

Table 3S Zircon Hf isotopic data for Late Carboniferous intrusive rocks from the Kalamaili region

| Spots | Age | $^{176}\text{Yb}/^{177}\text{Hf}$ | $^{176}\text{Lu}/^{177}\text{Hf}$ | $^{176}\text{Hf}/^{177}\text{Hf}$ | 2σ | $\epsilon_{\text{Hf}}(0)$ | $\epsilon_{\text{Hf}}(t)$ | $T_{\text{DM}}(\text{Ma})$ | $T_{\text{DM2}}(\text{Ma})$ | $f_{\text{Lu/Hf}}$ |
|---------------------------------|-----|-----------------------------------|-----------------------------------|-----------------------------------|-----------|---------------------------|---------------------------|----------------------------|-----------------------------|--------------------|
| Qinchengnan gabbro | | | | | | | | | | |
| T12716-3.5-1 | 320 | 0.076624 | 0.002324 | 0.282833 | 0.000041 | 2.2 | 8.7 | 615 | 778 | -0.93 |
| T12716-3.5-2 | 319 | 0.076486 | 0.002330 | 0.282739 | 0.000027 | -1.2 | 5.3 | 755 | 994 | -0.93 |
| T12716-3.5-3 | 306 | 0.083344 | 0.002353 | 0.282917 | 0.000039 | 5.1 | 11.4 | 494 | 596 | -0.93 |
| T12716-3.5-4 | 308 | 0.064869 | 0.001963 | 0.282733 | 0.000051 | -1.4 | 5.0 | 755 | 1006 | -0.94 |
| T12716-3.5-6 | 316 | 0.072616 | 0.002171 | 0.282828 | 0.000040 | 2.0 | 8.5 | 621 | 790 | -0.93 |
| T12716-3.5-7 | 307 | 0.025784 | 0.000777 | 0.282818 | 0.000033 | 1.6 | 8.2 | 612 | 800 | -0.98 |
| T12716-3.5-8 | 314 | 0.056063 | 0.001750 | 0.282902 | 0.000034 | 4.6 | 11.1 | 507 | 619 | -0.95 |
| T12716-3.5-10 | 306 | 0.024575 | 0.000670 | 0.282745 | 0.000051 | -0.9 | 5.6 | 713 | 964 | -0.98 |
| T12716-3.5-11 | 309 | 0.024628 | 0.000747 | 0.282695 | 0.000076 | -2.7 | 3.9 | 785 | 1077 | -0.98 |
| T12716-3.5-12 | 306 | 0.027065 | 0.000728 | 0.282904 | 0.000034 | 4.7 | 11.3 | 490 | 603 | -0.98 |
| T12716-3.5-16 | 317 | 0.091236 | 0.002320 | 0.282776 | 0.000026 | 0.1 | 6.6 | 700 | 911 | -0.93 |
| T12716-3.5-17 | 320 | 0.046205 | 0.001123 | 0.282819 | 0.000016 | 1.7 | 8.5 | 616 | 794 | -0.97 |
| T12716-3.5-18 | 307 | 0.082518 | 0.001881 | 0.282825 | 0.000026 | 1.9 | 8.3 | 620 | 797 | -0.94 |
| T12716-3.5-19 | 305 | 0.044874 | 0.001149 | 0.282845 | 0.000018 | 2.6 | 9.0 | 580 | 745 | -0.97 |
| T12716-3.5-22 | 308 | 0.048154 | 0.001356 | 0.282811 | 0.000013 | 1.4 | 7.9 | 632 | 823 | -0.96 |
| T12716-3.5-23 | 527 | 0.021764 | 0.000516 | 0.282561 | 0.000017 | -7.5 | 4.0 | 966 | 1243 | -0.98 |
| T12716-3.5-24 | 308 | 0.027804 | 0.000740 | 0.282791 | 0.000021 | 0.7 | 7.3 | 649 | 860 | -0.98 |
| Xiaopu porphyritic monzogranite | | | | | | | | | | |
| T12716-6.3-1 | 321 | 0.168392 | 0.004556 | 0.283013 | 0.000022 | 8.5 | 14.6 | 374 | 399 | -0.86 |
| T12716-6.3-2 | 314 | 0.058323 | 0.001751 | 0.282885 | 0.000018 | 4.0 | 10.5 | 532 | 657 | -0.95 |
| T12716-6.3-4 | 322 | 0.076458 | 0.002282 | 0.282890 | 0.000019 | 4.2 | 10.8 | 531 | 647 | -0.93 |
| T12716-6.3-5 | 318 | 0.046727 | 0.001354 | 0.282858 | 0.000018 | 3.0 | 9.8 | 564 | 710 | -0.96 |
| T12716-6.3-6 | 315 | 0.052299 | 0.001543 | 0.282862 | 0.000022 | 3.2 | 9.8 | 562 | 705 | -0.95 |
| T12716-6.3-7 | 328 | 0.057993 | 0.001671 | 0.282923 | 0.000016 | 5.3 | 12.2 | 475 | 561 | -0.95 |
| T12716-6.3-8 | 318 | 0.058711 | 0.001705 | 0.282933 | 0.000017 | 5.7 | 12.3 | 462 | 544 | -0.95 |
| T12716-6.3-9 | 328 | 0.052644 | 0.001611 | 0.282925 | 0.000018 | 5.4 | 12.3 | 472 | 555 | -0.95 |
| T12716-6.3-11 | 331 | 0.144998 | 0.003936 | 0.283081 | 0.000028 | 10.9 | 17.4 | 262 | 228 | -0.88 |
| T12716-6.3-12 | 304 | 0.050943 | 0.001486 | 0.282956 | 0.000024 | 6.5 | 12.9 | 425 | 496 | -0.96 |
| T12716-6.3-17 | 328 | 0.512424 | 0.015077 | 0.283138 | 0.000045 | 13.0 | 16.9 | 256 | 256 | -0.55 |
| T12716-6.3-18 | 318 | 0.088073 | 0.002591 | 0.282918 | 0.000021 | 5.2 | 11.6 | 494 | 589 | -0.92 |
| T12716-6.3-19 | 317 | 0.132596 | 0.003558 | 0.283001 | 0.000028 | 8.1 | 14.3 | 382 | 415 | -0.89 |
| T12716-6.3-20 | 305 | 0.037115 | 0.001120 | 0.282846 | 0.000015 | 2.6 | 9.1 | 578 | 742 | -0.97 |
| T12716-6.3-21 | 320 | 0.060030 | 0.001741 | 0.282860 | 0.000014 | 3.1 | 9.8 | 568 | 710 | -0.95 |
| T12716-6.3-22 | 310 | 0.056987 | 0.001680 | 0.282850 | 0.000014 | 2.8 | 9.2 | 581 | 736 | -0.95 |
| T12716-6.3-23 | 321 | 0.143817 | 0.003662 | 0.282983 | 0.000024 | 7.5 | 13.7 | 411 | 455 | -0.89 |
| T12716-6.3-25 | 319 | 0.085411 | 0.002399 | 0.282912 | 0.000012 | 5.0 | 11.5 | 501 | 600 | -0.93 |
| T12716-6.3-26 | 311 | 0.069710 | 0.002011 | 0.282889 | 0.000014 | 4.2 | 10.6 | 529 | 651 | -0.94 |
| T12716-6.3-27 | 309 | 0.356844 | 0.009020 | 0.283106 | 0.000032 | 11.8 | 16.8 | 263 | 250 | -0.73 |
| T12716-6.3-29 | 318 | 0.147377 | 0.003878 | 0.282955 | 0.000017 | 6.5 | 12.7 | 456 | 523 | -0.88 |
| T12716-6.3-30 | 303 | 0.040241 | 0.001206 | 0.282857 | 0.000015 | 3.0 | 9.4 | 563 | 718 | -0.96 |
| Wuzunbulak diorite | | | | | | | | | | |
| T15709-2-1 | 304 | 0.020741 | 0.000596 | 0.282907 | 0.000025 | 4.8 | 11.3 | 485 | 599 | -0.98 |
| T15709-2-2 | 309 | 0.027032 | 0.000770 | 0.282989 | 0.000024 | 7.7 | 14.2 | 370 | 413 | -0.98 |
| T15709-2-3 | 307 | 0.026004 | 0.000710 | 0.282954 | 0.000027 | 6.4 | 12.9 | 420 | 494 | -0.98 |
| T15709-2-4 | 305 | 0.043335 | 0.001132 | 0.282929 | 0.000030 | 5.5 | 11.9 | 460 | 555 | -0.97 |
| T15709-2-5 | 299 | 0.039549 | 0.001085 | 0.282960 | 0.000029 | 6.6 | 13.0 | 415 | 484 | -0.97 |
| T15709-2-6 | 312 | 0.051425 | 0.001346 | 0.282901 | 0.000027 | 4.6 | 10.9 | 503 | 622 | -0.96 |
| T15709-2-7 | 305 | 0.037900 | 0.001049 | 0.283027 | 0.000026 | 9.0 | 15.4 | 319 | 330 | -0.97 |
| T15709-2-8 | 306 | 0.049801 | 0.001275 | 0.282958 | 0.000029 | 6.6 | 12.9 | 421 | 492 | -0.96 |
| T15709-2-11 | 308 | 0.024897 | 0.000718 | 0.282938 | 0.000024 | 5.9 | 12.4 | 442 | 529 | -0.98 |
| T15709-2-12 | 309 | 0.047635 | 0.001326 | 0.283030 | 0.000028 | 9.1 | 15.5 | 317 | 327 | -0.96 |
| T15709-2-13 | 300 | 0.036238 | 0.001063 | 0.282968 | 0.000025 | 6.9 | 13.3 | 404 | 466 | -0.97 |
| T15709-2-14 | 304 | 0.059192 | 0.001554 | 0.282895 | 0.000030 | 4.3 | 10.7 | 514 | 638 | -0.95 |
| T15709-2-15 | 306 | 0.043723 | 0.001124 | 0.283033 | 0.000025 | 9.2 | 15.6 | 311 | 318 | -0.97 |
| T15709-2-16 | 307 | 0.049738 | 0.001332 | 0.282962 | 0.000027 | 6.7 | 13.1 | 415 | 483 | -0.96 |

| Spots | Age | $^{176}\text{Yb}/^{177}\text{Hf}$ | $^{176}\text{Lu}/^{177}\text{Hf}$ | $^{176}\text{Hf}/^{177}\text{Hf}$ | 2σ | $e_{\text{Hf}}(0)$ | $e_{\text{Hf}}(t)$ | $T_{\text{DM}}(\text{Ma})$ | $T_{\text{DM2}}(\text{Ma})$ | $f_{\text{Lu/Hf}}$ |
|---------------------|-----|-----------------------------------|-----------------------------------|-----------------------------------|-----------|--------------------|--------------------|----------------------------|-----------------------------|--------------------|
| T15709-2-17 | 306 | 0.074044 | 0.001944 | 0.282916 | 0.000030 | 5.1 | 11.3 | 489 | 595 | -0.94 |
| T15709-2-18 | 287 | 0.049481 | 0.001348 | 0.282902 | 0.000030 | 4.6 | 10.9 | 501 | 620 | -0.96 |
| T15709-2-19 | 293 | 0.035993 | 0.000995 | 0.282903 | 0.000028 | 4.6 | 11.1 | 495 | 612 | -0.97 |
| T15709-2-20 | 299 | 0.053372 | 0.001588 | 0.282897 | 0.000027 | 4.4 | 10.7 | 511 | 633 | -0.95 |
| T15709-2-21 | 294 | 0.039924 | 0.001161 | 0.282949 | 0.000026 | 6.2 | 12.6 | 432 | 511 | -0.97 |
| T15709-2-22 | 297 | 0.028824 | 0.000861 | 0.282995 | 0.000023 | 7.9 | 14.3 | 363 | 401 | -0.97 |
| T15709-2-23 | 291 | 0.030893 | 0.000912 | 0.282886 | 0.000024 | 4.0 | 10.5 | 518 | 651 | -0.97 |
| T15709-2-24 | 292 | 0.039624 | 0.001169 | 0.282930 | 0.000028 | 5.6 | 12.0 | 459 | 553 | -0.96 |
| Yiwuxi granodiorite | | | | | | | | | | |
| 16913-1-24 | 304 | 0.055258 | 0.001796 | 0.282915 | 0.000027 | 5.1 | 11.4 | 488 | 594 | -0.95 |
| 16913-1-23 | 300 | 0.036677 | 0.001272 | 0.282815 | 0.000018 | 1.5 | 7.9 | 625 | 815 | -0.96 |
| 16913-1-22 | 301 | 0.072201 | 0.002154 | 0.282932 | 0.000020 | 5.7 | 11.9 | 468 | 559 | -0.94 |
| 16913-1-21 | 303 | 0.048325 | 0.001582 | 0.282800 | 0.000023 | 1.0 | 7.3 | 651 | 852 | -0.95 |
| 16913-1-20 | 305 | 0.040746 | 0.001238 | 0.282893 | 0.000015 | 4.3 | 10.7 | 513 | 638 | -0.96 |
| 16913-1-19 | 298 | 0.080212 | 0.002764 | 0.282870 | 0.000048 | 3.5 | 9.6 | 568 | 709 | -0.92 |
| 16913-1-18 | 299 | 0.036119 | 0.001177 | 0.282847 | 0.000014 | 2.6 | 9.1 | 578 | 742 | -0.96 |
| 16913-1-17 | 299 | 0.050482 | 0.001732 | 0.282872 | 0.000029 | 3.5 | 9.9 | 550 | 691 | -0.95 |
| 16913-1-16 | 304 | 0.063014 | 0.001857 | 0.282882 | 0.000014 | 3.9 | 10.2 | 537 | 669 | -0.94 |
| 16913-1-15 | 301 | 0.031094 | 0.000953 | 0.282849 | 0.000012 | 2.7 | 9.2 | 571 | 734 | -0.97 |
| 16913-1-13 | 307 | 0.048453 | 0.001521 | 0.282855 | 0.000024 | 3.0 | 9.3 | 571 | 727 | -0.95 |
| 16913-1-13 | 307 | 0.042898 | 0.001430 | 0.282856 | 0.000021 | 3.0 | 9.3 | 569 | 724 | -0.96 |
| 16913-1-12 | 305 | 0.050575 | 0.001732 | 0.282818 | 0.000028 | 1.6 | 8.0 | 628 | 814 | -0.95 |
| 16913-1-10 | 306 | 0.041220 | 0.001279 | 0.282871 | 0.000016 | 3.5 | 9.9 | 545 | 689 | -0.96 |
| 16913-1-11 | 303 | 0.036456 | 0.001122 | 0.282862 | 0.000014 | 3.2 | 9.6 | 555 | 707 | -0.97 |
| 16913-1-9 | 305 | 0.051786 | 0.001678 | 0.282837 | 0.000039 | 2.3 | 8.6 | 600 | 771 | -0.95 |
| 16913-1-8 | 299 | 0.051498 | 0.001609 | 0.282838 | 0.000018 | 2.3 | 8.7 | 597 | 767 | -0.95 |
| 16913-1-7 | 305 | 0.052967 | 0.001742 | 0.282731 | 0.000056 | -1.5 | 4.8 | 754 | 1013 | -0.95 |
| 16913-1-6 | 300 | 0.062280 | 0.002108 | 0.282842 | 0.000035 | 2.5 | 8.7 | 599 | 764 | -0.94 |
| 16913-1-5 | 307 | 0.045090 | 0.001471 | 0.282856 | 0.000021 | 3.0 | 9.3 | 570 | 726 | -0.96 |