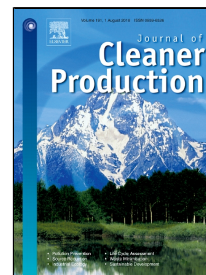


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Effect of particle shape on the flotation kinetics of fine coking coal

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Abstract:

Particle shape has a significant effect on the flotation process of fine mineral and fine coal particles. In this paper, the effects of particle shape on the flotation kinetics and behavior of fine coking coal of different size fractions were investigated. The coal particles with different shape properties were gained from the grinding and crushing products of the rod mill and jaw crusher, respectively. The shape parameter of the coal particle was measured by Image J software by analyzing the photos of coal particles taken by the microscope. The flotation tests of fine coking coal were done in a 0.5 L XFD flotation cell without any usage of flotation collector in order to study the natural floatability of coal particle. Six flotation models were used to assess how the particle shape affects the flotation behavior of fine coking coal of different size fractions. The results showed that the coal particle with a larger elongation ratio had a higher flotation recovery. The first-order model with rectangular distribution of floatability was found to be well consistent to the experimental data, and the modified flotation rate constant of the flotation process increased with the increase of elongation ratio.

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