**Northeastern Section - 53rd Annual Meeting - 2018**

Paper No. 57-1
Presentation Time: 8:00 AM-12:00 PM

# ENCLAVE CHARACTERIZATION AND RELATIONSHIPS WITH HOST ANDESITE IN MORNE MICOTRIN, DOMINICA, LESSER ANTILLES

**HICKERNELL, Sarah M.**, FREY, Holli M. and MANON, Matthew R.F., Geology Department, Union College, Schenectady, NY 12308

Morne Micotrin lava dome is located at the head of the Roseau Valley in Dominica, Lesser Antilles, and has an explosive past; the valley was filled with ~3 $km^3$ of pyroclastic deposits from 65-25 ka. The andesitic dome (59-62 wt% $SiO_2$) contains two distinct types of enclaves, coarse-grained and fine-grained, which differ texturally and compositionally from one another as well as the host. Enclaves provide evidence of magma mingling/mixing processes at depth, which may be introducing volatiles into the magma chamber and triggering eruptions. Fine-grained enclaves (52-54 wt% $SiO_2$) are 1-15 cm in diameter, and saturated in plagioclase, opx, cpx, and two oxides. Fine-grained enclaves are cumulate-like, and lack microlites and matrix glass. Coarse-grained enclaves (55-56 wt% $SiO_2$) are larger, 3-20 cm, lack cpx phenocrysts, and contain plagioclase microlites. Coarse-grained enclaves are vesicular, a characteristic not observed in the host or fine-grained enclaves, and the margins are diffuse compared to the sharp fine-grained enclave margins. Coarse-grained enclave oxides are highly exsolved, and two oxides yielded temperatures of 890± 91° and 774± 168°, whereas fine-grained enclave oxides yielded temperatures of 891± 74° and 794± 60°. Both enclave types yielded higher $fO_2$ values than the host (average host yield $fO_2$ values of 0.30± 0.15, coarse-grained enclaves yield $fO_2$ values of 1.00± 0.23 and 1.49± 1.22, fine-grained enclaves yield $fO_2$ values of 0.42± 0.23 and 0.60± 0.21, all relative to DNNO). Mineral zoning in the enclaves is more complex than in the host. Plagioclase is normally and reversely zoned and ranges from $An_{40}$ to $An_{90}$ in the host and enclaves. Many enclave plagioclase exhibit potassic rims, up to Or20. Opx in all samples display mostly reverse zoning (En50-70). Enclave opx are characterized by cpx overgrowth. Cpx compositions are more varied within the enclaves, with up to 20 mol% Wo variation. Whole-rock REE concentrations compared to chondrite reveal that fine-grained enclave compositional trends are not parallel to the trends of the host and coarse-grained enclaves. This suggests a unique source compared to the host and coarse-grained enclaves. Understanding enclave characteristics may give insight into changes occurring in the magmatic system, and how the interaction of magmas may cause eruptions.

Session No. 57--Booth# 25

D11. Igneous and Metamorphic Petrology (Posters)
Tuesday, 20 March 2018: 8:00 AM-12:00 PM

Lake Champlain Exhibition Hall (DoubleTree by Hilton)

Geological Society of America *Abstracts with Programs*. Vol. 50, No. 2
doi: 10.1130/abs/2018NE-311007



Back to: D11. Igneous and Metamorphic Petrology (Posters)

*Previous Abstract* | Next Abstract >>