Special Issue

Metal Extraction and Recovery from Slag: Separation and Reduction Processes

Message from the Guest Editors

By utilizing the differences in physical and chemical properties between metals and slag, such as density, magnetism, melting point, etc., effective separation of metal particles from slag phase can be achieved, including physical, chemical, electromagnetic, and other separations. The reduction reaction is a key step in achieving metal recovery in slag metallurgy; by adding reducing agents (such as carbon, aluminum, silicon, etc.) to the slag, carbon thermal, aluminum thermal, and silicon thermal reduction reactions occur, reducing the metal oxides in the slag to metallic elements, and further separating them to obtain the product. The metal recycling methods include smelting, hydrometallurgy, and the pyrometallurgy–hydrometallurgy mixed method. Separation, reduction, and metal recovery technologies in slag metallurgy are key in recycling and achieving sustainable development for metal resources. By optimizing separation, reduction, and recovery technologies, efficiency and purity in metal recovery operations can be improved, reducing resource waste and environmental pollution.

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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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