Supplementary Materials

Ionically Assembled Hemostatic Powders with Rapid Self-Gelation, Strong Acid Resistance, and On-Demand Removability for Upper Gastrointestinal Bleeding

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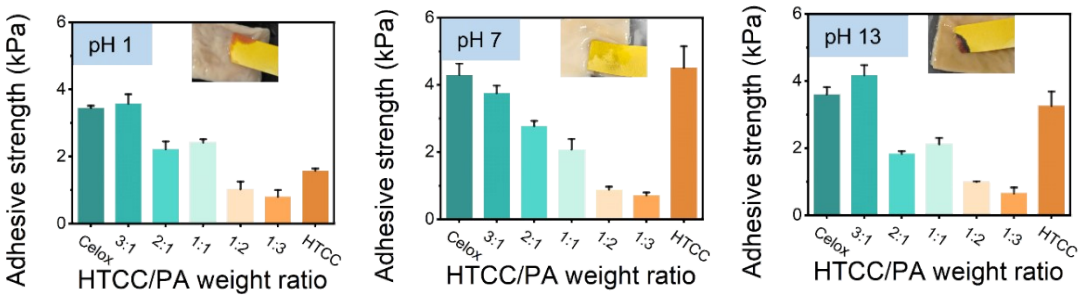

Figure S1. Adhesive strength of Celox, HTCC and HP powders at various HTCC/PA ratios on porcine gastric tissue surfaces after treatment with HCl solution (pH 1), deionized water (pH 7), and NaOH solution (pH 13). Insets confirm the pH value of the liquids on the gastric tissue surfaces after treatment.

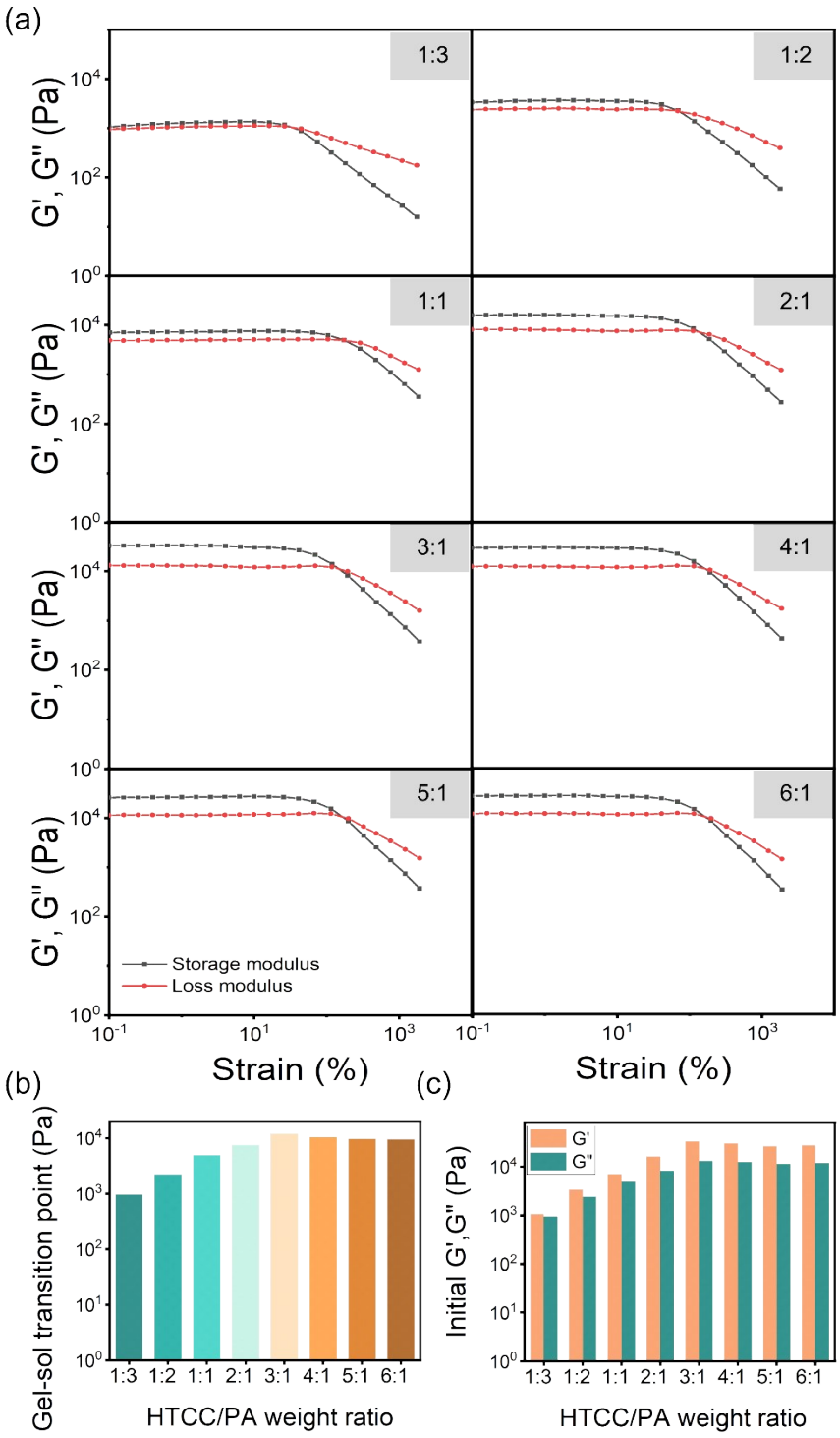

Figure S2. (a) Rheological properties of HP hydrogels with different HTCC/PA ratios scanning at a frequency of 1 Hz. (b) The gel-sol transition point of HP hydrogels with different HTCC/PA ratios. (c) The initial storage modulus (G') and loss modulus (G") of HP hydrogels with different HTCC/PA ratios.

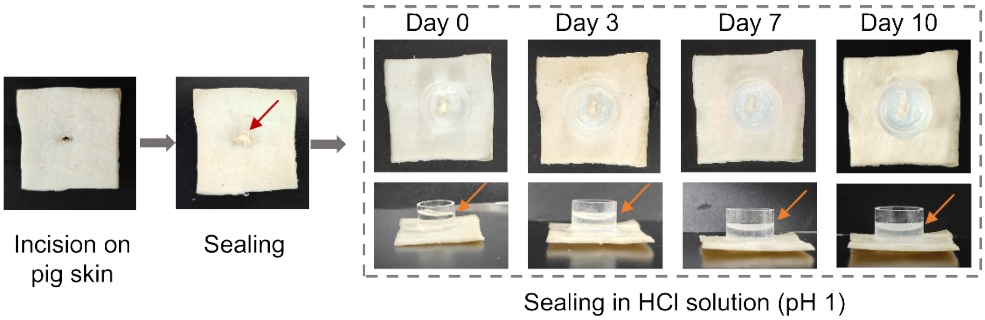

Figure S3. HP hydrogel sealed on porcine skin in a HCl solution (pH 1) for up to 10 days. Red arrow: HP hydrogel. Orange arrows: HCl solution.

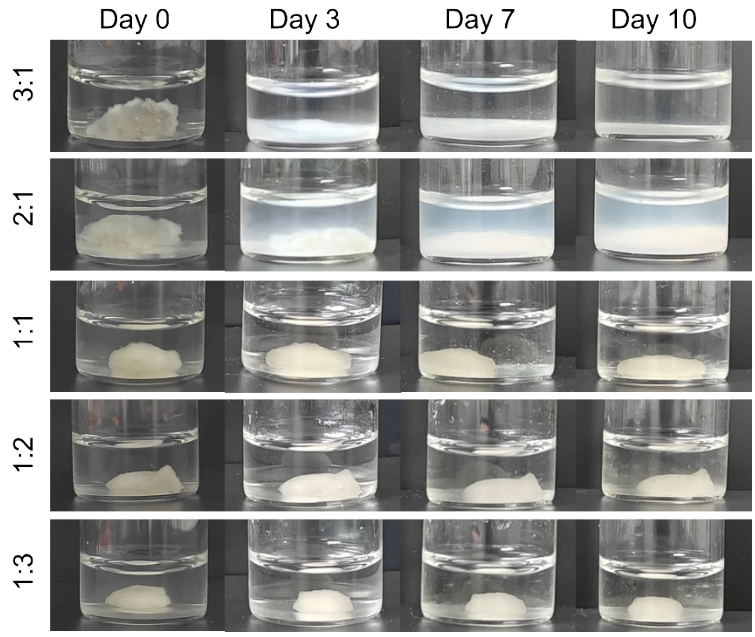

Figure S4. Stability of HP hydrogels with various HTCC/PA ratios in deionized water (pH 7) for up to 10 days.

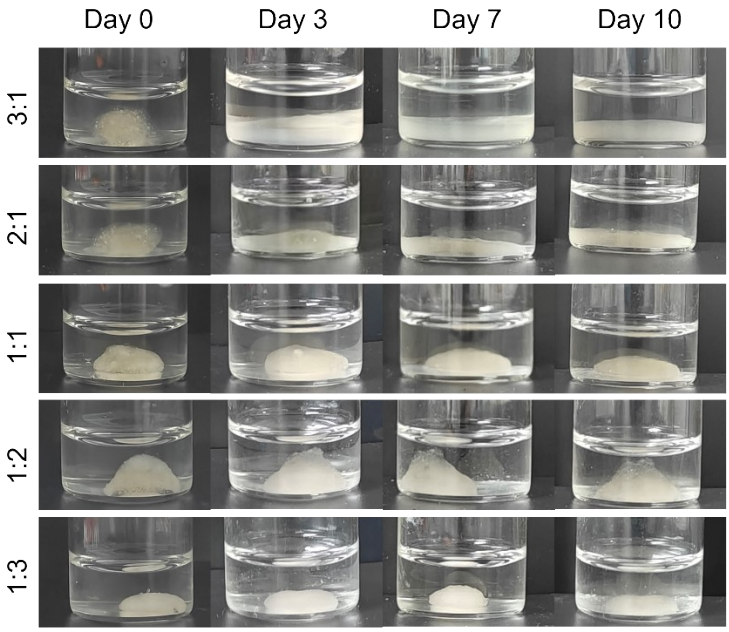

Figure S5. Stability of HP hydrogels with various HTCC/PA ratios in NaOH solution (pH 13) for up to 10 days.

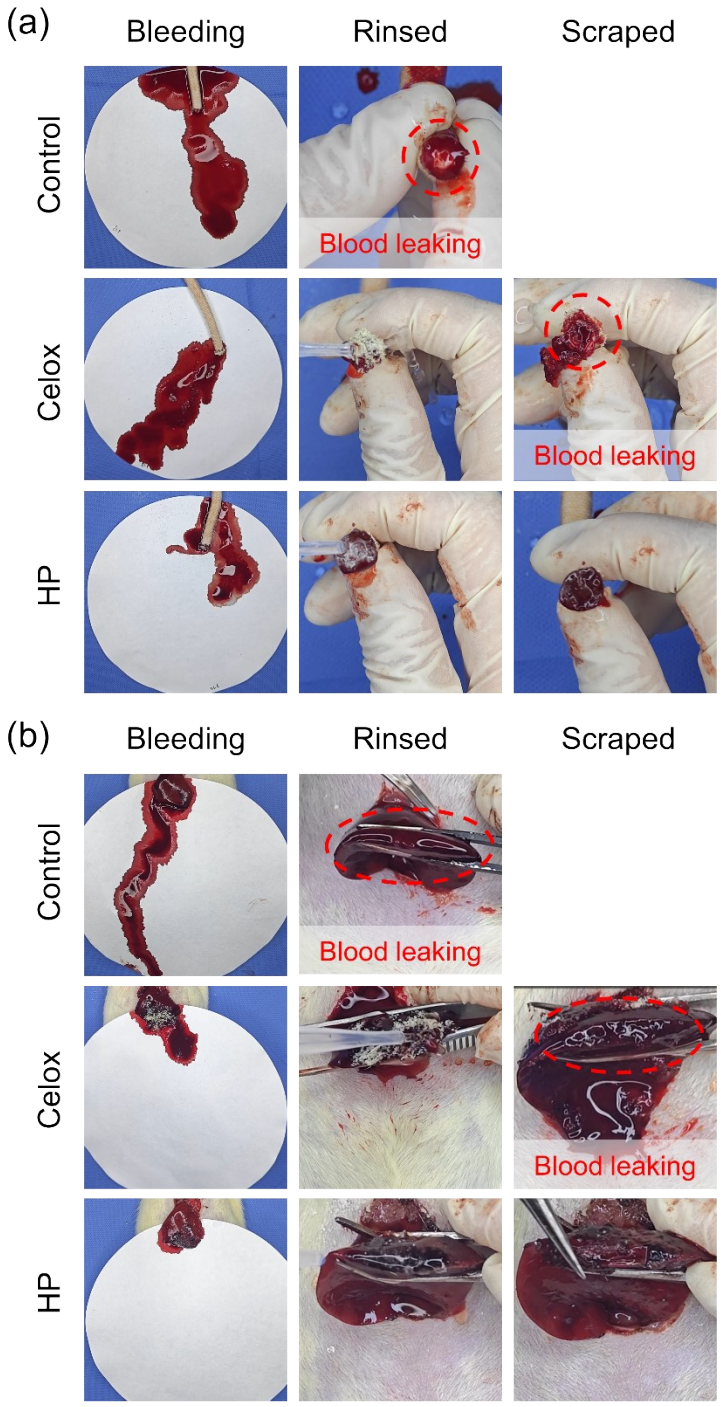

Figure S6. *In vivo* hemostatic performance of HP powders in (a) rat tail bleeding models, and (b) rat liver injury. After hemostasis, the hemostatic powders were removed by forceps to test tissue adhesion on the wounds and rebleeding situations.

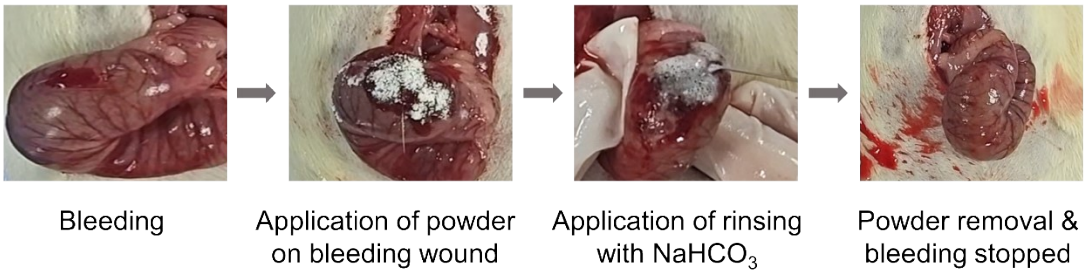

Figure S7. *In vivo* removable sealing of HP powders on a wound on a rat stomach after hemostasis and rinsed with 2 mL of 2.5% sodium bicarbonate solution.

Supplementary movies

Movie S1: Gelation of HP powder

Movie S2: Bursting pressure of Celox powder

Movie S3: Bursting pressure of HP powder

Movie S4: Rat tail bleeding test of blank group

Movie S5: Rat tail bleeding test of Celox group

Movie S6: Rat tail bleeding test of HP group

Movie S7: Rat liver injury test of blank group

Movie S8: Rat liver injury test of Celox group

Movie S9: Rat liver injury test of HP group

Movie S10: *In vivo* on-demand removable test of HP powder