Composition and characterisation of chromites, alloys and sulphide inclusions from the Indo-Myanmar Ophiolite Belt of Northeastern India

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Chromite is commonly used for deciphering the petrogenesis and geodynamic setting of ultramafic rocks. We report here the compositions of chrome-spinels occurring in the form of podiform chromitites associated with mantle sequence of the Indo-Myanmar Ophiolite Belt and the chrome-spinel phenocrysts from a volcanic suite of rocks. The Cr/(Cr+Al) and Mg/(Mg+Fe^{2+}) range from 66 to 70 in the chromitite, whereas volcanic spinels have Cr/(Cr+Al) of 47 to 56 and the Mg/(Mg+Fe^{2+}) ranges from 67 to 70. The computed crystallisation conditions indicates that the chromites were crystallised in an upper mantle environment.

Using the chrome spinel compositions, we further computed the parental melt for the chromitite rock and indicative of boninitic composition. In contrast, the volcanic spinel resembles more with mid-ocean ridge basalt type. Minor and trace elements (Ga, Ni, Zn, Co, Mn, V, Sc) compositions of the spinels are comparable to those reported from other podiform chromitites of ophiolite complexes. Mineral compositions of these two chrome spinels are also used to infer the probable crystallization conditions.

Additionally, metallic alloys, such as Ni-Fe, Ni-Fe-Cr and sulphide of Ni-Cr-Fe are present as inclusions in the chromitites. We focus on the chemical characterisation and discuss the probable formation processes of these inclusive phases.