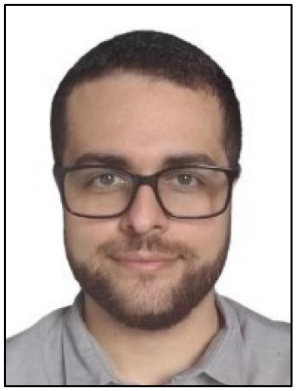
PhD Candidate Profile



Name:
Leonardo Almeida Delgado

Research Group (if relevant):
N/A

Research Centre (if relevant):
Laboratory of Separation and Reaction Engineering and Laboratory of Catalysis and Materials (LSRE-LCM)

Department/School(s) (if relevant):
Department of Chemical Engineering

College:
Faculty of Engineering - University of Porto (FEUP)

Supervisor(s):
Dr. Vítor Jorge Pais Vilar

Co-Supervisor(s):
Dra. Maria Francisca da Costa Moreira

Funding body:
Fundação para Ciência e Tecnologia (FCT) - 2021.07258.BD

Area (field) of study:
Chemical Engineering (electrocatalysis and photoelectrocatalysis to obtain value-added products from glycerol)

Thesis Title:
Breakthrough photoelectrocatalytic technology for glycerol valorization

Abstract:
This project aims at turning crude glycerol, a surplus from the ever-increasing worldwide biodiesel production, into value-added chemicals through the development of a cutting-edge green technology, stimulating transition towards a circular and self-sufficient economy. The new technology will be built on three main pillars: a new process, new materials, and a new reactor. The understudied photoelectrocatalysis process will be approached. Disruptive photoanodes will be developed alongside with a pioneering microfluidic photoelectrocatalytic reactor embedding the new photoanodes. Photoanodes will be based on nanostructured transparent conductive oxides (TCOs) and semiconductors. They may have improved activity and selectivity towards glycerol selective oxidation. The new reactor will be based on conventional filter-press electrochemical cells but with anode irradiation and a cathode with a mechanically imprinted static mixer, NETmix, at microscale

for fluid circulation. Microflow technology and photoelectrochemisty combined features may induce improved mass, heat and photon transfer, electrical conductance, scalability, reproducibility, automation, and safety.

Collaborations:

N/A

Publications:

N/A

Presentations:

N/A