

ARTICLE

## Supporting Information

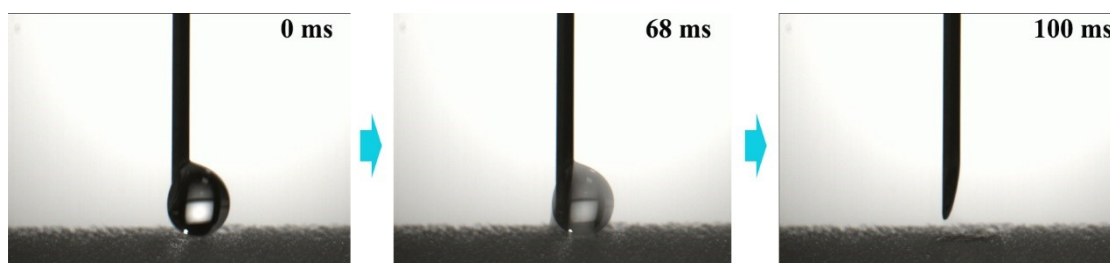
# A mild, versatile and time-saving interfacial gelation blackening strategy for fabricating high-quality 3D porous solar steam evaporator

Xiangyi Zhang,<sup>a</sup> Kaimin Deng,<sup>b</sup> Chunhua Zhang,<sup>ab</sup> Bin Shang<sup>\*ab</sup> and Xin Liu<sup>\*ab</sup>

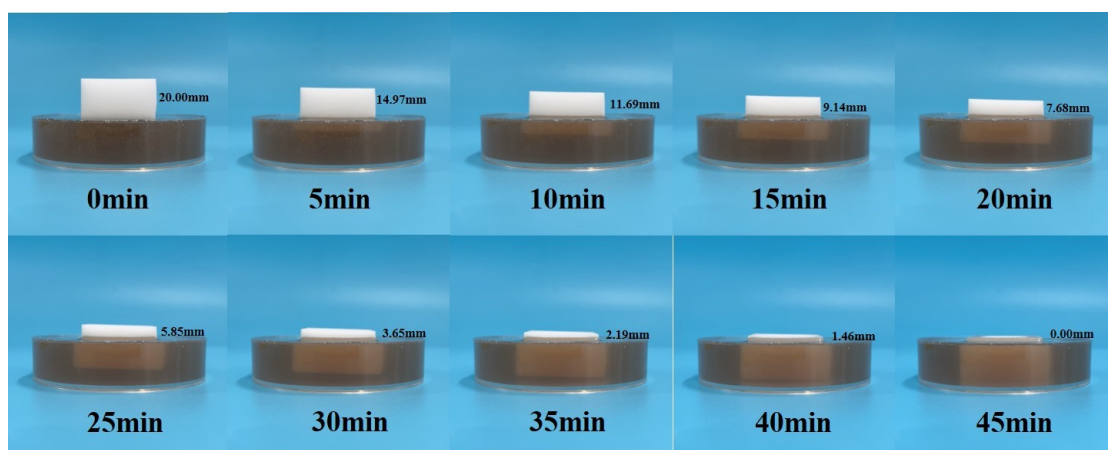
<sup>a</sup> School of Materials Science and Engineering, Wuhan Textile University, Wuhan, 430200, P. R. China

<sup>b</sup> State Key Laboratory of New Textile Materials and Advanced Processing Technologies, Wuhan Textile University, Wuhan 430073, P. R. China.

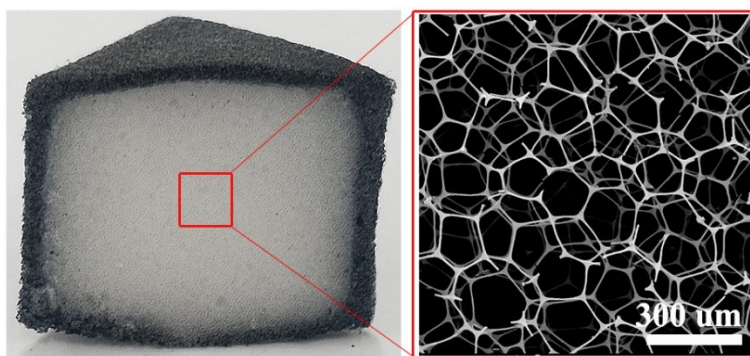
Email: bshang@wtu.edu.cn; xinliu@wtu.edu.cn



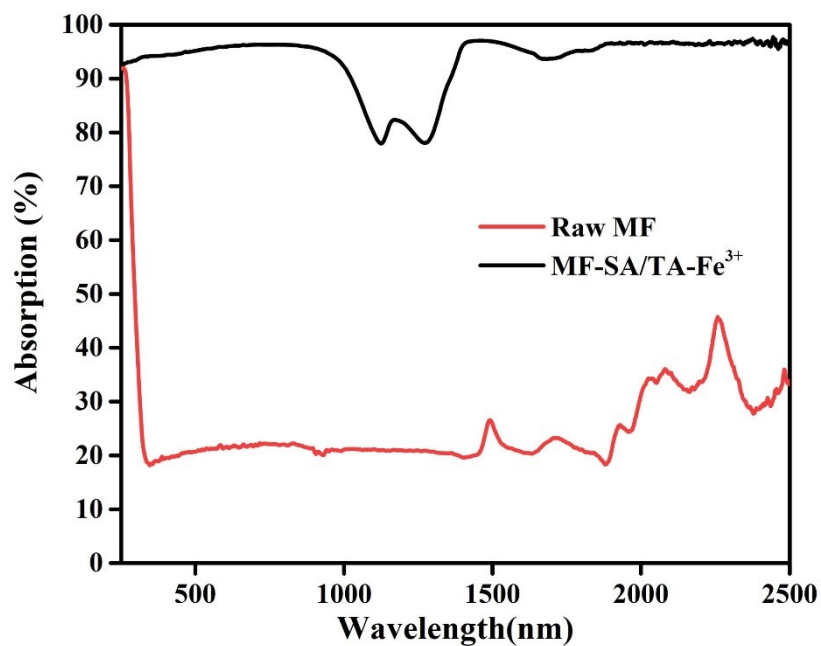
**Fig. S1** Water wetting behavior on raw MF surface.



**Fig. S2** Process diagram of the SA/TA mixture wetting the MF.



**Fig. S3** Sectional picture of MF-SA/TA-Fe<sup>3+</sup> and SEM image of the internal structure.



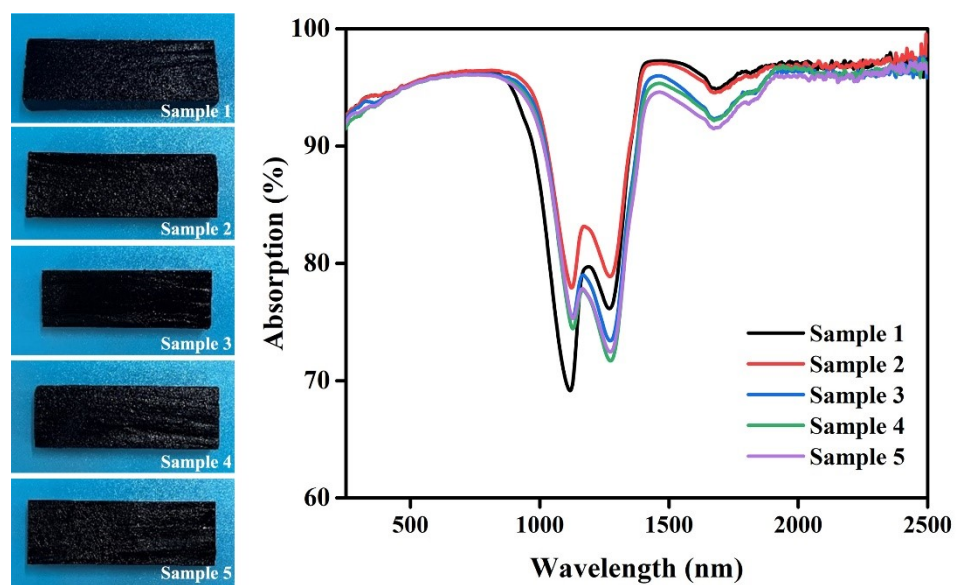
**Fig. S4** UV/vis/NIR absorption spectra of different samples.

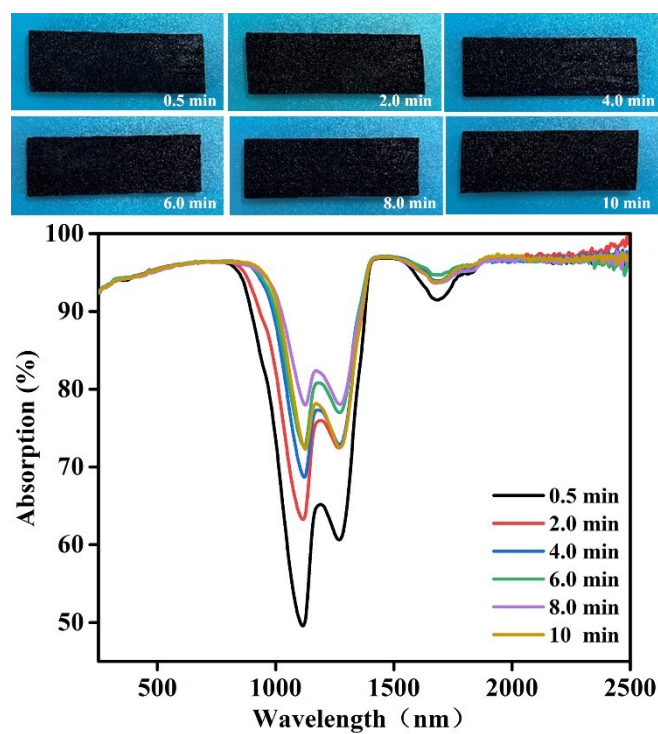


**Fig. S5** Water wetting behavior on MF-SA/TA-Fe<sup>3+</sup> surface.

**Table S1.** Formulation for preparation of the MF-SA/TA-Fe<sup>3+</sup>.

Number	Composition		
	SA (%)	TA (%)	FeCl <sub>3</sub> (%)
Sample 1	2.0	0.2	2.0
Sample 2	2.0	0.4	2.0
Sample 3	2.0	0.8	2.0
Sample 4	2.0	1.2	2.0
Sample 5	2.0	1.6	2.0

**Fig. S6** Photographs of the obtained different samples and corresponding UV/vis/NIR absorption spectra, the surface blackening time is 8 minutes.



**Fig. S7** Photographs of the obtained samples with different surface blackening time, the concentration of SA, TA and  $\text{Fe}^{3+}$  is 2%, 0.4% and 2%, respectively.



**Fig. S8** Photograph of the obtained MF-SA/TA- $\text{Fe}^{3+}$  self-float in water.

### Supplementary movie captions

**Movie S1:** This movie shows the wetting behavior of water on the surface of raw MF.

**Movie S2:** This movie shows the wetting behavior of water on the surface of MF-SA/TA-Fe<sup>3+</sup>.

**Movie S3:** This movie shows the sliding behavior of methylene chloride on the surface of MF-SA/TA-Fe<sup>3+</sup>.

**Movie S4:** This movie shows the adhesion of methylene chloride on the surface of MF-SA/TA-Fe<sup>3+</sup>.