Solid-state lithium-sulfur batteries

In this review, the progress on applying various classes of SSEs including gel, solid-state polymer, ceramic, and composite electrolytes to solve the issues of Li-S batteries is summarized.

Flexible solid-state Lithium-sulfur batteries (FSSLSBs) are critical to industrious applications in the area that requires batteries to be low cost, have good mechanical ...

We critically assess the rationale for transitioning from conventional systems to all-solid-state lithium-sulfur batteries, elucidate the electrochemical mechanisms governing ...

Challenges in developing practical all-solid-state lithium-sulfur batteries (ASSLSBs) and recently devised concepts to address those critical challenges have been ...

All-solid-state lithium-sulfur (Li-S) batteries have emerged as one of the most promising alternative energy storage solutions ascribed to their potentials of high energy density, cost-effectiveness, and enhanced safety. ...

Inorganic solid electrolyte-based all-solid-state lithium-sulfur batteries (ASSLSBs) have garnered significant attention due to their inherent safety and higher energy density, making them a promising candidate for the ...

A dilemma arises when striving to balance the maximum desired ion conductivity and minimize the undesired lithium polysulfide shuttling effect for all-solid-state lithium-sulfur batteries (ASSLSBs).

All-solid-state lithium-sulfur batteries (ASSLSBs) are promising next-generation battery technologies with a high energy density and excellent safety. Because of the insulating ...

The different designs between the strategies used for solid polymer electrolyte (SPE)-based lithium-sulfur batteries (LSBs) and those from SPE based Li batteries and liquid electrolyte (LE)-based LSBs caused by the ...

All-solid-state batteries (ASSBs) offer solutions to these challenges. By replacing the liquid electrolyte with a solid electrolyte, an ASSLSBs can fundamentally avoid polysulfide dissolution and the resultant ...

In this review, we have reported some of the latest developments in solid state Li-S batteries, including the quasi-solid-state and all-solid-state batteries.

Abstract All-solid-state lithium-sulfur batteries (ASSLSBs) hold great promise for achieving high energy densities. However, their practical applications are hindered by low sulfur utilization and limited cycle life attributed to the sluggish ...

Solid-state lithium-sulfur batteries

Secondary batteries with high energy density, high specific energy and long cycle life have attracted increasing research attention as required for ground and aerial electric ...

Compared with other secondary batteries, lithium-sulfur batteries (LSBs) have unparalleled advantages such as high energy density, low cost, etc. In liquid LSB systems, it is ...

This paper provides a comprehensive review of recent research progresses on the solid-state electrolytes, sulfur-containing composite cathodes, lithium metal and lithium alloy anodes, and...

By using lithium thioborophosphate iodide glass-phase solid electrolytes in all-solid-state lithium-sulfur batteries, fast solid-solid sulfur redox reaction is demonstrated, ...

Redox mediators (RMs) play a vital role in some liquid electrolyte-based electrochemical energy storage systems. However, the concept of redox mediator in solid-state batteries remains unexplored. Here, we ...

Abstract Lithium-sulfur batteries (LSBs) represent a promising next-generation energy storage system, with advantages such as high specific capacity (1675 mAh g -1), abundant resources, ...

All-solid-state lithium-sulfur batteries (ASSLSBs) are promising next-generation battery technologies with a high energy density and excellent safety. Because of the insulating nature of sulfur/Li2S, conventional cathode ...

Researchers at the University of California San Diego have developed a new cathode material for solid-state lithium-sulfur batteries that significantly improves their electrical ...

Lithium-sulfur all-solid-state batteries using inorganic solid-state electrolytes are considered promising electrochemical energy storage technologies.

A dilemma arises when striving to balance the maximum desired ion conductivity and minimize the undesired lithium polysulfide shuttling effect for all-solid-state lithium-sulfur ...

All solid-state lithium-sulfur batteries (ASSLSBs) are considered to be one of the most promising next-generation energy storage systems, due to the promises of high energy density and ...

Abstract All-solid-state lithium-sulfur batteries (ASSLSBs) have attracted intense interest due to their high theoretical energy density and intrinsic safety. However, constructing durable lithium ...

All-solid-state lithium-sulfur batteries (ASSLSBs) hold great promise for achieving high energy densities. However, their practical applications are hindered by low sulfur utilization and limited cycle life attributed to the sluggish sulfur reaction ...

This review aims to provide an overview of solid-state electrolytes (gels, solid-state polymers, ceramics, and composite electrolytes) for addressing the major drawbacks of Li-S batteries, including the lithium ...

Lithium-sulfur (Li-S) all-solid-state batteries (ASSBs) hold great promise for next-generation safe, durable and energy-dense battery technology. However, solid-state sulfur conversion ...

ConspectusThe energy density of the ubiquitous lithium-ion batteries is rapidly approaching its theoretical limit. To go beyond, a promising strategy is the replacement of ...

All-solid-state lithium-sulfur batteries (ASSLSBs) hold great promise for achieving high energy densities. However, their practical applications are hindered by low sulfur utilization and limited ...

The development of all-solid-state lithium-sulfur batteries offers higher specific energies and lower costs compared to state-of-the-art Li-ion batteries. However, a lack of mechanistic understanding hinders advancement. ...

All-solid-state lithium-sulfur battery (ASLSB) is deemed a promising next-generation energy storage device owing to its combination of high theoretical specific energy ...

The lithium-sulfur (Li-S) battery has long been a research hotspot due to its high theoretical specific capacity, low cost, and nontoxicity. However, there are still some challenges impeding the Li-S battery from ...

Abstract Rechargeable lithium-sulfur (Li-S) batteries are one of the most promising next-generation energy storage systems due to their extremely high energy densities and low cost compared with state-of-the-art lithium-ion ...