

## **Environmental constraints on the petroleum formation and occurrence in coal-bearing basin**

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In potentially coal-bearing petroliferous basins there is a need in petroleum exploration to predict ahead of drilling: whether any coal-bearing strata present are oil-prone, and where the oil-prone coaly facies are. Theoretically, the evolution of depositional conditions within coal-bearing sequence will result in the changes of biota community and affect the composition of peats that are formed, and further affect the hydrocarbon-generated potential of coal measures. In this study, coals from different depositional environments are organic-geochemically compared, and beneficial coal facies for hydrocarbon generation have been identified using quantitative pyrolysis gas chromatography technique in a sequence stratigraphic framework. With the water table rising in swamps, organic matter from coal measures are more enriched in hydrogen contents. This can be attributed to an increased input of water-column biota (e.g. algae) and the good preservation in the relatively anoxic conditions during peat deposition. The result suggests that coal seams deposited in lower delta plain environment and lacustrine bog setting may possess the excellent potential to generate and release liquid hydrocarbons and may have general application to hydrocarbon exploration in areas thought to be sourced from coal-bearing strata. As a support of this content, a case study from Turpan basin, North-western China has been introduced.