

## Supplementary Information

### **Polybenzoxazine-based highly porous carbon nanofibrous membranes hybridized by tin oxides nanoclusters: durable mechanical elasticity and capacitive performance**

Jianlong Ge<sup>a</sup>, Yongshuai Qu<sup>a</sup>, Leitao Cao<sup>a</sup>, Fei Wang<sup>a</sup>, Lvyue Dou<sup>a</sup>, Jianyong Yu<sup>a</sup>, Bin Ding<sup>a,b,\*</sup>

<sup>a</sup> Key Laboratory of Textile Science & Technology, Ministry of Education, College of Textiles, Donghua University, Shanghai 201620, China.

<sup>b</sup> Nanofibers Research Centre, Modern Textile Institute, Donghua University, Shanghai 20051, China

\*Email: binding@dhu.edu.cn

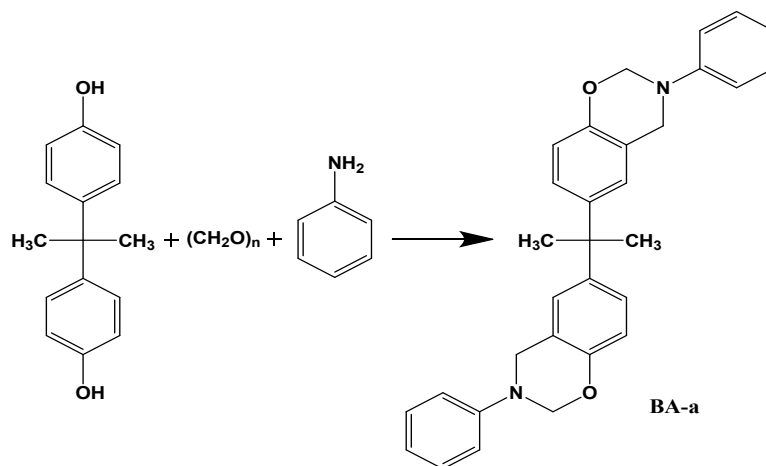


Fig. S1 Chemical synthetic route of BA-a.

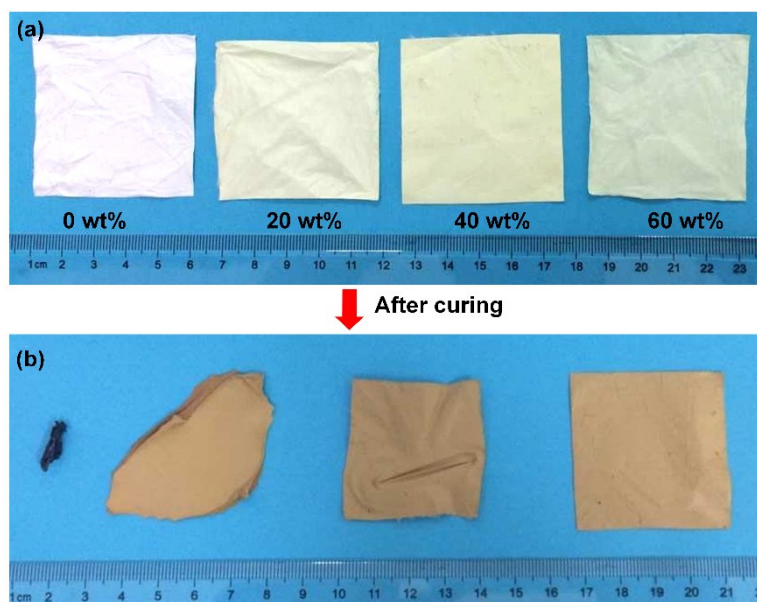


Fig. S2 Digital photo of the precursor membranes with different  $\text{SnCl}_2$  weight ratio to BA-a monomer before (a) and after (b) curing.

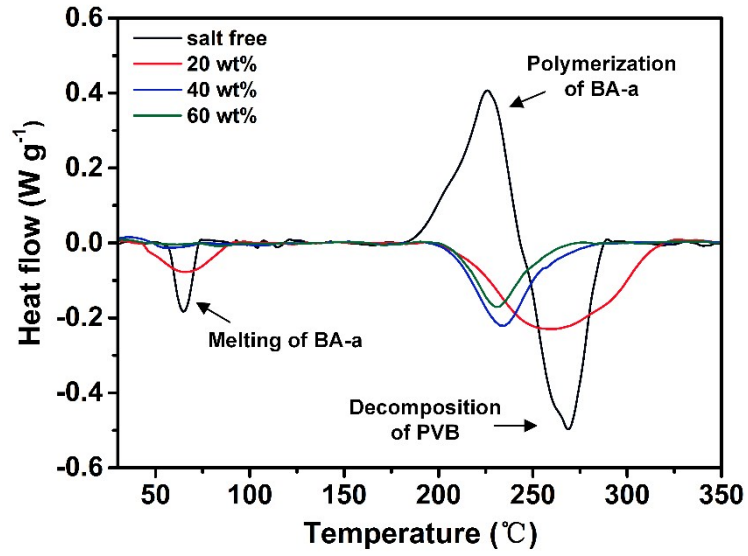


Fig. S3 The DSC curves of as-spun nanofibrous membranes with different weight ratio of  $\text{SnCl}_2$  to BA-a.

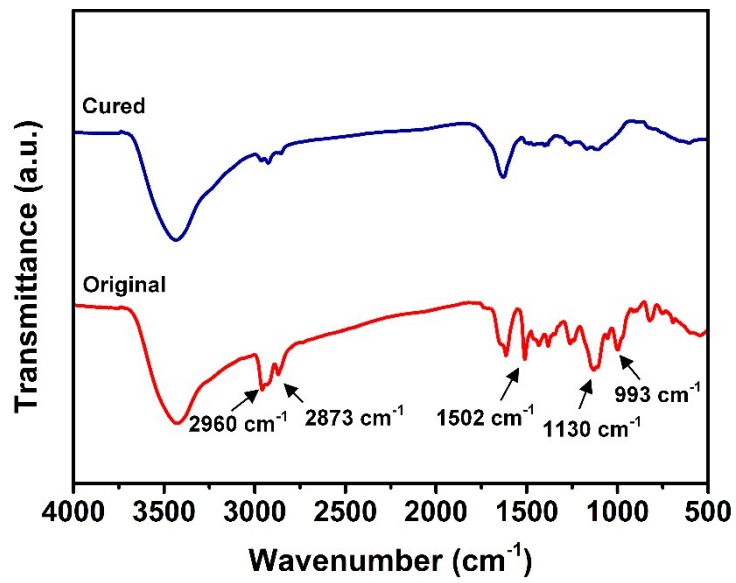


Fig. S4 FT-IR spectra of relevant original and cured precursor nanofibrous membranes.

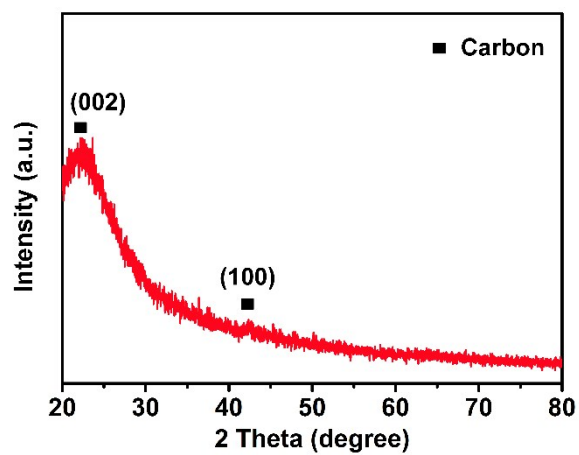


Fig. S5 XRD spectra of pure carbon membranes derived from precursor nanofibers without  $\text{SnCl}_2$ .

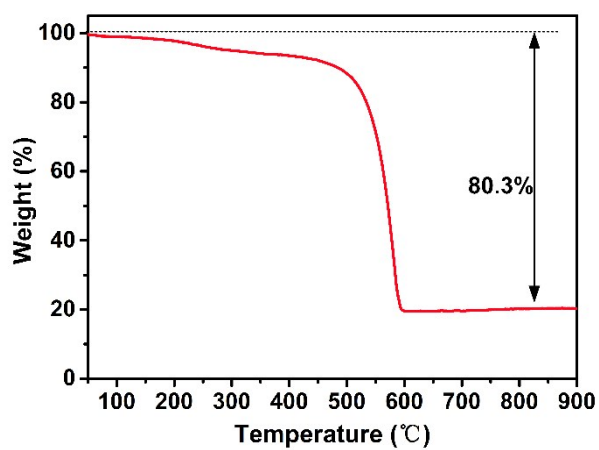


Fig. S6 TGA plots of  $\text{SnO}_2/\text{CNFs}$  derived from precursor nanofibers with different 60%  $\text{SnCl}_2$  aspect to BA-a.

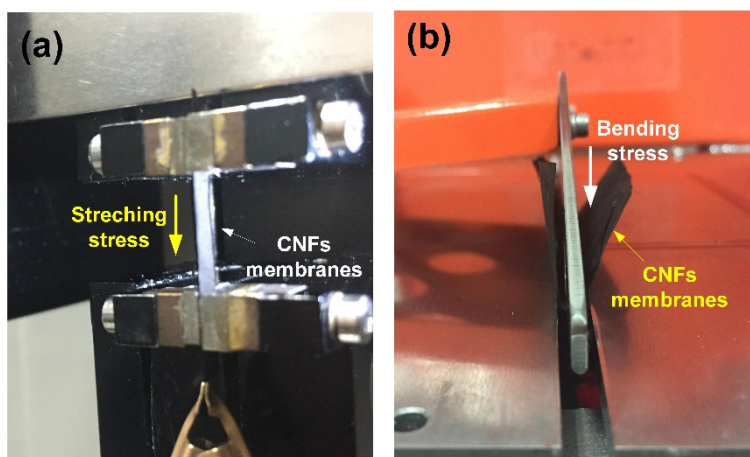


Fig. S7 Digital photos demonstrate the (a) tensile strength and (b) bending rigidity testing process.

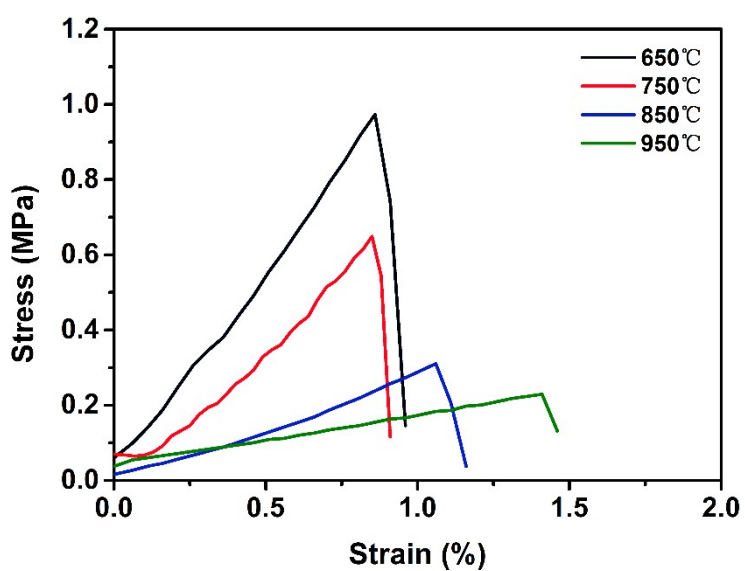


Fig. S8 Stress-strain curves of the SnO<sub>2</sub>/CNFs membranes derived from different carbonization temperatures.

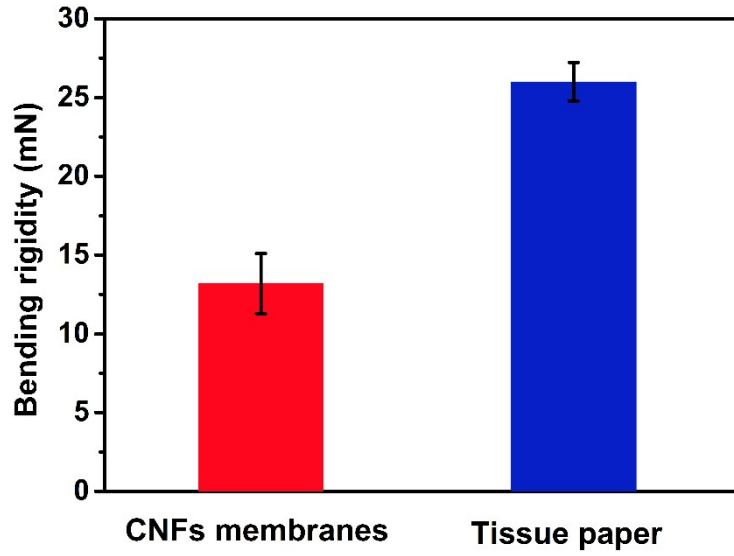


Fig. S9 Compare of the bending rigidity of the as-prepared SnO<sub>2</sub>/CNFs membranes and commercial polymer based tissue paper.

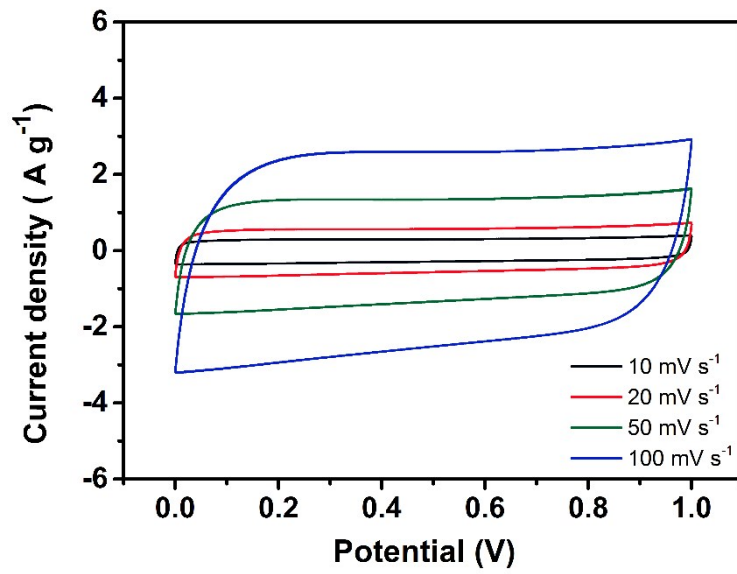


Fig. S10 CV curves of CNFs derived from composite SnO<sub>2</sub>/CNFs via etching the SnO<sub>2</sub> component.

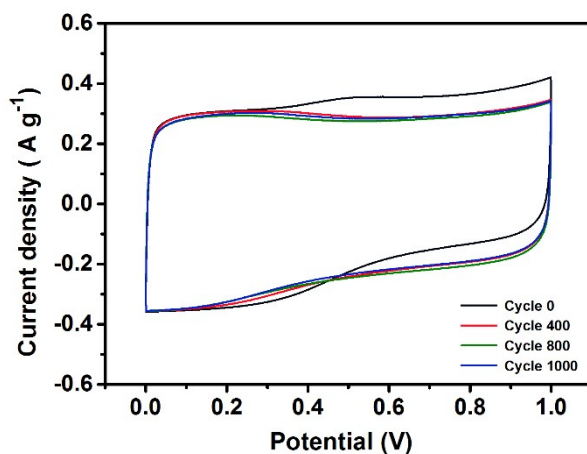


Fig. S11 CV curves of supercapacitors derived from SnO<sub>2</sub>/CNFs electrodes suffering from various cycles of bending deformation.

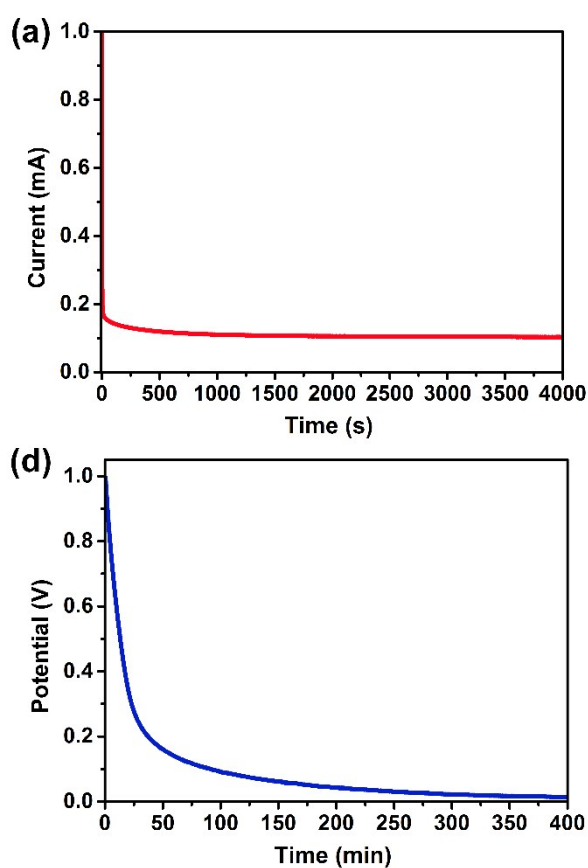


Fig. S12 (a) Leakage current curves of the SnO<sub>2</sub>/CNFs based supercapacitor. (b) Self-discharge curve of the device.

Table S1. Composition and property of different electrospinning solutions.

Weight ratio of SnCl <sub>2</sub> aspect to BA-a	Viscosity (cps)	Conductivity ( $\mu\text{S m}^{-1}$ )	Surface tension ( $\text{mN m}^{-1}$ )
0	44	310	35
20	54	494	30
40	209	851	27
60	215	1308	31