

## A study on the influence of ionic strength on the elution behaviour of membrane organic foulant using advanced separation tools

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### ABSTRACT

Although membrane technology has become a reliable and viable alternative for water and wastewater treatment, membrane fouling is a serious challenge. In this case study, we report application of different techniques to extract foulant from the hollow fibre membrane and characterize the foulant into various components of organic, inorganic and different fractions. The organic foulant was subjected to high-pressure size exclusion chromatography (HPSEC) and flow field-flow fractionation (FIFFF) analysis to study the influence of ionic strength on its elution behaviour using NaCl and CaCl<sub>2</sub> as carrier solutions. It was observed that an increase in ionic strength delayed the elution time of both the organic foulant and the Na-salt of polystyrene sulphone (PSS) with HPSEC. However, no such effect was observed with FIFFF analysis. Such study is significant because the characteristics of the membrane organic foulant are believed to be influenced by the carrier ionic conditions and pH and, therefore their subsequent interaction with the membrane and membrane fouling process. However with FIFFF, whether the influence of carrier ionic strength is limited to certain type of ionic carriers or certain groups of natural organic matter is a scope for further research.

**Keywords:** Flow field-flow fractionation (FIFFF); High performance size exclusion chromatography (HPSEC); Ionic strength; Membrane fouling; Organic foulant

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