疏水沸石负载纳米TiO2光催化去除水中土霉素

Removal of oxytetracycline in water by UV/Hydrophobic Zeolite loaded with TiO2

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中文摘要

通过固体扩散法将纳米二氧化钛负载在疏水沸石上制成复合光催化剂.研究了不同配比的复合光催化剂在32W紫外灯照射下对水中土霉素的去除效果,探讨了复合光催化剂投加量、土霉素初始质量浓度、初始pH值对降解效果的影响.结果表明:质量分数为40%的纳米二氧化钛和质量分数为60%的疏水沸石制成的复合光催化剂在UV照射下对土霉素具有最佳的去除效果,对于初始质量浓度为50 mg.L-1的土霉素水溶液,复合光催化剂投加500 mg.L-1,UV照射150 min即可将土霉素去除99％以上,UV照射6 h,溶液的总有机碳(TOC)可去除86%.土霉素质量浓度越低降解速度越快,随着pH值的提高,其降解速率常数逐渐增大.

英文摘要

The composite photocatalysts were made by solid dispersion method with hydrophobic Zeolite and nanometer titanium dioxide. The removals of oxytetracycline (OTC) in water by UV/ Hydrophobic Zeolite loaded with different ratio of TiO2 were investigated respectively under the irradiation of 32W low-pressure mercury lamps. The effects of composite photocatalyst quantity, initial OTC concentration and pH were studied. It is showed that UV/Composite photocatalyst with 40% TiO2 and 60% hydrophobic Zeolite is the best way to remove OTC in water compared to the others. 99% of OTC (50 mg.L-1) in ultrapure water mixed with 500 mg.L-1 composite photocatalyst degrades within 150 min under UV irradiation. And after 6 hours, 86% TOC of the OTC solution is removed. It is found that the degradation rate is quicker when the OTC initial concentration is lower and initial pH is higher.

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