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Rock-Eval Pyrolysis and Petrographic Characteristics of Coals of Chintalapudi Sub-Basin, Pranhita-Godavari Basin, Southern India: Implication to Depositional Environment

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Abstract

The results of the Rock-Eval pyrolysis and petrological investigation carried out on coal samples from the Chintalapudi sub-basin of the Pranhita-Godavari basin have been discussedtoidentify the assessment of the maturity, type, and quantity of organic matter and interpret the depositional environment. Petrographically these coals are enriched in vitrinite (40.0%-60.7%) followed by liptinite (7.3%-26.0%) and inertinite (9.3%-24.0%) macerals.TOC concentrations range from 17.54% to 64.97%. S_1 ranges from 0.30% to 1.63% and S_2ranges from 11.70% to 138.06% are considered to be good source rocks. The T_{max} values of the Chintalapudi sub-basin coals are found to be between 420°C to 428°C, indicating an immature source rock for the production of oil. The coal samples have an average HI of 157 mg HC/g TOC and VRo of 0.30% placing them in the Type III gas kerogen range. HI, and OI values reveal that the samples of organic matter composition mostly follow the evolutionary route of mixed Type II/III kerogens and are contributed by terrestrial plants which is the main source of the organic matter. The GI (1.67-5.95) and TPI (2.75-47.14)values favour the existence of wet moor with moderate to severe floods with short periods of alternateoxic and anoxic moor environments due to the high concentration of vitrinite that allowed for adequate tissue preservation.

Keywords: Kerogen, Rock-Eval Pyrolysis, Petrography, Chintalapudi Sub-basin

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