

## PhD Candidate Profile

**Name:**

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**Research Group:**

Laboratory of Catalysis and Materials (LCM)

**Research Centre:**

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**Department/School(s):**

Department of Chemical Engineering

**College:**

Faculty of Engineering of University of Porto (FEUP), Portugal.

**Supervisor(s):**

Doctor Adrián Manuel Tavares da Silva

Doctor Ana Rita Lado Ribeiro

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**Funding body:**

Fundação para a Ciência e Tecnologia (FCT)

**Area (field) of study:**

Analytical chemistry; Carbon-based materials and Advanced oxidation processes.

**Thesis Title:**

Multi-layer carbon cartridges for determination of EU multi-class organic micropollutants.

**Abstract:**

The presence of organic micropollutants in the aquatic environment has been highlighted in many studies. These residual compounds are not completely removed during wastewater treatment and are discharged into receiving water bodies. The main motivation of this PhD project is based on the lack of an analytical tool to simultaneously determine a wide variety of organic priority substances/groups of substances (PSs) and contaminants of emerging concern (CECs) defined in recently launched EU legislation. Solid-phase-extraction (SPE) is the most used pre-concentration technique for determination of organic micropollutants in water samples. Thus, the main technological aim of this PhD project is to fabricate a SPE-cartridge with multi-layer carbon materials to extract in a single procedure these PSs and CECs that will be then analysed by ultra-performance liquid-chromatography coupled to mass-spectrometry (UPLC-MS/MS). The innovative carbon-based SPE-cartridge will be used for water and wastewater monitoring campaigns performed in Portugal before and after advanced oxidation processes.



### Collaborations:

N/A

### Publications:

**M.O. Barbosa**, N.F.F. Moreira, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva. Occurrence and removal of organic micropollutants: an overview of the watch list of EU Decision 2015/495, *Water Research*, 2016, 94: 257–279.

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva. Eco-friendly LC-MS/MS method for analysis of multi-class micropollutants in tap, fountain, and well water from Northern Portugal, *Analytical and Bioanalytical Chemistry*, 2016, doi: 10.1007/s00216-016-9952-7.

### Presentations:

#### International Conferences

##### Oral Communications

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Micropollutants in drinking water and their removal by chemical processes”, *XXI Encontro Galego-Portugués de Química*, 18th to 20th November, 2015, Pontevedra, Spain (p. 127).

##### Poster Communications

J.C.G. Sousa, **M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Determination of contaminants of emerging concern in surface water”, *XXII Encontro Luso-Galego de Química*, 9th to 11th November, 2016, Bragança, Portugal (p. 190).

A.M. Gorito, A.R. Ribeiro, **M.O. Barbosa**, M.F.R. Pereira, C.M.R. Almeida, A.M.T. Silva., “Constructed wetlands and advanced oxidation processes for removal of organic micropollutants”, *XXII Encontro Luso-Galego de Química*, 9th to 11th November, 2016, Bragança, Portugal (p. 203).

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Determination of micropollutants in drinking water by SPE-UHPLC-MS/MS”, *XVI Latin-American Congress on Chromatography (XVI COLACRO) & 9th National Meeting on Chromatography (9ENC)*, 5th to 9th January, 2016, Lisbon, Portugal (p. 61).

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Development of a green SPE-UHPLC-MS/MS method to evaluate micropollutants in drinking waters: meeting the concerns of water policy”, *HPLC 2015 - 42th International Symposium on High-Performance Liquid Phase Separations and Related Techniques*, 21th to 25th June, 2015, Geneva, Switzerland (p. 32).

### National Conferences

#### Oral Communications

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Removal of micropollutants from drinking water using UV and ozonation processes”, *9ª Edição do Encontro Investigação Jovem da Universidade do Porto (IJUP 16’)*, 17th to 19th February, 2016, Porto, Portugal.

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Development of an eco-friendly SPE-UHPLC-MS/MS method to evaluate residual micropollutants in drinking water”, *15as Jornadas de Engenharia Química*, 10th to 11th November, 2015, Porto, Portugal.

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Optimization of solid phase extraction of micropollutants from drinking waters”, *8ª Edição do Encontro Investigação Jovem da Universidade do Porto (IJUP 15’)*, 13th to 15th May, 2015, Porto, Portugal (p.182).

#### Poster Communications

J.C.G. Sousa, **M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Contaminants of emerging concern in river water”, *16as Jornadas de Engenharia Química*, 15th November, 2016, Porto, Portugal.

A.M. Gorito, A.R. Ribeiro, **M.O. Barbosa**, M.F.R. Pereira, C.M.R. Almeida, A.M.T. Silva., “Coupling constructed wetlands and ozonation to remove organic micropollutants”, *16as Jornadas de Engenharia Química*, 15th November, 2016, Porto, Portugal.

**M.O. Barbosa**, A.R. Ribeiro, M.F.R. Pereira, A.M.T. Silva., “Development of an eco-friendly SPE-UHPLC-MS/MS method to evaluate residual micropollutants in drinking water”, *15as Jornadas de Engenharia Química*, 10th to 11th November, 2015, Porto, Portugal.