

Evaluation of the Operating Parameters for the Separation of Xylitol from A mixed Sugar Solution by using A polyethersulfone Nanofiltration Membrane

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Abstract: Nanofiltration (NF) membranes may offer a good route for the recovery of xylitol due to the difference in the size of its particles compared to the other sugars. We evaluated the ability of an in-house polyethersulfone (PES) NF membrane to separate xylitol from a simulated broth solution containing xylose and arabinose. Initially, a Box-Behnken design was utilized to optimize the factors that were significantly involved in the recovery of xylitol, such as the concentration of the components, the composition of the solution, and the pressure. The results obtained from the analysis of the experimental response revealed that the fabricated PES membrane was able to retain 92% of the xylitol and remove 50% of the arabinose, with the purity of the xylitol being enhanced accordingly. The results of fouling showed a good membrane performance for long-term filtration. The concentration polarization was dominated by the membrane pores and the charge. It could be concluded that nanofiltration has a high potential to recover xylitol from its corresponding sugars.

Keywords:

PES Membrane, Box-Behnken, Xylitol Solution, Fouling, Concentration Polarization.

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