FACIES ARCHITECTURE, PETROGRAPHIC AND GEOCHEMICAL ANALYSIS OF TOBRA FORMATION, SALT RANGE, PAKISTAN

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Abstract

Present research work is aimed to mark litho-facies and to understand sedimentology of Tobra Formation through petrographic and geochemical analysis. Three sections were selected for sampling, Zaluch Section in western Salt Range, Pidh and Tobra Sections in eastern Salt Range. The field studies comprise of measuring designated litho-sections, collection of representative samples and recording for sedimentary features. This research work determined 7 litho-facies of Tobra Formation i.e. Matrix-Supporter Conglomerates Facies, Clast-Supported Conglomerate Facies, Claystone-Conglomerate Facies, Claystone Facies, Massive Clay Facies, Massive Sandstone Facies and Pebbly-Sandstone Facies. These Facies expresses glacial influenced debris flow to stream flow deposits. The petrographical analysis revealed that the sandstone of Tobra Formation is quartz arenite to lithic arenite and immature to submature. It is interpreted as recycled orogenic tectonic regime deposits during semi humid to humid climate conditions. The conglomerates are Diamictite, mostly clasts are derived from igneous origin. The framework grains observed under polarizing microscope are monocrystalline and polycrystalline quartz, alkali feldspar, plagioclase, microcline, biotite, chert, muscovite and number of lithic fragments from distinct origins. The geochemical analysis (XRD) finds that quartz, dolomite and albite are the major mineral constituents, whereas aluminium, magnesium, sodium, palygorskite and dickite are minor constituents. Major element analysis finds out that Tobra Formation sandstone are lithic-arenite and non-marine deposits with increasing maturity and subalkaline, basic to acidic rocks.