Electronic Supplementary Material (ESI) for Polymer Chemistry.

Dual Stimuli Responsive Self-Healing and Malleable Materials based on dynamic thiol-Michael Chemistry

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Supplementary Figures and Tables

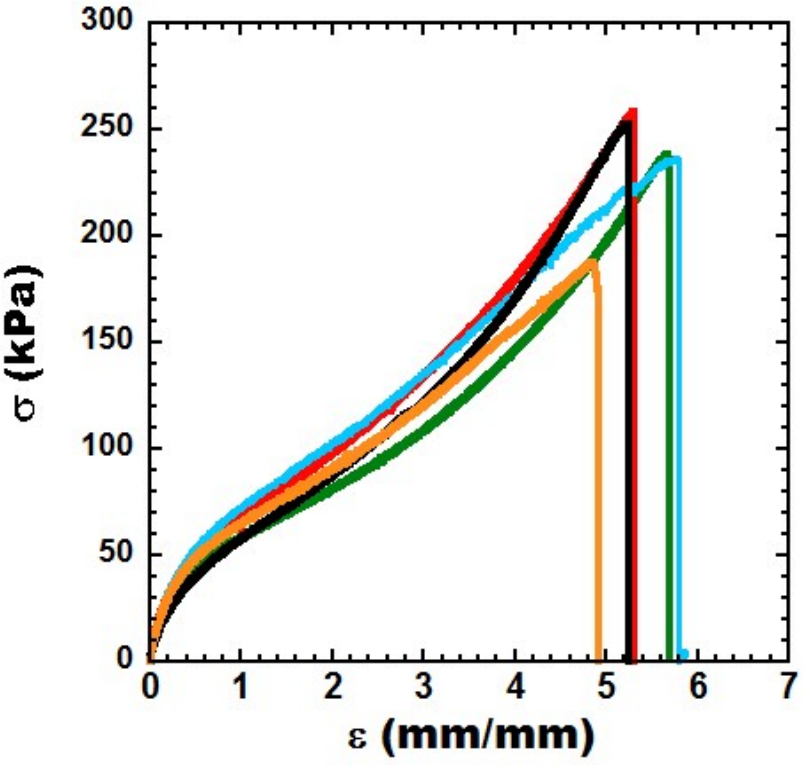

Figure S1: Typical stress (σ) vs strain (Ɛ) plots for PHEA-1.5%TMMDA materials.

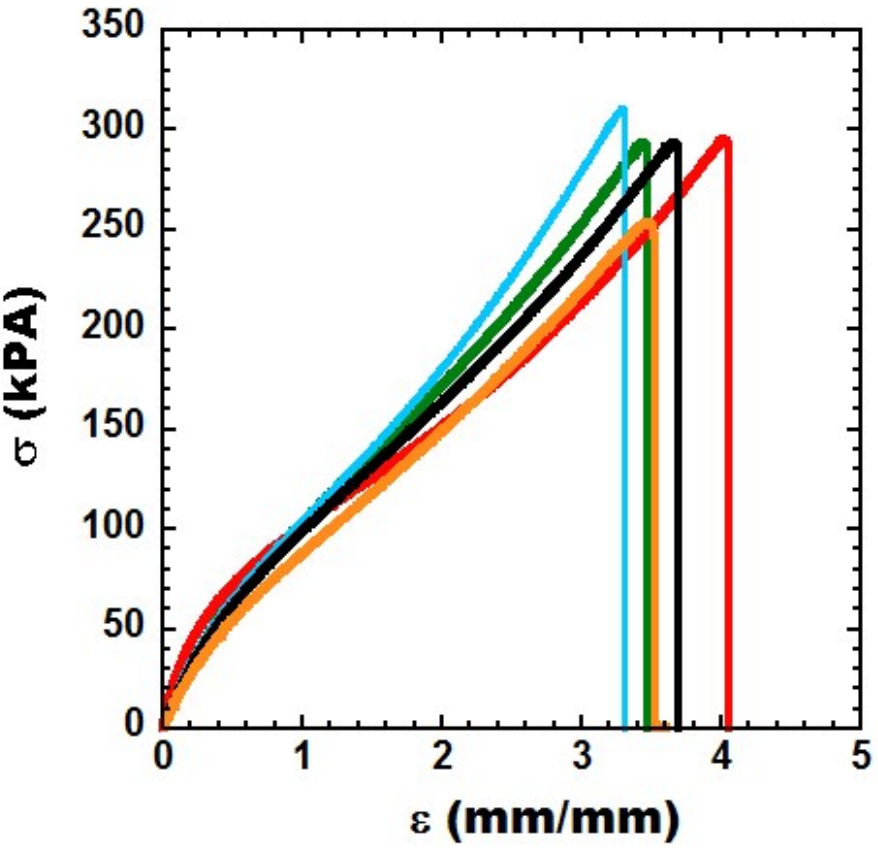

Figure S2: Typical stress (σ) vs strain (Ɛ) plots for PHEA-3%TMMDA materials.

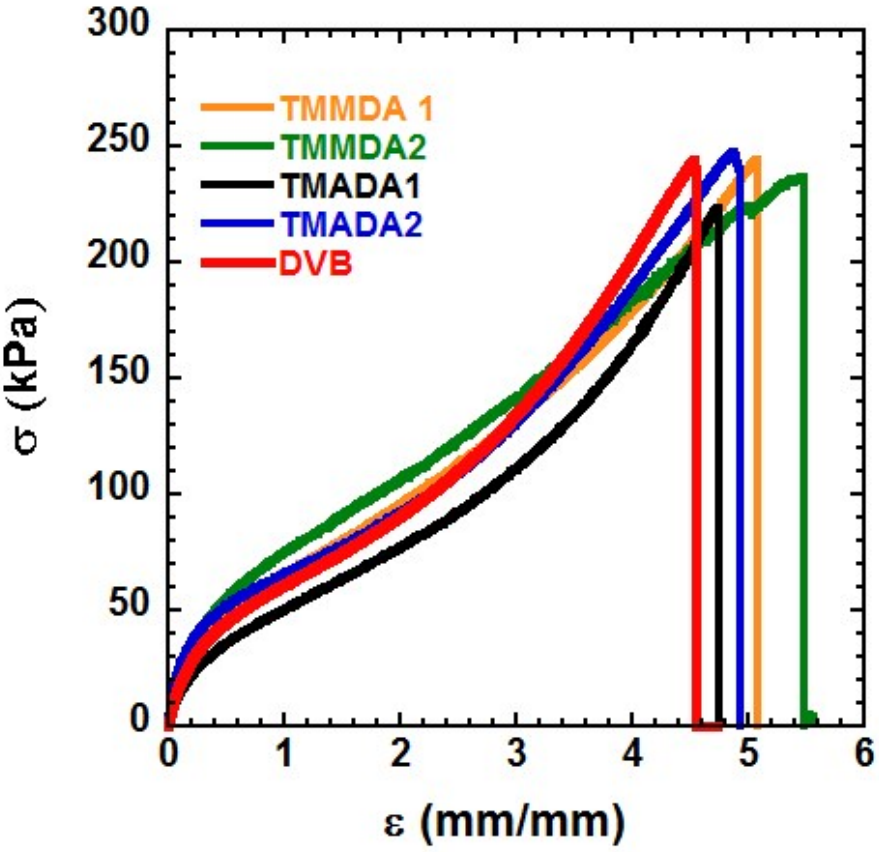

Figure S3: Typical stress (σ) vs strain (Ɛ) plots for PHEA-1.5%TMMDA, TMADA and DVB materials.

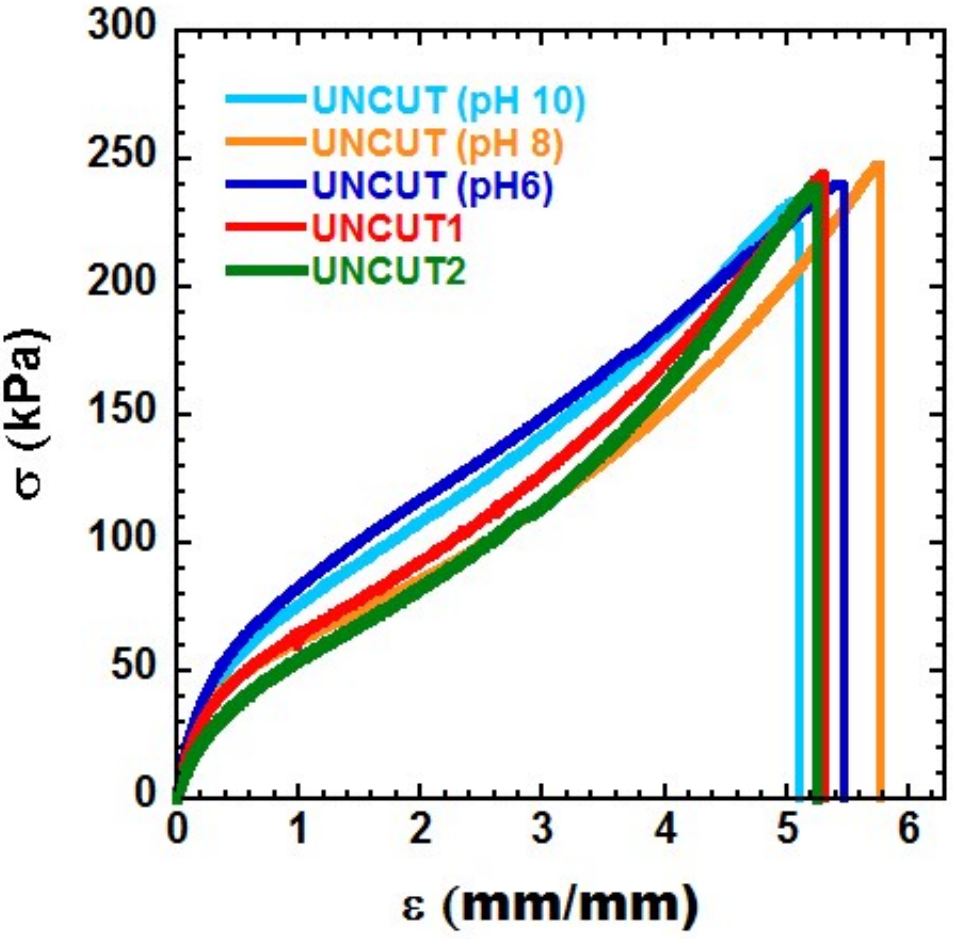

Figure S4: Typical stress (σ) vs strain (Ɛ) plots for PHEA-1.5%TMMDA uncut materials in different pH solutions

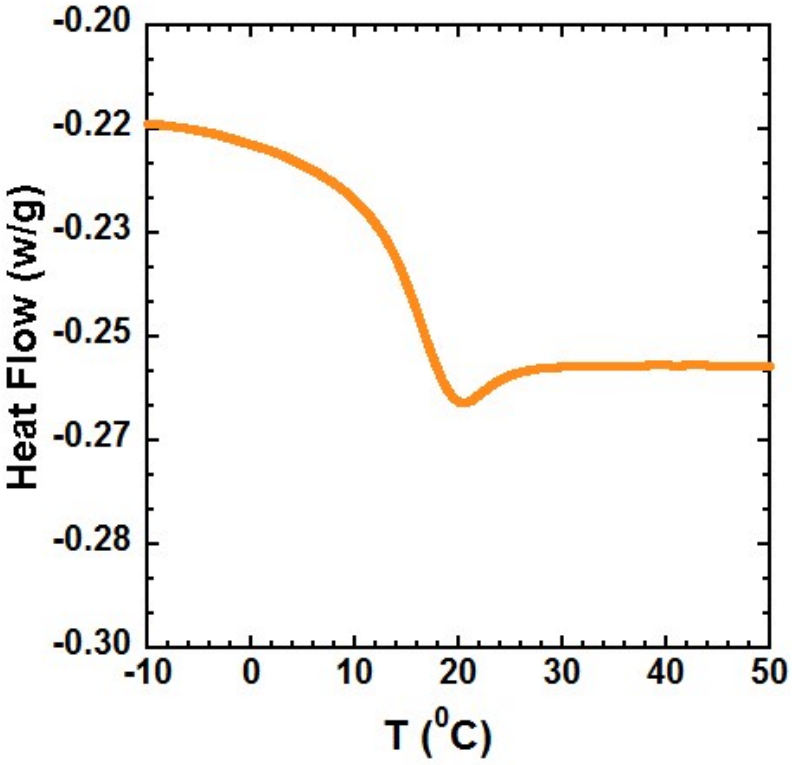

Figure S5: DSC curve for PHEA-1.5%TMMDA material measured from the second heating cycle.

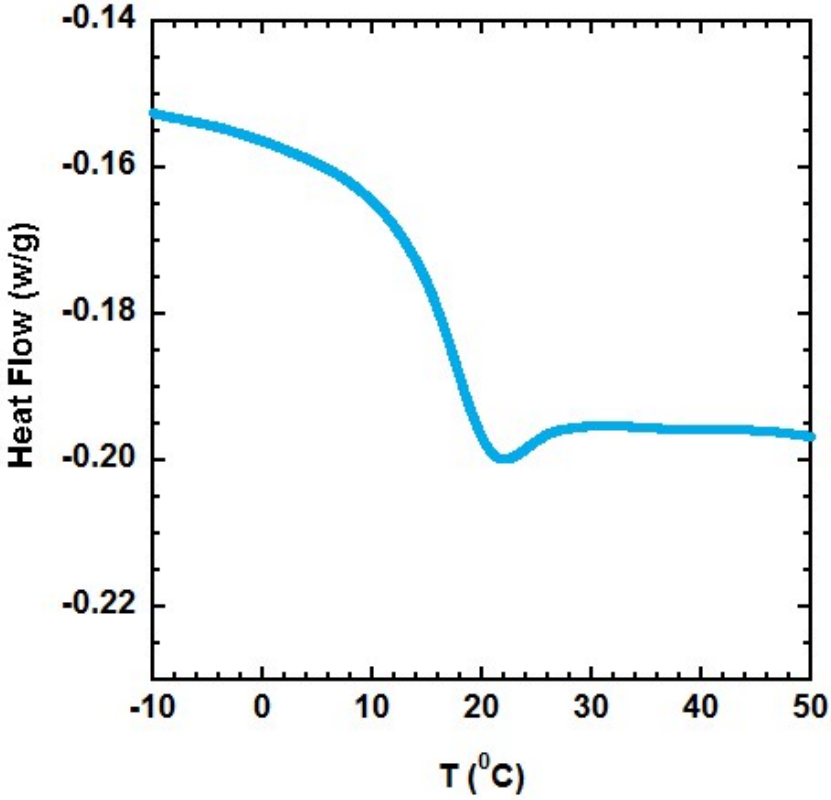

Figure S6: DSC curve for PHEA-3%TMMDA material measured from the second heating cycle.

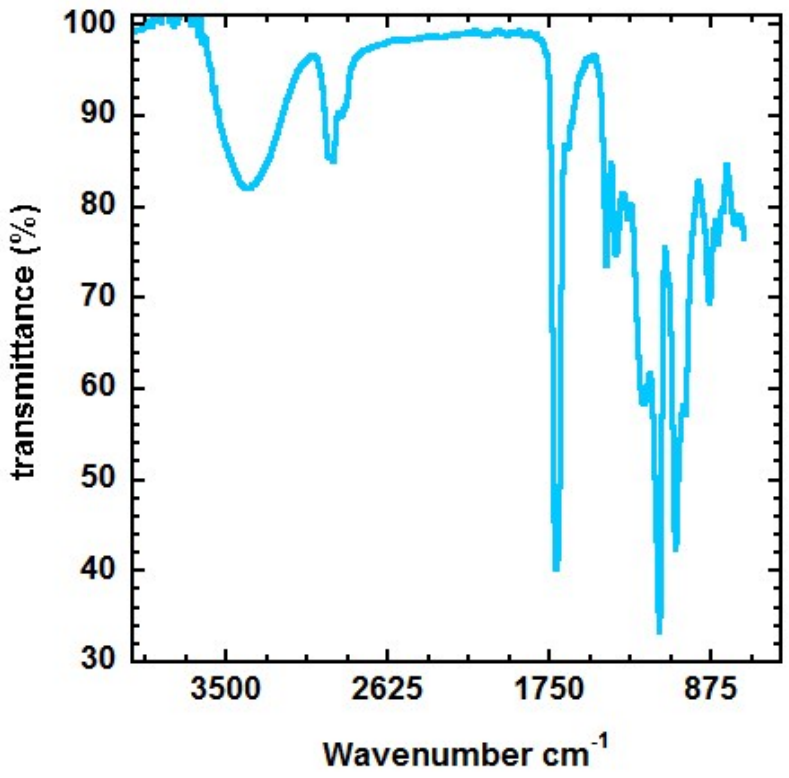

Figure S7: Infrared (IR) spectrum of PHEA-1.5%TMMDA material.

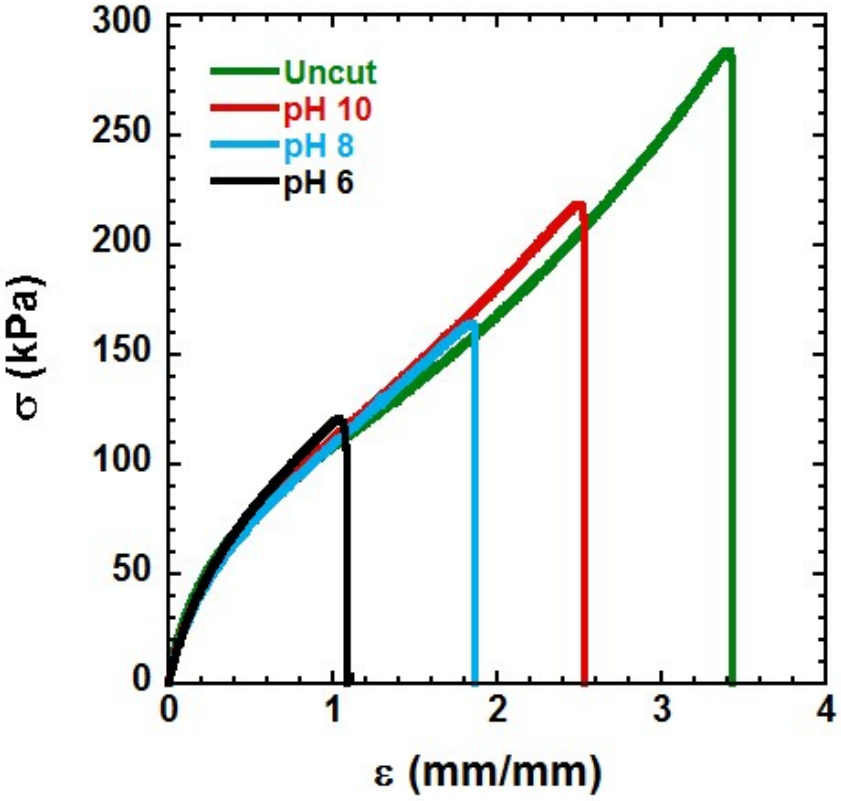

Figure S8: stress-strain curve for self-healing properties of PHEA-3%TMMDA material at different pH values. All the samples were kept for 30 minutes in pH buffer solutions.

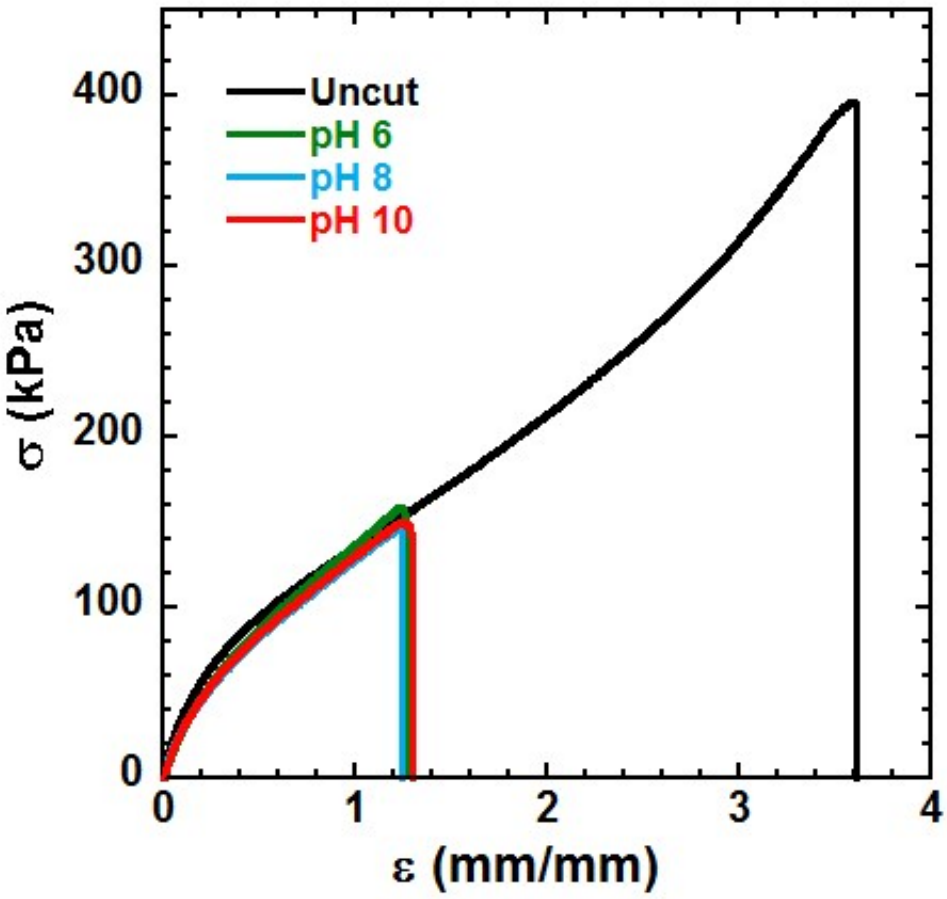

Figure S9: Stress-strain curve for self-healing properties of PHEA-2%DVB material in different pH solutions

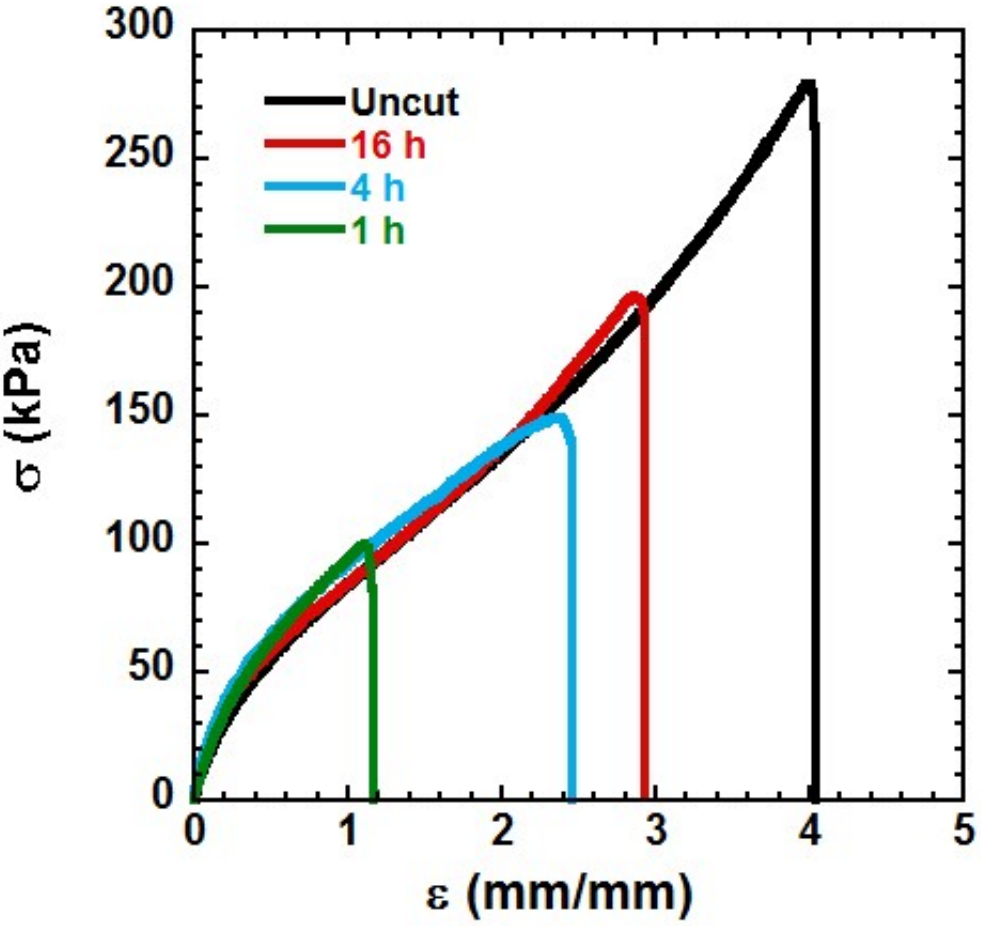

Figure S10: stress-strain curve for self-healing properties of PHEA-3%TMMDA material at 90 °C

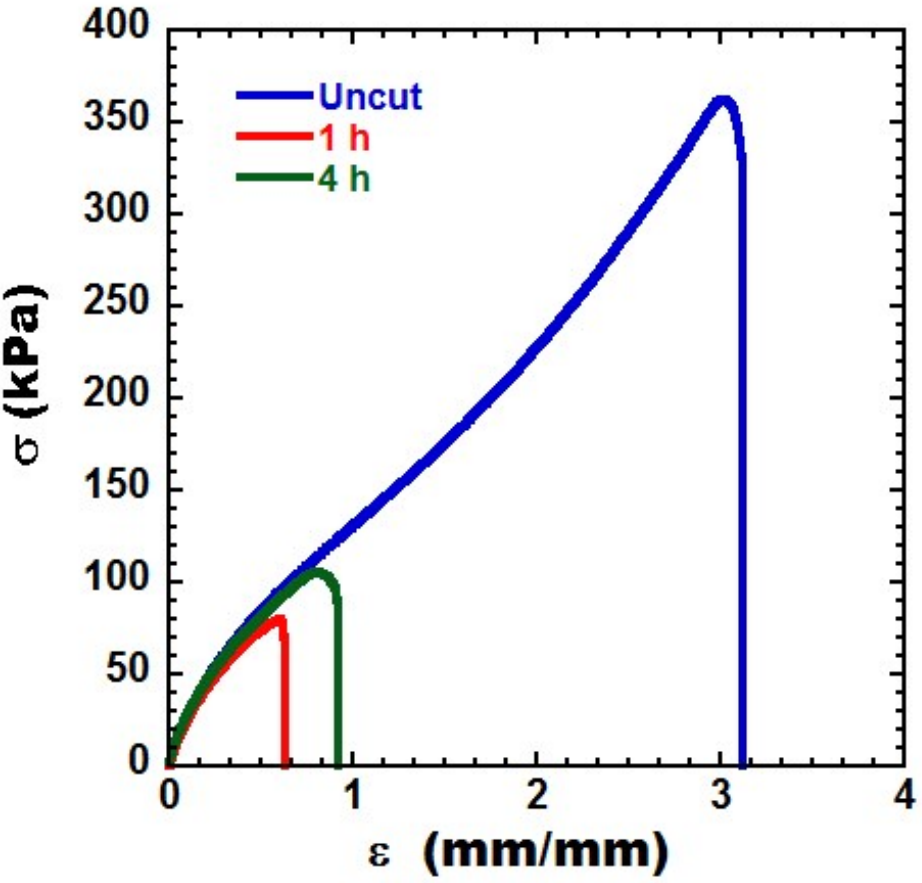

Figure S11: stress-strain curve for self-healing properties of PHEA-2%DVB material at 90 ^{o}C

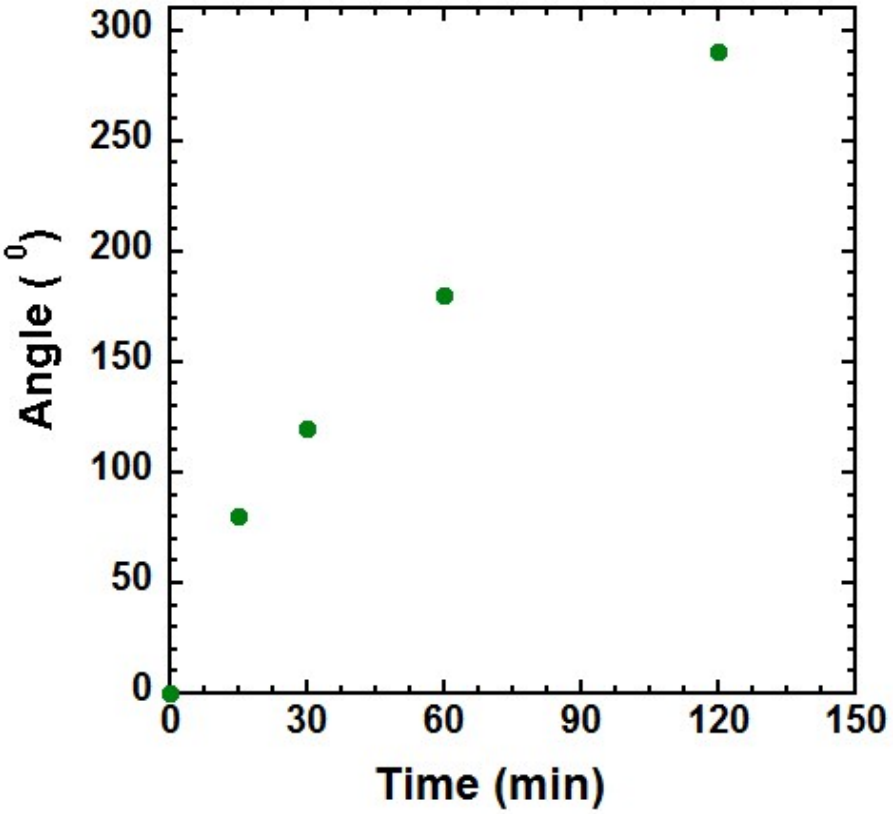

Figure S12: Malleability of PHEA-3%TMMDA materials at different time in pH 10 buffer solution

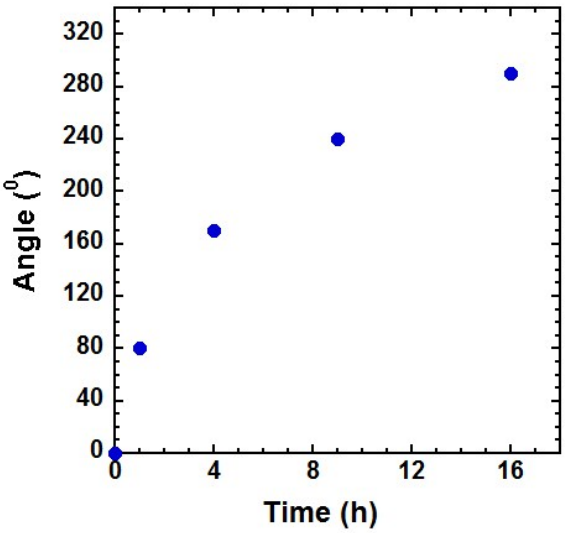

Figure S13: Malleability of PHEA-3%TMMDA at different time performed in 90 °C.

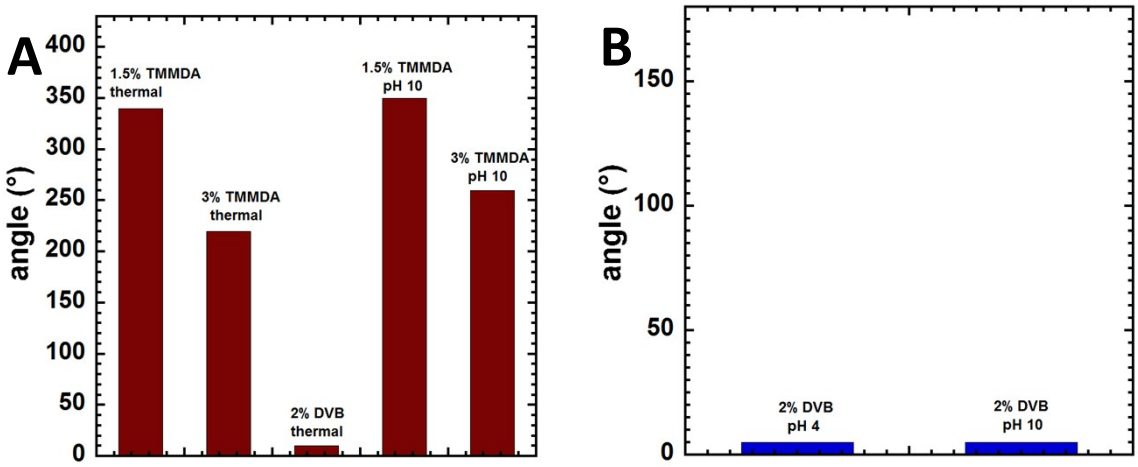

Figure S14: A) Malleability of PHEA-2%DVB under thermal stimulus of 90 °C compared to PHEA-1.5%TMMDA and PHEA-3%TMMDA under both thermal (90 °C) and pH (pH =10) stimulus. Materials were shaped towards a 360° twisted shape. B) Malleability of PHEA-2%DVB materials at 30 minutes time period, performed in at pH = 4 and pH = 10 in a 180° configuration. Materials were shaped towards a 180° twisted shape.

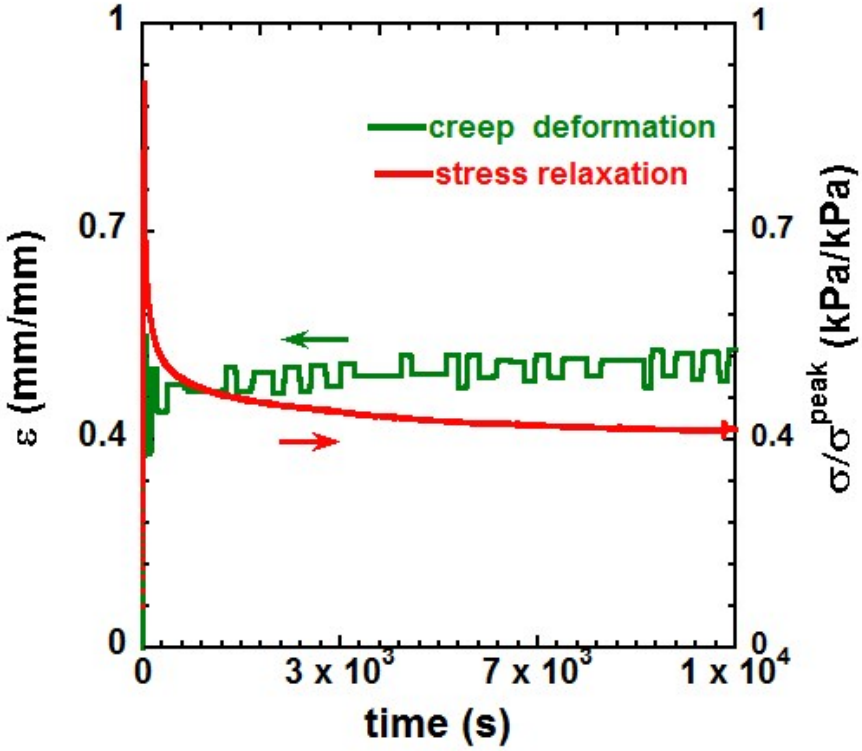

Figure S15: Stress relaxation and creep deformation of PHEA-3%TMMDA material as a function time

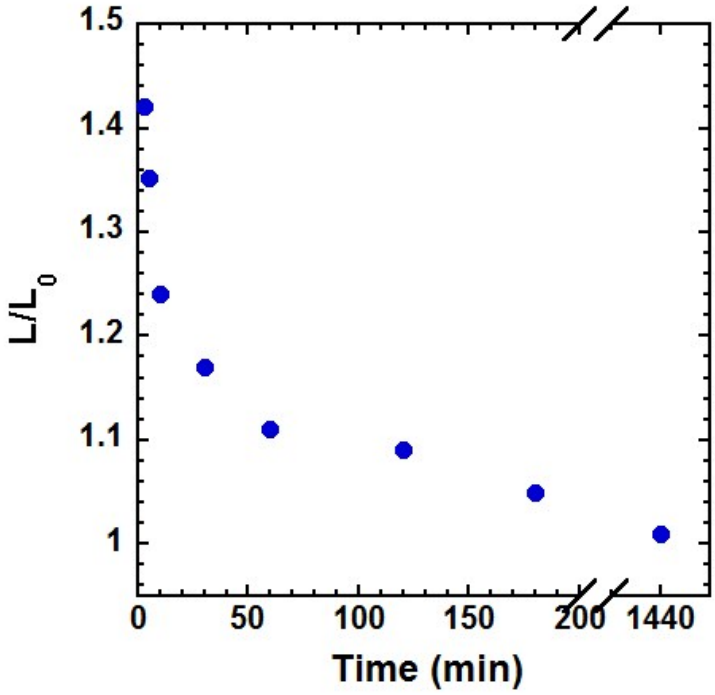

Figure S16: Creep recovery of PHEA-3%TMMDA material as a function of time after releasing from 100% strain for 1 day.