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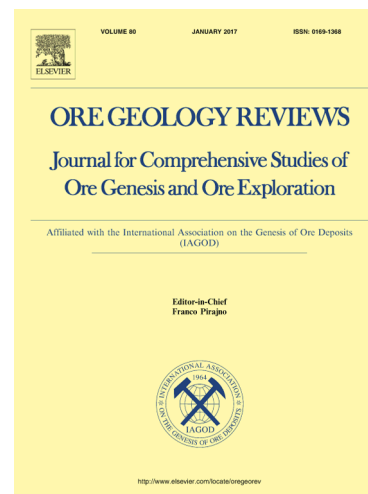
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Early Carbonate Veining and Gold Mineralization in the Timmins Camp: Depositional Context of the Dome Mine Ankerite Veins

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Abstract

The earliest auriferous veining event in the development of the over 16 Moz gold endowment at the Dome mine was an extensive set of ankerite veins (over 5,400 m strike length). The depositional context of the Dome mine ankerite veins has been historically contentious and their role in the mineralization history of the deposit not well understood. We present a deposit wide geochemical study of the ankerite veins and their host rocks, with observations from new underground mapping. Ankerite veining across the mine is almost exclusively restricted to the Vipond Formation, which is Fe rich and tholeiitic in nature. Metamorphic fluids and ankerite vein formation generally focused along flow boundaries in the volcanic sequence, however, carbonatization is ubiquitous. The flows of the Vipond Formation maintain their protolith geochemical signatures as REE, Zr, Al₂O₃, TiO₂, and Y are largely immobile during mineralization and alteration, which mobilized Na₂O, K₂O, and locally Fe₂O₃. The ankerite vein structures are reactivated and overprinted by quartz and quartz-tourmaline veining, and gold grade is variable, ranging from <1 to 98 g/t with the highest grades related to the overprinting veining. Gold in the ankerite veins occurs primarily at the vein margins associated with pyrite

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