Electronic Supplementary Material (ESI) for RSC Advances.

Transparent Superhydrophobic PTFE Films *via* One-Step Aerosol Assisted Chemical Vapor Deposition

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S1:

Calculation of the surface energy of Tergitol TMN-6 + PTFE precursor

Tergitol TMN-6 + PTFE precursor was spin-coated onto a glass slide followed by 450 °C annealing for ~ 30 s.

The surface energy of the precursor was calculated by Owens-Wendt method as follows

$$(1+\cos\theta)\gamma_{LV} = 2\left(\gamma_S^D\gamma_{LV}^D\right)^{1/2} + 2\left(\gamma_S^P\gamma_{LV}^P\right)^{1/2} \tag{S1}$$

$$\gamma_S = \gamma_S^D + \gamma_S^P \tag{S2}$$

In Equations (S1) and (S2), γ_{LV}, γ_{LV}^D and γ_{LV}^P are, respectively, the total surface tension, the dispersion component, and the polar component of the liquid; γ_S, γ_S^D ,and γ_S^P are, respectively, the total surface energy, the dispersion component, and the polar component of the sample surface. Here, deionized water and formamide were selected as the test liquids, and the relevant parameters were shown in the following table. θ is the measured contact angles (CA) of liquids on the sample surface, and CA of deionized water on the sample surface is 116°, CA of formamide on the sample surface is 97°. So the value of γ_S can be calculated for the sample film to be about 14.8 mN/m.

Table S1. The total surface tension γ_{LV}, the dispersion component γ_{LV}^D, and the polar component γ_{LV}^P of the deionized water and formamide.

Liquids	γ_{LV}^D (mJ/m^2)	γ_{LV}^P (mJ/m^2)	γ_{LV} (mJ/m^2)
Deionized water	22.0	50.2	72.2
Formamide	39.6	18.6	58.2

Video Captions

Video S1

The video shows that 10 g of sand grains was dropped from 65 cm onto a slightly tilted surface, exhibiting superhydrophobicity after the sand grains impact.

Video S2

The video shows the bounce dynamics of water droplets on superhydrophobic PTFE surfaces under ambient conditions at a rate of 3000 fps. It can be found that there were more than eight such reciprocating motions due to the little adhesion between the film and the water drops, which exhibited the excellent superhydrophobicity of the transparent PTFE film.

Video S3

The video shows the untreated glass surface was easily wetted by the aqueous dye while the superhydrophobic PTFE surface remained dry and stain-free.

Video S4

The video shows water drops effectively picked up carbon powder and rolled away from the superhydrophobic PTFE surface, thus achieving the self-cleaning performance. In contrast, some carbon powder was still left on the untreated glass surface.