Supporting Information

A Bioinspired Slippery Surface with Stable Lubricant Impregnation for Efficient Water Harvesting

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The supporting information included 7 pages, 10 figures, and 3 tables.

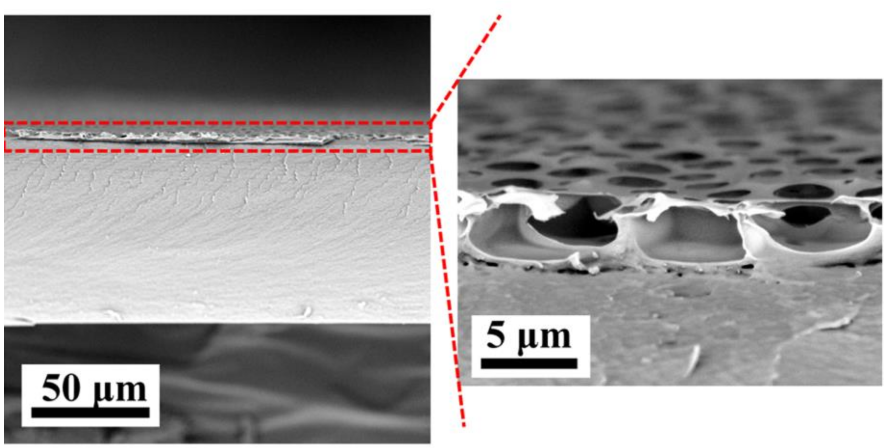

Figure S1. Sectional SEM images of HC film.

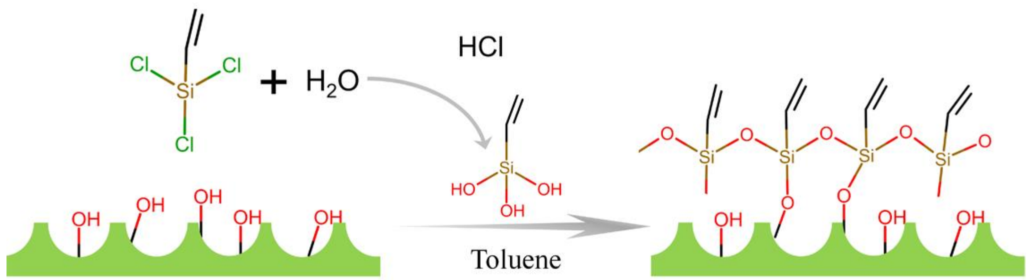

Figure S2. The schematic diagram of TCVS-modified on PC film, involving three steps: (1) reaction of chlorosilane with water to form silanols (hydrolysis); (2) coupling of silanols to hydroxy groups at the cellulose surface; (3) subsequent polymerization of silanols into a rough structure.

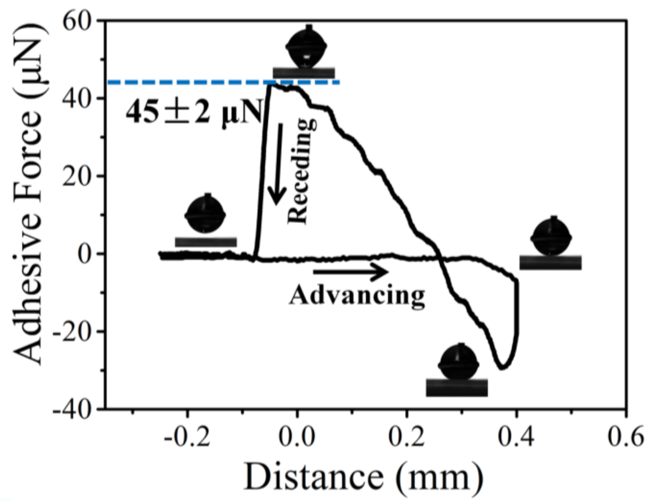

Figure S3. Water adhesion curve of SHS.

Figure S4. Adhesion procedure of silicone oil on the SHS. Once touching the SHS, the silicon oil spreads immediately and cannot extricate from the surface.

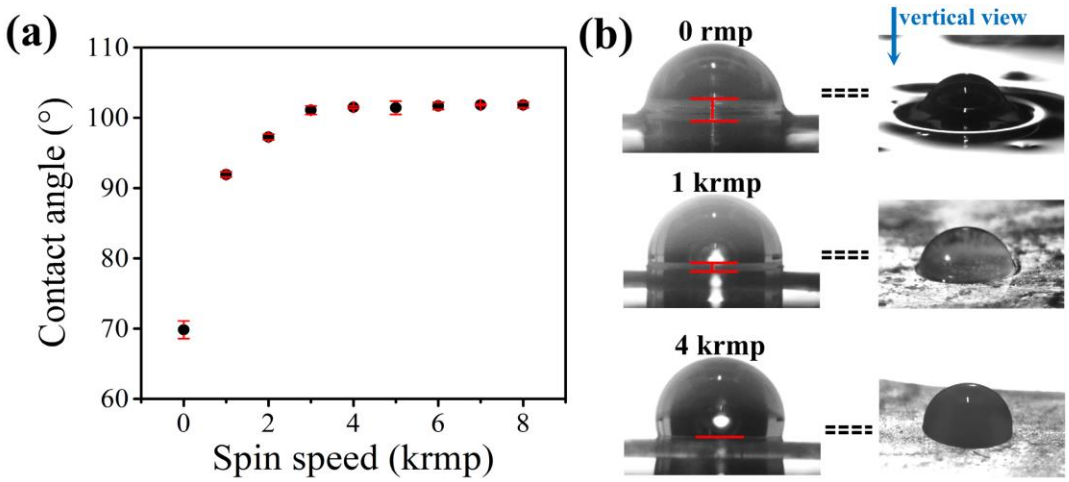

Figure S5. (a) WCA as a function of spinning speed. (b) Optical photos of water droplets standing on SLIPSs prepared at different spinning speeds (the region of water/oil mixture is marked by the red line).

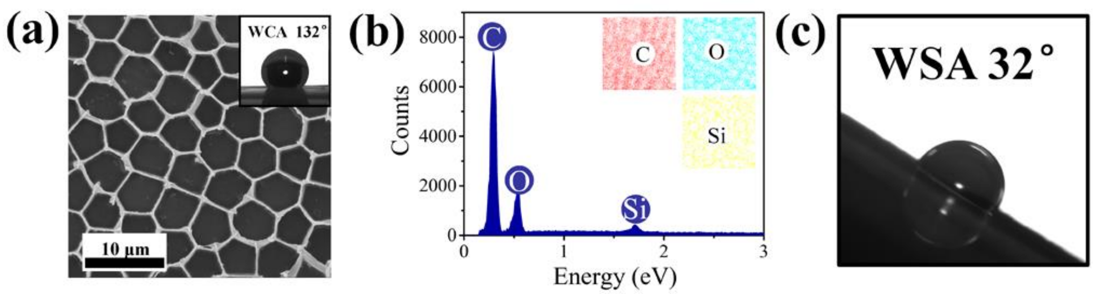

Figure S6. (a) SEM image (insert is the WCA) and (b) EDS spectrum of the TCVS-modified PC surface without nanostructure which was prepared under water-free condition (inserted is the element mapping images). (c) Water sliding angle of the TCVS-modified PC surface without nanostructure after infusing silicon oil.

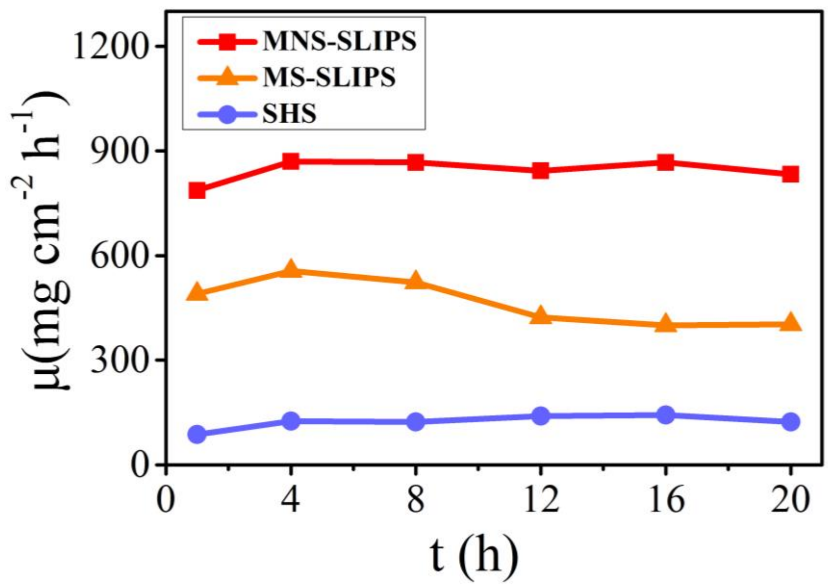

Figure S7. Water collection efficiency of MNS-SLIPS, MS-SLIPS and SHS film within continuous 20-h application.

Table S1. Summary of some recent studies about water collection materials under similar collecting conditions

Ref.	Substrates	Flow rate ($cm\ s^{-1}$)	Temp. (℃)	Water collection efficiency ($mg\ cm^{-2}\ h^{-1}$)	Collection time (h)
This work	CTA silicone oil	45~50	20	852	20
1	Silicon wafer silicone oil	50	18	563	4
2	CTA TiO_2/Ag	25	20	1043	2
3	SPI/ZIF-8	50	20	917	2
4	PDMS/Pt	45~50	Room temp.	5300	No mentioned
5	TiO_2/SiO_2	70	22	174	8

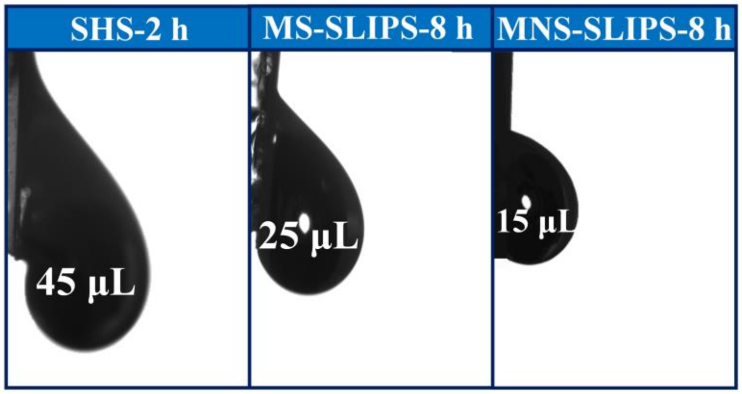

Figure S8. Illustrating the minimum volume (V_{min}) of water drops that starts to move when the film is set vertically for different surfaces after collecting water for hours.

Table S2. Weight of silicon oil infused in MS-SLIPS and MNS-SLIPS

Sample	M (mg)	s (cm^2)	m' (mg/cm^2)
MS-SLIPS	1.2 ± 0.06	1.5	0.80 ± 0.04
MNS-SLIPS	1.4 ± 0.13	1.5	0.93 ± 0.09

Table S3. TOC of collected water and lubricant loss for SHS, MS-SLIPS and MNS-SLIPS at different time intervals

t (h)		1	2	3	4	5	6	7	8
SHS	TOC (ppm)	8.95±0.24	—	—	—	—	—	—	—
MS-SLIPS	TOC (ppm)	82.89±0.59	16.98±0.98	21.07±0.89	18.14±1.58	18.13±3.92	13.64±0.92	18.59±3.29	14.48±0.72
	Loss (%)	5.47±0.05	1.16±0.14	1.72±0.13	1.42±0.24	1.61±0.69	0.90±0.18	1.71±0.58	1.08±0.14
MNS-SLIPS	TOC (ppm)	18.11±0.37	14.43±0.41	9.16±0.06	4.76±0.62	6.00±1.02	6.99±0.14	6.12±0.57	7.17±0.58
	Loss (%)	1.53±0.06	1.10±0.08	0.04±0.01	0	0	0	0	0

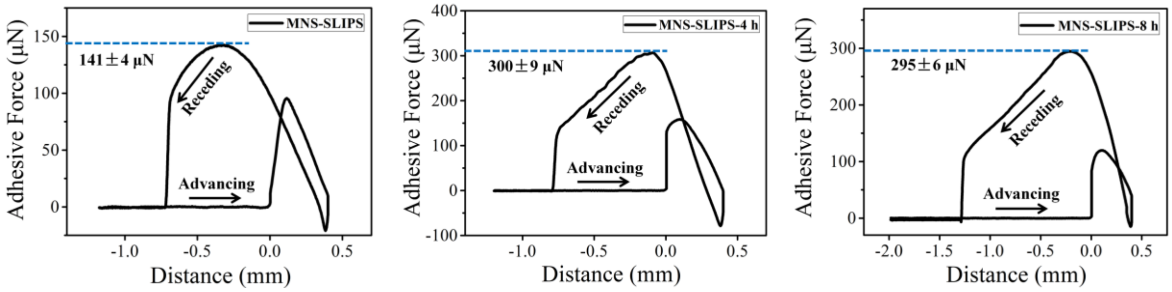

Figure S9. Water adhesion curve of MNS-SLIPS after 0 h (MNS-SLIPS), 4 h (MNS-SLIPS-4h) and 8 h (MNS-SLIPS-8h) continuous water collection.

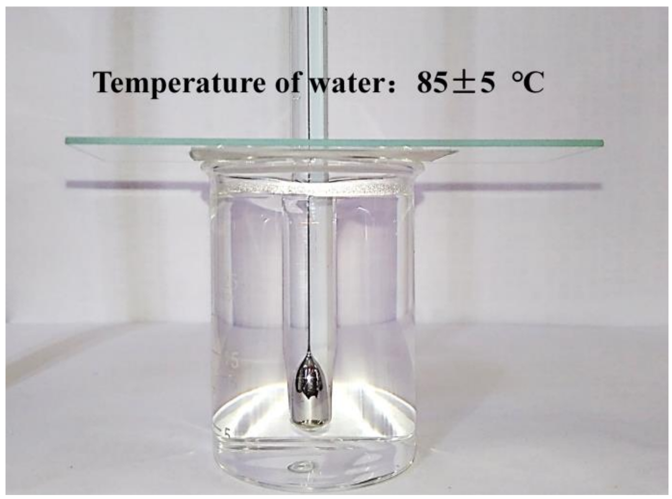

Figure S10. Diagram of hot steam test installation, including a beaker filled with hot water to generate hot steam, a glass slide as the sample holder which is placed 1 cm-above hot water and a thermometer immersed in water. Samples are faced to the hot steam.

Movie S1. Water droplet is sliding on SLIPS film at the tilting angle of 3°, demonstrating the good water mobility.

Movie S2. Dynamic water collection processes of SHS and MNS-SLIPS films within 2 h. The surface of MNS-SLIPS film can achieve quick water dropwise coalescence and transportation, while filmwise coalescence occurs on SHS film at 2 h.

Movie S3. Dynamic water collection processes of MS-SLIPS and MNS-SLIPS films within 8 h.

Movie S4. Detailed processes of hot steam test, showing that the water droplets can keep moving on the SLIPS film but are pinned on the SHS film after the hot-steam treatment for 2 minutes.

Movie S5. Detailed processes of hot water test, showing that the water droplets can keep moving on the SLIPS film but are pinned on the SHS film after the hot-water treatment for 2 minutes.

Reference

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