

Editorial

Polymer Nanocomposite Processing, Characterization, and Applications 2012

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Polymer nanocomposites have attracted interest in the last few decades providing scope for improvement of various functional properties, such as mechanical, thermal, optical, rheological, magnetic, and electrical. The improvements in functional properties of polymers are achieved at very low loading of nanoparticles. While significant work has been done on preparation and properties of polymer nanocomposites, effort is still needed to elucidate the interrelationship between processing, morphology, and functional properties of nanocomposites. The properties of nanocomposites are affected by a large number of factors including microstructural distributions that are generated during nanocomposite processing as well as the state of nanoparticle distribution in polymer systems. It is believed that understanding of the relationship between processing, morphology and functional properties of nanocomposites will be very helpful in optimizing the ultimate properties of nanocomposites as well as improving the models for predicting properties of nanocomposite systems.

Considering the challenges in the area of processing of nanocomposites, we invited research articles for this special issue with a particular focus on the interrelationships between polymer nanocomposite processing, characterization, and novel applications. This special issue with a total of seven papers covers a wide range of areas related to fabrication of electrically conductive compounds of poly(carbonate), liquid crystalline polymer, and multiwalled carbon nanotubes (CNTs); gas permeability and morphological properties of nanocomposites prepared

by the mixing of poly(lactic acid) (PLA), poly(butylene succinate) (PBS), and clay; synthesis and evaluation of gold/chitosan nanocomposites as a therapeutic agent for the photothermal therapy applications; novel direct-write drawing of CNT/poly(methyl methacrylate) (PMMA) composite microfibers; influence of lauro lactam content on clay intercalation in poly(amide) 6, 12/clay nanocomposites synthesized by open ring anionic polymerization; fabrication and application of iron(III)-oxide nanoparticle/poly(dimethylsiloxane) composite cone in microfluidic channels; and finally layer-by-layer (LbL) nanoassembly of copper indium gallium selenium (CIGS) nanoparticle films for solar cell applications.

It is expected that this special issue will help readers with a wide range of backgrounds to understand the impact of various processing methods as well as nanoparticles on nanocomposite properties, and applications.

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