



Hydroxynaphthoquinone flow battery





Overview

Quino Energy has developed a process that converts quinone raw materials – dyestuff chemicals – directly into high-performance, long lifetime quinones using the flow battery system itself as the production reactor.

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Among the various emerging technologies, aqueous organic redox flow batteries be achieved thanks to the possibilities offered by molecular engineering. While anthraquinones have been widely explored as negolyte, few works report the use of naphthoquinones. This of water-soluble naphthoquinones for.

les with many desired proper-ties. Here we introduce a naphthoquinone dimer, bislawsone, as the redox-active material in a negative potential e ectrolyte (negolyte) for an AORFB. This dimerization strategy substantially improves the perform-ance of the electrolyte versus that of the lawsone monomer.

We introduce an aqueous flow battery based on low-cost, non-flammable, non-corrosive and Earth-abundant elements. During charging, electrons are stored in a concentrated water solution of 2,5-dihydroxy-1,4-benzoquinone (DHBQ), which rapidly receives electrons with inexpensive carbon electrodes.

Quino Energy’s water-based organic redox flow batteries are enabled by a number of technological breakthroughs, some of which were first discovered at Harvard University and later licensed by Quino Energy. Quinones are redox-active molecules that can be easily converted between a reduced.

(a)Cyclic voltammograms of $5 \times 10^{-3}M$ 2,3-HButCNQ in 1 M KOH at different scan rates (b)Peak current vssquare root of scan rate (c)Current-voltage curves of $5 \times 10^{-3}M$ 2,3-HButCNQin 1 M KOH at a gold rotating disk electrode with different rotation speeds (d) Koutecky-Levich and (e)Tafel plots from. What is alkaline benzoquinone aqueous flow battery?

Alkaline benzoquinone aqueous flow battery for large-scale storage of electrical energy Renewable-lawsone-based sustainable and high-voltage aqueous flow



battery Organic redox species in aqueous flow batteries: redox potentials, chemical stability and solubility.

Are aqueous organic redox flow batteries safe?

In contrast, aqueous organic redox flow batteries (AORFBs) can be safely operated, and the operation in high current density is possible.

Can Quinones be used as flow battery reactants?

Some quinones have high water solubility and high chemical stability, which make them ideal for use as flow battery reactants. Organic molecules such as quinones are cheap and can effectively store electricity, but tend to decompose over time, thereby constraining the useful system lifetime.

How does Quino energy rebalance redox flow batteries?

Quino Energy has developed a simple technique for rebalancing redox flow batteries and counteracting the effect of atmospheric oxygen while avoiding any long-term water transport issues. This enables Quino's flow batteries to be operated without any supplemental supply of inert gas, thereby lowering costs and improving system reliability.



Hydroxynaphthoquinone flow battery



Technology

Quino Energy has developed a process that converts quinone raw materials - dyestuff chemicals - directly into high-performance, long lifetime ...

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Aqueous organic redox flow batteries using naphthoquinone and ...

In this study, 2-hydroxy-1,4-naphthoquinone (NQ-OH) and potassium iodide (KI) are utilized as active materials for aqueous organic redox flow battery (AORFB).

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Technology

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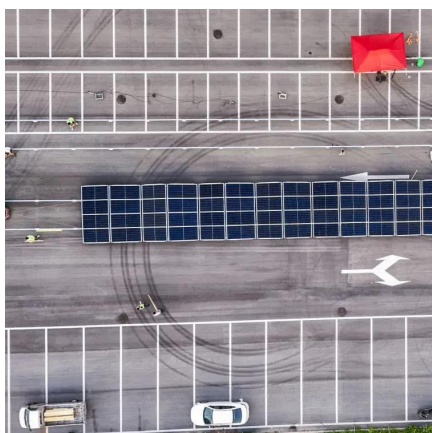
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We introduce an aqueous flow battery based on low-cost, non-flammable, non-corrosive and Earth-abundant elements. During charging, electrons are stored in a concentrated water ...

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[Efficient in Situ One-Pot Synthesis of Water-Soluble](#)

This work aims to exploit an innovative in situ and cost-effective method for the one-pot synthesis of water-soluble naphthoquinones for application as a negolyte in redox flow ...

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[Flow Batteries Soluble Hydroxynaphthoquinones for Redox ...](#)

S1 Supporting Information Efficient In Situ One-Pot Synthesis of Water-Soluble Hydroxynaphthoquinones for Redox Flow Batteries Patricia Bassil, Didier Floner*, Solène ...

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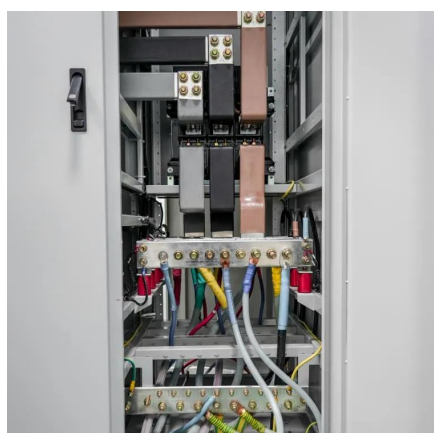
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Interestingly, the synthesis is performed directly in the battery cell with the electrolyte medium for AORFB for both electrolytes, avoiding laborious purification procedures.

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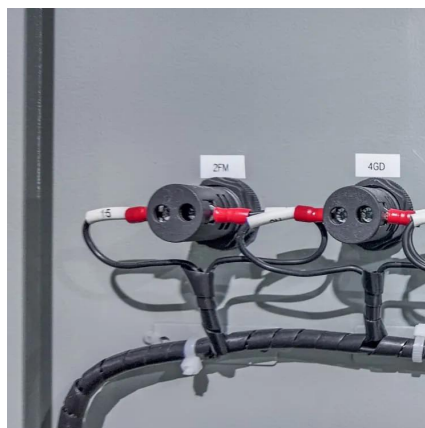


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[Quinone and hydroquinone based flow battery](#)

The invention provides an electrochemical cell based on a new chemistry for a flow battery for large scale, e.g., gridscale, electrical energy storage. Electrical energy is stored ...

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Naphthoquinone Flow Battery Letter

hraquinone flow battery molecules. One molecule, with a two-carbon linkage between the lawsone units, and 4 total functionalizations (of the -OCCCOOH type) is predicted to be both more ...

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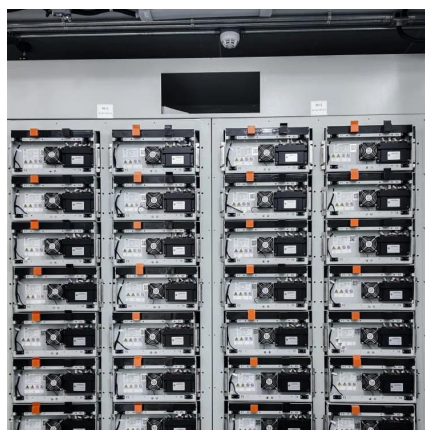
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Alkaline aqueous organic redox flow batteries of high energy and ...

Mixture of 1,2-naphthoquinone-4-sulfonic acid sodium salt (NQ-S) and 2-hydroxy-1,4-naphthoquinone (Lawsone) is used as negative active species for aqueous organic redox ...

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[Efficient in Situ One-Pot Synthesis of](#)



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This work aims to exploit an innovative in situ and cost-effective method for the one-pot synthesis of water-soluble naphthoquinones for application as a negolyte in redox flow ...

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