

Technology frontier of lithium battery positive electrode materials

Research on sodium-ion batteries began in the early 1980's (Delmas et al., 1980), but the successful commercialization of lithium ion batteries in 1990 distracted the attention from research and development of SIB (Ellis and Nazar, 2012). ...

The cathode materials of lithium ion batteries play a significant role in improving the electrochemical performance of the battery. Different cathode materials have been developed to remove possible difficulties and enhance properties.

Three classes of host lattices for lithium insertion are considered: transition-metal oxides V_2O_5 , $\alpha\text{-NaV}_2O_5$, $\alpha\text{-MnO}_2$, olivine-like $LiFePO_4$, and layered compounds $LiNi_{0.55}Co_{0.45}O_2$, $LiNi_{1/3}Mn_{1/3}Co_{1/3}O_2$...

Organic electrode materials present the potential for biodegradable energy storage solutions in batteries and supercapacitors, fostering innovation in sustainable technology.

Keywords: electrode materials, amorphization engineering, electrochemical performance, lithium ion batteries, sodium ion batteries, glass. Citation: Xiong F, Tao H and Yue Y (2020) Role of Amorphous Phases in Enhancing Performances of Electrode Materials for Alkali Ion Batteries. *Front. Mater.* 6:328. doi: 10.3389/fmats.2019.00328

As battery designs gradually standardize, improvements in LIB performances mainly depend on the technical progress in key electrode materials such as positive and ...

In addition to exploring and choosing the preparation or modification methods of various materials, this study describes the positive and negative electrode materials of lithium-ion...

This review is aimed at providing a full scenario of advanced electrode materials in high-energy-density Li batteries. The key progress of practical electrode materials in the LIBs in the past 50 years is presented at first. Subsequently, ...

Imanishi, N. et al. Lithium intercalation behavior into iron cyanide complex as positive electrode of lithium secondary battery. *J. Power Sources* 79, 215-219 (1999).

In this paper, we briefly review positive-electrode materials from the historical aspect and discuss the developments leading to the introduction of lithium-ion batteries, why lithium insertion materials are important in considering lithium-ion batteries, and what will constitute the second generation of lithium-ion batteries. We also highlight ...

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Effect of Layered, Spinel, and Olivine-Based Positive Electrode Materials on Rechargeable Lithium-Ion Batteries: A Review November 2023 Journal of Computational Mechanics Power System and Control ...

Dopants and coatings have been widely used to improve the performance of Ni-rich positive electrode active materials. Previous studies have aimed to elucidate the ...

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Electrodeposition induces material syntheses on conductive surfaces, distinguishing it from the widely used solid-state technologies in Li-based batteries. Electrodeposition drives uphill reactions by applying electric energy instead of heating. These features may enable electrodeposition to meet some needs for battery fabrication ...

This mini-review discusses the recent trends in electrode materials for Li-ion batteries. Elemental doping and coatings have modified many of the commonly used electrode materials, which are used either as anode or cathode materials. This has led to the high diffusivity of Li ions, ionic mobility and conductivity apart from specific capacity ...

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