

Study of Micro Cleats in Thar Coal, Lower Indus Basin of Pakistan with Scanning Electronic Microscope (SEM) Approach

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Abstract

This study involves the analysis of cleat geometry using Scanning Electronic Microscope (SEM) in Thar coal Lower Indus Basin of Pakistan. The Thar coalfield spread over 9100 square km is located between latitudes 24° 30' N & 25° 00' N and longitudes 70°10' E & 70° 30' E in the south eastern part of Sindh. The location is accessed by 667 km black top road to Islamkot from Karachi via Hyderabad-Mirpur khas-Naukot. This Coalfield is covered by sand-dunes with an average thickness of over 80 meters resting upon the structural platform formed of granitic basement in the eastern part of the desert. The coal contains cleats, that are natural openings or fractures in coal bed, which produce permeability in coal, the permeability play important role in migration of coal bed methane (CBM). Cleats are linear discontinuities in coal forming a structural fabric in coal cleats are produced as a result of physical changes and tectonic stress during coalification. Cleats are classified as Face cleats and Butt cleats, Face cleats usually give directional permeability towards their orientation, whereas Butt cleats extend in the direction of in-situ stress and are discontinuous, short in extent. The face cleats have larger content area and are capable of draining out water from large areas of coal seam.

This study discusses the cleat patterns in Thar coal and preliminary study shows that the cleats in the Thar are regular reticulate sub pattern and irregular reticulate sub patterns. This characterization of cleats in Thar coal will be beneficial in order to investigate the porosity in coal and occurrence of economical contents with in the coal reserves of the area. This study will useful for the various relevant professional, researchers and industries.