Electronic Supplementary Material (ESI) for Polymer Chemistry.

Highly Elastic, Strong, and Reprocessable Cross-linked Polyolefin Elastomers Enabled by Boronic Ester Bonds

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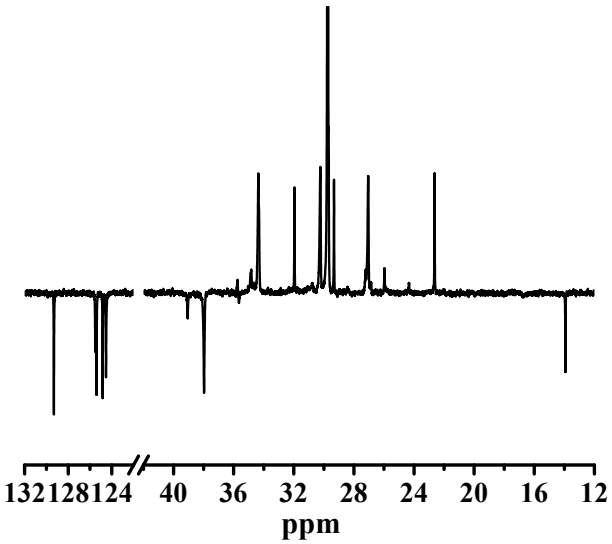

Figure S1. DEPT NMR spectrum in *o*-$C_2D_2Cl_4$ of anthracene-containing POE1.3 copolymer.

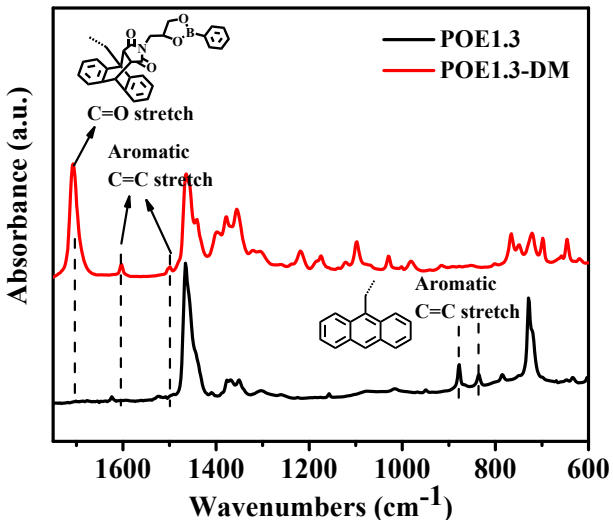

Figure S2. The FTIR spectra of anthracene-containing POE1.3 and POE1.3-DM copolymers.

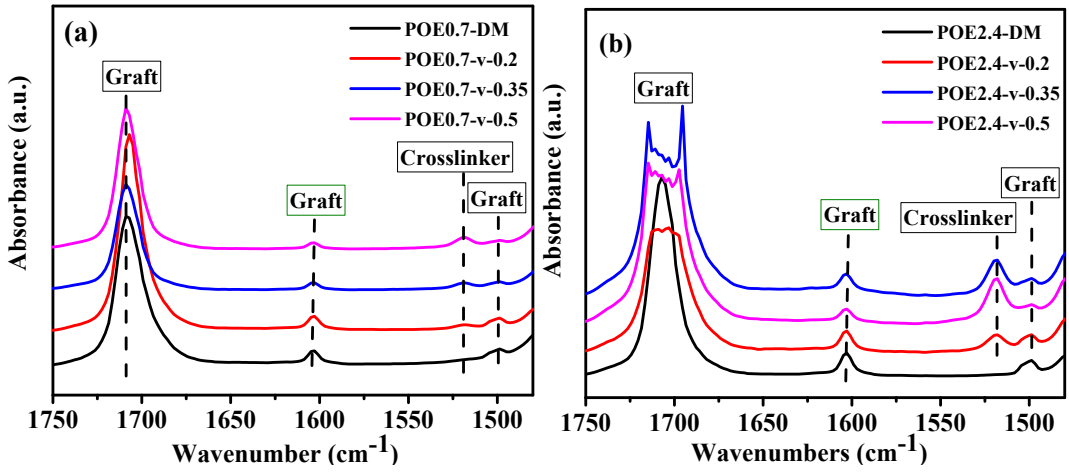

Figure S3. The FTIR spectra of (a) POE0.7-v-β and (b) POE2.4-v-β vitrimers.

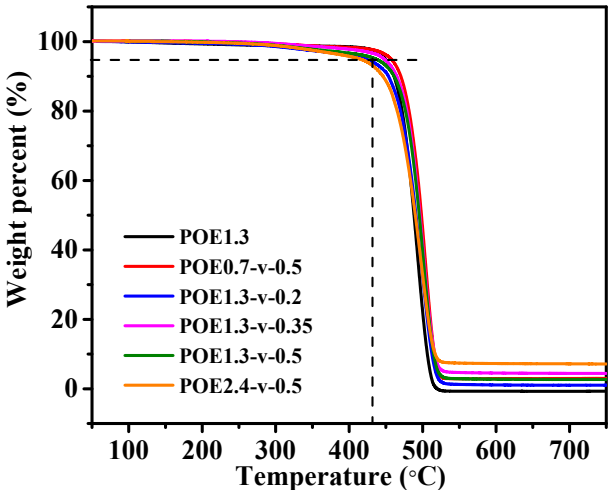

Figure S4. Thermogravimetric analysis of the anthracene-containing POE copolymer and POEα-v-β vitrimers.

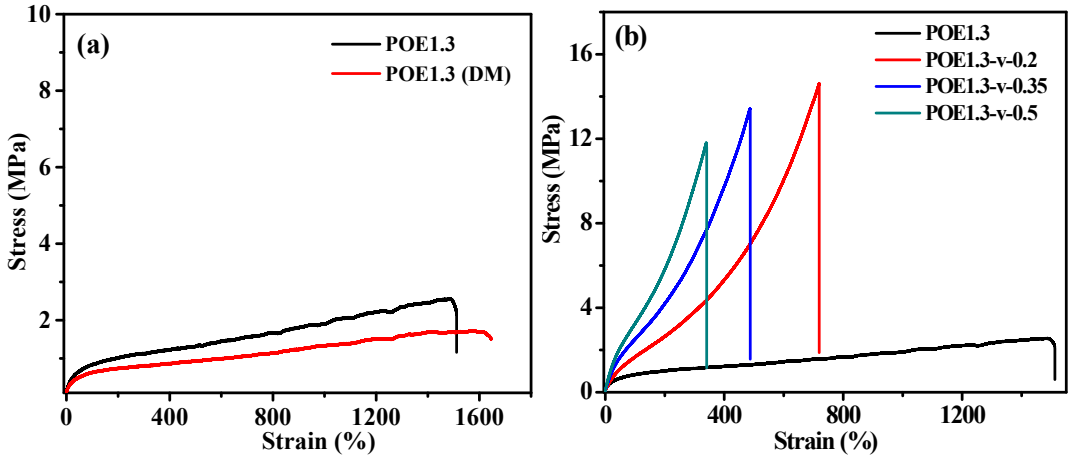

Figure S5. (a) Stress-strain curves of POE1.3 and POE1.3-DM copolymers. (b) Stress-strain curves of POE1.3 copolymer and POE1.3-v-β vitrimers.

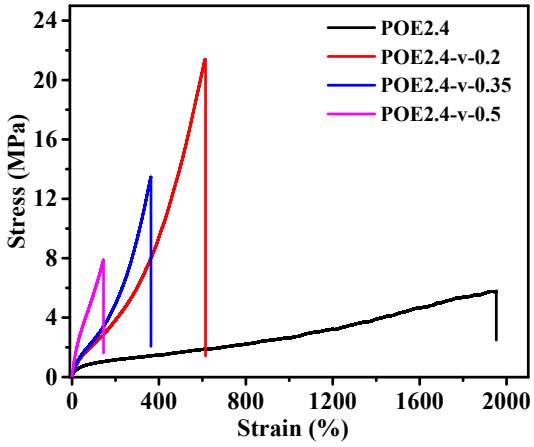

Figure S6. Stress−strain curves of POE2.4 copolymer and POE2.4-v-β vitrimers.

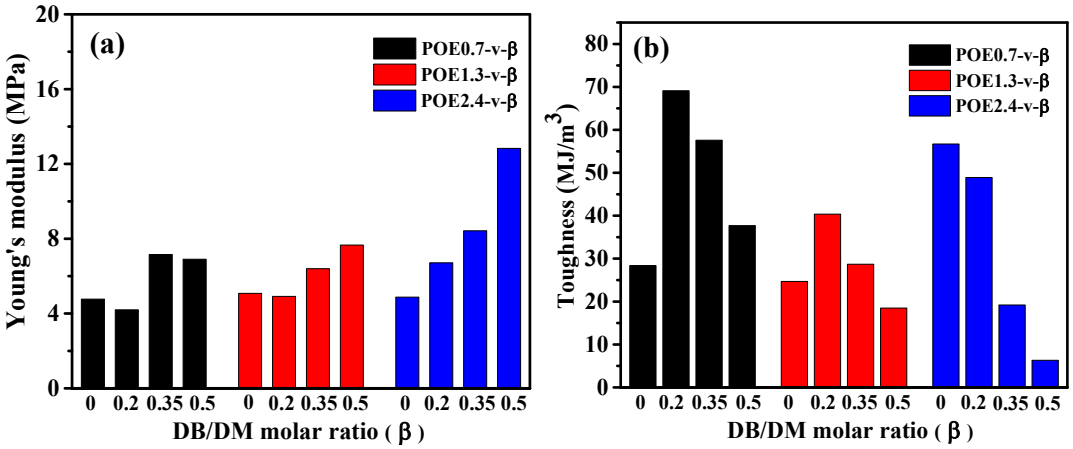

Figure S7. (a) Fracture toughness and (b) Young's modulus of POEα copolymers and POE vitrimers with different DB/DM molar ratio (β).

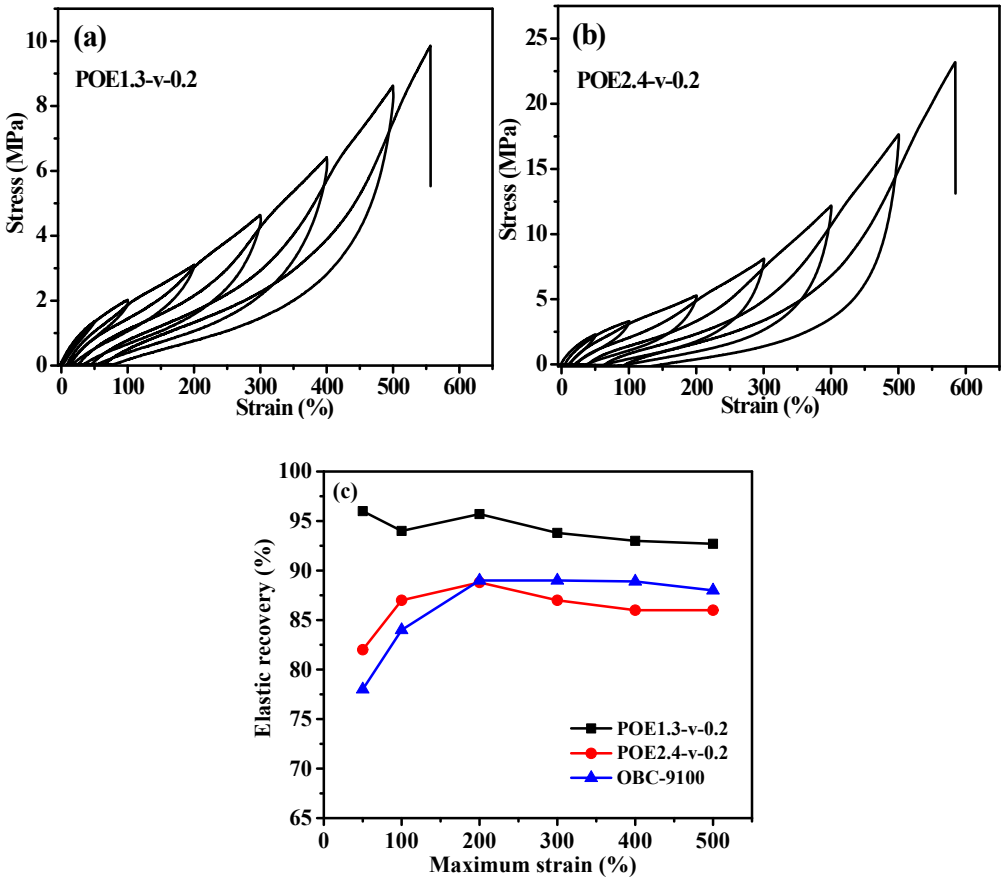

Figure S8. The cyclic tensile test curves of (a) POE1.3-v-0.2 and (b) POE2.4-v-0.2 vitrimers. (c) The elastic recovery values (maximum strain of 500%) of OBC-9100 material, POE1.3-v-0.2 and POE2.4-v-0.2 vitrimers.

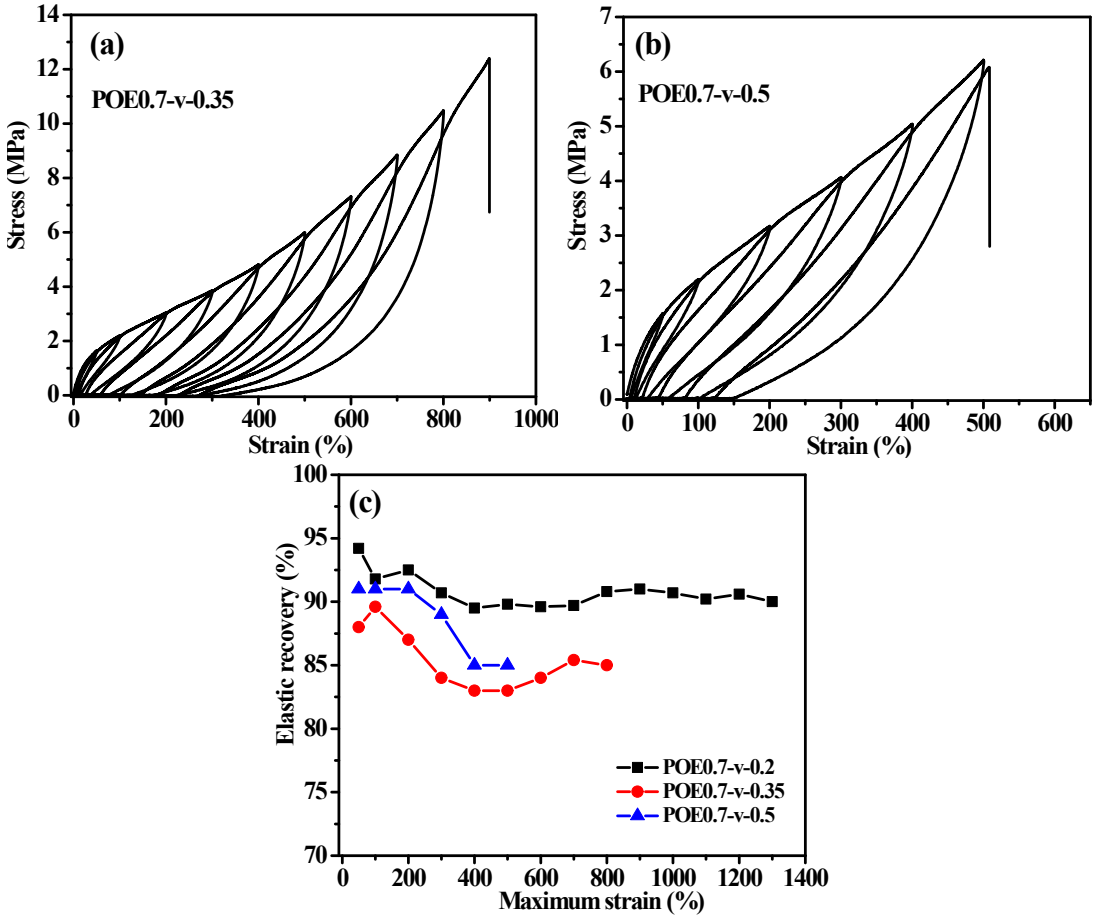

Figure S9. The cyclic tensile test curves of (a) POE0.7-v-0.35 and (b) POE0.7-v-0.5 vitrimers. (c) The elastic recovery values (maximum strain up to break) of POE0.7-v-β vitrimers.

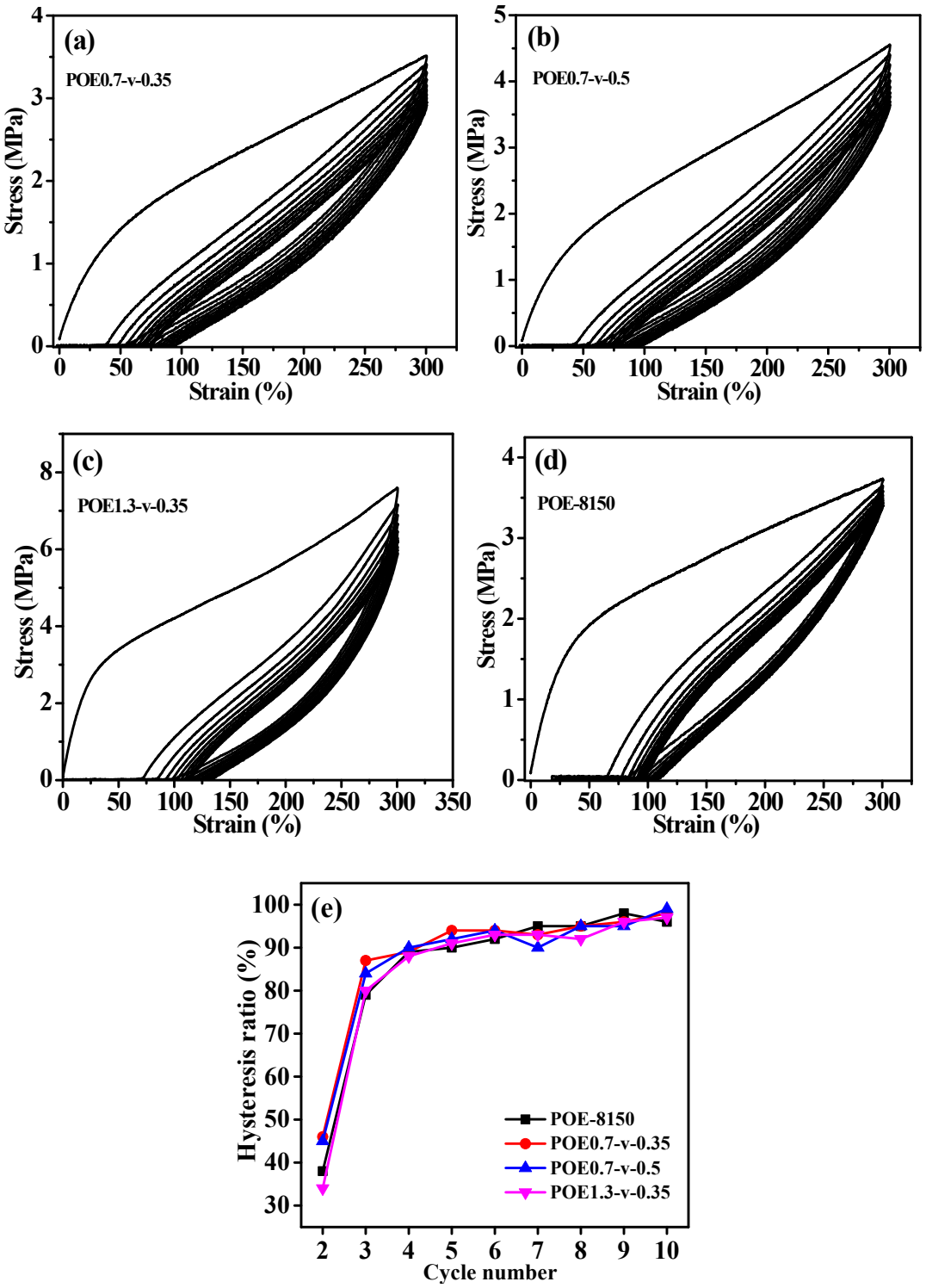

Figure S10. (a-d) Hysteresis test curves of POEα-v-β vitrimers and POE-8150 material. (e) The hysteresis ratios calculated from the hysteresis tests.

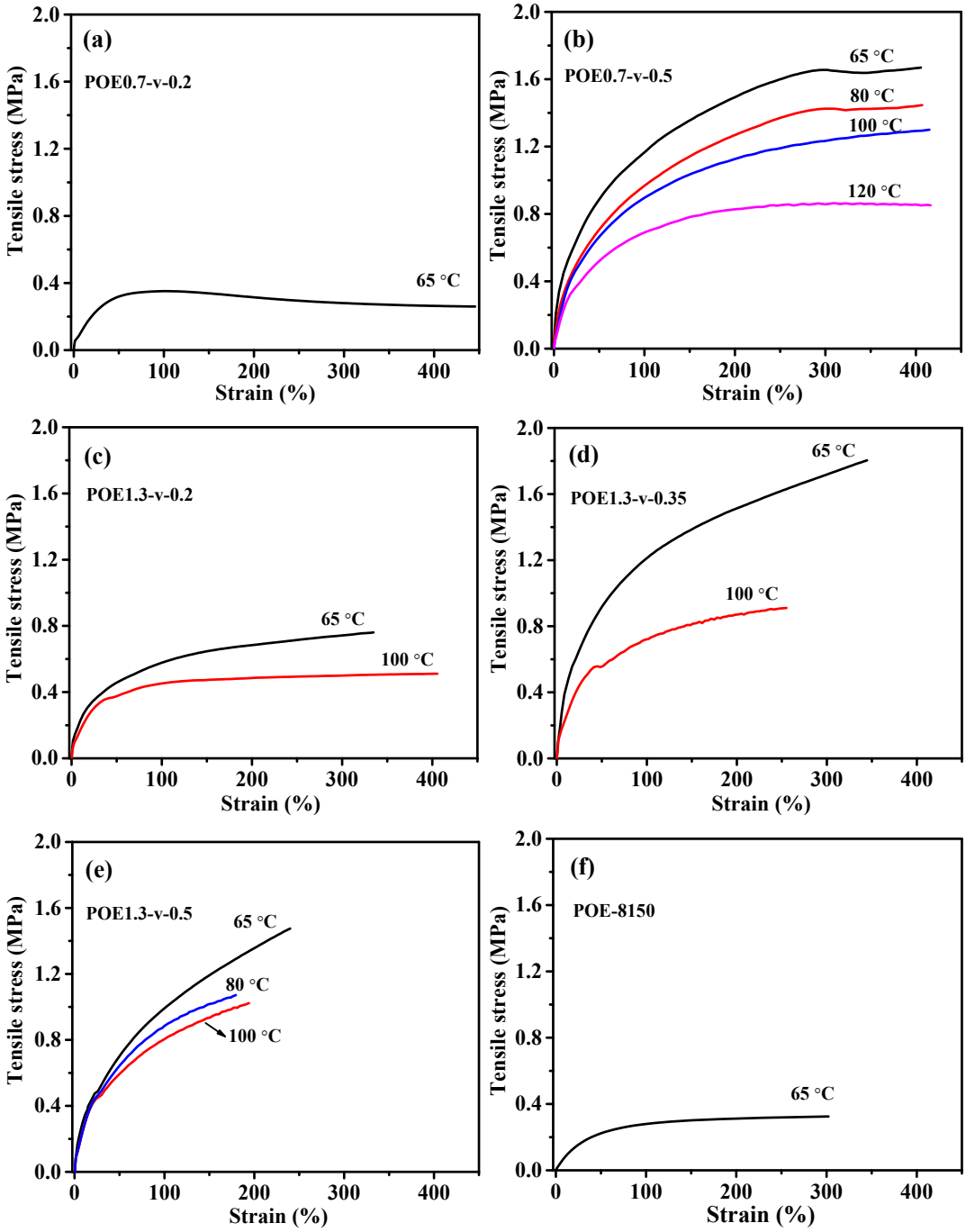

Figure S11. Stress-strain curves of POE vitrimers, POE-8150 and OBC-9100 materials at the strain rate of 100%/min under different temperatures.

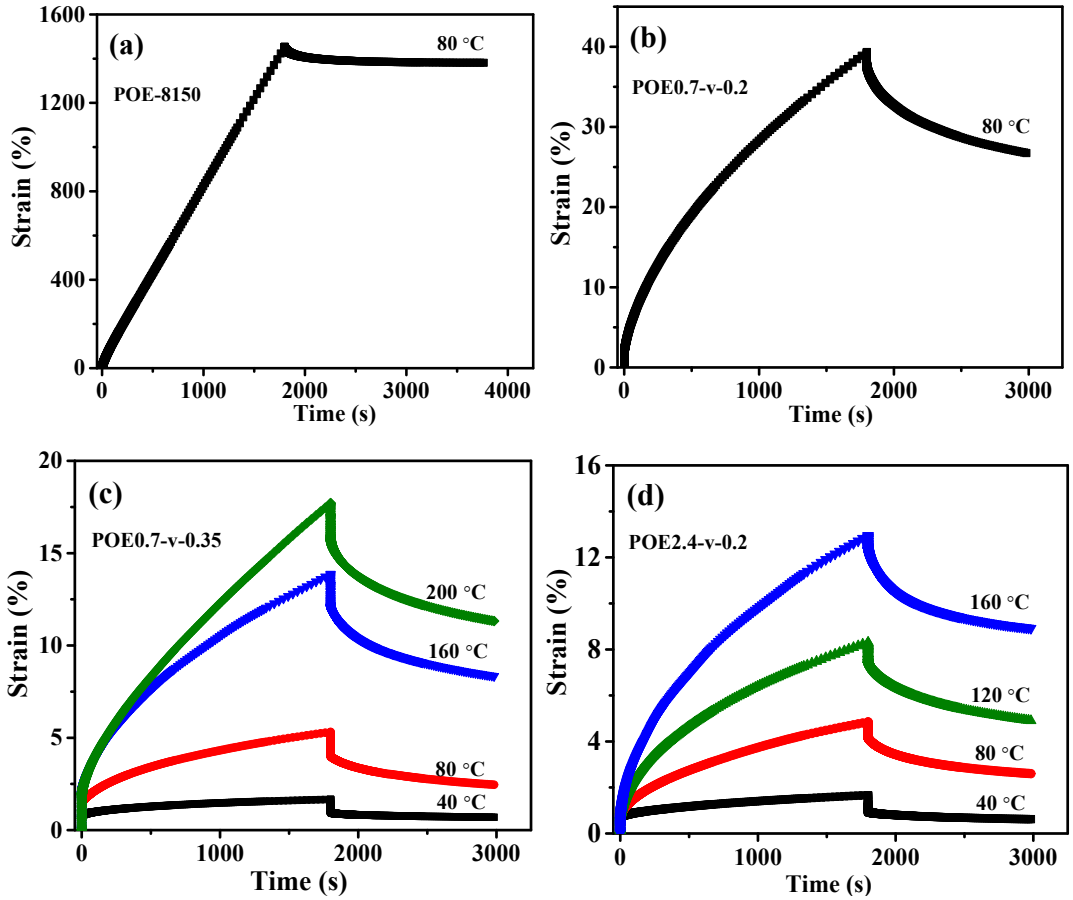

Figure S12. The creep-recovery plots of commercial POE-8150 material and POEα-v-β vitrimers under a constant stress of 5000 Pa for 1800 s at different temperatures.

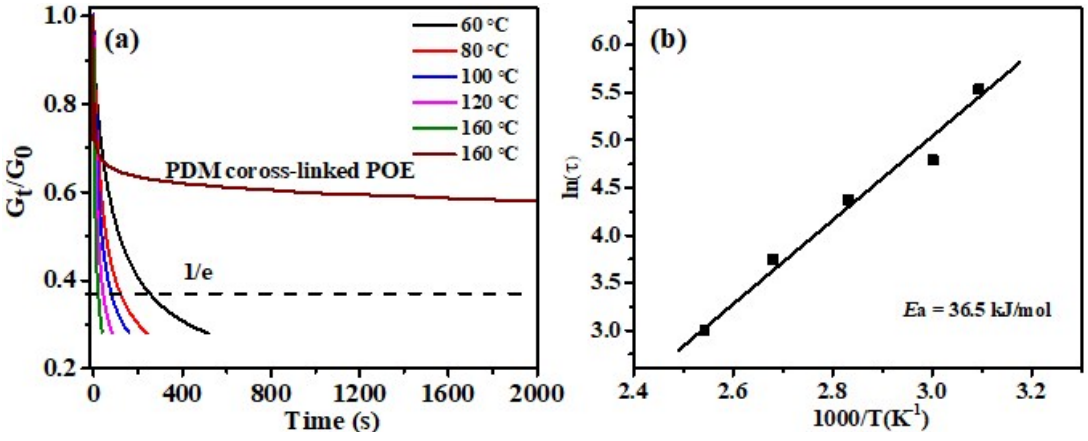

Figure S13. (a) Stress relaxation curves of POE2.4-v-0.35 vitrimer at different temperatures. (b) Arrhenius plot relating the characteristic relaxation time τ to temperature.

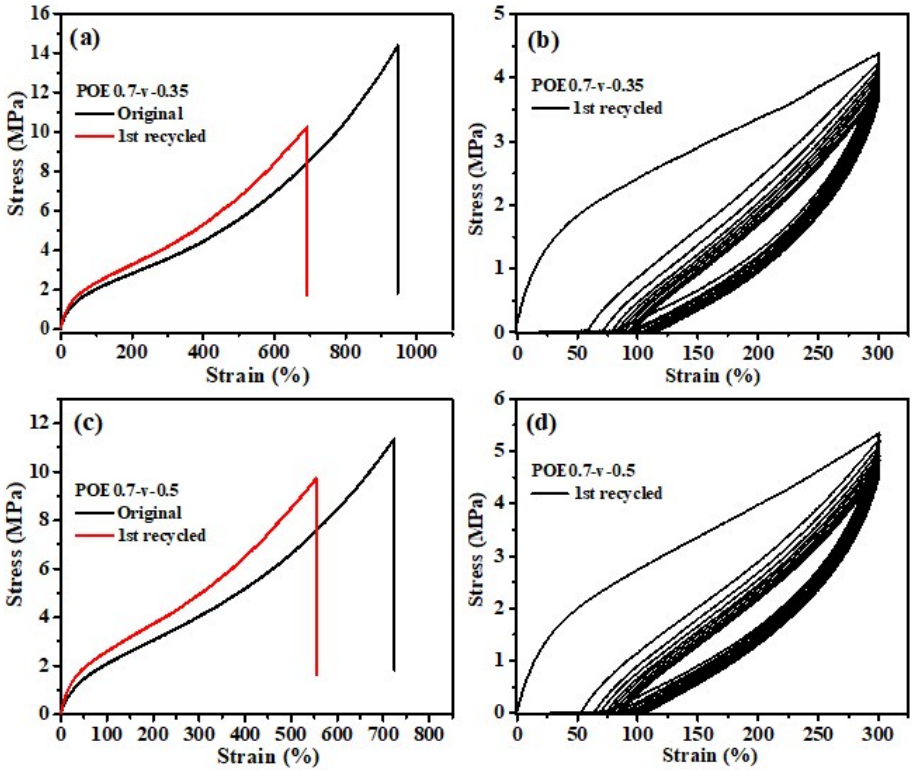

Figure S14. (a), (c) Stress-strain curves of the original and recycled POE0.7-v-0.35 and POE0.7-v-0.5 vitrimers. (b), (d) Hysteresis test curves of the original and recycled POE0.7-v-0.5 and POE0.7-v-0.5 vitrimers.