
Decompressional reaction textures in the southeast Long Range Inlier, Newfoundland: products of thermal metamorphism adjacent to the Taylor Brook Gabbro Complex?

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High-grade metamorphic terranes typically record aspects of their tectonic history subsequent to regional metamorphism. The rocks in many such terranes commonly preserve arrested mineral reaction features, such as corona structures, indicating that high-grade metamorphism was superseded either by near-isobaric cooling or near-isothermal decompression. However, in the Proterozoic Long Range Inlier of western Newfoundland, these corona structures are spatially associated with a mafic intrusion, the Silurian Taylor Brook Gabbro Complex (TBGC).

Reaction textures and corona structures, which include pressure-sensitive assemblages (e.g., coronal pyroxene on garnet in metabasite), have been identified in gneissic rocks near (within a few km) the TBGC. These types of coronal assemblages are generally interpreted to indicate near-isothermal decompression following regional metamorphism, which in the inlier occurred at ca. 1.03 – 1.10 Ga. However, since they appear to be absent elsewhere in the inlier, there is reason to believe that they are products of contact metamorphism within the thermal aureole of the intrusion. Furthermore, one-dimensional thermal modeling calculations yield results consistent with paleotemperatures determined for the coronal assemblages in samples collected at various distances from the TBGC. We therefore conclude that the coronas formed during cooling of the TBGC, so that there is a ca. 0.7 Ga difference (i.e., mid-Proterozoic versus Silurian) between the age of the regional metamorphic mineral assemblages, as represented by the mineral cores of the corona structures, and the coronas

themselves. Investigation of coronal structures within the aureole of the TBGC therefore adds an additional point to the P-T-t curve for the Long Range Inlier.