

Economic feasibility study for draw solution assisted reverse osmosis process

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The world's population has increased especially from the 1990 and the growth rate has incurred some problems. One of the problems is global water scarcity, which is directly correlated with human survival. Thus, the importance of the problem has been emphasized more and more. To alleviate it, seawater desalination can be one of the solutions because the portion of seawater to all of the water in Earth is extremely high, almost 98%. Reverse osmosis has been regarded as the most efficient technology in seawater desalination. There are some drawbacks, however, in reverse osmosis such as high fouling propensity and high energy requirement. These drawbacks have inspired many researchers to developing more energy-efficient and cost-efficient technology. In this present study, we suggests a draw solution assisted reverse osmosis process which is designed with two-staged reverse osmosis unit and draw solution stream for reducing osmotic pressure difference between seawater and draw solution. By cost-based analysis, the economic feasibility of the process is compared to conventional reverse osmosis and it can reduce the specific water cost more than 12%.