GROUP OF TRACE ELEMENTS, SPECTROSCOPY AND SPECIATION

(Last update 03/04/2013)

Code: GI-1622
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Research field

- Metal contamination studies
- Development of analytical methods for the metal determination in biological and environmental media
- Bioavailability studies of trace elements
- Development of analytical methods for the metal speciation in biological and environmental media
- Study of sample preparation methods for the determination of metals and non-metals
- Development of new analytical methods for determination of organic compounds: phthalates, natural organic matter, fatty acids, drugs, vitamins and antioxidants
- Food supplementation studies
- Trace Element studies in clinical samples
- Sensors and biosensors for trace elements and organic compounds
- Sampling studies of industrial raw materials and manufacturer products
Technology services

- Analysis of metals in biological samples
- Analysis of metals in foods
- Determination of metals in environmental samples (waters, sediments, plants, etc)
- Environmental studies by metals and non metals
- Studies of bioavailability and speciation of metals
- Food supplementation studies

Key words

Metals; environment; biological samples; foods; metal speciation.

Researchers

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<th>Name</th>
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External collaborators

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RTD PROJECTS (period: 2009 - 2013)

Title: Innovaciones en Especiación Funcional-Química en Nanotecnología Medioambiental (Nanometrología). Caracterización de nanopartículas artificiales y materia orgánica natural. (SUBPROXECTO)

Tipology: (PN) Plan Nacional
Duration: 01/01/2013 - 31/12/2015
Main investigator: Bermejo Barrera, Pilar

Title:
Tracking Drug Trafficking (TDT)
Tipology: (PI) Programas Internacionais
Duration: 01/12/2012 - 30/11/2015
Main investigator: Bermejo Barrera, Pilar

Title:
Uso de nanopartículas multifuncionales para la simplificación de métodos analíticos.
Tipology: Proxectos Xunta
Duration: 10/08/2010 - 30/09/2013
Main investigator: Bermejo Barrera, Pilar

Title:
Mejora en la detección y determinación de estupefacientes en muestras clínicas para una rápida y fiable respuesta en laboratorios toxicológico-forenses.
Tipology: Proxectos Xunta
Duration: 08/08/2010 - 30/09/2013
Main investigator: Moreda Piñeiro, Antonio

Title:
Desarrollo de polímeros de impronta (molecularly imprinted polymers) para su aplicación en el campo alimentario (MIPFOOD)
Tipology: Outros Proxectos Nacionais
Duration: 22/06/2010 - 31/12/2013
Main investigator: Bermejo Barrera, Pilar

Title:
Especiación multielemental, química y funcional de elementos traza en materia orgánica del agua de mar
Tipology: Plan Nacional
Duration: 01/01/2010 - 31/12/2012
Main investigator: Bermejo Barrera, Pilar

Technological customers and partners
- ASERPAL, S.A.
- Centro de Investigaciones Submarinas, S.L.
- Commission of the European Communities
- FEIRACO LÁCTEOS S.L.U.
- Fundación MAPFRE
- InDrops
- Laboratorios R. Bescansa, S.L.
- LGC Limited
- Varias entidades

SCIENTIFIC PRODUCTION ( period: 2007 - 2011 )

Articles in scientific journals
Article:
Pressurized liquid extraction-assisted mussel cytosol preparation for the determination of metals bound to metallothionein-like proteins.
Journal: ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2007

Article:
Improvements on enzymatic hydrolysis of human hair for illicit drug determination by gas chromatography/mass spectrometry
Journal: ANALYTICAL CHEMISTRY, ISSN: 0003-2700
2007

Article:
Application of microwave energy to speed up the alkaline extraction of humic and fulvic acids from marine sediments
Journal: ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2007

Article:
Antimony determination in mussel samples by atomic absorption spectrometry using palladium-magnesium nitrate as chemical modifier
Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2007

Article:
Use of chelating solvent-based pressurized liquid extraction combined with inductively coupled plasma-optical emission spectrometry for trace element determination in atmospheric particulate matter.
Journal: JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477
2007

Article:
Development of a new sample pre-treatment procedure based on pressurized liquid extraction for the determination of metals in edible seaweed.
Journal: ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2007

Article:
Antimony determination in marine sediments by graphite furnace atomic absorption spectrometry with slurry sampling
Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2007

Article:
On-line preconcentration cold vapour atomic absorption spectrometry for the determination of trace mercury in edible seaweeds.
Journal: JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477
2007

Article:
Concentrations of iodide and total iodine in edible seaweeds harvested on the Galician coast (Northwest Spain)
Journal: BOTANICA MARINA, ISSN: 0006-8055
2007

Article:
Optimization of a vapour generation method for metal determination using ICP-OES
Journal: JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477
2007

Article:
Multi-element determination in raft mussels by fast microwave-assisted acid leaching and inductively coupled plasma-optical emission spectrometry
Journal: TALANTA, ISSN: 0039-9140
2007

Article:
Determination of major and trace elements in human scalp hair by pressurized-liquid extraction with acetic acid and inductively coupled plasma-optical-emission spectrometry
Journal: ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642
2007

Article:
Selenium speciation in cow milk obtained after supplementation with different selenium forms to the cow feed using liquid chromatography coupled with hydride generation-atomic fluorescence spectrometry.
Journal: TALANTA, ISSN: 0039-9140
2007

Article:
Fractionation metallothionein-like proteins in mussels with on line metal detection by high performance liquid chromatography-inductively coupled plasma-optical emission spectrometry
Journal: TALANTA, ISSN: 0039-9140
2007

Article:
Feasibility of pressurization to speed up enzymatic hydrolysis of biological materials for multielement determinations.
Journal: ANALYTICAL CHEMISTRY, ISSN: 0003-2700
2007

Article:
Direct determination of copper, lead and cadmium in aniseed spirits by electrothermal atomic absorption spectrometry.
Journal: FOOD CHEMISTRY, ISSN: 0308-8146
2007

Article:
Separation and determination of Se-compounds by liquid chromatography coupled with electrospray mass spectrometry.
Journal: JOURNAL OF TRACE ELEMENTS IN MEDICINE AND BIOLOGY, ISSN: 0946-672X
2007

Article:
Determination of iodine in human milk and infant formulas
Journal: JOURNAL OF TRACE ELEMENTS IN MEDICINE AND BIOLOGY, ISSN: 0946-672X
2007

Article:
Analysis of brain regional distribution of aluminium in rats via oral and intraperitoneal administration
Article:
Preparatory studies for the implementation of the Norm UNE 66020-1:2001 (or Norm ISO 2859-1:1999) in a Canned Marine Food Factory
Journal: JOURNAL OF FOOD PROCESSING AND PRESERVATION, ISSN: 0145-8892
2008

Article:
Screening of humic and fulvic acids in estuarines sediments by near-infrared spectrometry
Journal: ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642
2008

Article:
Vapor generation for metal determination in steels using ICP-OES
Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2008

Article:
Preliminary results of a quick, simple method of detecting antimony in water samples
Journal: CENTRAL EUROPEAN JOURNAL OF CHEMISTRY, ISSN: 1895-1066
2008

Article:
Matrix solid-phase dispersion as a sample pretreatment for the speciation of arsenic in seafood products
Journal: ANALYTICAL CHEMISTRY, ISSN: 0003-2700
2008

Article:
Synthesis, characterization and evaluation of ionic-imprinted polymers for solid-phase extraction of nickel from seawater
Journal: ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2008

Article:
Study of a microwave digestion method for total arsenic determination in marine mussels by electrothermal atomic absorption spectrometry; application to samples from the Ria de Arousa
Journal: EUROPEAN FOOD RESEARCH AND TECHNOLOGY, ISSN: 1438-2377
2008

Article:
Preparatory studies for the implementation of norm UNE 66020-1:2001 (or norm ISO 2859-1:1999) in a canned marine food factory
Journal: JOURNAL OF FOOD PROCESSING AND PRESERVATION, ISSN: 0145-8892
2008

Article:
Phthalates determination in physiological saline solutions by HPLC-ES-MS
Journal: TALANTA, ISSN: 0039-9140
2008
Article:
Characterization of estuarine sediments by near infrared diffuse reflectance spectroscopy
Journal: ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2008

Article:
Inductively coupled plasma-optical emission spectrometry/mass spectrometry for the determination of Cu, Ni, Pb and Zn in seawater after ionic imprinted polymer based solid phase extraction
Journal: TALANTA, ISSN: 0039-9140
2009

Article:
Microwave assisted extraction of iodine and bromine from edible seaweed for inductively coupled plasma-mass spectrometry determination
Journal: TALANTA, ISSN: 0039-9140
2009

Article:
Characterization of raft mussels according to total trace elements and trace elements bound to metallothionein-like proteins
Journal: JOURNAL OF ENVIRONMENTAL MONITORING, ISSN: 1464-0325
2009

Article:
On-line ionic imprinted polymer selective solid-phase extraction of nickel and lead from seawater and their determination by inductively coupled plasma-optical emission spectrometry
Journal: ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642
2009

Article:
Ionic imprinted polymer for nickel recognition by using the bifunctionalized 5-vinyl-8-hydroxyquinoline as a monomer: Application as a new solid phase extraction support
Journal: MICROCHEMICAL JOURNAL, ISSN: 0026-265X
2009

Article:
Microalgae fiber optic biosensors for herbicide monitoring using sol-gel technology
Journal: BIOSENSORS & BIOELECTRONICS, ISSN: 0956-5663
2009

Article:
Use of high resolution continuum source atomic absorption spectrometry as a detector for chemically generated noble and transition metal vapours
Journal: SPECTROCHIMICA ACTA PART B-ATOMIC SPECTROSCOPY, ISSN: 0584-8547
2009

Article:
Alternative solid sample pre-treatment methods in green analytical atomic spectrometry
Journal: SPECTROSCOPY LETTERS, ISSN: 0038-7010
2009

Article:
Matrix solid-phase dispersion of organic compounds and its feasibility for extracting inorganic and organometallic compounds
Journal: TRAC-TRENDS IN ANALYTICAL CHEMISTRY, ISSN: 0165-9936
2009

Article:
Evaluation of an in Vitro method to estimate trace elements bioavailability in edible seaweeds
Journal: TALANTA, ISSN: 0039-9140
2010

Article:
Characterization of edible seaweed harvested on the Galician Coast (Northwestern Spain) using pattern recognition techniques and major and trace element data
Journal: JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, ISSN: 0021-8561
2010

Article:
Estuarine increase of chromium surface sediments: distribution, transport and time evolution
Journal: MICROCHEMICAL JOURNAL, ISSN: 0026-265X
96

Article:
Estuarine sediment quality assessment by Fourier-transform infrared spectroscopy
Journal: VIBRATIONAL SPECTROSCOPY, ISSN: 0924-2031
2010

Article:
Phthalates determination in pharmaceutical formulae used in parenteral nutrition by LC-ES-MS: importance in public health
Journal: ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642
2010

Article:
Matriz solid-phase dispersión on column clean-up/pre-concentration as a novel approcah for fase isolation of abuse drugs from human hair
Journal: JOURNAL OF CHROMATOGRAPHY A, ISSN: 0021-9673
2010

Article:
A sensitive, simple and safe method for total arsenic determination in edible seaweed by HG-AFS
Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2010

Article:
Simultaneous pressurized enzymatic hydrolysis extraction and clean up for arsenic speciation in seafood samples befote high performance liquid chromatography-inductively coupled plasma-mass spectrometry determination
Journal: ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2010

Article:
Application of fast ultrasound water-bath assisted enzymatic hydrolysis - High performance liquid chromatography-inductively coupled plasma-mass spectrometry procedures for arsenic speciation in seafood materials
Journal: JOURNAL OF CHROMATOGRAPHY A, ISSN: 0021-9673
2011

Article:
A review on iodine speciation for environmental, biological and nutrition fields
**Journal:** JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477
2011

Article:
Bioavailability study using an in-vitro method of iodine and bromine in edible seaweed
**Journal:** FOOD CHEMISTRY, ISSN: 0308-8146
2011

Article:
Selective determination of V(IV) and V(V) in seawater by solid phase extraction and electrothermal atomic absorption spectrometry
**Journal:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2011

Article:
Electrospray ionization tandem mass spectrometry for the simultaneous determination of opiates and cocaine in human hair
**Journal:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670
2011

Article:
Presence of phthalates in contact lens and cleaning solutions
**Journal:** MICROCHEMICAL JOURNAL, ISSN: 0026-265X
2011

Article:
In-vivo and in-vitro testing to assess the bioaccessibility and the bioavailability of arsenic, selenium and mercury species in food samples
**Journal:** TRAC-TRENDS IN ANALYTICAL CHEMISTRY, ISSN: 0165-9936
2011

Article:
Direct LC-ES-MS/MS determination of phthalates in physiological saline solutions
**Journal:** JOURNAL OF CHROMATOGRAPHY B-ANALYTICAL TECHNOLOGIES IN THE BIOMEDICAL AND LIFE SCIEN
2011

Article:
Direct speciation analysis of Sb(III) and Sb(V) based on their different sensitivities for GFAAS
**Journal:** SPECTROSCOPY LETTERS, ISSN: 0038-7010
2011

Article:
Matrix solid phase dispersion-assisted BCR sequential extraction method for metal partitioning in surface estuarine sediments
**Journal:** TALANTA, ISSN: 0039-9140
2011

Article:
Total antimony determination in galician mussel samples (Mytilus galloprovincialis) by slurry sampling-Graphite Furnace Atomic Absorption Spectrometry. Preliminary Results
Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2011

Article:
Cr(VI) determination in seawater samples using and on-line sorption preconcentration in a knotted reactor coupled with electrothermal atomic absorption spectrometry

Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2011

Article:
Use of an in vitro digestion method to evaluate the bioaccessibility of arsenic in edible seaweed by inductively coupled plasma-mass spectrometry

Journal: MICROCHEMICAL JOURNAL, ISSN: 0026-265X
2011

Article:
Trace metals distribution in surface and deep seawater from the Ría de Arousa estuary (north-western Spain). Study before and after the Prestige oil tanker sinking

Journal: MICROCHEMICAL JOURNAL, ISSN: 0026-265X
2011

Article:
Blood lead and cadmium levels in a six hospital employee population. PESA study 2009

Journal: JOURNAL OF TRACE ELEMENTS IN MEDICINE AND BIOLOGY, ISSN: 0946-672X
2011

Article:
Evaluation of direct determination of mercury in whole human blood using a mercury analyzer

Journal: ATOMIC SPECTROSCOPY, ISSN: 0195-5373
2011

Book:
Title:
Analytical Chemistry of Cadmium, Sample pre-treatment and determination methods
(978-1-60876-808-0) Publicación: 2010

Editorial: nova science publishers, Inc

Chapter:
Title:
Analytical Techniques for the determination of inorganic constituents

Book:
Analytical measurements in aquatic environments
(978-1-4200-8268-5) Publicación: 2010

Editorial: CRC Press

Title:
Analytical Chemistry of Cadmium: simple pretreatment and determination methods

Book:
Cadmium in the environment
(978-1-60741-934-1) Publicación: 2010
Editorial: Nova Science Publishers, Inc

Title:
Analytical methods for phthalates determination in biological and environmental samples: a review

Book:
Bisphenol A and Phthalates: uses, health effects and Environmental risk
(978-1-60741-701-9) Publicación: 2010


Title:
Use of microwave energy for assisting analytical procedures

Book:
Microwaves: Theoretical aspects and practical applications in chemistry
(978-81-7895-508-7) Publicación: 2011

Editorial: Transworld Research Network

Doctoral theses:

Title:
Biodisponibilidad de cromo en sedimentos marinos de la Ría de Arousa

Date of dissertation: 30/11/2007
Director: Pilar Bermejo Barrera, María del Carmen Barciela Alonso
Author: Paula Pazos Capeáns

Title:
Especiación de metales pesados mediante la formación quelatos. Distribución de las especies inorgánicas de As y Cr en la Ría de Arousa

Date of dissertation: 29/03/2007
Director: Pilar Bermejo Barrera, María del Carmen Barciela Alonso
Author: Paloma Herbello Hermelo

Title:
Desenvolvemento e aplicación de métodos de análise por espectrometria de masas en tándem para o estudio de metabolitos urinarios marcadores de erros conxénitos do metabolismo

Date of dissertation: 03/12/2007
Director: José María Fraga Bermúdez, Pilar Bermejo Barrera
Author: María Mayra Rebollido Fernández

Title:
Contribución a la determinación de la fracción de metales traza ligados a las proteínas similares a las metalotoneínas en muestras de mejillón
**Date of dissertation:** 20/04/2007  
**Director:** Pilar Bermejo Barrera, Antonio Moreda Piñeiro  
**Author:** Sandra Santiago Rivas

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**Title:**  
Desenvolvemento e aplicación de métodos de análise por espectrometría de masas en tándem para o estudio de metabolitos urinarios marcadores de erros conxénitos do metabolismo

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**Date of dissertation:** 03/12/2007  
**Director:** José María Fraga Bermúdez, Pilar Bermejo Barrera  
**Author:** María Mayra Rebollido Fernández

---

**Title:**  
Desenvolvemento de novos métodos de extracción en fase sólida para a preconcentración de metais traza no auga de mar: avaliación dun soporte de C-18 e de polímeros de impronta iónica. Aplicación ao estudio da Ría de Arousa.

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**Date of dissertation:** 15/12/2009  
**Director:** Pilar Bermejo Barrera, Antonio Moreda Piñeiro  
**Author:** Jacobo Otero Romaní

---

**Title:**  
Uso da Xeneración de Vapor na Determinación de Metais Trawa por Técnicas Atómicas

---

**Date of dissertation:** 16/03/2011  
**Director:** Pilar Bermejo Barrera, Elena María Peña Vázquez  
**Author:** Julia Villanueva Alonso