Anode-free solid-state battery

The development of anode-free batteries requires investigations at the electrode and electrolyte levels. Here, the authors report a high-energy quasi-solid-state anode-free ...

Anode-free solid-state lithium batteries are promising for next-generation energy storage systems, especially the mobile sectors, due to their enhanced energy density, improved safety, and extended calendar life.

Researchers unveil the world"s first anode-free sodium solid-state battery, promising cost-effectiveness and environmental benefits.

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Anode-free (or lithium-metal-free) batteries with garnet-type solid-state electrolytes are considered a promising path in the development of safe and high-energy ...

Sulfide-based anode-free solid-state batteries (AFSSBs) have emerged as a transformative technology for next-generation energy storage, offering compelling advantages ...

Taking energy density and safety into account, the anode-free all-solid-state lithium battery is a strong candidate to surpass the capabilities of routine lithium-ion batteries. However, achieving uniform stable lithium metal ...

Combining these characteristics with an anode-free design significantly enhances the battery energy density and safety. Meanwhile, eliminating the Li foil simplifies the battery ...

UChicago Pritzker Molecular Engineering Prof. Y. Shirley Meng"s Laboratory for Energy Storage and Conversion has created the world"s first anode-free sodium solid-state battery. With this research, the LESC - a ...

Scientists explore anode-free solid-state batteries, improving energy density and safety for next-generation energy storage solutions.

Employing Li metal as an anode has been one of the key targets in the rechargeable battery field. However, the chemical and physical properties of Li metal make this a challenge in liquid electrolyte and solid-state batteries. ...

The researchers reported that a sodium anode-free all-solid-state battery full cell has demonstrated stable

cycling for several hundred cycles.

Scientists have created an anode-free sodium solid-state battery. This brings the reality of inexpensive, fast-charging, high-capacity batteries for electric vehicles and grid ...

This Perspective presents a critical overview of the mechanisms governing the behaviour of anode-free solid-state batteries and provides guidance to improve this type of ...

Anode-free solid-state lithium batteries are promising for next-generation energy storage systems, especially the mobile sectors, due to their enhanced energy density, improved safety,...

A team led by Kelsey Hatzell, an associate professor of mechanical and aerospace engineering and the Andlinger Center for Energy and the Environment, has uncovered insights that could ...

This perspective article summarizes recent research trends in anode-less all-solid-state batteries (ALASSBs) based on different types of solid electrolytes and anticipates future directions these ...

In this review, a comprehensive summary of anode-free lithium batteries developed in both liquid and solid-state electrolyte systems, the technical challenges that plague their practical applications, as well as ...

An anode-free all-solid-state battery employing a sulfide-based solid-electrolyte (argyrodite Li 6 PS 5 Cl) with NMC811 cathode delivers an initial CE of 83% at 0.2C, with a ...

"Anode-free" or, more fittingly, metal reservoir-free cells could drastically improve current solid-state battery technology by achieving higher energy density, improving safety and ...

In recent years, anode-free cell configurations have gained attention for their potential to improve the stability of solid-state batteries. Such configurations exclude a lithium ...

Anode-free all-solid-state lithium metal batteries (ASLMBs) promise high energy density and safety but suffer from a low initial Coulombic efficiency and rapid capacity decay, especially at high cathode loadings. Using ...

It opted for an anode-free battery design, which removes the anode and stores the ions on electrochemical deposition of alkali metal directly on the current collector.

Solid-state batteries (SSBs) have been intensively studied due to their high energy density and improved safety for nextgeneration energy storage systems. Anode-free SSBs (AFSSBs) ...

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