Electronic Supplementary Material (ESI) for Materials Horizons.
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Supplementary Information

DLP 3D printed hydrogels with hierarchically structured pores post-programmed by lyophilization and ionic locking

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Supporting Videos

Movie S1: The squeeze-out and absorb-back of water from the 3D lattice hydrogels with micropores.

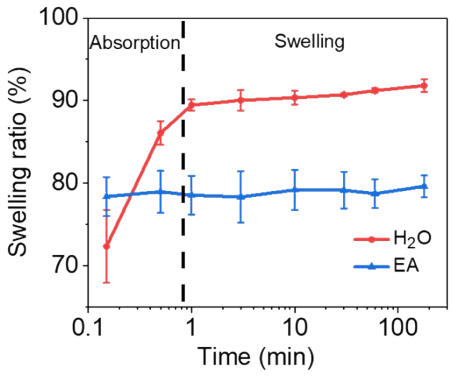

Fig. S1 Swelling kinetics of freeze-dried NA50 foams in different solvents.

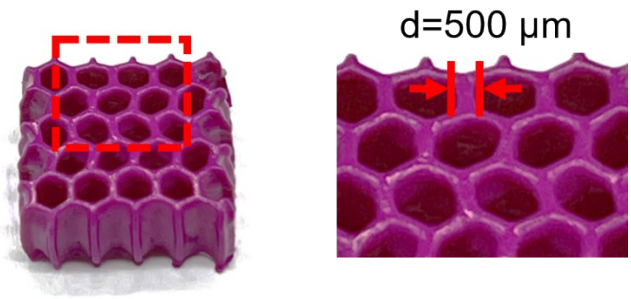

Fig. S2 Optical images of a representative 3D printed NA50 hydrogel.

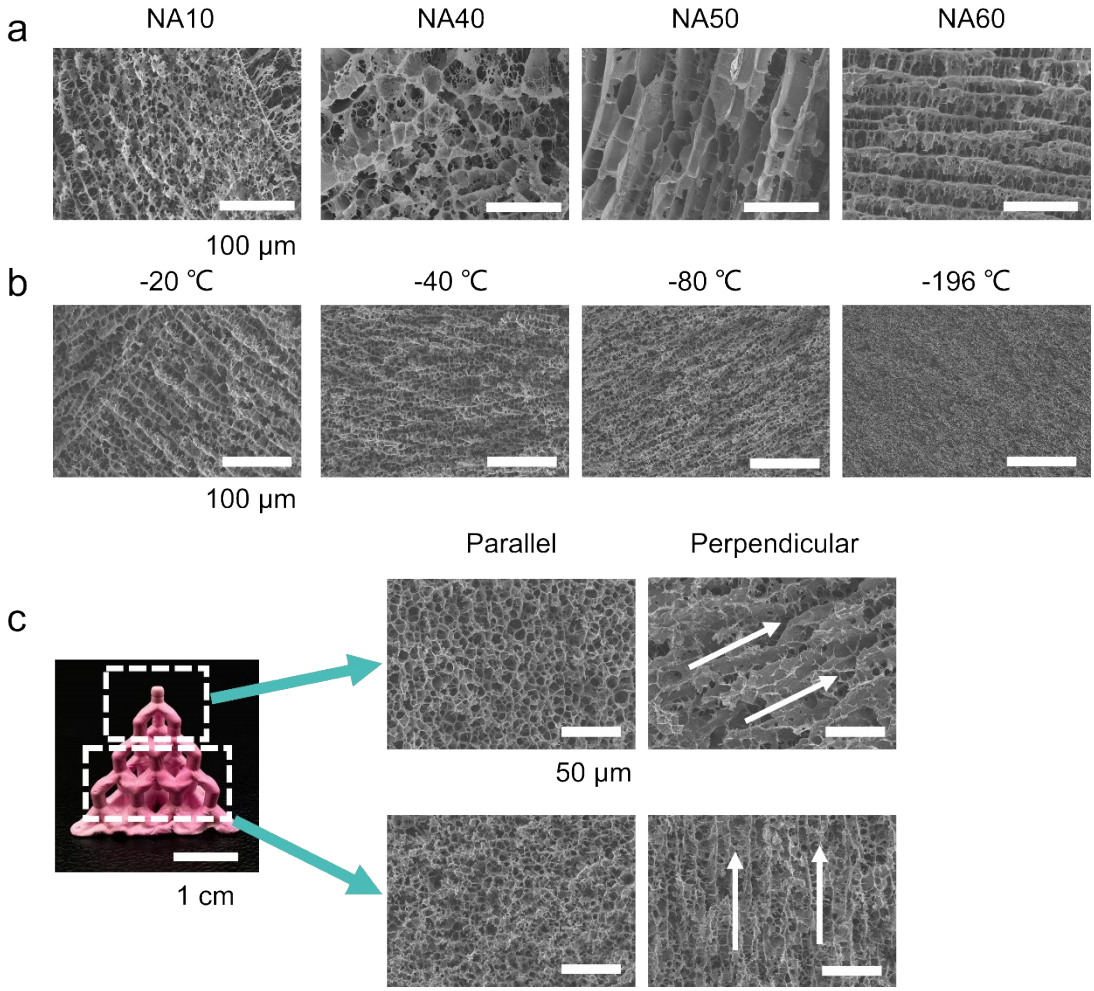

Fig. S3 SEM images of NIPAM-AA hydrogels before Fe^{3+} loading. a) Morphologies of freeze-dried hydrogels of different AA contents. b) Morphologies of NA50 hydrogels freeze-dried in different temperatures. c) Morphologies of unidirectional freeze-dried NA50 hydrogel. Scale bar: 50 μm.

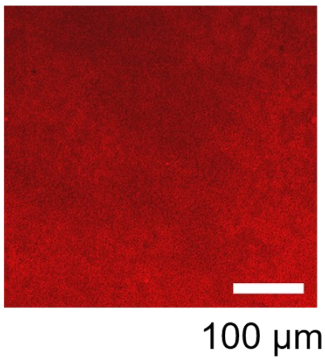

Fig. S4 CLSM image of NA50 foams directly hydrated with pure water.

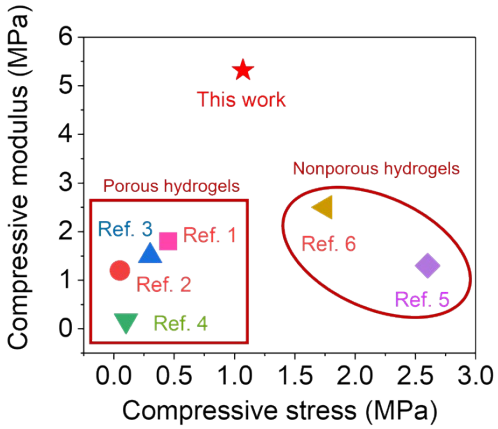

Fig. S5 Compressive modulus and stress comparison of NA50-1 M with preciously reported hydrogels.[1-6]

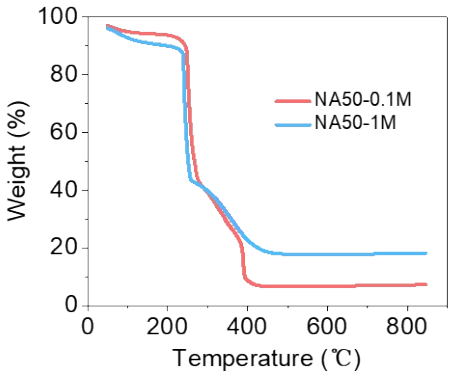

Fig. S6 TGA curves of NA50-0.1 M and NA50-1 M.

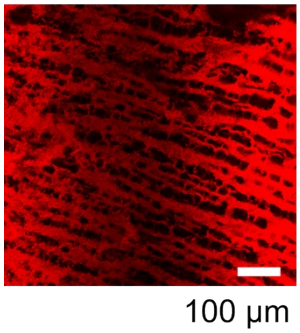

Fig. S7 CLSM images of NA50-0.1 M hydrogels treated with a HCl aqueous solution with a pH of 1.

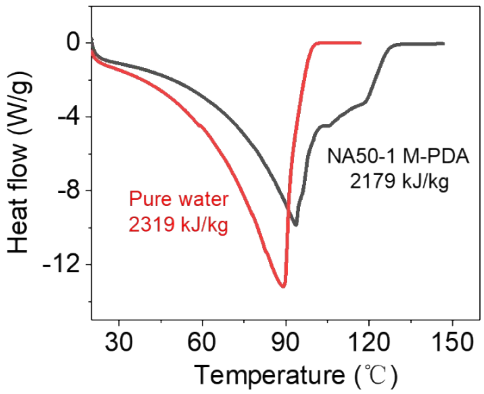

Fig. S8 DSC curves of pure water and NA50-1 M-PDA hydrogel.

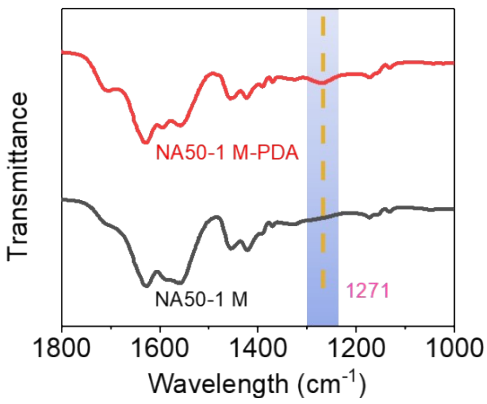

Fig. S9 ATR-FTIR of NA50-1 M hydrogel and NA50-1 M-PDA hydrogel.

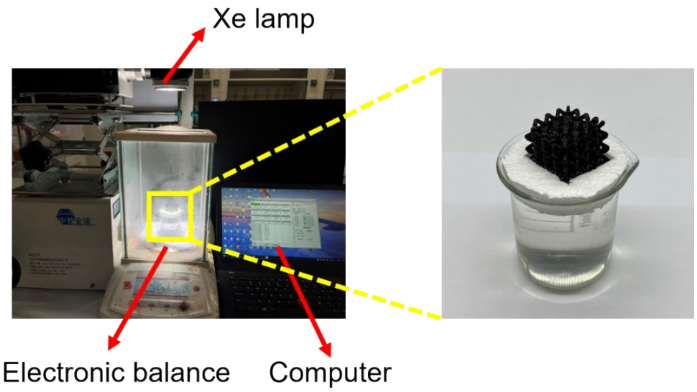

Fig. S10 A customized device for measuring the water evaporation rate.

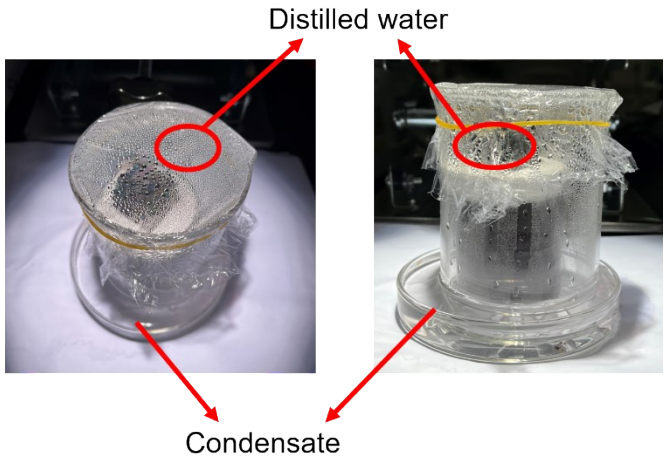

Fig. S11 A customized device for capturing the desalination water. A condenser is made of glass petri dishes filled with water at the bottom.

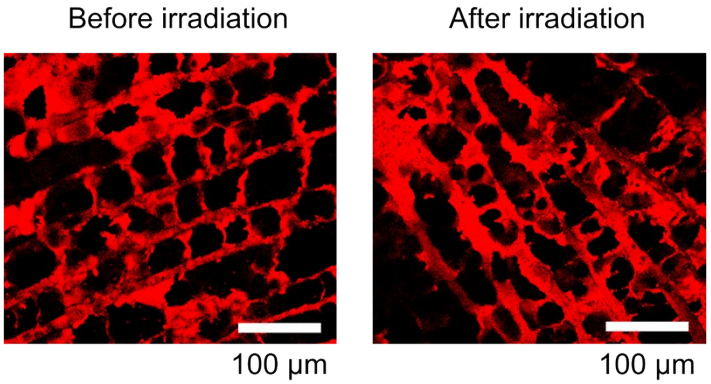

Fig. S12 CLSM images of NA50-1 M-PDA before and after irradiation under 1 sun.

Notes and references

1 L. Zhang, W. Lee, X. Li, Y. Jiang, N. X. Fang, G. Dai, and Y. Liu, *Bioact. Mater.*, 2022, **10**, 48.

2 Z. Zhang, Z. Zheng, Y. Zhao, J. Hu, and H. Wang, *Compos. Sci. Technol.*, 2021, **213**, 108968.

3 M. Su, Y. Liu, S. Li, Z. Fang, B. He, Y. Zhang, Y. Li, and P. He, *Chem. Eng. J.*, 2019, **361**, 364.

4 Z. Zhang, L. Tang, C. Chen, H. Yu, H. Bai, L. Wang, M. Qin, Y. Feng, and W. Feng, *J. Mater. Chem. A*, 2021, **9**, 875.

5 C. Ding, S. Zhang, X. Fu, T. Liu, L. Shao, M. Fei, C. Hao, Y. Liu, and W. Zhong, *J. Mater. Chem. A*, 2021, **9**, 24613.

6 L. Cui, W. Tong, H. Zhou, C. Yan, J. Chen, and D. Xiong, *J. Mater. Sci.*, 2021, **56**, 3935.