



“Gh. Asachi” Technical University of Iasi, Romania

CIPROFLOXACIN DEGRADATION IN WATER BY SEVERAL ADVANCED OXIDATION PROCESSES

Maria-Magdalena Bobu, Ilie Siminic^{*}

*“Gheorghe Asachi” Technical University of Iasi, Department of Chemical Engineering,
71 Mangeron Blvd., Iasi 700050, Romania*

Abstract

The experimental results on the ciprofloxacin (CFX) degradation in water by six advanced oxidation processes (AOPs) are reported in this paper: UV- H₂O₂, UV- H₂O₂- Fe(II), O₃, O₃- UV, O₃- UV- H₂O₂, and O₃- UV- H₂O₂- Fe(II). The optimal operation parameters have been established for each process. The effectiveness of each process has been evaluated on the basis of four performance criteria derived from the kinetic experimental data: CFX conversion under the optimal conditions at a given time (X_{CFX}), CFX mineralization degree under the optimal conditions at a given time (X_{TOC}), the pseudo- first order rate constant based on molar concentration of CFX ($k_{ap,c}$), and the pseudo- first order rate constant based on total organic carbon concentration ($k_{ap,TOC}$). According to these criteria the effectiveness of the investigated processes increased in the following order:

UV < UV-H₂O₂ < O₃ < O₃-UV < O₃-UV-H₂O₂ < UV-H₂O₂- Fe (II) < O₃-UV-H₂O₂-Fe (II)
The toxicity of the final solution seems to decrease in the same order, i.e. the process with the highest mineralization degree had the lowest toxicity.

Keywords: degradation experiments, conversion degree, mineralization, rate constants, toxicity

^{*} Author to whom all correspondence should be addressed: e-mail: isiminic@ch.tuiasi.ro