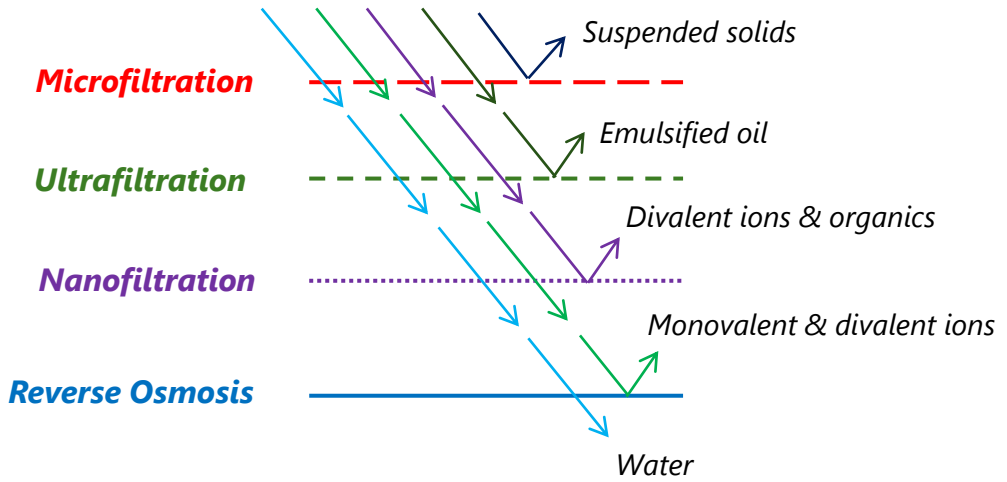
Nanofiltration (NF)

Process Description

NF is a pressure-driven membrane technology typically used for water softening, sulfate removal, and selective ion separation applications. NF membranes preferentially reject divalent ions while allowing a significant portion of monovalent ions to pass, enabling efficient removal of hardness and sulfate constituents.

Compared with reverse osmosis (RO), NF operates at lower pressures and can achieve higher water recovery, contributing to improved energy efficiency and reduced treatment costs. NF membranes are typically supplied in a spiral-wound configuration, which maximizes membrane packing density while minimizing equipment footprint. NF has been widely applied in municipal and industrial water treatment, including seawater injection systems for oil and gas operations where sulfate removal is required to mitigate reservoir souring.

Process Schematic



Publications

- Screening of advanced produced water technologies: overview and testing results (Link)
- Membrane applications and opportunities for water management in the oil & gas industry (Link)

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