Special Issue

Emerging Technologies for Chemical Recovery of Spent Batteries

Message from the Guest Editors

Emerging chemical recycling technologies including hydrometallurgy, pyrometallurgy, and bioleaching are now considered promising approaches for recovering critical metals (e.g., lithium, cobalt, nickel) from spent batteries. These methods not only enhance resource efficiency but also minimize hazardous waste generation. Given the complex composition of battery materials, the effectiveness of these recycling techniques depends on the synergistic optimization of multiple processes, such as selective leaching, solvent extraction, and electrochemical recovery. This multi-mechanism approach likely contributes to higher metal recovery rates and reduced secondary pollution, making large-scale industrial adoption increasingly feasible.

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