

Supporting Information

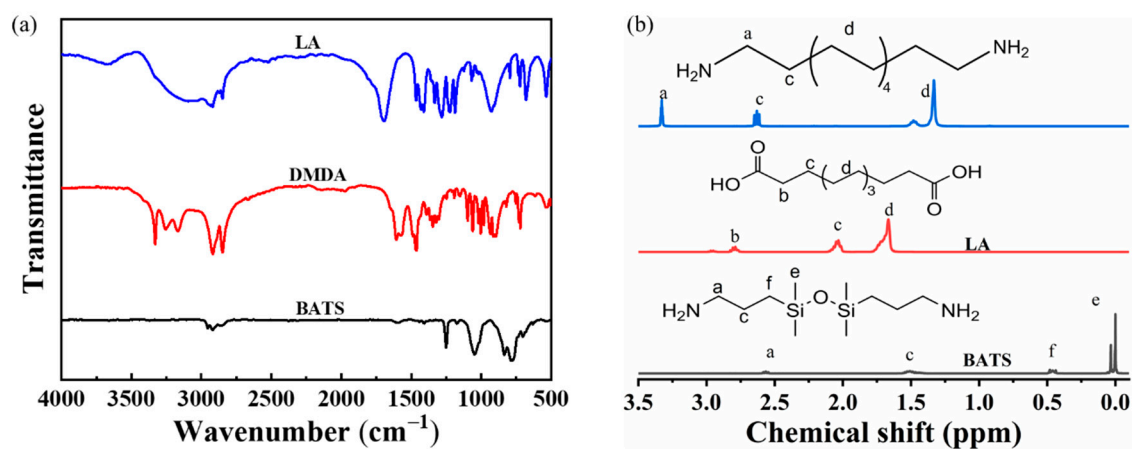
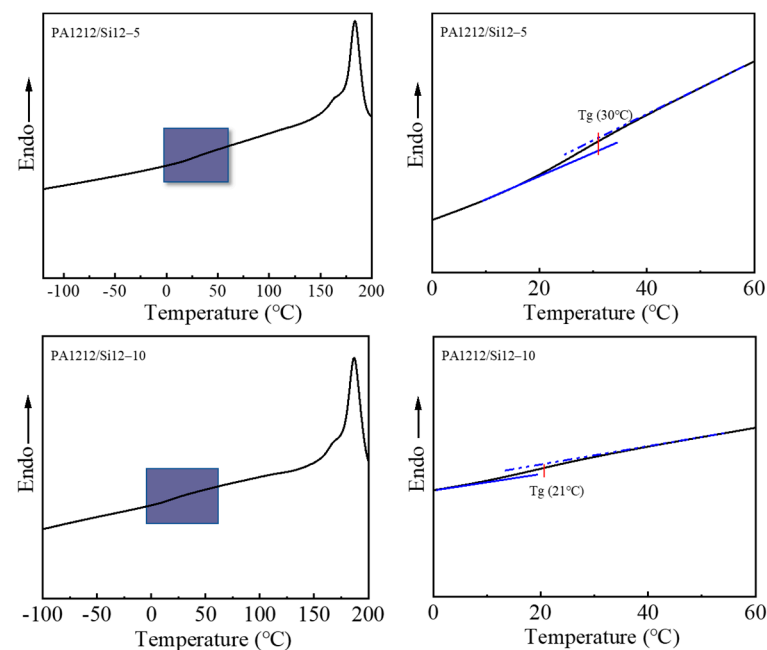


Figure S1. FT-IR (a) and ¹H NMR (b) spectra of BATS, LA and DMDA monomers.

Table S1. The DSC test results of PA1212.

Sample	T_g (°C)	T_m (°C)	T_c (°C)	ΔT (°C)	ΔH (J/g)	X_c^b (%)
PA1212 ^a	43	182	161	26	58.6	48.5

^a homemade and $[\eta] = 2.2$ dL/g; ^b the standard enthalpy is 121.8 J/g[43].



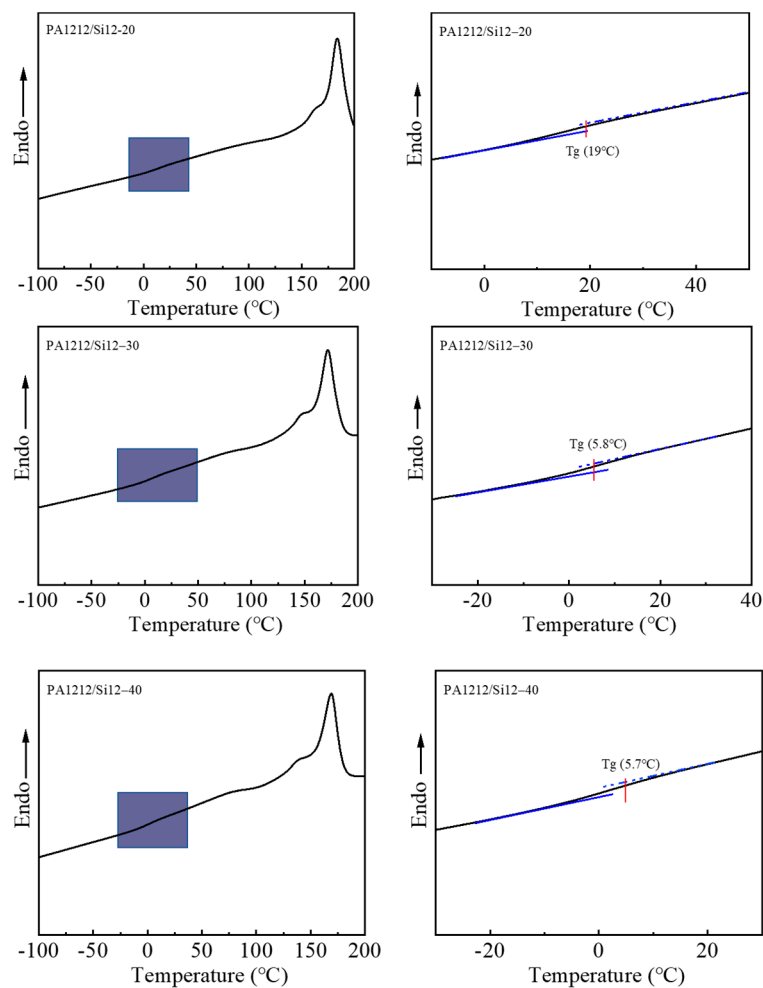


Figure S2. Determination of T_g of PA1212/Si12 copolymers by DSC (the second heating curves, 100 °C/min, under N_2 atmosphere).

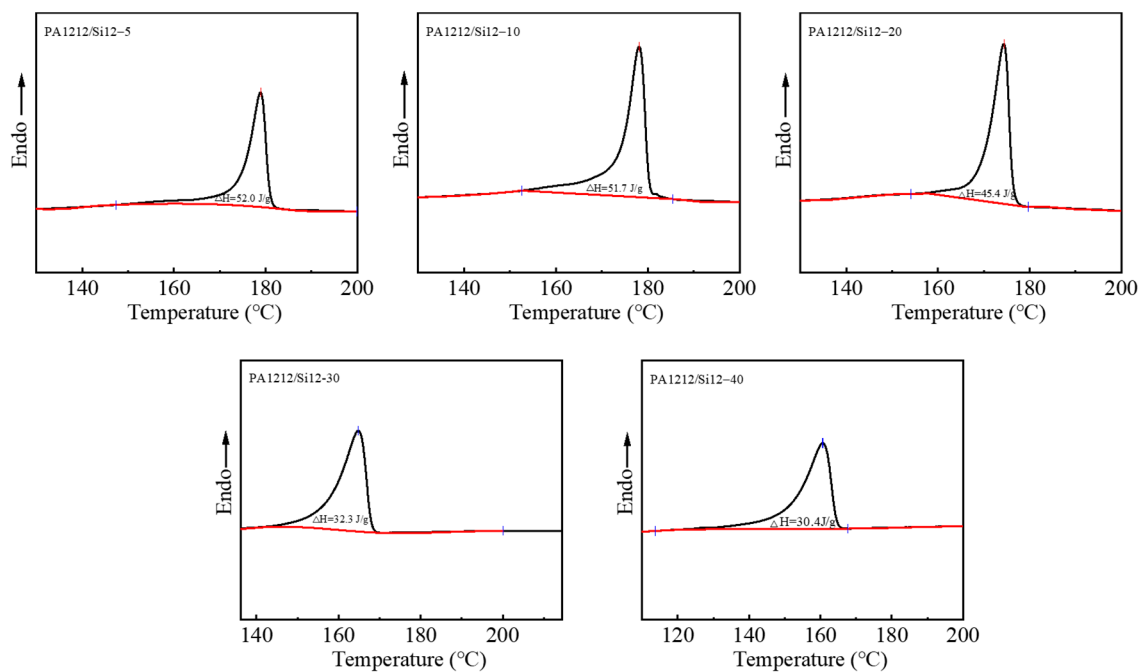


Figure S3. Determination of ΔH of PA1212/Si12 copolymers by DSC (the second heating curves, 10 °C/min, under N_2 atmosphere).

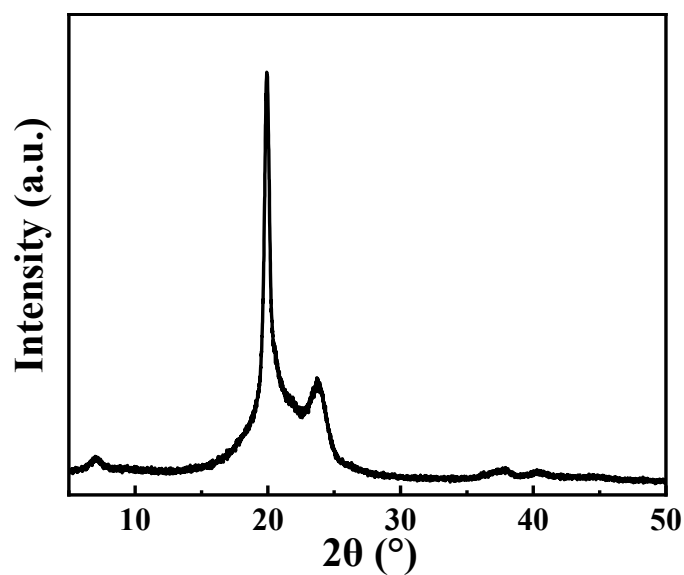


Figure S4. The WAXD pattern of PA1212.

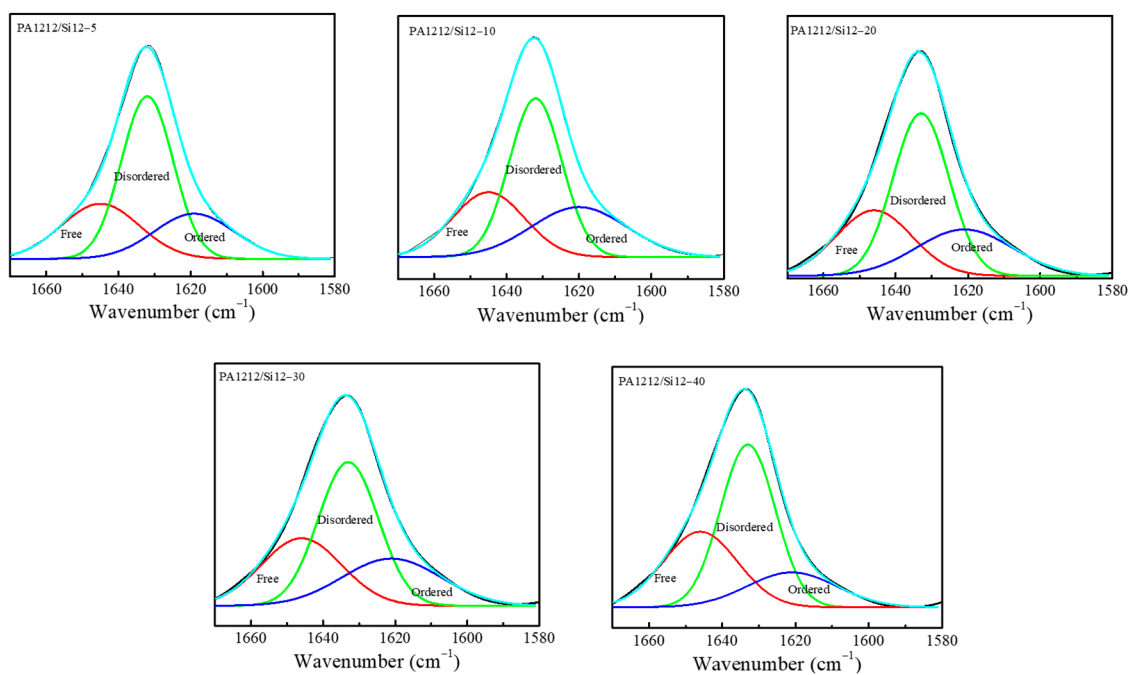


Figure S5. Deconvolution of Amide I band in IR spectra of PA1212/Si12 copolymers.

Table S2. The deconvolution results and HBI of PA1212/Si12 copolymers.

Sample	Peak Area of Free C=O	Peak Area of disordered- hydrogen-bonded C=O	Peak Area of ordered- hydrogen-bonded C=O	HBI
PA1212/Si12-5	1.27	2.50	1.07	2.79
PA1212/Si12-10	1.10	1.97	1.13	2.81
PA1212/Si12-20	1.71	3.12	1.53	2.58
PA1212/Si12-30	1.62	2.58	1.39	2.45
PA1212/Si12-40	1.39	2.21	0.77	2.14

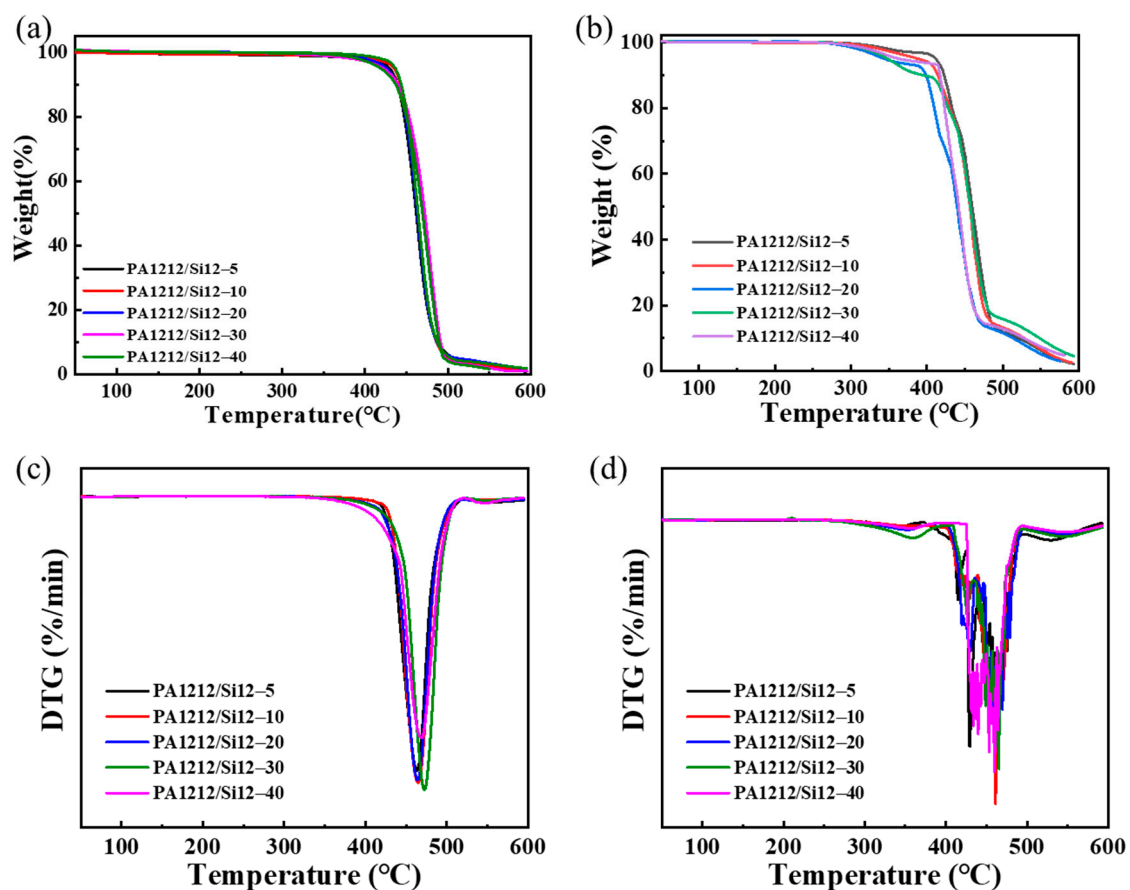


Figure S6. TGA and DTG curves of PA1212/Si12 copolymers (a) and (c) N₂ atmosphere; (b) and (d) under air atmosphere.

Table S3. TG characteristic parameters of PA1212 and TPAE-22.

Sample	N ₂ atmosphere			Air atmosphere			
	T _{5%} (°C)	T _{max1} (°C)	Residue (%)	T _{5%} (°C)	T _{max1} (°C)	T _{max2} (°C)	Residue (%)
PA1212 ^a	405	455	1.46	367	455	532	0
TPAE-22 ^b	392	434	0.26	325	409	530	1.67

^a $[\eta]$ of PA1212 is 2.2 dL/g; ^b TPAE-22 was synthesized by PA1212 prepolymer and ED2003 (purchased from Huntsman, USA)[4] and $[\eta]$ is 1.7 dL/g.

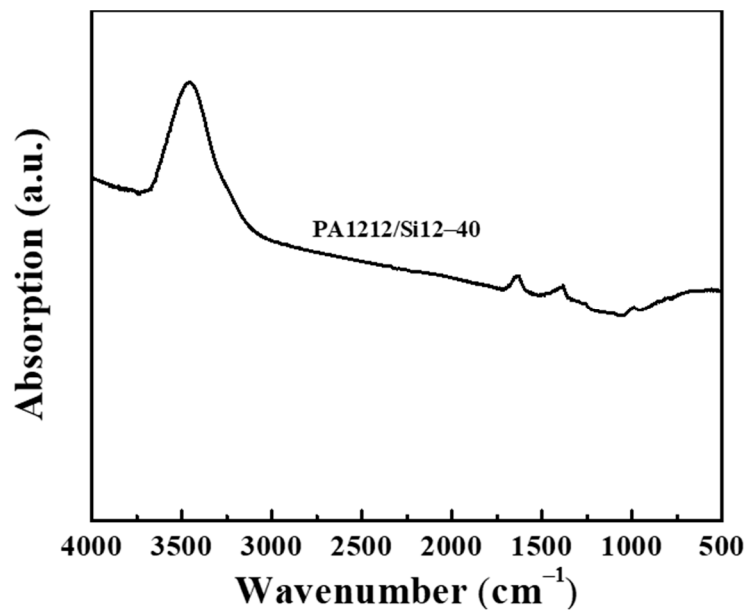


Figure S7. FT-IR spectra of PA1212/Si12-40 after combustion.

Table S4. Water contact angle and bibulous rate of PA1212 and TP AE.

Sample	Water contact angle (°)	Bibulous rate (%)
PA1212	84	0.63
TPAE-22	31	1.39

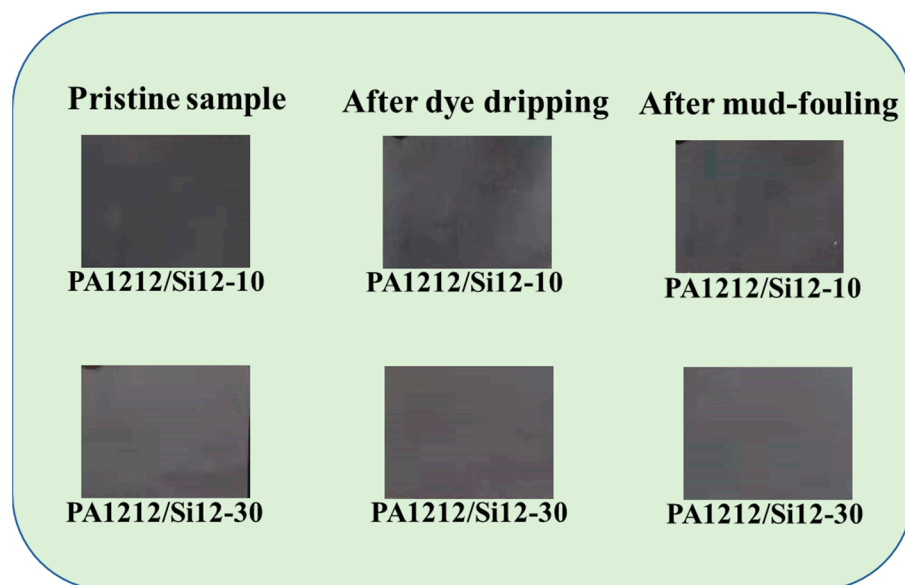


Figure S8. The digital images for PA1212/Si12-10 and -30 after dye dripping and mud contamination tests.