

Supporting Information for

**Tuning Surface Properties of Poly(methyl methacrylate) Film Using
Poly(perfluoromethyl methacrylate)s with Short Perfluorinated Side
Chains**

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Table S1. Contact angles, surface energies (RMS), and surface roughness values of the blend films of PFMMA and PMMA (50/50 wt.%).

Sample	Contact angle[deg.](STD) ^a				Surface energy (mN/m) ^d	Surface roughness RMS (nm)
	Water		Diiodomethane			
	θ_{adv}^b	θ_{rec}^c	θ_{adv}^b	θ_{rec}^c		
PTFEMA	104.1 (0.7) ^e	^f	80.9 (1.0)	66.8 (0.3)	17.6	1.9
PPFPMA	110.9 (1.0)	87.8 (1.3)	91.4 (1.2)	75.9 (0.4)	12.5	1.5
PHFIPMA	113.2 (0.4)	95.1 (0.7)	93.1 (0.5)	80.7 (1.8)	11.7	0.7
PHFBMA	116.2 (0.9)	89.2 (1.8)	97.5 (1.5)	75.3 (0.1)	9.9	3.2

^a Standard deviations were inserted in the brackets.

^b Advancing contact angle.

^c Receding contact angle.

^d The surface energies were calculated by Owen-Wendt-Rable-Kaelble method.

^e The stick angle was adopted as the advancing contact angle according to previous reports.

^f Due to the stick-slip behavior, the receding contact angles could not obtained.

Table S2. Contact angles, surface energies (RMS), and surface roughness values of the blend films of PFMMAs and PMMA (25/75 wt.%).

Sample	Contact angle[deg.](STD) ^a				Surface energy (mN/m) ^d	Surface roughness RMS (nm)
	Water		Diiodomethane			
	θ_{adv}^b	θ_{rec}^c	θ_{adv}^b	θ_{rec}^c		
PTFEMA	99.5 (0.8)	79.0 (0.5)	79.4 (0.9)	51.5 (1.4)	19.0	0.8
PPFPMA	110.0 (0.7)	86.1 (0.7)	91.1 (1.0)	74.0 (0.7)	12.8	0.8
PHFIPMA	112.9 (0.5)	93.6 (1.0)	94.1 (0.8)	82.0 (0.5)	11.3	1.0
PHFBMA	116.1 (0.4)	88.4 (0.7)	98.1 (1.3)	77.6 (1.0)	9.7	2.3

^a Standard deviations were inserted in the brackets.

^b Advancing contact angle.

^c Receding contact angle.

^d The surface energies were calculated by Owen-Wendt-Rable-Kaelble method.

Table S3. Contact angles, surface energies (RMS), and surface roughness values of the blend films of PFMMAs and PMMA (10/90wt.%).

Sample	Contact angle[deg.](STD) ^a				Surface energy (mN/m) ^d	Surface roughness RMS (nm)
	Water		Diiodomethane			
	θ_{adv}^b	θ_{rec}^c	θ_{adv}^b	θ_{rec}^c		
PTFEMA	99.3 (0.9)	76.4 (0.7)	73.9 (0.9)	39.6 (1.0)	21.4	1.4
PPFPMA	113.5 (0.3)	87.7 (0.9)	90.6 (1.0)	73.6 (0.7)	12.6	0.8
PHFIPMA	113.4 (0.4)	94.5 (0.7)	92.6 (0.8)	81.8 (1.3)	11.8	0.4
PHFBMA	117.1 (0.9)	89.6 (0.4)	96.2 (1.4)	74.7 (0.2)	10.2	0.6

^a Standard deviations were inserted in the brackets.

^b Advancing contact angle.

^c Receding contact angle.

^d The surface energies were calculated by Owen-Wendt-Rable-Kaelble method.

Table S4. Contact angles, surface energies (RMS), and surface roughness values of the blend films of PFMMAs and PMMA (5/95wt.%).

Sample	Contact angle[deg.](STD) ^a				Surface energy (mN/m) ^d	Surface roughness RMS (nm)
	Water		Diiodomethane			
	θ_{adv}^b	θ_{rec}^c	θ_{adv}^b	θ_{rec}^c		
PTFEMA	87.5 (0.9)	66.0 (1.6)	70.3 (0.9)	26.8 (2.0) ^e	26.0	1.8
PPFPMA	105.6 (0.5)	87.2 (0.2)	87.8 (1.2)	69.3 (1.4)	14.6	0.3
PHFIPMA	109.6 (0.4)	95.1 (0.3)	91.0 (0.6)	79.0 (0.6)	12.8	0.4
PHFBMA	112.6 (0.5)	89.7 (0.5)	94.2 (0.6)	73.6 (0.7)	11.3	0.3

^a Standard deviations were inserted in the brackets.

^b Advancing contact angle.

^c Receding contact angle.

^d The surface energies were calculated by Owen-Wendt-Rable-Kaelble method.

^e The stick angle was adopted as the advancing contact angle according to previous reports.

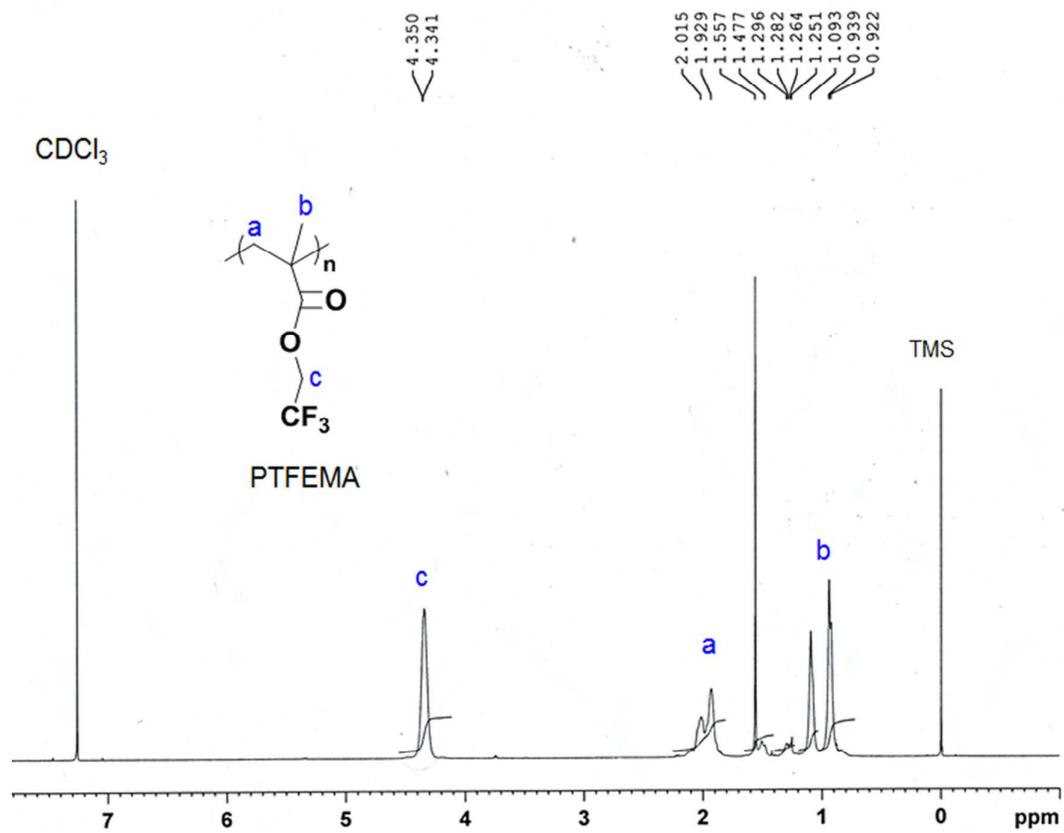


Figure S1. ¹H NMR spectra of PTFEMA.

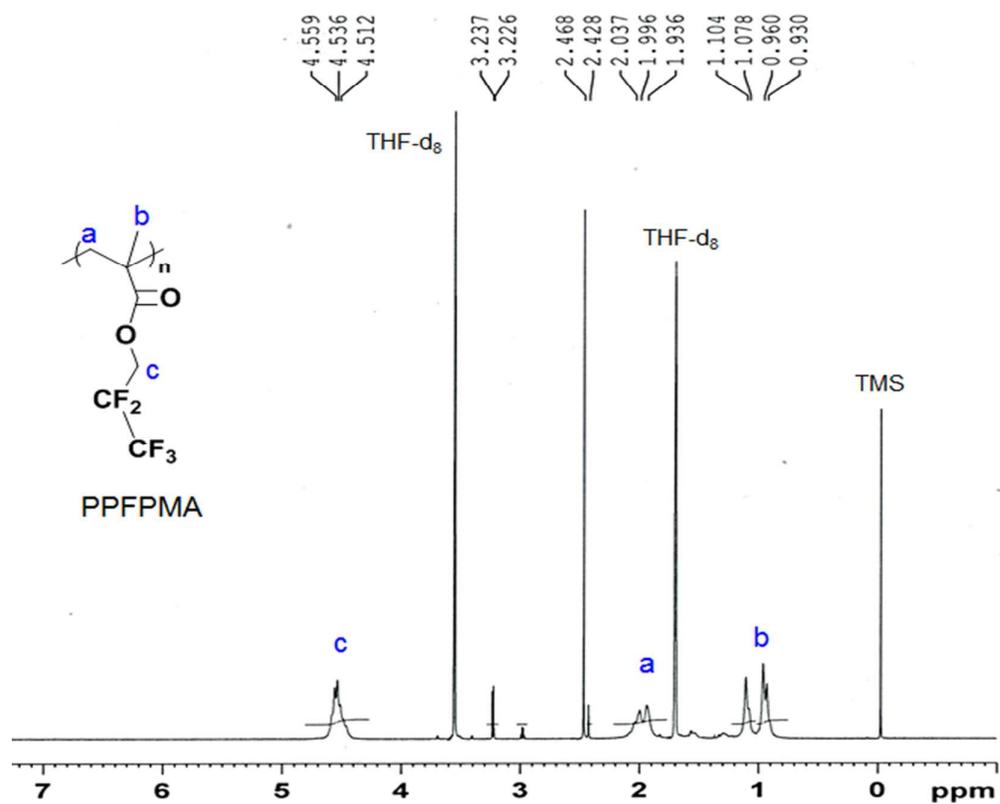


Figure S2. ¹H NMR spectra of PFPMA.

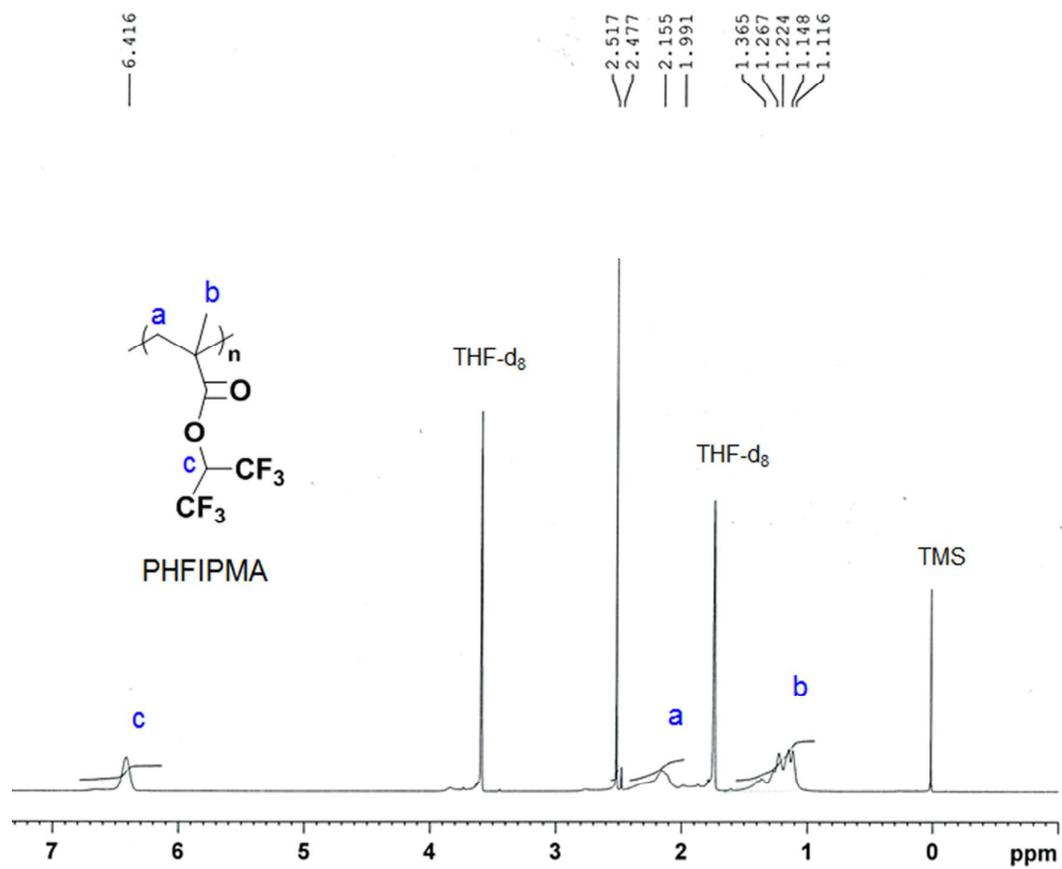


Figure S3. ¹H NMR spectra of PHFIPMA.

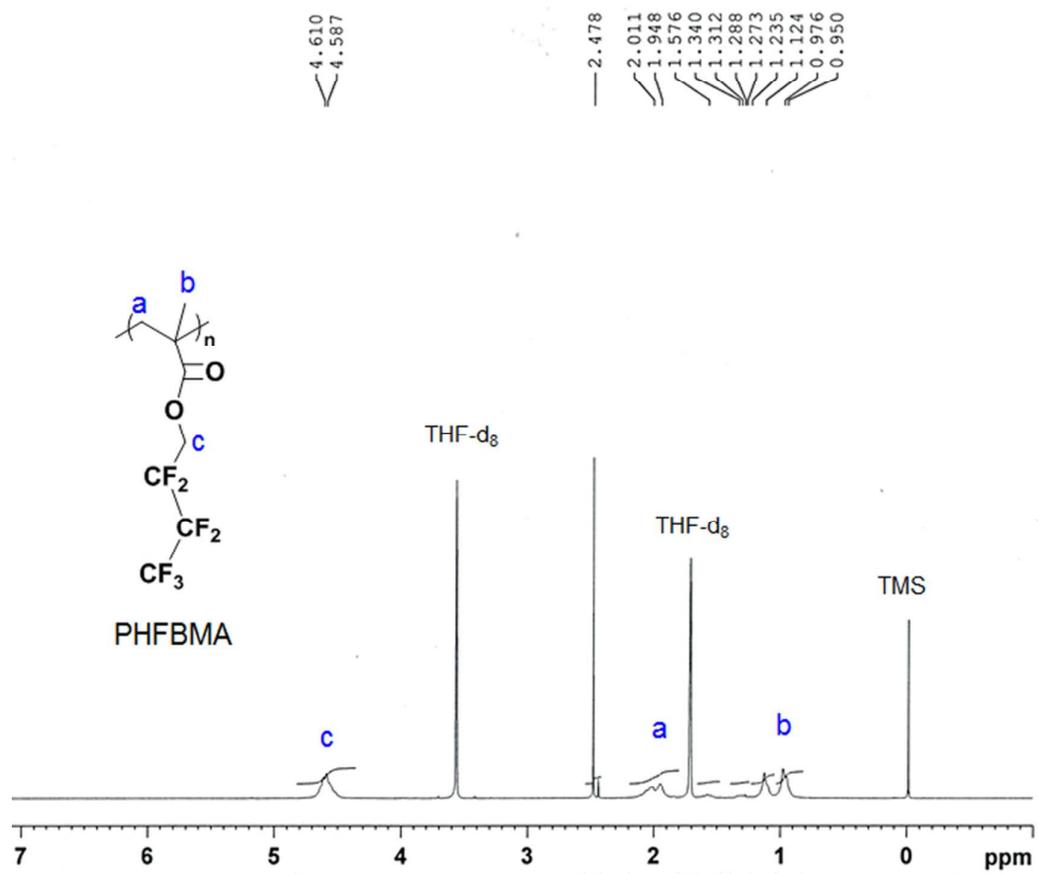


Figure S4. ¹H NMR spectra of PHFBMA.

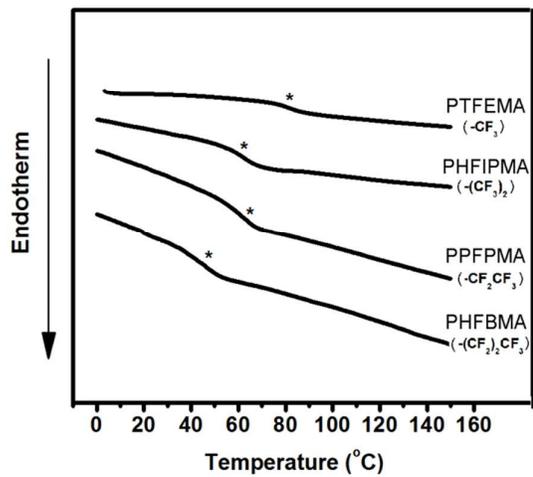


Figure S5. DSC thermograms of PFMMAs. The asterisks indicate the T_g s of the polymers.

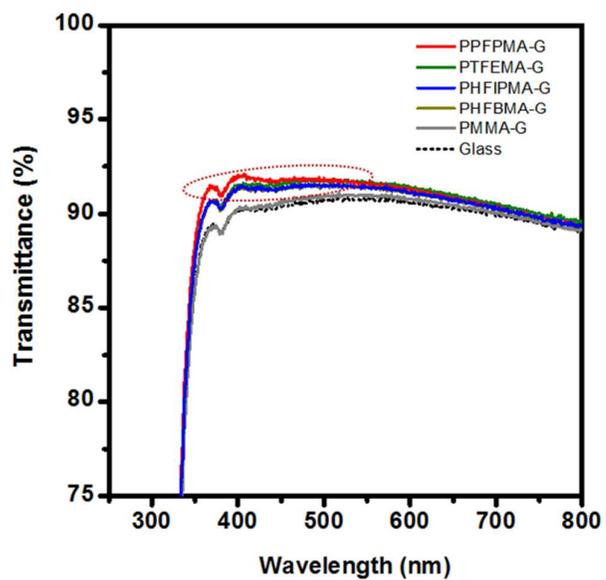


Figure S6. UV-vis transmission spectra of PFMMA- and PMMA-coated glass slides.

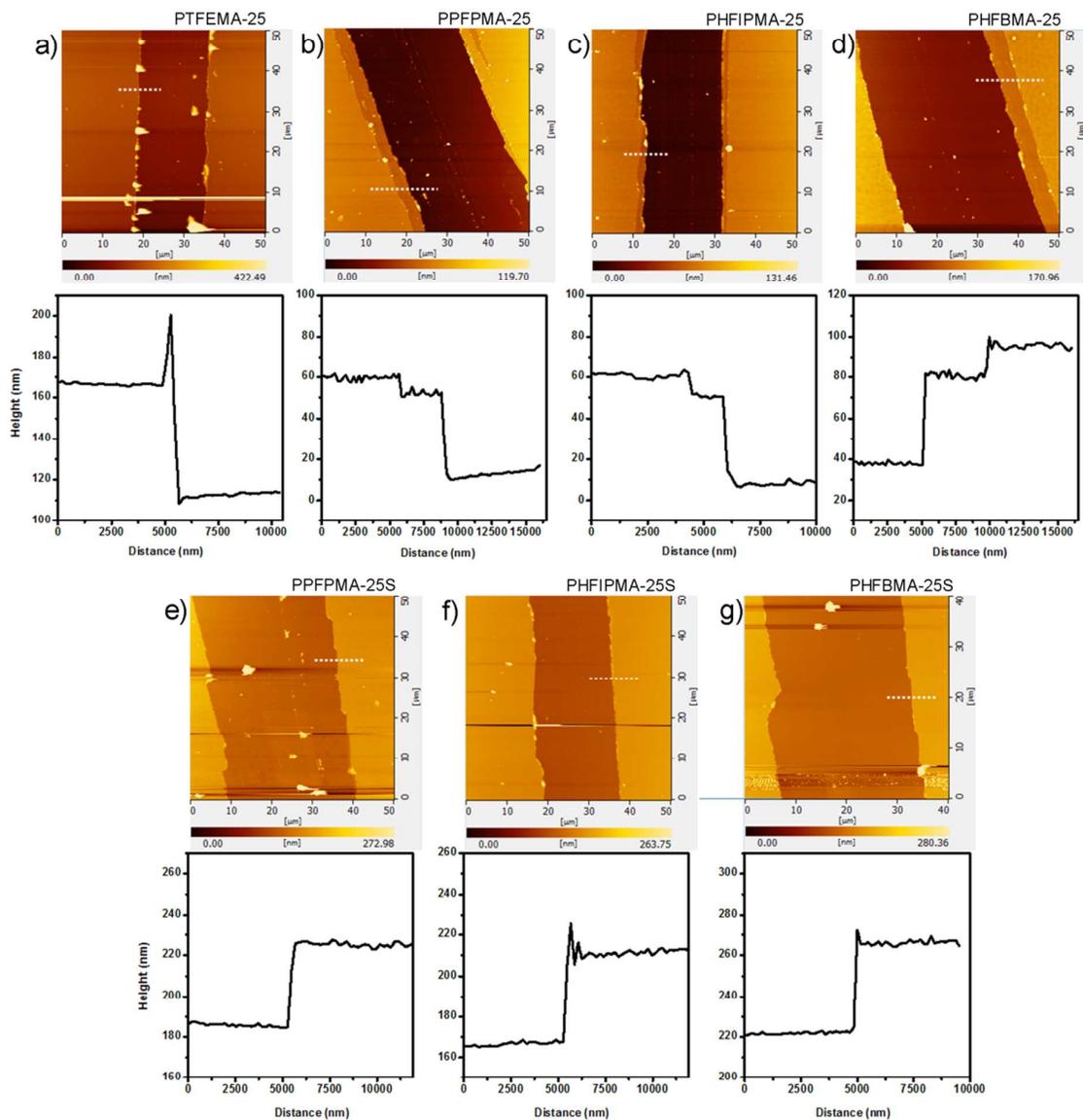


Figure S7. AFM topographical images and line profiles of scratched surfaces of PFMMAs /PMMA blends (25/75 wt.%) before and after solvent treatment. PPFMA-25S, PHFIPMA-25S, and PHFBMA-25S indicate the surfaces measured after solvent treatment.

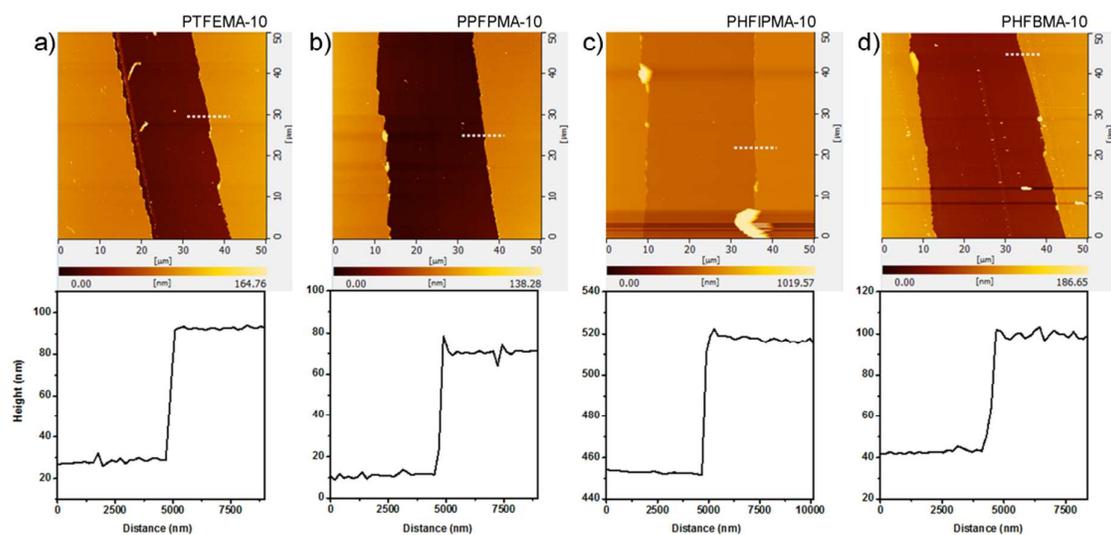


Figure S8. AFM topographical images and line profiles of scratched surfaces of PFMMAs /PMMA blends (10/90 wt.%).

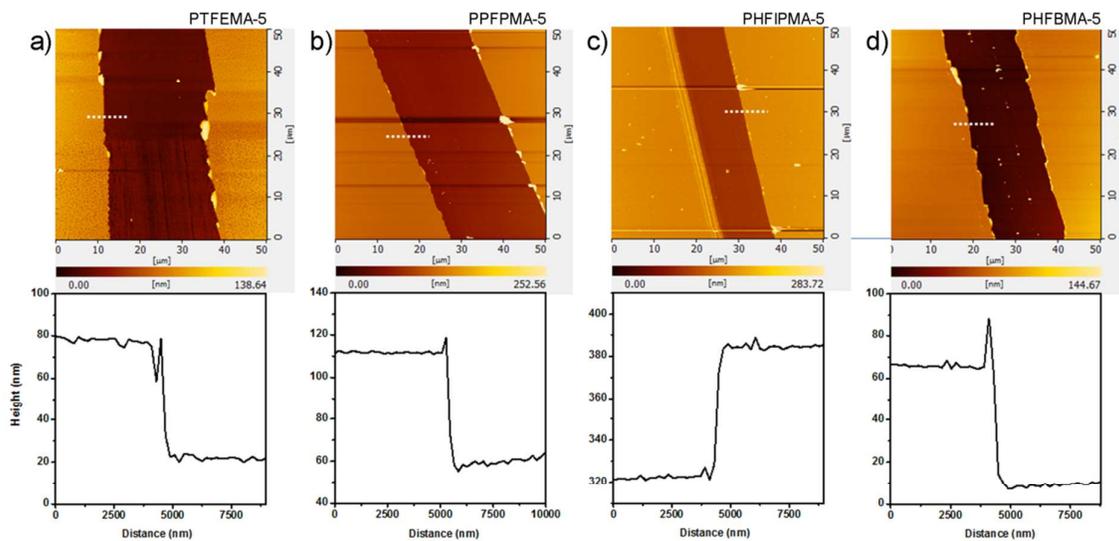


Figure S9. AFM topographical images and line profiles of scratched surfaces of PFMMA /PMMA blends (95/5 wt.%).

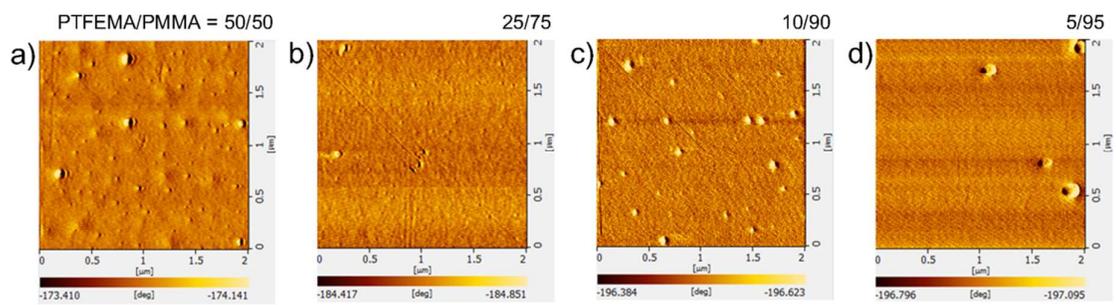


Figure S10. AFM images of PTFEMA/PMMA: a) 50/50, b) 25/75, c) 10/90, and d) 5/95.

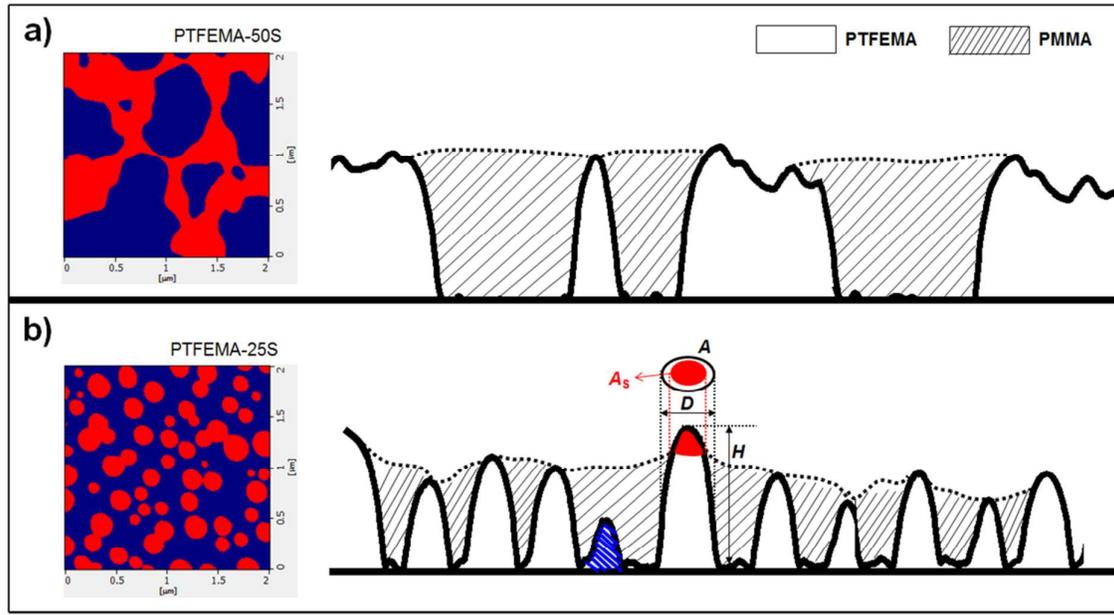


Figure S11. PTFEMA part (red)-highlighted AFM images (left figures) of a) PTFEMA-50S and b) PTFEMA-25S (or -10S), and the proposed phase structures (right figures) of their blends. A and A_s indicate the surface area of PTFEMA island calculated from the highlighted AFM images such as the left figures, and proposed real surface area which was not shielded by PMMA part, respectively. The surface energy and composition are closely related to A_s than A . The island with blue deviant crease lines in the proposed phase structure of figure b) represents the buried one under PMMA part. D and H denote diameter and height of PTFEMA islands, respectively.