

**AAPG HEDBERG CONFERENCE**  
**“NATURAL GAS GEOCHEMISTRY: RECENT DEVELOPMENTS, APPLICATIONS, AND**  
**TECHNOLOGIES”**  
**MAY 9-12, 2011 – BEIJING, CHINA**

**Late Mesozoic Volcanic Activities in Songliao Basin: Implications for Gas Generation and Accumulation\***

MENG Fanchao<sup>1</sup>, LIU Jiaqi<sup>2</sup>

<sup>1</sup>College of Geo-resources and Information, China University of Petroleum, Qingdao, Shandong, China

<sup>2</sup>Institute of Geology and Geophysics, Chinese Academy of Sciences, Beijing, China

Volcanism brings a lot of hot water and gas which can firing source rock. The maturity of organic matter reduces regularly keeping away from igneous intrusion. Magmatism have actively influence in source maturity and growing hydrocarbon(Jin et al.,1999; Othman et al., 2001; Jin et al., 2004; Pangaro et al., 2005; Zhu et al., 2007) in that three reasons: 1) Temperature. Volcanisms can provide caloric with which source rocks become maturity. It makes superficial organic matter rapidly get hydrocarbon generation threshold (Magara, 2003); 2) Catalyst. Minerals such as olivine and zeolite are good for the hydrocarbon generation quantity and conversion of organic matters. Metals not only promote matter thermal degradation, but also are catalysts of Fischer-Tropsch synthesis (Reuter and Perdue, 1977; Sherwood-Lollar et al., 2002; Potter et al., 2004); 3) Volcano gases. The volcano gases always contain a lot of H<sub>2</sub> and CO<sub>2</sub>. H<sub>2</sub> can promote source rocks maturity. CO<sub>2</sub> may become the carrier of petroleum (Jin et al., 1999).

Late Mesozoic volcanic activities were divided two periods in Songliao Basin, which constitute Huoshiling and Yingcheng Formation, respectively. The ages of volcanic rocks show two peak values that are 150Ma and 110Ma. The volcanoes erupted most intensively in Yingcheng Formation, lasting a long time. There were always volcanisms in Late Mesozoic, while the source rocks of Huoshiling and Shahezi Formations were generating hydrocarbons. Volcanism efficiently enhanced the maturity. It is advantaged for gas pools that the volcanoes erupted before hydrocarbon accumulating, because volcanisms can make migration pathway and volcanic rocks are good reservoirs. There are hydrothermal fluids such as calcite, quartz and magma deposits in volcanic fractures. The K-Ar age of magma deposits in trachyte fractures is 73Ma, which is important for volcanic reservoirs reconstructed, gas migration and CO<sub>2</sub> accumulating.

\* National Basic Research Program of China(No.2009CB219301)