

Supporting Information For

Free standing graphene oxide membrane works in tandem with confined interfacial polymerization of polyamide towards excellent desalination and chlorine tolerance performance through Forward Osmosis.

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Characterization of free-standing GO:

Structural properties of free-standing GO were analysed by Xpert Pro X-ray diffractometer using Cu K α as a source. The free-standing GO was scanned from 5° to 80° with a step size of 0.049°. The XRD pattern of free-standing GO is shown in figure S1. The prominent peak at 10.4° is observed is corresponding to the oxidized graphitic peak.

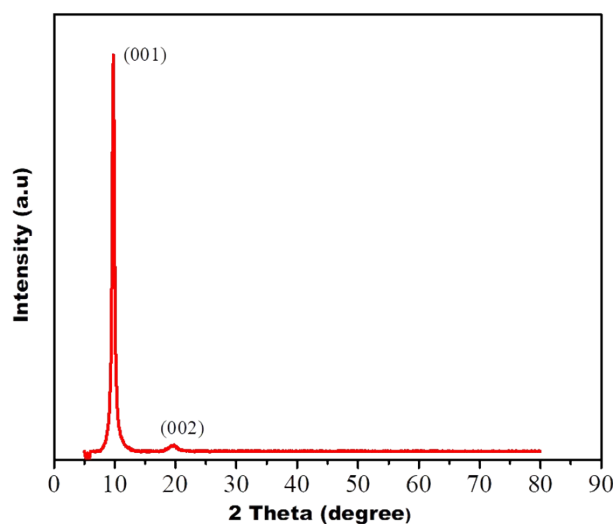


Figure S1: XRD pattern of free-standing GO.

The functional groups present in the free-standing GO were assessed using FTIR Spectra. From figure S2 it is clearly observed that peaks at 1720 cm⁻¹, 1625 cm⁻¹ and 1050 cm⁻¹ are characteristic peaks of carboxylic acid carbonyl stretching, aromatic C=C stretching and

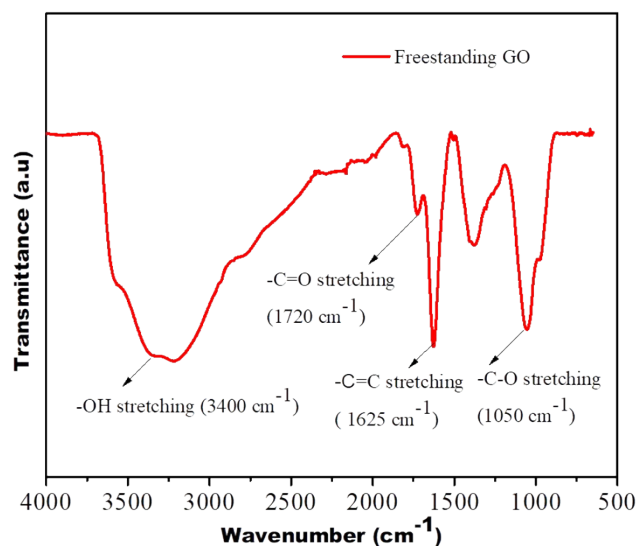


Figure S2: FTIR Spectrum of free standing GO.

epoxy C-O stretching respectively. Carboxylic acid group and hydroxyl groups are further validated by the appearance of an intense broad peak around 3400 cm^{-1} .

The surface and cross-sectional morphology of free-standing GO were characterized using a scanning electron microscope (SEM) by Ultra55 FESEM Karl Zeiss as shown in figure S3. From the cross-sectional image it can be stated that thickness of free-standing GO is approximately $7\text{-}8\text{ }\mu\text{m}$.

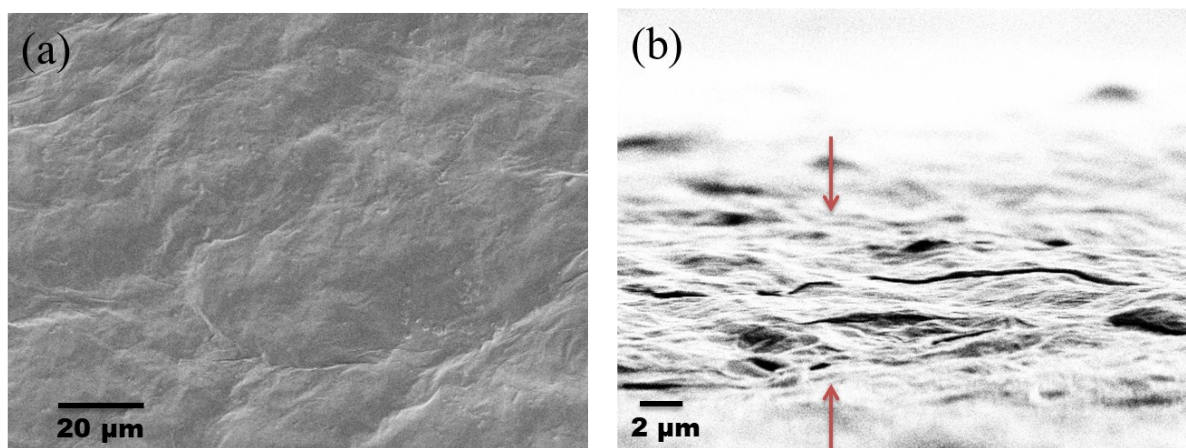


Figure S3: Micrograph showing the surface (a) and cross-sectional (b) morphology of free standing GO.

Cross-sectional morphology of composites membrane:

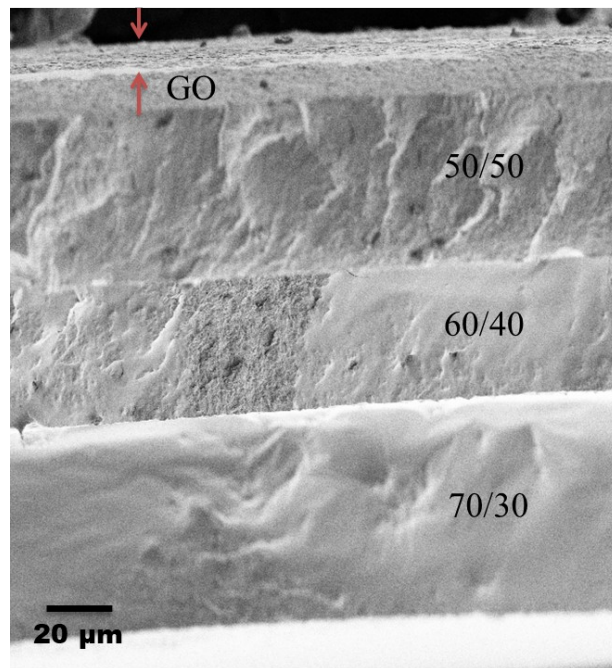


Figure S4: Micrograph showing the cross-sectional morphology of GO-PA modified composite membrane. It showing the overall thickness of the membrane in the range of 160-170 μm.