

## PhD Candidate Profile

**Name:**

Miguel Martín Sómer

**Research Group:**

Group of Chemical and Environmental Engineering

**Research Centre:**

School of Experimental Sciences and Technology

**Department/School(s):**

Department of Chemical and Energy Technology, Chemical and Environmental Technology, Mechanical Technology and Analytical Chemistry

**College:**

Rey Juan Carlos University

**Supervisor(s):**

Javier Marugán Aguado and Rafael van Grieken Salvador

**Funding body:**

Spanish Ministry of Economy and Competitiveness (FPU scholarship)

**Area (field) of study:**

Water treatment by photocatalysis

**Thesis Title:**

Design and evaluation of advanced photocatalytic processes for the removal of emerging contaminants in reclaimed water.

**Abstract:**

Emerging contaminants such as pharmaceuticals, perfluorinated compounds, flame retardants or biocides have been detected in wastewater, aquatic environments and even in drinking water. It is necessary to undertake appropriate measures and removal processes to prevent discharge into the aquatic environment avoiding impacts on ecosystems and human health.

Advanced oxidation processes have demonstrated their effectiveness in eliminating many contaminants. Among them the processes of photocatalysis, either based on the use of semiconductor or Fenton reactions have been widely studied because the radiation frequencies employed are located inside the UV-A spectral region, enabling the use of sunlight to carry out the process. This PhD Project focuses on the developing of TiO<sub>2</sub> heterogeneous photocatalytic processes and photo-Fenton processes at neutral pH based for use in water disinfection with simultaneous removal of emerging contaminants. To achieve the correct development of these processes will be performed theoretical modeling using



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computational fluid dynamics techniques, preparation and characterization of new catalytic materials, the development of advanced analytical methods for the quantification of emerging pollutants in water at trace level, the application of standardized microbiological methods for monitoring disinfection processes and finally a techno-economic study of energy costs associated with the process, using LED radiation sources, such as solar-collector.

### **Collaborations:**

N/A

### **Publications:**

N/A

### **Presentations:**

N/A