Electronic Supplementary Material (ESI) for New Journal of Chemistry.

Supporting information for

Mechanically robust biomass-derived carbonaceous foam for efficient solar water evaporation

Sainan Ma [a,b], *Yuhao Wu* [a], *Ruiling Lv* [a], *Xiang Gao* [b,*], *Qianqian Wang* [a,b,*]

[a] Ningbo Research Institute, Zhejiang University, Ningbo 315000, China

[b] The State Key Laboratory of Chemical Engineering, College of Chemical and Biological Engineering, Zhejiang University, Hangzhou, 310027, China

*Email: gaox@zju.edu.cn, qqwanggood@zju.edu.cn

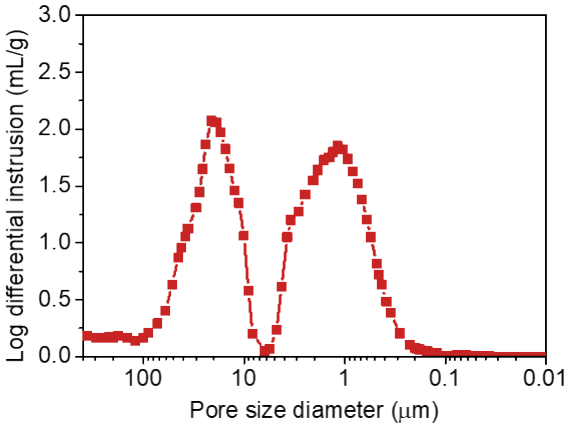

Figure S1. Pore size distribution curve of CBF obtained by mercury intrusion porosimetry.

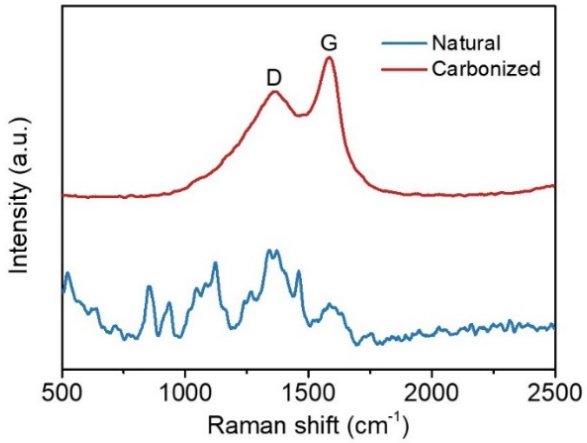

Figure S2. Raman spectra of freeze-dried natural banana and CBF.

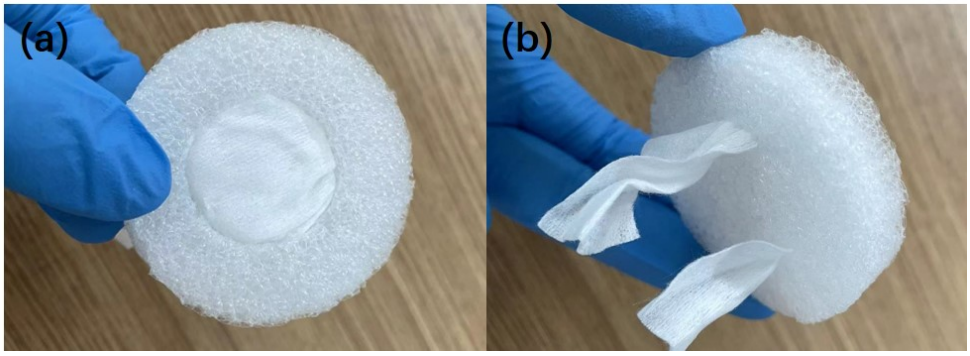

Figure S3. Digital images of designed insulator with air-laid paper as water path. (a) Top-view and (b) bottom-view.

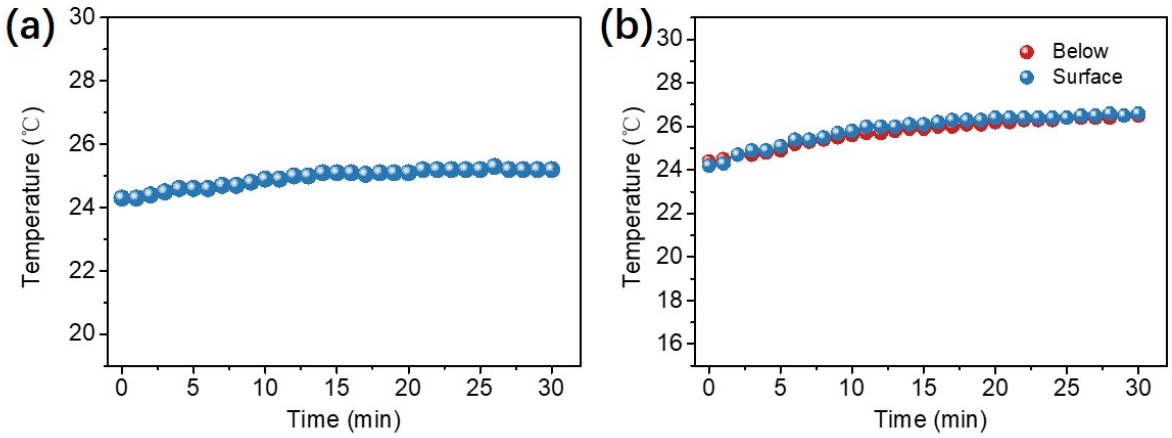

Figure S4. Time course of the below bulk water temperature of systems with (a) CBF, and (b) pure water under 1 sun illumination.

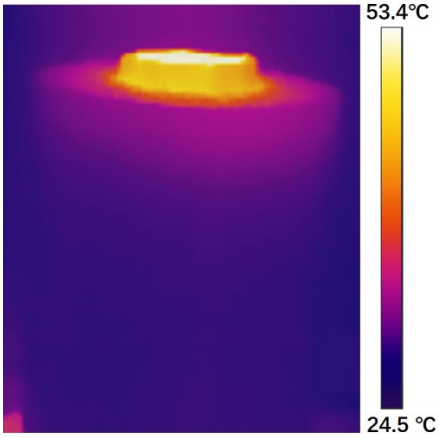

Figure S5. Side-view IR image of system with CBF under 3 sun illumination for 30 min.

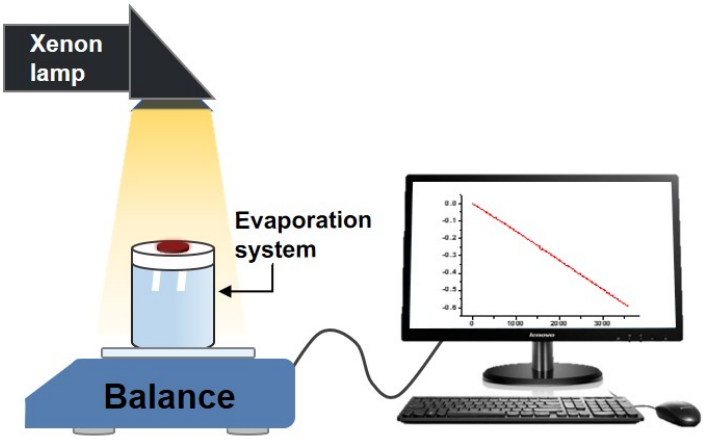

Figure S6. Schematic illustration of the setup for solar water evaporation.

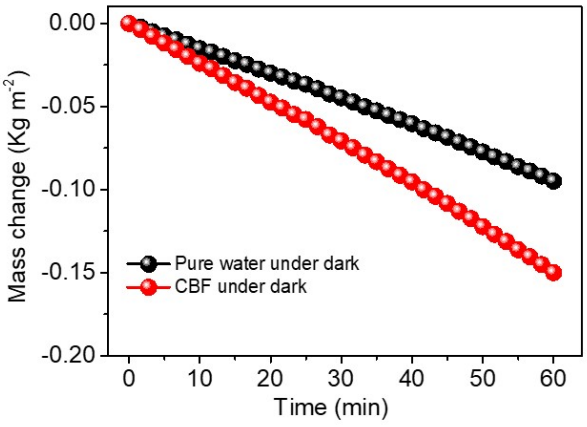

Figure S7. The evaporation mass change over time of systems with pure water and CBF under

dark field.

Table S1. Comparison of energy conversion efficiency (η_{th}) of CBF with previous reported biomass-based absorbers under solar illumination of 1 kW m^{-2}.

Absorbers	Evaporation rate (kg m^{-2} h^{-1})	η_{th} (%)	Reference
Carbonized mushroom	1.475	~78	Adv Mater. 2017, 29:1606762.
Flame-Treated Wood	1.05	72	ACS Appl. Mater. Interfaces 2017, 9, 17, 15052–15057
Carbonized lotus seedpods	1.30	86.5	Chem. Mater. 2018, 30, 6217−6221
Carbonized de-sugaring stems of sugarcane	1.57	87.44	J. Mater. Chem. A 2019,7, 9034-9039
Carbonized daikon	1.57	85.9	Sol. Energy Mater Sol. Cells 2019, 191, 83.
Carbonized lime peels	1.386	90.88	Sol. Energy Mater Sol. Cells 2020, 215, 110604.
Carbonized potatoes	1.48	86	J. Mater. Chem. A, 2020, 8, 9528
Carbonized rice husk	1.0315	71	Renew. Energy 2020, 151, 1067.
Carbonized pomelo peel	1.37	93.7	ACS Sustainable Chem. Eng. 2021, 9, 4571−4582
Pomelo@MXene	1.48	92.3%	Carbon 2022, 188, 265-275
PPy-bamboo	1.125	76.87	ACS Appl. Polym. Mater. 2022, 4, 4, 2393–2400
CBF	**1.51**	**93.3**	**This work**

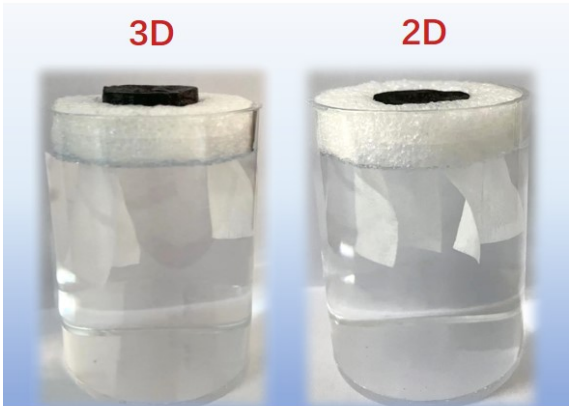

Figure S8. Digital images of solar absorber with 3D structure (left) and 2D structure (right).

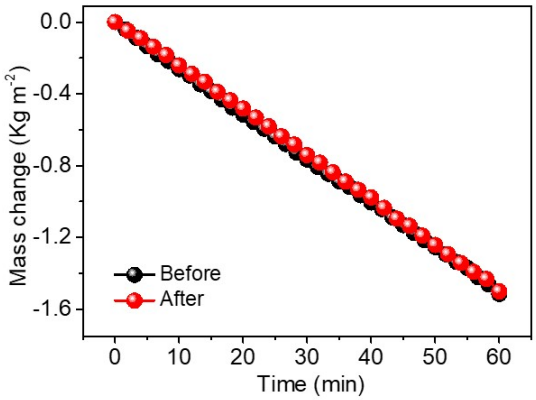

Figure S9. The evaporation mass change over time of CBF before (black) and after (red) being soaked in water for two weeks.

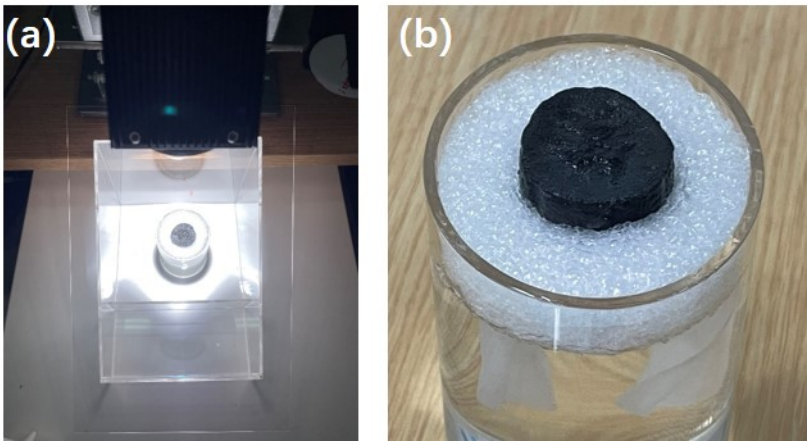

Figure S10. Digital images of (a) homemade setup for solar desalination and wastewater

treatment, and (b) CBF after continuous solar seawater evaporation under 1 sun illumination for 8 h.

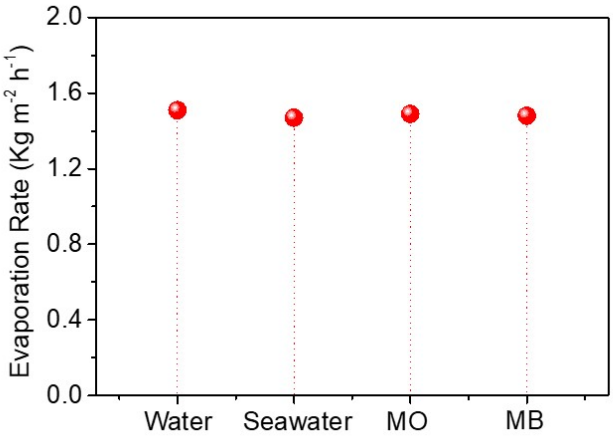

Figure S11. The evaporation mass change over time of systems using seawater, MO, and MB as raw water under 1 sun illumination.