|  |  |  |
| --- | --- | --- |
| **Table 2: Average titanite compositions (wt%) and calculated crystallization conditions.** |  |  |
|   |   |   |   |   |   |   |   |
|  |  |  |  |  |  |  |  |
| Intrusion | CShipi | CTuolumne | CMt Princeton | CSoultz-s-F | CÄspö | CQitianling | CQitianling |
| Location | China | USA | USA | France | Sweden | China | China |
| Type | \*Magnesian | \*Magnesian | \*Magnesian | \*Magnesian | \*Magnesian | \*Ferroan | \*Ferroan |
|  |  |  |  |  |  |  |  |
| Analyses | *n = 7*4 | *n = 1*2 | *n = u*nknown | *n = 2* | *n = 4* | *n = 8* | *n = 2*1 |
| Data | This study | S2010 | A2010 | S2002 | M2009 | This study | X2010 |
|  |  |  |  |  |  |  |  |
| SiO2 | 30.47(0.32) | 29.06(0.72) | 29.50(0.66) | 29.84(0.18) | 29.78(0.11) | 29.74(0.40) | 30.38(0.72) |
| TiO2 | 37.24(0.50) | 36.31(1.03) | 38.98(1.06) | 35.41(0.31) | 36.70(0.14) | 32.36(0.59) | 34.05(1.51) |
| Al2O3 | 1.38(0.10) | 1.14(0.09) | 0.66(0.36) | 1.29(0.02) | 1.75(0.05) | 2.54(0.19) | 2.67(0.38) |
| Fe2O3 | 1.98(0.21) | 1.56(0.25) | 1.74(0.56) | 2.39(0.33) | 1.10(0.07) | 2.26(0.44) | 2.35(0.58) |
| CaO | 28.13(0.37) | 27.02(0.57) | 25.97(0.92) | 26.95(0.67) | 28.58(0.22) | 26.77(0.50) | 28.16(1.69) |
| F+Cl | 0.08(0.07) |  -  |  -  |  -  |  -  | 0.91(0.21) | 0.21(0.12) |
|  |  |  |  |  |  |  |  |
| Hbl *P* (MPa)M2016 | 167(20) | 188(31) | 150(12) | 151 | 232 | 307(15) | 307(15) |
| Ttn P (MPa) | 199(10) | 174(9) | 126(37) | 190(2) | 237(5) | 317(19) | 330(38) |
|  |  |  |  |  |  |  |  |
| Intrusion | CGuposhan | CGuposhan | CMelville-1 | CMelville-2 |  | TMt Milligan | TBoss Mt |
| Type | \*Ferroan | \*Ferroan | \*Ferroan | \*Ferroan |  | Porphyry | Porphyry |
|  |  |  |  |  |  |  |  |
| Analyses | *n = 2*7 | *n = 1* | *n = 1*1 | *n = 1*1 |  | *n = 4*1 | *n = 2* |
| Data | This study | W2013 | This study | This study |  | C2010 | C2013 |
|  |  |  |  |  |  |  |  |
| SiO2 | 29.72(0.28) | 29.85 | 31.13(0.21) | 30.84(0.30) |  | 29.84(0.31) | 30.75(0.12) |
| TiO2 | 33.85(0.57) | 32.66 | 34.91(0.42) | 35.54(0.41) |  | 36.94(1.01) | 35.09(0.07) |
| Al2O3 | 2.27(0.16) | 3.11 | 2.70(0.15) | 2.65(0.05) |  | 0.97(0.32) | 0.98(0.04) |
| Fe2O3 | 2.41(0.27) | 2.49 | 2.05(0.21) | 2.37(0.52) |  | 1.32(0.43) | 1.78(0.07) |
| CaO | 28.17(0.13) | 27.52 | 28.71(0.23) | 28.25(0.48) |  | 27.46(0.63) | 26.96(0.18) |
| F+Cl | 0.58(0.10) | 0.97 | 0.60(0.15) | 0.61(0.12) |  | 0.37(0.09) |  -  |
|  |  |  |  |  |  |  |  |
| Hbl *P* (MPa)M2016 | 318(25) | 318(25) | 382(7) | 387(8) |  | \*\*>90,≤200 | \*\*>90,≤200 |
| Ttn *P* (MPa) | 296(16) | 375 | 333(15) | 328(5) |  | 158(33) | 158(5) |
|   |   |   |   |   |   |   |   |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| A2010 = Ackerson, 2010; C2010 =  Celis, 2010; C2013 =  Che et al., 2013; M2009 = Morad et al., 2009; M2016 = Mutch et al., 2016; S2010 =  Solgadi, 2010; S2002 = Stussi et al., 2002; W2013 = Wang et al., 2013; X2010 = Xie et al., 2010. C = calibration data; T = test data.\* Classification follows Frost et al. (2001). The values in parentheses are standard deviations.\*\* Independent estimates as reported in the text. Pressures were estimated using stratigraphy (del Real et al., 2017) and amphibole compositions (Zhu et al., 2018). |