



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



MONA MAGHRABY



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شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



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جامعة عين شمس التوثيق الإلكتروني والميكروفيلم

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MONA MAGHRABY



**UREA REMOVAL FROM WASTEWATER USING
ELECTROCOAGULATION PROCESS UNDER VARIOUS
OPERATING CONDITIONS**

By

Mostafa Mamdouh Mohamed Mohamed Abdel-Latief

A Thesis Submitted to the
Faculty of Engineering at Cairo University
In Partial Fulfillment of the
Requirements for the Degree of
DOCTOR OF PHILOSOPHY
in
Civil Engineering - Public Works

FACULTY OF ENGINEERING, CAIRO UNIVERSITY
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Title of Thesis:

Urea Removal From Wastewater Using Electrocoagulation Process Under Various Operating Conditions

Key Words:

Electrochemistry; Chemical coagulation; Urea; Voltage; Wastewater.

Summary:

In this research, the efficacy of electrocoagulation has been investigated as a potential treatment process for the removal of urea from synthetic and real domestic wastewaters. The purpose of this research is to evaluate the ability of the electrocoagulation process to remove urea using aluminum, titanium, copper and iron electrodes under varying operating conditions. The impact of electrode material type, electrode voltage, electrolyte type, and electrode spacing has been investigated. The maximum removal efficiencies for urea occurred after 90 min and its values were 67.85% at a 9 V for titanium, 57.76 % at 12 V for the aluminum electrode, 49.65% at a 6 V for the copper electrode and 59% at 12 V for the iron electrode. Comparative analysis of urea uptake by chemical coagulation and electrocoagulation has been conducted.

Disclaimer

I hereby declare that this thesis is my own original work and that no part of it has been submitted for a degree qualification at any other university or institute.

I further declare that I have appropriately acknowledged all sources used and have cited them in the references section.

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