Special Issue

Tungsten Composite Materials and New Alloys for Extreme Application

Message from the Guest Editor

Tungsten (W) is the metal for extreme environments as it has the highest melting point However, tungsten has two main disadvantages: poor oxidation resistance at temperatures above 600 °C as well as a low room temperature (RT) fracture toughness, KIQ, and a brittle-to-ductile transition (BDT) that occurs at high temperatures. This is why tungsten is currently only used as a functional material and not as a structural material, that is, not for safety relevant, pressurized parts. Consequently, thinking about tungsten as a structural material, the question of how to make tungsten ductile and how to decrease the brittle-to-ductile transition temperature (BDTT) arises. The purpose of this special issue is thus to compile the current status of work related to the improvement of the properties of tungsten for applications such as fusion, and other extreme environments, e.g. solar thermal power. Contributions related to the manufacture of new tungsten materials, studies of W-composites, their constituent components as well as modelling and material characterization methods will be accepted.

Guest Editor

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Metallic materials play a vital role in the economic life of modern societies; contributions are sought on fresh developments that enhance our understanding of the fundamental aspects related to the relationships between processing, properties and microstructure – disciplines in the metallurgical field ranging from processing, mechanical behavior, phase transitions and microstructural evolution, nanostructures, as well as unique metallic properties – inspire general and scholarly interest among the scientific community.

Editor-in-Chief

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