

INTISARI

Kajian Karakteristik Mekanik Nanofiber Polyvinyl Alcohol/Kitosan Yang Distabilisasi Dengan Pemanasan Terhadap Potensinya Sebagai Biomaterial

Oleh

Retno Namira Widyaningsih

(18/430223/PA/18736)

Nanofiber Poli(vinil alkohol) (PVA)/Kitosan berpotensi sebagai biomaterial, namun memiliki kelemahan yaitu kurang stabil di media cair. Peningkatan stabilitas nanofiber dapat diatasi dengan meningkatkan kristalinitas nanofiber PVA/kitosan menggunakan stabilisasi fisik berupa pemanasan. Nanofiber PVA dibuat dengan menggunakan larutan PVA konsentrasi 12% dan larutan kitosan *medium molecular weight* konsentrasi 2% menggunakan metode elektrospinning. Nanofiber PVA/kitosan dikarakterisasi menggunakan *Scanning Electron Microscope* (SEM), dilakukan uji kuat tarik menggunakan *Universal Testing Machine* (UTM) dan uji *swelling* pada larutan *Phosphate Buffered Saline* (PBS). Morfologi optimal didapat pada rasio volume PVA/kitosan 85/15 dengan diameter rata-rata (421 ± 9) nm dan porositas 44%. Penelitian stabilisasi fisik dengan pemanasan telah dilakukan pada nanofiber PVA/kitosan 85/15 selama 2 jam dengan variasi tiga suhu berbeda (110°C, 120°C, dan 130°C) terhadap morfologi, sifat mekanik dan kemampuan *swelling* nanofibernya. Hasil penelitian menunjukkan variasi suhu stabilisasi memberikan morfologi lebih baik, sifat mekanik meningkat, kemampuan *swelling* tinggi serta ketahanannya terhadap media cair hingga perendaman 7 hari.

Kata kunci : Nanofiber PVA/kitosan, Biomaterial, Elektrospinning, Stabilisasi fisik, *Swelling*, *Universal Testing Machine*, *Scanning Electron Microscope*

ABSTRACT

Study of Mechanical Characteristics of Polyvinyl Alcohol/Chitosan Nanofibers Stabilized By Heat Treatmen On Its Potential as Biomaterials

By

Retno Namira Widyaningsih

(18/430223/PA/18736)

Poly(vinyl alcohol) nanofibers (PVA)/Chitosan have the potential to be biomaterials, but have the disadvantage of being less stable in liquid media. The increase in nanofiber stability can be overcome by increasing the crystallinity of PVA/Chitosan nanofibers using physical stabilization in the form of heating. PVA nanofibers were prepared using a PVA concentration of 12% and a *medium molecular weight* chitosan concentration of 2% using the electrospinning method. PVA/Chitosan nanofibers were characterized using *Scanning Electron Microscope* (SEM), tensile strength tests were performed using a *Universal Testing Machine* (UTM) and *swelling* on *Phosphate Buffered Saline* solutions (PBS). Optimal morphology was obtained at the PVA/Chitosan volume ratio of 85/15 with an average diameter (421 ± 9) nm and porosity of 44%. Physical stabilization research by heating has been carried out on PVA/Chitosan 85/15 nanofibers for 2 hours with variations in three different temperatures (110°C, 120°C, and 130°C) on the morphology, mechanical properties and swelling ability of nanofibers. The results showed that variations in stabilization temperatures provide better morphology, increased mechanical properties, high *swelling* ability and resistance to liquid media up to 7 days.

Kata kunci: PVA/chitosan Nanofibers, Biomaterials, Electrospinning, Physical Stabilization, *Swelling*, *Universal Testing Machine*, *Scanning Electron Microscope*