

## **Petroleum generation potential of the Eocene liptinite-rich coals in the Xihu Sag, East China Sea Shelf Basin**

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Petroleum generation from liptinite-rich coal is an important focus in petroleum geology as well as in coal geology. In this study, the characteristics and processes of petroleum generation of the liptinite-rich coals of the Paleogene in the Xihu Sag of the East China Sea Shelf Basin were analyzed by means of optical microscopic analysis, bulk organic geochemistry, confined pyrolysis experiment in gold tubes. Coals from the Pinghu and Huagang formations have a liptinite content mostly higher than 10%, and contain Type II-III organic matter. The  $HI_{max}$  values, H/C, and O/C ratios of these coals are in the range of 200 to 300 mg/g-TOC, 0.97 to 1.42, and 0.08 to 0.20, respectively [1]. All these characteristics demonstrate that the coals can generate both oil and gas. The liptinite-rich coals in the Pinghu Formation mainly generate oil at the  $R_o$  values below 1.43% and generate gas at the  $R_o$  values above 1.43%. The coals in the Huagang Formation mainly generate oil at the  $R_o$  values below 1.56% and generate gas at the  $R_o$  values above 1.56%. In addition, the coals in the Xihu sag can also generate oil in their immature stage ( $R_o=0.36\% - 0.5\%$ ) due to abundant resinite (mostly higher than 5%). To assess petroleum generation under real geological conditions, we reconstructed the petroleum generation history of the coals in three structural units of Xihu Sag, i.e., the West Slope Belt, West Sub-sag, and Central Anticlinal Belt. The West Slope Belt is an area favorable for the oil generation and unfavorable for the gas generation, while the West Sub-sag and the Central Anticlinal Belt are areas favorable for gas generation and unfavorable for oil generation. These results provide a better understanding of the characteristics and potential of petroleum generation from the liptinite-rich coals and are of significance for petroleum exploration in the Xihu Sag.

### **References:**

[1] Li, S.X., Shao, L.Y., Liu, J.S., Qin, L.Z., Kang, S.L., Eriksson, K.A., Chen, X.D., Yu, Z.K., Liu, J.Z., 2022, Oil generation model of the liptinite-rich coals: Palaeogene in the Xihu Sag, East China Sea Shelf Basin. *Journal of Petroleum Science and Engineering*. 209, 109844