Mona Maghraby

بسم اللّه الرحمن الرحيم

مركز الشبكات وتكنولوجيا المعلومات

قسم التوثيق الإلكتروني

Mona Maghraby

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم باللّه العظيم أن المادة التي تم توثيقها وتسجيلها

علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات

ENHANCING EFFLUENT QUALITY OF WASTEWATER TREATMENT PLANTS USING ENVIRONMENTALLY FRIENDLY OXIDATIVE MATERIALS

Submitted By

Mohammed El-Sayed Moustafa Mohmoud

B.Sc. of Science, Faculty of Science, Al-Azhar University, 2007

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

Department of Environmental Basic Sciences
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APPROVAL SHEET

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This thesis was discussed and approved by:

The Committee Signature

1-Prof. Dr. Mostafa Mohamed Hassan Khalil
Prof. of Analytical & Inorganic Chemistry
Faculty of Science
Ain Shams University

2-Prof. Dr. Nabila Mohamed Saleh Ammar
Prof. of Water Chemistry
National Research Center

3-Prof. Dr. Taha Abd El Azzem Mohamed Abd El- Razek
Prof. of Environmental Chemistry, Department of Environmental Basic Sciences - Faculty of Graduates Studies & Environmental Research
Ain Shams University

4-Prof. Dr. Hanan Sayed Abd El-Rahman
Prof. of Water pollution, Environmental Research sector
National Research Center

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ABSTRACT

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The critical situation about water resources in Egypt forces the state to increase its uses from non-conventional water resources (reuse of wastewater and desalination). These resources represent 22.2% of the total available water resources. Wastewater reuse represent a potential source for around 8 BCM /year. The micropollutant sophisticated specification hinder the usage of wastewater. Advanced oxidation process (AOPs) represents new potential way for improving the effluent of wastewater treatment plants (WWTPs). In this work, the discharge of three WWTPs (Arab Abosaaed, El Berka and Balaqs) were investigated and treated. The investigation illustrated that El Berka WWTP is the most vulnerable WWTP this why its effluent was used to conduct further treatment on it. Wastewater quality index (WWQI) For the effluent (output) of the three WWTPs indicated that mostly the three are appropriate for use according to Egyptian law 48/1982 and the uses quality for treated wastewater are fitted with Class D and Class C Code 501/2015 specification. Effluent from the three-treatment plant is unsuitable for uses according to Class A and B. All the oxidants used has been successfully implemented to achieve 100% WWQI for different reuse purposes. The result demonstrated that hydrogen peroxide at a dose of 15 mg/l is very effective in the removal of different pollutants with removal percent of TSS, COD, BOD_5, TOC, and Total Coliform was 84%, 83%, 94%, 89% and 97%, respectively. While when using ferrate achieved removal percent of TSS and T.C higher than other use oxidants in this study. Finally, in terms of cost and application, ferrate and hydrogen peroxide achieved the highest percent removal of pollutants.

Keywords: Wastewater; WWQI; Oxidation; Fenton; Ferrate.

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LIST OF ABBREVIATIONS