Emerging Membrane Technology: Organic Solvent Nanofiltration (OSN) Overview

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Organic Solvent Nanofiltration (OSN), also called solvent resistant nanofiltration (SRNF), is an emerging class of separation process competitive to other commonly-known processes such as distillation and adsorption. OSN membranes separate solutes mainly based on their size and molecular weight, ranging between 100 ~ 2000 Da. Although it is still a young technology, it holds a tremendous potential with its ability to perform molecular separations in organic media using a simple pressure gradient at ambient temperature. Since many polymeric membranes are not stable in aggressive organic solvents, the liquid-phase application of membrane technology has been somewhat limited to aqueous systems such as reverse osmosis and wastewater treatment. However, OSN technology now allows inexpensive polymeric membranes to be used in various organic solvents, greatly expanding its applicability into many fields. For instance, cases such as de-waxing process in petroleum industry, organometallic catalyst recovery in fine chemicals industry, and solvent-exchange process in pharmaceutical industry have shown the potential of the OSN technology. In this presentation, a general overview of the OSN technology will be discussed.