

The hydrocarbon generation and expulsion derived from Jurassic coals in the Turpan basin (China) using diamond anvil cell pyrolysis

CHANGYI ZHAO¹, YUNPENG WANG², YANRONG ZOU³ WENZHI ZHAO⁴

¹ Research Institute of Petroleum Exploration & Development, PetroChina. Beijing 100083, China, (*correspondence: zcy@petrochina.com.cn)

² Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China, (wangyp@gig.ac.cn)

³ Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China, (zouyr@gig.ac.cn)

⁴ Research Institute of Petroleum Exploration & Development, PetroChina. Beijing 100083, China, (zwz@petrochina.com.cn)

The diamond anvil cell (DAC) can be used to visualize the oil generation also reveal additional information on expulsion processes. In this study, DAC was used to observe the hydrocarbon generation and expulsion information of coal samples from Turpan and Kequa areas, China in high temperature and high pressure states. After comparison, we found the following phenomenon

Coals from two areas show different expulsion characteristics. The main generation and expulsion range of Turpan coal is 440-540°C, corresponding to maturity range of 0.65-1.08Ro%, while the main generation and expulsion range of Kuqua coal is 460-520 °C corresponding to maturity range of 0.75-0.9Ro%.

Oil amount generated from Tupan is much higher than that from Kuqua coal. And oil generated from Tupan looks like a kind of light oil under microscope while that from Kuqua coal is more likely some kind of oil with higher polar fractions including asphaltene and resin

The migration of oil within the coal is along a dominant path first and a network route formed by dominant path connections later. The hydrocarbons generated in later will migrate along the dominant path formed by the hydrocarbons previous generated.