

报告题目： 高压气体诱发煤岩动力破坏的实验研究
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摘要： 煤岩内部含有大量孔隙，这些孔隙在一定条件下会充满高压气体。在地下开挖、掘进和开采过程中，煤岩内部高压气体可能会诱发冲击矿压、岩爆和煤与瓦斯突出等动力灾害。基于自主设计的高压气体煤岩实验装置，通过气体泄压作用诱发煤岩的动力破坏，观察了破坏现象并研究了高压气体对煤岩材料变形破坏的作用。研究表明，当气体泄压速率小时，煤岩仅会出现变形；当气体泄压速率大时，煤岩将会产生破裂和破碎现象。发现了煤岩的破坏程度不仅取决于气体泄压速率，还取决于孔隙气体压强。当气体泄压速率和气体压强都达到一定临界值，煤岩才会发生剧烈破碎。

Experimental Study on Dynamic Rupture of Coal and Rock Caused by High-pressure Gas

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Abstract: Coal and rocks are porous materials containing various pores and voids. These pores and voids can be filled with high-pressure gases under certain conditions. The gases in coal and rocks would expand and cause fractures and failure during underground excavation, tunneling, and mining, causing rockbursts and coal and gas outbursts. The effect of high-pressure gases on the deformation and failure of coal and rocks is studied using a designed apparatus. Dynamic ruptures of coal and rock are realized by gas decompression. The results show that a low gas decompression rate only causes deformation of coal samples slightly while high gas decompression rate leads to fracture and outburst phenomena. The degree of damage of rocks depends on not only the gas decompression rate but also the gas pressure. Violent fragmentation is generated when gas decompression rate and high saturation pressure exceed critical values.