

Experimental and simulated results of hybrid FO, crystallization and RO desalination process

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Seawater desalination based on membrane technology is widely considered as source of water supply so it can alleviate water scarcity. At present, reverse osmosis (RO) is one of the most effective and robust technologies for seawater desalination and wastewater reuse. Nevertheless, RO process generally requires high applied pressure which leads to high energy consumption and operational cost. Recently, forward osmosis (FO) is emerging technology due to its low energy consumption. It has gained increasing attention in the field of seawater desalination. However, FO process still requires draw solution recovery process such as distillation which consumes much energy in separating fresh water from draw solution. In this study, a new hybrid SWFO, Crystallization and SWRO process is suggested as an alternative desalination process. The simulation and experiments were conducted in order to estimate the required energy of the hybrid SWFO, Crystallization and SWRO process. As a result, the energy consumptions of the hybrid process using the selected draw solutes are lower than the typical RO process.