

# Genetic Types Classification of Tight Oil System and Its Exploration Significance of China\*

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Search and Discovery Article #120137 (2013)

Posted March 13, 2013

\*Adapted from extended abstract prepared in conjunction with poster presentation at AAPG Hedberg Conference, Petroleum Systems: Modeling The Past, Planning The Future, 1-5 October 2012, Nice, France, AAPG©2012

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## Abstract

As the new focus of global petroleum exploration, tight oil exploration has received much attention in recent years due to its huge resource potential. The tight oil refers to oil that accumulates in source rocks in a free or adsorbed state or in tight sandstones and carbonates interbedded with or adjacent to source rocks ([Figure 1](#)). Generally, this oil accumulation has not yet experienced a large-scale, long-distance migration.

Many excellent research results have been found in the reservoir properties, petroleum properties, and development technology in recent years, but little attention has been paid to the tight oil system and its genetic types of classification in China.

Based on the clarity of the tight oil concept and connotation, we carefully studied the structure bedding, lithology, sedimentary facies, lithofacies, and paleogeography. According to this genetic drive mold research thinking, we proposed ten key indices to evaluate the tight oil, established tight oil system, and research the reservoir classification and genetic types of classification of tight oil. Tight oil reservoirs of China can be generally divided into 3 different types based on porosity and permeability ([Figure 2](#)), while the tight oil itself can be also classified into 3 types depending on the genetic correlation of a close contact between tight reservoirs and source rocks, i.e., tight oil in lacustrine carbonate rocks; tight oil in deep-lake gravity flow sandstones, and tight oil in deep-lake delta sandstones.

## Discussion

The tight oil is widely distributed in China, currently, a number of important exploration discoveries of the tight oil have been achieved in the Triassic Chang-6 and Chang-7 sections in the Erdos Basin, the Permian Lucaogou Formation in the Junggar Basin, the Middle-Lower Jurassic of the Sichuan Basin, and the Qingshankou-Quantou Formation of the Songliao Basin. To expect the tight oil prospect in China, we preliminary forecast that the tight oil geological resources in China are about  $(106.7 \sim 111.5) \times 10^8$  t.

Under the direction of the genetic types of classification and distribution, we can design the exploration plans on tight oil more reasonably. Combined with the analysis of future prospects of petroleum development, we can come to a conclusion that the tight oil in China should be a realistic replacement resource of the conventional oil.

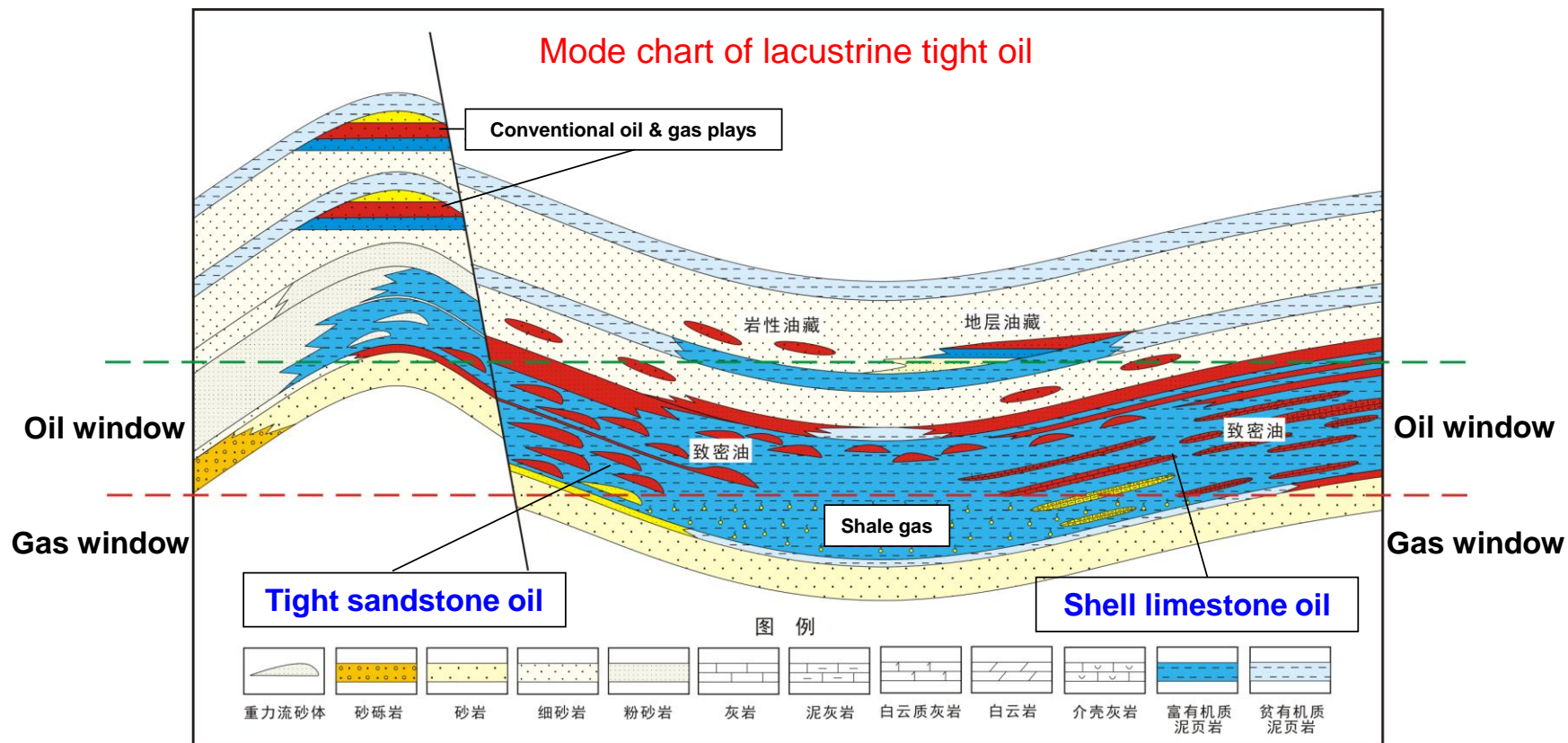


Figure 1. Accumulation model of tight oil.

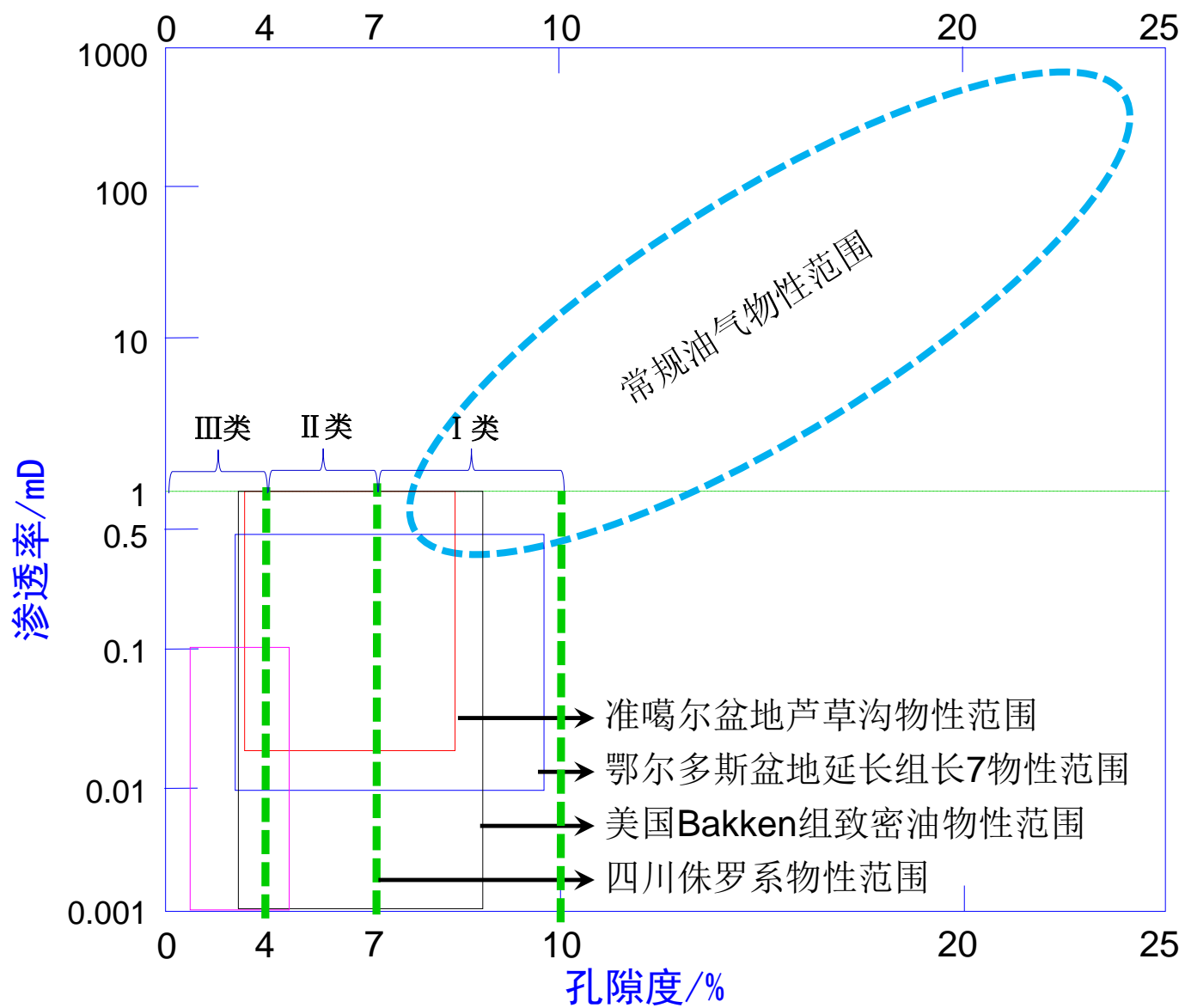


Figure 2. The statistics of the key physical parameters and the reservoir types classification.