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UV-photografting modification of NF membrane surface for NOM fouling reduction

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ABSTRACT

Fouling of natural organic matter is one of the common problems in water treatment plant. Despite physical and chemical treatment normally used to recover the flux loss, membrane surface properties also not less important to be considered. In this study, UV-photografting technique was applied to modify commercial nanofiltration (NF) membrane surface in order to reduce fouling tendency. Neutral hydrophilic N-vinylpyrrolidone has been chosen as the monomer for the UV-photografting. The result revealed that the grafted membrane at optimum conditions exhibits low humic acid fouling tendency compared with the unmodified membrane. In addition, both the unmodified and the UV-grafted polyethersulfone NF membranes were characterized in terms of structural properties (pore size, $r_{p,}$ and ratio of membrane thickness to porosity, $\Delta x/A_k$) using Pore Model in order to evaluate the effect of UV-photografting modification on structural parameters and indirectly influence the membrane performance and fouling as well.

Keywords: Nanofiltration; UV-photografting; Pore model; Fouling

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