PhD Candidate Profile

Name:
Mylena Spina Cruz

Research Group (if relevant):
N/A

Research Centre (if relevant):
N/A

Department/School(s) (if relevant):
School Of Civil Engineering, Architecture And Urban Design - Department Of Infrastructure And Environment

College:
University of Campinas (UNICAMP), Brazil

Supervisor(s):
Prof. Dr. José Roberto Guimarães

Funding body:
CAPES (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior)

Area (field) of study:
Application of AOPs to degrade contaminants of emerging concern in the environment, and residual ecotoxicological assessment.

Thesis Title:
Degradation of psychoactive drugs by advanced oxidative processes: residual toxicity assessment.

Abstract:
There was a considerable increase in the consumption of psychoactive drugs on the last decade. Once administered and excreted by the human organism, these drugs are persistent in the environment due to the difficulty of removing them by the conventional water and wastewater treatment processes. The objective of the research is to evaluate the degradation of three psychoactive drugs widely used worldwide: fluoxetine (FLU), escitalopram (ESC) and bupropion (BUP) by advanced oxidative processes (AOPs), such as photoperoxidation (UV/H_2O_2) and ozonation at basic pH. The detection and quantification of the levels of the three drugs during the degradation processes, an analytical method was developed using the mass spectrometry technique (SPE-UHPLC-MS / MS), and it is possible to quantify (LOQ) levels greater than 250 ng L^{-1} of each drug in different aqueous matrices, such as ultrapure water, tap water, reclaimed water and surface water. In addition to the assessing the degradation of the target compounds, acute toxicity tests using luminescent marine bacteria *Vibrio fischeri*, and chronic toxicity tests using freshwater microalgae *Raphidocelis subcapitata*, will be carried out to assess whether there is a change in the toxicity of the samples during the

reactions. Once defined the best conditions performed to degrade the three psychoactive drugs, they will be applied on a pilot scale treatment plant.

Collaborations:

N/A

Publications:

Spina-Cruz, M., Maniero, M.G. & Guimarães, J.R. "Advanced oxidation processes on doxycycline degradation: monitoring of antimicrobial activity and toxicity". Environmental and Science Pollution Research 26, 27604–27619 (2019).

Presentations:

17th Luso-Brazilian Symposium on Sanitary and Environmental Engineering (SILUBESA), June 6th – 8th 2016, Florianopolis, SC – Brazil.

18th International Symposium on Toxicity Assessment (ISTA 18), July 16th-21th 2017, Limeira - SP, Brazil.

1st Workshop Sao Paulo – Germany Advanced Oxidation Processes For Water and Wastewater Treatment, July 19th - 20th 2018, Limeira, SP – Brazil.

10th European meeting on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA10), June 4th – 8th 2018, Almería, Spain.

1st São Paulo School of Advanced Science on the Water-Energy-Food Nexus, October 15th – 26th 2018, Campinas, SP – Brazil.

4th Iberoamerican Conference on Advanced Oxidation Processes (IV CIPOA), November 18th – 22nd 2019, Natal, RN – Brazil.