

Influences of pristine carbon nanotube on the rheological properties of compatibilized polylactic acid/natural rubber nanocomposite

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ABSTRACT

Polylactic Acid (PLA) was blended with Natural Rubber (NR) and compatibilized by PLA grafted maleic anhydride (PMA) and NR grafted maleic anhydride (NMA) to achieve high performance of PLA/NR blends. Pristine carbon nanotube (CNT) was then added into PLA/NR blends with different CNT loading (1-8 part per hundred resin) using melt blending technique to form nanocomposites. A systematic investigation of the rheological properties of the nanocomposites as a function of pristine CNT content were carried out. Rheological analysis exhibited an enhancement in the storage and loss moduli of nanocomposites compared to blends without CNT. The compatibilizers PMA and NMA have shown contrasting results in terms of rheological values. Rheological analysis showed that the both sets of nanocomposites behaved solid-like at lower frequencies. When the CNT loading was increased the nanocomposites showed no dependence of frequency.

KEYWORDS

Carbon nanotube; High-performance nanocomposites; Melt blending; Natural rubber; Polylactic acid

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