

Special Issue

Carbonaceous Materials for Sustainable Energy and Biomedical Applications

Message from the Guest Editors

Modern science shows the significance of functional and smart materials to advance sustainable ecosystems and human well-being. Recent studies have demonstrated a great deal of interest in carbonaceous nanomaterials (CNMs) for their potential applications in green hydrogen (H₂) production, energy storage, carbon dioxide (CO₂) conversion and capture, and biomedical research. There are diverse morphologies and structures of CNMs, each with unique electrical, mechanical, optical, thermal, and chemical properties. Typically, CNMs include zero-dimensional (fullerenes, nanodiamonds, and graphene/carbon quantum dots), one-dimensional (carbon nanotubes and carbon nanofibers), and two-dimensional (graphene and its derivatives) features. The multifunctionality of CNMs offers tremendous benefits in addressing state-of-the-art challenges in the global energy, environment, and medical sectors. Moreover, these environmentally benign materials are relatively cost-effective, and they can be fabricated through sustainable strategies with minimal energy consumption. The intriguing properties of CNMs have inspired extensive research in biomedical and energy fields.

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