

论文

温度及含水率对切削原煤吸附瓦斯特性的影响

王俊峰, 张力, 赵东

太原理工大学 矿业工程学院, 山西 太原 030024

摘要:

为了测定温度、含水率对切削原煤吸附特性的影响, 针对之前煤对瓦斯吸附性研究的不足, 采用屯兰矿的焦煤、屯留矿的贫煤并经煤岩钻样机切削加工成 100 mm×150 mm的圆柱形块状原煤, 根据实验结果及相关理论采用Langmuir单分子层吸附模型进行结果分析。实验从等温条件下测定两种煤的吸附常数入手, 之后调节至不同的温度和不同的含水率, 测得吸附常数 a、b 分别随温度、含水率变化的关系式。结果表明: 温度对吸附性的影响只取决于吸附常数 a 的变化, 而含水率与 b 有关; 在实验所研究的温度梯度内, 得到吸附常数 a 随温度的变化呈线性衰减的趋势; 在干燥到饱和和含水的范围内, 得出吸附常数 b 随含水率的变化呈指数衰减的趋势, 并说明切削原煤的含水吸附性质与粉煤粒煤是存在差异的。

关键词: 温度 含水率 原煤 吸附特性 Langmuir吸附方程

Effect of temperature and moisture on raw coal adsorption characteristics

Abstract:

In order to study the effects of temperature and moisture ratio on raw coal samples' adsorption characteristics towards coalbed methane and due to lack of researches of effects of temperature or moisture ratio on the adsorption capability of coal samples, coke coal from Tunlan Mine and the lean coal from Tunliu Mine were adopted. The original ones were processed from big block samples with size of 100 mm×150 mm, and the experimental results were fitted through Langmuir single molecule adsorption model. The experiments begun from the measurement on adsorption constants of the two sorts of coal at equal temperature, and later different temperature and moisture ratio were regulated and determined the relationship of the adsorption constants a & b followed by temperature & moisture ratio. The conclusion show that: the equal temperature experiments of coal samples with different metamorphose degree displays that adsorption becomes much larger with the increase of metamorphose degree of coal; temperature is only related to adsorption constant a. At the fixed temperature scope of these experiments, the relationship of adsorption constant a by temperature is in linearity attenuation; in the range from dryness to saturation moisture, the relationship of adsorption constant b by moisture ratio is in exponential attenuation. And the diversity of block coal sample and renew shaped one on adsorption characteristics was explained.

Keywords: temperature; moisture; raw coal; adsorption characteristic; Langmuir adsorption model

收稿日期 2011-09-27 修回日期 网络版发布日期 2012-01-12

DOI:

基金项目:

科技部国际合作攻关基金资助项目 (2008DBF70100)

通讯作者: 王俊峰

作者简介: 王俊峰 (1973—), 男, 山西晋城人, 讲师, 博士

作者Email: tyutwjf@163.com

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