Cost optimization and sensitivity analysis in a FO/crystallization/RO hybrid process with high-temperature operation

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In this study, cost optimization and sensitivity analysis in FO/crystallization/RO hybrid process are performed to determine optimal operating recovery with high-temperature operation. The cost estimation model for FO/crystallization/RO hybrid process is developed. With the cost estimation model and process simulation model, optimization problem is formulated based on specific water cost to find out an optimal operating condition of FO/crystallization/RO hybrid process. The results are compared with the conventional SWRO process to identify the feasibility of the FO/crystallization/RO hybrid process. Finally, sensitivity analysis is carried out to investigate the effects of operation conditions and parameters on the feasibility of the FO/crystallization/RO hybrid process.