



Kinetics of TransMembrane ChemiSorption for wastewater with high ammonia contents

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ABSTRACT

The use of membrane contactor solutions (TransMembrane ChemiSorption) is a widely researched area for removing or recovering many kinds of gases from various fluids. In an earlier paper, we examined the removal of ammonia from industrial wastewater and provided a detailed description of the necessary equipment and the technology, as well as modeling the executed process. The aim of this work is to improve the model developed in our earlier study. The models found in literature usually interpret the whole process as a simple diffusion process through a flat sheet membrane. By applying the Bodenstein principle, the model introduced also considers the effect of chemisorption on the whole process. Furthermore, it also focuses on the transfer of the results obtained by the model to the membrane contactor, making its practical implementation possible. The proof of the model's validity in industrial settings was provided by membrane contactor experiments. The results obtained during the measurements are in accordance with the model and results found in the literature; at the same time, they also reveal further development possibilities.

Keywords: Ammonia removal; Chemisorption; Mass transport; Model; Membrane contactors; Water treatment; Temperature dependence

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