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Flower-like Porous Structure for Solar Thermal Distillation and Brine Treatment

Monday, 30 May 2022 14:10 (15 minutes)

Conventional desalination processes generate a flow of clean water and almost equivalent volume of excessively saline brine solution, which is harmful to the aquatic life. In order to mitigate environmental concerns, innovative solar thermal distillation technology are expected to produce freshwater without brine rejection. Herein, we have fabricated scalable petals-like porous structure for solar vapor generation and brine treatment with zero liquid discharge that is driven by localized heating and interfacial evaporation. The proposed porous structure shows an excellent wicking performance while having good light absorptivity. Under one-sun irradiance, our device is able to obtain a stable evaporation rate when dealing with synthetic seawater with a salinity of 3.5 wt%. The proposed solar evaporator can also achieve directional salt precipitation by controlling the surface wettability of the porous structure. The device is currently under evaluation with real concentrated brine (24 wt%) to attain cost-effective and eco-friendly solar thermal brine treatment.

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References

Time Block Preference

Time Block A (09:00-12:00 CET)

Participation

In person

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