



Desalination of Simulated Textile Wastewater by Capacitive Deionization Using Nitric Acid Modified Carbon Electrodes

Mugaishudeen.G*, ChitraDevi.V,Gomadurai.C, Mothil.S

**Department of Chemical Engineering, Kongu Engineering College, Erode-638052,
Tamil Nadu, India**

Abstract:The dyeing process involves the use of inorganic salts (NaCl) in large quantities during the dye fixation of fabric and here the disposal of saline effluent from textile industries is an increasing problem worldwide. Zero discharge desalination process is the most promising technology to prevent addition of salinity and thermal shocks to ecosystem by effluent streams of desalination unit drained into the water bodies. Multiple Effect Evaporator and Crystallizer are the major equipment involved in conventional method of desalination of textile wastewater which require enormous amount of energy and produces a large quantity of contaminated unusable NaCl crystals that are stored unnecessarily. In order to overcome these complications, Capacitive Deionization (CDI) is one of the methods for treating RO reject. In this work, CDI with an activated carbon (AC) modified by nitric acid has been used as the electrodes for the desalination of simulated textile wastewater. The experimental results showed that the modification could greatly increase the efficiency of salt removal from the solution for various residence time and voltage. It was found that the modification greatly increased the oxygen-containing functional groups on the surfaces of activated carbon, leading to an increase in capacitance and decrease in charging resistance, which might be attributed to the improvement of the desalination.

Key words:Capacitive Deionization, Desalination, Textile wastewater, NaCl, Modified Carbon Electrodes.