

快报

## 基于核磁共振测井和毛管压力的储层渗透率计算方法

肖忠祥, 肖亮

西安石油大学 油气资源学院, 陕西 西安 710065

收稿日期 2007-11-30 修回日期 2008-2-27 网络版发布日期: 2008-10-20

**摘要** 针对利用核磁共振测井数据计算储层渗透率的SDR模型和Tim-Coates模型在实际应用中存在的参数确定方面的困难, 基于核磁共振测井 $T_2$ 分布和毛管压力曲线均反映储层孔隙结构的事实, 提出了基于核磁共振测井和毛管压力计算储层渗透率的方法。通过对比31块同时进行了压汞和核磁共振测井实验的岩心样品, 建立了Swanson参数与渗透率之间的对应关系模型。针对压汞数据受岩心样品数量限制的问题, 提出了利用核磁共振横向弛豫时间 $T_2$ 几何平均值( $T_{2lm}$ )与Swanson参数之间的相关性, 求取Swanson参数, 从而计算储层的渗透率。通过对A井实际数据的处理, 计算得到的渗透率与岩心分析的空气渗透率之间吻合较好, 验证了该方法的准确性。

**关键词** [核磁共振测井](#); [毛管压力曲线](#); [Swanson参数](#); [渗透率](#);  [\$T\_2\$ 几何平均值](#)

分类号 [P631.8](#)

## Method to Calculate Reservoir Permeability Using Nuclear Magnetic Resonance Logging and Capillary Pressure Data

XIAO Zhong-xiang, XIAO Liang

College of Petroleum Resources, Xi'an Shiyou University, Xi'an 710065, China

**Abstract** In view of the problems of SDR and Tim-Coates models in calculating permeability using nuclear magnetic resonance logging data, based on the fact that nuclear magnetic resonance  $T_2$  distribution and capillary pressure curves reflect the reservoir pore structure, a method was presented to calculate reservoir permeability using nuclear magnetic resonance logging and capillary pressure data. The correlation between Swanson parameter and permeability was established by comparing 31 core samples which were measured by mercury penetration and nuclear magnetic resonance logging. Considering the problem that capillary pressure data are limited by their quantity, the good correlativity between  $T_2$  geometric mean value of lateral relaxation time of nuclear magnetic resonance and Swanson parameter can be used to determine the Swanson parameter and to calculate reservoir permeability consecutively. The processing of the data in well A yields a permeability closer to the result of core analysis, and this indicates the accuracy of the method.

**Key words** [nuclear magnetic resonance](#) [capillary pressure curve](#) [Swanson parameter](#) [permeability](#)  [\$T\_2\$  geometric mean value](#)

DOI

通讯作者

### 扩展功能

#### 本文信息

- ▶ [Supporting info](#)
- ▶ [\[PDF全文\]\(995KB\)](#)
- ▶ [\[HTML全文\]\(0KB\)](#)
- ▶ [参考文献](#)

#### 服务与反馈

- ▶ [把本文推荐给朋友](#)
- ▶ [文章反馈](#)
- ▶ [浏览反馈信息](#)

#### 相关信息

- ▶ [本刊中 包含“核磁共振测井; 毛管压力曲线; Swanson参数; 渗透率;  \$T\_2\$ 几何平均值”的 相关文章](#)
- ▶ 本文作者相关文章

- [肖忠祥](#)
- [肖亮](#)