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Establishing Sequence Stratigraphic Framework and Hydrocarbon Potential of the Late Cretaceous Strata: A Case Study from Central Indus Basin, Pakistan

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Abstract : The Late Cretaceous strata (Mughal Kot Formation) exposed in Central Indus Basin, Pakistan is evaluated for establishing sequence stratigraphic framework and potential of hydrocarbon accumulation. The petrographic studies and SEM analysis were carried out to infer the hydrocarbon potential of the rock unit. The petrographic details disclosed 4 microfacies including Pelagic Mudstone, OrbitoidalWackestone, Quartz Arenite, and Quartz Wacke. The lowermost part of the rock unit consists of OrbitoidalWackestone which shows deposition in the middle shelf environment. The Quartz Arenite and Quartz Wacke suggest deposition on the deep slope settings while the Pelagic Mudstone microfacies point toward deposition in the distal deep marine settings. Based on the facies stacking patterns and cyclicity in the chronostratigraphic context, the strata is divided into two 3rd order cycles. One complete sequence i.e Transgressive system tract (TST), Highstand system tract (HST) and Lowstand system tract (LST) are again replaced by another Transgressive system tract and Highstant system tract with no markers of sequence boundary. The LST sands are sandwiched between TST and HST shales but no potential porosity/permeability values have been determined. Microfacies and SEM studies revealed very fewer chances for hydrocarbon accumulation and overall reservoir potential is characterized as low.

Keywords : cycle, deposition, microfacies, reservoir
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