

Cleat Fractures and Matrix Porosity in Coals of Sindh

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This paper presents the results of detailed Scanning Electron Microscopic (SEM) study carried out on coal samples from various locations of Thar and Lakhra coalfields of Sindh to evaluate the porosity and permeability patterns, which are essentially required to turn coal in to potential unconventional gas reservoir. Coal has dual porosity containing micropores (matrix) and network of natural fractures known as cleats. The results indicate that Thar and Lakhra coals are significantly cleated and coals also contain micropores of less than 5 μ m. A variety of Cleat fractures such as regular, reticulate, isolated, random and isolated 'S' sub-pattern have been observed. In Lakhra coal regular and reticulate sub patterns and at places few isolated 'S' sub-pattern of cleats have been formed due to intrinsic tensile forces, fluid pressure, and tectonic stresses. In Thar coal Random and isolated 'S' pattern Meso-cleats have been identified.

The research studies suggest that the Thar and Lakhra coals may have best permeability for the storage of CBM provided other geological factors required for the CBM generation are favorable. Further integrated work is required to take deep insight into the CBM generation and storage capabilities of coals of Sindh.