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Price of seawater desalination energy storage batteries

Overview

Can rechargeable seawater batteries be desalinated simultaneously?

Due to the unique structure, containing both aqueous (seawater) electrolyte and organic electrolyte, it is easy to implement simultaneous water desalination and energy storage if the system of rechargeable seawater batteries is modified. In 2018, Zhang et al. proposed a rechargeable seawater battery desalination system.

What is seawater battery desalination (SWB-D)?

Seawater battery desalination (SWB-D) uses rechargeable seawater battery (SWB) to save energy used during seawater desalination.

How much does seawater desalination cost?

The cost of seawater desalination ranges between $5 and $10 per 1,000 gallons. This means that the cost per gallon of seawater desalination is approximately $0.005 to $0.01.

Can seawater batteries be used for energy storage and water desalination?

Dual-use of seawater batteries for energy storage and water desalination Small, 18 (2022), Article e2107913, 10.1002/smll.202107913 Highly improved voltage efficiency of seawater battery by use of chloride ion capturing electrode J. Power Sources, 313 (2016), pp. 46 - 50, 10.1016/j.jpowsour.2016.02.060.

How much energy does seawater battery desalination consume?

The energy consumption of seawater batteries desalination depends on the amount of removed salt. The removal of 9% of all salt ions corresponded with an energy consumption of 4.7 kWh m −3. The energy consumption increased to 53.9 kWh m −3 when the salt removal increased to ≈75%.

What is a seawater battery?

A seawater battery basically consists of an anode in an organic electrolyte and a seawater cathode with a current collector. This design allows its use both as an energy storage system and for water desalination (Figure 1).

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