15th European Conference on Composite Materials (ECCM15), Venice, Italy, June 24-28, 2012

Thematic session on
Structure-property relationship in polymer composites/nanocomposites

The polymer matrix composites/nanocomposites are the promising materials for demanding applications where unique properties and high durability are required. However, the final properties of composite/nanocomposites materials are strongly dependent on many parameters such as state of dispersion of reinforcements, geometry/structure of reinforcement and interfacial interactions between polymer-reinforcement. These parameters are strongly dependent on the type of polymer matrix and the type of reinforcement and can be dominated by many factors such as the mixing methods, surface treatment of reinforcement and manufacturing processes. In this regard, many critical issues such as the dispersion mechanisms of reinforcements in the matrix, reinforcing mechanisms of micro/nanoreinforcement, molecular characteristics of polymers on the reinforcing efficiency, development and effectiveness of inter-phase in polymer composites/nanocomposites are still open from the academic point of view. Existence of a wide range of polymeric materials with specific characteristics including thermoplastics, thermostes and rubbers and various reinforcements make the structure-property relationship much interesting and more challenging in the field of polymer composite/nanocomposite materials. Accordingly all aspects of structure-property relationship including (not limited) the following sub-topics will be discussed in this special session.

- Tailoring surface properties of reinforcements (nano and micro scale) for improvement of properties and dispersion state.
- Techniques to characterize the dispersion states of reinforcements, direct and indirect methods.
- Formation and development of inter-phase and interface in micro/nanocomposites.
- Correlation between the micro/nanostructure and mechanical/physical/thermal/electrical properties.
- Correlation between the mixing/processing methods and the dispersion state of micro/nanocomposites.
- Computational modeling of properties

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