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论文

区域构造热事件对高煤阶煤层气富集的控制

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摘要:

中国高煤阶含煤盆地经历了多期构造活动影响,使高煤阶煤层气藏具有其独特的复杂性。通过对沁水盆地高煤阶煤层气藏的实例进行剖析,从煤层的热演化程度,煤系地层的方解石脉、石英脉体中的包裹体温度和压力,磷灰石、锆石的裂变径迹古地温分析,中生代火成岩的同位素年龄,岩浆活动产生的大地热流值方面证明了构造热事件的存在。结合煤岩的热解实验分析发现,构造热事件过程中产生的高温、高压的环境促使煤层的生烃,提高了煤层的吸附能力,使沁水盆地煤层的含气量比美国同期形成的黑勇士盆地煤层含气量高5～13 m3/t,岩浆侵入产生的温度变化是沁水盆地煤层气含气量欠饱和的原因之一,高温高压的地层环境改善了煤层的物性。

关键词: 构造热事件;高煤阶;煤层气;渗透率;含气量

The control of tectonic thermal events on the concentration of high coal rank coalbed methane

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Abstract:

China high coal rank coalbed methane basins have undergone multiphase of tectonic activity, which makes the high coal rank coalbed methane reservoirs of peculiar complexity. By the research on the high coal rank coalbed methane reservoir of the Qinshui basin including the study of the coalbed thermal evolution level, the temperature and pressure of inclusion in calcite or quartz reef in coal bearing strata, the palaeogeothermal analysis of the fission track of apatite and zircon, the anogenic isotopic age, and the geothermal flux caused by magmatic activity, we have proved the existence of the tectonic thermal event. It is found from the experimental analysis of coal thermal decomposition that the high temperature and high pressure of the reservoir environment caused by the tectonic thermal event accelerates the hydrocarbon production in the coalbed, and raises the coal adsorptive capability, which make the gas content in the Qinshui basin 513 m3/t higher than that in the Black Warrior basin. Moreover, the change in temperature caused by the igneous intrusion is one of the reasons for the undersaturation of the gas content in the Qinshui basin, and the high temperature and high pressure of the reservoir environment improve the coal permeability.

Keywords:

Key words: the tectonic thermal event; high coal rank; coalbed methane; permeability; gas content.

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