

研究报告

郑展望,雷乐成,张珍,岑沛霖.非均相UV/Fe-Cu-Mn-Y/H₂O₂反应催化降解4BS染料废水[J].环境科学学报,2004,(6):1032-1038

非均相UV/Fe-Cu-Mn-Y/H₂O₂反应催化降解4BS染料废水 Heterogeneous UV/ Fe-Cu-Mn-Y/H₂O₂ catalyst catalytic degradation of 4BS

关键词: [FeCuMnY催化剂](#) [废水处理](#) [非均相催化氧化](#) [4BS](#) [动力学](#)

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摘要: 制备了负载在Na-Y分子筛上的Fe-Cu-Mn-Y复合催化剂,并对其在非均相UV/Fe-Cu-Mn-Y/H₂O₂体系中催化氧化4BS染料废水进行了研究。结果表明,非均相UV/Fe-Cu-Mn-Y-H₂O₂体系对4BS染料废水的处理具有很高的效率。在基准条件下,反应时间为20min时,废水中4BS的去除率达到了93.7%。与均相UV/Fenton体系不同,非均相UV/Fe-Cu-Mn-Y/H₂O₂

Abstract: The homogeneous UV/Fenton system's pH had to be adjusted to a limited range (3~5) and the Photo-Fenton process requires recovery of iron, so operation cost in chemicals and labor has to be added. In order to widen the application of Fenton-type oxidation processes, these drawbacks have to be overcome by immobilization of ferric ion. Investigations showed that other transition metal ions, due to their variety of valence could replace ferric ion and serve as a like-Fenton reagent. Furthermore, different kinds of transition metal ions and their ratio in the UV/like-Fenton process will favorably affect the degradation of contamination significantly. In this article, the heterogeneous Fe-Cu-Mn-Y catalyst was developed by immobilizing Fe²⁺, Cu²⁺, Mn²⁺ on Na-Y zeolite. The degradation of 4BS has been investigated by the heterogeneous UV/Fe-Cu-Mn-Y/H₂O₂ process. The results indicated that the heterogeneous UV/ Fe-Cu-Mn-Y/H₂O₂ process shows high proficiency in catalytic oxidizing 4BS, whose 4BS removal rate reached 93.7% when the reaction time is 20 min under the standard experimental conditions (as defined in the article). Deferent from the homogeneous one, the heterogeneous process remains higher efficiency of removal of COD_{Cr} and 4BS, even in alkaline solution (pH reached 10.5). Kinetic model was correlated, which could provide the direction of the practical treatment of such deep color dye effluents.

Key words: [Fe-Cu-Mn-Y catalyst](#) [wastewater treatment](#) [heterogeneous catalytic oxidation](#) [4BS](#) [kinetics](#)

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