

Molybdenite-bearing vugs in microgranite in the Preissac pluton, Québec, Canada: Relicts of aqueous fluid pockets?

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ABSTRACT

Field, petrochemical, and stable isotope data from peraluminous microgranite dikes and their molybdenite-bearing vugs in the Archean Preissac-Lacorne batholith, Québec, provide evidence for the transport and deposition of molybdenum by an aqueous fluid that exsolved from a felsic magma. A model is proposed in which the microgranite-forming liquid fractionated from a magma that was parental to and intruded less-evolved muscovite monzogranite. Fluid saturation is interpreted to have occurred immediately prior to emplacement, allowing sufficient time for small spherical pockets of fluid to form and rise through the liquid but insufficient time for them to leave the system. These fluid pockets scavenged molybdenum and other components during their migration but were frozen in situ to form molybdenite-bearing vugs as a result of the quenching of the magma. We therefore conclude that the vugs are relicts of the exsolved fluid pockets and that the molybdenite in them reflects the concentration of molybdenum in the fluid, estimated from volumetric relationships to have reached ~7800 ppm.

Keywords: Molybdenum mineralization, miarolitic cavity, volatile exsolution, monzogranite, Québec