Characterization of Irreversible Fouling after Ultrafiltration of Thermomechanical Pulp Mill Process Water - DTU Orbit (28/07/2019)

Characterization of Irreversible Fouling after Ultrafiltration of Thermomechanical Pulp Mill Process Water

Large volumes of wastewater with dissolved wood components are treated in wastewater treatment plants at thermomechanical pulp mills. It has been shown previously that hemicelluloses in these wastewater streams can be recovered by membrane filtration. A serious obstacle when treating lignocellulose process streams is fouling of the membranes. Fouling not only increases operating costs but also reduces the operating time of the membrane plant. When optimizing the membrane cleaning method, it is important to know which compounds cause the fouling. In this work fouling of an ultrafiltration membrane was studied. The fouling propensity of untreated process water and microfiltrated process water was compared. Fouled membranes were analyzed using scanning electron microscopy and attenuated total reflection Fourier transform infrared spectrometry. Acid hydrolysis of membranes exposed to untreated process water and microfiltration permeate revealed that 508 mg/m² and 37 mg/m² of polysaccharides, respectively, remained on the membranes even after alkaline cleaning.

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