

PhD Candidate Profile

Name:

Sandra Mesones Bernal

Research Group:

Group of Chemical and Environmental Engineering

Research Centre:

School of Experimental Sciences and Technology (ESCET)

Department:

Department of Chemical and Environmental Technology

College:

Rey Juan Carlos University

Supervisor:

Javier Marugán Aguado and María José López Muñoz

Funding body:

Rey Juan Carlos University

Area (field) of study:

Water treatment by advanced photochemical processes.

Thesis Title:

Design and evaluation of advanced photochemical processes for the elimination of emerging contaminants and antibiotic resistant genes in wastewater.

Abstract:

One of the biggest concerns with water quality is the presence of emerging pollutants (ECs), such as pharmaceuticals and antibiotics, and their impact on the development of antibiotic resistant bacteria. Its detection in wastewater, aquatic environments and even in drinking water makes it necessary to implement appropriate measures and elimination processes to avoid its discharge into the aquatic environment.

There are several processes for the elimination of pollutants in water. Advanced oxidation processes have demonstrated to be effective in eliminating a large number of contaminants. These processes can be combined with others such as electrochemical oxidation. On the other hand, the treatment of water with photolysis of free chlorine is also being investigated by applying UV-C light, considering as an alternative to the UV / H₂O₂ process.

For this reason, processes will be developed for its application in disinfection and elimination of emerging contaminants and antibiotic resistant genes (ARG) in water. Photoelectrocatalytic processes based on the use of TiO₂ supported on activated carbon in a



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three-dimensional electrochemical reactor and photolysis of free chlorine with UV-C light (Cl / UV-C) processes will be developed.

Collaborations:

N/A

Publications:

J. Rodriguez-Chueca, S. Mesones, J. Marugán (in press). Hybrid UV-C/microfiltration process in membrane photoreactor for wastewater disinfection. Environmental Science and Pollution Research.

Esperanza Mena, María José Martín de Vidales, Sandra Mesones, Javier Marugán. Influence of anodization mode on the morphology and photocatalytic activity of TiO₂-NTs array large size electrodes. Catalysis Today. Volume 313, 2018, Pages 33-39.

C. Adán, J. Marugán, S. Mesones, C. Casado, R. van Grieken. Bacterial inactivation and degradation of organic molecules by titanium dioxide supported on porous stainless steel photocatalytic membranes. Chemical Engineering Journal, Volume 318, 2017, Pages 29-38.

Presentations:

XIII Congreso Español de Tratamiento de Aguas (META). León, Spain, 18-20 June 2018.