

## Electrochemical Decolorization of Reactive Dye from Synthetic Wastewater by Mono-Polar Aluminum Electrodes System

Rasoul Khosravi<sup>1</sup>, Hooshyar Hossini<sup>2</sup>, Mohsen Heidari<sup>3</sup>, Mehdi Fazlzadeh<sup>4</sup>, Hamed Biglari<sup>5</sup>, Aliakbar Taghizadeh<sup>1</sup>, Behnam Barikbin<sup>1,\*</sup>

<sup>1</sup> Social determinants of health Research Center, Birjand University of Medical Sciences, Birjand, Iran

<sup>2</sup> Department of Environmental Health Engineering, Faculty of Health, Kermanshah University of Medical Sciences, Kermanshah, Iran

<sup>3</sup> Social Determinants in Health Promotion Research Center, Hormozgan University of Medical Sciences, Bandar Abbas, Iran

<sup>4</sup> Department of Environmental Health, Faculty of Medical Sciences, Ardabil University of Medical Sciences, Ardabil, Iran

<sup>5</sup> Department of Environmental Health Engineering, School of Public Health, Social Development & Health Promotion Research Center, Gonabad University of Medical Sciences, Gonabad, Iran

\*E-mail: [b\\_barikbin@yahoo.com](mailto:b_barikbin@yahoo.com)

doi: 10.20964/2017.06.75

Received: 5 November 2016 / Accepted: 11 April 2017 / Published: 12 May 2017

---

Azo dyes are important groups of chromospheres having a particular structure in color-contaminated wastewater. In the present study, Reactive Red 198 (RR198) dye was chosen as a model of azo dyes group. Electrocoagulation technique as an effective and environmental-friendly process for wastewater treatment was applied. Hence; to determine the extent of decolorization process, the main different parameters such as pH (4-11), contact time (80 min), initial concentrations (25-400 mg/L), current density (1.9-23.1 mA/cm<sup>2</sup>), distance between gaps (1-4 cm), and effect of supporting electrolytes were evaluated. Results show that optimum conditions were 20 min of operation time, 1 cm distance between electrodes, pH equal to 4 and optimum initial concentration of dye equal to 100 mg/L as well as NaCl was identified as the best electrolyte. Under these optimum conditions and also at both aeration and non-aeration operating conditions decolorization efficiency was more than 90%. The results also demonstrated that total organic carbon removal efficiency as (TOC), during 120 min of contact time was about 80.95%. XRF analyses show that a large portion of deposited sludge (58.282%) was aluminum oxide.

---

**Keywords:** Aluminum electrode; Electrochemical decolorization; Reactive Red 198, aqueous solutions

[FULL TEXT](#)

© 2017 The Authors. Published by ESG ([www.electrochemsci.org](http://www.electrochemsci.org)). This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).