

Field investigations of dolomite fronts in the Jurassic Samanasuk Formation (Khan pur Area, KPK): Possible reservoir analogue

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This contribution aims to investigate the impact of fracture-controlled as well as bedding parallel, dolomites on reservoir heterogeneities. Such type of dolomites are important because they are related to faults/fractures, which upon reactivation can enhance the porosity and permeability (vertical connectivity) of these dolomites, which in turn facilitate the movement of fluids towards these dolomites to make them good reservoirs.

The study area near Koi Mera area comprised of E-W extended carbonate build-ups (Samansuk Formation), which contain excellent dolomite bodies oriented along the bedding as well as cross-cutting the host limestone. The folded stratigraphic sequence shows that dolomite occurs at various levels i.e., ranging from core to the hinge zone of the structure. This indicates that dolomitisation may have occurred in multiple stages. Initially, two dolomite phases have been identified on the basis of field investigations. (1) Dark grey colored, thin to medium bedded dolomite (D-I) mostly present in the lower horizons of the host limestone (core of the anticline structure), having porosity of about 10% and permeability of ~ 15-20mD (physical observation), whereas (2) Light grey colored, medium bedded dolomite (D-II) mostly occurs in the uppermost part of the anticlinal structure exhibiting similar reservoir properties as D-I dolomite.

Although dolomite facies variation does not effect too much in the increase of porosity and permeability values but multiple stages of tectonic events resulted in dolomite alteration products are responsible for the enhancement of these petrophysical properties. Multiple fluid flows may be responsible for the formation of multistage dolomitisation. Such dolomite bodies may act as probable reservoirs in the Margalla Hill Ranges, where step faulting may provide pathways for hydrocarbons to migrate from source to reservoir.



Field photograph showing dark gray colored dolomite in off-white host limestone.