Residual alkali in battery positive electrode material

Can acetic acid neutralize residual alkali species in layered cathode materials?
Here,we introduce acetic acid (AC) in layered cathode materials to neutralize the residual alkali species and form sodium acetate(AC-Na). AC-Na possesses a high specific capacity of ~300 mAh g -1 and serves as the Na compensation additive with ~92% capacity utilization and an appropriate oxidation potential (~4.1 V).

What is residual alkali?
Abstract Residual alkali is one of the biggest challenges for the commercialization of sodium-based layered transition metal oxide cathode materials since it can even inevitably appear during the p...

How to reduce residual alkali?
Herein,taking O3-type Na 0.9 Ni 0.25 Mn 0.4 Fe 0.2 Mg 0.1 Ti 0.05 O 2 as an example,an active strategy is proposed to reduce residual alkali by slowing the cooling rate,which can be achieved in one-step preparation method.

Is residual alkali a problem for layered transition metal oxide cathode materials?
Use the link below to share a full-text version of this article with your friends and colleagues. Learn more. Residual alkali is one of the biggest challengesfor the commercialization of sodium-based layered transition metal oxide cathode materials since it can even inevitably appear during the production process.

Are alkaline batteries reversible?
In recent decades,substantial efforts have been made to render alkaline batteries reversible. A notable breakthrough was achieved by Yamamoto 3 who demonstrated the intrinsic reversibility of the Zn/MnO 2 system using a mildly acidic ZnSO 4 -based electrolyte.

Does calcination cooling reduce residual alkali?
It is suggested that slow cooling can significantly enhance the internal uniformity of the material,facilitating the reintegration of Na +into the bulk material during the calcination cooling phase,therefore substantially reducing residual alkali.

In this work, we develop a new coating material, LiH 2 PO 4, which can effectively optimize the residual alkali on the surface of NCA to remove H 2 O and CO 2 and ...

The present study revealed that introducing a promising two-step nano-paste NaHC 2 O 4 (NHC) additive into the cathode slurry of NaNi 1/3 Fe 1/3 Mn 1/3 O 2 (NFM) overcomes the drawback ...

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With the increasing demand for electronics and electric vehicles, electrochemical energy storage technology is expected to play a pivotal role in our daily lives. ...

Here, we introduce acetic acid (AC) in layered cathode materials to neutralize the residual alkali species and form sodium acetate (AC-Na). AC-Na possesses a high specific ...

The invention relates to a method for reducing residual alkali content of a layered oxide positive electrode material of a sodium ion battery, which comprises the following specific...

Similarly, in the extensive research on the structural stability and electrochemical performance of positive electrode materials for sodium-ion batteries, it has been found that layered metal ...

Two types of solid solution are known in the cathode material of the lithium-ion battery. One type is that two end members are electroactive, such as LiCo x Ni 1-x O 2, which is a solid solution ...

An active strategy is introduced to reduce residual alkali by slowing the cooling rate, which notably enhances the internal uniformity and facilitates the reintegration of Na+ into the bulk material,...

Furthermore, we demonstrate that a positive electrode containing Li2-xFeFe(CN)6?nH2O (0 <= x <= 2) active material coupled with a Li metal electrode and a LiPF6 ...

Due to their low weight, high energy densities, and specific power, lithium-ion batteries (LIBs) have been widely used in portable electronic devices (Miao, Yao, John, Liu, & ...

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An active strategy is introduced to reduce residual alkali by slowing the cooling rate, which notably enhances the internal uniformity and facilitates the reintegration of Na+ into ...

Although NFM cathode materials can provide higher energy density, the residual alkaline sodium compounds (e.g., NaOH and Na 2 CO 3) on the surface of these cathodes during synthetic ...

Kang et al. developed a novel aqueous rechargeable Ni/Bi battery based on highly porous Bi 2 WO 6 and Co 0.5 Ni 0.5 MoO 4 microspheres as electrode active materials, ...

The battery is assembled in a glove box (Mikrouna universal 2440) filled with argon atmosphere (O 2 and H 2 O content < 0.1 ppm) in which the positive case, working ...

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The interface K + diffusion behaviors between active material and electrolyte was optimized as well by decreasing the activation energy and consolidating the crystalline ...

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