# Supporting Information

## Structure Tailoring of Hierarchical Fibrous Composite (HFC) Membranes to Balance Mass Transfer and Heat Transfer for State-of-the-Art Desalination Performance in Membrane Distillation

**Xiaochan An[1,3], Guorong Xu[2], Baolei Xie[1,4], Yunxia Hu*[1,4]**

1. State Key Laboratory of Separation Membranes and Membrane Processes, National Center for International Research on Membrane Science and Technology, School of Materials Science and Engineering, Tianjin Polytechnic University, Tianjin 300387, P. R. China
2. The Institute of Seawater Desalination and Multipurpose Utilization, State Oceanic Administration (SOA), Tianjin, China, 300192
3. CAS Key Laboratory of Coastal Environmental Processes and Ecological Remediation; Yantai Institute of Coastal Zone Research, Chinese Academy of Sciences, Yantai, Shandong Province 264003, P. R. China
4. School of Chemical and Environmental Engineering, Tianjin Polytechnic University, Tianjin 300387, P. R. China

*Corresponding author, Tel: +86-535-2109236; E-mail: yunxiahu@tjpu.edu.cn

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**Figure S1**

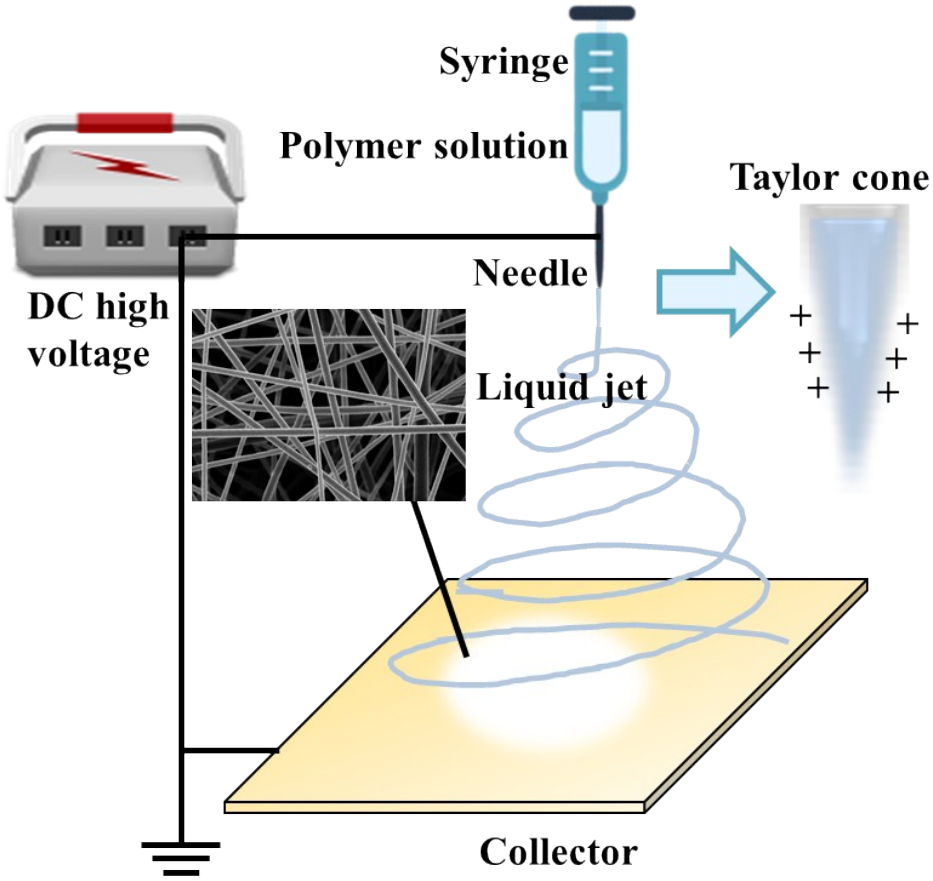


**Figure S1.** Schematic illustration of the custom-made electrospinning device for the fabrication of PH, PET, and PH/PET fibers.

**Figure S2**

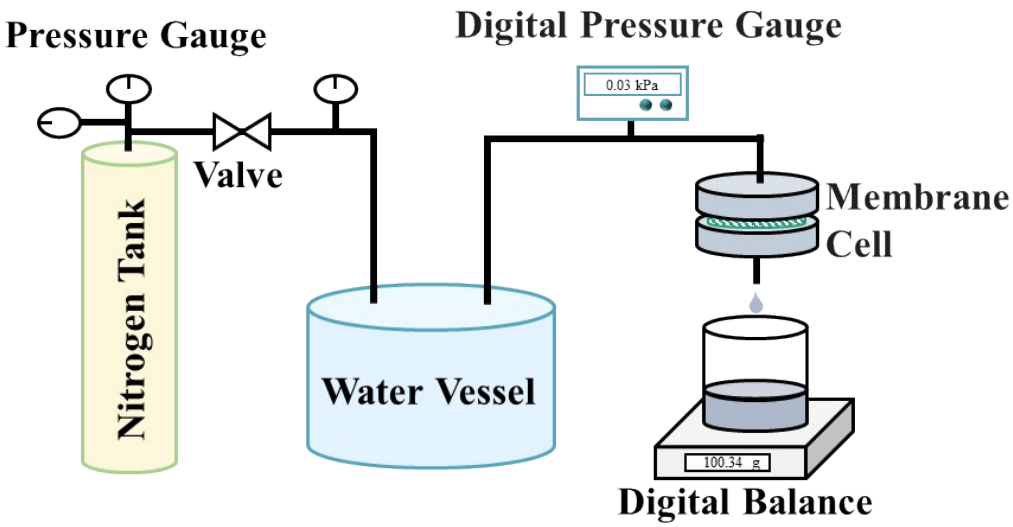


**Figure S2**. Schematic illustration of $LEP_w$ measurement setup.

**Figure S3**

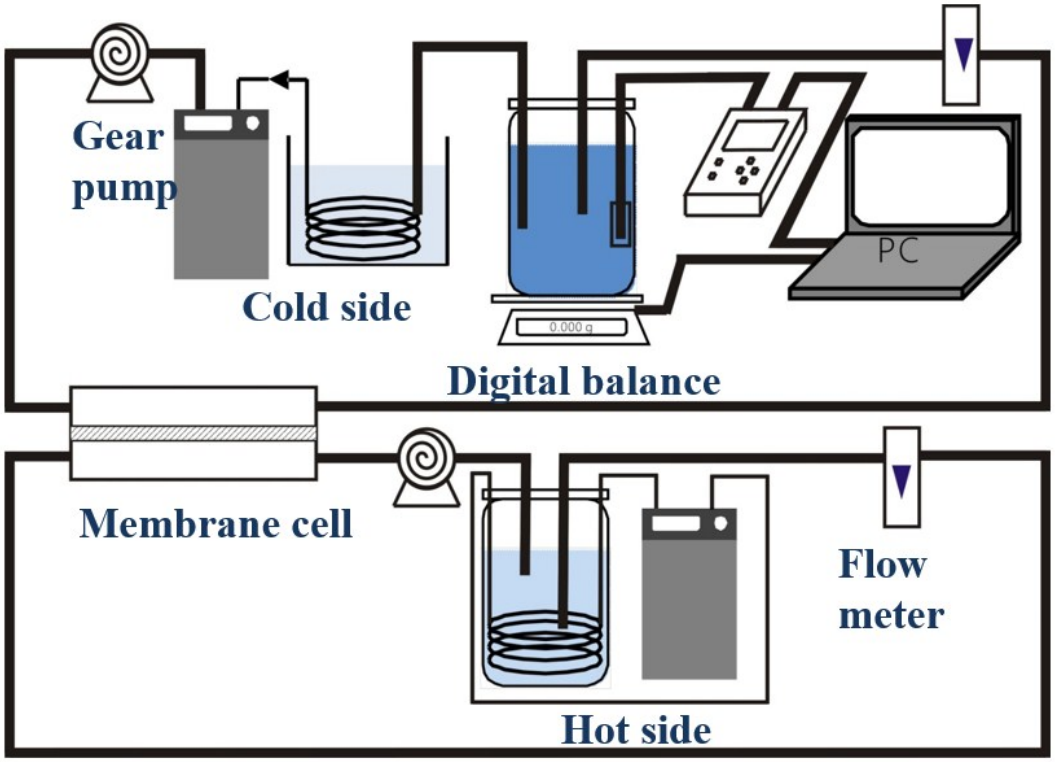


**Figure S3.** Schematic illustration of DCMD system.

**Figure S4**

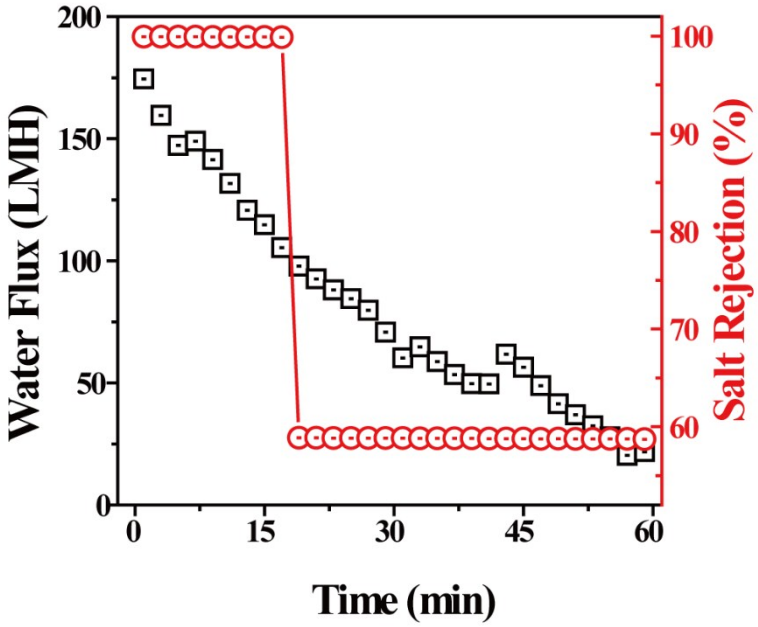


**Figure S4.** Unstable MD performance of HFC membrane comprising the thin PH active layer with thickness of <1 μm and the PET support layer with thickness of 70 μm.

**Figure S5**

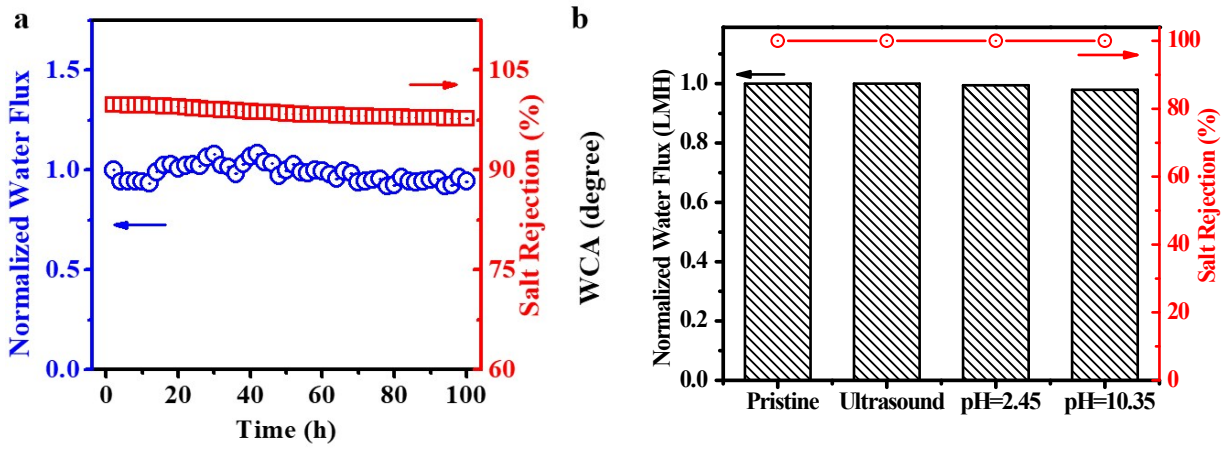


**Figure S5.** Stability of the optimized HFC membrane: (a) long-term MD performance in terms of water flux and salt rejections (Operation conditions: feed solution, 3.5 wt% NaCl, 65℃; Permeate, DI water, 25℃; Velocity: 0.4 L/min), (b) MD performance of the HFC membranes after various treatments under harsh conditions.

## Table S1

**Table S1.** The effect of heat-press treatment temperature on the porosity and LEP of individual PH and PET layers

| Active Layer PVDF-HFP | 100 °C | 130 °C | 140 °C | |
|---|---|---|---|---|
| Porosity (%) | 79 | 78 | 69 | |
| $LEP_w$ (psi) | 3.63 | 3.63 | <1.45 | |
| **Support Layer PET** | **100 °C** | **130 °C** | **160 °C** | **200 °C** |
| Porosity (%) | 83 | 77 | 70 | 70 |
| $LEP_w$ (psi) | 1.45 | 2.90 | 1.45 | 1.45 |

| Active Layer PVDF-HFP | 10s | 30s | 60s | 120s |
|---|---|---|---|---|
| Porosity (%) | 78 | 78 | 79 | 79 |
| $LEP_w$ (psi) | 3.63 | 3.63 | 3.63 | 3.63 |
| **Support Layer PET** | **10s** | **30s** | **60s** | |
| Porosity (%) | 77 | 76 | 72 | |
| $LEP_w$ (psi) | 2.90 | 2.90 | 2.90 | |