

Supplementary Materials

Table S1. LA-ICP-MS U-Pb date of zircons for Late Cambrian - Late Silurian volcanic rocks in Arong Qi.

| Samples | Th / U | Isotope Ratio | | | | | | Age (Ma) | | | | | |
|-------------|--------|-------------------------------------|--------|-------------------------------------|--------|--------------------------------------|--------|--------------------------------------|-------|-------------------------------------|-------|-------------------------------------|-------|
| | | Pb ²⁰⁷ /U ²³⁵ | ±σ | Pb ²⁰⁶ /U ²³⁸ | ±σ | Pb ²⁰⁸ /Th ²³² | ±σ | Pb ²⁰⁷ /Pb ²⁰⁶ | ±σ | Pb ²⁰⁷ /U ²³⁵ | ±σ | Pb ²⁰⁶ /U ²³⁸ | ±σ |
| CY-YTTW1-01 | 0.33 | 0.5964 | 0.0120 | 0.0774 | 0.0007 | 0.0234 | 0.0006 | 475.0 | 7.60 | 480.7 | 4.38 | 467.0 | 10.96 |
| CY-YTTW1-02 | 0.63 | 0.6027 | 0.0106 | 0.0770 | 0.0006 | 0.0236 | 0.0006 | 478.9 | 6.71 | 478.3 | 3.76 | 471.9 | 12.46 |
| CY-YTTW1-03 | 0.45 | 0.6414 | 0.0153 | 0.0818 | 0.0008 | 0.0244 | 0.0007 | 503.2 | 9.47 | 506.9 | 5.04 | 487.2 | 14.74 |
| CY-YTTW1-04 | 0.46 | 0.6515 | 0.0160 | 0.0817 | 0.0009 | 0.0245 | 0.0013 | 509.4 | 9.83 | 506.5 | 5.42 | 489.3 | 25.04 |
| CY-YTTW1-05 | 0.37 | 0.6583 | 0.0228 | 0.0811 | 0.0013 | 0.0256 | 0.0015 | 513.6 | 13.94 | 502.8 | 7.59 | 510.5 | 30.45 |
| CY-YTTW1-06 | 0.71 | 0.6393 | 0.0165 | 0.0814 | 0.0009 | 0.0252 | 0.0010 | 501.9 | 10.20 | 504.6 | 5.37 | 503.2 | 19.30 |
| CY-YTTW1-07 | 0.84 | 0.5620 | 0.0168 | 0.0731 | 0.0013 | 0.0232 | 0.0011 | 452.8 | 10.92 | 455.0 | 7.52 | 462.8 | 22.14 |
| CY-YTTW1-08 | 0.58 | 0.6469 | 0.0135 | 0.0824 | 0.0011 | 0.0245 | 0.0012 | 506.6 | 8.31 | 510.6 | 6.71 | 489.8 | 22.91 |
| CY-YTTW1-09 | 0.75 | 0.6503 | 0.0191 | 0.0818 | 0.0012 | 0.0250 | 0.0009 | 508.7 | 11.78 | 506.8 | 6.86 | 498.1 | 17.85 |
| CY-YTTW1-10 | 0.95 | 0.6508 | 0.0111 | 0.0825 | 0.0009 | 0.0253 | 0.0010 | 509.0 | 6.84 | 510.7 | 5.34 | 505.1 | 19.46 |
| CY-YTTW1-11 | 0.85 | 0.5622 | 0.0167 | 0.0724 | 0.0011 | 0.0237 | 0.0010 | 452.9 | 10.87 | 450.4 | 6.68 | 473.0 | 19.71 |
| CY-YTTW1-12 | 0.67 | 0.6075 | 0.0086 | 0.0775 | 0.0008 | 0.0240 | 0.0008 | 482.0 | 5.46 | 481.5 | 4.71 | 479.7 | 16.44 |
| CY-YTTW1-13 | 0.58 | 0.6484 | 0.0121 | 0.0819 | 0.0009 | 0.0257 | 0.0008 | 507.5 | 7.43 | 507.7 | 5.29 | 512.8 | 14.80 |
| CY-YTTW1-14 | 0.60 | 0.6429 | 0.0098 | 0.0817 | 0.0006 | 0.0252 | 0.0006 | 504.1 | 6.05 | 506.5 | 3.65 | 503.9 | 12.61 |
| CY-YTTW1-15 | 1.29 | 0.6438 | 0.0127 | 0.0813 | 0.0008 | 0.0241 | 0.0004 | 504.7 | 7.86 | 503.7 | 4.97 | 481.8 | 8.53 |
| CY-YTTW1-16 | 0.45 | 0.6813 | 0.0091 | 0.0855 | 0.0007 | 0.0278 | 0.0006 | 527.6 | 5.51 | 529.0 | 4.14 | 553.9 | 10.92 |
| CY-YTTW1-17 | 0.68 | 0.6605 | 0.0311 | 0.0825 | 0.0018 | 0.0248 | 0.0012 | 515.0 | 19.02 | 510.8 | 10.49 | 495.4 | 24.61 |
| CY-YTTW1-18 | 0.47 | 0.6603 | 0.0183 | 0.0818 | 0.0013 | 0.0258 | 0.0006 | 514.8 | 11.16 | 507.1 | 7.47 | 514.4 | 12.18 |
| CY-YTTW1-19 | 0.45 | 0.6516 | 0.0164 | 0.0824 | 0.0010 | 0.0241 | 0.0007 | 509.5 | 10.10 | 510.3 | 6.06 | 481.0 | 14.29 |
| CY-YTTW1-20 | 0.76 | 0.6531 | 0.0139 | 0.0816 | 0.0007 | 0.0245 | 0.0004 | 510.4 | 8.56 | 505.5 | 4.38 | 488.5 | 7.30 |
| CY-YTTW1-21 | 0.52 | 0.6482 | 0.0104 | 0.0817 | 0.0008 | 0.0252 | 0.0003 | 507.4 | 6.40 | 506.0 | 4.68 | 503.4 | 6.81 |
| CY-YTTW1-22 | 0.51 | 0.6030 | 0.0151 | 0.0777 | 0.0008 | 0.0238 | 0.0005 | 479.1 | 9.54 | 482.5 | 4.49 | 476.1 | 10.38 |
| CY-YTTW1-23 | 0.40 | 0.7096 | 0.0150 | 0.0890 | 0.0008 | 0.0263 | 0.0006 | 544.5 | 8.90 | 549.4 | 4.85 | 524.6 | 12.27 |
| CY-YTTW1-24 | 0.50 | 0.7214 | 0.0147 | 0.0888 | 0.0009 | 0.0286 | 0.0007 | 551.5 | 8.69 | 548.7 | 5.27 | 570.3 | 14.20 |
| CY-YTTW1-25 | 1.21 | 0.6193 | 0.0159 | 0.0776 | 0.0007 | 0.0247 | 0.0005 | 489.4 | 9.94 | 481.9 | 4.46 | 493.3 | 9.73 |
| CY-YTTW1-26 | 0.82 | 0.6580 | 0.0170 | 0.0822 | 0.0012 | 0.0249 | 0.0006 | 513.4 | 10.40 | 508.9 | 7.32 | 496.6 | 11.24 |
| CY-YTTW1-27 | 0.62 | 0.6522 | 0.0129 | 0.0816 | 0.0009 | 0.0245 | 0.0003 | 509.8 | 7.90 | 506.0 | 5.65 | 489.2 | 6.15 |
| CY-YTTW1-28 | 0.32 | 0.5609 | 0.0129 | 0.0721 | 0.0007 | 0.0221 | 0.0007 | 452.1 | 8.38 | 448.5 | 4.47 | 442.7 | 13.18 |
| CY-YTTW1-29 | 0.57 | 0.6563 | 0.0135 | 0.0822 | 0.0008 | 0.0244 | 0.0004 | 512.3 | 8.30 | 509.5 | 4.93 | 487.2 | 7.28 |
| CY-YTTW1-30 | 0.55 | 0.6585 | 0.0170 | 0.0812 | 0.0012 | 0.0256 | 0.0006 | 513.7 | 10.43 | 503.5 | 6.97 | 510.9 | 11.54 |
| CY-YTTW1-31 | 0.63 | 0.6034 | 0.0156 | 0.0779 | 0.0011 | 0.0248 | 0.0006 | 479.4 | 9.88 | 483.4 | 6.47 | 495.1 | 11.19 |
| CY-YTTW1-32 | 0.40 | 0.6612 | 0.0148 | 0.0823 | 0.0011 | 0.0250 | 0.0006 | 515.4 | 9.02 | 510.0 | 6.40 | 499.1 | 12.56 |
| CY-YTTW1-33 | 0.48 | 0.6213 | 0.0165 | 0.0803 | 0.0011 | 0.0240 | 0.0007 | 490.7 | 10.33 | 498.2 | 6.71 | 478.6 | 13.06 |

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|--------------|------|--------|--------|--------|--------|--------|--------|-------|-------|-------|------|-------|-------|
| CY-YTTW1-34 | 0.46 | 0.6430 | 0.0140 | 0.0820 | 0.0008 | 0.0255 | 0.0006 | 504.1 | 8.66 | 507.8 | 4.89 | 509.9 | 11.96 |
| CY-YTTW1-35 | 0.92 | 0.6659 | 0.0140 | 0.0825 | 0.0012 | 0.0250 | 0.0004 | 518.2 | 8.55 | 511.0 | 7.17 | 499.3 | 7.33 |
| CY-YTTW1-36 | 0.67 | 0.6584 | 0.0185 | 0.0821 | 0.0009 | 0.0258 | 0.0006 | 513.6 | 11.34 | 508.6 | 5.60 | 515.3 | 12.32 |
| CY-YTTW1-37 | 0.47 | 0.6459 | 0.0171 | 0.0820 | 0.0012 | 0.0252 | 0.0007 | 506.0 | 10.57 | 507.9 | 6.85 | 502.1 | 14.12 |
| CY-YTTW1-38 | 0.70 | 0.6520 | 0.0123 | 0.0818 | 0.0009 | 0.0248 | 0.0004 | 509.7 | 7.55 | 507.0 | 5.09 | 495.3 | 7.59 |
| CY-YTTW1-39 | 0.73 | 0.6381 | 0.0203 | 0.0812 | 0.0015 | 0.0252 | 0.0007 | 501.1 | 12.61 | 503.1 | 9.21 | 503.7 | 14.76 |
| CY-YTTW1-40 | 0.49 | 0.7228 | 0.0210 | 0.0888 | 0.0014 | 0.0250 | 0.0009 | 552.3 | 12.35 | 548.6 | 8.50 | 499.0 | 16.85 |
| CY-YTTW1-41 | 0.32 | 0.6125 | 0.0175 | 0.0767 | 0.0011 | 0.0228 | 0.0010 | 485.1 | 11.02 | 476.1 | 6.51 | 454.9 | 20.09 |
| CY-YTTW1-42 | 0.49 | 0.6367 | 0.0162 | 0.0817 | 0.0015 | 0.0236 | 0.0008 | 500.3 | 10.07 | 506.0 | 9.23 | 470.8 | 15.98 |
| CY-YTTW1-43 | 0.53 | 0.6584 | 0.0070 | 0.0815 | 0.0009 | 0.0241 | 0.0003 | 513.6 | 4.28 | 505.2 | 5.28 | 480.4 | 6.31 |
| CY-YTTW1-44 | 0.46 | 0.6556 | 0.0119 | 0.0816 | 0.0008 | 0.0246 | 0.0005 | 511.9 | 7.29 | 505.8 | 4.66 | 490.7 | 9.63 |
| CY-YTTW1-45 | 0.27 | 0.6034 | 0.0127 | 0.0769 | 0.0010 | 0.0236 | 0.0008 | 479.4 | 8.01 | 477.4 | 6.19 | 471.0 | 16.39 |
| CY-YTTW1-46 | 0.92 | 0.6529 | 0.0135 | 0.0815 | 0.0009 | 0.0251 | 0.0008 | 510.3 | 8.30 | 504.9 | 5.10 | 500.7 | 15.09 |
| D5396-TW1-01 | 0.82 | 0.5885 | 0.0117 | 0.0748 | 0.0008 | 0.0238 | 0.0005 | 469.9 | 7.48 | 465.1 | 4.92 | 475.3 | 8.92 |
| D5396-TW1-02 | 0.93 | 0.5839 | 0.0092 | 0.0747 | 0.0009 | 0.0250 | 0.0004 | 467.0 | 5.92 | 464.1 | 5.26 | 498.8 | 7.62 |
| D5396-TW1-03 | 0.63 | 0.5712 | 0.0341 | 0.0729 | 0.0016 | 0.0220 | 0.0015 | 458.8 | 22.04 | 453.5 | 9.59 | 440.0 | 29.29 |
| D5396-TW1-04 | 0.65 | 0.5733 | 0.0290 | 0.0722 | 0.0012 | 0.0241 | 0.0013 | 460.2 | 18.75 | 449.2 | 7.18 | 481.7 | 25.69 |
| D5396-TW1-05 | 0.73 | 0.5686 | 0.0105 | 0.0725 | 0.0007 | 0.0237 | 0.0007 | 457.1 | 6.78 | 450.9 | 4.41 | 473.3 | 14.44 |
| D5396-TW1-06 | 0.92 | 0.5631 | 0.0192 | 0.0721 | 0.0011 | 0.0235 | 0.0014 | 453.6 | 12.50 | 448.7 | 6.38 | 470.0 | 27.32 |
| D5396-TW1-07 | 0.88 | 0.5613 | 0.0146 | 0.0730 | 0.0011 | 0.0220 | 0.0009 | 452.4 | 9.51 | 454.4 | 6.58 | 439.0 | 17.13 |
| D5396-TW1-08 | 0.68 | 0.5656 | 0.0178 | 0.0735 | 0.0011 | 0.0235 | 0.0009 | 455.2 | 11.53 | 457.2 | 6.57 | 470.3 | 18.43 |
| D5396-TW1-09 | 0.40 | 0.5626 | 0.0454 | 0.0723 | 0.0016 | 0.0255 | 0.0020 | 453.2 | 29.52 | 450.1 | 9.37 | 508.3 | 39.03 |
| D5396-TW1-10 | 0.52 | 0.5755 | 0.0214 | 0.0738 | 0.0011 | 0.0251 | 0.0011 | 461.6 | 13.80 | 459.1 | 6.31 | 500.6 | 20.94 |
| D5396-TW1-11 | 1.19 | 0.5765 | 0.0163 | 0.0742 | 0.0008 | 0.0226 | 0.0006 | 462.2 | 10.49 | 461.6 | 5.01 | 451.9 | 10.91 |
| D5396-TW1-12 | 0.39 | 0.5678 | 0.0242 | 0.0740 | 0.0013 | 0.0244 | 0.0015 | 456.6 | 15.68 | 460.3 | 8.00 | 487.9 | 30.33 |
| D5396-TW1-13 | 0.60 | 0.5421 | 0.0140 | 0.0699 | 0.0008 | 0.0222 | 0.0006 | 439.8 | 9.19 | 435.3 | 4.79 | 444.4 | 11.20 |
| D5396-TW1-14 | 0.48 | 0.5692 | 0.0248 | 0.0738 | 0.0010 | 0.0242 | 0.0012 | 457.5 | 16.06 | 458.9 | 6.19 | 483.4 | 23.07 |
| D5396-TW1-15 | 0.49 | 0.5519 | 0.0269 | 0.0729 | 0.0012 | 0.0218 | 0.0011 | 446.2 | 17.57 | 453.5 | 7.00 | 435.0 | 22.74 |
| D5396-TW1-16 | 0.45 | 0.5705 | 0.0221 | 0.0728 | 0.0011 | 0.0212 | 0.0009 | 458.3 | 14.26 | 453.2 | 6.34 | 424.1 | 17.48 |
| D5396-TW1-17 | 0.50 | 0.5608 | 0.0270 | 0.0724 | 0.0010 | 0.0227 | 0.0010 | 452.0 | 17.55 | 450.8 | 6.18 | 454.2 | 20.13 |
| D5396-TW1-18 | 0.76 | 0.5624 | 0.0185 | 0.0728 | 0.0008 | 0.0217 | 0.0007 | 453.1 | 12.01 | 452.7 | 4.59 | 433.3 | 13.42 |
| D5396-TW1-19 | 0.98 | 0.5724 | 0.0161 | 0.0730 | 0.0010 | 0.0213 | 0.0006 | 459.5 | 10.38 | 454.0 | 5.80 | 425.4 | 12.15 |
| D5396-TW1-20 | 0.81 | 0.5517 | 0.0143 | 0.0731 | 0.0007 | 0.0224 | 0.0005 | 446.1 | 9.34 | 454.7 | 3.98 | 448.0 | 9.17 |
| D5396-TW1-21 | 1.57 | 0.5672 | 0.0141 | 0.0723 | 0.0008 | 0.0220 | 0.0008 | 456.2 | 9.16 | 450.3 | 4.70 | 439.8 | 15.35 |
| D5396-TW1-22 | 0.75 | 0.5620 | 0.0158 | 0.0729 | 0.0008 | 0.0219 | 0.0006 | 452.8 | 10.26 | 453.6 | 5.03 | 438.7 | 12.09 |

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|--------------|------|--------|--------|--------|--------|--------|--------|-------|-------|-------|------|-------|-------|
| D5396-TW1-23 | 1.03 | 0.5675 | 0.0167 | 0.0733 | 0.0007 | 0.0224 | 0.0005 | 456.4 | 10.84 | 455.7 | 4.23 | 447.9 | 9.10 |
| D5396-TW1-24 | 0.47 | 0.5619 | 0.0268 | 0.0733 | 0.0010 | 0.0213 | 0.0012 | 452.7 | 17.44 | 455.8 | 5.93 | 426.7 | 23.88 |
| D5396-TW1-25 | 0.89 | 0.5631 | 0.0167 | 0.0731 | 0.0008 | 0.0217 | 0.0005 | 453.6 | 10.84 | 454.6 | 4.76 | 433.6 | 10.43 |
| D5396-TW1-26 | 0.55 | 0.5647 | 0.0121 | 0.0734 | 0.0006 | 0.0224 | 0.0004 | 454.6 | 7.85 | 456.5 | 3.65 | 448.6 | 8.56 |
| D5396-TW1-27 | 0.40 | 0.5719 | 0.0389 | 0.0737 | 0.0013 | 0.0208 | 0.0013 | 459.3 | 25.11 | 458.2 | 7.75 | 415.7 | 26.66 |
| D5396-TW1-28 | 0.46 | 0.5724 | 0.0241 | 0.0738 | 0.0010 | 0.0227 | 0.0009 | 459.6 | 15.58 | 458.8 | 5.89 | 454.4 | 16.83 |
| D5396-TW1-29 | 0.68 | 0.5798 | 0.0166 | 0.0743 | 0.0008 | 0.0237 | 0.0007 | 464.3 | 10.66 | 461.8 | 5.08 | 473.1 | 13.86 |
| D5396-TW1-30 | 0.68 | 0.5705 | 0.0244 | 0.0736 | 0.0011 | 0.0212 | 0.0007 | 458.3 | 15.75 | 458.0 | 6.47 | 424.4 | 12.89 |
| D5396-TW2-01 | 0.84 | 0.5543 | 0.0160 | 0.0711 | 0.0013 | 0.0232 | 0.0015 | 447.8 | 10.46 | 443.0 | 7.95 | 463.5 | 30.37 |
| D5396-TW2-02 | 0.94 | 0.5766 | 0.0106 | 0.0745 | 0.0009 | 0.0248 | 0.0004 | 462.2 | 6.86 | 463.3 | 5.62 | 495.1 | 8.25 |
| D5396-TW2-03 | 0.63 | 0.5410 | 0.0251 | 0.0710 | 0.0012 | 0.0220 | 0.0010 | 439.1 | 16.55 | 442.2 | 7.28 | 440.4 | 20.06 |
| D5396-TW2-04 | 0.76 | 0.5449 | 0.0119 | 0.0712 | 0.0007 | 0.0224 | 0.0006 | 441.6 | 7.79 | 443.4 | 4.05 | 447.7 | 12.15 |
| D5396-TW2-05 | 0.71 | 0.5575 | 0.0127 | 0.0711 | 0.0006 | 0.0227 | 0.0008 | 449.9 | 8.26 | 443.0 | 3.62 | 453.0 | 16.52 |
| D5396-TW2-06 | 1.11 | 0.5468 | 0.0168 | 0.0703 | 0.0012 | 0.0226 | 0.0013 | 442.9 | 11.05 | 437.7 | 6.96 | 452.5 | 25.46 |
| D5396-TW2-07 | 0.93 | 0.5530 | 0.0135 | 0.0716 | 0.0009 | 0.0217 | 0.0006 | 447.0 | 8.84 | 446.0 | 5.66 | 434.4 | 11.15 |
| D5396-TW2-08 | 0.46 | 0.5431 | 0.0194 | 0.0716 | 0.0010 | 0.0226 | 0.0009 | 440.5 | 12.74 | 445.6 | 5.94 | 452.4 | 18.56 |
| D5396-TW2-09 | 0.41 | 0.5824 | 0.0461 | 0.0716 | 0.0015 | 0.0260 | 0.0021 | 466.0 | 29.60 | 446.0 | 9.26 | 517.8 | 40.67 |
| D5396-TW2-10 | 0.47 | 0.5486 | 0.0233 | 0.0725 | 0.0012 | 0.0255 | 0.0012 | 444.1 | 15.29 | 451.0 | 7.14 | 508.8 | 22.99 |
| D5396-TW2-11 | 1.23 | 0.5443 | 0.0207 | 0.0726 | 0.0012 | 0.0212 | 0.0007 | 441.3 | 13.58 | 451.7 | 7.05 | 424.6 | 13.09 |
| D5396-TW2-12 | 0.40 | 0.5548 | 0.0195 | 0.0719 | 0.0009 | 0.0235 | 0.0010 | 448.1 | 12.75 | 447.9 | 5.24 | 470.4 | 19.15 |
| D5396-TW2-13 | 0.58 | 0.5340 | 0.0176 | 0.0704 | 0.0010 | 0.0230 | 0.0008 | 434.5 | 11.67 | 438.5 | 6.26 | 459.3 | 16.73 |
| D5396-TW2-14 | 0.50 | 0.5494 | 0.0314 | 0.0721 | 0.0014 | 0.0226 | 0.0014 | 444.6 | 20.56 | 449.0 | 8.32 | 450.9 | 27.20 |
| D5396-TW2-15 | 0.50 | 0.5413 | 0.0190 | 0.0713 | 0.0008 | 0.0233 | 0.0008 | 439.3 | 12.51 | 443.8 | 4.85 | 465.3 | 15.49 |
| D5396-TW2-16 | 0.52 | 0.5524 | 0.0172 | 0.0711 | 0.0009 | 0.0218 | 0.0008 | 446.6 | 11.23 | 442.8 | 5.42 | 436.6 | 14.93 |
| D5396-TW2-17 | 0.50 | 0.5463 | 0.0146 | 0.0716 | 0.0008 | 0.0220 | 0.0006 | 442.6 | 9.57 | 446.0 | 4.80 | 439.1 | 12.52 |
| D5396-TW2-18 | 0.75 | 0.5480 | 0.0193 | 0.0717 | 0.0008 | 0.0221 | 0.0006 | 443.7 | 12.69 | 446.2 | 4.53 | 441.5 | 12.04 |
| D5396-TW2-19 | 1.01 | 0.5536 | 0.0157 | 0.0725 | 0.0009 | 0.0220 | 0.0006 | 447.4 | 10.28 | 451.0 | 5.12 | 440.1 | 10.91 |
| D5396-TW2-20 | 0.78 | 0.5556 | 0.0175 | 0.0726 | 0.0008 | 0.0225 | 0.0006 | 448.6 | 11.44 | 451.7 | 4.52 | 450.2 | 12.26 |
| D5396-TW2-21 | 1.58 | 0.5458 | 0.0126 | 0.0713 | 0.0006 | 0.0219 | 0.0004 | 442.2 | 8.31 | 444.2 | 3.61 | 438.3 | 7.35 |
| D5396-TW2-22 | 0.81 | 0.5492 | 0.0132 | 0.0718 | 0.0007 | 0.0218 | 0.0004 | 444.5 | 8.62 | 446.8 | 4.06 | 436.1 | 7.76 |
| D5396-TW2-23 | 1.19 | 0.5481 | 0.0110 | 0.0717 | 0.0006 | 0.0221 | 0.0003 | 443.8 | 7.20 | 446.2 | 3.33 | 441.6 | 6.29 |
| D5396-TW2-24 | 0.48 | 0.5444 | 0.0208 | 0.0716 | 0.0007 | 0.0226 | 0.0008 | 441.3 | 13.67 | 445.6 | 4.46 | 452.5 | 16.51 |
| D5396-TW2-25 | 0.89 | 0.5509 | 0.0162 | 0.0721 | 0.0008 | 0.0222 | 0.0006 | 445.6 | 10.60 | 449.1 | 4.78 | 444.0 | 11.17 |
| D5396-TW2-26 | 0.71 | 0.5580 | 0.0116 | 0.0724 | 0.0006 | 0.0227 | 0.0004 | 450.2 | 7.59 | 450.4 | 3.49 | 453.6 | 8.48 |
| D5396-TW2-27 | 0.42 | 0.5506 | 0.0214 | 0.0712 | 0.0008 | 0.0220 | 0.0010 | 445.4 | 14.04 | 443.3 | 4.76 | 440.4 | 18.94 |

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|--------------|------|--------|--------|--------|--------|--------|--------|-------|-------|-------|------|-------|-------|
| D5396-TW2-28 | 0.50 | 0.5325 | 0.0158 | 0.0714 | 0.0008 | 0.0227 | 0.0008 | 433.4 | 10.47 | 444.7 | 4.74 | 453.7 | 14.90 |
| D5396-TW2-29 | 0.68 | 0.5832 | 0.0168 | 0.0743 | 0.0008 | 0.0236 | 0.0007 | 466.5 | 10.80 | 462.1 | 4.92 | 471.7 | 14.09 |
| D5396-TW2-30 | 0.67 | 0.5699 | 0.0183 | 0.0714 | 0.0008 | 0.0206 | 0.0006 | 457.9 | 11.84 | 444.7 | 4.52 | 412.2 | 11.76 |
| D2145TW3-01 | 0.43 | 0.6310 | 0.0177 | 0.0798 | 0.0010 | 0.0252 | 0.0006 | 496.7 | 11.04 | 495.1 | 6.07 | 503.4 | 11.38 |
| D2145TW3-02 | 0.59 | 0.5169 | 0.0164 | 0.0685 | 0.0009 | 0.0205 | 0.0007 | 423.1 | 11.00 | 427.1 | 5.15 | 411.0 | 14.36 |
| D2145TW3-03 | 0.52 | 0.5278 | 0.0157 | 0.0673 | 0.0009 | 0.0204 | 0.0007 | 430.4 | 10.44 | 419.8 | 5.49 | 409.0 | 13.89 |
| D2145TW3-04 | 0.99 | 0.5145 | 0.0116 | 0.0671 | 0.0009 | 0.0220 | 0.0007 | 421.5 | 7.79 | 418.6 | 5.31 | 440.1 | 14.80 |
| D2145TW3-05 | 0.71 | 0.5191 | 0.0106 | 0.0677 | 0.0007 | 0.0219 | 0.0006 | 424.5 | 7.06 | 422.6 | 4.39 | 438.7 | 11.26 |
| D2145TW3-06 | 1.11 | 0.6059 | 0.0081 | 0.0698 | 0.0008 | 0.0209 | 0.0002 | 481.0 | 5.11 | 435.1 | 5.02 | 418.8 | 4.95 |
| D2145TW3-07 | 0.79 | 0.2673 | 0.0096 | 0.0380 | 0.0006 | 0.0113 | 0.0004 | 240.6 | 7.66 | 240.6 | 3.63 | 227.0 | 7.72 |
| D2145TW3-08 | 0.66 | 0.5153 | 0.0117 | 0.0679 | 0.0008 | 0.0207 | 0.0004 | 422.0 | 7.86 | 423.6 | 4.67 | 413.9 | 8.77 |
| D2145TW3-09 | 0.68 | 0.5258 | 0.0109 | 0.0679 | 0.0008 | 0.0209 | 0.0006 | 429.0 | 7.25 | 423.4 | 4.80 | 418.5 | 12.57 |
| D2145TW3-10 | 0.61 | 0.5266 | 0.0134 | 0.0686 | 0.0009 | 0.0205 | 0.0007 | 429.5 | 8.94 | 427.8 | 5.66 | 411.0 | 13.15 |
| D2145TW3-11 | 0.54 | 0.5141 | 0.0137 | 0.0675 | 0.0009 | 0.0206 | 0.0006 | 421.2 | 9.18 | 420.8 | 5.30 | 412.3 | 11.75 |
| D2145TW3-12 | 1.00 | 0.1546 | 0.0061 | 0.0221 | 0.0004 | 0.0067 | 0.0003 | 146.0 | 5.36 | 141.0 | 2.56 | 135.8 | 5.88 |
| D2145TW3-13 | 0.02 | 0.5198 | 0.0120 | 0.0678 | 0.0009 | 0.0190 | 0.0027 | 425.0 | 7.99 | 422.9 | 5.67 | 380.2 | 53.31 |
| D2145TW3-14 | 0.68 | 0.6510 | 0.0089 | 0.0825 | 0.0008 | 0.0247 | 0.0004 | 509.1 | 5.45 | 510.9 | 4.70 | 494.0 | 7.14 |
| D2145TW3-15 | 0.34 | 0.6496 | 0.0105 | 0.0827 | 0.0008 | 0.0243 | 0.0007 | 508.2 | 6.44 | 512.1 | 4.78 | 485.6 | 13.80 |
| D2145TW3-16 | 0.69 | 0.5198 | 0.0095 | 0.0681 | 0.0007 | 0.0200 | 0.0004 | 425.0 | 6.35 | 424.7 | 4.19 | 399.4 | 8.04 |
| D2145TW3-17 | 1.03 | 0.6465 | 0.0155 | 0.0819 | 0.0010 | 0.0239 | 0.0005 | 506.3 | 9.57 | 507.2 | 6.15 | 478.2 | 8.90 |
| D2145TW3-18 | 0.99 | 0.5261 | 0.0135 | 0.0677 | 0.0007 | 0.0213 | 0.0004 | 429.2 | 9.00 | 422.0 | 4.21 | 426.6 | 8.90 |
| D2145TW3-19 | 0.51 | 0.5539 | 0.0094 | 0.0710 | 0.0007 | 0.0216 | 0.0003 | 447.5 | 6.13 | 442.3 | 3.91 | 432.8 | 6.68 |
| D2145TW3-20 | 0.53 | 0.6512 | 0.0149 | 0.0826 | 0.0008 | 0.0268 | 0.0006 | 509.2 | 9.18 | 511.4 | 4.87 | 534.0 | 11.10 |
| D2145TW3-21 | 0.54 | 0.2970 | 0.0063 | 0.0422 | 0.0004 | 0.0130 | 0.0002 | 264.1 | 4.92 | 266.2 | 2.33 | 261.8 | 4.41 |
| D2145TW3-22 | 0.59 | 0.6562 | 0.0117 | 0.0827 | 0.0007 | 0.0256 | 0.0003 | 512.3 | 7.17 | 512.1 | 4.38 | 511.8 | 6.71 |
| D2145TW3-23 | 0.56 | 0.6597 | 0.0153 | 0.0825 | 0.0010 | 0.0257 | 0.0005 | 514.4 | 9.39 | 511.0 | 6.17 | 513.4 | 10.32 |
| D2145TW3-24 | 0.65 | 0.5306 | 0.0123 | 0.0692 | 0.0009 | 0.0213 | 0.0007 | 432.2 | 8.15 | 431.2 | 5.19 | 426.8 | 14.15 |
| D2145TW3-25 | 1.89 | 0.1309 | 0.0049 | 0.0195 | 0.0002 | 0.0062 | 0.0001 | 124.9 | 4.36 | 124.3 | 1.54 | 125.0 | 2.15 |
| D2145TW3-26 | 1.99 | 0.1386 | 0.0059 | 0.0200 | 0.0003 | 0.0062 | 0.0002 | 131.8 | 5.25 | 127.4 | 1.73 | 123.9 | 3.24 |
| D2145TW3-27 | 0.55 | 0.2643 | 0.0060 | 0.0376 | 0.0003 | 0.0122 | 0.0003 | 238.1 | 4.79 | 237.7 | 2.10 | 244.2 | 6.13 |
| D2145TW3-28 | 0.59 | 0.5258 | 0.0139 | 0.0680 | 0.0006 | 0.0208 | 0.0006 | 429.0 | 9.27 | 424.2 | 3.89 | 415.7 | 11.10 |
| D2145TW3-29 | 0.68 | 0.6952 | 0.0147 | 0.0869 | 0.0007 | 0.0268 | 0.0005 | 535.9 | 8.79 | 537.2 | 4.12 | 534.8 | 9.31 |
| D2145TW3-30 | 0.46 | 0.1264 | 0.0061 | 0.0194 | 0.0002 | 0.0061 | 0.0003 | 120.9 | 5.52 | 123.6 | 1.50 | 122.9 | 5.23 |

Table S2. Majore element (%) and trace element (×10-6) analys for Late Cambrian - Late Silurian volcanic rocks in Arong Qi.

| Epoch | Late Cambrian | | | Late Ordovician | | | Late Silurian | | | |
|--------------------------------|---------------|-------|--------|-----------------|-------|-------|---------------|-------|----------|-------|
| Dating sam- ples | CY-YTTW1 | | | D5396TW2 | | | D5396TW1 | | D2145TW3 | |
| Samples | G1 | G2 | G3 | G4 | G5 | G8 | G6 | G7 | G9 | G10 |
| SiO ₂ | 48.72 | 57 | 62.43 | 60.95 | 61.24 | 61.66 | 62.79 | 61.1 | 61.62 | 60.83 |
| TiO ₂ | 1.71 | 1.02 | 0.76 | 0.71 | 0.57 | 0.67 | 0.47 | 0.56 | 1.01 | 1.44 |
| Al ₂ O ₃ | 16.99 | 15.72 | 18.23 | 16.67 | 16.98 | 17.14 | 18.08 | 17.1 | 17.52 | 16.69 |
| Fe ₂ O ₃ | 6.45 | 2.85 | 1.32 | 1.72 | 1.44 | 1.65 | 1.43 | 1.99 | 2.54 | 1.97 |
| FeO | 4 | 3.46 | 3.47 | 4.66 | 4.74 | 4.29 | 2.88 | 4.39 | 4.09 | 4.45 |
| MnO | 2 | 3.26 | 1.35 | 2.02 | 2.05 | 1.79 | 2.14 | 1.85 | 3.03 | 2.14 |
| MgO | 0.12 | 0.08 | 0.23 | 0.28 | 0.24 | 0.26 | 0.18 | 0.24 | 0.08 | 0.24 |
| CaO | 5.73 | 3.65 | 1.52 | 2.07 | 1.98 | 1.85 | 1.28 | 1.95 | 0.6 | 1.05 |
| Na ₂ O | 4.12 | 5.46 | 4.34 | 2.4 | 2.23 | 3.46 | 3.76 | 2.97 | 3.75 | 3.71 |
| K ₂ O | 2.38 | 2.17 | 4.27 | 5.87 | 6.3 | 4.5 | 5.16 | 5.27 | 1.95 | 3.84 |
| P ₂ O ₅ | 0.57 | 0.37 | 0.31 | 0.44 | 0.36 | 0.36 | 0.41 | 0.42 | 0.26 | 0.36 |
| LOI | 7.31 | 4.92 | 1.93 | 1.78 | 1.68 | 1.95 | 1.59 | 1.79 | 3.78 | 3.26 |
| Total | 100.12 | 99.95 | 100.15 | 99.55 | 99.81 | 99.58 | 100.17 | 99.63 | 100.23 | 99.98 |
| [Mg#] | 2.14 | 2.31 | 8.09 | 7.44 | 6.61 | 7.44 | 7.14 | 6.47 | 2.19 | 6.44 |
| FeO* | 9.8 | 6.02 | 4.66 | 6.21 | 6.04 | 5.77 | 4.17 | 6.18 | 6.38 | 6.22 |
| Rb | 44.7 | 35.1 | 121 | 179 | 186 | 103 | 98.3 | 95.8 | 50 | 67 |
| Sr | 527 | 878 | 475 | 436 | 408 | 326 | 339 | 433 | 293 | 321 |
| Ba | 490 | 820 | 1000 | 1500 | 1700 | 1676 | 1100 | 1300 | 507 | 705 |
| Nb | 12.3 | 6.46 | 7.66 | 6.87 | 8.25 | 6.76 | 5.06 | 5.42 | 15.5 | 13.1 |
| Ta | 0.57 | 0.35 | 0.57 | 0.64 | 0.94 | 0.45 | 0.26 | 0.16 | 2.54 | 1.6 |
| Zr | 230 | 129 | 119 | 75.7 | 125 | 95.8 | 49.9 | 58 | 226 | 185 |
| Hf | 4.93 | 3.12 | 4.58 | 4.52 | 6.98 | 3.64 | 1.51 | 3.04 | 5.55 | 4.84 |
| Th | 2.69 | 3.4 | 2.69 | 6.45 | 15.6 | 1.93 | 2.62 | 2.97 | 6.35 | 3.11 |
| Cr | 6.68 | 44.6 | 5.72 | 5.95 | 6.98 | 6.55 | 14.9 | 14.8 | 84.1 | 55.4 |
| Ni | 10.2 | 18.8 | 4.62 | 3.92 | 2.59 | 3.34 | 3.83 | 4.95 | 53.1 | 3.75 |
| U | 0.59 | 0.91 | 1.49 | 4.08 | 4.27 | 1.23 | 0.72 | 0.93 | 1.28 | 1.32 |
| V | 168 | 109 | 44.2 | 102 | 90.9 | 41.7 | 72 | 69.6 | 113 | 101 |
| Co | 26.6 | 19.4 | 5.19 | 8.56 | 8.83 | 5.17 | 5.83 | 7.89 | 18.4 | 10.4 |

| | | | | | | | | | | |
|----------------------|--------|--------|--------|--------|--------|--------|-------|-------|--------|--------|
| Li | 27.2 | 41.1 | 61.3 | 41.2 | 49.3 | 56.1 | 31.8 | 33.5 | 44.7 | 38.1 |
| Be | 1.46 | 1 | 2 | 1.57 | 1.93 | 1.59 | 1.27 | 1.36 | 1.66 | 2 |
| La | 28.6 | 22.6 | 22.7 | 32.5 | 27.2 | 16.9 | 12 | 14 | 27.6 | 28.1 |
| Ce | 61.3 | 47 | 54.5 | 69.7 | 61.9 | 41.2 | 25.1 | 29.6 | 57.6 | 55.2 |
| Pr | 8.32 | 6.09 | 7.5 | 9.13 | 7.85 | 5.39 | 3.63 | 4.42 | 7.39 | 7.45 |
| Nd | 36.9 | 25.7 | 32.8 | 37.4 | 32.5 | 24 | 15.3 | 19 | 29.1 | 30.2 |
| Sm | 6.86 | 4.59 | 7.15 | 7.56 | 6.75 | 5.16 | 3.3 | 4.2 | 5.58 | 6.17 |
| Eu | 1.81 | 1.58 | 1.88 | 2 | 1.95 | 1.39 | 1.12 | 1.5 | 1.44 | 1.55 |
| Gd | 5.43 | 3.44 | 6.18 | 6.34 | 5.73 | 4.32 | 2.61 | 3.37 | 4.62 | 5.11 |
| Tb | 0.75 | 0.44 | 1.03 | 1.07 | 0.95 | 0.72 | 0.47 | 0.6 | 0.75 | 0.78 |
| Dy | 4.75 | 2.57 | 6.13 | 6.11 | 5.6 | 4.4 | 2.65 | 3.34 | 4.23 | 4.32 |
| Ho | 0.86 | 0.43 | 1.26 | 1.23 | 1.12 | 0.86 | 0.54 | 0.7 | 0.85 | 1.35 |
| Er | 2.17 | 1.14 | 3.61 | 3.36 | 3.17 | 2.54 | 1.67 | 2.14 | 2.32 | 3.12 |
| Tm | 0.34 | 0.16 | 0.66 | 0.62 | 0.58 | 0.45 | 0.28 | 0.36 | 0.37 | 0.35 |
| Yb | 2.14 | 0.97 | 4.1 | 3.66 | 3.84 | 2.91 | 1.92 | 2.51 | 2.37 | 2.55 |
| Lu | 0.31 | 0.16 | 0.59 | 0.55 | 0.55 | 0.44 | 0.28 | 0.38 | 0.35 | 0.41 |
| Y | 25.2 | 12.8 | 31.5 | 33.4 | 31.5 | 22.1 | 11.6 | 17.6 | 19 | 21 |
| ΣREE | 160.54 | 116.87 | 150.09 | 181.23 | 159.69 | 110.68 | 70.87 | 86.12 | 144.57 | 146.66 |
| LR/HR | 8.58 | 11.55 | 5.37 | 6.90 | 6.41 | 5.65 | 5.80 | 5.43 | 8.12 | 7.15 |
| (La/Yb) _N | 9.03 | 15.74 | 3.74 | 6.00 | 4.79 | 3.92 | 4.22 | 3.77 | 7.87 | 7.45 |
| (La/Sm) _N | 2.62 | 3.10 | 2.00 | 2.71 | 2.54 | 2.06 | 2.29 | 2.10 | 3.11 | 2.87 |
| (Gd/Yb) _N | 2.06 | 2.87 | 1.22 | 1.40 | 1.21 | 1.20 | 1.10 | 1.09 | 1.58 | 1.62 |
| δEu | 0.88 | 1.17 | 0.84 | 0.86 | 0.93 | 0.88 | 1.13 | 1.18 | 0.84 | 0.82 |