

塔里木盆地塔中地区奥陶系碳酸盐岩封盖性能

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Sealing capacity of the Ordovician carbonate rocks in Tazhong area, the Tarim Basin

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摘要

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摘要 利用5口区探井碳酸盐岩的矿物组成、微孔特征和测井资料等对塔里木盆地塔中地区奥陶系碳酸盐岩封盖性能进行了研究。结果表明,塔中奥陶系良里塔格组和鹰山组位于中成岩A-B亚段和晚成岩A亚段。良里塔格组中颗粒灰岩的突破压力为1.81~29.76 MPa,突破半径为13.89~77.35 nm,变化较大;泥灰岩的突破压力为14.33 MPa,突破半径为9.77 nm;含泥质条带泥晶灰岩的突破压力为3.15~5.41 MPa,突破半径为25.90~44.51 nm。鹰山组灰云岩的突破压力为0.98~10.35 MPa,突破半径为13.52~142.60 nm。因此,良里塔格组泥灰岩、部分颗粒灰岩及鹰山组云灰岩均有一定的封盖能力,其连续厚度大于5 m,突破压力大于5 MPa,突破半径介于10~20 nm,孔喉半径小于0.1 μm。塔中鹰山组内分布稳定、厚4~10 m的高电阻含云灰岩构成的致密层段可作为局部封盖层,是中1井奥陶系鹰山组上油、下气油气分布的主要原因之一。

关键词: 成岩阶段 微孔结构 高阻层 局部封盖 储盖组合 碳酸盐岩 塔里木盆地

Abstract: Mineral composition, micro-pore characteristics and well-logs from five wells were used to study the sealing capacity of the Ordovician carbonate rocks in Tazhong area, Tarim Basin. The Ordovician Lianglitage and Yingshan formations are at substage A-B of the middle diagenetic stage and substage A of the late diagenetic stage. For the Lianglitage Formation grainstone, the breakthrough pressure (BP) is 1.81-29.76 MPa, and the threshold radius (TR) is 13.89-77.35 nm. For the marlstones, the BP is 14.33 MPa and TR is 25.9-44.51 nm. For the micritic limestone with band of argillite, the BP is 0.98-10.35 MPa and the TR is 13.52-142.60 nm. The BP and the TR of the Yingshan Formation limy dolomites are 0.98-10.35 MPa and 13.52-142.60 nm. Thus, the marlstone and partial grainstone of the Lianglitage Formation and the Yingshan Formation dolomite limestone have certain sealing capacity, with thickness over 5 m, BP over 5 MPa, TR between 10-20 nm, pore throat radius less than 0.1 μm. In addition, the tight interval consisted of dolomite limestone with high resistivity of 4-10 m thick in the Yingshan Formation is thought to be local caprocks in Tazhong area. Its existence is one of the main factors resulting in the oil/gas distribution pattern in the Ordovician Yingshan Formation in Zhong-1 well, i.e. oil in its upper part and gas in its lower part.

Keywords: diagenetic stage micro-pore structure high resistance strata local sealing reservoir-cap assemblage carbonate rock Tarim Basin

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