Lithium battery chlorination leaching

Do water leaching conditions and chlorination roasting conditions affect lithium extraction efficiency?
The effect of water leaching conditions and chlorination roasting conditions, such as water/calcines mass ratio, leaching temperature and time, roasting temperature and time, and molar mass of the chlorine donor on the extraction efficiency of lithium, were studied and optimized. 2. Materials and methods 2.1. Materials

Does CaCl2 contribute to the formation of lithium ion batteries?
In the light of the thermodynamic calculations and experimental results,the excellent chlorine donor of CaCl2 contributes to the formation of LiCl. This work was useful for determining a new suitable method to extract lithium,which is,in turn,beneficial for lithium storage and development of lithium ion batteries. None.

Can a high concentration chloride solution extract valuable metals from lithium-ion batteries?
This study focused on the extraction of valuable metals from the cathode-active materials in spent lithium-ion batteries using a high-concentration chloride solution.

Can lithium ion batteries recover valuable metals from cathode active materials?
A novel recovery process of valuable metals from the cathode active materials of the lithium-ion secondary batteries. Hydrometallurgy. 2009;99 (3-4):194. Joulié M, Laucournet R, Billy E. Hydrometallurgical process for the recovery of high value metals from spent lithium nickel cobalt aluminum oxide based lithium-ion batteries.

Who supplied the cathode-active materials of spent lithium batteries?
The cathode-active materials of spent LIBs were supplied by Funeng Lithium Battery Co.,Ltd,Jiangsu,China. The samples used in the leaching experiments had a particle size of below 37 um.

What is HCl leaching method based on ammonium chloride (NH 4 Cl)?
This study developed a novel HCl leaching methodbased on the addition of ammonium chloride (NH 4 Cl) to the HCl solution. A high recovery rate was obtained for the valuable metals while the release of chlorine gas was inhibited effectively. The cathode-active materials of spent LIBs were supplied by Funeng Lithium Battery Co.,Ltd,Jiangsu,China.

A chlorination roasting-water leaching process to recover Li, Ni, Co, and Mn from spent Li-ion batteries is introduced in this paper. The key parameters were studied and optimized, over 98% of Li, Ni, and Co, and 97% of Mn can be leached out under the most suitable condition of 350 °C roasting temperature, 30 min roasting time, and a 2:1 mass ratio of NH 4 Cl to ...

The recycling of valuable metals from spent lithium-ion batteries (LIBs) has great significance for environmental protection and resource conservation. In this paper, a low-temperature clean chlorination roasting-water leaching process was proposed to simultaneously extract Li, Ni, Co and Mn from ca ...

Previous investigations have reported that the chlorination roasting-water leaching process can be efficient in extracting valuable metals from spent lithium-ion batteries [32,33].

It was found that the addition of solid NH 4 Cl to an HCl solution significantly improved the metal extraction capability of the latter and reduced the formation of chlorine gas by 96.0% compared to that only using HCl. The activation energies for leaching Li, Ni, Co, and Mn were determined to be 30.4, 38.5, 30.6, and 38.2 kJ·mol -1, respectively.

2 ???· The growing demand for lithium-ion batteries has created an urgent need for the recycling of spent lithium-ion batteries. Nevertheless, the efficient extraction of lithium remains a substantial challenge. Herein, we propose a novel method for the preferential lithium extraction as high-purity lithium chloride, which integrates NaCl-assisted roasting, water leaching, and ...

The objective of this study is to describe primary lithium production and to summarize the methods for combined mechanical and hydrometallurgical recycling of lithium-ion batteries (LIBs). This study also aims to draw attention to the problem of lithium losses, which occur in individual recycling steps. The first step of hydrometallurgical treatment is leaching, ...

Traditional acid leaching process for leaching metal values from spent lithium-ion batteries (LIBs) is low efficiency and inevitably consumes large amounts of reductants. In ...

Li L et al (2013) Recovery of metals from spent lithium-ion batteries with organic acids as leaching reagents and environmental assessment. J Power Sources 233:180-189. Article CAS Google Scholar Wang B et al (2019) Recycling LiCoO2 with methanesulfonic acid for regeneration of lithium-ion battery electrode materials. J Power Sources 436:226828

The present work investigates the extraction of lithium, as lithium chloride, from spent LIBs by carbochlorination roasting. The starting samples consisted of a mixture of cathode and anode...

Abstract. Lithium is considered to be the most important energy metal of the 21st century. Because of the development trend of global electrification, the consumption of lithium has increased significantly over the last decade, and it is foreseeable that its demand will continue to increase for a long time.

A chlorination roasting-water leaching process to recover Li, Ni, Co, and Mn from spent Li-ion batteries is introduced in this paper. The key parameters were studied and ...

Comprehensive experiments were conducted to determine the optimum leaching conditions (130 °C, 60 g/L, M ChCl:MAL:Glycerol of 1:1:3, 3 h), achieving high ...

Lithium was recovered from both Li-bearing minerals (kunzite, hiddenite, and lepidolite) and Li-bearing slags,

using a chlorination roasting process at 1100 °C under an argon atmosphere. According to the XRD analysis, gehlenite (Ca2Al2SiO7) and lithium aluminate (LiAlO2) constitute the main phases in the LIB recycling slag. The major mineral phases ...

When the spent lithium ion battery is processed pyrometallurgically, lithium is generally fixed as slag with a high melting/boiling point which is difficult to be treated further. In this research, an innovative method to recycle lithium from pyro-slag by evaporation during chlorination roasting was proposed. Different chlorine donors, namely NaCl, AlCl3, and CaCl2 were evaluated by ...

With the continuous increase in the disposal volume of spent lithium-ion batteries (LIBs), properly recycling spent LIBs has become essential for the advancement of the circular economy. This study presents a systematic analysis of the chlorination roasting kinetics and proposes a new two-step chlorination roasting process that ...

A chlorination roasting-water leaching process to recover Li, Ni, Co, and Mn from spent Li-ion batteries is introduced in this paper. The key parameters were studied and optimized, over 98% of Li, Ni, and Co, and 97% of Mn can be leached out under the most suitable condition of 350 °C roasting temperature, 30 min roasting time, and ...

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