

SolarTech Power Solutions

Reverse Flow Battery



Overview

- Flow battery based on the neutralization of an acid and a base by reverse electrodialysis with bipolar membranes.

Is a flow battery a good alternative to a redox battery?

A flow battery based on the neutralization of acids and bases in an electrodialysis process with bipolar membranes is an interesting alternative to the redox battery. The main advantage of this concept is that the electrolytes to be used in the process such as HCl, NaOH and NaCl are abundant and inexpensive.

What is a flow battery?

Conclusions The decisive element of the flow battery concept presented is the bipolar membrane, where a conversion between electrical and chemical energy takes place. This is the main difference from most other flow batteries, where the chemical energy is transformed in the electrode reactions.

What is the reversal of a battery?

The reversal of this process represents the discharge of the battery with the generation of electricity from the electrodialytical neutralization of acid and base in the bipolar membrane (upper half of Fig. 1). Fig. 1.

What are the problems affecting flow batteries?

Issues plaguing flow batteries are low energy density, high overall cost, poor stability of electrolytes, shifting of solvent from anolyte to catholyte while using cation exchange membrane, reverse flow with anion exchange membrane, and corrosion of graphite felt in the catholyte side.

How can a battery prevent reversal?

In general, these batteries offer no mechanical means for preventing the reversal of one or more cells. For these systems, a designer must ensure that any flow of reverse current is low enough to avoid damaging the circuit or the battery. A variety of circuits can provide this assurance.

What is battery reversal protection?

A variety of circuits can provide this assurance. The simplest form of battery-reversal protection is a diode in series with the positive supply line (Figure 1a). The diode allows current from a correctly installed battery to flow to the load and blocks current flow to a backward-installed battery.

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