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The methods of extracting lead acid from batteries are

How are lead-acid batteries separated?

Usually,spent lead-acid batteries are separated in lead recycling plants by dismantling and sorting into four fractions: lead paste,metallic fragments,waste acid,and plastic case (Worrell and Reuter,2014; Zhang et al.,2019). The processing of lead paste is relatively complex because it contains refractory lead sulphate.

Can spent lead-acid batteries be recycled?

Recycling spent lead-acid batteries has always been a research hotspot. Although traditional pyrometallurgical smelting is still the dominant process,it has serious environmental drawbacks,such as the emission of lead dust and SO 2,and high energy consumption. This study presents a clean process for recycling spent lead-acid battery paste.

What is lead acid battery recycling?

Lead acid battery (LAB) recycling benefits from a long history and a well-developed processing network across most continents. Yet, LAB recycling is subject to continuous optimization efforts because of increasingly stringent regulations on process discharge and emissions.

How is Lead extracted from raw material?

The lead in the raw material was recovered via a direct leaching-electrowinning processin calcium chloride solution. Different from the traditional hydrometallurgical processes used to treat the lead paste,this new process does not require the desulphurisation step.

How efficient is electrowinning a lead-acid battery?

The leaching of lead was over 99% and the current efficiency was 96.3%. The energy consumption of the electrowinning was only 85.9 kWh/t Pb. The spent electrolyte was recyclable and the chlorine evolution was avoided. No desulfurization step is required in the novel process. Recycling spent lead-acid batteries has always been a research hotspot.

What is a lead-acid battery?

1. Introduction Lead-acid batteries are the oldest type of rechargeable batteryand have been widely used in many fields,such as automobiles,electric vehicles,and energy storage due to the features of large power-to-weight ratio and low cost (Kumar,2017).

The invention discloses a treatment method for extracting lead acid from waste acid of waste lead-acid batteries, and relates to the technical field of recovery of lead-acid batteries. The method is used for solving the technical problems that the recycling of electrolyte and lead oxide can not be realized simultaneously and the economic benefit of waste lead-acid battery ...

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The lead content in the cathode crude lead was analysed using the EDTA volumetric method. The metal extraction ratio, current efficiency, and energy consumption were calculated according to the method reported by Xing et al. (2018). 3. ... The proposed process is an attractive solution to extracting Pb from spent lead-acid battery paste. The ...

This study proposed a cleaner pyrometallurgical lead-acid battery (LAB) recycling method for lead extraction and sulfur conservation without an excessive amount of SO 2 generation. A reducing atmosphere was introduced to the lead paste recycling system to selectively reduce PbSO 4 to PbS. At the same time, PbO and PbO 2 components contained ...

This work presents a new methodology for the extraction of lead from slag, based on the complexing effect of EDTA, a chelating ligand that has the ability to solubilize several heavy metals.

The solvent extraction method forms complexes with metal ions through the use of extractants, which has high recovery efficiencies of metals and high purity of the obtained substances. ... Lead-acid batteries have a series of advantages such as low cost, simple production process, mature recycling technology, and reliable performance [165] ...

smelters is in the form of scrap lead-acid batteries. The lead metal and the sludge are separated from the case and the electrolyte and are smelted at high temperatures in a reverberatory or blast furnace (8).3 Emissions of lead and sulfur oxide fumes during pyrometallurgical smelting are ...

In "Clean Recycling Process for Lead Oxide Preparation from Spent Lead-Acid Battery Pastes Using Tartaric Acid-Sodium Tartrate as a Transforming Agent," Ouyang et al. ...

FIELD: chemistry; electrochemistry. ^ SUBSTANCE: present invention pertains to the chemical industry, and more specifically to extraction of silica contained in diaphragms, acting as separators between lead-acid battery cells, using different methods. According to the invention, the method of extracting the said silica contains the following stages: a) washing heavy ...

Recycling spent lead-acid batteries for a useful lead iodide resource can not only offer an approach to recycle hazardous solid waste but also save manufacturing cost of new ...

Lead-acid batteries (LABs) have been undergoing rapid development in the global market due to their superior performance [1], [2], [3].Statistically, LABs account for more than 80% of the total lead consumption and are widely applied in various vehicles [4].However, the soaring number of LABs in the market presents serious disposal challenges at the end of ...

Preparation from Spent Lead-Acid Battery Pastes Using Tartaric Acid-Sodium Tartrate as a Trans-forming Agent,"" Ouyang et al. present a novel desulfurization-calcination procedure. Sulfur removal of LAB paste is

experimentally conducted using tartaric acid and sodium tartrate to produce a lead tartrate product. A calcination step then ...

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