



“Gheorghe Asachi” Technical University of Iasi, Romania



RESEARCH OF MEMBRANE FOULING PERFORMANCE IN A SUBMERGED DOUBLE-SHAFT ROTARY ANAEROBIC MEMBRANE BIOREACTOR

Ling Bai^{1*}, Chao Liu², Weiguang Lan³

¹College of Natural Science, Jiangxi Agricultural University, Nanchang, China

²College of computer Information and Engineering, Jiangxi Normal University, Nanchang, China

³Suntar Membrane Technology Co. Ltd., Xiamen, China

Abstract

Considering the membrane fouling problem in submerged anaerobic membrane bioreactors, a set of submerged double-shaft rotary anaerobic membrane bioreactor (SDRAnMBR) was constructed by applying a double-shaft rotary module to submerged anaerobic bioreactor, and the theoretic analysis of the characteristics of hydraulics dynamics in SDRAnMBR has been performed. The membrane fouling performance for treatment of synthetic brewery wastewater was investigated by SDRAnMBR. The results of a theoretical analysis showed that the effects of homogenization, interleaving oscillation and three-phase rotating flow were produced within SDRAnMBR. Owing to their synergistic effect, the characteristics of shear, turbulence, oscillation and mass transfer within rotating fluid were enhanced so that the concentration polarization was reduced and permeate flux increased. The experiment results showed that SDRAnMBR had good anti-contamination performance and could maximize the reduction and control of the membrane fouling, proving the theoretic analysis on the characteristics of hydraulics dynamics in SDRAnMBR.

Key words: double-shaft rotary membrane module, membrane fouling control, submerged anaerobic membrane bioreactor

Received: March, 2011; Revised final: July, 2011; Accepted: July, 2011

* Author to whom all correspondence should be addressed: e-mail: bailing716@yahoo.com.cn; Phone: +791 8732527; Fax: +791 3813574