



Chemical cleaning of ultrafiltration membrane fouled by an activated sludge effluent

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ABSTRACT

In this study, membrane foulants and cleaning efficiency of different membrane cleaners for the ultrafiltration (UF) of a municipal activated sludge effluent were investigated. The major membrane foulants were polysaccharides, proteins, and humic substances (HS). Backwashing the fouled membrane removed some polysaccharides and proteins, but was not able to displace the adsorbed HS. Of the cleaners studied for the polyvinylidene fluoride (PVDF) UF membrane the most effective were sodium hypochlorite (200 ppm available chlorine), Terg-a-zyme (1.0 wt.%), and sodium dodecyl sulphate (10 mM). The results indicated that hydrophobic attraction was the most important force keeping the hydraulically irreversible foulants attached to the membrane. The surfaces of the fouled and cleaned membranes were analysed and interactions among the membranes, foulants, and the cleaning agents were discussed in terms of their chemistry and cleaning efficiency.

Keywords: Activated sludge effluent; Chemical cleaning; Cleaning efficiency; Membrane analysis; Membrane fouling; Ultrafiltration

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