

Researching for performance of membrane distillation for operating conditions and design parameter

이성호, 양대륙^{1,*}
고려대학교 대학원; ¹고려대학교
(dryang@korea.ac.kr*)

In reverse osmosis(RO) process, a membrane contactor (MC) may make equipment size, production capacity ratio, energy consumption and waste production decrease.

Membrane distillation(MD), one of the MC is most suitable process for these improvement. Unlike RO process, the driving force of MD process, is the difference of the saturated vapor pressure induced by the difference of temperature. Therefore, MD process is not limited by concentration polarization occurred in RO process, but by temperature polarization. Also MD process use a hydrophobic membrane located between feed side (retentate side) and distillate side (permeate side) because the transport mechanism of MD process is different to one of RO process. The hydrophobic membrane access to only vapor phase of feed stream for permeating through the membrane. Therefore, the MD process can be achieved 100% rejection of ions, macromolecules colloids and other nonvolatile components.

In this study, the mathematical model of MD process is developed and then using the model, the effects of the operating conditions and design parameters are researched.