ABSTRAK

Orang yang memiliki gagal ginjal membutuhkan prosedur hemodialisa untuk menggantikan fungsi ginjal. Prosedur hemodialisis menggunakan *dialyzer* berisi membran hollow fiber. Membran hollow fiber dapat disintesis dengan polieugenol yang dapat meningkatkan selektivitasnya dengan membuat cetakan molekul urea dan kreatinin serta penambahan D2EHPA sebagai senyawa pembawa. Tujuan peneilitian untuk mengetahui cara sintesis, mengetahui karakteristik membran, permeabilitas, selektivitas dan absorbansi senyawa yang berhasil tertranspor. Pembuatan membran *hollow fiber* berbasis polieugenol dengan katalis BF_3-dietil eter, hasil kemudian dikontakkan urea-kreatinin secara *in-situ* dengan variasi crosslinker PEG 6000 dan PEGDE serta penambahan D2EHPA dihasilkan MIM (*molecularly imprinted membrane*). NIM (*non-imprinted membrane*) disintesis untuk membandingkan kinerja MIM. Polieugenol dianalisis FTIR dan diukur berat molekul dengan 1ransport1 Ubbehlohde. MIM dan NIM dianalisis FTIR, SEM-EDX, uji tarik, COD dan TGA. MIM dan NIM digunakan untuk 1ransport larutan campuran yang terdiri dari urea, kreatinin, dan vitamin B_{12} pada pH 7,4 selama 4 jam dengan pengambilan sampel setiap 1 jam. Polieugenol berhasil disintesis dengan rendemen polieugenol sebesar 95,87% dengan berat molekul 30.760,968 g/mol. Template molekul urea-kreatinin berhasil tercetak dengan munculnya serapan pada hasil FTIR urea dan kreatinin pada larutan membran MIM dan tidak muncul pada hasil FTIR membran MIM. D2EHPA berhasil tercampur dengan munculnya serapan P-O-H di bilangan gelombang 1679 cm^{-1} pada spektra FTIR. Berdasarkan hasil karakterisasi dan transpor pada PBS diperoleh MIM PEGDE D2EHPA sebagai membran terbaik sehingga dilakukan transpor pada variasi buffer dengan pH 5 dan pH 9. Transpor terbaik dihasilkan pada buffer pH 7,4 dan selektivitas urea lebih baik dibandingkan kreatinin dan vitamin B_{12}.

Kata kunci: Polieugenol, MIM, NIM, D2EHPA, hemodialisis

ABSTRACT

People with kidney failure need hemodialysis procedures to replace kidney function. Hemodialysis procedures use dialyzers containing hollow fiber membranes. Hollow fiber membranes can be synthesized with polyeugenol which can increase its selectivity by creating urea and creatinine molecular molds and adding D2EHPA as a carrier compound. The purpose of this study was to determine the synthesis method, determine the characteristics of the membrane, permeability, selectivity and absorbance of the compounds that were successfully transported. The manufacture of hollow fiber membranes based on polyeugenol with BF3-diethyl ether catalyst, the results were then contacted with urea-creatinine in-situ with variations of PEG 6000 and PEGDE crosslinkers and the addition of D2EHPA produced MIM (molecularly imprinted membrane). NIM (non-imprinted membrane) was synthesized to compare the performance of MIM. Polyeugenol was analyzed by FTIR and its molecular weight was measured by Ubbehlohde transport. MIM and NIM were analyzed by FTIR, SEM-EDX, tensile test, COD and TGA. MIM and NIM were used to transport a mixed solution consisting of urea, creatinine, and vitamin B_{12} at pH 7,4 for 4 hours with sampling every 1 hour. Polyeugenol was successfully synthesized with a polyeugenol yield of 95,87% with a molecular weight of 30.760,968 g/mol. The urea-creatinine molecular template was successfully printed with the appearance of absorption in the FTIR results of urea and creatinine in the MIM membrane solution and did not appear in the FTIR results of the MIM membrane. D2EHPA was successfully mixed with the appearance of P-O-H absorption at a wave number of 1679 cm^{-1} in the FTIR spectra. Based on the results of characterization and transport in PBS, MIM PEGDE D2EHPA was obtained as the best membrane so that transport was carried out in buffer variations with pH 5 and pH 9. The best transport was produced in a buffer of pH 7,4 and the selectivity of urea was better than creatinine and vitamin B_{12}.

Keywords: Polyeugenol, MIM, NIM, D2EHPA, hemodialysis