

# Chemical Engineering Thesis Defense

Desalination Pervaporation Using Modified Zwitterionic  
Poly(arylene ether sulfone) Membranes

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## Abstract

Freshwater is becoming more and more scarce, and the need to make use of other water resources is critical. Although processes such as Sea Water Reverse Osmosis (SWRO) exist, these processes are not without drawbacks, such as a brine with a high salt concentration being a byproduct of SWRO. Pervaporation is a potential solution to this problem, however the membranes used in these processes are prone to fouling and the high salt conditions are difficult to work around. Incorporating zwitterions into the polymeric backbone of these membranes has proven to be an effective way to increase fouling resistance. In this work, sulfobetaine – based zwitterions were incorporated into the backbone of poly(arylene ether sulfone) to synthesize sulfobetaine – modified poly(arylene ether sulfone) (SB-PAES) membranes, which were then tested in a cross-flow pervaporation apparatus to analyze salt rejection.

The SB-PAES membranes were tested with feed solutions of pure water and salt solutions with concentrations of 1 g/L, 5 g/L, and 10 g/L.



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Zoom Link: <https://asu.zoom.us/j/84956252999>