

论文

含水煤岩变形破坏过程中瓦斯运移规律的实验研究

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摘要:

配合自制煤岩三轴流固耦合夹持装置, 采用实验方法对煤岩变形破裂过程中瓦斯运移规律进行研究。实验结果表明: 煤岩破裂前后, 瓦斯解吸量、解吸速率以及渗透率的差异较大, 在弹性压密到强化阶段, 瓦斯解吸规律基本遵循Langmuir等温吸附规律。在煤岩破裂阶段, 瓦斯解吸量和解吸速率都急剧增大, 瓦斯渗透率的变化表现为少许滞后于应变的特点; 在瓦斯压力较低的情况下, 煤岩渗透性能受含水饱和度的影响显著, 破裂后气测渗透率值比压密阶段高近6倍, 含水饱和度增大后, 煤岩破裂前后气测渗透率变化规律大致相同, 虽然增大了煤岩孔隙压力, 但煤岩变形破裂全过程中测定的气测渗透率反而降低。

关键词: 煤岩; 瓦斯流动; 瓦斯动力灾害; 吸附解吸

Experimental research on gas flow law of containing water coal specimens in deformation and fracture process

Abstract:

Gas migration law during coal rock deformation and fracture was researched by using experimental methods combined with self made fluid solid coupling three axial clamping device. The experiment results show that desorption, desorption rate and the permeability of coal have large difference before and after the fracture of coal rock, in elastic compaction and strengthen stage, and the law of gas desorption basic ally follows Langmuir adsorption isotherm. In stage of coal fracture, gas desorption and desorption rates increase dramatically, gas permeability changes lagging behind strain changes; coal permeability performance by the influence of water saturation is remarkable in case of low pore pressure, the fracture coal sample gas permeability value is nearly six times higher than the compaction stage, water saturation increases, and coal sample gas permeability change law is about the same, although increased pore pressure, but gas permeability lowers in coal petrography deformation and fracture process.

Keywords: coal rock; gas flow; gas dynamic disaster; adsorption and deabsorption

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