

Natural gas genetic types in the Northern Margin of the Qaidam Basin, NW China

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There is abundant natural gas resources present in the northern margin of the Qaidam Basin. Based on chemical composition and carbon isotopic values of natural gases, natural gases can be divided into three different origins. Natural gases in Lenghu and Nabaxian structural belt are typical coal-derived gases with $\delta^{13}\text{C}_1$ ranging from -25.3‰ to -31.0‰ and $\delta^{13}\text{C}_2$ values range from -26.1‰ to -28.2‰. Lower Jurassic mudstone in Yikeyawuru Sag was regarded as main source rocks for these natural gases.

Natural gases in the Mabei and Mahai have different geochemical characteristics, their $\delta^{13}\text{C}_1$ range from -34.3 to -40.9‰, $\delta^{13}\text{C}_2$ values range from -25.0‰ to -27.7‰. It is showed that natural gases in these structural belt are generated probably from Middle Jurassic source rocks.

Special geochemical characteristics for natural gases in the Hulusan, Yahu, Yikeyawuru, Eboliang, Nabei and Jiansan structural belt have been observed. The methane carbon isotope compositions range from -18.1‰ to -22.6‰, and $\delta^{13}\text{C}_2$ values range from -17.6‰ to -23.0‰; some gases show carbon isotopic reversal ($\delta^{13}\text{C}_1 > \delta^{13}\text{C}_2$), this natural gas type maybe related to deep Lower Jurassic or Carboniferous source rocks at high levels of thermal maturity, which is new natural gas exploration field in Qaidam Basin.

This work was supported by partly by the Chinese National Natural Science Foundation (41072105), the Chinese National Major Fundamental Research Developing Project (2011CB201102), the National Special Projects of Science and Technology (2011ZX05008-004-01).

Source And Geochemical Characteristics Of Carbon And Nitrogen In Poyang Lake Sediments

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A certain proportion of organic carbon (OC) deposited onto the sediments will be mineralized and the remainder will be buried over geological timescales. The OC that reaches the lake sediment surface will partly be mineralized to CO_2 or CH_4 by heterotrophic microorganisms [1]. Lake is a rather considerable carbon source and sensitively responding to regional and global climate changes [2]. In this paper, we study geochemical proxies of total organic carbon (TOC), N, $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ in lake sediments of Poyang Lake to estimate its source of organic matter in 2012.

Results show that the organic matters source in sediments were mainly autochthonous in Poyang Lake, of which the terrigenous were less, especially in the south. Before 1970s, sediment organic matters were less affected by human activities, mainly from the deposition of aquatic plants in the northern Poyang Lake. From 1970s in the last century to the present, the main source were constant, however, there were more and more terrigenous. As for in the southern, deposition of aquatic plants were the main source before 1960s. From 1960s to 1980s in the last century, organic matters were mainly derived from soil erosion and death of algae. From 1970s to the present, the source of organic matters were autochthonous and terrigenous. In addition, the terrestrial source of nitrogen were increasing.

[1] Gudasz *et al.* (2010) Nature 466, 478–48. [2] Kling *et al.* (1991) Science 251, 298–301.