

A Two-Dimensional CFD Model for Heap Bioleaching of Chalcocite

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Abstract

A 3-phase computational fluid dynamics (CFD) model for heap bioleaching of chalcocite is investigated to identify and understand the effect of oxygen flow during air sparging. The study uses an existing one-dimensional model of liquid flow, bacterial transport (including attachment/detachment of bacteria to ore particles), and the depletion of a copper-sulphide, coupled with a two-dimensional (2D) model of gas flow in the heap. The CFD model includes the effects of oxygen and ferrous ion consumption, coupled with leaching of copper-sulphide via a shrinking core model. The model is used to investigate the 2D effects of air flow in heap bioleaching with regard to oxygen limitation.