

Supported Liquid Membrane Using Hybrid Polyethersulfone/ Graphene Flat Sheet Membrane for Acetic Acid Removal

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ABSTRACT: *Acetic acid is one of the inhibitors mainly found in biomass hydrolysates after acid hydrolysis of lignocellulose biomass. The presence of this compound can affect the final yield of bioethanol. Supported liquid membrane (SLM) is an efficient method for solute extraction from aqueous solution. However, unsuitable membrane structure and insufficient membrane strength are the typical problems experienced by the membrane support in the SLM system. In the current study, graphene nanopowder was incorporated into polyethersulfone (PES) dope polymer solution to fabricate flat sheet PES membrane support. The hydrophobicity of the PES membrane was increased from 85° to 120° when the graphene was added. The force required to break the PES/graphene membrane was 4.3N. This force was higher compared to the pristine PES membrane which was 1.9N. Both membranes however showed almost similar acetic acid removal percentages which were 86% and 83% for pristine PES and PES/graphene membrane, respectively.*

Keywords: Acetic acid, liquid membrane, hybrid Polyethersulfone, graphene, flat sheet membrane