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Supporting Information

Superior Stretchable, low thermal resistance and efficient self-healing composite elastomers for thermal management

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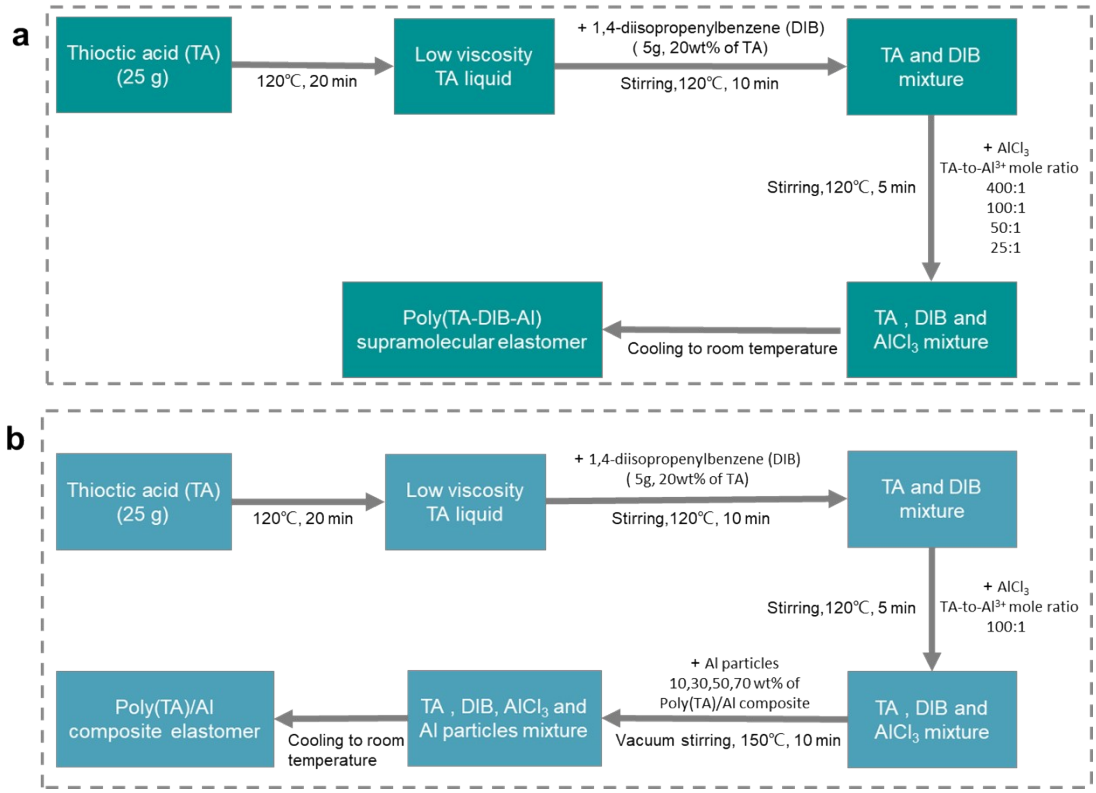

Figure S1. The preparation flow chart of (a) Poly(TA-DIB-Al) supramolecular elastomer and (b) Poly(TA)/Al composite elastomer.

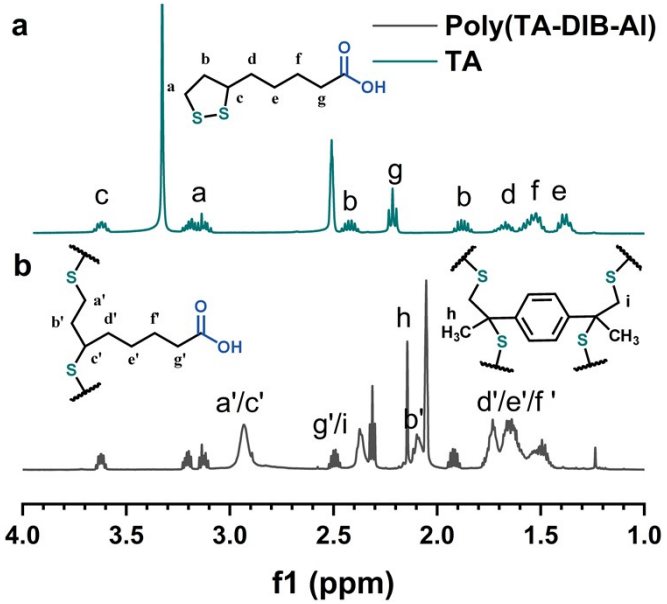

Figure S2. NMR analysis. (a) Partial 1H NMR spectra of TA monomer and (b) Poly(TA-DIB-Al) supramolecular elastomer (TA-to-Al^{3+} molar ratio of 100:1; 20 wt% DIB).

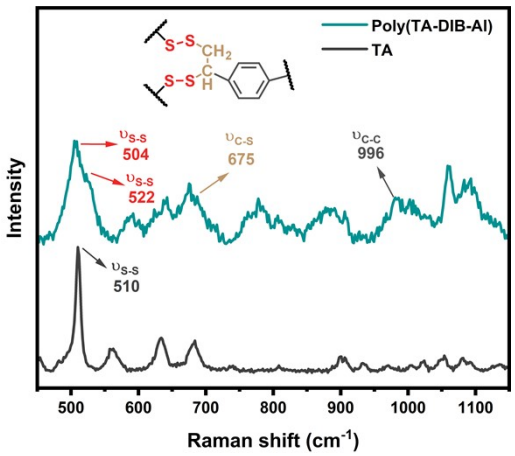

Figure S3. Raman spectrum of the Poly(TA-DIB-Al) supramolecular elastomer. (TA-to-Al^{3+} molar ratio of 100:1; 20 wt% DIB).

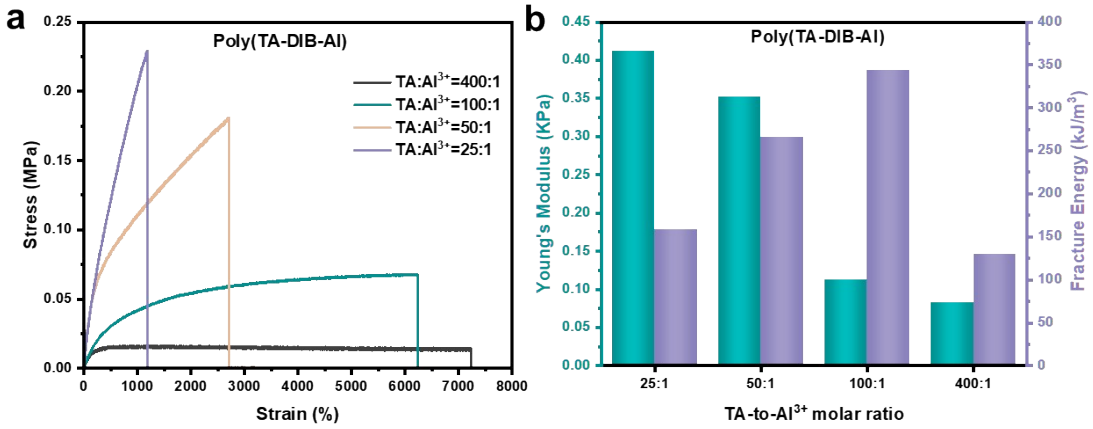

Figure S4. Mechanical properties of Poly(TA-DIB-Al) supramolecular elastomer. (a) Stress-strain curves of the elastomer with different Al^{3+} concentrations. (b) Young's modulus and fracture energy versus different Al^{3+} concentrations.

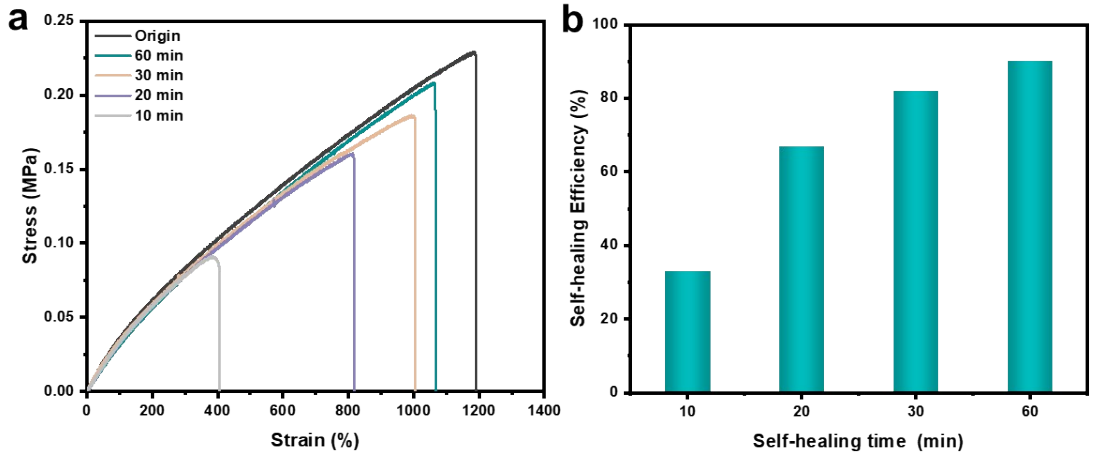

Figure S5. Stress–strain curves of the Poly(TA-DIB-Al) supramolecular elastomer air (TA-to-Al^{3+} molar ratio of 25:1; 20 wt% DIB) healed for different time periods at room temperature. Stretching ability increases when the film is allowed to heal for a longer time.

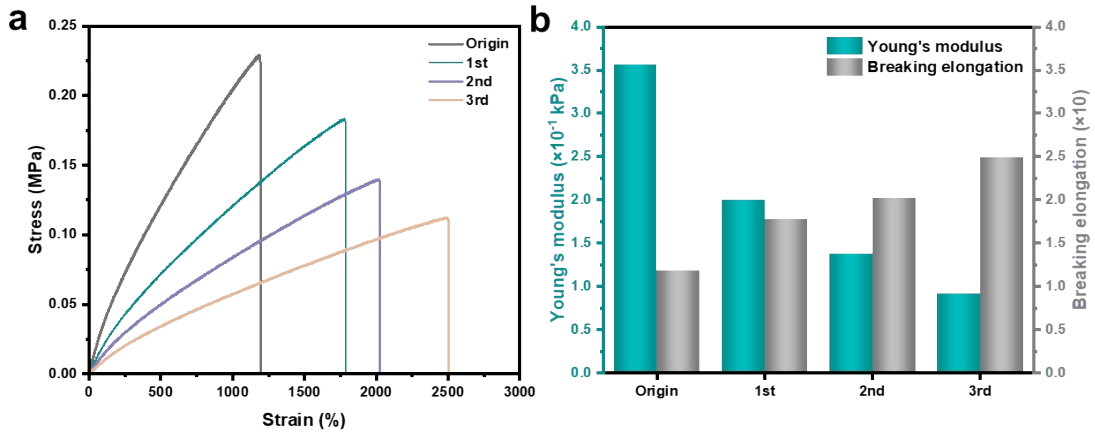

Figure S6. (a) Stress–strain curves and (b) mechanical properties of the recycled Poly(TA-DIB-Al) supramolecular elastomers during three cycles (TA-to-Al^{3+} molar ratio of 25:1; 20 wt% DIB).

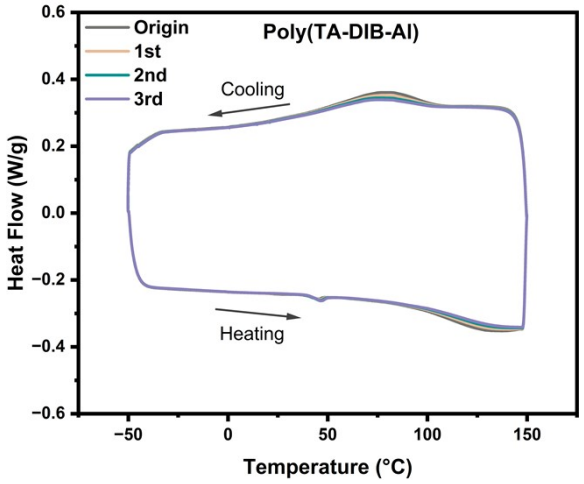

Figure S7. DSC curves of the (a) TA monomer, (b) original and recycled Poly(TA-DIB-Al) elastomers (TA-to-Al^{3+} molar ratio of 25:1; 20 wt% DIB).

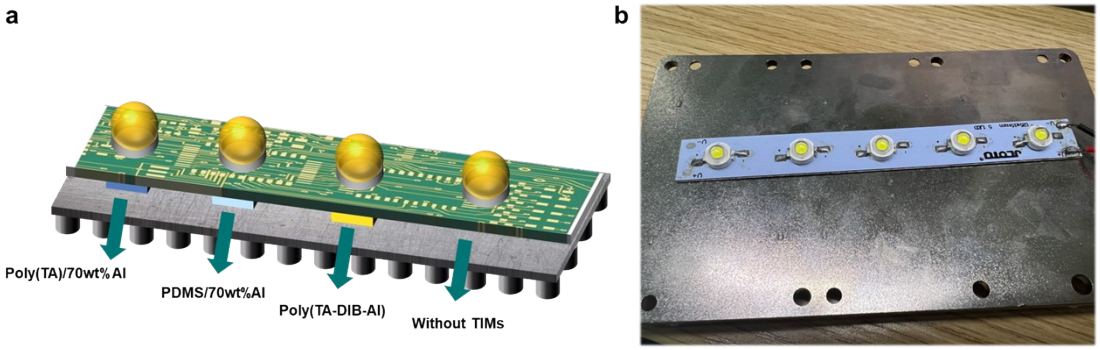

Figure S8. Thermal management application of Poly(TA)/70wt%Al, PDMS/70wt%Al and Poly(TA-DIB-Al) supramolecular elastomers (TA-to-Al^{3+} molar ratio of 100:1; 20 wt% DIB) in LED lamps. (a) An illustration and (b) a photo of experimental configuration for heat dissipation of LED lamps.