Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

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Supporting Information

3D-printed integrated MXene-based evaporator with vertical array structure for salt-resistant solar desalination†

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Table of contents

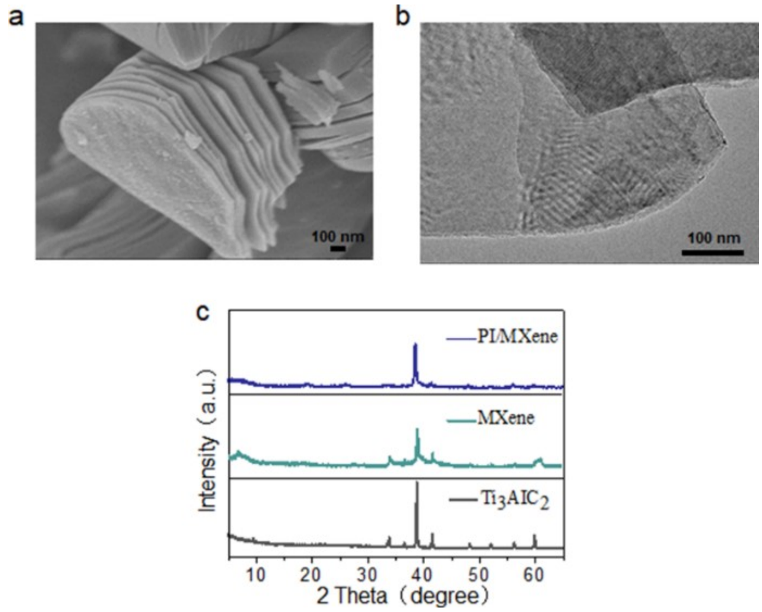

Fig. S1. a) SEM image of multi-layered MXene. b) TEM image of few-layered MXene. c) XRD patterns of Ti_3AlC_2, MXene, and PI/MXene.

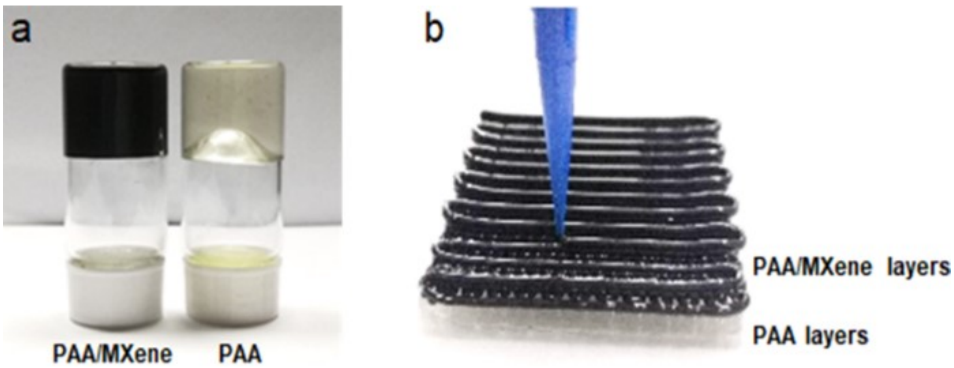

Fig. S2. a) Digital image of PAA/MXene and PAA inks. b) Digital image of 3D printing process.

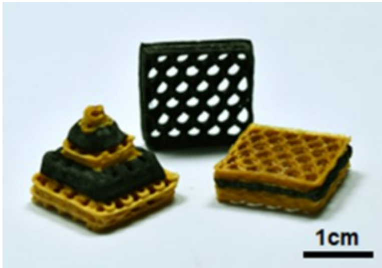

Fig. S3. PI/PIM aerogels with different macrostructure: pyramid and honeycomb.

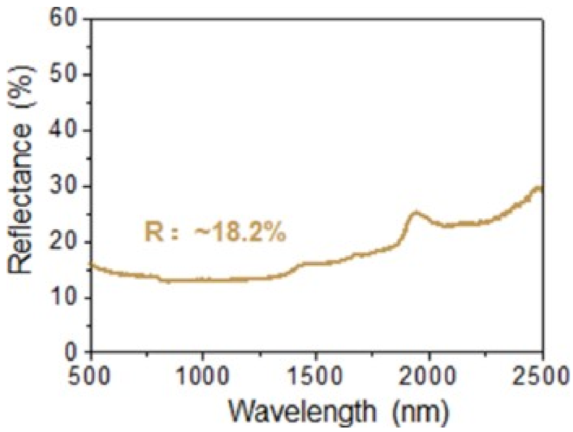

Fig. S4. The reflectance spectra of PIM aerogel with arrayless structure.

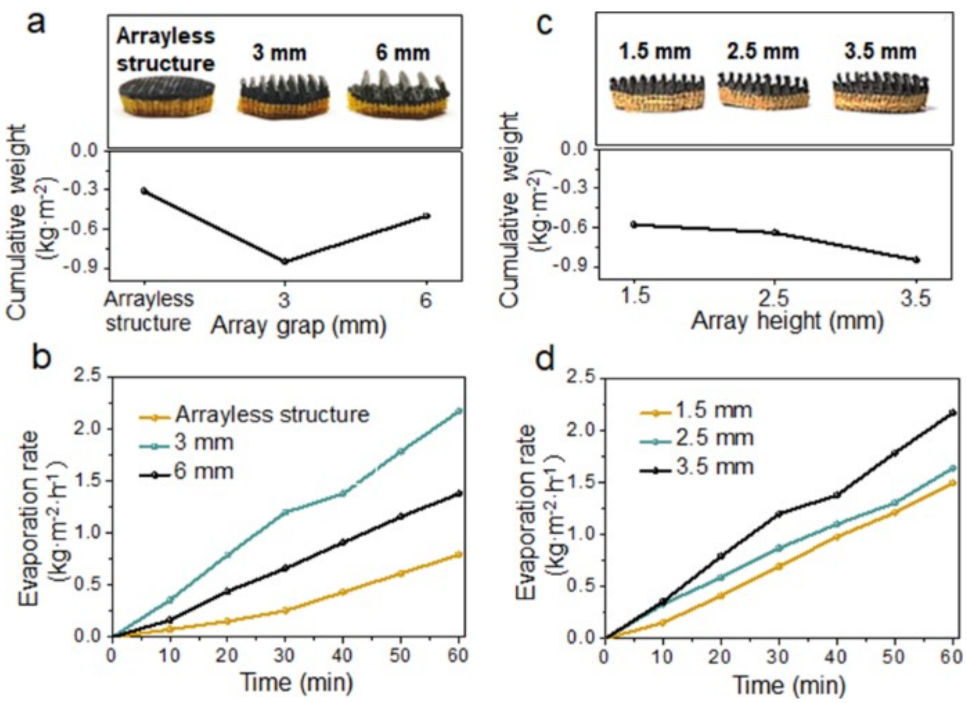

Fig. S5 (a) The cumulative weight loss and (b) the water evaporation rates of 3D evaporator with different array gaps under 1 sun illumination. (c) The cumulative weight loss and (d) the water evaporation rates of 3D evaporator with different array heights under 1 sun illumination.

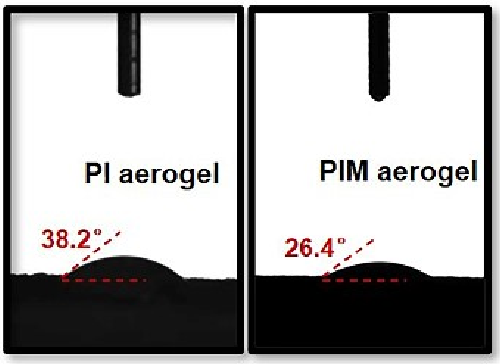

Fig. S6. The surface contact angle of PI and PIM aerogel in simulated seawater (NaCl solution, 20wt%) after surface plasma treatment.

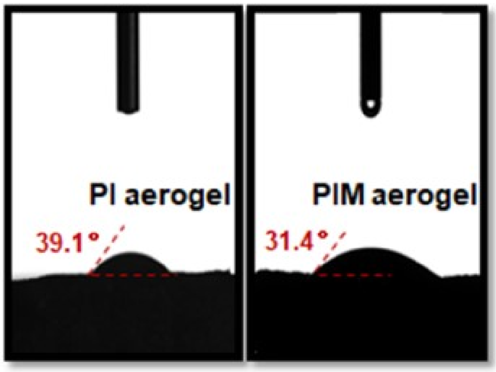

Fig. S7. The surface contact angle of PI and PIM aerogel in dyed water after surface plasma treatment.

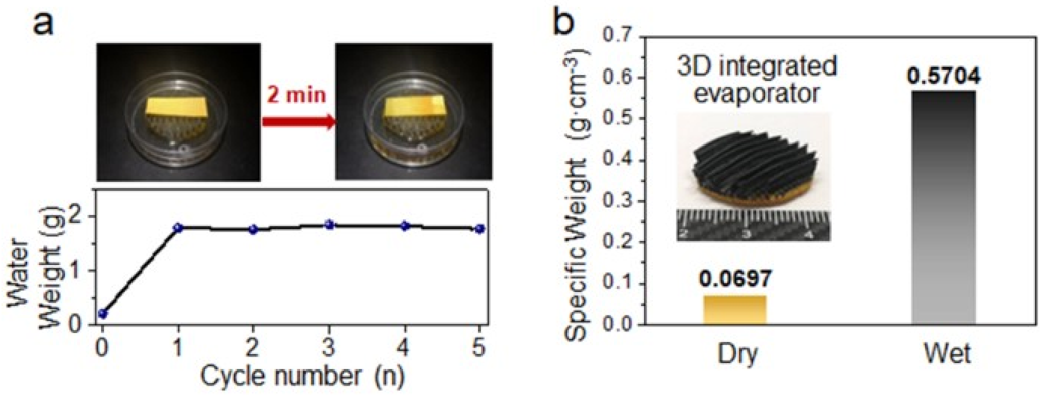

Fig. S8. a) Digital image of the 3D integrated evaporator adsorbing water and the weight change of the evaporator after water adsorption. b) Specific weight change of the 3D integrated evaporator when it is fully saturated with water.

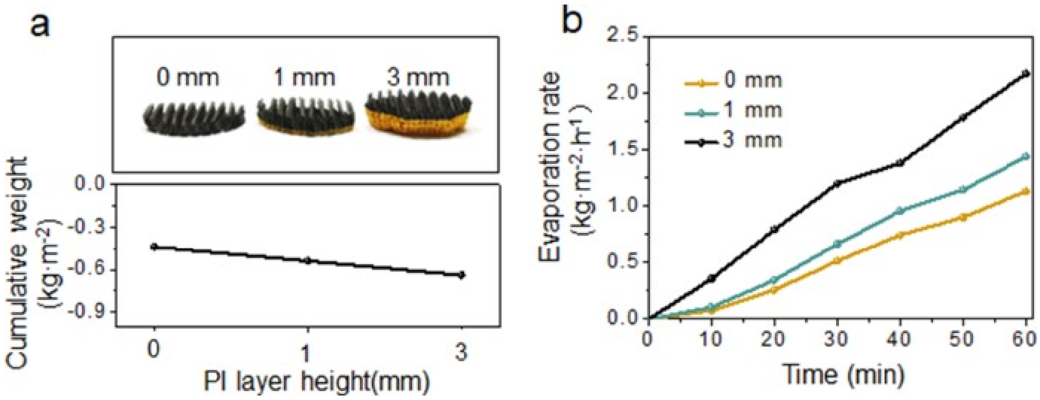

Fig. S9. a) The cumulative weight loss and b) water evaporation rates of 3D integrated evaporator with lattice structure of different heights under 1 sun illumination.

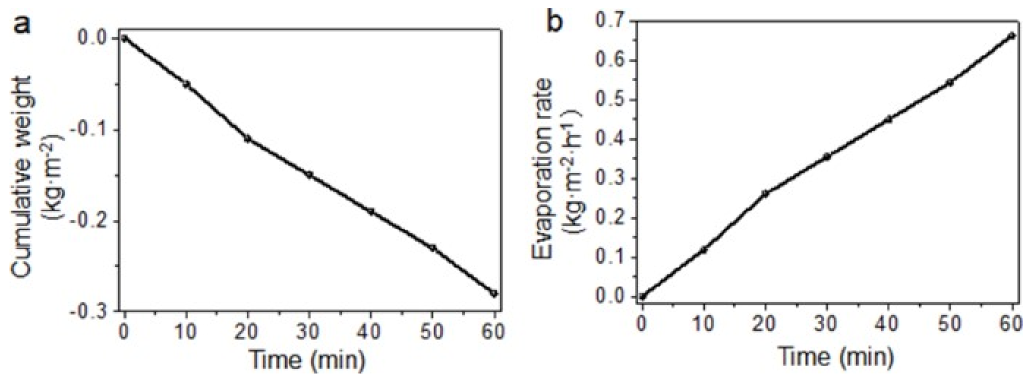

Fig. S10. a) The curve shows weight change of the 3D integrated evaporator at dark field. b) The curve shows evaporation rate of the 3D integrated evaporator at dark field.

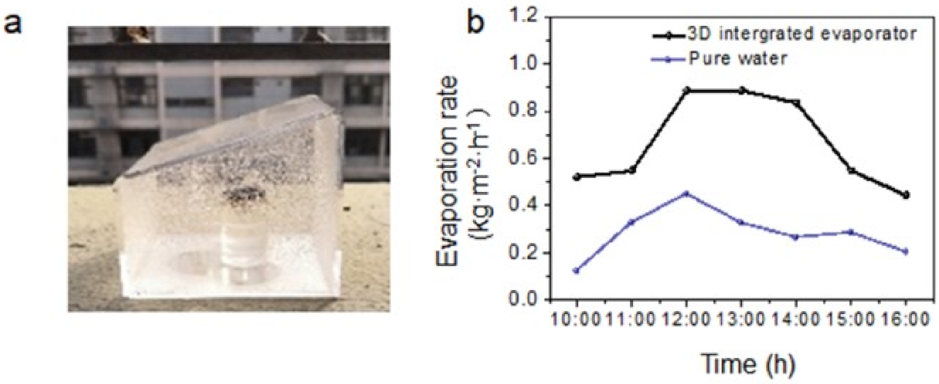

Fig. S11. The evaporation rate of 3D integrated evaporator and pure water in the actual environment, which recorded from 9:00 am to 16:00 pm, 24 December 2020, Shanghai, China.

Movie S1: Water transport process of PI aerogel strips with lattice structure in dyed seawater (NaCl solution, 20 wt%).