A plant-stabilized and self-initiated liquid metal hydrogel for high-performance multifunctional sensing and infrared camouflage

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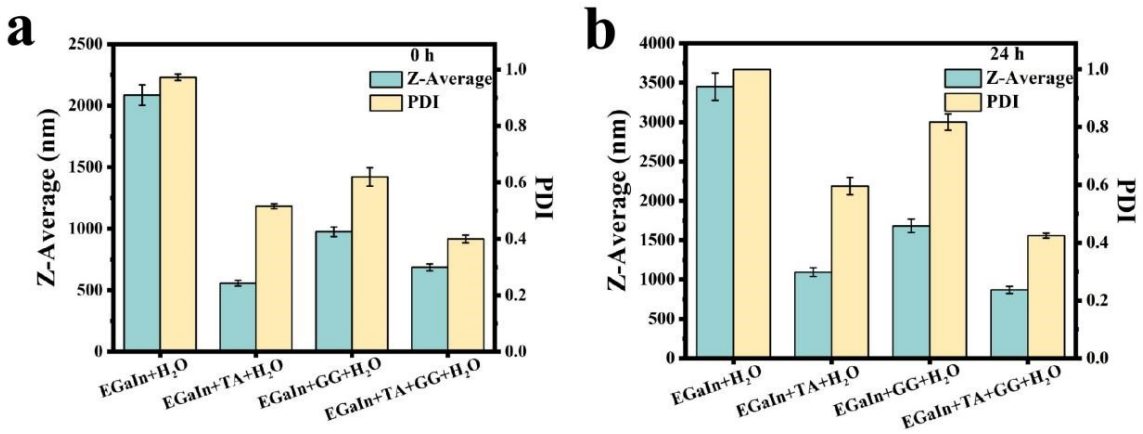

Fig. S1 Particle size and polydispersity index (PDI) of EGaIn droplets in various dispersion systems, measured after (a) 0 h and (b) 24 h.

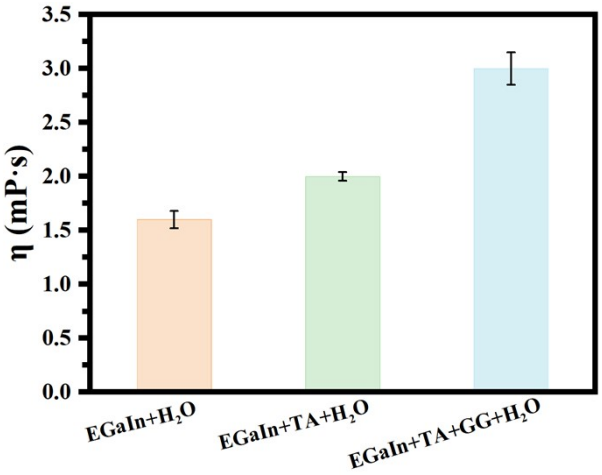

Fig. S2 Viscosity of different EGaIn aqueous dispersions.

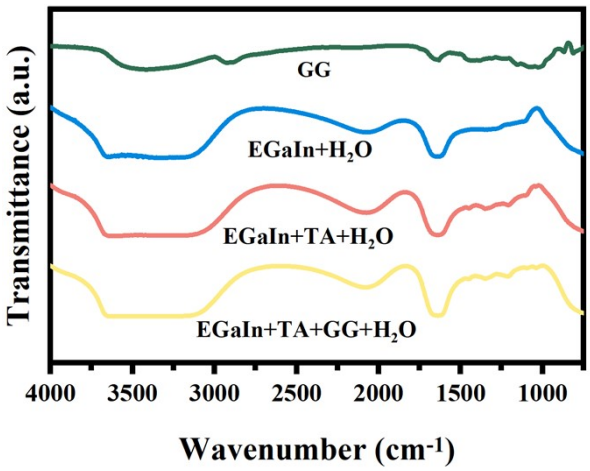

Fig. S3 FTIR spectra of different EGaIn aqueous dispersions.

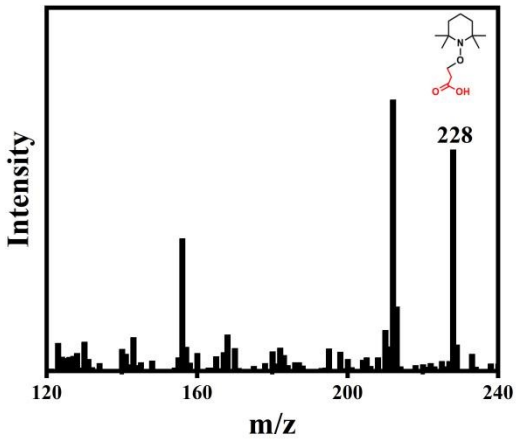

Fig. S4 Radical trapping experiments with AA, EGaIn, TA, GG and TEMPO. The ESI-MS spectrum shows the acrylic acid radical adduct with TEMPO. ESI-MS:calcd for $C_{12}H_{22}O_3N$= 228.

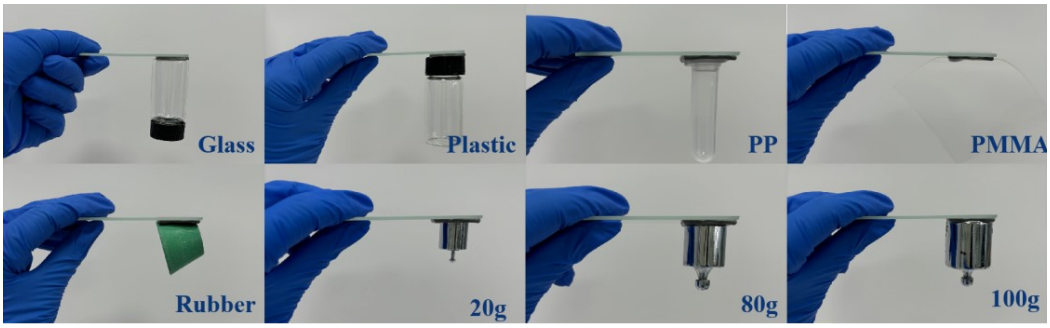

Fig. S5 Photos of EGaIn-reinforced hydrogel adhesion on substrates of different materials (glass, plastic, PP, PMMA and rubber) with different counterweights (20g, 80g and 100g).

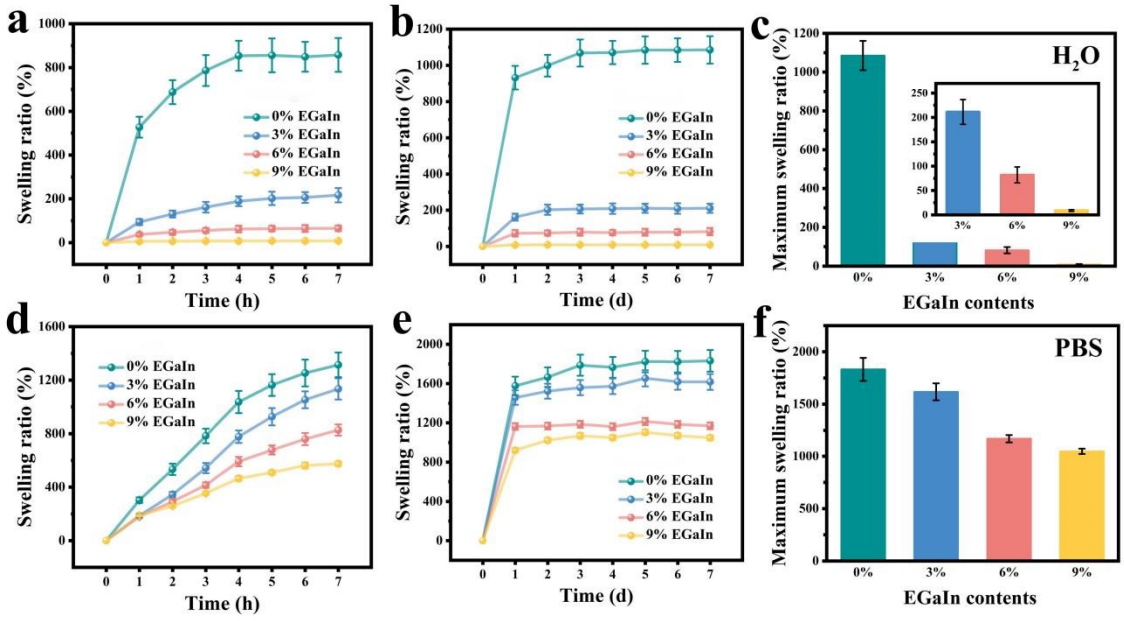

Fig. S6 Swelling ratios in deionized water at 60℃ over 7 hours (a) and 7 days (b), respectively. (c)

Maximum swelling ratio in deionized water for 7 days. Swelling ratios in PBS at 60℃ over 7 hours (d) and 7 days (e), respectively. (f) Maximum swelling ratio in PBS for 7days.

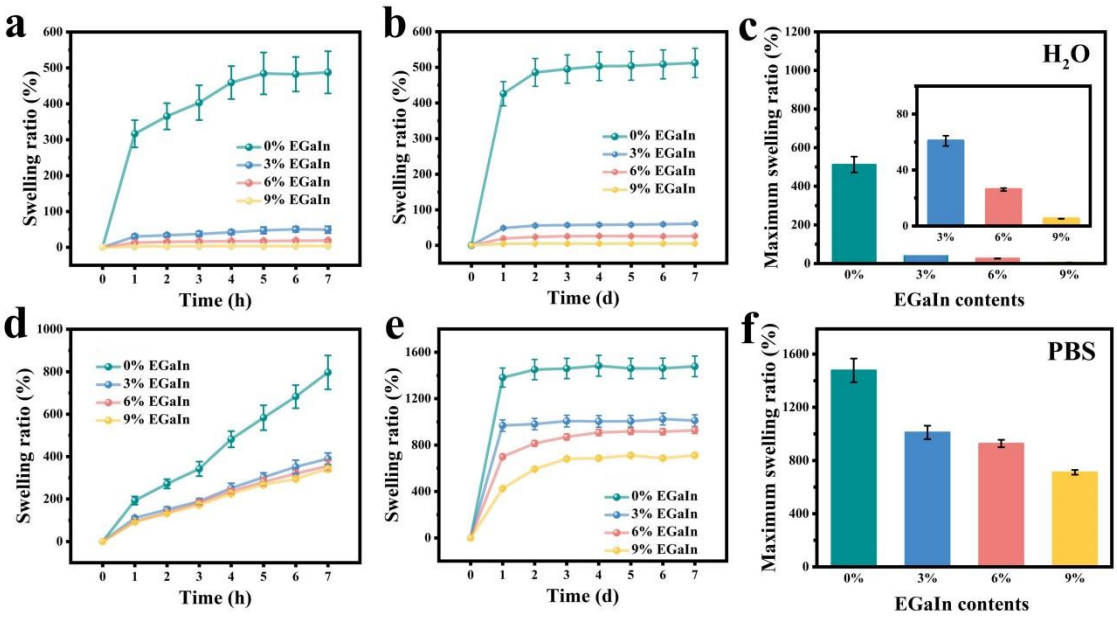

Fig. S7 Swelling ratios in deionized water at 5℃ over 7 hours (a) and 7 days (b), respectively. (c) Maximum swelling ratio in deionized water for 7 days. Swelling ratios in PBS at 5℃ over 7 hours (d) and 7 days (e), respectively. (f) Maximum swelling ratio in PBS for 7days.

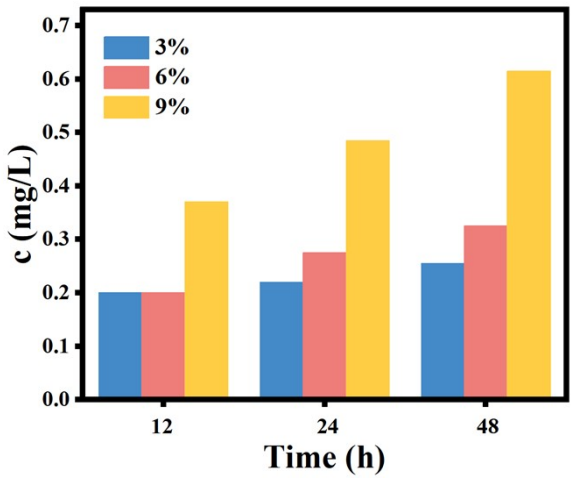

Fig. S8 Cumulative Ga release from hydrogels. ICP-OES measurements of Ga^{3+} concentration in solution after immersing dry hydrogels with 3%, 6% and 9% EGaIn in deionized water for 12, 24 and 48 h (solution was completely refreshed at each time point).

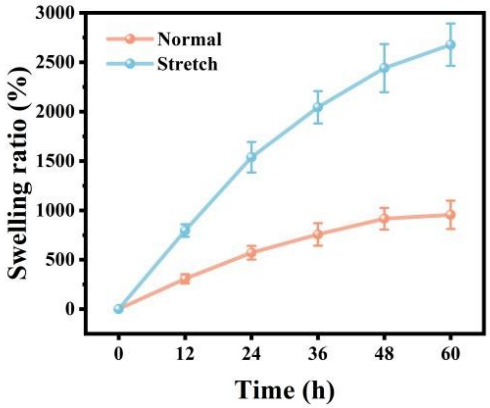

Fig. S9 Comparison of the swelling ratios of the 6% EGaIn-reinforced hydrogel in PBS in its normal state and under 100% stretch.

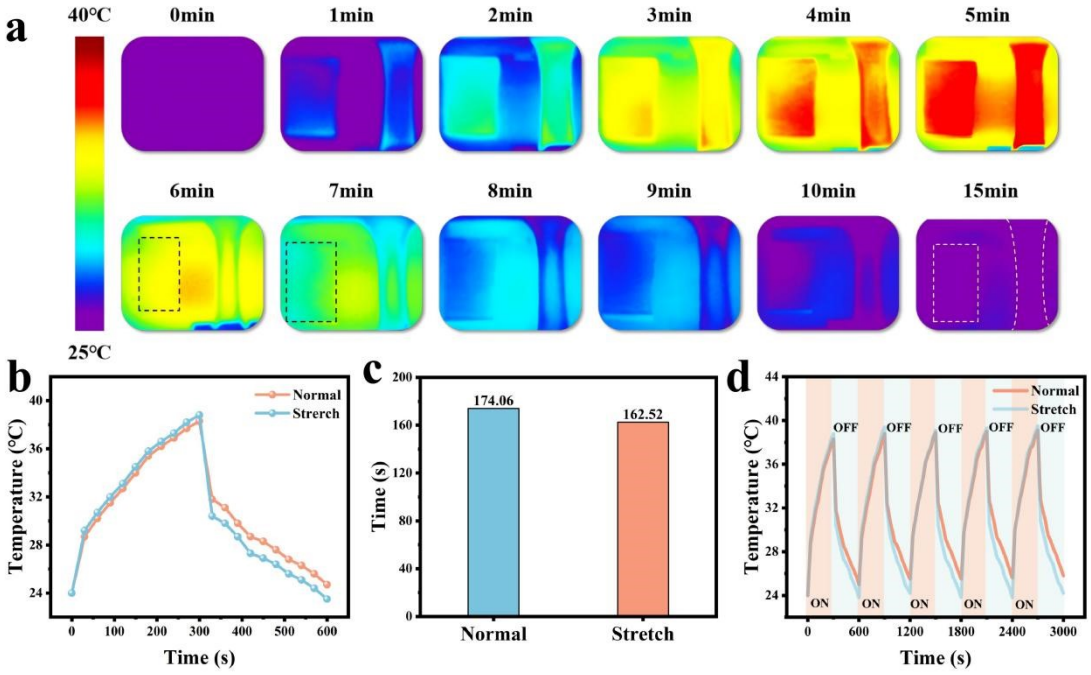

Fig. S10 Photothermal performance of the 6% EGaIn-reinforced hydrogel in its normal state and under 100% stretch. (a) Thermal infrared images of the hydrogels under one sun illumination for 5 minutes. (b) Temperature variation curves of the hydrogels under cyclic on/off light illumination.(c) Time required for the hydrogels to reach 36°C under one sun illumination. (d) Temperature response of the hydrogels during five cycles of on/off light switching.

Table S1 Comparative analysis of key properties of the hydrogels.

Hydrogels	Tensile strength (KPa)	Stretchability (%)	Toughness ($MJ \cdot m^{-3}$)	Conductivity ($mS \cdot cm^{-1}$)	Adhesion (KPa)
PAA-Lignin-LM[44]	848	500	2.11	1.2	4.8
PAA/EGaIn[45]	500	1300	3.54	6	-
PAA-LM/rGO[46]	140	1400	-	2.5	-
LMBP[47]	290	2350	2.77	3.7	230
PAA-CNF-LMNPs[48]	90	2250	1.5	4.5	-
PAA-DAL-LM[49]	101.8	980	0.9982	2.4	16.23
This work	458	1770	3.75	11.2	130

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