UJI *SWELLING* DAN PERMEABILITAS MEMBRAN KOMBINASI *NATA DE COCO* - LERI MERAH DAN KITOSAN – ALGINAT SERTA APLIKASINYAUNTUK DESALINASI NaCl BERBASIS ELEKTRODIALISIS

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ABSTRAK

Penelitian ini bertujuan untuk mensintesis membran kombinasi *nata de coco* – leri merah dan kitosan – alginat guna untuk mengetahui sifat permeabilitas dan uji *Swelling*, serta efektivitas pengurangan kadargaram NaCl dengan metode deslinasi berbasis elektrodialisis (ED). Sintesis membran *nata de coco* – leri merah dilakukan dengan fermentasi campuran airkelapa dan air cucian beras merah (leri merah) selama 12 hari oleh bakteri *Acotobacter Xylinum* dengan penambahan gula, ammonium sulfat, dan asam asetat glasial. Sedangkan, membran kitsan – alginat disintesis dengan mencapurkan kitosan dan alginat dengan penembahan HCl dan asam aseat glasial.Hasil sintesis membran kemudian dilakukan uji *swelling* dan uji permeabilitas serta efektivitas elektrodialisis larutan NaCl 3,5% padavariasi waktu 2, 4, 8, 16 jam dengan alat elektrodialisis sederhana menggunakan dua membran. Pada hasil uji permeabilitas ion Cl^- dan efektivitas pengurangan kadar NaCl ditetapkan dengan metode titrasi argentometri dan untukuji permeabilitas ion Na^+ditetapkan degan metode analisis gravimetri.

Hasil penelitian menunjukkan hasil uji *swelling* pada membran pada membran *nata de coo* – leri merah yaitu 177,04% dan pada membran kombinasi kitosan – alginat yaitu sebesar 259,15%. Uji permeabilitas menunjukkan hasil kedua membran permeable terhadap ion Na^+ dan Cl^- dengan kadar yang hampir sama sehingga kedua membran ini tidak selektif pada salah satu ion. Proses elektrodialisis tetap dapat dilakukan karena kedua membran ini permeable terhadap ion Na^+ dan Cl^-. Efektivitas hasil desalinasi berbasisi elektrodialisis tertinggi yaitu pada waktu 16 jam dengan hasil efektivtas pengurangan kadar NaCl sebesar 85,02%.

Kata Kunci: *nata de coco*, leri merah, elektrodialisis, kitosan, alginate

SWELLING AND PERMEABILITY TEST OF MEMBRANE COMBINATIONS OF NATA DE COCO – RED LERI AND CITHOSAN – ALGINATE AND ITS APPLICATION FOR ELECTRODIALYSIS BASED NaCl DESALINATION

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ABSTRACK

The purpose of this research is to synthesize the combination membrane of nata de coco–red rice washing waste waterand chitosan–alginate, as well as to determine the permeability and swelling capacityand optimization of NaCl salt reduction using electrodialysis-based deslination (ED) method. Synthesis of nata de coco-red rice washing waste wate membrane was carried out by fermentation of a mixture of coconut water and red rice washing water (red leri) for 12 days by the bacterium Acotobacter Xylinum with the addition of sugar, ammonium sulfate, and glacial acetic acid. Accordingly,the chitosan-alginate membrane was synthesized by mixing chitosan and alginate with the addition of HCl and aceticacid.The resulted membrane were then tested for swelling ability,and permeability capacity,as well as electrodialysis optimization of 3.5% NaCl solution at a time variation of 2, 4, 8, 16 hours with a simple electrodialysis device using two membranes.The Cl^- ion permeability and effectivenessof NaCl levels reduction was determined by the argentometric titration method. Meanwhile, the Na^+ ion permeability was determined by the gravimetric analysis method.

The results showed that the swelling test was 177.04% and on the chitosan-alginate combination membrane was 259.15%. Permeability test indicated thatboth membranes were classified as permeable against Na^+ and Cl^- ions with almost the same levelsso that both of this membranes are not selective on one of the ions.The electrodialysis process can still be doing because both this membranes are permeable toNa^+ and Cl^- ions. Effectiveness of electrodialysis-based desalination results is highest at 16 hours with the results of effectiveness of NaCl reduction of 85.02%.

Keywords: nata de coco, red leri, electrodialysis, chitosan, alginate