

FO RO and Crystallization Hybrid Process Solute Selection Experiment for Enhanced Water Flux and Efficiency

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Not all forms of natural liquids are strictly potable water, including the vast infinite source of seawater. Thus seawater desalination is the best option for limitless supply of potable water. There are roughly two possible ways to desalinate seawater. One is selective evaporation and the other is membrane filtration. The former involves boiling salt water to obtain evaporated H₂O which does not necessarily distill into pure H₂O and the process is not fast enough for industrial applications. The latter involves osmotic pressure gradient through membrane that are naturally driven forward osmosis or pressure driven reverse osmosis. Each as individual does not surpass the selective evaporation in efficiency. A stand-alone FO process is not much faster than the evaporation method and the RO process requires too much drive energy. Together, however, they should provide a more efficient and thoroughly desalinated potable water from seawater. This study will focus on temperature dependent draw solute investigation that will provide better FO water flux and lower RO process drive pressure.