

PhD Candidate Profile

Name:

Deborah Cordeiro de Andrade

Research Group (if relevant):

Environmental and Applied Electrochemistry Laboratory

Research Centre (if relevant):

N/A

Department/School(s) (if relevant):

Chemical Engineering Department

College:

Federal University of Rio Grande do Norte

Supervisor(s):

Elisama Vieira dos Santos

Vitor Jorge Pais Vilar

Funding body:

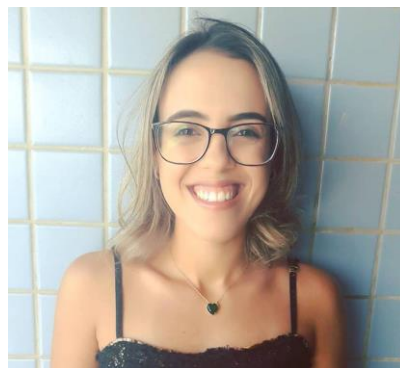
CAPES-FCT

Area (field) of study:

Removal of heavy metals and hydrocarbons from soil by applying electrokinetics, washing and permeable reactive barriers

Thesis Title:

Permeable reactive barriers using cork granules to remediate soil contaminated with heavy metals and hydrocarbons



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Abstract:

Over the last decade, there has been a need to develop cost-effective and efficient techniques for the remediation of large tracts of contaminated soils. This project intends to develop a new application of cork granules as sustainable absorbents for efficient and economically feasible decontamination of soils contaminated with heavy metals or hydrocarbons, competitive with current treatments.

In the case of contamination with heavy metals, recent studies carried out in collaboration with the Federal University of Santa Catarina showed that natural cork granules are electron donors, promoting the reduction of Cr (VI) to Cr (III) in acidic medium. The cork surface oxidation in the presence of Cr (VI) allows the creation of negatively charged functional groups capable of attracting trivalent chromium species. This integrated reaction / adsorption process allows chromium removal from industrial as well as soil effluents.

For hydrocarbons removal, modified cork granules, as a hydrocarbon absorber, are used with a catalyst inside to promote degradation of absorbed pollutants on cork surface and intensifying the process of these PRBs with electrokinetic technology.

Thus, use of cork granules in PRBs as reactive and permeable material to remove heavy metals and hydrocarbons present in contaminated soils will be evaluated in combination with the use of advanced oxidation processes for organic contaminants degradation as well as the intensification with electrokinetic technology.

Collaborations:

LSRE-LCM (University of Porto);

Federal University of Santa Catarina;

Publications:

N/A

Presentations:

N/A