Electrical Supplementary Information for

**Novel fluorinated polyurethane decorated electrospun silica nanofibrous membranes exhibiting the robust waterproof and breathable performances**

Xue Mao,\textsuperscript{ab} Yuecheng Chen,\textsuperscript{ab} Yang Si,\textsuperscript{ab} Yang Li,\textsuperscript{ab} Huigao Wan,\textsuperscript{ab} Jianyong Yu,\textsuperscript{b} Gang Sun\textsuperscript{b} and Bin Ding\textsuperscript{aabc}

\textsuperscript{a} State Key Laboratory for Modification of Chemical Fibers and Polymer Materials, College of Materials Science and Engineering, Donghua University, Shanghai 201620, China

\textsuperscript{b} Nanomaterials Research Center, Modern Textile Institute, Donghua University, Shanghai 200051, China

\textsuperscript{c} State Environmental Protection Engineering Center for Pollution Treatment and Control in Textile Industry, Donghua University, Shanghai 201620, China

* Corresponding author. E-mail: binding@dhu.edu.cn; Phone: +86-21-62378202; Fax: +86-21-62378202
Functional group affirmation of pure and fluorinated polyurethane modified silica nanofibrous membranes

To check the role of chemical wettability imparted by fluorinated polyurethane (FPU) to the silica nanofibrous (SNF) membranes, a Fourier transform infrared (FT-IR) spectroscopic analysis was performed. Fig. S1† shows the comparative FT-IR spectra of SNF1 and SNF1/FPU1 membranes. The Si–O–Si specific for relevant membranes has given their absorption peak at 1147 and 811 cm\(^{-1}\), and the peak at 1064 and 455 cm\(^{-1}\) was assigned to the Si–OH.\(^1,2\) The typical absorption features for FPU were found at 1596 cm\(^{-1}\) (–CF\(_3\)), 1311 cm\(^{-1}\) (–N–H), 647 cm\(^{-1}\) (C–C–C), and 555 cm\(^{-1}\) (C–C=O), respectively.\(^3\) The C–O–C specific for FPU has given their absorption band around 3311 and 1708 cm\(^{-1}\).\(^4\) The stretching vibrations for aromatic ring and deformation vibration for –CH\(_2\)– appeared at 1533, 1411, 2933 and 2854 cm\(^{-1}\), respectively, which indicates the existence of FPU in the relevant composite membranes.\(^4\)

![Fig. S1. FT-IR spectra of (a) SNF1 and (b) SNF1/FPU1 membranes.](image)
**Fig. S2.** Stress-strain curves of SNF2/FPU1, SNF3/FPU1, and SNF4/FPU1 membranes.
Fig. S3. (a) BET surface areas of SNF1/FPU1, SNF2/FPU1, SNF3/FPU1, and SNF4/FPU1 membranes. (b) Nitrogen physisorption isotherms of relevant membranes. (c) The differential pore volume as a function of pore width.

REFERENCES

