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CHARACTERIZATION STUDIES OF A NEW CERAMIC NANOFILTRATION MEMBRANE WITH FOULING RESISTANT PROPERTIES FOR EFFICIENT WATER TREATMENT

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Abstract

Membrane technology has become a fundamental unit operation in the industry and society of nowadays and fouling is, probably, the most important concern related with this technology. Fouling is a complex process that can limit the performances of facilities using membranes. Many research efforts have been done in order to reduce fouling tendency. Ceramic membranes can play a major role in fouling mitigation due to its high hydrophilic nature. This paper describes the characterization of a new ceramic nanofiltration (NF) prototype membrane with increased surface and modified in its active surface, which makes it more resistant to fouling. The main goal of this paper was to characterize, under different operating conditions, the membrane performance. Authors have used two model foulants: peptone (meat extract) and humic acids as mimicking fouling substances usually present in natural waters and wastewaters. Tests consisted of using different concentrations of these model foulants; varying the pH (6.0-9.0) and using different cross flow velocities (CVF) from 0.5 to 1.5 m/s. Influence of calcium on foulant deposition onto membrane has also been studied. Results show that this new membrane showed resistance to fouling while conserved a high permeability and rejection.

Key words: ceramic membrane, fouling, nanofiltration

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