

Which cathode is suitable for a co-sintered solid-state battery?

Furthermore, if the active material can be co-sintered with the oxide-based electrolyte, the sintered high-capacity cathode is suitable for a high-performance cathode of the co-sintered solid-state battery. 12-15

Which active material should be used in a sintered cathode?

A thick and dense electrode using an active material sintered disk is expected to have a high capacity because the volume of the active material is 100% in the cathode. This study focused on LiCoO_2 , the most well-known active material for the cathode, to improve the properties of the sintered cathode.

What is a solid-state lithium battery?

Solid-state lithium batteries fabricated with LLTO-based composite solid electrolytes deliver a high discharge capacity at room temperature. Solid-state batteries have the potential for higher energy densities and enhanced safety when compared to conventional lithium-ion batteries.

Can cold sintering be used to recycle battery materials?

In addition to the potential for composite fabrication, cold sintering could enable recycling of spent battery materials. Eliminating the need for high-temperature processing and the use of solvents to decompose materials into recoverable compounds is advantageous.

Why is excess Li added to the electrolyte for a co-sintered solid-state battery?

Moreover, in the case of the co-sintered solid-state battery, the excess Li is added to the electrolyte to prevent Li-loss during sintering at high temperatures. Thus, more precise tuning of the amount of excess Li in LiCoO_2 for the cathode of the co-sintered solid-state battery will be strongly required to realize the high-performance battery.

Does excess Li affect the electrode properties of the LiCoO_2 sintered cathode?

These results show that excess Li affects the electrode properties of the LiCoO_2 sintered cathode, and this tendency can be explained by the increase in Li-ion conduction through the LiCoO_2 sintered disk. This means it is a crucial design factor when the LiCoO_2 sintered cathode is applied to the Li-ion battery.

The flash sintered LTO exhibits improved capacity, excellent cycling stability, and rate capability, suggesting that flash sintering technique could be a promising method for ...

The fabrication of 3D ink-printed and sintered porous Si scaffolds as electrode material for lithium-ion batteries is explored. A hierarchically-porous architecture consisting of ...

The study of multi-electron conversion cathodes is an important direction for developing next-generation rechargeable batteries. Iron fluoride (FeF_3), in particular, has a ...

Scanning electron micrographs of the surface of sintered Te electrodes fabricated using a) coarse and c) fine Te powder. Galvanostatic discharge curves at the rates of C/1000 (blue), C/200 (black ...

This study investigated the effect of excess Li in the LiCoO_2 thickly and densely sintered cathode without conductive carbon additives on the microstructure, the local structure, electrical ...

Lithium iron phosphate (LiFePO_4 , LFP) with an olivine structure is a promising cathode material that has recently been refocused on for lithium-ion batteries that satisfy those ...

The fabrication of 3D ink-printed and sintered porous Si scaffolds as electrode material for lithium-ion batteries is explored. A hierarchically-porous architecture consisting of channels (~220 nm ...

3 ???· Wood, D. L. III et al. Perspectives on the relationship between materials chemistry and roll-to-roll electrode manufacturing for high-energy lithium-ion batteries. Energy Storage Mater. ...

anode materials for lithium-ion batteries. The work mainly focuses on combining an active material and an inactive material. Al-Ni intermetallic compounds offer the advantages of ... sintered ...

The electrolyte is one of the three essential constituents of a Lithium-Ion battery (LiB) in addition to the anode and cathode. During increasingly high power and high current ...

Lithium ion batteries, particularly those incorporating LFP as the cathode material, demonstrate exceptional potential for electric vehicles and renewable energy storage applications. Some of the benefits of LFP over alternative chemistries ...

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