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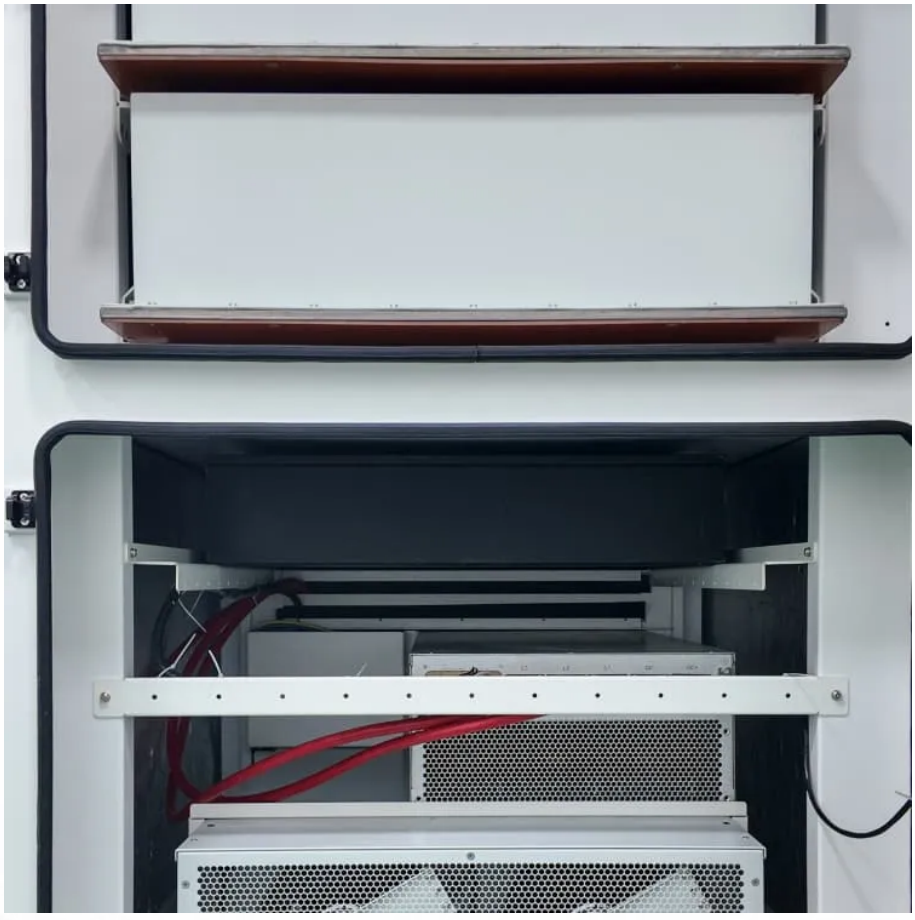
A-Core Container

Flow Battery Solubility



Overview

The fundamental difference between conventional and flow batteries is that energy is stored in the electrode material in conventional batteries, while in flow batteries it is stored in the electrolyte.

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In this paper, a new approach is proposed to surpass the solubility limit by manipulating the solvation structure with polycomplex ion additives (PIA).

We show how the appearance of new polymorphs can cause unexpectedly huge changes in solubility, what methods can be applied to avoid the formation of these densely packed crystals that will lead to low solubility, and how to obtain structures with better solubility.

Incorporating phosphorus into sodium-sulfur catholytes enhances their stability and solubility, increasing the volumetric capacity and making Na-P-S catholytes a promising, cost-effective alternative for high-energy redox flow batteries.

We demonstrate the potential utility and applicability of this high-throughput process by measuring the aqueous and non-aqueous solubilities of redox-active materials and studying the effect of additives on their solubilities for both aqueous and non-aqueous redox flow battery applications.

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