Special Issue

Passivity and Localized Corrosion of Metallic Materials

Message from the Guest Editor

Several metals, such as Fe, Ni, and Al, are inherently reactive. These metals and their alloys are extensively used in industry because of the formation of a protective oxide/hydroxide film, known as passivity, which considerably affects the kinetics of the corrosion process. However, passive films are not perfect, and under certain conditions, tend to break down, resulting in localized corrosion. Pitting, crevice and stress corrosion cracking (SCC) are the main forms of localized corrosion, which directly or indirectly cause corrosion failures of many industrial assets. This Special Issue aims to give an updated outlook on passivity and localized corrosion of different metals and alloys, with a special interest in the passivity and pitting corrosion of additive manufactured alloys, microstructure/pitting corrosion relationship, analytical methods and theoretical mechanisms of localized corrosion, multiscale modeling for localized corrosion prediction, failure analysis, and corrosion inhibitors. Manuscripts are welcome from both academic research teams and authors from industrial companies involved in the field.

Guest Editor

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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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