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Desalination of Iraqi surface water using nanofiltration membranes

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ABSTRACT

Nanofiltration (NF) has received increased attention as a possible treatment process providing high rejection of solutes and high water flux rate. Using NF as a desalination process for Iraqi surface water is considered in this research. A small system with one membrane of 4 inch diameter and 1 m long was used to evaluate the performance of NF membrane for the desalination of Tigris River water in Baghdad, and compare it with a reverse osmosis (RO) membrane. The results showed that one could get double the permeate flow rate and spend about 20% less electric power when using NF membranes instead of RO membranes. Permeated water TDS values for NF membrane are low enough to allow for further adjustment for drinking water quality. NF rejection capacity for monovalent ions is lower than that of the divalent ions, and in general the salt rejection capacity is above 95%.

Keywords: Nanofiltration; Reverse osmosis; Surface water; Desalination; Hardness

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