

Is desulfurization of lead-acid batteries effective

What is a direct desulfurizer for lead paste?

NaOH was used as the direct desulfurizer for lead paste, and lime was used to regenerate NaOH from the mother liquor at sufficient concentrations for desulfurization.

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

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 does sodium-calcium double-alkali lead paste pre-desulfurization work?

The new sodium-calcium double-alkali lead paste pre-desulfurization process proposed in this paper involved the direct reaction of lead paste with NaOH solution. Relatively cheap lime was reacted with the mother liquor, the sodium sulfate produced by desulfurization, to regenerate NaOH.

Can Na-Ca double alkali pre-desulfurization recover lead from spent lead paste?

In summary, the Na-Ca double alkali pre-desulfurization process can successfully recover lead from spent lead paste in an environmentally sustainable manner, minimize the disposal of hazardous solid waste, and prevent the emission of harmful gases.

5. Conclusion

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 feasible in industrial applications. A pilot-scale experiment would be necessary to predict the economic benefit more precisely for future large-scale industrial application.

As more and more lead-acid batteries (LAB) are scrapped after being widely used, more than 110 million LAB are currently scrapped every year in China [1]. ... cannot continue to react. Therefore, an effective PbSO_4 desulfurization method is urgently needed to reduce the incomplete desulfurization problem caused by the PbCO_3 product layer.

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 ...

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3 ???· Affordable yet highly effective, the Schumacher SC1281 includes an integrated desulfation mode that helps restore battery performance. ... For lead-acid batteries, consider using a battery maintainer to keep it in good condition. Conclusion. Desulfating a battery can significantly improve its performance and extend its lifespan, especially when ...

The treatment of spent lead paste is essential for the recycling of spent lead-acid batteries. In this study, we propose a facile route for the recovery of lead from spent lead paste by pre ...

Spent lead paste (SLP) obtained from end-of-life lead-acid batteries is regarded as an essential secondary lead resource. Recycling lead from spent lead-acid batteries has been demonstrated to be of paramount significance for both economic expansion and environmental preservation. Pyrometallurgical and hydrometallurgical approaches are proposed to recover ...

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.

Desulfation in Lead-acid Batteries; a Novel (resistive) Approach: A major life-limiting problem with lead-acid batteries is that when discharged (partially or otherwise) the resulting lead-sulfate ...

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 ...

Cleaner and more cost-effective battery recycling techniques are still in demand for improving battery's sustainability. Herein, a novel electrochemical spent lead-acid battery recycling approach with ultra-low energy consumption is proposed in this work, which is achieved via coprocessing with desulfurization wastewater. Desulfurization wastewater (containing ...

Lead-acid batteries are the oldest type of rechargeable battery and 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). Lead-acid batteries account for ~80% of the total lead consumption in the world (Worrell and Reuter, 2014; Zhang et al., ...

Lei et al. (Lei et al., 2012; Liu et al., 2014) reported a new technology to synthesize PbO from the PbSO₄ in spent lead acid batteries by the reduction of CH₃OH under hydrothermal condition.

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