Supplementary table 3 In situ zircon Hf isotope compositions from the granitoids from Qiyugou gold deposit

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Analysis name | Age (Ma) | 176Yb/177Hf | 2σ | 176Lu/177Hf | 2σ | 176Hf/177Hf | 2σ | (176Hf/177Hf)i | εHf(0) | εHf(t) | TDM1 (Ma) | TDM2(Ma) | fLu/Hf |
| **Porphyritic monzogranite at Qi189 pluton** | | | | | | | | | | | | | |
| QYG-B02\_1 | 130 | 0.042020 | 0.000270 | 0.001393 | 0.000007 | 0.282092 | 0.000039 | 0.282089 | -24.0 | -21.3 | 1652 | 2537 | -0.96 |
| QYG-B02\_2 | 133 | 0.068600 | 0.002500 | 0.002300 | 0.000140 | 0.282090 | 0.000042 | 0.282084 | -24.1 | -21.4 | 1696 | 2544 | -0.93 |
| QYG-B02\_3 | 129 | 0.037700 | 0.001100 | 0.001282 | 0.000039 | 0.282142 | 0.000034 | 0.282139 | -22.3 | -19.6 | 1577 | 2426 | -0.96 |
| QYG-B02\_4 | 133 | 0.085800 | 0.005200 | 0.003120 | 0.000230 | 0.282176 | 0.000076 | 0.282168 | -21.1 | -18.4 | 1608 | 2357 | -0.91 |
| QYG-B02\_5 | 132 | 0.036050 | 0.000360 | 0.001274 | 0.000027 | 0.282124 | 0.000041 | 0.282121 | -22.9 | -20.1 | 1602 | 2464 | -0.96 |
| QYG-B02\_6 | 132 | 0.034100 | 0.001800 | 0.001012 | 0.000060 | 0.282088 | 0.000035 | 0.282085 | -24.2 | -21.4 | 1641 | 2543 | -0.97 |
| QYG-B02\_7 | 131 | 0.041200 | 0.003200 | 0.001530 | 0.000120 | 0.282180 | 0.000100 | 0.282176 | -20.9 | -18.2 | 1534 | 2342 | -0.95 |
| QYG-B02\_8 | 130 | 0.051300 | 0.005900 | 0.001860 | 0.000240 | 0.282174 | 0.000045 | 0.282169 | -21.1 | -18.5 | 1556 | 2357 | -0.94 |
| QYG-B02\_9 | 132 | 0.075990 | 0.000270 | 0.002279 | 0.000009 | 0.282357 | 0.000042 | 0.282351 | -14.7 | -12.0 | 1309 | 1949 | -0.93 |
| QYG-B02\_10 | 128 | 0.067800 | 0.006500 | 0.002110 | 0.000170 | 0.282002 | 0.000040 | 0.281997 | -27.2 | -24.6 | 1813 | 2741 | -0.94 |
| **Granite porphyry** | | | | | | | | | | | | | |
| QYG-BQ01\_1 | 132 | 0.193500 | 0.000750 | 0.005669 | 0.000013 | 0.281734 | 0.000045 | 0.281720 | -36.7 | -34.3 | 2428 | 3343 | -0.83 |
| QYG-BQ01\_2 | 132 | 0.226500 | 0.002800 | 0.006400 | 0.000120 | 0.281650 | 0.000049 | 0.281634 | -39.7 | -37.4 | 2616 | 3530 | -0.81 |
| QYG-BQ01\_3 | 134 | 0.172800 | 0.003100 | 0.005727 | 0.000066 | 0.281735 | 0.000043 | 0.281721 | -36.7 | -34.2 | 2430 | 3340 | -0.83 |
| QYG-BQ01\_4 | 134 | 0.058730 | 0.000530 | 0.001968 | 0.000015 | 0.281836 | 0.000040 | 0.281831 | -33.1 | -30.3 | 2042 | 3104 | -0.94 |
| QYG-BQ01\_5 | 133 | 0.073800 | 0.003300 | 0.002750 | 0.000190 | 0.281861 | 0.000040 | 0.281854 | -32.2 | -29.5 | 2049 | 3053 | -0.92 |
| QYG-BQ01\_6 | 133 | 0.059500 | 0.001400 | 0.001932 | 0.000044 | 0.281739 | 0.000031 | 0.281734 | -36.5 | -33.8 | 2177 | 3318 | -0.94 |
| QYG-BQ01\_7 | 132 | 0.270000 | 0.120000 | 0.004500 | 0.001200 | 0.281787 | 0.000041 | 0.281779 | -34.8 | -32.2 | 2183 | 3217 | -0.90 |
| QYG-BQ01\_8 | 135 | 0.098300 | 0.001800 | 0.003189 | 0.000061 | 0.281719 | 0.000034 | 0.281707 | -37.2 | -34.8 | 2395 | 3373 | -0.85 |
| **Monzogranite porphyry** | | | | | | | | | | | | | |
| QYG-BR01\_1 | 126 | 0.034570 | 0.000840 | 0.001171 | 0.000023 | 0.282285 | 0.000040 | 0.282282 | -17.2 | -14.6 | 1372 | 2109 | -0.96 |
| QYG-BR01\_2 | 129 | 0.033700 | 0.001300 | 0.001157 | 0.000042 | 0.282312 | 0.000038 | 0.282309 | -16.3 | -13.5 | 1334 | 2047 | -0.97 |
| QYG-BR01\_3 | 128 | 0.032530 | 0.000670 | 0.001110 | 0.000023 | 0.282321 | 0.000042 | 0.282318 | -15.9 | -13.2 | 1319 | 2024 | -0.97 |
| QYG-BR01\_4 | 126 | 0.030340 | 0.000730 | 0.001036 | 0.000019 | 0.282292 | 0.000042 | 0.282290 | -17.0 | -14.3 | 1357 | 2091 | -0.97 |
| QYG-BR01\_5 | 128 | 0.022440 | 0.000390 | 0.000771 | 0.000012 | 0.282321 | 0.000038 | 0.282319 | -15.9 | -13.2 | 1308 | 2026 | -0.98 |
| QYG-BR01\_6 | 127 | 0.038980 | 0.000520 | 0.001262 | 0.000013 | 0.282308 | 0.000040 | 0.282305 | -16.4 | -13.7 | 1343 | 2057 | -0.96 |
| QYG-BR01\_7 | 128 | 0.022750 | 0.000590 | 0.000773 | 0.000017 | 0.282331 | 0.000038 | 0.282329 | -15.6 | -12.9 | 1294 | 2003 | -0.98 |
| QYG-BR01\_8 | 131 | 0.035010 | 0.000770 | 0.001225 | 0.000029 | 0.282316 | 0.000038 | 0.282313 | -16.1 | -13.4 | 1331 | 2038 | -0.96 |
| QYG-BR01\_9 | 129 | 0.024820 | 0.000350 | 0.000836 | 0.000017 | 0.282299 | 0.000039 | 0.282297 | -16.7 | -13.9 | 1341 | 2073 | -0.97 |
| QYG-BR01\_10 | 127 | 0.028630 | 0.000570 | 0.001013 | 0.000017 | 0.282314 | 0.000043 | 0.282312 | -16.2 | -13.5 | 1326 | 2041 | -0.97 |
| QYG-BR01\_11 | 127 | 0.023760 | 0.000450 | 0.000802 | 0.000019 | 0.282306 | 0.000043 | 0.282304 | -16.5 | -13.8 | 1330 | 2059 | -0.98 |
| QYG-BR01\_12 | 130 | 0.034300 | 0.001500 | 0.001253 | 0.000086 | 0.282311 | 0.000042 | 0.282308 | -16.3 | -13.6 | 1339 | 2050 | -0.96 |
| QYG-BR01\_13 | 129 | 0.032930 | 0.000900 | 0.001085 | 0.000035 | 0.282345 | 0.000047 | 0.282342 | -15.1 | -12.4 | 1285 | 1972 | -0.97 |
| QYG-BR01\_14 | 126 | 0.027240 | 0.000440 | 0.000926 | 0.000020 | 0.282329 | 0.000047 | 0.282327 | -15.7 | -12.9 | 1302 | 2007 | -0.97 |
| QYG-BR01\_15 | 129 | 0.048340 | 0.000990 | 0.001624 | 0.000033 | 0.282374 | 0.000036 | 0.282370 | -14.1 | -11.4 | 1262 | 1912 | -0.95 |
| **Porphyritic monzogranite beneath J4 breccia pipe** | | | | | | | | | | | | | |
| QYG-B06\_1 | 128 | 0.035200 | 0.003000 | 0.001221 | 0.000097 | 0.282130 | 0.000034 | 0.282127 | -22.7 | -20.0 | 1591 | 2453 | -0.96 |
| QYG-B06\_2 | 131 | 0.058300 | 0.002800 | 0.002080 | 0.000110 | 0.282103 | 0.000056 | 0.282098 | -23.7 | -21.0 | 1667 | 2515 | -0.94 |
| QYG-B06\_3 | 132 | 0.040900 | 0.001600 | 0.001209 | 0.000062 | 0.282265 | 0.000037 | 0.282262 | -17.9 | -15.1 | 1402 | 2150 | -0.96 |
| QYG-B06\_4 | 128 | 0.071900 | 0.008200 | 0.002310 | 0.000190 | 0.282073 | 0.000038 | 0.282067 | -24.7 | -22.1 | 1721 | 2585 | -0.93 |
| QYG-B06\_5 | 129 | 0.061700 | 0.005000 | 0.002310 | 0.000190 | 0.282088 | 0.000044 | 0.282082 | -24.2 | -21.6 | 1699 | 2551 | -0.93 |
| QYG-B06\_6 | 132 | 0.025400 | 0.001500 | 0.000822 | 0.000057 | 0.282090 | 0.000052 | 0.282088 | -24.1 | -21.3 | 1630 | 2538 | -0.98 |
| QYG-B06\_7 | 132 | 0.085400 | 0.002000 | 0.002556 | 0.000086 | 0.282160 | 0.000039 | 0.282154 | -21.6 | -19.0 | 1606 | 2390 | -0.92 |
| QYG-B06\_8 | 129 | 0.058600 | 0.002100 | 0.002070 | 0.000140 | 0.282084 | 0.000037 | 0.282079 | -24.3 | -21.7 | 1694 | 2559 | -0.94 |
| QYG-B06\_9 | 129 | 0.024910 | 0.000450 | 0.001013 | 0.000031 | 0.282149 | 0.000034 | 0.282147 | -22.0 | -19.3 | 1556 | 2409 | -0.97 |
| QYG-B06\_10 | 131 | 0.086900 | 0.003700 | 0.002840 | 0.000130 | 0.282008 | 0.000054 | 0.282001 | -27.0 | -24.4 | 1841 | 2729 | -0.91 |
| QYG-B06\_11 | 130 | 0.051900 | 0.001300 | 0.001800 | 0.000062 | 0.281965 | 0.000050 | 0.281961 | -28.5 | -25.9 | 1850 | 2821 | -0.95 |
| QYG-B06\_12 | 128 | 0.057200 | 0.002800 | 0.002150 | 0.000140 | 0.282092 | 0.000044 | 0.282087 | -24.0 | -21.4 | 1686 | 2541 | -0.94 |
| QYG-B06\_13 | 132 | 0.068000 | 0.002200 | 0.002325 | 0.000084 | 0.282138 | 0.000042 | 0.282132 | -22.4 | -19.7 | 1628 | 2438 | -0.93 |
| QYG-B06\_14 | 128 | 0.064400 | 0.003300 | 0.002280 | 0.000160 | 0.282123 | 0.000042 | 0.282118 | -23.0 | -20.3 | 1647 | 2473 | -0.93 |
| **Reference materials** | 176Yb/177Hf | 2σ | 176Lu/177Hf | 2σ | 176Hf/177Hf | 2σ | 178Hf/177Hf | 2σ | 180Hf/177Hf | 2σ |
| **Mudtank** | | | | | | | | | | |
| mud-1 | 0.001066 | 0.0000097 | 0.00002377 | 0.00000023 | 0.28252 | 0.000043 | 1.46724 | 0.00018 | 1.8865 | 0.00014 |
| mud-2 | 0.0011575 | 0.0000097 | 0.00002611 | 0.00000035 | 0.282511 | 0.00004 | 1.46719 | 0.00015 | 1.88668 | 0.00015 |
| mud-3 | 0.0009789 | 0.0000096 | 0.00002219 | 0.00000034 | 0.282514 | 0.000033 | 1.4672 | 0.00015 | 1.88654 | 0.00012 |
| mud-4 | 0.0010387 | 0.0000095 | 0.00002314 | 0.00000031 | 0.282505 | 0.000032 | 1.46727 | 0.00013 | 1.88654 | 0.00017 |
| mud-5 | 0.0010731 | 0.0000082 | 0.00002428 | 0.0000003 | 0.282496 | 0.000045 | 1.46726 | 0.00013 | 1.88659 | 0.00013 |
| mud-6 | 0.001118 | 0.000011 | 0.00002535 | 0.00000035 | 0.282472 | 0.000043 | 1.46727 | 0.00013 | 1.88671 | 0.00014 |
| mud-7 | 0.001062 | 0.000011 | 0.00002451 | 0.0000003 | 0.282504 | 0.000045 | 1.46718 | 0.00017 | 1.88642 | 0.00011 |
| mud-8 | 0.001054 | 0.000012 | 0.00002443 | 0.00000024 | 0.282523 | 0.000046 | 1.46712 | 0.00015 | 1.88676 | 0.00018 |
| mud-9 | 0.001075 | 0.000011 | 0.00002451 | 0.00000032 | 0.282514 | 0.000034 | 1.46725 | 0.00011 | 1.88662 | 0.00018 |
| mud-10 | 0.00126 | 0.00013 | 0.0000272 | 0.0000024 | 0.282477 | 0.000038 | 1.46719 | 0.00011 | 1.88668 | 0.00016 |
| mud-11 | 0.000749 | 0.000015 | 0.0000192 | 0.00000045 | 0.282533 | 0.000037 | 1.46722 | 0.00016 | 1.88649 | 0.00011 |
| mud-12 | 0.0010413 | 0.0000099 | 0.00002356 | 0.00000033 | 0.28249 | 0.000034 | 1.46744 | 0.00019 | 1.88648 | 0.00017 |
| mud-13 | 0.0010293 | 0.0000069 | 0.00002349 | 0.00000036 | 0.282522 | 0.000037 | 1.46725 | 0.00011 | 1.88661 | 0.00014 |
| mud-14 | 0.0009688 | 0.0000084 | 0.00002192 | 0.00000043 | 0.282492 | 0.000035 | 1.46737 | 0.00015 | 1.88648 | 0.00011 |
| mud-15 | 0.0010149 | 0.0000096 | 0.0000233 | 0.00000034 | 0.282524 | 0.000044 | 1.46732 | 0.00017 | 1.88636 | 0.00015 |
| mud-16 | 0.0011 | 0.000011 | 0.00002522 | 0.00000041 | 0.282531 | 0.000038 | 1.46735 | 0.00015 | 1.88635 | 0.00015 |
| mud-17 | 0.001034 | 0.000011 | 0.00002338 | 0.00000032 | 0.282499 | 0.000033 | 1.46733 | 0.00018 | 1.88646 | 0.00014 |
| mud-18 | 0.001051 | 0.000011 | 0.00002386 | 0.00000043 | 0.282499 | 0.000042 | 1.4672 | 0.00017 | 1.88649 | 0.00014 |
| mud-19 | 0.000953 | 0.000012 | 0.00002152 | 0.00000029 | 0.282532 | 0.000041 | 1.46746 | 0.00019 | 1.88623 | 0.00023 |
| mud-20 | 0.0010392 | 0.0000072 | 0.00002308 | 0.00000026 | 0.282488 | 0.000039 | 1.46735 | 0.00017 | 1.88637 | 0.00019 |
| **91500** | | | | | | | | | | |
| 91500-1 | 0.009795 | 0.000021 | 0.0002787 | 0.000001 | 0.282314 | 0.000039 | 1.46727 | 0.00016 | 1.88649 | 0.00021 |
| 91500-2 | 0.010271 | 0.000025 | 0.00029068 | 0.00000068 | 0.282259 | 0.000041 | 1.46718 | 0.00013 | 1.88681 | 0.00022 |
| 91500-3 | 0.009859 | 0.000069 | 0.00028026 | 0.00000081 | 0.282289 | 0.000043 | 1.46714 | 0.00013 | 1.88665 | 0.00015 |
| 91500-4 | 0.010452 | 0.000041 | 0.00029658 | 0.00000084 | 0.282269 | 0.000052 | 1.46721 | 0.0002 | 1.88664 | 0.00022 |
| 91500-5 | 0.010508 | 0.000054 | 0.0002964 | 0.00000078 | 0.282259 | 0.00005 | 1.46737 | 0.00017 | 1.88659 | 0.00017 |
| 91500-6 | 0.009716 | 0.00003 | 0.00027811 | 0.00000059 | 0.282348 | 0.000044 | 1.46731 | 0.00017 | 1.88666 | 0.00018 |
| 91500-7 | 0.009779 | 0.000024 | 0.00028016 | 0.00000076 | 0.282252 | 0.000051 | 1.46728 | 0.00017 | 1.88666 | 0.00022 |
| 91500-8 | 0.010027 | 0.000059 | 0.00028846 | 0.00000064 | 0.282265 | 0.000051 | 1.46735 | 0.00018 | 1.88663 | 0.0002 |
| 91500-9 | 0.010127 | 0.000055 | 0.00029025 | 0.00000062 | 0.282278 | 0.000056 | 1.46726 | 0.00016 | 1.88645 | 0.00017 |
| 91500-10 | 0.010042 | 0.000033 | 0.00028598 | 0.00000062 | 0.282356 | 0.000055 | 1.46732 | 0.00025 | 1.88615 | 0.00018 |
| 91500-11 | 0.0103 | 0.000031 | 0.00029471 | 0.00000066 | 0.282309 | 0.000037 | 1.46731 | 0.00016 | 1.88663 | 0.00018 |
| 91500-12 | 0.009791 | 0.000049 | 0.00027995 | 0.00000056 | 0.282235 | 0.000049 | 1.46734 | 0.00021 | 1.88665 | 0.00023 |
| 91500-13 | 0.01019 | 0.000019 | 0.0002922 | 0.0000011 | 0.282234 | 0.000044 | 1.4673 | 0.00018 | 1.8866 | 0.0002 |
| 91500-14 | 0.010031 | 0.000048 | 0.00028752 | 0.00000064 | 0.282354 | 0.000058 | 1.46724 | 0.00017 | 1.88645 | 0.00021 |
| 91500-15 | 0.010208 | 0.000042 | 0.00029122 | 0.00000059 | 0.282286 | 0.00005 | 1.4674 | 0.00015 | 1.88648 | 0.00018 |
| 91500-16 | 0.010452 | 0.000024 | 0.00029915 | 0.00000068 | 0.282328 | 0.000051 | 1.46725 | 0.00017 | 1.88644 | 0.00021 |
| 91500-17 | 0.010081 | 0.000022 | 0.00028798 | 0.00000069 | 0.282311 | 0.000049 | 1.46732 | 0.00017 | 1.88645 | 0.00019 |
| 91500-18 | 0.009147 | 0.00002 | 0.0002615 | 0.0000011 | 0.282321 | 0.000044 | 1.46739 | 0.00019 | 1.88591 | 0.00032 |
| 91500-19 | 0.009881 | 0.000028 | 0.00028337 | 0.00000073 | 0.2823 | 0.000042 | 1.46726 | 0.00015 | 1.88639 | 0.00019 |
| 91500-20 | 0.009489 | 0.000036 | 0.00027237 | 0.00000062 | 0.282324 | 0.000047 | 1.46754 | 0.0002 | 1.88591 | 0.00024 |
| **Plesovice** |  |  |  |  |  |  |  |  |  |  |
| ples-1 | 0.003331 | 0.000028 | 0.00006295 | 0.00000038 | 0.28249 | 0.000037 | 1.46718 | 0.00012 | 1.88657 | 0.00013 |
| ples-2 | 0.0032 | 0.000021 | 0.00006057 | 0.00000035 | 0.28249 | 0.000034 | 1.46719 | 0.00014 | 1.88652 | 0.00015 |
| ples-3 | 0.002928 | 0.00001 | 0.00005531 | 0.00000038 | 0.282447 | 0.000037 | 1.46731 | 0.00014 | 1.88668 | 0.00013 |
| ples-4 | 0.003211 | 0.000016 | 0.00006109 | 0.00000037 | 0.28248 | 0.000024 | 1.46726 | 0.00014 | 1.88646 | 0.00014 |
| ples-5 | 0.003089 | 0.000014 | 0.00005901 | 0.00000039 | 0.282481 | 0.000036 | 1.46724 | 0.00016 | 1.88647 | 0.00017 |
| ples-6 | 0.008872 | 0.000028 | 0.00017241 | 0.00000054 | 0.282465 | 0.000039 | 1.46734 | 0.00016 | 1.88658 | 0.00015 |
| ples-7 | 0.009576 | 0.000048 | 0.00018746 | 0.00000032 | 0.282439 | 0.000033 | 1.46736 | 0.00018 | 1.88664 | 0.00013 |
| ples-8 | 0.005444 | 0.000032 | 0.00010602 | 0.00000037 | 0.282489 | 0.000038 | 1.46731 | 0.00017 | 1.88625 | 0.00016 |
| ples-9 | 0.005456 | 0.000026 | 0.0001059 | 0.000001 | 0.282453 | 0.000037 | 1.46726 | 0.0002 | 1.88655 | 0.00013 |
| ples-10 | 0.004783 | 0.000013 | 0.00008969 | 0.00000042 | 0.282486 | 0.000037 | 1.4672 | 0.00016 | 1.88639 | 0.0001 |