Special Issue

Carbon Capture, Utilization and Storage Technologies of Cement-Based Materials

Message from the Guest Editors

. Recent advancements in CO2 capture, utilization, and storage (CCUS) technologies integrated with cement-based materials offer a potential pathway to transition from "carbon source" to "carbon sink," attracting significant attention from both academia and industry. This Special Issue seeks cutting-edge research on the full-chain innovation of CO2 "capture–conversion–storage" in cement-based materials, driving low-carbon transformation from production to application. Key topics include, but are not limited to, the following:

- Low-Carbon Binder Design: Novel low-calcium cements, carbon-activated industrial byproducts (e.g., steel slag, fly ash, etc.) as supplementary cementitious materials, and alkali-activated materials.
- Carbonation Curing: Reaction mechanisms, process optimization, and impacts on concrete durability.
- Carbon-Negative Construction Materials: CO2 permanent sequestration (e.g., carbonated aggregates, precast elements, etc.) and life cycle assessment.
- Scalable Implementation: Industrial-scale CCU–cement integration, carbon trading mechanisms, and cost–benefit analysis.

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Message from the Editor-in-Chief

Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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