

孙剑辉,孙胜鹏,乔利平,王晓蕾,祁巧艳.负载型纳米TiO₂/AC对偶氮染料的光催化降解研究[J].环境科学学报,2006,(3):420-425

负载型纳米TiO₂/AC对偶氮染料的光催化降解研究

Photocatalytic degradation of azo dyes using nanometer-sized TiO₂ photocatalyst immobilized on activated carbon

关键词: [TiO₂/AC](#) [溶胶凝胶浸渍](#) [偶氮染料](#) [光催化](#)

基金项目: [河南省重点科技攻关项目\(No.0523032200\)](#)

作者 单位

孙剑辉 河南师范大学化学与环境科学学院,河南省环境污染控制重点实验室,新乡 453007

孙胜鹏 河南师范大学化学与环境科学学院,河南省环境污染控制重点实验室,新乡 453007

乔利平 河南师范大学化学与环境科学学院,河南省环境污染控制重点实验室,新乡 453007

王晓蕾 河南师范大学化学与环境科学学院,河南省环境污染控制重点实验室,新乡 453007

祁巧艳 河南师范大学化学与环境科学学院,河南省环境污染控制重点实验室,新乡 453007

摘要: 以钛酸四丁酯和粒状活性炭(AC)为主要原料,采用溶胶凝胶浸渍法制备出负载型纳米TiO₂/AC催化剂。在流化床反应器中分别对2种典型的偶氮类染料橙黄G、活性艳红X3B模拟废水进行了光催化降解研究,探讨了pH值、外加氧化剂对光催化降解率的影响,并对催化剂进行了回收再生利用试验。结果表明,TiO₂/AC催化剂具有良好的光催化活性、吸附特性及可再生性,60min后对2种染料反应的光催化降解率分别可达到99.71%和97.12%,反应180min后的TOC去除率分别达到81.54%和81.99%。

Abstract: Using tetrabutyl titanate and granular activated carbon as the raw material, nanometer-sized TiO₂ photocatalyst immobilized on activated carbon(TiO₂/AC) was prepared by sol-gel-dip method. The photocatalytic degradation of 2 azo dyes orange G and reactive brilliant red X-3B in simulated wastewater were studied in a fluidized photocatalytic reactor. The influences of pH value, additive oxidants to the photocatalytic degradation rate were investigated. The recovered efficiency and catalytic activity of the regenerated photocatalyst was also tested. The results indicated that TiO₂/AC photocatalyst showed high photocatalytic activity, absorbability and regeneratjng property. The photocatalytic degradation rates of orange G and reactive brilliant red X-3B were achieved 99.71% and 97.12% in 60mins, the TOC removal rates were achieved 81.54% and 81.99% after 180mins reaction respectively. The recovery rate of TiO₂/AC photocatalyst was more than 95%, and the photocatalytic degradation rates of orange G was achieved 95.93% by calcination regenerated TiO₂/AC especially.

Key words: [TiO₂/AC](#) [sol-gel-dip](#) [azo dye](#) [photocatalytic](#)

摘要点击次数: 77 全文下载次数: 78

[关闭](#)[下载PDF阅读器](#)

您是第308002位访问者

主办单位: 中国科学院生态环境研究中心

单位地址: 北京市海淀区双清路18号 邮编: 100085

服务热线: 010-62941073 传真: 010-62941073 Email: hjxxb@rcees.ac.cn

本系统由北京勤云科技发展有限公司设计