

Preparation of poly[3-(methacryloylamino) propyl] trimethylammonium chloride coated mesh for oil–water separation

Jeng-Yi Wu, Chao-Wei Huang, Ping-Szu Tsai*

Department of Chemical and Materials Engineering, National Kaohsiung University of Science and Technology, No. 415, Jiangong Road, Sanmin District, Kaohsiung City 80778, Taiwan, R.O.C., Tel. +886-7-3814526 Ext: 15139; emails: charles1@nkust.edu.tw (P.-S. Tsai), supershatman@gmail.com (J.-Y. Wu), Tel. +886-7-3814526 Ext: 15135; email: huangcw@nkust.edu.tw (C.-W. Huang)

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ABSTRACT

This study aims to prepare a polymer-coated mesh which could achieve good oil–water separation efficiency with an antibacterial property. These polymers were synthesized by the polymerization process of [3-(methacryloylamino) propyl] trimethylammonium chloride (MAPTAC). The hydrolysis resistance and the swelling ratio of the polymers were also examined in order to choose a suitable oil–water separation material. The prepared meshes showed not only high oil–water separation efficiency (>99%) with high permeate flux (up to $4,308 \text{ L h}^{-1} \text{ m}^{-2}$), but also a good antibacterial property. In addition, the oil–water separation efficiencies exceed 99% even under various severe conditions, such as acidic (1 M HCl), alkaline (1 M NaOH), and salty (8 wt.% NaCl) solutions. The excellent durability of the polymer-coated mesh shows the fact that it is a facile and promising filtration mesh for oil–water separation.

Keywords: [3-(Methacryloylamino) propyl] trimethylammonium chloride; Oil–water separation; Polymer-coated mesh; Antibacterial property; Durability

* Corresponding author.