

Special Issue for Recent Patents on Materials Science

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Freeze-thaw damage mechanism of construction materials in cold regions

Aims & Scope:

The cold area is widely distributed on the earth. According to statistics, only permafrost regions account for about a quarter of the total land area of the Earth, while the permafrost regions, seasonal permafrost regions and transient permafrost regions account for about 50% of the land area. This means that a large number of human production activities and engineering construction will be carried out in the cold environment. At present, different countries have different standards for the division of the cold region, but it is certain that the division standards are all related to temperature. In the cold region, due to the large seasonal or day-night temperature difference, the project built in the cold region is constantly subject to freeze-thaw damage, which has a great impact on the safety and stability of the project.

In recent years, with the continuous growth of the global population and the depletion of readily available resources in non-cold regions, people have to develop natural resources such as land, minerals, and energy in cold regions, and more and more construction projects are carried out in cold regions. In the past, in terms of engineering structure design, people paid more attention to the safe use of the structure, but the freeze-thaw durability of the structure was not considered comprehensively. However, in practical projects, the application of construction materials from traditional non-cold regions to cold regions may lead to a decline in performance, and thus the number of structural damage caused by freeze-thaw damage is increasing. Understanding the damage evolution law of construction materials under freezing and thawing environment, analyzing its freeze-thaw durability, accurately evaluating the stability of engineering structures, and preventing and controlling freeze-thaw disasters have become an urgent problem to be solved.

The purpose of this special issue is to promote the study of freeze-thaw damage mechanism of construction materials in cold regions. Using modern equipment to study the physical and mechanical properties of construction materials under freeze-thaw cycles, establish the evaluation mechanism of freeze-thaw durability of construction materials and engineering structure stability, develop anti-freeze-thaw construction materials suitable for cold environment, and effectively prevent freezing and thawing disasters in cold regions.

Keywords:

Cold Region, Freeze-thaw Durability, Freeze-thaw Damage Mechanism, Physical and Mechanical Properties, Evaluation Mechanism, Engineering Structure Stability, Anti-freeze-thaw Construction Materials

Subtopics:

Topics of interest include, but are not limited to:

- Evaluation standard of construction stability in cold regions
- Building stability monitoring in cold regions

- Research on freeze-thaw damage mechanism of construction materials in cold region
- Research on damage evolution of construction materials under freeze-thaw cycles
- Microstructural changes inside the material under freezing and thawing conditions
- Study on the influence of physical and chemical environment on the freeze-thaw durability of construction materials
- Influence of construction material composition on its frost resistance
- Construction materials with freeze-thaw resistance
- Damage evolution mechanism of building materials under multi-field coupling

Papers submitted for publication for this special issue will be peer reviewed and selected on basis of their quality and relevance to the theme of this special issue. Submitted manuscripts should not have been published previously, nor be under consideration for publication elsewhere. A guide for authors and other relevant information for submission of manuscripts are available on the Instructions for Authors page (<http://benthamscience.com/journals/recent-patents-on-materials-science/authorguidelines/#top>).

Please submit your manuscript via email to

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Schedule:

Manuscript Submission Deadline:	15 th June, 2019
Peer Review Date:	10 th Jul. 2019
Revision Due Date:	01 st Aug. 2019
Notification of Acceptance by the Guest Editor's:	10 th Aug. 2019
Manuscript Due:	15 th Aug. 2020