

Special Issue

Sustainable Materials for Energy Industry: High-Temperature Polymer Nanocomposites

Message from the Guest Editor

This special issue on “Sustainable Materials for Energy Industry: High-Temperature Polymer Nanocomposites” seeks high-quality works focusing on cutting-edge developments in this field. Topics include, but are not limited to:

- Design and synthesis of high-temperature polymer nanocomposites using advanced polymer matrices (e.g., polyimides, PEEK, elastomers) and functional nanofillers (graphene, CNTs, boron nitride, metal oxides);
- Innovative processing techniques such as melt compounding, in-situ polymerization, surface functionalization, and additive manufacturing to enhance nanoparticle dispersion and interfacial interactions;
- Thermo-mechanical and chemical performance under extreme environments, including thermal stability, creep resistance, modulus retention, and degradation pathways;
- Durability, reliability, and modeling of long-term behavior in harsh operating conditions;
- Applications in advanced energy systems such as geothermal well sealing, hydrogen storage and transport, solar thermal components, and nuclear energy technologies;
- Sustainable material strategies involving bio-based polymers and recyclability in high-temperature applications.

Guest Editor

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Deadline for manuscript submissions

31 January 2026



Processes

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CiteScore 5.5



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