

Experimental analysis on system performance of spiral wound RO and FO membrane modules in accordance with draw solutions and operation conditions

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The types of membranes and membrane properties in a spiral wound forward and reverse osmosis membrane channel, draw solutions utilized FO, RO, or hybrid processes and operation conditions, pressure, temperature, flow-rate, are important concerns for understanding the performance of membrane processes. However, an accurate quantification of these elements derived from fundamental principles is impractical due to the complexity of the processes. In this study, experimental analysis was developed to estimate the performance of the spiral wound membrane modules with a proposed FO-RO system. This system has membrane modules, pumps, tanks, transmitters, sensors, and data logging hardware to identify conditions in every corner of the system. Under various operation conditions, patterns were found with experimental observations in along membrane channel of spiral wound membrane modules.