 0.0190 | 0.0523 | 0.0028 | 323.14 | 4.09 | 319 | 14 | 298 | 120 |
| KM19-21-3 | 51 | 140 | 173 | 0.81 | 0.0514 | 0.0005 | 0.3947 | 0.0107 | 0.0557 | 0.0015 | 323.09 | 3.06 | 338 | 8 | 439 | 55 |
| KM19-21-4 | 53 | 140 | 195 | 0.72 | 0.0516 | 0.0005 | 0.3866 | 0.0092 | 0.0543 | 0.0012 | 324.25 | 3.21 | 332 | 7 | 383 | 50 |
| KM19-21-6 | 20 | 53 | 77 | 0.69 | 0.0515 | 0.0009 | 0.3755 | 0.0179 | 0.0542 | 0.0027 | 323.59 | 5.35 | 324 | 13 | 389 | 77 |
| KM19-21-8 | 50 | 130 | 201 | 0.65 | 0.0515 | 0.0006 | 0.3916 | 0.0117 | 0.0554 | 0.0018 | 323.75 | 3.40 | 336 | 9 | 428 | 70 |
| KM19-21-10 | 13 | 32 | 63 | 0.51 | 0.0520 | 0.0007 | 0.3952 | 0.0193 | 0.0555 | 0.0028 | 326.78 | 4.36 | 338 | 14 | 432 | 113 |
| KM19-21-11 | 17 | 38 | 89 | 0.43 | 0.0514 | 0.0007 | 0.4043 | 0.0166 | 0.0575 | 0.0025 | 323.20 | 4.17 | 345 | 12 | 522 | 99 |
| KM19-21-12 | 26 | 60 | 150 | 0.40 | 0.0514 | 0.0006 | 0.3733 | 0.0124 | 0.0528 | 0.0018 | 323.30 | 3.50 | 322 | 9 | 320 | 76 |
| KM19-21-14 | 11 | 26 | 60 | 0.44 | 0.0515 | 0.0007 | 0.3665 | 0.0218 | 0.0518 | 0.0031 | 323.52 | 4.43 | 317 | 16 | 276 | 105 |
| KM19-21-15 | 12 | 26 | 72 | 0.36 | 0.0515 | 0.0007 | 0.3869 | 0.0187 | 0.0550 | 0.0026 | 323.47 | 4.58 | 332 | 14 | 409 | 110 |
| KM19-21-16 | 24 | 68 | 83 | 0.82 | 0.0516 | 0.0006 | 0.3705 | 0.0163 | 0.0522 | 0.0023 | 324.50 | 3.77 | 320 | 12 | 295 | 100 |
| KM19-21-20 | 10 | 25 | 46 | 0.55 | 0.0516 | 0.0009 | 0.3715 | 0.0211 | 0.0522 | 0.0027 | 324.21 | 5.52 | 321 | 16 | 300 | 120 |
| KMD19-03 | | | | | | | | | | | | | | | | |
| KMD19-03-1 | 20 | 53 | 87 | 0.60 | 0.0533 | 0.0007 | 0.3522 | 0.0167 | 0.0482 | 0.0023 | 334.86 | 4.06 | 306 | 13 | 109 | 107 |
| KMD19-03-2 | 17 | 47 | 76 | 0.62 | 0.0517 | 0.0007 | 0.4038 | 0.0176 | 0.0572 | 0.0025 | 324.74 | 4.49 | 344 | 13 | 502 | 64 |
| KMD19-03-4 | 18 | 52 | 67 | 0.78 | 0.0515 | 0.0007 | 0.4019 | 0.0203 | 0.0570 | 0.0028 | 323.98 | 4.58 | 343 | 15 | 500 | 105 |
| KMD19-03-11 | 11 | 26 | 59 | 0.45 | 0.0529 | 0.0008 | 0.3754 | 0.0193 | 0.0521 | 0.0027 | 332.58 | 4.68 | 324 | 14 | 300 | 149 |
| KMD19-03-12 | 11 | 30 | 46 | 0.66 | 0.0530 | 0.0009 | 0.3872 | 0.0224 | 0.0547 | 0.0034 | 332.94 | 5.36 | 332 | 16 | 398 | 173 |
| KMD19-03-13 | 9 | 23 | 43 | 0.53 | 0.0530 | 0.0010 | 0.3878 | 0.0202 | 0.0551 | 0.0031 | 332.63 | 5.89 | 333 | 15 | 417 | 158 |
| KMD19-03-14 | 12 | 33 | 57 | 0.58 | 0.0528 | 0.0008 | 0.4083 | 0.0199 | 0.0565 | 0.0027 | 331.96 | 4.83 | 348 | 14 | 472 | 105 |
| KMD19-03-15 | 14 | 37 | 57 | 0.66 | 0.0530 | 0.0007 | 0.4053 | 0.0224 | 0.0561 | 0.0031 | 333.17 | 4.34 | 345 | 16 | 454 | 122 |
| KMD19-03-16 | 14 | 33 | 66 | 0.50 | 0.0517 | 0.0008 | 0.4238 | 0.0207 | 0.0600 | 0.0029 | 324.88 | 4.77 | 359 | 15 | 606 | 104 |
| KMD19-03-17 | 13 | 37 | 61 | 0.62 | 0.0529 | 0.0009 | 0.3888 | 0.0241 | 0.0534 | 0.0032 | 332.28 | 5.32 | 333 | 18 | 346 | 132 |
| KMD19-03-18 | 12 | 34 | 47 | 0.72 | 0.0530 | 0.0008 | 0.4172 | 0.0245 | 0.0576 | 0.0034 | 332.72 | 4.74 | 354 | 18 | 522 | 125 |
| KMD19-03-19 | 44 | 134 | 106 | 1.27 | 0.0529 | 0.0016 | 0.4337 | 0.0273 | 0.0621 | 0.0040 | 332.19 | 9.67 | 366 | 19 | 680 | 141 |
| KMD19-03-20 | 25 | 69 | 106 | 0.65 | 0.0529 | 0.0007 | 0.3982 | 0.0140 | 0.0548 | 0.0019 | 332.12 | 3.99 | 340 | 10 | 467 | 78 |
| OU19-01 | | | | | | | | | | | | | | | | |
| OU19-01-5 | 42 | 108 | 122 | 0.88 | 0.0526 | 0.0006 | 0.3614 | 0.0157 | 0.0496 | 0.0020 | 330.63 | 3.46 | 313 | 12 | 176 | 127 |
| OU19-01-6 | 44 | 111 | 105 | 1.05 | 0.0527 | 0.0007 | 0.3981 | 0.0160 | 0.0550 | 0.0021 | 330.77 | 4.08 | 340 | 12 | 413 | 87 |
| OU19-01-9 | 43 | 108 | 116 | 0.93 | 0.0529 | 0.0006 | 0.3887 | 0.0136 | 0.0535 | 0.0019 | 332.12 | 3.95 | 333 | 10 | 350 | 47 |
| OU19-01-10 | 83 | 224 | 169 | 1.32 | 0.0530 | 0.0006 | 0.4082 | 0.0131 | 0.0561 | 0.0018 | 332.93 | 3.39 | 348 | 9 | 457 | 72 |
| OU19-01-13 | 60 | 147 | 144 | 1.02 | 0.0531 | 0.0006 | 0.4111 | 0.0169 | 0.0562 | 0.0022 | 333.55 | 3.55 | 350 | 12 | 457 | 87 |
| OU19-13 | | | | | | | | | | | | | | | | |
| OU19-13-1 | 43 | 90 | 155 | 0.58 | 0.0607 | 0.0007 | 0.4701 | 0.0145 | 0.0566 | 0.0018 | 380.00 | 4.37 | 391 | 10 | 476 | 69 |
| OU19-13-2 | 30 | 61 | 125 | 0.49 | 0.0608 | 0.0007 | 0.4753 | 0.0159 | 0.0569 | 0.0019 | 380.73 | 4.52 | 395 | 11 | 487 | 77 |
| OU19-13-3 | 33 | 64 | 137 | 0.47 | 0.0609 | 0.0008 | 0.4531 | 0.0150 | 0.0540 | 0.0017 | 381.22 | 4.69 | 379 | 11 | 372 | 72 |
| OU19-13-6 | 24 | 44 | 112 | 0.39 | 0.0609 | 0.0007 | 0.4789 | 0.0155 | 0.0572 | 0.0018 | 381.21 | 4.44 | 397 | 11 | 498 | 70 |
| OU19-13-7 | 24 | 47 | 99 | 0.48 | 0.0608 | 0.0007 | 0.4651 | 0.0160 | 0.0559 | 0.0020 | 380.21 | 4.16 | 388 | 11 | 450 | 78 |
| OU19-13-9 | 37 | 78 | 135 | 0.58 | 0.0608 | 0.0007 | 0.4573 | 0.0153 | 0.0546 | 0.0017 | 380.26 | 4.00 | 382 | 11 | 394 | 70 |
| OU19-13-10 | 21 | 37 | 98 | 0.37 | 0.0608 | 0.0008 | 0.4427 | 0.0149 | 0.0530 | 0.0018 | 380.56 | 4.56 | 372 | 10 | 332 | 76 |
| OU19-13-12 | 39 | 78 | 157 | 0.49 | 0.0608 | 0.0006 | 0.4337 | 0.0129 | 0.0517 | 0.0014 | 380.23 | 3.79 | 366 | 9 | 272 | 69 |
| OU19-13-13 | 23 | 42 | 108 | 0.39 | 0.0608 | 0.0006 | 0.4545 | 0.0162 | 0.0545 | 0.0020 | 380.49 | 3.94 | 380 | 11 | 391 | 84 |
| OU19-13-14 | 18 | 33 | 89 | 0.37 | 0.0609 | 0.0007 | 0.4563 | 0.0172 | 0.0547 | 0.0020 | 381.04 | 4.19 | 382 | 12 | 398 | 81 |
| OU19-13-15 | 21 | 42 | 104 | 0.40 | 0.0608 | 0.0006 | 0.4548 | 0.0167 | 0.0545 | 0.0020 | 380.28 | 3.80 | 381 | 12 | 394 | 81 |
| OU19-13-17 | 39 | 75 | 158 | 0.47 | 0.0608 | 0.0006 | 0.4746 | 0.0140 | 0.0568 | 0.0017 | 380.47 | 3.90 | 394 | 10 | 483 | 65 |
| OU19-13-18 | 34 | 65 | 163 | 0.40 | 0.0608 | 0.0007 | 0.4226 | 0.0131 | 0.0507 | 0.0016 | 380.51 | 4.54 | 358 | 9 | 233 | 70 |
| OU19-13-20 | 22 | 40 | 97 | 0.41 | 0.0608 | 0.0007 | 0.4734 | 0.0172 | 0.0568 | 0.0021 | 380.29 | 4.49 | 394 | 12 | 483 | 47 |
| OU19-24 | | | | | | | | | | | | | | | | |
| OU19-24-1 | 11 | 22 | 47 | 0.48 | 0.0537 | 0.0008 | 0.3832 | 0.0206 | 0.0516 | 0.0026 | 336.99 | 5.12 | 329 | 15 | 333 | 121 |
| OU19-24-2 | 23 | 58 | 73 | 0.80 | 0.0535 | 0.0007 | 0.3983 | 0.0185 | 0.0543 | 0.0025 | 336.03 | 4.22 | 340 | 13 | 383 | 104 |
| OU19-24-5 | 22 | 58 | 76 | 0.77 | 0.0536 | 0.0007 | 0.3829 | 0.0159 | 0.0525 | 0.0022 | 336.42 | 4.39 | 329 | 12 | 306 | 96 |
| OU19-24-6 | 15 | 37 | 60 | 0.61 | 0.0539 | 0.0008 | 0.4004 | 0.0203 | 0.0536 | 0.0025 | 338.27 | 4.85 | 342 | 15 | 354 | 107 |
| OU19-24-7 | 11 | 26 | 52 | 0.51 | 0.0538 | 0.0008 | 0.3797 | 0.0227 | 0.0511 | 0.0030 | 337.92 | 4.89 | 327 | 17 | 243 | 137 |
| OU19-24-8 | 31 | 82 | 87 | 0.94 | 0.0538 | 0.0007 | 0.3925 | 0.0147 | 0.0539 | 0.0023 | 337.73 | 4.32 | 336 | 11 | 369 | 62 |
| OU19-24-10 | 10 | 25 | 50 | 0.49 | 0.0539 | 0.0009 | 0.4127 | 0.0237 | 0.0566 | 0.0034 | 338.56 | 5.35 | 351 | 17 | 472 | 133 |
| OU19-24-11 | 45 | 130 | 129 | 1.01 | 0.0538 | 0.0008 | 0.3960 | 0.0181 | 0.0533 | 0.0022 | 337.87 | 5.02 | 339 | 13 | 343 | 90 |
| OU19-24-12 | 11 | 25 | 49 | 0.50 | 0.0538 | 0.0008 | 0.3823 | 0.0197 | 0.0521 | 0.0027 | 337.89 | 5.04 | 329 | 14 | 287 | 151 |
| OU19-24-13 | 20 | 51 | 76 | 0.67 | 0.0537 | 0.0007 | 0.3789 | 0.0158 | 0.0513 | 0.0020 | 337.23 | 4.26 | 326 | 12 | 254 | 88 |
| OU19-24-15 | 13 | 32 | 46 | 0.70 | 0.0538 | 0.0008 | 0.4066 | 0.0231 | 0.0549 | 0.0029 | 337.60 | 5.03 | 346 | 17 | 409 | 119 |
| OU19-24-17 | 20 | 50 | 91 | 0.55 | 0.0537 | 0.0007 | 0.4023 | 0.0178 | 0.0544 | 0.0023 | 337.25 | 4.25 | 343 | 13 | 391 | 92 |
| OU19-24-18 | 26 | 70 | 86 | 0.81 | 0.0538 | 0.0006 | 0.3867 | 0.0144 | 0.0527 | 0.0020 | 337.87 | 3.96 | 332 | 11 | 322 | 82 |
| OU19-24-20 | 8 | 19 | 40 | 0.48 | 0.0538 | 0.0009 | 0.3941 | 0.0235 | 0.0545 | 0.0033 | 337.54 | 5.68 | 337 | 17 | 391 | 135 |
| OU19-32 | | | | | | | | | | | | | | | | |
| OU19-32-1 | 99 | 286 | 208 | 1.38 | 0.0529 | 0.0006 | 0.3789 | 0.0118 | 0.0521 | 0.0016 | 332.34 | 3.38 | 326 | 9 | 300 | 75 |
| OU19-32-2 | 75 | 212 | 170 | 1.24 | 0.0531 | 0.0006 | 0.3974 | 0.0124 | 0.0546 | 0.0018 | 333.62 | 3.44 | 340 | 9 | 394 | 72 |
| OU19-32-3 | 116 | 367 | 225 | 1.63 | 0.0528 | 0.0005 | 0.3931 | 0.0099 | 0.0540 | 0.0014 | 331.97 | 2.81 | 337 | 7 | 372 | 53 |
| OU19-32-5 | 52 | 145 | 142 | 1.02 | 0.0531 | 0.0006 | 0.3773 | 0.0125 | 0.0516 | 0.0016 | 333.43 | 3.80 | 325 | 9 | 333 | 72 |
| OU19-32-6 | 52 | 150 | 126 | 1.19 | 0.0531 | 0.0006 | 0.3899 | 0.0121 | 0.0535 | 0.0017 | 333.75 | 3.57 | 334 | 9 | 350 | 70 |
| OU19-32-7 | 120 | 354 | 226 | 1.57 | 0.0530 | 0.0005 | 0.3929 | 0.0120 | 0.0537 | 0.0016 | 333.16 | 3.10 | 337 | 9 | 367 | 67 |
| OU19-32-8 | 108 | 312 | 198 | 1.57 | 0.0532 | 0.0005 | 0.4047 | 0.0109 | 0.0554 | 0.0016 | 334.33 | 3.29 | 345 | 8 | 428 | 69 |
| OU19-32-9 | 93 | 280 | 179 | 1.56 | 0.0532 | 0.0007 | 0.3816 | 0.0116 | 0.0519 | 0.0015 | 334.19 | 4.30 | 328 | 9 | 283 | 65 |
| OU19-32-10 | 100 | 295 | 196 | 1.51 | 0.0532 | 0.0005 | 0.4007 | 0.0119 | 0.0546 | 0.0016 | 334.27 | 3.01 | 342 | 9 | 398 | 67 |
| OU19-32-12 | 99 | 287 | 208 | 1.38 | 0.0532 | 0.0005 | 0.3923 | 0.0121 | 0.0535 | 0.0016 | 333.92 | 3.13 | 336 | 9 | 350 | 69 |
| OU19-32-13 | 54 | 153 | 127 | 1.20 | 0.0532 | 0.0007 | 0.3747 | 0.0122 | 0.0512 | 0.0016 | 333.89 | 4.36 | 323 | 9 | 250 | 74 |
| OU19-32-14 | 113 | 323 | 205 | 1.57 | 0.0529 | 0.0006 | 0.3980 | 0.0116 | 0.0549 | 0.0017 | 332.45 | 3.50 | 340 | 8 | 406 | 64 |
| OU19-32-18 | 61 | 177 | 136 | 1.30 | 0.0529 | 0.0005 | 0.3790 | 0.0142 | 0.0521 | 0.0020 | 332.50 | 3.14 | 326 | 10 | 300 | 82 |
| OU19-32-19 | 60 | 164 | 139 | 1.18 | 0.0531 | 0.0006 | 0.3901 | 0.0133 | 0.0534 | 0.0018 | 333.22 | 3.70 | 334 | 10 | 346 | 44 |
| OU19-32-20 | 54 | 148 | 131 | 1.13 | 0.0529 | 0.0006 | 0.3949 | 0.0131 | 0.0543 | 0.0018 | 332.44 | 3.89 | 338 | 10 | 389 | 78 |
| BF-1 | | | | | | | | | | | | | | | | |
| BF-1-3 | 16 | 145 | 251 | 0.58 | 0.0536 | 0.0006 | 0.3746 | 0.0126 | 0.0507 | 0.0016 | 336.33 | 3.88 | 323 | 9 | 228 | 76 |
| BF-1-4 | 38 | 573 | 565 | 1.01 | 0.0527 | 0.0006 | 0.3799 | 0.0112 | 0.0525 | 0.0016 | 331.24 | 3.70 | 327 | 8 | 309 | 77 |
| BF-1-9 | 10 | 111 | 156 | 0.71 | 0.0519 | 0.0008 | 0.3841 | 0.0167 | 0.0539 | 0.0024 | 326.04 | 4.70 | 330 | 12 | 369 | 100 |
| BF-1-10 | 19 | 242 | 291 | 0.83 | 0.0535 | 0.0008 | 0.3960 | 0.0131 | 0.0539 | 0.0017 | 335.73 | 4.79 | 339 | 10 | 369 | 72 |
| BF-1-11 | 20 | 274 | 313 | 0.87 | 0.0517 | 0.0006 | 0.3758 | 0.0133 | 0.0528 | 0.0018 | 325.01 | 3.68 | 324 | 10 | 320 | 80 |
| BF-1-12 | 25 | 274 | 386 | 0.71 | 0.0534 | 0.0005 | 0.3899 | 0.0103 | 0.0530 | 0.0014 | 335.63 | 3.05 | 334 | 8 | 328 | 61 |
| BF-1-16 | 26 | 244 | 411 | 0.59 | 0.0540 | 0.0006 | 0.3829 | 0.0114 | 0.0517 | 0.0016 | 339.33 | 3.97 | 329 | 8 | 333 | 70 |
| BF-1-17 | 41 | 487 | 631 | 0.77 | 0.0529 | 0.0006 | 0.3966 | 0.0106 | 0.0543 | 0.0014 | 332.38 | 3.63 | 339 | 8 | 383 | 59 |
| TS16-3 | | | | | | | | | | | | | | | | |
| TS16-3-1 | 47 | 604 | 621 | 0.97 | 0.0593 | 0.0006 | 0.4434 | 0.0118 | 0.0542 | 0.0014 | 371.09 | 3.37 | 373 | 8 | 389 | 57 |
| TS16-3-2 | 10 | 75 | 140 | 0.54 | 0.0613 | 0.0010 | 0.4938 | 0.0239 | 0.0587 | 0.0028 | 383.30 | 5.97 | 408 | 16 | 554 | 101 |
| TS16-3-3 | 41 | 431 | 558 | 0.77 | 0.0592 | 0.0005 | 0.4584 | 0.0109 | 0.0563 | 0.0014 | 370.63 | 3.19 | 383 | 8 | 465 | 54 |
| TS16-3-4 | 29 | 338 | 379 | 0.89 | 0.0601 | 0.0007 | 0.4763 | 0.0126 | 0.0576 | 0.0015 | 376.19 | 4.34 | 396 | 9 | 517 | 57 |
| TS16-3-5 | 25 | 238 | 344 | 0.69 | 0.0604 | 0.0008 | 0.4380 | 0.0146 | 0.0529 | 0.0018 | 377.91 | 4.61 | 369 | 10 | 324 | 71 |
| TS16-3-7 | 45 | 531 | 602 | 0.88 | 0.0594 | 0.0005 | 0.4426 | 0.0105 | 0.0541 | 0.0013 | 371.77 | 2.89 | 372 | 7 | 372 | 56 |
| TS16-3-8 | 36 | 372 | 493 | 0.76 | 0.0585 | 0.0009 | 0.4715 | 0.0130 | 0.0594 | 0.0020 | 366.52 | 5.49 | 392 | 9 | 583 | 74 |
| TS16-3-10 | 48 | 340 | 697 | 0.49 | 0.0597 | 0.0007 | 0.4684 | 0.0113 | 0.0569 | 0.0014 | 373.88 | 4.13 | 390 | 8 | 487 | 52 |
| TS16-3-11 | 40 | 355 | 583 | 0.61 | 0.0599 | 0.0006 | 0.4853 | 0.0139 | 0.0587 | 0.0016 | 374.88 | 3.89 | 402 | 10 | 554 | 59 |
| TS16-3-12 | 68 | 103 | 1089 | 0.09 | 0.0609 | 0.0005 | 0.4596 | 0.0096 | 0.0547 | 0.0011 | 380.89 | 3.17 | 384 | 7 | 467 | 51 |
| TS16-3-14 | 20 | 188 | 285 | 0.66 | 0.0588 | 0.0006 | 0.4254 | 0.0140 | 0.0526 | 0.0018 | 368.39 | 3.61 | 360 | 10 | 322 | 78 |
| TS16-3-15 | 14 | 97 | 216 | 0.45 | 0.0583 | 0.0008 | 0.4436 | 0.0227 | 0.0558 | 0.0031 | 365.15 | 4.58 | 373 | 16 | 443 | 121 |
| TS16-3-16 | 12 | 127 | 174 | 0.73 | 0.0598 | 0.0008 | 0.4375 | 0.0177 | 0.0533 | 0.0021 | 374.20 | 5.07 | 368 | 13 | 343 | 87 |
| TS16-3-17 | 13 | 120 | 188 | 0.64 | 0.0587 | 0.0008 | 0.4111 | 0.0201 | 0.0517 | 0.0029 | 367.60 | 4.90 | 350 | 14 | 333 | 126 |
| TS16-3-18 | 34 | 349 | 485 | 0.72 | 0.0585 | 0.0006 | 0.4218 | 0.0119 | 0.0523 | 0.0014 | 366.29 | 3.48 | 357 | 8 | 298 | 66 |
| TS16-3-19 | 26 | 220 | 364 | 0.60 | 0.0594 | 0.0007 | 0.4808 | 0.0165 | 0.0588 | 0.0020 | 372.18 | 4.34 | 399 | 11 | 561 | 72 |
| TS16-3-20 | 24 | 222 | 340 | 0.65 | 0.0580 | 0.0007 | 0.4546 | 0.0172 | 0.0570 | 0.0021 | 363.20 | 4.34 | 381 | 12 | 494 | 81 |

表2 南蒙古岛弧地体中酸性岩石锆石 Hf 同位素分析结果

Table 2 Zircon Hf isotopic data for intermediate acidity magmatic rocks in the island arc terrane of South Mongolia

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **样品编号** | **Age (Ma)** | **176Yb/177Hf** | **176Lu/177Hf** | **176Hf/177Hf** | **2σ** | **176Hf/177Hfi** | **eHf(0)** | **εHf(t)** | ***t*DM1** | ***t*DM2** | *f***Lu/Hf** |
| KM19-14 | | | | | | | | | | | |
| KM19-14-01 | 332.5 | 0.029097 | 0.000869 | 0.282919 | 0.000024 | 0.282914 | 5.3 | 12.3 | 471 | 553 | -0.97 |
| KM19-14-07 | 332.0 | 0.039302 | 0.001368 | 0.282940 | 0.000027 | 0.282932 | 6.0 | 12.9 | 447 | 513 | -0.96 |
| KM19-14-08 | 332.4 | 0.050313 | 0.001628 | 0.283027 | 0.000024 | 0.283016 | 9.1 | 16.0 | 325 | 321 | -0.95 |
| KM19-14-11 | 332.7 | 0.032548 | 0.000980 | 0.282903 | 0.000025 | 0.282897 | 4.7 | 11.7 | 495 | 591 | -0.97 |
| KM19-14-12 | 332.6 | 0.052863 | 0.001703 | 0.282905 | 0.000030 | 0.282894 | 4.8 | 11.6 | 502 | 597 | -0.95 |
| KM19-14-13 | 332.7 | 0.036307 | 0.001076 | 0.282959 | 0.000022 | 0.282952 | 6.7 | 13.7 | 416 | 465 | -0.97 |
| KM19-14-14 | 332.0 | 0.042212 | 0.001304 | 0.282925 | 0.000025 | 0.282916 | 5.5 | 12.4 | 468 | 547 | -0.96 |
| KM19-14-16 | 329.8 | 0.032344 | 0.001103 | 0.282935 | 0.000022 | 0.282928 | 5.8 | 12.8 | 451 | 522 | -0.97 |
| KM19-14-17 | 329.8 | 0.038848 | 0.001329 | 0.282983 | 0.000025 | 0.282975 | 7.5 | 14.4 | 384 | 416 | -0.96 |
| KM19-14-20 | 332.1 | 0.029009 | 0.000874 | 0.282938 | 0.000023 | 0.282933 | 5.9 | 13.0 | 444 | 511 | -0.97 |
| KM19-21 | | | | | | | | | | | |
| KM19-21-01 | 325.2 | 0.064501 | 0.001612 | 0.282995 | 0.000026 | 0.282985 | 8.0 | 14.7 | 371 | 396 | -0.95 |
| KM19-21-02 | 323.1 | 0.025990 | 0.000766 | 0.282924 | 0.000029 | 0.282920 | 5.5 | 12.3 | 462 | 546 | -0.98 |
| KM19-21-03 | 323.1 | 0.033890 | 0.000940 | 0.282937 | 0.000029 | 0.282931 | 5.9 | 12.7 | 446 | 520 | -0.97 |
| KM19-21-04 | 324.3 | 0.043638 | 0.001258 | 0.282977 | 0.000025 | 0.282970 | 7.3 | 14.1 | 392 | 432 | -0.96 |
| KM19-21-06 | 323.6 | 0.042098 | 0.001341 | 0.282922 | 0.000032 | 0.282914 | 5.4 | 12.1 | 472 | 558 | -0.96 |
| KM19-21-14 | 323.3 | 0.024891 | 0.000749 | 0.282959 | 0.000027 | 0.282955 | 6.7 | 13.6 | 412 | 466 | -0.98 |
| KM19-21-15 | 323.5 | 0.028302 | 0.000873 | 0.282987 | 0.000030 | 0.282982 | 7.7 | 14.5 | 374 | 404 | -0.97 |
| KM19-21-16 | 323.5 | 0.031153 | 0.000988 | 0.282893 | 0.000028 | 0.282887 | 4.3 | 11.2 | 510 | 620 | -0.97 |
| KM19-21-20 | 324.5 | 0.053754 | 0.001356 | 0.282932 | 0.000031 | 0.282923 | 5.7 | 12.5 | 459 | 536 | -0.96 |
| KMD19-03 | | | | | | | | | | | |
| KMD19-03-02 | 324.7 | 0.063008 | 0.002417 | 0.282938 | 0.000049 | 0.282923 | 5.9 | 12.5 | 463 | 536 | -0.93 |
| KMD19-03-04 | 324.0 | 0.022113 | 0.000803 | 0.282937 | 0.000028 | 0.282932 | 5.9 | 12.8 | 444 | 516 | -0.98 |
| KMD19-03-11 | 332.6 | 0.038087 | 0.001472 | 0.282892 | 0.000026 | 0.282883 | 4.3 | 11.2 | 517 | 623 | -0.96 |
| KMD19-03-12 | 332.9 | 0.020910 | 0.000821 | 0.282900 | 0.000024 | 0.282895 | 4.6 | 11.7 | 497 | 596 | -0.98 |
| KMD19-03-13 | 332.6 | 0.032612 | 0.001045 | 0.282875 | 0.000029 | 0.282869 | 3.7 | 10.7 | 535 | 654 | -0.97 |
| KMD19-03-14 | 332.0 | 0.023390 | 0.000742 | 0.282899 | 0.000028 | 0.282895 | 4.6 | 11.6 | 497 | 597 | -0.98 |
| KMD19-03-15 | 333.2 | 0.021166 | 0.000689 | 0.282921 | 0.000024 | 0.282917 | 5.4 | 12.5 | 465 | 545 | -0.98 |
| KMD19-03-17 | 332.3 | 0.031285 | 0.001136 | 0.282866 | 0.000030 | 0.282859 | 3.4 | 10.4 | 549 | 676 | -0.97 |
| KMD19-03-18 | 332.7 | 0.033743 | 0.001098 | 0.283014 | 0.000025 | 0.283007 | 8.6 | 15.6 | 339 | 342 | -0.97 |
| KMD19-03-20 | 332.1 | 0.047713 | 0.001604 | 0.282956 | 0.000025 | 0.282946 | 6.6 | 13.5 | 427 | 480 | -0.95 |
| OU19-32 | | | | | | | | | | | |
| OU19-32-1 | 332.3 | 0.074869 | 0.001871 | 0.282990 | 0.000026 | 0.282978 | 7.8 | 14.6 | 381 | 408 | -0.94 |
| OU19-32-2 | 333.6 | 0.070946 | 0.001733 | 0.282909 | 0.000029 | 0.282898 | 4.9 | 11.8 | 496 | 587 | -0.95 |
| OU19-32-3 | 332.0 | 0.084011 | 0.002101 | 0.282963 | 0.000025 | 0.282950 | 6.8 | 13.6 | 422 | 471 | -0.94 |
| OU19-32-6 | 333.7 | 0.070114 | 0.001791 | 0.283032 | 0.000030 | 0.283021 | 9.3 | 16.1 | 318 | 310 | -0.95 |
| OU19-32-7 | 333.2 | 0.077768 | 0.001904 | 0.282984 | 0.000034 | 0.282972 | 7.6 | 14.4 | 389 | 420 | -0.94 |
| OU19-32-9 | 334.2 | 0.047903 | 0.001243 | 0.282962 | 0.000020 | 0.282955 | 6.8 | 13.8 | 414 | 460 | -0.96 |
| OU19-32-12 | 333.9 | 0.053825 | 0.001547 | 0.283006 | 0.000025 | 0.282996 | 8.3 | 15.3 | 354 | 366 | -0.95 |
| OU19-32-18 | 332.5 | 0.044878 | 0.001185 | 0.282989 | 0.000021 | 0.282982 | 7.8 | 14.7 | 374 | 399 | -0.96 |
| OU19-32-19 | 333.2 | 0.055876 | 0.001468 | 0.283027 | 0.000023 | 0.283018 | 9.1 | 16.0 | 323 | 317 | -0.96 |
| OU19-32-20 | 332.4 | 0.050017 | 0.001303 | 0.282967 | 0.000018 | 0.282959 | 7.0 | 13.9 | 408 | 451 | -0.96 |
| OU19-01 | | | | | | | | | | | |
| OU19-01-5 | 330.6 | 0.040759 | 0.001336 | 0.282896 | 0.000022 | 0.282887 | 4.4 | 11.4 | 510 | 614 | -0.96 |
| OU19-01-6 | 330.8 | 0.043372 | 0.001238 | 0.282849 | 0.000025 | 0.282842 | 2.8 | 9.7 | 575 | 717 | -0.96 |
| OU19-01-9 | 332.1 | 0.047817 | 0.001512 | 0.282942 | 0.000027 | 0.282933 | 6.1 | 13.0 | 445 | 510 | -0.95 |
| OU19-01-10 | 332.9 | 0.050276 | 0.001709 | 0.282962 | 0.000033 | 0.282952 | 6.8 | 13.7 | 419 | 467 | -0.95 |
| OU19-01-13 | 333.5 | 0.047106 | 0.001358 | 0.283013 | 0.000022 | 0.283004 | 8.6 | 15.6 | 342 | 347 | -0.96 |
| OU19-13 | | | | | | | | | | | |
| OU19-13-01 | 380.0 | 0.056492 | 0.001794 | 0.282888 | 0.000027 | 0.282875 | 4.2 | 12.0 | 528 | 610 | -0.95 |
| OU19-13-02 | 380.7 | 0.044883 | 0.001395 | 0.282890 | 0.000026 | 0.282880 | 4.3 | 12.2 | 519 | 598 | -0.96 |
| OU19-13-03 | 381.2 | 0.049953 | 0.001507 | 0.282879 | 0.000023 | 0.282869 | 3.9 | 11.8 | 536 | 624 | -0.95 |
| OU19-13-07 | 380.2 | 0.042281 | 0.001303 | 0.282941 | 0.000025 | 0.282932 | 6.1 | 14.0 | 444 | 482 | -0.96 |
| OU19-13-09 | 380.3 | 0.067339 | 0.001981 | 0.282930 | 0.000027 | 0.282916 | 5.7 | 13.5 | 469 | 517 | -0.94 |
| OU19-13-10 | 380.6 | 0.056989 | 0.001729 | 0.282967 | 0.000030 | 0.282955 | 7.0 | 14.8 | 412 | 429 | -0.95 |
| OU19-13-13 | 380.5 | 0.049303 | 0.001600 | 0.282890 | 0.000020 | 0.282879 | 4.3 | 12.2 | 521 | 601 | -0.95 |
| OU19-13-14 | 381.0 | 0.045979 | 0.001536 | 0.282913 | 0.000022 | 0.282902 | 5.0 | 13.0 | 489 | 550 | -0.95 |
| OU19-13-15 | 380.3 | 0.038349 | 0.001268 | 0.282907 | 0.000021 | 0.282898 | 4.9 | 12.8 | 492 | 557 | -0.96 |
| OU19-13-17 | 380.5 | 0.070276 | 0.002604 | 0.282940 | 0.000021 | 0.282922 | 6.0 | 13.7 | 462 | 505 | -0.92 |
| OU19-24-1 | 337.0 | 0.031615 | 0.000992 | 0.282997 | 0.000020 | 0.282990 | 8.0 | 15.1 | 362 | 376 | -0.97 |
| OU19-24-2 | 336.0 | 0.051762 | 0.001428 | 0.282953 | 0.000021 | 0.282944 | 6.5 | 13.5 | 429 | 482 | -0.96 |
| OU19-24-5 | 336.4 | 0.042213 | 0.001162 | 0.282954 | 0.000019 | 0.282946 | 6.5 | 13.6 | 425 | 477 | -0.97 |
| OU19-24-6 | 338.3 | 0.040457 | 0.001136 | 0.282955 | 0.000021 | 0.282948 | 6.5 | 13.6 | 423 | 473 | -0.97 |
| OU19-24-7 | 337.9 | 0.034016 | 0.001020 | 0.282963 | 0.000022 | 0.282957 | 6.8 | 14.0 | 409 | 452 | -0.97 |
| OU19-24-8 | 337.7 | 0.073152 | 0.002407 | 0.282921 | 0.000033 | 0.282906 | 5.3 | 12.2 | 488 | 568 | -0.93 |
| OU19-24-11 | 337.9 | 0.079993 | 0.002207 | 0.282955 | 0.000027 | 0.282942 | 6.6 | 13.4 | 435 | 487 | -0.93 |
| OU19-24-17 | 337.2 | 0.033127 | 0.001126 | 0.282973 | 0.000024 | 0.282966 | 7.2 | 14.3 | 397 | 432 | -0.97 |
| OU19-24-18 | 337.9 | 0.065606 | 0.001929 | 0.282965 | 0.000026 | 0.282952 | 6.9 | 13.8 | 418 | 462 | -0.94 |
| OU19-24-20 | 337.5 | 0.022912 | 0.000761 | 0.282964 | 0.000023 | 0.282959 | 6.8 | 14.0 | 407 | 448 | -0.98 |
| BF-1 | | | | | | | | | | | |
| BF-1-03 | 336.3 | 0.044510 | 0.001767 | 0.282943 | 0.000039 | 0.282932 | 6.1 | 13.1 | 447 | 510 | -0.95 |
| BF-1-04 | 331.2 | 0.076647 | 0.002722 | 0.283000 | 0.000027 | 0.282983 | 8.1 | 14.8 | 374 | 397 | -0.92 |
| BF-1-10 | 335.7 | 0.043807 | 0.001241 | 0.282993 | 0.000017 | 0.282985 | 7.8 | 14.9 | 369 | 389 | -0.96 |
| BF-1-11 | 325.0 | 0.057637 | 0.001984 | 0.282960 | 0.000026 | 0.282947 | 6.6 | 13.4 | 426 | 483 | -0.94 |
| BF-1-12 | 335.6 | 0.039009 | 0.001273 | 0.283006 | 0.000022 | 0.282998 | 8.3 | 15.4 | 351 | 361 | -0.96 |
| BF-1-15 | 336.0 | 0.042483 | 0.001271 | 0.282793 | 0.000023 | 0.282785 | 0.7 | 7.8 | 656 | 846 | -0.96 |
| BF-1-16 | 339.3 | 0.047723 | 0.001333 | 0.282957 | 0.000019 | 0.282949 | 6.6 | 13.7 | 421 | 470 | -0.96 |
| BF-1-17 | 332.4 | 0.033284 | 0.001008 | 0.283011 | 0.000020 | 0.283005 | 8.5 | 15.5 | 341 | 347 | -0.97 |
| TS16-3 | | | | | | | | | | | |
| TS16-3-01 | 374.4 | 0.085100 | 0.002562 | 0.282940 | 0.000020 | 0.282919 | 5.8 | 13.4 | 466 | 516 | -0.92 |
| TS16-3-02 | 383.3 | 0.048884 | 0.001631 | 0.282912 | 0.000025 | 0.282900 | 5.0 | 13.0 | 490 | 553 | -0.95 |
| TS16-3-03 | 372.1 | 0.076468 | 0.002457 | 0.282941 | 0.000019 | 0.282918 | 5.8 | 13.4 | 468 | 520 | -0.93 |
| TS16-3-08 | 372.1 | 0.059399 | 0.001826 | 0.282860 | 0.000019 | 0.282844 | 3.0 | 10.7 | 574 | 689 | -0.95 |
| TS16-3-10 | 373.9 | 0.041322 | 0.001171 | 0.282869 | 0.000019 | 0.282861 | 3.4 | 11.4 | 546 | 650 | -0.96 |
| TS16-3-12 | 380.9 | 0.082499 | 0.002368 | 0.282979 | 0.000021 | 0.282962 | 7.3 | 15.1 | 402 | 414 | -0.93 |
| TS16-3-16 | 374.2 | 0.048323 | 0.001677 | 0.282861 | 0.000024 | 0.282850 | 3.2 | 11.0 | 564 | 674 | -0.95 |
| TS16-3-17 | 367.6 | 0.039818 | 0.001502 | 0.282875 | 0.000025 | 0.282865 | 3.6 | 11.4 | 542 | 644 | -0.95 |

表3 南蒙古岛弧地体主要斑岩铜矿床成岩成矿年龄

Table 3 Summary of isotope ages of the porphyry copper deposits in the island arc terrane of South Mongolia

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **样品编号** | **测试对象** | **年龄（Ma）** | **测试方法** | **数据来源** |
| 哈马戈泰 | | | | |
| KM19-14 | 石英二长闪长玢岩 | 332±2 | LA-ICP-MS锆石U-Pb | 本文 |
| KM19-21 | 花岗闪长斑岩 | 324±2 | LA-ICP-MS锆石U-Pb | 本文 |
| KMD19-03 | 花岗闪长斑岩 | 331±1 | LA-ICP-MS锆石U-Pb | 本文 |
| 奥尤特乌兰 | | | | |
| OU19-01 | 蚀变安山岩 | 332±1 | LA-ICP-MS锆石U-Pb | 本文 |
| OU19-13 | 二长斑岩 | 381±2 | LA-ICP-MS锆石U-Pb | 本文 |
| OU19-24 | 花岗闪长岩 | 338±2 | LA-ICP-MS锆石U-Pb | 本文 |
| OU19-32 | 花岗闪长岩 | 334±2 | LA-ICP-MS锆石U-Pb | 本文 |
| 青狐狸 | | | | |
| BF-01 | 闪长岩 | 333 ± 4 | LA-ICP-MS锆石U-Pb | 本文 |
| 查干苏尔加 | | | | |
| TS16-3 | 似斑状二长花岗岩 | 372±3 | LA-ICP-MS锆石U-Pb | 本文 |
| CT-29 | 辉钼矿 | 370±1 | Re-Os等时线 | Watanabe and Stein, 2000 |
| 2011SEM-103 | 花岗闪长岩 | 367±4 | SHRIMP锆石U-Pb | 朱明帅等，2015 |
| 欧玉陶勒盖 | | | | |
| AJW-03-182 | 石英闪长岩 | 374±3 | SHRIMP锆石U-Pb | Wainwright et al.,2011 |
| AJW-03-181 | 石英二长岩 | 368±3 | SHRIMP锆石U-Pb | Wainwright et al.,2011 |
| AJW-03-185 | 花岗闪长岩 | 366±4 | SHRIMP锆石U-Pb | Wainwright et al.,2011 |
| AJW03-179 | 英安岩 | 363±4 | SHRIMP锆石U-Pb | Wainwright et al.,2011 |
| - | 辉钼矿 | 373~370 | Re-Os等时线 | Kirwin et al., 2005b |
| 苏廷矿区 | | | | |
| 2011SEM-133 | 花岗斑岩 | 333±5 | SHRIMP锆石U-Pb | 朱明帅等，2015 |
| 97.2A | 细粒花岗岩脉 | 325±1 | TIMS锆石U-Pb | Blight et al., 2010b |
| 那瑞胡塔格 | | | | |
| JBSP010 | 石英二长岩 | 332±1 | TIMS锆石U-Pb | Blight et al., 2010b |