



## Catálogo de Investigadores e Grupos de Investigación

### GRUPO DE ELEMENTOS TRAZA, ESPECTROSCOPIA E ESPECIACION

(Última actualización 03/04/2013)

**Código:** GI-1622

**Departamento:** Química Analítica, Nutrición e Bromatoloxía

**Web:** [www.geteeanalitica.es](http://www.geteeanalitica.es)

**Contacto:**

Bermejo Barrera, Pilar

[pilar.bermejo@usc.es](mailto:pilar.bermejo@usc.es)

Telf. 981-563100 ext.14266

---

**Centro de Innovación e Transferencia de Tecnoloxía**

[cittinfo@usc.es](mailto:cittinfo@usc.es)

Telf.: 981-547000

#### Liñas de Investigación

- Estudos de contaminación ambiental por metais
- Desenvolvemento de métodos analíticos para a determinación de metais en medios biolóxicos e ambientais
- Estudos de biodisponibilidade de elementos traza
- Desenvolvemento de métodos analíticos para a especiación de metais en medios biolóxicos e ambientais
- Estudio de métodos de preparación de mostra na determinación de metais e no metais
- Desenvolvemento de novos métodos analíticos para a determinación de compostos orgánicos: ftalatos, materia orgánica natural, ácidos grasos, drogas de abuso, vitaminas e antioxidantes.
- Estudos de fortificación de alimentos
- Estudos de elementos traza en mostras clinicas
- Desenvolvemento de sensores e biosensores para elementos traza e compostos orgánicos
- Estudos de mostreo de materias primas industriais e produtos manufacturados

## Servizos e Recursos

- Análisis de metais en medios biolóxicos
- Análise de metais en alimentos
- Determinación de metais en mostras de interese ambiental ( auga, sedimentos, prantas,etc)
- Estudos de contaminación ambiental por metais and non metais
- Estudos de biodisponibilidade e especiación de metais
- Estudos de fortificación de alimentos

## Palabras chave

Metais; medio ambiente; medios biolóxicos; alimentos; especiación de metais.

## Investigadores

### Nome

Bermejo Barrera,P.  
Aboal Somoza,M.  
Barciela Alonso,M.d.  
Domínguez González,M.R.  
Moreda Piñeiro,A.  
Peña Vázquez,E.M.  
Pita Calvo,C.  
García Nimo, L.  
García Otero, N.  
García Sartal,C.  
Míguez Framil,M.  
Herbello Hermelo,P.

### Cargo

Coordinador  
Membro  
Membro  
Membro  
Membro  
Membro  
Membro  
IFP  
IFP  
IFP  
IFP  
PA

### Colaboradores externos

Juan Castillo Suaréz  
José Ángel Cocho de Juan  
Jorge Moreda Piñeiro  
Heidi Goneaga Infante  
Carlos Gustavo Peña Farfal  
Maria Cruz Moreno Bondi  
Antonio Martín Esteban  
Miguel De la Guardia Cirugeda  
Dario Prada Rodriguez  
Elia Alonso Rodriguez  
Purificación Lopez Mahia  
Soledad Muniategui Lorenzo  
Maria Cruz Moreno Bondi

Universidad de Zaragoza  
Complejo Hospitalario Universitario de Santiago  
Universidade da Coruña  
LGC, Londre, UK  
Universidad de Concepción, Chile  
Universidad Complutense de Madrid  
Instituto Nacional Investigación Agroalimentaria, INIA, Madrid  
Universidade de Valencia  
Universidade da Coruña  
Universidade da Coruña  
Universidade da Coruña  
Universidade da Coruña  
Universidad Complutense de Madrid

## PROXECTOS DE INVESTIGACIÓN 2009 - 2013

### Título:

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

**Tipo:** (PN) Plan Nacional  
**Fechas:** 01/01/2013 - 31/12/2015  
**Investigador principal:** Bermejo Barrera, Pilar

---

**Título:**  
Tracking Drug Trafficking (TDT)  
**Tipo:** (PI) Programas Internacionais  
**Fechas:** 01/12/2012 - 30/11/2015  
**Investigador principal:** Bermejo Barrera, Pilar

---

**Título:**  
Uso de nanopartículas multifuncionales para la simplificación de métodos analíticos.  
**Tipo:** Proxectos Xunta  
**Fechas:** 10/08/2010 - 30/09/2013  
**Investigador principal:** Bermejo Barrera, Pilar

---

**Título:**  
Mejora en la detección y determinación de estupefacientes en muestras clínicas para una rápida y fiable respuesta en laboratorios toxicológico-forenses.  
**Tipo:** Proxectos Xunta  
**Fechas:** 08/08/2010 - 30/09/2013  
**Investigador principal:** Moreda Piñeiro, Antonio

---

**Título:**  
Desarrollo de polímeros de impronta (molecularly imprinted polymers) para su aplicación en el campo alimentario (MIPFOOD)  
**Tipo:** Outros Proxectos Nacionais  
**Fechas:** 22/06/2010 - 31/12/2013  
**Investigador principal:** Bermejo Barrera, Pilar

---

**Título:**  
Especiación multielemental, química y funcional de elementos traza en materia orgánica del agua de mar  
**Tipo:** Plan Nacional  
**Fechas:** 01/01/2010 - 31/12/2012  
**Investigador principal:** Bermejo Barrera, Pilar

---

## Cientes e socios tecnolóxicos

- 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

## PRODUCCIÓN CIENTÍFICA 2007 - 2011

### Artigos en revistas científicas

**Artigo:**

Pressurized liquid extraction-assisted mussel cytosol preparation for the determination of metals bound to metallothionein-like proteins.

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2007

---

**Artigo:**

Improvements on enzymatic hydrolysis of human hair for illicit drug determination by gas chromatography/mass spectrometry

**Revista:** ANALYTICAL CHEMISTRY, ISSN: 0003-2700  
2007

---

**Artigo:**

Application of microwave energy to speed up the alkaline extraction of humic and fulvic acids from marine sediments

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2007

---

**Artigo:**

Antimony determination in mussel samples by atomic absorption spectrometry using palladium-magnesium nitrate as chemical modifier

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2007

---

**Artigo:**

Use of chelating solvent-based pressurized liquid extraction combined with inductively coupled plasma-optical emission spectrometry for trace element determination in atmospheric particulate matter.

**Revista:** JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477  
2007

---

**Artigo:**

Development of a new sample pre-treatment procedure based on pressurized liquid extraction for the determination of metals in edible seaweed.

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2007

---

**Artigo:**

Antimony determination in marine sediments by graphite furnace atomic absorption spectrometry with slurry sampling

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2007

---

**Artigo:**

On-line preconcentration cold vapour atomic absorption spectrometry for the determination of trace mercury in edible seaweeds.

**Revista:** JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477  
2007

---

**Artigo:**

Concentrations of iodide and total iodine in edible seaweeds harvested on the Galician coast (Northwest Spain)

**Revista:** BOTANICA MARINA, ISSN: 0006-8055  
2007

---

**Artigo:**

Optimization of a vapour generation method for metal determination using ICP-OES

**Revista:** JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477  
2007

---

**Artigo:**

Multi-element determination in raft mussels by fast microwave-assisted acid leaching and inductively coupled plasma-optical emission spectrometry

**Revista:** TALANTA, ISSN: 0039-9140  
2007

---

**Artigo:**

Determination of major and trace elements in human scalp hair by pressurized-liquid extraction with acetic acid and inductively coupled plasma-optical-emission spectrometry

**Revista:** ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642  
2007

---

**Artigo:**

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.

**Revista:** TALANTA, ISSN: 0039-9140  
2007

---

**Artigo:**

Fractionation metallothionein-like proteins in mussels with on line metal detection by high performance liquid chromatography-inductively coupled plasma-optical emission spectrometry

**Revista:** TALANTA, ISSN: 0039-9140  
2007

---

**Artigo:**

Feasibility of pressurization to speed up enzymatic hydrolysis of biological materials for multielement determinations.

**Revista:** ANALYTICAL CHEMISTRY, ISSN: 0003-2700  
2007

---

**Artigo:**

Direct determination of copper, lead and cadmium in aniseed spirits by electrothermal atomic absorption spectrometry.

**Revista:** FOOD CHEMISTRY, ISSN: 0308-8146  
2007

---

**Artigo:**

Separation and determination of Se-compounds by liquid chromatography coupled with electrospray mass spectrometry.

**Revista:** JOURNAL OF TRACE ELEMENTS IN MEDICINE AND BIOLOGY, ISSN: 0946-672X  
2007

---

**Artigo:**

Determination of iodine in human milk and infant formulas

**Revista:** JOURNAL OF TRACE ELEMENTS IN MEDICINE AND BIOLOGY, ISSN: 0946-672X  
2007

---

**Artigo:**

Analysis of brain regional distribution of aluminium in rats via oral and intraperitoneal administration

**Revista:** JOURNAL OF TRACE ELEMENTS IN MEDICINE AND BIOLOGY, ISSN: 0946-672X  
2007

---

**Artigo:**

Preparatory studies for the implementation of the Norm UNE 66020-1:2001 (or Norm ISO 2859-1:1999) in a Canned Marine Food Factory

**Revista:** JOURNAL OF FOOD PROCESSING AND PRESERVATION, ISSN: 0145-8892  
2008

---

**Artigo:**

Screening of humic and fulvic acids in estuarines sediments by near-infrared spectrometry

**Revista:** ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642  
2008

---

**Artigo:**

Vapor generation for metal determination in steels using ICP-OES

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2008

---

**Artigo:**

Preliminary results of a quick, simple method of detecting antimony in water samples

**Revista:** CENTRAL EUROPEAN JOURNAL OF CHEMISTRY, ISSN: 1895-1066  
2008

---

**Artigo:**

Matrix solid-phase dispersion as a sample pretreatment for the speciation of arsenic in seafood products

**Revista:** ANALYTICAL CHEMISTRY, ISSN: 0003-2700  
2008

---

**Artigo:**

Synthesis, characterization and evaluation of ionic-imprinted polymers for solid-phase extraction of nickel from seawater

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2008

---

**Artigo:**

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

**Revista:** EUROPEAN FOOD RESEARCH AND TECHNOLOGY, ISSN: 1438-2377  
2008

---

**Artigo:**

Preparatory studies for the implementation of norm UNE 66020-1:2001 (or norm ISO 2859-1:1999) in a canned marine food factory

**Revista:** JOURNAL OF FOOD PROCESSING AND PRESERVATION, ISSN: 0145-8892  
2008

---

**Artigo:**

Phthalates determination in physiological saline solutions by HPLC-ES-MS

**Revista:** TALANTA, ISSN: 0039-9140  
2008

---

**Artigo:**

Characterization of estuarine sediments by near infrared diffuse reflectance spectroscopy

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2008

---

**Artigo:**

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

**Revista:** TALANTA, ISSN: 0039-9140  
2009

---

**Artigo:**

Microwave assisted extraction of iodine and bromine from edible seaweed for inductively coupled plasma-mass spectrometry determination

**Revista:** TALANTA, ISSN: 0039-9140  
2009

---

**Artigo:**

Characterization of raft mussels according to total trace elements and trace elements bound to metallothionein-like proteins

**Revista:** JOURNAL OF ENVIRONMENTAL MONITORING, ISSN: 1464-0325  
2009

---

**Artigo:**

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

**Revista:** ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642  
2009

---

**Artigo:**

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

**Revista:** MICROCHEMICAL JOURNAL, ISSN: 0026-265X  
2009

---

**Artigo:**

Microalgae fiber optic biosensors for herbicide monitoring using sol-gel technology

**Revista:** BIOSENSORS & BIOELECTRONICS, ISSN: 0956-5663  
2009

---

**Artigo:**

Use of high resolution continuum source atomic absorption spectrometry as a detector for chemically generated noble and transition metal vapours

**Revista:** SPECTROCHIMICA ACTA PART B-ATOMIC SPECTROSCOPY, ISSN: 0584-8547  
2009

---

**Artigo:**

Alternative solid sample pre-treatment methods in green analytical atomic spectrometry

**Revista:** SPECTROSCOPY LETTERS, ISSN: 0038-7010  
2009

---

**Artigo:**

Matrix solid-phase dispersion of organic compounds and its feasibility for extracting inorganic and organometallic compounds

**Revista:** TRAC-TRENDS IN ANALYTICAL CHEMISTRY, ISSN: 0165-9936  
2009

---

**Artigo:**

Evaluation of an in Vitro method to estimate trace elements bioavailability in edible seaweeds

**Revista:** TALANTA, ISSN: 0039-9140  
2010

---

**Artigo:**

Characterization of edible seaweed harvested on the Galician Coast ( Northwestern Spain) using pattern recognition techniques and major and trace element data

**Revista:** JOURNAL OF AGRICULTURAL AND FOOD CHEMISTRY, ISSN: 0021-8561  
2010

---

**Artigo:**

Estuarine increase of chromium surface sediments: distribution, transport and time evolution

**Revista:** MICROCHEMICAL JOURNAL, ISSN: 0026-265X  
96

---

**Artigo:**

Estuarine sediment quality assessment by Fourier-transform infrared spectroscopy

**Revista:** VIBRATIONAL SPECTROSCOPY, ISSN: 0924-2031  
2010

---

**Artigo:**

Phthalates determination in pharmaceutical formulae used in parenteral nutrition by LC-ES-MS: importance in public health

**Revista:** ANALYTICAL AND BIOANALYTICAL CHEMISTRY, ISSN: 1618-2642  
2010

---

**Artigo:**

Matriz solid-phase dispersión on column clean-up/pre-concentration as a novel approach for fase isolation of abuse drugs from human hair

**Revista:** JOURNAL OF CHROMATOGRAPHY A, ISSN: 0021-9673  
2010

---

**Artigo:**

A sensitive, simple and safe method for total arsenic determination in edible seaweed by HG-AFS

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2010

---

**Artigo:**

Simultaneous pressurized enzymatic hydrolysis extraction and clean up for arsenic speciation in seafood samples before high performance liquid chromatography-inductively coupled plasma-mass spectrometry determination

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2010

---

**Artigo:**



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

**Revista:** JOURNAL OF CHROMATOGRAPHY A, ISSN: 0021-9673  
2011

---

**Artigo:**

A review on iodine speciation for environmental, biological and nutrition fields

**Revista:** JOURNAL OF ANALYTICAL ATOMIC SPECTROMETRY, ISSN: 0267-9477  
2011

---

**Artigo:**

Bioavailability study using an in-vitro method of iodine and bromine in edible seaweed

**Revista:** FOOD CHEMISTRY, ISSN: 0308-8146  
2011

---

**Artigo:**

Selective determination of V(IV) and V(V) in seawater by solid phase extraction and electrothermal atomic absorption spectrometry

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2011

---

**Artigo:**

Electrospray ionization tandem mass spectrometry for the simultaneous determination of opiates and cocaine in human hair

**Revista:** ANALYTICA CHIMICA ACTA, ISSN: 0003-2670  
2011

---

**Artigo:**

Presence of phthalates in contact lens and cleaning solutions

**Revista:** MICROCHEMICAL JOURNAL, ISSN: 0026-265X  
2011

---

**Artigo:**

In-vivo and in-vitro testing to assess the bioaccessibility and the bioavailability of arsenic, selenium and mercury species in food samples

**Revista:** TRAC-TRENDS IN ANALYTICAL CHEMISTRY, ISSN: 0165-9936  
2011

---

**Artigo:**

Direct LC-ES-MS/MS determination of phthalates in physiological saline solutions

**Revista:** JOURNAL OF CHROMATOGRAPHY B-ANALYTICAL TECHNOLOGIES IN THE BIOMEDICAL AND LIFE S  
2011

---

**Artigo:**

Direct speciation analysis of Sb(III) and Sb(V) based on their different sensitivities for GFAAS

**Revista:** SPECTROSCOPY LETTERS, ISSN: 0038-7010  
2011

---

**Artigo:**

Matrix solid phase dispersion-assisted BCR sequential extraction method for metal partitioning in surface estuarine sediments

**Revista:** TALANTA, ISSN: 0039-9140

2011

---

**Artigo:**

Total antimony determination in galician mussel samples (*Mytilus galloprovincialis*) by slurry sampling-Graphite Furnace Atomic Absorption Spectrometry. Preliminary Results

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2011

---

**Artigo:**

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

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2011

---

**Artigo:**

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

**Revista:** MICROCHEMICAL JOURNAL, ISSN: 0026-265X  
2011

---

**Artigo:**

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

**Revista:** MICROCHEMICAL JOURNAL, ISSN: 0026-265X  
2011

---

**Artigo:**

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

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

---

**Artigo:**

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

**Revista:** ATOMIC SPECTROSCOPY, ISSN: 0195-5373  
2011

---

**Libros:**

**Título:**

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

**Editorial:** nova science publishers, Inc

---

**Capítulos de libro:**

**Título:**

Analytical Techniques for the determination of inorganic constituents

**Libros:**

Analytical measurements in aquatic environments

(978-1-4200-8268-5) Publicación: 2010

**Editorial:** CRC Press

---

**Título:**

Analytical Chemistry of Cadmium: simple pretreatment and determination methods

**Libros:**

Cadmium in the environment

(978-1-60741-934-1)Publicación: 2010

**Editorial:**nova science publishers, Inc

---

**Título:**

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

**Libros:**

Bisphenol A and Phthalates: uses, health effects and Environmental risk

(978-1-60741-701-9)Publicación: 2010

**Editorial:**nova science publishers, Inc

---

**Título:**

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

**Libros:**

Bisphenol A and Phthalates. Uses, health effects and environmental risk

(978-1-60741-701-9)Publicación: 2010

**Editorial:**Nova Science Publishers, Inc.

---

**Título:**

Use of microwave energy for assisting analytical procedures

**Libros:**

Microwaves: Theoretical aspects and practical applications in chemistry

(978-81-7895-508-7)Publicación: 2011

**Editorial:**Transworld Research Network

---

**Teses doutorais:**

**Título:**

Biodisponibilidad de cromo en sedimentos marinos de la Ría de Arousa

**Data lectura:** 30/11/2007

**Director:** Pilar Bermejo Barrera, María del Carmen Barciela Alonso

**Autor:** Paula Pazos Capeáns

---

**Título:**

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

**Data lectura:** 29/03/2007

**Director:** Pilar Bermejo Barrera, María del Carmen Barciela Alonso

**Autor:** Paloma Herbelo Hermelo

---

**Título:**

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

**Data lectura:** 03/12/2007

**Director:** José María Fraga Bermúdez, Pilar Bermejo Barrera

**Autor:** María Mayra Rebolledo Fernández

---

**Título:**

Contribución a la determinación de la fracción de metales traza ligados a las proteínas similares a las metalotioneínas en muestras de mejillón

**Data lectura:** 20/04/2007

**Director:** Pilar Bermejo Barrera, Antonio Moreda Piñeiro

**Autor:** Sandra Santiago Rivas

---

**Título:**

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

**Data lectura:** 03/12/2007

**Director:** José María Fraga Bermúdez, Pilar Bermejo Barrera

**Autor:** María Mayra Rebolledo Fernández

---

**Título:**

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 estudo da Ría de Arousa.

**Data lectura:** 15/12/2009

**Director:** Pilar Bermejo Barrera, Antonio Moreda Piñeiro

**Autor:** Jacobo Otero Romaní

---

**Título:**

Uso da Xeneración de Vapor na Determinación de Metais Traza por Técnicas Atómicas

**Data lectura:** 16/03/2011

**Director:** Pilar Bermejo Barrera, Elena María Peña Vázquez

**Autor:** Julia Villanueva Alonso

---