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Gas-Liquid Membrane Contactors: III. Modeling Study of Non-Uniform Membrane Wetting

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Abstract

Current available models for simulation of the separation process in gas-liquid membrane contactor (MC) systems consider a uniform partial membrane wetting along the membrane length (L_{mem}). However, transmembrane pressure changes along the L_{mem} . Additionally, the available models usually consider a simplified uniform pore size to represent the micro-porous MC. However, not all the pores in a MC have the same size. In this study, a pore-scale network model is developed to simulate the physical separation of H_2S using MCs by taking into account for (i) transmembrane pressure variation and (ii) pore size distribution of the MC. The model results are compared with the experimental results of H_2S separation presented in the Volume II of this paper [1]. Modeling results indicate membrane wetting is non-uniformly distributed along the L_{mem} . The membrane wetting ratio is

¹ Now with University of Alberta.

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