Petroleum formation mechanism in deep-buried and extremely deep-buried marine carbonates is one of hot and difficult topics in petroleum geology. In this paper, we have made a discussion based on a case study from the Puguang gas field of the northeastern Sichuan Basin, by comprehensively analyzing the oil and gas source and the processes of hydrocarbon generation and accumulation. The methods include assessment of hydrocarbon sources and their geochemical correlation with oil, reservoir bitumen and gas, study on formation, evolution and preservation of hydrocarbon pools, analysis of gas composition, fluid inclusion and simulation of hydrocarbon generation from multiple sources. The results showed that the deep-buried marine source sequences and main hydrocarbon-producing intervals may have experienced high temperatures, high pressures and multi-stage sedimentological and tectonic movements. As a result, various kinds of hydrocarbon sources were formed, including different types of kerogens, accumulated and dispersed soluble organic matters, and insoluble organic matters of organic acid salts. It is common for the continuous and/or overlapping dynamic transformation of various kinds of hydrocarbon sources and multiple origins of hydrocarbons to have contributed to petroleum pools. Based on these results, we propose that the main mechanism for hydrocarbon formation and evolution in deep-buried strata is the dynamic transformation for hydrocarbon generation from multiple sources. The gas generation can be extended to high to extremely high evolution stages. This is favorable for the gas re-filling and accumulation in deep and extremely deep-buried reservoirs."/>

腾格尔,刘文汇,秦建中,郑伦举,付小东,申宝剑,卢龙飞,王杰. 2012. 川东北地区海相深层多源生烃动态转化机制——以普光气田为例. 岩石学报, 28(3): 895-904

川东北地区海相深层多源生烃动态转化机制——以普光气田为例

作者	单位
腾格尔	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
刘文汇	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
秦建中	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
郑伦举	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
付小东	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
申宝剑	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
卢龙飞	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China
王杰	Key Laboratory of Petroleum Accumulation Mechanisms, Wuxi Research Institute of Petroleum Geology, Research Institute of Petroleum Exploration and Production, SINOPEC, Wuxi 214151, China

基金项目：本文受石油化工联合基金项目(40839910)及国家重大专项(2008ZX05005-01-02)联合资助.

摘要：

海相碳酸盐岩层系深层-超深层油气形成机制是石油地质学研究的热点和难点。以川东北普光气田为例,通过烃源(岩)评价及其与原油、储层沥青和天然气之间的地球化学对比、油气藏形成演化与保存过程分析,结合不同类型天然气组分、流体包裹体以及多种烃源生烃模拟等实验数据,对油气来源和成烃成藏过程进行了系统分析。结果表明,在多期沉积构造活动背景下,海相深层烃源岩系和主力产层均经历过高温高压环境与高热演化,形成了不同类型的干酪根、以分散和富集状态赋存的可溶有机质,以及以有机酸盐形式存在的不溶有机质等多种形式烃源,并普遍存在不同类型烃源、不同成因油气的连续或叠置动态相态转化,及其对油气成藏贡献的接替过程,呈现出"来源的多样性、转化的接替性、过程的多期性和成因的复合性"之油气形成演化特点,提出"多源生烃动态转化"是深层油气形成演化的主要机制,将烃源生气过程延续到更高的演化阶段,有利于深层-超深层条件下油气藏的再充注和聚集保存。

关键词：多源生烃 动态转化 海相层系 深层 天然气 普光气田 川东北

投稿时间：2011/7/21 **最后修改时间：**2011/11/30