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MEMBRANE SEPARATION FOR BIOGAS PURIFICATION

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Membrane separations were found to be a useful tool for the biogas upgrading. One of the recent breakthroughs in biogas membrane upgrading is application of water-swollen membranes. Its big advantage consists in fact that water present in the raw biogas helps separation and thus, pre-treatment of a feed stream is not necessary such as in the other membrane separation processes. Selection of the suitable membrane material was found to be a complex procedure that includes not only separation properties but also the basic membrane characteristics. To decrease time necessary for the membrane testing before suggestion of a scale-up, determination of the mass transfer coefficients of main compounds contained in raw biogas such as carbon dioxide and methane was suggested. The mass transfer coefficients were evaluated from experiments done on two membranes supplied by Koch and Sterlitech Company using simple engineering procedure. Further, prediction from the model was compared to the experimental data. The missing data could be predicted using the theoretical mass transfer coefficients. However, it was found that the coupling effect has to be included in the future prediction models to obtain more precise prediction.

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