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页岩等温吸附/解吸影响因素研究

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Study of Impact Factors on Shale Gas Adsorption and Desorption

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PDF (PC)

349

摘要/Abstract

摘要 :

页岩吸附气含量对储量计算至关重要, 吸附气解吸过程直接关系到页岩的产量。采用川南地区和昭通地区龙马溪组页岩样品, 设计页岩吸附/解吸实验, 研究页岩的等温吸附/解吸特征以及影响因素。实验结果表明: 温度升高页岩最大吸附量(V_L)下降, 解吸率上升, 并且两者都与温度呈现良好的线性关系; 总有机碳含量(TOC)和黏土矿物含量均会影响页岩的吸附能力, TOC含量高的页岩最大吸附量与TOC呈正相关, TOC含量低的页岩最大吸附量与黏土矿物含量呈正相关; 水分的存在会降低页岩的吸附能力同时也降低页岩的解吸率, 含水率越高解吸剩余吸附量越大。

关键词: 页岩, 吸附, 温度, 水分, 黏土矿物, TOC

Abstract:

Adsorbed gas content is essential to the calculation of shale gas reserves, and adsorbed gas desorption process is directly related to the production of shale. Isothermal adsorption and desorption experiments under different conditions were carried out with Longmaxi shale samples collected from south of Sichuan and Zhaotong area. The results show that the maximum adsorption volume V_L decreases with the increase of temperature and the desorption ratio increases with the increase of temperature, which both showed a good linear relationship with the temperature. TOC and clay mineral content will affect the shale gas adsorption capacity. The shale maximum adsorption volume has a positive correlation with TOC in shale with high TOC content, while the maximum adsorption volume and clay mineral content was positively correlated in shale with low TOC content. The presence of water will reduce the shale adsorption capacity and also the desorption ratio. The remaining adsorption volume after desorption increases with the moisture content.

Key words: Shale gas, Adsorption, Temperature, Moisture content, minerals, TOC

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