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Recent Findings and Developments on Bainite in Advanced High-Strength Steels

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Message from the Guest Editors

To reduce energy consumption in a world of high mobility, the automotive industry continuously demands lighter and stronger materials to design new lightweight concepts. Therefore, new steel grades with improved strength–ductility properties are in constant development. On the one hand, new medium-Mn TRIP/TWIP steels produced by C partitioning procedures are in the focus of research activity. On the other hand, bainite, often considered a single phase, is known to provide good toughness and high strength, promising high tensile strength–total elongation products (UTS x TE). Bainitic microstructures consisting of multiple constituents are the reason for these auspicious properties, and explain why the development of new advanced high-strength steels (AHSSs) has employed complex bainitic microstructures in recent years. The broad spectrum of properties achieved with bainitic microstructures indicates a vast potential to generate specific high-strength steel grades. Therefore, this Special Issue focuses on the latest findings on bainite to understand the technology–microstructure–property relations in complex bainitic steels for lightweight design.

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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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