

A new microfiltration photocatalytic reactor for DDT removal

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ABSTRACT

In this paper, a process combining stainless steel membrane and UV/TiO₂ is developed to degrade DDT in water. The photocatalyst TiO₂ was deposited on a kind of glass cenospheres whose diameters ranged from 20 to 200 nm, so they could be kept in the reactor by microfiltration membrane. The influence of different variables (TiO₂ concentration, radiation) on the reaction rate was tested. According to the experiment, the removal was mainly caused by adsorption during the early stages of the reaction and mainly by UV/TiO₂ degradation in the later stages. Three sample solutions with DDT concentrations: C₀ = 30, 40 and 50 mg/L, were treated in the reactor and the removal rate of DDT was found to be 98.3%, 97.8% and 97.6%, respectively. Adequate dosage of the catalyst increased the generation rate of electron/hole pairs which promoted the formation of OH radicals for enhancing photodegradation.

Keywords: Drinking water; Stainless steel membrane; Persistent organic pollutants

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