

TO CATEGORIES 

1.400.000 PAGES OF RESEARCH

MONTHLY
1.200.000
PAGE VIEWS

OVER
300.000
VISTORS PER MONTH

new E-BOOKS 

FULLTEXT SEARCH

[> GO!](#)

NEW: [Advanced Search](#)

Periodicals:

MSF

> Materials Science Forum

KEM

> Key Engineering Materials

SSP

> Solid State Phenomena

DDF

> Defect and Diffusion Forum

AMM

> Applied Mechanics and Materials

AMR

> Advanced Materials Research

AST

> Advances in Science and Technology

JNanoR

> Journal of Nano Research

JBBTE

> Journal of Biomimetics,

Facile Enrichment and Photocatalytical Degradation of Low Concentration MB in Aqueous Solution

Journal [Applied Mechanics and Materials](#) (Volumes 110 - 116)

Volume [Mechanical and Aerospace Engineering](#)

Edited by Wu Fan

Pages 2308-2315

DOI 10.4028/www.scientific.net/AMM.110-116.2308


Citation Liu Xue Zhang et al., 2011, Applied Mechanics and Materials, 110-116, 2308

Online since October, 2011

Authors [Liu Xue Zhang](#), [Xiu Lian Wang](#)

Keywords [Absorbent](#), [Anatase Titania](#), [Attapulgit](#), [Decantation](#), [Enrichment](#), [Photodegradation](#), [Simple Separation](#)

Abstract Fine particles of photoactive anatase-type TiO₂, prepared by hydrolysis of tetrabutyl orthotitanate and crystallized under microwave (MV) irradiation, were loaded on adsorbent support attapulgit (ATP). The prepared hybrids TiO₂-ATP were characterized with transmission electron microscopy (TEM), selected-area electron diffraction (SAED), and X-ray diffraction (XRD) and photoactivity properties were evaluated separately. The substrates of target were adsorbed on the adsorbent support, and then a high concentration environments of the substrate was formed around the loaded TiO₂, resulting in an increase in the photodestruction rate. One of the most interesting features of the resulting catalysts with low titania contain (<30%) is their fast decantability in comparison with that of TiO₂. This way one of the most important drawbacks of photocatalysis, the catalysts separation from the solution, was overcome by simple sedimentation and decantation. The low concentrations MB may be removed through enrichment and photodegradation using the prepared TiO₂-ATP photocatalyst.

Full Paper  [Get the full paper by clicking here](#)

First page example



Facile Enrichment and Photocatalytical Degradation of Low Concentration MB in Aqueous Solution

Liuxue Zhang^a and Xiulian Wang^b

^a College of Materials and Chemical Engineering, China

^b Zhongyuan University of Technology, China

Zhengzhou, Henan, 450007,

^{a, b} e-mail: zhangliuxue@zzti.edu.cn

Keywords: anatase titania; attapulgite; adsorbent; enrichment; photodegradation; decantation; simple separation

Abstract. Fine particles of photoactive anatase-type TiO₂, prepared by hydrolysis of tetrabutyl orthotitanate and crystallized under microwave (MW) irradiation, were loaded on adsorbent support attapulgite (ATP). The prepared hybrids TiO₂-ATP were characterized with transmission electron microscopy (TEM), selected-area electron diffraction (SAED), and X-ray diffraction (XRD) and photoactivity properties were evaluated separately. The substrates of target were adsorbed on the adsorbent support, and then a high concentration environments of the substrate was formed around the loaded TiO₂, resulting in an increase in the photodegradation rate. One of the most interesting features of the resulting catalysts with low titania content (<30%) is their fast decantability in comparison with that of TiO₂. This way one of the most important drawbacks of photocatalysis, the catalysts separation from the solution, was overcome by simple sedimentation and decantation. The low concentrations MB may be removed through enrichment and photodegradation using the prepared TiO₂-ATP photocatalyst.

1. INTRODUCTION

Within the recent years, the application of photocatalytic materials has increasingly been addressed by many research groups and companies for the removal of numerous organic pollutants from water because it is a cleaning technology in water system treatment and the final decomposition products of organic compounds can be only CO₂, water and products of mineralization [1-2]. Due to its high oxidizing power, its high stability against photocorrosion and its environmental non-toxicity, TiO₂ in its anatase modification has become the most important material for this use [3-5]. When suspended particles are applied for water purification, the resulting highly active surfaces are advantageous, because of their availability for reactants and photons.

Such TiO₂-photocatalytic processes have important significance when applied to the destruction of target compounds of very low concentrations of ppm level or below. The allowance limit of these substances is very low such as less than 0.1 mg/l for substances dissolved in water and such as less than 0.1 ppm for vapor of bad smell substances, though the absolute values of the allowance limit are different depending on the kind of the substances. Therefore, the photodegradation of these harmful and/or bad smell substances should be achieved to a level far below the allowance limit.

In order to make the environmental application of TiO₂ photocatalysis for the destruction of target compounds of very low concentrations of ppm level or below, immobilization of TiO₂ on a certain suitable substrate is inevitably required. Recently it has been demonstrated that the rate of photodegradation at TiO₂ is enhanced by loading TiO₂ onto adsorbents and a few kinds of adsorbents such as SiO₂ [6-8], alumina [6-7], zeolites [6, 9], ZrO₂ [10], pillared clay (such as montmorillonite, saponite and fluorine mica) [11-12] and activated carbon [6-7, 13] were used. The adsorbent supports make a high concentration environment of target compounds around TiO₂, hence, increasing the collision probability between them. The most important in the preparation of hybrid photocatalysts is to select the most suitable adsorbent for TiO₂-loading. The adsorbents should have high absorbabilities for the substances of target but the diffusion of the adsorbed substrates should not be seriously hindered.

CONFERENCE



11/13/2012 - 11/15/2012

The International Conference on Advanced Eng

8/24/2012 - 8/25/2012

AMMT 2012: 2012 International Conference on

7/27/2012 - 7/29/2012

2012 International Conference on Intelligent Sys

[more...](#)