

EVALUATION OF EFFECTIVENESS OF ORDOVICIAN LOW-ABUNDANCE CARBONATE SOURCE ROCKS WITH AND WITHOUT HYDROCARBON EXPULSION IN THE PLATFORM OF TARIM BASIN

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ABSTRACT

The term hydrocarbon expulsion threshold refers to the critical conditions whereby hydrocarbon generation by source rocks meets the particular residual hydrocarbon requirements and begins to discharge free-phase hydrocarbon in quantity. Only source rocks that reach a hydrocarbon expulsion threshold can be referred to as effective source rocks. The objective of this project is to distinguish between Ordovician low-abundance carbonate source rocks with and without hydrocarbon expulsion in the platform of Tarim Basin and to identify the effective low-abundance carbonate source rocks with hydrocarbon expulsion. In this work, first, we will conduct pyrolysis, organic carbon, vitrinite reflectance, and other related experiments on core and cuttings samples. Next, we will measure the actual residual hydrocarbon content of the rock and, based on the hydrocarbon expulsion threshold theory and the experimental parameters obtained, calculate the maximum residual hydrocarbon content of source rocks at the same buried depth. Finally, we will establish a mathematical model for determining source rock with and without hydrocarbon expulsion. When the actual residual hydrocarbon content of the rock is greater than or equal to the calculated maximum residual hydrocarbon content at the hydrocarbon expulsion threshold, we can determine hydrocarbon expulsion to have occurred and the source rock can be classified as an effective low-abundance source rock. Otherwise, the source rock will be classified as ineffective. Through this project, we hope to demonstrate that not all low-abundance carbonate source rocks are effective and, specifically, that only low-abundance carbonate source rock with hydrocarbon expulsion is effective source rock.

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