Short Communication

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PII: S0960-8524(16)31460-2
DOI: http://dx.doi.org/10.1016/j.biortech.2016.10.054
Reference: BITE 17209

To appear in: *Bioresource Technology*

Received Date: 5 September 2016
Revised Date: 13 October 2016
Accepted Date: 19 October 2016

Please cite this article as: Salerno, C., Vergine, P., Berardi, G., Pollice, A., Influence of air scouring on the performance of a Self Forming Dynamic Membrane BioReactor (SFD MBR) for municipal wastewater treatment, *Bioresource Technology* (2016), doi: http://dx.doi.org/10.1016/j.biortech.2016.10.054

Influence of air scouring on the performance of a Self Forming Dynamic Membrane BioReactor (SFD MBR) for municipal wastewater treatment

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Abstract

The Membrane BioReactor (MBR) is a well-established filtration-based technology for wastewater treatment. Despite the high quality of the effluent produced, one of the main drawbacks of the MBR is membrane fouling. In this context, a possible evolution towards systems having potentially lower installation and operating costs is the Self Forming Dynamic Membrane BioReactor (SFD MBR). Key of this technology is the self-formation of a biological filtering layer on a support of inert material. In this work, a lab-scale aerobic SFD MBR equipped with a nylon mesh was operated at approximately 95 L m^{-2} h^{-1}. Two mesh pore sizes (20 and 50 µm) and three air scouring flow rates (150, 250, and 500 mL_{air} min^{-1}) were tested at steady state. Under all the tested conditions, the SFD MBR effectively treated real municipal wastewater. The quality of the produced effluent increased for lower mesh size and lower air scouring intensity.

Keywords: air scouring; dynamic membrane; MBR; mesh; wastewater

Abbreviations:
COD, Chemical Oxygen Demand; EC, Electrical Conductivity; HRT, Hydraulic Retention Time; MBR, Membrane BioReactor; SFD MBR, Self Forming Dynamic Membrane BioReactor; SRT, Solids Retention Time; TMP, Trans Membrane Pressure; TN, Total Nitrogen; TP, Total Phosphorus; TSS, Total Suspended Solids; VLR, Volumetric Loading Rate; VSS, Volatile Suspended Solids.