

**Rajca, M., Bodzek, M., Cichy, J. Kinetics of Fulvic Acid Degradation in the Integrated Process Photooxidation–Ultrafiltration. *Ochrona Srodowiska* 2011, Vol. 33, No. 3, pp. 63–66.**

**Abstract:** In this study, fulvic acids were removed from model solutions by catalysis, photolysis and photocatalysis, as well as in the integrated process of photocatalysis and ultrafiltration. Experiments were carried out in the Heraeus reactor, where model water of an approximately  $10 \text{ g/m}^3$  content of fulvic acids was treated. Titanium dioxide was used as a photocatalyst. The efficiency of fulvic acid oxidation, measured in terms of dissolved organic carbon content and UV absorbance ( $\lambda=254 \text{ nm}$ ), was related to the pH of the water (3.5, 7.0 and 10.0) and to the catalyst dose applied (100 to  $600 \text{ gTiO}_2/\text{m}^3$ ). The results substantiated the efficiency of the photocatalysis process at fulvic acid removal from water and the usefulness of the ultrafiltration membrane in the recovery of the catalyst being used in the photocatalytic process. The values of the reaction rate constant and the half-time of fulvic acid degradation were determined using a kinetic model based on a first-order reaction. Established were also the relations between rate constant, pH and photocatalyst concentration in the reaction environment. The results obtained make it possible to precisely describe the progression of fulvic acid photodegradation.

**Keywords:** Fulvic acids, water treatment, photocatalysis, ultrafiltration, catalysis, photolysis, kinetic model.