

## PhD Candidate Profile

**Name:**

André Torres Pinto

**Research Group:**

Laboratory of Catalysis and Materials

**Research Centre:**

Associate Laboratory LSRE-LCM

**Department/School:**

Department of Chemical Engineering

**College:**

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

**Supervisor:**

Professor Adrián M.T. Silva

Doctor Cláudia G. Silva

Professor Joaquim L. Faria

**Funding body:**

Fundação para a Ciência e Tecnologia (FCT)

**Area (field) of study:**

Carbon materials for photocatalytic water treatment

**Thesis Title:**

Smart Conception of Photocatalytic Carbon Membranes for Water Treatment

**Abstract:**

This PhD project aims: (i) to reveal how to perform a meticulous smart tailoring of the surface chemistry of two-dimensional carbon materials, in order (ii) to elucidate pollutants' adsorption/desorption (sorbents), rejection (membranes) and oxidation (catalysts) mechanisms. This will make possible (iii) to modulate the separation ability and catalytic property of smart materials for the (iv) development of an unusual (but expected to be proficient) metal-free photocatalytic carbon membrane producing highly reactive radicals (from electrons/holes and/or in-situ generated  $H_2O_2$ ) for water/wastewater treatment. The ultimate target is to oxidize EU-relevant pollutants, including organic micropollutants and phenolic compounds, at the same time considering water disinfection (eliminating antibiotic resistant bacteria and their genes).

**Collaborations:**

N/A



### Publications:

#### Book

1. Sarai Bes Monge; **André Torres-Pinto**; Rui S. Ribeiro; Adrián M.T. Silva; Christophe Bengoa. 2018. "Manual técnico sobre Procesos de Oxidación Avanzada aplicados en el tratamiento de aguas de la industria". Spain: Programa Iberoamericano CYTED, Red de Tratamiento y reciclaje de aguas industriales mediante soluciones sostenibles fundamentadas en procesos biológicos (TRITÓN-316RT0508). ISBN: 978-84-09-08637-5.

#### Journal article

1. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Recent Strategies for Hydrogen Peroxide Production by Metal-Free Carbon Nitride Photocatalysts". *Catalysts*, 2019, 9 (12): 990-990. doi.org/10.3390/catal9120990.

2. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Metal-free carbon nitride photocatalysis with in-situ hydrogen peroxide generation for the degradation of aromatic compounds". *Applied Catalysis B: Environmental*, 2019, 252: 128-137. doi.org/10.1016/j.apcatb.2019.03.040.

### Presentations:

#### Oral communications

1. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Metal-free photocatalytic oxidation of aromatic contaminants", 3<sup>rd</sup> Doctoral Congress in Engineering, Porto, Portugal, June 2019.

2. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Materiais de carbono isentos de metais para o tratamento fotocatalítico de compostos fenólicos", XXIV Encontro Luso-Galego de Química, Porto, Portugal, November 2018.

#### Poster communications

1. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Degradation of phenolic contaminants in aqueous mixtures using carbon nitride photocatalysts", 2<sup>nd</sup> International Meeting on New Strategies in Bioremediation Processes, Porto, Portugal, October 2019.

2. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Improving oxidation of aromatic contaminants with simultaneous production of H<sub>2</sub>O<sub>2</sub> by photoactivated carbon nitride materials", XXVI Encontro Nacional da Sociedade Portuguesa de Química, Porto, Portugal, July 2019.

3. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Exfoliated graphitic carbon nitride for photocatalytic degradation of aromatic contaminants with simultaneous production of H<sub>2</sub>O<sub>2</sub>", VIth Jornadas Ibéricas de Fotoquímica, Aveiro, Portugal, September 2018.

November 2019

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4. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Degradação de poluentes aromáticos com um fotocatalisador de nitreto de carbono grafitico exfoliado e ativado por radiação visível ", Escola Ibero-Americana de Catálise, Lisboa, Portugal, September 2018.

5. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Visible-light degradation of aromatic pollutants using exfoliated graphitic carbon nitride as photocatalyst", 3<sup>rd</sup> International Conference on New Photocatalytic Materials for Environment, Energy and Sustainability-4th International Conference on Photocatalytic and Advanced Oxidation Technologies for the Treatment of Water, Air, Soil and Surfaces, Porto, Portugal, July 2018.

6. **A. Torres-Pinto**; M.J. Sampaio; C.G. Silva; J.L. Faria; A.M. T. Silva. "Visible-light degradation of aromatic pollutants using exfoliated graphitic carbon nitride as photocatalyst", 8<sup>th</sup> International Symposium on Carbon for Catalysis, Porto, Portugal, June 2018.

7. **A.T. Pinto**; L. Rodrigues. "O efeito da polarização e o ângulo de Brewster", XVII Jornadas de Engenharia Química, Porto, Portugal, November 2017.

8. **A.T. Pinto**; F.S. Coelho; M. Gomes. "Arrefecimento ao ar de sólidos bons condutores". XV Jornadas de Engenharia Química. Porto, Portugal, November 2015.