

# Carbon Membranes Prepared from a Polymer Blend of Polyethylene Glycol and Polyetherimide

*Wan Nurul Huda Wan Zainal<sup>1,2</sup>, \*Soon Huat Tan<sup>1</sup>, Mohd Azmier Ahmad<sup>1,3</sup>*

<sup>1</sup>School Of Chemical Engineering, Engineering Campus, Universiti Sains Malaysia, 14300 Nibong Tebal, Penang, Malaysia.

<sup>2</sup>Faculty Of Engineering Technology, Universiti Malaysia Pahang, Kuantan, Pahang, Malaysia.

<sup>3</sup>Solid Waste Management Cluster, Science And Engineering Research Centre, Universiti Sains Malaysia, Nibong Tebal, Penang, Malaysia.

## ABSTRACT

Through a dip-coating technique, carbon membranes were produced from a polymer blend consisting of the thermally stable polymer polyetherimide (PEI) and the thermally labile polymer polyethylene glycol (PEG). The PEG/PEI carbon membranes were synthesized on an alumina support coated with an Al<sub>2</sub>O<sub>3</sub> intermediate layer. The polymer blend ratio and carbonization temperature influenced the structure and permeation performance of the derived carbon membranes. The porosity of the PEG/PEI carbon membranes increased with higher PEG content in the blends. However, the derived carbon membranes tended to lose gas permeability with raising the carbonization temperatures. The carbon membranes were successfully optimized in order to achieve the highest CO<sub>2</sub>/CH<sub>4</sub> and CO<sub>2</sub>/N<sub>2</sub> selectivities.

## KEYWORDS:

Carbon membrane, CO<sub>2</sub> separation, Molecular sieving, Polyetherimide, Polymer blend

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