Supporting Information

Swelling-resistant, Anti-Freezing and Conductive Hydrogels with dual-crosslinked networks

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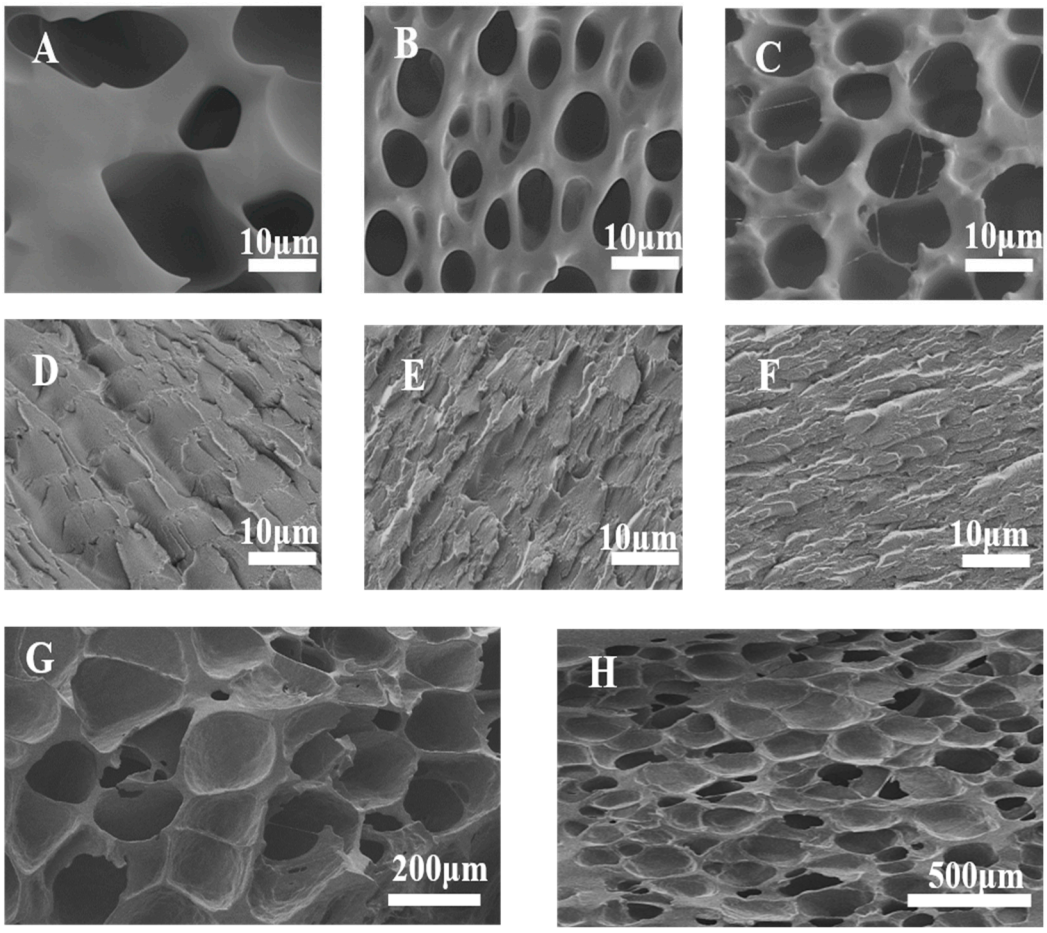


Figure S1. SEM images of the PAM hydrogel (A), the P(AM-co-AA) hydrogel (B) , the P(AM-co-AA)/CMC-Na hydrogel (C), the P(AM-co-AA)/Fe^{3+} hydrogel (D), the P(AM-co-AA)/CMC-Na/Fe^{3+} hydrogel (E), P(AM-co-AA)/CMC-Na/Fe^{3+} /NaCl hydrogel (F) , P(AM-co-AA)/CMC-Na/Fe^{3+}(G,200μm) and (H,500μm).

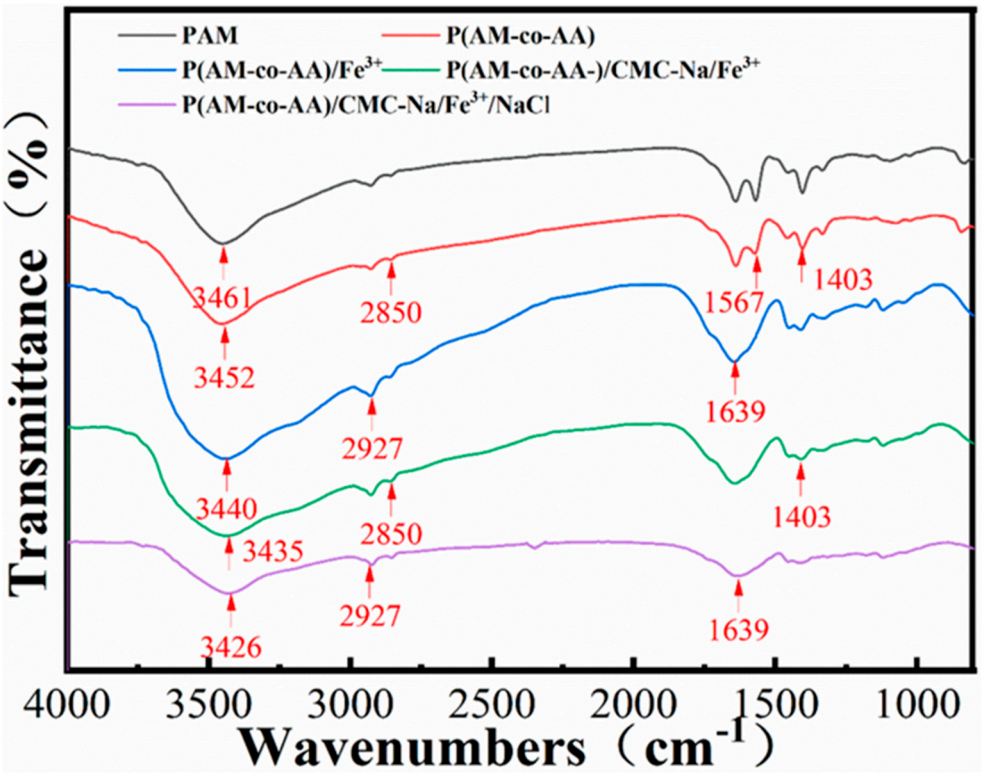


Figure S2. FTIR spectra of different hydrogels

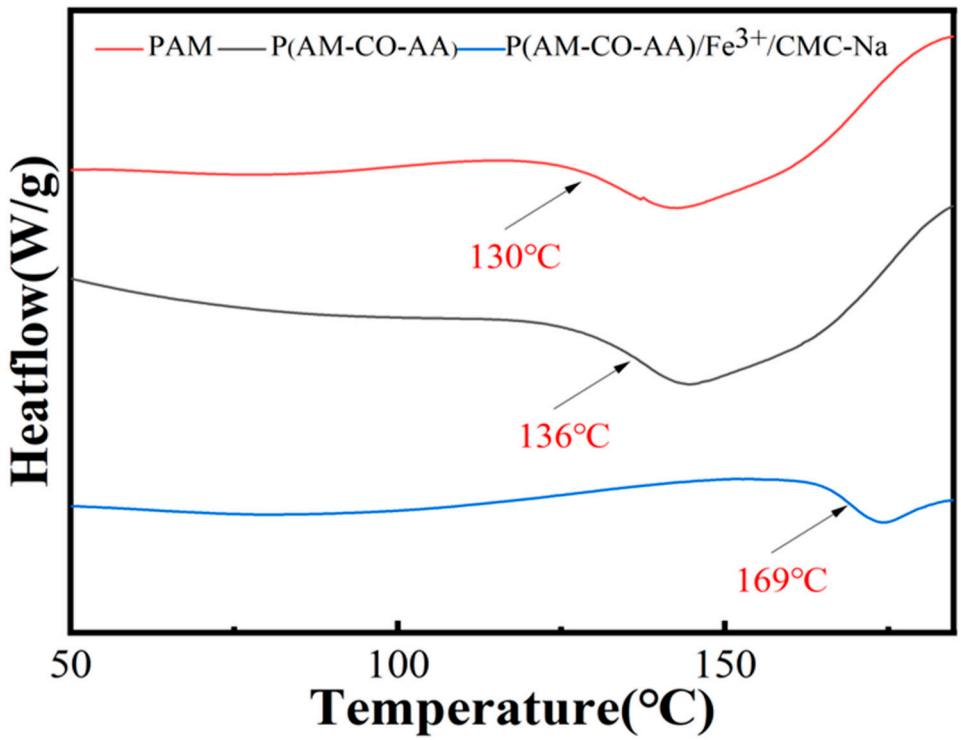


Figure S3. DSC curves of PAM, P(AM-co-AA), and P(AM-co-AA)/ CMC-Na / Fe^{3+}

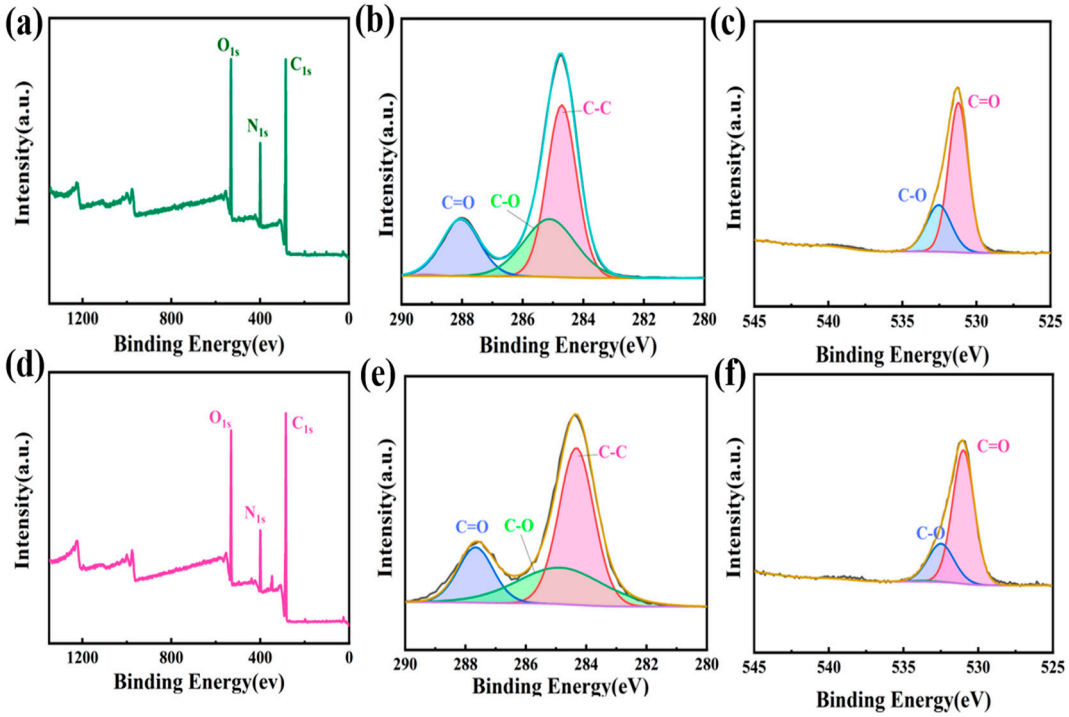


Figure S4. (a) XPS of the P(AM-co-AA)/ CMC-Na wide sweep curve,(b) XPS of the P(AM-co-AA)/ CMC-Na C_{1s} narrow sweep curve,(c) XPS of the P(AM-co-AA)/ CMC-Na O_{1s} narrow sweep curve,(d) XPS of the P(AM-co-AA)/ CMC-Na / Fe^{3+} wide sweep curve,(e) XPS of the P(AM-co-AA)/ CMC-Na / Fe^{3+} C_{1s} narrow sweep curve,(f) XPS of the P(AM-co-AA)/ CMC-Na / Fe^{3+} O_{1s} narrow sweep curve.

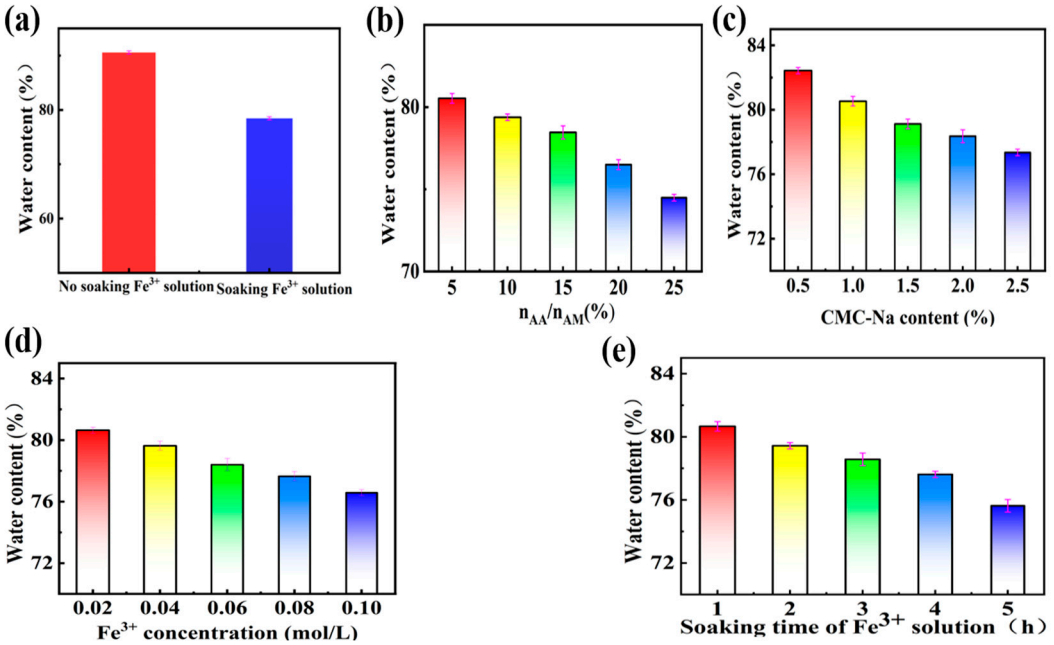


Figure S5. (a) Water content of P(AM-co-AA)/ CMC-Na hydrogels and P(AM-co-AA)/ CMC-Na/Fe^{3+} hydrogels,(b,c) Effects of different CMC-Na concentration and

n_{AA}:n_{AM} on Water content of P(AM-co-AA)/ CMC-Na/Fe^{3+} hydrogels. (d,e) Effects of soaking different Fe^{3+} concentration and soaking different Fe^{3+}solution time on Water content of P(AM-co-AA)/ CMC-Na/Fe^{3+} hydrogels.