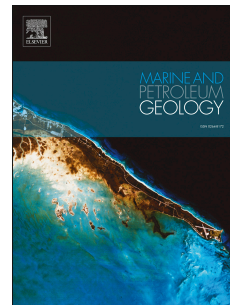


Accepted Manuscript

Chemical structure evolution of kerogen during oil generation

Zhenkai Huang, Tian Liang, Zhao-Wen Zhan, Yan-Rong Zou, Maowen Li, Ping'an Peng



PII: S0264-8172(18)30363-5

DOI: [10.1016/j.marpetgeo.2018.08.039](https://doi.org/10.1016/j.marpetgeo.2018.08.039)

Reference: JMPG 3479

To appear in: *Marine and Petroleum Geology*

Received Date: 17 May 2018

Revised Date: 30 July 2018

Accepted Date: 30 August 2018

Please cite this article as: Huang, Z., Liang, T., Zhan, Z.-W., Zou, Y.-R., Li, M., Peng, Ping', Chemical structure evolution of kerogen during oil generation, *Marine and Petroleum Geology* (2018), doi: 10.1016/j.marpetgeo.2018.08.039.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Chemical Structure Evolution of Kerogen during Oil Generation

Zhenkai Huang^a, Tian Liang^{b,c,1}, Zhao-Wen Zhan^b, Yan-Rong Zou^{b,2}, Maowen Li^a, Ping'an Peng^{b,c}

^a *State Key Laboratory of Shale Oil and Gas Enrichment Mechanisms and Effective Development, SINOPEC, Beijing 100083*

^b *Guangzhou Institute of Geochemistry, Chinese Academy of Sciences, Guangzhou 510640, China*

^c *University of Chinese Academy of Sciences, Beijing 100049, China*

Abstract

Kerogen was isolated from the source rock of Well L69, Zhanhua depression, Bohai Bay Basin and an artificial pyrolysis experiment was carried out in a closed gold tube system with a heating rate of 2 °C/h. Products were collected at eleven temperature points every ten degrees from 350 °C to 450 °C. The soluble organic matter and residual kerogens from the experiment were quantified by weighing. Furthermore, the residual kerogens were analysed by element analysis, X-ray photoelectron spectroscopy (XPS) and solid ¹³C nuclear magnetic resonance (¹³C NMR) spectroscopy to determine the chemical structural of kerogen during oil generation. Combining the data from the analyses, information on the elemental compositions as well as on how functional groups were connected in residues was obtained. Seven molecular models of initial and residual kerogens were established to trace the structure changes in kerogen with maturity. The results suggest that as the temperature increases, aliphatic chains and small clusters of aromatic groups break down from kerogens, generating soluble hydrocarbons at temperatures of less than 390 °C (Easy% Ro1.15). At higher thermal maturity, a few short aliphatic carbons remain in the structure of residues. The number of aromatic groups increases and their size grows

¹ Co-first authors.

² Corresponding author. Tel. +8620-8529-0187. E-mail address: zouyr@gig.ac.cn (Yan-Rong Zou).

Download English Version:

<https://daneshyari.com/en/article/10119948>

Download Persian Version:

<https://daneshyari.com/article/10119948>

[Daneshyari.com](https://daneshyari.com)