

# WATER TREATMENT IN INTEGRATED PROCESS WITH THE USE OF CERAMIC MEMBRANES

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Increasing demand for potable water of high quality results in searching for new, effective methods of water purification. The use of membrane technology with another treatment process could be a practical solution to fulfill stringent water standards. Currently, the most common method of fouling prevention and improving water quality involves influent pretreatment by physical, chemical or biological unit process. Ion exchange with the use of MIEX resin might be successfully applied as a pretreatment stage prior to ultrafiltration. The MIEX resin enables removal of negatively charged organic particles from water. These particles are mainly responsible for membrane fouling.

The objective of the study was to compare the efficiency of water treatment by MIEX-DOC process and ultrafiltration. The effect of MIEX-DOC water pretreatment on the UF performance was also evaluated. The influence of MIEX resin dose and water turbidity on the efficiency of natural organic matter (NOM) removal was analyzed. The ceramic membrane modules CeramINSIDE (TAMI Industries) of various cut-off values were used in the experiments. The UF experiments were conducted at semi-pilot installation.

On the basis of the results obtained it might be stated that magnetic ion-exchange resin MIEX is very effective in NOM separation from natural waters. For resin dose equal to  $15 \text{ cm}^3/\text{dm}^3$  the reduction of absorbance (at 254 nm) and water color reached 68% and 59%, respectively. The increase of water turbidity did not influence the efficiency of MIEX-DOC process. Retention of color in ultrafiltration amounted to 46% and decreased with the increasing water turbidity. Application of MIEX-DOC process prior to ultrafiltration significantly improved the UF efficiency.