

## Supporting Information

# An elaborate balance between water transport and heat localization: phoenix-tail skirt inspired solar evaporator

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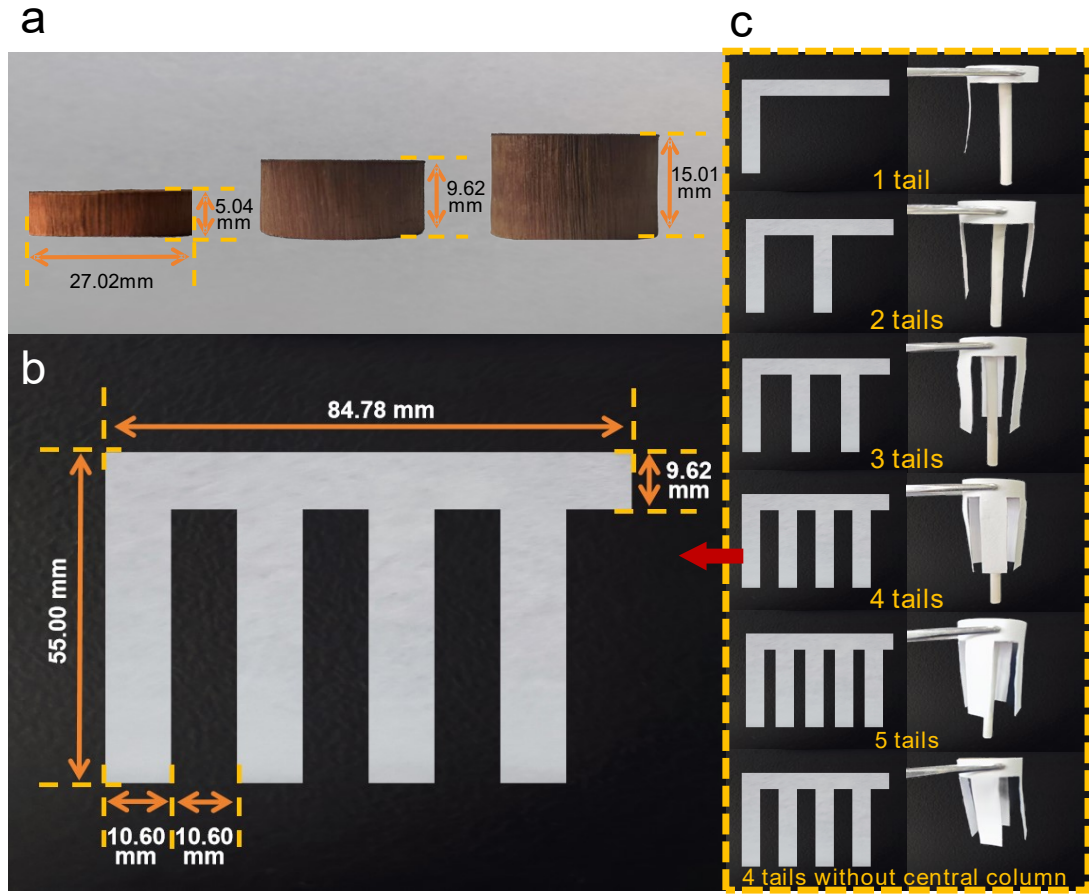
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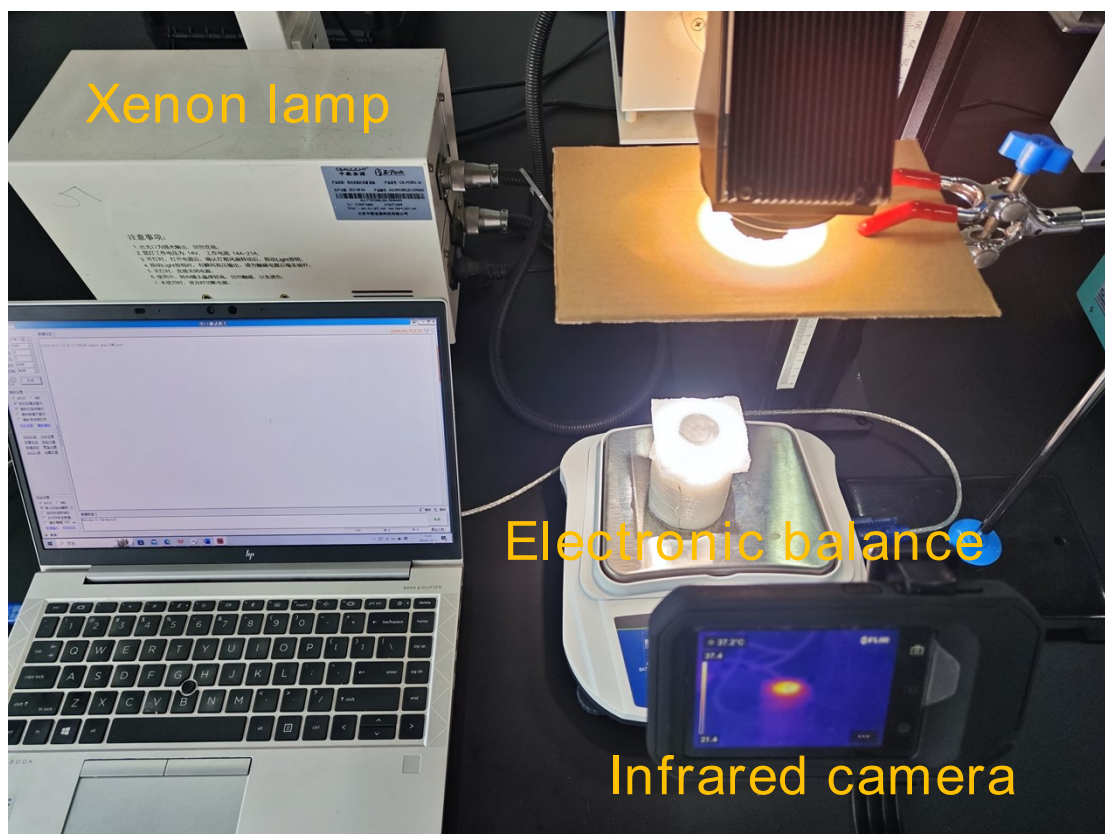
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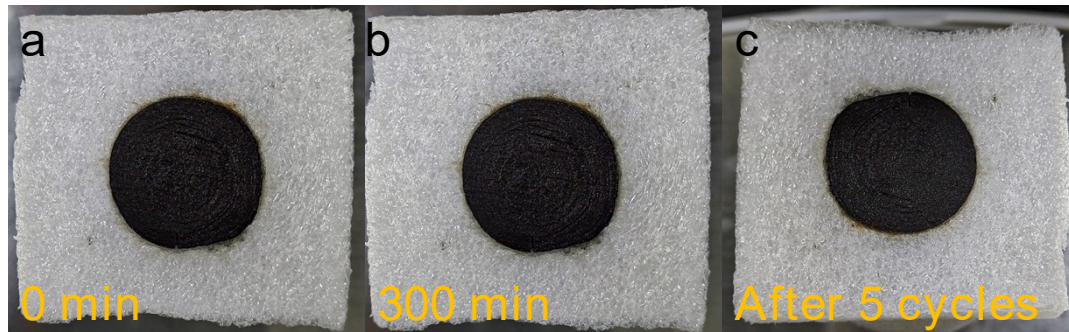
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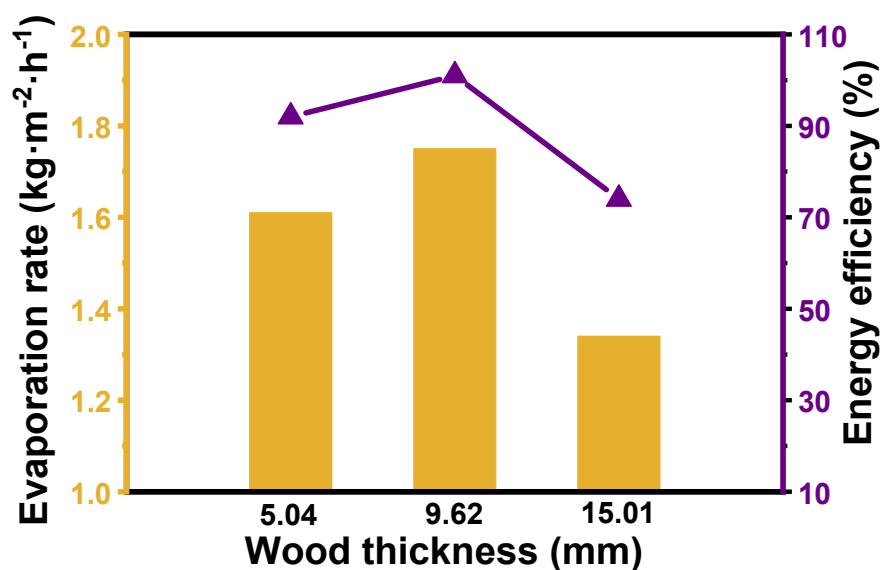
**Fig. S1.** Digital photos of (a) Nb<sub>4</sub>N<sub>5</sub>-CW with different thicknesses. (b) air-laid paper with the four-tail structure, and (c) Nb<sub>4</sub>N<sub>5</sub>-based phoenix-tail skirt-like evaporators with different structures.



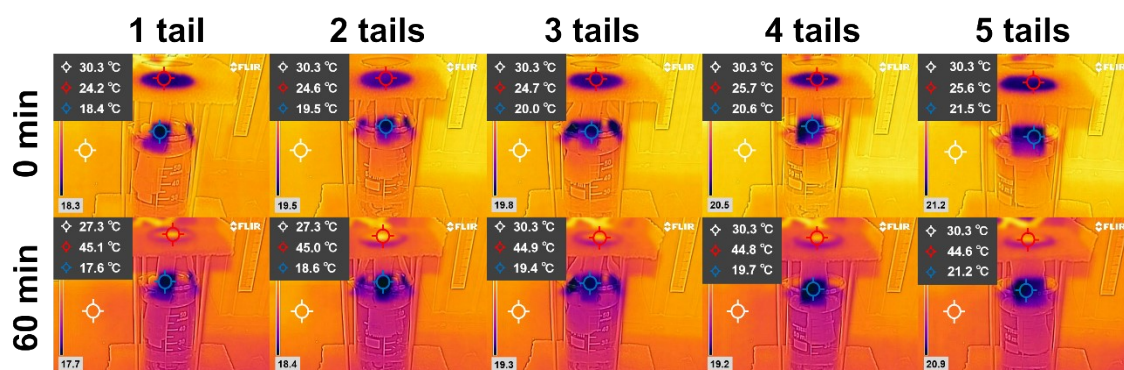
**Fig. S2.** Photo of the solar interfacial water evaporation system.



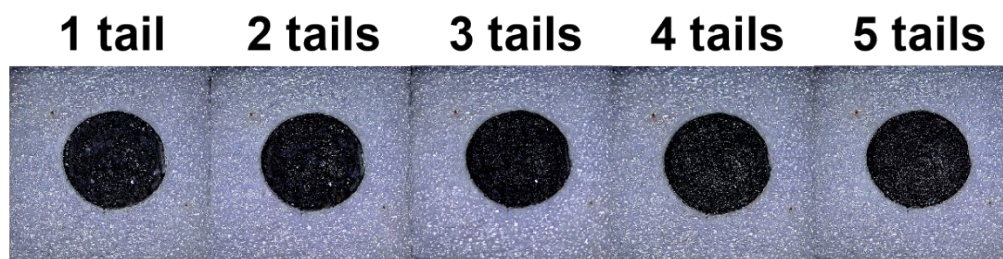
**Fig. S3.** Photos of the evaporator surface showing the absence of salt accumulation. (a) Before the evaporation test. (b) After the 5-h evaporation test. (c) After the cyclic test.



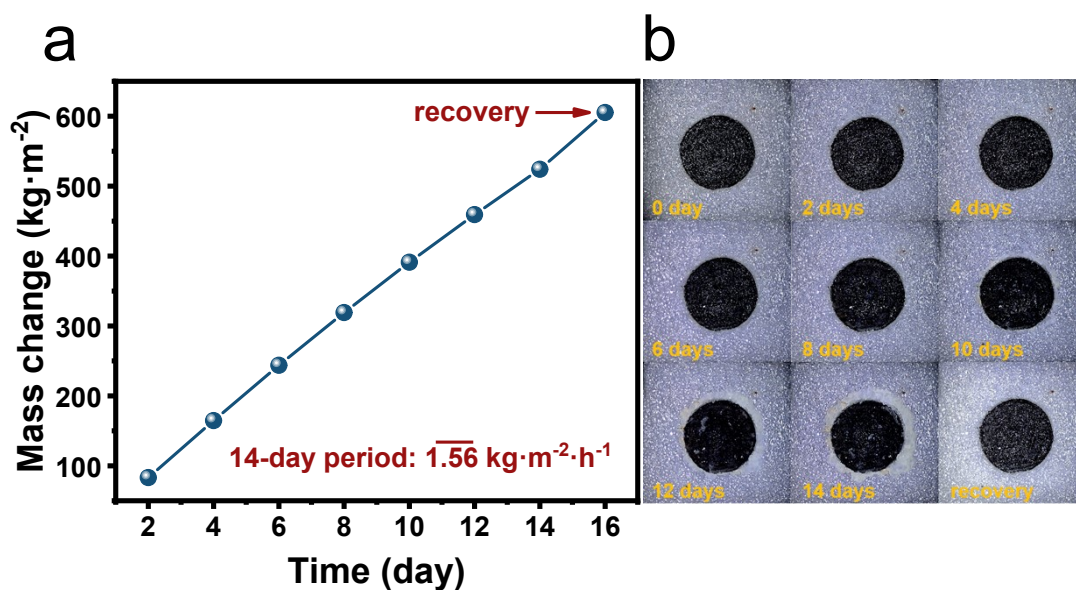
**Fig. S4.** Evaporation performances of artificial seawater (3.5 wt% NaCl) under 1.0 sun irradiation over the evaporators with different thicknesses.



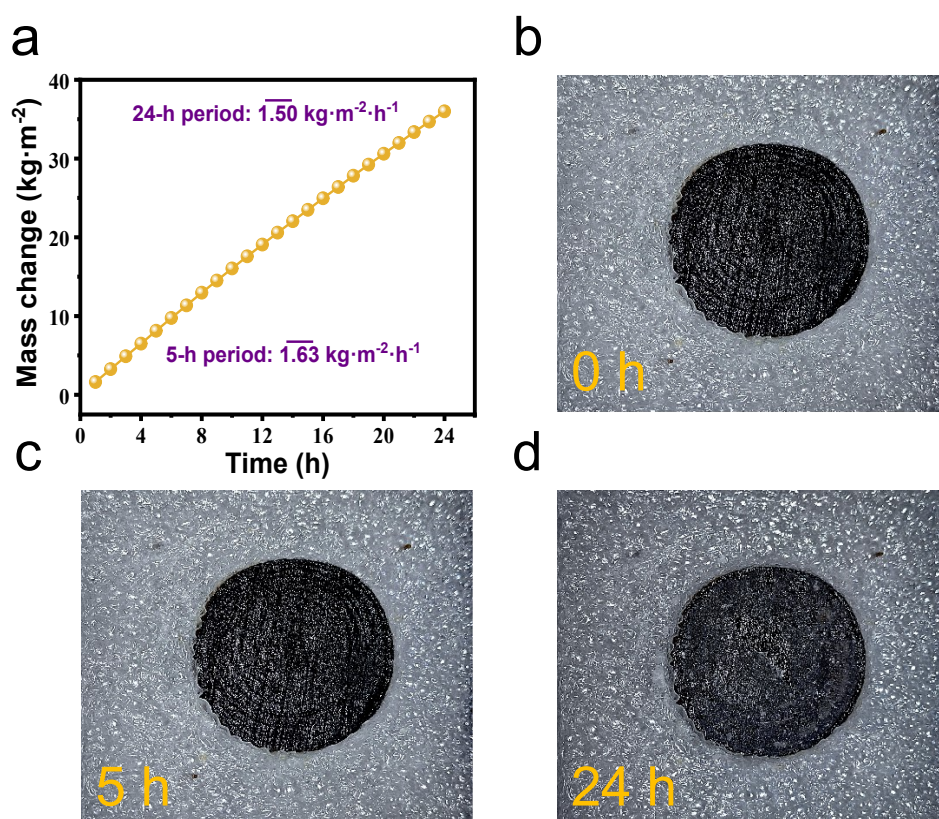
**Fig. S5.** The temperature distributions of evaporators with 1, 2, 3, 4, 5 tails respectively and a central column before irradiation and after 1.0 sun irradiation for 1 h.



**Fig. S6.** Photos of the top surfaces of evaporators with different tail numbers, respectively, after the same 24-h evaporation.



**Fig. S7.** A two-week evaporation performance test of 3.5 wt% NaCl solution over the Nb<sub>4</sub>N<sub>5</sub>-based phoenix-tail skirt-like evaporator with 4 tails and a central column under 1.0 sun irradiation. (a) Mass changes. (b) Salt precipitation situations.



**Fig. S8.** Water evaporation test of 10 wt% NaCl solution over the Nb<sub>4</sub>N<sub>5</sub>-based phoenix-tail skirt-like evaporator with 4 tails and a central column under 1.0 sun irradiation. (a) Mass change during the 24-h evaporation. (b-d) Salt precipitation situations before the evaporation, after the 5-h evaporation, after the 24-h evaporation.