
**Metamorphic petrology of calc-silicate nodules
from greenschist facies to migmatite grade,
Liverpool-Pubnico area, Nova Scotia**

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Calc-silicate nodules occur within the low-pressure regionally metamorphosed rocks of the Meguma Group in southwestern Nova Scotia. These nodules show the effects of increasing temperature during metamorphism by changes in the zonation of their mineral assemblages. The purpose of this study was to determine what mineral zonation within the nodules occurred during diagenesis as opposed to metamorphism and to determine the role of fluids during the metamorphism of the pelitic, psammitic, and calc-silicate rocks of the Meguma Group. To determine the amount of Ca and Si metasomatism between the surrounding siliceous rocks and calcareous nodules during metamorphism, the mineral assemblages of the nodules were analyzed and compared across the different metamorphic zones. Approximately 40 samples from chlorite to sillimanite grades were collected from Pubnico to Liverpool. Petrological and petrographic studies and electron microprobe analysis were performed to estimate the temperature, pressure, and fluid composition during metamorphism.

The calc-silicate nodules are generally located within psammitic beds in the Goldenville Formation. The nodules have a range in size and shape, from lens to irregular shaped to con-

tinuous layers of calc-silicate mineral assemblages. Calcareous nodules found at the lowest metamorphic grade at Green Bay do not show mineral zonation, suggesting that the zonation was not a result of diagenetic processes. At chlorite grade, the nodules vary gradationally from a quartz-plagioclase (An_{18})-garnet rim to a quartz-plagioclase (An_{37})-actinolite-chlorite-epidote core. At higher andalusite-staurolite grade, the nodules have a quartz-plagioclase (An_{30-83})-garnet-epidote±hornblende-biotite-chlorite-muscovite rim that grades to a coarser grained quartz-plagioclase (An_{97})-epidote-garnet±calcite-diopside core. At the highest grade (sillimanite grade) the nodules grade from a plagioclase (An_{27-57})-quartz-biotite±chlorite-hornblende rim to a plagioclase (An_{90-96})-quartz-biotite-garnet-chlorite±epidote-muscovite core. With increasing metamorphic grade, there is a general increase in the abundance of epidote, biotite, hornblende, diopside and anorthite. A change in mineral composition across individual calc-silicate nodules also occurs, with a general increase in epidote, anorthite, spessartine and grossular garnet, diopside, and hornblende from rim to core of the nodule.