Influence of Adsorption Properties on the Heterogeneous Photocatalytic Oxidation Rate of 2,4,6-Trinitrotoluene(TNT)

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The influence of adsorption on the kinetics on the photocatalytic degradation of 2,4,6-trinitrotoluene (TNT)was investigated. The effects of various parameters such as temperature, the initial TNT concentration, the initial pH and TiO_2 dosage, and the light intensity of UV lamp on the TNT degradation rate by TiO_2 photocatalysis were examined. The reaction rate was found to obey pseudo second-order kinetics represented by the Langmuir-Hinshelwood kinetic expression. The values of the adsorption equilibrium constant (K_{TNT}) and the second-order rate constant (k_c) were determined to analyze the effect of adsorption properties on the heterogeneous photocatalytic oxidation rate. It was found that the photocatalysis rate of TNT was highly dependent on the initial concentration and temperature.