

## Ultrafast and Selective Isopropyl Alcohol Nanofiltration with Turbostratic Nanoporous Carbon Sheets Membranes

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Development of organic solvent nanofiltration (OSN) membranes for viscous green solvents such as isopropyl alcohol (IPA) is one of the big challenges in pharmaceutical and fine chemical industry due to its sustainability. However, all existing membranes (including polymer membrane) for IPA nanofiltration have needed an alternative due to low solvent permeance from strong interaction between membrane materials and solvent molecules. Here, high performance OSN membrane is developed by stacking turbostratic nanoporous carbon sheets (TNCS) fabricated by rapid thermal treatment. TNCS membrane exhibits ultrafast IPA permeance ( $1800 \text{ L m}^{-2} \text{ h}^{-1} \text{ bar}^{-1}$ ) with sharp separation of solvent molecules from larger molecules than 600 Da, which is molecular weight cut off (MWCO). The performance exceeds the upper bound of IPA permeance of commercially available OSN membranes by two orders, maintaining high rejection rates for sub-nanoscale sized molecules.