

Investigation of Electrospun Composites Nanofiber of Poly (Lactic Acid)/Hazelnut Shell Powder/Zinc Oxide

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Abstract : In recent years, many researchers focused on nano-size fiber production. Nanofibers have been studied due to their different and superior physical, chemical and mechanical properties. Poly (lactic acid) (PLA), is a type of biodegradable thermoplastic polyester derived from renewable sources used in biomedical owing to its biocompatibility and biodegradability. In addition, zinc oxide is an antibacterial material and hazelnut shell powder is a filling material. In this study, nanofibers were obtained by adding of different ratio Zinc oxide, (ZnO) and hazelnut shell powder at different concentration into Poly (lactic acid) (PLA) by using electrospinning method which is the most common method to obtain nanofibers. After dissolving the granulated polylactic acids in % 1,% 2,% 3 and% 4 with chloroform solvent, they are homogenized by adding tween and hazelnut shell powder at different ratios and then by electrospinning, nanofibers are obtained. Scanning electron microscope (SEM), Fourier transform infrared spectroscopy (FTIR), Differential scanning calorimeter (DSC) and physical analysis such as density, electrical conductivity, surface tension, viscosity measurement and antimicrobial test were carried out after production process. The resulting structures of the nanofiber possess antimicrobial and antiseptic properties, which are attractive for biomedical applications. The resulting structures of the nanofiber possess antimicrobial, non toxic, self-cleaning and rigid properties, which are attractive for biomedical applications.

Keywords : electrospinning, hazelnut shell powder, nanofibers, poly (lactic acid), zinc oxide

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