

Visualization of angular particle-bubble surface interaction using a high speed video camera

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Abstrak

Flotation is an important process in mining industries. This process employs the bubble and hydrophobic properties of a particle to separate valuable mining particles from impurities. The most important phenomenon in determining flotation efficiency is the bubble-particle interaction; therefore, understanding this phenomenon is very important. The aim of this research is to study the mechanism of bubble-particle interactions with and without the addition of a collector. The experimental setup consists of a water container, bubble generator, particle feeding system, and an image capturing system. The water container is made from transparent material of a size large enough so that the wall's effects on bubbles and particles can be neglected. Air bubbles are generated by a bubble generator which consists of a small nozzle and programmable syringe pump. A high speed video camera and halogen lamp backlighting system are used as image capturing devices. Observation of the images reveals that bubble-particle interaction follows the stages of bubble-particle collision, particle attached to the bubble, and particle detached from the bubble. The addition of a collector to the liquid affects the bubble-particle interactions.