

# RESEARCH TEAM FOR SUSTAINABLE PRODUCTION IN CANTABRIA



**2019 ACTIVITY**

# SOSPROCAN TEAM



# SOSPROCAN TEAM

The **SOSPROCAN team** hosts more than 60 researchers of the University of Cantabria with background in the analysis, design and optimization of environmental and production processes.

The aim of this team is to develop cutting-edge research to progress the sustainability and innovation of production, energy and environmental processes.

The members of SOSPROCAN team belong to four research groups:

## DEPRO Research Group

- Head of the Group:
- Prof. Ángel Irabien Gullías

## ASP Research Group

- Head of the Group:
- Prof. Inmaculada Ortiz Uribe

## TAB Research Group

- Head of the Group:
- Prof. Ane Urtiaga Mendía

## IPS Research Group

- Head of the Group
- Prof. Raquel Ibáñez Mendizábal

## New Head of the Chemical & Biomolecular Engineering Department

Prof. Ane Urtiaga was nominated as Head of the Chemical & Biomolecular Engineering Department. The event, chaired by the Rector of the University of Cantabria, Prof. Ángel Pazos, took place on October 16<sup>th</sup>, 2019. A representative group of researchers of the Chemical and Biomolecular Engineering Department wanted to share with her this moment.



# PROFESSORS



**Prof. Angel Irabien**  
Head of the research group  
**DEPRO**  
[irabienj@unican.es](mailto:irabienj@unican.es)



**Prof. Inmaculada Ortiz**  
Head of the research group  
**PAS**  
[ortizi@unican.es](mailto:ortizi@unican.es)



**Prof. Ane M. Urtiaga**  
Head of the research group  
**TAB**  
[urtiaga@unican.es](mailto:urtiaga@unican.es)



**Prof. Raquel Ibáñez**  
Head of the research group  
**IPS**  
[ibanezr@unican.es](mailto:ibanezr@unican.es)



**Prof. Daniel Gorri**  
[gorrie@unican.es](mailto:gorrie@unican.es)



**Ignacio Fernández**  
[fernandi@unican.es](mailto:fernandi@unican.es)



**Aurora Garea**  
[gareaa@unican.es](mailto:gareaa@unican.es)



## ASSOCIATE PROFESSORS



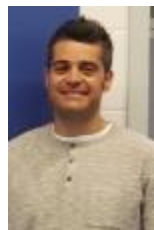
**Rubén Aldaco**

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**Manuel Álvarez**

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**Eugenio Bringas**

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**Clara Casado**

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**Alfredo Ortiz**

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**María José Rivero**

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**Mª Fresnedo San Román**

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## PERMANENT PROFESSORS



**Nazely Diban**

[dibann@unican.es](mailto:dibann@unican.es)



**Antonio Dominguez**

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## ASSISSTANT PROFESSORS



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## PART TIME TEACHING PROFESSORS



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**Jose Antonio Fernández**

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**Pedro M. Gómez**

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## POST-DOC RESEARCHERS



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**Jara Laso**

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**Víctor M. Ortiz**

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## TECHNICAL STAFF



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## PHD. STUDENTS & CONTRACTED RESEARCHERS



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**María Yáñez**

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**INDUSTRIAL DOCTORATE**

- Ángela Fernández
- Rubén Leivas

# MANAGEMENT ACTIVITIES



# DEPARTMENT

## Head of the Chemical & Biomolecular Engineering Department



**Prof. Angel Irabien**  
Director  
(March 2018 - July 2019)  
[irabienj@unican.es](mailto:irabienj@unican.es)



**Prof. Ane M. Urtiaga**  
Director  
(starting August 2019)  
[urtiaga@unican.es](mailto:urtiaga@unican.es)



## Administration of the Chemical & Biomolecular Engineering Department:

[secretaria.quimica@unican.es](mailto:secretaria.quimica@unican.es) Tel.: +34 972 20 15 90 / Fax: +34 972 20 15 91



**Rosa Álvarez**  
[alvarezr@unican.es](mailto:alvarezr@unican.es)



**Domingo Álvarez**  
[alvaferd@unican.es](mailto:alvaferd@unican.es)

### Department Council

- Academic and Research staff : 35 members
- Research staff (doctorate students, others) (20%): 11 members
- Master Students (max. 5%): 1 member
- Undergraduate Students (max. 10%): 2 members
- Administration (5%): 3 members

### Permanent Commission

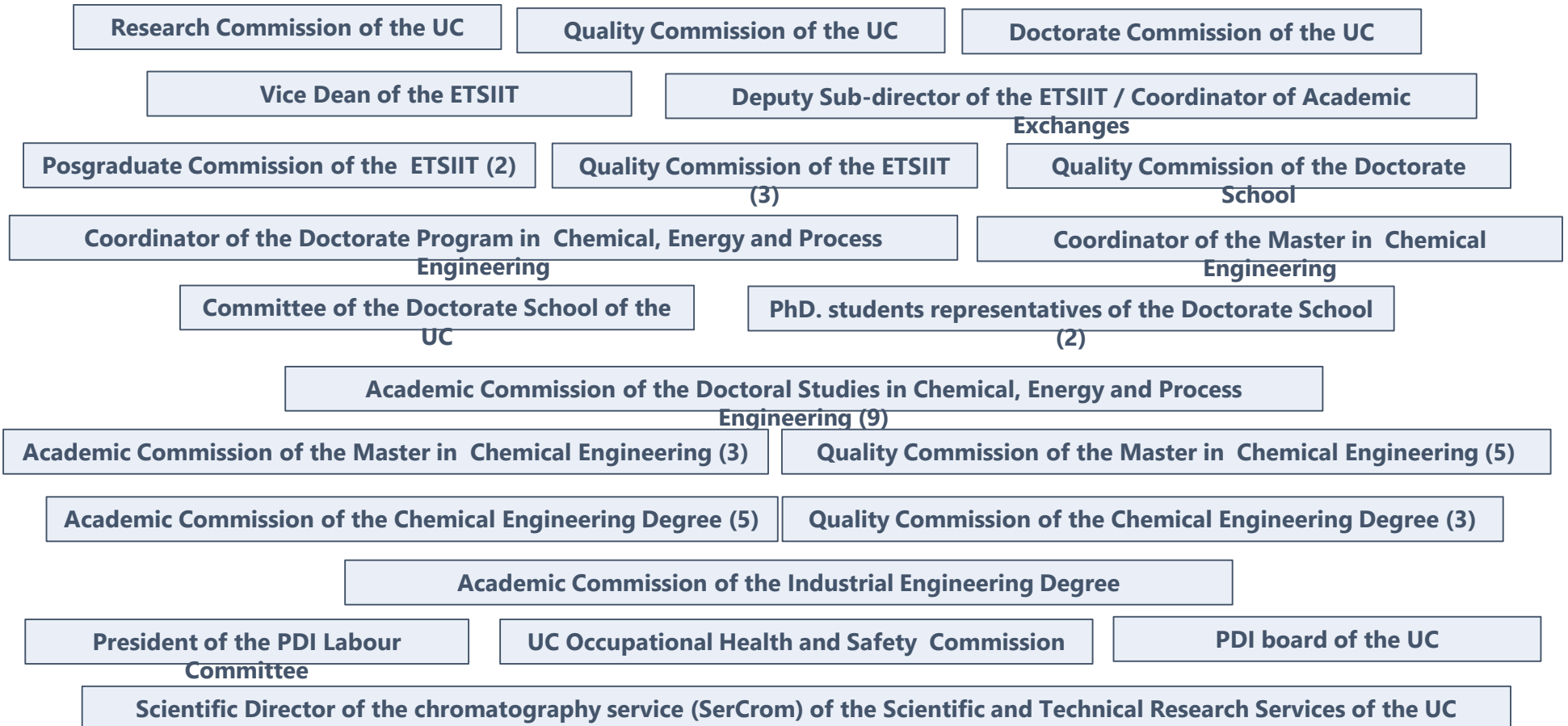
- Director of the Department
- Deputy Director of the Department
- Department Council Secretary
- 5 representatives of the PDEI – PhD
- 2 representatives of the PDI – No PhD
- 1 representative of master and undergraduate students
- 1 representative of the Administrative personnel

# PARTICIPATION IN UC MANAGEMENT ACTIVITIES



UC Senate Members	
Members of the Department	Total Members
7	302

ETSiIT Faculty Members	
Members of the Department	Total Members
6	102





## POSITIONS IN EXTERNAL ORGANIZATIONS



General Director of Universities, Research and Transfer of Cantabria Government

President of the Chemical Engineering Group of the RSEQ

International Academy and Research Evaluator: Slovenian Research Agency, Flandes: FWO Expert Panel, Science Foundation Ireland's, etc.

Editorial Board Applied Sciences, MPDI

Correspondent member of the Royal Academy of Sciences of Spain

Associate Editor of the Journal of Chemical Technology and Biotechnology

Member of the Assessment Committee "Engineering and Architecture" of UNIBASQ

Committee for the quality assessment of doctorate programs (AQU), Master Programs and research outcomes of the academic staff (UNIBASQ), research grants (IRCSET)



Member of PDI Accreditation Panel UNIBASQ

Member of the Chemical Sciences and Technology (CTQ) panel, Spanish State Research Agency, Ministry of Science, Innovation and Universities.

President of the Scientific Committee of the ERANET EIG Concert – Japan, Evaluation of proposals in 2019 Call

Guest Editor in Separation & Purification Technology (Elsevier)

President of the Commission of Conferencia de Directores y Decanos de Ingeniería Química (CODDIQ)

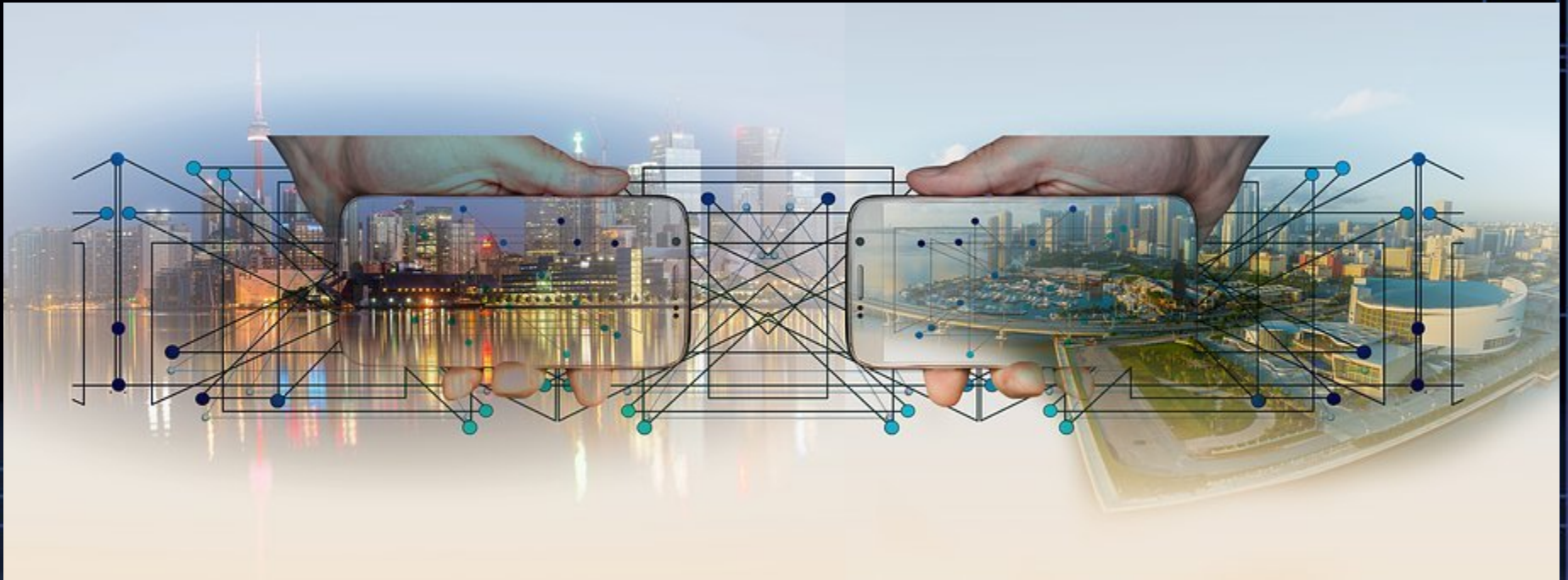
Member of the Evaluation committee of CYTED 2019 (Programa Iberoamericano de Ciencia y Tecnología para el Desarrollo) .

Evaluator for the Agencia Andaluza del Conocimiento – Call for the assessment of teaching activity, research and management of the academic and research personnel, of the public universities of Andalucía (May – June 2019)



Member of the Editorial Board of Membranes (MDPI)

# RESEARCH TOPICS





- ✓ CO<sub>2</sub> Capture and Utilisation. Materials Circular Economy. Sustainability.
- ✓ R&D of Membrane Separation Processes.
- ✓ Sources and Characterization of Particulate Matter and its Components.
- ✓ Life Cycle Assessment Tools for Decision Support in Processes and Products

- ✓ High performance materials. Functionalized Magnetic Nanomaterials. High performance membranes.
- ✓ High Efficient Separation and Bio-separation Technologies
- ✓ Energy Sustainability: Blue Energy, Hydrogen

- ✓ Environmental Technologies
- ✓ Resource Efficiency: Hydrogen, SynGas, refrigerants
- ✓ Preparation & Characterization of Biocompatible Materials and bioreactors for Tissue Regeneration

- ✓ Electro-Membrane Technologies
- ✓ Quantitative assessment of PCDD/Fs formation in Engineering Process
- ✓ Development of advanced technologies for selective metal separation

## RESEARCH KNOWLEDGE SHARING CONSULTING



# TRANSFER OF KNOWLEDGE





# STUDY PROGRAMMES

## 5<sup>th</sup> Edition - Official Master in Chemical Engineering

The Official Master in Chemical Engineering is jointly taught BY THE University of Cantabria and the University of the Basque Country promoting an excellence training program with highly specialized Academics. The degree follows the previous editions of the Master in Chemical Engineering “Sustainable Production and Consumption” of the University of Cantabria and the Master in Chemical Process Engineering and Sustainable Development of the University of the Basque Country, both taught since 2007.

The master endorses the governmental guidelines for the profession of Chemical Engineer, registered in BOE A-2009-12977, June 8th, 2009.

More info:

<http://web.unican.es/centros/etsiit/Paginas/Master-Universitario-en-Ingenieria-Quimica.aspx>



## Doctoral Studies in Chemical, Energy and Process Engineering

More info:

<https://web.unican.es/estudios/detalle-doctorado?p=183&a=2017>

## International Academic Exchange Socrates-Erasmus Programmes.

More info:

<https://web.unican.es/unidades/oficina-relaciones-internacionales/estudiantes>



Socrates  
Grundtvig



# PROFESSIONAL PROMOTIONS

## FULL PROFESSORS

**October 8<sup>th</sup>, 2019**

Aurora Garea was promoted to Full Professor in Chemical Engineering. The evaluation committee was chaired by Prof. Javier León (UC), with the participation of Prof. Juan José Rodríguez (UAM), Prof. Aurora Santos (UCM), Prof. Ana Gayubo (UPV/EHU) and Prof. Raquel Ibáñez (UC).

**October 28<sup>th</sup>, 2019**

Ignacio Fernández was promoted to Full Professor in Chemical Engineering. The evaluation committee was chaired by Prof. Javier León (UC), with the participation of Prof. Juan José Rodríguez (UAM), Prof. Eloy García Calvo (UAH), Prof. Ana Gayubo (UPV/EHU) and Prof. Ane Urtiaga (UC).



# PROFESSIONAL PROMOTIONS: ASSOCIATE PROFESSORS

**October 9<sup>th</sup>, 2019**

**Manuel Álvarez** was promoted to Associate Professor in the area of Chemical Engineering. The evaluation committee was chaired by Dr. Mario Mañana Vice-Chancellor for Campus, Services and Sustainability of the UC, with the participation of Prof. Manuel Rodrigo (University of Castilla-La Mancha), Prof. Aurora Santos (Complutense University) and Prof. Ane Urtiaga and Dr. María Fresnedo San Román, from the University of Cantabria.



**October 17<sup>th</sup>, 2019**

**Alfredo Ortiz** was promoted to Associate Professor in the area of Chemical Engineering. The evaluation committee was chaired by Dr. Mario Mañana (UC), with the participation of Prof. Juan Ramón González (University of the Basque Country), Prof. Jesús María Araúzo (University of Zaragoza), and Prof. Inmaculada Ortiz and Dr. María José Rivero, from the University of Cantabria.



**October 28<sup>th</sup>, 2019**

**Clara Casado** was promoted to Associate Professor in the area of Chemical Engineering. The evaluation committee was chaired by Prof. Javier León, Vice-Chancellor for Research and Transfer of Knowledge of the UC, with the participation of Prof. Juan José Rodríguez (UAM), Prof. Ane Urtiaga (UC), Prof. Manuel Arruebo (UNIZAR), and Dr. Rubén Aldaco (UC).



**October 29<sup>th</sup>, 2019**

Eugenio Bringas was promoted to Associate Professor in the area of Chemical Engineering. The evaluation committee was chaired by Dr. Mario Mañana (UC), with the participation of Prof. Juan José Rodríguez (UAM), Prof. Ana Gayubo (UPV/EHU), Prof. Inmaculada Ortiz (UC) and Prof. Raquel Ibañez (UC).



# PROFESSIONAL PROMOTIONS: ASSOCIATE PROFESSORS

*December 12<sup>th</sup>, 2019*

**Nazely Diban** was promoted to a permanent position as Associate Professor in the area of Chemical Engineering of the University of Cantabria. The evaluation committee was formed by Mr. Mario Mañana Canteli, Vice-Chancellor for Campus, Services and Sustainability of the UC, Prof. Inmaculada Ortiz Uribe, Prof. Ane Urtiaga, Prof. E. Daniel Gorri and Dr. María José Rivero.



*December 19<sup>th</sup>, 2019*

**Antonio Domínguez** was proposed for promotion to a permanent position as Associate Professor in the area of Chemical Engineering of the University of Cantabria. The evaluation committee was formed by Mr. Mario Mañana Canteli (UC), Prof. Ane Urtiaga, Prof. Raquel Ibañez, Dr. María Fresnedo San Román and Dr. Rubén Aldaco.

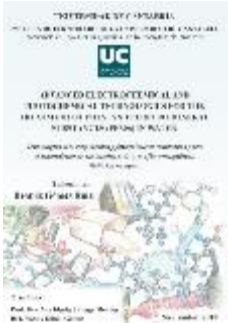




*January 28<sup>th</sup>, 2019*

Beatriz Gómez PhD Dissertation: **“Advanced electrochemical and photochemical technologies for the treatment of poly- and perfluoroalkyl substances (PFASs) in water”**

Supervisors: Prof. Ane Urriaga and Dr. Nazely Diban  
International doctorate mention



*March 1<sup>st</sup>, 2019*

Sandra Sanchez PhD Dissertation: **“New biocompatible polymer membranes functionalized with graphene based nanomaterials for in vitro neural models”**

Supervisors: Prof. Ane Urriaga and Dr. Nazely Diban  
International doctorate mention



*April 9<sup>th</sup>, 2019*

Ana Hernández PhD Dissertation: **“Urban air concentration and deposition of manganese and physico-chemical characterization of manganese-bearing particles”**

Supervisor: Prof. Ignacio Fernández  
International doctorate mention



*May 31<sup>st</sup>, 2019*

Jose Antonio Fernández PhD Dissertation: **“Sustainability assessment of hydraulic fracturing based on the multicriteria Fuzzy-ANP decision technique”**

Supervisor: Prof. Ángel Irabien  
Industrial doctorate mention



*June 30<sup>th</sup>, 2019*

Pedro Díaz PhD Dissertation: **“New process for the biotechnological production of lactic acid: Integration of membranes filtration technologies”**

Supervisors: Prof. Raquel Ibañez and Dr. Jose A. Otero



*November 20<sup>th</sup>, 2019*

Claudia Solás PhD Dissertation: **“Traceability of PCDD/FS formation in the advanced oxidation of triclosan in aqueous samples”**

Supervisors: Prof. Inmaculada Ortiz and Dr. M<sup>a</sup> Fresnedo San Román  
International doctorate mention



*November 22<sup>nd</sup>, 2019*

Ángela Fernández's PhD Dissertation: **"Feasibility analysis of an innovation project in circular economy: Valorization of municipal solid waste incineration fly ashes by carbonation"**

Supervisors: Prof. Ángel Irabien and Dr. Esther Santos  
Industrial doctorate mention



*November 25<sup>th</sup>, 2019*

Álvaro Soriano's PhD Dissertation: **"Process integration base don membrane preconcentration and electrochemical oxidation of poly- and perfluoroalkyl substances in industrial water treatment"**

Supervisors: Prof. Ane Urtiaga and Prof. Daniel Gorri  
International doctorate mention



*December 20<sup>th</sup>, 2019*

Selene Cobo's PhD Dissertation: **"A life cycle optimization framework for the sustainable design of circular municipal solid waste management systems"**

Supervisors: Prof. Ángel Irabien and Dr. Antonio Domínguez  
International doctorate mention





# EVALUATION COMMITTEE – PhD. Thesis Defenses in External Universities

**January 24<sup>th</sup>, 2019**

**Prof. Ignacio Fernández Olmo and Dr. Nazely Diban** attended the PhD. Thesis Defense of Javier Izquierdo Navarro, as a member of the evaluation committee.

Thesis title: “Tratamiento de corrientes residuales de la industria minera mediante tecnología de nanociclado”

University of the Basque Country (Spain)



**April 10<sup>th</sup>, 2019**

**Prof. Daniel Gorri** attended the PhD. Thesis Defense of Alan Didier Pérez Ávila, as a member of the evaluation committee.

Thesis title: “Applications of a liquid membrane in Taylor flow regime (LMTF) on separation processes and design of fermentation hybrid systems”

Universidad Nacional de Colombia - Sede Manizales, Manizales (Colombia)



**July 26<sup>th</sup>, 2019**

Dr. María José Rivero attended the PhD. Thesis Defense of Laura Ponce Robles, as a member of the evaluation committee.

Thesis Title: “Tratamiento de aguas residuales mediante procesos basados en la radiación solar y ozono. Evaluación mediante técnicas analíticas y microbiológicas avanzadas”

University of Almeria, Almeria (Spain).





# EVALUATION COMMITTEE – PhD. Thesis Defense

## September 20<sup>th</sup>, 2019

Clara Casado participated as a member of the evaluation committee of the PhD. thesis of Ms. Inés Durán Vera.

Thesis Title: “Diseño de procesos cíclicos de adsorción para la captura de CO<sub>2</sub> en el contexto de una planta de gestión de residuos”,

University of Oviedo (Spain)



## September 27<sup>th</sup>, 2019

Prof. Raquel Ibáñez and Dr. Nazely Diban participated as members of the evaluation committee of the PhD. thesis of Mr. Pablo Rodríguez Vega.

Thesis Title: “Experimental Development and modeling of a membrane reactor for the direct synthesis of DME with CO<sub>2</sub> valorization”,

University of the Basque Country (Spain)



## October 7<sup>th</sup>, 2019

Jonathan Albo was member of the evaluation committee of the thesis defended by Jesús García

Thesis Title: “Reducción electrocatalítica de CO<sub>2</sub> en fase gas mediante catalizadores sintetizados en medio supercrítico”

University of Castilla-La Mancha, Toledo Campus (Spain)



# EVALUATION COMMITTEE – PhD. Thesis Defense

## November 14<sup>th</sup>, 2019

Prof. Ane Urtiaga participated in the Assessment Committee of the PhD thesis of Makdi Nikbakht Fini.

Thesis Title: Studies of membrane separation for a combined membrane and biofiltration of pesticides in groundwater based drinking water treatment.

Esbjerg Campus of the University of Aalborg (Denmark)



## November 29<sup>th</sup>, 2019

Prof. Ane Urtiaga participated in the Assessment Committee of the PhD thesis of Zhihong Ye.

Thesis Title: Processes and catalysts for the electrochemical removal of persistent organic micropollutants from urban wastewater at mild pH

University of Barcelona (Spain)



## December 10<sup>th</sup>, 2019

Prof. Ane Urtiaga participated in the Assessment Committee of the PhD thesis of José Palomo Jimenez

Thesis Title: “Catalizadores Avanzados para la Síntesis de Dimetil Éter”

University of Málaga – Málaga (Spain)



# MASTER DISSERTATION THESIS

**March 1<sup>st</sup>, 2019**

Estela Abascal, Iñigo Cabrejas, Alba Diaz, Iñigo Elorriaga, Mónica Gómez, Fernando Losada, Miguel Mas and Amaia Zarandona defended their final master thesis in the Master in Chemical Engineering (UC-UPV/EHU). The defense took place in the University of Cantabria and the academic evaluation committee was formed by Prof. Raquel Ibáñez, from the UC, Dra. Miriam Arabiourrutia and Dr. Rubén López, both from the UPV-EHU.



**July 5<sup>th</sup>, 2019**

Estefanía Alonso, Josu Goitia, Sara Martinez, Ainara Quijada, Diego Rebe, Raúl Robles and Amaia Sáenz de Burjaca, defended their final master thesis in the Master in Chemical Engineering (UC-UPV/EHU). The defense took place in the University of Cantabria, and the academic evaluation committee was formed by Prof. Raquel Ibáñez, from the UC, Dra. Miriam Arabiourrutia and Dr. Rubén López, both from the UPV-EHU.

# MASTER DISSERTATION THESIS

## October 1<sup>st</sup>, 2019

Salvador Asensio defended his final thesis in the Master in Chemical Engineering (UC-UPV/EHU). The defense took place in the University of Basque Country on October 1<sup>st</sup>, 2019, and the academic evaluation committee was formed by Prof. Jose María Arandes (UPV/EHU), Dr. María José Rivero (UC) and Dr. Alfredo Ortiz (UC).

## October 29<sup>th</sup>, 2019

María de los Angeles Mantecón, Zuria Tabernilla, Gontzal Lezcano and Leire Landa, defended their final thesis in the Master in Chemical Engineering (UC-UPV/EHU). The defense took place in the University of Basque Country on October 29<sup>th</sup>, 2019, and the academic evaluation committee was formed by Prof. Jose María Arandes (UPV/EHU), Dr. María José Rivero (UC) and Dr. Alfredo Ortiz (UC).



## November 29<sup>th</sup>, 2019

Carmen Barquín and Belén García defended their final thesis in the Master in Chemical Engineering (UC-UPV/EHU). The defense took place in the University of Basque Country on October 29<sup>th</sup>, 2019, and the academic evaluation committee was formed by Prof. Jose María Arandes (UPV/EHU), Dr. María José Rivero (UC) and Dr. Alfredo Ortiz (UC).



# EUROPEAN PROJECT SEMESTER DEFENSE OF FINAL PROJECT DEGREE

The students enrolled in the European Project Semester 2018-2019, defended their final degree project in Chemical Engineering. The evaluation committee in the year 2018-2019 was formed by Eugenio Bringas, Guillermo Díaz and Marcos Fallanza.

The defenses took place in the ETSIIT of the University of Cantabria, at three different calls:

## - June 7<sup>th</sup>, 2019

Teresa María Jagiello, Agata Katarzyna Pluta, Aleksandra Makiej, Julia Anna Platkiewicz, Gottfried Segner and Monika Sobczuk

## - July 19<sup>th</sup>, 2019

Cristina Campos, Lucía Ceballos, Sergio Valentín Gutiérrez, Marcos León and Tamara Sampedro.

## - September 24<sup>th</sup>, 2019

Anibal Bringas Mirayes, Carlos Díaz Ceballos and Javier Fernández González



# LECTURES AND SEMINARS AT THE DEPARTMENT

**January 18<sup>th</sup>, 2019**

Qazi Sohaib, doctorate student in the Institut Européen des Membranes (Montpellier, France) delivered the seminar “CO<sub>2</sub> capture in hollow fiber membrane contactors coupled with ionic liquids: Experimental, modelling and simulation”.



**February 1<sup>st</sup>, 2019**

Dr. Gastón Merlet, postdoctoral researcher in the University of Santiago de Chile, delivered the seminar “Desarrollo de una tecnología de microextracción de octaclorodibenzo-p-dioxina desde muestras de leche bovina comercial utilizando líquidos iónicos como solventes y dióxido de carbono supercrítico como facilitador de la extracción”.



**February 14<sup>th</sup>, 2019**

Prof. Vicente Montiel, from the Applied Electrochemistry Institute of the University of Alicante, delivered the lecture “Electroquímica y acumulación de energía eléctrica”.



**March 28<sup>th</sup>, 2019**

Dr. Luis Branco, from the LAQV/REQUIMTE, Department of Chemistry of the Faculty of Science and Technology of the Universidade Nova de Lisboa delivered the lecture “Functional Materials based on Task-Specific Ionic Systems”.



# LECTURES AND SEMINARS AT THE DEPARTMENT

**March 28<sup>th</sup>, 2019**

James W. Levis, Research Assistant Professor in the North Carolina State University, delivered the lecture “Life Cycle Optimization of Solid Waste Management Systems”.



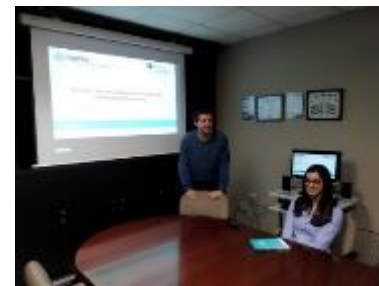
**April 10<sup>th</sup>, 2019**

Patrick Martin, from the Université d'Artois (France) delivered the conference “Bio-based Chemistry – Bioeconomy applied to biocomposites”.



**April 21<sup>st</sup>, 2019**

Cátia Azenha, PhD. student of the University of Porto, delivered a seminar about her research work to all members of the Chemical & Biomolecular Engineering Department.



**May 21<sup>st</sup>, 2019**

Marta Sebastiá, coordinator of Industry and Energy, F. Iniciativas, delivered the seminar “Economía Circular e Innovación Tecnológica”, in the ETSIIT.



**May 27<sup>th</sup>, 2019**

Aleksandra Pacula, Jerzy Haber Institute of Catalysis and Surface Chemistry, Polish Academy of Science, delivered the lecture “Porous N-doped carbon materials and their composites”.



# LECTURES AND SEMINARS AT THE DEPARTMENT

**May 29<sup>th</sup>, 2019**

Prof. Ignacio Grossmann, Carnegie Mellon University (Pittsburgh, USA) – Doctor Honoris Causa in the University of Cantabria, delivered the lecture “Evolución y Tendencias en la Educación Universitaria en los Estados Unidos”



**October 15<sup>th</sup>, 2019**

Haruyiki Ishii, Department of Sustainable Environmental Engineering, Yamaguchi University delivered the lecture “A comprehensive introduction of emulsion polymerization from laboratory to industrial scale”.



**November 25<sup>th</sup>, 2019**

Prof. David Bogle, Professor of Chemical Engineering at University College London (UCL) and Pro-Vice-Provost of UCL’s Doctoral School, delivered the lecture “The Role for Process Systems Engineering in Physiology and Clinical Medicine”.



**December 16<sup>th</sup>, 2019**

Dr. Jenifer Gómez, Ohio State University (USA), delivered the talk “Magnetic behavior of human blood constituents and their separation”.





## INVITED LECTURES



**Prof. Inmaculada Ortiz Uribe** participated as **invited lecturer** in the session “Depuración, reutilización y desalinización”, with a conference entitled “Recuperación de energía a partir de salmueras” in the **Congreso Nacional del Agua**, celebrated in Orihuela (Alicante, Spain), on February 21-22, 2019.

**Dr. Nazely Diban** delivered the talk “Functional polymeric membranes for biomedical applications”, as invited lecturer or the 5<sup>th</sup> International Symposium on Green and Smart Technologies for a Sustainable Society at Yamaguchi University, in Ube (Japan), on March 25 - 27, 2019.



**Dr. Gabriel Zarca** delivered the talk “Novel materials and processes for the recovery of high-added value compounds from industrial waste gaseous streams”, as invited lecturer or the 5<sup>th</sup> International Symposium on Green and Smart Technologies for a Sustainable Society at Yamaguchi University (Japan), on March 25 - 27, 2019.

**Dr. Alfredo Ortiz** participated as **invited lecturer** in the **International School Progress in Hydrogen Safety 2019**, organized by the Hydrogen Safety Engineering and Research Centre (HySAFER) - Belfast School of Architecture and the Built Environment - Ulster University, Belfast, Northern Ireland. The conference took place on March 11<sup>th</sup>, 2019.



## INVITED LECTURES



**Prof. Daniel Gorri** delivered the conference “Avances en la separación de olefinas ligeras mediante membranas de transporte facilitado”. The event took place on April 9<sup>th</sup>, 2019 in the Department of Chemical Engineering of the Universidad Nacional de Colombia – Sede Manizales, Manizales, Colombia.



**Prof. Inmaculada Ortiz Uribe** took part in the cycle of conferences “**Ciencia para todos**” organized by the **Spanish Royal Academy of Sciences**, with the conference “El valor de los residuos y el paradigma de la economía circular”, that was taught on April 20<sup>th</sup>, 2019 in the Main Hall of RAC in Madrid, on May 13 in the Main Hall of the Club de Prensa Asturiana in Oviedo and on May 14 in the “Casa de las Ciencias” in Logroño.



**Dr. Manuel Álvarez** was invited to participate in the 7<sup>th</sup> Annual International School Sotacarbon Summer School on Low Carbon Technologies 2019, where he delivered the conference “CO<sub>2</sub> to liquid fuels: Electrochemical processes. The event took place on June 12<sup>th</sup>, 2019 in the Sotacarbo Research Centre, in Carbonia, Italy.

**Dr. Nazely Diban** delivered the talk “**Membrane processes integration for the adjustment of the alcohol content of red wines**”, at the Department of Sustainable Environmental Engineering, **Yamaguchi University**, as invited lecturer in a research seminar aimed at undergraduate and master students, that took place on July 8<sup>th</sup>, 2019.



## INVITED LECTURES



Prof. Inmaculada Ortiz delivered the **plenary conference** of the **ECCE12 - 12<sup>th</sup> European Congress of Chemical Engineering**, celebrated in Florence (Italy) on September 15-19. The conference was entitled “**Separation Challenges in the Quest for Sustainability**”. In her talk, she presented the upmost forefront developments in advanced separation processes with challenging applications such as for reduction of energy consumption, new energy sources and devices, biomedical applications.

Prof. Ane Urtiaga was invited to present her research results in **the 8<sup>th</sup> De Nora R&D Symposium** that was held at Milan on November 5-6, 2019. The presentation was aimed at knowledge transfer on the topic of **process integration of environmental electrochemical technologies and membrane separation**. The De Nora R&D Symposium series is aimed at creating sustainable, active, and interactive communication network between the leading Academia Communities and De Nora Corporate R&D Groups.



Prof. Ane Urtiaga participated in the **Technical Symposium on Membranes**, organized by AEDyR, that was held in Madrid on November 20<sup>th</sup>, 2019, with the invited lecture **on Progress in the integration of nanofiltration and electrochemical oxidation for the treatment of persistent organic pollutants**.



## INVITED LECTURES

**Dr. Jonathan Albo** participated as invited lecturer in the **III Jornadas Juan Carlos Ruíz Morales**, celebrated in the Instituto de Materiales y Nanotecnología – Universidad de la Laguna, Santa Cruz de Tenerife, on November 22<sup>nd</sup>, 2019. The conference was entitled “CO<sub>2</sub> utilization in the transition to a low-carbon circular economy”.



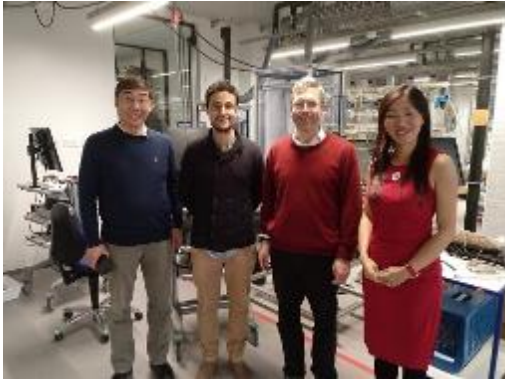
**Prof. Inmaculada Ortiz** participated as invited lecturer at the **MIDES Desalination School**, celebrated in Denia (Alicante, Spain) on November 25-27, 2019. She delivered the conference “**Increasing Desalination Sustainability**”, on November 26<sup>th</sup>, 2019.

**Dr. Gabriel Zarca** was invited by the University of Pamplona (Colombia) to participate in the **II Simposio Nacional de Ingeniería Química**, celebrated on November 26<sup>th</sup> and 27<sup>th</sup>, 2019, where he delivered the lectures “Separación de gases fluorados de alto potencial de calentamiento global empleados como refrigerantes en equipos de aire acondicionado y refrigeración” and “Diseño de un nuevo proceso para la captura selectiva de H<sub>2</sub> y CO a partir de corrientes residuales de la industria”





## INVITED LECTURES



**Dr. Jonathan Albo** was invited to delivered the talk “Turning CO<sub>2</sub> into fuels: closing the loop”, in the **Technical University of Denmark- DTU Energy** (Denmark), on December 4<sup>th</sup>, 2019.

**Rubén Aldaco** participated in the scientific debate 'Avances recientes en el estudio sobre el cambio climático', celebrated in the UC, in the frame of the **Conferencia del Cambio Climático COP25**, on December 5<sup>th</sup>, 2019. All scientists showed the relevance of the outcomes coming from the knowledge of the climate change evolution, and highlighted the importance of intensifying the research to overcome the uncertainty around the scenario in the near future.



# COLLABORATIVE PROJECTS



## “EFFICIENT ENERGY FOR PUBLIC SOCIAL HOUSING (SOE3/P3/E0865)”

September 2019 – August 2022

### October 3-4<sup>th</sup>, 2019 - Seminar and Agreements Signing

Alfredo Ortiz, as member of the consortium of the project SUDOE ENERGY PUSH, attended the meeting organized by the Interreg SUDOE Programme last October 3-4, 2019. All participants received useful advice for the project management. Furthermore, this event is considered the official beginning of the project.



## COLLABORATIVE PROJECTS

“X-MEM: “Outperforming functionality: composite/mixed matrix porous materials in membrane-based processes”

April 2019 – March 2022

**October 18<sup>th</sup>, 2019**

The project X-MEM, coordinated by Dr. Nazely Diban, member of the TAB research group in the Chemical & Biomolecular Engineering Department of the UC, held its kick-off meeting in Santander. The consortium is formed by the Yamaguchi University in Japan, the Jerzy Haber Institute of Catalysis and Surface Chemistry in Poland, Ege University, Atılım University and Hacettepe University, the three of them located in Turkey.

XMEM is funded by the international competitive action EIG Concert Japan – Connecting and Coordinating European Research and Technology Development with Japan. The main objective of the project is to develop innovative separation and catalytic processes with biomedical and environmental applications and renewable energy production based on new porous functionalized membranes.



# COLLABORATIVE PROJECTS

## “Water-Energy-Seafood Nexus: Eco-innovation and Circular Economy Strategies in the Atlantic Area”

June 2019 – March 2022



### September 2<sup>nd</sup>, 2019

Rubén Aldaco, Angel Irabien, María Margallo, Daniel Hoehn, Jara Laso and Israel Ruiz attended the kick off meeting of NEPTUNUS project. Next, Ian Vázquez-Rowe, researcher at the Pontificia Universidad Católica del Perú presented the keynote ‘A fine kettle of fish: the fishing industry and environmental impacts’. The meeting continued with the presentation of the working groups and the lines of research and interest of each partner.

### October 9<sup>th</sup>, 2019 - INTERREG AA IT PLATFORM MEETING

The UC, lead partner of NEPTUNUS project, attended to the IT Platform meeting. Organizers gave a detailed presentation about all steps regarding the submission process and attendees could solve the eventual issues and questions as well as suggest improvements.

### October 21<sup>st</sup>, 2019

During the meeting, participants discussed about the framework and scopus of the project and set the processes to be analysed along the supply chain of both fishes and molluscs of the Atlantic region. Besides, the methodology and boundaries of the study were established. The main partners involved where Santiago de Compostela University, Aveiro University, Energy Lab, Instituto Português do Mar e da Atmosfera and the Cantabria University.





# COLLABORATIVE PROJECTS



Interreg  
Sudoe  
KET4F-Gas

*you can cool it!*

**“Reduction of the environmental impact of fluorinated gases in the SUDOE space using key enabling technologies”**

**April 2018 – March 2021**

**June 18<sup>th</sup>, 2019**

The Project Meeting of the project “KET4F-GAS: Reduction of the Environmental Impact of Fluorinated Gases in the Sudoe Space through Key Enabling Technologies”, took place in Santander, on June 18, 2019. During the meeting, the leader of each workpackage presented a summary of the activities developed over the past six months, followed by a fruitful discussion regarding the future steps.



**June 19<sup>th</sup>, 2019**

The Workshop “Mitigation of the Environmental Impact of Fluorinated Gases” took place in Santander, as part of the ANQUE-ICCE 2019 congress. This workshop was a core activity for the dissemination of results of the European project “KET4F-GAS”. This event, chaired by Dr. Joao M. M. de Araújo and Dr. Ana B. Pereiro from Universidade Nova de Lisboa and Dr. Gabriel Zarca from Universidad de Cantabria, counted with 2 keynote lectures (Prof. Margarida Costa, France and Prof. Lourdes Vega, Khalifa University, United Arab Emirates) and 7 oral presentations on the development of new separation processes for the recovery of refrigerant gases, including those of the invited speakers



## COLLABORATIVE PROJECTS



“Reduction of the environmental impact of fluorinated gases in the SUDOE s pace using key enabling technologies”

April 2018 – March 2021

June 18<sup>th</sup>, 2019

The awareness seminar on **Mitigation of the Environmental Impact of fluorinated gases** took place in Santander.

The event was aimed to disseminate the strategies for the reduction of emissions of gases of high global warming potential which are used in refrigeration and air conditioning. The seminar was organized by Prof. Ane Urriaga and Dr. Gabriel Zarca, both of them members of the Department of Chemical and Biomolecular Engineering of the UC, as one of the activities of the international project KET4F-GAS, co-funded by the Interreg SUDOE program.

The open ceremony was chaired by the institutional representatives and the General Director of Environment of the Cantabria regional Government. 7 invited speakers from Spain, France and Portugal, representing the administration (Spanish Office of Climate Change, Cantabria Regional Government), companies involved in the trade of fluorinated gases, environmental ONGs and representatives of the employees, showed the main discussion points in the topic. More than 90 people registered as attendees to this event.



## COLLABORATIVE PROJECTS



“Reduction of the environmental impact of fluorinated gases in the SUDOE s pace using key enabling technologies”

April 2018 – March 2021

**December 3<sup>rd</sup>, 2019**

The 4<sup>th</sup> project meeting took place in Santiago de Compostela on December 3, 2019. During the meeting, the leader of each work package presented a summary of the activities developed over the past six months. Moreover, the awareness seminar “Mitigation of the Environmental Impacts of Fluorinated Gases in the Sudoe Region” was celebrated. During this event, the results achieved in the project were presented, and experts in the sector, researchers and public administration discussed the progress and territorial strategies.





## COLLABORATIVE PROJECTS



**EAPA\_204/2016 – “Atlantic Network for Renewable Generation and Supply of Hydrogen to Promote High Energy Efficiency - HYLANTIC”**

**October 2017 – September 2020**

**March 15<sup>th</sup>, 2019**

The 3<sup>rd</sup> follow-up meeting of HYLANTIC was held in Belfast, hosted by the project partners from Ulster University. During the meeting the partners presented their progress in the project and discuss about the future actions to be done.

**September 24-25<sup>th</sup>, 2019**

The 4<sup>th</sup> follow-up meeting of the HYLANTIC” was held in Bristol (UK) , hosted by Auriga Energy. During the meeting, all the partners presented their progresses. During the second day, participants did a sight-seeing trip on-board the Hydrogenesis, the hydrogen powered ship developed in the frame of the project.





## COLLABORATIVE PROJECTS



### EAPA\_204/2016 – “Atlantic Network for Renewable Generation and Supply of Hydrogen to Promote High Energy Efficiency - HYLANTIC”

October 2017 – September 2020

**March 11-15<sup>th</sup>, 2019**

The International School “Progress in Hydrogen Safety” within HYLANTIC project “Atlantic Network for Renewable Generation and Supply of Hydrogen to promote High Energy Efficiency” was held in Belfast (UK). The event was organized by Ulster University in close collaboration with other partners of the HYLANTIC project. The school aimed at dissemination of beyond the-state-of-the art knowledge in hydrogen safety, innovative safety strategies and engineering solutions, and building stronger ties between industry, academia, regulators and standard development organizations. It was an excellent training opportunity to meet and communicate with world leading experts in hydrogen safety.



**July 16<sup>th</sup>, 2019**

Rafael Ortiz was invited to the “Decarbonising Ireland with Zero-Carbon Technologies” event organised by the National University of Ireland (NUI) in Galway, for an oral dissemination of the project HYLANTIC results aimed to stakeholders in Ireland and Northern Ireland for discussing the deployment of hydrogen technologies in rural and peripheral regions with speakers from Ireland, Scotland, Netherlands, Iceland and Norway.

# COLLABORATIVE PROJECTS



## “ENERGY SUSTAINABILITY AT THE SUDOE REGION: PEMFC-SUDOE NETWORK - SOE1/P1/E0293 (INTERREG SUDOE/FEDER, UE)”

July 2016 – June 2019

April 4<sup>th</sup>, 2019

Interreg Sudoe Program organized a Roadtrip at the ETSIIT of the University of Cantabria, aimed at presenting the program to students of the Chair Jean Monnet of the UC. This event was organized by the Joint Secretariat of the Interreg SUDOE Program, in the frame of the Cooperation Days. The event was attended by Isabelle Roger, Head of the Joint Secretariat, Andrea Rodríguez, responsible for Communication and Capitalization; Alexandre Le Gall, project manager; Juan Llanes Cavia from the Management Authority, and Ana Carrera Poncela, from the Board of Directors of the Management Company of the Interreg South-West European Space SL.



### Humans of SUDOE

María Yáñez, researcher of the Chemical & Biomolecular Engineering Department involved in the project PEMFC\_SUDOE project, participated in the initiative “Humans of SUDOE” by recording a video about her experience in the project.

The video is available on: [https://youtu.be/lyIT5u\\_wUuA](https://youtu.be/lyIT5u_wUuA)

# COLLABORATIVE PROJECTS



## “ENERGY SUSTAINABILITY AT THE SUDOE REGION: PEMFC-SUDOE NETWORK - SOE1/P1/E0293 (INTERREG SUDOE/FEDER, UE)” July 2016 – June 2019

**June 20<sup>th</sup>-21<sup>st</sup>, 2019**

As part of the activities of the PEMFC-SUDOE project, the Workshop took place at the University of Cantabria, during the celebration of the ANQUE-ICCE 3 congress. The event was chaired by Prof. Alfredo Ortiz (UC), Prof. Deborah Jones (Institut Charles Gerhardt Montpellier, France) and Prof. Carmen Rangel (LNEG, Portugal), with the support of the Spanish Hydrogen Association AeH<sub>2</sub> and the Direção Geral de Energia e Geologia (Portugal).



**June 20<sup>th</sup>, 2019**

The Final Project Meeting of the PEMFC-SUDOE project took place at the University of Cantabria (Spain). Dr. Alfredo Ortiz, as project coordinator welcomed all the partners and presented a summary of the last action to be developed in order to finish the project. After that the leader of each workpackage presented the main results obtained during the whole project. The prototypes developed in the project were also presented.



## COLLABORATIVE PROJECTS

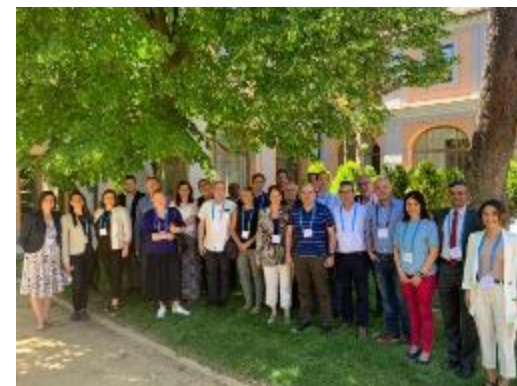


### EXCELLENCE NETWORK “E3TECH Environmental and Energy Applications of Electrochemical Technology”

2015-2020

**May 24<sup>th</sup>, 2019**

The 3<sup>rd</sup> Workshop of the Spanish Excellence Network “Environmental and Energy Applications of the Electrochemical Technology” took place in Toledo. The group of the UC participated with the contribution “Towards an Efficient Electrolysis of Perfluorocarboxylic Acids Through Integration with Membrane Separation using Process System Engineering Tools”, by Alvaro Soriano, and with Prof. Ane Urriaga chairing the Industry Session and Round Table on industrial applications of electrochemical technology.



**June 20<sup>th</sup>, 2019**

The 1<sup>st</sup> International Young Researchers Symposium on Applications of Electrochemical Technology (IYRS-AET) took place in Santander, as part of the ANQUE-ICCE 2019 congress. The Spanish network of Excellence E3TECH, the specialized Group of Electrochemistry of the RSEQ and the ISE sponsored the scientific activities. 3 awards to the best oral and poster communications were issued:

- Amaia Ortiz de Lejarazu, “Preparation of ion exchange membranes by using end-of-life reverse osmosis membranes and application in electrodialysis”.
- Sergio Díaz Abad “Study of the SO<sub>2</sub> depolarized electrolysis with advanced PBI based membranes at high temperature”
- Maria Arellano Pardo “Sulfate radical and its application to the removal of organic pollutants”





## COLLABORATIVE PROJECTS

**“Evaluación Técnica de la recuperación de la energía de gradiente salino contenido en la muestra salmuera-agua de mar mediante la Técnica de electrodiálisis reversa”**

**May 2018 – February 2019**

**March 12<sup>th</sup>, 2019**

The R& D Manager of the Company Acciona Agua Jorge Malfeito together with Dr. Olga Ferrer visited the Department for the final meeting of the joint collaborative project "EVALUACIÓN TÉCNICA DE LA RECUPERACIÓN DE LA ENERGÍA DE GRADIENTE SALINO CONTENIDO EN LA MUESTRA SALMUERA-AGUA DE MAR MEDIANTE LA TÉCNICA DE ELECTRODIÁLISIS REVERSA". After the presentation of the main outcomes of the project, the prospects for future collaboration were discussed.



# COLLABORATIVE PROJECTS

## “Valorization of the tail-gas of carbon black manufacturing”

2017 - 2019

**April 1<sup>st</sup>, 2019**

The final meeting of the project on “Valorization of the tail-gas of carbon black manufacturing” was held in the Department of Chemical and Biomolecular Engineering of the University of Cantabria. The delegation of Birla Carbon company was led by Ranjan Ghosal, Senior Vice-President, Global Research and Innovation, and Jacinto Zarca, General Director of Birla Carbon Spain. The Agenda of the included a meeting with the Rector of the University of Cantabria, Professor Angel Pazos. The fruitful discussion on the obtained results served also to define the targets for continuing this transfer of knowledge collaboration. We would like to thank the Head of the Department, Prof. Angel Irabien, and to the leaders of the research groups, Prof. Inmaculada Ortiz and Prof. Raquel Ibañez, their fruitful participation in the meeting.



# SEMINARS, COURSES AND WORKSHOPS

The Chemical & Biomolecular Engineering Department of the University of Cantabria has been involved in the organization of different seminars and courses during 2019.



## May 2019

**Prof. Ignacio E. Grossmann**, Doctor Honoris Causa in the University of Cantabria and Rudolph R. and Florence Dean University Professor of Chemical Engineering at Carnegie Mellon University (USA), delivered two seminars in the Chemical & Biomolecular engineering Department.

May 23<sup>rd</sup>, 2019 → **“Mixed-integer programming models for planning and scheduling for Enterprise-wide optimization”**

May 24<sup>th</sup>, 2019 → **“Optimization of process systems under uncertainty”**

## May 28<sup>th</sup>, 2019

**Dr. Clara Casado**, within Dr. Oana David, participated as coordinator of the **XXXVII Reunión Bienal de la Real Sociedad Española de Química (RSEQ)**, and moderated the symposium **“Preparación y Caracterización de Membranas para Aplicaciones Emergentes”**.

The event took place in San Sebastián (Spain), on May 26-30, 2019.



## SEMINARS, COURSES AND WORKSHOPS

**June 19-21, 2019**

Dr. Clara Casado, within Dr. Thomas Schaefer was in charge of the organization of the Symposium “**Membranes for the Water-Energy-Food nexus**”, celebrated in the frame of the 3<sup>rd</sup> International Congress in Chemical Engineering ANQUE-ICCE3-CIBIQ, celebrated in Santander (Spain).



**July 29-31, 2019**

The course “**Jóvenes y cambio climático**”, chaired by Clara Casado and Guillermo Díaz, took place on July 29-31, as a summer course of the **Universidad Internacional Menéndez Pelayo**. The course was held at Magdalena Palace, in Santander and was attended by 28 participants. The opening ceremony was chaired by Ms. Teresa Ribera (Minister of Ecological Transition) and Mr. Pablo Zuloaga (Vice-President of Cantabria Government) and Dr. Clara Casado (chair of the course).

Moreover, during the course, Prof. Ángel Irabien delivered the talk “La suma de evidencias del cambio climático, los científicos y los jóvenes”, and Dr. Clara Casado moderated the Round Table “Innovación para el cambio. Propuestas desde la educación”.





# SEMINARS, COURSES AND WORKSHOPS

## Doctorate Seminars – July 18<sup>th</sup>, 2019

The **Chemical, Energy and Process Engineering Doctorate program** organized the **annual Doctorate seminars**. The aim of the seminar is to promote the training of PhD students and disseminate their research activities. The seminar, open to the members of the doctorate program and to general public, included the assessment of the doctorate students' progress by the academic panel of supervisors. In this edition 6 students of different doctorate years presented their works.

The presented works were:

Juan Corredor – New developments in photocatalysis for environmental application

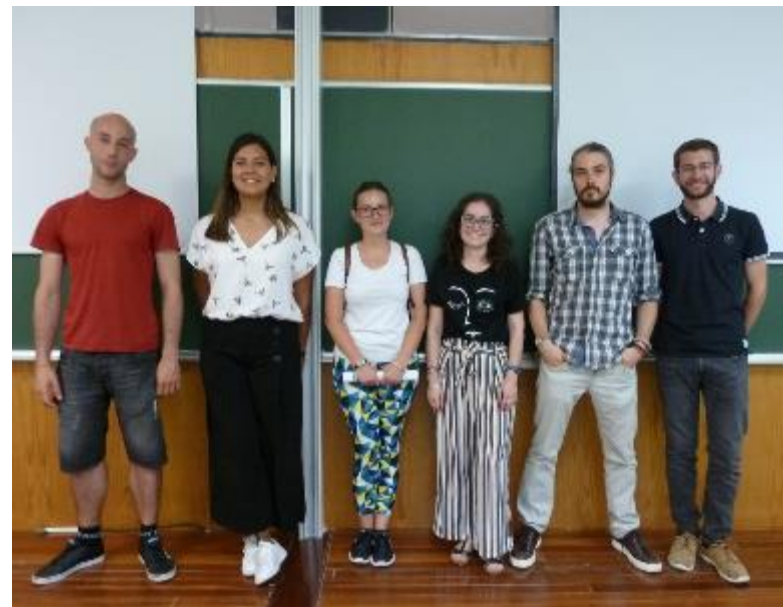
Sophie Schröder – Environmental assessment of advanced oxidation technologies

Cristina González – Design of extracorporeal detoxification stages by advanced simulation techniques

Daniel Hoehn – Food production strategies for the mitigation of climate change:  
Towards a circular food economy

Bohdana Markiv – Environmental exposure to particulate matter-bound manganese  
and other metals: bioaccessibility AND biomonitoring

Rafael Ortiz – Upgrading of industrial waste hydrogen in internal combustion  
engines



# SEMINARS, COURSES AND WORKSHOPS

## GaBi Jump Start Training



### GaBi Jump Start Training

The GaBi Jump Start Training session is designed to introduce new users to the main features and functionalities of GaBi.

**April 10<sup>th</sup>, 2019 / June 12<sup>th</sup>, 2019**

Dr. Marta Rumayor, Andrea Arguillarena and Daniel Hoehn attended de GaBi Jump Start Training, organized by Thinkstep, and celebrated in Bilbao (Spain). Dr. Marta Rumayor also attended de GaBi Intermediate Training.



**October 7<sup>th</sup> – 9<sup>th</sup>, 2019**

Prof. Ignacio Fernández attended the “Advanced Openair and R-Data Analysis and HYSPLIT Joint Training Seminar,” organized by the University of Huelva.

**November 26<sup>th</sup>, 2019**

Israel Ruiz y Jara Laso, post-doc researchers of the Chemical & Biomolecular Engineering Department of the University of Cantabria, attended the 7th EPD International Stakeholder Conference 2019, held in Bilbao (Spain).



# NATIONAL CHEMISTRY OLYMPIAD

May 10<sup>th</sup> – 12<sup>th</sup>, 2019

The XXXII National Chemistry Olympiad took place in Santander. A total 118 students coming from all over Spain participated in the contest. The event was organized by the Cantabria Territorial Section of the Spanish Royal Society of Chemistry (RSEQ). On Sunday, the ceremony award was chaired by the Counselor of Education, Culture and Sports of the Government of Cantabria, Mr. Francisco Fernández Mañanes; the Vice Chancellor of Doctorate and Institutional Relations of the University of Cantabria, Mr. Alberto Ruiz; the head of the Organizing Committee of the Olympics, Ms. Clara Casado, and other representatives of the academic institutions.





# CHEMISTRY OLYMPIAD

## Local Chemistry Olympiad – March 26<sup>th</sup>, 2019

the Local Chemistry Olympiad took place at the ETSIIT of the University of Cantabria, with the participation of 79 secondary students. The event was organized by the Association of Chemistry and Chemical Engineering of Cantabria – AQUIQÁN, in collaboration with the Spanish Royal Society of Chemistry (RSEQ).

In this edition the winners were:

- Gold Medal: Víctor Mencía Alonso – IES Alisal (Santander)
- Silver Medal: Alicia Palacio Solórzano – IES Santa Clara (Santander)
- Bronze Medal: Paz Marina Martínez Menéndez – IES Jose María Pereda (Santander)

Ángel Santiago Setién and Miguel Díez Quevedo (Colegio Calasanz Escolapios, Santander) and Pablo Amallo Fernández (IES Ataulfo Argenta, Castro Urdiales) received a mention for their outstanding results in the Olympiad.



## Local Award Ceremony – April 4<sup>th</sup>, 2019

The award ceremony of the Local Chemistry Olympiad 2019 took place at the ETSIIT of the University of Cantabria. Mr. Jose María Colina, President of the Evaluation Committee of the Local Chemistry Olympiad 2019, chaired the ceremony. The winners received the gold, silver and bronze medals, in recognition of their results in the Local Chemistry Olympiad 2019.





# CHEMISTRY MINI-OLYMPIAD

**May 10<sup>th</sup>, 2019**

The V Chemistry Miniolympiad took place in Cantabria. 103 ESO students, 3<sup>rd</sup> and 4<sup>th</sup> levels, attended the event, that was organized by the Chemistry and Chemical Engineering Association of Cantabria (AQUIQÁN-ANQUE) in collaboration with the Cantabria Territorial Section of the Spanish Royal Society of Chemistry (RSEQ).

In this edition the winners were:

## **3<sup>rd</sup> ESO**

Claudia Saiz Santiago – Colegio Apostolado (Medio Cudeyo)

Leire Souto Buenafé – IES Ocho de Marzo (Castro Urdiales)

Anaïs Shadmehr Sharif Rodríguez – Colegio Apostolado (Medio Cudeyo)

## **4<sup>th</sup> ESO**

Estíbaliz Sáez de Astiazu Mañes – IES Ocho de Marzo (Castro Urdiales)

Iván Jesús Melero López – IES Jose María Pereda (Santander)

Victoria Álvarez Méndez – IES Muriedas (Muriedas)



## EVENTS

### Saint Thomas Aquinas' Day – January 25<sup>th</sup>, 2019

During the academic celebration of St. Thomas Aquinas, the doctors in Chemical, Energy and Process Engineering who graduated in the academic year 2017-2018 received the recognition of the University of Cantabria. Raul Zarca, Sara Dominguez, Ana Fernandez, Paula Ribao and Andres del Castillo attended the celebration.



### EDUC Elections – March 28<sup>th</sup>, 2019

Guillermo Díaz and Andrea Arguillarena, PhD students in the Chemical, Energy and Process Engineering, were elected as representatives of students of the area of Engineering and Architecture, in the Board of the School of Doctorate of the University of Cantabria.

## EVENTS



### **G9 Days – April 10<sup>th</sup> – 12<sup>th</sup>, 2019**

Guillermo Díaz attended the VII Doctorate Days and II Scientific Dissemination Days of Group 9 of Universities (G9) that was held at the University of La Rioja. Guillermo Díaz was selected to participate in this event on behalf of the University of Cantabria in the area of Engineering and Architecture, with his contribution “Electrochemical CO<sub>2</sub> Utilization: Development of a Continuous Process for Obtaining Formate with High Efficiency”.

### **Visit to SYNCHROTRON ALBA – July 2 - 5, 2019**

Dr. Jonathan Albo visited the SYNCHROTRON ALBA, located in Barcelona. In collaboration with researchers of the Inorganic Chemistry Department of the UPV/EHU, they were granted the proposal entitled “Unravelling host-guest interactions on novel zirconium (IV) metalorganic frameworks with enhanced activity for the reduction of CO<sub>2</sub>”.



# R&D OUTCOMES





# INTERNSHIPS & VISITS

## **Antonio Domínguez**

Short teaching stay

Sami Shamoon College of Engineering in Beer Sheva (Israel)

December 30, 2018 - January 3, 2019.

Erasmus + KA107 International Mobility Credit program

Aim: Life Cycle Analysis Marathon (1<sup>st</sup> LCAton) was taught with the students of the Master of Science in Green Engineering.



## **María Yáñez**

Predocctoral Research Stay

Faculty of Engineering at the University of Porto (Portugal)

January 14<sup>th</sup> – April 19<sup>th</sup>, 2019

Aim: experimental and modeling study for producing hydrogen of fuel cell quality from industrial waste was mixtures based on pressure swing adsorption (PSA)

Supervisor: Prof. Adélio Mendes

# INTERNSHIPS & VISITS

## **Nazely Diban and Gabriel Zarca**

Faculty of Engineering of Yamaguchi University (Ube, Japan)

Erasmus+ programme between both institutions.

March 25-29<sup>th</sup>, 2019

Aim: invited speakers at the 5th International Symposium on Green and Smart Technologies for a Sustainable Society from 25th-27th March aimed at Master and PhD students. Other speakers belonged to the areas of Chemical Engineering, Civil Engineering and Information and Communications Technology of Universidade Nova de Lisboa, Norwegian University of Science and Technology, Universitat Jaume I, Universidad de Zaragoza, National Institute of Technology (Fukushima College) and Yamaguchi University.



## **Cristina González**

Predocctoral Research Stay

Institute of Molecular Modeling and Simulation of the University of Natural Resources and Life Sciences, Vienna.

April 1<sup>st</sup> – June 28<sup>th</sup>, 2019

Aim: molecular simulation of the interactions between lipid polysaccharide and potential receptor proteins Supervisor: Chris Oostenbrink.

# INTERNSHIPS & VISITS

## Daniel Hoehn

Predoctoral Internship

Department of Civil, Environmental and Geomatic Engineering, University College of London, UK

April 29<sup>th</sup> – June 28<sup>th</sup>, 2019

Aim: working in the field of the energy recovery through food waste in the European Union

Supervisor: Aiduan Borrion



## Nazely Diban

Faculty of Engineering of Yamaguchi University (Ube, Japan)

July 8<sup>th</sup> – 12<sup>th</sup>, 2019

Aim: teaching on 'Membrane processes for the adjustment of alcohol content in red wines to undergraduate and master students in Chemical Engineering and disseminate the academic and research activities of Chemical and Biomolecular Engineering of the University of Cantabria among the Japanese students.

## Alba Romano

Center for Integrated Technology and Organic Synthesis (CITOS) of the University of Liège

July 8<sup>th</sup> 14<sup>th</sup>, 2019

Aim: Perform experiments related to her PhD thesis in the Corning AFR Qualified Laboratory in University of Liège, using Corning Advanced-Flow Reactor technology

Supervisor: Dr. Jean-Christophe M. Monbaliu.



## INTERNSHIPS & VISITS

### Selene Cobo

Predocloral research stay

Process Energy Environmental Systems Engineering Research Group, Cornell University (USA)

May 15<sup>th</sup> – August 15<sup>th</sup>, 2019

Aim: Fundamentals of bi-level programming and to apply them to the optimize the environmental and economic performance of the stakeholders involved in the supply chain of organic fertilizers.

Supervisor: Prof. Gengqi You



### Dr. Víctor M. Ortiz

Microfluidics for Chemistry and Life Sciences Group, Dep. Chemistry & Biochemistry, University of Hull, UK

September – December 2019

Aim: Lab-on-a-chip technology for electrochemically-assisted production of metabolites

Supervisor: Prof. Nicole Pamme.

This stay is funded by the Mobility Program “José Castillejo”

### Miguel Guate

Predocloral research stay - Erasmus+ K107 International Credit Mobility, Project 2018-1-ES01-KA107-049471.

Yamaguchi University (Japan)

September to December 2019

Supervisor: Prof. Izumi Kumakiri

Aim: metal catalyst deposition onto ceramic supports.





## INTERNSHIPS & VISITS

### Rafael Ortiz

Predoctoral Research Internship

“Institut für Energie- und Klimaforschung, IEK-3: Technoökonomische Systemanalyse“ of the Research Centre "Forschungszentrum Jülich GmbH“, Germany.

Aim: Development a model for an Energy System for the estimation of hydrogen regeneration in the atlantic area by using renewable energies

November 1<sup>st</sup>– January 31<sup>st</sup>, 2020

Supervisor: de Martin Robinius and Heidi Heinrichs



### Prof. Raquel Ibáñez & Dr. Alfredo Ortiz

Erasmus+ K107 Action (Staff mobility for teaching)

Tashkent Chemical & Technological Institute (TCTI, Tashkent, Uzbekistan) and the Bukhara Engineering-Technological Institute (Bukhara, Uzbekistan)

November 4<sup>th</sup> – 8<sup>th</sup>, 2019

Aim: masterclasses to students of Ecology and Environmental Protection, Process Automation, Chemical Technology, Oil and Gas Processing among others.

Meeting with the academic authorities of both institutions.

### Arantza Basauri

Predoctoral Research Internship

Institut für Chemie und Biochemie - Freie Universität Berlin, Berlin, Germany

November 15<sup>th</sup>, 2019 – February 21<sup>st</sup>, 2020

Supervisor: A. G. Haag and Ernesto Osorio

Aim: Syntehsis and characterization of functionalized magnetic nano-gel with proteins anti-LPS



## INTERNSHIPS & VISITS AT UC

### Qazi Sohaib

Institut Européen des Membranes – Montpellier (France)

Predoctoral Research Stay

January 3<sup>rd</sup> – February 28<sup>th</sup>, 2019

Aim: Carbon Dioxide Capture using Hollow Fiber Membrane Contactors and Ionic Liquids

Supervisor at UC: Dr. Jonathan Albo



### Gaston Merlet

University of Santiago de Chile

Postdoctoral research stay - Postdoctoral project FONDECYT N° 3180143.

January 7<sup>th</sup> – February 13<sup>th</sup>, 2019

Aim: methodology for the quantification of OCDD in commercial bovine milk samples by means of microextraction using ionic liquids enhanced with supercritical carbon dioxide (scCO<sub>2</sub>)

Supervisor at UC: Dr. María Fresnedo San Román.



### Eduardo Felipe Olea Chandi

Master in Engineering Sciences of the University of Santiago de Chile

February 11<sup>th</sup> – March 15<sup>th</sup>, 2019

Aim: selective separation of lanthanides, cerium and lanthanum, using membrane contactors.

Supervisor at UC: Eugenio Bringas Elizalde



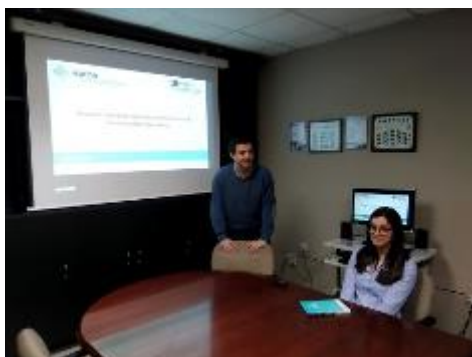
# INTERNSHIPS & VISITS AT UC

## Prof. Adi Wolfson

Sami Shamoon College of Engineering (Be'er Sheva, Israel)

March 11-15, 2019

Aim: Follow the progress in collaborative on-going activities related to the exchange of personnel between both institutions, and joint research on environmental sustainability. Moreover, Prof. Wolfson attended the Erasmus coordinators meeting of the action KA107 that took place in Santander.



## Catia Azenha

University of Porto (Portugal)

Predocctoral research stay

April 8<sup>th</sup> – June 30<sup>th</sup>, 2019

Aim: Electrochemical reduction of CO<sub>2</sub> using novel bimetallic electrocatalysts

Supervisor: Dr. Manuel Álvarez.

## Andrea Gouveia

Instituto Superior Técnico de Lisboa

Predocctoral research stay

April 22<sup>nd</sup> – June 30<sup>th</sup>, 2019

Aim: characterization of poly(ionic liquid)/ionic liquid membranes and permeation tests with multi-component gas mixtures

Supervisor: Prof. Daniel Gorri.



## INTERNSHIPS & VISITS AT UC

### Vítor Ramiro de Almeida Fernandes

Laboratório Nacional de Energia e Geologia (LNEG, Portugal)

May 6<sup>th</sup> – 10<sup>th</sup>, 2019.

Aim: development of new and highly efficient catalysts and membranes for fuel cell and electrolyzer systems

Supervisor at UC: Alfredo Ortiz.

Visit developed in the frame of the European project PEMFC-SUDOE



### Alexandra Pacula

Jerzy Haber Institute for Catalysis and Surface Chemistry – Polish Academy of Science

Varsovia, Poland

May 27<sup>th</sup> – 31<sup>st</sup>, 2019

Supervisor: Dr. Nazely Diban

### Adham Norkobilov

Technological Institute Tahskent (Uzbekistán)

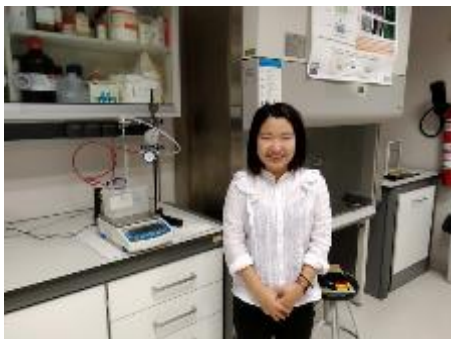
June 17<sup>th</sup> – 21<sup>th</sup>, 2019

Supervisor: Prof. Daniel Gorri





## INTERNSHIPS & VISITS AT UC



### Misaki Sawa

Master's internship funded by the Erasmus+ K107 International Credit Mobility, Project 2018-1-ES01-KA107-049471.

Yamaguchi University (Japan)

September 3<sup>rd</sup> – December 7<sup>th</sup>, 2019

Aim: research activities of the project X-MEM (EIG-Concert Japan), coordinated by Nazely Diban.

Supervisor: Dr. María José Rivero

### Angélica Quintriqueo

University of Santiago de Chile

September – December 2019

Aim: Design of separation processes for the recovery of rare earths.

Supervisor: Dr. Eugenio Bringas



### Nahúm Hernández Pérez

Electrochemistry and Corrosion Laboratory, National Polytechnic Institute (Ciudad de México)

Master research stay

September 2<sup>nd</sup>, 2019 – January 30<sup>th</sup>, 2020

Aim: Reversal electrodialysis technology to extract salinity gradient energy

Supervisors: Prof. Inmaculada Ortiz and Dr. Lucía Gómez.

## INTERNSHIPS & VISITS AT UC



### **Sarra Jomaa**

National Engineering School of Monastir, Tunisia

Predoctoral Research Stay

September 20<sup>th</sup> – December 20<sup>th</sup>, 2019

Aim: modelling RED/ED hybrid systems for desalination

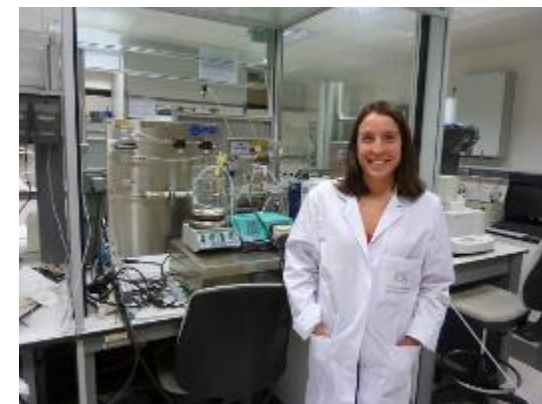
Supervisors: Prof. Inmaculada Ortiz and Dr. Lucía Gómez.

### **Beatriz Ávila Bolivar**

Institute of Electrochemistry of the University of Alicante (UA)

October 14<sup>th</sup> to 18<sup>th</sup>, 2019.

Aim: Analyze experimental systems for the electrochemical conversion of CO<sub>2</sub> to formic acid/formate, and took place in the frame of the project entitled “Multiscale Design of Processes for CO<sub>2</sub> capture and utilization (CTQ2016-76231-C2)”, coordinated project between UC and UA.



# AWARDS

## **ANQUE 2019 Award – Prof. Ángel Irabien**

Prof. Angel Irabien was awarded with the ANQUE 2019 Prize, in recognition of his work developed in the field of Chemical Engineering in the National Association of Chemists and Chemical Engineers. This award was created in 2007 by the National Association of Chemists and Chemical Engineers of Spain (ANQUE), aimed at recognizing the outstanding and extensive professional deployment of the awardees.



## **ICCE 2019 “Innovation & Transfer” Award – Prof. Inmaculada Ortiz**

Prof. Inmaculada Ortiz was awarded with the prize ICCE 2019 “Innovation and Transfer”, in recognition of her career and excellent work in these fields.

## **Gabriel Zarca, Lucía Gómez and Germán Santos**

Outstanding doctorate prize in the area of Engineering, among thesis defended in the University of Cantabria in the academic year 2016.

## **Salvador Asensio**

Award to the best academic achievement in the degree of Chemical Engineering in the academic year 2017-2018.



# AWARDS

## Saint Joseph's Day – March 2019 – University of Cantabria

**Cristina González**

Prize to the best research poster for Doctorate Programme

**Salvador Asensio**

Prize to the best final project of the Master in Chemical Engineering

**Salvador Asensio**

AQUIQÁN prize to the best final project degree

**Laura Rancaño**

Prize to the best research poster for Doctorate Programme

**Belén García**

Prize to the best final project of the Chemical Engineering Degree





## AWARDS



Student Conference ANQUE 2019 - Santander (Spain) – June 17– 18, 2019

**Sergio Valentín Gutiérrez**

Award to the best poster

**Belén García, Javier Fernández, Maria de los  
Ángeles Mantecón and Tamara Sampedro**

First position in the Chem-e-quiz contest



**Lucía Gómez, Cristina González, María José Rivero and Marta Romay**

Award to the best poster – ANQUE – ICCE 3 – CIBIQ 2019

Santander (Spain) – June 19 – 21, 2019



**Ángel Irabien, Raquel Ibáñez, Manuel Álvarez, Antonio Domínguez and Guillermo Díaz**

Special mention of the Societal Council of the University of Cantabria for the project 'Aprender haciendo: Chem-E-Car Competition como herramienta para adquirir y evaluar competencias'.

University of Cantabria, Santander (Spain) - April 16<sup>th</sup>, 2019

**Cristina González**

Award to the best oral presentation - Spanish XXXVI Chemical Engineering meeting

Zaragoza (Spain) – September 4 – 6, 2019



# AWARDS

## Javier Fernández González

Prize to the “Best final project degree or master thesis in capture, transport, storage and uses of CO<sub>2</sub>” of the Plataforma Tecnológica Española del CO<sub>2</sub>, in the Edition 2019.

November 2019



## Inmaculada Ortiz Uribe

Award to the trajectory in Chemical Engineering 2019

December 2019

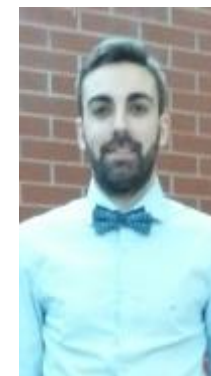
Spanish Royal Society of Chemistry (RSEQ)

## Iván Merino

Award to the Best Doctorate Thesis

December 2019

Spanish Royal Society of Chemistry (RSEQ)

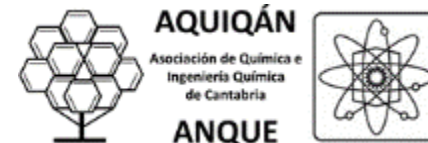


## Raquel Ibañez

AQUIQÁN Award 2019

December 2019

Association of Chemistry and Chemical Engineering of Cantabria (AQUIQÁN)



## Ana Fernández and Iván Merino

AQUIQÁN Award Doctorate Thesis 2019

December 2019

Association of Chemistry and Chemical Engineering of Cantabria (AQUIQÁN)

## R&D PROJECTS: International Projects

### **Title: SUDOE ENERGY PUSH – Efficient eENERGY for Public Social Housing (SOE3/P3/E0865)**

Financial support: Interreg SUDOE Programme. FEDER. European Commission

Participants: Fundación Centro Tecnológico en Logística Integral Cantabria (CTL, Spain), ADENE - Agência para a Energia (Portugal), Agencia de Vivienda y Rehabilitación de Andalucía (AVRA, Spain), Gestion de viviendas e infraestructuras en Cantabria S.I. (GESVICAN, Spain), Universidade do Porto (Portugal), Universidad de Cantabria (Spain), Centre National de la Recherche Scientifique (France), Universidade do Porto (Portugal), Laboratório Nacional de Energia e Geologia, IP (Portugal), APRIA Systems S.L. (Spain), A Silva Matos (Portugal), Tipee (France), Agence Locale de l'Energie et du Climat (Francia), Asociación Empresarial Centro Tecnológico de la Energía y del Medio Ambiente de la Región de Murcia, (CETENMA, Spain), CARBONE 64 SARL (France).

Principal investigator UC partner: Dr. Alfredo Ortiz Sainz de Aja

Dates: 01/09/2019 – 31/08/2022

### **Title: NEPTUNUS: water-energy-seafood nexus: eco-innovation and circular economy strategies in the atlantic area (FEDER) (ATLANTIC AREA EAPA\_576/2018)**

Financial support: European Commission

Participants: Universidad de Cantabria, Universidad de Santiago de Compostela, Energylab, Universidade de Aveiro, IPMA, Université de Bordeaux, University of Liverpool, National University of Ireland (Galway), Atholone Institute of Technology, Asociación Nacional de Fabricantes de Conservas de Pescados y Mariscos, VertigoLab.

Coordinator (UC): Dr. Rubén Aldaco García

Dates: 30/06/2019 – 29/06/2022

### **Title: X-MEM: “Outperforming functionality: composite/mixed matrix porous materials in membrane-based processes”**

Financial support: Spain: State Research Agency AEI - Ministry of Economy, Industry and Competitiveness (MINECO)

Participants: University of Cantabria (Spain), University of Yamaguchi (Japan), Jerzy Haber Institute of Catalysis and Surface Chemistry de la Academia Polaca de las Ciencias and the Universities of Atilim, Hacettepe and Edge (Turkey).

Coordinator (UC): Dr. Nazely Diban Gómez

Dates: April 2019 – March 2022

## R&D PROJECTS: International Projects

**Title: KET4F-GAS: Reduction of the environmental impact of fluorinated gases in the SUDOE space using key enabling technologies**

Financial support: Interreg SUDOE Programme. European Commission

Partners: INTERLUN S.L.; Apria Systems, S.L.; Université Clermont Auvergne; Talence Innovation sud Développement; Université de Pau et des Pays de Ládour, Fundación FUNDECYT- Parque Científico y Tecnológico de Extremadura; FEUGA Fundación Empresa-Universidad Gallega, Instituto Químico de Sarria, Universidade Nova de Lisboa, No Waste- Gestao e recuperaçao de residuos LDA, NETRSDS-NETRESIDUOS, UNIPESSOAL, LDA; Universidad de Cantabria, Universidad de Vigo, Xunta de Galicia.

Principal investigator UC partner: Gabriel Zarca Lago

Dates: 01/04/2018 – 31/03/2021

**Title: Atlantic Network for Renewable Generation and Supply of Hydrogen to promote High Energy Efficiency EAPA\_204/2016**

Financial support: Interreg ATLANTIC Programme. European Commission

Participants: University of Cantabria, coordinator (Spain), U. Porto (Portugal), LNEG (Portugal), Dublin City University DCU (Ireland), University of Brest (France), Ulster University, Hydrogen Safety Engineering and Research Centre (HySAFER), Coleraine, United Kingdom, APRIA SYSTEMS (Spain), UlemCo Ltd Liverpool (UK), Pure Energy® Centre (UK), Auriga Energy Limited (UK), A. Silva Matos (Portugal)

Coordinator (UC): Dr. Alfredo Ortiz Sainz de Aja

Dates: 01/10/2017 – 30/09/2020

**Title: LIFE2ACID**

Financial support: LIFE Programme. European Commission.

Project in collaboration with: MARE S.A., Galvanizadora Valenciana S.L.U., Apria Systems, S.L., Instituto Tecnológico Metalmeccanico, mueble, madera, embalajes y afines, Asociación de Industrias de acabados de superficies, Universidad de Cantabria, Universidad Politécnica de Valencia.

Principal investigator UC partner: Prof. Ana María Urriaga Mendía

Dates: 01/07/2017 – 31/12/2020



## R&D PROJECTS: International Projects

**Title: LIFE zero cabin waste. Tackling international airline catering waste by demonstrating integral and safe recollection, separation & treatment (LIFE15 ENV/ES/000209)**

Financial support: Life Program-European Commission

Partners: Iberia (Spain), Ecoembes (Spain), Ferrovial (Spain), Gate Gourmet (Spain), Ferrovial Servicios (Spain), Escuela Superior de Comercio Internacional (Spain), Univesridad de Cantabria (Spain).

Principal investigator UC partner: Rubén Aldaco García

Dates: 01/09/2016 – 31/12/2019

**Title: PEMFC-SUDOE: Sostenibilidad energética en la región SUDOE: Red PEMFCSUDOE**

Financial support: Programa Interreg SUDOE.

Participants: University of Cantabria (Coordinator), Université Montpellier. Centre National de la Recherche Scientifique, Universidade do Porto, LNEG - Laboratório Nacional de Energia e Geologia, Institut National Polytechnique de Toulouse, Ariema Energía y Medioambiente. S.L., Apria Systems. S.A, Institut de la Filtration et des Techniques Séparatives. IFTS, NanoInnova Technologies S.L.

Coordinator (UC): Dr. Alfredo Ortiz Sainz de Aja

Dates: 01/07/2016 – 30/06/2019

## R&D PROJECTS: National Projects

Title: **Separaciones microfluidicas de elevado rendimiento, retos y oportunidades (RTI2018-093310-B-I00)(MCIU/AEI/FEDER,UE)**

Financial support: Agencia Estatal de Investigación

Main Researcher: Inmaculada Ortiz Uribe

Dates: 01/01/2019 - 31/12/2021

Title: **Retos en la implementación de la fotocatalisis para aplicaciones medioambientales (CTM2015-69845-R) (MCIU/AEI/FEDER,UE)**

Financial support: Agencia Estatal de Investigación

Main Researcher: María José Rivero Martínez

Dates: 01/01/2019 - 31/12/2021

Title: **IMPULRAS: Hacia una mejora tecno-económica de ELOXIRAS®: Control y minimización de subproductos (RTC-2017-6035-2)(AEI/FEDER,UE)**

Financial support: Agencia Estatal de Investigación, FEDER, UE

Main Researcher: Raquel Ibañez Mendizábal

Dates: 01/07/2018 – 31/12/2020

Title: **Red de Excelencia de Aplicaciones Medioambientales y Energéticas de la Tecnología Electroquímica – E3TECH**

Financial support: MINECO – Convocatoria 2017

Main Researcher in the UC: Ana María Urtiaga Mendía

Participants: Universidad de Cantabria, Universidad de Barcelona, Universidad de Castilla La Mancha, Instituto de Nanociencia y Nanotecnología de la Universidad de Barcelona, Universidad de Alicante, Universidad Autónoma de Barcelona, Universidad Politécnica de Valencia, Universidad de Vigo, CSIC, Instituto Nacional del Carbón

Dates: 01/07/2018 – 30/06/2020

Title: **Laboratorio integrado de membranas y sistemas de reacción (MRSIL) (EQC2018-004757-P) (AEI/FEDER, UE)**

Financial support: Agencia Estatal de Investigación, Ministerio de Ciencia, Innovación y Universidades

Main Researcher: Raquel Ibañez Mendizábal

Dates: 01/01/2018 – 31/12/2020

## R&D PROJECTS: National Projects

**Title: Tecnologías ambientales sostenibles para el aprovechamiento energético de corrientes residuales (CTM2017-87850-R) (AEI/FEDER,UE)**

Financial support: Agencia Estatal de Investigación, FEDER, UE

Main Researcher: Raquel Ibañez Mendizábal

Dates: 01/01/2018 – 31/12/2020

**Title: Aplicación de tecnologías ambientales a matrices líquidas conteniendo contaminantes orgánicos emergentes precursores de la formación de derivados clorados (PCDD/FS) (CTM2017-87740-R) (AEI/FEDER,UE)**

Financial support: Agencia Estatal de Investigación, FEDER, UE

Main Researcher: María Fresnedo San Román San Emeterio

Dates: 01/01/2018 – 31/12/2020

**Title: Exposición ambiental a manganeso y otros metales contenidos en material particulado: bioaccesibilidad, biomonitorización, y su asociación con la función neurológica (CTM2017-82636-R) (AEI/FEDER,UE)**

Financial support: Agencia Estatal de Investigación, FEDER, UE

Main Researcher: Ignacio Fernández Olmo

Dates: 01/01/2018 – 31/12/2020

**Title: Separador magnético en endotoxinas bacterianas (LPS) en el tratamiento de la sepsis (CTQ2015-72364-EXP) (AEI)**

Financial support: MINECO

Main Researcher: Inmaculada Ortiz Uribe

Dates: 01/05/2017 – 30/04/2019

**Title: Membranas compuestas selectivas y su incorporación en dispositivos microfluídicos (CTQ2016-75158-R) (AEI/FEDER, UE)**

Financial support: Agencia Estatal de Investigación

Main Researcher: E. Daniel Gorri Cirella

Dates: 30/12/2016 – 29/12/2019

**Title: Estrategias avanzadas de integración de membranas y procesos electrocatalíticos y fotocatalíticos para la eliminación de contaminantes persistentes (CTM2016-75509-R) (AEI/FEDER, UE)**

Financial support: Agencia Estatal de Investigación

Main Researcher: Ana María Urriaga Mendía

Dates: 30/12/2016 – 30/09/2020

## R&D PROJECTS: National Projects

Title: **Membranas compuestas selectivas y su incorporación en dispositivos microfluídicos (CTQ2016-75158-R) (AEI/FEDER, UE)**

Financial support: Agencia Estatal de Investigación

Main Researcher: E. Daniel Gorri Cirella

Dates: 30/12/2016 – 29/12/2019

Title: **Diseño multiescala de procesos de captura y utilización de dióxido de carbono (CTQ2016-76231-C2-1-R) (AEI/FEDER, UE)**

Financial support: MINECO

Main Researcher: Ángel Irabien Gulías and Aurora Garea Vázquez

Dates: December 2016 – December 2020

Title: **Estrategias de producción alimentaria para la mitigación del cambio climático: hacia una economía circular de los alimentos (CTM2016-76176-C2-1-R) (AEI/FEDER, UE)**

Financial support: Agencia Estatal de Investigación, FEDER, UE

Main Researcher: Rubén Aldaco García

Dates: 01/10/2015 – 29/12/2019

Title: **Aplicaciones avanzadas de separación. Modelado y validación experimental (CTQ2015-66078-R) (MINECO/FEDER, UE)**

Financial support: MINECO

Main Researcher: Inmaculada Ortiz Uribe

Dates: 01/01/2016 – 30/06/2019

Title: **Dotación Adicional Jonathan Albo Sánchez. Convocatoria Subprograma Estatal de Formación. Ayuda Ramón y Cajal.**

Financial support: MINECO

Main Researcher: Jonathan Albo Sánchez

Dates: 01/12/2016 – 30/11/2020



## R&D PROJECTS: Regional Projects

Title: **Opportunities for the Cantabrian agro-food system under a Bio- and Circular economy approach**

Financial support: Universidad De Cantabria / Gobierno De Cantabria (Ayudas para contratos postdoctorales Augusto González de Linares)

Main Researcher: Rubén Aldaco García / Jara Laso Cortabitarte

Dates: 01/12/2019 – 30/11/2020

Title: **Detector Array de Diodos (DAD) para cromatografía líquida HPLC**

Financial support: Consejería de Universidades e Investigación, Medio Ambiente y Política Social

Main Researcher: Ana María Urtiaga Mendía

Dates: 18/09/2019 – 15/11/2020

Title: **Estación de trabajo para técnicas de simulación de dinámica de fluidos computacional (CFD) y dinámica molecular (DM) en aplicaciones de la ingeniería química**

Financial support: Universidad de Cantabria

Main Researcher: Inmaculada Ortiz Uribe

Dates: 15/06/2018 – 30/09/2019

Title: **Estrategias de ecoinnovación en la industria alimentaria: Aplicación a la industria de destilados**

Financial support: Universidad de Cantabria

Main Researcher: Rubén Aldaco García

Dates: 20/04/2018 – 09/04/2021

Title: **Diseño de estructuras biopoliméricas funcionalizadas con grafeno para el desarrollo de cultivos neuronales en modelos celulares de patología de la motoneurona (INNVAL 17/20).**

Financial support: Fundación Instituto de Investigación Marqués de Valdecilla (IDIVAL).

Main Researcher: Nazely Diban Gómez

Dates: January 2018 – January 2020

## R&D PROJECTS: Regional Projects

Title: **GRADISAL - Aplicación en Cantabria de la Tecnología EDR (Electrodíálisis reversa) a la obtención de energía renovable marina mediante gradiente salino. Fase I: Viabilidad técnico económica (RM16-XX-046)**

Financial support: Plan Regional SODERDAN – FEDER

Participants: Universidad de Cantabria, MARE S.A., Apria Systems

Main Researcher: Inmaculada Ortiz Uribe

Dates: 30/12/2016 – 30/06/2019

Title: **Valorización de cenizas volantes de incineración de RSUS mediante carbonatación**

Financial support: Universidad de Cantabria

Participants: Universidad de Cantabria, SADER

Main Researcher: Ángel Irabien Gullás / Delegate: Inmaculada Ortiz Uribe

Dates: 01/08/2016 – 31/07/2019

Title: **Desarrollo y Caracterización de filmes multicapa extruidos en base polimérica aplicando tratamiento de entrecruzamiento mediante radiación ionizante**

Financial support: Vicerrectorado de Investigación – Universidad de Cantabria

Main Researcher: Ana María Urtiaga Mendía

Dates: 01/02/2015 – 27/02/2019

Title: **Jornada de sensibilización sobre el impacto ambiental de gases fluorados**

Financial support: Universidad de Cantabria

Participants: Universidad de Cantabria

Main Researcher: Ana María Urtiaga Mendía

Dates: 03/05/2019 – 33/09/2019

# R&D PROJECTS: P.A.R. Projects

Title: **Diseño de un proceso de separación con agentes quelantes para la recuperación de metales de corrientes residuales**

Financial support: Universidad de Cantabria

Main Researcher: Eugenio Bringas Elizalde

Dates: 18/10/2018 – 17/10/2020

Title: **Avances y Desafíos de la Ingeniería Química**

Financial Support: Universidad de Cantabria

Main Researcher: Prof. Ane Urtiaga Mendía

Dates: 08/09/2018 – 07/09/2020

Title: **Nuevas aplicaciones de los procesos avanzados de separación**

Financial support: Universidad de Cantabria

Main Researcher: Inmaculada Ortiz Uribe

Dates: 27/07/2018 – 26/07/2020

Title: **Líneas de investigación del grupo de Procesos Avanzados de Separación (REPAS)**

Financial support: Fundación Leonardo Torres Quevedo

Main Researcher: Inmaculada Ortiz Uribe

Dates: 17/07/2018 – 16/07/2019

Title: **Desarrollo de Procesos y Productos Sostenibles**

Financial support: Universidad de Cantabria

Main Researcher: Ángel Irabien Gulías / Delegate: Inmaculada Ortiz Uribe

Dates: January 2018 – January 2020

Title: **Separaciones con membranas selectivas**

Financial Support: Universidad de Cantabria

Main Researcher: Daniel Gorri Cirella

Dates: 31/10/2017 – 30/10/2019

Title: **Resource Efficiency in the Process Industry**

Financial Support: Fundación Leonardo Torres Quevedo

Main Researcher: Ane Urtiaga Mendía

Dates: 19/05/2017 – 18/05/2019

# R&D PROJECTS: CONTRACTS WITH COMPANIES & ADMINISTRATION

**Title: Procesos de reacción química en combustión de quemadores de cocción a gas**

Financial support: BSH Electrodomésticos España

Main Researcher: Alfredo Ortiz Sainz de Aja

Dates: 03/06/2019 – 03/06/2020

**Title: Reutilización de componentes estratégicos en el proceso de producción de negro de carbono**

Financial Support: Birla Carbon

Main Researcher: Ana María Urtiaga Mendía

Dates: 25/04/2019 – 01/07/2020

**Title: Nueva generación de reactores fotocatalíticos UV-LED para la eliminación de compuestos persistentes en aguas (LED4Future)**

Financial support: Apria Systems

Main Researcher: María José Rivero Martínez

Dates: 01/04/2019-31/03/2020

**Title: Tratamiento electroquímico de aguas residuales procedentes de EDAR**

Financial Support: CADAGUA S.A.

Main Researcher: Ana María Urtiaga Mendía

Dates: 16/10/2018 – 30/07/2019

**Title: Evaluación técnica de la recuperación de la energía de gradiente salino contenida en la mezcla salmuera-agua de mar mediante electrodiálisis reversa**

Financial support: Acciona Agua S.A.

Main Researcher: Inmaculada Ortiz Uribe

Dates: 01/05/2018 – 01/02/2019

**Title: Estudios comparativo de tecnologías de desulfuración de humos de barcos**

Financial Support: Solvay Química S.L.

Main Researcher: Ángel Irabien Gulías / Delegate: Inmaculada Ortiz Uribe

Dates: 17/07/2018 – 31/08/2019



# R&D PROJECTS: CONTRACTS WITH COMPANIES & ADMINISTRATION

Title: **Ensayos e informes de caracterización de muestras sólidas y líquidas mediante ensayos físico-químicos**

Financial support: Several companies

Main Researcher: Ángel Irabien Gulías / Delegate: Raquel Ibañez Mendizabal

Dates: February 2017 -

Title: **Ensayos Sosprocan: Ensayos e informes de caracterización de muestras sólidas y líquidas mediante ensayos físico-químicos**

Financial support: Several companies

Main Researcher: Ángel Irabien Gulías / Delegate: Raquel Ibañez Mendizabal

Dates: January 2008 -

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- J. Albo, M. Perfecto-Irigaray, G. Beobide, A. Irabien. **Cu/Bi metal-organic framework-based systems for an enhanced electrochemical transformation of CO<sub>2</sub> to alcohols**. Journal of CO<sub>2</sub> Utilization 33, 157-165. 2019.
- R. Aldaco, I. Butnar, M. Margallo, J. Laso, M. Rumayor, A. Domínguez-Ramos, A. Irabien, P.E. Dodds. **Bringing value to the chemical industry from capture, storage and use of CO<sub>2</sub>: A dynamic LCA of formic acid production**. Science of Total Environment 663, 738-753. 2019.
- A. Bala, J. Laso, R. Abejón, M. Margallo, P. Fullana-i-Palmer, R. Aldaco., **Environmental assessment of the food packaging waste management system in Spain: Understanding the present to improve the future**. Science of the Total Environment 702, 134603, 2020.
- A. Basauri, J. Gómez-Pastora, M. Fallanza, E. Bringas, I. Ortiz. **Predictive model for the design of reactive micro-separations**. Separation & Purification Technology 209, 900-907, 2019.
- L. Battle-Bayer, A. Bala, E. Lemaire, J. Albertí, I. García-Herrero, R. Aldaco, P. Fullana-i-Palmer. **An energy- and nutrient-corrected functional unit to compare LCAs of diets**. Science of the Total Environment 671, 175-179, 2019.
- L. Battle-Bayer, A. Bala, I. García-Herrero, L. Lemaire, G. Song, R. Alcardo, P. Fullana-i-Palmer. **The Spanish Dietary Guidelines: A potential tool to reduce greenhouse gas emissions of current dietary patterns**. Journal of Cleaner Production 213, 588-598, 2019.
- L. Battle-Bayer, R. Aldaco, A. Bala, P. Fullana-i-Palmer. **Towards sustainable dietary patterns under a water-energy-food nexus life cycle thinking approach**. Current Opinion in Environmental Science & Health, <https://doi.org/10.1016/j.coesh.2019.11.001>, 2019.
- E. Brillas, V. Montiel, I. Sirés, A. Urriaga. **Editorial of the Special Issue on advanced electrochemical technologies for environmental applications**. Separation & Purification Technology 208, 1-2, 2019.
- C. Casado-Coterillo, **Mixed Matrid Membranes**, Membranes 2019, 9(11), 149, 2019.
- S. Cobo, J. W. Levis, A. Domínguez-Ramos, A. Irabien. **Economics of enhancing nutrient circularity in an organic waste valorization system**. Environmental Science & Technology 53(11), 6123-6132. 2019.
- J. Corredor, M.J. Rivero, C.M. Rangel, f. Gloaguen, I. Ortiz. **Comprehensive review and future perspectives on the photocatalytic hydrogen production**. Journal of Chemical Technology and Biotechnology 94, 3049-3063. 2019.

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- G. Díaz Sainz, M. Álvarez Guerra, J. Solla Gullón, L. García Cruz, V. Montiel, A. Irabien. **Catalyst coated membrane electrodes for the gas phase CO<sub>2</sub> electroreduction to formate**. Catalysis Today. Article in press. 2019. <https://doi.org/10.1016/j.cattod.2018.11.073>
- G. Díaz Sainz, M. Álvarez Guerra, J. Solla Gullón, L. García Cruz, V. Montiel, A. Irabien. **CO<sub>2</sub> electroreduction to formate: continuous single-pass operation in a filter-press reactor at high current densities using Bi Gas Diffusion Electrodes**. Journal of CO<sub>2</sub> Utilization 34, 12-19. 2019
- A. Domínguez-Ramos, M. Álvarez-Guerra, G. Díaz-Sainz, R. Ibáñez, A. Irabien. **Learning-by-doing: The Chem-E-Car competition in the University of Cantabria as case study**. Education for Chemical Engineers 26, 14-23, 2019.
- A. Domínguez-Ramos, A. Irabien. **The carbon footprint of power-to-synthetic natural gas by photovoltaic solar powered electrochemical reduction of CO<sub>2</sub>**. Sustainable Production and Consumption 17, 229-240. 2019.
- G. Feijoo, R. Ibáñez, J. Herguido, P. Partal, M. Tobajas, J. Sempere, M. F. López-Pérez, M. J. Rivero. **Reprint of: Education of Chemical Engineering in Spain: A global picture**. Education for Chemical Engineers 26, 2-7, 2019.
- C. Ferreriro, N. Villota, J. I. Lombraña, M.J. Rivero, V. Zúñiga, J.M. Riotuerto. **Analysis of a hybrid suspended-supported photocatalytic reactor for the treatment of wastewater containing benzothiazole and aniline**. Water 11(2), 337. 2019.
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- I. García-Herrero, M. Margallo, J. Laso, L. Battle-Bayer, A. Bala, P. Fullana-i-Palmer, I. Vazquez-Rowe, M.J. González, F. Amo-Setién, F.J. Durá, C. Sarabia, R. Abajas, A. Quiñones, A. Irabien, R. Aldaco. **Nutritional data management of food losses and waste under a life cycle approach: Case study of the Spanish agri-food system**. Journal of Food Composition and Analysis 82, 103223, 2019.
- L. Gómez-Coma, V.M. Ortiz-Martínez, J. Carmona, L. Palacio, P. Prádanos, M. Fallanza, A. Ortiz, R. Ibáñez, I. Ortiz. **Modeling the influence of divalent ions on membrane resistance and electric power in reverse electro dialysis**. Journal of Membrane Science 592, 117385, 2019.
- J. Gómez-Pastora, I.H. Karampelas, E. Bringas, E. P. Furlani, I. Ortiz. **Numerical analysis of bead magnetophoresis from flowing blood in a continuous-flow microchannel: Implications to the bead fluid interactions**. Scientific Reports 9(1), 7265, 2019.

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- A. Hernández-Pellón, I. Fernández-Olmo. **Using multi-site data to apportion PM-bound metal(loid)s: Impact of a manganese alloy plant in an urban area.** Science of the Total Environment 651, 1476-1488. 2019.
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- M. Herrero-González, N. Admon, A. Domínguez-Ramos, R. Ibañez, A. Wolfson, A. Irabien. **Environmental sustainability assessment of seawater reverse osmosis valorization by means of electro dialysis.** Environmental Science and Pollution Research. Article in press. <https://doi.org/10.1007/s11356-019-04788-w> (2019).
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R. Leivas, J. Laso, D. Hoehn, M. Margallo, P. Fullana-i-Palmer, R. Aldaco. **Product vs Corporate Carbon Footprint: A Case Study for the Spirit Drinks Sectors**, Chemical Engineering Transactions, 76, 223-228. 2019.

A. Marcos-Madrado, C. Casado-Coterillo, A. Irabien. **Sustainable Membrane-Coated Electrodes for CO<sub>2</sub> Electroreduction to Methanol in Alkaline Media**. ChemElectroChem 6, 5273-5282, 2019.

M. Margallo, S. Cobo, J. Laso, Á. Fernández, E. Muñoz, E. Santos, R. Aldaco, A. Irabien. **Environmental performance of alternatives to treat fly ash from a waste to energy plant**. Journal of Cleaner Production 231, 1016-1026. 2019.

M. Margallo, A. Domínguez-Ramos, R. Aldaco, **Incorporating life cycle assessment and ecodesign tools for green chemical engineering: A case study of competences and learning outcomes assessment**. Education for Chemical Engineers 26, 89-96, 2019.

M. Margallo, K. Zieger-Rodriguez, I. Vázquez-Rowe, R. Aldaco, A. Irabien, R. Kahhat. **Enhancing waste management strategies in Latin America under a holistic environmental assessment perspective: A review for policy support**. Science of the Total Environment. 2019.

I. Merino-García, J. Albo, A. Irabien. **Cu oxide/ZnO-based surfaces for a selective ethylene production from gas-phase CO<sub>2</sub> electroconversion**. Journal of CO<sub>2</sub> Utilization 31, 135-142. 2019.

I. Merino-García, J. Albo, G. Mul, P. Krzywda, A. Irabien. **Bimetallic Cu-based hollow fibre electrodes for CO<sub>2</sub> reduction**. Catalysis Today. Article in press. <https://doi.org/10.1016/j.cattod.2019.03.025>. 2019

P. Ortiz-Albo, S. Torres-Ortega, M. González-Prieto, A. Urriaga, R. Ibáñez. **Techno-economic feasibility analysis for minor elements valorization from desalination concentrates**. Separation and Purification Reviews 48(3), 220-241, 2019.

P. Ortiz-Albo, R. Ibáñez, A. Urriaga, I. Ortiz. **Phenomenological prediction of desalination brines nanofiltration through the indirect determination of zeta potential**. Separation & Purification Technology 210, 746-753, 2019.

R. Ortiz-Imedio, L. Gómez-Coma, M. Fallanza, A. Ortiz, R. Ibáñez, I. Ortiz. **Comparative performance of salinity gradient power-reverse electro dialysis under different operating conditions**. Desalination 457, 8-21, 2019.

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- V. M. Ortiz-Martínez, L. Gómez-Coma, A. Ortiz, I. Ortiz. **Overview on the use of surfactants for the preparation of porous carbon materials by the sol-gel method: Applications in energy systems.** Reviews in Chemical Engineering. Article in press. 2019. DOI: 10.1515/revce-2018-0056.
- V. M. Ortiz-Martínez, A. Ortiz, V. Fernández-Stefanuto, E. Tojo, M. Colpaert, B. Ameduri, I. Ortiz. **Fuel cell electrolyte membranes based on copolymers of protic ionic liquid [HSO<sub>3</sub>-BVIm][TfO] with MMA and hPFSVE.** Polymers 179, 28, 2019.
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- P. Ribao, M.A. Esteves, V.R. Fernandes, M.J. Rivero, C.M. Rangel, I. Ortiz. **Challenges arising from the use of TiO<sub>2</sub>/rGO/Pt photocatalysts to produce hydrogen from crude glycerol compared to synthetic glycerol.** International Journal of Hydrogen Energy 44, 28494 -28506, 2019.
- M.J. Rivero, O. Iglesias, P. Ribao, I. Ortiz. **Kinetic performance of TiO<sub>2</sub>/Pt/reduced graphene oxide composites in the photocatalytic hydrogen production.** International Journal of Hydrogen Energy 44, 101-109, 2019.
- M. Rumayor, A. Dominguez-Ramos, A. Irabien. **Environmental and economic assessment of the formic acid electrochemical manufacture using carbon dioxide: Influence of the electrode lifetime.** Sustainable Production and Consumption 18, 72-82. 2019
- M. Rumayor, A. Dominguez-Ramos, A. Irabien. **Innovative alternatives to methanol manufacture: Carbon footprint assessment.** Journal of Cleaner Production 225, 426-434. 2019
- M. Rumayor, A. Domínguez-Ramos, P. Pérez, A. Irabien. **A techno-economic evaluation approach to the electrochemical reduction of CO<sub>2</sub> for formic acid manufacture.** Journal of CO<sub>2</sub> Utilization 24, 490-499. 2019.
- J. Santos-Lorenzo, R. San José-Velado, J. Albo, G. Beobide, P. Castaño, O. Castillo, A. Luque, S.A. Pérez-Yáñez. **Straightforward route to obtain zirconium based metal-organic gels.** Microporous and Mesoporous Materials 284, 128-132, 2019.
- Q. Sohaib, L. Gómez-Coma, J. Albo, S. Duron-Bocquet, A. Irabien, J. Sánchez-Marcano. **CO<sub>2</sub> capture in a hollow fiber membrane contactor coupled with ionic liquid: Influence of membrane wetting and process parameters.** Separation and Purification Technology 233, 115986 (2019).

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- Q. Sohaib, L. Gómez-Coma, J. Albo, S. Bruon-Bocquet, A. Irabien, Y. Mohammad, J. Sánchez-Marcano. **Modelling of CO<sub>2</sub> Absorption with Ionic Liquids in a Membrane Contactor, Study of Absorption Kinetics and Influence of Temperature.** Journal of Chemical Technology & Biotechnology. Article in press. <https://doi.org/10.1002/jctb.6265>. 2019.
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- A. Soriano, D. Gorri, L.T. Bliegler, A. Urtiaga. **An optimization model for the treatment of perfluorocarboxylic acids considering membrane preconcentration and BDD electrooxidation.** Water Research 164, 114954, 2019.
- A. Soriano, D. Gorri, A. Urtiaga. **Selection of high flux membrane for the effective removal of short-chain perfluorocarboxylic acids.** Industrial and Engineering Chemistry Research 58(8), 3329-3338, 2019.
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- J. Valecillos, E. Epelde, J. Albo, A.T. Aguayo, J. Bilbao, P.M. Castaño. **Slowing down the deactivation of H-ZSM-5 zeolite during methanol-to-olefin (MTO) reaction by Zn modification.** Catalysis Today. 2019. DOI: <https://doi.org/10.1016/j.cattod.2019.07.059>.
- I. Vazquez-Rowe, K. Ziegler-Rodríguez, J. Laso, I. Quispe, R. Aldaco, R. Kahhat. **Production of cement in Peru: Understanding carbon-related environmental impacts and their policy implications.** Resources, Conservation and Recycling 142, 283-292, 2019.
- I. Vazquez-Rowe, J. Laso, M. Margallo, I. García-Herrero, D. Hoehn, F. Amo-Setién, A. Bala, R. Abajas, C. Sarabia, M.J. Durá, P. Fullana-i-Palmer, R. Aldaco. **Food loss and waste metrics: a proposed nutritional cost footprint linking linear programming and life cycle assessment.** The International Journal of Life Cycle Assessment. Article in press 2019. <https://doi.org/10.1007/s11367-019-01655-1>
- A. Wolfson, A. Domínguez-Ramos, A. Irabien. **From Goods to Services: The Life Cycle Assessment Perspective.** Journal of Service Science Research 11 (1), 17-45. 2019.
- M. Yáñez, A. Ortiz, B. Brunaud, I. E. Grossmann, I. Ortiz. **The use of optimization tools for the hydrogen circular economy.** Computer Aided Chemical Engineering 46, 1777-1782, 2019.

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- R. Zarca, A.C.C. Campos, A. Ortiz, D. Gorri, I. Ortiz. **Comprehensive study of PVDF-HFP/BMIImBF<sub>4</sub>/AgBF<sub>4</sub> membranes for propylene purification.** Journal of Membrane Science 572, 255-261, 2019.
- R. Zarca, A. Ortiz, D. Gorri, L. T. Biegler, I. Ortiz. **Optimization of multistage olefin/paraffin membrane separation processes through rigorous modeling.** AIChE Journal. Article in press 2019. <https://doi.org/10.1002/aic.16588>.
- K. Ziegler-Rodríguez, M. Margallo, R. Aldaco, I. Vazquez-Rowe, R. Kahhat. **Transitioning from open dumpsters to landfilling in Peru: Environmental benefits and challenges from a life-cycle perspective.** Journal of Cleaner Production 229, 989-1003, 2019.
- E. Brillas, V. Montiel, I. Sires, A. Urriaga. **Editorial of the special issue on advanced electrochemical technologies for environmental applications.** Separation and Purification technology 208, 1-2, 2019.



# BOOKS AND BOOK CHAPTERS

Author: Álvarez Guerra, E.

Referees: Jose María Colina Pérez, Gabriel Zarca Lago, Joaquin Salgado del Palacio, Lucía Gómez Coma and Manuel Álvarez Guerra

Title: **Olimpiada y Miniolimpiada de Química de Cantabria 2019, Enunciados y Resolución.**

Editorial: Editorial Universidad de Cantabria

Santander, Spain

2019



Authors: Albo J., Álvarez-Guerra Manuel, Irabien A.

Title: **Electro-, photo- and photoelectro-chemical reduction of CO<sub>2</sub>. Heterogeneous Catalysts: Emerging Techniques for Design, Characterization and Applications.**

Wiley-VCH.

ISBN: 978-3527344154

2019.



Authors: Gómez-Coma, L., Ortiz-Martínez, V.M., Fallanza Torices, M., Ortiz, A., Ibáñez, R., Ortiz, I.

Chapter Title: **Recuperación de energía a partir de salmueras**

Book Title: Congreso Nacional del Agua Orihuela. Innovación y Sostenibilidad.

Pages: 901-910

Editors: Joaquín Melgarejo, Patricia Fernández-Aracil

Universidad de Alicante, Alicante, Spain. 2019.



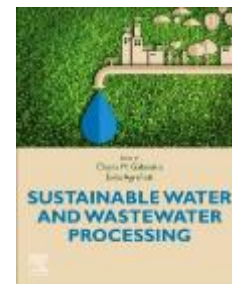
Authors: Ortiz, I., Rivero M.J., Margallo, M.

Chapter Title: **Advanced oxidative and catalytic processes (Chapter 6)**

Book Title: Sustainable Water and Wastewater Processing

Editorial: Elsevier

Amsterdam, The Netherlands, 2019



## EDITED BOOKS

Book Title: **Book of Abstract 3<sup>rd</sup> ANQUE-ICCE International Congress of Chemical Engineering**

Editors: Antonio Domínguez Ramos, Lucía Gómez Coma, Jonathan Albo Sánchez, Guillermo Díaz Sainz, Pedro Díaz Guridi, Gabriel Zarca Lago and Manuel Álvarez Guerra

Santander, Spain

June 2019

ISBN: 978-84-09-12430-5

Book Title: **Libro de Resúmenes del 1<sup>er</sup> Congreso Iberoamericano de ingeniería Química**

Editors: Jonathan Albo Sánchez, Lucía Gómez Coma, Antonio Domínguez Ramos, Guillermo Díaz Sainz, Pedro Díaz Guridi, Gabriel Zarca Lago and Manuel Álvarez Guerra.

Santander, Spain

June 2019

ISBN: 978-84-09-12431-2

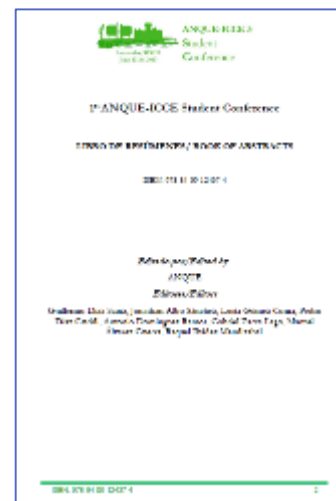
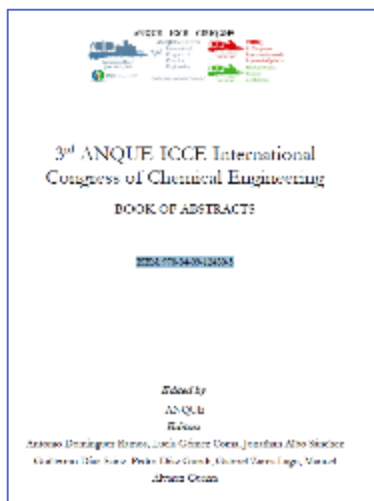
Book Title: **Book of abstract Student Conference ANQUE-ICCE 3**

Editors: Guillermo Díaz Sainz, Jonathan Albo Sánchez, Lucía Gómez Coma, Pedro Díaz Guridi, Antonio Domínguez Ramos, Gabriel Zarca Lago, Manuel Álvarez Guerra and Raquel Ibañez Mendizábal.

Santander, Spain

June 2019

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# CONGRESSES



The Chemical & Biomolecular Engineering Department of the University of Cantabria organized and hosted the **ANQUE-ICCE 3 - 3<sup>rd</sup> International Congress of Chemical Engineering, CIBIQ - 1<sup>er</sup> Congreso Iberoamericano de Ingeniería, Congreso de Estudiantes ANQUE-ICCE-3**. The event took place in Santander from June 17th to 21st, 2019, and it was attended by around 500 people.

All the information about the congress is available on: <https://www.anque-icce2019.com/>



## Management Activities during the Congress:

- Member of the Executive Committee of ANQUE-ICCE 2019.
- Member of the Scientific Committee of ANQUE-ICCE 2019.
- Co-President of committee of the Students Conference of ANQUE ICCE 2019
- Organizers of the symposia/workshops of ANQUE-ICCE 2019: “Membranes for Water-Food-Energy Nexus”, “1<sup>st</sup> International Young Researchers Symposium on Applications of Electrochemical Technology (IYRS\_AET)”, “Mitigation of the environmental impact of fluorinated gases” and “Renewable Hydrogen Energy World”.

# CONGRESSES

In **2019** the researchers of the Chemical & Biomolecular Engineering Department have participated in the following **congresses**:

**Congreso Nacional del Agua 2019: Innovacion y Sostenibilidad**, February 21-22, 2019, Orihuela (Spain)

**8<sup>th</sup> International Conference on Fundamentals and Development of Fuel Cells – FDFC 2019**, February 12-14, 2019, Nantes (France)

**10<sup>th</sup> International Conference on Hydrogen technologies- Hydrogen Days**, March 27-29, 2019, Prague (Czech Republic)

**Engineering with Membranes Conference 2019 – WEM2019**, April 9-10, 2019, Båstad (Sweden)

**VII Jornadas Doctorales G-9**, April 10-12, 2019, Logroño (Spain)

**25<sup>th</sup> Topical Meeting of the International Society of Electrochemistry**, May 12-15, 2019, Toledo (Spain)

**3<sup>rd</sup> Workshop of the Spanish Excellence Network “Environmental and Energy Applications of the Electrochemical Technology**, May 14-15, 2019, Toledo (Spain)

**XXXVII Reunión Bienal de la Sociedad Española de Química**, May 26-30, 2019, San Sebastián (Spain)

**SETAC Europe 29<sup>th</sup> Annual Meeting**, May 26-30, 2019, Helsinki (Finland)

**XXXIV Congreso Nacional de la Sociedad Mexicana de Electroquímica and 12<sup>th</sup> Meeting of the Mexican Section of Electrochemical Society**, June 2-6, 2019, Querétaro (Mexico)

**World Hydrogen Technologies Convention (WHTC) 2019**. June 2-7, 2019, Tokyo (Japan)

**11<sup>th</sup> Mediterranean Combustion Symposium**, June 16-20, 2019, Tenerife (Spain)

**Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain)

**29<sup>th</sup> European Symposium on Computer – AIDED Process Engineering (ESCAPE-20)**, June 16-19, 2019, Eindhoven (The Netherlands)



# CONGRESSES

**Nanotech 2019 Conference & Expo**, June 17-19, 2019, Boston (USA)

**3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain)

**7<sup>th</sup> Symposium on Hydrogen, Fuel Cells and Advanced Batteries – HYCELTEC**, July 1-3, 2019, Barcelona (Spain)

**3<sup>rd</sup> International MEEP Symposium 2019**, July 3-4, 2019, Lucerne (Switzerland)

**Fuel Cells, Electrolysers & H<sub>2</sub> Processing Forum – EFCF 2019**, July 2-5, 2019, Lucerne (Switzerland)

**XL Meeting of the Electrochemistry Group of Spanish Royal Society of Chemistry**, July 2-5, 2019, Huelva (Spain)

**14<sup>th</sup> International Conference on Catalysis in Membrane Reactors (ICCMR14)**, July 8-11, 2019, Eindhoven (The Netherlands)

**VIII Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica, CILCA 2019**, July 15-20, 2019, Cartago (Costa Rica) Red Nacional de ACV de Costa Rica / Red Iberoamericana de Ciclo de Vida.

**6<sup>th</sup> European Conference on Environmental Applications of Advanced Oxidation Processes (EAAOP-6)**, July 26-30, 2019, Portoroz, Portores (Slovenia)

**36 Jornadas Nacionales de Ingeniería Química (JNIQ)**, September 4-6, 2019, Zaragoza (Spain)

**4<sup>th</sup> International Conference on Ionic Liquids in Separation and Purification Technology**, September 8-11, 2019, Sitges (Spain)

**10<sup>th</sup> Euro-Mediterranean Symposium on Laser-Induced Breakdown Spectroscopy**, September 8-13, 2019, Brno (Czech Republic)

**12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy)

**II Congreso Internacional de Jóvenes Investigadores del Mar**, October 1-4, 2019, Málaga (Spain)

**14<sup>th</sup> Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES)**, October 1-6, 2019, Dubrovnik (Croatia)

# CONGRESSES

**Aportando Valor al CO<sub>2</sub>**, Madrid, España. 2-3 octubre 2019

**29<sup>th</sup> ISWA World Congress**, October 7-9, 2019, Bilbao (Spain)

**22<sup>nd</sup> Conference on Process Integration for Energy Saving and Pollution Reduction (PRES'19)**, October 20-23, 2019, Aristotle University Of Thessaloniki, Creta (Greece)

**Congreso Iberoamericano de Hidrógeno y Pilas de combustible (IBERCONAPPICE)**, October 23-25, 2019, Madrid (Spain)

**8<sup>th</sup> De Nora R&D Symposium Agenda, De Nora**, November 5-6, 2019. Milán (Italy)

**AICHE Annual Meeting 2019**, November 10-15, 2019, Orlando (USA)

**MEMTEK 2019**, November 18-20, 2019, Istanbul (Turkey)

**37 Congreso Anual de la Sociedad Española de Ingeniería Biomédica (CASEIB)**, November 27-29, 2019, Santander (Spain)

**4<sup>th</sup> International Conference on Desalination using Membrane Technology**, December 1-4, 2019, Perth (Australia)

## CONGRESS CONTRIBUTIONS

Gómez-Coma, L., Ortiz-Martínez, V.M., Fallanza, M., Ortiz, A., Ibáñez, R., Ortiz, I. Recuperación de energía a partir de salmueras, presented at **Congreso Nacional del Agua 2019: Innovacion y Sostenibilidad**, February 21-22, 2019, Orihuela (Spain).

Guate, M., Ortiz, A., Ortiz, I., Eliminación de nitritos de aguas contaminadas mediante el empleo de un reactor catalítico de fibras hueca, presented at **Congreso Nacional del Agua 2019: Innovacion y Sostenibilidad**, February 21-22, 2019, Orihuela (Spain).

Lagarteira, T., Delgado, S., Pérez, G., Ortiz, A., Méndes, A., Nature of the high stability of graphene-supported catalysts upon accelerated stress tests for fuel cells: electrochemical and physicochemical evidences, presented at **8<sup>th</sup> International Conference on Fundamentals and Development of Fuel Cells – FDFC 2019**, February 12-14, 2019, Nantes (France).

Yáñez, M., Ortiz, A., Gorri, D., Ortiz, I. Recovery of industrial waste hydrogen by membrane technology, presented at **10<sup>th</sup> International Conference on Hydrogen technologies- Hydrogen Days**, March 27-29, 2019, Prague (Czech Republic).

Ortiz-Martínez, V.M., Ortiz, A., Ortiz, I., Novel proton conductive membranes base don poly([HSO<sub>3</sub>-BVIIm][TfO]-co-MMA)and poly([HSO<sub>3</sub>-BVIIm][TfO]-co-hPFSVE) for fuel cell applications, presented at **Engineering with Membranes Conference 2019 – WEM2019**, April 9-10, 2019, Båstad (Sweden).

Díaz-Sainz, G., Álvarez-Guerra, M., Irabien, A. Electrochemical CO<sub>2</sub> Utilization: development of a continuous processing for obtaining formate with high efficiency, presented at **VII Jornadas Doctorales G-9**, April 10-12, 2019, Logroño (Spain).

Gómez-Ruiz, B., Tenorio, R., Brown, J., C. Higgins, Bellona, C.B., Strathmann, T., Diban, N., Urtiaga, A. Degradation of poly- and perfluoroalkyl substances (PFASs) in aqueous film-forming foam by sequential UV oxidative/reductive treatments, presented at **25<sup>th</sup> Topical Meeting of the International Society of Electrochemistry**, May 12-15, 2019, Toledo (Spain).

Romano, A., Urtiaga, A.M., Ortiz, I., High performance ELOX in zero-discharge regeneration of RAS water, presented at **25<sup>th</sup> Topical Meeting of the International Society of Electrochemistry**, May 12-15, 2019, Toledo (Spain).

## CONGRESS CONTRIBUTIONS

Soriano, A., Gorri, D., Urriaga, A., Towards an Efficient Electrolysis of Perfluorocarboxylic Acids Through Integration with Membrane Separation using Process System Engineering Tools, presented at **3<sup>rd</sup> Workshop of the Spanish Excellence Network “Environmental and Energy Applications of the Electrochemical Technology**, May 14-15, 2019, Toledo (Spain).

Urriaga, A., Diban, N., Gómez-Ruiz, B., Outstanding electrolysis of poly- and perfluoroalkyl substances (PFASs). Evaluation of energy needs, presented at **3<sup>rd</sup> Workshop of the Spanish Excellence Network “Environmental and Energy Applications of the Electrochemical Technology**, May 14-15, 2019, Toledo (Spain).

Castro, S., Albo, J., Irabien, A. A TiO<sub>2</sub> photoanode-driven electrochemical system for CO<sub>2</sub> transformation, presented at **XXXVII Reunión Bienal de la Sociedad Española de Química**, May 26-30, 2019, San Sebastián (Spain).

Díaz-Sainz, G., Álvarez-Guerra, M., Sollá-Gullón, J., García-Cruz, L., Montiel, V., Irabien, A. CO<sub>2</sub> electroreduction into formate using Bi Gas Diffusion Electrodes: comparison with tin electrodes, presented at **XXXVII Reunión Bienal de la Sociedad Española de Química**, May 26-30, 2019, San Sebastián (Spain).

Guati, C., Albo, J., Irabien, A. Photoelectrochemical conversion of CO<sub>2</sub> to methanol in an optofluidic microreactor, presented at **XXXVII Reunión Bienal de la Sociedad Española de Química**, May 26-30, 2019, San Sebastián (Spain).

Marcos-Madrado, A., Casado-Coterillo, C., Irabien, A. New membrane coated electrodes resistant in alkaline media for the electro reduction of CO<sub>2</sub>, presented at **XXXVII Reunión Bienal de la Sociedad Española de Química**, May 26-30, 2019, San Sebastián (Spain).

Rumayor, M., Domínguez-Ramos, A., Irabien, A. Global warming potential of the production of formic acid by electrochemical reduction, presented at **XXXVII Reunión Bienal de la Sociedad Española de Química**, May 26-30, 2019, San Sebastián (Spain).



## CONGRESS CONTRIBUTIONS

Arguillarena, A., Margallo, M., Urtiaga, A., Life cycle assessment of hot-dip galvanizing process, presented at **SETAC Europe 29<sup>th</sup> Annual Meeting**, May 26-30, 2019, Helsinki (Finland).

Escudero, C.J., Rivero, M.J., Ortiz, I. Evaluación electroquímica de dos compuestos fenólicos: evaluación de la cinética y consumo energético, presented at **XXXIV Congreso Nacional de la Sociedad Mexicana de Electroquímica** and **12<sup>th</sup> Meeting of the Mexican Section of Electrochemical Society**, June 2-6, 2019, Querétaro (Mexico).

Ortiz, R., Ortiz, A., Urroz, J.C., Diéguez, P.M., Gorri, D., Gandía, L.M., Ortiz, I. Valorization of coke oven gas waste stream applied in a spark ignition engine, presented at **World Hydrogen Technologies Convention (WHTC) 2019**. June 2-7, 2019, Tokyo (Japan).

Rivero, M.J., Corredor, J., Ortiz, I. Waste upgrading with photocatalytic hydrogen recovery. Stability of TiO<sub>2</sub>-based materials, presented at **World Hydrogen Technologies Convention (WHTC) 2019**. June 2-7, 2019, Tokyo (Japan).

Laguillo, S., Ochoa, J.S., Ortiz, A., Numerical simulation of a methane flame impinging onto cooking pot, presented at **11<sup>th</sup> Mediterranean Combustion Symposium**, June 16-20, 2019, Tenerife (Spain).

Asensio-Delgado, S., Pardo, F., Urtiaga, A., Zarca, G., Innovative separation processes for the recyclability of refrigerant gases, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

Fernández-Caso, K., Díaz-Sainz, G., Domínguez-Ramos, A., Álvarez-Guerra, M., Ibáñez, R., Improvement of the detention and control mechanism of the Chem-E-Car, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

Gómez, R., Díaz-Sainz, G., Álvarez-Guerra, M., Domínguez-Ramos, A., Ibáñez, R. Design, building and improvement of a Chem-E-Car prototype based on a chemical reaction, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

## CONGRESS CONTRIBUTIONS

Guati, C., Irabien, A., Albo, J., Cu-decorated TiO<sub>2</sub> surfaces for the continuous photocatalytic conversion of CO<sub>2</sub> into methanol using an optofluidic microreactor, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

Gutiérrez-Hernández, S., Pardo, F., Urriaga, A., Zarca, G., Membrane technology for the mitigation of the environmental impact of fluorinated gases used as refrigerants, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

León-Solórzano, M., Arregoitia-Sarabia, C.A., Gómez-Coma, L., Fallanza, M., Gorri, D., Ortiz, I., Butanol recovery from azeotropic solutions by pervaporation process. From flat-sheet membranes to hollow fibers, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

Sampedro-Pelayo, T., Gómez-Coma, L., Fallanza, M., Ortiz, A., Ortiz, I. Membrane resistance characterization for salinity gradient power by reverse electrodialysis, presented at **Student Conference SC-ICCE**, June 17-18, 2019, Santander (Spain).

Yáñez, M., Ortiz, A., Brunaud, B., Grossman, I. E., Ortiz, I., The use of optimization tools for the hydrogen circular economy, presented at **29<sup>th</sup> European Symposium on Computer – AIDED Process Engineering (ESCAPE-20)**, June 16-19, 2019, Eindhoven (The Netherlands).

González-Fernández, C., Gómez-Pastora, J., Karampelas, I.H., Bringas, E., Ortiz, I., Optimization of continuous-flow magnetic bioseparators through CFD numerical models, presented at **Nanotech 2019 Conference & Expo**, June 17-19, 2019, Boston (USA).

Roodan, V.A., Gómez-Pastora, J., González-Fernández, C., Karampelas, I.H., Bringas, E., Furlani, E.P., Ortiz, I., CFD analysis of the generation and manipulation of ferrofluid droplets, presented at **Nanotech 2019 Conference & Expo**, June 17-19, 2019, Boston (USA).

Aldaco, R., Burnar, I., Margallo, M., Laso, J., Irabien, A., Transitioning to a decarbonized chemical industry: an opportunity for the CO<sub>2</sub>: circular economy through the emerging use of hydrogen fuel cells, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

## CONGRESS CONTRIBUTIONS

Arguillarena, A., Margallo, M., Urtiaga, A., Irabien, A., Environmental impact assessment of the hot-dip galvanising process, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Arregoitia, C.A., Fallanza, M., Norkobilov, A., Gorri, D., Ortiz, I., New membranes for butanol recovery from ABE mixtures by pervaporation, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Asensio-Delgado, S., Zarca, G., Urtiaga, A., Llóvell, F., Evaluating the Performance of Ionic Liquids to Separate Refrigerant Gases Using the soft-SAFT EoS, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Asensio-Delgado, S., Barquín, C., Cantudo, R., Expósito, A., García, B., González, S., González, D., Guati, C., de la Hoz, R., Ibañez, I., Mantecón, M.A., Pelayo, D., San Martín, S., Aldaco, R., The eco-learning experience: life cycle assessment of digitizing university classes, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Basauri, A., González-Fernández, C., Fallanza, M., Bringas, E., Moncalián, G., de la Cruz, F., Ortiz, I., Micro-separators design for lipopolysaccharides selective sequestration, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Casado-Coterillo, C., Irabien, A., Effect of water and contaminants in the CO<sub>2</sub>/CH<sub>4</sub> separation of hydrophobic and hydrophilic composite membranes, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Castro, S., Albo, J., Irabien, A., Continuous photo-electrochemical reduction of CO<sub>2</sub> in a TiO<sub>2</sub> photoanode-driven system, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Cobo, S., Levis, J., Domínguez-Ramos, A., Irabien, A. Economics and carbon footprint of enhancing nutrient circularity, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

## CONGRESS CONTRIBUTIONS

Corredor, J., Rivero, M.J., Ortiz, I., Composite Nafion membranes with supported reduced Graphene oxide rGO/TiO<sub>2</sub> photocatalysts, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Díaz-Guridi, P., Lugera, S., González-Barrero, P., Otero-Hermida, J.A., Ibañez, R., Nanofiltration contribution to the purification of lactic acid obtained biotechnologically, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Díaz-Sainz, G., Álvarez-Guerra, M., Solla-Gullón, J., García-Cruz, L., Montiel, V., Irabien, A., CO<sub>2</sub> utilization: improving a continuous CO<sub>2</sub> electroreduction process to formate using Bi-based electrocatalysts, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Domínguez-Ramos, A., Álvarez-Guerra, M., Díaz-Sainz, G., Ibañez, R., Irabien, A., Learning-by-Doing: a successful innovative teaching experience at the University of Cantabria, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Escudero, C.J., Peralta-Hernández, J.M., Rivero, M.J., Ortiz, I. Photocatalytic degradation of p-cresol using TiO<sub>2</sub>-based nanomaterials with light emitting diodes illumination, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Fernández, I., Hernández-Pellón, A., Particle size distribution of metals near a ferromanganese plant in relation with sources and control technologies of emitted particles, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Fernández, I., Markiv, B., Santibáñez, M., A protocol to assess the bioaccessibility of particulate matter-bound metals, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

## CONGRESS CONTRIBUTIONS

García, B., Fallanza, M., Bringas, E., Ortiz, I. Separation of toxins from blood by means of functionalized magnetic nanoparticles and a microfluidic device, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Guate, M., Ortiz, A., Ortiz, I. Catalytic reduction of nitrates in a hollow fibers membrane reactor, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Gómez-Coma, L., Ortiz-Martínez, V.M., Fallanza, M., Ortiz, A., Ibañez, R., Ortiz, I. Optimum performance of salinity gradient power generation through RED technology, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

González-Fernández, C., Gómez-Pastora, J., Bringas, E., Ortiz, I., Optimized design of novel magnetophoretic-microfluidic devices for biofluids detoxification, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Herrero-González, M., Domínguez-Ramos, A., Ibañez, R., Wolfson, A., Irabien, A., Environmental sustainability assessment of seawater reverse osmosis valorization by means of electrodialysis, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Hoehn, D., Laso, J., Margallo, M., Bala, A., Fullana, P., Aldaco, R., Environmental efficiency of the Spanish food packaging waste management system, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Ibañez, R., Feijoo, G., Herguido, J., Partal, P., tobajas, L, Sempere, J., López-Pérez, M.F., Rivero, M.J., Innovation on Chemical Engineering Education in Spain: The role of the Conference of Directors and Deans of Chemical Engineering (CODDIQ), presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).



## CONGRESS CONTRIBUTIONS

Laso, J., Leivas, R., Margallo, M., Aldaco, R. Towards eco-innovation in the beverage industry: the case study of spirit drinks sector in Cantabria (Spain), presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Marcos-Madrado, A., Sebastián, V., Arruebo, M., Casado-Coterillo, C., Irabien, A., Mixed matrix membrane coated electrodes for CO<sub>2</sub> electroreduction in alkaline media, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Margallo, M., Laso, J., Aldaco, R., Eco-innovation and circular economy strategies for the sustainability of the seafood sector under a nexus water-energy-food framework, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Ortiz-Imedio, R., Ortiz, A., Urroz, J.C., Diéguez, P.M., Gorri, D., Gandía, L.M., Ortiz, I. Specific CO<sub>2</sub> emissions of coke oven gas applied in internal combustion engines, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Pardo, F., Zarca, G., Urtiaga, A., Exploring the suitability of using composite polymer ionic liquid membranes (CPILMs) in the recovery of low GWP refrigerant gases, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Pérez, G., Gómez-Coma, L., Díaz-Sainz, G., Ibañez, R., Starting the Chemical Engineering Education since the Primary Schools: Project “La Universidad en tu Barrio”, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Rancaño, L., González, M., Yedra, A., Rivero, M.J., Ortiz, I. Performance of reduced Graphene oxide in TiO<sub>2</sub>-based photocatalysts in the oxidation of metolachlor, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Rivero, M.J., Ribao, P., Gómez-Ruiz, B., Urtiaga, A., Ortiz, I. Comparative performance of TiO<sub>2</sub>-rGO composites on the photocatalytic degradation of halogenated organic compounds, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

## CONGRESS CONTRIBUTIONS

Romano, A., Urutiaga, A.M., Ortiz, I., Traceability of THMs formation in the electrochemically assisted regeneration of aquacultures waters, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Romay, M., Diban, N., Urutiaga, A., Analysis of PVDF/NMP/water ternary phase diagrams to predict membrane morphology by phase inversion, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Rumayor, M., Domínguez-Ramos, A., Irabien, A., A techno-economic assessment of the formic acid production by electrochemical reduction of CO<sub>2</sub>, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Sohaib, Q., Gómez-Coma, L., Albo, J., Druon-Bocquet, S., Iraiben, A., Younas, M., Sánchez-Marcano, J., CO<sub>2</sub> capture with room temperature ionic liquids coupled with membrane contactor, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Solá-Gutiérrez, C., Schröder, S., San Román, M.F., Ortiz, I., Formation of chlorinated organic compounds during triclosan electrochemical oxidation: Determination of PCDD/Fs, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Soriano, A., Gorri, D., Biegler, L.T., Urutiaga, A., Minimization of electrooxidation total costs through its integration with membrane pre-concentration. Perfluorohexanoic acid removal as a case study, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Teixeira, F.C., De Sá, A.I., Teixeira, A.P.S., Ortiz-Martínez, V.M., Ortiz, A., Ortiz, I., Rangel, C.M. New modified nafion-biphosphonic acid composite membranes for enhanced proton conductivity and PEMFC performance, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

## CONGRESS CONTRIBUTIONS

Tristán, C., Rumayor, M., Fallanza, M., Domínguez-Ramos, A., Ibáñez, R., Ortiz, I. Integration of SGE-RED in a SWRO plant: an evaluation of the potential environmental benefits using LCA, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Vadillo, J.M., Irabien, A., Design of an experimental CO<sub>2</sub> regeneration system in non-dispersive absorption processes using ionic liquids, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Yáñez, M., Relvas, F., Ortiz, A., Gorri, D., Mendes, A., Ortiz, I. High-purity hydrogen production by PSA technology from ammonia purge gas, presented at **3<sup>rd</sup> International Congress of Chemical Engineering – ANQUE-ICC3-CIBIQ**, June 19-21, 2019, Santander (Spain).

Yáñez, M., Relvas, F., Ortiz, A., Gorri, D., Mendes, A., Ortiz, I. Fuel cell grade hydrogen purification by PSA of purge gases from ammonia plants, presented at **7<sup>th</sup> Symposium on Hydrogen, Fuel Cells and Advanced Batteries – HYCELTEC**, July 1-3, 2019, Barcelona (Spain).

Ortiz-Martínez, V.M., Gómez-Coma, L., Ortiz, A., Ortiz, I., Copolymers of ionic liquids with MMA and HPFSVE as novel proton exchange membranes, presented at **3<sup>rd</sup> International MEEP Symposium 2019**, July 3-4, 2019, Lucerne (Switzerland).

Yáñez, M., Ortiz, A., Gorri, D., Ortiz, I., Hydrogen recovery from industrial gaseous waste streams using polymeric membranes, presented at **Fuel Cells, Electrolysers & H<sub>2</sub> Processing Forum – EFCF 2019**, July 2-5, 2019, Lucerne (Switzerland).

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## CONGRESS CONTRIBUTIONS

Corredor, J., Rivero, M.J., Ortiz, I. Photocatalytic membranes based on the use of Graphene oxide/TiO<sub>2</sub> composite for hydrogen production, presented at **14<sup>th</sup> International Conference on Catalysis in Membrane Reactors (ICCMR14)**, July 8-11, 2019, Eindhoven (The Netherlands).

Aldaco, R., Hoehn, D., Laso, J., Margallo, M., Butnar, I., Solano-Rodríguez, B., A consequential life cycle approach for the food waste energy management: assessing bioenergy generation on the electricity grid mix and related GHG emissions, presented at **VIII Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica, CILCA 2019**, July 15-20, 2019, Cartago (Costa Rica) Red Nacional de ACV de Costa Rica / Red Iberoamericana de Ciclo de Vida.

Aldaco, R., Blanca-Alcubilla, G., Bala, A., García-Aedo, M., Sanz, N., De Castro, N., Rodríguez, P., Fullana-i-Palmer, P., Airplane catering and catering waste: a life look, presented at **VIII Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica, CILCA 2019**, July 15-20, 2019, Cartago (Costa Rica) Red Nacional de ACV de Costa Rica / Red Iberoamericana de Ciclo de Vida.

Leivas, R., Laso, J., Margallo, M., Martínez, D., Aldaco, R., Towards eco-innovation under a life cycle approach: a case study for the spirit drinks sector, presented at **VIII Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica, CILCA 2019**, July 15-20, 2019, Cartago (Costa Rica) Red Nacional de ACV de Costa Rica / Red Iberoamericana de Ciclo de Vida.

Margallo, M., Laso, J., Aldaco, R., The NEPTUNUS project: Water-Energy-Seafood NEXUS. Eco-innovation and Circular Economy strategies in the Atlantic Area, presented at **VIII Conferencia Internacional de Análisis de Ciclo de Vida en Latinoamérica, CILCA 2019**, July 15-20, 2019, Cartago (Costa Rica) Red Nacional de ACV de Costa Rica / Red Iberoamericana de Ciclo de Vida.

Gómez-Ruiz, B., Tenorio, R., Brown, J., Higgins, C.P., Bellona, C., Strathmann, T.J., Diban, N., Urtiaga, A., Degradation of poly- and perfluoralkyl substances (PFASs) in aqueous film-forming foam by sequential UV oxidative/reductive treatments, presented at **6<sup>th</sup> European Conference on Environmental Applications of Advanced Oxidation Processes (EAAOP-6)**, July 26-30, 2019, Portoroz, Portores (Slovenia).

## CONGRESS CONTRIBUTIONS

Rancaño, L., Rivero, M.J., Ortiz, I., Energy assessment for the photocatalytic removal of pesticide metolachlor, presented at **6<sup>th</sup> European Conference on Environmental Applications of Advanced Oxidation Processes (EAAOP-6)**, July 26-30, 2019, Portoroz, Portores (Slovenia).

Rivero, M.J., Rancaño, L., Ortiz, I. Assessment of metolachlor degradation from landfill leachates by an MBR-Photocatalytic oxidation hybrid process, presented at **6<sup>th</sup> European Conference on Environmental Applications of Advanced Oxidation Processes (EAAOP-6)**, July 26-30, 2019, Portoroz, Portores (Slovenia).

Soriano, A., Gorri, D., Biegler, L. T., Urriaga, A., Optimization approach to the Integration of electrochemical Oxidation and nanofiltration for treatment of fluorinated micropollutants in water, presented at **6<sup>th</sup> European Conference on Environmental Applications of Advanced Oxidation Processes (EAAOP-6)**, July 26-30, 2019, Portoroz, Portores (Slovenia).

Ortiz, I. Retos de la Ingeniería Química en la sociedad del siglo XXI. Plenary conference at **36 Jornadas Nacionales de Ingeniería Química (JNIQ)**, September 4-6, 2019, Zaragoza (Spain).

González-Fernández, C., Bringas, E., Ortiz, I., Molecular design of Lipid A- LBP interaction as a tool for sepsis control, presented at **36 Jornadas Nacionales de Ingeniería Química (JNIQ)**, September 4-6, 2019, Zaragoza (Spain).

Vadillo, J.M., Irabien, A., Novel CO<sub>2</sub> regeneration system from room temperature ionic liquid (RTIL) in Chemical Absorption processes using hollow fibre membranecontactors, presented at **36 Jornadas Nacionales de Ingeniería Química (JNIQ)**, September 4-6, 2019, Zaragoza (Spain).

Arregoitia, C.A., Fallanza, M., Gorri, D., Ortiz, I., Addition of IL to pervaporation membranes for improving the recovery of butanol, presented at **4<sup>th</sup> International Conference on Ionic Liquids in Separation and Purification Technology**, September 8-11, 2019, Sitges (Spain).



## CONGRESS CONTRIBUTIONS

Ortiz-Martínez, V.M., Ortiz, A., Ortiz, I. New ionic liquid copolymer membranes based on [HSO<sub>3</sub>-BVIIm][TfO] with methacrylate and fluorinated monomers for fuel cell application, presented at **4<sup>th</sup> International Conference on Ionic Liquids in Separation and Purification Technology**, September 8-11, 2019, Sitges (Spain).

Sohaib, Q., Gómez-Coma, L., Albo, J., Druon-Bocquet, S., Albo, J., Younas, M., Sánchez-Marcano, J. CO<sub>2</sub> capture with room temperature ionic liquids coupled with membrane contactor, presented at **4<sup>th</sup> International Conference on Ionic Liquids in Separation and Purification Technology**, September 8-11, 2019, Sitges (Spain).

Zarca, G., Pardo, F., Urriaga, A., Composite polymer/ionic liquid membranes for the recovery of high global warming potential fluorinated refrigerants, presented at **4<sup>th</sup> International Conference on Ionic Liquids in Separation and Purification Technology**, September 8-11, 2019, Sitges (Spain).

Martínez-Mindhero, Ulloa, L., Bringas, E., San Román, M.F., López-Higuera, J.M., Cobo, A., Copper and nickel elemental composition analysis by laser-induced breakdown spectroscopy (LIBS) in metal recovery chelating resin, presented at **10<sup>th</sup> Euro-Mediterranean Symposium on Laser-Induced Breakdown Spectroscopy**, September 8-13, 2019, Brno (Czech Republic).

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Basauri, A., Giner, L., Fallanza, M., Moncalián, G., de la Cruz, F., Ortiz, I., Design of high performance micro-devices for endotoxins removal from biological fluids. Protein-lipid A binding step, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Díaz-Sainz, G., Álvarez-Guerra, M., Solla-Gullón, J., García-Cruz, L., Montiel, V., Irabien, A. Electroreduction of CO<sub>2</sub> to formate using carbon-supported Bi nanoparticles in Gas Diffusion Electrodes in a continuous mode, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

## CONGRESS CONTRIBUTIONS

Gómez-Coma, L., Ortiz-Martínez, V.M., Tristán, C., Fallanza, M., Ortiz, A., Ibáñez, R., Ortiz, I. Long-term assessment of energy recovery from salinity gradients, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

González-Fernández, C., Gómez-Pastora, J., Bringas, E., Ortiz, I., Novel design of magnetophoretic microdevices for extracorporeal sepsis treatment, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Ortiz, I. Separation Challenges in the Quest for Sustainability, **Plenary Conference at 12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Pardo, F., Zarca, G., Urriaga, A., Towards the recovery of refrigerant gases from end-of-life equipment: study of the separation performance of polymer membranes, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Romay, M., Diban, N., Urriaga, A., Addressing limitation to implement ternary phase diagram into systematic prediction of membrane morphology by phase inversion, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Rumayor, M., Domínguez-Ramos, A. Irabien, A., Climate change mitigation: A techno-economic assessment of the formic acid production by electrochemical reduction of CO<sub>2</sub>, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Schröder, S., Solá, C., San Román, M.F., Ortiz, I. Aqueous electrochemical oxidation of triclosan: the potential formation of PCDD/Fs, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Tristán, C., Rumayor, M., Fallanza, M., Domínguez-Ramos, A., Ibáñez, R., Ortiz, I. Environmental benefits of SGE-RED energy recovery using LCA, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

## CONGRESS CONTRIBUTIONS

Ulloa, L., Bringas, E., San Román, M.F., Selective recovery of nickel and copper from spent acids by chelating resins, presented at **12<sup>th</sup> European Congress of Chemical Engineering**, September 15-19, 2019, Florence (Italy).

Ruiz-Salmón, I., Margallo, M., Laso, J., Irabien, A., Aldaco, R. Neptunus Project: Providing opportunities for the transition to the circular economy of the seafood sector in the Atlantic Area, presented at **II Congreso Internacional de Jóvenes Investigadores del Mar**, October 1-4, 2019, Málaga (Spain). Campus de Excelencia Internacional del Mar / Universidad de Málaga.

Aldaco, R., Margallo, M., Bala, A., Fullana-i-Palmer, P., Bringing Value to the Toys Industry Through Ecodesign, presented at **14<sup>th</sup> Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES)**, October 1-6, 2019, Dubrovnik (Croatia).

Leivas, R., Margallo, M., Laso, J., Aldaco, R. About path to drinking the best spirits for the environment: factors assessment under a nexus energy-water approach, presented at **14<sup>th</sup> Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES)**, October 1-6, 2019, Dubrovnik (Croatia).

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Solá-Gutiérrez, C., Schröder, S., San Román, M.F., Ortiz, I. Photocatalytic degradation of triclosan, presented at **14<sup>th</sup> Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES)**, October 1-6, 2019, Dubrovnik (Croatia).

Álvarez-Guerra, M., Díaz-Sainz, G., Rumayor, M., Domínguez-Ramos, A., Irabien, A. Valorización electroquímica de CO<sub>2</sub>: Desarrollo de procesos continuos para la obtención de formiato, presented at **Aportando Valor al CO<sub>2</sub>**, Madrid, España. 2-3 octubre 2019.

## CONGRESS CONTRIBUTIONS

Cobo, S., Levis, J., Domínguez-Ramos, A., Irabien, A. A life cycle optimization framework for the sustainable design of circular municipal bio-waste management systems, presented at **29<sup>th</sup> ISWA World Congress**, October 7-9, 2019, Bilbao (Spain).

Hoehn, D., Laso, J., Margallo, M., Irabien, A., Solano-Rodríguez, B., Butnar, I., Aldaco, R. Towards Sustainable Management Of Food Waste Energy In Europe, presented at **22<sup>nd</sup> Conference on Process Integration for Energy Saving and Pollution Reduction (PRES'19)**, October 20-23, 2019, Aristotle University Of Thessaloniki, Creta (Greece).

Leivas, R., Laso, J., Hoehn, D., Fullana-i-Palmer, P., Aldaco, R. 1. Product vs corporate carbon footprint: a case study for the spirit drinks sector, presented at **22<sup>nd</sup> Conference on Process Integration for Energy Saving and Pollution Reduction (PRES'19)**, October 20-23, 2019, Aristotle University Of Thessaloniki, Creta (Greece).

Yáñez, M., Relvas, F., Ortiz, A., Gorri, D., Mendes, A., Ortiz, I. High-purity hydrogen production by PSA technology of purge gases from ammonia plants, presented at **Congreso Iberoamericano de Hidrógeno y Pilas de combustible (IBERCONAPPICE)**, October 23-25, 2019, Madrid (Spain).

Romano, A., Urtiaga, A.M., Ortiz, I. High performance ELOX in zero-discharge regeneration of RAS water, presented at **8<sup>th</sup> De Nora R&D Symposium Agenda, De Nora**, November 5-6, 2019. Milán (Italy).

Yáñez, M., Ortiz, A., Gorri, D., Brunaud, B., Grossmann, I.E., Ortiz, I. Contribution of upcycling surplus hydrogen to design of a sustainable supply chain: The case study of Northern Spain, presented at **AICHE Annual Meeting 2019**, November 10-15, 2019, Orlando (USA).

Diban, N., Güler, E., Kabay, N., Kumakiri, I., Ortiz, I., Pacula, A., Rivero, M.J., Tuncel, A., Urtiaga, A. Outperforming functionality: composite/mixed matrix porous materials in membrane-based processes, presented at **MEMTEK 2019**, November 18-20, 2019, Istanbul (Turkey).

## CONGRESS CONTRIBUTIONS

C. González-Fernández, A. Basauri, M. Fallanza, E. Bringas, I. Ortiz, “Contribution to the design of novel tailor-made magnetic biomaterials for blood detoxification through molecular dynamics simulations”, presented at **37 Congreso Anual de la Sociedad Española de Ingeniería Biomédica (CASEIB)**, November 27-29, 2019, Santander (Spain).

Herrero-González, M., Wolfson, A., Domínguez-Ramos, A., Ibañez, R., Irabien, A. Using the monetized footprint index for the environmental assessment of a solar-powered chemicals self-supplied desalination plant, presented at **4<sup>th</sup> International Conference on Desalination using Membrane Technology**, December 1-4, 2019, Perth (Australia).

Herrero-González, M., Díaz-Guridi, P., Domínguez-Ramos, A., Ibañez, R. Brine valorization into high-concentrated HCl and NaOH by means of photovoltaic solar electrodialysis with bipolar membranes, presented at **4<sup>th</sup> International Conference on Desalination using Membrane Technology**, December 1-4, 2019, Perth (Australia).

Tristán, C., Fallanza, M., Ibañez, R., Ortiz, I. Towards RED efficient integration into a SWRO desalination plant, presented at **4<sup>th</sup> International Conference on Desalination using Membrane Technology**, December 1-4, 2019, Perth (Australia).

Tristán, C., Rumayor, M., Domínguez-Ramos, A., Fallanza, M., Ibañez, R., Ortiz, I. Environmental assessment of reverse electrodialysis-seawater reverse osmosis hybrid concept, presented at **4<sup>th</sup> International Conference on Desalination using Membrane Technology**, December 1-4, 2019, Perth (Australia).



# TRANSFER UNIT SOSPROCAN



# TRANSFER UNIT SOSPROCAN

The Transfer Unit SOSPROCAN has a scientific and technological infrastructure, a set of last generation analytical techniques and a group of highly qualified staff, that enable to carry out a complete physico-chemical characterization of a wide range of samples. The available equipment allows comprehensive control of a high number of environmental parameters as well as monitoring compliance. The main aim of the Transfer Unit SOSPROCAN is to collaborate and make available the extensive analytical capabilities of the equipments to the productive sector and the Administration, offering a high quality service.

## Transfer Unit SOSPROCAN - Team



**Prof. Raquel Ibáñez**  
Head of the Analytical  
Services

### Technical Staff



**Oscar Primo**



**Beatriz Arce**

### Quality Staff



**Sonia Gómez**



**Gema Pérez**

# TRANSFER UNIT SOSPROCAN



**ENVIRONMENTAL PARAMETERS  
AND WATER CHARACTERIZATION**



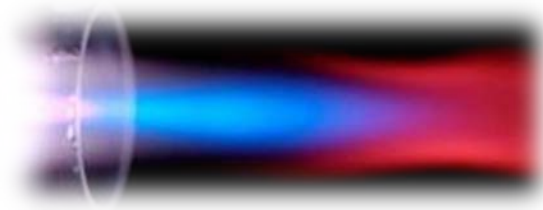
**SOLID  
CHARACTERISATION**



**CHROMATOGRAPHIC  
TECHNIQUES**



**PLASMA MASS  
SPECTROMETRY**



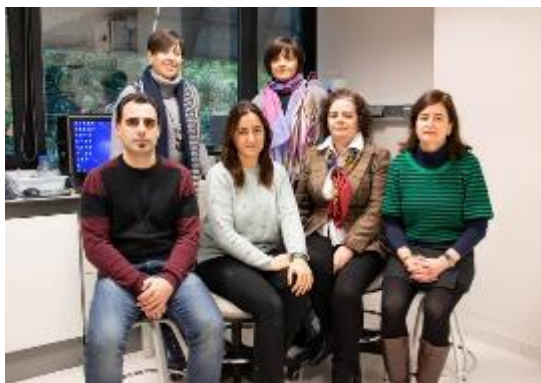
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# TRANSFER UNIT SOSPROCAN

## MAIN ACTIVITIES DURING 2019:



We are working on the obtention of the **Certification ISO 9001:2015 Standard** – Sistemas de Gestión de Calidad.



Training in the ISO 9001:2015 Standard, with the aim of adapting their quality management system to the ISO9001:2015 requirements.

### January, 2019



Dr. Sonia Gómez attended the course “Excel. Nivel avanzado” organized by the University of Cantabria.

### April, 2019

Dr. Oscar Primo attended the course “MS Excel para la Elaboración de Hojas de Cálculo, Formularios e Informes de Laboratorio” organized by Curso de Formación On-Line de Aula Científica, S.L.



# TRANSFER UNIT SOSPROCAN

## MAIN ACTIVITIES DURING 2019:

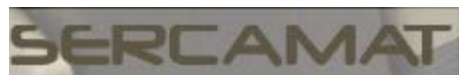
Meetings with potential customers



## CUSTOMERS 2019:



Cátedra de Física Médica  
Departamento de Ciencias  
Médicas y Quirúrgicas





# SCIENCE DISSEMINATION & SOCIAL EVENTS



### January 31<sup>st</sup>, 2019 – Meetings with Chemical Engineering

Students of the IES Santa Clara (Santander) visited the Chemical & Biomolecular Engineering Department. Prof. Raquel Ibáñez, responsible of the Chemical Engineering Studies, welcomed the students and presented a summary on several attractive and challenging projects that involve the participation of chemical engineers. Next, the students did a guided tour to the laboratories and had the opportunity to speak to the academic staff about the research topics that are developed in the Department.



### February 4<sup>th</sup>, 2019 – Meetings with Chemical Engineering

Students of the IES Marqués de Santillana (Torrelavega) visited the Chemical & Biomolecular Engineering Department. Raquel Ibáñez, responsible of the Chemical Engineering Studies in the ETSIIT, welcomed the students and introduced them a summary of the most attractive projects in which a Chemical Engineer could be involved. After that, the students visited the laboratories and had the opportunity to get more information about the research topics developed in the Department.



# February 2019

Researchers of the Chemical & Biomolecular Engineering Department delivered a series of conferences in the following schools and high schools of Cantabria Region, on the occasion of the International Day of Women and Girls in Science:

IES María Telo, Los Corrales de Buelna	IES Alberto Pico, Santander
IES La Granja, Heras	CEIP Gerardo Diego, Santander
IES Las Llamas, Santander	IES José Hierro, San Vicente de la Barquera
IES Dr. José Zapatero, Castro Urdiales	IES Marqués de Manzanedo, Santoña
IES El Alisal, Santander	IES Muriedas, Camargo
IES Augusto G. Linares, Santander	IES Leonardo Torres Quevedo, Santander
IES Foramontanoes, Cabezón de la Sal	IES Verdemar, Santander
IES Peñacastillo, Santander	IES Ataulfo Argenta, Castro Urdiales
IES Valle de Piélagos, Renedo	IES La Albericia, Santander
IES La Marina, Santa Cruz de Bezana	IES Fuente Fresnedo, Laredo
IES El Astillero, Astillero	







### March 8<sup>th</sup>, 2019 – Meetings with Chemical Engineering

Primary students of the CEIP Juan de la Cosa (Santoña) visited the Chemical & Biomolecular Engineering Department. During the visit, Elena Manteca and Gema Pérez, with the Chemical Engineering Degree students, Sandra Ceballos, Ana Fernández and Lidia Calva, prepared a science exhibition about the diverse activities of chemical engineers. Next, students dressed up like a chemical engineer working in a lab, and did a chromatography experiment aimed at separating the different colors that a pen ink has. Furthermore, they played a game related to the periodic table of elements.

### March 18<sup>th</sup>, 2019 – Meetings with Chemical Engineering

80 primary school students of the CEIP Jose María de Pereda (Los Corrales de Buelna) visited the ETSIIT of the University of Cantabria. During the visit they were welcomed by the Head of the School of Engineering. Raquel Ibáñez, Guillermo Díaz and Gema Pérez were in charge of presenting them the Chemical & Biomolecular Engineering Department, and prepared a science show about the work of chemical engineers.



### April 3<sup>rd</sup>, 2019 – Open Doors Day

The Open Doors Day of the University of Cantabria took place. The Chemical & Biomolecular Engineering Department participated in this event by organizing the visit of secondary students to the teaching and research labs. Students had the opportunity to meet the researchers and asked them about their doubts and curiosities.



### **May 3<sup>rd</sup>, 2019 – Crystallization Contest**

Clara Casado-Coterillo, on behalf of the Cantabria territorial section of the Spanish Royal Society of Chemistry (RSEQ) took part in the evaluation committee of the III Crystallization-at-School contest, that was held at the University of Cantabria. In this edition 18 groups formed by 3 students coming from secondary and high schools presented their flashy creations.

### **May 6<sup>th</sup>, 2019 – Meetings with Chemical Engineering**

Students of the secondary school Valle del Saja in Cabezón de la Sal (Cantabria) visited the Chemical & Biomolecular Engineering Department. Raquel Ibáñez delivered a talk about the role of Chemical Engineers around the world. Then, students visited the facilities of the Department to know about the different academic and research activities that are currently performed.



### **May 10<sup>th</sup>, 2019 – University of Cantabria Information Fair**

The University of Cantabria organized the day “Feria informativa UC”, with the aim of showing the academic offer of the UC to prospective students. Raquel Ibáñez, Eugenio Bringas and Marcos Fallanza were in charge of explaining to the audience the academic levels in the area of Chemical Engineering, including the degree, master and the doctorate program.



### May 17<sup>th</sup>, 2019 – Meetings with Chemical Engineering

Students of 4<sup>o</sup> ESO of the Atalaya School visited the Chemical & Biomolecular Engineering Department. Elena Manteca and Gema Pérez organized two experimental activities that students developed during the whole morning, consisting on the removal of copper from a wastewater sample by applying ion exchange technology, and a chromatographic separation by doing an experiment using chromatography paper. They watched how an ion chromatograph works.



### May 24<sup>th</sup>, 2019 – Ecodesign Exhibition

Students of the Master in Chemical Engineering who follow the course Life Cycle Assessment of Processes and Products showed their works in the hall of the ETSIIT of the University of Cantabria. The students used eco-design strategies and tools in their propose new eco-designed products.



### June 7<sup>th</sup>, 2019 – Science Week CEIP Sardinero

Elena Manteca and Gema Pérez participated in the celebration of the Science Week of the Sardinero Primary School. They organized a science show on chemical engineering. The fundamentals of chromatography analysis were explained, through a simple experiment to separate the colors of an ink. In a second experiment, students played with the periodic table of the chemical elements, in a way to celebrate the 150 anniversary of the periodic table.



### July 3<sup>rd</sup>, 2019 – ANQUE-ICCE3-CIBIQ

The Association of Chemistry and Chemical Engineering of Cantabria – AQUIQÁN organized an event to acknowledge all the volunteers that collaborated during the celebration of the ANQUE-ICCE 3 –CIBIQ, held in Santander last June 17-21, 2019. The volunteers received a diploma that recognized their participation in the organization of the event and a picture as a memory of the conference.



**July 22<sup>nd</sup>, 2019 – Celebration of the new births during Academic year 2018/2019**

The Chemical & Biomolecular Engineering Department congratulated the parents of the 8 recent births, in the Department. During the celebration the parents received a small present for the babies from their Department's colleagues



**July 24<sup>th</sup>, 2019 – SUMMER EXCURSION**

The members of the Chemical & Biomolecular Engineering Department spent the day in Ajo to welcome the 2019 summer. The day started with a hiking trail along the coast of Ajo Cape and after that all the participants had lunch together.



### February 11<sup>th</sup>, 2019

Prof. Raquel Ibáñez was interviewed by Gema Matanzas on the radio program “La Vida por Delante”, of the local radio “Radio Santoña”, on the occasion of the International Day of Women and Girls in Science.



### June 5<sup>th</sup>, 2019

Prof. Ignacio Fernández was interviewed by Javier Barbero on the radio program “Cantabria en la Onda”, of the radio “Onda Cero”, on the occasion of the Environment World Day.

### February 27<sup>th</sup>, 2019

Prof. Ignacio Fernández was interviewed by Javier Barbero on the radio program “Cantabria en la Onda”, of the radio “Onda Cero”, about the atmospheric pollution in Cantabria region.





**November 2018 – March 2019**

Ane Urtiaga and Andrea Arguillarena were involved in the project “Ciencia con Arte”, organized by the University of Cantabria. The aim was to bring the research of the UC closer to secondary school students in the region and promote scientific vocations. In this project, the students of Ocho de Marzo High School (Castro Urdiales) selected the project LIFE2ACID to prepare an artistic video using the "stop motion" animation technique.

The final video made by the students is available on: <https://www.youtube.com/watch?v=aaYVmLMX8Sk&t=2s>







**September 27<sup>th</sup>, 2019**

Researchers of the Chemical & Biomolecular Engineering Department participated in the event “European Researchers’ Night”, organized by the Scientific Culture and Innovation Unit of the University of Cantabria in Pombo Square, Santander. A total of 29 members of the four research groups (DEPRO, PAS, TAB and IPS) performed science shows and several activities aimed at making chemical engineering science closer to the general public, and the relevance of R&D in daily life.





### November 8<sup>th</sup>, 2019

82 students of the schools Jardín de África, Augusto G. Linares and Menendez Pelayo had the opportunity to visit the Department and speak to researchers that are working on different projects.



### November 1<sup>th</sup>, 2019

The NEPTUNUS project has been presented to high school students in two workshops during the Science Week of the University of Cantabria (UC). This time, we received students (4<sup>o</sup>ESO to 2<sup>o</sup> Bachillerato) from the IES Fuente Fresnedo (Laredo). The workshop involved the interaction with students in order to answer questions such as “What is sustainability and carbon footprint?” or “How does climate change affect fisheries and aquaculture?”. Besides, a case study about the life cycle assessment of the Cantabrian anchovy was presented. The students discovered which is the most ecofriendly anchovy product regarding the packaging (tin, plastic or glass) and surprising reactions were found.



### November 15<sup>th</sup>, 2019

74 students of the schools Reina Inmaculada, Las Llamas and Jose María Pereda, had the opportunity to visit the Department and speak to researchers that are working on different projects.



November 11<sup>th</sup>, 2019 - Workshop “What can a chemical engineer do against the climate change?”



November 14<sup>h</sup>, 2019 - Workshop “Nanomateriales aplicados a la energía y el medio ambiente”



November 25<sup>th</sup>, 2019 - Workshop “Blue energy: obteniendo energía sostenible del mar”





### December 3<sup>rd</sup>, 2019 – Meetings with Chemical Engineering

A group of 36 primary students of the school Cicero visited the ETSIIT of the University of Cantabria. The students visited the Chemical & Biomolecular Engineering Department, where they dressed up like a chemical engineer working in a lab, and did a chromatography experiment aimed at separating the different colors in pen ink, and learnt how the Chem-e-car, developed by chemical engineer students, works.



### December 19<sup>th</sup>, 2019 – Lecture at Santa Clara School

Alfredo Ortiz delivered a talk to secondary students of Santa Clara School, in which he highlighted the importance of Chemistry in the society and in the industrial and academic sector of Cantabria region and showed them some examples of applications of the different topics that they study at school.

# The COMPANY CHRISTMAS PARTY

On December 18<sup>th</sup>, 2019 the Chemical & Biomolecular Engineering Department celebrated the Christmas party at the Casino de Santander.







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