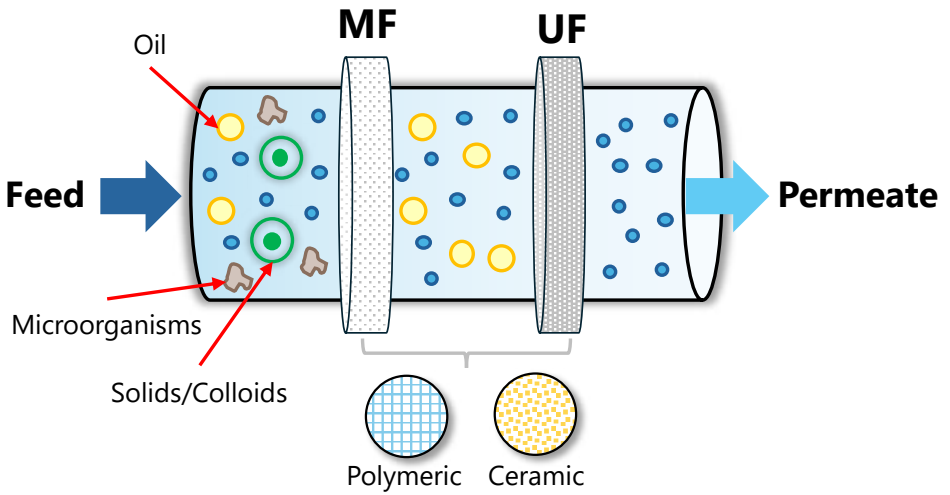
Microfiltration (MF) / Ultrafiltration (UF)

Process Description

MF/UF are pressure-driven membrane filtration processes that remove suspended solids, colloids, microorganisms, and high-molecular-weight organic compounds from water. Membranes with pore size above 0.1 µm are classified as MF; while membranes with pore size smaller than 0.1 µm are called UF. MF/UF systems operate at high (> 90%) water recovery compared to reverse osmosis, producing a permeate and a concentrated retentate streams. Membrane performance is maintained through periodic permeate backwashing to remove accumulated foulants.

MF/UF membranes are available in polymeric and ceramic configurations. Polymeric membranes are widely used due to their lower cost, while ceramic membranes offer greater resistance to fouling, chemicals, abrasion, and high temperatures. Membrane filtration is typically applied for water clarification, wastewater reuse, and reverse osmosis pretreatment.

Process Schematic



Publications

- Validation and application of a membrane filtration evaluation protocol for oil-water separation (Link)
- Performance evaluation of emerging block copolymer membranes for oil-water separation (Link)
- Membrane applications and opportunities for water management in the oil & gas industry (Link)
- Protocol for preparing synthetic solutions mimicking produced water from oil and gas operations (Link)
- Advanced water treatment technologies for produced water (Link)

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