INFLUENCE OF SURFACE TREATMENT OF THIN-FILM COMPOSITE MEMBRANE ON SEPARATION OF CARBON DIOXIDE FROM BIOGAS

L. Morávková, M. Kárászová, Z. Petrusová, P. Izák

Institute of Chemical Process Fundamentals of the Czech Academy of Sciences, v.v.i., Prague 6, Czech Republic

Carbon dioxide can be successfully separated from a raw biogas by a water-swollen thin-film composite membrane [1-3]. The separation is based on the high solubility of carbon dioxide in water. Water is continuously refreshed from a feed stream and diffusing to the permeate stream. The wetting of the polyamide skin layer was found to be the important key factor for the separation.

The original reverse osmosis membranes have a low selectivity. Therefore, they must be wetted before use.

The effect of the various wetting procedure on the membrane performance was studied [1]. Spraying is clearly more efficient than spreading water on the top of the membrane with a brush and results in higher methane purity. Spraying ensures a more uniform distribution of the water on the skin layer of the membrane, leading to much higher CO2 permeation through the membrane and higher CH4 content in the retentate stream.

However, the water wetting is not always uniform. It leads to a decrease of membrane selectivity. Therefore, the surface of this membrane was treated with 1mL of a 1 mol. % solution of Triton X-165 surfactant, deposited using a brush. Although it takes longer to reach the steady state after surfactant treatment, it helped to endure the stable separation.

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*Literature*

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