

**MICRO-ANALYSIS OF INCLUSION-BEARING ALBITE AND GARNET
PORPHYROBLASTS OF THE HOOSAC FORMATION, WINDSOR, MA:
IMPLICATIONS FOR THE TECTONIC HISTORY OF NORTHERN
APPALACHIA**

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The Appalachian mountains began forming as early as 480 Ma by collisions of one or more continents with ancient eastern North America. Multiple collisional events resulted in the complex geology that is now exposed. Broad understanding of this mountain building process is limited by the complex structures and fabrics that resulted, and the ages of deformation and metamorphic events remain unclear. Unraveling this history requires detailed observation of the structures, fabrics and minerals in rocks affected by these events. Inclusion-bearing albite and garnet porphyroblasts of the Hoosac Formation may provide a window to understanding previous metamorphic conditions because inclusion trails may represent older mineral assemblages while mineral rims show younger, superimposed events. Thus, these porphyroblasts may provide a deeper understanding of multiply deformed metamorphosed rocks. Geologic mapping, oriented sample collection, thin section preparation, petrographic analysis, electron microprobe analysis and monazite age-dating techniques will be combined to investigate the tectonic history of rocks of the Hoosac Formation of Western Massachusetts. Field work has shown that albite-bearing rocks form in roughly north-south striking, east-dipping belts with parallel belts of garnet-bearing rocks. Thin sections allow analysis of the exact orientation of inclusion fabrics and the minerals that define them. Petrologic analysis has shown the presence of an early foliation as well as a later, more predominate, foliation. Certain garnet porphyroblasts indicate two, or perhaps three, growth stages. Analysis is underway to determine absolute age relations of metamorphism and the P-T-t-D path of the Hoosac Formation itself. Specific attention to understanding how inclusion trails form within porphyroblasts, the nature by which polymetamorphic events affect rock compositions and fabrics, and the pressure-temperature-time-deformation (P-T-t-D) path of the Hoosac Formation will be critical in developing models for the tectonic history of these rocks, and along with similar “windows” in other formations, will provide the necessary foundation to unravel the complexities that inhibit broad understanding of the Northern Appalachia.