



*materials*



*Special Issue Reprint*

## **Reaction Mechanism and Properties of Cement-Based Materials**

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Cement is one of the most important building materials and is used to build various infrastructures due to its high strength, durability, and relatively low cost. The microstructure of cement-based materials comprises a cement paste system, stone, porosity, water content, and other components. Among the cement-based materials, the cement paste system, mainly the hydration product of clinker or a reaction precursor, is the most important. The microstructure of reaction products, pores, and the constituent phase and the hardening process of the cement paste system have a crucial influence on the mechanical and physical properties of the resulting materials. An in-depth understanding of the relationship between the microstructure and macroscopic properties of cement-based materials helps in the design of more efficient and stable cementitious materials for construction. Cement-based materials are multi-phase and multi-scale structures, and each component has a different degree of influence on the overall mechanical and physical properties. The Special Issue “Reaction Mechanism and Properties of Cement-Based Materials” includes the current research, application, and development of strengthening, toughening, and durability enhancement components of different scales of cement-based materials, reaction mechanisms, and properties of various cementitious materials, including Portland cement, aluminat cement, sulfate aluminum cement, ferroaluminate cement, and phosphate cement.



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