



Carbonaceous Materials for Sustainable Energy and Biomedical Applications

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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.

