

Special Issue

Hydrogen Effects in Alloys and Steels

Message from the Guest Editors

Hydrogen is expected to play a key role in a future climate-neutral economy. However, the exposure of metals and alloys to a hydrogen-containing environment may cause mechanical degradation that strongly influences the integrity of the metallic structure, known as “hydrogen embrittlement”. The hydrogen embrittlement phenomenon is a complex procedure that may depend on the hydrogen source, hydrogen diffusion and uptake, mechanical loading, and the material's intrinsic properties. Despite the remarkable research investment involving couple theory and physical findings, fundamental studies still remain the key issue for future progress in the understanding of hydrogen embrittlement. This Special Issue is focused on sharing the latest findings on the hydrogen degradation effect in alloys and steels. The topics covered in this Special Issue include hydrogen embrittlement mechanisms, hydrogen–material interaction, hydrogen–plasticity interaction, hydrogen-assisted fatigue/cracking/ fracture, hydrogen diffusion and trapping, multiscale approaches to hydrogen embrittlement, and computational methods for modelling hydrogen embrittlement.

Guest Editors

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About the Journal

Message from the Editorial Board

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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