

JOM TECHNICAL TOPICS

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Applications of Autonomous Data Collection and Active Learning

Scope: Recent advances in data processing and robotics have expanded the possibilities for real-time data feedback to improve in situ monitoring of characterization and manufacturing processes. This special topic focuses on experimental methodologies that employ automatic data collection routines for materials characterization, with an emphasis on utilizing these data to enable closed loop controls. The topic also focuses on automated data collection or experimental design using active or adaptive learning approaches.

Editor: Andrew Polonsky, Sandia National Laboratories

Sponsors: Advanced Characterization, Testing, and Simulation Committee

High Temperature Alloys: Manufacturing, Processing, and Repair

Scope: High-temperature alloys are crucial for allowing components in power generation and propulsion systems to operate at the highest possible temperatures and in extreme environments, for maximum efficiency. This topic explores advances in manufacturing, processing, and repair of high-temperature alloys, such as Ni- and Co- based superalloys, high entropy alloys, and refractory alloys. Areas of interest include advanced processing methodologies, novel manufacturing techniques, process-microstructure-property relationships, surface modification, repair, welding, and joining techniques.

Editor: Benjamin Adam

Sponsor: High Temperature Alloys Committee

Progress on Recovery of Critical Raw Materials

Scope: Computational modeling continues to play an increasingly important role for evaluating and improving metallurgical furnace design and operation. Metallurgical furnaces typically involve complex transport phenomena, multi-phase chemical reactions and phase transformations, which make modeling efforts challenging. This special topic covers original research aimed at developing techniques for high-fidelity simulations of industrial metallurgical furnaces.

Editors: Hong Peng, University of Queensland, and Kerstin Forsberg, KTH Royal Institute of Technology

Sponsor: Hydrometallurgy and Electrometallurgy Committee and Recycling and Environmental Technologies Committee

Two-Dimensional (2D) Materials, Devices, and Sensors

Scope: This special topic explores magnetic materials which can be used for multifunctional applications in the power and energy sector (energy conversion, energy storage, power generation, etc.). Fundamental and applied research in this area with an emphasis in novel processing, and the interplay between composition-processing-structure-microstructure-property-performance is also featured.

Editors: Michael Cai Wang, University of South Florida, and Wenzhuo Wu, Purdue University

Sponsors: Nanotechnology Committee

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