Supporting information

A simple route to transform normal hydrophilic cloth into superhydrophobic-superhydrophilic hybrid surface

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Table S1 Weight variations of as-dried SSH fabrics before and after in situ growth of Fe and Co nanoparticles with different concentration ratio of $FeSO_4$ and $Co(NO_3)_2$ in precursor.

Concentration ratio of Co(II) and Fe(II) ([Co(II)]/[Fe(II)])	**1:4**	**1:3**	**1:1**	**3:1**	**4:1**
Weight before in situ growth, m_{before} (g)	0.1630	0.1531	0.1600	0.1610	0.1610
Weight after in situ growth, m_{after} (g)	0.1682	0.1620	0.1672	0.1664	0.1647
Increasing rate, $(m_{after}- m_{before})/ m_{before}$	3.19%	5.81%	4.50%	3.35%	2.30%

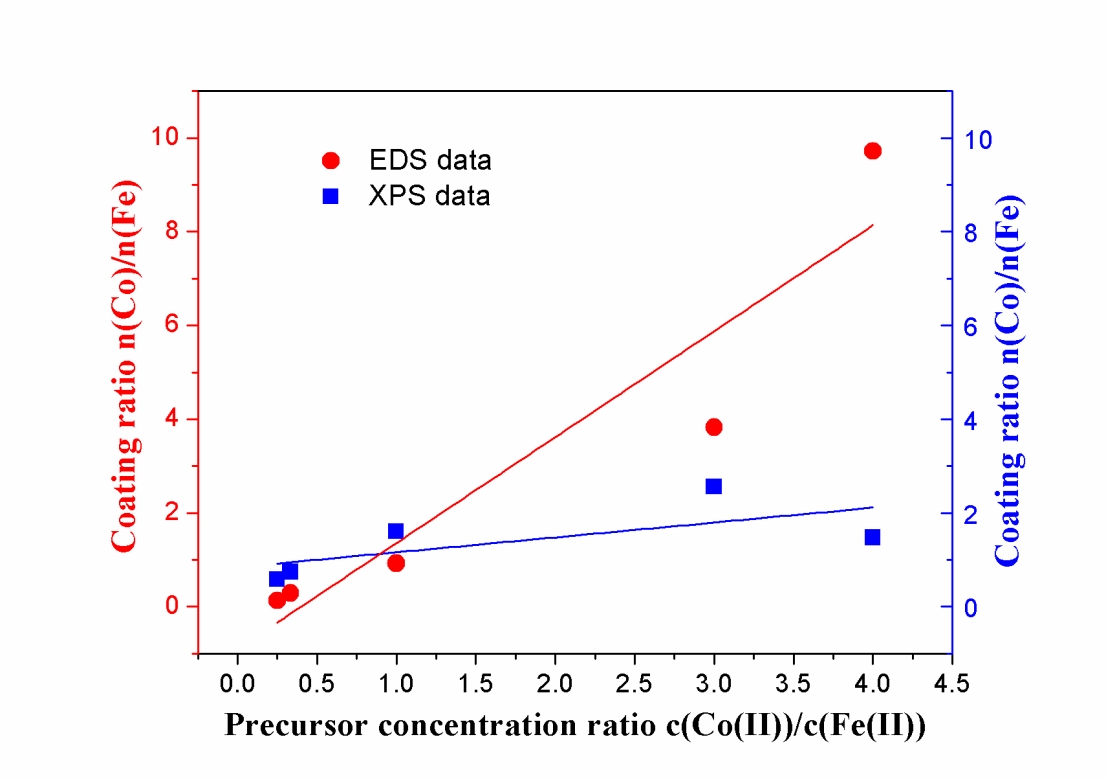

Figure S1 Relationship between the coating amount ratio of Co and Fe nanoparticles (respectively detected by EDS and XPS) and the concentration ratio of Co(II) and Fe(II) ions in the precursor.

Table S2 Contents of the as-coated Fe and Co nanoparticles on the fabrics measured by AAS.

Concentration ratio of precursor ([Co(II)]/[Fe(II)])	**1:4**	**1:3**	**1:1**	**3:1**	**4:1**
Co (wt %)	0.33	0.45	0.98	0.93	0.81
Fe (wt %)	1.38	1.5	1.14	0.35	0.23
Weight ratio m(Co)/m(Fe)	0.239	0.300	0.860	2.657	3.522
Moral ratio n(Co)/n(Fe)	0.227	0.284	0.815	2.518	3.338

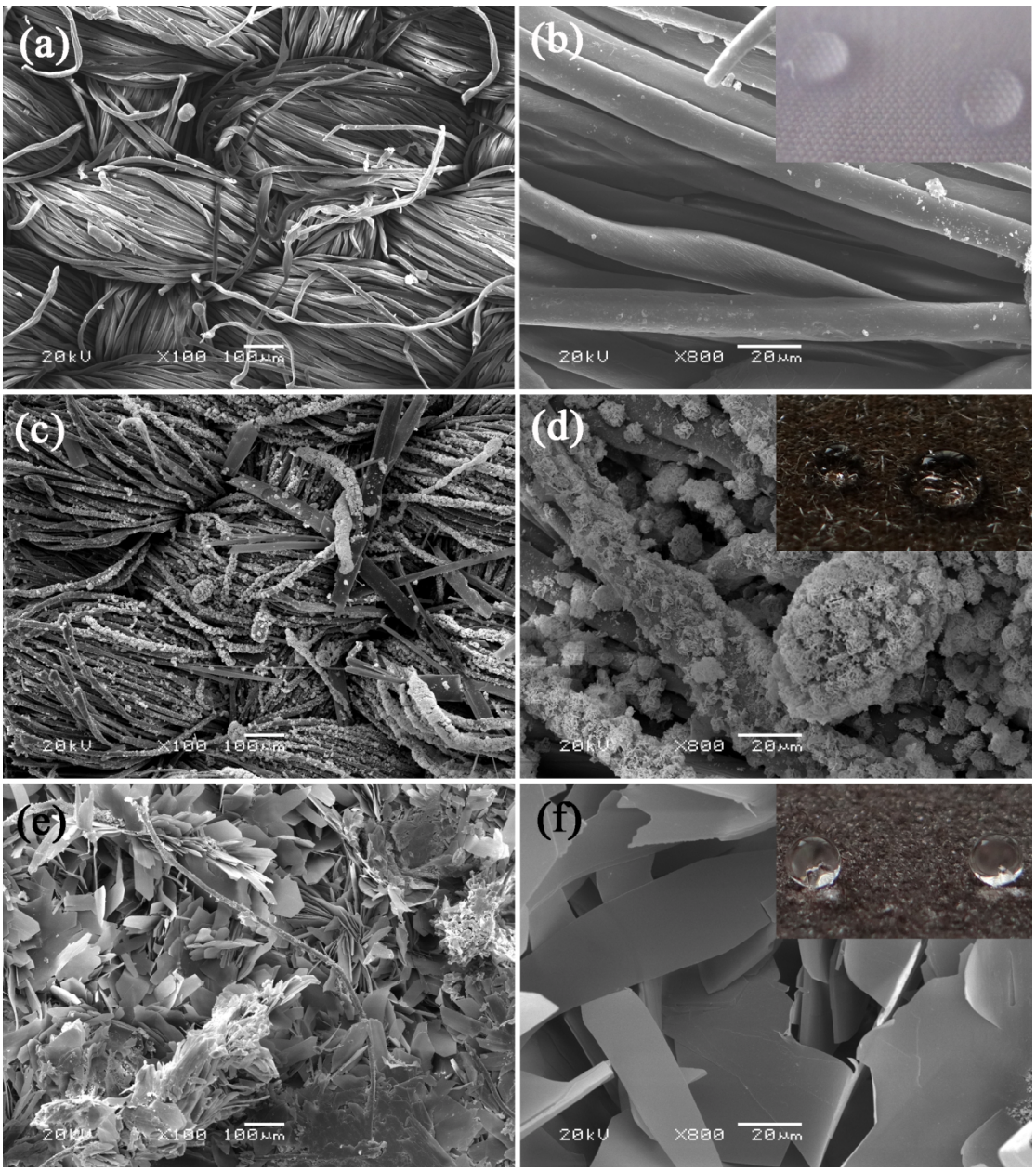

Figure S2 SEM images of the original fabric (a, b) and the as-prepared ones corresponding to different concentration ratios of Co(II) and Fe(II) ions in the precursors as labeled with dots 1 and 5 in Fig. 4a: (c, d) dot 1 (concentration ratio 1:4), (e, f) dot 5 (concentration ratio 1:4). The inset panels show the unstable hydrophobic and stable superhydrophobic fabrics with the concentration ratio 1:4 and 4:1, respectively.

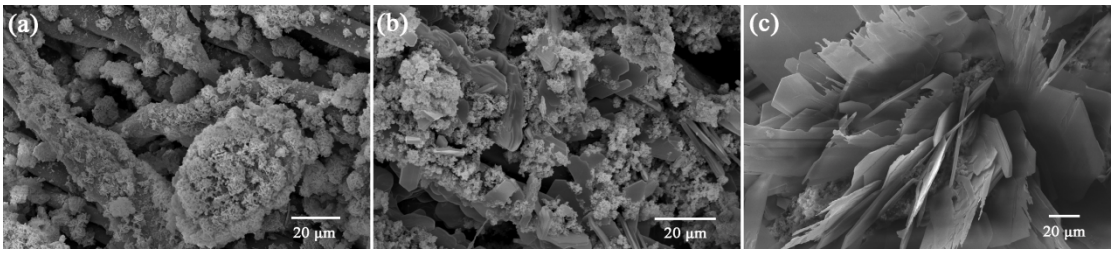

Figure S3 The geometric morphology variation from the Fe(II) ion dominant precursor to the Co(II) ion dominant precursor. Panels (a-c) respectively represent the different concentration ratios of Co(II) and Fe(II) ions (n(Co(II))/n(Fe(II))): (a) 1:4, (b) 1:1 and (c) 4:1.

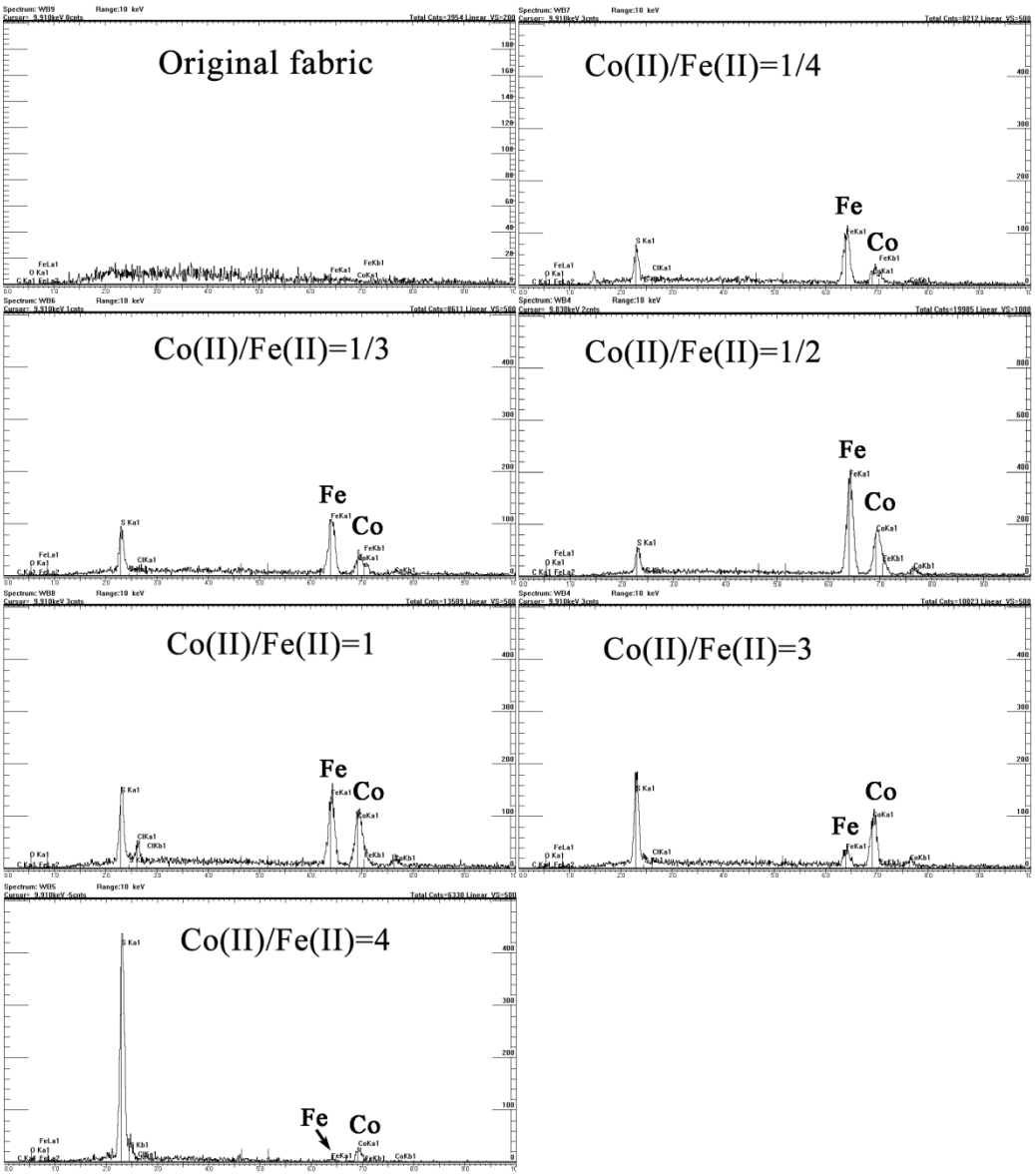

Figure S4 EDS spectra of the as-fabricated SSH fabrics from in situ growth of Co and Fe nanoparticles with different precursor concentrations that have labeled in each panels. The intensity of the peak values can intuitively reflect the amount of the corresponding nanoparticles.

Figure S5 Photograph of the ultrasonic humidifier that is used to produce micro-scale water fogs.

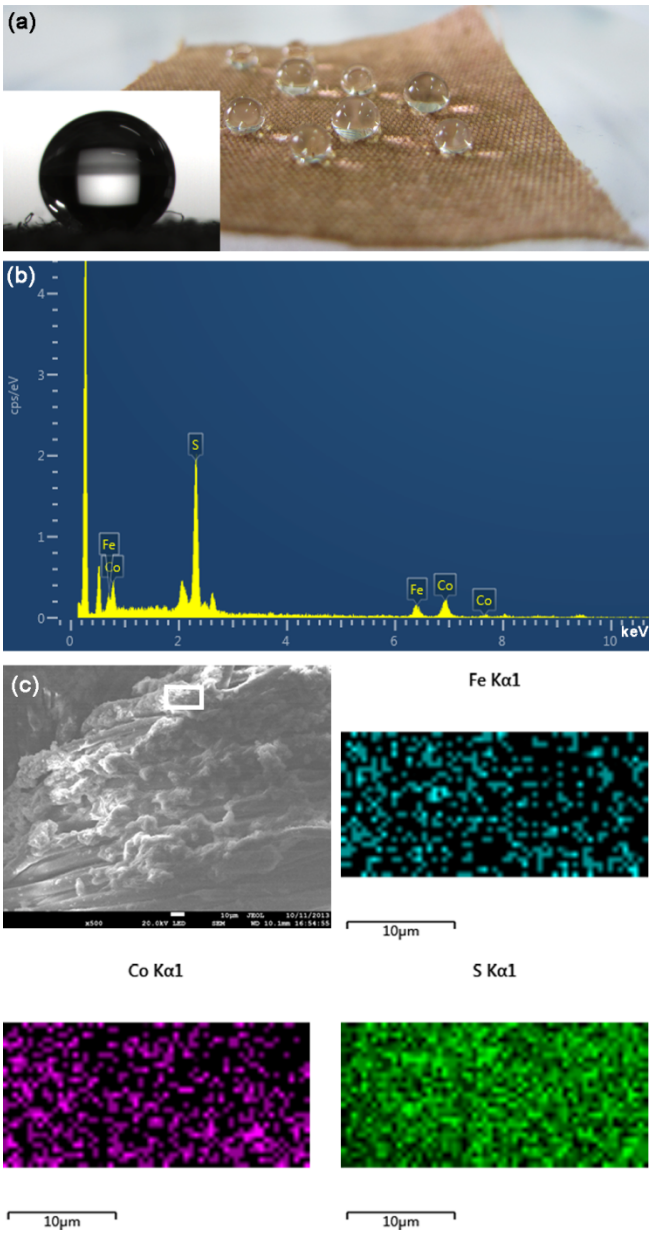

Figure S6 (a) Optical images of macroscale water droplets deposit on the as-prepared fabric with the precursor's concentration ratio 3:1 of n(Co(II))/c(Fe(II)) after 12 times repetitions. The inset shows the water CA of the fabric. (b) EDS spectrum of the SSH fabric after 12 times repetitions. (c) SEM image and the EDS maps of the SSH fabric after 12 times repetitions.

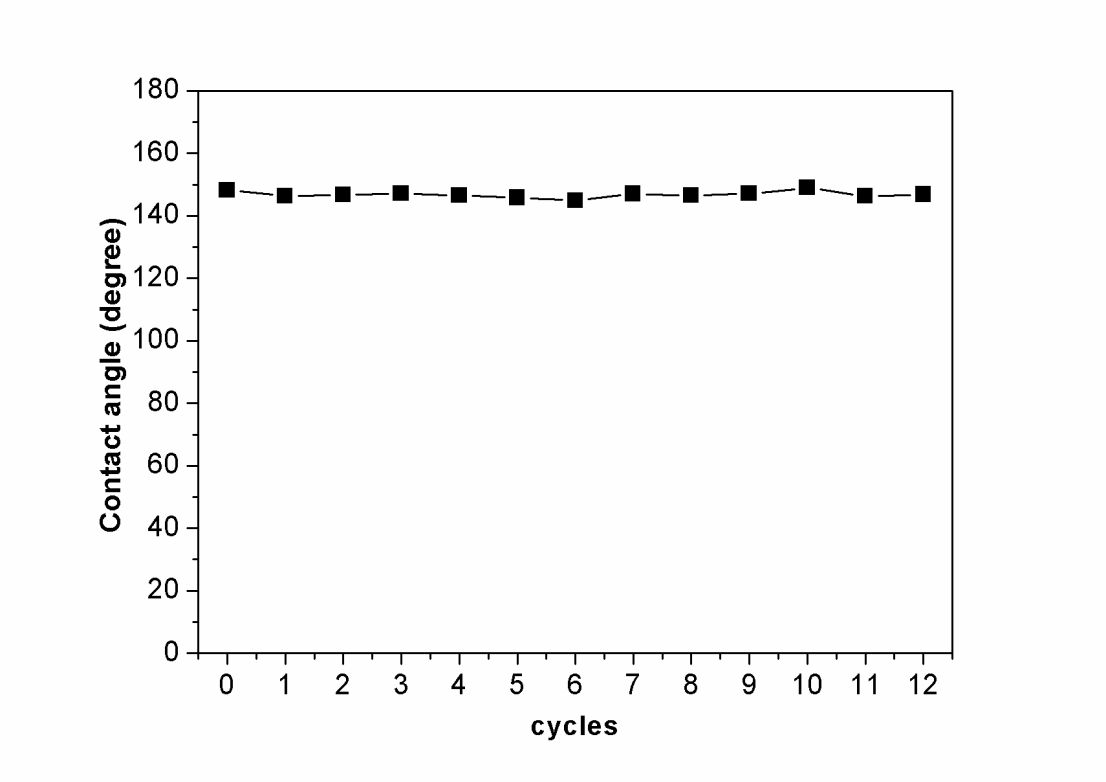

Figure S7 Line graph showing the relationship between contact angle and the cycle numbers.

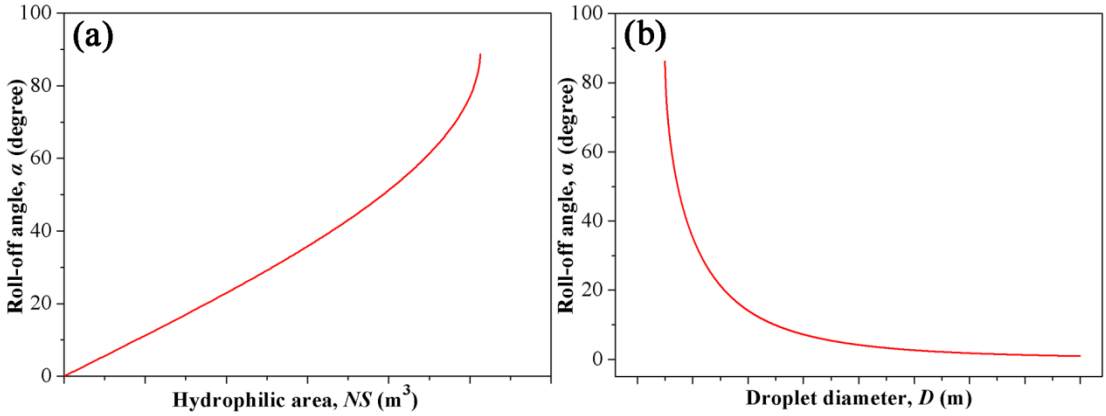

Figure S8 Theoretical prediction of (a) the relationship between the roll-off angle and the total area formed by the superhydrophilic Fe nanoparticles, and (b) the relationship between the roll-off angle and the diameter of the water droplet.