

## Scale-Up of 2D Material-Based Membranes

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Recently, nanosheet materials have been utilized for the preparation of high-performance membranes for both liquid and gas separation. Graphene oxide, MXene, graphene nanoribbons, MOFs & zeolite nanosheets are some of the materials. The fast expansion of membrane technology and science-based on 2D materials can be attributed to several reasons. First, precise molecular sieving or selective molecular transport can be achieved by the interlayer spacing of stacked nanosheets or by the crystalline pore structure. And abundant surface functional groups can interact with penetrating molecules affecting the solubility and diffusivity. Second, large aspect ratio, excellent mechanical and chemical stability of the nanosheet easily allow the fabrication of defect-free ultrathin film (thickness of nanometer scale) on porous support enhancing the flux of solvents or gas molecules. Unfortunately, membrane fabrication is only achieved in the lab-scale by using unpractical coating methods such as vacuum filtration or bar-coating. In this talk, I will introduce facial ways for the preparation of 2D materials-based membranes on a large-scale in a scalable manner.