

Electronic Supplementary Information.

Micro/nanotextured polymer coatings fabricated by UV curing-induced phase separation technique: creation of superhydrophobic surfaces

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1. Additional Results

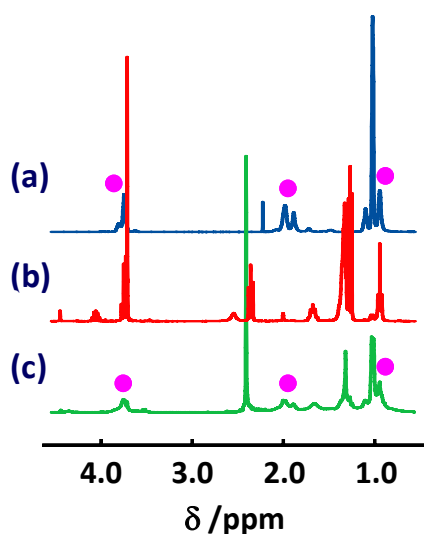


Fig. S1 Comparison of ¹H-NMR spectra of PIBMA itself and extracted chemicals from the as-UV cured polymer films. (a) PIBMA dissolved in CDCl₃, which was used as a soluble polymer component for the PIPS process. (b and c) The components extracted to ethanol and toluene, respectively. The polymer film was fabricated on silanized glass plates (38 x 26 mm²) by UV curing using a monomer mixture containing a 42:6:1 weight ratio of EGDMA, TBMA, and FMA, respectively, with a porogenic additive of 10 wt % PIBMA (M_w of 3.0×10^5 g mol⁻¹) in methyl caprate. After the UV curing process, the polymer film was quickly washed by ethanol flushing as a standard procedure in the present method, followed by thoroughly washed with toluene by immersion for 48 h at room temperature. Both extracts were evaporated and the residual chemicals were dissolved in CDCl₃ for the ¹H-NMR measurements with anthracene as internal reference for quantitative evaluation.

Table S1 Viscosity data of the PIPS precursors. All the precursors consist of a monomer mixture of EGDMA, TBMA, and FMA (42:6:1 in weight ratio) and a certain porogenic additive in 4:3 volume ratio. The viscosity data are displayed for each solvent as a function of PIBMA concentration (wt %) in the porogenic additives.

Solvent	Viscosity / mPa·s ^a					
	Concentration of PIBMA ^b					
	0%	1.0%	3.0%	5.0%	10%	20%
MeHex	1.42				7.08	23.7
MeOct	1.75			4.40	8.57	24.7
MeCap	2.29	2.55	3.89	5.30	9.90	25.3
MeLau	2.44	2.93			11.5	31.0
MeMyr	2.92	3.57	5.11	6.82	11.8	32.0
MePal	3.11			7.43	13.3	

^a At 23 °C. ^b Weight percent of PIBMA in porogenic mixtures.

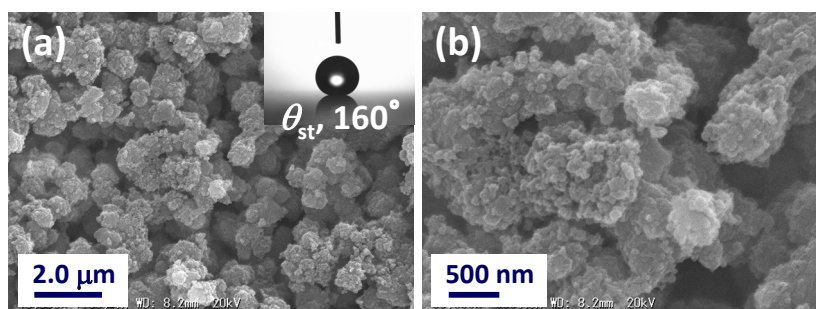


Fig. S2 Scanning electron microscope (SEM) images of the microtextured polymer film, which was prepared in the absence of the fluorinated monomer, FMA. The polymer film was fabricated on a silanized glass plate (38 x 26 mm²) by UV curing using a monomer mixture containing a 42:6 weight ratio of EGDMA and TBMA, respectively, with a porogenic additive of 10 wt % PIBMA (M_w of 3.0×10^5 g mol⁻¹) in methyl caprate. (a) A surface image of the film with an inset indicating a profile of a water droplet. (b) A magnified image of the identical polymer film. For the SEM observation, the polymer film was coated with vacuum-deposited Pt thin layer (thickness, 5 nm) and then imaged using 12 – 20 kV accelerating voltage. Static contact angles were measured on sessile drops (4 μL) of distilled water at 23 °C under air. All the observed values were averaged for at least three measurements taken on different drops.

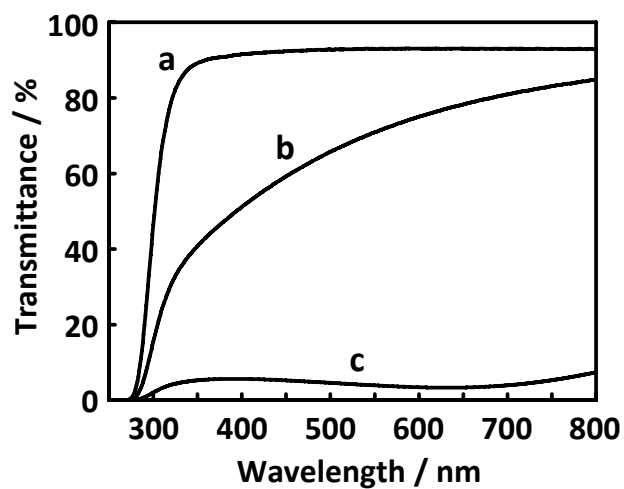


Fig. S3 UV-vis transmittance spectra of the microtextured polymer films on silanized glass plates ($38 \times 26 \text{ mm}^2$), which were fabricated by UV curing using a monomer mixture containing a 42:6:1 weight ratio of EGDMA, TBMA, and FMA, respectively, with a porogenic additive of 10 wt % PIBMA (M_w of $3.0 \times 10^5 \text{ g mol}^{-1}$) in methyl myristate. Each spectrum was obtained for the films prepared under the spin-coat condition of (a) 7000 rpm, (b) 4000 rpm, and (c) 2000 rpm for 25 s.