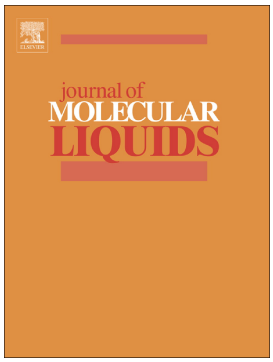

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Novel high throughput mixed matrix membranes embracing poly ionic liquid-grafted biopolymer: fabrication, characterization, permeation and antifouling performance

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Abstract

We report a simple and effective protocol for preparation of a poly-ionic liquid (PIL)-grafted chitosan Schiff base (**PILCSB**) and titanium oxide nanoparticles (TNPs) for application as an antibiofouling nanocomposite in the fabrication of new polysulfone (PSU) ultrafiltration mixed matrix membranes (MMMs). The effect new additive (**PILCSB**@TNPs) on the porosity texture, pure water flux (PWF) and antibiofouling profile for modified MMMs was investigated. Interestingly, the surface hydrophilicity of these MMMs was remarkably enhanced in comparison to the neat PSU membrane (M0) as revealed from wettability and water contact- angle results (wettability/ water contact angle = 29.18%/ 93.48° and 83.46%/ 57.35° for M0 and MMM6, respectively).

Keywords: Mixed matrix membranes; PIL-grafted biopolymer; Nanocomposite; Antibiofouling; Water flux.

1. Introduction

During last few decades, the worldwide population has quadrupled while global water demands grown seven-fold [1]. Where by the end of 2030, 3.9 billion people will suffer