Desalination and Water Treatment
www.deswater.com

24 (2010) 278–283
December

1944-3994/1944-3986
doi: 10.5004/dwt.2010.1624

Identification and quantification of foulant in submerged membrane reactor

J. Lebegue[a], R. Aryal[b], H.K. Shon[b], S. Vigneswaran[b], M. Heran[a], A. Grasmick[a]*

[a]*UMR Génie des Procédés Eau et Bioproduits (UMR–CIRAD 016), Université Montpellier II, CC005, Place Eugène Bataillon; 34095, Montpellier Cedex 05, France. Tel. +33467143892; fax +33467144787; email: marc.heran@univ-montp2.fr*
[b]*Faculty of Engineering and Information Technology, University of Technology, Sydney, P.O. Box 123, Broadway, NSW 2007, Australia. Tel. +61295144084; Fax +6129514 8349*

Received 16 October 2009; accepted 11 May 2010

ABSTRACT

In submerged membrane system, membrane fouling is linked to the reversible accumulation of macromolecules and solids on the membrane surface and the irreversible sorption of soluble molecules inside the pores. In the first part of the paper, the fouling was analysed at two different aeration rates through the determination of membrane resistance due to (a) sludging ($R_{sludging}$), (b) irreversible biofilm ($R_{biofilm}$) and (c) adsorption of organic ($R_{adsorption}$). These results confirm the importance of aeration for sludge control in the bundle. In the second part of the paper, irreversible foulant obtained at different aeration rates were characterised. Membrane air flow rate limits adsorption of biopolymers onto or into the membrane surface.

Keywords: Submerged membrane bioreactors; Aeration; Membrane fouling

*Corresponding author