OPEN ACCESS Freely available online

ISSN: 2252-5211
International Journal of Waste Resources

Opinion Article

Waste Water Treatment by using Microfiltration Technique

Ludovic Merenda*

Department of Chemical Engineering, Khalifa University, Abu Dhabi, United Arab Emirates

DESCRIPTION

Physical filtration techniques such as microfiltration are used to separate bacteria and suspended particles from process fluids by passing contaminated fluid through a specific membrane filter with tiny pores. For all living things, water is the source of energy. Water that is suitable for drinking must be pure, clear, and uncontaminated. Water picks up soil particles in the ground, travels through the atmosphere, and then mixes with them as it travels along the earth's surface. The levels of contaminants are also raised by human activity. If permitted to enter water systems, industrial chemicals and human waste can immensely harm people's health. Water becomes unfit for drinking when it contains too much mud and other substances. In addition, as it moves, water dissolves and carries away anything it encounters, including heavy metals, which may be brought on by corroded pipes that transport water from the source to the consumer.

To get rid of the aforementioned pollutants, microfiltration utilizing micro-sieves is helpful. The micro-sieves are made up of a thin, uniform layer of well-defined and uniformly sized pores on flexible membranes. They can display permeability and selectivity that are impossible for ordinary membranes to display because of their structure. The pores can range in size from a few micrometers to hundreds of them. Paramagnetic particles that combine to create linear chains when an applied external magnetic field is present can be used to mix in microfluidic channels. To control tiny fluid flow, the resulting chains can be magnetically activated. Use of microfiltration in the dairy sector. An electro kinetic method is used to mix analytes in microfluidic Lab-on-Chip devices. Antibiotic Resistance Genes (ARGs) are thought to be significant environmental pollutants, and environmental scientists and engineers are striving to stop the spread of ARGs. Particles of different sizes and water are combined at the micromixer stage. The different micromixer inlets are used to supply the micromixer with microorganisms such as *Salmonella Enterica*, which has a size of 0.7 m, Cyanobacteria, which has a size of 35 µm, and Green algae, which has a size of 60 µm. The microfiltration steps are used to force the contaminated water through.

By combining membrane separation with Electrocatalytic (EC) destruction of organic pollutants, Electrocatalytic Membrane Reactors (ECMRs) were created as hybrid water treatment methods to address the latter issues. In electro-conductive membrane reactors (ECMRs), the production of oxidizing radicals and electron transfer are the main mechanisms for the degradation of organic pollutants. By using a cell voltage between the electro-conductive membrane anode and cathode, this technology improves mass transfer from the bulk solution to the reactive membrane anode surface during the membrane filtration process. While metal/metal oxide materials may be susceptible to corrosion and leaching during the electrocatalytic processes, the manufacturing of ceramic ECMRs necessitates intricate chemical and thermal treatment procedures. In contrast, in order to increase the electrical conductivity and electrocatalytic characteristics of polymer composite membrane anodes, conductive nanoparticles were included into the polymeric matrix using wet chemical or deposition processes. For instance, ZnO coated electrospun poly (acrylonitrile) (PAN) membranes were discovered to exhibit good removal effectiveness above 95% against diverse organic dyes with a reaction kinetic constant of 4.9 10-3 min1. However, the weak electrical conductivity and subpar electrocatalytic efficiency of polymer composite membranes put them at a disadvantage.

CONCLUSION

In order to create flexible microfiltration Carbon Nanofiber membranes (CNF) for effective separation and electrocatalytic destruction of developing organic contaminants, a cutting-edge stepwise methodology was created. By adding oxygen-containing functional groups to the CNF membrane surface *via* oxygen plasma treatment, the CNF membrane's wettability and surface reactivity were improved. To ascertain each microfiltration membrane's effectiveness in removing microbes, variations in pressure and velocity at the output are also investigated. The

Correspondence to: Ludovic Merenda, Department of Chemical Engineering, Khalifa University, Abu Dhabi, United Arab Emirates, Email: ludovic@mere.com

Received: 21-Jun-2023, Manuscript No. IJWR-23-22181; **Editor assigned:** 23-Jun-2023, PreQC No. IJWR-23-22181 (PQ); **Reviewed:** 10-Jul-2023, QC No. IJWR-23-22181; **Revised:** 17-Jul-2023, Manuscript No. IJWR-23-22181 (R); **Published:** 24-Jul-2023, DOI: 10.35248/2252-5211.23.13.546.

Citation: Merenda L (2023) Waste Water Treatment by using Microfiltration Technique. Int J Waste Resour. 13:546.

filtration process appears to work best when velocity increases and pressure lowers, according to the results. Our ability to create these devices employing microfluidic mixers and microsieves has been made possible by the results of the finite element analysis carried out using the COMSOL multiphysics® tool.