

بسم الله الرحمن الرحيم



HOSSAM MAGHRABY



شبكة المعلومات الجامعية التوثيق الالكتروني والميكرو فيلم



HOSSAM MAGHRABY

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
على هذه الأقراص المدمجة قد أعدت دون أية تغيرات



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تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



HOSSAM MAGHRABY

USING DIFFERENT COAGULANTS TO IMPROVE COAGULATION PROCESS AND DRINKING WATER QUALITY

Submitted By

Reham Adel Ali Abobaker

B.Sc. of Science, (Chemistry), Faculty of Science, Ain Shams University, 2000

A Thesis Submitted in Partial Fulfillment
Of
The Requirement for the Master Degree
In
Environmental Sciences

Department of Environmental Basic Sciences
Faculty of Graduates Studies & Environmental Research
Ain Shams University

2021

APPROVAL SHEET
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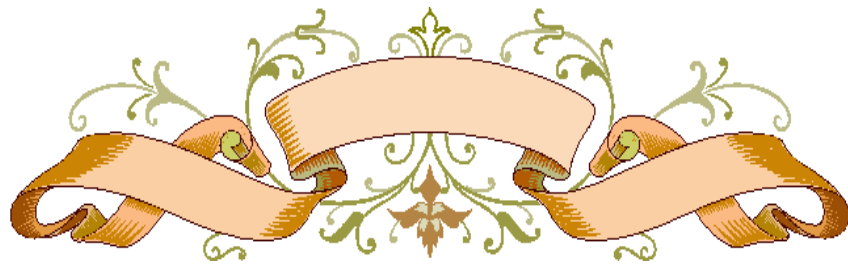
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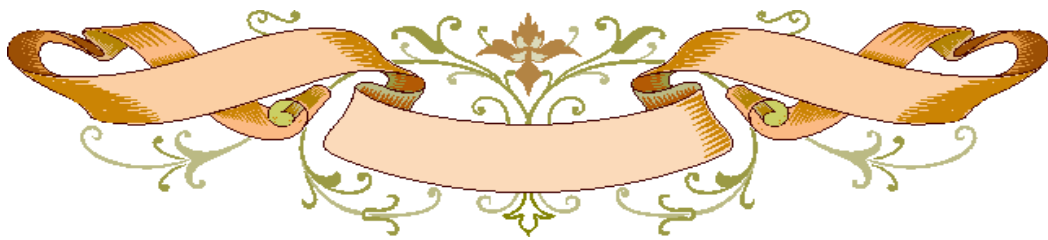
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2021



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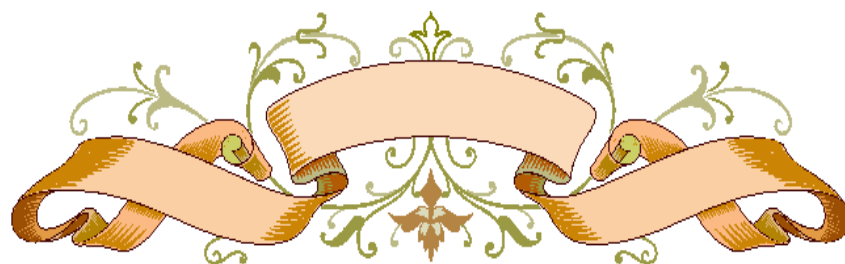
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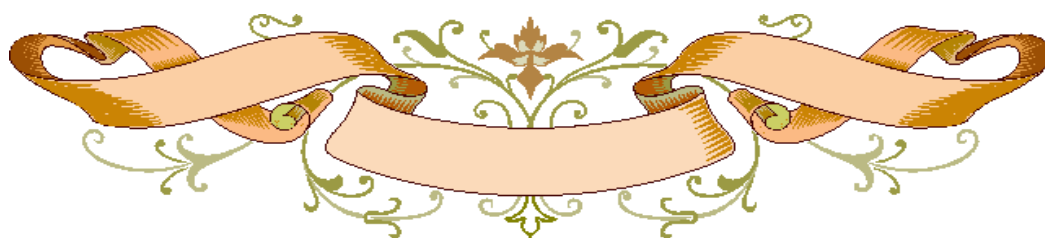
*I also dedicated this appreciation to my colleagues in **Holding Company for Water and Wastewater**.*

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Finally, dedicate this work to my beloved sons
Marwan, Mohand & Omar.



Abstract



ABSTRACT

Name: Reham Adel Ali Abo Baker

Title of thesis: Using Different Coagulants To Improve Coagulation Process And Drinking Water Quality

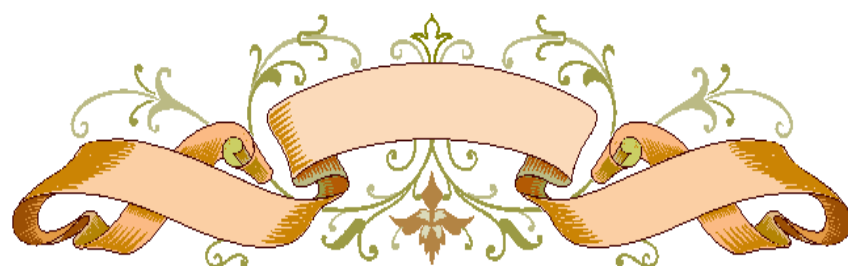
Degree: (M.Sc.) Master of environmental sciences thesis, department of environmental basic sciences, institute of environmental studies and research, Ain Shams University, 2021.

This study aims to investigate acceptable approach to enhance coagulation for TOC (DBD precursors), turbidity and aluminum minimization using aluminum and iron based coagulants in drinking water treatment, single and dual dosing with aluminum sulphate and ferric chloride coagulants. Once the condition for optimized coagulation has been determined by Jar tests, TOC was evaluated under baseline coagulation conditions and optimized coagulation. Jar tests were conducted to simulate the conventional processes of water treatment. Enhanced coagulation used the traditional alum that is already applied in water treatment in Egypt, with a comparison with ferric chloride and mixture of alum and ferric chloride, the strategy of enhanced treatment adopted mainly organic matter and THMs beside turbidity, so the doses of coagulant were increased to achieve better removal of THMs which have a health issue. Conventional treatment processes including addition of aluminum sulphate or ferric chloride to the raw water followed by coagulation, sedimentation and rapid sand filtration are important step in water purification; they reduced the organic matter to about 42% and THMs to 37 using the baseline dose (25 mg/l). The enhanced coagulation process by increasing the dose of alum reduced the total organic carbon and THMs to 57 % and 54 % respectively. Using of

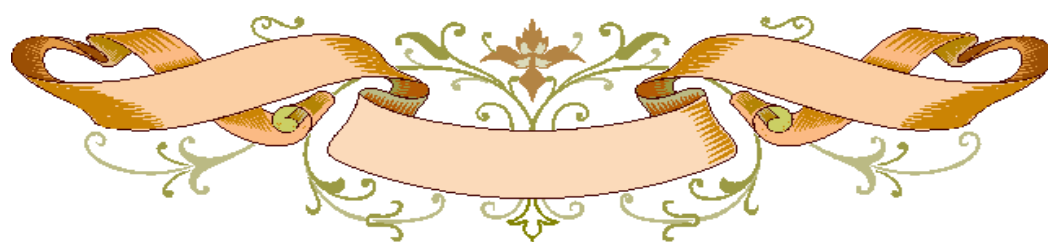
ferric chloride at a baseline dose reduced TOC and THMs by 40 % and 36% respectively, while enhanced coagulation by increasing the dose of ferric chloride (at a dose of 35 mg/l) raised up the removal of TOC and THMs to 47 % and 44% respectively. The dual coagulant of alum and ferric chloride achieved 47% removal of TOC and 36% for THMs at a dosage of 25 mg/l, while the enhanced coagulation by increasing the dose of dual coagulant of alum and ferric chloride (35 mg/l) raised up the removal of TOC to 61% and THMs to 50%. The advantageous of the dual coagulant is higher reduction of residual aluminum and THMs, this attributed to the enhancement of flocculation which create activated adsorption sites of flocs surfaces.

KEY WORDS

Water, Water treatment, Coagulation, TOC, THMs, Enhanced coagulation, Flocculation, Optimization, Evaluation



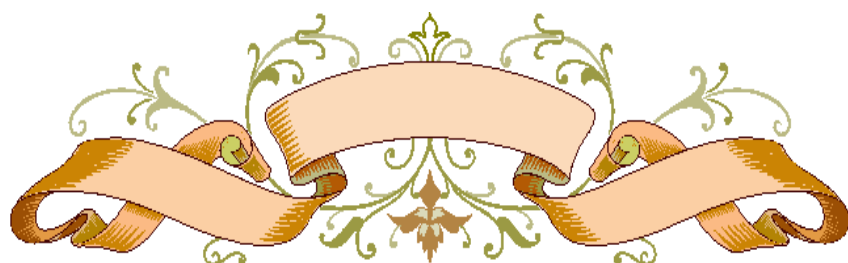
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