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Petrological significance of the abyssal peridotites from the ophiolite belt of Indo-Myanmar Range, northeastern India

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The ophiolite belt of the Indo-Myanmar Range of northeastern India is regarded as the continental extension of the Indonesia island arc. The ophiolite sequence forms a belt extending about 200 km from Pukhpur (Nagaland state) in the north to Moreh (Manipur state) in the south. Here we report preliminary mineralogical and phase geochemical data of peridotites collected from the ophiolite sequences of the Ukhrul district in Manipur.

Primary minerals are clinopyroxene, orthopyroxene and spinel with scarce relicts of olivine. Andraditic garnet present in a few samples is of secondary origin. The clinopyroxene and orthopyroxene show limited compositional range. Well's (1977) single clinopyroxene thermometry yielded variable equilibrium temperature between 780-1250oC. The lower temperature value suggests post-crystallisation re-equilibration. Equilibrium pressure estimates based on Nimis and Ulmer's single clinopyroxene (1998) and Köhler and Brey's (1990) olivine-spinel geobarometries range from 19 to 25 kbars. Oxygen fugacity expressed in terms of quartz-fayalite-magnetite (Delta QFM) value is calculated as –1.32. Spinel Cr# (Cr/(Cr+Al)) of the peridotites reflects mantle residues after low degree of melting (F = 0.5 – 11%) if derived from primitive mantle. Mineral composition tectonomagmatic discrimination diagrams confirm the studied samples to be abyssal peridotites. Laser Ablation ICPMS analyses of the rare earth element patterns of clinopyroxene in the peridotites show depleted light rare earth element with flat middle and heavy rare earth element patterns, similar to the reported abyssal peridotites.

References
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