Desalination and Water Treatment
www.deswater.com

doi: 10.1080/19443994.2015.1110716

57 (2016) 20574–20581
September

Taylor & Francis
Taylor & Francis Group

Decolorization of azo dye C.I. Acid Red 33 from aqueous solutions by anodic oxidation on MWCNTs/Ti electrodes

Farideh Nabizadeh Chianeh*, Jalal Basiri Parsa

Faculty of Chemistry, Department of Applied Chemistry, University of Bu-Ali Sina, Hamadan, Iran, Tel. +98 813 8282807; emails: nabizadeh_farideh@yahoo.com, f.nabizadeh@basu.ac.ir (F. Nabizadeh Chianeh), Parssa@basu.ac.ir (J. Basiri Parsa)

Received 12 October 2014; Accepted 9 October 2015

ABSTRACT

In this study, a titanium electrode coated with multiwall carbon nanotubes was prepared by the electrophoretic deposition method. The electrode was characterized by field emission scanning electron microscopy and cyclic voltammetry. The electrochemical oxidation (EO) performance of prepared electrode was investigated using Acid Red 33 (AR33) as a model pollutant. The effect of initial pH of dye solution, current density, and type of supporting electrolyte on color removal efficiency were studied. High color removal efficiency (90%) was achieved for AR33 dye using a current density of 5.5 mA/cm^2 for 60 min. In addition, a comparison of EO, ozonation (O), and electrolysis combined ozonation (ECO) processes for decolorization of AR33 solution was performed. Results indicated that color removal efficiency follows the decreasing order: ECO > EC > O.

Keywords: MWCNTs/Ti electrode; Electrophoretic deposition; Decolorization; Acid Red 33

*Corresponding author.