

Preliminary Study of COF-Based Mixed Matrix Membranes for Improved Antifouling Property

Nur Azizah Johari^{a,b}, Noor Yahida Yahya^{c}, Norhaniza Yusof^{a,b} and Siti Nur Syazana Zakaria^c*

^aAdvanced Membrane Technology Research Centre (AMTEC), Universiti Teknologi Malaysia, 81310 Skudai, Johor, Malaysia

^bSchool of Chemical and Energy Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Skudai, Johor, Malaysia

^cFaculty of Civil Engineering Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Gambang, Kuantan, Pahang, Malaysia

*Corresponding author: yahida@ump.edu.my

Abstract

A covalent organic framework (COF) was successfully incorporated to construct a new ultrafiltration (UF) membrane via interfacial polymerization. A mixed-matrix UF membranes with concentrations COF range of 0 to 1 wt% have been prepared and characterized. The influence of COF concentration on the membrane morphology and antifouling property has been evaluated. Increasing COF concentration from 0 to 1 wt% could significantly enhance the rejection rate from 26.11% to 95.87% for bovine serum albumin (BSA). Moreover, membrane hydrophilicity significantly improved by 30.53%, with the decrease of water contact angle from 66.94° to 46.50°.

Keywords: Covalent organic framework (COF); Ultrafiltration; Anaerobic membrane bioreactors (AnMBRs); Antifouling property.