
Title: Research on the Characterizations of Polymers Developed to Reveal the Effect of Microstructure on their Dynamic and Mechanical Activity



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(Guest Editor)

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Proposal

Polymer materials are widely used in various applications due to their unique characterization. Understanding the relationship between the microstructure of polymers and their dynamic and mechanical behavior is crucial for optimizing their performance and developing new materials with enhanced functionalities.

Most research has recently focused on improving impact resistance and multidisciplinary functions to absorb noise and mechanical impact. Polymers are reinforced with varying proportions of metal loads and other components to increase shock absorption. The main objective is to develop high-performance polymeric materials with different compositions and specific densities.

Dynamic collisions cause deformations of the structure of the polymer. Dynamic stress-strain response curves are used to characterize different stress rates. High-stress levels and similar strains indicate a high resistance to shock.

Understanding the relationship between polymer microstructure and their performance is essential for optimizing their behavior and designing novel materials with enhanced functionalities. These polymers have several advantages, such as higher energy absorption and dissipation, resulting in lower impact force. The aerodynamic stability and accuracy allow more precise control. Also, they have lower cost and environmental impact, as these polymers are recyclable and biodegradable materials.

By employing advanced characterization techniques, researchers can unravel the intricate details of polymer microstructure, including crystallinity, surface morphology, chemical composition, and molecular organization. This knowledge contributes to a deeper understanding of the relationship between microstructure and polymers' dynamic and mechanical behavior, enabling the design of tailored materials for specific applications.

The Goal

This special issue aims to gather cutting-edge research that focuses on the characterizations of polymers and their microstructure, shedding light on the influence of microstructural variations on polymers' dynamic and mechanical properties.

Topics of Interest

In this Special Issue, potential topics include but are not limited to the following:

- Advanced characterization techniques for studying polymer microstructure
- Relationships between polymer processing, microstructure, and properties

- Impact of microstructural variations on polymer dynamics and Mechanical behaviour
- Novel approaches for tailoring polymer microstructure to achieve desired functionalities
- Computational modelling and simulation of polymer microstructure and properties
- Multiscale characterization and modelling of polymer behavior
- Functional and smart polymer materials and their characterizations
- Applications of microstructural characterizations in polymer science and engineering

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