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Effects of chemical properties of coal dust on its wettability

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Abstract

The relationship between coal dust chemical composition and its wettability was analyzed in detail using the Walker test method. The wetting rate of coal dust was also investigated. Results show that the wetting time of coal dust is negatively correlated with moisture content. Increased moisture content improves the wettability, while the content of ash, volatile matter and fixed carbon in the coal dust has no effect on wettability. Surface hydroxyl is the main factor that determines the wettability of coal dust. The wetting time decreases linearly ($R^2 = 0.81$) with increasing hydroxyl functional group content. The increase of carbonyl group content improves coal dust wettability, but there is no obvious relationship between carboxyl group content and the wetting time. Increased quartz content leads to decreased wettability, which indicates that quartz on the coal dust surface associated with organic composition may be

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