

Supporting Information

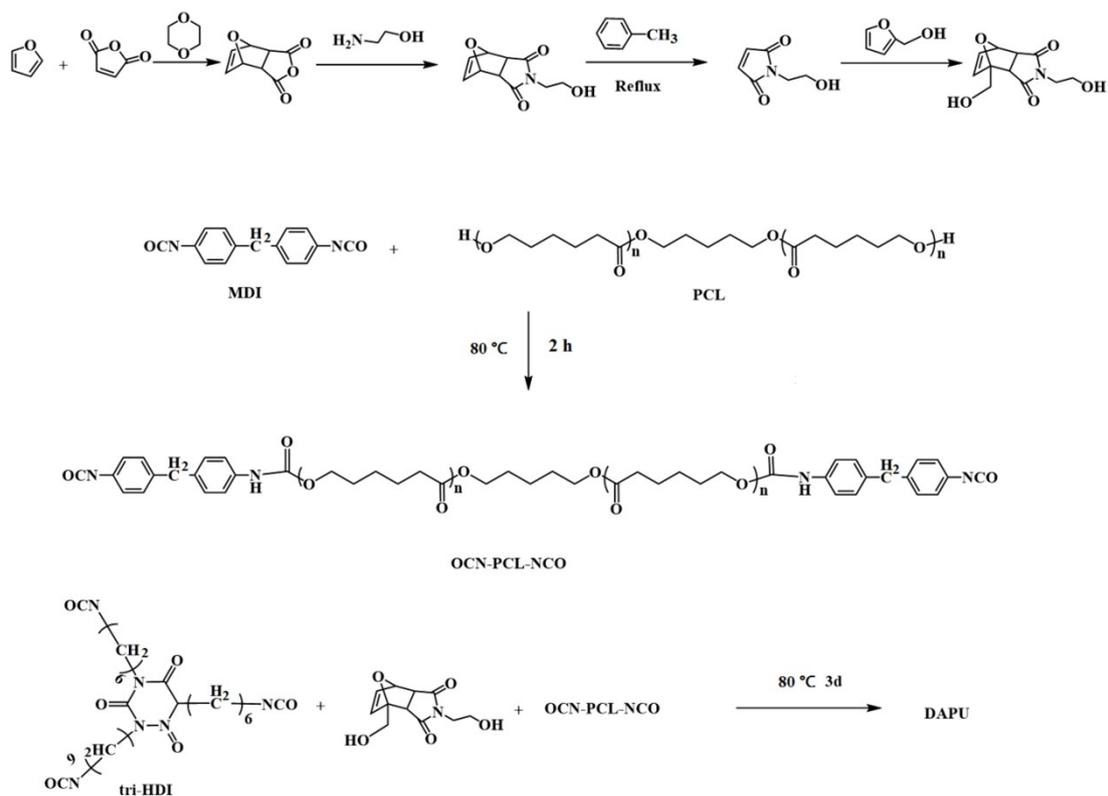
Diels-Alder Dynamic Crosslinked Polyurethane/polydopamine Composites with NIR Triggered Self-healing Function

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Synthesis of Diels–Alder bonds crosslinked PU (DAPU)



Scheme S1. Synthesis routes of Diels–Alder bonds crosslinked PU (DAPU)

Table S1. Injection parameters of PDAPs/PU composite preparation

	Injection	Injection	Holding	Holding	Molding	Melt
PU	pressure	speed	pressure	pressure	temperature	temperature
	[bar]	[mm/s]	[bar]	time [s]	[$^\circ\text{C}$]	[$^\circ\text{C}$]
DAPU	750	300	500	60	40	120

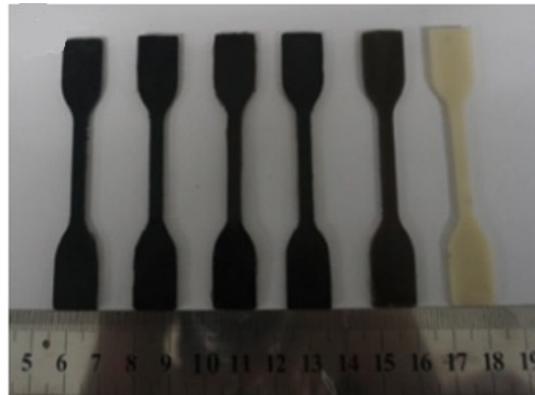


Figure S1. Photographs of DAPU (right) and PDAPs/DAPU-0.01, 0.1, 0.5, 1, 2 (from right to left)

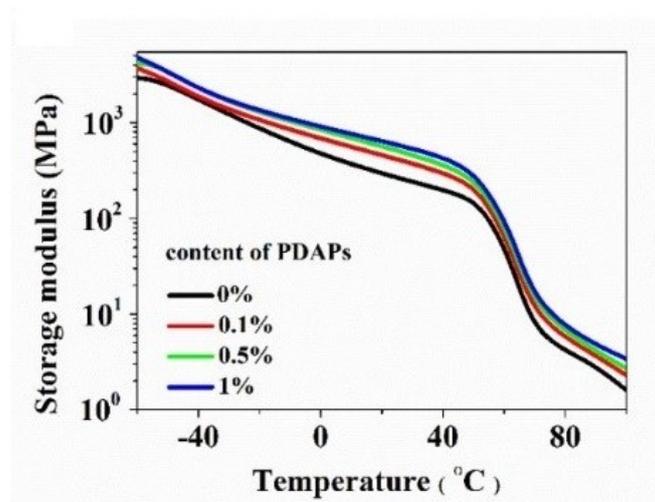


Figure S2. Thermal shape recovery curves of 50% strain stretched PDAPs/DAPU composites samples with different PDAPs contents

The DAPU samples were equilibrated at 65 °C for 30 min before deformation. One cycle consists of four steps: (1) elongated to 100% strain corresponding to the maximum strain ϵ_m at a constant rate of 2mm min⁻¹, (2) cooled to 0 °C at a rate of 3 °C

min⁻¹ to fix the deformation under a constant stress, (3) held for 10 min at 0 °C to obtain a fixed strain (ϵ_u) upon unloading of the stress and (4) reheated to 65 °C at a rate of 10 °C min⁻¹ and held for 10 min, allowing the shape recovery to complete to a recovery strain (ϵ_p). In a thermomechanical cycle, the shape fixity ratio (R_f) and shape recovery ratio (R_r) are defined as below:

$$R_f = \frac{\epsilon_u}{\epsilon_m} \times 100\% \quad (1)$$

$$R_r = \frac{\epsilon_m - \epsilon_p}{\epsilon_m} \times 100\% \quad (2)$$

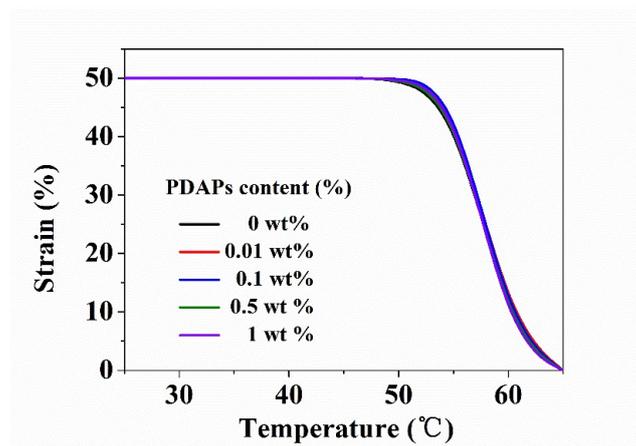


Figure S3. Thermal shape recovery curves of 50% strain stretched PDAPs/DAPU composites samples with different PDAPs content

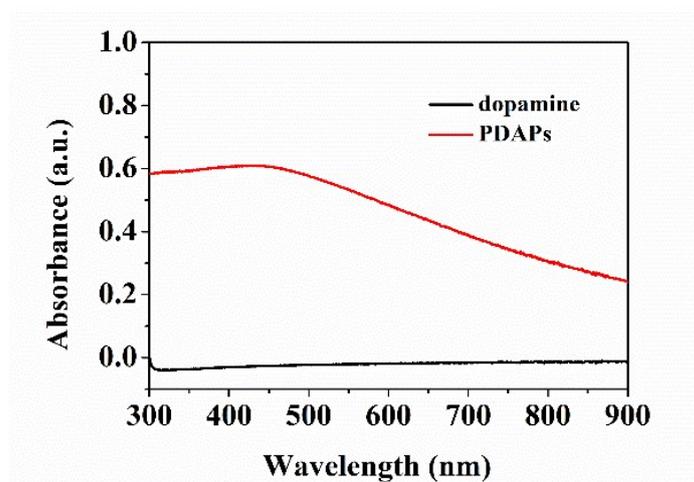


Figure S4. UV-vis spectra of dopamine and PDAPs at an equivalent concentration of 0.06 mg /mL