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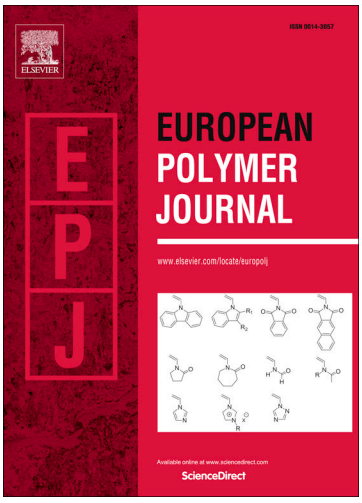

Ultrasound Promoted Synthesis and Properties of Chitosan Nanocomposites Containing Carbon Nanotubes and Silver Nanoparticles

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Ultrasound Promoted Synthesis and Properties of Chitosan Nanocomposites Containing Carbon Nanotubes and Silver Nanoparticles

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Abstract

A rapid and facile method to prepare functional chitosan nanocomposite films incorporating silver nanoparticles (AgNPs) has been developed using ultrasound assisted in-situ synthesis, dispersion and crosslinking. Addition of AgNPs and CNTs increased the mechanical strength and extensibility of polymeric chitosan nanocomposites. The films were characterized by transmission electron microscopy (TEM), scanning electron microscopy (SEM), and infrared spectroscopy (IR). TEM showed that ultrasound produced more homogeneous dispersion of AgNPs and nanotubes as a result of breakage of CNTs bundles. Dielectric spectroscopy revealed that the real part of dielectric constant is found to increase with increase in temperature and frequency for both Chi/Ag and Chi/CNTs/Ag nanocomposite films. The conductivity of Chi/CNTs/Ag nanocomposite films was lower than when the CNTs were omitted.