

AN ABSTRACT OF A THESIS

A STUDY OF MASS TRANSFER IN GAS-SPARGED VESSELS

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Master of Science in Chemical Engineering

Mass-transfer coefficients for carbon dioxide and oxygen being stripped from water by air or nitrogen in a gas-sparged vessel were obtained. A mass-transfer model consisting of nine dimensionless groups was derived by using the dimensional analysis method. The model was fitted to the experimental data for the water-carbon dioxide system and was tested with the experimental data taken from other operating conditions for both the water-carbon dioxide system and the water-oxygen system. Reasonably good agreement was obtained. The mean deviation of the mass transfer coefficients, $k_L a$, between the predicted values by the model and the experimental values was 6.7 percent for the water-carbon dioxide system and was 15.3 percent for the water-oxygen system. The experimental mass-transfer coefficients for both the water-carbon dioxide system and the water-oxygen system were compared with a prediction method presented by Donald N. Miller. The mean deviation between the experimental mass-transfer coefficients and Miller's prediction was about 17 percent for the carbon dioxide-water system and was about 35 percent for the oxygen-water system.

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CERTIFICATE OF APPROVAL OF THESIS

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by

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