

Expression of Interest



Contact Person/Scientist in Charge

- **Name and surname:** Antonio Canals Hernández
- **Email:** a.canals@ua.es

Universidad de Alicante

Department / Institute / Centre

- **Name of institution:** Materials Science Institute of Alicante (IUMA)
- **Address:** Carretera Alicante - San Vicente
- **Province:** Alicante

Research Area

- Chemistry (CHE)

Brief description of the institution:

The University of Alicante (UA) was created in 1979. Today it educates and trains more than 36.000 students -2.500 of them are international students - and offers more than 80 undergraduate and 96 postgraduate programmes: consequently it is proportionally one of the fastest growing universities in Spain. The UA houses 227 research groups in Social and Legal Sciences, Experimental Sciences, Technological Sciences, Human Sciences, Education and Health Sciences and 15 Research Institutes (Water & Environment, Materials, Electrochemistry, Biodiversity, Chemical Processes and Organic Synthesis, and Modern Languages, among others). Thus, the UA employs over 2.400 researchers/ professors and has a complex management /administration structure of 1.300 people, which involves an annual budget of 175 million Euros.

UA is a young and dynamic university with vast experience in implementing EU funded projects in different programmes and areas, with presence in more than 60 countries worldwide. In the last 10 years, UA has successfully acted as coordinator of many Tempus, Alfa, Edulink projects involving Third Countries and Lifelong Learning and Framework Programme (FP, DG Research) Projects. Moreover, the participation in FP has been increasing in the last years, taking part in 25 5th FP, 26 6th FP, 45 7th FP projects (13 of them coordinated by UA), and 6 in H2020.

It is worth underline the big effort performed by UA in order to meet the commitment with the principles set out in the European Charter for Researchers and in the Code of Conduct for the Recruitment of Researcher

Brief description of the Centre/Research Group (including URL if applicable):

INVESTIGATION LINES

Atomic Spectroscopy

1. Development and characterization of systems of generation and transport of aerosols:

- Characterisation of aerosols generated with commercial nebulizers
- Characterisation and development of new and more efficient (micro)nebulizers
- Characterisation and study of spray chambers
- Systems of desolvatación of aerosols based in lasers

2. New applications of Laser-Induced Breakdown Spectrometry (LIBS):

- Trace elemental analysis of liquid samples by microextraction procedures combined with LIBS detection
- Use of chemometric tools in LIBS analysis

Sample treatment

Development of faster and enviromentally respectful sample preparation methodologies

1. Miniaturisation: Microextracción

- Solid phase microextraction
- Liquid phase microextraction

2. Extraction-digestion: Microwaves and/or ultrasounds

- Assisted by microwaves
- Assisted by ultrasounds
- Assisted by microwaves-ultrasounds

<http://web.ua.es/en/qace/presentation.html>

Project description:

In recent years, there has been increasing concern about the state of the environment. On this new concept of chemical activities, the analytical labs pay a key point for controlling products and chemical processes. This is because many analytical procedures require hazardous chemicals as part of sample preservation, preparation, quality control, calibration, and equipment cleaning, effectively creating wastes in large quantities and with greater toxicity than that of the original analyzed sample. For all of these reasons, Green Analytical Chemistry (GAC) is becoming a new and important subarea of Green Chemistry. The goal of GAC is to develop and use analytical procedures that generate less hazardous wastes and that are safer to use and more benign to the environment.

One of the most challenging steps on chemical analysis is the sample preparation, and among them extraction techniques. Our research group has been working the last ten years on developing new microextraction methodologies with the main goal focused on the reduction of the environmental impact. The project aims to assess the applicability of new and/or advanced materials on new extraction approaches for chemical analysis. These materials will be used to preconcentrate both elements and organic analytes previously to detect and quantify by means of spectrochemical and chromatographic systems, respectively. From our knowledge these materials have never been used before for sample preparation purposes associated with spectrochemical and/or chromatographic detectors. Therefore, new scientific problems and challenges should be studied, solved and answered. This research project shows a high level of innovation, scientific value and potential applicability in many scientific and technological fields.

Applications

CV and a letter of motivation will be welcome