Desulfurization of lean lead-acid batteries

Can a pulsing method extend the life of a lead acid battery?
In this instructable a novel (resistive) pulsing approach is described for driving the lead-sulfate back into solution that is faster than the more traditional inductive method. Sulfation is not the only aging mode in lead acid batteries,so while desulfation may extend the life,it will not do so indefinitely.

How to desulfurize lead paste by regenerated alkali?
The desulfurization of lead paste by regenerated alkali was as follows: (i) desulfurization was conducted by adding waste lead paste to a beaker containing a certain volume of regenerated NaOH solution and stirred. (ii) After the desulfurization reaction was complete, filter residue and filtrate were obtained by vacuum filtration.

How much desulfurizer is required for sodium-calcium double alkali lead paste slurry?
Hence,based on the minimum specific gravity of industrial lead paste slurry,the concentration of desulfurizer required for sodium-calcium double alkali lead paste desulfurization was estimated to be at least 2.32 mol/L. 3.2. Mechanism of a novel process of lead paste pre-desulfurization

Why are lead-acid batteries important to modern society?
Lead-acid batteries are important to modern society because of their wide usage and low cost. The primary source for production of new lead-acid batteries is from recycling spent lead-acid batteries. In spent lead-acid batteries,lead is primarily present as lead pastes.

What is a direct desulfurizer for lead paste?
NaOHwas used as the direct desulfurizer for lead paste,and lime was used to regenerate NaOH from the mother liquid at sufficient concentrations for desulfurization.

Is the pre-desulfurization process for lead paste economically feasible?
Thus,the proposed pre-desulfurization process for lead paste using the Na-Ca double alkali method is economically feasiblein industrial applications. A pilot-scale experiment would be necessary to predict the economic benefit more precisely for future large-scale industrial application.

Recycling of spent lead-acid batteries (LABs) is extremely urgent in view of environmental protection and resources reuse. The current challenge is to reduce high consumption of chemical reagents. Herein, a closed-loop spent LABs paste (SLBP) recovery strategy is demonstrated through Na2MoO4 consumption-regeneration-reuse. Experimental and DFT ...

and human health problems. Therefore, spent lead-acid battery recycling is urgently required for the sustainable development of the lead industry.2-4 Spent lead-acid batteries comprise spent lead paste, spent electrolyte, a grid, a polymer container, and some other parts. Among these, spent lead paste with a complex composition, mainly ...

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The traditional sodium desulfurization process for waste lead-acid batteries is beneficial to the environment; however, it is limited by poor economic viability as the cost of desulfurizer is much higher than the value of desulfurization by-products. This study proposes a new closed-loop pre-desulfurization process for lead paste, which consumes only lime as the ...

In this instructable a novel (resistive) pulsing approach is described for driving the lead-sulfate back into solution that is faster than the more traditional inductive method. Sulfation is not the ...

In this paper, a novel approach to recover PbO from lead pastes of spent lead acid batteries by desulfurization and crystallization in sodium hydroxide (NaOH) solution after sulfation was proposed. In the lead pastes, PbO can react with sulfuric acid easily to generate PbSO 4, so that the contents of PbO have little impact on the sulfation.

The study presents a novel lead dioxide reduction process which combined with flue-gas desulfurization technology to recover lead from lead-paste in the spent lead-acid ...

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In this instructable a novel (resistive) pulsing approach is described for driving the lead-sulfate back into solution that is faster than the more traditional inductive method. Sulfation is not the only aging mode in lead acid batteries, so while desulfation may extend the life, it will not do so indefinitely. Last car battery I had lasted 8 ...

In the recycling process for lead-acid batteries, the desulphurization of lead sulfate is the key part to the overall process. In this work, the thermodynamic constraints for...

This paper reports a new method of direct recovery of highly pure lead oxide (PbO) from waste lead pastes and lead grids of spent lead-acid batteries via catalytic conversion, desulfurization, and recrystallization processes in sequence. On the basis of the analytical results of lead (Pb) and lead dioxide (PbO2) contents in the scrap lead paste, a certain amount of waste lead grid was ...

A novel approach involving hydrometallurgical desulphurisation and thermal degradation is developed to recover lead as PbO products from spent lead acid batteries with minimal pollution and low energy consumption. Spent lead paste is the main component in lead-acid batteries reaching end of life. It contains about 55% lead sulphate and 35% lead dioxide, ...

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Abstract The recycling of lead acid batteries (LABs) comprises relevant concerns on the suitable methodologies to recover lead. In this investigation, two electrorefining processes, by using acidic and alkaline electrolytes, have been compared to determine the most significant results of both methodologies. Acidic electrolytes used 200 g/L HBF4, 1.2 g/L ...

Recycling of spent lead-acid batteries (LABs) is extremely urgent in view of environmental protection and resources reuse. The current challenge is to reduce high consumption of chemical reagents. Herein, a closed-loop spent LABs paste (SLBP) recovery strategy is demonstrated through Na

Lead-acid battery (LAB) has widespread applications in uninterrupted power supplies, electric vehicles, energy storage ... such as hydrochloric acid, nitric acid and acetic acid and others. Thus, desulfurization of lead sulfate into other lead compounds which can easily react with acid is a common pretreatment process for the spent lead paste [24]. Carbonate and ...

1. Introduction. In 2013, global annual refined lead output reached 11.12 million tons, and over 80% of which were consumed in the manufacture of lead-acid batteries (China, 2010; Zhu et al., 2013a; Zhang et al., 2016a).The world"s largest producer and consumer of primary and secondary refined lead shifted to China, which emerged as the center of ...

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