

Development of Polybenzoxazine Membranes on Al₂O₃ Support for Water-Ethanol Separation via Pervaporation Technique

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Abstract : Bioethanol is one of the candidates to replace fossil fuels. Membrane technique is one of the attractive processes to produce high purity of ethanol. In this work, polybenzoxazine (PBZ) membrane successfully synthesized from bisphenol-A (BPA), formaldehyde, and two different types of multifunctionalamines: tetraethylenepentamine (tepa), and diethylenetriamine (deta), was evaluated for water-ethanol separation. The membrane thickness was determined by scanning electron microscopy (SEM). Pervaporation technique was carried out to find separation performance. It was found that the optimum PBZ concentration for the preparation of the membranes is 25%. The dipping cycles of PBZ-tepa and PBZ-deta was found to be 4 and 5, giving the total permeation flux of 28.97 and 14.75 g/m².h, respectively. The separation factor of both membranes was higher than 10,000.

Keywords : polybenzoxazine, pervaporation, permeation flux, separation factor

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