

## PhD Candidate Profile

**Name:**

Jordi Arévalo Aguado

**Research Group (if relevant):**

Advanced Oxidation Processes Group

**Research Centre (if relevant):**

N/A

**Department/School(s) (if relevant):**

Department of Textile and Paper Engineering

**College:**

Universitat Politècnica de València (UPV)

**Supervisor(s):**

Dr. Lucas Santos-Juanes Jordá

**Funding body:**

Project AGROALNEXT/2022/041, funded by European Union NextGenerationEU (PRTR-C17) with the support of Ministerio de Ciencia e Innovación – Spanish Government and Generalitat Valenciana.

**Area (field) of study:**

Photochemical advanced oxidation processes (Photo-Fenton)

**Thesis Title:**

Iron complexing substances extracted from plant residues: Applications in the conditioning of irrigation water by Fenton-type processes and in ecological fertilization systems.

**Abstract:**

The objective of this thesis is the revalorization of agro-food plant residues (humic substances) for use as iron complexing agents in Fenton-like processes for water regeneration. Once incorporated, the iron complexes will act as ecological fertilizers, thus contributing to the sustainability of the agri-food sector and reducing the environmental impact of waste generated by the industry.

Firstly, plant residues will be used as a source of humic substances, which can form stable metal complexes in aqueous solution, especially with iron. Humic substance-iron complexes have applications both in the treatment of pollutants and water disinfection and in agriculture, acting as a source of iron for plants.

The stability of the complexes at different pH values, its capacity to absorb visible light (volumetric rate of photon absorption), its quantum yield for iron photoreduction or the optimization of the ration iron:complexant will be evaluated. The photo-Fenton process will be applied to regenerate wastewater treatment plant effluents to achieve the quality required by the Regulation (EU) 2020/741 with special interest in *Clostridium* disinfection.



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### Collaborations:

Department of Agrochemistry and Biochemistry. University of Alicante.

### Publications:

N/A

### Presentations:

Certificate of participation in the congress 1st Workshop: "Novel Nanomaterials for Photocatalytic Applications" held from November 21 to 22, 2021 in Alicante, Spain with the paper "Novel Trends in Photo-Fenton Process: Towards Application in Mild Conditions and Roles of Water Matrix".

Certificate of poster communication and attendance at the XIV Congreso De La Mesa Española De Tratamiento De Aguas (META) held on June 1-3, 2022 in Seville, Spain with the title "Study of the application of the photo-Fenton process in the degradation of emerging pollutants present in WWTP water and in the removal of dissolved organic matter".

Certificate of poster communication and attendance at the XIV Congreso De La Mesa Española De Tratamiento De Aguas (META) held on June 1-3, 2022 in Seville, Spain with the title "Catalytic activity of copper in Fenton processes with saline waters".

Certificate of poster presentation and attendance to the 5th Iberoamerican Conference on Advanced Oxidation Technologies (CIPOA V) held on November 7-11, 2022 in Cuzco, Peru with the title "Effect of photo-Fenton process on inlet and outlet WWTP effluents and on CECs degradation from real WWTP waters".

Certificate of poster presentation in the 11th European Conference on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA11) held from June 6th to 10th, 2022 in Turin, Italy with the title "Photo-Fenton process effect on primary and secondary WWTP effluents and on Terbutylazine and Acetaminophen degradation". ISBN 979-12-210-0970-5. P/01-PO013.

Certificate of attendance to the 1st International School on Water Reuse held from September 19th to 21st, 2022 in Turin, Italy.