

Use of chemical species as dynamic membranes with crossflow microfiltration

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Abstract: The feasibility of utilizing the phenomenon of dynamic membrane formation with crossflow microfiltration in treating domestic wastewater was investigated. The primary membrane, used throughout the investigation, was made of woven polyester. Different chemical species, such as CaCO_3 , FeCl_3 , and NaAlO_2 , were used in forming dynamic membranes on top of the primary membrane. Secondary effluent from a domestic activated sludge wastewater treatment plant was treated. A calcium carbonate dynamic membrane produced a stabilized permeate flux of $90 \text{ L/m}^2\cdot\text{h}$, with a permeate turbidity of 0.21 Nephelometric Turbidity Unit (NTU), at optimum conditions. Ferric chloride produced optimum results when it was mixed with tap water. A permeate flux and turbidity of $70 \text{ L/m}^2\cdot\text{h}$ and 0.16 NTU, respectively, were obtained. Sodium aluminate produced a stabilized permeate flux of $77 \text{ L/m}^2\cdot\text{h}$ when it was mixed with tap water during the formation of the dynamic membrane. The permeate turbidity was 0.16 NTU. The fouling mechanism of the three dynamic membranes was investigated, and empirical models were produced.