Modelling and Simulation in Engineering

Hindawi

Special Issue on

Modelling and Simulation for Concrete Durability: Mechanism and Prediction

CALL FOR PAPERS

Concrete is the most widely used man-made material in modern construction industry. It is frequently applied in architectural structures, foundations, roads, pavements, pipe, bridges/overpasses, and so forth. However, the service life of concrete has been seriously shortened due to the durability problems, particularly when serving in nonideal environment and suffering internal/external attacks. Therefore, it is extremely significant to achieve a better understanding of the deterioration mechanisms as well as reliable prediction methods for durability properties and/or long-term performance of concrete. Modern computational modelling theories and methods are favourable for bringing innovative solutions to above issues and thus developing durable cement-based materials or concrete structures.

This special issue aims to present novel modelling studies on concrete durability by using analytical/numerical approaches alone or in conjunction with experimental techniques. Contributions to both performance predictions at structural level and mechanism investigations at material level are welcome in this special issue. The modelling and simulation based on more precise description of concrete/cement at meso-, micro-, or nanoscales is of particular interest.

Potential topics include but are not limited to the following:

- Simulation of deterioration processes
- Permeability and diffusivity modelling
- Simulation of Rebar corrosion process
- Cracking and fracture model
- Microstructure modelling of cementitious materials
- Simulation of hydration processes
- Molecular dynamics modelling
- Durability model of concrete components
- Prediction model of long-term performance
- Simulation of protection/rehabilitation methods

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