

**PETROCHEMICAL AND GEOCHRONOLOGICAL STUDY OF THE ROCKS OF  
INDUS SUTURE ZONE AND KAMILA AMPHIBOLITES, SWAT, KP, PAKISTAN**  
Lawangin Sheikh<sup>1,2</sup>; Wasiq Lutfi<sup>1</sup>; Zhidan Zhao<sup>1</sup>; Muhammad Awais<sup>2</sup>; Laeiq Ahmad<sup>2</sup>; and  
Qingshan Shi<sup>1</sup>

<sup>1</sup>*China University of Geosciences, Beijing, China*

<sup>2</sup>*Department of Geology, University of Swabi, KP, Pakistan*

Lawangin@uoswabi.edu.pk

**Abstract**

Geologically the northern most part of Pakistan has formed as a result of collision of two mega plates namely Asian plate at the north and Indian plate at the south. Kohistan Island Arc (KIA), a cretaceous arc has developed as a result of intra oceanic subduction of Tethys Ocean and separated from the Indian plate by Indus suture zone. Rock samples from Charbagh to Madyan area Swat were collected for petrography, geochemistry and geochronology to investigate the age relationships with the eastern extension in Pakistan. The rocks formed along the suture zones are metamorphosed quartz mica schist showing anhedral stressed quartz grains embedded in the laths of coarse grained mica, mainly muscovite. The rocks of kamila amphibolite are highly altered to less altered and dominantly consisting of medium to coarse grained anhedral to subhedral amphiboles, quartz, plagioclase, ore minerals, sericite and feldspars (dominantly microcline). The fine to medium grained amphibolites are under less stressed with no visible banding while the coarse grained altered amphibolites from the contact area are under high stresses. Rocks of Kamila amphibolite belt falls in the region of intermediate with SiO<sub>2</sub> content ranges (45.26% to 57.37%), TiO<sub>2</sub> (0.55% to 0.97%), Al<sub>2</sub>O<sub>3</sub> (12.51% to 18.82%), Fe<sub>2</sub>O<sub>3</sub> ranges (5.11% to 12.05%), MnO (0.13% to 0.23%), MgO (1.17% to 6.07%), CaO (8.13% to 22.37%), Na<sub>2</sub>O (0.14% to 3.64%), K<sub>2</sub>O (0.00% to 1.40%) and P<sub>2</sub>O<sub>5</sub> (0.05% to 0.38%). The rocks are plotted in the sub-alkaline/tholeiitic basaltic field on silica versus total alkalis diagram, while they are further divided into tholeiitic and calc-alkaline fields on the AFM diagram. Tectonically the rocks are plotted in the zone of island arc basalts or boundary between island arc and mid oceanic ridges basalts. Eleven samples are selected for zircon U-Pb geochronology and they were crushed and mounted in epoxy resins. Cathodoluminescence images of the zircons selected for geochronology were obtained and selected areas of zircons will be run on LA-ICP-MS.