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Short Communication

Mechanism of Micro-Filtration Membrane and Its Characteristic's

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DESCRIPTION

Micro-Filtration (MF) membrane is a physiological filtration method that involves to transmitting contaminated liquids through a special pore-sized membrane to separate micro-organisms and suspended particles from the wastewater industry. It is frequently used in isolation or in combination with the other separation processes such as Ultra-Filtration (UF) and Reverse Osmosis (RO) to provide a synthesis gas complimentary of contamination [1].

Microfiltration is frequently used as a pre-treatment for other separation techniques such as ultrafiltration and as a post-treatment for detailed communication separation membrane. The characteristic size of the particles for microfiltration is between 0.1 and 10 μm. In terms of approximate molecular structure, these membranes are responsible of separating macro-molecules to molecular size less than 100,000 g/mol. Filtration used in the micro-filtration technique are particularly designed to prevent particles such as sediment, algae, protozoa, or large bacteria from passing through [2]. Water (H2O), monovalent species such as Sodium (Na+) or Chloride (Cl-) ions, absorbed or natural organic compounds, and small colloids and viruses will all pass through the filtration system.

Characteristics of membrane filtration

Three major characteristics differentiate membrane filtration techniques: driving force, permeate water system, and permeate flow. Pressure forces the microfiltration process, which uses suspended particles and water as filtrates and dissolved solutes containing water as encompass. Hydraulic pressure accelerates the separation process by increasing the flow rate (flux) of the liquid stream, but it has no effect on the chemical structure of the organisms in the extraction tool and product streams [3].

Membrane Fouling (MF) is a significant factor that affects the performance of microfiltration or any membrane technology. Membrane fouling is the deposition and accumulation of feed components on the membrane surface and within the semipermeable membrane, such as suspended particles, impermeable dissolved solutes, or even permeable solutes. The fouling of the membrane during the filtration process reduces the flux and, as a result, the overall efficiency of the operation. This is indicated when pressure drops reach a certain level. It occurs even if the operational parameters remain constant (pressure, flow rate, temperature and concentration). Membrane Fouling (MF) is mostly irreversible, though removing for a short period of time can reverse a portion of the fouling surface [4].

Membrane configurations

Micro-Filtration (MF) membranes can generally operate in two configurations.

Cross-flow filtration: Where the fluid is flowing slightly related with respect to the membrane. A portion of the characterized liquid in the feed solution is obtained under the filtration system, while the remaining of the water passes through the membrane untreated. Cross flow filtration is considered to be a single operation rather than a procedure.

Dead-end filtration: All procedures flow characteristics and particles larger than the pore sizes of the membrane are prevented at its surface. Cake formation occurs because all of the feed water is treated simultaneously. This method is commonly used for production or semi continuous filtration of low concentration solutions.

Applications of micro filtration

Cold removing and disinfection of beverages and pharmaceuticals. Removing of fruit juice, wines, and beer. Bacterial separation from water (biological wastewater treatment). Treatment of untreated sewage. Oil/water emulsification separation. Pre-treatment of water for Nano Filtration (NF) or Reverse Osmosis (RO). Separation of solids and liquids in pharmacies and food industries. Explanation and purification of cell bacterial cultures in order to separate macro-molecules from other large molecules, proteins, or cellular elements. Other biological and bio-technological applications

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include dextrose clarification. Paint and adhesive industrial production [5].

CONCLUSION

The dissolved organic liquid is passed through at a relatively high velocity of around 1-3 m/s and at low to moderate pressures around 100-400 kPa in a layer or tube form parallel or completely irrelevant to the semi-permeable membrane. To enable the liquid to pass through the membrane filter, a compressor is usually implemented on the processing technologies. There are also pumping system configurations: Pressure driven and vacuum driven. To measure the pressure, drop between the outlet and inlet streams, a differential or regular pressure gauge is commonly attached. Micro-Filtration (MF) membranes are most commonly used in the water, beverage, and bio-processing industries. The recovery rate of the discharge product stream after treatment with a micro-filter membrane is typically in the 90-98% range.

REFERENCES

1. Wakeman RJ, Williams CJ. Additional techniques to improve microfiltration. Sep Purif Technol. 2002;26(1):3-18.
2. Leos JZ, Zydney AL. Microfiltration and ultrafiltration: Principles and applications. Routledge. 2017.
3. Ripperger S, Altmann J. Cross flow microfiltration-state of the art. Sep Purif Technol. 2002;26(1):19-31.
4. Saboyainsta LV, Maubois JL. Current developments of microfiltration technology in the dairy industry. Le Lait. 2000;80(6): 541-553.
5. Belfort G, Davis RH, Zydney AL. The behavior of suspensions and macromolecular solutions in crossflow microfiltration. J Membr Sci. 1994;96(1-2):1-58.