

Petroleum Geology of the Northeastern Sichuan Basin and the Characteristics of Puguang Gas Field, China

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The northeastern Sichuan Basin contains all the essential elements for a giant petroleum system with three major Silurian, Permian and Upper Triassic source rocks, excellent Permian and Triassic reservoir rocks, and good regional seals. The main reservoir is the Triassic carbonate with an average porosity of 8.1%. The reservoir rocks consist of oolitic dolomite, residual oolitic dolomite and sugary grained residual oolitic mid-macro crystalline dolomite. The late Permian reef carbonate comprises mainly hummocky patch reefs with excellent reservoir properties. The patch reef cap dolomite is the best reservoir rock.

The area east of Najiangtiechang River-Xuhan Puguang-Huangchang structural belt in the northeastern Sichuan Basin is the area where reef flat- dolomite reservoir rocks had been extensively developed. The Puguang Gasfield is a structural-lithologic gas pool and is the largest, deepest and the most abundant gas reservoir discovered recently in the Sichuan Basin with an estimated reserve in the Puguang Gasfield exceeding $350 \times 10^9 \text{ m}^3$. The Triassic reservoir lithology consists solely of dolomite with the development of oolitic dolomite and residual oolitic dolomite and is an excellent reservoir rock with a moderate to good porosity and permeability.

The development and preservation of pores in deep burial may be related to the vugular dissolution by deep hot water. The favorable conditions for the formation of the Puguang giant gas field can be attributed to the proximity of a major hydrocarbon generating sag, the development of excellent reservoirs and the presence of palaeo-highs at the time of hydrocarbon charge.