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高煤阶煤层气藏储层应力敏感性研究 [点此下载全文](#)

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摘要:

水相存在使煤储层应力敏感性更加复杂, 是煤层气开发需要特别关注的问题。通过开展煤储层干样与湿样的应力敏感性实验, 分析了煤储层应力敏感性特征。应用数值模拟方法, 研究了煤储层应力敏感性对煤层气井产能的影响。研究结果显示, 煤储层具有强应力敏感性并且明显不可逆性。有效压力从2 MPa增加到10 MPa, 气相渗透率降低90%; 初始渗透率越低, 应力敏感性越强, 有效应力降低以后, 煤岩渗透率不能恢复到原始水平。水相存在使得煤层气藏应力敏感性更强, 有效压力从2 MPa增大到3 MPa, 3块煤岩湿样渗透率分别降低了66.0%、50.4%和58.5%, 而干岩芯渗透率降低幅度均低于50%。同时随含水饱和度增高, 表现出应力敏感性愈强的趋势。煤储层应力敏感性极大地影响煤层气井产能, 储集层原始渗透性越差, 应力敏感对产量的影响越大。因此, 煤层气生产过程中, 特别是煤层气排采初期, 地层压力较高, 一味地增大生产压差可能不会增加煤层气井产量。

关键词: [煤储层](#) [应力敏感性](#) [含水饱和度](#) [数值模拟](#) [产能](#)

Stress Sensitivity of High rank Coalbed Methane Reservoir [Download Fulltext](#)

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Abstract:

Water facies in coal beds has been a critical problem in coal development and has been received a wide attention because it makes more complicated stress sensitivity of coal reservoir. This study analyses characteristic of stress sensitivity of coal beds by an experiment on dry and wet samples from coal beds, and its influence on productivity of gas well using digital modeling. The research shows distinctly irreversible, intensive stress sensitivity of coal reservoir. It was proved that the gas permeability decreased about 90% with efficient pressure increasing from 2 MPa to 10 MPa; the lower the initial pressure, the more intensive stress sensitivity. The permeability of coal rock could not be restored completely even if efficient pressure was lowered. Existence of water facies makes stress sensitivity much intensive. The experiment shows that the permeability of the wet samples decreased 66.0%, 50.4% and 58.5% with efficient pressure increasing from 2 MPa to 3 MPa, while the permeability of a couple of the dry samples decreased averagely by less than 50%. Meanwhile, stress sensitivity was continuously intensive with increasing of water saturation. The sensitivity of coal beds greatly affects output of oil well: the worse the permeability of original reservoir is, the greater the sensitivity influences over output of coalbed gas. Therefore, during the production of coal beds, especially at the beginning of discharge and mining, increasing pressure difference doesn't advance the output of coalbed gas.

Keywords: [coal bed reservoir](#) [stress sensitivity](#) [water saturation](#) [numerical simulation](#) [production](#)

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