Special Issue

Modeling and Simulation of Multiphase Transport Phenomena in Process Metallurgy

Message from the Guest Editor

Process metallurgy typically involves complex multiphase transport phenomena (MTP), including fluid flow, heat, and mass transfer between inter/intra-phases with the dispersed phases such as droplets, particles, and bubbles (DPBs) and continuum carried phase(s). With the rapid development of computer technology, many advanced computational technologies have been developed and applied to tackle problems of various types.

In this Special Issue, I am pleased to invite you to contribute to this topic related to the modeling and simulation of metallurgical processes, especially involving DPBs and MTP (either discrete- or continuum-based), such as molecular dynamics (MD), lattice Boltzmann method (LBM), smooth particle hydrodynamic (SPH), discrete element method (DEM), population balance model (PBM), two/multi-fluid method (TFM), Eulerian–Eulerian (E-E CFD), volume of fluid (VOF), or their coupled/combined/hybrid methods. The application of these techniques in metals processes is particularly encouraged, and related experimental or physical model investigations are also welcomed.

Guest Editor

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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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