ABSTRACT

Renal insufficiency is a condition in which the kidneys lose their ability to excrete metabolic products. Hemodialysis is a combined renal replacement therapy that uses a dialyzer to remove excess substances from the blood. Currently, the membrane commonly used in hemodialysis dialyzers is the hollow fiber membrane. In this study, hollow fiber membranes were synthesized from polysulfone with the addition of polyeugenol BF3-diethylether or polyeugenol H2SO4-CH3COOH as functional polymers, and PEGDE as a crosslinker combined with D2EHPA as a carrier compound. The purpose of this study was to synthesize polyeugenol using BF3-diethylether and H2SO4-CH3COOH catalysts and a combination with D2EHPA which was then used in the synthesis of hollow fiber membranes using the Non-Imprinted Membrane (NIM) and Molecularly Imprinted Membrane (MIM) techniques with the phase inversion method. The results obtained were that eugenol was successfully polymerized into polyeugenol BF3-diethylether and polyeugenol H2SO4-CH3COOH. FTIR results showed urea absorption in the MIM membrane solution. SEM-EDX results showed no N elements in MIM, indicating that the urea template had been released from MIM. FTIR results showed D2EHPA absorption in NIM D2EHPA, MIM H2SO4 D2EHPA, and MIM BF3 D2EHPA. The membrane characterization results showed that MIM BF3 D2EHPA had the best hydrophilicity, thermal resistance, and mechanical resistance. Transport data showed that MIM was able to transport urea better than NIM due to the presence of a urea template. Transport data showed that D2EHPA was able to provide a synergistic effect. The selectivity of MIM to urea was better than to creatinine and vitamin B12, with the selectivity order being urea > creatinine > vitamin B12. The most optimal mixture transport is at pH 7.4.

Keywords: *polyeugenol, hollow fiber, D2EHPA, MIM*