



## Pervaporation of phenol wastewater with PVDF–PU blend membrane

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### ABSTRACT

The compatibility of poly (vinylidene fluoride) (PVDF) and polyurethane (PU) was studied based on the theoretical analysis of solubility parameter and mixing enthalpy. The results showed that PVDF and PU are partially compatible. Then, the blend membranes of PVDF–PU with 5, 10, and 80 wt.% PVDF content were prepared with the application of solution blending in solvent N, N-dimethylacetamide (DMA). The membranes were characterized by Fourier transformed infrared spectroscopy (FT-IR) to assess the intermolecular interactions. And the morphology of the membranes was studied by scanning electron microscope (SEM). 80wt.% PVDF–PU membrane was porous. However, 5% and 10% PVDF–PU membrane were suitable for pervaporation. The study showed that the degree of swelling (DS) of PVDF–PU membrane increased with the phenol concentration, which suggested that these membranes have stronger sorption capacity to phenol. Then, the pervaporation performance of the membranes was examined. The results showed that the pervaporation performances of the blend membranes have been improved comparing with the plain PU membrane.

*Keywords:* PVDF; PU; Blend; Pervaporation; Phenol

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