

**Name:**

Daniela Morais

**Research Group (if relevant):**

Thermodynamics and Environment

**Research Centre (if relevant):**

LSRE-LCM/ALiCE

**Department/School(s) (if relevant):**

Department of Chemical Engineer

**College:**

Faculty of Engineering, University of Porto (FEUP)

**Supervisor(s):**

Vítor Jorge Pais Vilar (Supervisor)

Maria Francisca da Costa Moreira (Co-supervisor)

Carlos José Macedo Tavares (Co-supervisor)

**Funding body:**

Fundação para a Ciência e Tecnologia (FCT) – SFRH/BD/146476/2019

**Area (field) of study:**

Organic synthesis by (photo)electrochemical processes

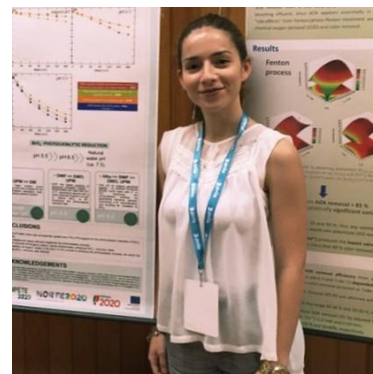
**Thesis Title:**

Advances in photoelectrocatalysis: A continuous-flow photoelectrocatalytic static mixer microreactor applied to the synthesis of high-value organic chemicals

**Abstract:**

Photoelectrocatalysis has demonstrated remarkable efficiency and eco-friendly characteristics; however, its practical implementation on an industrial scale is hindered by the limited availability of optimal reactor designs and the lack of comprehensive studies on its application for synthesizing high-value organic chemicals. Concurrently, global authorities are progressively embracing the concept of a circular and self-sufficient bio-based economy.

This thesis project aims to bridge these gaps by developing an innovative photoelectrocatalytic flow microreactor and the design and fabrication of transparent photoanodes. The ultimate goal is to apply this novel photoelectrocatalytic technology, integrating the microreactor and photoanodes, to two specific scenarios: (i) a model synthesis reaction and (ii) the oxidation of lignin derived from Kraft black liquor, a waste stream



## PhD Candidate Profile

generated during pulp processing, with the aim of producing valuable compounds, chemicals, and/or fuels.

### Collaborations:

University of Minho

SINTEF

LEPABE/ALiCE

### Publications:

N/A

### Presentations:

4<sup>th</sup> Doctoral Congress in Engineering (DCE 21). Porto, Portugal, 28-29 June 2021.

13<sup>th</sup> European Symposium on Electrochemical Engineering (13<sup>th</sup> ESEE2023). Toulouse, France, 26-29 June 2023.