Elaboration and characterization of ceramic membrane supports from raw materials used in microfiltration

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\textbf{ABSTRACT}

There is a much current interest in the application of membranes in separation procedures because of their application in the treatment of big amounts of wastewaters. The use of ceramic membranes has many advantages such as a high thermal and a chemical stability, a pressure resistance, a long lifetime, and good defouling properties. Microfiltration (MF) and ultrafiltration are often used to remove particles, micro-organisms, and colloidal materials from suspensions. In this work, the supports for MF were prepared with local clays and calcite mixtures. The choice of these raw materials is based on their natural abundance (low price) and interesting microstructures. These supports were made by an extrusion technique in order to obtain tubular supports, which were afterward sintered at 1,250°C for 1 h. It has been found that the elaborated supports had interesting characteristics; an average pore size of about 4 \( \mu \text{m} \) and a porosity ratio around 50\%. Moreover, the pore size distribution is almost homogenous (mono-modal type). The surface and the cross-section morphologies observed through a scanning electron microscope are also homogenous and do not present any macro defects (cracks, etc.). Moreover, these supports were tested with distilled water. A cross-flow microfiltration was performed. The result showed a good retention of supports turbidity.

\textit{Keywords:} Kaolin; Calcite; Supports; Membranes; Microfiltration; Permeate flux

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