

# 瞬态径向热流法测定松散煤体变导热系数

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Title: Measurement of changing thermal conductivity of loose coal with transient radial heat flow method

作者: 孙越; 李增华; 高思源; 杨永良; 彭飞;  
中国矿业大学安全工程学院;

Author(s): SUN Yue; LI Zeng-hua; GAO Si-yuan; YANG Yong-liang; PENG Fei  
Faculty of Safety Engineering, China University of Mining & Technology, Xuzhou 221008, China

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摘要: 松散煤体的导热系数是指在单位梯度作用下,松散煤体单位时间内通过单位面积的热量,表征了松散煤体导热性能的强弱,是研究煤自燃的重要参数。目前,使用最广泛的热线法,测试结果易受电阻升温变化影响。针对当前测试方法的不足,本文在二维径向导热模型的基础上,设计了瞬态径向热流法测定松散煤体变导热系数测试装置,并建立了相应的导热系数解算模型。通过测定不同煤样随温度变化的变导热系数。结果表明,随着温度的升高,松散煤体的导热系数不断上升,两者之间基本成线性关系,测试结果符合松散煤体的导热特性。

Abstract: Thermal conductivity of loose coal means that the heat comes through the unit area of the loose coal in a unit time. The experiment happens in a special status, and the test of the loose coal works in a unit gradient. Thermal conductivity of loose coal is a characterization of the thermal conductivity of loose coal strength, also it is an important parameter to study coal spontaneous combustion. Up to now, there are many different kinds of methods to determine the thermal conductivity of loose coal, like transient hot plate, hot-wire method, etc, in which hot-wire method is most widely used. But, when the temperature increases the resistance changes continuously, it will inevitably affect the results. According to the disadvantages of existing measuring methods, based on the 2D radial conduction model, a measuring equipment of thermal conductivity with transient radial heat flow method was designed and the corresponding calculating model was developed. Through measuring thermal conductivities of different coal samples changing with temperature, the results showed that the thermal conductivity of loose coal increased with increasing temperature. It meant that the thermal conductivity of loose coal changed with the temperature linearly. The results conformed to the thermal conductive characteristics of loose coal.

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