

Kabsch-Korbutowicz, M., Majewska-Nowak, K. Use of Integrated Membrane Processes for Organic Matter Removal from Water. *Ochrona Srodowiska* 2010, Vol. 32, No. 3, pp. 27–32.

Abstract: Low-pressure membrane processes are frequently used in the treatment of water intended for human consumption. In order to increase the efficiency of water treatment and reduce membrane fouling, membrane separation processes are integrated with other biological, chemical or physical processes (creating so-called integrated processes). In this paper four integrated processes were analyzed for the efficiency of natural organic matter removal from water: sequential coagulation/ultrafiltration, in-line coagulation/ultrafiltration, sequential ion exchange/ultrafiltration, and simultaneous ion exchange/ultrafiltration (hybrid process). Another major objective of the study was to determine how the coagulant or ion-exchange resin dose, as well as the method used for the realization of the process, affected the transport properties of the membrane and the final quality of the water. The experiments involved model solutions containing natural organic matter, an alum coagulant for the coagulation process and a MIEX[®] resin for the ion exchange process. The integrated ion exchange/ultrafiltration process, regardless of whether conducted in the sequential or simultaneous mode, provided water of a higher final quality as compared to the integrated coagulation/ultrafiltration process. With all the integrated processes tested, similar decrease in membrane fouling was observed. Taking into account the comparable treatment effects obtained with either the sequential or the hybrid process, preference should be given to the hybrid process, which, owing to the lack of the sedimentation step, lowers the overall treatment costs.

Keywords: Ultrafiltration, coagulation, ion exchange, natural organic matter.