



## Flux decline and membrane fouling in cross-flow microfiltration of oil-in-water emulsions

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### ABSTRACT

One of the major problems in pressure driven membrane processes is the reduction of the flux to far below the theoretical capacity of the membrane. The typical variation of the flux with time is that of initial rapid decrease followed by a long and gradual decline. The results of an experimental study regarding fouling mechanisms of membrane in separation of oil from oil-in-water emulsions are presented. Mullite microfiltration membranes were synthesized from kaolin clay as MF ceramic membranes. Hermia's models were used to investigate the fouling mechanisms of membranes. The effect of pressure, cross-flow velocity (CFV), temperature and oil concentration on flux decline has been investigated. The results show that cake filtration model can well predict the flux decline of mullite ceramic membranes. After cake filtration model, the best flux predicted to the experimental data was intermediate pore blocking model and worst predicted flux was for complete pore blocking model.

*Keywords:* Membrane fouling; Microfiltration; Ceramic membranes; Hermia's models

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