



Elaboration of low-cost ceramic membrane based on local material for microfiltration of particle from drinking water

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ABSTRACT

A low-cost, ceramic membrane was prepared from local Cameroon clay (collected from Mouka village), small amount of binding materials and organic material (rice husks). The support was prepared by paste casting. It was sintered at temperature of about 1100 °C. The raw materials and the prepared support were characterized using thermal analysis, X-ray diffraction and scanning electron microscope. Subsequently, porosity, flexural strength, chemical stability, pure water permeability, phenol and particle elimination was investigated. At this temperature, the flexural strength, chemical stability and porosity of the membranes were found to be excellent. Based on these results, average pore diameter was 0.459 μm with porosity of 36.83 % and flexure strength of 22 ± 5 N. At this average size, the support was appropriate in microfiltration and can retain micro-organism. The results revealed a maximum retention of 98 % for particle suspension after continuously running for 2h without backwashing; high permeate flux of 0.83 cm.mm⁻².min⁻¹ was obtained in the permeability of pure water at frontal mode filtration.

Keywords: clay material, drinking water, Microfiltration, Ceramic membrane, particle.
