

Characterization of Poly(ϵ -caprolactone) Nanofibers Containing Silver Nanoparticles

Rodrigo Guerreiro Fontoura Costa¹, Alessandra Alves Correa², Cauê Ribeiro Oliveira¹, Luiz Henrique Capparelli Mattoso¹

¹Embrapa Instrumentação, ²Universidade Federal de São Carlos - Campus: São Carlos

e-mail: guerreiro_rodrigo@yahoo.com.br

Solution blow spinning (SBS) is a versatile method to produce micro and nanofibers of nanocomposites loaded with nanoparticles, such as, silver and titanium dioxide [1,2]. Poly(ϵ -caprolactone) (PCL) is a biodegradable and biocompatible polymer that has been explored in nanocomposites, medical and packaging applications [3]. In this study, we employed the SBS process for spinning PCL/Ag solutions with 0,04, 0,08, 0,2, 0,4 and 0,8 wt.% Ag. The viscosities of the PCL/Ag solutions were measured using a Brookfield Viscometer at 20 rpm and at 25°C. The nanofibers were characterized by X-ray diffraction (XRD) and scanning electron microscopy (SEM). The average fiber diameters ranged from 162 nm for PCL/Ag (0,04 wt.%) nanofibers to 242 nm for PCL/Ag (0,8 wt.%) nanofibers. The existence of silver nanoparticles on the PCL spun fibers was confirmed by the XRD. The present results showed for the first time that the SBS process could be used to produce PCL uniform nanofibers and silver nanoparticles were successfully incorporated into the poly(ϵ -caprolactone) nanofibers.

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