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

Ultra-strong adhesive, self-healable and electroactive bio-based hydrogels for on-demand fabrication of sandwich-inspired smart electronic sensing floor

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1. Methods

1.1 Equilibrium swelling ratio (ESR) test

The equilibrium swelling ratio (ESR) was measured using a previously reported method [1]. Briefly, three replicates of each dried hydrogel were incubated in PBS at 37°C. The wet weight of the hydrogels was measured at different time points from the start of incubation. The swelling ratio was calculated as follows:

$$ESR\ (\%)\ = \frac{W_i - W_0}{W_0}$$

where W_i represented the weight of the swollen hydrogel at swelling equilibrium and W_0 represented the weight of the dry hydrogel on day 0 in each case.

1.2 Tensile tests.

Mechanical performance was investigated by using a Universal Testing Machine (UTM 2102) at room temperature on dumbbell specimen (35 mm × 2 mm × 1.5 mm) at 100 mm/min. Measurements on three specimens were conducted for each material and the results were reported as mean ± standard deviation.

2. Supplementary Figures

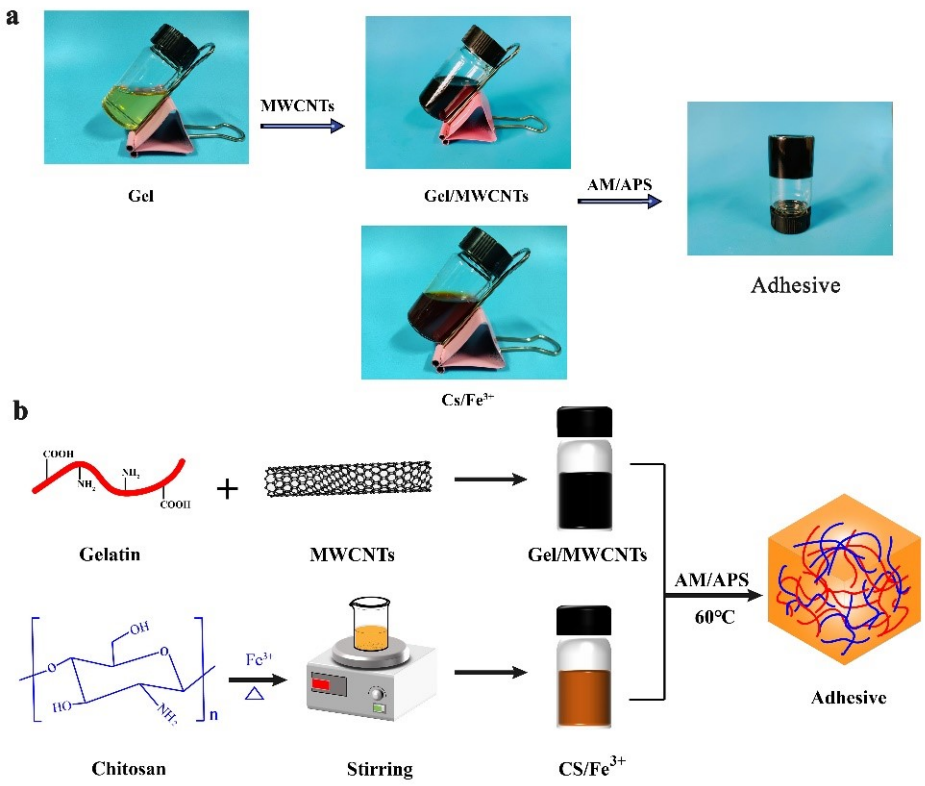

Figure S1. Preparation process of the CAM-Gels.

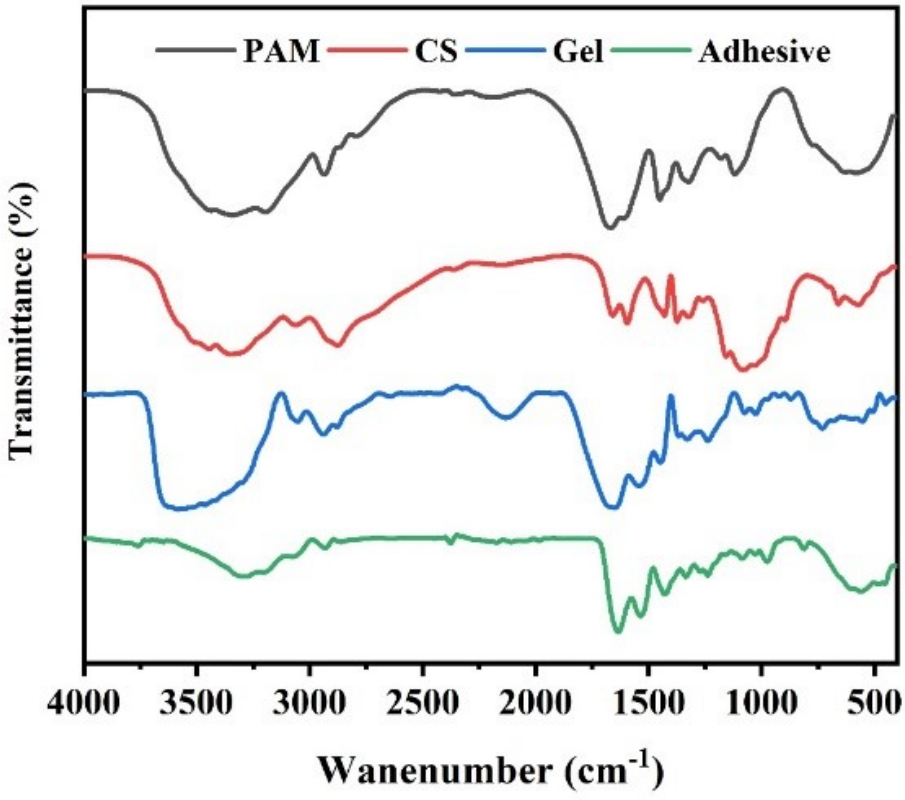

Figure S2. The FTIR spectra of Gel, CS, PAM and the CAM-Gel.

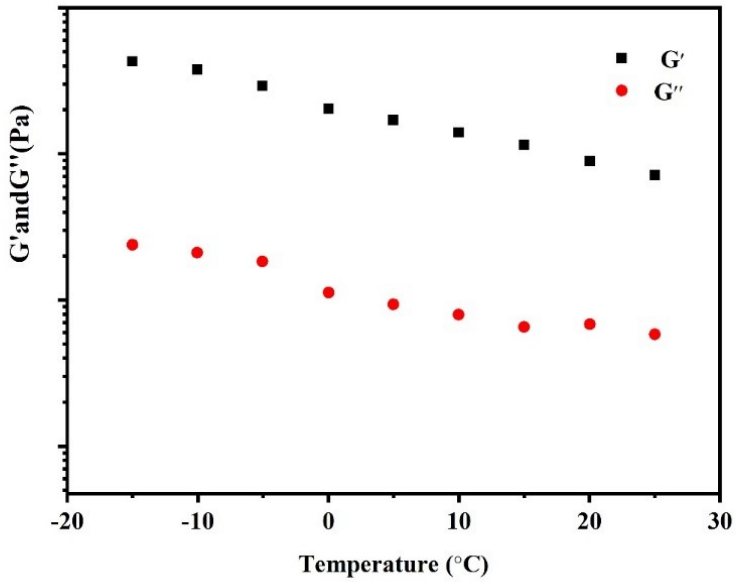

Figure S3. Temperature-dependent storage modulus *G*', and loss modulus *G*'' of the CAM-Gels.

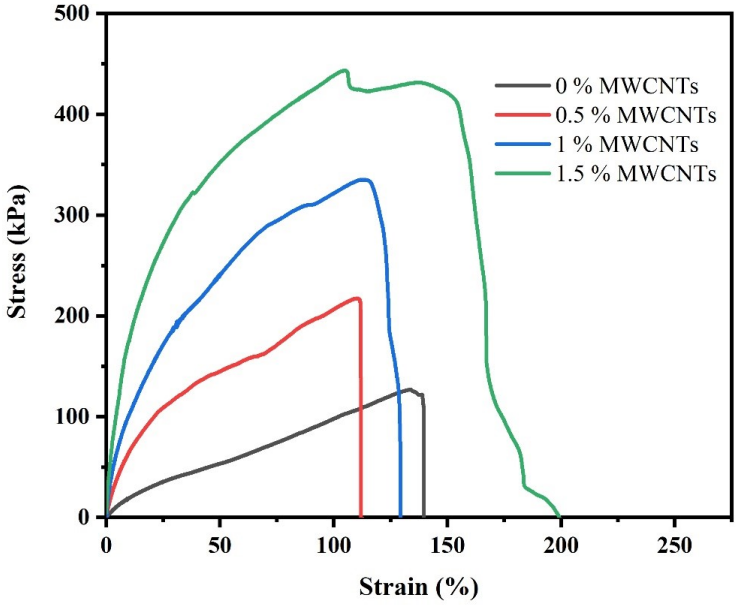

Figure S4. Stress-strain curves of the CAM-Gels.

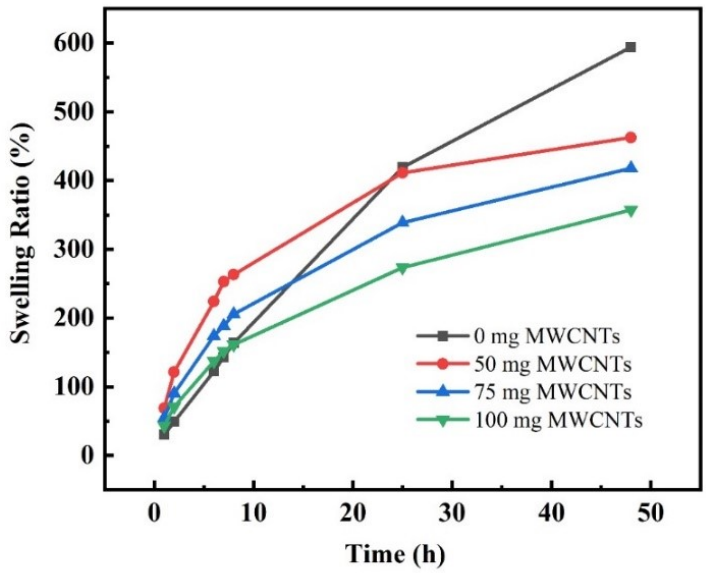

Figure S5. The Swelling behavior of the CAM-Gels.

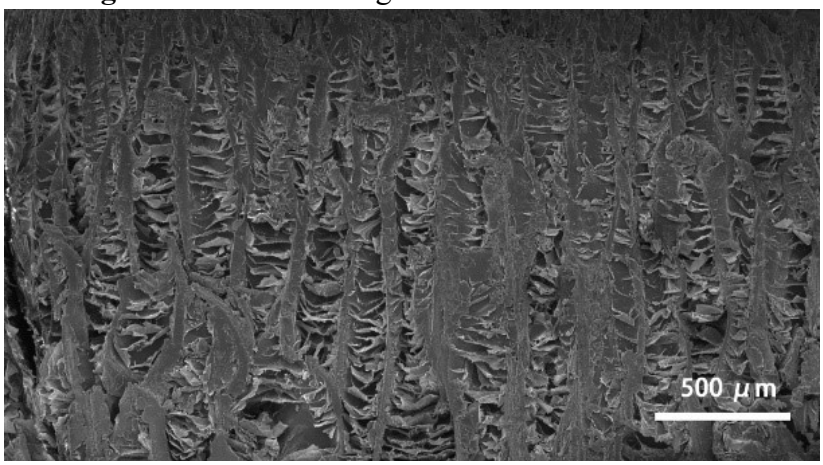

Figure S6. The SEM of gelatin

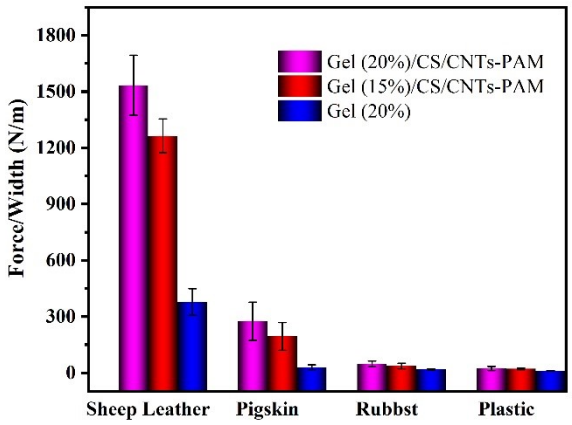

Figure S7. Comparison of peel strength of the CAM-Gels.

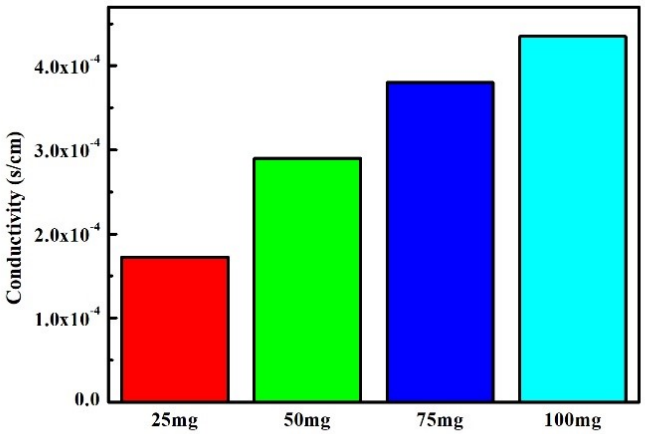

Figure S8. Conductivity of different MWCNTs in the CAM-Gels.

References

[1] D. Gan, T. Xu, W. Xing, M. Wang, J. Fang, K. Wang, X. Ge, C.W. Chan, F. Ren, H. Tan, Mussel-inspired dopamine oligomer intercalated tough and resilient gelatin methacryloyl (GelMA) hydrogels for cartilage regeneration, J. Mat. Chem. B 7(10) (2019) 1716-1725.