Special Issue

Cutting Edge Strategies in Zeolite Synthesis, CO_2 Utilization and Machine Learning-Driven Catalysis

Message from the Guest Editors

This *Processes* Special Issue invites contributions addressing innovative zeolite synthesis strategies such as templating approaches, post-synthesis modifications, and the engineering of hierarchical pore structures to achieve tailored acidity, shape selectivity, and long-term catalyst stability. It also seeks studies on the catalytic conversion of CO2 through hydrogenation, photocatalytic reduction, and cascade reactor schemes that demonstrate efficient carbon capture utilization and value-added chemical production. Focus is centrally placed on the integration of machine learning and artificial intelligence methods for rapid catalyst discovery and optimization using high-throughput experimentation, predictive modeling, and mechanistic algorithms. We welcome research that bridges materials design, catalytic testing, and process development to deliver scalable, sustainable techniques. Topics of interest include reactor design, operando characterization techniques, and techno-economic assessments aligned with circular economy principles. Reviews that synthesize recent advances and perspective articles on future challenges in low-carbon catalysis are also encouraged.

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Editor-in-Chief

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