

CURRICULUM VITAE

Personal Information

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Nationality: Spanish

Date of birth: 02/06/1986



Education

Degree: Chemistry (5 years).

Place: Faculty of Chemistry, University of Oviedo.

Date of finalization: July 2011.

Participation in research projects: Thesis Degree "Analysis of thin layers on glass using radio frequency glow discharge in pulsed mode with mass spectrometry time of flight detection" defended at the Faculty of Chemistry of the University of Oviedo in November 2011 under the direction of the Dr. Beatriz Fernández García and the Prof. Rosario Pereiro García.

Master: International Master in Analytical and Bioanalytical Sciences 2012/2013, Faculty of Chemistry, University of Oviedo.

Work Experience

Date: Ph.D. student from January 2012 to present.

Place: Analytical Spectrometry Research Group, belonging to Department of Physical and Analytical Chemistry, Faculty of Chemistry; University of Oviedo.

Occupation: Ph.D. Student grant.

Main activities:

- November 2011

Thesis degree: "Analysis of thin layers on glass using radio frequency glow discharge in pulsed mode with mass spectrometry time of flight detection".

- Since January 2012

Ph.D. student with a FUO grant.

- "Development of new technologies based on ion mobility. Study and characterization of new sources of ionization for DMA (differential mobility analysis) and DMA-MS".
- "SPME GC-MS for volatile organic compounds present in breath analysis for oral cancer detection".

- “GC-GD-TOF for analysis of volatile organic compounds”.
- Three months short stay at Indiana University Clemmer Group. The work developed was focused in the study of the behavior of polar polymers electrospray mechanism using ion mobility as structure identification tool.

Field of Expertise

- Direct solid analysis and chemical characterization of materials by glow discharge time-of-flight mass spectrometry (GD-TOFMS).
- Radiofrequency pulsed glow discharge plasmas.
- Time of flight mass spectrometry.
- Ion mobility spectrometry, instrumental development and characterization of analytical capabilities of a HRIMS (*High Resolution Ion Mobility Spectrometer*), DMA (*Differential Mobility Analysis*) based technology. Characterization and evaluation of a prototype in development for the analysis of volatile organic compounds using photoionization as ion source.
- Ambient ion sources as alternative for the ionization of the target compounds in DMA. The discharge used correspond to the family of the ambient pressure glow discharge (APGD), in particular a flowing atmospheric pressure afterglow (FAPA).
- Solid phase microextraction (SPME).
- Gas chromatography mass spectrometry for volatile organic compounds as tool for search breath biomarkers ion oral cancer.
- Instrumental development:
 - # DMA-MS coupling.
 - # Gas chromatography-glow discharge- time of flight mass spectrometry

Publications

- M. Bouza, B. Fernández, C. González-Gago, N. Bordel, R. Pereiro, A. Sanz-Medel. “RF-pulsed glow discharge time-of-flight mass spectrometry for glass analysis: Investigation of the ion source design” *Anal. Chim. Acta*, 756 (2012) 30-36.
- M. Bouza , S. López-Vidal, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. “Characterization of a new mobility separation tool: HRIMS as differential mobility analyzer” *Talanta*, 130 (2014) 400-407.
- M. Bouza, N. Bordel, R. Pereiro, A. Sanz-Medel, B. Fernández, “Pulsed radiofrequency glow discharge time of flight mass spectrometry for coated glass analysis” *J. Anal. Atom. Spectrom.* 30 (2015) 1108-1116.

- M. Bouza, J. Orejas, S. López-Vidal, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. *"Atmospheric pressure glow discharge as ion source coupled to a differential mobility analyzer for volatile organic compounds detection"* Analyst, 141 (2016) 3437-3443.
 - M. Bouza, J. Fandiño, N. Bordel, R. Pereiro, A. Sanz-Medel. *"Volatile organic compounds analysis by pulsed glow discharge time of flight mass spectrometry as a structural elucidation tool"* Submitted.
- Under development:
- *"SPME-GC-MS as analytical tool in the search of potential biomarkers in human breath as early diagnosis tools for oral cancer"*.

Conferences

- M. Bouza, B. Fernández, C. González, N. Bordel, R. Pereiro, A. Sanz-Medel. *"Evaluación de un diseño de descarga luminiscente acoplado a Espectrometría de masas de tiempo de vuelo para análisis de vidrios"* Oral communication XXIII Reunión Nacional de Espectroscopía (XXIII RNE) y el VII Congreso Ibérico de Espectroscopía (VII CIE), Córdoba (Spain). September 2012
- M. Bouza, J. Orejas, S. Lopez-Vidal, E. Montoya, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. *"Development of new ionization sources for DMA: Comparative study of Photoionization and APGD sources"* Poster: European Winter Conference on Plasma Spectrometry, Krakow (Poland). February 2013
- M. Bouza, J. Orejas, S. Lopez-Vidal, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. *"Desarrollo de nuevas formas de ionización para DMA: estudio comparativo entre ionización mediante APGD y Fotoionización"* Poster and Flash communication XVIII Reunión de la Sociedad Española de Química Analítica, Úbeda (Jaén, Spain). June 2013.
- M. Bouza, J. Orejas, S. López-Vidal, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. *"FAPA-APGD as ion source for VOCs detection by a novel ion differential mobility analyser"* Oral communication XXIV Reunión Nacional de Espectroscopia-VIII Congreso Ibérico de Espectroscopia, Logroño (La Rioja, Spain), July 2014.
- M. Bouza, J. Orejas, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. *"FAPA-APGD como fuente de ionización para instrumentación basada en movilidad iónica"* Poster: XXXV Reunión Bienal de la Real Sociedad Española de Física y 25º Encuentro Ibérico de Enseñanza de la Física, Gijón (Asturias, Spain), July 2015.

Awards

- Prize awarded by the SEQA (Spanish Society of Analytical Chemists) for one of the best communications presented as poster and defended in the corresponding session as "flash communication" named "*Desarrollo de nuevas formas de ionización para DMA: estudio comparativo entre ionización mediante APGD y Fotoionización*" M. Bouza, J. Orejas, S. Lopez-Vidal, J. Pisonero, N. Bordel, R. Pereiro, A. Sanz-Medel. This work was defended at the XVIII Reunión de la Sociedad Española de Química Analítica (XVIII Conference of the Spanish Royal Society of Analytical Chemistry).

Other data of interest

- *Spanish*: Mother tongue.
- *English*: Intermediate level.
- *Computer skills*:
 - Competent with Microsoft Office programs.
 - Competent with data analysis software (OriginLab).
 - Competent with specific software from data treatment (TofDaq, TOF Viewer).
- *Equipment used*:
 - GD-TOFMS instrument developed by Horiba for the analysis of conductor and non-conductor materials.
 - Synapt G2 HDMS for the analysis of electrospray mechanism of polar polymers.
 - IONER HRIMS for the analysis of volatile organic compounds.
 - GC-EI-MS (Agilent 5975B) for the analysis of volatile organic compounds in human breath.