

# Study and prediction of a relationship between particles shape characteristics of minerals and their flotation kinetics

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## Abstract

Distribution of particle size and shape are of great importance to mineral industries. Morphological and shape properties of particles, affects next processes such as flotation. On the other hand, crushing and grinding are factors that cause changes in the physical and chemical properties of materials under processing, such as size and shape distributions. Shape properties have been stated in terms of shape descriptors such as elongation and roundness by measuring on the projections of particles using scanning electron microscope. The floatability and wettability characteristics of particles were determined by flotation technique using the laboratory flotation cell. Results show that recovery rate of particles in flotation method will vary with elongation and roundness; there is a predictable relationship between particle shape characteristics, including elongation (E) and roundness (R), and flotation kinetics (k) as followed:

$$k \propto a[R]^b \text{ \& } k \propto a[E]^b$$

Where a and b, are constant values, [E],[R], are mathematical operators that may be different for each mineral.

Keywords Flotation, Particle Shape characteristics, Kinetics.

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