

Efficient measurement of actual intrinsic membrane parameter in forward osmosis (FO) using constant flux

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Forward osmosis (FO) has been attracted to researchers and industrial fields as sustainable solution for water stress. For designing efficient membrane processes, intrinsic membrane parameters have been estimated. Among parameters, actual diffusion coefficient (D) measurement is important because it allows the characterization of the solute's osmotic transport to the membrane. However, they not have been standard method due to laborious work and expensive equipment.

We proposed a new estimation method of actual D based on pressure assisted forward osmosis (PAFO) using constant flux. This method has two advantages. First, a fixed permeate flux makes concise condition for understanding water and solute transport phenomena in membrane. Second, this continuous constant flux method provides D as a function of concentration with a single experiment. In past methods, time consuming and laborious experimental tests is needed for obtaining values for various range of draw solute concentration. Moreover, This method enables to measure diffusion coefficient of mixture of various solutes and to understand complex transportation in osmosis.