

ABSTRAK

Membran modifikasi berupa membran kitosan tertaut silang asam malat dan PEG 4000 dibuat sebagai kandidat membran hemodialisis. Membran disintesis dengan metode inversi fasa menghasilkan 5 variasi membran berupa membran CS, CS/PEG, CMP 1, CMP 2, dan CMP 3. Keberhasilan sintesis membran dikarakterisasi melalui struktur dan morfologinya menggunakan FTIR dan SEM. Hasil FTIR menunjukkan keberadaan interaksi PEG pada bilangan gelombang sekitar 3287 hingga 3290 cm^{-1} dan pada 2873 hingga 2875 cm^{-1} , serta interaksi asam malat melalui peningkatan intensitas keberadaan gugus C=O, C-H, dan C-O. Hasil analisis SEM menghasilkan citra gambar morfologi membran dengan tekstur pori yang semakin banyak dengan penambahan asam malat dan PEG 4000. Sifat fisikokimia membran juga meningkat pada modifikasi membran berupa peningkatan sifat hidrofil dan kekuatan mekanik. Hasil permeasi oleh membran modifikasi CMP 3 mengalami peningkatan sebesar 82% pada permeasi urea dan peningkatan sebesar 90,89% pada permeasi kreatinin, dengan tidak melewatkan vitamin B12.

Kata kunci : hemodialisis, membran, kitosan, asam malat, PEG 4000

ABSTRACT

Modified membranes in the form of malic acid and PEG 4000 cross-linked chitosan membranes were made as candidates for hemodialysis membranes. The membranes were synthesized using the phase inversion method producing 5 membrane variations in CS, CS/PEG, CMP 1, CMP 2, and CMP 3 membranes. The success of membrane synthesis was characterized through its structure and morphology using FTIR and SEM. FTIR results showed the presence of PEG interactions at wave numbers around 3287 to 3290 cm^{-1} and at 2873 to 2875 cm^{-1} , as well as malic acid interactions through increasing the intensity of the presence of C=O, C-H, and C-O groups. The results of the SEM analysis produced membrane morphology images with increasing pore textures in addition to malic acid and PEG 4000. The physicochemical properties of the membrane also increased in membrane modification in the form of increased hydrophilic properties and mechanical strength. The permeation results by the CMP 3 modified membrane increased by 82% in urea permeation and increased by 90,89% in creatinine permeation, without passing vitamin B12.

Keywords: hemodialysis, membrane, chitosan, malic acid, PEG 4000