Supporting Information

Impact of Surface Cooling on the Water Harvesting Efficiency of Nanostructured Window Glass

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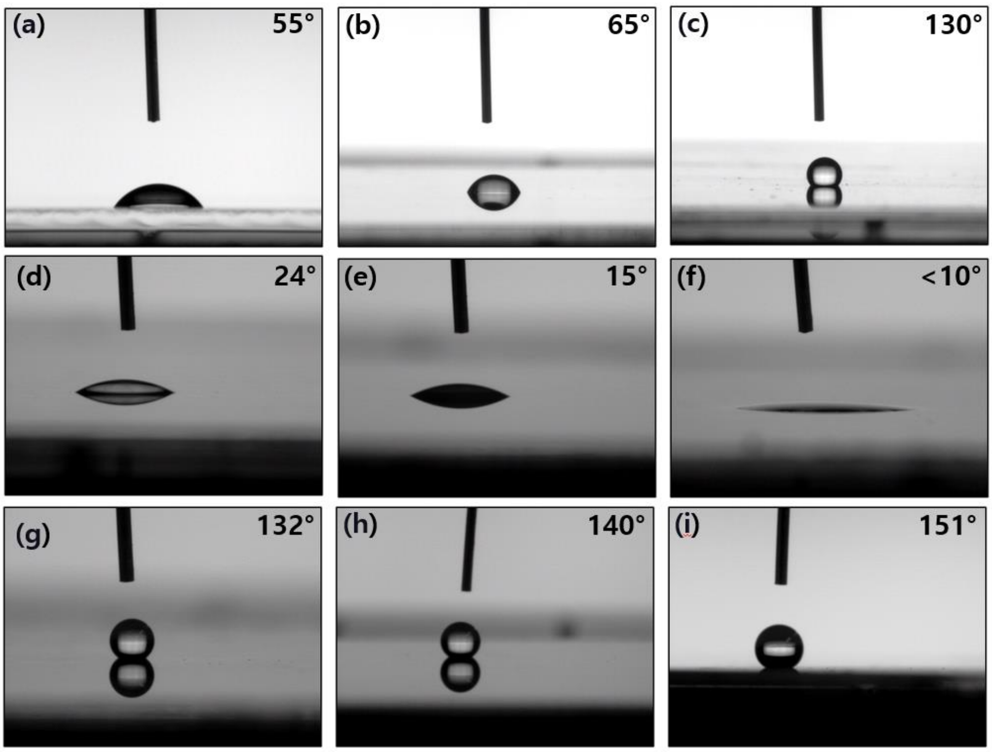

Fig. S1. Optical picture of the contact angle variation with the wettability of the surface structure: (a) bare glass substrate, (b) TiO_2 plain film, (c) HDFS-coated TiO_2 plain film, (d) 100 nm, (e) 300 nm, (f) 500 nm height of TiO_2 nanopillar arrays, (g) 100 nm, (h) 300 nm, (i) 500 nm height of HDFS-coated TiO_2 nanopillar arrays.

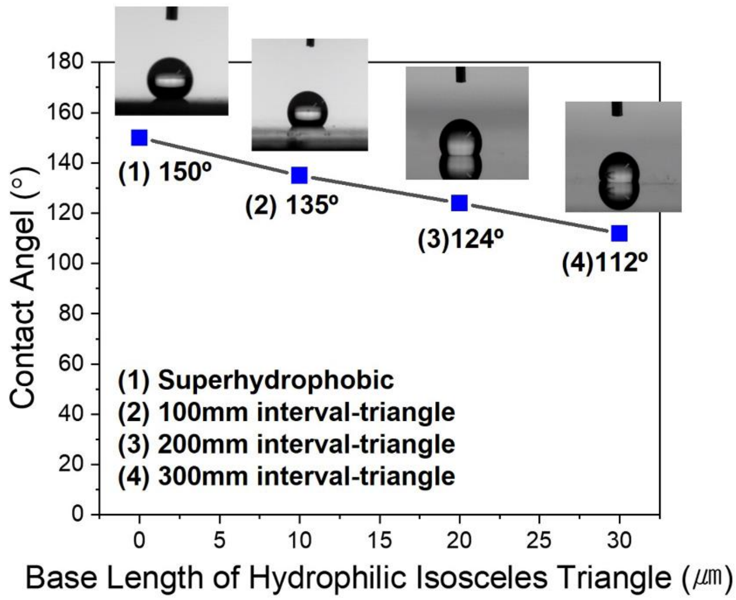

Fig. S2. Optical image and graph of the contact angle variation with the distance between superhydrophilic isosceles triangle and the area of the triangle.

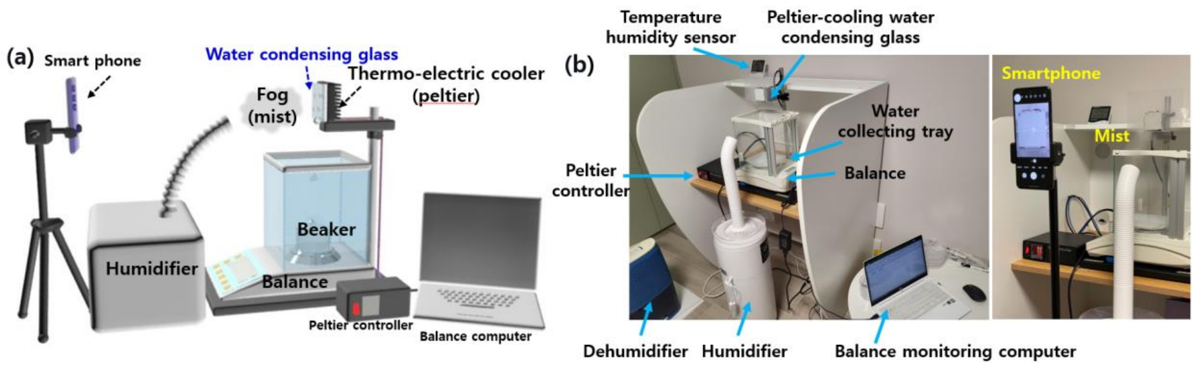

Fig. S3. (a) Schematic diagram and (b) actual photographs of Peltier-cooling-based water collecting set-up in this experiment.

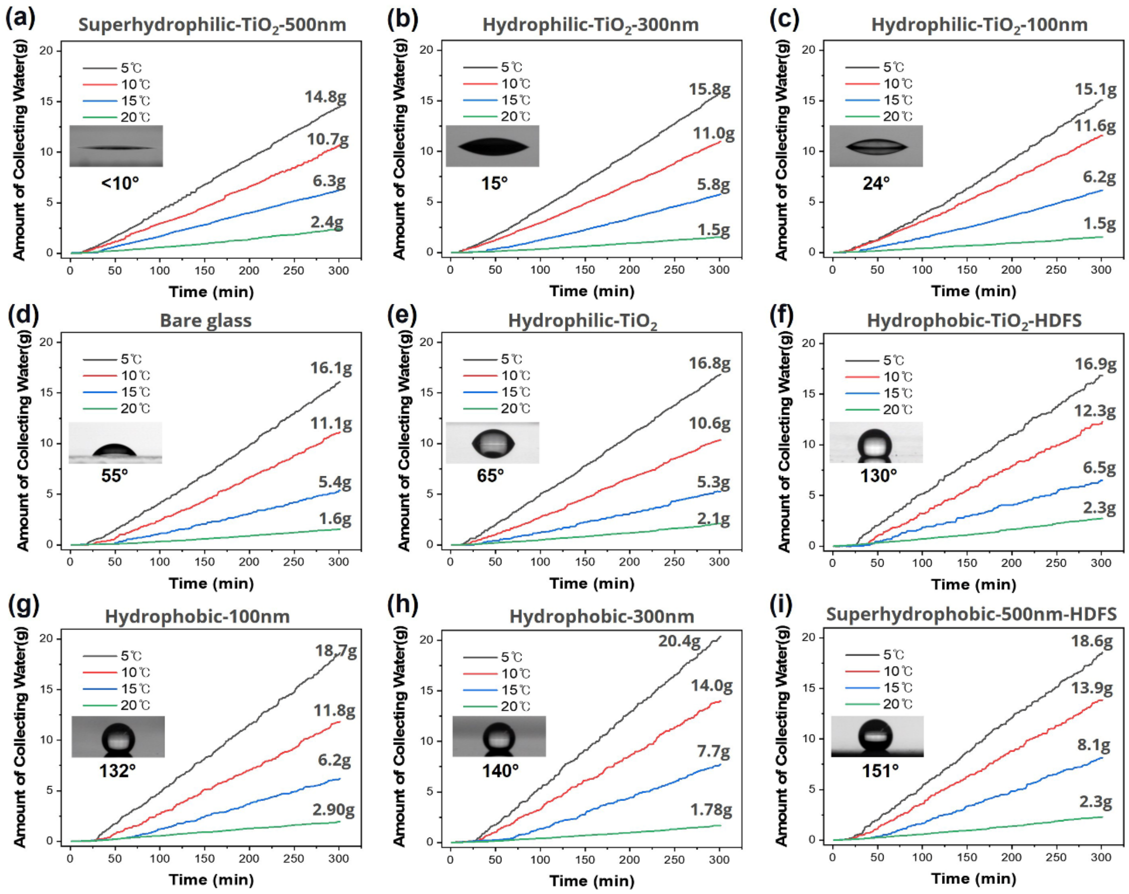

Fig. S4. Amounts of collected water with various surface wettability of the glass as a function of collecting time for 5 hr with the cooling temperature: (a) 500 nm, (b) 300 nm, (c) 100 nm height of TiO_2 nanopillar arrays, (d) bare glass substrate, (e) TiO_2 plain film, (f) HDFS-coated TiO_2 plain film, (g) 100 nm, (h) 300 nm, (i) 500 nm height of HDFS-coated TiO_2 nanopillar arrays.

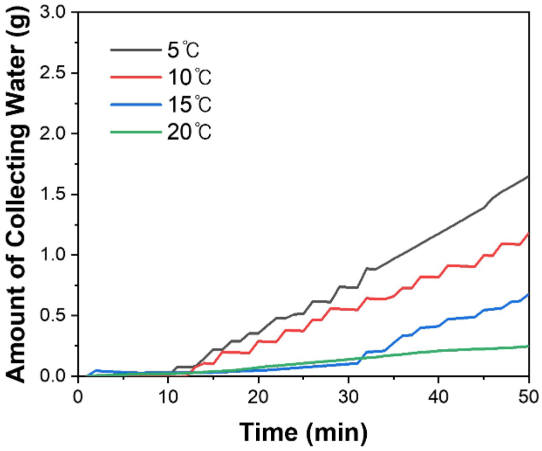

Fig. S5. (a) Water collecting mass per unit area of superhydrophilic surface coated with TiO_2 nanopillar arrays with 500 nm of height as a function of collecting time for 50 min and the cooling temperature.

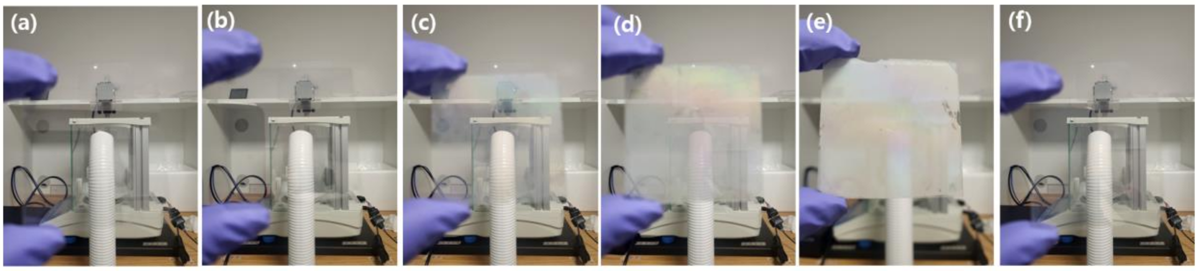

Fig. S6. Visibility images of various glass substates: (a) Plain glass, (b) TiO_2 film coated glass, (c) 100 nm height of TiO_2 nanopillar array-patterned glass, (d) 300nm height of TiO_2 nanopillar array-patterned glass, (e) 500 nm height of TiO_2 nanopillar array-patterned glass, (f) PTFE nanofilm coated glass substrate.

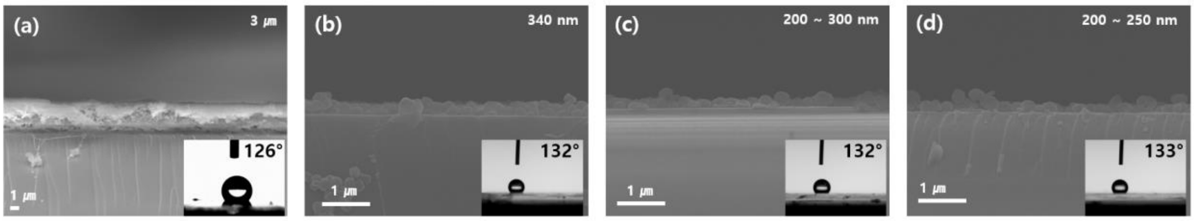

Fig. S7. SEM images showing cross-sectional view and contact angle (inset) of various PTFE coated glass substrates. PTFE film coated glass with different coating speeds and concentrations; (a) Original PTFE solution was coated with 1000 rpm for 60s. Diluted PTFE solutions (PTFE:H_2O = 1:2) were coated at coating speeds of (b) 1000 rpm, (c) 2000 rpm, (d) 3000 rpm for 60s.

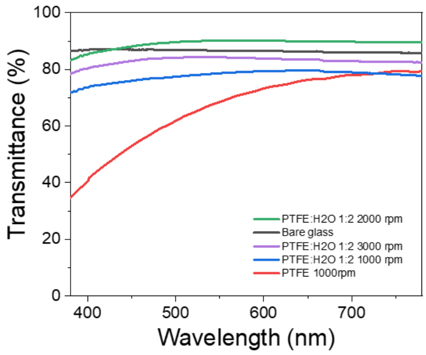

Fig. S8. Transmittance spectra of various PTFE coated glass substrates. PTFE film coated glass with different coating speeds and concentrations. The original PTFE solution was coated at 1000 rpm for 60s. Diluted PTFE solutions (PTFE : H_2O = 1:2) were coated with different coating speeds (1000 rpm.

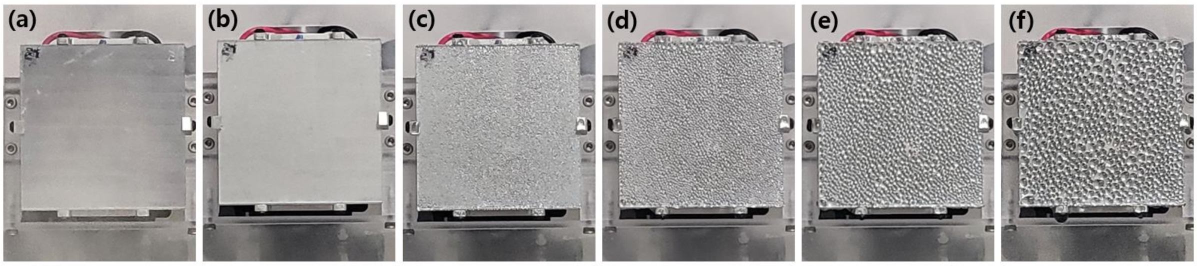

Fig. S9. Photo images show shedding phenomena on an optimum PTFE coated glass substrate with exposure time to mist at 10 ℃ cooling temperature. They show dropwise condensation and the drop sliding removal process by a PTFE coated glass. (a) Before exposing mist. After exposing mist: (b) 1.0 min, (c) 10 min, (d) 20 min, (e) 30 min, (f) 40 min.