PhD Candidate Profile

Name:

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Research Group (if relevant):

Bioengineering and Sustainable Processes Group (BiosUV)

Research Centre (if relevant):

N/A

Department/School(s) (if relevant):

Department of Chemical Engineering

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Funding body:

N/A

Area (field) of study:

Chemical Engineering

Thesis Title:

Combination of advanced oxidation technologies and selective adsorption for the treatment of micro-contaminants.

Abstract:

The impacts of increasing industrialization and its effects on environmental deterioration requires the development of alternative treatment technologies for the removal of the new generated pollutants. Among them, the so-called emerging micro-contaminants, whose presence in the environment is not necessarily new but cause environmental problems, are a matter of concern that require solutions.

In recent years, advanced oxidation processes (AOPs) became a suitable alternative in the treatment of effluents due to their versatility in the degradation of organic pollutants of different nature. This property lies in the powerful action shown by the agent generated in all of them: the hydroxyl radical. However, and due to the low concentration in which the pollutants are found in wastewater, their previous concentration would allow to improve the water treatment by AOP and favour the elimination in an even more efficient way. Techniques based on adsorption are good alternatives to facilitate this process.

In this context, this doctoral thesis will be focused on the application of various technologies such as adsorption and electro-adsorption for the concentration of micro-contaminants and, thereby, reducing the volume of liquid to be treated; and, on the other hand, the coupling with AOP processes for the final treatment of concentrated emerging contaminants. Therefore, it will be necessary to

optimize separately the different technologies, and in the specific case of the AOPs, a special interest will be given in the development of new heterogeneous catalysts and the optimization of the processes for operating in a continuous flow system.

In the last phase of the thesis, the design and implementation of a hybrid treatment system will be carried out for the wastewater treatment encompassing the two mentioned steps. Thus, it will be possible to concentrate and degrade the micro-contaminants to complete the cycle of this study.

Collaborations:

N/A

Publications:

Puga, A., Rosales, E., Sanromán, M.A., Pazos, M., 2019. Environmental application of monolithic carbonaceous aerogels for the removal of emerging pollutants from aquatic environment. Chemosphere. (Sent on September 30, 2019)

Presentations:

Simultaneous removal of sulfamethoxazole and methyl paraben by electro-Fenton treatment. XXIV Encontro Luso Galego de Química. A. Puga, E. Rosales, M. Pazos, M. A. Sanromán.

Valorisation of wastes as biosorbents for the simultaneous removal of pharmaceuticals and personal care products. XXIV Encontro Luso Galego de Química. A. Puga, E. Rosales, M. Pazos, M. A. Sanromán.

Removal of micropollutants from aquatic environment by two-stage approach: adsorption and electro-Fenton. 3rd workshop of the excellence network on environmental and energy applications of the chemical technology. A. Puga, S. Escudero, E. Rosales, M. Pazos, M. A. Sanromán.

Wastes from hydrocolloid and fibre industry as low-costadsorbents: adsorption and regeneration. Congreso nacional de biotecnología. V. Acevedo, A. Puga, E. Rosales, M. Pazos, M. A. Sanromán.

Alternative cathode materials and catalysts for the treatment of micropollutants by electrochemical advanced oxidation processes. 3rd International congress of chemical engineering. A. Puga, I. Costas, E. Rosales, M. Pazos, M. A. Sanromán.

Nuevos catalizadores flotantes para su aplicación en los procesos electro-Fenton procesos: eliminación de sulfametizol. 1er simposio Novedar. A. Puga, E. Rosales, M. Pazos, M. A. Sanromán.