

SIMULATION OF CIRCULATION IN AERATION TANKS

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ABSTRACT

Aeration is one of the most common stages in the liquid waste clarification process. Most aeration tanks are equipped with aeration devices that inject oxygen to enhance the biodegradation of the liquid waste. In the present work the aeration with air injected at the bottom of a cylindrical tank is simulated. Two different numerical models were developed and their results are verified against published experimental data. The first model considers the liquid phase and gas phase to be a homogeneous fluid. The calculated velocities refer to the mixture of the phases. The second model considers two distinct phases, a liquid and a gas phase. Both models solve the momentum, continuity and k- ϵ equations for the relevant phases. Velocity and volume fraction profiles portray the motion of the liquid and the extent of the aeration process.