

## **Fabrication and characterization of poly(ether-block-amide)(Pebax-1657) and silicoaluminophosphate (SAPO-34) composite membranes**

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### **ABSTRACT**

In the past few years, composite membrane has been introduced to cater the limitation of polymeric and inorganic membranes. However, the fabrication of ideal composite membrane with appropriate loading of filler remains challenging. Thus, the material selection as well as optimum loading with the conditions observed for the formulation of the composite membrane studied. In this present work, a series of poly(ether-block-amide) (Pebax-1657) and silicoaluminophosphate (SAPO-34) composite membrane with different loading of SAPO-34 particles (0-4 wt%) were fabricated. The physicochemical properties of the resultant membranes were investigated by utilizing X-ray diffraction (XRD), scanning electron microscopy (SEM) and energy dispersive X-ray (EDX). Based on analysis, a good distribution of filler was obtained for the membranes loaded with 1 wt% and 2 wt% of SAPO-34 particles. Further increase of inorganic filler loading lead to the sedimentation and agglomeration of particle in the membrane, which may deteriorate the membrane performance in gas separation. Therefore, the optimum loading of inorganic particles in polymer phase play a major role in obtaining membrane with minimum defects ahead of gas separation performance tests such as for CO<sub>2</sub>/ethylene separation application.

### **KEYWORDS**

Characterization; Composite membrane; Fabrication; Pebax-1657; SAPO-34

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