Special Issue

Advances in Hydration, Microstructure, and Properties of Modern Cement and Concrete Composites

Message from the Guest Editors

This Special Issue aims to highlight cutting-edge research focused on the fundamental mechanisms governing the hydration processes, microstructural development, and engineering properties of modern cementitious systems. Topics of interest include, but are not limited to, the following:

- Multi-component interactions: Effects of chemical admixtures, nanomaterials, and mineral additives on hydration kinetics and phase assemblages.
- Microstructural characterization: Advanced experimental techniques for probing multi-scale microstructural features.
- Property enhancement: Solutions and mechanisms for property enhancement of cementitious materials (mechanical strength, durability, shrinkage, rheology, etc.).
- Modern design and simulation approaches: Designing of novel cement and concrete composites and computational modeling (e.g., phase-field, molecular dynamics, and machine learning) for predicting hydration behavior, microstructure formation, and performance optimization.
- Sustainability-driven innovations: Strategies for reducing carbon footprint, including low-clinker cements, alkali-activated systems, and carbon-capture technologies.

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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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