



Runoff water treatment with high organic matter load through a scalable prototype electrocoagulation system with a rotary axis design

J.A. Silis-Cano^a, M. Tejocote-Pérez^{b,*}, O. Monroy-Vilchis^b, A.E. Alcántara-Valladolid^c, C.E. Barrera-Díaz^a, L.A. Vaje-Romero^b

^a*Centro Conjunto de Investigación en Química Sustentable, UAEMex-UNAM, Carretera Toluca-Atlaconulco Km 14.5, 50200, Toluca, Mexico, Tel. (+52) 722-276-66-10; emails: adrian.silis07@gmail.com (J.A. Silis-Cano), cbd0044@gmail.com (C.E. Barrera-Díaz)*

^b*Centro de Investigación en Ciencias Biológicas Aplicadas, UAEMex, Carretera Toluca-Atlaconulco Km 14.5, 50200, Toluca, Mexico, Tel. (+52) 462-85-85; emails: moytej@yahoo.com.mx (M. Tejocote-Pérez), tavomonroyvilchis@gmail.com (Monroy-Vilchis), luisvaje@gmail.com (L.A. Vaje-Romero)*

^c*Instituto Interamericano de Tecnología y Ciencias del Agua, UAEMex, Carretera Toluca-Atlaconulco Km 14.5, 50200, Toluca, Mexico, Tel. (+52) 722-180-61-91; email: aealcantarav@uaemex.mx (A.E. Alcántara-Valladolid)*

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ABSTRACT

The removal accomplished by an electrocoagulation method in a 2.5 L cylindrically shaped batch electrochemical reactor, made of plastic, wood, and aluminum, was assessed with runoff water used for crop irrigation. Aluminum electrodes were employed; there was no supporting electrolyte so as to maintain the sample as unaltered as possible. The removal efficiencies accomplished are as follows: turbidity removal about 91.3%; color of about 90.2%; the chemical oxygen demand removal achieved was 23.8%, not negligible since no supporting electrolyte was used to avoid adding extra chemicals to the water. As for free chlorine, phosphates, phosphorus, nitrates, and sulfates, the removal percentages achieved are 66.7%, 69.9%, 92.13%, 99.99%, and 33.3%, respectively. Also, microbial consortia were targeted with this method, according to the most probable number technique, a 97.8% removal of fecal coliforms was achieved in irrigation water.

Keywords: Electrocoagulation; Water treatment; Runoff water

* Corresponding author.