INTISARI

Pada penelitian ini dilakukan pembuatan membran serat nano untuk mengetahui karakteristik morfologi dan sifat tarik *polyvinyl alcohol* (PVA) untuk aplikasi pembalut luka (*wound dressing*). *Nanofiber* difabrikasi menggunakan polimer tersebut karena memiliki sifat *biodegradable*, *biocompatible*, dan *non-toxic*. Metode yang digunakan untuk fabrikasi serat nano menggunakan teknik pemintalan elektrik (*electrospinning*).

Fabrikasi serat nano terlebih dahulu dilakukan dengan melarutkan PVA *Gohsenol* (teknis) dan PVA (BM 85.000-124.000) (analis) ke dalam aquades, Kemudian larutan PVA teknis dibuat dengan berbagai variasi konsentrasi 6%, 8%, 10%, sedangkan PVA analis dibuat dengan konsentrasi 10% $^{w}/_{w}$. Selanjutnya larutan PVA tersebut difabrikasi menggunakan metode *electrospinning*. Parameter yang digunakan yaitu dengan diameter *spinnerate* 0,7 ; jarak tip ke kolektor (TCD) = 12 cm ; tegangan = 25 kV. Karakterisasi sifat fisis membran *Nanofiber* dilakukan menggunakan *scanning electron microscope* (SEM, Hitachi TM3030) sedangkan untuk uji tarik diuji menggunakan mesin uji tarik *universal testing machine* (UTM, Zwick 0.5 Jerman), spesimen uji tarik dipreparasi dengan mengacu pada ASTM D 882.

Hasil analisis membran *nanofiber* menggunakan SEM menunjukkan bahwa ukuran diameter serat mengalami peningkatan dengan diameter rata-rata antara (356 - 551 nm). Kuat tarik PVA 85.000-124.000 jauh lebih tinggi di bandingkan dengan kuat tarik variasi PVA Gohsenol. Dari hasil pengujian tarik didapat nilai kuat tarik antara (3,27 – 15,42 MPa), nilai modulus elastisitas (17,53 – 83,07) dan nilai regangan (23,01 – 89,95 %) yang berpotensi diaplikasikan sebagai pembalut luka, karena sesuai dalam standar material medis yang harus memiliki nilai kuat tarik 1-24 MPa dan nilai elongasi antara 17 – 207 %.

Kata kunci : PVA *Gohsenol*, PVA (BM 85.000-124.000), *Electrospinning*, *Nanofiber*, SEM

Characterization of Morphology and Tensile Properties of PVA GOHSENOL and PVA (M_w: 85.000 – 124.000) Nanofiber Membranes Prepared by Electrospinning

Abstract

Polyvinyl alcohol (PVA) is one of the conductive polymers which potentially uses for wound dressing material due to its beneficial properties such as biodegradable, biocompatible and non-toxic. Nanofiber membranes of PVA were prepared by electrospinning method to characterize the fiber morphology and tensile properties of PVA nanofiber membranes, and the relationship between them.

In this work, PVA GOHSENOL with various concentrations of (6%, 8% and 10% w/w) and PVA (M_w: 85.000 – 124.000) with a concentration of 10% w/w were used as polymer solutions in the electrospinning process. Preparation of PVA nanofiber membranes was carried out at constant parameters of high DC voltage 25 kV, spinneret diameter 0.7 mm and a distance between the tip and metallic collector (TCD) 12 cm. The fiber morphology of PVA membranes was characterized by scanning electron microscopy (SEM, Hitachi TM3030). A universal testing machine (UTM, Zwick 0.5 Germany) was used for tensile test of the nanofiber membranes. The tensile test specimen was prepared according to ASTM D 882.

The results showed that the average fiber diameter increases with increasing concentration of polymer solution made of PVA GOHSENOL and fiber diameter of a polymer solution made of PVA (M_w: 85.000 – 124.000) is higher than that of PVA GOHSENOL. Those fiber diameters are ranging from 356 nm to 551 nm. Enhancement of fiber diameter seems to possess a correlation effect on the increase of tensile properties of the PVA nanofiber membranes. Tensile strength (3.27 – 15.42 MPa), tensile modulus (17.53 – 83.07 MPa) and elongation (23.01 – 89.95%) of PVA nanofiber membranes are included in the range of a standard material for the biomedical application.

Keywords: PVA GOHSENOL, PVA (M_w: 85.000 – 124.000), electrospinning, nanofiber, SEM, tensile properties