Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Hydrophilic amphibious open-cell macroporous sponge by the Hofmeister effect induced Nanofibrils

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Movie S1.mp4: Compress the obtained PVA/Na_3Cit/$CaCl_2$/glycerol bulk scaffold, the milk-white liquid would be spilled from the bulk composite hydrogel and the mesh-like spongy like hydrogel would be obtained

Movie S2.mp4: This PVA wet sponge gel could absorb 1.40 times water of their own weight and became PVA porous hydrogel, and these water could be squeezed out from the PVA porous hydrogel and this absorption/squeezing-out process could be repeated.

Movie S3.mp4: Once the dried foam was immersed distilled water, it could rapidly adsorb water and expand, and finally the spongy-like porous hydrogel were obtained again.

Movie S4.mp4: The contact Angle test for water.avi, ethanol.avi and hexane.avi.

Movie S5.mp4: The Methyl orange solution transport processes of PCN-PPy sponge along the longitudinal direction.mp4 and radial direction.mp4. [1]

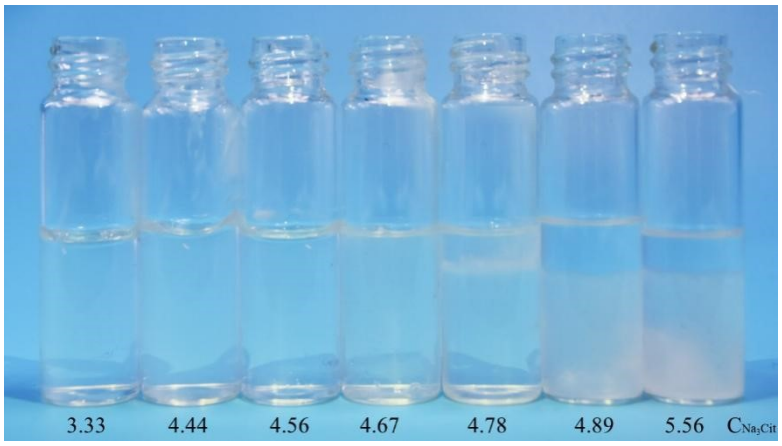

Figure S1 Photos of 10 wt% PVA solutions with different C_{Na_3Cit} in vials.

Figure S2 The change of PVA/glycerol/$CaCl_2$ solution from transparent to milk-white state with the addition of Na_3Cit.

Figure S3. The photos of unpigmented spongy-like hydrogel, wet sponge and dried sponge.

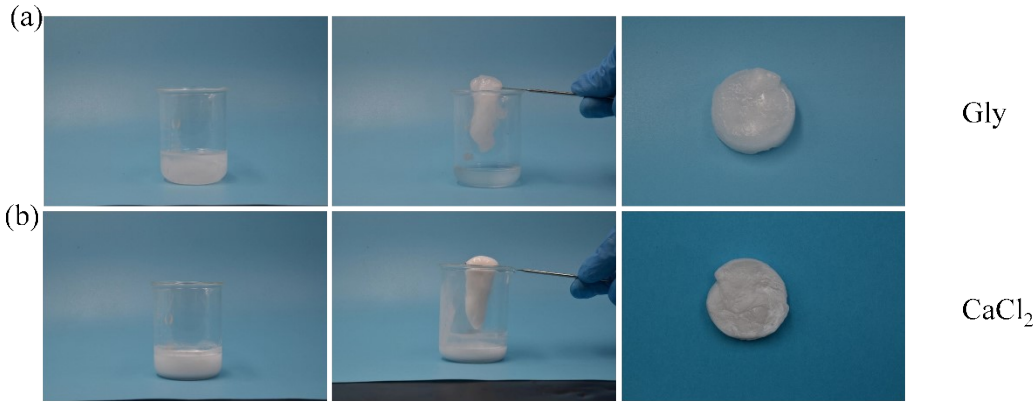

Figure S4. (a) Experimental phenomenon when only glycerol (15 wt%) and Na_3Cit (12 wt%) were added to the PVA (10 wt%) solution, (b) Experimental phenomenon when only $CaCl_2$ (2 wt%) and Na_3Cit (12 wt%) were added to the PVA (10 wt%) solution.

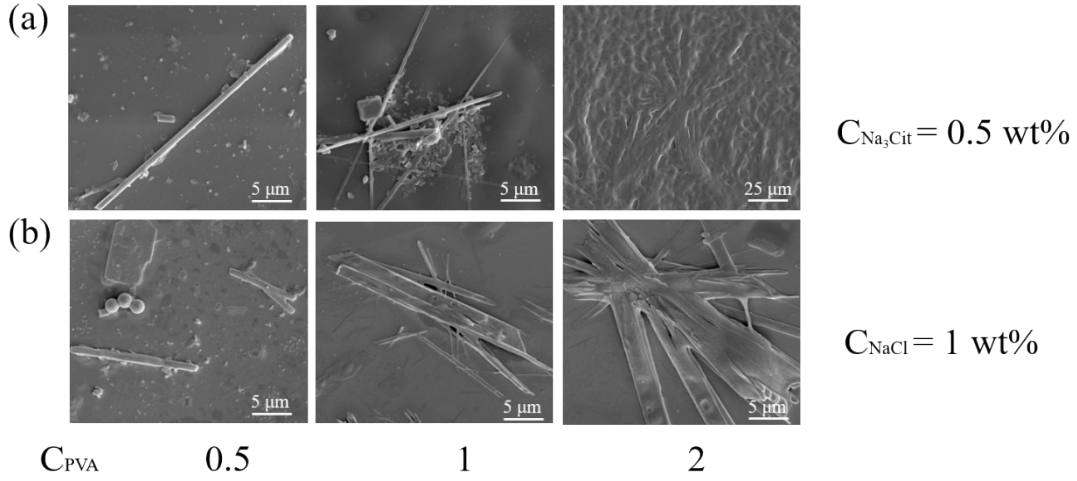

Figure S5. The illustration of nanofibrils directly produced by salting-out effect: (a) Na_3Cit and (b) NaCl was added to the PVA solution, respectively.

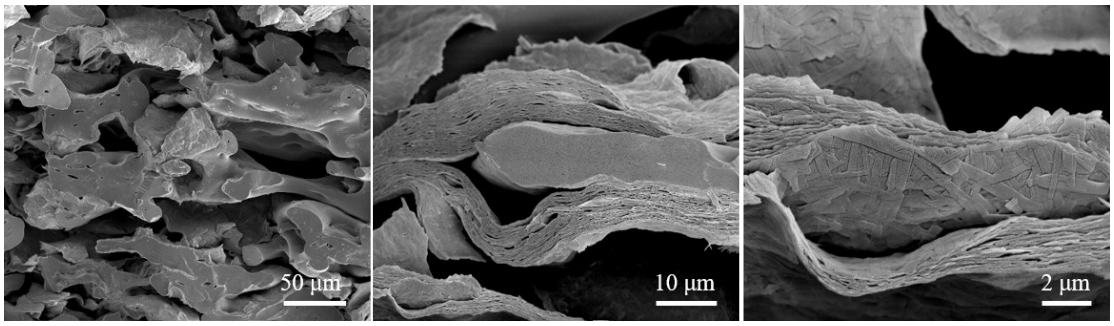

Figure S6 SEM images of unwashed spongy-like hydrogel.

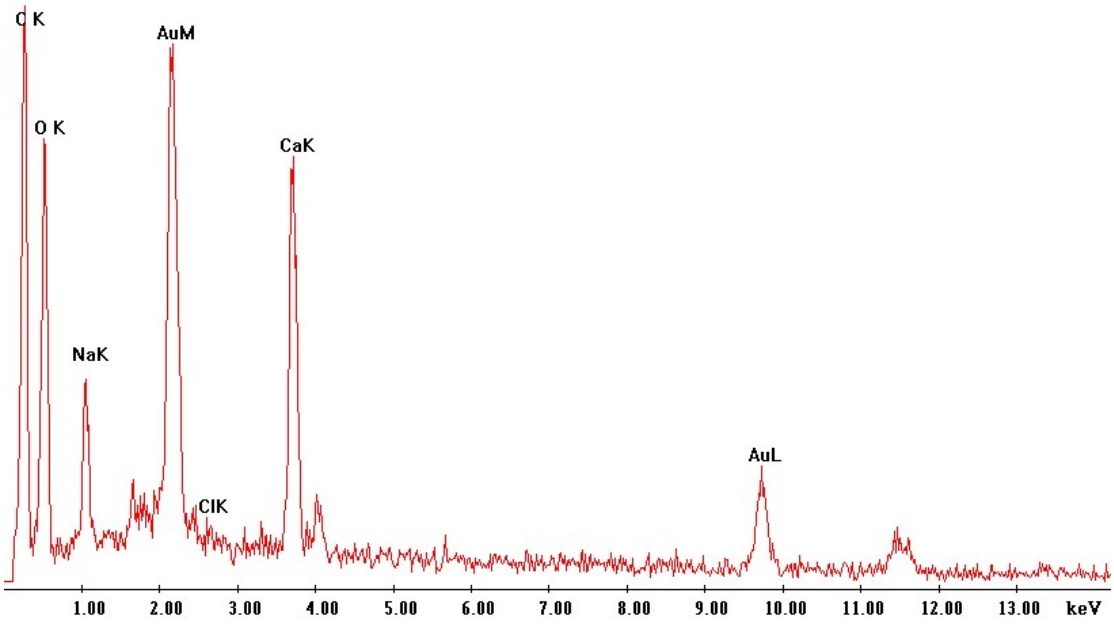

Figure S7 The SEM-EDS results of the unwashed spongy-like hydrogel.

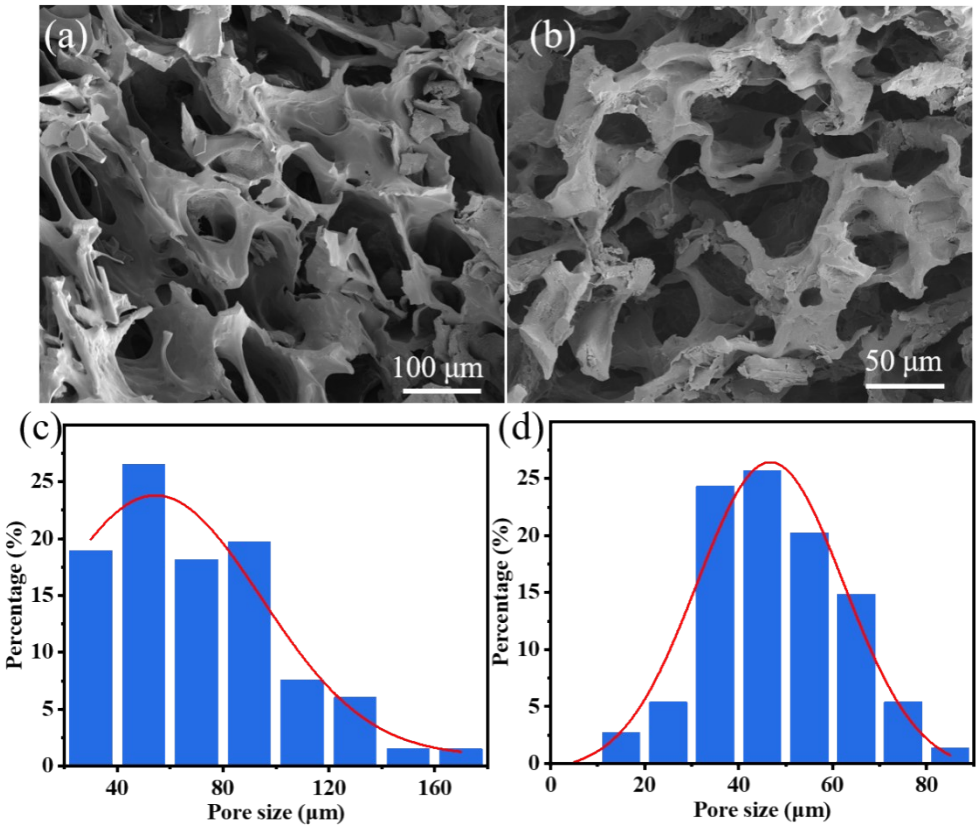

Figure S8 (a, b) SEM of PVA wet sponge and dried sponge, (c, d) Pore size distribution of wet sponge and dried sponge calculated by SEM.

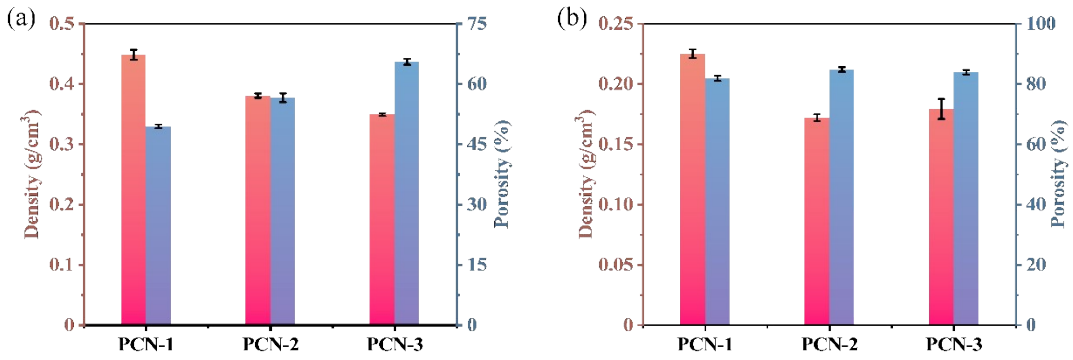

Figure S9 The density and porosity values of (a) wet sponge and (b) dried sponge.

Figure S10 The compressive capacity (90% strain) of PVA wet sponge.

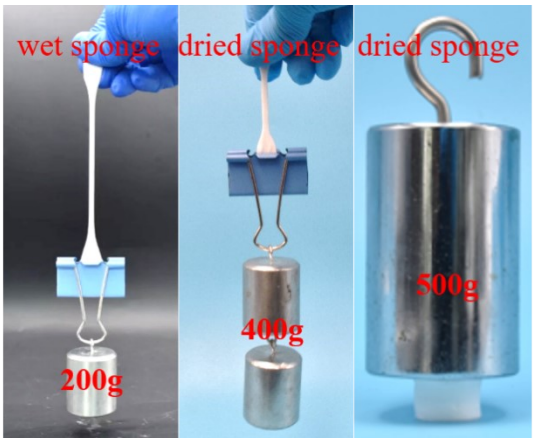

Figure S11 The illustration of mechanical robustness of the wet sponge and dried sponge.

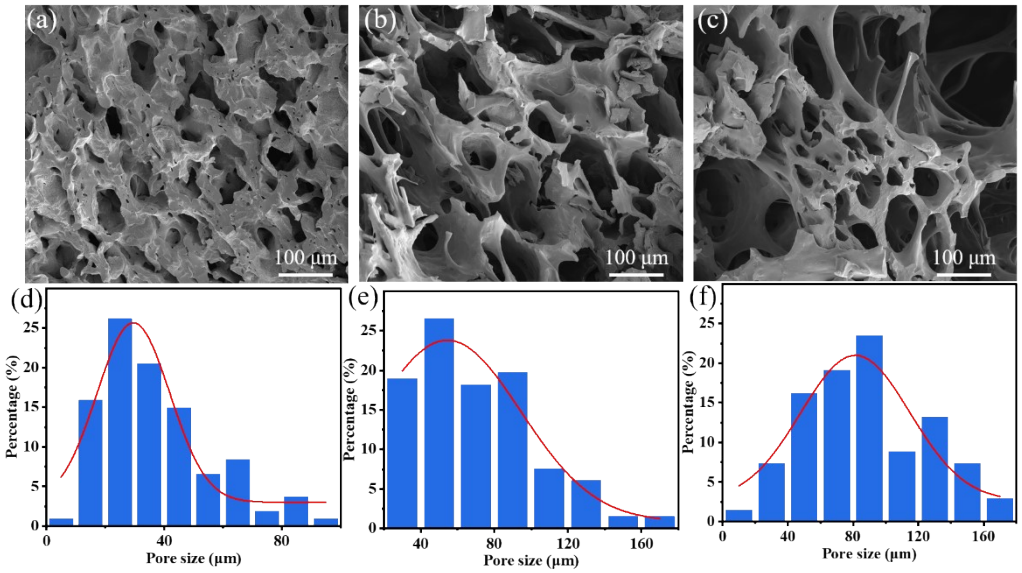

Figure S12 (a,b,c) The SEM of PCN-1 sponge, PCN-2 sponge and PCN-3 sponge. (d,e,f) Pore size distribution of PCN-1 sponge, PCN-2 sponge and PCN-3 sponge calculated by SEM.

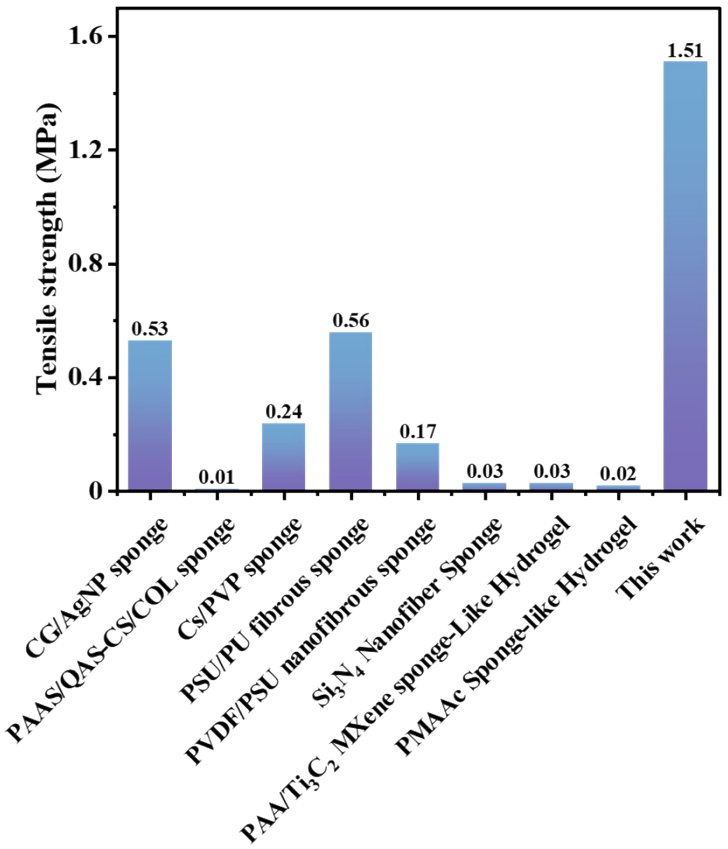

Figure S13. Mechanical properties of PVA wet sponge compared to other jobs[2-9].

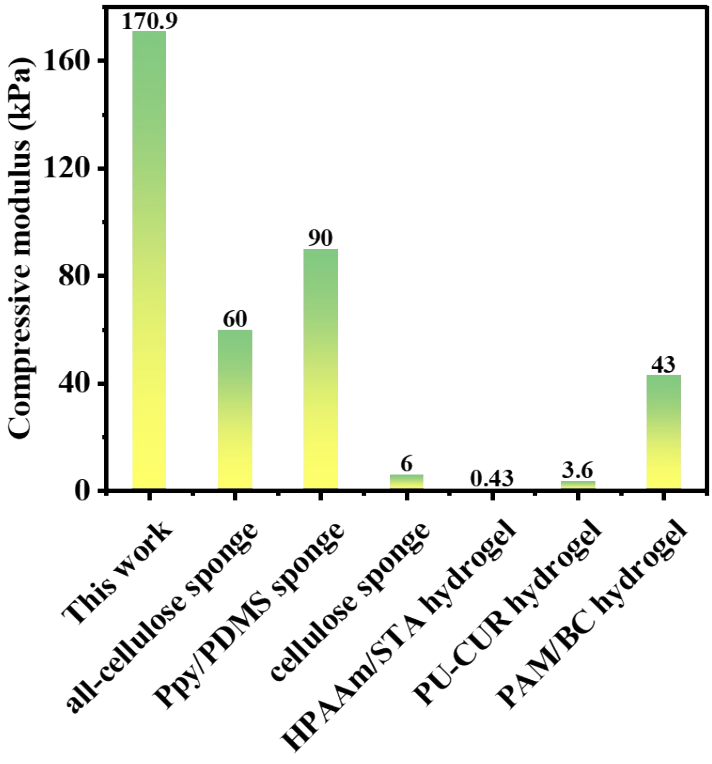

Figure S14. Compression modulus compared with other work[10-15].

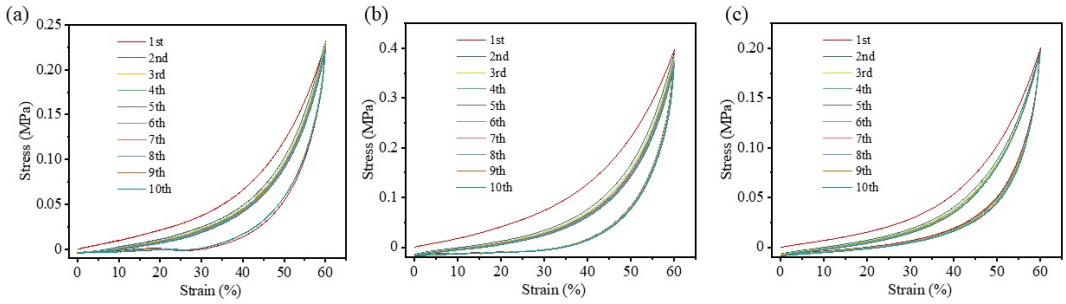

Figure S15 Ten compression cycles of (a) PCN-1, (b) PCN-2, (c) PCN-3 wet spongy.

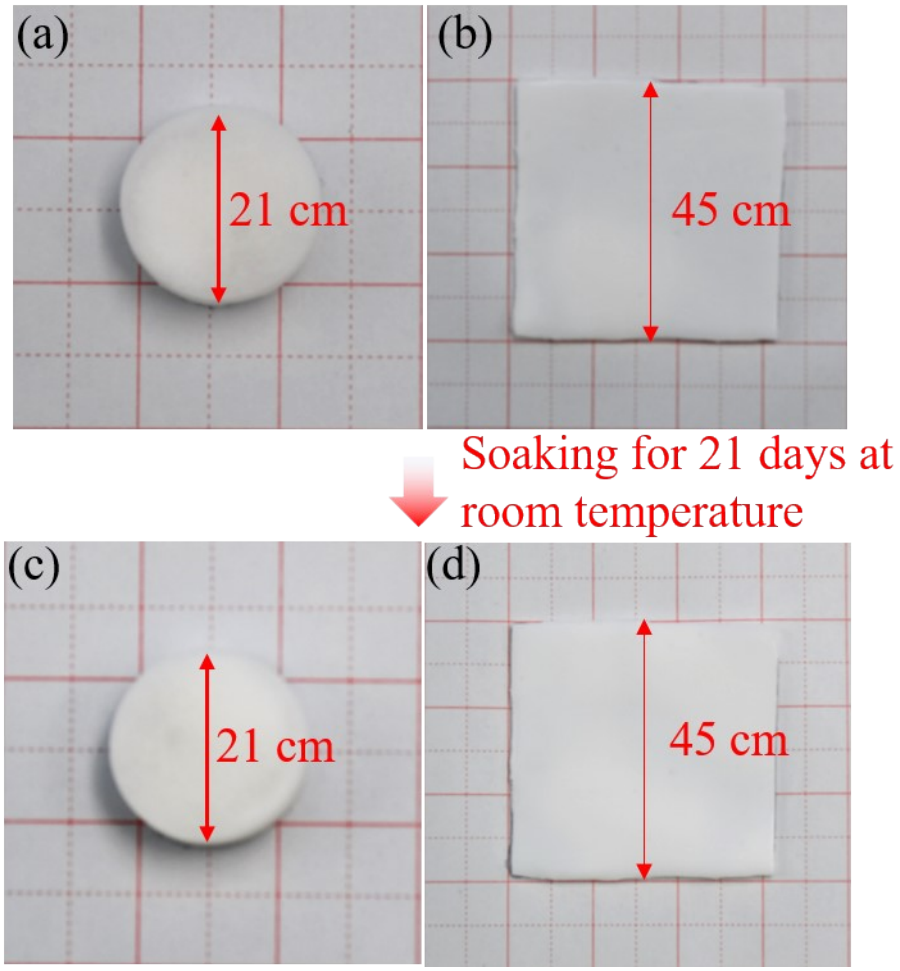

Figure S16 Morphological changes of wet sponges after 21 days soaking in water at room temperature.

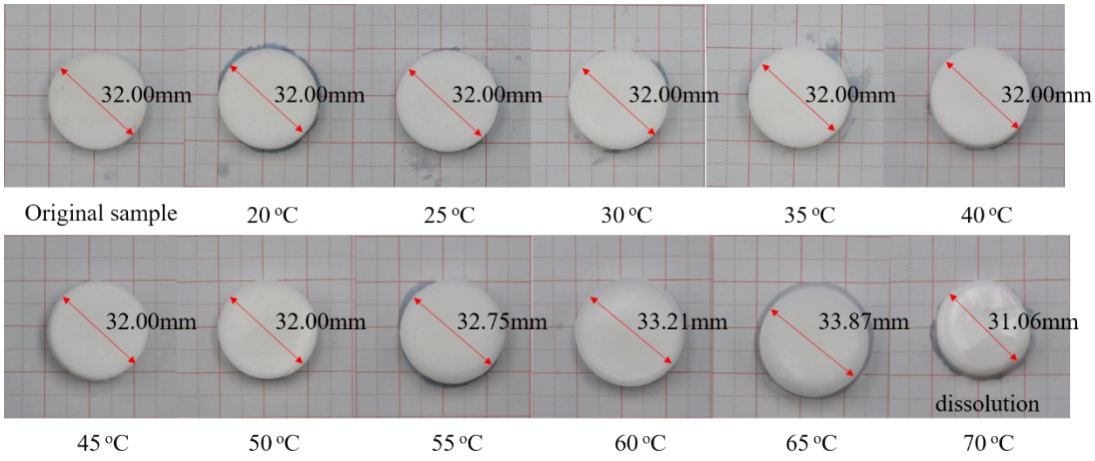

Figure S17 Morphological changes of wet sponges after 24 h soaking in water at different temperatures.

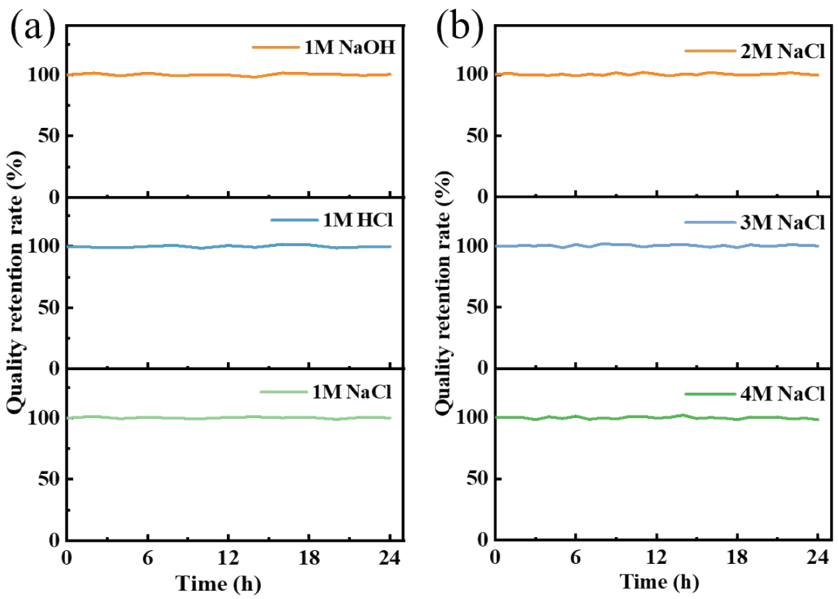

Figure S18 The weight change after soaking in different solution for 24 hours.

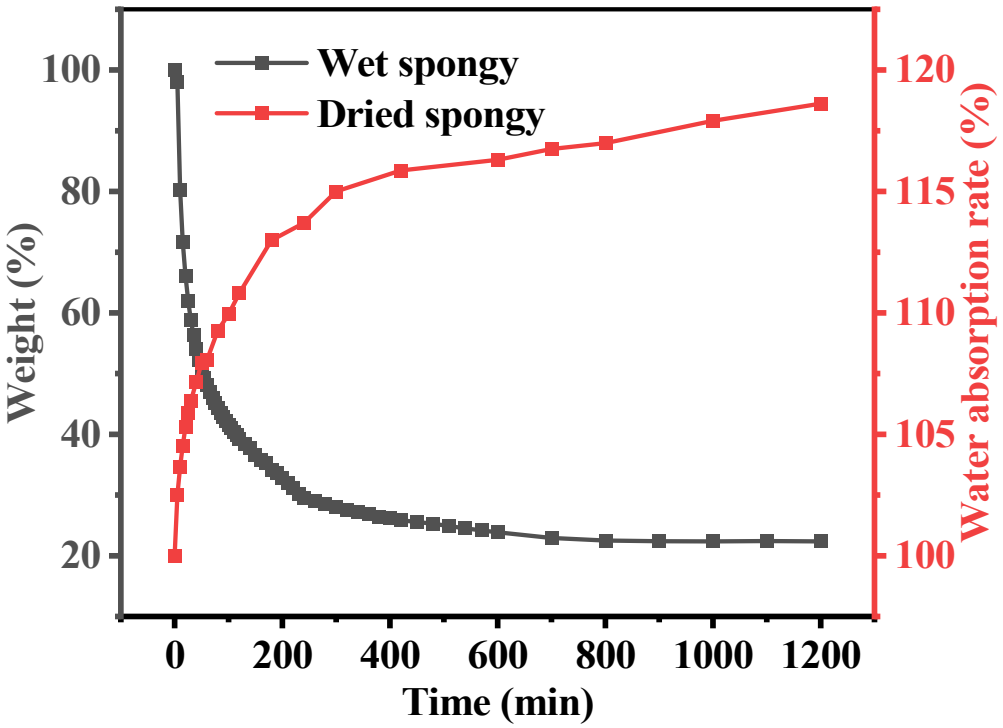

Figure S19 The weight loss rate of wet sponge under the environment of the relative humidity of 0% and the water absorption rate of dry sponge under the relative humidity of 100%.

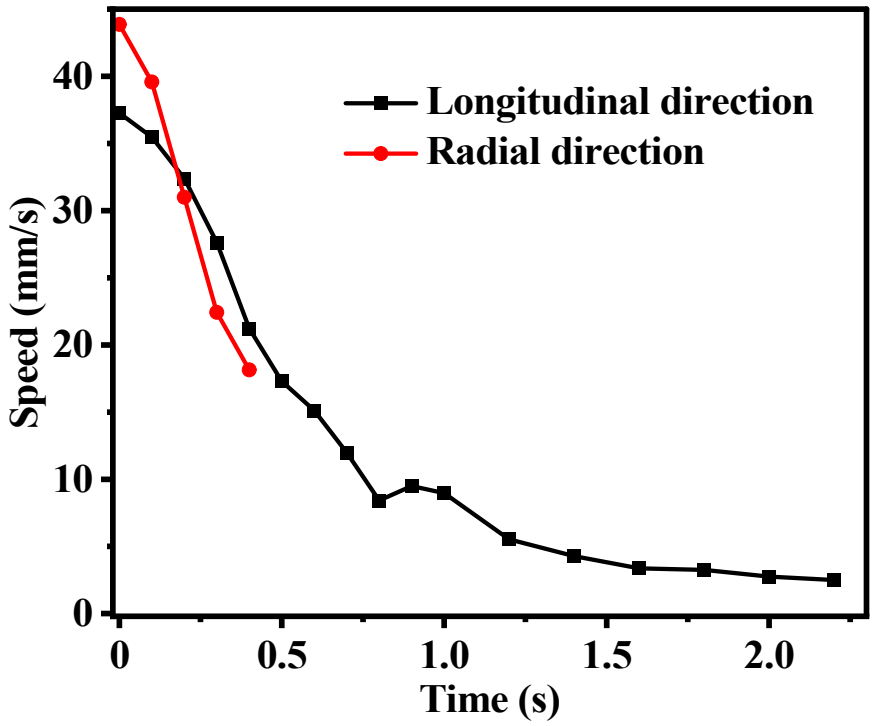

Figure S20 The absorbing velocity curves of the PCN sponge along longitudinal and radial directions.

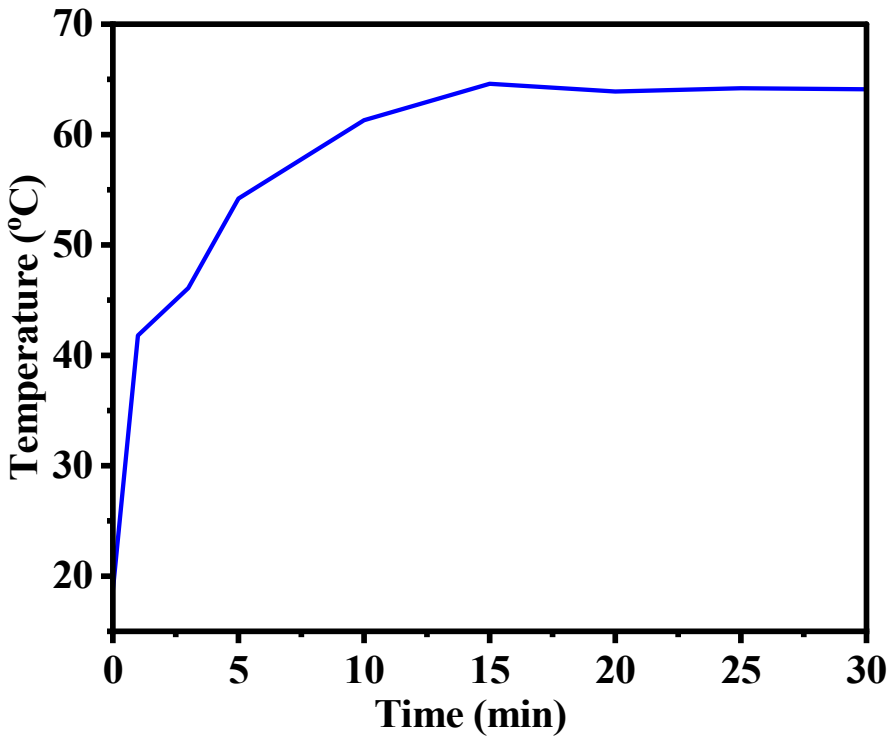

Figure S21 The temperature variation of the sample over time under NIR light irradiation.

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