Title: Membrane solar power generation device
Generated on: 2026-04-29 18:42:53

Can integrated solar PV panel-membrane distillation produce fresh water and electricity?
In this work, we report a strategy for simultaneous production of fresh water and electricity by an integrated solar PV panel-membrane distillation (PV-MD) device in which a PV panel is employed as both photovoltaic component for electricity generation and photothermal component for clean water production.

Can solar-driven multistage membrane distillation improve clean water productivity?
Very recently, solar-driven multistage membrane distillation (MSMD) devices have been reported with a much higher clean water productivity, 3 kg m -2 h -1 in a 10-stage device under one Sun illumination, by recycling the latent heat released during vapor condensation in each stage as the heat source for the next stage 27, 28.

How does a floating solar panel integrate with a five-stage membrane distillation device?
Herein, we present a groundbreaking integration concept that combines a floating solar panel with a five-stage membrane distillation (MD) device, enabling simultaneous clean water and electricity generation on water surfaces.

What is solar-driven interfacial water-electricity cogeneration?
Since Xue et al. first proposed electricity generation induced by a water evaporation process based on a hydrovoltaic effect, solar-driven interfacial water-electricity cogeneration has emerged as a promising solar energy utilization technology for clean water and energy collection [4, 5, 6].

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To overcome these challenges, we have intelligently assembled different functional components to form a multistage assembled laminar membrane used for interfacial solar-driven ...

Here the authors develop a membrane-distillation device that exploits sunlight and the heat dissipated by an integrated solar cell unit, enabling simultaneous efficient production of...

Importantly, a rational integration of water evaporation and waste solar heat utilization for thermoelectric power generation is presented. The integrated device produces an open-circuit ...

Outdoor tests show that the device realizes simultaneously freshwater production (8.6 L m -2 day -1) and stable voltage generation (107.4 mV), which provides an innovative approach to ...

This study provides new methods for the scalable fabrication of ionic power generation membranes and a design strategy for high-performance solar power generators.

In this study, we propose modifying MXene with cetyltrimethylammonium bromide (CTAB) to increase the interlayer spacing and surface roughness, thereby significantly enhancing the ...

Here, we demonstrate a photovoltaics-membrane distillation (PV-MD) device that can stably produce clean water (>1.64 kg·m -2 ·h -1) from seawater while simultaneously having uncompromised ...

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