

## PhD Candidate Profile

**Name:**

Ivan Vallés

**Research Group (if relevant):**

Group of Advanced Oxidation Processes

**Research Centre (if relevant):**

Universitat Politècnica de València

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

Departamento de Ingeniería textil y papelera

**College:**

Escuela Politécnica Superior de Alcoy

**Supervisor(s):**

Prof. Antonio Arques

**Funding body:**

Ministry of Universities, Spanish Government

**Area (field) of study:**

Application of photo-Fenton process at circumneutral pH and highly saline waters.

**Thesis Title:**

Treatment of highly saline waters through photo-Fenton processes in the presence of complexing agents.

**Abstract:**

The thesis consists of applying the photo-Fenton process at mild pH values. Also, the application of this process to saline water will be checked. For this purpose, some organic chelating agents will be used.

Taking this into account, the objectives of the thesis are:

To study the mechanism of organic matter to complex iron. It is important to observe the ability of phenolic compounds as iron complexing agents and to check if they can accelerate (photo)-Fenton processes at mild pH. Also, the efficiency of these compounds will be followed, depending on the presence of different groups in the aromatic ring.

In addition, the effect of inorganic anions will be studied. Species like chlorides or phosphates, among others, will be observed. Following this, the application of the photo-Fenton process in highly saline waters will be checked. Finally, the effect of the natural organic matter present in marine water will be studied.



### Collaborations:

N/A

### Publications:

Moreno-Andrés, J.; Vallés, I.; García-Negueroles, P.; Santos-Juanes, L.; Arques, A., Enhancement of Iron-Based Photo-Driven Processes by the Presence of Catechol Moieties. *Catalysts* 2021, 11, 372 <https://doi.org/10.3390/catal11030372>

Vallés, I.; Santos-Juanes, L.; Amat, A.M.; Moreno-Andrés, J.; Arques, A., Effect of Salinity on UVA-Vis Light Driven Photo-Fenton Process at Acidic and Circumneutral pH. *Water* 2021, 13, 1 <https://doi.org/10.3390/w13091315>

Vallés, I., Sciscenko, I., Mora, M., Micó, P., Amat, A.M., Santos-Juanes, L., Moreno-Andrés, J., Arques, A., On the relevant role of iron complexation for the performance of photo-Fenton process at mild pH: role of ring substitution in phenolic ligand and interaction with halides. *Applied Catalysis B: Environmental* (under final revisión).

### Presentations:

CONFERENCE: XXV Congreso Internacional de Dirección e Ingeniería de Proyectos. Alcoi (Spain), 2021. Oral communication: Use of phenolic catechol for circumneutral pH photo-Fenton treatment of emerging concern pollutants. <http://dspace.aeipro.com/xmlui/handle/123456789/2962>

1st Workshop “Novel nanomaterials for photocatalytic Applications”. Alicante (Spain), 2021. Oral communication: Novel trends in photo-Fenton Process: Towards Applications in Mild Conditions and Role of Water Matrix.

11th European Conference on Solar Chemistry and Photocatalysis: Environmental Applications (SPEA). Turin (Italy), 2022. Flash oral + poster: Effect Of Different Ions On Photo-Fenton Process At Mild pH With The Use Of Phenolic Compound (Catechol) As A Complexant.

5th Iberoamerican Conference on Advanced Oxidation Technologies (V CIPOA). Cusco (Peru), 2022. Flash oral + poster: Effect of humic acids as a complex agent on photo-Fenton process at mild pH and the presence of inorganic ions (chlorides).

META 2022: XIV Congreso de la Mesa Española de Tratamiento de Aguas. Seville (Spain), 2022. Suppression of the inhibitory effect of chlorides, fluorides and phosphates in the photo-Fenton process by the use of phenolic complexing agents.