

عنوان مقاله:

Preparation and characterization of Nano- and Micro fiber Cellulose in the polylactic acid (PLA) based biocomposites

محل انتشار:

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خلاصه مقاله:

Cellulose nanofiber (CNF) and microcrystalline cellulose (MCC) reinforced polylactic acid (PLA) composites were prepared using a solvent casting method, with the aim of making green nanocomposites. Microstructure, mechanical and thermal properties of the nanocomposites were studied. Scanning electron microscopy (SEM) micrographs revealed uniform distribution of nano and micro particles in the polymer matrix at low contents (1 and 3 wt%), but also that a higher content (5wt%) of CNF was easily agglomerated. Mechanical properties of the composites were increased considerably in CNF incorporated composites comparing to MCC filled PLA films. Tensile strength (TS) and elastic modulus (EM) of nanocomposites with MCCs and 1 wt% CNF did not show significant changes, however elongation percentage (E) increased by more than 60%. The TS, EM and E changed significantly for nanocomposites with 3 and 5 wt% CNF. Moreover, nanofiber orientation effectively occurred in the PLA matrix. The reinforcing effect of CNF composition with PLA caused a slight increase in glass transition and melting temperatures

کلمات کلیدی:

Cellulose, polylactic acid, nanofiber, microcrystalline, nanocomposite

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