PETROGRAPHIC STUDY OF METAMORPHOSED PANJAL TRAPS FROM THE KAGHAN VALLEY, NORTH PAKISTAN

Faisal Muhamamd[1]; Muhammad Sajid[1]; Razeph Razzaq[1]; Syed Mohsin Shah[1] and Kirpal Sonu[1]

[1]*Department of Geology, University of Peshawar*

faisalmuhammad0408@gmail.com

Abstract

Different metabasic rocks were sampled from the Higher Himalayan Sequence (HHS) of Kaghan Valley, northwest Himalaya, Pakistan. The sampled rocks are expected to be metamorphosed Permian Panjal traps reported elsewhere in the region. Detailed mineralogical and textural relationships lead to categorize them into four different groups: 1) eclogites, 2) amphibolitized eclogites 3) garnet amphibolites and 4) amphibolites. Eclogites mainly consist of garnet, omphacitic clinopyroxene and symplectite with minor rutile and epidote group minerals (including zoisite, clinozoisite and epidote). In contrast, amphibolitized eclogites are strongly overprinted by amphibolite facies minerals that omphacite only survived in relics. Growth of symplectite, secondary amphibole, biotite and titanite corona around the peak eclogitic rutile are the dominant retrogressive featured observed in these rocks. Based on mineralogy and textures, eclogites are interpreted to be deeply subducted rocks due to India-Kohistan collision followed by rapid exhumation resulting from the Himalayan uplift. Amphibolites, both foliated to weakly or non-foliated varieties are cropping out in the form of vertical to sub-vertical dykes with variable thickness and texture, in the foliated host rocks. They are further grouped into garnet bearing (with and without plagioclase) and garnet free (plagioclase bearing). Garnet amphibolites mainly consist of hornblende, garnet and quartz with minor rutile, ± epidote and ± plagioclase. Presence of ubiquitous garnet and rare occurrence or absence of plagioclase restraint the higher-pressure conditions of these rocks. Conversely, amphibolites with hornblende, plagioclase and quartz with minor rutile, ± titanite and ± epidote are presumed to be metamorphosed comparatively at lower pressure. The observed differences in the metamorphic grade is supported by their occurrence in the field; amphibolites are restricted to the south while garnet amphibolites and eclogites to the north of the valley which is consistent with the increasing grade of metamorphism towards the collisional boundary (MMT).