

2nd World Congress on Petrochemistry and Chemical Engineering

October 27-29, 2014 Embassy Suites Las Vegas, USA

Characteristics of large erosional valley in Cambrian-Sinian in Sichuan Basin, China, and its significance for hydrocarbon accumulation

Zecheng Wang, Hua Jiang and Tongshan Wang

PetroChina Research Institute of Petroleum Exploration & Development, China

The Sichuan Basin is a superimposed basin developed on the basis of upper Yangtze craton platform. Recently, Sinian-Cambrian giant gas field was discovered in Moxi-Gaoshiti zones in Central Sichuan Basin, China. According to our study, a large erosional valley was developed in Central-Southern Sichuan Basin before the deposition of Qiongzhusi Formation. This special palaeo-geomorphology had a major controlling effect on the formation of the giant Moxi-Gaoshiti gasfield.

In our study, the characteristics and periods of Tongwan tectonization, which originally referred to the orogeny between Sinian and Cambrian in Yangtze platform, are analyzed. Based on seismic, drilling and outcrop data, the erosional palaeogeomorphology of pre-Qiongzhusi Formation is described using the methods of residual thickness and impression. Then the hydrocarbon accumulation conditions are analyzed. Results show that the Tongwan tectonization formed in the Sichuan Basin and surrounding areas during late Sinian to early Cambrian. The three phases of Tongwan tectonization all show a character of uplifting and erosion, forming three disconformities. Affected by that, large scale of N-S directional Deyang-Luzhou erosional valley formed in Central-Southern Sichuan Basin. In the valley, sediments of Maidiping Formation and Qiongzhusi Formation were deposited, which is an important source kitchen of Cambrian. They form high-quality play conditions with two sets of karst reservoir rocks of Deng 3 and Deng 4 members in the Dengying Formation. It is favorable for the forming of giant gas fields with great exploration potential.

The thrust-folding uplift movement in second episode of Tongwan tectonization during late Sinian, erosion, and the extensional tectonization in the background of rapid transgression in early Cambrian are key factors for the forming of the erosional valley. Furthermore, because the erosional valley was deep buried and source rock matured during early stage, and reservoir rocks near hydrocarbon source assemblage were favorable conditions for giant gasfields in Central Sichuan Basin.

wangzecheng@petrochina.com.cn