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Commentary

# Membrane Fouling (MF) Technique and Its Significance

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## ABOUT THE STUDY

Membrane Fouling (MF) is a technique whereby a solution is deposited on a membrane surface techniques which includes membrane bioreactor, reverse and forward osmosis, membrane distillation, ultrafiltration, microfiltration so that the membrane's performance is degraded. It is a major obstacle to the widespread use of this technology. Membrane fouling can cause severe flux decline and affect the quality of the water produced. Severe fouling may require membrane replacement. This increases the operating costs of a treatment plant. There are different types of foul ants: colloidal, biological, organic, and scaling or mineral precipitates.

Membrane Fouling (MF) can be divided into reversible fouling and irreversible fouling based on the attachment strength of particles to the membrane surface. Reversible fouling can be removed through a strong shear backwashing. Formation of a strong matrix of fouling layer with the solute during a continuous filtration technique will result in reversible fouling being transformed into an irreversible fouling layer. Irreversible fouling is the strong attachment of particles which cannot be removed through physical cleaning.

It is sometimes reversible but not always. That's why it's best to implement preventative measures to reduce membrane fouling in the first place. Below, we have outlined some common preventative measures to avoid membrane fouling. Membrane fouling is a technique by which the colloidal particles or solute macro molecules are deposited onto the membrane surface by physical and chemical interactions, which results in smaller membrane surface. Membrane fouling can cause various flux drops and affects the quality of the water produced. Severe fouling may require membrane replacement.

Membrane Fouling (MF) directly impacts membrane flux and has been extensively studied through many researchers. In general, membrane fouling control can be achieved through the following techniques: To mitigate the fouling rate, membrane fouling can be controlled through pre-treatment of influents, optimization of operational conditions, and modifying the membrane properties.

Even though Membrane Fouling (MF) is an inevitable phenomenon during Membrane Filtration (MF), it can be minimized through techniques including appropriate membrane selection and choice of operating conditions. Membranes can be cleaned physically, biologically. Physical cleaning consists of gas scour, sponges, backlashing using pressurized air. Biological cleaning uses biocides to remove all viable microorganisms, whereas chemical cleaning involves by using acids and bases to remove foul ants and impurities. Another strategy to minimize membrane fouling is the use of the appropriate membrane for a specific operation. The nature of the feed water must first be known then a membrane that is less prone to fouling with that solution is chosen. For aqueous filtration, a hydrophilic membrane is preferred for membrane distillation.

Membrane Filtration Systems (MFS), which includes Micro Filtration (MF), Ultra Filtration (UF), Reverse Osmosis (RO), and Nano Filtration (NF). Membrane Filtration (MF) occurs when contaminants are deposited on the surface of a filtration membrane, restricting the flow of liquids through the membrane's pores. There can be more elements that contribute to fouling, such as the presence of excess biological, and organic particles in the source water, an inappropriate choice of membrane material and unsuitable technique conditions including temperature, and pressure.

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