بسم الله الرحمن الرحيم

شبكة المعلومـــــات الجامعية

التوثيق الالكتروني والميكروفيلم

شبكة المعلومات الجامعية

جامعة عين شمس

التوثيق الالكتروني والميكروفيلم

﴿ قـــسـم ﴾

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأفلام قد اعدت دون آية تغيرات

يجب أن

تحفظ هذه الأفلام بعيداً عن الغبار

في درجة حرارة من 15 – 20 مئوية ورطوبة نسبية من 20-40 %

To be kept away from dust in dry cool place of
15 – 25c and relative humidity 20-40 %

بعض الوثائق الأصلية تالفة

بالرسالة صفحات

لم ترد بالأصـــل

PHOTOCHEMICAL DEGRADATION OF WASTES OF TEXTILE INDUSTRIES

THESIS

Submitted in fulfillment of M.Sc. Degree in Chemistry (Photochemistry)

Presented by

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To

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ABSTRACT

Recently, the utilization of semiconductor particulate systems as a reactive heterogeneous medium has been reached to a tremendous growth in carrying out photochemical transformations of organic and inorganic compounds. One of the particular areas of applied research for the application of the semiconductors is the degradation of textile dyes. Attractive practical applications include, particularly, in terms of photo-catalytic oxidation of dyes.

Reactive inorganic oxide surfaces can participate in photochemical reactions by absorbing the incident photons and transferring charge to an adsorbed molecule.

Advanced oxidation techniques (AOT) by using semiconductors as coupled TiO_2-SiO_2 & $V_2O_5SiO_2$ has been applied. Light energy from ultraviolet radiation in the form of photons excites the electrons on the surface of titanium atoms, moving them from "the valence band to the conductance band". The result of this energy change is the formation of holes in the surface of the titanium atom, and free electrons which are now available to form hydroxide, superoxide or other radicals, which can oxidize organic chemicals, or reduce metal species. The semiconductors powder is added to the solution of a given chemical dye and exposed to ultraviolet light, either from natural sunlight or commercial lamps. Photo-catalytic detoxification process consists on the utilization of the wavelength shorter than 400nm by using different laser sources with different wavelengths to promote a strong oxidation reaction. This reaction took place when such UV radiation photo excited a semiconductor catalyst in the presence of oxygen. In this circumstances hydroxyl

radicals which attack oxidizable contaminant dye are generated, producing a progressive breaking of molecules yielding only to carbon dioxide, water and dilute mineral acids.

The aim of this work is to demonstrate the feasibility of the photochemical degradation process using the direct red dye 23 as well as to investigate the photochemical and photophysical characteristics of the photo-catalytic reaction.

CHAPTER 1 :

INTRODUCTION