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利用核磁共振物理模拟实验研究岩性油气藏成藏机理 [点此下载全文](#)

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摘要:

本文采用核磁共振成像技术(NMR)进行物理模拟实验, 直观地观测了岩性圈闭中油的聚集成藏过程并定量模拟了不同条件下砂体中的含油性。实验结果表明, 油气在砂体中的聚集是缓慢的, 向上、向下及侧向都有油的运移, 但以向上的运移速度较快, 其次是侧向, 向下较慢; 温度、压力、砂体物性和围岩含油性是影响砂体含油性的重要因素。在实验研究的基础上, 分析了岩性油气成藏的微观机理, 将油气成藏过程划分为三个阶段, 第一阶段为在扩散作用力、烃浓度差异压力作为动力克服毛细管阻力下的油气在烃源岩孔隙中心顺干酪根网络运移的过程; 第二阶段为在毛细管压力差引导下的油气在砂泥岩界面通过孔隙和喉道渗滤的过程; 第三阶段为在浮力作用下克服流体流动粘滞阻力和吸附阻力在砂体内富集的过程。

关键词: [核磁共振成像](#) [物理模拟实验](#) [岩性油气藏](#) [成藏动力](#) [成藏模式](#)

Hydrocarbon Accumulation Mechanism Analysis of Lithological Reservoir by NMR Modeling Experiment [Download Fulltext](#)

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Abstract:

Hydrocarbon accumulation process and oil-bearing property controlling factors of lithological reservoir were observed and modeled by NMR (nuclear magnetic resonance) experimental modeling. The experimental results showed that the hydrocarbon accumulation process is slow and hydrocarbon migration has upward, downward and lateral directions. Migration speed is much greater in the former direction than the latter two, and temperature, pressure, reservoir property of sandbody, and oil-bearing property of surrounding mudstone play important roles on the oil-bearing property of sandbody. Based on NMR experiments, micro-hydrocarbon accumulation mechanism of lithological reservoir was analyzed and three stages of accumulation process were presented, that is, the first stage is the migration process along kerogen organic networks in the middle of pores of mudstone by diffusion and hydrocarbon concentrate difference pressure as drive and capillary pressure as resistance, the second stage is the filtering process in the interface of sandstone and mudstone pores and throats by capillary pressure difference, and the third stage is hydrocarbon filling process in sandstone by buoyancy conquering liquid flowing sticky and adsorbing resistance forces.

Keywords: [NMR](#) [physical modeling experiment](#) [lithological reservoir](#) [hydrocarbon accumulation drive](#) [accumulation model](#)

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