Methods for removing sulfur from lead-acid batteries

Can a cleaner pyrometallurgical lead-acid battery recycling system reduce SO2 generation?
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.

Can lead-acid battery paste be recycled?
An innovative and environmentally friendly lead-acid battery paste recycling method is proposed. The reductive sulfur-fixing recycling technique was used to simultaneously extract lead and immobilize sulfur. SO 2 emissions and pollution were significantly eliminated.

Can reductive sulfur-fixing recycling be used to extract lead from lab paste?
Effective lead extraction from LAB paste by a reductive sulfur-fixing recycling technique was shown to be feasible, thermodynamically and experimentally. The reaction mechanism investigations revealed that the presence of Na 2 CO 3 helped to transform SO 3 from PbSO 4 to Na 2 SO 4 at low temperatures and in weakly reductive atmospheres.

Can a reductive sulfur-fixing smelting process be used to recycle lab paste?
The feasibility and reliability of the proposed reductive sulfur-fixing smelting process for lead recovery and sulfur conservation from scrap LAB paste were confirmed. Fe 2 O 3 -containing materials,such as hematite,pyrite cinder,26 and jarosite residue,can be used as sulfur-fixing agents to recycle LAB paste in a reducing atmosphere.

What is the purity of a lead-acid battery?
Primary recoveries of 96.2% for lead and 98.9% for sulfur were obtained. The purity of the crude lead bullion was 98.6 wt.%. Sulfur was fixed in the solidified matte as FeS and NaFeS 2. Spent lead-acid batteries (LABs) are widely scrapped from automobiles and electric bicycles in urban areas.

Are scrap labs a secondary lead source?
As a result,scrap LABs have become a significant secondary lead sourceworldwide. 1 Secondary lead produced by recycling is gradually dominating the world's lead market. 4 Typically,a spent LAB consists of four components: waste electrolyte (11-30%),polymeric materials (22-30%),lead alloy grids (24-30%),and lead paste (30-40%).

The treatment of waste lead paste is the key to the recycling of waste lead-acid battery [1].For the treatment of waste lead paste, the main technical methods used in the production process of ...

The technology has developed into a $52 billion industry worldwide [110], where over 90% of the feedstock is

expended lead acid batteries while the rest is scrap lead from other lead applications ...

The remainder of this paper is organized as follows. Section 2 summarizes the major causes of aging in lead-acid batteries and provides a mathematical definition of the battery SOH and SOC. Section 3 introduces the classification and characteristics of different SOH estimation methods for lead-acid batteries.

DOI: 10.1016/j.jhazmat.2018.01.017 Corpus ID: 46758595; Removing antimony from waste lead storage batteries alloy by vacuum displacement reaction technology. @article{Liu2018RemovingAF, title={Removing antimony from waste lead storage batteries alloy by vacuum displacement reaction technology.}, author={Tiantian Liu and Ke-qiang Qiu}, ...

It was a long wait for roadside assistance, but it got me thinking about battery restoration methods for lead acid batteries. Let"s dive into this topic and explore how to bring those old batteries back to life! Understanding Lead Acid ...

This study proposes a cleaner lead-acid battery (LAB) paste and pyrite cinder (PyC) recycling method without excessive generation of SO2. PyCs were employed as sulfur-fixing reagents to conserve ...

Lead-acid batteries (LABs) ... which further confirmed the robust performance of our method on lead recovery (the purity of metallic lead was higher than 99% and less than 1% lead remained in the slag). ... Spent Lead-Acid Battery Recycling via Reductive Sulfur-Fixing Smelting and Its Reaction Mechanism in the PbSO 4-Fe 3 O 4-Na 2 CO 3-C System ...

This study proposed a cleaner pyrometallurgical lead-acid battery (LAB) recycling method for lead extraction and sulfur conservation without an excessive amount of SO2 generation.

Although lead recovery from spent lead acid batteries is carried out by pyrometallurgical processes which comprise over 90% of the recovery technology, decomposition of lead sulfate needs high carbothermic reduction temperature of over 1000 °C, causing environmental problems due to the emission in the atmosphere of lead particulates (30-50 ...

An innovative and environmentally friendly lead-acid battery paste recycling method is proposed. The reductive sulfur-fixing recycling technique was used to ...

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Against this background, sodium carbonate (Na 2 CO 3) was proposed as a low-cost, safe, and non-toxic reagent for recycling the high-risk environmental elements lead (Pb) ...

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The process comprises (a) breaking the batteries to remove the acid, (b) separating the plastic from the lead bearing materials, (c) smelting the lead bearing materials ...

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 ...

Recycling lead from waste lead-acid batteries has substantial significance in environmental protection and economic growth. Bearing the merits of easy operation and large capacity, pyrometallurgy methods are mostly used for the regeneration of waste lead-acid battery (LABs). However, these processes are generally operated at the temperature higher than ...

How do car batteries work? The main types of lead-acid battery are flooded (wet), AGM and gel. Lead-acid batteries are made up of 6 cells. Each cell provides 2.13V and when fully charged ...

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