

# **lacustrine shale of the Shahejie Formation, Zhanhua Sag, Bohai Bay Basin**

CHENG CHENG AND SIYUAN SU

Jilin University

Presenting Author: 727372480@qq.com

Shale reservoirs have extremely low porosity and permeability which are often associated with their highly heterogeneous and poorly connected pores. This is due to peculiar pore structure system and morphology of the shale reservoirs. The focus of this study is to evaluate the pore structure, connectivity and heterogeneities of lacustrine shale reservoirs of the Shahejie Formation within the Bohai Bay Basin using a combination of three methods. These are low temperature gas adsorption experiment (for pore morphology and structure), spontaneous imbibition experiments (for pore connectivity) and nuclear magnetic resonance (NMR) to characterize the structure and fluid saturation of the entire shale sample. The results showed that, high clay content blocked the pore throat and caused significant reduction in connectivity which results in the collapse of pores. However, high content of brittle minerals (e.g. calcite and quartz) promotes the formation of intergranular and intercrystalline pores of inorganic minerals as well as microfractures, which favours good pore connectivity in shale. Increase in available space for fluid movement in shales with higher porosity results in a beneficial increase in the mobility of the fluid within the pores. Hence, mineral composition and degree of pore development are the two main factors affecting the connectivity of the pore structures within the Zhanhua Sag of the Jiyang Depression in the Bohai Bay Basin.