Study of Volcanic Reservoir Characteristics in Lower Cretaceous Yin Cheng Member, Xu Jiaweizi Fault Depression, Songliao Basin

By
Tang, Hong
University of Petroleum, Beijing, Dept. of Geoscience, Beijing, P.R.China
(stanghong@sohu.com)

The oil reserves and production in Songliao Basin rank No.1 in China. Xu Jiaweizi fault depression, formed in late Mesozoic, is one of the largest extensional fault depressions in northern Songliao Basin. Volcanic Rocks, which were widely distributed during deposition of the Yin Cheng Member, Early Cretaceous in age, lie in or near the center of the oil-bearing sag. Where combined with other favorable petroleum geological conditions, a volcanic oil/gas reservoir can be formed. However, because the research area is covered by thick Quaternary formations and lacks direct outcrop study, very little research in this area has been reported. The main task of this project is to construct a comprehensive conceptual geological model of the volcanic reservoir, thus constraining the geophysics interpretation and reducing the risk in prediction.

This project will integrate well log data, seismic data, core and various analysis, and well test data into the research; it is divided into three successive and related aspects. (1) One dimensional distribution model of volcanic petrology, lithofacies study. Single well evaluation profiles are established based on core, core slice, test data, and well log facies. (2) Spatial distribution of volcanic petrology, lithofacies, is delineated from seismic interpretation. VSP data are used to constrain the lithology and structural interpretation. (3) Comprehensive spatial volcanic geological models and reservoir prediction, based on single well evaluation and seismic lithology interpretation in well-completion areas, spatial seismic and well log interpretation, are translated into geological conceptual models. Such models, constrained by existing knowledge database of eastern China and global volcanic reservoir reports, can be used to guide seismic interpretation and reservoir characterization.