

Special Session

Emerging technologies and measurement techniques of nanostructured and hierarchical polymeric composites

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Session Abstract:

Nanostructured polymers are emerging as attractive materials in the nanoscience and nanotechnology field. More recently, the introduction of nanofillers into conventional fibre-reinforced polymer composites lead to multiscale (or hierarchical) composites, characterized by enhanced structural and functional properties.

Conventional approaches to fabrication and characterization are not adequate and modeling often requires scaling down to atomistic levels. The engineering aspects associated with the development of polymer nanocomposites are related to the distribution of nanofiller in the polymeric matrix, which strongly affects both their final properties and processability. The selection of the most appropriate measurement technique for obtaining evidence of the nanodispersion is, therefore, of primary importance.

Structural and morphological data should be related to mechanical, thermal, transport and rheological properties in order to achieve a proper scale-up of polymeric nanocomposite fabrication.

This sessions will focus on recent developments in processing technologies and measurement techniques of polymer matrix nanocomposites obtained from carbon nanotubes, carbon nanofibers, exfoliated graphite (graphene), etc.

Topics of interest include but not limited to:

- Processing and applications of nanostructured polymeric composites
- Processing and applications of hierarchical polymer based composites
- Innovative experimental techniques for the characterization of nanostructured and hierarchical polymeric composites
- Thermal analysis of nanostructured and hierarchical polymeric composites
- Rheological analysis of nanostructured and hierarchical polymeric composites
- Mechanical, ultrasonic and dielectric analysis of nanostructured and hierarchical polymeric composites
- Transport properties of nanostructured and hierarchical polymeric composites
- Nanofiller dispersion in polymeric matrices
- Modeling and optimization of nanostructured and hierarchical polymeric composites