

Special Issue

Advances in Carbides of Steels: Experiment and Modeling

Message from the Guest Editor

Special steels are frequently designed with the addition of a small number of chemical elements that improve mechanical properties, such as strength, toughness, creep resistance, abrasion resistance, among others. These unique properties are given by carbides precipitation after the tempering process, called secondary hardness. Carbides are chemical compounds where carbon is combined with a metallic or semimetallic element with lower electronegativity. To improve mechanical properties by carbide precipitation, the size, the separation between them, thermodynamic stability, and kinetics of growing and coarsening must be adequate. Nowadays, thermodynamic and kinetic modeling are very reliable tools to predict the carbides behaviour related to the evolution of these phases on the exceptional properties of these kinds of steels. In Special Issue, authors are welcome to provide the latest experimental and modeling results on this fascinating topic of the physical metallurgy applied to the design and characterization of special steels. This includes fundamental questions regarding carbide growth, coarsening and stability, and secondary hardening improvement in mechanical properties.

Guest Editor

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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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