

## Supporting Information

### Neuron-Inspired Multifunctional Conductive Hydrogel for Flexible Wearable Sensors

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**Content**

**4 Pages**

**5 Figures (Fig. S1-S5)**

**Table (Table S1)**

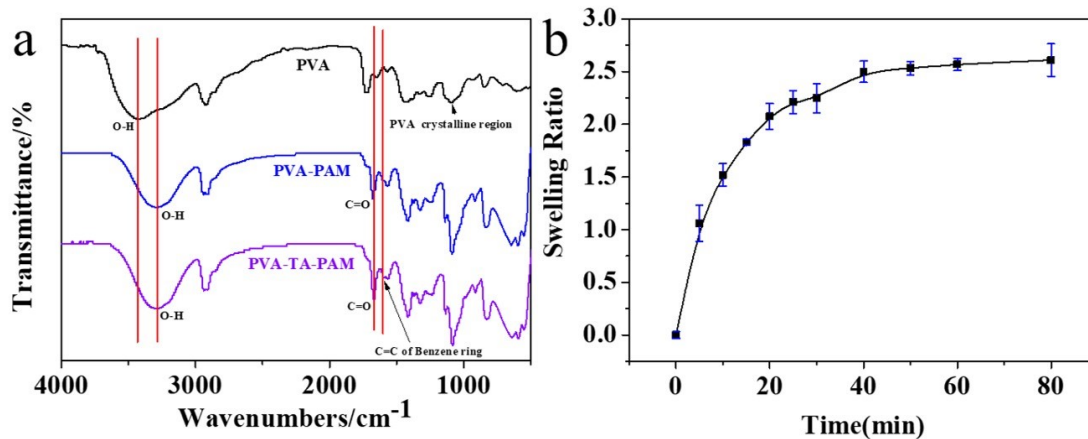


Fig.S1 (a) FT-IR of PVA/TA/PAM, (b) Swelling ratio of PVA/TA/PAM.

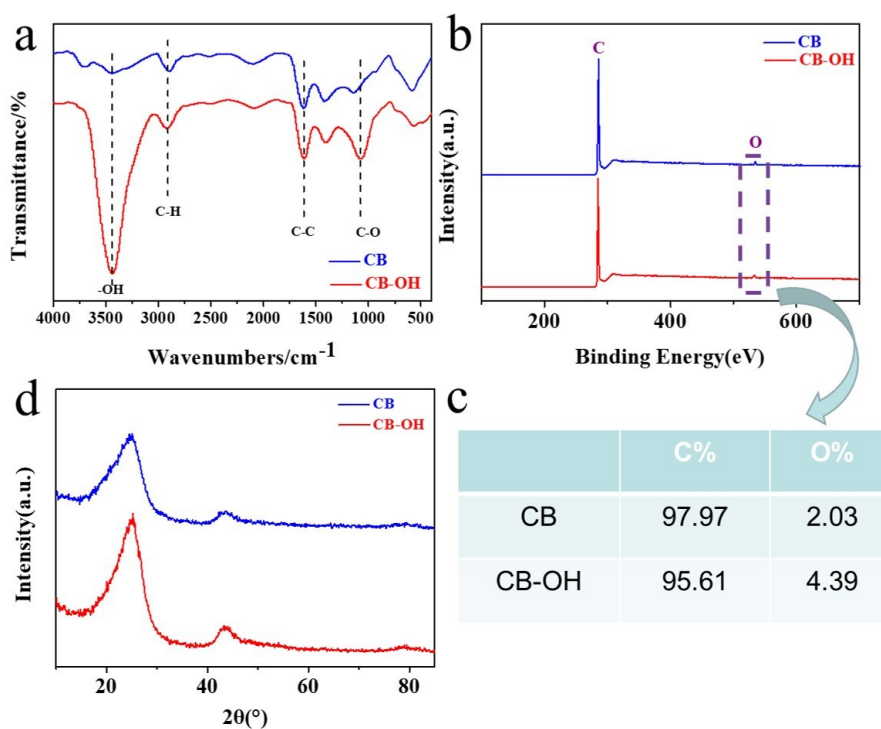


Fig.S2 (a) FT-IR of CB and CB-OH, (b) XPS of CB and CB-OH, (c) the content of C and O of CB and CB-OH, (d) XRD of CB and CB-OH.

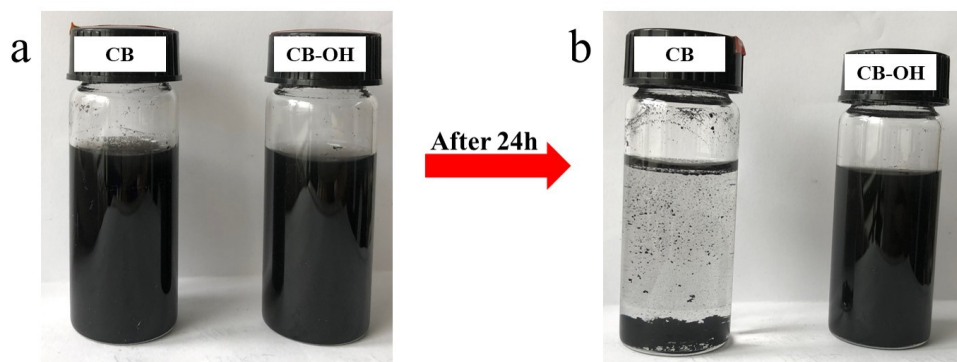


Fig.S3 The dispersion liquid photographs of (a) CB and CB-OH, (b) CB and CB-OH after

being placed for 24h.

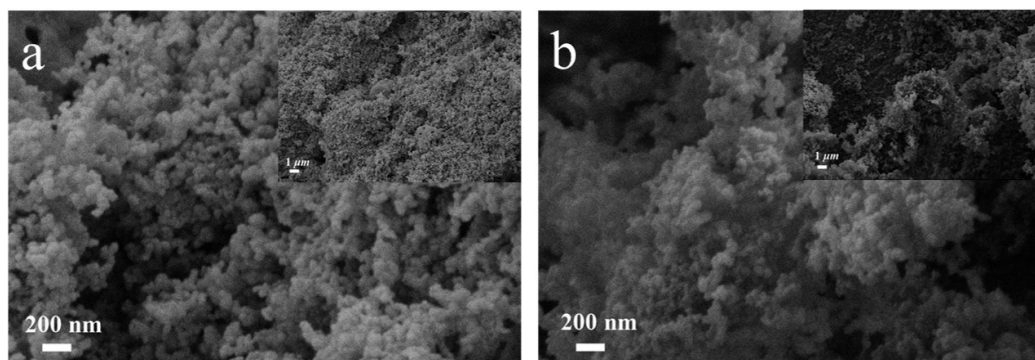


Fig.S4 SEM image of (a) CB and (b) CB-OH

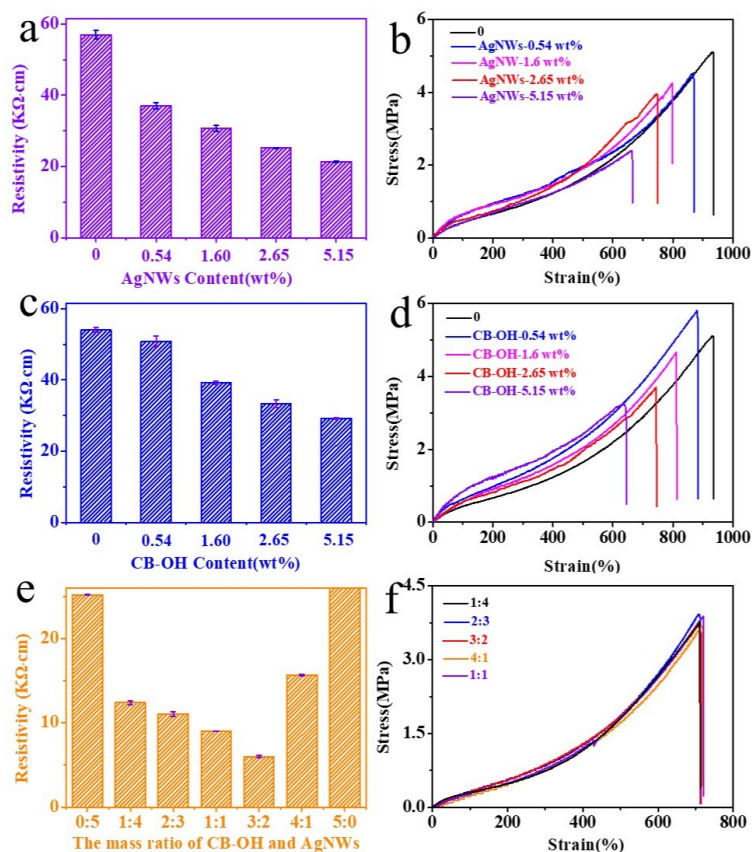


Fig.S5 (a) Resistivity of AgNWs/PVA/TA/PAM composite conductive hydrogels with different AgNWs content, (b) Stress-strain curves of AgNWs/PVA/TA/PAM composite conductive hydrogels with different AgNWs content, (c) Resistivity of CB-OH/PVA/TA/PAM composite conductive hydrogels with different CB-OH content, (d) Stress-strain curves of CB-OH/PVA/TA/PAM composite conductive hydrogels with different CB-OH content, (e) Resistivity of AgNWs/CB-OH/PVA/TA/PAM composite conductive hydrogels with different mass ratios of AgNWs and CB-OH, (f) Stress-strain curves of AgNWs/CB-OH/PVA/TA/PAM composite conductive hydrogels with different mass ratios of AgNWs and CB-OH

**Table S1 The sensitivity comparison of our composite conductive hydrogel-based multifunctional flexible wearable sensor with that of previously reported hydrogel-based flexible wearable sensors**

| Composition                            | Strain sensitivity(GF) | Pressure sensitivity(S) | Durability (cycle times) | Reference        |
|--|------------------------|-------------------------|--------------------------|------------------|
| MXene/PVA/PVP                          | 19.18                  | 10.75                   | 380                      | 46               |
| CNTs/HAPAAm                            | 4.32                   | 0.127                   | 300                      | 45               |
| PAA/PVA/Fe <sup>3+</sup> /borax/CNT/EG | 1.61                   | 0.243                   | 150                      | 49               |
| SiO <sub>2</sub> -g-PBA/P(AAm-co-LMA)  | 5.44                   | 0.131                   | 300                      | 43               |
| PVA/CNTs/graphene                      | 152.6                  | 0.127                   | 1000                     | 31               |
| PAM/PVA                                | -                      | 0.05                    | 500                      | 14               |
| PVA/SA/BC/MCC                          | 5.01                   | 0.033                   | -                        | 47               |
| PVA/Borax/SA/TA                        | 15.98                  | -                       | -                        | 1                |
| HP(AAm/AA)-CS-Fe <sup>3+</sup>         | 3.621                  | -                       | 300                      | 2                |
| CS/PHEAA                               | 6.9                    | 0.224                   | 500                      | 51               |
| PAAm-co-APMA/rGO/PDA                   | 5.4                    | 0.074                   | 300                      | 50               |
| <b>AgNWs/CB-OH/PVA/TA/PAM</b>          | <b>68.64</b>           | <b>0.229</b>            | <b>300</b>               | <b>This work</b> |