

## عنوان مقاله:

Experimental Investigation of Energy Consumption and Performance of Reverse Osmosis Desalination using Design of Experiments Method

## محل انتشار:

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## خلاصه مقاله:

To control the quality of reverse osmosis (RO) product water and reduce operational costs and environmental impacts by increasing the system's energy efficiency, it is necessary to identify the influence of process parameters on energy consumption and permeate water quality. This paper introduces a case study focused on the application of Design of Experiments (DOE) method in an industrial-scale RO desalination plant. In this study, energy consumption and permeate water salinity are formulated in terms of system design (the number of membranes and system recovery rate) and flow parameters (feed water flow rate, alkalinity, thermal effects, and salinity). Findings indicate that energy consumption decreases by increasing feed water temperature and the number of membranes. Moreover, increasing feed water flow rate and alkalinity leads to higher quality permeate water (lower salinity), whereas, increasing the number of membranes and system recovery rate and higher feed water temperature and salinity, increases the salinity of permeate water. The findings provide insight into the RO process features and can help designers and operators achieve a higher energy efficiency and better performance in the design and operation of RO units and the presented solution can be built into systems for comprehensive techno-economic evaluation of RO-based processes .to consider changes in effective parameters

## کلمات کلیدی:

,Desalination,Reverse Osmosis,Design of Experiment,Performance,Permeate Salinity,Specific Energy Consumption

## لینک ثابت مقاله در پایگاه سیویلیکا:

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