



Expansion and evolution of fractures in coal-rock mass for coalfield fires with the conditions of temperatures and pressures in China

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The process of coalfield fire is a complicated result of physical and chemical action, which is attributed to uncontrolled continuously combustion. The fire holds the ceaselessly expansion which dues to the oxygen supply constantly. The fractures play a key role to provide passageway for oxygen supply, and heat discharge and gases emission. In this article, we chose the samples of coal and rock in coalfields of Qinshui and Zhunnan, China, and the conditions: (1) single affection of temperature from 25 °C (room temperature) to 500 °C, (2) effect of temperatures (room temperature, 80 °C, 140 °C, 200 °C), and total process of stress and strain. The MTS 880, and industrial CT employed to do the experimental tests. For given heating at 5 °C/min, the length and width of fractures are increased as raising the temperature, and the threshold of temperature at 300 °C is determined at the range of 25–500 °C. As rising the temperature, the total amounts of fractures are augmented in samples, which shapes are converted from slightness to ellipse. The compression strength occurs first increase and then decrease, which reached the maximal value at 140 °C.