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| Supplementary Table S1. Zircon Hf isotopic analyses from Permian-Triassic granite from the Duobagou area. |
| Sample | t | 176Yb/177Hf | 176Lu/177Hf | 2σ | 176Hf/177Hf | 2σ | εHf(0) | εHf(t) | TDM1 | fLu/Hf | TDM2 |
| spot | (Ma) |  |  |  |  |  |  |  | (Ma) |  | (Ma) |
| 16DBG04 |  |  |  |  |  |  |  |  |  |  |  |
| 2 | 250 | 0.053706  | 0.001452  | 0.000006  | 0.282729  | 0.000014  | -1.5  | 3.7  | 750  | -0.96  | 1091  |
| 3 | 250 | 0.024330  | 0.000679  | 0.000004  | 0.282660  | 0.000018  | -4.0  | 1.4  | 831  | -0.98  | 1228  |
| 5 | 244 | 0.034954  | 0.000992  | 0.000001  | 0.282727  | 0.000017  | -1.6  | 3.6  | 744  | -0.97  | 1085  |
| 7 | 245 | 0.040518  | 0.001320  | 0.000012  | 0.282684  | 0.000013  | -3.1  | 2.1  | 811  | -0.96  | 1198  |
| 8 | 246 | 0.028702  | 0.000961  | 0.000026  | 0.282658  | 0.000019  | -4.0  | 1.2  | 840  | -0.97  | 1246  |
| 9 | 256 | 0.037906  | 0.000999  | 0.000016  | 0.282718  | 0.000013  | -1.9  | 3.5  | 757  | -0.97  | 1098  |
| 10 | 247 | 0.022237  | 0.000689  | 0.000004  | 0.282657  | 0.000015  | -4.1  | 1.2  | 836  | -0.98  | 1238  |
| 11 | 243 | 0.025308  | 0.000724  | 0.000022  | 0.282650  | 0.000020  | -4.3  | 0.9  | 846  | -0.98  | 1258  |
| 12 | 247 | 0.063794  | 0.002072  | 0.000005  | 0.282666  | 0.000011  | -3.7  | 1.3  | 854  | -0.94  | 1268  |
| 13 | 243 | 0.036694  | 0.001034  | 0.000010  | 0.282732  | 0.000019  | -1.4  | 3.8  | 737  | -0.97  | 1075  |
| 14 | 246 | 0.039887  | 0.001281  | 0.000035  | 0.282728  | 0.000022  | -1.6  | 3.6  | 748  | -0.96  | 1090  |
| 15 | 248 | 0.031327  | 0.000854  | 0.000003  | 0.282710  | 0.000015  | -2.2  | 3.1  | 765  | -0.97  | 1118  |
| 16 | 243 | 0.048978  | 0.001330  | 0.000019  | 0.282640  | 0.000017  | -4.7  | 0.5  | 874  | -0.96  | 1305  |
| 18 | 248 | 0.043640  | 0.001215  | 0.000011  | 0.282655  | 0.000021  | -4.1  | 1.1  | 850  | -0.96  | 1261  |
| 19 | 247 | 0.043371  | 0.001201  | 0.000015  | 0.282665  | 0.000020  | -3.8  | 1.4  | 836  | -0.96  | 1237  |
| 20 | 249 | 0.056042  | 0.001623  | 0.000022  | 0.282678  | 0.000016  | -3.3  | 1.9  | 827  | -0.95  | 1220  |
| 21 | 246 | 0.045498  | 0.001237  | 0.000003  | 0.282699  | 0.000019  | -2.6  | 2.6  | 788  | -0.96  | 1158  |
| 22 | 244 | 0.040456  | 0.001321  | 0.000040  | 0.282692  | 0.000017  | -2.8  | 2.3  | 800  | -0.96  | 1179  |
| 23 | 244 | 0.060757  | 0.001585  | 0.000017  | 0.282692  | 0.000019  | -2.8  | 2.3  | 806  | -0.95  | 1189  |
| 24 | 247 | 0.027858  | 0.000726  | 0.000005  | 0.282677  | 0.000016  | -3.4  | 1.9  | 809  | -0.98  | 1192  |
| 25 | 250 | 0.029944  | 0.000827  | 0.000004  | 0.282671  | 0.000016  | -3.6  | 1.8  | 819  | -0.98  | 1208  |
| 26 | 245 | 0.038292  | 0.001135  | 0.000002  | 0.282701  | 0.000015  | -2.5  | 2.7  | 783  | -0.97  | 1151  |
| 27 | 242 | 0.021997  | 0.000616  | 0.000003  | 0.282672  | 0.000019  | -3.5  | 1.7  | 813  | -0.98  | 1203  |
| 28 | 247 | 0.038255  | 0.001067  | 0.000028  | 0.282681  | 0.000017  | -3.2  | 2.0  | 810  | -0.97  | 1194  |
| 30 | 248 | 0.042151  | 0.001263  | 0.000006  | 0.282703  | 0.000016  | -2.4  | 2.8  | 783  | -0.96  | 1148  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 16DBG06 |  |  |  |  |  |  |  |  |  |  |  |
| 2 | 277 | 0.035049  | 0.001077  | 0.000011  | 0.282576  | 0.000022  | -6.9  | -1.0  | 959  | -0.97  | 1424  |
| 3 | 275 | 0.031693  | 0.000981  | 0.000020  | 0.282544  | 0.000017  | -8.1  | -2.2  | 1001  | -0.97  | 1497  |
| 5 | 275 | 0.018971  | 0.001032  | 0.000094  | 0.282598  | 0.000027  | -6.2  | -0.3  | 926  | -0.97  | 1371  |
| 6 | 277 | 0.035489  | 0.001068  | 0.000005  | 0.282602  | 0.000014  | -6.0  | -0.1  | 922  | -0.97  | 1362  |
| 8 | 278 | 0.028309  | 0.000904  | 0.000001  | 0.282626  | 0.000013  | -5.2  | 0.8  | 884  | -0.97  | 1298  |
| 10 | 272 | 0.041264  | 0.001310  | 0.000012  | 0.282506  | 0.000021  | -9.4  | -3.7  | 1064  | -0.96  | 1604  |
| 11 | 272 | 0.019443  | 0.000627  | 0.000014  | 0.282527  | 0.000017  | -8.7  | -2.8  | 1016  | -0.98  | 1523  |
| 12 | 276 | 0.039282  | 0.001229  | 0.000006  | 0.282597  | 0.000017  | -6.2  | -0.3  | 933  | -0.96  | 1381  |
| 13 | 275 | 0.015116  | 0.000484  | 0.000010  | 0.282576  | 0.000018  | -6.9  | -1.0  | 944  | -0.99  | 1401  |
| 17 | 278 | 0.031906  | 0.000976  | 0.000008  | 0.282549  | 0.000017  | -7.9  | -2.0  | 994  | -0.97  | 1483  |
| 18 | 277 | 0.032912  | 0.001013  | 0.000013  | 0.282538  | 0.000017  | -8.3  | -2.4  | 1010  | -0.97  | 1511  |
| 19 | 276 | 0.022921  | 0.000719  | 0.000005  | 0.282548  | 0.000015  | -7.9  | -2.0  | 989  | -0.98  | 1475  |
| 20 | 277 | 0.031720  | 0.000943  | 0.000020  | 0.282486  | 0.000016  | -10.1  | -4.2  | 1081  | -0.97  | 1631  |
| 21 | 275 | 0.022593  | 0.000725  | 0.000004  | 0.282557  | 0.000016  | -7.6  | -1.7  | 976  | -0.98  | 1455  |
| 24 | 272 | 0.022132  | 0.000695  | 0.000002  | 0.282455  | 0.000016  | -11.2  | -5.4  | 1118  | -0.98  | 1695  |
| 25 | 276 | 0.030680  | 0.000964  | 0.000004  | 0.282515  | 0.000016  | -9.1  | -3.2  | 1041  | -0.97  | 1564  |
| 26 | 276 | 0.028969  | 0.000932  | 0.000004  | 0.282498  | 0.000014  | -9.7  | -3.8  | 1064  | -0.97  | 1602  |
| 27 | 280 | 0.035298  | 0.001088  | 0.000005  | 0.282493  | 0.000014  | -9.9  | -3.9  | 1076  | -0.97  | 1619  |
| 28 | 277 | 0.039270  | 0.001337  | 0.000041  | 0.282483  | 0.000017  | -10.2  | -4.4  | 1097  | -0.96  | 1656  |
| 29 | 275 | 0.030553  | 0.000905  | 0.000024  | 0.282469  | 0.000018  | -10.7  | -4.8  | 1104  | -0.97  | 1670  |
| 30 | 277 | 0.034649  | 0.000954  | 0.000022  | 0.282660  | 0.000015  | -4.0  | 2.0  | 837  | -0.97  | 1220  |
|  |  |  |  |  |  |  |  |  |  |  |  |
| 16DBG10 |  |  |  |  |  |  |  |  |  |  |  |
| 1 | 279 | 0.036041  | 0.001034  | 0.000005  | 0.282637  | 0.000015  | -4.8  | 1.2  | 872  | -0.97  | 1276  |
| 3 | 273 | 0.056201  | 0.001785  | 0.000064  | 0.282619  | 0.000015  | -5.4  | 0.3  | 915  | -0.95  | 1353  |
| 5 | 277 | 0.033725  | 0.001028  | 0.000005  | 0.282604  | 0.000016  | -5.9  | 0.0  | 918  | -0.97  | 1355  |
| 6 | 274 | 0.035280  | 0.001038  | 0.000007  | 0.282653  | 0.000018  | -4.2  | 1.6  | 849  | -0.97  | 1241  |
| 7 | 273 | 0.028395  | 0.000955  | 0.000015  | 0.282694  | 0.000017  | -2.8  | 3.1  | 789  | -0.97  | 1142  |
| 9 | 275 | 0.037757  | 0.001133  | 0.000012  | 0.282664  | 0.000014  | -3.8  | 2.0  | 836  | -0.97  | 1218  |
| 11 | 276 | 0.040337  | 0.001165  | 0.000021  | 0.282676  | 0.000013  | -3.4  | 2.5  | 819  | -0.96  | 1190  |
| 12 | 272 | 0.018496  | 0.000538  | 0.000009  | 0.282581  | 0.000015  | -6.8  | -0.9  | 938  | -0.98  | 1393  |
| 15 | 274 | 0.028847  | 0.000863  | 0.000005  | 0.282608  | 0.000015  | -5.8  | 0.1  | 908  | -0.97  | 1341  |
| 16 | 270 | 0.037720  | 0.001164  | 0.000015  | 0.282625  | 0.000018  | -5.2  | 0.5  | 892  | -0.96  | 1316  |
| 17 | 273 | 0.037699  | 0.001194  | 0.000022  | 0.282620  | 0.000015  | -5.4  | 0.4  | 899  | -0.96  | 1327  |
| 20 | 271 | 0.023382  | 0.000725  | 0.000009  | 0.282617  | 0.000015  | -5.5  | 0.3  | 892  | -0.98  | 1317  |
| 24 | 273 | 0.032653  | 0.001036  | 0.000017  | 0.282605  | 0.000014  | -5.9  | -0.1  | 917  | -0.97  | 1356  |
| *Note:* TDM is depleted mantle model age. εHf(t) = [({176Hf/177Hf}S – {176Lu/177Hf}S × {eλt – 1})/({176Hf/177Hf}CHUR,0 – {176Lu/177Hf}CHUR × {eλt – 1}) – 1] × 10,000; TDM1(Hf) = 1/λ × ln[1 + ({176Hf/177Hf}S – {176Hf/177Hf}DM)/({176Lu/177Hf}S – {176Lu/177Hf}DM)]; TDM2(Hf) = TDM1(Hf) – [TDM1(Hf) – t][(fCC – fs)/(fCC – fDM)]; TDMc = (1/k) – ln[1+ (176Hf/177HfDM – 176Hf/177HfS)/(176Lu/177HfDM – 176Lu/177HfS)]; fLu/Hf = (176Lu/177Hf)S/(176Hf/177Hf)CHUR – 1; where fCC, fS, and fDM are the fLu/Hf values of the continental crust, sample, and the depleted mantle; t = crystallization age of zircon; subscript S = analyzed sample; CHUR = chondritic uniform reservoir. |