Electronic Supplementary Material (ESI) for Soft Matter.

Adhesion and Friction in Polymer Films on Solid Substrates: Conformal Sites Analysis and Corresponding Surface Measurements

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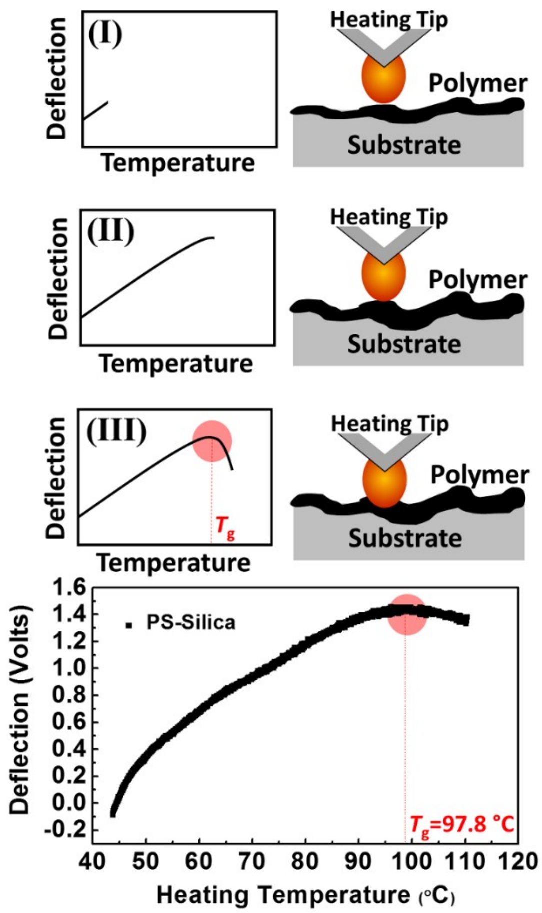

Fig. S1 Schematic diagram showing the basic operating principle of Nano-TA and a representative deflection curve for a PS film (thickness = 340 nm) on a silica surface.

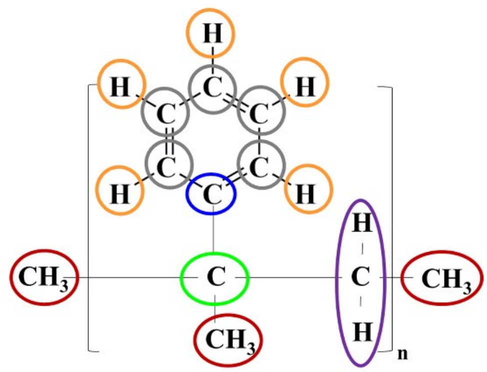

Fig. S2 Polymer structures and bead center locations chosen for poly(α-methylstyrene) (PAMS).

Table S1. Site mole fractions and potential energy parameters[1] for PAMS with M_w =450 kDa (OPLS force field)

PAMS	ε_v / k_B (K)	x_v	σ_v (nm)
CH_3 (sp^3)[2]	88.1	0.0004	0.390
CH_2 (sp^3)[2]	59.4	0.071	0.390
C (aliphatic)[3]	33.2	0.071	0.350
C (aromatic)[3]	35.2	0.071	0.355
H (aromatic)[3]	17.4	0.357	0.242
C (aromatic link)[3]	38.3	0.357	0.355

Table S2. Site mole fractions and potential energy parameters[4, 5] for PMMA with $M_w \approx 100$ kDa (OPLS force field)

PMMA	ε_v / k_B (K)	x_v	σ_v (nm)
CH_3 (sp^3)[2]	88.1	0.143	0.390
CH_2 (sp^3)[2]	59.4	0.143	0.390
C (sp^3)[3]	33.2	0.143	0.350
C (carbonyl)[3]	52.8	0.143	0.375
O (carbonyl)[3]	106	0.143	0.296
O (ether)[6]	85.6	0.143	0.300
CH_3 (ether)[2]	85.6	0.143	0.380

Table S3. The structural parameters of Au[7, 8] and silica surfaces,[9] and parameters for the reference system to calculate wetting parameters for PMMA-Au and PAMS-silica systems

		silica	Au
	ρ_s (nm^{-3})	44.2	0.59
	Δ_s (nm)	0.220	0.288
	σ_{ss} (nm)	0.270	0.257
	ε_{ss}/k_B (K)	230	5310
PMMA	ε_{xs}/k_B (K)	/	607
	σ_{xs} (nm)	/	0.308

	ε_x / k_B (K)	69.6	
	σ_x (nm)	0.356	
	α_{wx}	/	0.141
PAMS	ε_{xs} / k_B (K)	86.3	/
	σ_{xs} (nm)	0.287	/
	ε_x / k_B (K)	32.1	
	σ_x (nm)	0.304	
	α_{wx}	0.051	/

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