

Supporting Information

The Cu NWs is obtained by hydrothermal method with long aspect ratio, as shown in Figure S1.

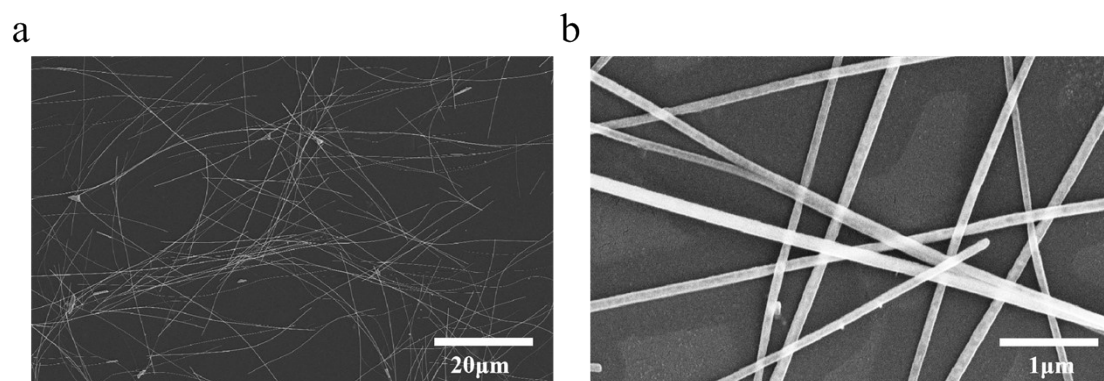


Figure S1. The SEM image of the CuNWs

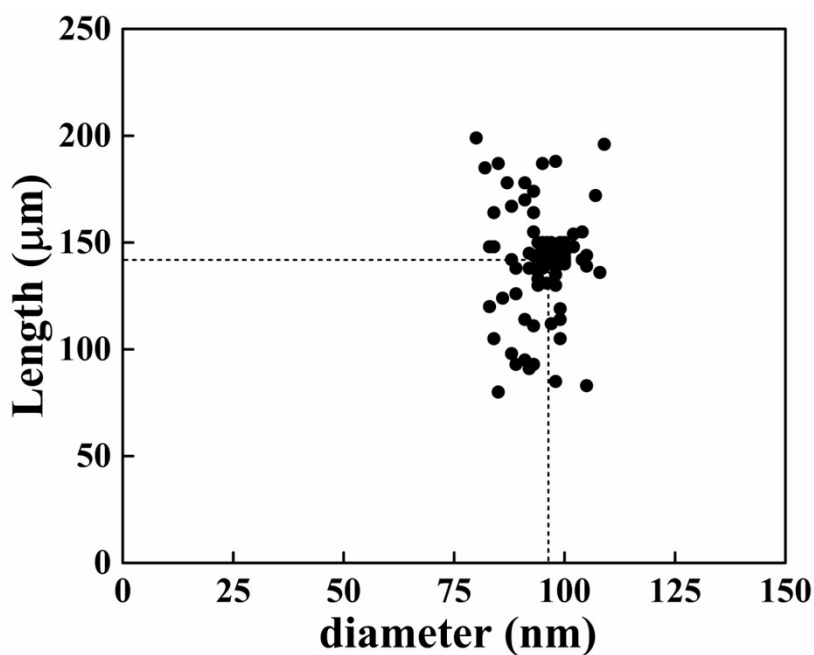


Figure S2. Statistics on the diameter and length of Cu NWs

In the Figure S2, the diameter and length data of 100 groups of Cu NWs are counted. The average diameter and length of copper nanowires are ~95 nm and ~142

μm respectively by statistical correlation calculation. According to standard deviation formula:

$$\sigma = \sqrt{\frac{1}{N} \sum_{i=1}^N (x_i - \mu)^2}$$

The σ can be concluded that the standard deviation of the diameter is 5.2622 and that of the length is 20.664.

The X-Ray Diffraction (XRD) with (111), (200), and (220) planes demonstrated that the as-prepared Cu NWs are well-crystallized (see Figure S3).

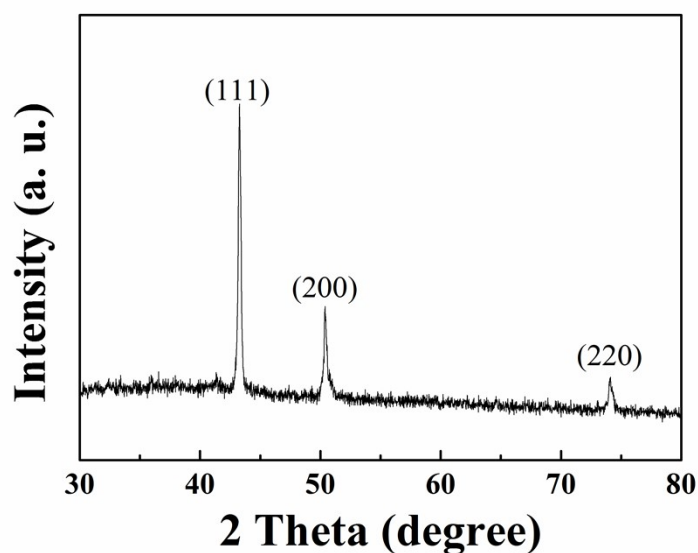


Figure S3. The X-Ray Diffraction (XRD) of Cu NWs

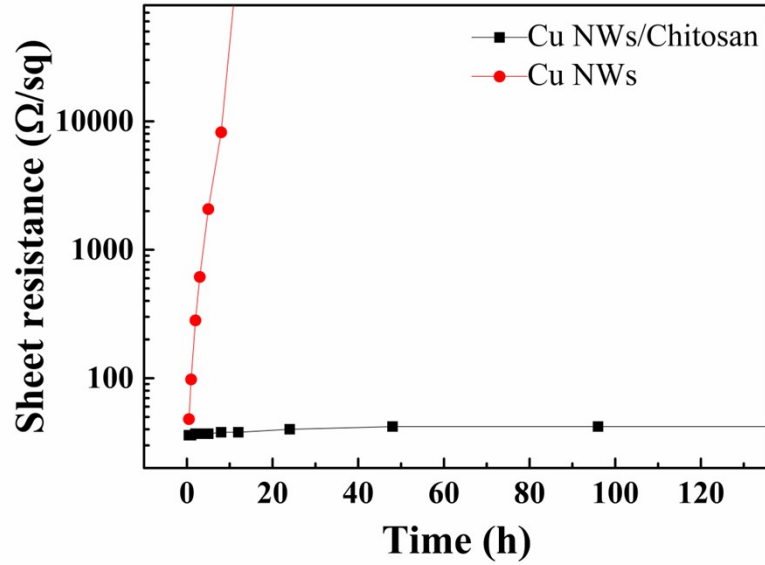


Figure S4. The oxidation resistance of the Cu NWs/Chitosan and Cu NWs in high temperature (85 °C) and humidity (85%) environment

As can be seen from the figure above, the chitosan layer has a good protective effect on the Cu NWs, which can prevent the Cu NWs from contacting with water and oxygen in the air under high temperature and high humidity, thus improving its stability.

Table S1

	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
Before coating the chitosan and heating	39.2	45.3	42.2	38.1	49.4
After coating the chitosan and heating for 30 min	38.1	44.7	40.8	36.9	48.1

The resistance of five samples was statistically measured before and after coating the chitosan layer. The table shows that after coating the chitosan layer and heating it

to cure, the resistance drops slightly, which is due to the presence of acetic acid in the uncured chitosan solution and the direct connection of Cu NWs becomes tight during heating.

The results of the repeated test when the tensile degree was 200% are shown in the figure below. The conductive network of nanowires has been obviously damaged after 500 times.

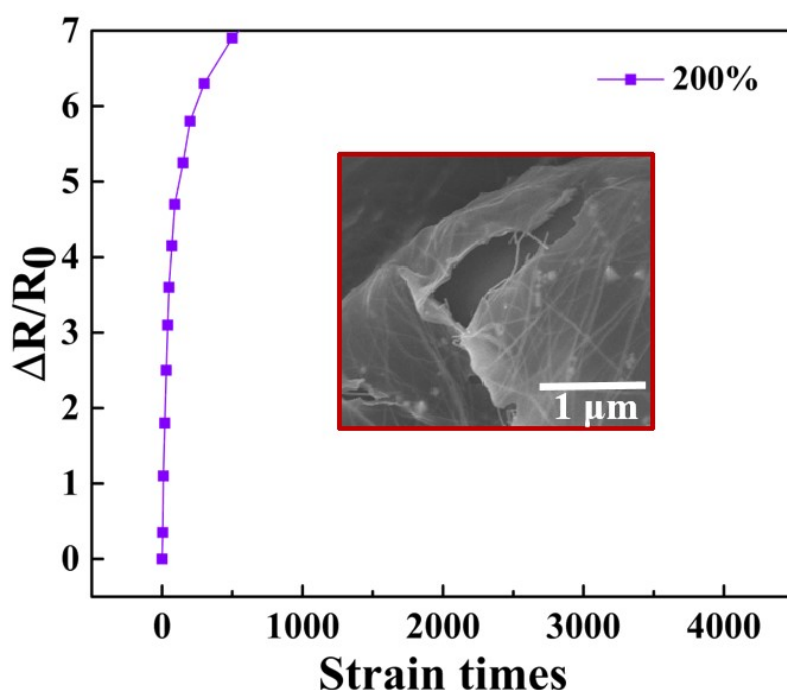


Figure S5. The durability test of the PPCC electrode

The adhesion test between the nanowire network and PI tape is shown in the figure S4. The resistance of 3M tape does not change significantly after 100 times of adhesion, indicating that there is a strong adhesion between the 3M tape (pressure:0.6 MPa). In particular, the adhesion between the PI tape and the PDMS substrate is also great which is shown in the Figure S5. After applying a force of 2kPa to the 3M tape, the tape was removed and the PI tape did not show any signs of coming off.

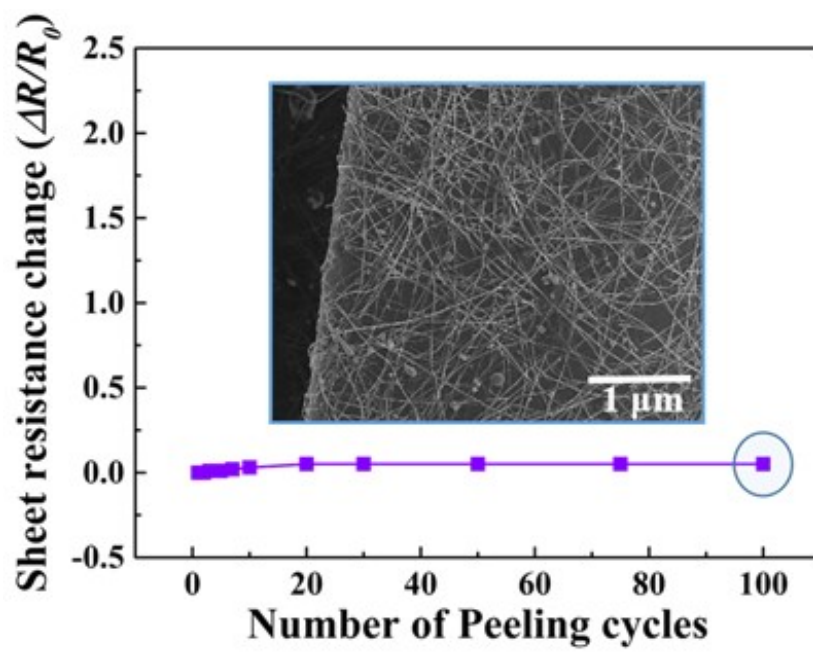


Figure S6. The adhesion test of the PPCC electrode

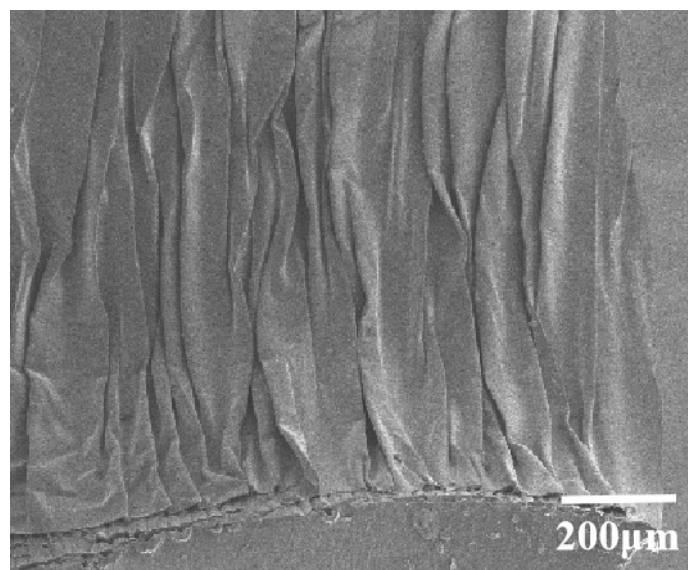


Figure S7. The surface morphology of the PPCC electrode after peeling test.