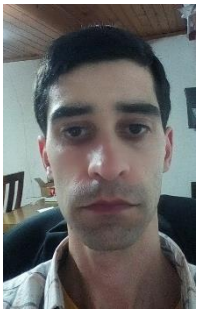
PhD Candidate Profile



Name:
Nuno Filipe Alves Jorge

Research Group (if relevant):
Agro-Environmental Technologies Laboratory

Research Centre (if relevant):
Chemistry Research Centre

Department/School(s) (if relevant):
Campus da Auga; Chemistry Department (UTAD)

College:
University of Vigo (Ourense), Spain
Universidade de Trás-os-Montes e Alto Douro (UTAD)

Supervisor(s):
Doctor José Alcides Silvestre Peres; Associate Professor with Habilitation
Doctor Marco Paulo Gomes de Sousa Lucas; Principal Investigator

Funding body:
Project INTERACT

Area (field) of study:
Environmental Chemistry; Environmental Engineering; Chemical Engineering

Thesis Title:
Winery wastewater treatment by new Advanced Oxidation Processes

Abstract:
Wine industry is one of the largest marketplaces in agricultural production around the world, with a global production of around 265 million of hL in 2015. From wine processing are generated wastewaters characterized by a high organic load with a large phenolic content, low biodegradability and the presence of dissolved suspended and colloidal particles, requiring a suitable treatment to reduce their impact on water quality, if released in water courses or reused into facilities.

Physical-chemical treatments by coagulation-flocculation-decantation (CFD) performed with oenological coagulants and natural origin coagulants (bentonite and *Acacia verek*), are a low exploited alternative which have several advantages such as biodegradability, sustainability,

low toxicity, low residual sludge production, operate at acidic and neutral pH and are cost effective.

Additionally, we will test bentonite (a natural clay) used commonly in Oenology on adsorption processes for organic matter removal, to promote circular economy.

The combination of CFD processes with Advanced Oxidation Processes like Fenton and photo-Fenton processes, ozonation and sulphate-radical oxidation will also be studied as post-treatment of winery wastewaters.

Collaborations:

N/A

Publications:

Jorge, N.; Vilela, A.; Braga, A.; Nunes, F.M; Cosme, F.; "Estabilização tartárica de um vinho do Porto ruby reserva por electrodiálise: processo alternativo à estabilização tartárica pelo frio". *Enovitis – revista técnica de viticultura e enologia*, nº 47, p.30-34 (2016).

Jorge, N.; Vilela, A.; Braga, A.; Nunes, F.M; Cosme, F.; "Estabilização tartárica de um vinho do Porto ruby reserva por electrodiálise: processo alternativo à estabilização tartárica pelo frio. *Livro de atas do 10º Simpósio de Vitivinicultura do Alentejo*, Évora, 4-6 de Maio de 2016, p.215-222 (1º volume).

Presentations:

Jorge, N.; Vilela, A.; Braga, A.; Nunes, F.M; Cosme, F.; "Estabilização tartárica de um vinho do Porto ruby reserva por electrodiálise: processo alternativo à estabilização tartárica pelo frio". *10º Simpósio de Vitivinicultura do Alentejo*, Évora, 4-6 de Maio de 2016. (communication in poster).

Jorge, N.; Amor, C.; Fernandes, J.R.; Lucas, M.S.; Peres, J.A.; "Combination of chemical coagulation, photo-Fenton oxidation and adsorption for the treatment of winery wastewater", *VII Meeting of Young Researchers of the USC*, University of Santiago de Compostela, Spain, 27-29 May 2019 (oral communication).

Prizes:

Jorge, N.; Amor, C.; Fernandes, J.R.; Lucas, M.S.; Peres, J.A.; "Combination of chemical coagulation, photo-Fenton oxidation and adsorption for the treatment of winery wastewater", *VII Meeting of Young Researchers of the USC*, University of Santiago de Compostela, Spain, 27-29 May 2019 (best oral presentation for Science thematic).