

The effect of unfavourable process conditions on the water desalination by membrane distillation

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ABSTRACT

The exploitation of household membrane installations by unqualified people may lead to errors in the installation operation. The impact of poor maintenance of such an installation and its role on water desalination by membrane distillation was presented. The polypropylene membranes Accurel PP S6/2 and Accurel PP V8/2 HF were used in the studies. The operation conditions of installations, which were supplied with poor quality water, for example, from small surface reservoirs in the arid zone, were analysed. The desalination of a lake water salted with NaCl and clay was performed for this purpose. The influence of a lack of periodical cleaning of installation, feeding the installation with high turbidity water and the maintaining conditions allowing for the intensive growth of micro-organisms on the membrane wettability was studied. A considerable decline of the permeate flux and a deterioration of quality of obtained freshwater was not found, although the membrane modules were operated continuously for 1 year. The examination of membranes samples using an electron microscope confirmed that the membrane fouling was relatively light despite a long period of exploitation and unfavourable conditions of installation work.

Keywords: Membrane distillation; Water desalination; Freshwater; Fouling

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