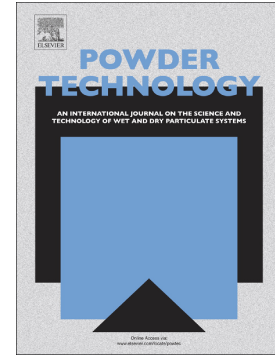


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Influence of bubble approach velocity on liquid film drainage between a bubble and a spherical particle

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## Abstract

The flotation process strongly depends on drainage of liquid film between a bubble and a particle which might be influenced by hydrodynamic conditions in a flotation cell. This technical note investigates the influence of bubble approach velocity on the liquid drainage process between a bubble and a particle under constant conditions. It was found that the increase in bubble approach velocity results in a higher critical thickness of the wetting liquid film. The results also showed that the rupture of the films was affected more strongly by electrostatic double layer forces than hydrophobic forces. Hydrophobic forces were more pronounced at high bubble approach velocities. This work shows that hydrodynamic conditions should not be neglected when investigating liquid film drainage process.

**Key words:** flotation, hydrodynamics, wetting liquid film

## 1. Introduction

Separation of hydrophobic from hydrophilic particles using air bubbles is critical in flotation separation which is widely used in the recovery of valuable minerals, the deinking of wastepaper, the water treatment and the oil recovery from tar sands [1]. A key step for

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