Special Issue

Environmental Degradation of Composites: Microscopic Characterization and Analysis

Message from the Guest Editors

Composite materials are crucial in various industries, offering lightweight, high-strength alternatives. However, exposure to harsh environments like chlorides, sulfates, alkalis, and UV radiation can affect their durability. This Special Issue focuses on microscopic techniques for studying degradation mechanisms and failure modes at nano- and microstructural levels. We invite contributions using methods like SEM/TEM, AFM, XPS, and Raman spectroscopy to explore environmental degradation. Topics include chemical attack, water ingress, phase separation, interfacial debonding, protective coatings, and barrier materials. We also welcome studies integrating experimental and machine learning techniques for modeling degradation based on microstructural evolution, as well as comparisons between bio-based and synthetic composites under extreme conditions. This Special Issue aims to enhance understanding of degradation and support the development of more resilient composite systems. We welcome original research, reviews, and case studies offering new insights into composites in extreme environments.

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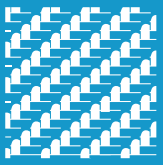

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