

MEMBRANE SEPARATION PROCESSES IN PRACTICE – LANDFILL LEACHATE TREATMENT

**Marek Šír¹⁾, Zuzana Honzajková¹⁾, Pavla Hrychová¹⁾, Martin Bystrianský¹⁾,
Radek Vurm¹⁾, Pavel Kocurek²⁾**

*¹⁾University of Chemistry and Technology Prague, Department of Environmental Chemistry,
Technická 5, Prague 6, 166 28, Czech Republic, e-mail: sirm@vscht.cz*

*²⁾Tomas Bata University in Zlín, Faculty of Applied Informatics, Nad Stráněmi 4511, 76005, Zlín,
Czech Republic*

Abstract

This paper deals with the membrane fouling by humic acids contained in landfill leachate and it represents a part of a comprehensive solution for the removal of landfill leachate using membrane separation processes. Humic acid content in the leachate changes depending mainly on the age of the landfill. Separation experiments were performed with raw leachate and with leachate adjusted by the addition of 20 mg/L, 40 mg/L and 50 mg/L of humic acids. In the case of raw leachate treatment, concentration of inorganic salts decreased from 7200 mg/L to 50 mg/L in the permeate. The concentration of organic substances, expressed as total organic carbon (TOC), was reduced from 225.6 mg/L in the leachate to 6.2 mg/L in the permeate. Natural content of humic acids in raw leachate was 18 mg/L. After the addition of 50 mg/L of humic acids, permeation flux decreased by 18% on average and the separation efficiency decreased by 20% on average.

Key words:

membrane separation processes, reverse osmosis, nanofiltration, membrane fouling, landfill leachate