

INTISARI

Terapi dialisis adalah pemisahan zat-zat sisa metabolisme dari darah menggunakan alat bantu yang dioperasikan di luar tubuh sebagai pengganti fungsi ginjal dalam menyaring darah. Terapi ini memang sangat berkembang dan banyak digunakan, namun pasien harus menjalani terapi ini selama empat jam sebanyak tiga kali dalam seminggu. Untuk mengurangi frekuensi terapi dialisis di rumah sakit, dikembangkanlah *Wearable Artificial Kidney* (WAK). *Wearable Artificial Kidney* lebih fleksibel, murah dan *portable* dibandingkan dengan mesin terapi dialisis konvensional.

Penelitian ini fokus kepada pengembangan mikrofilter pada bagian membran PES masih mempunyai kekurangan yaitu belum bersifat *water permeable*. Dengan mengatur kondisi pada saat pembentukan membran, seperti ketebalan membran, media gelatinisasi dan zat-zat penyusun larutan membran, maka ukuran dan densitas pori-pori membran dapat disesuaikan. Pada penelitian ini suhu media gelatinisasi pada fabrikasi membrane divariasikan dan diujikan.

Hasil penelitian menunjukkan bahwa meningkatkan suhu media gelatinisasi dalam pembuatan membrane dapat meningkatkan permeabilitas dan performa membrane secara umum.

Kata kunci: *wearable artificial kidney*, *water permeable*, mikrofilter, membran *polyethersulfone*, koefisien difusi, *waterflux*, *water contact angle*.

ABSTRACT

Dialysis therapy is removing process of metabolic wastes from the blood using machine operated outside the body as a substitute of the kidney in filtering blood. This therapy widely used, however, patients must undergo this therapy for around three - four hours, three times a week.

To reduce the frequency of dialysis treatment in hospital, a Wearable Artificial Kidney (WAK) is developed. Wearable Artificial Kidney is more flexible and portable compared with conventional dialysis therapy machine. This study focuses on the improvement of permeability of PES membrane. By regulating the membrane-forming conditions, such as membrane thickness, gelatinization medium, or composition of casting solution of the membrane, the size and density of the pores of the membrane can easily be adjusted.

In this research, the forming condition of membrane is optimized. Temperature of the gelatinization medium is variated and tested by various experiments. The results show that increasing the temperature of gelatinization medium of the membrane fabrication would increase the permeability and antifouling property of the membrane generally.

Key Word: wearable artificial kidney, water permeable, microfilter, polyethersulfone membrane, Diffusion Coefficient, waterflux, water contact angle.