

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قال تعالى :

أُولَئِكَ الَّذِينَ كَفَرُوا أَنَّ السَّمَوَاتِ وَالْأَرْضَ كَانَّا رَتْقًا
فَفَتَقْنَاهُمَا وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ أَفَلَا يُؤْمِنُونَ ﴿٣٠﴾

صدق الله العظيم

سورة الأنبياء

DEDICATION

To: My Family and Friends...

Acknowledgement

I would like to thank my supervisor Professor Nafie Abdellatif for supervising this research and for his continuous guidance during the course.

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Abstract

In this work a simple and active photocatalysis system was used to degrade chloroform from wastewater by irradiation with monochromatic UV light source with output power of 1200 mW and 365 nm wavelength. Fe_2O_3 semiconductor was used as a photocatalytic with different weights.

The absorption spectra of samples were recorded before and after irradiation and the influence of Fe_2O_3 weights and UV exposure time on the absorption of chloroform were studied. The results showed that the degradation of chloroform increased by increasing the weight of the semiconductor and increasing the exposure time, where the lower percentage of chloroform degradation was 11.77% when 300 mg of Fe_2O_3 was added to 1 ml from chloroform dissolved in 100 ml of water and irradiated for 15 min, while the highest percentage of chloroform degradation was 100% (completely removed) when 700 mg of Fe_2O_3 was added to 1 ml of chloroform dissolved in 100 ml of water and irradiated for 45 min.

The study concluded that the chloroform degradation can be done efficiently by using UV light and Fe_2O_3 , of certain weight, as a photocatalytic in a reasonable time.

المستخلص

في هذا العمل استخدمت منظومة بسيطة وفعالة للتحفيز الضوئي لتكسير مادة الكلوروفورم من مياه الصرف الصحي وذلك بتشجيعها بمصدر ضوئي أحادي الطول الموجي في المنطقه الفوق بنفسجية بقدرة **1200** ملي واط وطول موجي **365** نانومتر واستخدام أكسيد الحديدك للتحفيز الضوئي بأوزان مختلفة.

تم تسجيل أطياف الامتصاص للعينات تم تسجيلها قبل وبعد التشعيع وتمت دراسة تأثير وزن مادة أكسيد الحديدك وتأثير زمن التشعيع على امتصاصية الكلوروفورم. أظهرت النتائج ان تكسير الكلوروفورم يزداد بزيادة وزن أكسيد الحديدك وبزيادة زمن التعريض. حيث كانت اقل نسبه لتكسير الكلوروفورم قدرها **11.77** % عند إضافة **300** ملي جرام من أكسيد الحديدك الى **1** ملي لتر من الكلوروفورم المذاب في **100** ملي لتر من الماء وتشجيعها لزمن قدره **15** دقيقة. في حين كانت اعلى نسبه لتكسير الكلوروفورم قدرها **100** % (إزالة تامه) عند إضافة **700** ملي جرام من أكسيد الحديدك الى **1** ملي لتر من الكلوروفورم المذاب في **100** ملي لتر من الماء وتشجيعها لزمن قدرة **45** دقيقة.

خلصت الدراسة الى ان تكسير الكلوروفورم يمكن القيام به بكفاءة باستخدام الاشعة الفوق بنفسجيه و مادة أكسيد الحديدك بأوزان مختلفه بإعتبارها محفز ضوئي وذلك في زمن معقول.

CONTENTS

Article	Page Number
الآية	I
Dedication	II
Acknowledgment	III
Abstract	IV
المستخلص	V
Contents	VI
List of figure	VIII
List of tables	IX
Chapter one	
Introduction and basic concepts	
1.1 Introduction	1
1.2 Justification and aim of the work	2
1.3 Structure of the thesis	3
1.4 Fundamental concepts of semiconductors	3
1.5 Definition and mechanism of photocatalysis	6
1.6 Hetrogeneous semiconductor photocatalysis	13
1.7 Literature review	14
Chapter two	
The Experimental part	
2.1 Introduction	17
2.2 The materials	17
2.2.1 Iron oxide (Fe₂O₃)	17
2.2.1.1 Physical properties	18
2.2.1.2 Chemical properties	18
2.2.2. Chloroform (CHCl₃)	19
2.2.2.1 Physical properties	19
2.2.2.2 Chemical properties	19
2.2.2.3 Overview	19
2.2.2.4 Effect on humans	20
2.3 Equipments, tools and setup	20

2.3.1 The UV source	21
2.3.2 The magnetic stirrer	22
2.3.3 UV/visible spectrometer	23
2.4 Experimental procedure	24
Chapter Three Results and discussion	
3.1 Introduction	26
3.2 Spectrum of the pure distilled water	26
3.3 The absorption Spectrum of chloroform in distilled water	27
3.4 Degradation of chloroform	28
3.4.1 The spectra after adding 300mg Fe₂O₃ and irradiation with different times	29
3.4.2 The spectra after adding 400mg Fe₂O₃ and irradiation with different times	31
3.4.3 The spectra after adding 700mg Fe₂O₃ and irradiation with different times	33
3.5 Discussion	39
3.6 Conclusions	41
3.7 Recommended for future work	42
References	43

List of Figures

Figures	Page number
Figure (1.1) Energy bands in solids	4
Figure (1.2) Photocatalysis on a semiconductor	12
Figure (2.1) Block diagram of the setup used in this work	20
Figure (2.2) Photo of the setup	21
Figure (2.3) The LED with 365nm	22
Figure (2.4) The magnetic stirrer	23
Figure (2.5) UV/Visible spectrometer	24
Figure (3.1) The absorption spectrum of the pure distilled water	27
Figure (3.2) The absorption spectrum of 1ml from chloroform in 100ml distilled water	28
Figure (3.3) The spectra of a mixture composed 1ml chloroform and 300mg Fe₂O₃ irradiated by UV source for different times	29
Figure (3.4) The relation between the exposure time and absorption intensity of a mixture composed of 1 ml chloroform and 300 mg Fe₂O₃ irradiated for different times.	30
Figure (3.5) The spectra of a mixture composed 1ml chloroform and 400 mg Fe₂O₃ irradiated by UV source for different times.	31
Figure (3.6) The relation between the exposure time and absorption intensity of a mixture composed 1 ml chloroform and 400 mg Fe₂O₃ irradiated for different times.	32
Figure (3.7) The spectra of a mixture composed 1ml chloroform and 700 mg Fe₂O₃ irradiated by UV source for different times.	33
Figure (3.8) The relation between the exposure time and absorption intensity of a mixture composed of 1 ml chloroform and 700 mg Fe₂O₃ irradiated for different times.	34
Figure (3.9) The relation between the weights of Fe₂O₃ and the absorption intensity of a mixtures composed of 1 ml chloroform and different weights of Fe₂O₃ irradiated for 15 min.	36
Figure (3.10) The relation between the weights of Fe₂O₃ and the absorption intensity of a mixture composed of 1 ml chloroform and different weights of Fe₂O₃ irradiated for 30 min.	37
Figure (3.11) The relation between the weights of Fe₂O₃ and the absorption intensity of the chloroform irradiated for 45 min.	38

List of Tables

Tables	Page Number
Table (3.1): The absorption intensities of the band at 281.704 nm using 300 mg from Fe₂O₃ for different exposure times.	30
Table (3.2): The absorption intensities of the band at 281.704 nm using 400 mg from Fe₂O₃ for different exposure times.	32
Table (3.3): The absorption intensities of the band at 281.704 nm using 700 mg from Fe₂O₃ for different exposure times.	34
Table (3.4): The absorption intensities of the band at 281.704 nm after irradiation with 15 min and different weights of Fe₂O₃.	35
Table (3.5): The absorption intensities of the band at 281.704 nm after irradiation for 30 min and different weights of Fe₂O₃.	36
Table (3.6): The absorption intensities of the band at 281.704nm after irradiation of 45 min and different weights of Fe₂O₃.	38