



Journal of Nanomaterials

Special Issue on  
**Polymer-Based Nanocomposites: Theory, Synthesis,  
Modifications, and Properties**

CALL FOR PAPERS

The need for better materials has driven us to composites, obtained by combining two or more materials with different physical and chemical properties. The first composite (wattle and daub) was discovered about 6,000 years ago and the first polymer-based composite (bakelite) was patented in 1907. In polymer-based composites, one or more materials labelled as fillers are dispersed within a polymeric matrix (homopolymer, copolymer, block copolymer, or polymer blend). The advent of nanoscience and nanotechnology made available submicron fillers and resulted in a new class of materials named nanocomposites, where submicron fillers are dispersed within polymeric matrices. Most of the new or modified physical and chemical properties of nanocomposites are derived from quantum effects triggered by the submicron confinement, by surface related phenomena, or by new or enhanced atomic or molecular interactions.

This special issue concentrates on both theoretical and empirical aspects of polymer-based composites with emphasis on polymer-based nanocomposites, where more technological progress is expected. Innovative approaches, multidisciplinary studies, and brief reviews that are connected to polymer-based nanocomposites are also encouraged.

Potential topics include, but are not limited to:

- ▶ New paths to synthesize/obtain/disperse polymer-based (nano)composites
- ▶ Original methods to modify the polymer-based (nano)composites or their components (e.g., via the functionalization of nanoparticles)
- ▶ New or significantly enhanced physical and chemical properties due to the addition of fillers (including mechanical properties and adhesion, thermal stability, transport properties, and smart capabilities)
- ▶ New techniques for the characterization of polymer-based (nano)composites
- ▶ Advanced theoretical and computational approaches that improve our understanding of the physical and chemical properties of polymer-based (nano)composites
- ▶ The behavior of polymer-based (nano)composites in extreme environments (space environment, nuclear plant environment, and high pressure and high temperature environments)
- ▶ Applications of polymer-based (nano)composites
- ▶ Health/medical and biological issues or applications of polymer-based (nano)composites

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**Manuscript Due**

Friday, 5 June 2015

**First Round of Reviews**

Friday, 28 August 2015

**Publication Date**

Friday, 23 October 2015