



Surface modification of polyethersulfone ultrafiltration (PES-UF) membrane using myoglobin as modifying agent

Nora'aini Ali*, Saidatul Syaima Mat Tari

Faculty of Science & Technology, Department of Engineering Science, Universiti Malaysia Terengganu, Kuala Terengganu 21030, Terengganu, Malaysia

Email: noraaini@umt.edu.my

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ABSTRACT

Surface modification is one of the practical approaches in fouling mitigation strategy. This study investigated the usage of myoglobin as surface-modifying molecule coated on polyethersulfone ultrafiltration membrane. The pH and concentration of myoglobin solution were used as the modification parameters. Characterization of the surface-modified polyethersulfone (PES) membrane was performed using Fourier transform infrared spectroscopy, contact angle, surface charged measurements, and scanning electron microscopy. The membrane performance toward permeability of lysozyme (model protein) was evaluated at the different stirring speed and feed concentrations. The results show that the water contact angles changed up to 47.13% and hydraulic results are markedly increased by 55.9%, indicating that the hydrophilicity of the surface-modified PES membrane has been improved due to the surface pretreatment. The rejection of lysozyme via surface-modified membrane also indicates significant enhancement (up to 21.43%). The results of flux behavior study also proved that surface modification resulted in decrease of flux decline occurrence.

Keywords: Fouling; Surface modification; Myoglobin; Lysozyme

*Corresponding author.