Petrography of Gneissic Xenoliths from the Popes Harbour Dyke, Nova Scotia: Fragments of the Basement to the Meguma Group

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Fragments of the probable basement to the Meguma Group occur as xenoliths in a lamprophyric dyke at Popes Harbour, Nova Scotia. The xenoliths comprise a heterogeneous assemblage of (meta)plutonic rocks and gneisses. The gneissic xenoliths comprise disequilibrium mineral assemblages which include relicts of an early, granulite facies event, and a younger, higher temperature overprint attributed to the lamprophyre. Most of the gneissic xenoliths are quartz-poor metapelites and garnet + orthopyroxene-bearing, quartzofeldspathic gneiss. Textural features suggest that the pre-dyke pelitic assemblage included poikiloblastic garnet, biotite, kyanite, oligoclase and quartz. Kyanite is largely replaced by sillimanite. Available data for mineral core compositions indicate metamorphic conditions of ca. 600°C (gt-bi and opx-gt thermometers) and 500-600 MPa (g-Al_2SiO_5-pl-aq and gt-opx-pl-qz barometers). The kyanite- and sillimanit-forming events are not clearly distinguished by these data. Features attributed to the thermal imprint of the dyke comprise texturally-overprinting assemblages including, in the pelites, sapphirine, spinel, corundum and/or rutile (all the anatectic (?) calcic, plagioclase and ternary feldspar rims). Calcic rims on plagioclase and pyrope-rich overgrowths on garnet characterize thermal metamorphism in both the pelites and quartzofeldspathic gneiss.

The polymict assemblage of xenoliths in the Popes Harbour dyke testifies to the heterogeneity of the basement to the Meguma Group.