

## Accepted Manuscript

Title: Recovery of manganese from sulfuric acid leaching liquor of spent lithium-ion batteries and synthesis of lithium ion-sieve

Authors: Jishen Li, Xiyun Yang, Zhoulan Yin

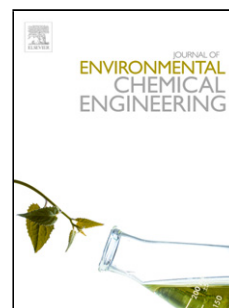
PII: S2213-3437(18)30587-6  
DOI: <https://doi.org/10.1016/j.jece.2018.09.044>  
Reference: JECE 2665

To appear in:

Received date: 18-7-2018  
Revised date: 21-9-2018  
Accepted date: 22-9-2018

Please cite this article as: Li J, Yang X, Yin Z, Recovery of manganese from sulfuric acid leaching liquor of spent lithium-ion batteries and synthesis of lithium ion-sieve, *Journal of Environmental Chemical Engineering* (2018), <https://doi.org/10.1016/j.jece.2018.09.044>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



# Recovery of manganese from sulfuric acid leaching liquor of spent lithium-ion batteries and synthesis of lithium ion-sieve

Jishen Li<sup>a</sup>, Xiyun Yang<sup>\*a, b</sup>, Zhoulan Yin<sup>b</sup>

<sup>a</sup>School of Metallurgy and Environment, Central South University, Changsha 410083, China

<sup>b</sup>College of Chemistry and Chemical Engineering, Central South University, Changsha 410083, China

## Highlights

- Mn was recovered as lithium ion-sieve from leaching solution of spent LIBs.
- Mn was separated from Ni and Co with D2EHPA extraction following two-step stripping.
- Co doping improves structure stability and adsorption capacity of lithium ion-sieve.

## ABSTRACT

A novel process of recovery of Mn as lithium ion-sieve from H<sub>2</sub>SO<sub>4</sub> leaching liquor of spent lithium-ion batteries was developed. After precipitation of Fe<sup>3+</sup> and Cu<sup>2+</sup> in the leaching liquor, Mn was recovered with D2EHPA extraction followed by two-step stripping with H<sub>2</sub>SO<sub>4</sub> solution. Lithium ion-sieve was synthesized by oxidation of the stripping solution using KMnO<sub>4</sub>, then roasting at atmosphere followed by acid leaching. The effects of solvent extraction parameters on Mn recovery rate and Co doping content on the performance of lithium ion-sieve were investigated. The result indicates that through secondary countercurrent solvent extraction, Mn is fully separated from Ni and a MnSO<sub>4</sub> solution containing a small amount of Co is obtained. Co can incorporate into the lattice of lithium ion-sieve and improve the structure

Download English Version:

<https://daneshyari.com/en/article/11029000>

Download Persian Version:

<https://daneshyari.com/article/11029000>

[Daneshyari.com](https://daneshyari.com)