

REGATA

Rede Galega de Tratamento de Augas

Research Stays 2014

Cometabolic model of organic micropollutants in activated sludge reactors of WWTPs

October 1st, 2014 | November 31st, 2014

Objectives

Determination of kinetic coefficients in the cometabolic biotransformation of emerging organic micropollutants in activated sludge reactors of wastewater treatment plants to model their fate in wastewater treatment plants (WWTPs) more accurately.

Methodology

- Dynamic model of activated sludge reactors (ASM3) implemented in Matlab.
- Use of experimental data from pilot scale bioreactors (nitrifying and nitrifying-denitrifying reactors) to obtain kinetic coefficients of the cometabolic biotransformation of micropollutants by different types of biomass: nitrifying and heterotrophic aerobic and anoxic.

Results

A 30 L nitrifying-denitrifying pilot scale bioreactor was modelled by ASM3 and kinetic coefficients of cometabolic biotransformation of micropollutants were determined. The results obtained for ibuprofen are shown in Figure 1.

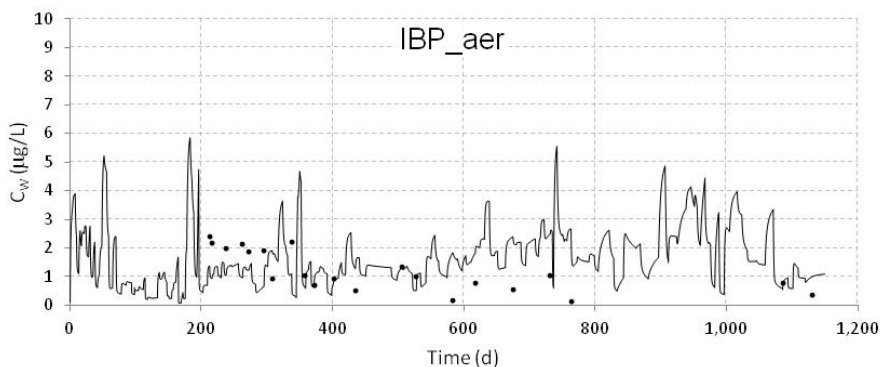


Figure 1. Evolution of experimental (dots) and predicted (continuous line) soluble ibuprofen concentrations in the effluent of a pilot scale nitrifying-denitrifying reactor fed with 10 µg/L.

Modelling of activated sludge process in a full-scale WWTP with ASM3 coupled to the proposed cometabolic model for micropollutants will be completed to validate the model.

Highlights

Concentration of emerging organic micropollutants in effluents of WWTPs can be more accurately predicted applying cometabolic kinetics in dynamic models decreasing the use of expensive analytical tools.

Researcher

Eduardo Fernández Fontaina



Group of Environmental Engineering and Bioprocesses (Biogrup)
University of Santiago de Compostela

Group leader: Prof. Juan M. Lema

Host Institution

Laboratoire Réactions et Génie des Procédés.
University of Lorraine, France

Responsible: Prof. Marie-Noëlle Pons



Contact Network details

Chair of the Network REGATA

Juan M. Lema
Professor of Chemical Engineering
Univ. Santiago de Compostela, Spain
Juan.Lema@usc.es

Research stays Coordinator

M^a. Ángeles Sanroman Braga
Professor of Chemical Engineering.
University of Vigo, Spain.
sanroman@uvigo.es

Organised by

Universidade de Vigo



UNIVERSIDADE DA CORUÑA

Supported by

