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PETROLOGICAL SIGNIFICANCE OF MANTLE PERIDOTITES FROM THE NAGA OPHIOLITE BELT, PHEK DISTRICT, NAGALAND

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Abstract

The northeast Indian ophiolite belt is exposed in parts of Nagaland and Manipur states. We present the results of an investigation into the petrology and constituent mineral chemistry of peridotite from the ophiolite belt of Phek District, Nagaland. Based on relict primary mineral compositions, the studied rocks are identified as abyssal peridotite. Spinel composition shows that the rocks have undergone low degree of partial melting (5 11%). Equilibration of the ophiolite mantle sequence peridotite was calculated at a temperature range of 850–1165ºC, pressure ranging between 19 to 25 kbar, and an oxygen fugacity between 0.437 to 0.657 log units above the FMQ buffer, whereas for the xenolith peridotite the temperature was estimated to be between 850 to 1100 ºC, pressure ranging from 12 to 17 kbar and oxygen fugacity between 0.577 to 0.706 log units above the FMQ buffer. Equilibrium condition suggests that the rocks were equilibrated in an upper mantle environment.

Keywords: Abyssal peridotite, equilibrium temperature, oxygen fugacity, partial melting, ophiolite