

Petrogenesis and geochemistry of mafic granulites from the Upper-Deck of the Tantato Domain, northern Saskatchewan, Canada

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The Tantato Domain, or the East Athabasca Mylonite Triangle, is one of three “lozenges” of mylonitized Archean crust that extend from northern Saskatchewan northeast into the Northwest Territories along the Snowbird Tectonic Zone. The Tantato Domain is divided into two subdomains based on structural and metamorphic characteristics, commonly referred to as the Upper Deck and the Lower Deck. The Upper Deck is host to the mafic granulites in question, which are found as extensive mafic sills emplaced approximately 2.639 Ga into psammopelitic gneisses and meta-tonalities. These mafic sills have since undergone predominately granulite facies metamorphism and therefore are referred to by many authors as mafic granulites, although it should be noted that small lenses of mafic eclogites can be found in the northern half of the Upper Deck, and mafic amphibolites can be found in the southern portion of the Upper Deck, towards which the metamorphic grade decreases. The mafic sills have attracted the considerable interest of exploration companies since 1929 after the discovery of potentially economic nickel-copper sulphide mineralization in the Axis lake area, yet very little is understood about the petrogenesis of the rocks. Some authors have proposed, that the sequence of rocks and metamorphic relationships, of the Upper Deck may represent an exhumed “dismembered” Archean arc, accreted on the western margin of the Hearne Craton; however, geochemical modeling has never been done to support this hypothesis. This poster will summarize recent geochemical analysis being carried out on the mafic granulites. The goal of the geochemical work is to shed light on the petrogenesis of the rocks, including the tectonic setting, the source, evolution, and the cooling history of the magmas