

Department of Chemistry – CQFB / REQUIMTE



Maria Bernardo

2005 - Graduation in Chemical Engineering

2011 - MSc in Energy and Bioenergy

2013 - PhD in Energy and Bioenergy

2014 - Post-doc fellow

Author of several papers in the areas mentioned.

Carbon materials and pharmaceuticals adsorption

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requimte



Objectives

To evaluate the viability of using biochars and activated carbons obtained from wastes generated in agro-food industries with relevance in Portugal, for the adsorption and removal of pharmaceutical compounds present in wastewaters.

Specific objectives:

- Optimization of experimental conditions to improve the quality of the resulting biochars and activated carbons;
- Full characterization of the carbon materials, including their ecotoxic properties;
- Evaluation of the performance of the waste-based adsorbents in the adsorption of pharmaceutical compounds present in wastewaters.

Methodology

Preparation of biochars through pyrolysis/carbonisation in inert atmospheres

Surface and textural modifications of biochars to improve their properties

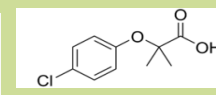
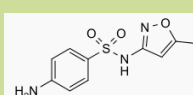
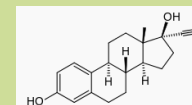
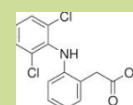
Textural, chemical and ecotoxicological characterisation of the prepared materials (N₂ adsorption, Hg porosimetry, AAS, SEM, TEM, FTIR, XPS, XRD, bioindicators)

Adsorption tests: Batch and column experiments with synthetic and real wastewaters containing pharmaceutical compounds of different therapeutic classes.

Regeneration studies of the adsorbents through thermal and chemical methods

Expected Results

This project is expected to improve the current knowledge on adsorption technologies particularly focused in improving their environmental and economic performance for controlling emerging pharmaceutical compounds in water streams by making use of novel, cost-effective and sustainable adsorbents obtained from wastes from the Portuguese agro-food sector with no market valorisation.



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