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Simultaneous recovery of cobalt and manganese by hydrometallurgy and electro chemical process

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To simultaneously manufacture cobalt metal and electronic manganese dioxide, the process consists of solvent extraction and electro chemical process from spent Li-ion batteries. In solvent extraction, to separate cobalt and manganese from nickel and lithium, the experiments such as pH-isotherm, effect of saponification of 2-ethylhexyl phosphonic acid, McCabe-Thiele diagram, counter current simulation test were conducted. Also, electro chemical process experiments such as, effect of concentration of cobalt and manganese, effect of current density, pH and, effect of temperature are investigated. As a result, the cobalt and manganese were co-extracted from Ni and Li by Na- 2-ethylhexyl phosphonic acid. And then, recovered cobalt and manganese is subjected to electro winning. In all electro winning experiments, concentration of Mn does not affect the purity of cobalt metal which is over 99.8%. Also, for high current efficiency and low energy consumption of deposition of Co on cathode, the most important factors are pH and concentration of cobalt. Therefore, this study will contribute to recovery process of cobalt and manganese because of advantage for simultaneous recovery of Co and Mn at one-energy consumption.

Biography

Shun Myung Shin has completed his PhD from Tohoku University. He is the Director and Principal Researcher of Korea Institute of Geoscience and Mineral Resources. He has published more than 50 papers in reputed journals, and has been serving as an Editorial Board Member of reputed.

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