

UNIVERSITI TEKNOLOGI MARA

**FABRICATION &
CHARACTERIZATION OF
ELECTROSPUN CHITOSAN/ALOE
VERA COMPOSITE NANOFIBER
MEMBRANE**

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ABSTRACT

Electrospinning has been recognized as an efficient technique for the fabrication of polymer nanofibers. The current research is on fabrication composite nanofibers membrane for wound healing treatment. In these projects, a mixture of chitosan and aloe vera were used as a material. Nanofiber chitosan acts as carriers while aloe vera were served as a model of drugs. Different ratio of chitosan and aloe vera were prepared and successfully electrospun to produce membrane. The membrane was characterized by FESEM, FT-IR, DSC, TGA, fiber diameter, HPLC, UV-Vis and solubility study. The membrane fiber was found at 90% concentration of acetic acid with the ratio of chitosan and aloe vera nanofiber is 3:5. The results were achieved from the optimization of parameter observed at the voltage equal to 15 kV for a distance of 10 cm. The values were obtained from the applied voltage per unit length, being 1.5 kV/cm with the solution flow rate of 0.5 ml/h. The interaction between chitosan and aloe vera nanofiber was explained by FTIR, DSC and TGA. Based on the analysis, broad peaks appeared at the wavelength of 3367.34 cm^{-1} (given by FTIR spectroscopy) indicated the nitrate group of chitosan was interacting with hydroxide group of aloe vera to form a stronger hydrogen bonding between compounds. DSC and TGA analysis proved the presence of antraquinone in aloe vera membrane. This compound caused the value shifted from $301.0\text{ }^{\circ}\text{C}$ to $382.5\text{ }^{\circ}\text{C}$. The shifting of the temperature during testing process showed the aloe vera was embedded into chitosan, forming composite chitosan/aloe vera membranes.

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