

论文

泥岩孔裂隙分布特征及其对吸水性的影响

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摘要:

基于泥岩样品的扫描电镜测试和液氮等温吸附试验, 系统研究煤系泥岩的显微孔裂隙形态特征和分布规律, 进而探讨孔裂隙分布特征对其吸水软化崩解性的影响规律。主要研究成果为: ① 泥岩孔裂隙类型有粒间孔、层间孔、粒缘收缩孔、气胀孔、溶蚀孔、矿物铸模孔及裂隙等; ② 孔裂隙的发育程度及相互间的连通性差, 自然状态下, 多以隐裂隙的形式存在, 肉眼很难辨别; ③ 孔裂隙以所含黏土矿物微集集体间孔隙和构成泥岩骨架的大颗粒间孔隙为主, 其中构成泥岩骨架的大颗粒间孔隙体积占泥岩总体积的20%以上; ④ 泥岩吸水软化崩解是在宏观结构破坏或扰动的基础上, 由微孔裂隙吸附效应引起的, 受其物质组成不同的影响, 自然吸水率和软化崩解机理存在明显差异。

关键词: 泥岩; 孔隙结构; 氮气等温吸附; 微孔裂隙吸附效应; 软化崩解

Distribution characteristics of mudstone pore fracture and its influence on absorption

Abstract:

Based on scanning electronic microscope(SEM) analysis and isothermal adsorption of low temperature nitrogen experimentation of mudstone samples, microstructure morphological characteristics and distribution laws of pore fracture of coal measures mudstone were studied systematically, and the influence of distribution characteristics of mudstone pore fracture on absorption softening disintegration was researched. The research results are as follows: ① Pore fracture types of mudstone include inter granular pores, inter stratum pores, granular edge shrink pores, blowholes, corrosion pores, mineral casting pores and fractures etc. ② Degree of development and inter connectivity of pore fracture of mudstone is poor, and it occurs in implicit fracture form in the natural state. ③ The pore fracture of mudstone is dominated by clay mineral inter conglomeration pores and inter large granules that compose the mudstone skeleton pores, and inter large granules pores accounts for a little more than 20% of total pores volume. ④ The absorption softening disintegration of mudstone is caused by adsorption effect of micropore fractures on the basis of macrostructure damage and disturbed, the natural absorption and soften disintegration mechanism difference obviously differ in composition of substance.

Keywords: mudstone; pore structure; adsorption isotherm of nitrogen; adsorption effect of micropore fracture; softening disintegration

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