

## Removal of oily hydrocarbon contaminants from wastewater by $\gamma$ -alumina nanofiltration membranes

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### ABSTRACT

A supported  $\gamma$ -Al<sub>2</sub>O<sub>3</sub> nanofiltration (NF) membrane was prepared from colloidal dispersions of bohemite via a sol–gel method. The structure and morphology of the membrane were characterized by scanning electron microscopy (SEM) and atomic force microscopy (AFM). The pore mean diameters were determined by nitrogen adsorption measurements. The filtration properties of the membrane were tested by cross flow nanofiltration using oil-in-water emulsion. The influence of the parameters such as transmembrane pressure (TMP), cross flow velocity (CFV) and oil concentration in feed were investigated by the measurements of permeate flux and total organic carbon (TOC). The removal efficiency higher than 90% was obtained under all experimental conditions.

*Keywords:* Alumina membrane; Nanofiltration; Oily water; Permeate flux; Cross flow

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