

IN SITU INVESTIGATION OF SOFT CAKE FOULING LAYERS USING FLUID DYNAMIC GAUGING

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ABSTRACT

Cake fouling is a major factor contributing to flux decline during cross-flow filtration. Its behaviour is also difficult to predict, especially for challenging separations wherein organic materials often form compressible cakes with high resistance. In this study Kraft lignin was used as a model material for organic foulants in cross-flow microfiltration experiments, and a non-contact fluid dynamic gauging (FDG) technique in pressure-mode configuration was used to investigate the cake fouling layers in situ. Using FDG, very thin fouling layers were observed; in addition, FDG was used to investigate their cohesive and adhesive strengths, showing that over a 10-fold increase in fluid shear stress was required to remove foulant closer to the membrane compared with that on the surface of the cake.