Effect of low temperature on electrochemical energy storage

Here, based on a novel porous-microspherical yttrium niobate (Y 0.5 Nb 24.5 O 62) model material, this work demonstrates that the operation temperature plays vital roles in electrolyte decomposition on ...

At low temperatures (<0 °C), decrease in energy storage capacity and power can have a significant impact on applications such as electric vehicles, unmanned aircraft, spacecraft and ...

Aqueous zinc-based batteries have garnered the attention of the electrochemical energy storage community, but they suffer from electrolytes freezing and sluggish kinetics in cold...

Advanced electrolyte design and feasible electrode engineering to achieve desirable performance at low temperatures are crucial for the practical application of rechargeable batteries.

Sluggish ion transport or the freezing of electrolytes at the electrode-electrolyte interface are the primary factors that limit the performance of EES under low temperatures, leading to fading of ...

Lithium-ion batteries (LIBs), while dominant in energy storage due to high energy density and cycling stability, suffer from severe capacity decay, rate capability degradation, and lithium ...

In this review, we provide an overview of the limiting factors faced by electrodes and discuss various strategies developed to enhance their performance in low-temperature environments.

Low-temperature environments have slowed down the use of LIBs by significantly deteriorating their normal performance. This review aims to resolve this issue by clarifying the ...

To account for the reduction in battery performance, a kinetic model based on the classical Arrhenius model is proposed, which introduces the temperature dependence of the ...

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In this perspective, we focus on the recent advances in low-temperature electrolytes for supercapacitors. We first introduce the critical physical parameters for evaluating low-temperature ...

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