

Biological Wastewater Treatment and Resource Recovery

Edited by Robina Farooq and Zaki Ahmad, ISBN 978-953-51-3046-8, Print ISBN 978-953-51-3045-1, 254 pages, Publisher: InTech, Chapters published March 29, 2017 under CC BY 3.0 license

DOI: 10.5772/62795

Edited Volume

OPEN ACCESS

BOOK CONTENTS

BOOK EDITORS

MOST DOWNLOADED CHAPTERS

HOW TO LINK

Chapter 1 **OPEN ACCESS**

Treatment of Organic Recalcitrant Contaminants in Wastewater

by Asmita Gupta and Indu Shekhar Thakur

Chapter 2 **OPEN ACCESS**

Application of Microbiological Methods in the Settlement Wastewater Treatment

by Dragan Milićević, Slaviša Trajković and Milan Gocić

Chapter 11 **OPEN ACCESS**

Biohydrogen Production from Wastewaters

by Periyasamy Sivagurunathan, Gopalakrishnan Kumar, Arivalagan Pugazhendhi, Guangyin Zhen, Takuro Kobayashi and Kaiqin Xu

Chapter 12 **OPEN ACCESS**

Valorization of Glucose-Based Wastewater Through Production of Hydrogen, Volatile Fatty Acids and Alcohols

by Eduardo Lucena Cavalcante de Amorim, Leandro Takano Sader, Lucas Rodrigues Ramos and Edson Luiz Silva

Chapter 13 **OPEN ACCESS**

Production of Biogas and Performance Evaluation of Ultrasonic Membrane Anaerobic System (UMAS) for Palm Oil Mill Effluent Treatment (POME)

by Abdurahman Hamid Nour and Azhari Hamid Nour

Production of Biogas and Performance Evaluation of Ultrasonic Membrane Anaerobic System (UMAS) for Palm Oil Mill Effluent Treatment (POME)

RESEARCH-ARTICLE

Abdurahman Hamid Nour^{1*} and Azhari Hamid Nour²

[¹] Faculty of Chemical and Natural Resources Engineering, University Malaysia Pahang-UMP, Pekan, Pahang, Malaysia

[²] Faculty of Pure and Applied Sciences International University of Africa, Khartoum, Sudan

*Corresponding author(s) email: nour2000_99@yahoo.com

DOI: 10.5772/67602

Abstract

This study proposes a new approach for integrated technology of ultrasonic and membrane for a palm oil mill effluent treatment. This study evaluated the performance of the new design of ultrasonic membrane anaerobic system (UMAS) when a palm oil mill effluent (POME) introduces this approach. To fit kinetic study, six steady states were investigated and the results have shown that the mixed liquor volatile suspended solids (MLVSSs) range from 10,400 to 17,350 mg/l while the mixed liquor suspended solids (MLSSs) range from 13,800 to 22,600 mg/l. Three kinetic models of Monod, Contois, and Chen and Hashimoto were used to evaluate the integrated system at organic loading rates ranging from 1 to 15 kg COD/m³/day. The percentage efficiency of COD removal was from 92.8 to 98.3%, and hydraulic retention time (HRT) was from 500.8 to 8.6 days. The influent COD concentrations of the POME ranged from 70,400 to 90,200 mg/l. The integrated technology of UMAS is a more attractive one as it avoids membrane fouling problems.

Keywords: membrane, ultrasonic, POME, methane, CO₂, UMAS