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Development of Bainitic Steels

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Deadline for manuscript submissions:
closed (31 March 2019)

Message from the Guest Editor

Dear Colleagues,

Steels with fully or partially bainitic microstructures are used in a variety of applications, ranging from the ~0.5 mm advanced high strength steel sheets for vehicle bodies in white, to the ~250 mm wall thickness of nuclear reactor pressure vessels.

Successful development implies the ability to achieve specific criteria (tensile strength, toughness, ductility, fatigue or wear resistance, etc.). Notwithstanding costly trial and error approaches, the design of new steel compositions or processes usually require the bringing together of two major fields of investigations.

A first domain of investigation is the understanding and quantification of the relationship between microstructure (carbides distribution if they are present, density of low/high misorientation interfaces, retained austenite, including its carbon content and morphology, etc.) and target properties.

A second one is similarly concerned with the relationship between composition, thermo-mechanical processing and resulting microstructure; both from a characterization and modeling point of view.

The objective of this Special Issue will thus be to compile a wide-ranging collection of contributions, covering both mechanical properties and microstructural development of bainitic steels.

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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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