Supporting information for

Tailored Mechanical Properties of Soybean Oil-based Non-isocyanate Polyurethanes by Copolymer Integration

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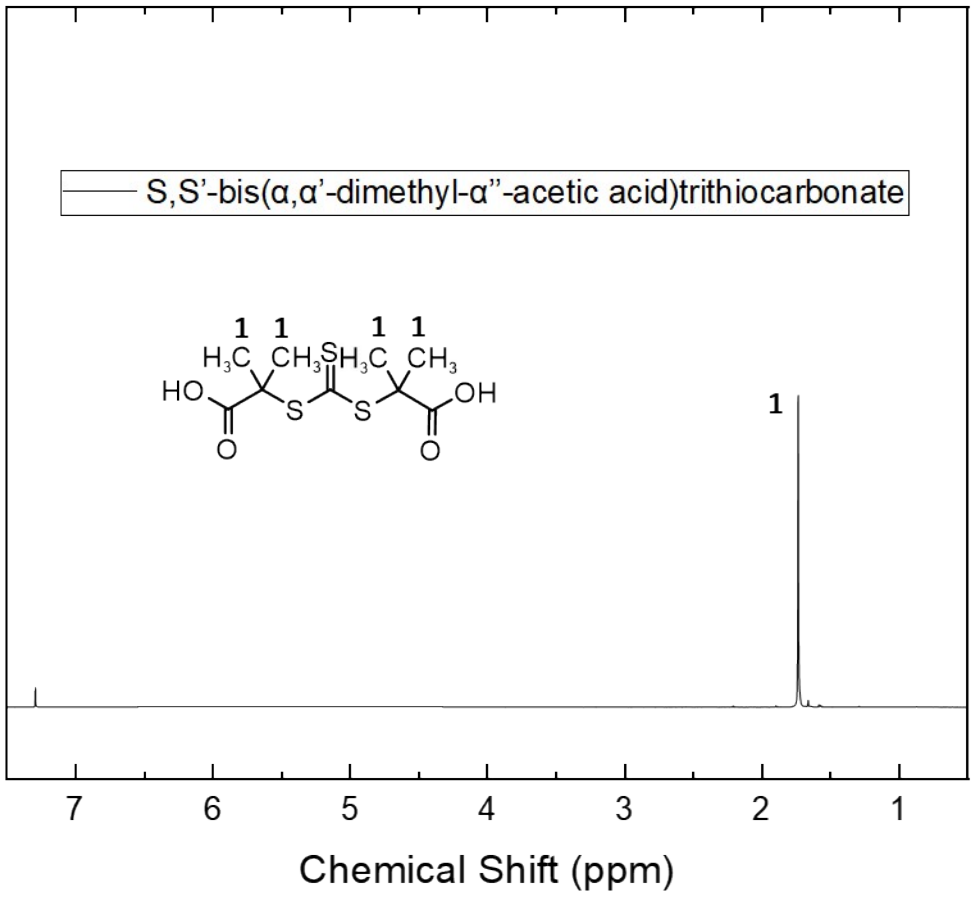

Fig. S1 ^{1}H NMR (400 MHz, $CDCl_3$) analysis of S,S'-bis(*α,α'*-dimethyl-*α''*-acetic acid)trithiocarbonate.

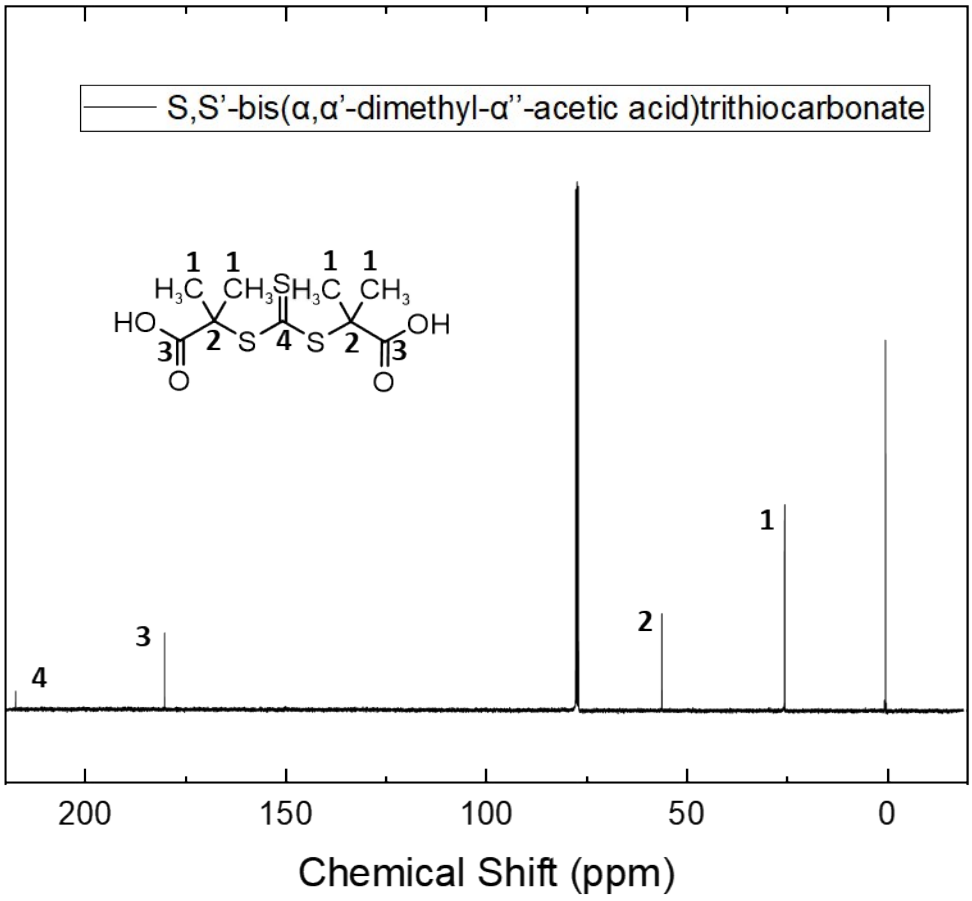

Fig. S2 ^{13}C NMR (400 MHz, $CDCl_3$) analysis of S,S'-bis(*α,α'*-dimethyl-*α''*-acetic acid)trithiocarbonate.

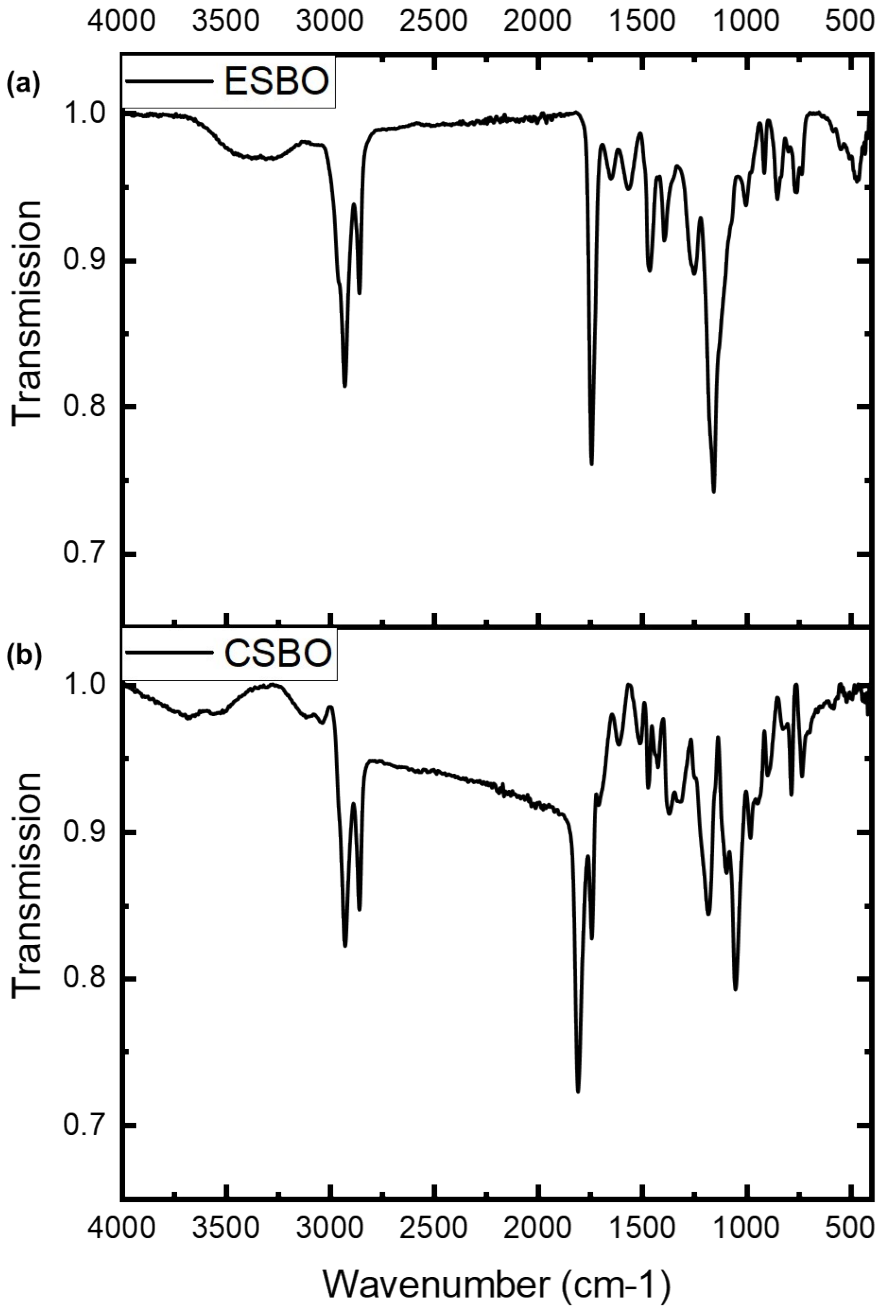

Fig. S3 Fourier-transform infrared (FT-IR) spectra of epoxidized soybean oil (ESBO) and carbonated soybean oil (CSBO).

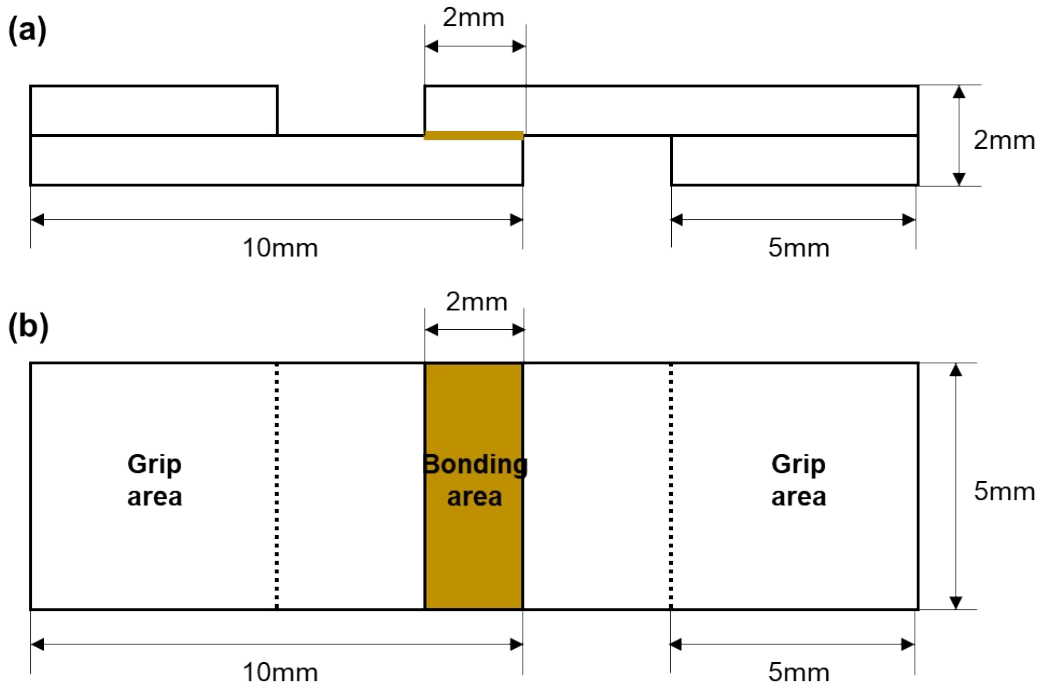

Fig. S4 The overall description and scale of the lap shear test samples.

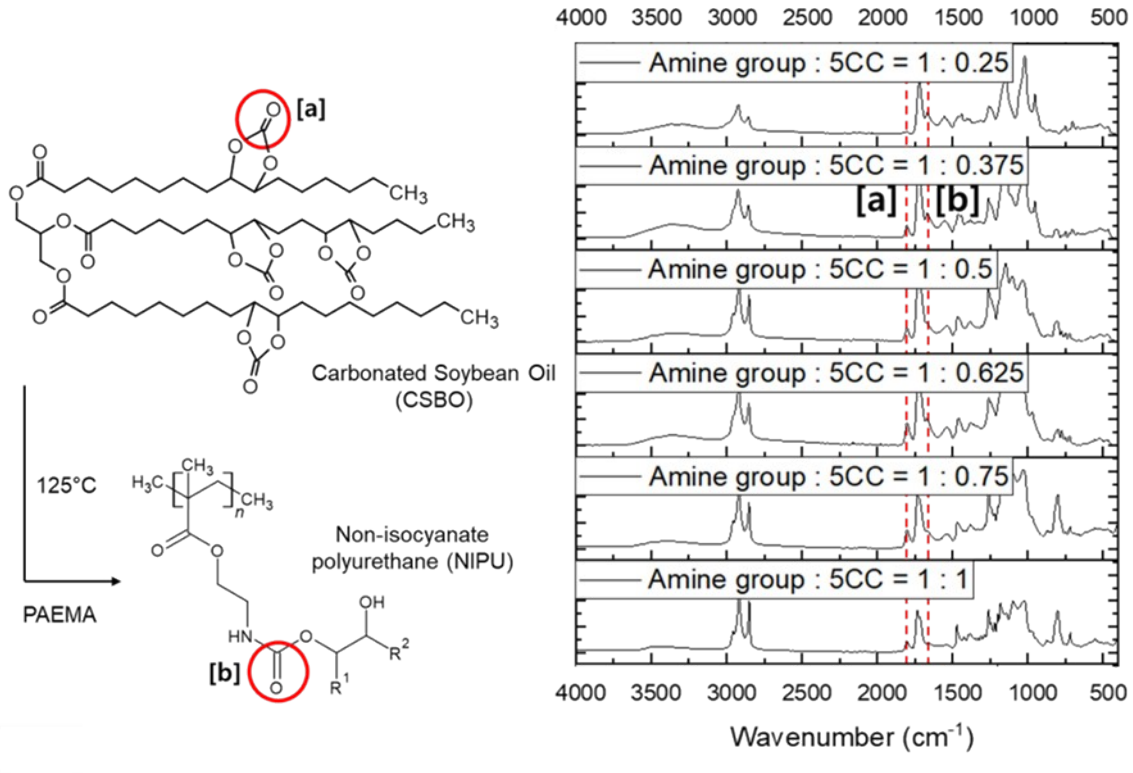

Fig. S5 Fourier-transform infrared (FT-IR) spectra of NIPU samples synthesized with PAEMA.

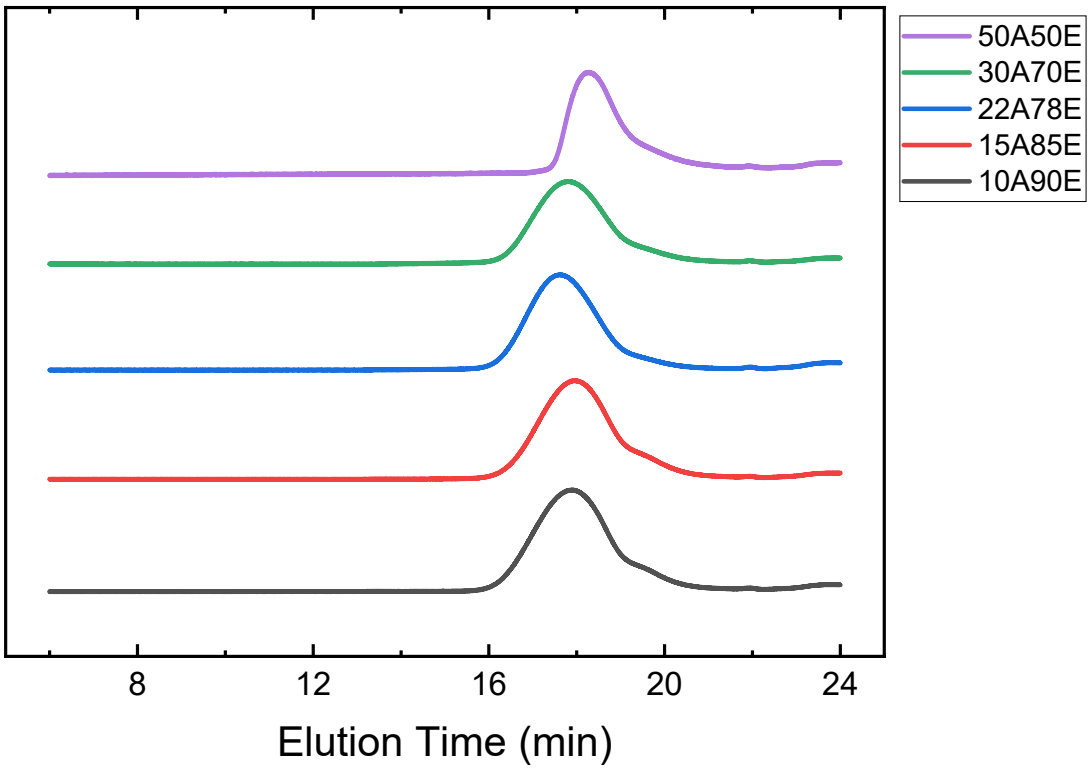

Fig. S6 Size exclusion chromatograph (SEC) spectra of copolymer samples.

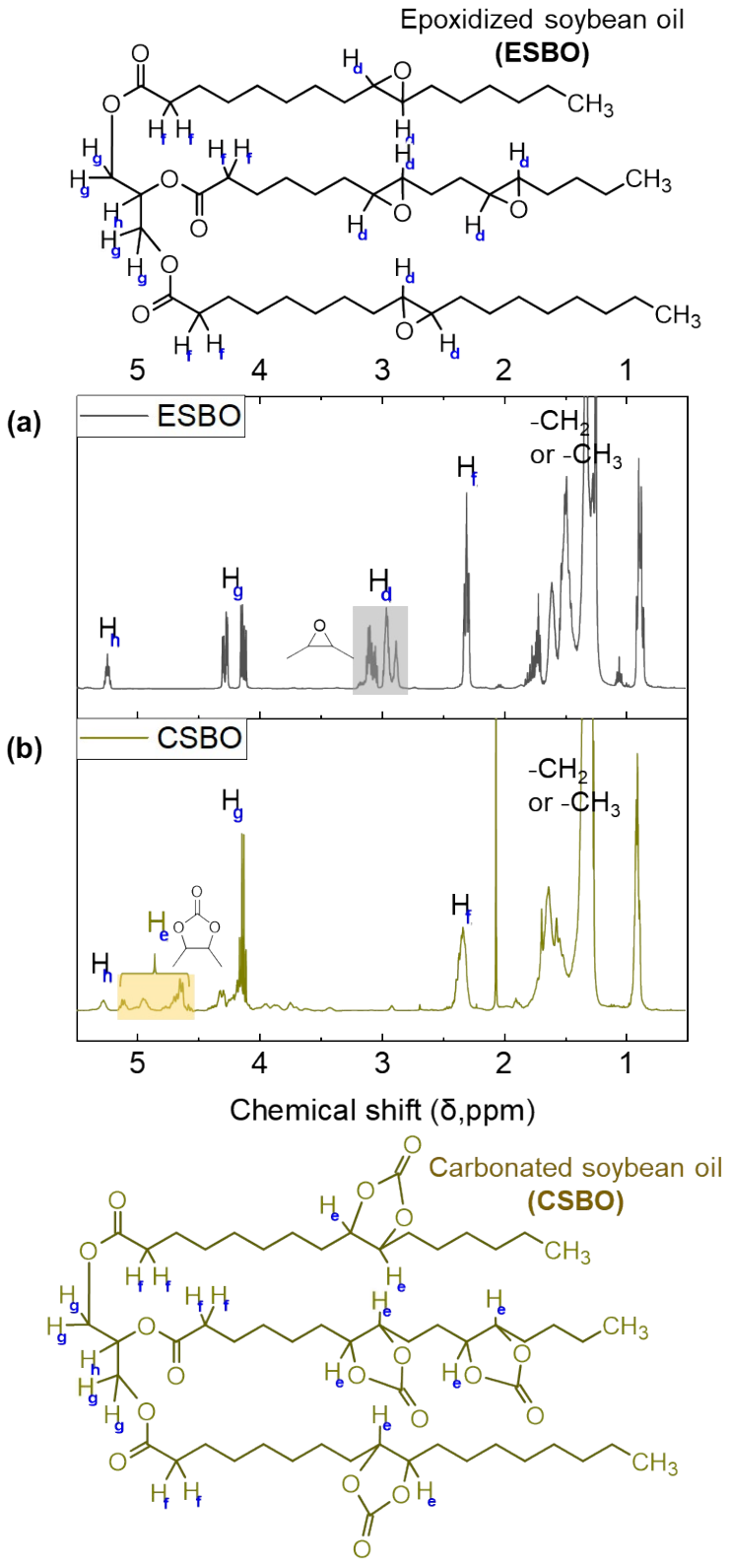

Fig. S7 ^{1}H NMR (400 MHz, $CDCl_3$) analysis of (a) epoxidized soybean oil (ESBO) and (b) carbonated soybean oil (CSBO).

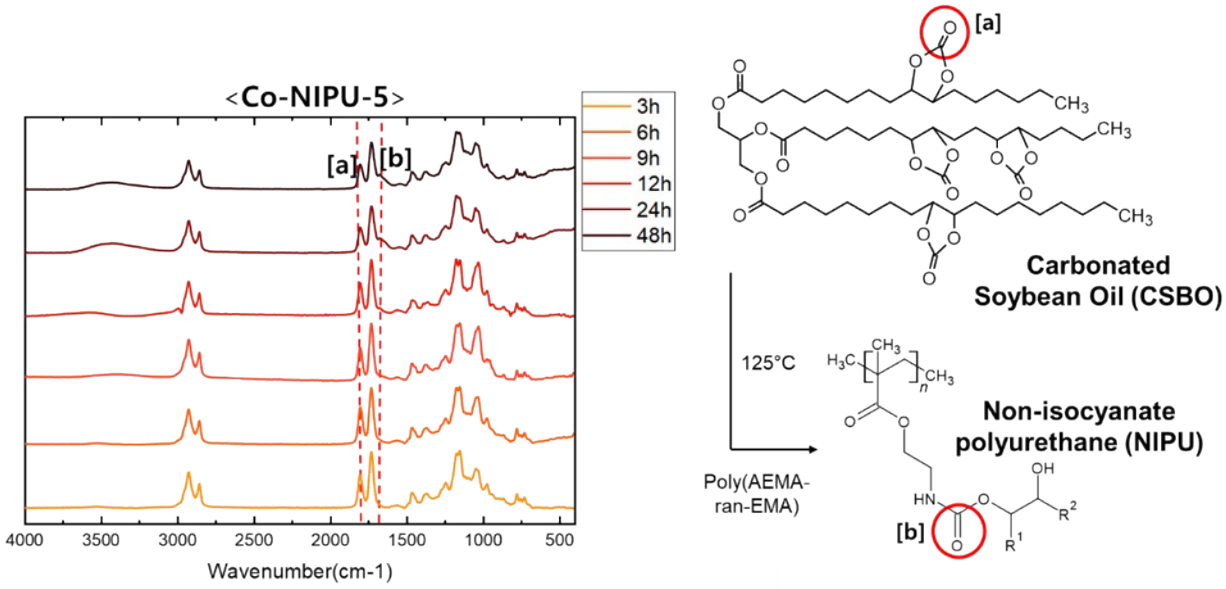

Fig. S8 FT-IR data of co-NIPU-5 sample over reaction time.

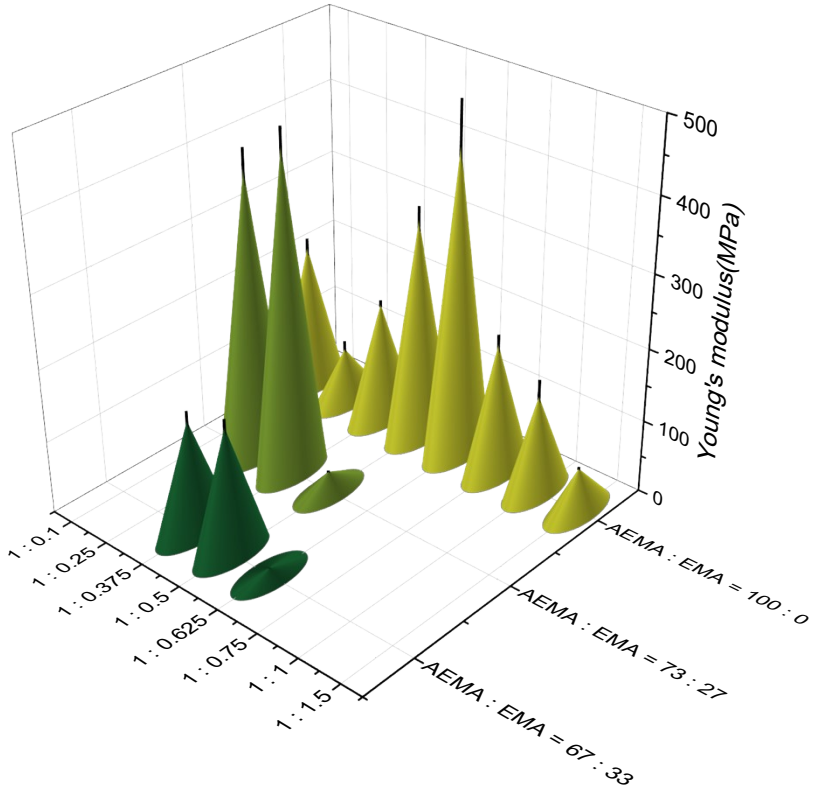

Fig. S9. The Young's modulus data result of NIPU samples synthesized by poly(AEMA-block-EMA).

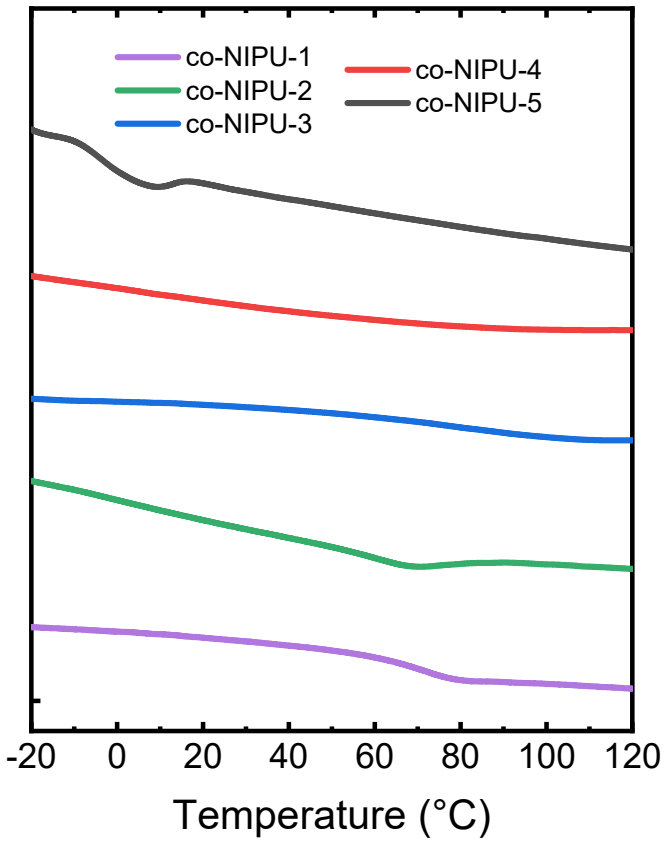

Fig. S10 Characterization of co-NIPU-x: differential scanning calorimetry (DSC).

Table S1 Chemical & thermal resistance properties of synthesized co-NIPU-x series.

NIPU sample		**co-NIPU-1**	**co-NIPU-2**	**co-NIPU-3**	**co-NIPU-4**	**co-NIPU-5**
Toluene	GC[a] (%)	91 ± 1	95 ± 3	97 ± 3	81 ± 2	54 ± 3
	SR[b] (%)	148 ± 29	41 ± 4	35 ± 8	80 ± 2	112 ± 11
Water	SR[b] (%)	1 ± 1	0 ± 0	0 ± 0	5 ± 2	11 ± 2
$T_{5\%,TGA}$[c] **(°C)**		297	271	272	280	276
$T_{peak,DTG}$[d] **(°C)**		436	429	418	423	413
$T_{g,DSC}$[e] **(°C)**		71	69	-	-	-
$2\theta_{XRD}$ **(°) /** d_{XRD} **(Å)**[f]		19.5 / 4.55	18.6 / 4.77	18.3 / 4.84	-	-

[a]Gel content of NIPU sample. [b]Swelling ratio of NIPU sample. [c]Temperature corresponding to 10% thermal decomposition, Derivative Thermogravimetric analysis(DTG). [d]Temperature corresponding to the peak detected in Derivative Thermogravimetric analysis(DTG). [e]Glass transition temperature, Differential Scanning Caloriometry(DSC). See the Figure S8 for detailed result. [f]The position of peak($2\theta_{XRD}$) in Powder X-ray Diffraction(XRD) data and its corresponding spacing(d_{XRD}).