The prospects of battery cathode materials

Are there competing interests in battery cathode materials?
Correspondence to Chen Yang. Competing interests The authors declare that they have no competing interests. Yang,C.,Mu,XY. Mapping the trends and prospects of battery cathode materials based on patent landscape. Front.

How is a patent analysis performed on 6 popular cathode materials?
In this paper, a patent analysis is performed on 6 popular cathode materials by comprehensively considering performance comparison, development trend, annual installed capacity, technology life cycle, and distribution among regions and patent assignees.

How do cathode materials affect battery performance?
However,the challenge comes to satisfy the energy demand in practicality. Progress has been achieved in material chemistry by focusing on cathode materials. One of the key parameters that influence LIB performance is the composition of cathode materials,which determines battery voltage,capacity,and overall efficiency.

What are the latest advancements in cathode materials?
This review dives into recent advancements in cathode materials, focusing on three promising avenues: layered lithium transition metal oxides, spinel lithium transition metal oxides, and olivine phosphates and silicates.

Can cathode materials be used for future-generation libs?
Recent advantages and future prospects of cathode materials towards the exploration of future-generation LIBs have also been highlighted in this review, aiming to remarkably reduce the cost and enhance the efficiency of future LIBs, which may revolutionize the transportation way and various aspects of our lives. 1. Introduction

How can lithium-ion battery technology improve portable electronics & electric vehicles?
Advancing portable electronics and electric vehicles is heavily dependent on the cutting-edge lithium-ion (Li-ion) battery technology, which is closely linked to the properties of cathode materials. Identifying trends and prospects of cathode materials based on patent analysis is considered a kernel to optimize and refine battery related markets.

When the battery is charged, the process is reversed. Lithium ions are moved from the cathode to the anode, using an external power source as shown in Fig. 1. The core of a lithium-ion battery lies in its cathode material, and three main types reign supreme: layered oxides, spinels, and the rising star, olivines [16,17].

2.1.1 Mn-Based Cathodes. Manganese (Mn)-based oxides, including MnO 2 polymorphs (?-, ?-, ?-, ?-, ?-, and

todorokite-MnO 2), Mn 2 O 3, Mn 3 O 4, MnO and ZnMn 2 O 4, are reportedly used as cathodes for energy ...

Choosing suitable electrode materials is critical for developing high-performance Li-ion batteries that meet the growing demand for clean and sustainable energy storage.

The properties of the cathode materials are directly related to the battery performance. The improvement of energy density, cycle life, and charge and discharge rates ...

Aqueous zinc-ion batteries (AZIBs) have been the focus of secondary rechargeable battery research because of their high theoretical specific capacity, safety, and environmental friendliness. However, an ideal cathode material remains a primary challenge in the commercialization of aqueous zinc-ion batteries. Journal of Materials Chemistry C Recent ...

Recent emerging cathode materials, such as amorphous NaFePO 4 and pteridine derivatives show interesting electrochemical properties and attractive prospects for application in SIBs. Future work should focus on ...

As a result of their short activation time, high power density, and long storage life, thermal batteries have been widely used in various military applications. Important thermal battery characteristics, such as operation ...

Alternatively, matching organic cathode materials with suitable inorganic cathode materials can effectively eliminate the dead weight of the latter, particularly the binders, improving not only ...

Herein, we summarized recent literatures on the properties and limitations of various types of cathode materials for LIBs, such as Layered transition metal oxides, spinel ...

Recent advantages and future prospects of cathode materials towards the exploration of future-generation LIBs have also been highlighted in this review, aiming to ...

Sodium-ion batteries (SIBs) have emerged as a promising alternative to lithium-ion batteries (LIBs) due to the abundant availability of sodium and the potential for lower costs. However, the development of high ...

<p>Advancing portable electronics and electric vehicles is heavily dependent on the cutting-edge lithium-ion (Li-ion) battery technology, which is closely linked to the properties of cathode materials. Identifying trends and prospects of cathode materials based on patent analysis is considered a kernel to optimize and refine battery related markets. In this paper, a patent ...

After that, optimization strategies of these three kinds of material as cathode materials published in recent years are summarized, emphasizing the element doping, surface coating, structure ...

Based on data sourced from tier 1 cathode manufacturer annual reports and initial public offering prospectuses

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(2019), the raw material precursors of mainstream cathode active material variants already account for about 80% ...

2019~2020 CURRENT STATUS AND FUTURE PROSPECTS OF LITHIUM ION BATTERY COMPONENT MARKET ~CATHODE MATERIALS~ English Version Language: English Product Code No: C62102320 ... 2019~2020 CURRENT STATUS AND FUTURE PROSPECTS OF LIB MATERIAL MARKET ~CATHODE MATERIALS~ Price. PDF Regular (Site License) ...

In this review, the history of DIBs cathode materials was sorted out and suggestions and prospects were put forward for the design of high-performance cathode materials ...

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