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致密储层束缚水膜厚度分析

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Thickness Analysis of Bound Water Film in Tight Reservoir

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PDF (PC)

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摘要/Abstract

摘要：

针对塔里木盆地和鄂尔多斯盆地致密储层岩心平行样，分别进行气水高速离心核磁分析和低温吸附实验，定量获得每块岩心总束缚水饱和度、岩石比表面积及微孔隙百分数等参数，综合各参数建立储层束缚水膜厚度分析方法。结果表明：结合气水高速离心核磁分析和低温吸附实验等技术，可有效区分毛细管束缚水和水膜束缚水，为准确计算束缚水膜厚度提供了新方法|利用该方法计算获得的致密储层岩心束缚水膜厚度分布范围为4.92～38.94nm，平均值为12.88nm，小于传统渗透率较高储层束缚水膜厚度为50nm左右的认识。渗透率越小储层束缚水膜相对越厚，有效渗流喉道半径和可流动孔隙空间越小，边界层影响越大，储层流体渗流非线性特征越显著。

关键词: 致密储层, 束缚水膜厚度, 核磁共振, 高速离心, 低温吸附

Abstract: Based on high-speed centrifugal gas-water displacement experiment using NMR and low-temperature adsorption experiment for typical tight reservoir parallel cores of Tarim and Ordos basins.The study obtained total bound water saturation,specific surface area and ratio of micro-pore of the reservoir quantitatively,which are used for the establishment of analytical method of bound water film thickness.Research results show that,with high-speed centrifugal gas-water displacement experiment using NMR and low-temperature adsorption experiment,this study distinguishes capillary bound water and bound water film effectively,which provides a new method for calculating thickness of bound water film accurately.Distribution range of thickness of bound water film in this study is 4.92-38.94nm with an average value of 12.88nm,which is smaller than that of the traditional high permeability reservoir which is about 50nm.The lower permeability the reservoir has,the higher bound water film thickness the reservoir gets,the smaller effective throat radius and seepage flowing pore space the reservoir owns,the more boundary layer effect and nonlinear characteristics of fluid flow the reservoir exist.

Key words: Tight reservoir, Thickness of bound water film, NMR, High speed centrifugation, Low-temperature adsorption experiment

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