



Geothermal water treatment. Membrane selection for the RO process

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ABSTRACT

Many factors determine the effectiveness of membrane processes used in the desalination of water. One of the most critical of these is the careful selection of membranes which have selective parameters and permeability suited to the needs of the user. The paper presents the results of studies related to the selection of membranes for the process of desalinating mineralised geothermal waters with an elevated silica content, sulphate ions, boron ions and high total hardness. Based on the preliminary theoretical models, four commercially available types of membranes were identified, which were then used for laboratory tests. Particular attention was paid in this work to the selectivity of removal of boron ions and also the effectiveness of the process in conditions of respectively 50% and 75% permeate recovery. Tests were carried out on geothermal water at a temperature 22°C. The results of the studies carried out showed that the best permeability parameters in relation to time taken were found with the BW30HR-440i membrane at a level of 50% permeate recovery. An increase in permeate recovery to 75% demonstrated signs of a drop in performance with time which may be caused by the precipitation of deposits on the membrane and the lowering of its permeability. Favourable selectivity ratios in relation to the key inorganic components of the mineral water were obtained with the selected membrane.

Keywords: Membrane selection; Geothermal water; Water treatment; Reverse osmosis

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