Supplementary Information for

"Polymer to polymer" recycling and body-temperature triggered shape memory of carvone-based epoxy thermoset system achieved by thiol-Michael covalent adaptable network

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This Word file includes:

Figs. S1 to S14

Other Supplementary Materials for this manuscript include the following:

Videos S1 to S6

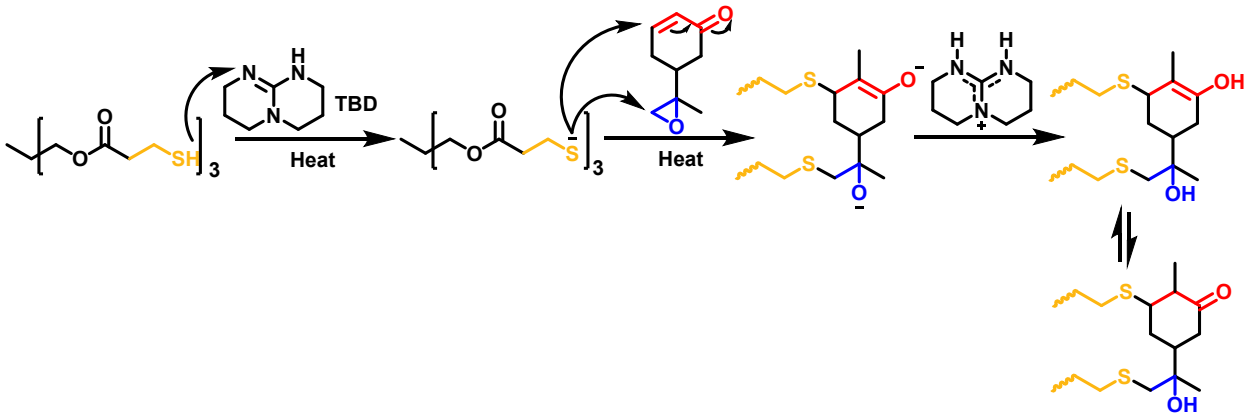

Fig. S1 Curing mechanism of EPCA/TMPTMP.

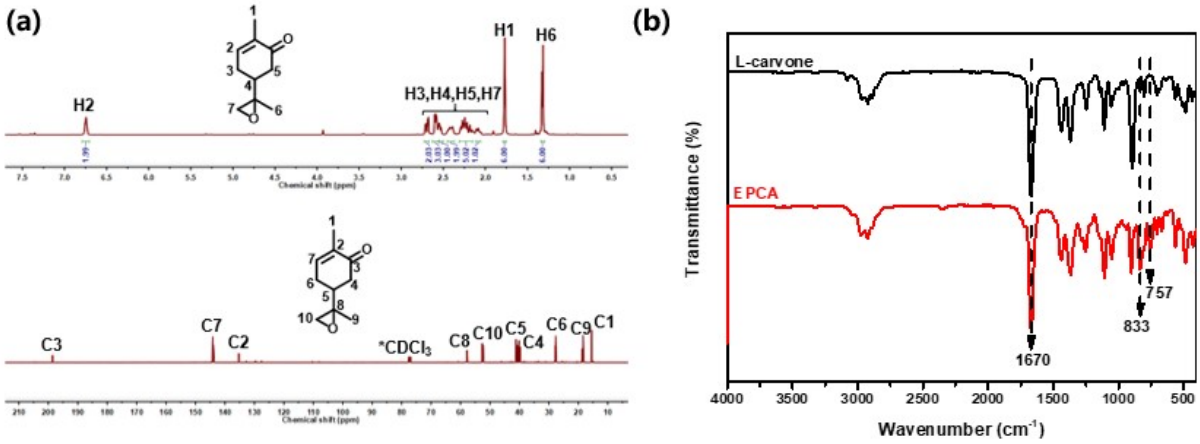

Fig. S2 Structure characterization of EPCA. (a) ^{1}H NMR and ^{13}C NMR spectra of EPCA. (b) FT-IR spectra of EPCA.

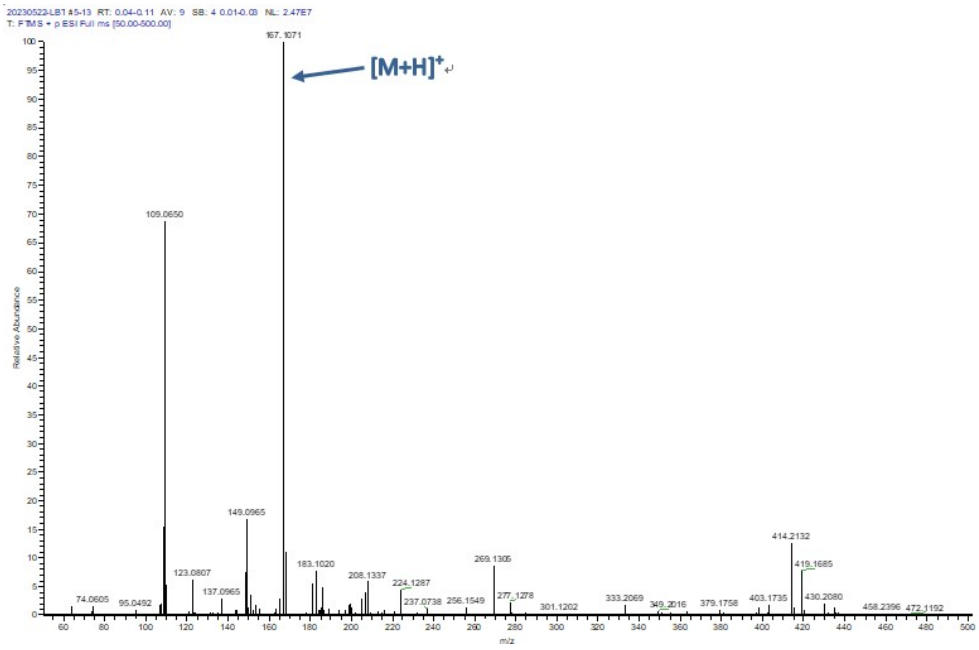

Fig. S3 TOF-MS of EPCA.

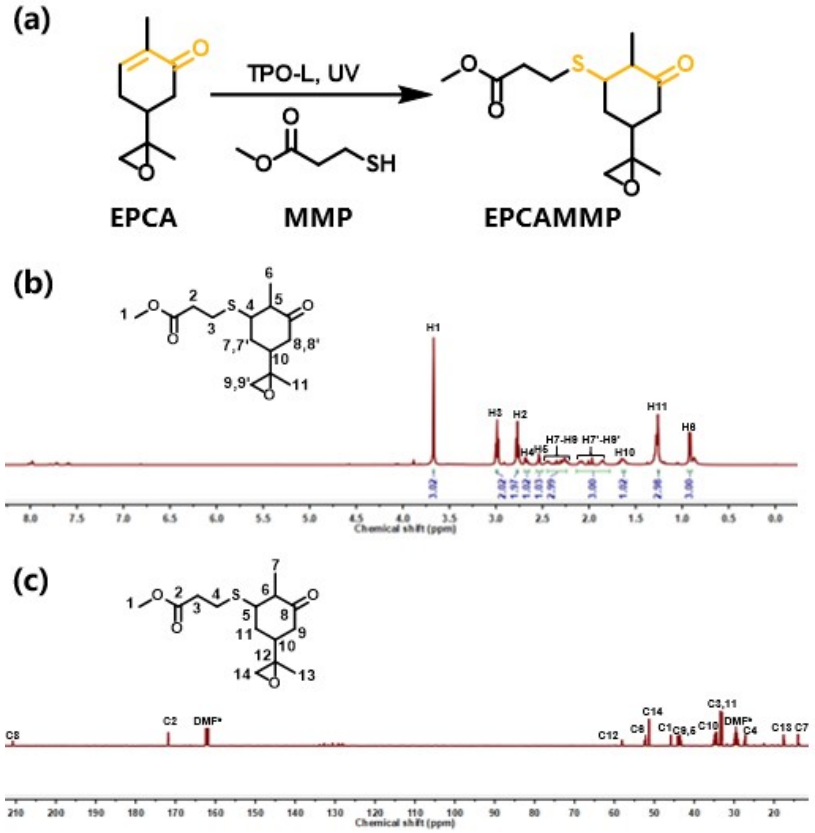

Fig. S4 Structure characterization of EPCA/MMP. (a) Synthetic route of EPCA/MMP. (b) ^{1}H NMR and (c) ^{13}C NMR spectra of EPCA/MMP.

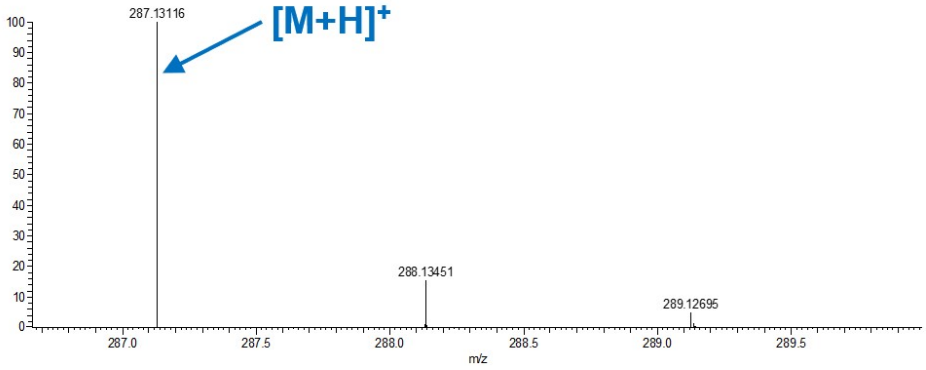

Fig. S5 TOF-MS of EPCA/MMP.

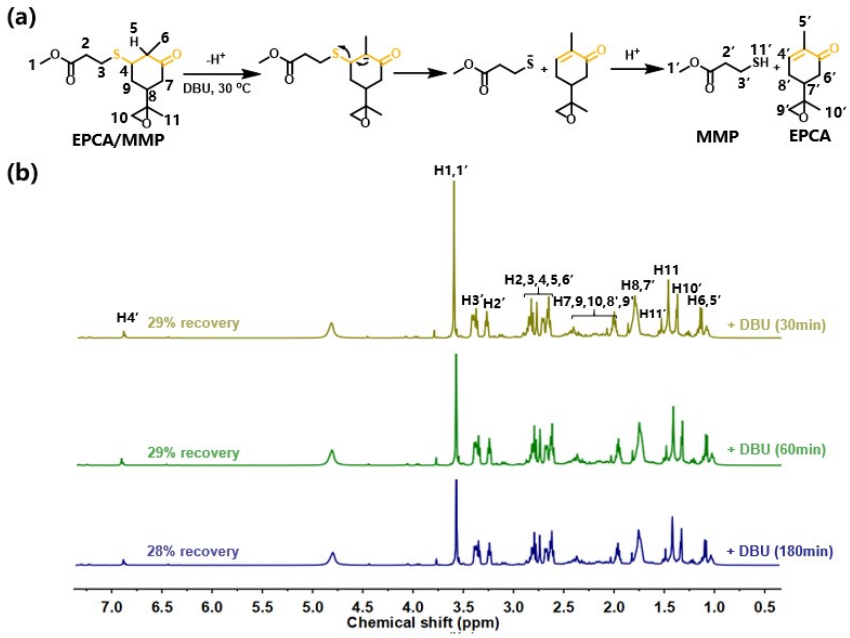

Fig. S6 (a) The cleavage mechanism of thiol-Michael bonds under alkaline condition. (b) ^{1}H NMR of degraded EPCA/MMP at 30 °C with DBU (5 wt%) at different reaction times.

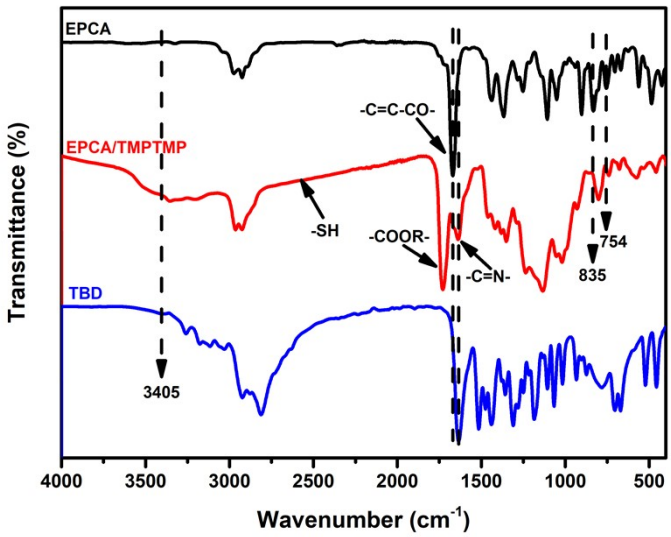

Fig. S7 FT-IR spectra of EPCA, EPCA/TMPTMP and TBD.

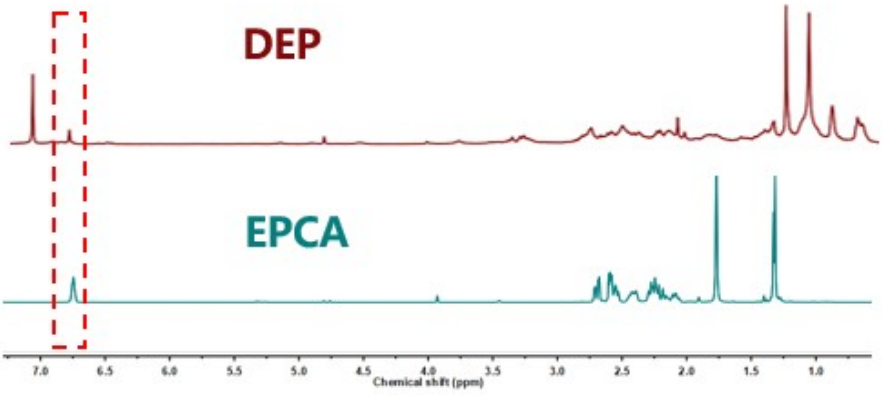

Fig. S8 ^{1}H NMR spectra of DEP and EPCA.

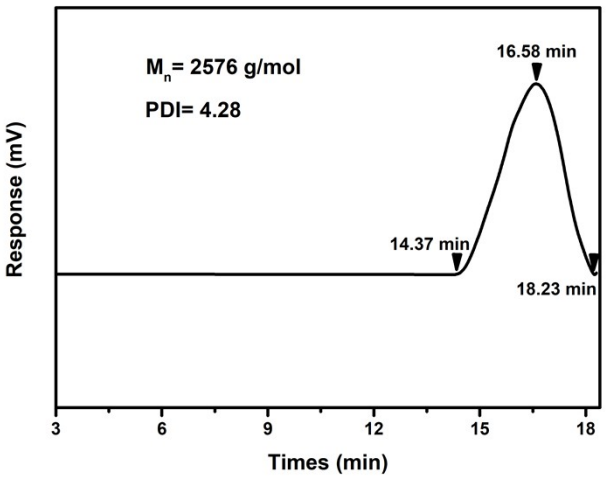

Fig. S9 GPC chromatogram of DEP against polystyrene standards.

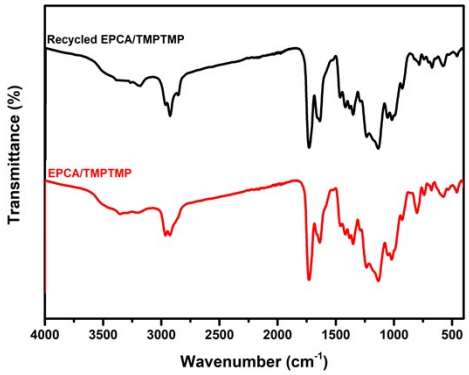

Fig. S10 FT-IR spectra of EPCA/TMPTMP and recycled EPCA/TMPTMP.

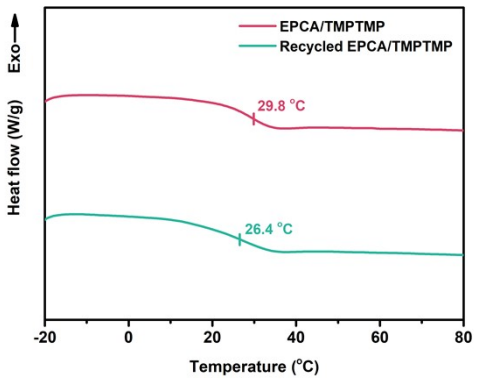

Fig. S11 DSC curves of the pristine and recycled EPCA/TMPTMP.

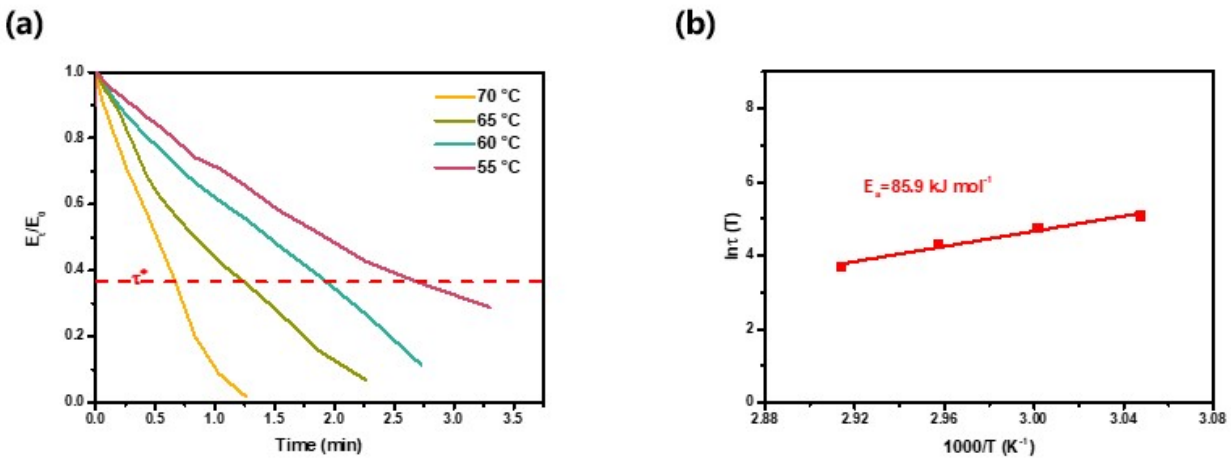

Fig. S12 Dynamic property of EPCA/TMPTMP. (a) Normalized stress relaxation curves from 55 to 70 °C by DMA tension mode with the strain of 1%. (b) Linear fitting to calculate the relaxation activation energy (E_a) of EPCA/TMPTMP via the Arrhenius equation.

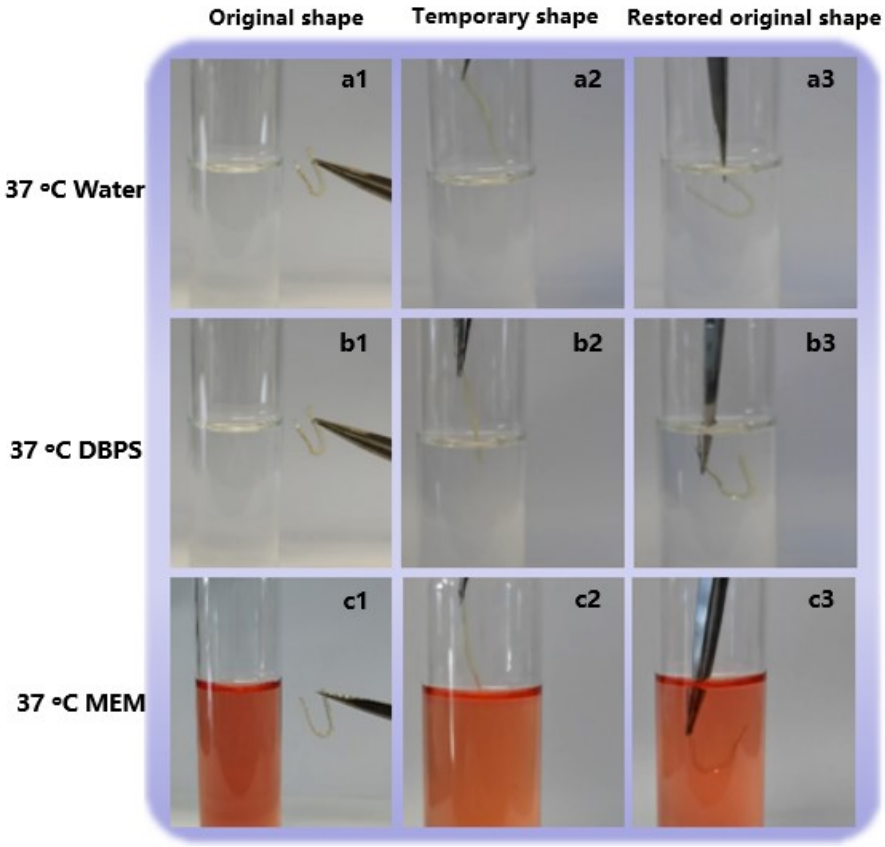

Fig. S13 Photos showing the shape recovery process in (a1, a2, a3) 37 ºC water, (b1, b2, b3) 37 ºC DPBS, and (c1, c2, c3) 37 ºC MEM. a1, b1 and c1 represent the original shape; a2, b2 and c2 represent the temporary shape; a3, b3 and c3 represent the restored original shape.

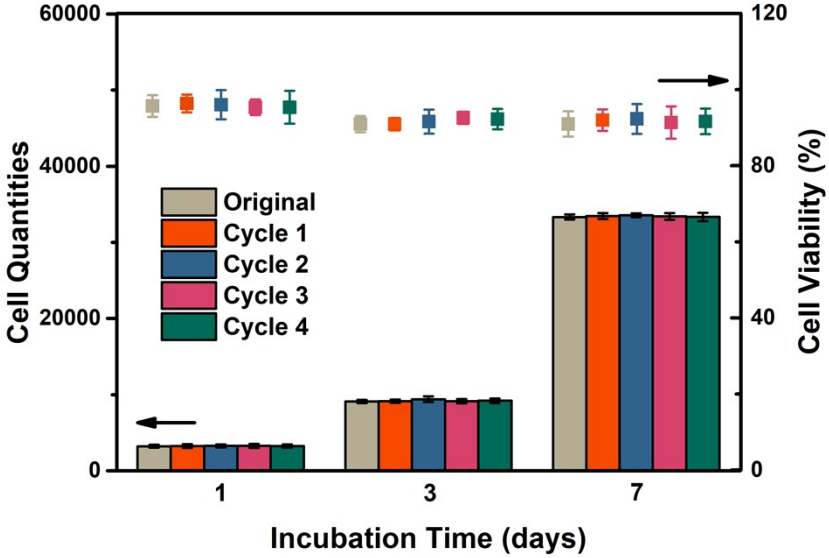

Fig. S14 Cell proliferation and viability of MC3T3-E1 cells with (recycled) EPCA/TMPTMP for 1, 3 and 7 days.