Special Issue

Full-Cycle Innovation of Titanium Resources: From Mineral Development to High-End Material Manufacturing

Message from the Guest Editors

Titanium and its alloys hold irreplaceable strategic value in aerospace, marine engineering, biomedical fields, and other critical industries because of their high specific strength, corrosion resistance, and biocompatibility. However, the efficient development and high-value utilization of titanium resources still face challenges such as difficult mineral separation, high energy consumption in metallurgy, and complex material processing. This Special Issue focuses on full-industry-chain technological innovations in titanium resources, covering three core directions: mineral processing, green metallurgy, and material design and application. These areas aim to drive the titanium industry toward low-carbon practices, intelligent manufacturing, and circular economy models.

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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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