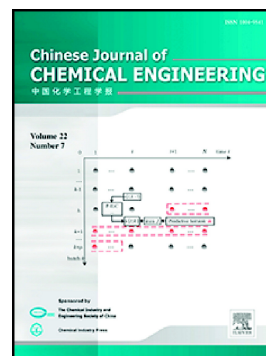


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Separation Science and Engineering

## **Fouling Evaluation on Membrane Distillation Used for Reducing Solvent in Polyphenol Rich Propolis Extract**

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### **ABSTRACT**

Membrane distillation (MD) has not been widely studied in the concentrate of phenolic rich solution in comparison to osmotic distillation. In this work, the potential of MD to reduce solvent in the polyphenol rich propolis extract was further investigated. Polyvinylidene fluoride (PVDF) membranes were engineered with the smaller pore size for the less hydrophobic surface in order to avoid wetting, allowing only the solvent vapor to be transferred from the warm feed into the cold permeate. All the membranes exhibited more than 95 % rejection of phenolic and flavonoids compounds. Although the hydrophilic membranes exhibited less fouling, they displayed a lower flux than the hydrophobic membrane due to the hindrance in the wetted pores. The hydrophobic membrane was seriously fouled by the phenolic acid as shown in the Fourier transform infrared spectroscopy spectrum. Pore plugging occurred on these hydrophobic membranes as confirmed in the scanning electron microscope images.

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