Osmotically-driven membrane modeling for selecting draw solute in forward osmosis desalination process

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In forward osmosis desalination process, energy consumption of the whole process and product water yield is mainly determined by selection of draw solution. This research aims at identifying the optimal draw solute by a systematic approach. A membrane model is presented to test various draw solute candidates. The model is implemented by identifying typical parameters of electrolyte system is characterized that it contains water and dissolvable solutes which separate anions and cations. The analysis of water-ion interaction or water-molecular interaction permits comparing the expected performance of draw solutes. Water-ion interaction parameters from activity coefficient models are gathered from Aspen Properties, OLI software and additional experimental data. The developed model will greatly facilitate evaluating the performance of potential draw solutes for forward osmosis process.