Special Issue

Physical Metallurgy of High Manganese Steels

Message from the Guest Editors

High manganese steels (HMnS) represent a highly fascinating class of alloys within the field of advanced high strength steels. HMnS have gained a lot of attention in both academic and industrial research. Therefore, potential fields of industrial application supposedly extend from components in the automotive industry over equipment for low-temperature applications to forging. Careful review of the related literature revealed that there is still a severe need to better understand the physical metallurgical mechanisms of HMnS. Relevant aspects include but are not restricted to microstructure evolution during deformation and annealing, the role of interfaces, hydrogen embrittlement, advanced processing techniques, and multi-scale strain-hardening. Both advanced experimental as well as numerical approaches, including first-principle calculations, are necessary for an increased understanding and future development of HMnS. Comprehensive fundamental research on these topics often necessitates interdisciplinary collaboration of materials scientists, physicists, chemists, and engineers. It is my pleasure to invite you to submit original contributions to this Special.

Guest Editors

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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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