Desalination and Water Treatment
www.deswater.com

27 (2011) 123–129
March

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doi: 10/5004/dwt.2011.2075

Effect of liquid flow on the separation of propylene/propane mixtures with a gas/liquid membrane contactor using Ag^+-RTIL solutions

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Received 2 June 2010; Accepted 30 October 2010

ABSTRACT

Industrial olefin/paraffin separations heavily rely upon energy intensive distillation-based technologies, which represent a class of the most important and also the most costly processes in the chemical industry. The method of olefin/paraffin separations certainly holds an enormous potential for capital and energy cost savings if a more efficient technique is developed. A module containing a microporous hydrophobic membrane has been assessed for their capability in the selective removal of propylene from a gas mixture with propane. A study of mass transfer in the membrane module indicates that the overall mass transfer coefficients, $K_{overall}$, are dominated by the individual coefficients in the liquid film, k_L. A model based on the resistance-in-series model and Sherwood correlations could describe this phenomenon.

Keywords: Propylene; Propane mixtures; Silver; $BMImBF_4$; Reactive absorption; Membrane contactor

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Presented at the VII Ibero-American Conference on Membrane Science and Technology (CITEM 2010), April 11–14, 2010, Sintra, Portugal