THE PETROGRAPHIC CHARACTERISTICS OF CRETACEOUS LUMSHIWAL FORMATION, KHWARI KHWAR SECTION, NIZAMPUR BASIN, PAKISTAN.

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Abstract

The Cretaceous Lumshiwal Formation was studied for its petrographic characteristics and presuming provenance by using 27 outcrop samples in Khwari Khwar Section, Nizampur Basin. The formation is mainly composed of sandstone with minor intercalations of shales and having a limestone bed at the top. The texturally sub-mature to mineralogically mature sandstones, classified as quartz arenites, generally represent as first order cycle of deposition. The constituents are dominated by monocrystalline non-undulose quartz (85%), some polycrystalline quartz (5%) and orthoclase feldspar (5%), few rock fragments (1%), micas (2%) and a suite of heavy minerals (1%). Whereas the rock fragments are well rounded, the heavy minerals include garnet, tourmaline, rutile, monazite, glauconite and biotite mica. The grains characteristics reveal that the source rock was acidic plutonic igneous, present in the craton interior, having semi humid to humid climate condition. The sandstones are poorly to moderately sorted and cemented by silica. The optically continuous quartz overgrowth, close packing of grains with planar to sutured contacts, presence of stylolites and alteration of feldspar into clay suggest phyllomorphic phase of diagenesis. Total absence of matrix, abundance of framework grains and presence of glauconite suggest high energy shallow marine environmental conditions. The topmost limestone bed is glauconitic bioclastic limestone, representing middle shelf environmental conditions and first sign of transgression before deposition of overlying Kawagarh Formation.