应用实例

储层物性参数与其微观孔隙结构的内在联系

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摘要   储层的微观孔隙结构指的是储集岩中孔隙和喉道的几何形状、大小、分布及其相互连通关系。准确掌握储层的孔隙结构信息,对于正确评价储层的储集性能和开采价值,搞清楚孔隙结构的差异对储层宏观地球物理特性的影响作用,进而更有效地从各种地球物理资料中去伪存真、去粗取精的提取含油饱和度等地球物理参数以提高油气解释精度,都具有十分重要的意义。从Kozeny Carmon方程入手,通过进一步理论推导并借助函数单调性的分析方法深入剖析了储层宏观物性参数与其微观孔隙结构的内在联系。通过对大量岩石物理数据的归一化相关对比分析,进一步验证了理论分析所得结论,即储层品质指数是定量表征储层微观孔隙结构的最佳宏观物性参数。该结论为探索利用宏观地球物理测井资料连续定量表征储层微观孔隙结构的应用奠定了基础。

关键词   经典渗透率方程   孔隙结构   归一化相关对比分析   储层品质指数   流动层带指数   渗孔比

Internal relationship between physical property and micro pore structure of reservoir

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Abstract Micro pore structure of reservoir consists of geometric shape,size,distribution and connectivity of pores and throats in reservoir.The information on pore structure of reservoir is vital to assess the performance of reservoir and its value of exploitation.It helps in understanding the effects of pore structure on reservoir properties and improving the accuracy of interpretation.The internal relationship between macro physical properties and micro pore structure was investigated through Kozeny Carmon equation.Normalized correlation analysis on a great deal of petrophysical data confirmed the conclusions from theoretical study that reservoir quality index is an optimal indicator for describing the micro pore structure quantitatively.

Key words   classical permeability equation;pore structure;normalized correlation analysis;reservoir quality index;flow zone index;permeability to porosity ratio

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