

BORON REMOVAL FROM SEAWATER BY MEMBRANE SEPARATION PROCESS

ODSTRAŇOVÁNÍ BORU Z MOŘSKÉ VODY POMOCÍ MEMBRÁNOVÝCH SEPARACÍ

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Abstract:

The paper deals with boron removal from the seawater by the means of reverse osmosis and nanofiltration. Boron in seawater is present in trace concentration of 5 mg/l. However, this concentration is higher than concentration recommended by the World Health Organization. Boron is an essential element but in higher concentrations it is toxic.

The aim of the work was to optimize the process of desalination of seawater by reverse osmosis so that the concentration of boron in permeate is efficiently low and it can be used for drinking water treatment and recommendation of WHO is fulfilled. Boron is one of substance which is hardly removed by reverse osmosis.

In the paper are described experiments with model solution and also with real samples of seawater. Conditions for reverse osmosis separation were tested and optimum for boron removal was found. Furthermore, experiments with nanofiltration were held for comparison.

For boron determination spectrophotometric method was used. Screening samples for this determination were taken during experiments. Chemical analysis of each entering and outgoing stream were performed.

It was confirmed that reverse osmosis is suitable method for boron removal. The keyrole in separation play speciation of boron present in seawater which depends strongly on pH.

Keywords:

Membrane separations, reverse osmosis, water treatment, drinking water, boron removal