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Review

A Review of Membrane Fouling and Its Control in Algal-Related Membrane Processes

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A Review of Membrane Fouling and Its Control in Algal-Related Membrane ProcessesYichen Liao^{1*}, Alnour Bokhary^{1*}, Esmat Maleki¹ and Baoqiang Liao^{1**}¹Department of Chemical Engineering, Lakehead University, 955 Oliver Road, Thunder Bay, ON, Canada P7B 5E1* Co-first author; ** Corresponding author, Email: bliao@lakeheadu.ca; Tel: (807) 343-8437**Abstract**

Membrane technologies have received much attention in microalgae biorefinery for nutrients removal from wastewater, carbon dioxide abatement from the air as well as the production of value-added products and biofuel in recent years. This paper provides a state-of-the-art review on membrane fouling issues and its control in membrane photobioreactors (MPBRs) and other algal-related membrane processes (harvesting, dewatering, and biofuel production). The mechanisms of membrane fouling and factors affecting membrane fouling in algal-related membrane processes are systematically reviewed. Also, strategies to control membrane fouling in algal-related membrane processes are summarized and discussed. Finally, the gaps, challenges, and opportunities in membrane fouling control in algal-related membrane technologies are identified and discussed.

Keywords: *Membrane technology; membrane photobioreactor; membrane fouling; microalgae cultivation; harvesting and dewatering*

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