



Effect of graphene oxide on desalination performance of cellulose acetate mixed matrix membrane

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Received 9 December 2018; Accepted 23 May 2019

ABSTRACT

In this study, the effect of different amounts of graphene oxide (GO) nanoparticles on the desalination performance of cellulose acetate (CA) reverse osmosis mixed matrix membranes has been investigated. To investigate the interactions between different parameters and optimize the membrane performances, response surface methodology (RSM) was applied. For a simultaneous enhancement of salt rejection and water flux performances, the analysis by central composite design (CCD) suggested the optimum values of 0.009 wt.% for GO content, 3500 ppm for feed salinity, and 18 bar for applied pressure as significant factors. The membrane, prepared and tested based on the optimal values, was found to have 11.12 l/m²·h permeation flux and 58.08% salt rejection which were in good agreement with the predicted values of 11.42 l/m²·h and 59.53%. It has been revealed that optimization using CCD in the range of the applied experimental parameters is a reliable method for prediction of the CA/GO membranes performance.

Keywords: Graphene oxide; Cellulose acetate; Mixed matrix membrane; Desalination; Response surface methodology; Central composite design

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