Special Issue

Heat Treatment and Additive Manufacturing of Alloys: Processing, Properties and Simulations

Message from the Guest Editors

Additive manufacturing (AM), also known as three-dimensional (3D) printing, has been widely used to produce metal components with complex structures in aerospace, consumer products, healthcare, energy, automotive, marine, and other industries. The metallic components produced by AM have shown comparable or superior properties to those of conventionally manufactured (CM) counterparts. However, in situ or post-processing heat treatment is often required to reduce the defects, modify the microstructure, alleviate residual stresses, and adjust the properties of the metal parts produced by AM. The fundamental and technological challenges in heat treatment and AM of metallic alloys include the complex thermophysical phenomena, microstructure/defects/stress development, process design and numerical simulation, characterization/evaluation, and the correlation between alloy composition, processing, microstructure and properties, etc. This Special Issue seeks to collect papers on developments in the heat treatment of AM metals. New insights into the microstructure, characterization, modelling/simulation, processing, properties, and their relationships of CM and AM metals are also welcomed.

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Message from the Editor-in-Chief

Materials (ISSN 1996-1944) was launched in 2008. The journal covers twenty-five comprehensive topics: biomaterials, energy materials, advanced composites, advanced materials characterization, porous materials, manufacturing processes and systems, advanced nanomaterials and nanotechnology, smart materials, thin films and interfaces, catalytic materials, carbon materials, materials chemistry, materials physics, optics and photonics, corrosion, construction and building materials, materials simulation and design, electronic materials, advanced and functional ceramics and glasses, metals and alloys, soft matter, polymeric materials, quantum materials, mechanics of materials, green materials, general. *Materials* provides a unique opportunity to contribute high quality articles and to take advantage of its large readership.

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