

GEOCHEMICAL FINGERPRINTING: TOURMALINE AS AN INDICATOR OF PROVENANCE

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ABSTRACT

My research seeks to understand the relationship between different pegmatitic melts and tourmaline chemistry using a combination of Electron Probe Micro-Analysis (EPMA) and Laser Induced Breakdown Spectroscopy (LIBS) to test the hypothesis that a geochemical signature of the original lithologic environment, unique to each subtype of granitic pegmatite, will be preserved within tourmaline. Tourmaline can accommodate a wide array of elements and this chemical information, a product of the environment in which it grew, is typically preserved. EPMA and LIBS techniques provide complementary data on major and trace elements in tourmaline, allowing us to define the optimal geochemical “fingerprint” left by the original igneous melt as well as its interactions with the country rock and local fluids. These fingerprints will be used to further refine definitions of pegmatite subtypes and can be used for more precise provenance investigations of detrital tourmaline as well as of gemstones.

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