Rachmawati, Ari, 2015, Pembuatan dan Karakterisasi Membran *Hollow Fiber* Selulosa Diasetat dari Serat Batang Pisang untuk Pengolahan Limbah Deterjen, skripsi ini dibawah bimbingan Siti Wafiroh S.Si., M.Si., dan Harsasi Setiawati, S.Si., M.Si., Departemen Kimia, fakultas Sains dan teknologi, Universitas Airlangga, Surabaya.

ABSTRAK

Aplikasi membran *hollow fiber* telah meluas di bidang lingkungan, termasuk salah satunya adalah untuk pengolahan limbah deterjen. Tujuan penelitian ini adalah membuat dan mengkarakterisasi membran *hollow fiber* selulosa diasetat dari serat batang pisang untuk pengolahan limbah deterjen. Membran *hollow fiber* dibuat dengan metode inversi fasa menggunakan komposisi larutan *dope* dengan berbagai perbandingan selulosa diasetat (CA) komersil, CA sintesis, aseton, formamida dengan variasi rasio berat CA komersil sebesar 9%, 13%, 17%, 21%, dan 25%. Karakterisasi membran *hollow fiber* meliputi analisa gugus fungsi dengan FTIR, pengukuran ketebalan, uji tegangan (*stress*), uji regangan (*strain*), Modulus Young, uji SEM (Scanning Electron Microscopy), fluks, rejeksi, dan aplikasi membran *hollow fiber* untuk pengolahan limbah deterjen. Hasil penelitian diperoleh perbandingan larutan *dope* yang optimum dengan perbandingan 17% CA komersil: 5% CA sintesis, 51% aseton, dan 27% formamida. Hasil karakterisasi membran *hollow fiber* dengan larutan *dope* optimum adalah ketebalan 0,15 mm, *stress* 448,71 kN/m^2 , *strain* 35,28 × 10^{-3}, Modulus Young 12,718× 10^3 kN/m^2, fluks 42,30 L/m^2.jam, dan rejeksi 89,60 %. Hasil aplikasi membran *hollow fiber* selulosa diasetat untuk pengolahan limbah deterjen adalah nilai fluks 40,67 L/m^2.jam dan rejeksi 87,70 %.

Kata kunci : membran *hollow fiber*, selulosa diasetat, pengolahan limbah deterjen.

Rachmawati, Ari, 2015, The Production and Characterization of Cellulose Diacetate *Hollow Fiber* Membrane from Banana Steam Fiber for Detergent Waste Treatment, final project was under guidance of Siti Wafiroh S.Si., M,Si, and Harsasi Setytawati S.Si., M,Si., Department of Chemistry, Faculty of Science and Technology, Airlangga University, Surabaya.

ABSTRACT

The applications of hollow fiber membranes have been widespread in the environment field, one of which includes detergent waste treatment. The aim of this research is to produce and characterise a cellulose diacetate hollow fiber membrane from banana steam fiber for detergent waste treatment. It was prepared by the phase inversion method using dope solutions containing varying amounts of commercial CA, synthesised CA, acetone, and formamide. The commercial CA weigh ratios that were used are 9%, 13%, 17%, 21%, and 25%. The characterization of the hollow fiber membrane was through the analysis of functional groups using Fourier Transform Infrared Spectroscopy (FTIR), Scanning Electron Microscopy (SEM), thickness, stress, strain, Modulus Young, fluks, rejection, and its application indetergent waste treatment. The result of the research showed that the optimum dope solution composition was 17% commercial CA, 5% synthesized CA, 51% acetone, and 27% formamide. The results of characterization of hollow fiber membrane are the thickness of membrane 0.15 mm, stress 448.714 kN/m^2 , *strain* 35.28×10^{-3}, Modulus Young $12.718 \times 10^3 kN/m^2$, flux 42.30 L/m^2.jam, dan rejection 89.60 %. The result of the application in detergent waste treatment using cellulose diacetate hollow fiber membrane are flux 40.67 L/m^2h and rejection 87.70 %.

Keywords : hollow fiber membranes, cellulose diacetate, detergent waste treatment.