

Environmentally friendly polymer nanocomposites: types, processing and properties

Sinha Ray Suprikas

CSIR, PO Box, 395, Pretoria, South Africa

Abstract

In recent years, the development of eco-friendly polymeric materials with balanced properties has become a subject of research attention due to concerns with increasing global-warming, carbon-emission, and limited natural resources. Nano-reinforcements of environmentally benign polymers have showed a great promise in designing of eco-friendly polymeric materials with desired properties. A fairly new type of composites has emerged in which the reinforcing filler has nano-meter scale dimensions (at least one dimension within 1-100 nm range). Such composite materials are known as nanocomposites. This book explores the major developments, both in fundamental aspects and applications, in this area during the last 5-10 years. Chapters discuss the various techniques used to prepare eco-friendly polymer nanocomposites, their structural and morphological characterization, their improved mechanical and material properties, their melt-state rheological and crystallization behaviors, processing, biodegradability; and finally, current applications and future prospects of these materials.