# Contact resistance in solid state batteries

Do interfacial contact areas drive the impedance rise in solid-state batteries?
The development of solid-state batteries (SSBs) is hindered by degradation at solid-solid interfaces due to void formation and contact loss, resulting in increased impedance. We systematically investigate the roles of real and unrecoverable interfacial contact areas at the electrode/Li 6 PS 5 Cl interface in driving the impedance rise.

Why do solid-state batteries have a high impedance?
The development of solid-state batteries (SSBs) is hindered by degradation at solid-solid interfaces due to void formation and contact loss,resulting in increased impedance. We systematically inve...

How can a solid-state Li-s battery be interfacial?
In the solid-state Li-S batteries, it is feasible to achieve intimate interfacial contact by either directly casting sulfur-based slurry on the SSEs pellet or applying SSEs slurry on the sulfur cathode.

Does pressure affect Li metal solid-state battery resistance?
We hypothesized that pressureand temp. affect Li metal solid-state battery (LMSB) resistance and susceptibility to Li metal penetration during cycling. To validate this,the kinetics and stability of the Li-solid electrolyte interface was studied using the model polymer electrolyte system: Li/Polyethylene oxide-LiTFSI (PEO-LiTFSI).

What causes large interfacial resistance in sulfide electrolytes based all-solid-state lithium batteries?
Large interfacial resistance resulting from interfacial reactions is widely acknowledged as one of the main challenges in sulfide electrolytes (SEs)-based all-solid-state lithium batteries (ASSLBs). However, the root cause of the large interfacial resistance between the SEs and typical layered oxide cathodes is not fully understood yet.

Can a solid-state Li-s battery be substituted with solid- state electrolytes?
Substitution of liq. electrolytes with solid-state electrolytes (SSEs) is an effective strategyto relieve or even solve these problems. This review focuses on the most crucial issues of the solid-state Li-S battery (SSLSB) and exhibits the recent progress in these fields.

Graphical abstract Electrochemical impedance spectroscopies of different solid-solid contact states in all-solid-state lithium batteries are simulated through finite element ...

In this review, we focus on the experimental strategies employed to enhance the interfacial contact between SSEs and electrodes, and summarize recent progresses of their ...

Solid-state batteries (SSBs) could offer improved energy density and safety, but the evolution and degradation

of electrode materials and interfaces within SSBs are distinct ...

Summary Polymer coatings and high mechanical pressure are promising solutions for improving interfacial contact in all-solid-state lithium metal batteries. However, ...

1. Preface All solid-state Battery (ASSB) are the most promising next-generation energy storage systems due to their high theoretical energy density and intrinsic safety. ...

Abstract Oxide solid-state electrolytes (OSEs) with high ionic conductivity, wide electrochemical window and inherent safety are critical to achieve high-energy-density and ...

Pieces of the puzzle: A solid electrolyte is a crucial component in all-solid-state lithium batteries. This Review summarizes multiple effective strategies to reduce the interfacial resistance between oxide-based ceramic ...

To address the challenge of interfacial contact between the solid electrolyte and electrode with a cost-efficient solution, we demonstrate a novel cathode-supported solid electrolyte membrane ...

This Review summarizes multiple effective strategies to reduce the interfacial resistance between oxide-based ceramic electrolytes and electrodes from the perspective of the transition layer, constituents of the ...

All-solid-state lithium metal batteries (ASSLIBs) are emerging as promising candidates for next-generation energy storage devices due to their high energy density and ...

The development of solid-state batteries (SSBs) is hindered by degradation at solid-solid interfaces due to void formation and contact loss, resulting in increased impedance.

The model can be used to predict the resistance of our contact mechanics model with different stack pressures and content ratios, and the result can be taken as a reference for ...

We simulate primary current distribution inside a solid-state electrolyte--separator that has contact loss with the lithium metal negative electrode. From the ...

This study systematically investigates the interfacial contact coefficient and its impact on electrochemical performance in solid-state batteries under varying pressure ...

In addition, the high ionic conductivity and the stable interface of the modified LAGP solid electrolyte enable the solid-state lithium battery with a LiFePO 4 cathode, ...

Our simulations predict interfacial resistances of the contact geometries in agreement with experiments. Our work emphasizes the distinct roles of unrecoverable and ...

# Contact resistance in solid state batteries

All-solid-state lithium batteries (ASSLBs) are strongly considered as the next-generation energy storage devices for their high energy density and intrinsic safety. The solid-solid contact ...

With the assistance of an equivalent circuit model and distribution of relaxation times, it is discovered that as the number of voids and the sharpness of cracks increase, the ...

Using primary current distribution, we have provided metrics that quantify effects of contact loss between lithium metal negative electrode and solid electrolyte separator on ...

Interface resistance has become a significant bottleneck for solid-state batteries (SSBs). Most studies of interface resistance have focused on extrinsic such as interface ...

1. Preface All solid-state Battery (ASSB) are the most promising next-generation energy storage systems due to their high theoretical energy density and intrinsic safety. However, the limitation of the "solid-solid" contact ...

The development of solid-state batteries (SSBs) is hindered by degradation at solid-solid interfaces due to void formation and contact loss, resulting in increased impedance. ...

This study examines and compares the impact of various interfacial modification strategies in optimizing the contact resistance between the rigid ceramic electrolyte and ...

The formation of a solid-solid interface plays a crucial role in tuning the electrochemical properties of solid-state batteries. The complex electrochemical behavior that ...

Solid-state batteries (SSBs) could offer improved energy density and safety, but the evolution and degradation of electrode materials and interfaces within SSBs are distinct from conventional batteries with liquid ...

Solid-state lithium-ion batteries (SSBs) have gained widespread attention due to their enhanced safety and energy density over conventional liquid electrolyte systems. ...

The induced strain distributions in the LiBH4 -LiNH 2 based all solid-state battery are measured using a combination of in-situ optical microscopy and digital image ...

All-solid-state batteries (ASSBs) based on inorganic solid electrolytes promise improved safety, higher energy density, longer cycle life, and lower cost than conventional Li-ion batteries. However, their practical ...

The development of solid-state batteries (SSBs) is hindered by degradation at solid-solid interfaces due to void formation and contact loss, resulting in increased impedance.

All-solid-state batteries (ASSBs) are being actively researched worldwide as promising next-generation

alternatives to lithium-ion batteries (LIBs). To further enhance the performance of ...

Interface resistance has become a significant bottleneck for solid-state batteries (SSBs). Most studies of interface resistance have focused on extrinsic mechanisms such as ...

In 2021, SES demonstrated a solid state battery, Apollo, with 107 Ah capacity and 417 Wh/kg energy density. Toyota has filed 203 solid state battery patents in the United States through 2021, the most of any company. ...

This Review summarizes multiple effective strategies to reduce the interfacial resistance between oxide-based ceramic electrolytes and electrodes from the perspective of ...

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