

# Investigation of nitrogen variability of metapelitic rocks in Mica Creek area, BC

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The Proterozoic Horsethief Creek Group in Mica Creek area (BC) has been metamorphosed to metapelites in various facies from sub-greenschist to upper amphibolite. These metapelites provide a valuable opportunity to examine the nitrogen isotope behavior in a collisional metamorphic sequence. In addition, based on the discovery of relative homogeneity of hydrogen and oxygen isotopes of minerals (quartz, muscovite and biotite etc.) in metapelites in the Mica Creek area by Bowman and Ghent (1986), the nitrogen-rich minerals (e.g., mica) may potentially provide an unprecedented chance to develop the first mineral standard for nitrogen isotope analysis if the mica samples show compositional and isotopic homogeneities. For these purposes, we selected 15 samples from Mica Creek area ranging from subgreenschist to upper amphibolite facies. All samples have been analyzed for bulk major and trace elements. Selected biotite and muscovite separates were further analyzed by electron probe microanalysis (EPMA) to test the heterogeneity in individual samples and isograds. The concentration of fluid-mobile elements such as Cs, Rb, U, LREEs and Cs/Th, Cs/K, Rb/K, U/Th ratios are relatively consistent across all grades, indicating that little of these fluid-mobile elements was lost during prograde metamorphism, and suggesting that the rock behaved as closed system and no sign of external fluid infiltration. Two of the kyanite zone samples (MET-001 and 6100), which are 10s meters apart, have been tested for nitrogen contents of muscovites. The nitrogen contents of single muscovites in MET-001 and 6100 are  $330 \pm 30$  ppm ( $1\sigma$ ;  $n=50$ ) and  $330 \pm 25$  ppm ( $1\sigma$ ;  $n=100$ ) respectively, supporting that the ammonium content is relatively homogeneous at least in the kyanite zone.

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