

EVALUATION OF DIFFERENT POLYMERIC MEMBRANE SUPPORT FOR ACETIC ACID REMOVAL BY SUPPORTED LIQUID MEMBRANE PROCESS

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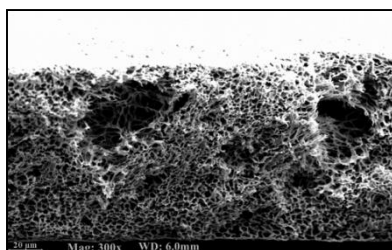
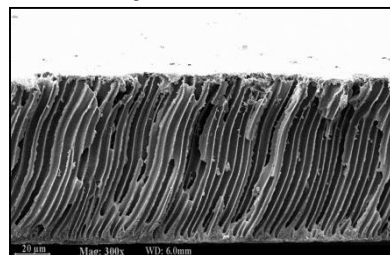
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Graphical abstract



Abstract

In this study, the removal of acetic acid from aqueous solution through supported liquid membrane (SLM) process by using tri-n-octylamine (TOA) as a carrier and sodium hydroxide as a stripping agent was conducted. Acetic acid can inhibit the microbial activity during fermentation process of biomass hydrolysate, thus decreasing the bioethanol production. It is crucial to remove acetic acid prior to fermentation process in order to increase the yield of bioethanol from biomass resources. In this study, the removal of acetic acid was conducted using different types of polymeric membrane in supported liquid membrane process. Three types of polymeric membranes support which are polyethersulfone (PES), polysulfone (PSF) and polyvinylflouride (PVDF) prepared by vapour induced phase separation (VIPS) were used as a support material. The types of polymer give a significant effect on membrane morphology and its physical characteristics. PES exhibited a porous membrane support with a symmetric structure and high contact angle. Almost 86% of 10 g/l of acetic acid was successfully removed by using PES as a support membrane, compared to the 6% and 38% removal using PSF and PVDF membrane, respectively.

Keywords: Supported liquid membrane, vapor induced phase separation, acetic acid, biomass hydrolysate, polymeric membrane