FTMRS SOLAR

Vanadium flow battery adapts to temperature

Overview

Does electrolyte viscosity affect the performance of vanadium flow batteries?

Abstract: The performance of vanadium flow batteries (VRFB) can be severely reduced when operating at low temperatures due to changing electrolyte properties. In this work, we develop a non-isothermal model of VRFB dynamics that takes into account changes in electrolyte viscosity depending on temperature.

Can a vanadium redox flow battery predict low temperatures?

In this paper, we present a physics-based electrochemical model of a vanadium redox flow battery that allows temperature-related corrections to be incorporated at a fundamental level, thereby extending its prediction capability to low temperatures.

Are vanadium flow batteries a viable solution to a high thermal precipitation problem?

Vanadium flow batteries (VFB) offer an ideal solution to the issue of storing massive amounts of electricity produced from intermittent renewables. However, the historical challenge of high thermal precipitation of V 2 O 5 from VO 2+ (~50 °C for 1 day) represents a critical concern.

What is the operational temperature of vanadium electrolyte?

The operational temperature of vanadium electrolyte was extended to -5~45 °C. Electrochemical characterization confirmed that WTR-electrolyte has comparable performance to the conventional electrolyte at 100 mA cm −2, while not sacrificing performance.

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