

**Name:**

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Research Group (if relevant):

Bioengineering and Sustainable Processes (BiosUV)

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N/A

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Funding body:

N/A

Area (field) of study:

Removal of emerging contaminants by advanced oxidation processes

Thesis Title:

Application of optimization and control tools to the treatment of emerging contaminants through advanced oxidation processes.

Abstract:

In recent years, the Advanced Oxidation Processes (AOPs) have emerged as a promising alternative for the effluent treatment due to the great versatility that show in the degradation of organic pollutants of diverse origins. This versatility lies in the powerful action of the agent generated in all the AOPs: the hydroxyl radical. However, the increasing in the use of synthetic pollutants, related to the expansion of industrialization, makes it necessary to validate these new technologies for its application in the removal of new pollutants, such as the so-called emerging contaminants.

In this context, this thesis is focused in optimizing and controlling the AOPs used for the treatment of emerging contaminants. Different AOPs will be studied: i) anodic oxidation, where an electric field generates hydroxyl radicals on the anode surface, ii) Fenton process, where hydroxyl radicals are obtained through the reaction of hydrogen peroxide and iron and iii) the electro-Fenton process, where an electric field is applied and iron is added in order to generate the hydroxyl radical in both the anode surface and through the reaction of hydrogen peroxide and iron.

PhD Candidate Profile

For the various AOPs, the treatment will be optimized depending on the selected pollutant and taking into account the operating variables and the type of reactor employed. This optimization will be carried out by performing a design of experiments using specialised software (e.g. Design expert) which allows evaluating and analysing the obtained results. Moreover, a monitoring system will be designed in order to ensure that the process is functioning in the optimal operating conditions. For doing so, a Supervisory, Control And Data Acquisition (SCADA) system will be employed.

Collaborations:

N/A

Publications:

N/A

Presentations:

N/A