

Electrical Supplementary Information for

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

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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} (–CF₃), 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 –CH₂– appeared at 1533, 1411, 2933 and 2854 cm^{-1} , respectively, which indicates the existence of FPU in the relevant composite membranes.⁴

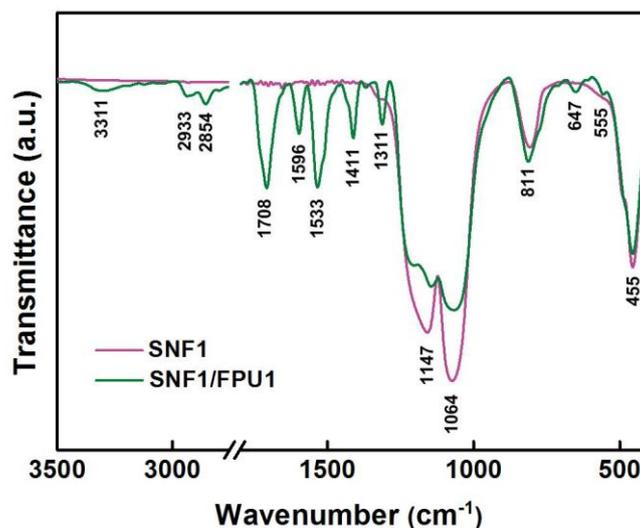


Fig. S1. FT-IR spectra of (a) SNF1 and (b) SNF1/FPU1 membranes.

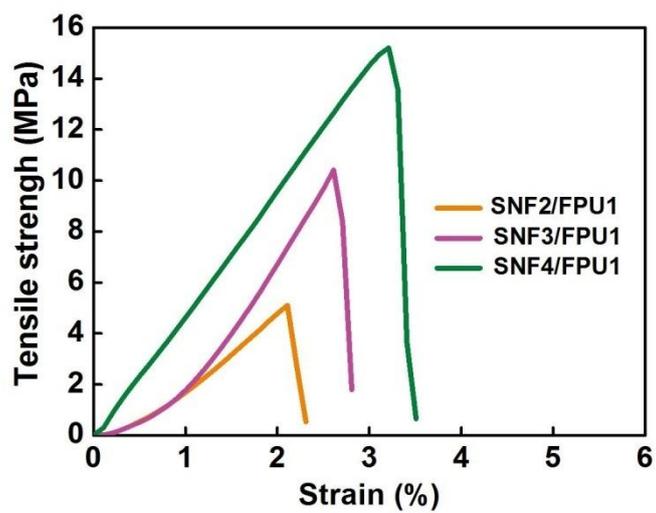


Fig. S2. Stress-strain curves of SNF2/FPU1, SNF3/FPU1, and SNF4/FPU1 membranes.

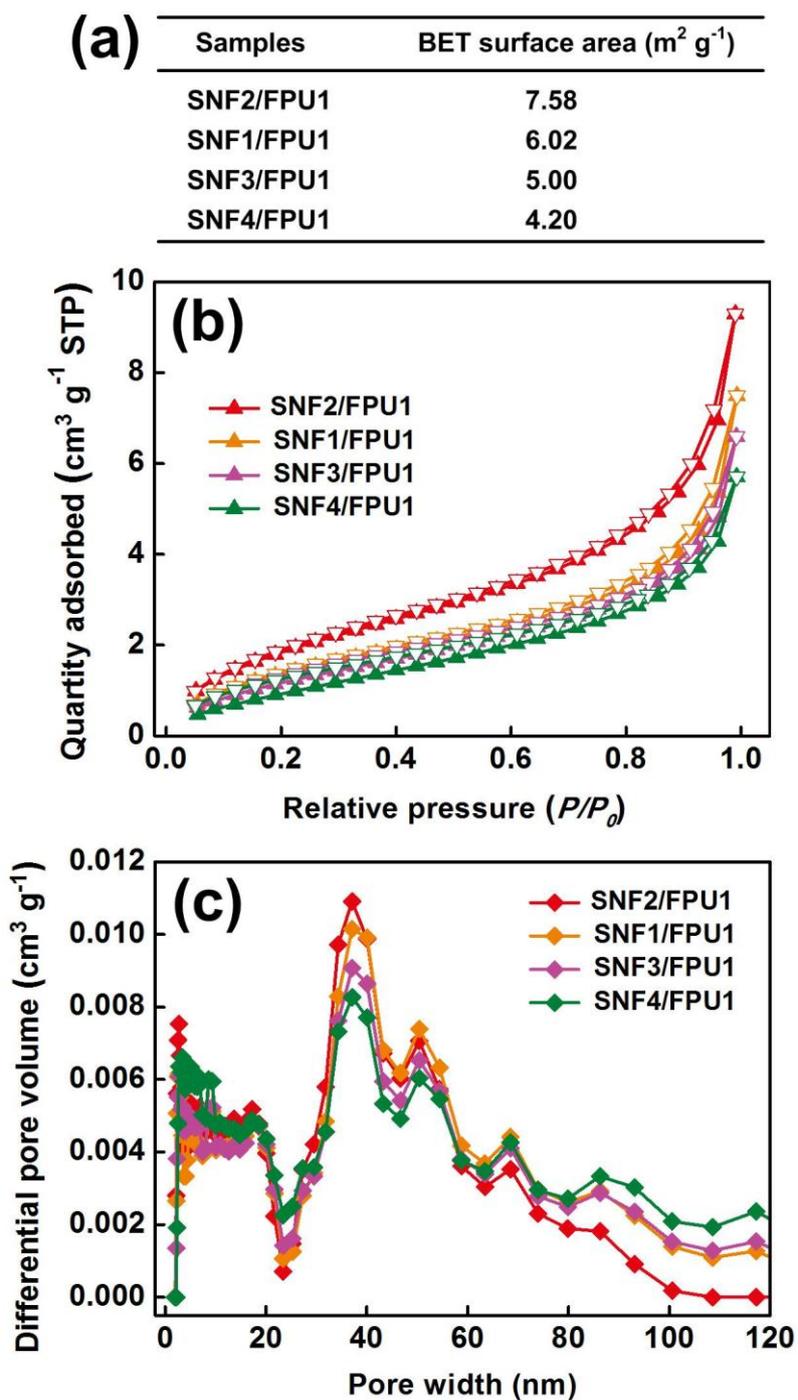


Fig. S3. (a) BET surface areas of SNF1/FPU1, SNF2/FPU1, SNF3/FPU1, and SNF4/FPU1 membranes. (b) Nitrogen physisorption isotherms of relevant membranes. (c) The differential pore volume as a function of pore width.

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