

Two-Dimensional Carbon Family for Fast Solvent Nanofiltration

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Recently, 2D materials such as graphene and graphene oxide have been widely adopted for membrane applications in water purification, gas separation, and even for a separator in battery. The fast expansion of graphene-based membrane can be attributed to the precise molecular sieving effect by the stacked structure of nano-sheets and the abundant functional groups on basal plane interacting with target molecules. Large aspect ratio, excellent mechanical and chemical stability of graphene materials easily allow the fabrication of defect-free ultrathin film (thickness of ~10 nm) on the porous support, which enhances the flux of water or gas molecules. Most of all, 2D materials are easy to prepare by the well-established synthesis method like Hummer's method for graphene oxide. In the talk, several two-dimensional carbon materials and its application for solvent nanofiltration will be introduced including graphene oxide, graphene nanoribbon, and turbostratic carbon sheets.