

## 地质勘探

### 川渝油气田碎屑岩储层测井解释及流体识别

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摘要:

四川盆地侏罗系—上三叠统的蓬莱镇组、沙溪庙组和须家河组等碎屑岩储层具有低孔低渗、岩性复杂、储集空间种类多、单砂体规模较小但累积厚度较大、横向变化大、含水饱和度较高、储层识别及储层参数定量计算难度大, 流体判别符合率低等特点。为此, 开展了一系列分析研究工作: ①在岩心分析基础上进行长石砂岩、岩屑砂岩、钙质砂岩等岩性识别; ②利用声电成像和常规测井资料进行低孔低渗碎屑岩储层识别; ③利用多种能谱资料计算泥质含量, 以及多种测井资料计算束缚水饱和度等储层参数; ④使用电阻率—孔隙度法和饱和度法等进行流体类型判别; ⑤使用压汞资料和试油资料进行有效储层确定。从而形成了一套适合四川盆地低孔低渗碎屑岩储层的测井解释和流体识别方法。利用该套技术能快速有效地确定射孔层位, 较准确地评价单井产能和油气藏储量, 在川渝地区多个油气田中取得了良好的地质应用效果, 提高了川渝油气田碎屑岩储层的解释评价精度和效率。

关键词: [川渝油气田](#) [侏罗纪—晚三叠世](#) [碎屑岩](#) [岩性识别](#) [泥质含量](#) [饱和度](#) [流体性质](#) [有效储层](#)

### Logging interpretation of clastic reservoirs and fluid identification in Sichuan and Chongqing oil and gas fields

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Abstract:

The Jurassic Upper Triassic clastic reservoirs such as the Penglaizhen, Shaximiao, and Xujiache formations in the Sichuan Basin are featured by low permeability and low porosity, complex lithology, diversified reservoir spaces, a small scale of single sandbody but relatively great gross thickness, great lateral variation, high water saturation, a great challenge in reservoir identification and quantitative calculation of reservoir parameters, as well as a low coincidence rate of fluid type identification. The following studies are performed. First, lithological identification is performed based on core analysis. Second, image logging and conventional logging data are integrated to identify the low porosity and low permeability clastic reservoirs. Third, various spectrometry data are used to calculate shale content and various logging data to calculate reservoir parameters such as irreducible water saturation. Fourth, the resistivity porosity and saturation methods are used to identify fluid types. Fifth, the mercury injection and oil test data are applied to determine effective reservoirs. A set of logging interpretation and effective reservoir identification methods is established for the low porosity and low permeability reservoirs in the Sichuan Basin. These methods can be used to rapidly and effectively determine intervals for perforation, and accurately evaluate single well productivity and reserves. They have been successfully applied in several oil and gas fields in Sichuan and Chongqing areas, improving the accuracy and efficiency of interpretation and evaluation of the clastic reservoirs there.

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