

Microfacies and Environmental Interpretation of Shekhan Formation: Implication for Hydrocarbon Exploration in Kohat Plateau, NW Pakistan.

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The Shekhan Formation was measured and sampled in Shekhan Nala section, Kohat for detailed petrographic analysis in order to conduct its microfacies and environmental interpretation. Seven microfacies are identified and interpreted that are; Siliciclastic mixed, bioclastic wacke-packstone microfacies, miliolid packstone microfacies, lime mudstone microfacies, bioclastic mud-wackestone microfacies, mollusk wacke-packstone microfacies, siliciclastic packstone microfacies and siliciclastic mixed, bioclastic pack-grainstone microfacies. These microfacies helped in determining their depositional environments on the basis of allochemical constituents which are mainly bioclasts (represented by foraminifera, gastropods, pelecypods, ostracods, mollusks, echinoids and algae), siliciclastic matter (represented by detrital quartz & chert), spar and micrite matrix. Shallow marine environments have been suggested for the deposits of Shekhan Formation based on our study. Diagenetic analysis indicates that processes like cementation, microbial micritization, neomorphism, compaction, dissolution and dolomitization have significant effects on formation porosity. Porosity is mainly secondary in origin and the dominant porosity types observed in Shekhan Formation are inter-granular, intra-granular, stylolitic, fracture, moldic and vuggy. The recent oil and gas discoveries in Kohat Plateau have opened up the way for exploration in the region with multiple proven reservoir horizons. Keeping in view the porosities in different microfacies of Shekhan Formation, it can become part of the petroleum system as a potential reservoir, especially in the north eastern part of Kohat Plateau.