

论文

基于显微CT的构造煤渗流孔精细表征

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摘要:

利用显微CT技术对重庆市中梁山南矿构造煤的渗流孔进行了精细定量表征。研究发现:构造煤孔隙直径一般小于10 μm,但不同类型构造煤的孔隙分布特征有着明显差别。随着构造变形的增强,煤的孔隙数量、面孔隙度逐渐增大。原生-碎裂煤的孔隙以原生孔为主;碎裂煤脆性破坏加剧,角砾孔增加;碎粒煤碎粒孔和微裂隙发育,平均孔径加大;鳞片煤受到强烈剪切作用,煤颗粒在脆性破碎的基础上,同时具有韧性变形特征,包括局部揉皱和粉末状糜棱质,充填部分孔隙,造成平均孔径下降。构造煤孔隙三维建模表明,随着应力作用的增强,构造煤的孔隙度、孔比表面积、孔体积及最大连通孔隙团不断增高。

关键词: 构造煤; 渗流孔; 显微CT; 煤层气; 连通孔隙团

Advanced characterization of seepage pores in deformed-coals based on micro-CT

Abstract:

The advanced quantitative characterization of seepage pores of deformed coals in Zhongliangshan Southern coalmine, Chongqing, was studied by micro-CT. The results show that the pore diameter of deformed coals is commonly less than 10 μm, but the pores distribution characteristics are different among various types of deformed coals. Pore numbers and areal porosity increase with the intensity of tectonic deformation. For primary cataclastic coal, the primary pore is the major pore types, and interbreccia pores from angular particles increase in cataclastic coal with stress increasing. For granulated coal, intergranular pores and micro fractures are well developed, and mean pore diameter increases. The intense shear failure resulted in the brittle ductile deformation, including local wrinkle structure and dusty mylonite in flake coal. Coal particles filled in some fractures and pores, which results in the reduction of mean pore diameter. The spatial visualization of pores indicate that porosity, pore surface area, pore volume and the distribution of max connective pores group increases along with stress strengthen.

Keywords: deformed coals; seepage pores; micro-CT; coalbed methane; connective pores group

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