



Fabrication Strategies for Nano Filtration Membranes

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ABOUT THE STUDY

Nano Filtration (NF) is a membrane liquid separation technology sharing many characteristics with Reverse Osmosis. Unlike Reverse Osmosis (RO), which has high rejection of all dissolved solutes, Nano filtration provides high rejection of multivalent ions, including calcium, and low rejection of monovalent ions, including chloride. It is a membrane filtration procedure and mostly used in disinfect water. Nano Filtration (NF) is a membrane filtration based technique that uses nanometer sized through pores that pass through the membrane. NF membranes have pore sizes from 1-10 nanometers, smaller than that used in microfiltration and ultrafiltration, but just larger than that in Reverse Osmosis (RO).

NF membranes used are predominantly created from polymer thin films. Materials which will consist of polyethylene terephthalate including aluminum. Pore dimensions are controlled through pH, temperature and time during development with pore densities ranging from 1 to 106 pores per cm². Nano Filtration (NF) membrane can be used in the Water treatment, Pre-treatment for Reverse Osmosis (RO), Pharmaceuticals, Textiles, and Bakeries process.

Membranes made from polyethylene terephthalate and other materials are referred to as track-etch membranes, named after the way the pores on the membranes are made. Tracking involves bombarding the polymer thin film with high energy particles. These results making tracks that are chemically developed into the etched into the membrane, which are the pores. Membranes created from metal which includes alumina membranes, are made through electro chemically developing a thin layer of aluminum oxide from aluminum metal in an acidic medium.

NF membranes are predominantly created from polymer thin films. Materials that are generally consist of metals including aluminum. NF membrane system means a water filtering system that uses membrane filters to process total dissolved solids. These water technologies are mostly used to soften water and to remove disinfection by products like natural and synthetic organic matter.

They concluded that using nano-filtration for treating surface water can remove completely Total Organic Carbon (TOC) and decrease the sulfate content material through approximately 90-99%, the carbonate content material through 82% and the monovalent salt content material through about 40-55%. Nano-filtration extracts organic compounds, nearly all bacteria, most natural organic matter and a wider range of salts. It is mainly used to soften hard water as it eliminates compounds that make water hard like divalent ions. Nano filtration is a separation technique characterized through organic, thin-film composite membranes with a pore size range of 0.1 nm to 10 nm. Unlike Reverse Osmosis (RO) membranes, which reject all solutes, Nano filtration membranes can operate at lower pressures and offer selective solute rejection based on both size and charge.

Nano Filtration (NF) membranes usually remove 50-90% of covalent ions including sodium. The design and operation of the filters used in NF membranes are similar to that of Reverse Osmosis (RO), with some differences. That being the membrane is not as tight as RO membranes and reduces a feed water pressure is required. NF has a pore size of approximately 0.001 micron. NF membrane has attained the name of the softening membrane as it is often used to filter water with low amounts of total dissolved solids, to remove organic matter and to soften water.

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