SYNTHESIS OF POLYSULFONE MEMBRANE: THE EFFECT OF POLYMER AND SOLVENT CONCENTRATION TOWARDS MEMBRANE PROPERTIES

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CERTIFICATION OF APPROVAL

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By

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CERTIFICATION OF ORIGINALITY

This is to certify that I am responsible for the work submitted in this project that the original work is my own except as specified in the references and acknowledgements and that the original work contained herein have not been undertaken or done by unspecified sources or persons.

MUHAMAD FIRDAUS CHE RAHIM

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ABSTRACT

Membrane technology is one of the promising technologies in CO2/CH4 gas separation which had attracted great interest from many people due to its performance-cost efficiency. Polymeric membranes lead the membrane separation industry market because they are very competitive in performance and economics. Owing to their strength, reproducibility, and low cost, they are suitable for various applications in science and technology and for research purposes.

Although polymeric membrane does possess lots of benefit, still it has its own drawback which is the trade-off issue of permeability and perm-selectivity. Thus, it has been a great discussion between researchers on the issue and lots of experiments in order to understand the problem. Thus, this experiment attempts to study the effect of concentration of polymer and solvent towards membrane properties as manipulating the ingredient in synthesizing the polymeric membrane will greatly affect the membrane properties. For the experiment, polysulfone (PSf) polymer was selected because of its satisfactory gas permeability and acceptable permselectivities, and widespread use as a commercial polymer. Its relative low cost and mentioned properties established PSf as the choice for use as a proper glassy polymer for the fabrication of CO2 or H2 separation membrane (Kapantaidakis GC 1996).

Phase inversion technique is a technique where a polymer is transformed from liquid to solid state in controlled manner. The solidification process is often getting started by the transition from one liquid state into two liquids, in other word liquid-liquid demixing. The membrane characterisation is done by using scanning electron microscopy (SEM) which is to observe the membrane morphology, differential scanning calorimetry (DSC) to determine the membrane crystallinity via glass transition temperature determination and viscosity test by using Brooksfield viscometer.

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