

The role of the electrode in flow batteries





Overview

The porous structure of the electrodes in redox flow batteries (RFBs) plays a critical role in their performance. We develop a framework for understanding the coupled transport and reaction processes in elec.

How do electrodes affect redox flow batteries?

Electrodes, which offer sites for mass transfer and redox reactions, play a crucial role in determining the energy efficiencies and power densities of redox flow batteries.

What is a battery electrode & why is it important?

Electrodes are a key component where coupled electrochemical reactions and mass transport take place, and they play a critical role in determining the battery performance and system cost.

What is a flow battery?

A flow battery is an electrochemical energy storage system that stores energy in liquid electrolyte solutions. Unlike conventional batteries, which store energy in solid electrodes, flow batteries rely on chemical reactions occurring between the liquids stored in external tanks and circulated through the battery's electrochemical cell.

What physics is involved in the flow battery electrode at the cathode side?

The physics involved in the flow battery electrode at the cathode side are advection-diffusion of bromine, conduction of protons/electrons, and reaction of bromine and protons at the internal surface of the electrode. We also assume that the electrolyte is dilute enough and therefore, species transport does not affect the flow field.



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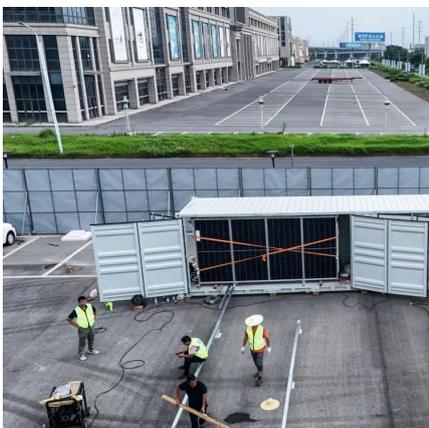
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