

Electronic Supplementary Information

A Large-scale water harvesting device with β -Al(OH)₃ microcone arrays by simple hydrothermal synthesis

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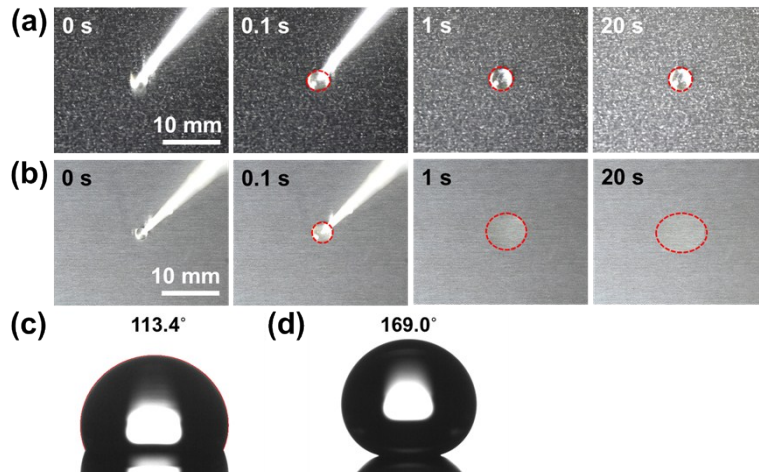


Figure S1. Images of a droplet spreading on (a) a bare aluminum surface and (b) a nanoflake surface; the volume of the water droplets was 1.5 μL . Images of a water droplet on (c) a hydrophobic coated aluminum surface and (d) a nanoflake surface.

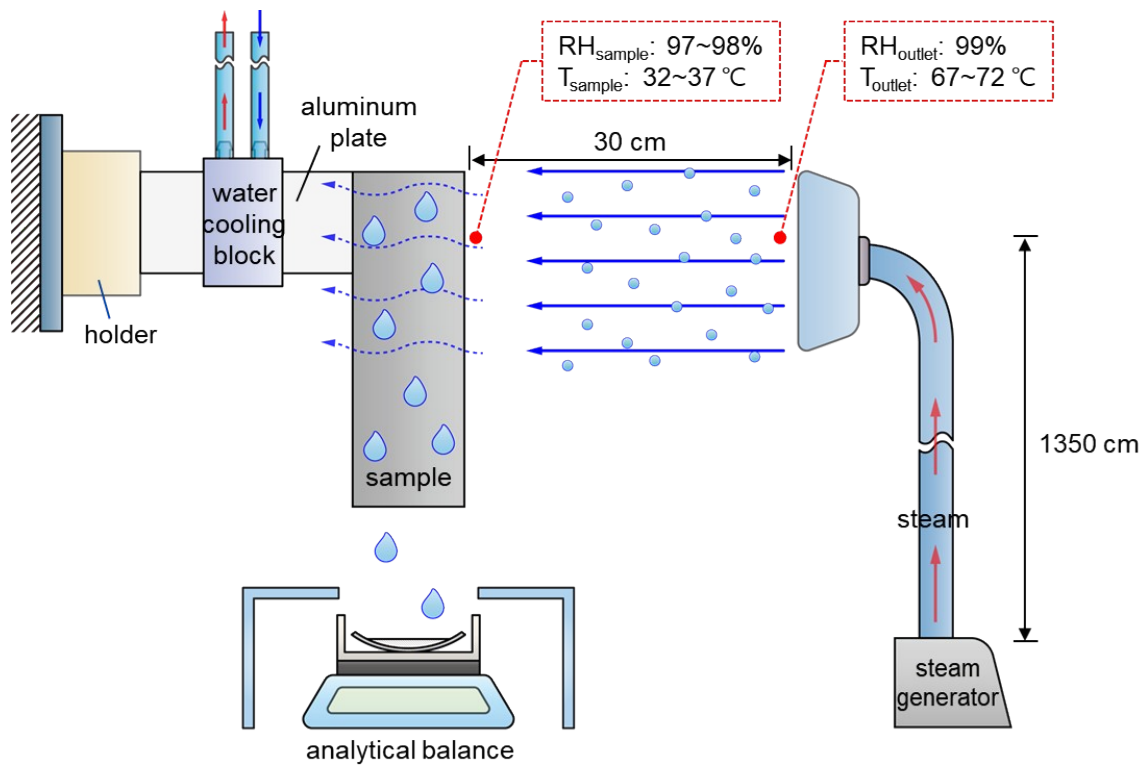


Figure S2. Experimental setup for the water-harvesting test of various surfaces.

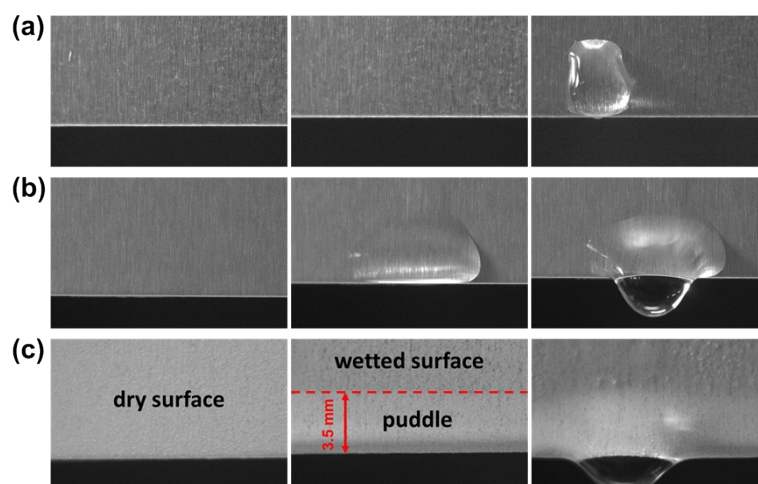


Figure S3. Images of the first falling droplet from (a) the bare aluminum surface, (b) the nanoflake surface, and (c) the microcone surface.

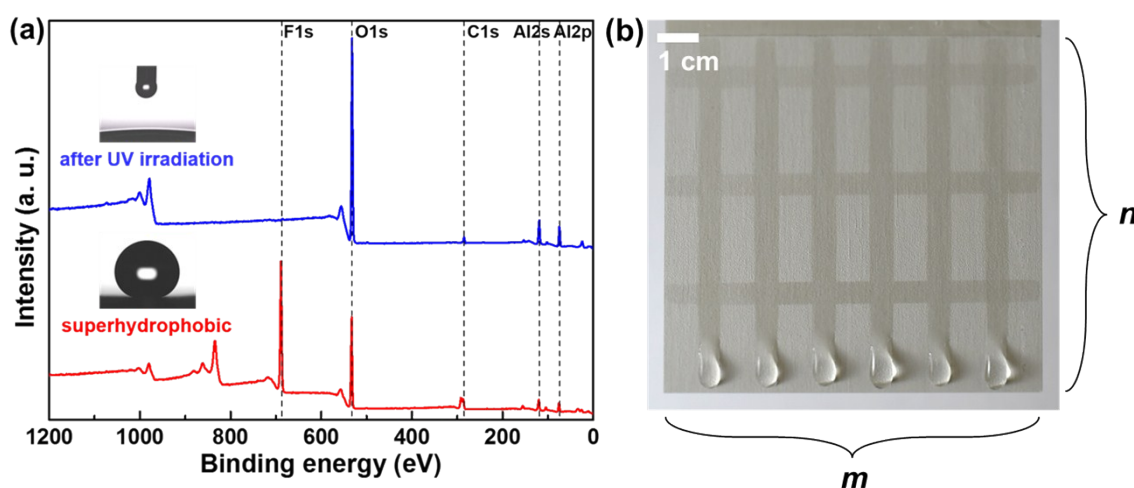


Figure S4. (a) Changes in wettability and chemical composition of superhydrophobic surfaces after UV treatment. After UV treatment, the CA of the superhydrophobic surface completely changed from 169.8° to 0° . The XPS intensities of both the F 1s and C 1s peaks assigned to the fluoroalkyl chains decreased, but the O 1s, Al 2s and Al 2p peaks related to aluminum hydroxide increased, which means that the HDFS coating layer on the microneedle surface was removed, exposing the aluminum hydroxide surface. (b) Superhydrophilic–superhydrophobic patterned surface prepared by partial UV irradiation using a mask with openings (m : number of superhydrophilic vertical lines, n : number of superhydrophilic horizontal lines).

Sample	<i>m</i>	<i>n</i>	Superhydrophilic area (%)
I	2	0	12.5
	4		25.0
	6		37.5
	8		50.0
II	2	3	31.3
	4		43.8
	6		56.3
	8		68.8
III	2	6	50.0
	4		62.5
	6		75.0
	8		87.5

Table S1. Approximate coverage of superhydrophilic regions on wettable patterned surfaces.

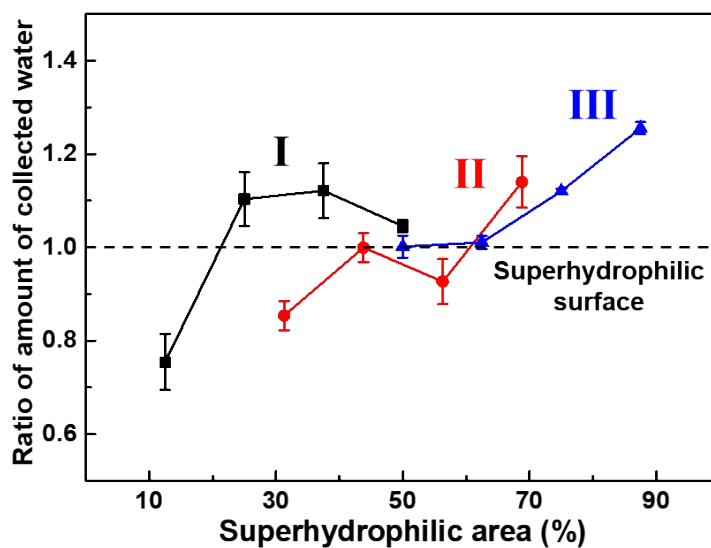


Figure S5. Ratio between the amount of water collected by a patterned surface and a superhydrophilic surface. For surfaces with a ratio greater than 1, the surface exhibited better water-harvesting performance than the superhydrophilic surface.

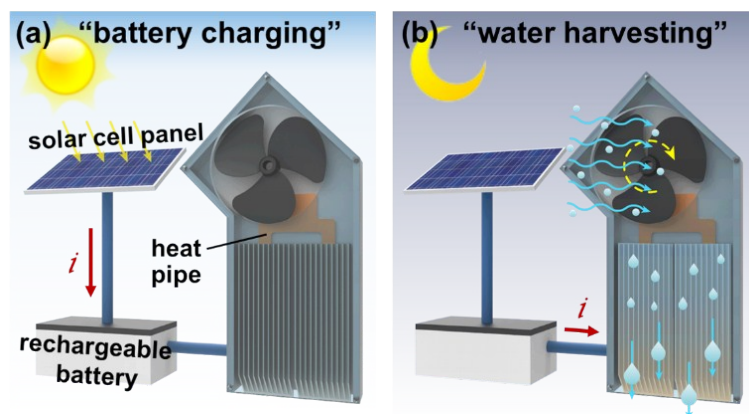


Figure S6. Schematic illustration of the water-harvesting system for practical applications.