Special Issue

Integrating Pyrolysis with Catalysis: A Pathway to Sustainable Chemicals

Message from the Guest Editors

Fossil fuel challenges drive the need for sustainable alternatives. Thermochemical conversion of organic materials like lignocellulosic biomass, organic waste, and unconventional fossil fuels shows promise. Pyrolysis effectively transforms these materials into high-value products. However, the direct use of pyrolysis products is limited due to high oxygen content, instability, and suboptimal properties. Integrating pyrolysis with advanced catalytic processes can upgrade these products into stable, value-added outputs such as aromatics, olefins, and sustainable aviation fuels.
This Special Issue invites research on novel catalytic materials, mechanistic insights, and process innovations advancing pyrolysis for sustainable chemical production. It emphasizes catalytic strategies for sustainable fuels and green chemicals, supported by catalyst design breakthroughs like acidity tuning, enhanced mesoporosity, and improved hydrothermal stability. These advancements enhance selectivity, yields, and durability. By combining pyrolysis and catalysis, the Issue highlights research tackling key challenges and offering practical solutions for the green chemical and sustainable fuel sectors.

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