



Advances in Titanium Alloys: Mechanical Properties, Microstructure and Ultrasonic Impact Treatment

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Message from the Guest Editor

Dear Colleagues,

Due to the remarkable combination of high strength-to-weight ratio, strong resistance to creep, excellent corrosion resistance, and low heat conductivity, titanium and its alloys have been extensively used in a wide range of applications. However, the poor wear resistance of titanium alloys is still the main shortcoming that restricts their applications, particularly in areas involving friction and wear.

Currently, ultrasonic impact treatment (UIT) and its modifications (ultrasonic impact peening, ultrasonic nanostructural surface modification, etc.) are effective methods for surface hardening that significantly improves functional properties of structural materials, as well as their welded joints.

In this Special Issue, we welcome articles that focus on the experimental observations, a molecular dynamics simulation and ab initio calculation mechanisms underlying the development of structural and phase transformations in loaded titanium alloys which made it possible to explain the UIT effect on their microstructure, mechanical properties, as well as deformation and fracture behavior under different external actions.

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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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