Multiple Hierarchical Dynamic Interactions Enabled Robust, Stretchable and Room Temperature Self-Healing Elastomer

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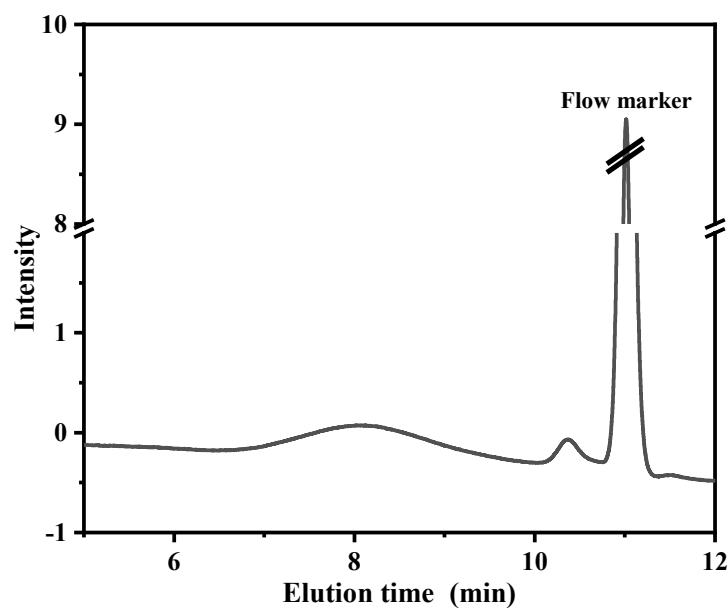
1. Supplementary Figures
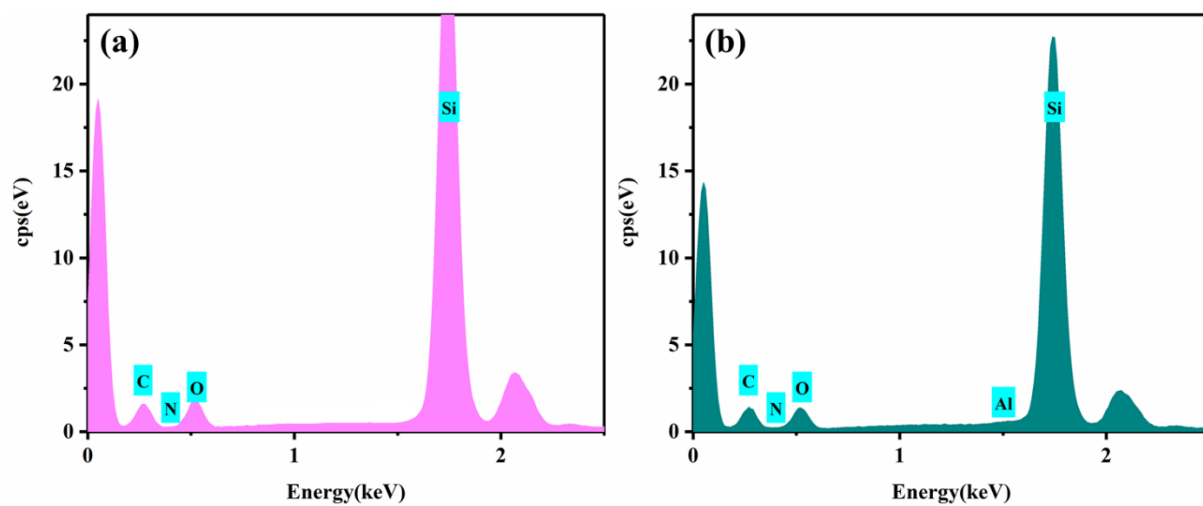

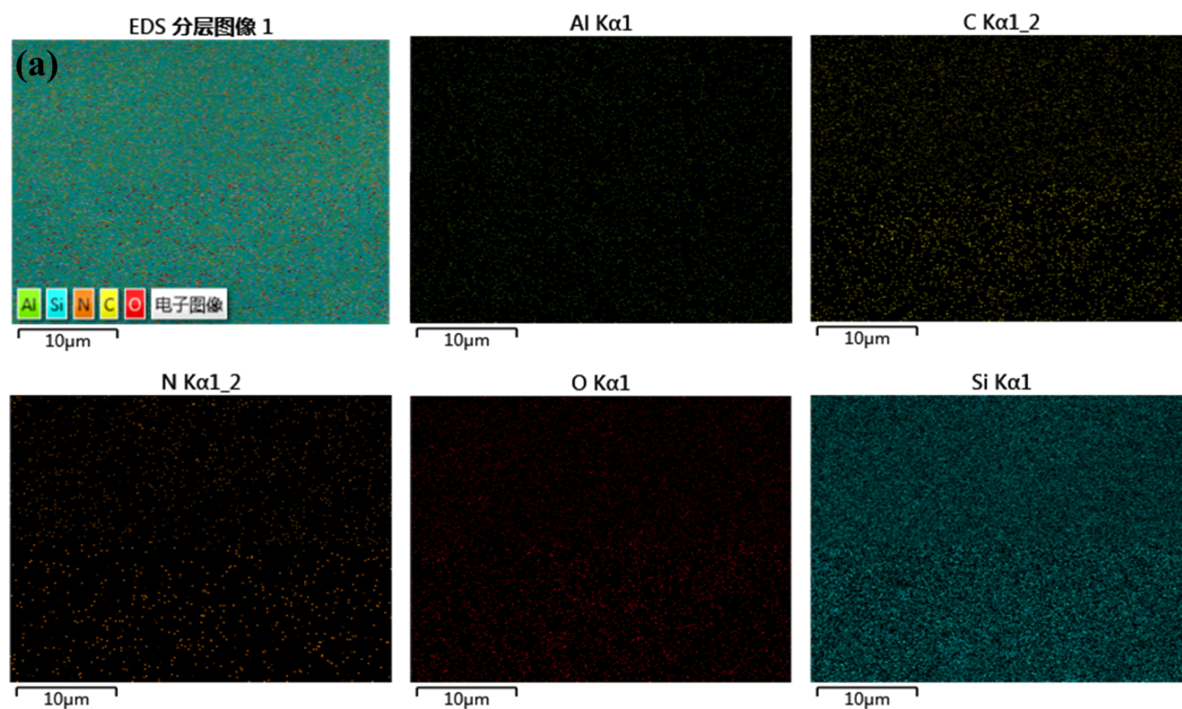Fig. S1. GPC chromatograms of PID-0.

Fig. S2. EDX element detection of PID-x: (a) PID-0; (b) PID-1

EDS 分层图像 1 | Al Kα1 | C Kα1_2
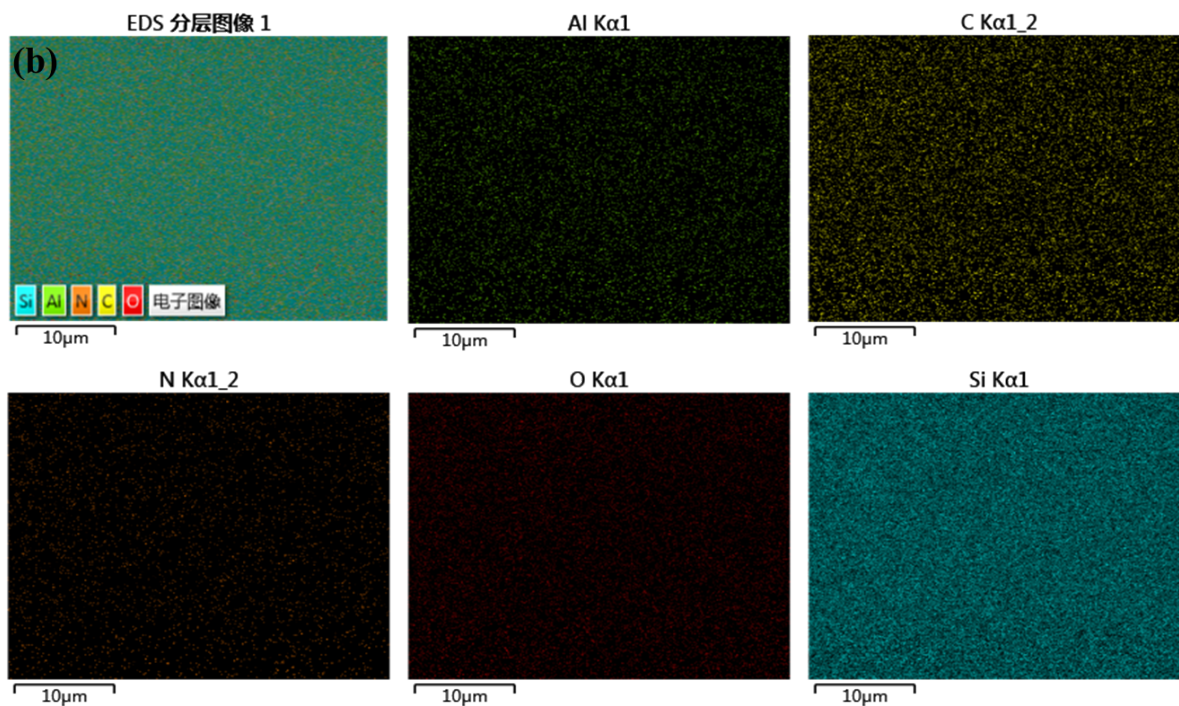
N Kα1_2 | O Kα1 | Si Kα1

Fig. S3. Element mapping images of C, Si, O, N, Al: (a) PID-0; (b) PID-1
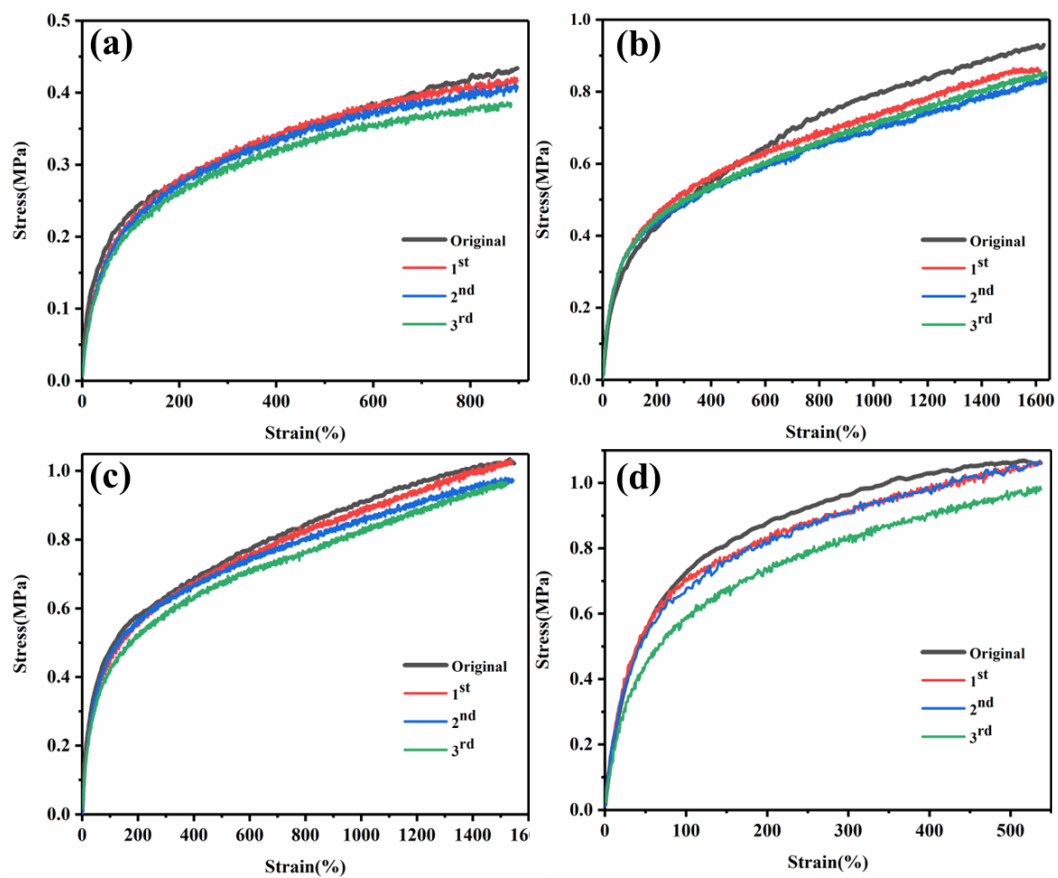

Fig. S4. Recyclable stress-strain curves of PID-x: (a) PID-0; (b) PID-1/2; (c) PID-1;
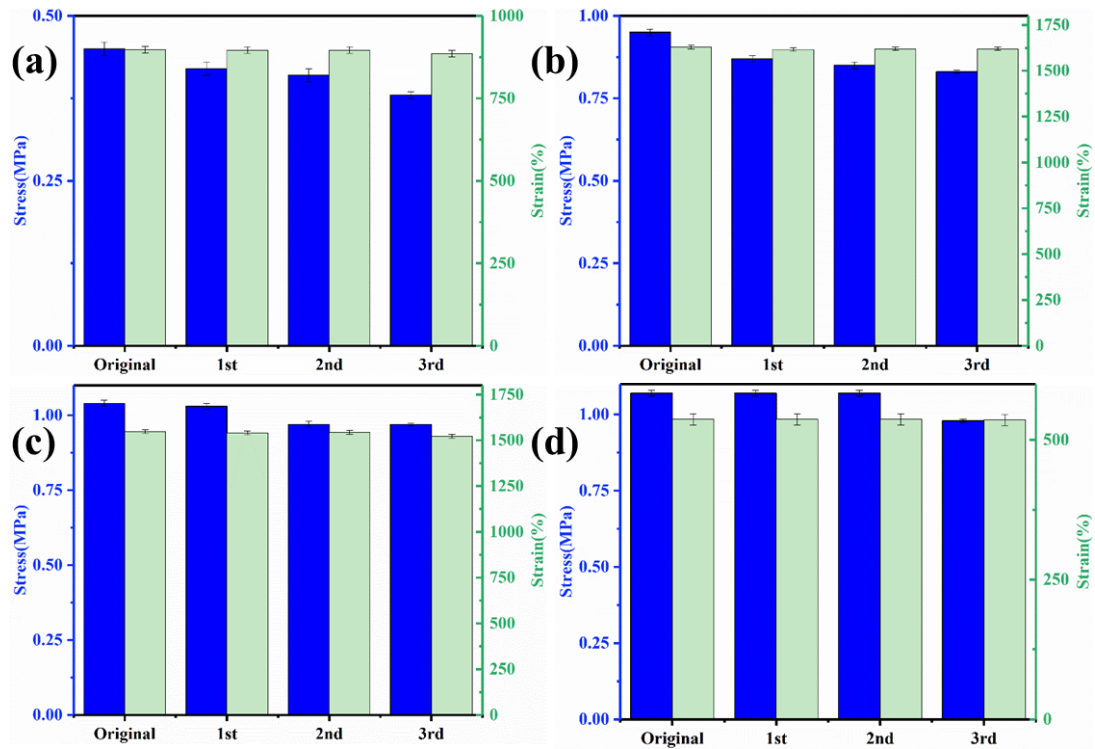
(d) PID-2.

Fig. S5. The recyclable stress and strain histogram of PID-x: (a) PID-0; (b) PID-1/2; (c) PID-1; (d) PID-2.
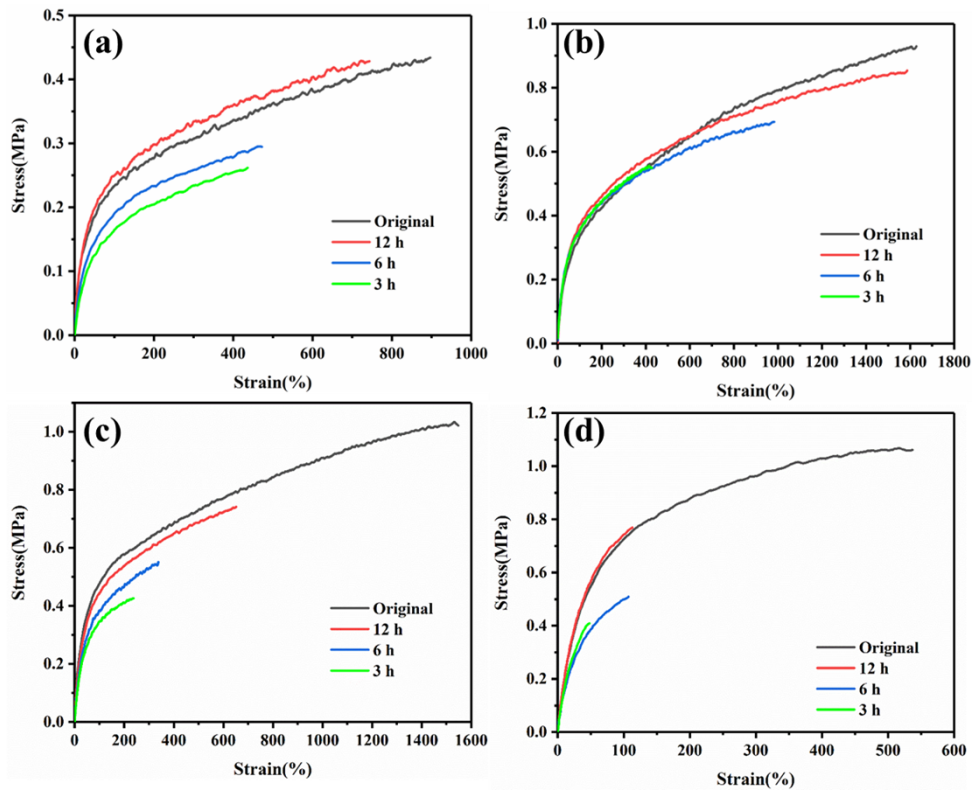

Fig. S6. Stress-strain curves of PID-x self-healing for 3 h, 6 h and 12 h at room temperature: (a) PID-0; (b) PID-1/2; (c) PID-1; (d) PID-2.

2. Supplementary Tables

Table S1. Compounding formulations of PIDx polysiloxane elastomers

Sample	PDMS [mol]	IPDI [mol]	DAP [mol]	AlCl$_3$·6H$_2$O [mol]
PID-0	3	4	1	0
PID-1/3	3	4	1	1/3
PID-1/2	3	4	1	1/2
PID-1	3	4	1	1
PID-2	3	4	1	2

In this work, PDMS components content was calculated according to the following equation, which is up to 82 wt%.

$$\text{PDMS components content (\%)} = \frac{\text{PDMS[g]}}{\text{IPDI [g]} + \text{DAP[g]} + \text{PDMS[g]}}$$

Table S2. Mechanical properties of PID-x elastomers

Sample	Fracture toughness (MJ/m^3)	Tensile strength (MPa)	Strain at break (%)
PID0	2.98 ± 0.2	0.45 ± 0.02	897 ± 16
PID-1/3	7.21 ± 0.6	0.75 ± 0.03	1326 ± 22
PID-1/2	11.14 ± 0.5	0.95 ± 0.02	1629 ± 24
PID-1	12.33 ± 0.8	1.04 ± 0.03	1548 ± 21
PID-2	4.67 ± 0.1	1.07 ± 0.02	537 ± 10