



毕海超, 赵俊梅, 董建芳, 李义. Fe-ZSM-5分子筛催化降解染料废水的研究[J]. 岩矿测试, 2013, 32(1): 119~123

Fe-ZSM-5分子筛催化降解染料废水的研究

[下载全文](#) [查看/发表评论](#) [下载PDF阅读器](#)

An Investigation on the Catalytic Degradation of Dyeing Wastewater with Fe-ZSM-5 Zeolite

投稿时间: 2012-05-27 最后修改时间: 2012-08-20

DOI:

中文关键词: [Fe-ZSM-5分子筛](#) [液相离子交换法](#) [均相亚铁盐催化剂](#) [染料废水](#) [脱色效果](#)

英文关键词: [Fe-ZSM-5 zeolite](#) [liquid phase ion exchange](#) [Fenton homogeneous ferrous-salt catalyst](#) [dyeing wastewater](#) [decolorization effect](#)

基金项目:

作者	单位
毕海超	河北省环境地质勘查院, 河北 石家庄 050021
赵俊梅	河北省环境地质勘查院, 河北 石家庄 050021
董建芳	河北省环境地质勘查院, 河北 石家庄 050021
李义	河北省环境地质勘查院, 河北 石家庄 050021

摘要点击次数: 365

全文下载次数: 447

中文摘要:

传统的Fenton均相亚铁盐催化剂处理染料废水, 具有难以避免的二次污染和亚铁离子流失问题。分子筛催化剂相比传统催化剂具有高效环保的特点, 在催化氧化染料废水领域有着良好的前景。本文通过液相离子交换法制备了Fe-ZSM-5非均相分子筛催化剂, 替代传统的亚铁盐催化剂, 应用X射线衍射对制备的Fe-ZSM-5分子筛催化剂进行表征, 表明随离子交换次数的增加, Fe-ZSM-5催化剂负载的铁量上升, 且较好地保持了分子筛结构, 有利于提高亚铁离子的催化能力。通过实验确定了Fe-ZSM-5催化剂催化反应的最佳温度、pH值、Fe-ZSM-5的用量、反应时间等工艺参数, 比较了Fe-ZSM-5催化剂和传统Fenton均相催化剂降解染料废水的脱色率和废水中铁离子的残留量, 结果表明Fe-ZSM-5的脱色率达到98.5%, 相比于Fenton均相催化剂的脱色率提升约3%; 两种催化剂的铁离子残留量差别显著, Fe-ZSM-5催化剂处理的废水中只产生微量的Fe离子, 可以认为Fe-ZSM-5非均相分子筛催化剂有效地解决了催化剂损耗和二次污染问题。

英文摘要:

A homogeneous ferrous salt catalyst was used in the traditional Fenton oxidation technology for dyeing wastewater. However, it was difficult to avoid the secondary pollution and loss of ferrous ions. Zeolite catalysts, which are more efficient and environmentally friendly than conventional catalysts, have good prospects in the field of catalytic oxidation of dyeing wastewater. In this article, Fe-ZSM-5 zeolite catalyst was prepared by the liquid ion exchange method to replace the traditional ferrous salt catalyst and its catalytic effect was studied for wastewater treatment with the Fenton reagent. X-ray Diffraction was applied to study the characteristics of the Fe-ZSM-5 zeolite catalyst. The result indicated that the Fe-ZSM-5 well reserved the structures of a molecular sieve, which improved the catalytic effect. The effect of the number of ion exchanges and supported Fe on the structure of ZSM-5 zeolite is discussed in this paper. The treatment of dyeing wastewater by catalyzer of Fe-

ZSM-5 and oxidant of H_2O_2 has been investigated under the optimal conditions of temperature, pH value, dosage of Fe-ZSM-5 and reaction time. Results show that Fe-ZSM-5 zeolite catalyst has excellent catalytic effect and the decolorization rate of the dye was to 98.5% under optimal conditions. The catalytic effect of the heterogeneous Fe-ZSM-5 was 3% higher than that of the traditional Fenton oxidation technology. Moreover, the residuals of Fe were significantly different between the two methods, which demonstrate that the heterogeneous Fe-ZSM-5 catalyzer efficiently overcame the problems of the catalyzer loss and secondary pollution.

主管单位：中国科学技术协会

主办单位：中国地质学会岩矿测试专业委员会
国家地质实验测试中心

版权所有《岩矿测试》编辑部

通讯地址：北京市西城区百万庄大街26号

E-mail: ykcs_zazhi@163.com; ykcs_zazhi@sina.com

京ICP备05032737号-2

技术支持：北京勤云科技发展有限公司

邮 编：100037

电 话：010-68999562 68999563

传 真：010-68999563