Special Issue

Grain Boundary Segregation in Metallic Materials: Experiment and Modelling

Message from the Guest Editors

Grain boundary segregation is a phenomenon of increasing importance, mainly in connection with stabilization of nanocrystalline structures. Simultaneously, the interest in grain boundary segregation is accelerated by the development of the methods of theoretical calculations and their expansive applications. However, all progress brings new questions and problems. One of the problems which needs to be clearly elucidated is the fact that experimentally determined segregation energies do not fit with those obtained from theoretical calculations in many cases. It may be connected with neglecting segregation entropies in theoretical calculations or with an inability to experimentally determine the segregation characteristics for individual grain boundary sites. The aim of this Special Issue is to demonstrate recent progress in the field of grain boundary segregation with a special focus on comparison of experimental results and theoretical calculations.

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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.

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