Application of Crushing Stage Test and Fluid Inclusion Studies on Orogenic Gold Exploration in the Yellowknife Greenstone Belt

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Summary

The Yellowknife greenstone belt (YGB), located in the Northwest Territories, is an Archean tectonic province that hosts numerous gold occurrences including the world-class Con and Giant deposits near Yellowknife Bay. Previous fluid inclusion studies in the area have indicated the likely depositional mechanisms in the Yellowknife greenstone belt. This project aims to expand that understanding and evaluate whether a chemical signature of the fluid inclusions can be used to discriminate between auriferous and non-auriferous samples in different geological backgrounds. We have performed crushing analyses (Roedder, 1970) in samples from underexplored claims as well as in mineralized samples from the historic mining sites. Our preliminary results showed a spatial link between the auriferous samples and highly-pressurized volatile content. Raman spectroscopy is used to determine the chemical composition of the ore-bearing fluids. If these results validate outcomes obtained from the crushing test, this simple test is expected to become an exploration tool that can be applied by industry. The Yellowknife greenstone belt is the ideal location for this type of analysis due to its historic validation as a large gold district as well as the new potential shown by recently expanded claims.