



Development of membrane separation technology and membrane-based bioreactor in wastewater treatment: conventional membrane and dynamic membrane

Lucheng Li^{a,*}, Ming Ye^{a,†}, Xiaosheng Gan^b, Ting Xiao^a, Zehua Zhu^a

^a*Collaborative Innovation Center of Atmospheric Environment and Equipment Technology, Jiangsu Key Laboratory of Atmospheric Environment Monitoring and Pollution Control, Nanjing University of Information Science & Technology, Nanjing 210044, China, email: lucheng.li@nuist.edu.cn (L. Li)*

^b*Ecological Environment Monitoring Center, Leshan 614000, China*

Received 1 January 2023; Accepted 19 July 2023

ABSTRACT

Nowadays, membrane has played an important role in wastewater treatment. However, high membrane cost and membrane fouling has hindered the developing of conventional membrane separation technology. With low-cost supporting membrane and easy operation, dynamic membrane (DM) technology presents a new route for pollutants separation in wastewater treatment. Similar pollutants removal and high separation efficiency made it more suitable for application in wastewater pretreatment and sludge separation. To have a full understanding of recent development of membrane separation technology, microfiltration, ultrafiltration, nanofiltration, and dynamic membrane filtration were briefly introduced and compared in this study. The filtration and pollutants removal performance in membrane bioreactor and dynamic membrane bioreactor were also evaluated. Besides, future perspectives of membrane separation technology with membrane fouling control, membrane cost and maintenance were presented for better application of membrane technology. Overall, DM technology indicates one potential developing direction of membrane separation technology in wastewater treatment.

Keywords: Membrane separation; Wastewater treatment; Dynamic membrane; Membrane bioreactor

* Corresponding author.

† Co-first authors.