TREATMENT OF DRINKING WATER FROM SURFACE WATER SOURCES BY MEANS OF PRESSURE DRIVEN MEMBRANE PROCESSES

ÚPRAVA PITNÉ VODY Z POVRCHOVÝCH ZDROJŮ POMOCÍ TLAKOVÝCH MEMBRÁNOVÝCH PROCESŮ

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Abstract:
This work deals with purification of drinking water from surface water sources using membrane separation processes. Separation experiments were carried out using samples from the real-world localities where the quality of surface water denied using it as a drinking water source. Ultrafiltration, nanofiltration and reverse-osmosis membranes were used for experiments in this work. The suitability of each membrane for every sample was tested by quality of the final permeate. Emphasis was placed not only on its chemical but also hygienic composition.

The worst results, based on the quality of produced permeate, showed ultrafiltration membranes, which failed to reduce the concentration of ammonia nitrogen or total organic carbon under LV. Similarly low efficiency in the removal of ammonia nitrogen showed the nanofiltration membranes. Best results were reached by reverse osmotic membrane, which in all cases produced permeate near in the quality of distilled water. Reverse osmosis is capable of removing of virtually all components including ammonia nitrogen and organic matter.

When considering the purification of drinking water from surface water sources the quality of water treated by nanofiltration and utlrafiltration is very dependent on the quality of the source water. On the other hand reverse osmosis is capable of producing high quality purified water and is less dependent on the quality of the inlet water.

Keywords:
Drinking water, membrane separation processes, ultrafiltration, nanofiltration, reverse osmosis, total organic carbon, ammoniacal nitrogen