

Statistical design of experiments for dye-salt-water separation study using bimodal porous silica/(-alumina membrane

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Received 6 October 2008; Accepted 8 March 2009

ABSTRACT

Treatment of textile wastewater using conventional methods is either inefficient or costly. This is because it usually involves reactive dye, great amounts of salt and high temperature. In this study, a bimodal porous silica/(-alumina membrane with improved permeability was tested in dye-salt water separation. The effects of temperature, feed concentration of dye, feed concentration of salt, pH and the pressure on permeate were examined using a response surface method. In general, the newly developed membrane showed satisfactory dye rejection (>90%) at common operating conditions. From the statistical analysis, it was found that the variation of salt rejection depends on the feed concentration of salt, feed concentration of dye and the pressure. Meanwhile, only the permeate flux is unaffected by the feed concentration of the dye.

Keywords: Dye; Salt; Membrane; Ceramic

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Presented at EuroMed 2008, Desalination for Clean Water and Energy Cooperation among Mediterranean Countries of Europe and the MENA Region, 9–13 November 2008, King Hussein Bin Talal Convention Center, Dead Sea, Jordan.