

Table 1. Selected Electron Microprobe Analyses of Secondary Amphiboles in Metasomatic Rocks at the South Wall of the Atlantis Massif^a

| Sample Analysis No. Mineralogy | 3647-1359 | | | | | | | 3646-1205 | | | | | 3646-1000 | | 3646-1409 | | D4-9 | |
|--------------------------------------|---------------|---------------|---------------|----------|----------|-------------|--------------|-------------|---------|---------|----------|-----------|-----------|-----------|-----------|---------|-----------|---------|
| | 1 Anth/Cum | 2 Anth/Cum | 3 Anth/Cum | 4 Act | 5 Act | 6 Fe-Act | 7 Act Hbl | 1 Mg-Hbl | 2 Ed | 3 Ed | 4 Act | 5 Trem | 1 Ed | 2 Trem | 1 Ed | 2 Ed | 1 Trem | 2 Ed |
| SiO ₂ | 57.85 | 56.93 | 57.60 | 56.53 | 57.38 | 53.29 | 53.25 | 49.00 | 47.93 | 47.43 | 55.06 | 56.44 | 49.75 | 58.94 | 48.45 | 48.13 | 57.31 | 51.48 |
| TiO ₂ | 0.13 | 0.29 | 0.25 | 0.07 | 0.10 | 0.26 | 1.00 | 1.61 | 2.93 | 2.18 | 0.18 | <d.l. | 0.03 | <d.l. | 0.23 | 0.27 | 0.08 | 0.15 |
| Cr ₂ O ₃ | 0.14 | 0.21 | 0.12 | 0.14 | 0.16 | 0.11 | 0.80 | 0.89 | 0.08 | 0.26 | 0.05 | 0.16 | 1.00 | 0.06 | 0.65 | 0.72 | 0.20 | 0.53 |
| Al ₂ O ₃ | 0.52 | 1.07 | 0.87 | 0.41 | 0.57 | 0.41 | 3.50 | 7.59 | 7.30 | 8.22 | 1.86 | 0.20 | 9.01 | 0.18 | 9.42 | 9.67 | 2.08 | 7.12 |
| FeO | 10.13 | 9.94 | 9.45 | 9.00 | 4.58 | 20.79 | 4.49 | 5.78 | 6.20 | 6.16 | 7.94 | 2.64 | 1.25 | 1.03 | 4.30 | 4.21 | 1.99 | 2.49 |
| MnO | 0.21 | 0.22 | 0.18 | 0.33 | 0.13 | 0.49 | 0.11 | 0.12 | 0.10 | 0.11 | 0.06 | 0.11 | 0.07 | 0.07 | 0.11 | 0.09 | 0.07 | 0.06 |
| NiO | 0.14 | 0.18 | 0.20 | 0.07 | 0.07 | 0.07 | 0.20 | 0.17 | 0.18 | 0.18 | 0.06 | 0.12 | 0.10 | 0.07 | 0.15 | 0.17 | 0.06 | 0.11 |
| MgO | 27.21 | 26.79 | 27.49 | 18.91 | 22.58 | 11.13 | 21.05 | 19.37 | 18.99 | 19.16 | 19.44 | 25.30 | 21.37 | 24.60 | 20.19 | 20.01 | 23.06 | 21.45 |
| CaO | 1.21 | 1.71 | 1.59 | 12.14 | 11.91 | 10.60 | 11.53 | 11.44 | 11.17 | 11.29 | 13.24 | 12.04 | 12.33 | 13.09 | 11.53 | 11.62 | 12.56 | 12.55 |
| Na ₂ O | 0.17 | 0.40 | 0.32 | 0.40 | 0.44 | 0.72 | 1.11 | 1.54 | 2.51 | 2.14 | 0.32 | 0.02 | 1.77 | 0.06 | 2.54 | 2.52 | 0.39 | 1.89 |
| K ₂ O | 0.01 | 0.02 | <d.l. | <d.l. | 0.02 | 0.02 | 0.12 | 0.11 | 0.18 | 0.16 | 0.01 | <d.l. | 0.21 | 0.02 | 0.16 | 0.12 | <d.l. | <d.l. |
| Cl | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.04 | 0.02 | 0.02 | <d.l. | <d.l. | 0.10 | <d.l. | 0.03 | 0.03 | <d.l. | <d.l. |
| F | <d.l. | <d.l. | 0.05 | <d.l. | 0.02 | 0.02 | 0.03 | 0.04 | 0.04 | 0.12 | 0.01 | <d.l. | - | - | - | - | - | - |
| Total | 97.71 | 97.75 | 98.07 | 97.99 | 97.94 | 97.89 | 97.17 | 97.61 | 97.55 | 97.30 | 98.22 | 97.03 | 96.89 | 98.12 | 97.73 | 97.53 | 97.80 | 97.83 |
| Si | 7.94 | 7.84 | 7.87 | 7.98 | 7.92 | 8.01 | 7.50 | 6.93 | 6.88 | 6.78 | 7.70 | 7.71 | 6.95 | 7.97 | 6.82 | 6.79 | 7.85 | 7.15 |
| Al ^{IV} | 0.06 | 0.16 | 0.13 | 0.02 | 0.08 | | 0.50 | 1.07 | 1.12 | 1.22 | 0.30 | 0.03 | 1.05 | 0.03 | 1.18 | 1.21 | 0.15 | 0.85 |
| Al ^{VI} | 0.02 | 0.01 | 0.01 | 0.05 | 0.01 | 0.07 | 0.08 | 0.20 | 0.12 | 0.16 | 0.00 | | 0.43 | 0.00 | 0.39 | 0.40 | 0.18 | 0.31 |
| Ti | 0.01 | 0.03 | 0.03 | 0.01 | 0.01 | 0.03 | 0.11 | 0.17 | 0.32 | 0.23 | 0.02 | | 0.00 | | 0.02 | 0.03 | 0.01 | 0.02 |
| Cr | 0.02 | 0.02 | 0.01 | 0.02 | 0.02 | 0.01 | 0.09 | 0.10 | 0.01 | 0.03 | 0.01 | 0.02 | 0.11 | 0.01 | 0.07 | 0.08 | 0.02 | 0.06 |
| Fe ³⁺ | | | | | | | | | | | 0.17 | 0.53 | | | | | | |
| Fe ²⁺ | 1.16 | 1.14 | 1.08 | 1.06 | 0.53 | 2.61 | 0.53 | 0.68 | 0.74 | 0.74 | 0.76 | | 0.15 | 0.12 | 0.51 | 0.50 | 0.23 | 0.29 |
| Mg | 5.57 | 5.50 | 5.60 | 3.98 | 4.65 | 2.49 | 4.42 | 4.08 | 4.06 | 4.08 | 4.05 | 5.15 | 4.45 | 4.96 | 4.24 | 4.21 | 4.70 | 4.44 |
| Mn | 0.02 | 0.03 | 0.02 | 0.04 | 0.02 | 0.06 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 | 0.01 |
| Ni | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.02 | 0.02 | 0.01 | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.01 | 0.01 |
| Ca | 0.18 | 0.25 | 0.23 | 1.84 | 1.76 | 1.71 | 1.74 | 1.73 | 1.72 | 1.73 | 1.98 | 1.76 | 1.84 | 1.90 | 1.74 | 1.76 | 1.84 | 1.87 |
| Na | 0.05 | 0.11 | 0.08 | 0.11 | 0.12 | 0.21 | 0.30 | 0.42 | 0.70 | 0.59 | 0.09 | 0.00 | 0.48 | 0.02 | 0.69 | 0.69 | 0.10 | 0.51 |
| K | 0.00 | 0.00 | | | | 0.00 | 0.02 | 0.02 | 0.03 | 0.03 | 0.00 | 0.00 | 0.04 | 0.00 | 0.03 | 0.02 | | |
| Total | 15.05 | 15.11 | 15.08 | 15.11 | 15.12 | 15.21 | 15.32 | 15.44 | 15.73 | 15.62 | 15.09 | 15.00 | 15.52 | 15.02 | 15.72 | 15.71 | 15.10 | 15.51 |
| H | 2.00 | 2.00 | 1.97 | 2.00 | 1.99 | 1.99 | 1.98 | 1.97 | 1.98 | 1.94 | 2.00 | 2.00 | 1.98 | 2.00 | 1.99 | 1.99 | 2.00 | 2.00 |
| Cl | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | | | 0.02 | | 0.01 | 0.01 | | |
| F | | | 0.02 | | 0.01 | 0.01 | 0.01 | 0.02 | 0.02 | 0.05 | 0.00 | | | | | | | |
| NaK(A) | 0.05 | 0.11 | 0.08 | 0.11 | 0.12 | 0.21 | 0.32 | 0.44 | 0.73 | 0.62 | 0.09 | 0.00 | 0.52 | 0.02 | 0.72 | 0.71 | 0.10 | 0.51 |
| X _{Mg} | 0.83 | 0.83 | 0.84 | 0.79 | 0.90 | 0.49 | 0.89 | 0.86 | 0.85 | 0.85 | 0.84 | 1.05 | 0.97 | 0.98 | 0.89 | 0.89 | 0.95 | 0.94 |

^aNotes: <d.l., below detection limit; “-”, not determined; Trem, tremolite; Act, actinolite; Anth/Cum, Anthophyllite/Cummingtonite; Fe-Act, ferro-actinolite; Act-Hbl, actinolitic hornblende; Mg-Hbl, magnesio-hornblende; Ed, edenite. Structural formula are based on 23O and 2(OH, F, Cl) [Leake, 1978].

