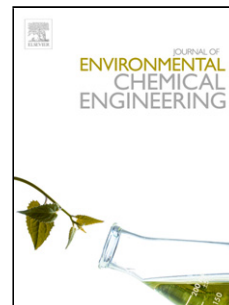


Accepted Manuscript

Title: Studies of Autocatalytic Electrocoagulation Reactor for Lead Removal from Simulated Wastewater

Author: Forat Yasir AlJaberi

PII: S2213-3437(18)30565-7
DOI: <https://doi.org/10.1016/j.jece.2018.09.032>
Reference: JECE 2653



To appear in:

Received date: 18-6-2018
Revised date: 11-8-2018
Accepted date: 18-9-2018

Please cite this article as: AlJaberi FY, Studies of Autocatalytic Electrocoagulation Reactor for Lead Removal from Simulated Wastewater, *Journal of Environmental Chemical Engineering* (2018), <https://doi.org/10.1016/j.jece.2018.09.032>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Studies of Autocatalytic Electrocoagulation Reactor for Lead Removal from Simulated Wastewater

Forat Yasir AlJaberi

Chemical Engineering Department, College of Engineering, University of Al Muthanna, Iraq
(forat_yasir@yahoo.com)

ABSTRACT

The removal of heavy metals from wastewater using efficient methods has caught the attention of scientists in recent years. One of these methods is the electrocoagulation technique which is widely studied and employed around the world. The aim of the present work was the study of the autocatalytic behavior of an electrocoagulation reactor that consisted of triple aluminum tubes which were constructed in a concentric manner, putting cathode electrode in between the tubes of the anode electrode. The operational parameters were the electrolysis time (2-30) min., initial lead concentration (10-300) ppm, electric current (0.2-2.6)Amps., and the mixing speed of the neutral solution was 150rpm. Results show that electrocoagulation reactor seems to be an autocatalytic reactor which improved the kinetics of the adsorption process to remove lead from the polluted solution.

Keywords: Electrocoagulation; Autocatalytic reaction; Heavy metals; Simulated wastewater

1. Introduction

Several sources of wastewater containing heavy metals, such as Cu, Ni, Hg, Zn, As, Cd, Pb, and Cr that are included in industrial effluents as shown their distribution in Table 1 [1], are consistently discharged into the aquatic environment as a result of the continuous demand of heavy metals and their components in numerous industries, which causes serious problems for the environmental and health [2,3].

Table 1
Toxic heavy metals in industrial wastewaters [1]

Heavy metals	Manufacturing Industries
Copper	Electrical, plating, rayon
Nickel	Electroplating, iron, steel
Mercury	Chlor-alkali, chemical, scientific instruments
Zinc	Plating, Galvanizing, iron, steel
Arsenic	Phosphate fertilizer, metal hardening, paints and textile
Cadmium	Electroplating, phosphate fertilizer, pigments
Lead	Battery, paints
Chromium	Metal plating, tanning, rubber, photographic

Heavy metal pollution has become a worldwide threat, therefore substantial trends of efficient techniques should be used to remove toxic metals from the contaminant

Download English Version:

<https://daneshyari.com/en/article/11028967>

Download Persian Version:

<https://daneshyari.com/article/11028967>

[Daneshyari.com](https://daneshyari.com)