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## Modelling of membrane cascades for the purification of oligosaccharides

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## ABSTRACT

The aim of this study was to evaluate the potential of NF membrane cascades for continuous oligosaccharide purification. Three different nanofiltration membranes were evaluated, and the best combination in terms of membrane type and process parameters was determined for two commercial oligosaccharide mixtures of fructooligosaccharides (FOS) and galactooligosaccharides (GOS). To represent the cascade mathematically, a dynamic model was built based on film theory and on measurements performed in single-stage conditions. The model predictability was demonstrated with experiments in a membrane cascade set-up.

Considering an initial purity of 84% for FOS and 40.4% for GOS, the model predicted a maximum attainable purity of 94.9% and 46.7% for FOS and GOS respectively. A minimum yield of 90% was used as constraint during the optimisation process, in which the physical limitations of the set up were also taken into account. This paper demonstrates that the trade-off situation between purity and yield can be overcome by using cascade configuration, leading to an efficient separation that cannot be achieved by single-stage membrane systems.

Keywords: Membrane cascades; oligosaccharides purification; dynamic modelling.

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