SCIENCESPRINGDAY

FACULDADE DE CIÊNCIAS E TECNOLOGIA
UNIVERSIDADE NOVA DE LISBOA

Chemical Department

Treatment of wastewater containing persistent pollutants

Biochemical and Process Engineering Group

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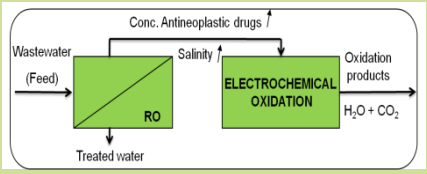
- 2009, Student of the PhD Program in Sustainable Chemistry

- 2005, Graduation degree in Water Resources Engineering

Objectives

Study and development of a new process for degradation of antineoplastic agents and their metabolites, through integration of reverse osmosis (RO) and boron-doped diamond (BDD) oxidation processes. This process integration methodology will allow the chemical destruction of the toxic compounds while taking advantage of the benefits offered by membrane technology: i) reduce the volume of wastewater to treat, ii) achieve a dynamic control of the processing conditions, namely the saline conditions and concentration of antineoplastics.



Methodology

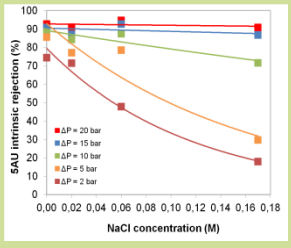
- Study of the transport and rejection of antineoplastic agents through reverse osmosis (RO) membranes.

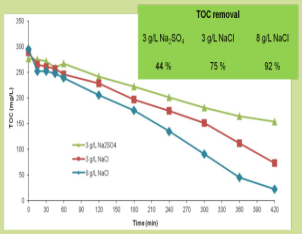
- Evaluation of the performance of BDD anodic oxidation for the degradation of antineoplastic agents.

- Validation and development of the integrated oxidation-membrane process, through the selection of the processing parameters that allow a better rejection and efficient degradation of the antineoplastic agents.

- Evaluation of the overall process in terms of its technical efficiency, environmental impact through a life cycle assessment and economic viability analysis.

Expected Results





- High rejection of organic solute (5AU compound) and salt ions obtained by adequate selection and well-defined RO process conditions, which may improve the chemical degradation of antineoplastic compounds and Total Organic Carbon (TOC) removal through BDD anodic oxidation.

- Development of an efficient and economically viable integrated membrane-oxidation process for *in situ* degradation of antineoplastic compounds present in hospital wastewaters and their disposable into municipal sewers without cause adverse effects to the environment and human health.

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