

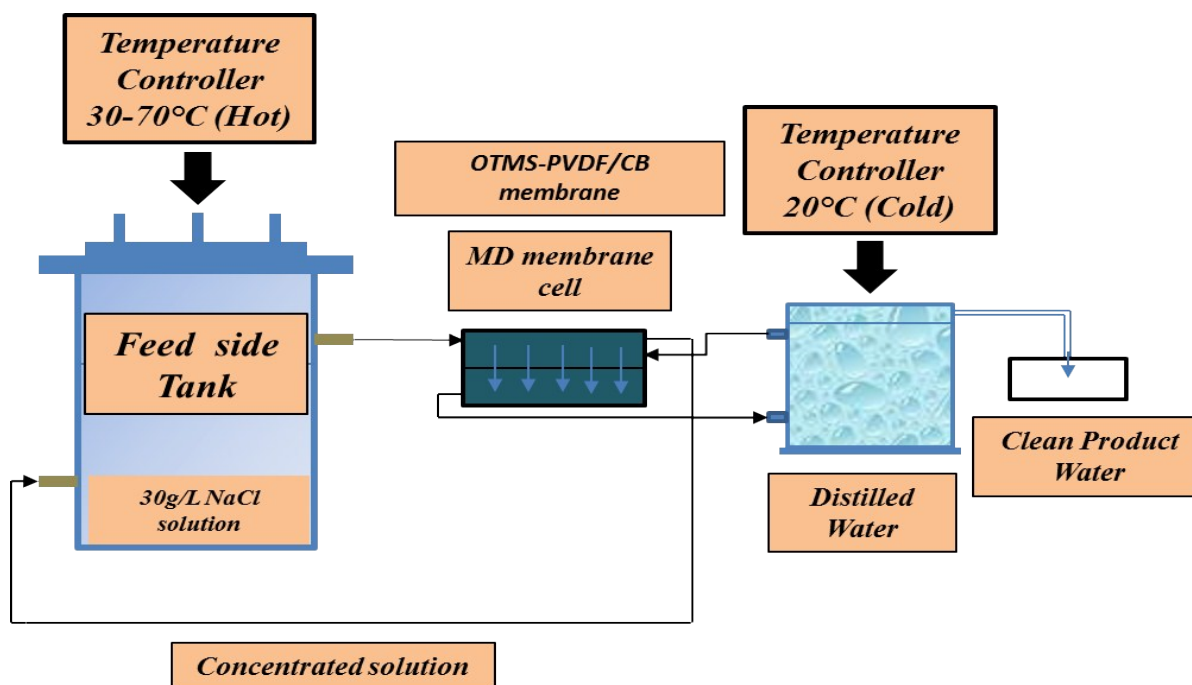
## Supporting Information

**SI Table 1. Conditions used for fabricating the PVDF membrane by utilizing a knife-casting device (phase inversion technique) [Note: Concentration % indicates: % w/v]**

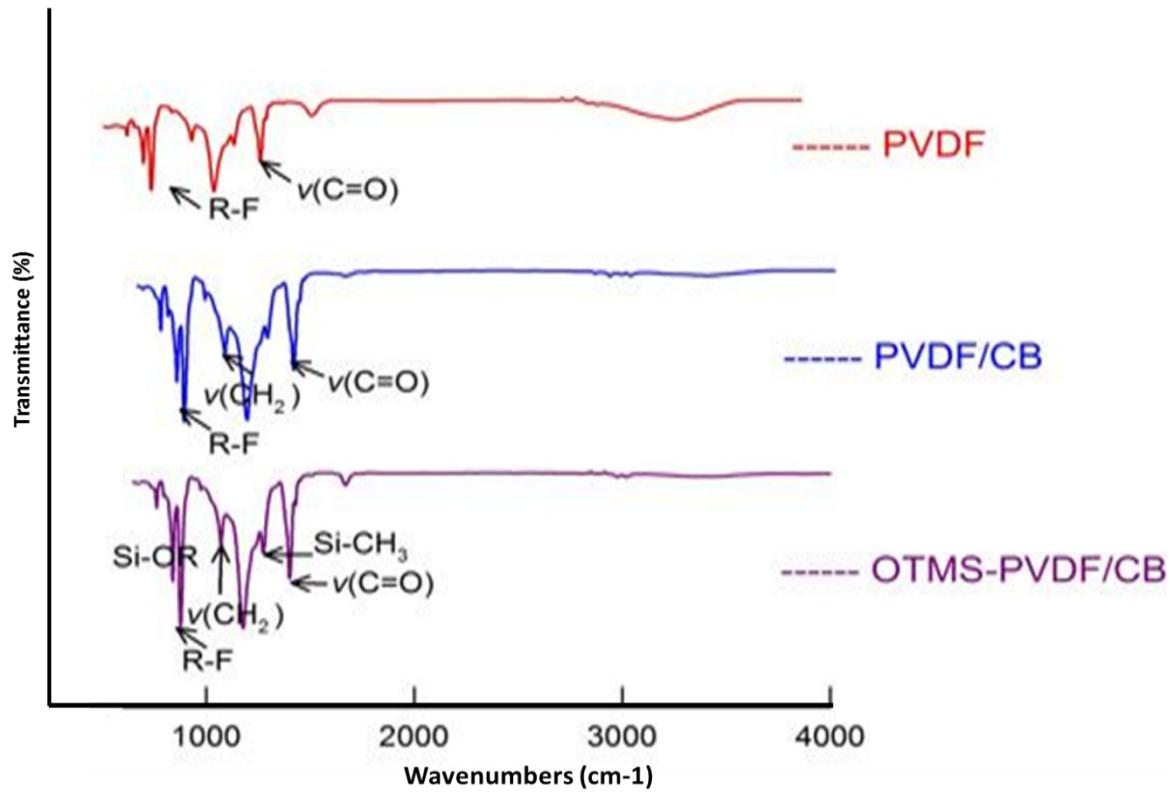
Polymer concentration	Casting Temperature	Relative air Humidity	Casting vacuum plate speed	Casting knife gap
18% PVDF	24± 2°C	31±5 %	10 mm/sec	50 µm
18% PVDF+ 2% CB	24± 2°C	31±5 %	10 mm/sec	50 µm

**SI Table 2. Effect of viscosity after CB incorporation in 18% w/v PVDF polymeric solution**

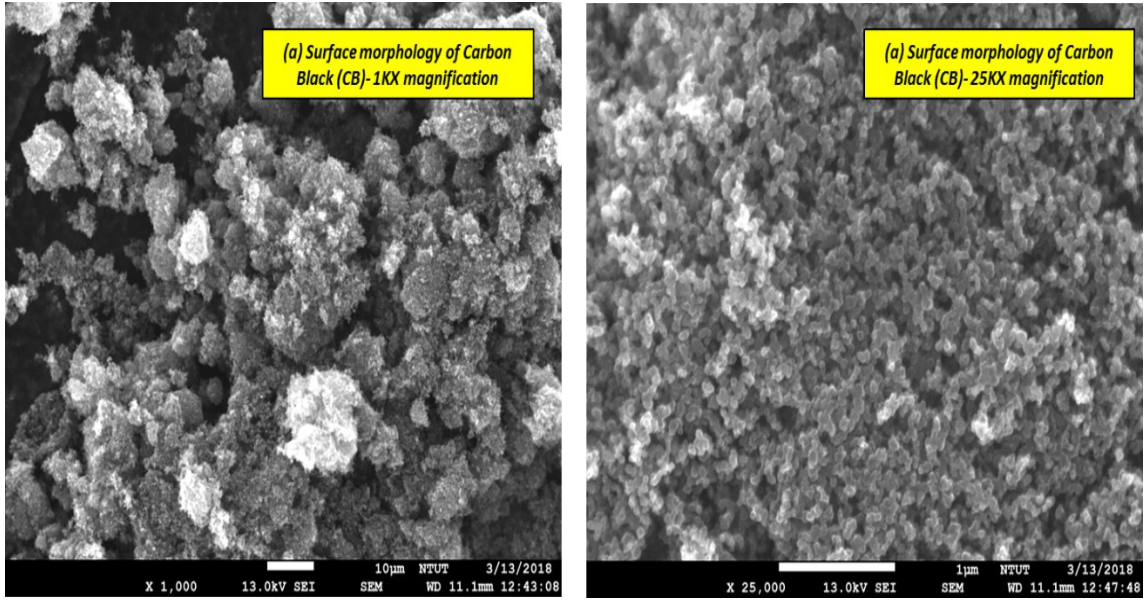
Solution Type	Viscosity (cP)
18 % w/v PVDF	48.7 cP
18% w/v PVDF + 2% w/v CB	51.5 cP



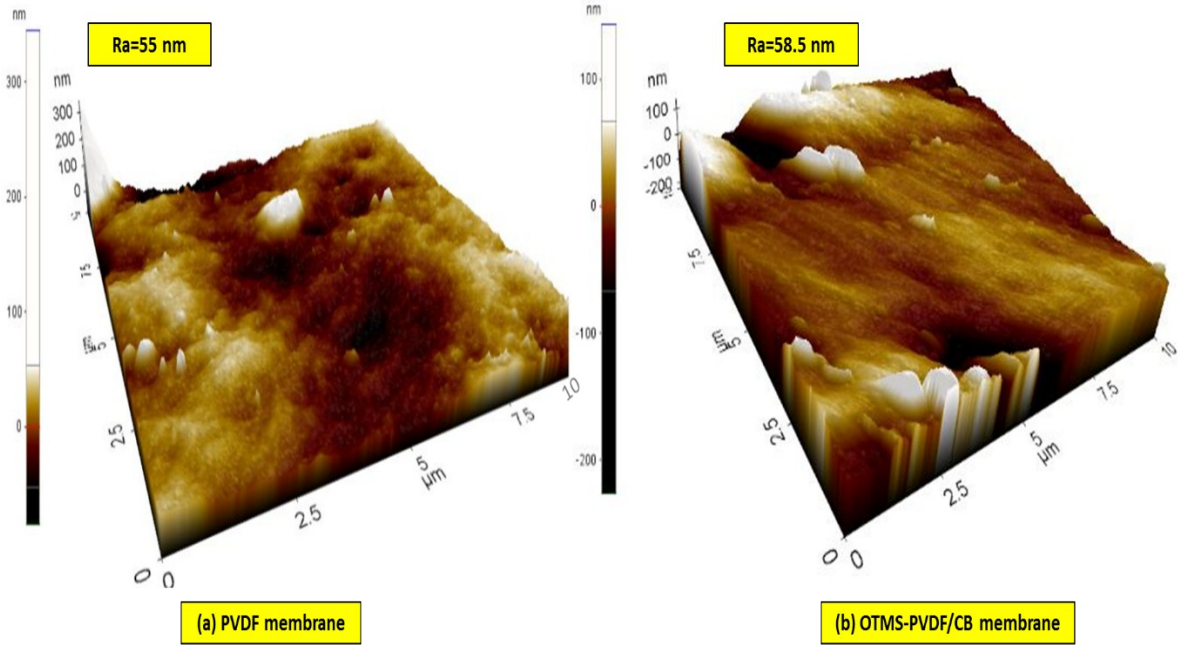
**SI Figure 1. Schematic of lab-scale DCMD process.**



SI Figure 2. FTIR spectroscopy analysis of the PVDF, PVDF/CB, and surface-modified OTMS-PVDF/CB membranes. [Note: FTIR spectra have been measured in the range of 600–4000 cm<sup>-1</sup>]



SI Figure 3. Surface topography and morphology of the granular CB. (a) Showing the CB granule of 1KX magnification (b) Showing their fine structure of 25 KX magnification



SI Figure 4: 3-D AFM pictures of different fabricated membrane surfaces (a) PVDF membrane and (b) OTMS-PVDF/CB membrane [Note: dimensions: 10 µm × 10 µm]