

论文

采动影响下突出煤体温度与声发射特性

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摘要:

利用自主研发的大型煤与瓦斯突出模拟试验装置和16 CHs SAMOS System声发射测试系统, 探讨采煤工作面前方卸压带应力水平对煤与瓦斯突出的孕育与发生发展过程中煤体温度及其声发射特性的影响。试验结果表明: 在煤体充瓦斯阶段, 煤体温度升高, 且随着卸压带应力的增大, 煤体温度的增量有减少的趋势; 在突出发生阶段, 煤体温度经历一个陡降突变的过程, 但卸压带应力水平的变化对煤体温度陡降突变的影响并不明显; 在煤体充瓦斯阶段, 随着卸压带应力的增大, Hit率峰值减小, 产生的声发射特性不明显, 而在突出发生阶段, 随着卸压带应力的增大, Hit率峰值增加, 产生的声发射特性越加明显。对煤与瓦斯突出全过程中煤体内声发射特性与其温度变化规律分析, 发现二者有着密切的内在联系, 说明煤与瓦斯突出过程中煤体破裂与能量变化有直接关系。

关键词: 采动影响; 煤与瓦斯突出; 声发射; 温度; 卸压带

Temperature and acoustic emission characteristics of coal in the process of outburst under the influence of mining

Abstract:

Using self-developed large-scale coal and gas outburst test device and 16 CHs SAMOS monitoring system of acoustic emission, discussed the impact of coal and gas outburst on acoustic emission characteristics of coal induced by the change of stress level in distressed area. The results show that, in the process of gas adsorbing, the temperature of coal increases, and with the increase of stress in the distressed area, the increment of temperature increase of coal has the trend to reduce. In the process of outburst, the temperature of coal will experience a steep drop mutation process, but the impact of stress change in distressed area is not obvious to the plunged mutations of coal body temperature. In addition, in the coal gas filling stage, along with the increase of stress in the distressed area, Hit rate peak decreases, and the produced acoustic emission characteristics are not obvious, but in the outburst stage, along with the increase of stress in the distressed area, Hit rate peak increases, the resulting acoustic emission characteristics are more obvious. In the whole process of coal and gas outburst, through coal body acoustic emission characteristics and its temperature change rule analysis, there is a close inner link between the acoustic emission and coal temperature, and in the coal and gas outburst, coal energy is in a direct relationship with coal rupture.

Keywords: mining influence; coal and gas outburst; acoustic emission; temperature; distressed area

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