

## Supporting Information

# Epoxy Polymer as a Versatile Hydrophobic Component for Tough Phase-Separated Hydrogels

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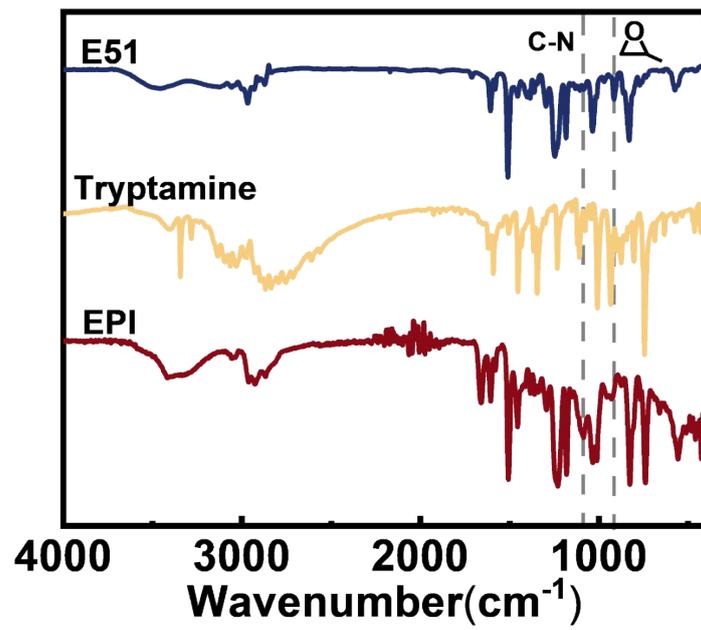
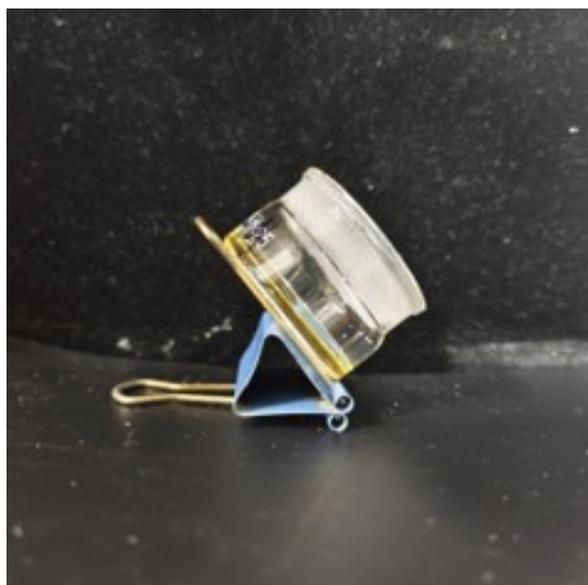
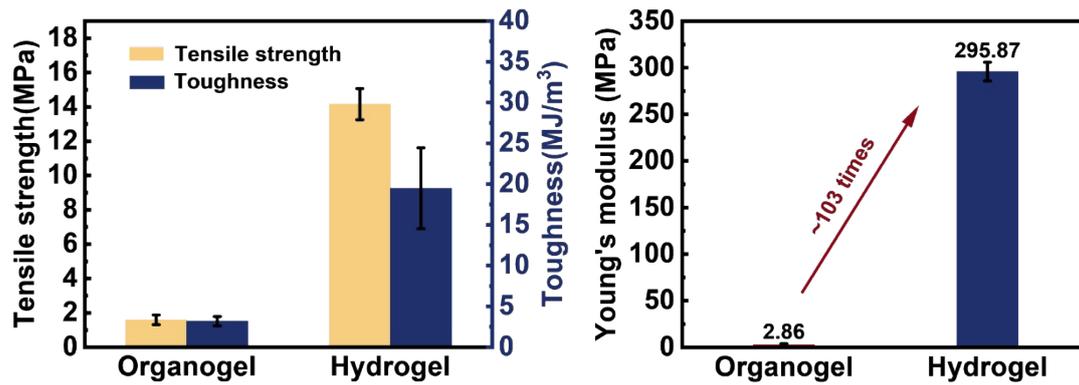


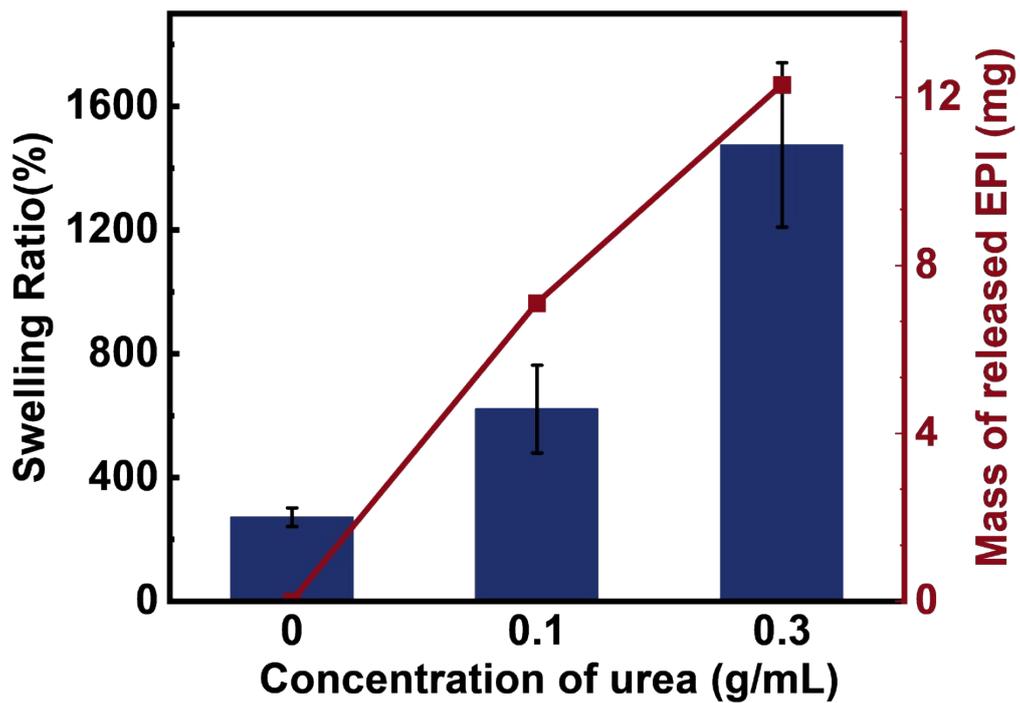
Fig. S1 FT-IR spectra of E51, tryptamine and EPI.



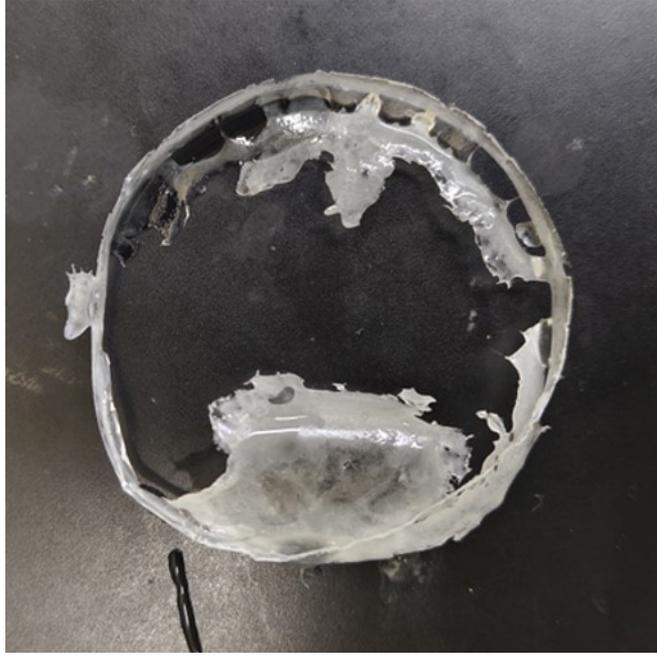
**Fig. S2** EPI/PAA can spontaneously form a gel after mixing.



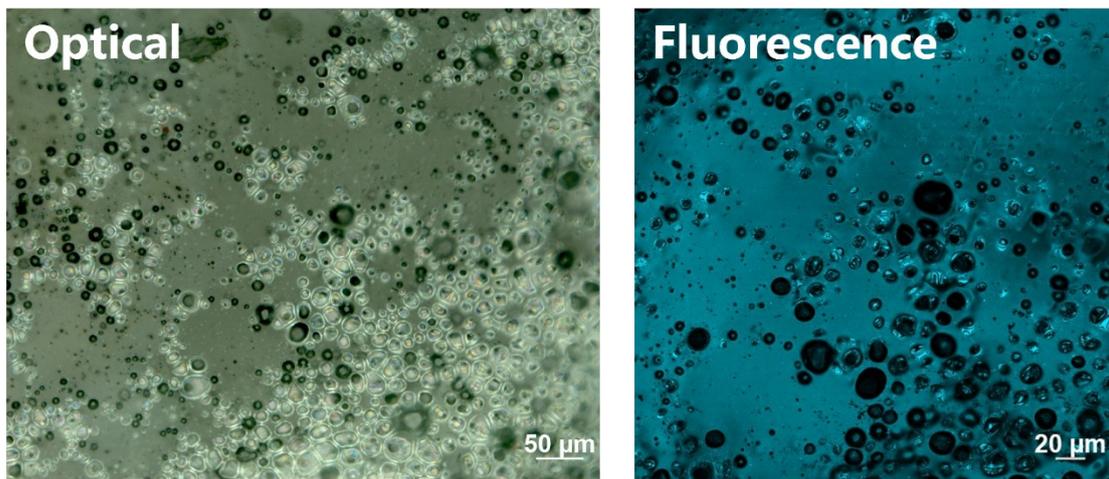
**Fig. S3** Tensile strength, toughness and Young's modulus of EPI/PAA organogel and hydrogel.



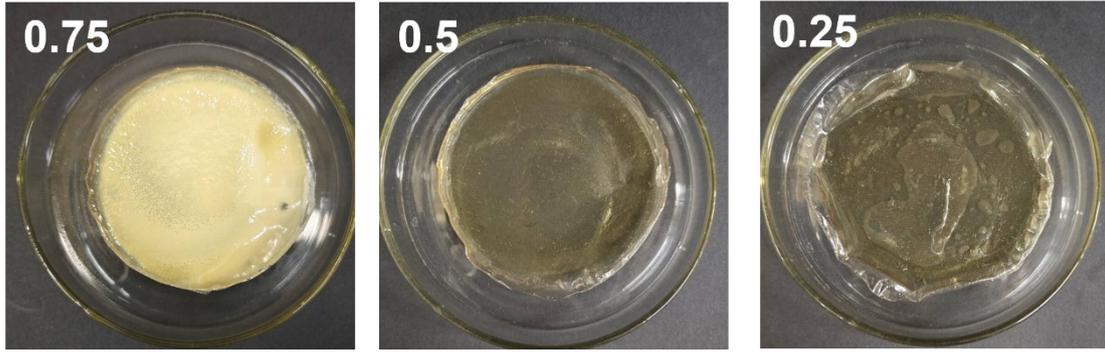
**Fig. S4** Swelling ratio of EPI/PAA and mass of released EPI after immersion in urea/DMF solutions at different concentrations following equilibrium in water.



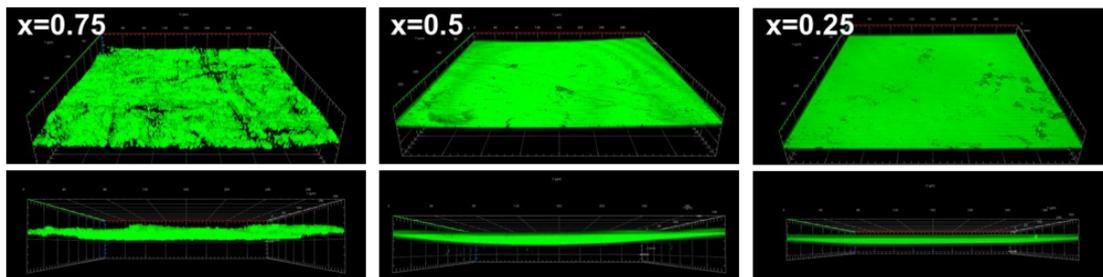
**Fig. S5** Image of PMMA/PAA.



**Fig. S6** Optical microscope and CLSM images of PMMA/PAA.



**Fig. S7** Images of EPI/PAA hydrogels with different EPI contents.



**Fig. S8.** CLSM images of EPI/PAA hydrogels with different EPI contents



**Fig. S9** Images of EPI/PEG, EPI/PEO and EPI/PVP hydrogels.

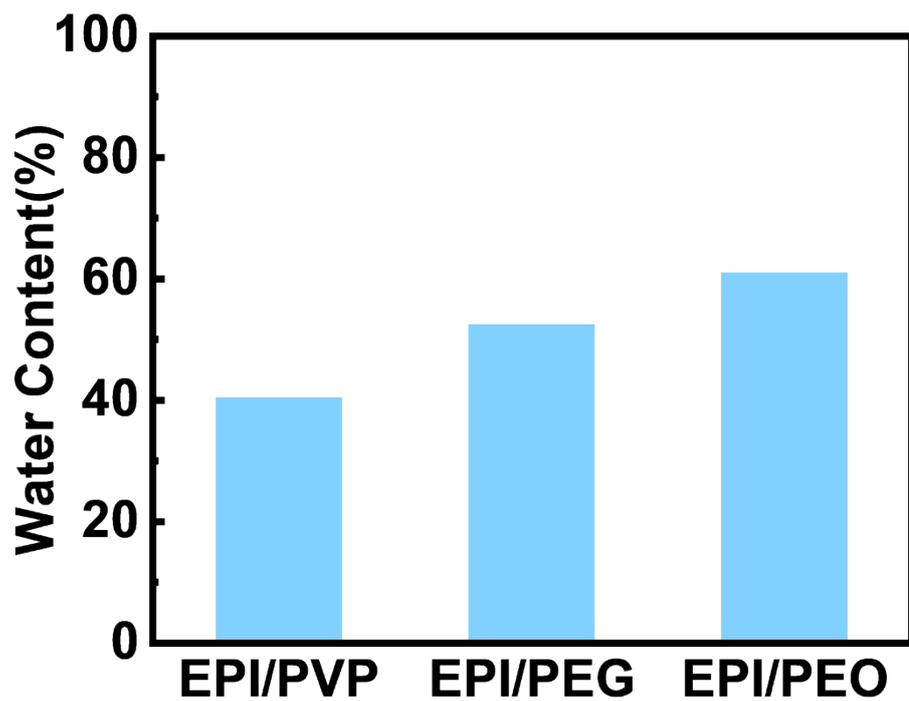
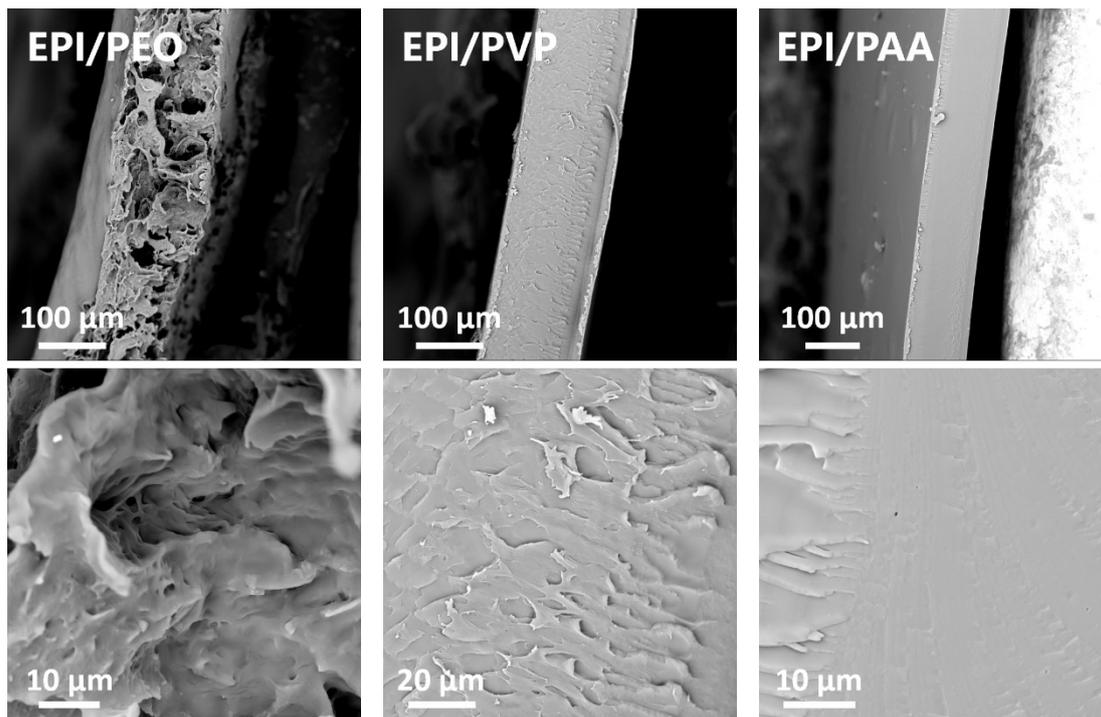
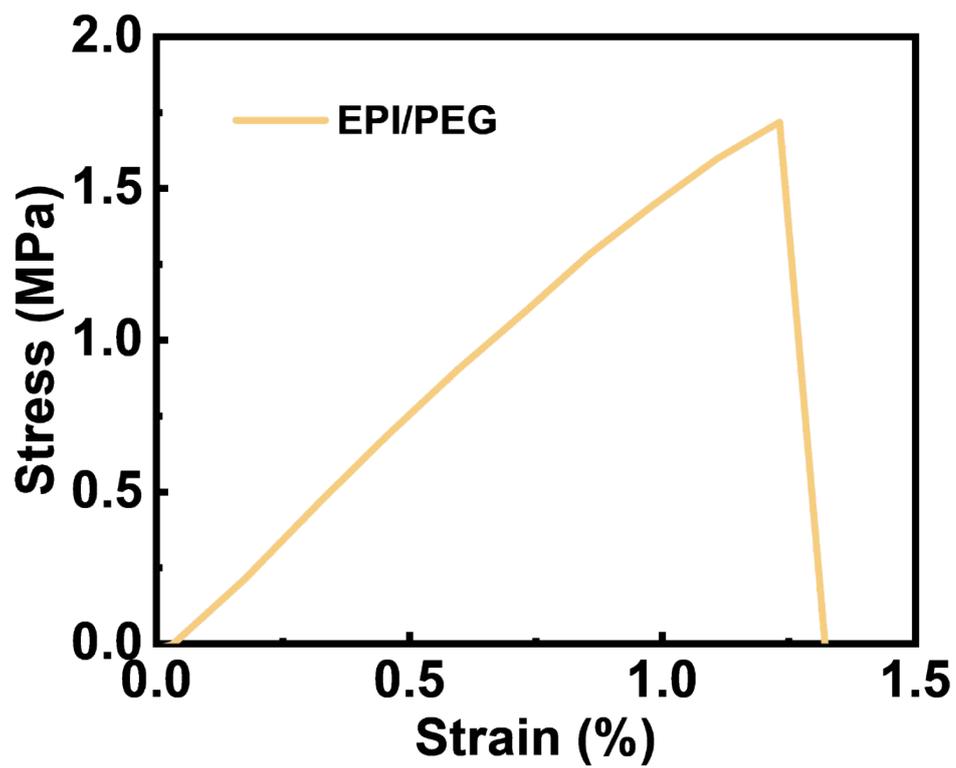


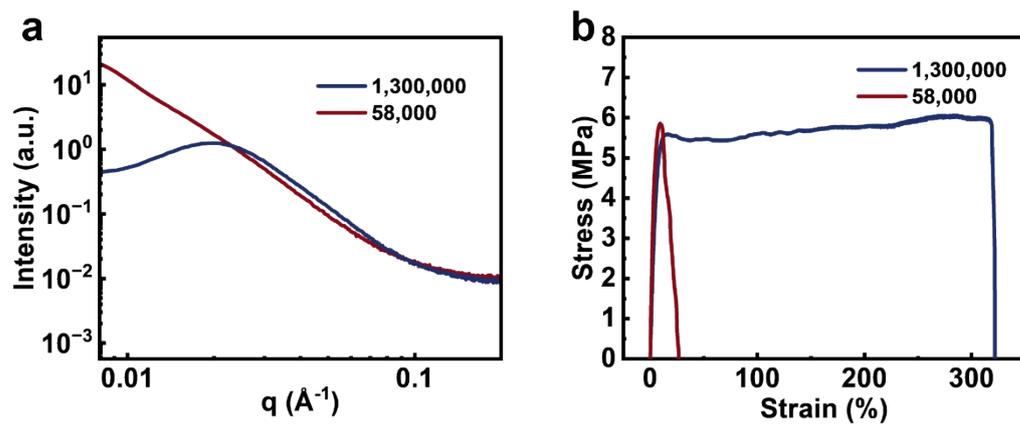
Fig. S10 Water contents of EPI/PVP, EPI/PEO and EPI/PEG hydrogels.



**Fig. S11** SEM images of the cross sections of EPI/PEO, EPI/PVP and EPI/PAA.



**Fig. S12** Tensile stress-strain curve of EPI/PEG.



**Fig. S13** SAXS spectra (a) and Tensile stress-strain curves (b) of EPI/PVP hydrogels with different  $M_w$  of PVP

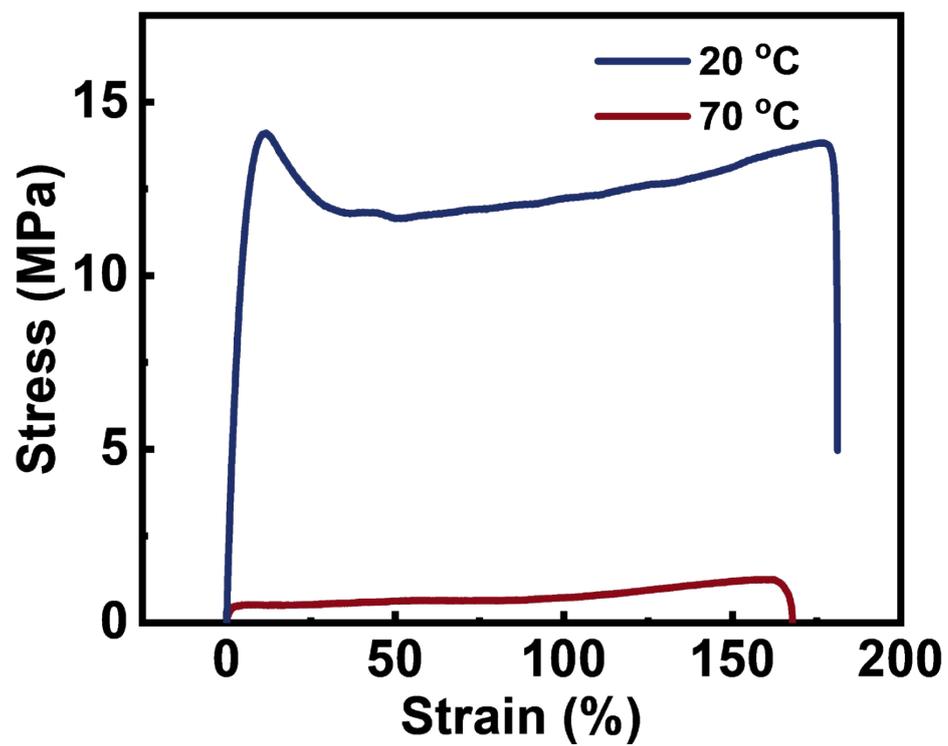
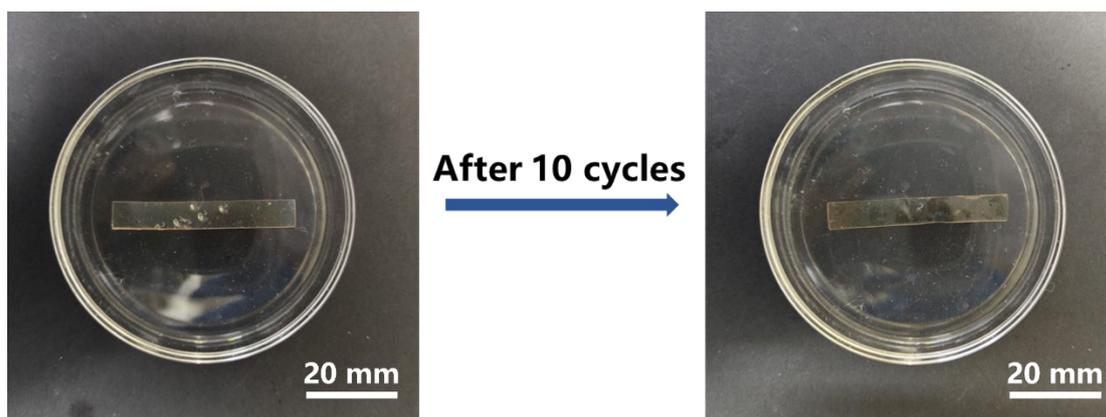


Fig. S14 Tensile stress-strain curves of EPI/PAA hydrogel at different temperatures.



**Fig. S15** Images of EPI/PAA hydrogel before and after 10 programming-recovery cycles.

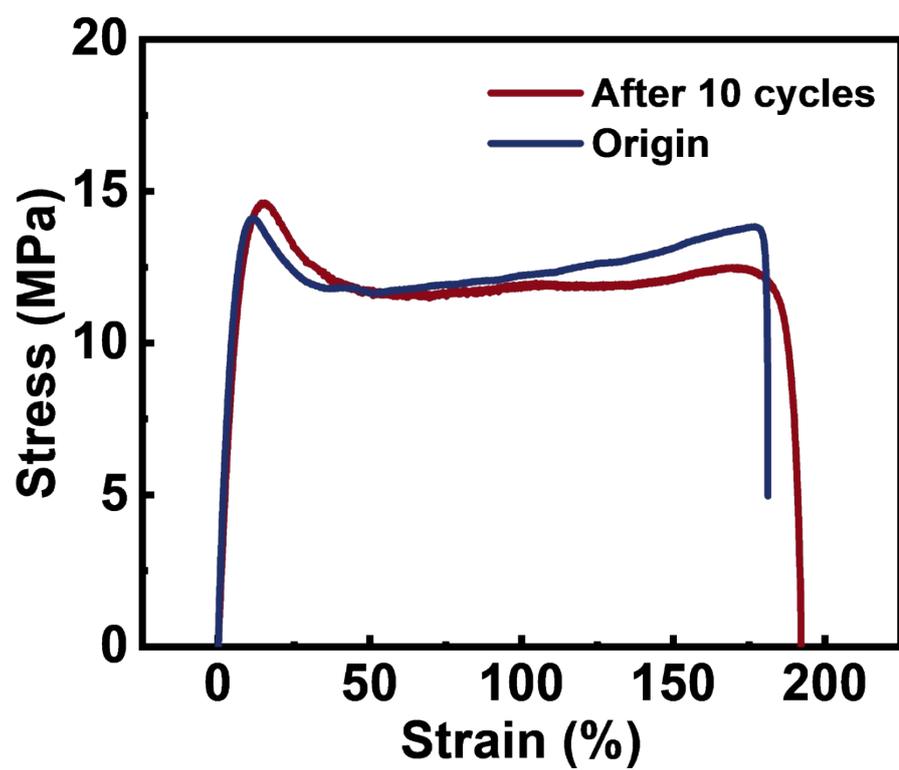
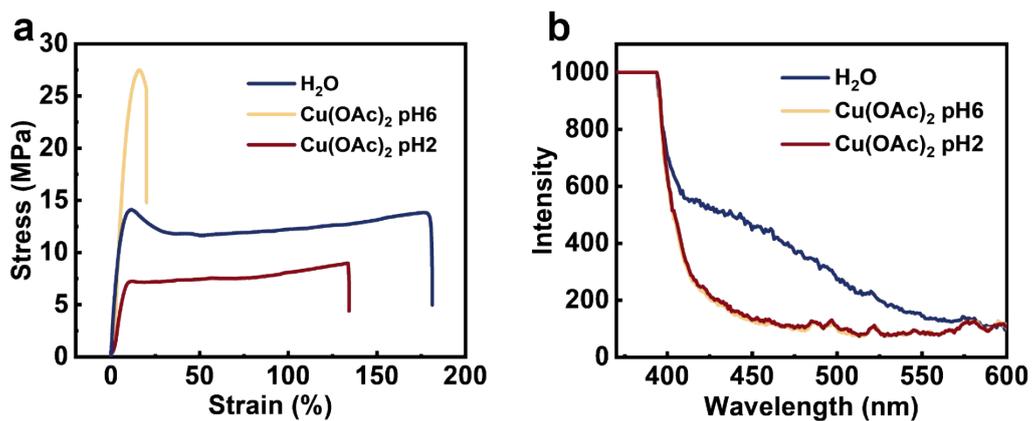


Fig. S16 Tensile stress-strain curves of EPI/PAA hydrogel before and after 10 programming-recovery cycles.



**Fig. S17** Tensile stress-strain curves (a) and fluorescence (b) of Cu<sup>2+</sup> enhanced EPI/PAA hydrogel at different pH.

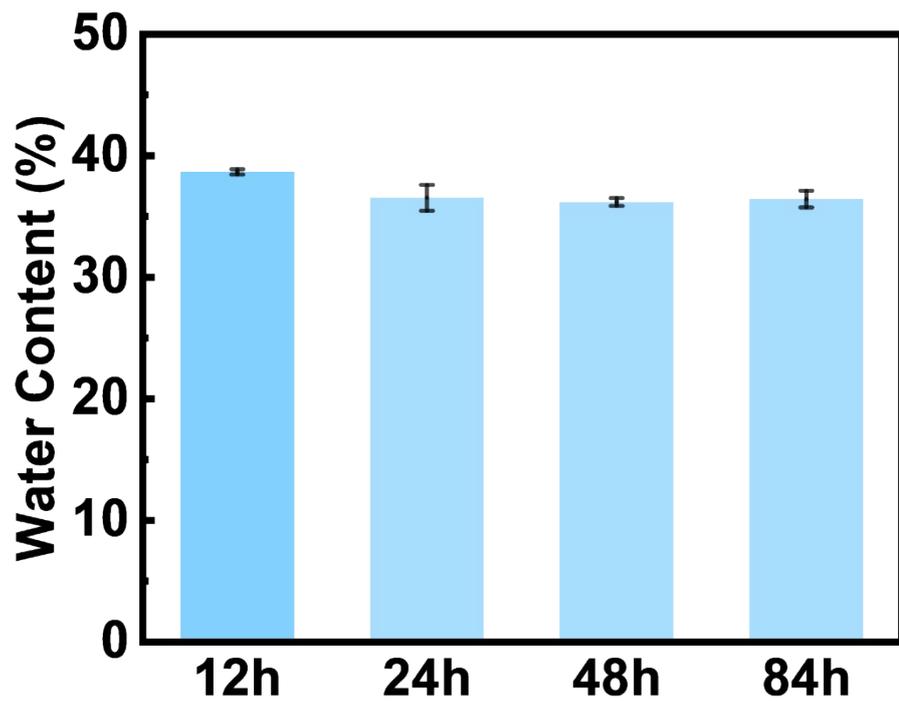
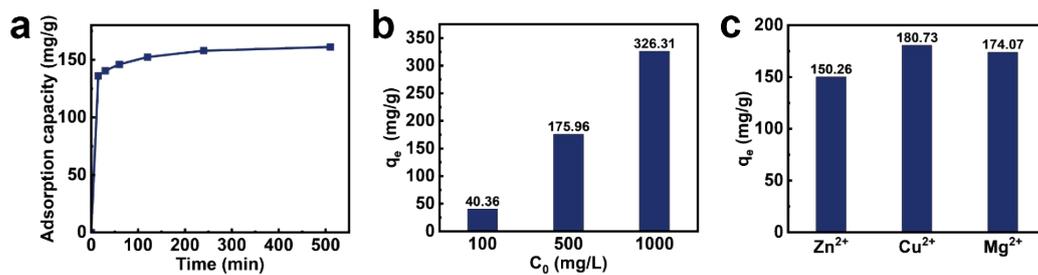


Fig. S18 Water contents of EPI/PAA at different times of swelling in water.



**Fig. S19** Adsorption capacity variation of EPI/PAA for zinc ions with time [ $C_0=500$  mg/L; Solid-liquid ratio=25 mg/L] (a) and different concentrations [Time=48 h; Solid-liquid ratio=25 mg/L] (b). (c) Adsorption capacity of EPI/PAA for different metal ions in the same solution [ $C_0$  of each ion is 500 mg/L; Time=48 h; Solid-liquid ratio=25 mg/L]