

Fig. S1. Schematic illustration of lab-scale cross-flow ultrafiltration system.

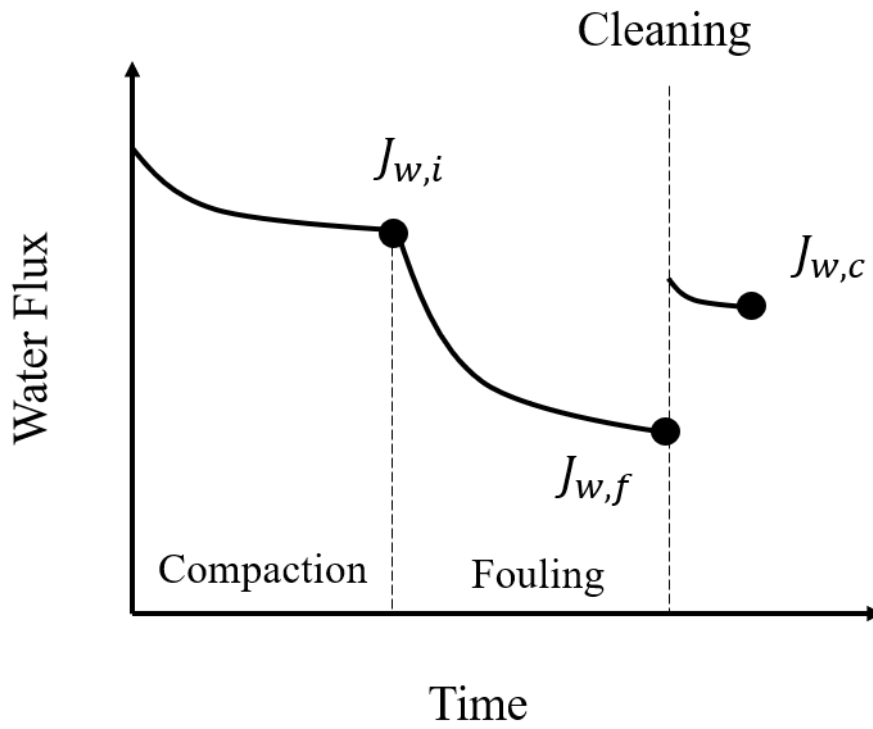


Fig. S2. Schematic illustration of humic acid fouling test.

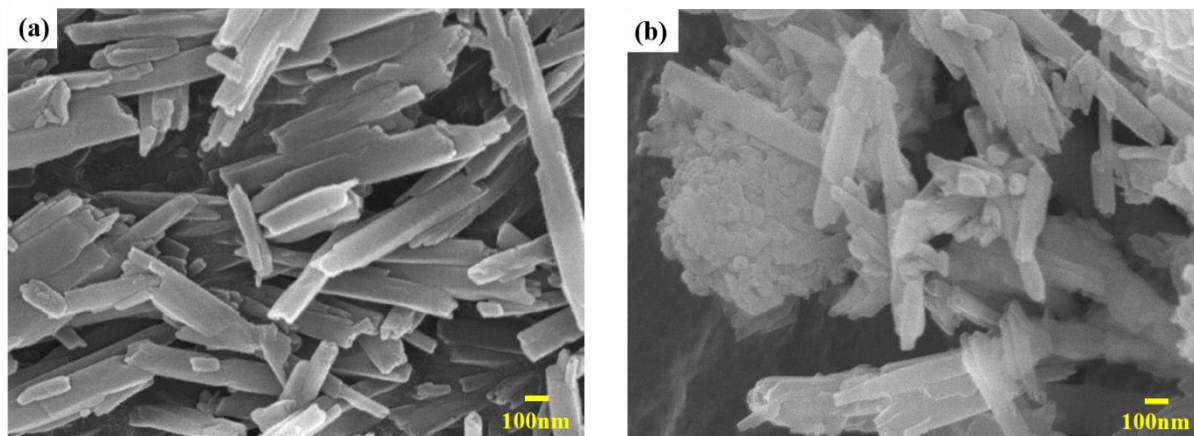


Fig. S3. FE-SEM images of (a) HNTs and (b) f-HNTs captured at 50,000x magnification.

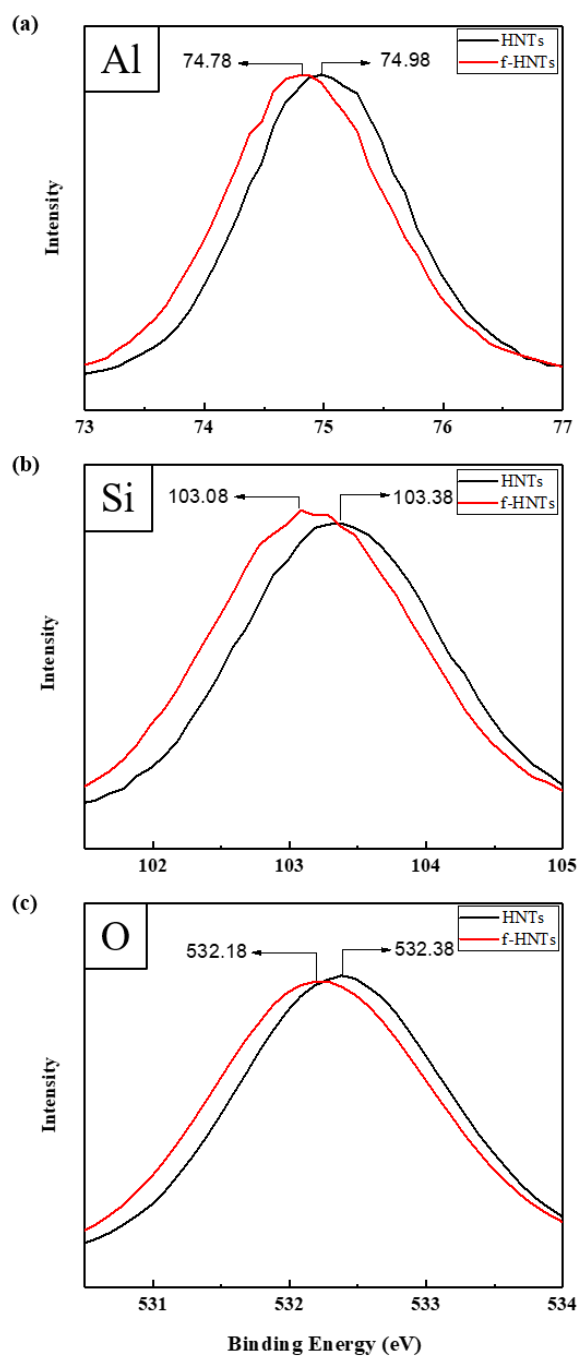


Fig. S4. XPS spectra of HNTs and f-HNTs. (a) Al 2p, (b) Si 2p and (c) O 1s

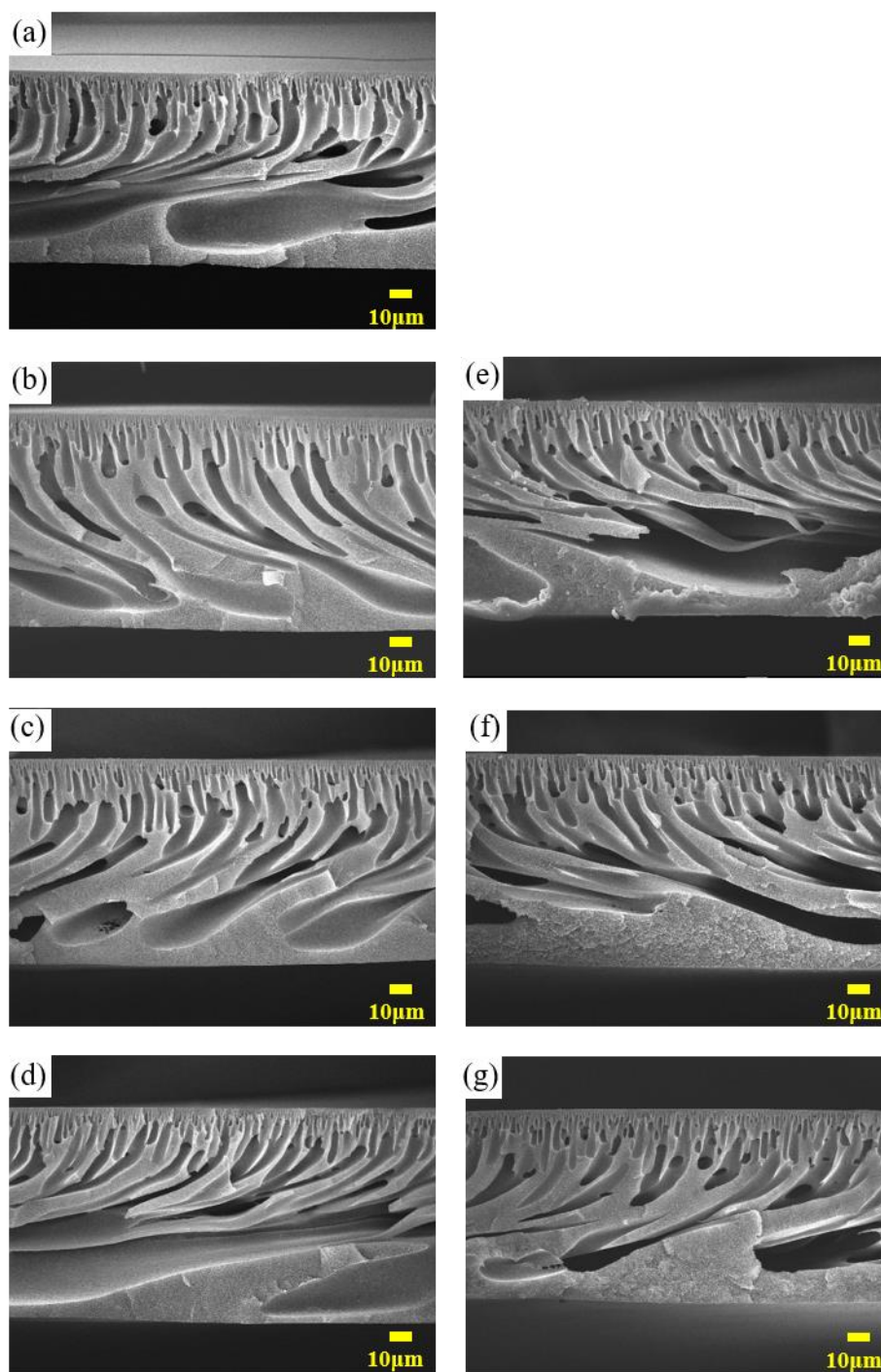


Fig. S5. Cross-sectional FE-SEM images of fabricated membrane of (a) PES, (b) HNT0.5, (c) HNT1.0, (d) HNT2.0, (e) f-HNT0.5, (f) f-HNT1.0, (g) f-HNT2.0 at 600x magnification.

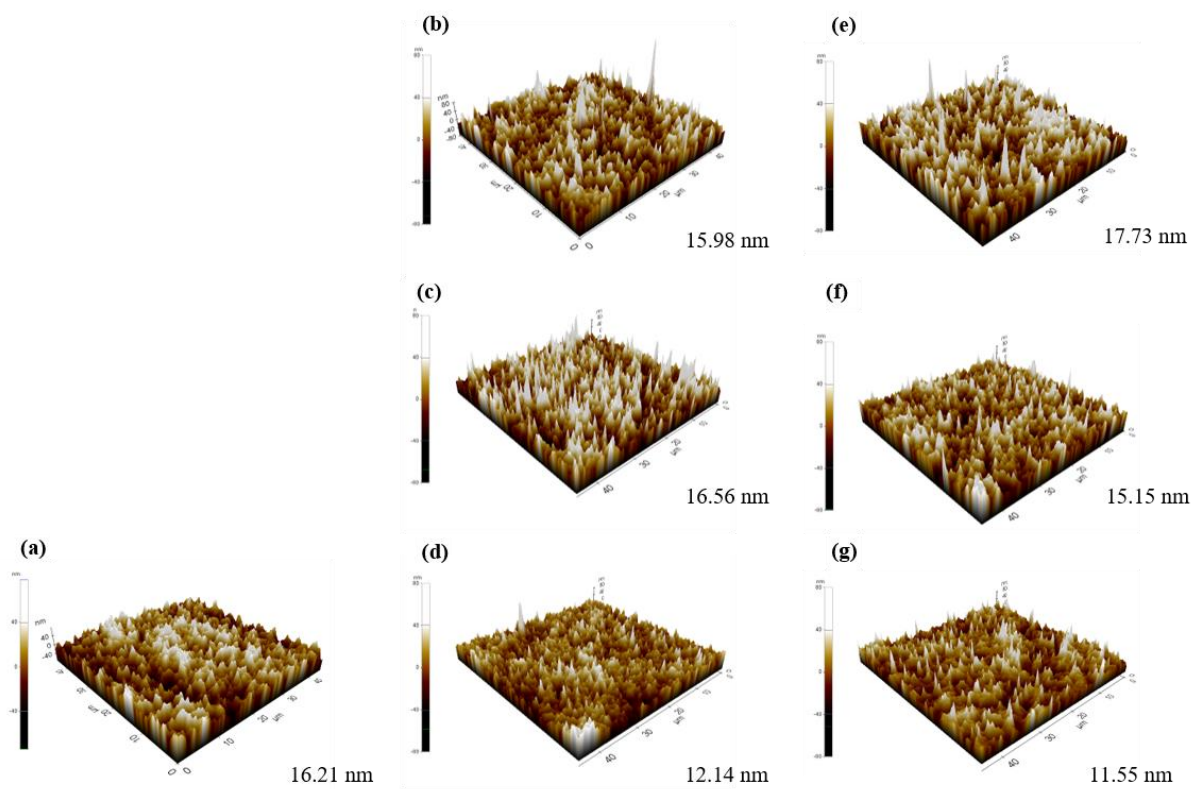


Fig. S6. Roughness of fabricated membranes of (a) PES, (b) HNT0.5, (c) HNT1.0, (d) HNT2.0, (e) f-HNT0.5, (f) f-HNT1.0 and (g) f-HNT2.0, respectively.