A Study on the Effect of Linear Velocity on Reverse Salt flux in Forward osmosis and its Modified Model

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Forward osmosis (FO) has gained much attention as a desalination technology that does not use any other energy source except osmotic pressure. However, reverse salt flux (RSF), which causes loss of draw solute in FO, and concentration polarization (CP), which causes loss of effective osmotic pressure, are hindering the expansion of technology.
Previous studies have developed model based on solution-diffusion theory to predict water flux and salt flux, and calculate effect of CP phenomena. In addition, various studies have been conducted to overcome these obstacles by changing operating conditions such as draw solute, temperature, and linear velocity.
However, under the assumption that linear velocity used in the lab-scale experiments makes the boundary layer negligible, so many studies about velocity have not been conducted compared to other factors.
Industrial FO uses lower velocities compared to lab-scale and are therefore highly affected by RSF. Therefore, in this work, we want to present experiments on velocity and a new model that has been modified to reflect RSF based on it.