

## **Mineralogy and petrology of chromite ore and associated ultramafic rocks of Jijal Complex, District Shangla, KP, Pakistan**

**Muhammad Nasir Siddiq<sup>1</sup>; Mr. Abdus Sattar<sup>2</sup>; Atif Ali Hassan<sup>1</sup> and Zaheer Anwar Ali<sup>1</sup>**

<sup>1</sup>*Geological Survey of Pakistan*

<sup>2</sup>*Institute of Geology, PU*

*mnasirsiddiq@yahoo.com*

### **Abstract**

This study is focused on the ultramafic rocks of the Jijal complex in Shangla district. Exposed rocks in the area are mostly dunites, peridotites, pyroxenites and at some places serpentinites. These rocks contain considerable amount of podiform chromite deposits. Main purpose of the study was to carry out the mineralogy and petrology of Chromite and associated ultramafic rocks. Systematic sampling was carried out from 7 different locations.

Geological map of about 36000 km<sup>2</sup> of Kohistan Island Arc (KIA) has been prepared by incorporating and modifying the existing maps on a scale 1:1,000,000 from Afghan border in the west upto Nanga Parbat Haramosh Massif in the east and from Main Mantel Thrust (MMT) in the south to Main Karakoram Thrust (MKT) in the north. Geological map of Jijal Complex showing location of chromite mines in different areas has been prepared by modifying the existing map on the scale 1:50,000. Entire lithology of KIA has been systemized and described in detail. Lithologic units of KIA are further subdivided into northern, central and southern terrane.

Petrographic and mineralogical assessment carried out by microscopic study and X-ray diffraction analysis revealed that, these rocks show mild to light alteration in the form of serpentinization. The alteration level increases towards the MMT which might be because of the presence of more joints and fractures. Secondary mineralization includes serpentine, magnetite, chlorite and garnierite mostly. Magnetite is present because of the iron leaching caused by fluids circulation and alteration. Where the rocks show no or less alteration chromite Spinel gradually replaces the Magnetite.

Chromite is mostly present in disseminated layers and lenses. Jijal ultramafic rocks are medium to coarse grained and have hypidiomorphic texture whereas chromite mostly has allotriomorphic texture. These rocks are rich in diopside and orthopyroxene is very rare. Bulk mineralogy of these rocks includes olivine, clinopyroxene,  $\pm$  magnetite,  $\pm$  chromite,  $\pm$  serpentine,  $\pm$  chlorite,  $\pm$  plagioclase and amphibole as traces. Geochemical studies of existing data have been done to interpret the source of these rocks and industrial usage of chromite ore.