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Author: Rose M. Mutiso Karen I. Winey

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Electrical Properties of Polymer Nanocomposites containing Rod-like Nanofillers

Rose M. Mutiso and Karen I. Winey

Department of Materials Science and Engineering

University of Pennsylvania

Philadelphia, PA 19146

Abstract

We present an in-depth critical review of major experimental, simulation, and theoretical work in the field of conducting polymer nanocomposites containing rod-like particles such as carbon nanotubes and metal nanowires. These are a versatile class of materials that are of interest for a wide range of applications. Commercialization of various classes of conducting polymer nanocomposites is growing, yet achieving their full technological potential will hinge on the ability to engineer composites with controllable and well-defined properties, as well as aggressive exploration of new application areas. Thus, the focus of this review is to clarify key structure-property relationships, and to discuss the major gaps and greatest opportunities in the field.

Keywords: polymer nanocomposites, electrical conductivity, resistive switching, carbon nanotubes, carbon nanofibers, metal nanowires