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ploratory Study on the Potential of Sapropelic Kerogen Degradation Gas and Oil Cracking Gas Differentiation

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Abstract

This experimental research focused on investigating the potential of sapropelic kerogen degradation gas and developing methods for discriminating it from gas resulting from oil cracking. Hydrocarbon generation and migration processes are crucial in petroleum geology and hydrocarbon exploration. Sapropelic kerogen, a signifcant precursor of hydrocarbons, was subjected to simulated subsurface conditions in a high-pressure, high-temperature reactor, alongside parallel experiments using crude oil samples [1]. The analysis of the sapropelic kerogen degradation gas revealed distinct characteristics, predominantly methane with a biogenic isotopic signature, indicating microbial degradation processes. In contrast, oil cracking gas exhibited diverse hydrocarbons and a thermogenic isotopic signature, indicating thermal breakdown. A discriminative approach based on methane content, isotopic signature, and hydrocarbon ratios was developed to diferentiate these gases. The implications of this research for hydrocarbon exploration and understanding Earth's carbon cycling are signifcant [2].

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