Special Issue

Advanced High-Strength Bainitic Steels

Message from the Guest Editor

Advanced bainitic steels have attracted the attention of steel makers and end users in recent years, owing to the simplicity of their chemical composition and their processing, as well as their ability to achieve both high strength and excellent toughness values. Bainite has many similarities to martensite from a crystallographic perspective. However, bainitic transformation does not involve severe quenching, which often leads to the formation of cracks in martensite and even failure during subsequent treatment. On the other hand, transformation at higher temperatures comes with the detrimental carbide precipitation typical of conventional bainite. This promising steel concept depends on the elimination of the massive precipitation of carbides by the rational addition of silicon, enabling the presence of a heterogeneous distribution of retained austenite at room temperature, which opens a window of applications to bainitic steels that has never been seen before. The Special Issue is to share novel findings on advanced bainitic steels regarding the following aspects: the design of the alloy and processing routes, advanced microstructural characterization, and mechanical testing.

Guest Editor

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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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