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Hydrogen Induced Damages in Metallic Materials

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Message from the Guest Editors

Exposing metal materials to hydrogen-rich environments can cause a range of damages, often resulting in premature cracking, ductility loss, bubbling/blistering, and swelling. These damages will deteriorate the performance of metallic materials, posing a great threat to the safety and efficiency of many applications. It is therefore crucial to understand the fundamental mechanisms of hydrogen-induced damages in metallic materials.

With the rapid development of computing of efficient and simulation methods, numerical modeling has become a powerful tool for investigating the microscopic behavior of hydrogen in metallic materials. We invite you to submit original research on the modeling and simulation of hydrogen-induced damages in metallic materials. The topics of interest in this Special Issue include but are not limited to the effect of hydrogen on mechanical performance, hydrogen–defect interaction, kinetics of hydrogen ingress, diffusion, trapping, and desorption, hydrogen damage mechanisms, and predictions regarding materials properties in hydrogen-rich environments.

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Message from the Editor-in-Chief

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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