Journal of Nanomaterials

Hindawi

Special Issue on

Conductive Filler-Polymer Nanocomposites: Advancements and Applications

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In today's marketplace, consumers are demanding lighter weight and smaller electronic devices with improved functionality and design options. Accordingly, conductive filler-polymer nanocomposites (CPNs) have drawn great attention for use in electronics, due to their superior properties such as adjustable electrical conductivity, light weight, low cost, corrosion resistance, and easy processability. Despite the intense research in the field of CPNs, this area is still at its infancy, and, in order to thoroughly exploit the potential of these materials, their weight, cost, and performance should be further improved.

The development of CPNs can be envisioned as a diamond, where its four corners are (i) synthesis and characterization of nanofiller, (ii) polymer processing and morphology development, (iii) morphological and structural characterization of developed nanocomposites, and (iv) characterizing final properties of generated CPNs. The diamond introduces the development of CPNs intensely interdisciplinary, necessitating collaboration among various scientific fields of engineering and science.

This special issue aims at creating an interdisciplinary forum of discussion on advancements and applications in the field of CPNs. This issue accepts high-quality research articles, as well as review articles, advancing a portion or the whole diamond of developing CPNs.

Potential topics include but are not limited to the following:

- Designing of engineered nanoparticles as conductive fillers
  - Synthesis
  - Surface modification and functionalization
  - Characterization of physical and structural properties
- Fabrication of CPNs
  - Polymer processing and moulding
- Structure of CPNs
  - Characterization (microscopy, spectroscopy, etc.)
  - Hybrid nanocomposites and blends
  - Nanofiller localization
  - Conductivity mechanisms
- Properties of CPNs
  - Electrical conductivity
  - Electromagnetic interference shielding
  - Dielectric properties
  - Thermoelectric
  - Piezoresistive and piezoelectric
  - Thermal and rheological properties
  - Structural and mechanical performance
  - Thermal conductivity

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