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论文

中梁山南矿构造煤吸附孔分形特征

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摘要：

采集华蓥山煤田中梁山南矿9个有代表性的煤层样品进行低温氮吸附实验，分析构造煤吸附孔分形特征及分形维数与气体吸附能力的关系。低温氮吸附、解吸曲线表明不同变形序列构造煤在相对压力0.5~1.0范围内吸附特征各异。在此基础上，运用分形FHH方法得到构造煤分形维数D。研究表明：分形维数D可以表征构造煤吸附孔孔径结构和孔表面的变化关系；分形维数越高，微孔含量越多，孔表面越不规则，孔隙结构非均质性愈强；分形维数大小可反映煤的吸附能力，分形维数增高，吸附能力增强。因此，由构造变形增强引起的高分形维数和复杂的孔隙结构显示出更高的吸附能力。

关键词： 构造煤；吸附孔；分形特征；低温液氮吸附；分形维数

Fractal characteristics of adsorption pores of tectonic coal from Zhongliangshan southern coalmine

Abstract:

Nine standard coal samples from different coalbeds of Zhongliangshan southern coal mine in Huayingshan coalfield were tested using the low-temperature nitrogen adsorption method to study the fractal characteristics of adsorption pores (pore diameter <100 nanometers) and the relationship between fractal dimension and the gas adsorption capacity of tectonic coal.The results of both the low-temperature nitrogen adsorption and desorption show that different deformed coal has different adsorption characteristics under relative pressures between 0.5-1.0.Based on the results，the fractal dimension D of tectonic coal was studied using the fractal Frenkel-Halsey-Hill (FHH) method.The results demonstrate that the fractal dimension D can represent the variation characteristics of pore structure and pore surface area of tectonic coal.The higher fractal dimension D，the more micropores，the more irregular specific coal surface，and the higher heterogeneity of pore structure.The gas storage capacity of coal can be represented by the fractal dimension D，and the gas adsorption capacity of coal increases with the increasing of fractal dimension D.Therefore，the higher fractal dimension and the more homogeneous pore structure resulting from strong tectonic deformation，indicate that the coal has a higher gas adsorption capacity.

Keywords: tectonic coal；adsorption pore；fractal characteristics；lowe temperature liquid nitrogen adsorption；fractal dimension

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