



Simulation of Pressure Retarded Osmosis (PRO) process for power generation

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Pressure retarded osmosis (PRO) is an interesting membrane technology for alternative power generation operating based on difference in osmosis pressure between river water and seawater. Water from river having a low salinity permeates through a membrane to the other side where elevated pressure seawater having higher salinity flows. The permeated water is then passed through a turbine to generate power. To date, there are a few works on development of mathematical models for predicting water flux, power density, and efficiency under specific conditions. The objective of this work is to investigate the effects of parameters to find the optimal operating conditions such as concentration of feed, membrane types, temperature, and feed flow rate to obtain the highest performance in term of power density. Water resources such as brine water and sea water are compare to determine the most efficient utilization of water resources. The available data of membrane properties and chemical properties of wastewater and seawater from literatures are used as input data in this study. The process simulation of PRO is performed by using Aspen Custom Modeler and Aspen Plus software.

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