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Supplementary Information

Paper-based Membrane on Silicone Floater for Efficient and Fast Solar-driven Interfacial Evaporation under One Sun

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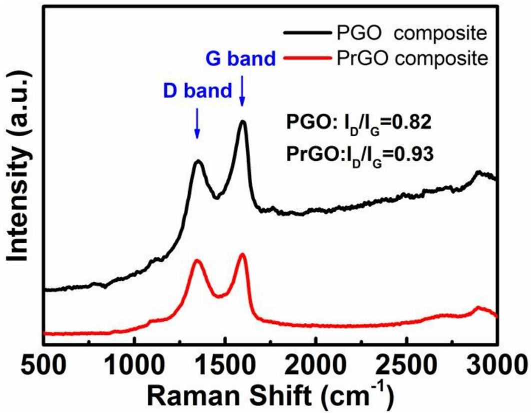

Fig. S1 Raman spectra of PGO and PrGO composite membrane.

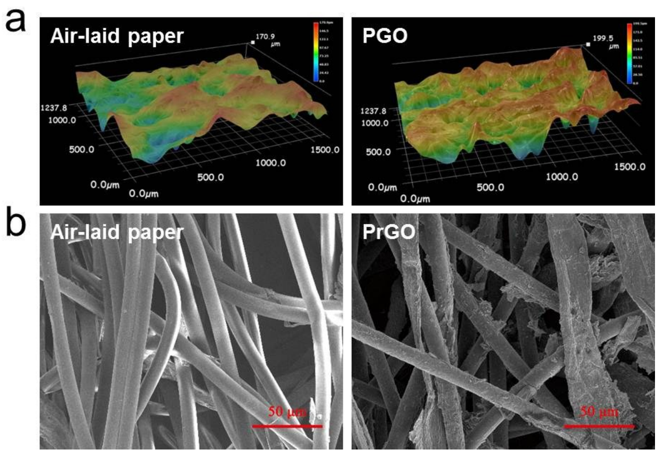

Fig. S2 (a) 3D optical images of air-laid paper and PGO composite membrane. (b) SEM images of air-laid paper and PrGO composite membrane. The air-laid paper sample has smooth fibers and the rGO flakes are partially decorated on the fiber surface in the PrGO membrane.

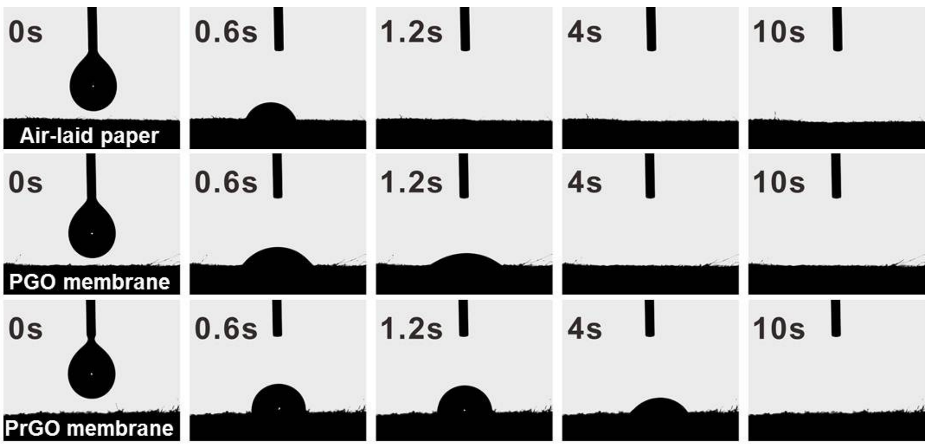

Fig. S3 Dynamic wetting of water droplet on air-laid paper, PGO membrane and PrGO membrane captured by a high-speed camera.

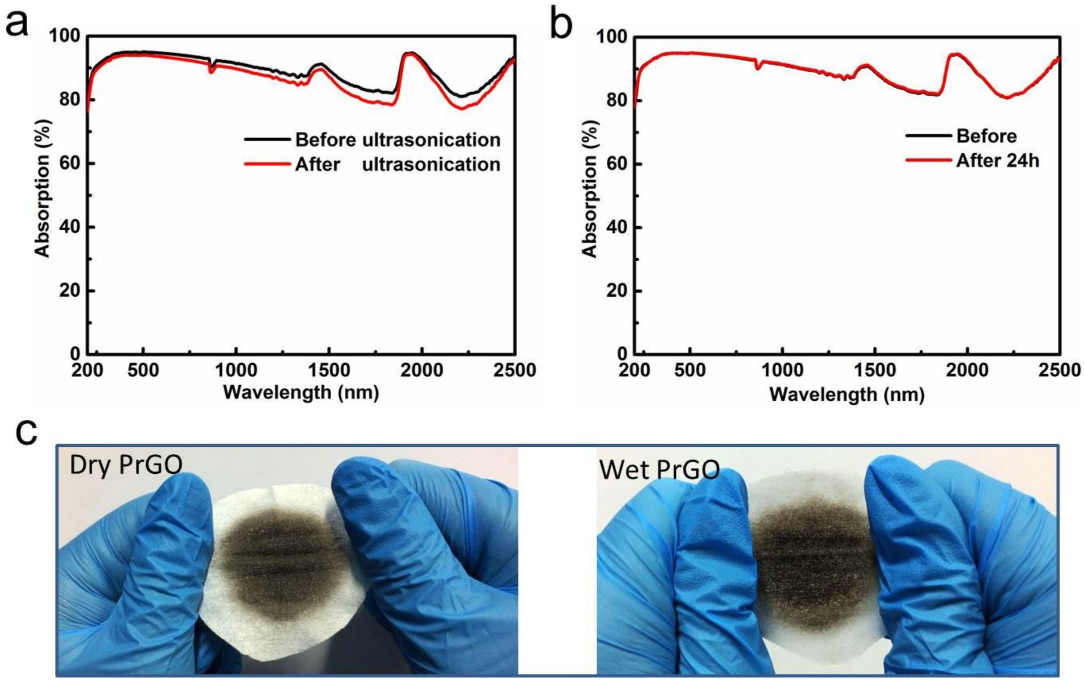

Fig. S4 (a) Optical absorption spectra of wet PrGO composite membrane with 10 wt% loading of rGO before and after ultrasonication for 40 min. (b) Optical absorption spectra of wet PrGO composite membrane (10 wt%) before and after immersing with water for 24 h. (c) Photographs of dry and wet PrGO membrane under stretch.

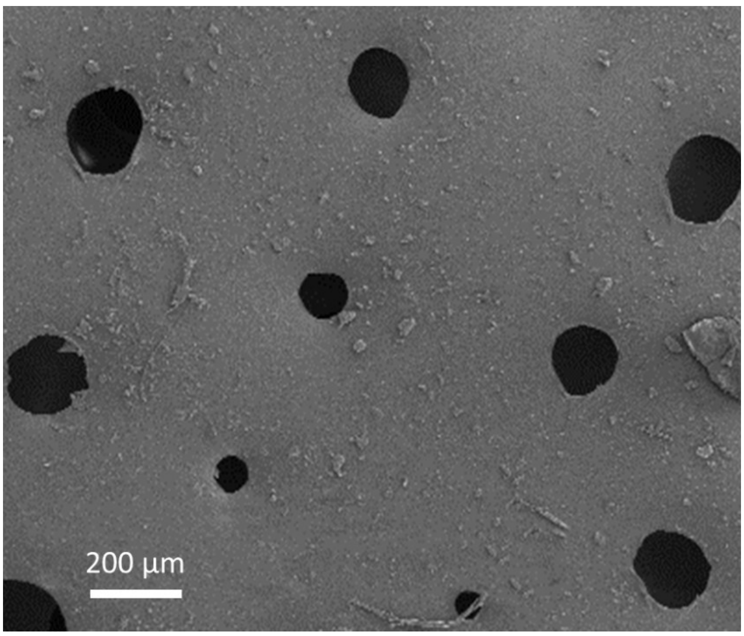

Fig. S5 SEM image of PDMS foam showing the porous microstructure.

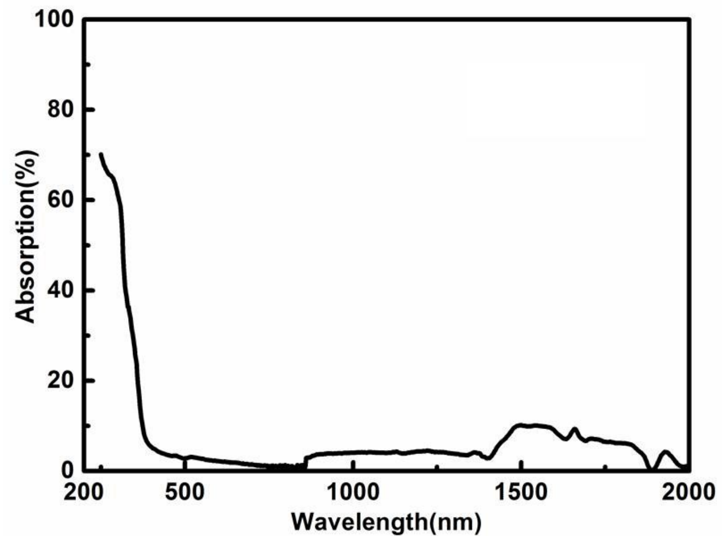

Fig. S6 Absorption spectrum of dry air-laid paper.

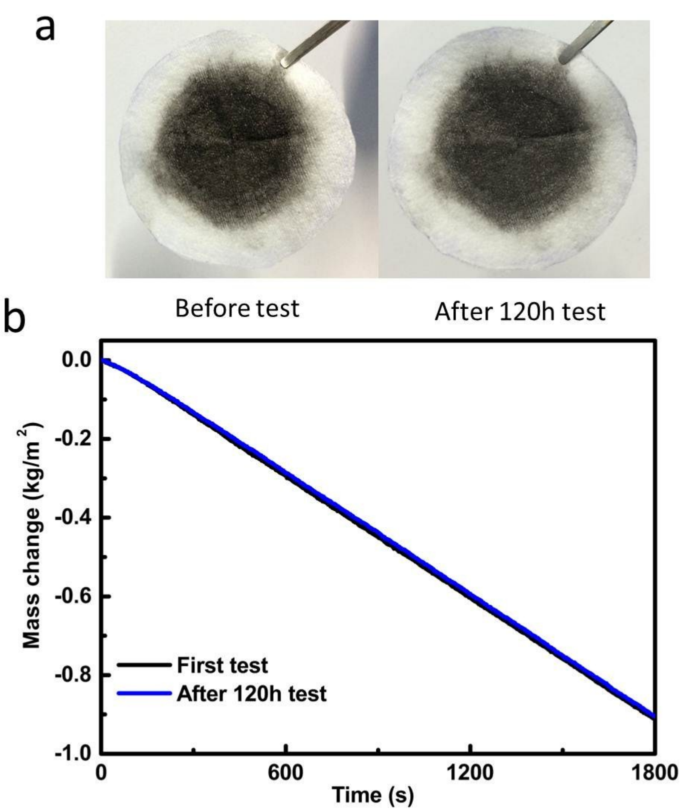

Fig. S7 (a) Optical images of the PrGO membrane before and after solar evaporation tests for 120 h. (b) Comparison of evaporation performances (mass loss during evaporation) for PrGO-PIL interfacial evaporation system during first test and after tested for 120 h.

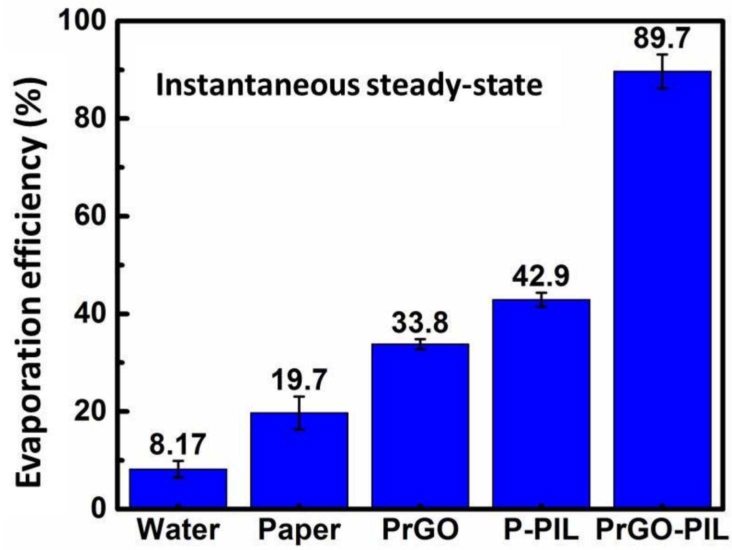

Fig. S8 Comparison of instantaneous steady-state evaporation efficiency for five different evaporation systems: pure water, water floating with air-laid paper, water floating with PrGO membrane (PrGO), air-laid paper supported by floating PIL (P-PIL), and PrGO supported by floating PIL (PrGO-PIL).

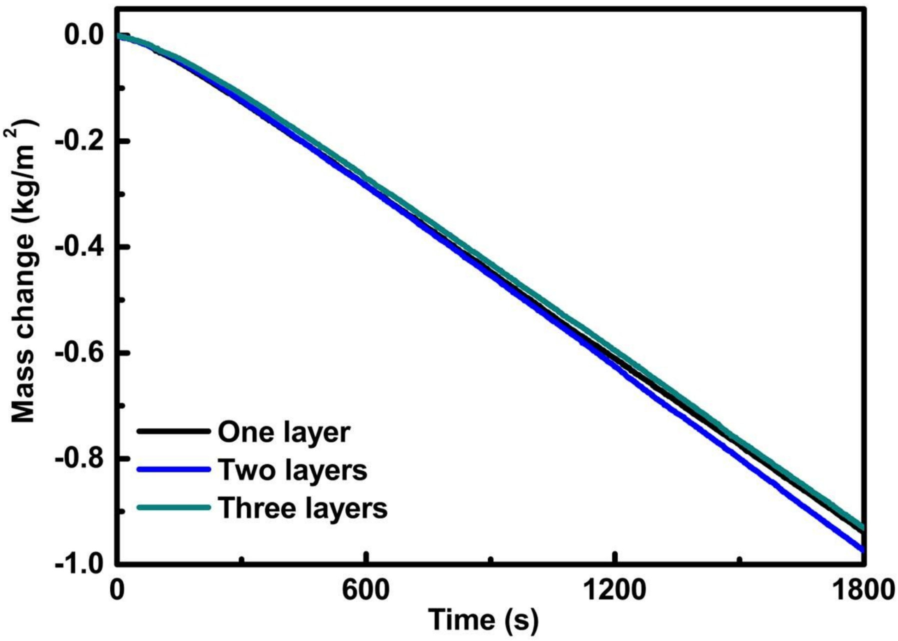

Fig. S9 Comparison of evaporation mass loss for PrGO-PIL interfacial solar-driven evaporation system with different layers of PrGO membrane under one-sun illumination for 30 min.

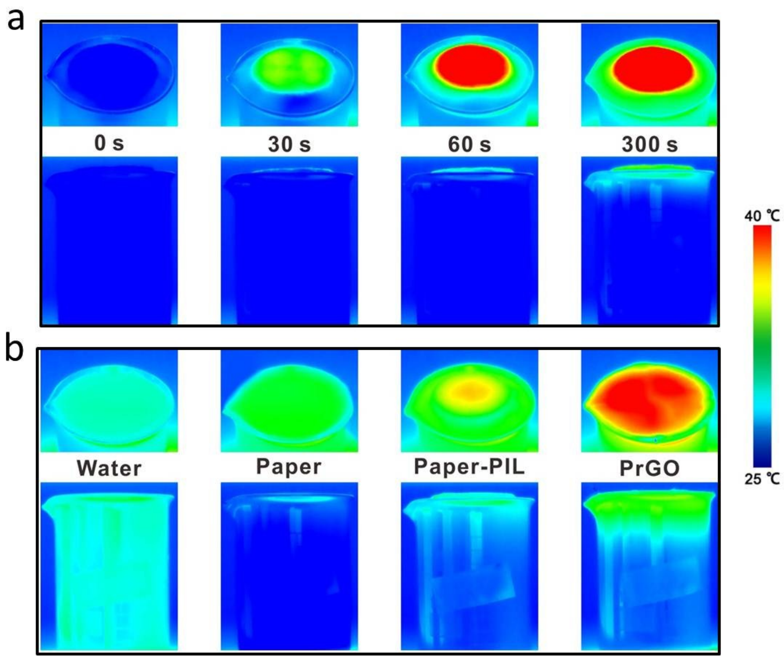

Fig. S10 (a) Evolution of temperature distribution for PrGO-PIL evaporation system with illumination time captured by an infrared camera. (b) Temperature distribution of other evaporation systems (water, paper, paper-PIL, PrGO) after one-sun solar illumination for 300 s captured by an infrared camera.

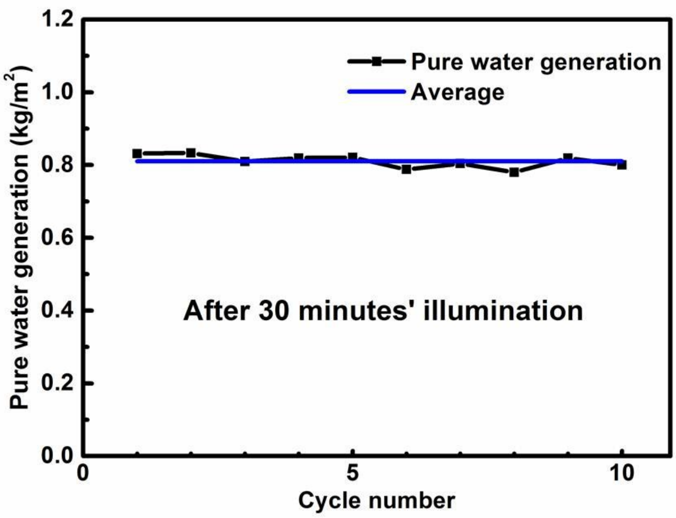

Fig. S11 Repeated solar desalination of seawater (3.5 wt% NaCl solution) by PrGO-PIL solar-driven interfacial evaporation system under one-sun illumination for 30 min.