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# Modeling of solute transport in multi-component solution for reverse osmosis membranes

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**ABSTRACT**

The model of salt transport through the membrane in multi-component system was developed with the irreversible thermodynamics theory considering the effect of the interaction between the salt ions. With the proposed transport model, the model for spiral-wound module was built based on the mass conservation law and concentration polarization derived by film theory. Through the parameter estimation, the frictional coefficients related to permeability of water and each ion was determined and then phenomenological analysis was conducted. The simulation results show that the salt rejection is increasing as the applied pressure and feed flow rate increasing. Also, the predictions by present model are in good agreement with the experimental data in the literature.

*Keywords*: Desalination; Spiral-wound reverse osmosis membrane; Membrane transport modeling

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