Review

Thermophilic Membrane Bioreactors: A Review

J. Duncan, A. Bokhary, P. Fatehi, F.G. Kong, H.J. Lin, B.Q. Liao

PII: S0960-8524(17)31155-0
DOI: http://dx.doi.org/10.1016/j.biortech.2017.07.059
Reference: BITE 18479

To appear in: *Bioresource Technology*

Received Date: 9 May 2017
Revised Date: 9 July 2017
Accepted Date: 10 July 2017

Please cite this article as: Duncan, J., Bokhary, A., Fatehi, P., Kong, F.G., Lin, H.J., Liao, B.Q., Thermophilic Membrane Bioreactors: A Review, *Bioresource Technology* (2017), doi: http://dx.doi.org/10.1016/j.biortech.2017.07.059

Thermophilic Membrane Bioreactors: A Review

J. Duncan[1*], A. Bokhary[1]*, P. Fatehi[1], F. G. Kong[2], H. J. Lin[3] and B. Q. Liao[1,2**]

[1]Department of Chemical Engineering, Lakehead University, 955 Oliver Road, Thunder Bay, ON, Canada P7B 5E1

[2]College of Paper-making and Plant Resources Engineering, Qilu University of Technology, 3501 Daxue Road, Jinan , Shandong Province, China

[3] College of Geography and Environmental Sciences, Zhejiang Normal University, Jinhua, 321004, PR China

*Equal contribution; **Corresponding author, E-mail: bliao@lakeheadu.ca; Tel: 1-(807) 343-8437 (BQLiao)

Abstract

This study undertakes a state-of-the-art review on thermophilic membrane bioreactors (ThMBRs). Thermophilic aerobic membrane bioreactors (ThAeMBR) and thermophilic anaerobic membrane bioreactors (ThAnMBR) have been widely tested for various high-temperature industrial wastewater treatments at lab- and pilot-scale studies and full-scale applications. The biological and membrane performances of the ThAeMBRs and ThAnMBRs could be better, comparable or poorer, as compared to the mesophilic ones. In general, sludge yield was much lower, biodegradation kinetic was higher, and microbial community was less diversity in the ThAeMBR and ThAnMBR systems. The results from the literature show that ThMBR technology has demonstrated many advantages and is a promising technology for industrial wastewater treatment and sludge digestion. Furthermore, challenges and opportunities of various ThMBRs for industrial applications are identified and discussed.

Keywords: *Thermophilic membrane bioreactor; thermophilic aerobic membrane bioreactor; thermophilic anaerobic membrane bioreactor; thermophilic membrane aerated biofilm reactor; membrane fouling; thermophilic wastewater treatment.*

Table of Contents