

Supporting information

ESI 1

Preparation of slurry: 1.28g active carbon (AC) was added into 3.5g 1:1 (w/w) ethanol/H₂O mixture in a small vial, and it was stirred vigorously until AC was dispersed in the mixture fully, then 1g 10 wt% PVA gel was added into the mixture and stirred continuously until uniform slurry was formed. Finally, 0.52g 1M H₃PO₄ was added into the vial, and it was left with stir on overnight. 10 wt% polyvinyl alcohol (PVA) was prepared by dissolving 1g PVA in 10 ml H₂O at 90°C, the mixture was stirred vigorously until transparent and homogeneous gel solution was obtained. PVA gel electrolyte was prepared by dissolving 1g PVA and 1g dry H₃PO₄ in 10 ml water at 90°C.

Preparation of the coaxial single fibre supercapacitor: 50µm (in diameter) stainless steel wire was cleaned in acetone for 10 minutes and activated in 0.1M H₂SO₄ for 30 minutes in ultrasonic water bath, rinsed using deionised water and dried in air. The dip-coating method was used to coat Chinese ink, gel electrolyte, and active carbon-gel layer sequentially as shown in the Figure 1. The required times for a certain thickness coating can be performed by moving the microwire up and down.

After the wire was coated using ink, it was dried in air, and then it was wetted briefly using 1M H₃PO₄ and followed by coating gel electrolyte twice. When the gel is solidified, activated carbon slurry coating was conducted. Finally, a silver paint layer was coated onto the wire as a current collector. All chemicals were purchased from Sigma-Aldrich, and used as received without further purification. 50 µm stainless steel wire was purchased from Advent Research Material, Oxford. Chinese ink was produced by Shanghai Ink Corporation.

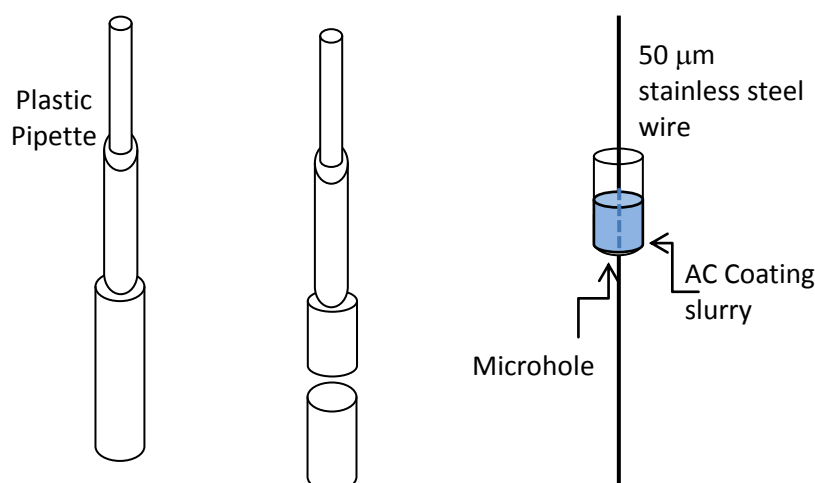


Fig. 1 Schematic of the dip coating method used for CSFS preparation,

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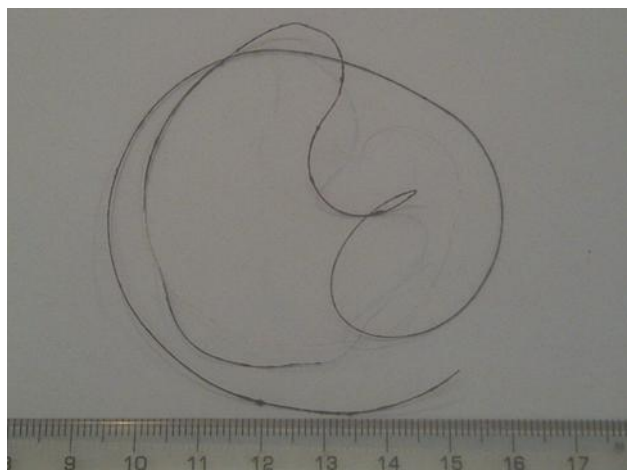


Fig. 2 A 44 cm long coaxial single fibre supercapacitor without silver paint coating layer (CSFS)